Aaron Meyers, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
750 W. Center St., Floor 3
West Bridgewater, MA 02379
Mobile: (774) 420-4202
ameyers@clinellc.com

DATE July 1, 2019

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

RE: Notice of Exempt Modification // Site Number: CT5273
2577 Main Street, Glastonbury, CT 06033 (Site Name: Glastonbury)
N 41.714389 // W -72.613028

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains nine (9) antennas at the 110-foot level of the existing 130-foot Lattice tower at 2577 Main Street, Glastonbury, CT 06033. The tower is owned by SBA Communications Corp. The property is owned by St. Paul's Roman Catholic Church. AT&T now intends to add three (3) antennas, add three (3) RRUS, add one (1) Surge Aresstor, replace three (3) Antennas, and replace three (3) RRUS for its LTE upgrade. This equipment would be installed at the 110-foot level of the tower.

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 Richard Johnson, Town Manager, as well as SBA Communications Corp., tower owner and St. Paul's Roman Catholic Church, ground owner.

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

Attached to accommodate this filing are construction drawings dated June 21, 2019 by Hudson Design Group, LLC, a structural analysis dated June 19, 2019 by Tower Engineering Solutions, a mount analysis dated April 17, 2019 by Hudson Design Group, LLC, and an Emissions Analysis Report dated June 16, 2019 by Centerline Communications, LLC.

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications 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 modifications 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 as shown in the attached structural analysis by Tower Engineering Solutions, dated June 19, 2019.

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

Sincerely,

Aaron Meyers, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
750 W. Center St., Floor 3
West Bridgewater, MA 02379
Mobile: (774) 420-4202
ameyers@centerlincommunications.com

Attachments

cc: Richard Johnson, Town Manager - as elected official
SBA Communications Corp. – as tower owner
St. Paul's Roman Catholic Church – as ground owner
Peter Carey – as Chief Building Official

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 130 ft Nudd Corporation Self Supporting Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT46126-A

Customer Site Name: Glastonbury-main St.

Carrier Name: AT&T (App#: 116132, v1)

Carrier Site ID / Name: CT5273 / Gastonbury NW

Site Location: 2577 Main Street

Glastonbury, Connecticut

Hartford County

Latitude: 41.714389

Longitude: -72.613028

Analysis Result:

Max Structural Usage: 95.8% [Pass]

Max Foundation Usage: 71% [Pass]

Additional Usage Caused by New Mount/Mount Modification: N/A

Report Prepared By : Ram Kodali

Tower Engineering Solutions
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Report Prepared By : Ram Kodali

Introduction

The purpose of this report is to summarize the analysis results on the 130 ft Nudd Corporation Self Supporting Tower to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Fred A Nudd Corp., Project # 6893B, dated 7/30/02
Foundation Drawing	Fred A Nudd Corp., Dwg # 99-6893-2, dated 9/16/99
Geotechnical Report	Tectonic Engineering Consultants P.C, Project # 1170.C057, dated 8/26/99
Modification Drawings	TowerCo, Job # 090403.05, dated 8/12/09; FDH, Project # 1338401400, dated 6/17/13; FDH, Project # 13SB5C1400, dated 9/10/13
Previous SA	AllPro, Job # 18-6523, dated 9/26/18

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 124 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 97 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.18, S_1 = 0.063

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

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
-	***128.0***	***2***	***LLPX310R - Panel***	***(3) T-Frames***	***(6) 5/16" in (2) 2" Conduit (4) ½" in (2) 1/2" Conduit***	***Sprint-Clearwire***
-		***1***	***840 10054 - Panel***			
-		***3***	***24" X 14" x 9" TMA***			
-		***1***	***Timing2000 -***			
-	***124.0***	***3***	***VHLP-2.5 - Dish***			
1	120.0	3	APXVSPP18-C-A20 - Panel	(3) Sector Frame	(4) 1-1/4" Fiber	Sprint Nextel
2		3	APXVTM14-C-120 - Panel			
3		4	ACU-A20-N RET			
4		3	1900 4X45 65 MHz RRU			
5		3	800 MHz 2X50W RRU			
6		3	TD-RRH8x20-25			
7		3	800 MHz filter			
	118.5	3	800 MHz filter			
-	110.0	6	Kathrein 800 10121 - Panel	(3) T-Frames	(18) 1 1/4" (36) 1/2" Fiber in (2) 3" Conduit (18) 3/8" in (1) 3" Conduit	AT&T
-		2	CCI HPA-65R-BUU-H6 - Panel			
-		1	CCI HPA-65R-BUU-H8 - Panel			
-		6	Powerwave LGP21401			
-		6	Powerwave LGP21901			
-		12	Kathrein 860 10025			
-		3	Ericsson RRUS-11			
-		3	Ericsson RRUS-12			
-		3	Ericsson RRUS-A2			
-		1	Raycap DC6-48-60-18-8F			
-		3	Andrew ATSBT-TOP-MF			
23	93.0	3	AIR 21 B2A B4P - Panel	(3) T-Frames w/ (3)2" x-strong pipe & SitePro1 SFS-V Stabilizer kit	(11) 1 5/8" (2) 1-1/4" Hybrid	T-Mobile
24		3	AIR 32 KRD9011461-B66A - Panel			
25		3	APXVAARR24_43-U-NA20 - Panel			
26		3	KRY 112 144/2			
27		3	4449 B71+B12			
28	80.0	6	BXA-70063/6CF - Panel	(3) T-Frames	(2) 1 5/8"	Verizon
29		6	BXA-171063/12CF - Panel			
30		6	RRH2x40-700U			
31		3	RRH2x40-AWS			
32		1	DB-T1-6Z-8AB-0Z			

<u>Important note:</u> All the existing antennas, coax lines, and mounts at 128' & 124' elevations must be removed prior to the addition of proposed antennas. These loads were not considered in the current analysis.

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
8	110.0	3	Kathrein 800 10121 - Panel	(3) T-Frames	(18) 1 1/4" (2) 1/2" Fiber (4) 3/4" DC (18) 3/8" in (1) 3" Conduit	AT&T
9		2	CCI HPA-65R-BUU-H6 - Panel			
10		1	CCI HPA-65R-BUU-H8 - Panel			
11		2	CCI HPA65R-BU6A - Panel			
12		1	CCI HPA65R-BU8A - Panel			
13		2	Kathrein 800 10965 - Panel			
14		1	Kathrein 800 10966 - Panel			
15		6	Powerwave LGP21401			
16		6	Powerwave LGP21901			
17		12	Kathrein 860 10025			
18		3	Ericsson RRUS-32			
19		3	Ericsson 4449 B5/B12			
20		3	Ericsson RRUS 8843 B2 B66A			
21		2	Raycap DC6-48-60-18-8F			
22		3	Andrew ATSBT-TOP-MF			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

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

Tower Component	Legs	Diagonals	Horizontals
Max. Usage:	**95.8%**	**91.1%**	**33.5%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Analysis Reactions	391.7	364.6	20.5

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

Operational Condition (Rigidity)

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.6031 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-G Standard under the design basic wind speed as specified in the Analysis Criteria. The results of this analysis will only be valid after the existing antennas, coax lines, and mounts at 128' & 124' elevations have been removed.

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 structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. 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 and/or 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.

4. 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.

5. 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.

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

Structure: CT46126-A-SBA

Site Name:	Glastonbury-main St.			**Code:**	EIA/TIA-222-G	6/19/2019
Type:	Self Support	**Base Shape:**	Triangle	**Basic WS:**	97.00	
Height:	130.00 (ft)	**Base Width:**	7.50	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	2.50	**Operational WS:**	60.00	Page: 1

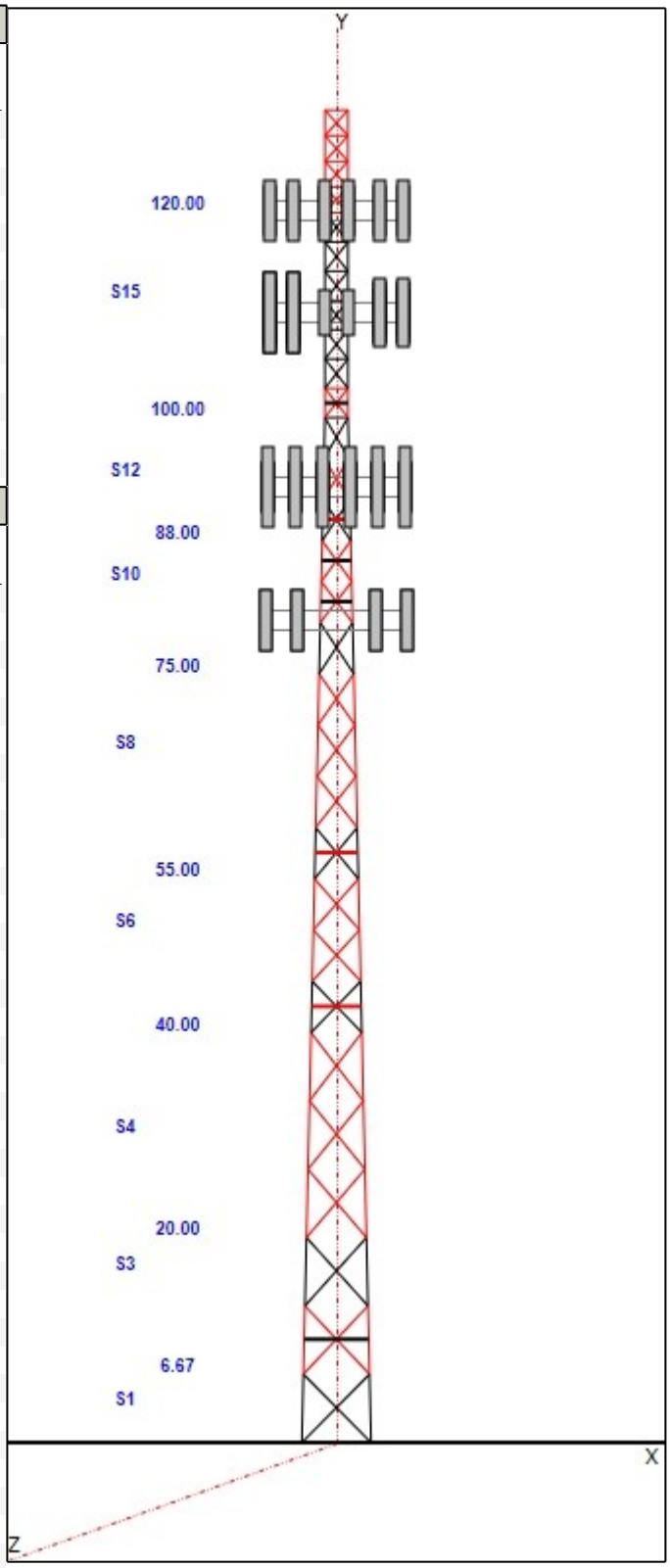
IES Tower Engineering Solutions

Section Properties

Sect	Leg Members	Diagonal Members	Horizontal Members
1	MOD 6PX+7.625x.301_1	DAE 2X2X0.1875	
2-3	PX 6" DIA PIPE	SAE 2X2X0.1875	
4	PX 6" DIA PIPE	DAE 1.75X1.75X.1875	
5	MOD 6PST+7.625x.301_	SAE 2X2X0.25	
6	MOD 6PST+7.625x.301_	DAE 1.5x1.5x.1875	
7-8	PST 6" DIA PIPE	DAE 1.5x1.5x.1875	
9	PST 6" DIA PIPE	SAE 2X2X0.25	
10	MOD 4"PST+5"PX1/2P	DAE 1.5x1.5x.1875	
11	PST 4" DIA PIPE	DAE 1.5x1.5x.1875	
12	PST 4" DIA PIPE	SAE 2X2X0.25	
13	PST 4" DIA PIPE	SAE 1.5X1.5X0.1875	SAE 1.25x1.25x0.1875
14-15	SOL 2" SOLID	SOL 3/4" SOLID	SAE 1.25x1.25x0.1875
16	SOL 1 1/2" SOLID	SOL 3/4" SOLID	SAE 1.25x1.25x0.1875

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
130.00	130.00	1	Beacon
120.00	118.50	3	Sector Frame
120.00	120.00	3	APXVSPP18-C-A20
120.00	120.00	3	APXVTM14-C-120
120.00	120.00	4	ACU-A20-N RET
120.00	120.00	3	1900 4X45 65 MHz RRU
120.00	120.00	3	800 MHz 2X50W RRU
120.00	120.00	3	TD-RRH8x20-25
120.00	120.00	3	800 MHz filter
118.50	118.50	3	800 MHz filter
110.00	108.50	3	T-Frames
110.00	110.00	3	800 10121
110.00	110.00	2	HPA-65R-BUU-H6
110.00	110.00	1	HPA-65R-BUU-H8
110.00	110.00	2	HPA65R-BU6A
110.00	110.00	1	HPA65R-BU8A
110.00	110.00	2	800 10965
110.00	110.00	1	800 10966
110.00	110.00	6	LGP21401
110.00	110.00	6	LGP21901
110.00	110.00	12	860 10025
110.00	110.00	3	RRUS-32
110.00	110.00	3	4449 B5/B12
110.00	110.00	3	8843 B2 B66A
110.00	110.00	2	DC6-48-60-18-8F
110.00	110.00	3	ATSBT-TOP-MF
93.00	91.50	3	T-Frames
93.00	93.00	3	AIR 21 B2A B4P
93.00	93.00	3	AIR 32 KRD9011461-B66A
93.00	93.00	3	APXVAARR24_43-U-NA20
93.00	93.00	3	KRY 112 144/2
93.00	93.00	3	4449 B71+B12
93.00	93.00	1	(3) SitePro1 SFS-V
93.00	93.00	1	(3) 2" X-Strong Pipe
80.00	80.00	3	T-Frames
80.00	80.00	6	BXA-70063/6CF



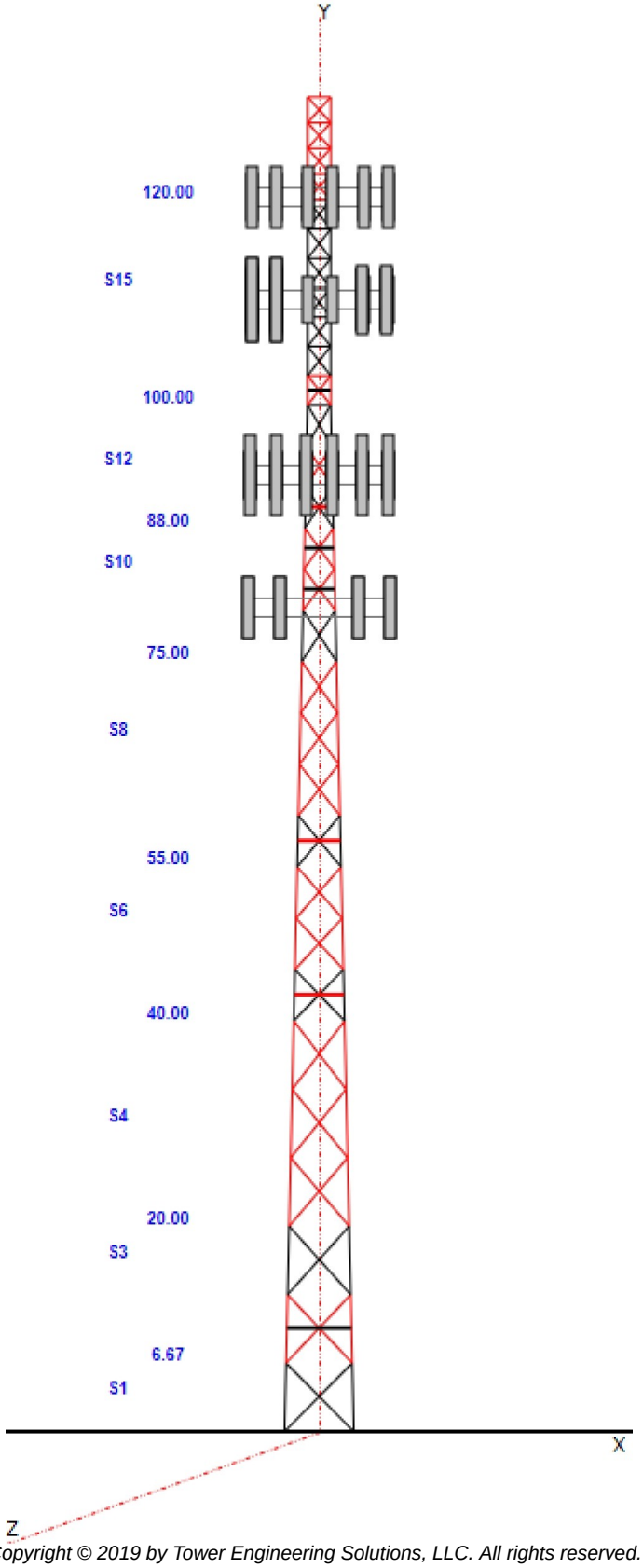
80.00	80.00	6	BXA-171063/12CF
80.00	80.00	6	RRH2x40-700U
80.00	80.00	3	RRH2x40-AWS
80.00	80.00	1	DB-T1-6Z-8AB-0Z

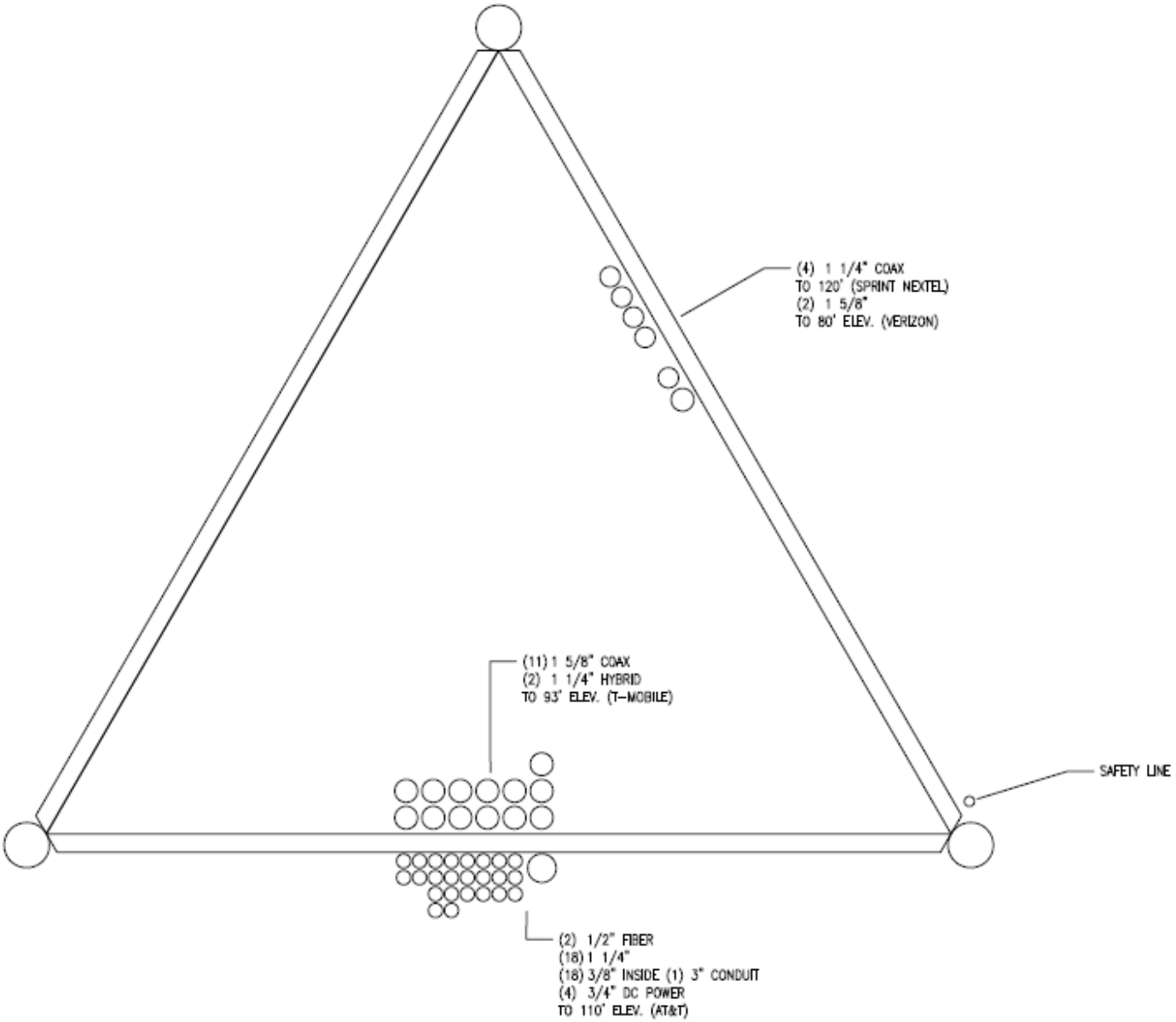
Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	130.00	1	Climbing Ladder
0.00	130.00	1	Safety Cable
0.00	130.00	2	W/G Ladder
0.00	130.00	1	W/G Ladder
0.00	120.00	4	1-1/4" Fiber
0.00	110.00	18	1 1/4" Coax
0.00	110.00	2	1/2" Fiber
0.00	110.00	1	3" Conduit
0.00	110.00	4	3/4" DC
0.00	93.00	11	1 5/8" Coax
0.00	93.00	2	1-1/4" Hybrid
0.00	80.00	2	1 5/8" Coax

Base Reactions

Leg			Overturning		
Max Uplift:	-364.58	(kips	Moment:	2467.06	(ft-kips)
Max Down:	391.72	(kips	Total Down:	35.68	(kips)
Max Shear:	20.45	(kips	Total Shear:	30.31	(kips)





Loading Summary

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 5	

Tower Engineering Solutions

Discrete Appurtenances Properties

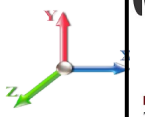
Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	Ice Weight (lb)	Ice CaAa (sf)	Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
130.00	Beacon	1	36.00	2.720	210.38	3.963	28.000	17.500	17.500	1.00	1.00	0.000
120.00	Sector Frame	3	450.00	14.000	905.37	23.108	0.000	0.000	0.000	0.75	0.75	-1.500
120.00	APXVSPP18-C-A20	3	57.00	8.020	330.31	9.728	72.000	11.800	7.000	0.80	0.83	0.000
120.00	APXVTM14-C-120	3	56.00	6.340	276.13	7.808	56.300	12.600	6.300	0.80	0.79	0.000
120.00	ACU-A20-N RET	4	1.00	0.140	6.56	0.524	4.000	2.000	3.500	0.80	0.67	0.000
120.00	1900 4X45 65 MHz RRU	3	60.00	2.710	164.52	4.346	25.100	11.100	10.700	0.80	0.67	0.000
120.00	800 MHz 2X50W RRU	3	64.00	2.400	163.92	3.849	19.000	13.000	12.200	0.80	0.67	0.000
120.00	TD-RRH8x20-25	3	70.00	4.050	221.90	5.126	26.100	18.600	6.700	0.80	0.67	0.000
120.00	800 MHz filter	3	68.30	3.460	185.36	5.161	19.200	18.500	10.400	0.80	0.67	0.000
118.50	800 MHz filter	3	68.30	3.460	185.36	5.161	19.200	18.500	10.400	0.80	0.67	0.000
110.00	T-Frames	3	450.00	14.000	905.37	23.108	0.000	0.000	0.000	0.75	0.75	-1.500
110.00	800 10121	3	46.30	5.150	234.21	6.529	54.500	10.300	5.900	0.80	0.79	0.000
110.00	HPA-65R-BUU-H6	2	51.00	9.660	387.73	11.459	72.000	14.800	9.000	0.80	0.85	0.000
110.00	HPA-65R-BUU-H8	1	68.00	12.980	463.13	15.108	92.400	14.800	7.400	0.80	0.79	0.000
110.00	HPA65R-BU6A	2	43.00	7.860	330.28	9.552	71.200	11.700	8.400	0.80	0.88	0.000
110.00	HPA65R-BU8A	1	54.00	11.230	417.52	13.396	96.000	11.700	7.600	0.80	0.86	0.000
110.00	800 10965	2	108.60	13.810	511.58	15.882	78.700	20.000	6.900	0.80	0.71	0.000
110.00	800 10966	1	125.70	17.360	608.25	19.729	96.000	20.000	6.900	0.80	0.72	0.000
110.00	LGP21401	6	14.10	1.290	46.46	2.372	14.400	9.200	2.600	0.80	0.67	0.000
110.00	LGP21901	6	5.50	0.230	15.45	0.706	4.000	6.000	3.000	0.80	0.67	0.000
110.00	860 10025	12	1.20	0.180	8.96	0.670	7.600	2.400	2.000	0.80	0.67	0.000
110.00	RRUS-32	3	77.00	3.870	233.15	4.362	29.900	13.300	9.500	0.80	0.75	0.000
110.00	4449 B5/B12	3	71.00	1.970	140.09	2.678	17.900	13.200	9.400	0.80	0.67	0.000
110.00	8843 B2 B66A	3	72.00	1.640	132.63	2.283	14.900	13.200	10.900	0.80	0.67	0.000
110.00	DC6-48-60-18-8F	2	31.80	0.920	111.82	1.487	24.000	11.000	11.000	0.90	0.90	0.000
110.00	ATSBT-TOP-MF	3	1.80	0.200	9.36	0.649	5.600	3.700	2.000	0.80	0.67	0.000
93.00	T-Frames	3	450.00	14.000	895.75	22.915	0.000	0.000	0.000	0.75	0.75	-1.500
93.00	AIR 21 B2A B4P	3	91.50	6.090	316.67	7.505	56.000	12.100	7.900	0.80	0.86	0.000
93.00	AIR 32 KRD9011461-B66A	3	132.20	6.510	375.85	7.956	56.600	12.900	8.700	0.80	0.87	0.000
93.00	APXVAARR24_43-U-NA20	3	128.00	20.240	675.60	22.671	95.900	24.000	7.800	0.80	0.70	0.000
93.00	KRY 112 144/2	3	11.00	0.410	24.66	1.012	6.900	6.100	2.700	0.80	0.67	0.000
93.00	4449 B71+B12	3	70.00	1.650	162.53	2.351	15.000	13.200	9.300	0.80	0.67	0.000
93.00	(3) SitePro1 SFS-V	1	140.00	3.700	362.88	8.609	0.000	0.000	0.000	0.75	1.00	0.000
93.00	(3) 2" X-Strong Pipe	1	650.00	15.500	1684.78	36.063	0.000	0.000	0.000	0.75	1.00	0.000
80.00	T-Frames	3	500.00	17.500	1371.30	34.883	0.000	0.000	0.000	0.75	0.75	0.000
80.00	BXA-70063/6CF	6	17.00	7.570	246.05	9.171	71.000	11.200	5.200	0.80	0.73	0.000
80.00	BXA-171063/12CF	6	15.00	4.780	176.28	6.353	72.400	6.100	4.100	0.80	0.84	0.000
80.00	RRH2x40-700U	6	50.00	2.120	141.84	3.356	20.900	12.200	10.600	0.80	0.67	0.000
80.00	RRH2x40-AWS	3	44.00	2.160	119.79	3.468	24.400	10.600	6.700	0.80	0.67	0.000
80.00	DB-T1-6Z-8AB-0Z	1	18.90	4.800	206.34	5.909	24.000	24.000	10.000	1.00	1.00	0.000
	Totals:	**127**	**11,304.60**		**34,615.88**						**Number of Appurtenances :**	**40**

Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	130.00	Climbing Ladder	1	1.50	6.90	100.00	2	Individual NR		N	1.00	1.00	
0.00	130.00	Safety Cable	1	0.38	0.27	100.00	2	Individual NR		N	1.00	1.00	
0.00	130.00	W/G Ladder	2	2.00	6.00	100.00	2,3	Individual NR		N	1.00	1.00	
0.00	130.00	W/G Ladder	1	2.00	6.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	120.00	1-1/4" Fiber	4	1.25	0.95	100.00	2	Individual IR		N	1.00	1.00	
0.00	110.00	1 1/4" Coax	18	1.55	0.66	33.30	1	Block		N	0.50	1.00	
0.00	110.00	1/2" Fiber	2	0.50	0.16	50.00	1	Block		N	1.00	1.00	0
0.00	110.00	3" Conduit	1	3.00	1.78	100.00	1	Individual NR		N	1.00	1.00	
0.00	110.00	3/4" DC	4	0.75	0.40	50.00	1	Block		N	0.50	1.00	
0.00	93.00	1 5/8" Coax	11	1.98	1.04	100.00	1	Block		N	0.50	1.00	0
0.00	93.00	1-1/4" Hybrid	2	1.25	0.95	50.00	1	Block		N	0.50	1.00	0
0.00	80.00	1 5/8" Coax	2	1.98	1.04	100.00	2	Individual IR		N	1.00	1.00	

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 7	



Tower Engineering Solutions

Load Case: 1.2D + 1.6W Normal Wind — 1.2D + 1.6W 97 mph Wind at Normal To Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

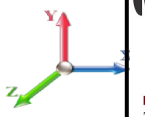
Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	17.40	3.092	8.48	0.00	0.22	2.54	1.00	1.00	0.00	7.19	31.76	0.00	1,786.2	0.0	431.82	402.23	834.05
2	10.0	17.40	4.190	7.36	0.00	0.23	2.50	1.00	1.00	0.00	7.99	31.76	0.00	1,400.8	0.0	473.13	402.17	875.30
3	16.7	17.77	2.959	7.36	0.00	0.21	2.55	1.00	1.00	0.00	6.70	31.76	0.00	1,316.4	0.0	412.81	410.71	823.51
4	30.0	20.11	7.367	22.09	0.00	0.22	2.52	1.00	1.00	0.00	18.43	95.28	0.00	4,273.9	0.0	1268.12	1394.36	2,662.49
5	42.5	21.64	3.592	6.36	0.00	0.33	2.22	1.00	1.00	0.00	6.97	23.82	0.00	1,192.1	0.0	454.61	375.11	829.72
6	50.0	22.39	3.218	12.71	0.00	0.28	2.34	1.00	1.00	0.00	9.53	47.64	0.00	2,177.6	0.0	680.35	776.34	1,456.69
7	57.5	23.06	2.325	5.52	0.00	0.30	2.29	1.00	1.00	0.00	5.25	23.82	0.00	894.2	0.0	377.01	399.76	776.77
8	67.5	23.85	4.449	16.57	0.00	0.30	2.30	1.00	1.00	0.00	13.16	71.46	0.00	2,574.8	0.0	980.55	1240.45	2,221.01
9	77.5	24.56	1.875	5.52	0.00	0.35	2.16	1.00	1.00	0.00	4.96	23.82	0.00	832.0	0.0	357.80	425.69	783.49
10	84.0	24.98	3.471	6.50	0.00	0.34	2.20	1.00	1.00	0.00	7.26	35.47	0.00	1,456.6	0.0	543.66	628.18	1,171.84
11	90.0	25.34	1.652	3.00	0.00	0.34	2.18	1.00	1.00	0.00	3.44	17.73	0.00	571.7	0.0	258.59	318.68	577.28
12	94.0	25.58	1.503	3.00	0.00	0.35	2.16	1.00	1.00	0.00	3.30	11.98	0.00	488.4	0.0	247.94	319.18	567.11
13	98.0	25.80	1.320	3.00	0.00	0.36	2.14	1.00	1.00	0.00	3.13	10.06	0.00	435.4	0.0	235.02	321.17	556.19
14	101.4	25.99	0.660	1.39	0.00	0.27	2.38	1.00	1.00	0.00	1.50	7.18	0.00	325.5	0.0	126.35	231.06	357.41
15	111.4	26.51	1.458	8.44	0.00	0.22	2.54	1.00	1.00	0.00	6.40	28.69	0.00	1,677.0	0.0	586.82	975.91	1,562.73
16	125.0	27.16	1.233	4.20	0.00	0.21	2.57	1.00	1.00	0.00	3.69	6.56	0.00	715.4	0.0	350.61	285.33	635.94
														22,118.0	**0.0**			**16,691.53**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 8	



Tower Engineering Solutions

Load Case: 1.2D + 1.6W 60° Wind — 1.2D + 1.6W 97 mph Wind at 60° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

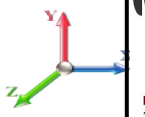
Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	17.40	3.092	8.48	0.00	0.22	2.54	0.80	1.00	0.00	6.57	31.76	0.00	1,786.2	0.0	394.68	402.23	796.91
2	10.0	17.40	4.190	7.36	0.00	0.23	2.50	0.80	1.00	0.00	7.16	31.76	0.00	1,400.8	0.0	423.54	402.17	825.70
3	16.7	17.77	2.959	7.36	0.00	0.21	2.55	0.80	1.00	0.00	6.11	31.76	0.00	1,316.4	0.0	376.36	410.71	787.07
4	30.0	20.11	7.367	22.09	0.00	0.22	2.52	0.80	1.00	0.00	16.96	95.28	0.00	4,273.9	0.0	1166.76	1394.36	2,561.12
5	42.5	21.64	3.592	6.36	0.00	0.33	2.22	0.80	1.00	0.00	6.25	23.82	0.00	1,192.1	0.0	407.74	375.11	782.85
6	50.0	22.39	3.218	12.71	0.00	0.28	2.34	0.80	1.00	0.00	8.89	47.64	0.00	2,177.6	0.0	634.42	776.34	1,410.76
7	57.5	23.06	2.325	5.52	0.00	0.30	2.29	0.80	1.00	0.00	4.79	23.82	0.00	894.2	0.0	343.65	399.76	743.41
8	67.5	23.85	4.449	16.57	0.00	0.30	2.30	0.80	1.00	0.00	12.27	71.46	0.00	2,574.8	0.0	914.24	1240.45	2,154.69
9	77.5	24.56	1.875	5.52	0.00	0.35	2.16	0.80	1.00	0.00	4.58	23.82	0.00	832.0	0.0	330.73	425.69	756.42
10	84.0	24.98	3.471	6.50	0.00	0.34	2.20	0.80	1.00	0.00	6.57	35.47	0.00	1,456.6	0.0	491.70	628.18	1,119.87
11	90.0	25.34	1.652	3.00	0.00	0.34	2.18	0.80	1.00	0.00	3.10	17.73	0.00	571.7	0.0	233.72	318.68	552.41
12	94.0	25.58	1.503	3.00	0.00	0.35	2.16	0.80	1.00	0.00	3.00	11.98	0.00	488.4	0.0	225.35	319.18	544.52
13	98.0	25.80	1.320	3.00	0.00	0.36	2.14	0.80	1.00	0.00	2.86	10.06	0.00	435.4	0.0	215.17	321.17	536.34
14	101.4	25.99	0.660	1.39	0.00	0.27	2.38	0.80	1.00	0.00	1.37	7.18	0.00	325.5	0.0	115.24	231.06	346.31
15	111.4	26.51	1.458	8.44	0.00	0.22	2.54	0.80	1.00	0.00	6.11	28.69	0.00	1,677.0	0.0	560.09	975.91	1,536.00
16	125.0	27.16	1.233	4.20	0.00	0.21	2.57	0.80	1.00	0.00	3.44	6.56	0.00	715.4	0.0	327.18	285.33	612.51
														22,118.0	**0.0**			**16,066.91**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 9	



Tower Engineering Solutions

Load Case: 1.2D + 1.6W 90° Wind — 1.2D + 1.6W 97 mph Wind at 90° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

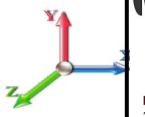
Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	17.40	3.092	8.48	0.00	0.22	2.54	0.85	1.00	0.00	6.73	31.76	0.00	1,786.2	0.0	403.96	402.23	806.19
2	10.0	17.40	4.190	7.36	0.00	0.23	2.50	0.85	1.00	0.00	7.37	31.76	0.00	1,400.8	0.0	435.94	402.17	838.10
3	16.7	17.77	2.959	7.36	0.00	0.21	2.55	0.85	1.00	0.00	6.26	31.76	0.00	1,316.4	0.0	385.47	410.71	796.18
4	30.0	20.11	7.367	22.09	0.00	0.22	2.52	0.85	1.00	0.00	17.33	95.28	0.00	4,273.9	0.0	1192.10	1394.36	2,586.46
5	42.5	21.64	3.592	6.36	0.00	0.33	2.22	0.85	1.00	0.00	6.43	23.82	0.00	1,192.1	0.0	419.46	375.11	794.57
6	50.0	22.39	3.218	12.71	0.00	0.28	2.34	0.85	1.00	0.00	9.05	47.64	0.00	2,177.6	0.0	645.91	776.34	1,422.24
7	57.5	23.06	2.325	5.52	0.00	0.30	2.29	0.85	1.00	0.00	4.91	23.82	0.00	894.2	0.0	351.99	399.76	751.75
8	67.5	23.85	4.449	16.57	0.00	0.30	2.30	0.85	1.00	0.00	12.49	71.46	0.00	2,574.8	0.0	930.82	1240.45	2,171.27
9	77.5	24.56	1.875	5.52	0.00	0.35	2.16	0.85	1.00	0.00	4.67	23.82	0.00	832.0	0.0	337.50	425.69	763.19
10	84.0	24.98	3.471	6.50	0.00	0.34	2.20	0.85	1.00	0.00	6.74	35.47	0.00	1,456.6	0.0	504.69	628.18	1,132.86
11	90.0	25.34	1.652	3.00	0.00	0.34	2.18	0.85	1.00	0.00	3.19	17.73	0.00	571.7	0.0	239.94	318.68	558.62
12	94.0	25.58	1.503	3.00	0.00	0.35	2.16	0.85	1.00	0.00	3.07	11.98	0.00	488.4	0.0	230.99	319.18	550.17
13	98.0	25.80	1.320	3.00	0.00	0.36	2.14	0.85	1.00	0.00	2.93	10.06	0.00	435.4	0.0	220.13	321.17	541.30
14	101.4	25.99	0.660	1.39	0.00	0.27	2.38	0.85	1.00	0.00	1.40	7.18	0.00	325.5	0.0	118.02	231.06	349.08
15	111.4	26.51	1.458	8.44	0.00	0.22	2.54	0.85	1.00	0.00	6.18	28.69	0.00	1,677.0	0.0	566.77	975.91	1,542.69
16	125.0	27.16	1.233	4.20	0.00	0.21	2.57	0.85	1.00	0.00	3.50	6.56	0.00	715.4	0.0	333.04	285.33	618.37
														22,118.0	**0.0**			**16,223.07**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 10	



Tower Engineering Solutions

Load Case: 0.9D + 1.6W Normal Wind — 0.9D + 1.6W 97 mph Wind at Normal To Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

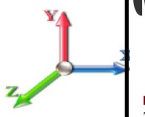
Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	17.40	3.092	8.48	0.00	0.22	2.54	1.00	1.00	0.00	7.19	31.76	0.00	1,339.6	0.0	431.82	402.23	834.05
2	10.0	17.40	4.190	7.36	0.00	0.23	2.50	1.00	1.00	0.00	7.99	31.76	0.00	1,050.6	0.0	473.13	402.17	875.30
3	16.7	17.77	2.959	7.36	0.00	0.21	2.55	1.00	1.00	0.00	6.70	31.76	0.00	987.3	0.0	412.81	410.71	823.51
4	30.0	20.11	7.367	22.09	0.00	0.22	2.52	1.00	1.00	0.00	18.43	95.28	0.00	3,205.4	0.0	1268.12	1394.36	2,662.49
5	42.5	21.64	3.592	6.36	0.00	0.33	2.22	1.00	1.00	0.00	6.97	23.82	0.00	894.1	0.0	454.61	375.11	829.72
6	50.0	22.39	3.218	12.71	0.00	0.28	2.34	1.00	1.00	0.00	9.53	47.64	0.00	1,633.2	0.0	680.35	776.34	1,456.69
7	57.5	23.06	2.325	5.52	0.00	0.30	2.29	1.00	1.00	0.00	5.25	23.82	0.00	670.6	0.0	377.01	399.76	776.77
8	67.5	23.85	4.449	16.57	0.00	0.30	2.30	1.00	1.00	0.00	13.16	71.46	0.00	1,931.1	0.0	980.55	1240.45	2,221.01
9	77.5	24.56	1.875	5.52	0.00	0.35	2.16	1.00	1.00	0.00	4.96	23.82	0.00	624.0	0.0	357.80	425.69	783.49
10	84.0	24.98	3.471	6.50	0.00	0.34	2.20	1.00	1.00	0.00	7.26	35.47	0.00	1,092.4	0.0	543.66	628.18	1,171.84
11	90.0	25.34	1.652	3.00	0.00	0.34	2.18	1.00	1.00	0.00	3.44	17.73	0.00	428.8	0.0	258.59	318.68	577.28
12	94.0	25.58	1.503	3.00	0.00	0.35	2.16	1.00	1.00	0.00	3.30	11.98	0.00	366.3	0.0	247.94	319.18	567.11
13	98.0	25.80	1.320	3.00	0.00	0.36	2.14	1.00	1.00	0.00	3.13	10.06	0.00	326.6	0.0	235.02	321.17	556.19
14	101.4	25.99	0.660	1.39	0.00	0.27	2.38	1.00	1.00	0.00	1.50	7.18	0.00	244.1	0.0	126.35	231.06	357.41
15	111.4	26.51	1.458	8.44	0.00	0.22	2.54	1.00	1.00	0.00	6.40	28.69	0.00	1,257.7	0.0	586.82	975.91	1,562.73
16	125.0	27.16	1.233	4.20	0.00	0.21	2.57	1.00	1.00	0.00	3.69	6.56	0.00	536.5	0.0	350.61	285.33	635.94
														16,588.5	**0.0**			**16,691.53**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 11	



Tower Engineering Solutions

Load Case: 0.9D + 1.6W 60° Wind — 0.9D + 1.6W 97 mph Wind at 60° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

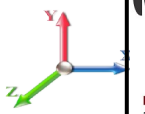
Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	17.40	3.092	8.48	0.00	0.22	2.54	0.80	1.00	0.00	6.57	31.76	0.00	1,339.6	0.0	394.68	402.23	796.91
2	10.0	17.40	4.190	7.36	0.00	0.23	2.50	0.80	1.00	0.00	7.16	31.76	0.00	1,050.6	0.0	423.54	402.17	825.70
3	16.7	17.77	2.959	7.36	0.00	0.21	2.55	0.80	1.00	0.00	6.11	31.76	0.00	987.3	0.0	376.36	410.71	787.07
4	30.0	20.11	7.367	22.09	0.00	0.22	2.52	0.80	1.00	0.00	16.96	95.28	0.00	3,205.4	0.0	1166.76	1394.36	2,561.12
5	42.5	21.64	3.592	6.36	0.00	0.33	2.22	0.80	1.00	0.00	6.25	23.82	0.00	894.1	0.0	407.74	375.11	782.85
6	50.0	22.39	3.218	12.71	0.00	0.28	2.34	0.80	1.00	0.00	8.89	47.64	0.00	1,633.2	0.0	634.42	776.34	1,410.76
7	57.5	23.06	2.325	5.52	0.00	0.30	2.29	0.80	1.00	0.00	4.79	23.82	0.00	670.6	0.0	343.65	399.76	743.41
8	67.5	23.85	4.449	16.57	0.00	0.30	2.30	0.80	1.00	0.00	12.27	71.46	0.00	1,931.1	0.0	914.24	1240.45	2,154.69
9	77.5	24.56	1.875	5.52	0.00	0.35	2.16	0.80	1.00	0.00	4.58	23.82	0.00	624.0	0.0	330.73	425.69	756.42
10	84.0	24.98	3.471	6.50	0.00	0.34	2.20	0.80	1.00	0.00	6.57	35.47	0.00	1,092.4	0.0	491.70	628.18	1,119.87
11	90.0	25.34	1.652	3.00	0.00	0.34	2.18	0.80	1.00	0.00	3.10	17.73	0.00	428.8	0.0	233.72	318.68	552.41
12	94.0	25.58	1.503	3.00	0.00	0.35	2.16	0.80	1.00	0.00	3.00	11.98	0.00	366.3	0.0	225.35	319.18	544.52
13	98.0	25.80	1.320	3.00	0.00	0.36	2.14	0.80	1.00	0.00	2.86	10.06	0.00	326.6	0.0	215.17	321.17	536.34
14	101.4	25.99	0.660	1.39	0.00	0.27	2.38	0.80	1.00	0.00	1.37	7.18	0.00	244.1	0.0	115.24	231.06	346.31
15	111.4	26.51	1.458	8.44	0.00	0.22	2.54	0.80	1.00	0.00	6.11	28.69	0.00	1,257.7	0.0	560.09	975.91	1,536.00
16	125.0	27.16	1.233	4.20	0.00	0.21	2.57	0.80	1.00	0.00	3.44	6.56	0.00	536.5	0.0	327.18	285.33	612.51
														16,588.5	**0.0**			**16,066.91**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 12	



Tower Engineering Solutions

Load Case: 0.9D + 1.6W 90° Wind — 0.9D + 1.6W 97 mph Wind at 90° From Face

Wind Load Factor: 1.60 — **Wind Importance Factor:** 1.00

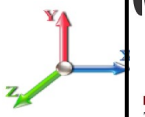
Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	17.40	3.092	8.48	0.00	0.22	2.54	0.85	1.00	0.00	6.73	31.76	0.00	1,339.6	0.0	403.96	402.23	806.19
2	10.0	17.40	4.190	7.36	0.00	0.23	2.50	0.85	1.00	0.00	7.37	31.76	0.00	1,050.6	0.0	435.94	402.17	838.10
3	16.7	17.77	2.959	7.36	0.00	0.21	2.55	0.85	1.00	0.00	6.26	31.76	0.00	987.3	0.0	385.47	410.71	796.18
4	30.0	20.11	7.367	22.09	0.00	0.22	2.52	0.85	1.00	0.00	17.33	95.28	0.00	3,205.4	0.0	1192.10	1394.36	2,586.46
5	42.5	21.64	3.592	6.36	0.00	0.33	2.22	0.85	1.00	0.00	6.43	23.82	0.00	894.1	0.0	419.46	375.11	794.57
6	50.0	22.39	3.218	12.71	0.00	0.28	2.34	0.85	1.00	0.00	9.05	47.64	0.00	1,633.2	0.0	645.91	776.34	1,422.24
7	57.5	23.06	2.325	5.52	0.00	0.30	2.29	0.85	1.00	0.00	4.91	23.82	0.00	670.6	0.0	351.99	399.76	751.75
8	67.5	23.85	4.449	16.57	0.00	0.30	2.30	0.85	1.00	0.00	12.49	71.46	0.00	1,931.1	0.0	930.82	1240.45	2,171.27
9	77.5	24.56	1.875	5.52	0.00	0.35	2.16	0.85	1.00	0.00	4.67	23.82	0.00	624.0	0.0	337.50	425.69	763.19
10	84.0	24.98	3.471	6.50	0.00	0.34	2.20	0.85	1.00	0.00	6.74	35.47	0.00	1,092.4	0.0	504.69	628.18	1,132.86
11	90.0	25.34	1.652	3.00	0.00	0.34	2.18	0.85	1.00	0.00	3.19	17.73	0.00	428.8	0.0	239.94	318.68	558.62
12	94.0	25.58	1.503	3.00	0.00	0.35	2.16	0.85	1.00	0.00	3.07	11.98	0.00	366.3	0.0	230.99	319.18	550.17
13	98.0	25.80	1.320	3.00	0.00	0.36	2.14	0.85	1.00	0.00	2.93	10.06	0.00	326.6	0.0	220.13	321.17	541.30
14	101.4	25.99	0.660	1.39	0.00	0.27	2.38	0.85	1.00	0.00	1.40	7.18	0.00	244.1	0.0	118.02	231.06	349.08
15	111.4	26.51	1.458	8.44	0.00	0.22	2.54	0.85	1.00	0.00	6.18	28.69	0.00	1,257.7	0.0	566.77	975.91	1,542.69
16	125.0	27.16	1.233	4.20	0.00	0.21	2.57	0.85	1.00	0.00	3.50	6.56	0.00	536.5	0.0	333.04	285.33	618.37
														16,588.5	**0.0**			**16,223.07**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 13	



Tower Engineering Solutions

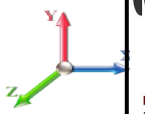
Load Case: 1.2D + 1.0Di + 1.0Wi Normal Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	4.62	3.092	17.27	8.79	0.37	2.12	1.00	1.00	1.59	13.87	54.43	3.53	3,978.0	2191.8	115.80	139.55	255.35
2	10.0	4.62	4.190	17.03	9.66	0.41	2.05	1.00	1.00	1.77	15.07	56.47	3.94	3,712.0	2311.2	121.57	144.44	266.01
3	16.7	4.72	2.959	17.39	10.02	0.41	2.05	1.00	1.00	1.87	14.06	57.52	4.15	3,587.1	2270.7	115.90	151.15	267.05
4	30.0	5.34	7.367	53.08	30.99	0.44	1.99	1.00	1.00	1.98	42.08	176.31	13.21	12,329.	8056.0	380.69	498.12	878.81
5	42.5	5.75	3.592	14.80	8.44	0.58	1.82	1.00	1.00	2.05	14.40	44.66	3.42	3,366.2	2174.1	128.02	102.65	230.67
6	50.0	5.95	3.218	29.50	16.78	0.55	1.85	1.00	1.00	2.08	24.20	89.89	6.95	6,517.1	4339.4	226.01	230.35	456.36
7	57.5	6.13	2.325	13.85	8.33	0.58	1.81	1.00	1.00	2.11	12.49	45.19	3.52	3,182.1	2287.9	118.06	109.50	227.55
8	67.5	6.34	4.449	41.25	24.68	0.61	1.80	1.00	1.00	2.15	35.26	136.42	10.74	9,071.3	6496.6	342.10	326.20	668.30
9	77.5	6.53	1.875	13.64	8.12	0.68	1.78	1.00	1.00	2.18	12.78	45.72	3.63	2,841.5	2009.5	125.87	90.64	216.51
10	84.0	6.64	3.471	19.95	13.45	0.72	1.78	1.00	1.00	2.20	19.93	67.15	5.86	4,953.1	3496.5	199.91	116.91	316.82
11	90.0	6.73	1.652	9.64	6.63	0.75	1.79	1.00	1.00	2.21	9.85	33.67	2.95	2,297.3	1725.6	100.83	52.30	153.12
12	94.0	6.80	1.503	9.58	6.58	0.78	1.80	1.00	1.00	2.22	9.85	24.50	2.96	1,741.3	1252.9	102.58	46.31	148.89
13	98.0	6.86	1.320	10.45	7.45	0.88	1.90	1.00	1.00	2.23	11.24	21.46	2.97	1,620.3	1184.9	124.15	25.75	149.90
14	101.4	6.91	0.660	7.29	5.90	0.92	1.95	1.00	1.00	2.24	7.82	15.36	2.13	1,215.9	890.4	89.37	13.08	102.44
15	111.4	7.04	1.458	44.14	35.71	0.87	1.89	1.00	1.00	2.26	43.27	66.86	9.14	5,752.6	4075.7	489.45	91.56	581.01
16	125.0	7.22	1.233	27.35	23.15	0.95	2.01	1.00	1.00	2.28	28.87	17.99	3.81	2,608.9	1893.5	355.09	12.13	367.22
														68,774.6	**46656.6**			**5,286.01**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 14	



Tower Engineering Solutions

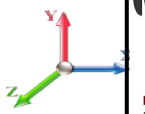
Load Case: 1.2D + 1.0Di + 1.0Wi 60° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	4.62	3.092	17.27	8.79	0.37	2.12	0.80	1.00	1.59	13.25	54.43	3.53	3,978.0	2191.8	110.64	139.55	250.19
2	10.0	4.62	4.190	17.03	9.66	0.41	2.05	0.80	1.00	1.77	14.23	56.47	3.94	3,712.0	2311.2	114.81	144.44	259.24
3	16.7	4.72	2.959	17.39	10.02	0.41	2.05	0.80	1.00	1.87	13.47	57.52	4.15	3,587.1	2270.7	111.02	151.15	262.17
4	30.0	5.34	7.367	53.08	30.99	0.44	1.99	0.80	1.00	1.98	40.61	176.31	13.21	12,329.	8056.0	367.36	498.12	865.48
5	42.5	5.75	3.592	14.80	8.44	0.58	1.82	0.80	1.00	2.05	13.68	44.66	3.42	3,366.2	2174.1	121.63	102.65	224.28
6	50.0	5.95	3.218	29.50	16.78	0.55	1.85	0.80	1.00	2.08	23.56	89.89	6.95	6,517.1	4339.4	220.00	230.35	450.35
7	57.5	6.13	2.325	13.85	8.33	0.58	1.81	0.80	1.00	2.11	12.03	45.19	3.52	3,182.1	2287.9	113.67	109.50	223.16
8	67.5	6.34	4.449	41.25	24.68	0.61	1.80	0.80	1.00	2.15	34.37	136.42	10.74	9,071.3	6496.6	333.46	326.20	659.67
9	77.5	6.53	1.875	13.64	8.12	0.68	1.78	0.80	1.00	2.18	12.40	45.72	3.63	2,841.5	2009.5	122.17	90.64	212.82
10	84.0	6.64	3.471	19.95	13.45	0.72	1.78	0.80	1.00	2.20	19.23	67.15	5.86	4,953.1	3496.5	192.95	116.91	309.86
11	90.0	6.73	1.652	9.64	6.63	0.75	1.79	0.80	1.00	2.21	9.52	33.67	2.95	2,297.3	1725.6	97.44	52.30	149.74
12	94.0	6.80	1.503	9.58	6.58	0.78	1.80	0.80	1.00	2.22	9.55	24.50	2.96	1,741.3	1252.9	99.45	46.31	145.76
13	98.0	6.86	1.320	10.45	7.45	0.88	1.90	0.80	1.00	2.23	10.97	21.46	2.97	1,620.3	1184.9	121.23	25.75	146.99
14	101.4	6.91	0.660	7.29	5.90	0.92	1.95	0.80	1.00	2.24	7.69	15.36	2.13	1,215.9	890.4	87.86	13.08	100.94
15	111.4	7.04	1.458	44.14	35.71	0.87	1.89	0.80	1.00	2.26	42.97	66.86	9.14	5,752.6	4075.7	486.15	91.56	577.71
16	125.0	7.22	1.233	27.35	23.15	0.95	2.01	0.80	1.00	2.28	28.63	17.99	3.81	2,608.9	1893.5	352.06	12.13	364.19
														68,774.6	**46656.6**			**5,202.53**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 15	



Tower Engineering Solutions

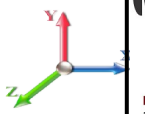
Load Case: 1.2D + 1.0Di + 1.0Wi 90° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	4.62	3.092	17.27	8.79	0.37	2.12	0.85	1.00	1.59	13.40	54.43	3.53	3,978.0	2191.8	111.93	139.55	251.48
2	10.0	4.62	4.190	17.03	9.66	0.41	2.05	0.85	1.00	1.77	14.44	56.47	3.94	3,712.0	2311.2	116.50	144.44	260.94
3	16.7	4.72	2.959	17.39	10.02	0.41	2.05	0.85	1.00	1.87	13.62	57.52	4.15	3,587.1	2270.7	112.24	151.15	263.39
4	30.0	5.34	7.367	53.08	30.99	0.44	1.99	0.85	1.00	1.98	40.98	176.31	13.21	12,329.	8056.0	370.69	498.12	868.81
5	42.5	5.75	3.592	14.80	8.44	0.58	1.82	0.85	1.00	2.05	13.86	44.66	3.42	3,366.2	2174.1	123.23	102.65	225.88
6	50.0	5.95	3.218	29.50	16.78	0.55	1.85	0.85	1.00	2.08	23.72	89.89	6.95	6,517.1	4339.4	221.50	230.35	451.85
7	57.5	6.13	2.325	13.85	8.33	0.58	1.81	0.85	1.00	2.11	12.15	45.19	3.52	3,182.1	2287.9	114.76	109.50	224.26
8	67.5	6.34	4.449	41.25	24.68	0.61	1.80	0.85	1.00	2.15	34.59	136.42	10.74	9,071.3	6496.6	335.62	326.20	661.82
9	77.5	6.53	1.875	13.64	8.12	0.68	1.78	0.85	1.00	2.18	12.50	45.72	3.63	2,841.5	2009.5	123.10	90.64	213.74
10	84.0	6.64	3.471	19.95	13.45	0.72	1.78	0.85	1.00	2.20	19.41	67.15	5.86	4,953.1	3496.5	194.69	116.91	311.60
11	90.0	6.73	1.652	9.64	6.63	0.75	1.79	0.85	1.00	2.21	9.60	33.67	2.95	2,297.3	1725.6	98.29	52.30	150.58
12	94.0	6.80	1.503	9.58	6.58	0.78	1.80	0.85	1.00	2.22	9.62	24.50	2.96	1,741.3	1252.9	100.23	46.31	146.54
13	98.0	6.86	1.320	10.45	7.45	0.88	1.90	0.85	1.00	2.23	11.04	21.46	2.97	1,620.3	1184.9	121.96	25.75	147.71
14	101.4	6.91	0.660	7.29	5.90	0.92	1.95	0.85	1.00	2.24	7.72	15.36	2.13	1,215.9	890.4	88.24	13.08	101.31
15	111.4	7.04	1.458	44.14	35.71	0.87	1.89	0.85	1.00	2.26	43.05	66.86	9.14	5,752.6	4075.7	486.97	91.56	578.54
16	125.0	7.22	1.233	27.35	23.15	0.95	2.01	0.85	1.00	2.28	28.69	17.99	3.81	2,608.9	1893.5	352.82	12.13	364.95
														68,774.6	**46656.6**			**5,223.40**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 16	



Tower Engineering Solutions

Load Case: 1.0D + 1.0W Normal Wind — 1.0D + 1.0W 60 mph Wind at Normal To Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

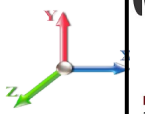
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	6.66	3.092	8.48	0.00	0.22	2.54	1.00	1.00	0.00	7.89	31.76	0.00	1,488.5	0.0	113.30	96.19	209.49
2	10.0	6.66	4.190	7.36	0.00	0.23	2.50	1.00	1.00	0.00	8.46	31.76	0.00	1,167.3	0.0	119.77	96.17	215.94
3	16.7	6.80	2.959	7.36	0.00	0.21	2.55	1.00	1.00	0.00	7.21	31.76	0.00	1,097.0	0.0	106.17	98.21	204.39
4	30.0	7.69	7.367	22.09	0.00	0.22	2.52	1.00	1.00	0.00	20.10	95.28	0.00	3,561.6	0.0	330.60	333.44	664.04
5	42.5	8.28	3.592	6.36	0.00	0.33	2.22	1.00	1.00	0.00	7.35	23.82	0.00	993.4	0.0	114.68	89.70	204.38
6	50.0	8.57	3.218	12.71	0.00	0.28	2.34	1.00	1.00	0.00	10.46	47.64	0.00	1,814.7	0.0	178.55	185.65	364.20
7	57.5	8.82	2.325	5.52	0.00	0.30	2.29	1.00	1.00	0.00	5.59	23.82	0.00	745.2	0.0	95.90	95.60	191.50
8	67.5	9.13	4.449	16.57	0.00	0.30	2.30	1.00	1.00	0.00	14.19	71.46	0.00	2,145.6	0.0	252.95	296.63	549.58
9	77.5	9.40	1.875	5.52	0.00	0.35	2.16	1.00	1.00	0.00	5.23	23.82	0.00	693.4	0.0	90.35	101.80	192.15
10	84.0	9.56	3.471	6.50	0.00	0.34	2.20	1.00	1.00	0.00	7.44	35.47	0.00	1,213.8	0.0	133.27	150.22	283.49
11	90.0	9.70	1.652	3.00	0.00	0.34	2.18	1.00	1.00	0.00	3.49	17.73	0.00	476.4	0.0	62.91	76.21	139.12
12	94.0	9.79	1.503	3.00	0.00	0.35	2.16	1.00	1.00	0.00	3.36	11.98	0.00	407.0	0.0	60.34	76.33	136.66
13	98.0	9.87	1.320	3.00	0.00	0.36	2.14	1.00	1.00	0.00	3.18	10.06	0.00	362.8	0.0	57.23	76.80	134.03
14	101.4	9.94	0.660	1.39	0.00	0.27	2.38	1.00	1.00	0.00	1.50	7.18	0.00	271.2	0.0	30.21	55.25	85.47
15	111.4	10.14	1.458	8.44	0.00	0.22	2.54	1.00	1.00	0.00	6.40	28.69	0.00	1,397.5	0.0	140.33	233.37	373.70
16	125.0	10.39	1.233	4.20	0.00	0.21	2.57	1.00	1.00	0.00	3.69	6.56	0.00	596.2	0.0	83.84	68.23	152.07
														18,431.7	**0.0**			**4,100.20**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 17	



Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60° Wind — 1.0D + 1.0W 60 mph Wind at 60° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

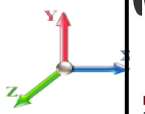
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	6.66	3.092	8.48	0.00	0.22	2.54	0.80	1.00	0.00	7.27	31.76	0.00	1,488.5	0.0	104.42	96.19	200.60
2	10.0	6.66	4.190	7.36	0.00	0.23	2.50	0.80	1.00	0.00	7.62	31.76	0.00	1,167.3	0.0	107.91	96.17	204.08
3	16.7	6.80	2.959	7.36	0.00	0.21	2.55	0.80	1.00	0.00	6.62	31.76	0.00	1,097.0	0.0	97.46	98.21	195.67
4	30.0	7.69	7.367	22.09	0.00	0.22	2.52	0.80	1.00	0.00	18.62	95.28	0.00	3,561.6	0.0	306.36	333.44	639.80
5	42.5	8.28	3.592	6.36	0.00	0.33	2.22	0.80	1.00	0.00	6.63	23.82	0.00	993.4	0.0	103.47	89.70	193.17
6	50.0	8.57	3.218	12.71	0.00	0.28	2.34	0.80	1.00	0.00	9.82	47.64	0.00	1,814.7	0.0	167.57	185.65	353.22
7	57.5	8.82	2.325	5.52	0.00	0.30	2.29	0.80	1.00	0.00	5.12	23.82	0.00	745.2	0.0	87.92	95.60	183.52
8	67.5	9.13	4.449	16.57	0.00	0.30	2.30	0.80	1.00	0.00	13.30	71.46	0.00	2,145.6	0.0	237.09	296.63	533.73
9	77.5	9.40	1.875	5.52	0.00	0.35	2.16	0.80	1.00	0.00	4.86	23.82	0.00	693.4	0.0	83.88	101.80	185.67
10	84.0	9.56	3.471	6.50	0.00	0.34	2.20	0.80	1.00	0.00	6.75	35.47	0.00	1,213.8	0.0	120.84	150.22	271.06
11	90.0	9.70	1.652	3.00	0.00	0.34	2.18	0.80	1.00	0.00	3.16	17.73	0.00	476.4	0.0	56.96	76.21	133.17
12	94.0	9.79	1.503	3.00	0.00	0.35	2.16	0.80	1.00	0.00	3.06	11.98	0.00	407.0	0.0	54.93	76.33	131.26
13	98.0	9.87	1.320	3.00	0.00	0.36	2.14	0.80	1.00	0.00	2.92	10.06	0.00	362.8	0.0	52.48	76.80	129.28
14	101.4	9.94	0.660	1.39	0.00	0.27	2.38	0.80	1.00	0.00	1.37	7.18	0.00	271.2	0.0	27.56	55.25	82.81
15	111.4	10.14	1.458	8.44	0.00	0.22	2.54	0.80	1.00	0.00	6.11	28.69	0.00	1,397.5	0.0	133.94	233.37	367.31
16	125.0	10.39	1.233	4.20	0.00	0.21	2.57	0.80	1.00	0.00	3.44	6.56	0.00	596.2	0.0	78.24	68.23	146.47
														18,431.7	**0.0**			**3,950.83**

Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 18	



Tower Engineering Solutions

Load Case: 1.0D + 1.0W 90° Wind — 1.0D + 1.0W 60 mph Wind at 90° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

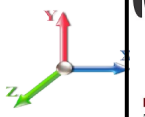
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.3	6.66	3.092	8.48	0.00	0.22	2.54	0.85	1.00	0.00	7.42	31.76	0.00	1,488.5	0.0	106.64	96.19	202.82
2	10.0	6.66	4.190	7.36	0.00	0.23	2.50	0.85	1.00	0.00	7.83	31.76	0.00	1,167.3	0.0	110.87	96.17	207.04
3	16.7	6.80	2.959	7.36	0.00	0.21	2.55	0.85	1.00	0.00	6.77	31.76	0.00	1,097.0	0.0	99.64	98.21	197.85
4	30.0	7.69	7.367	22.09	0.00	0.22	2.52	0.85	1.00	0.00	18.99	95.28	0.00	3,561.6	0.0	312.42	333.44	645.86
5	42.5	8.28	3.592	6.36	0.00	0.33	2.22	0.85	1.00	0.00	6.81	23.82	0.00	993.4	0.0	106.27	89.70	195.98
6	50.0	8.57	3.218	12.71	0.00	0.28	2.34	0.85	1.00	0.00	9.98	47.64	0.00	1,814.7	0.0	170.31	185.65	355.96
7	57.5	8.82	2.325	5.52	0.00	0.30	2.29	0.85	1.00	0.00	5.24	23.82	0.00	745.2	0.0	89.92	95.60	185.51
8	67.5	9.13	4.449	16.57	0.00	0.30	2.30	0.85	1.00	0.00	13.53	71.46	0.00	2,145.6	0.0	241.06	296.63	537.69
9	77.5	9.40	1.875	5.52	0.00	0.35	2.16	0.85	1.00	0.00	4.95	23.82	0.00	693.4	0.0	85.50	101.80	187.29
10	84.0	9.56	3.471	6.50	0.00	0.34	2.20	0.85	1.00	0.00	6.92	35.47	0.00	1,213.8	0.0	123.95	150.22	274.17
11	90.0	9.70	1.652	3.00	0.00	0.34	2.18	0.85	1.00	0.00	3.25	17.73	0.00	476.4	0.0	58.45	76.21	134.66
12	94.0	9.79	1.503	3.00	0.00	0.35	2.16	0.85	1.00	0.00	3.13	11.98	0.00	407.0	0.0	56.28	76.33	132.61
13	98.0	9.87	1.320	3.00	0.00	0.36	2.14	0.85	1.00	0.00	2.99	10.06	0.00	362.8	0.0	53.67	76.80	130.47
14	101.4	9.94	0.660	1.39	0.00	0.27	2.38	0.85	1.00	0.00	1.40	7.18	0.00	271.2	0.0	28.22	55.25	83.48
15	111.4	10.14	1.458	8.44	0.00	0.22	2.54	0.85	1.00	0.00	6.18	28.69	0.00	1,397.5	0.0	135.53	233.37	368.91
16	125.0	10.39	1.233	4.20	0.00	0.21	2.57	0.85	1.00	0.00	3.50	6.56	0.00	596.2	0.0	79.64	68.23	147.87
														18,431.7	**0.0**			**3,988.17**

Force/Stress Compression Summary

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 19	



Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	6.667	MOD - 6PX+7.625x.301_1/2P	-381.89	1.2D + 1.6W Normal Wind	6.67	100	100	100	36.87	54.00	519.92	73.5	Member X
2	13.33	PX - 6" DIA PIPE	-368.25	1.2D + 1.6W Normal Wind	6.67	50	50	50	18.27	54.00	397.62	92.6	Member X
3	20	PX - 6" DIA PIPE	-352.10	1.2D + 1.6W Normal Wind	6.67	100	100	100	36.55	54.00	367.37	95.8	Member X
4	40	PX - 6" DIA PIPE	-334.65	1.2D + 1.6W Normal Wind	6.67	100	100	100	36.54	54.00	367.38	91.1	Member X
5	45	MOD - 6PST+7.625x.301_.5P	-281.97	1.2D + 1.6W Normal Wind	5.00	50	50	50	13.90	54.00	435.04	64.8	Member X
6	55	MOD - 6PST+7.625x.301_.5P	-265.48	1.2D + 1.6W Normal Wind	5.00	100	100	100	27.80	54.00	415.57	63.9	Member X
7	60	PST - 6" DIA PIPE	-232.23	1.2D + 1.6W Normal Wind	5.00	50	50	50	13.34	54.00	267.40	86.8	Member X
8	75	PST - 6" DIA PIPE	-215.33	1.2D + 1.6W Normal Wind	5.00	100	100	100	26.68	54.00	256.37	84.0	Member X
9	80	PST - 6" DIA PIPE	-154.54	1.2D + 1.6W Normal Wind	5.00	100	100	100	26.68	54.00	256.37	60.3	Member X
10	88	MOD - 4"PST+5"PX1/2P	-136.85	1.2D + 1.6W Normal Wind	4.00	50	50	50	15.25	54.00	297.27	46.0	Member X
11	92	PST - 4" DIA PIPE	-103.91	1.2D + 1.6W Normal Wind	4.00	50	50	50	15.90	54.00	151.02	68.8	Member X
12	96	PST - 4" DIA PIPE	-89.71	1.2D + 1.6W Normal Wind	4.00	100	100	100	31.80	54.00	142.24	63.1	Member X
13	100	PST - 4" DIA PIPE	-75.45	1.2D + 1.6W Normal Wind	4.00	100	100	100	31.80	54.00	142.24	53.0	Member X
14	102.8	SOL - 2" SOLID	-62.90	1.2D + 1.6W Normal Wind	2.86	50	50	50	34.28	45.00	117.76	53.4	Member X
15	120	SOL - 2" SOLID	-50.21	1.2D + 1.6W Normal Wind	2.86	100	100	100	68.57	45.00	93.37	53.8	Member X
16	130	SOL - 1 1/2" SOLID	-1.89	1.2D + 1.6W Normal Wind	2.50	100	100	100	80.00	45.00	46.97	4.0	Member X

Splices

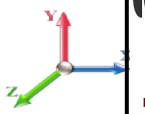
		Top Splice						Bottom Splice					
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	6.667	1.2D + 1.6W Normal Wind	376.10	0.00	0.0			1.2D + 1.6W Normal Wind	391.84	0.00			
2	13.33	1.2D + 1.6W Normal Wind	360.78	0.00	0.0			1.2D + 1.6W Normal Wind	376.10	0.00			
3	20	1.2D + 1.6W Normal Wind	344.33	0.00	0.0			1.2D + 1.6W Normal Wind	360.78	0.00			
4	40	1.2D + 1.6W Normal Wind	289.12	0.00	0.0			1.2D + 1.6W Normal Wind	344.33	0.00		1 A325	8
5	45	1.2D + 1.6W Normal Wind	274.27	0.00	0.0			1.2D + 1.6W Normal Wind	289.12	0.00		1 A325	8
6	55	1.2D + 1.6W Normal Wind	241.97	0.00	0.0			1.2D + 1.6W Normal Wind	274.27	0.00			
7	60	1.2D + 1.6W Normal Wind	224.46	0.00	0.0			1.2D + 1.6W Normal Wind	241.97	0.00			
8	75	1.2D + 1.6W Normal Wind	166.06	0.00	0.0			1.2D + 1.6W Normal Wind	224.46	0.00		1 A325	8
9	80	1.2D + 1.6W Normal Wind	145.18	0.00	0.0			1.2D + 1.6W Normal Wind	166.06	0.00			
10	88	1.2D + 1.6W Normal Wind	113.56	0.00	0.0			1.2D + 1.6W Normal Wind	145.18	0.00		1 A325	8
11	92	1.2D + 1.6W Normal Wind	97.02	0.00	0.0			1.2D + 1.6W Normal Wind	113.56	0.00			
12	96	1.2D + 1.6W Normal Wind	82.97	0.00	0.0			1.2D + 1.6W Normal Wind	97.02	0.00			
13	100	1.2D + 1.6W Normal Wind	71.03	0.00	0.0			1.2D + 1.6W Normal Wind	82.97	0.00			
14	102.8	1.2D + 1.6W Normal Wind	57.85	0.00	0.0			1.2D + 1.6W Normal Wind	71.03	0.00		3/4 A325	6
15	120	1.2D + 1.0Di + 1.0Wi 90° Wind	4.50	0.00	0.0			1.2D + 1.6W Normal Wind	57.85	0.00			
16	130	1.2D + 1.0Di + 1.0Wi 90° Wind	0.27	0.00	0.0			1.2D + 1.0Di + 1.0Wi 90° Wind	4.50	0.00		3/4 A325	4

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	6.66										0.00	0	0				
2	13.3										0.00	0	0				
3	20										0.00	0	0				
4	40										0.00	0	0				
5	45										0.00	0	0				
6	55										0.00	0	0				
7	60										0.00	0	0				
8	75										0.00	0	0				
9	80										0.00	0	0				

Force/Stress Compression Summary

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 20	



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HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
10	88										0.00	0	0				
11	92										0.00	0	0				
12	96										0.00	0	0				
13	100	SAE - 1.25x1.25x0.1875	-1.41	0.9D + 1.6W Normal Wind	2.50	100	100	100	122.95	36.00	6.34	1	1	7.95	7.50	22	Member Z
14	102.	SAE - 1.25x1.25x0.1875	-1.61	0.9D + 1.6W Normal Wind	2.50	100	100	100	86.07	36.00	9.52	0	0			17	Member Z
15	120	SAE - 1.25x1.25x0.1875	-1.20	0.9D + 1.6W Normal Wind	2.50	100	100	100	86.07	36.00	9.52	0	0			13	Member Z
16	130	SAE - 1.25x1.25x0.1875	-0.17	0.9D + 1.6W 60° Wind	2.50	100	100	100	86.07	36.00	9.52	0	0			2	Member Z

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	6.66	DAE - 2X2X0.1875	-7.20	1.2D + 1.6W Normal Wind	9.91	50	50	25	96.96	36.00	28.25	2	2	15.90	37.1	45	Bolt Shear
2	13.3	SAE - 2X2X0.1875	-6.64	0.9D + 1.6W 90° Wind	9.67	50	50	50	147.21	36.00	7.40	1	1	9.72	7.50	90	Member Z
3	20	SAE - 2X2X0.1875	-6.84	0.9D + 1.6W 90° Wind	9.43	50	50	50	143.59	36.00	7.78	1	1	9.72	7.50	91	Bolt Bear
4	40	DAE - 1.75X1.75X.1875	-7.46	1.2D + 1.6W 90° Wind	8.75	50	50	25	97.77	36.00	24.29	2	2	15.90	37.1	47	Bolt Shear
5	45	SAE - 2X2X0.25	-6.21	0.9D + 1.6W 90° Wind	7.34	50	50	50	114.49	36.00	15.27	1	1	7.95	10.0	78	Bolt Shear
6	55	DAE - 1.5x1.5x.1875	-6.58	1.2D + 1.6W 90° Wind	6.98	50	50	25	92.77	36.00	21.83	2	2	15.90	37.1	41	Bolt Shear
7	60	DAE - 1.5x1.5x.1875	-7.01	1.2D + 1.6W 90° Wind	6.81	50	50	25	90.48	36.00	22.32	2	2	15.90	37.1	44	Bolt Shear
8	75	DAE - 1.5x1.5x.1875	-7.79	1.2D + 1.6W 90° Wind	6.33	50	50	25	84.03	36.00	23.68	2	2	15.90	37.1	49	Bolt Shear
9	80	SAE - 2X2X0.25	-7.49	1.2D + 1.6W 90° Wind	6.18	50	50	25	60.85	36.00	25.06	2	2	15.90	24.8	47	Bolt Shear
10	88	DAE - 1.5x1.5x.1875	-5.82	1.2D + 1.6W 90° Wind	5.12	50	50	25	80.44	36.00	24.43	2	2	15.90	37.1	37	Bolt Shear
11	92	DAE - 1.5x1.5x.1875	-6.26	1.2D + 1.6W 90° Wind	5.00	50	50	25	66.42	36.00	27.23	2	2	15.90	37.1	39	Bolt Shear
12	96	SAE - 2X2X0.25	-4.65	1.2D + 1.6W 90° Wind	4.88	50	50	50	86.20	36.00	20.60	1	1	7.95	10.0	59	Bolt Shear
13	100	SAE - 1.5X1.5X0.1875	-4.45	1.2D + 1.6W Normal Wind	4.77	50	50	50	103.28	36.00	9.79	1	1	7.95	7.50	59	Bolt Bear
14	102.	SOL - 3/4" SOLID	-5.35	1.2D + 1.6W Normal Wind	3.80	50	50	50	109.34	36.00	7.63	0	0				T-Only
15	120	SOL - 3/4" SOLID	-4.99	1.2D + 1.6W Normal Wind	3.80	50	50	50	109.34	36.00	7.63	0	0				T-Only
16	130	SOL - 3/4" SOLID	-0.30	1.2D + 1.6W Normal Wind	3.54	50	50	50	101.82	36.00	8.29	0	0				T-Only

Force/Stress Tension Summary

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	6.667	MOD - 6PX+7.625x.301_1/2P	356.68	0.9D + 1.6W 60° Wind	54	578.83	61.6	Member
2	13.333	PX - 6" DIA PIPE	344.09	0.9D + 1.6W 60° Wind	54	408.24	84.3	Member
3	20	PX - 6" DIA PIPE	329.14	0.9D + 1.6W 60° Wind	54	408.24	80.6	Member
4	40	PX - 6" DIA PIPE	312.99	0.9D + 1.6W 60° Wind	54	408.24	76.7	Member
5	45	MOD - 6PST+7.625x.301_.5P	263.47	0.9D + 1.6W 60° Wind	54	441.73	59.6	Member
6	55	MOD - 6PST+7.625x.301_.5P	248.13	0.9D + 1.6W 60° Wind	54	441.73	56.2	Member
7	60	PST - 6" DIA PIPE	217.31	0.9D + 1.6W 60° Wind	54	271.19	80.1	Member
8	75	PST - 6" DIA PIPE	201.23	0.9D + 1.6W 60° Wind	54	271.19	74.2	Member
9	80	PST - 6" DIA PIPE	143.15	0.9D + 1.6W 60° Wind	54	271.19	52.8	Member
10	88	MOD - 4"PST+5"PX1/2P	127.45	0.9D + 1.6W 60° Wind	54	302.78	42.1	Member
11	92	PST - 4" DIA PIPE	96.48	0.9D + 1.6W 60° Wind	54	154.06	62.6	Member
12	96	PST - 4" DIA PIPE	84.35	0.9D + 1.6W 60° Wind	54	154.06	54.8	Member
13	100	PST - 4" DIA PIPE	70.87	0.9D + 1.6W 60° Wind	54	154.06	46.0	Member
14	102.85	SOL - 2" SOLID	58.74	0.9D + 1.6W 60° Wind	45	127.23	46.2	Member
15	120	SOL - 2" SOLID	46.36	0.9D + 1.6W 60° Wind	45	127.23	36.4	Member
16	130	SOL - 1 1/2" SOLID	1.51	0.9D + 1.6W 60° Wind	45	71.57	2.1	Member

Splices

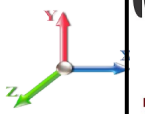
		Top Splice						Bottom Splice					
Sect	Top Elev	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	Load Case	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts
1	6.667	0.9D + 1.6W 60° Wind	350.22	0.00	0.0			0.9D + 1.6W 60° Wind	365.2	0.00			
2	13.333	0.9D + 1.6W 60° Wind	335.87	0.00	0.0			0.9D + 1.6W 60° Wind	350.2	0.00			
3	20	0.9D + 1.6W 60° Wind	320.66	0.00	0.0			0.9D + 1.6W 60° Wind	335.8	0.00			
4	40	0.9D + 1.6W 60° Wind	269.21	0.00	0.0			0.9D + 1.6W 60° Wind	320.6	424.08	75.6	1 A325	8
5	45	0.9D + 1.6W 60° Wind	255.47	0.00	0.0			0.9D + 1.6W 60° Wind	269.2	424.08	63.5	1 A325	8
6	55	0.9D + 1.6W 60° Wind	225.35	0.00	0.0			0.9D + 1.6W 60° Wind	255.4	0.00			
7	60	0.9D + 1.6W 60° Wind	208.95	0.00	0.0			0.9D + 1.6W 60° Wind	225.3	0.00			
8	75	0.9D + 1.6W 60° Wind	153.38	0.00	0.0			0.9D + 1.6W 60° Wind	208.9	424.08	49.3	1 A325	8
9	80	0.9D + 1.6W 60° Wind	133.41	0.00	0.0			0.9D + 1.6W 60° Wind	153.3	0.00			
10	88	0.9D + 1.6W 60° Wind	105.05	0.00	0.0			0.9D + 1.6W 60° Wind	133.4	424.08	31.5	1 A325	8
11	92	0.9D + 1.6W 60° Wind	88.92	0.00	0.0			0.9D + 1.6W 60° Wind	105.0	0.00			
12	96	0.9D + 1.6W 60° Wind	77.41	0.00	0.0			0.9D + 1.6W 60° Wind	88.92	0.00			
13	100	0.9D + 1.6W 60° Wind	66.08	0.00	0.0			0.9D + 1.6W 60° Wind	77.41	0.00			
14	102.85	0.9D + 1.6W 60° Wind	53.36	0.00	0.0			0.9D + 1.6W 60° Wind	66.08	180.60	36.6	3/4 A325	6
15	120	0.9D + 1.6W 60° Wind	1.31	0.00	0.0			0.9D + 1.6W 60° Wind	53.36	0.00			
16	130		0.00	0.00	0.0			0.9D + 1.6W 60° Wind	1.31	120.40	1.1	3/4 A325	4

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	6.667	-			36	0.00	0	0					
2	13.333	-			36	0.00	0	0					
3	20	-			36	0.00	0	0					
4	40	-			36	0.00	0	0					
5	45	-			36	0.00	0	0					
6	55	-			36	0.00	0	0					
7	60	-			36	0.00	0	0					
8	75	-			36	0.00	0	0					
9	80	-			36	0.00	0	0					
10	88	-			36	0.00	0	0					

Force/Stress Tension Summary

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 22	



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HORIZONTAL MEMBERS

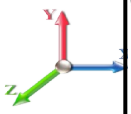
Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
11	92	-			36	0.00	0	0					
12	96	-			36	0.00	0	0					
13	100	SAE - 1.25x1.25x0.1875	1.75	1.2D + 1.6W 60° Wind	36	13.78	1	1	7.95	7.50	5.21	33.5	Blck Shear
14	102.85	SAE - 1.25x1.25x0.1875	2.02	1.2D + 1.6W 60° Wind	36	14.06	0	0				14.4	Member
15	120	SAE - 1.25x1.25x0.1875	1.57	1.2D + 1.6W 60° Wind	36	14.06	0	0				11.2	Member
16	130	SAE - 1.25x1.25x0.1875	0.21	1.2D + 1.6W 90° Wind	36	14.06	0	0				1.5	Member

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	6.667	DAE - 2X2X0.1875	6.17	0.9D + 1.6W 60° Wind	36	46.33	2	2	15.90	37.19	23.25	38.8	Bolt Shear
2	13.333	SAE - 2X2X0.1875	5.59	0.9D + 1.6W 90° Wind	36	23.00	1	1	9.72	7.50	7.25	77.1	Blck Shear
3	20	SAE - 2X2X0.1875	5.94	0.9D + 1.6W 90° Wind	36	23.00	1	1	9.72	7.50	7.25	82.0	Blck Shear
4	40	DAE - 1.75X1.75X.1875	6.45	0.9D + 1.6W 90° Wind	36	40.18	2	2	15.90	37.19	21.21	40.6	Bolt Shear
5	45	SAE - 2X2X0.25	5.74	1.2D + 1.6W 90° Wind	36	30.46	1	1	7.95	10.01	9.66	72.2	Bolt Shear
6	55	DAE - 1.5x1.5x.1875	6.13	1.2D + 1.6W 90° Wind	36	34.34	2	2	15.90	37.19	19.17	38.6	Bolt Shear
7	60	DAE - 1.5x1.5x.1875	6.21	1.2D + 1.6W 90° Wind	36	34.34	2	2	15.90	37.19	19.17	39.0	Bolt Shear
8	75	DAE - 1.5x1.5x.1875	7.22	1.2D + 1.6W 90° Wind	36	34.34	2	2	15.90	37.19	19.17	45.4	Bolt Shear
9	80	SAE - 2X2X0.25	6.99	1.2D + 1.6W 90° Wind	36	27.30	2	2	15.90	24.80	15.50	45.1	Blck Shear
10	88	DAE - 1.5x1.5x.1875	5.66	1.2D + 1.6W 90° Wind	36	34.34	2	2	15.90	37.19	19.17	35.6	Bolt Shear
11	92	DAE - 1.5x1.5x.1875	5.74	1.2D + 1.6W 90° Wind	36	34.34	2	2	15.90	37.19	19.17	36.1	Bolt Shear
12	96	SAE - 2X2X0.25	4.43	1.2D + 1.6W 90° Wind	36	30.46	1	1	7.95	10.01	9.66	55.7	Bolt Shear
13	100	SAE - 1.5X1.5X0.1875	4.07	1.2D + 1.6W 60° Wind	36	17.17	1	1	7.95	7.50	5.21	78.2	Blck Shear
14	102.85	SOL - 3/4" SOLID	5.02	1.2D + 1.6W 60° Wind	36	14.31	0	0				35.1	Member
15	120	SOL - 3/4" SOLID	4.75	1.2D + 1.6W 90° Wind	36	14.31	0	0				33.2	Member
16	130	SOL - 3/4" SOLID	0.40	0.9D + 1.6W 60° Wind	36	14.31	0	0				2.8	Member

Seismic Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 23	



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Load Case: 1.2D + 1.0E

Dead Load Factor	1.20	**Sds**	0.192	**Ss**	0.1800	**Fa**	1.6000	**Ke**	0.0000
Seismic Load Factor	1.00	**Sd1**	0.100	**S1**	0.0630	**Fv**	2.4000	**Kg**	0.0000
Seismic Importance Factor	1.00	**SA**	0.118	**R**	3.0000	**Vs**	1.4082	**f1**	1.1739

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	3.33	1488.4	0.00	0.03	0.01	4.07
2	10.00	1167.3	0.01	0.06	0.03	7.07
3	16.67	1097.0	0.03	0.07	0.04	8.69
4	30.00	3561.5	0.10	0.07	0.04	38.56
5	42.50	993.42	0.20	0.06	0.02	13.96
6	50.00	1814.7	0.28	0.05	0.01	28.86
7	57.50	745.16	0.37	0.03	0.01	12.85
8	67.50	2145.6	0.51	-0.02	0.01	38.40
9	77.50	2836.2	0.67	-0.08	0.02	50.60
10	84.00	1213.8	0.79	-0.11	0.05	22.49
11	90.00	476.44	0.91	-0.12	0.09	9.90
12	94.00	3845.1	0.99	-0.11	0.13	90.97
13	98.00	362.84	1.07	-0.08	0.17	10.16
14	101.43	271.24	1.15	-0.04	0.22	8.97
15	111.43	7085.0	1.39	0.26	0.42	400.71
16	125.00	632.15	1.75	1.31	0.89	70.92

Seismic Section Forces

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

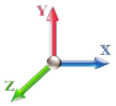
Load Case: 0.9D + 1.0E

Dead Load Factor	0.90	**Sds**	0.192	**Ss**	0.1800	**Fa**	1.6000	**Ke**	0.0000
Seismic Load Factor	1.00	**Sd1**	0.100	**S1**	0.0630	**Fv**	2.4000	**Kg**	0.0000
Seismic Importance Factor	1.00	**SA**	0.118	**R**	3.0000	**Vs**	1.4082	**f1**	1.1739

Sect #	Elev (ft)	Wz (lb)	a	b	c	Lateral Fsz (lb)
1	3.33	1488.4	0.00	0.03	0.01	4.07
2	10.00	1167.3	0.01	0.06	0.03	7.07
3	16.67	1097.0	0.03	0.07	0.04	8.69
4	30.00	3561.5	0.10	0.07	0.04	38.56
5	42.50	993.42	0.20	0.06	0.02	13.96
6	50.00	1814.7	0.28	0.05	0.01	28.86
7	57.50	745.16	0.37	0.03	0.01	12.85
8	67.50	2145.6	0.51	-0.02	0.01	38.40
9	77.50	2836.2	0.67	-0.08	0.02	50.60
10	84.00	1213.8	0.79	-0.11	0.05	22.49
11	90.00	476.44	0.91	-0.12	0.09	9.90
12	94.00	3845.1	0.99	-0.11	0.13	90.97
13	98.00	362.84	1.07	-0.08	0.17	10.16
14	101.43	271.24	1.15	-0.04	0.22	8.97
15	111.43	7085.0	1.39	0.26	0.42	400.71
16	125.00	632.15	1.75	1.31	0.89	70.92

Support Forces Summary

Structure:	CT46126-A-SBA	**Code:**	EIA/TIA-222-G	6/19/2019	
Site Name:	Glastonbury-main St.	**Exposure:**	C		
Height:	130.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 25	



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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.6W Normal Wind	1	0.00	391.72	-20.45	
	1a	8.27	-178.02	-4.93	
	1b	-8.27	-178.02	-4.93	
1.2D + 1.6W 60° Wind	1	-0.16	199.02	-10.19	
	1a	-8.93	199.91	4.94	
	1b	-16.61	-363.25	-9.59	
1.2D + 1.6W 90° Wind	1	-0.16	11.90	-0.35	
	1a	-15.23	338.23	8.66	
	1b	-14.45	-314.46	-8.31	
0.9D + 1.6W Normal Wind	1	0.00	387.10	-20.31	
	1a	8.36	-180.17	-5.00	
	1b	-8.36	-180.17	-5.00	
0.9D + 1.6W 60° Wind	1	-0.18	195.23	-10.05	
	1a	-8.82	196.11	4.86	
	1b	-16.71	-364.58	-9.65	
0.9D + 1.6W 90° Wind	1	-0.18	8.93	-0.23	
	1a	-15.11	333.83	8.58	
	1b	-14.55	-316.00	-8.35	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.00	139.20	-5.57	
	1a	2.30	-17.99	-1.37	
	1b	-2.30	-17.99	-1.37	
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-0.03	86.42	-2.79	
	1a	-2.44	86.66	1.37	
	1b	-4.66	-69.86	-2.69	
1.2D + 1.0Di + 1.0Wi 90° Wind	1	-0.03	34.41	-0.07	
	1a	-4.22	126.35	2.42	
	1b	-4.09	-57.53	-2.35	
1.2D + 1.0E	1	0.00	18.28	2.11	
	1a	2.24	8.70	-1.28	
	1b	-2.24	8.70	-1.28	
0.9D + 1.0E	1	0.00	15.30	2.23	
	1a	2.35	5.73	-1.35	
	1b	-2.35	5.73	-1.35	
1.0D + 1.0W Normal Wind	1	0.00	97.03	-5.07	
	1a	1.64	-33.65	-1.02	
	1b	-1.64	-33.65	-1.02	
1.0D + 1.0W 60° Wind	1	-0.05	52.82	-2.69	
	1a	-2.36	53.01	1.30	
	1b	-3.61	-76.10	-2.08	
1.0D + 1.0W 90° Wind	1	-0.06	9.91	-0.40	
	1a	-3.87	86.18	2.20	
	1b	-3.16	-66.35	-1.80	

Max Reactions

	Leg			Overturning	
Max Uplift:	-364.58	(kips)	Moment:	2467.06	(ft-kips)
Max Down:	391.72	(kips)	Total Down:	35.68	(kips)
Max Shear:	20.45	(kips)	Total Shear:	30.31	(kips)

Max Reactions

Leg			Overturning		
Max Uplift:	-364.58	(kips)	Moment:	2467.06	(ft-kips)
Max Down:	391.72	(kips)	Total Down:	35.68	(kips)
Max Shear:	20.45	(kips)	Total Shear:	30.31	(kips)

Anchor Bolts

Bolt Size (in.):	1.50	Number Bolts:	8
Yield Strength (Ksi):	55.00	Tensile Strength (Ksi):	75.00
Detail Type:	C		

Interaction Ratio: 0.60

Max Usages

Max Leg: 95.8% (1.2D + 1.6W Normal Wind - Sect 3)
Max Diag: 91.1% (0.9D + 1.6W 90° Wind - Sect 3)
Max Horiz: 33.5% (1.2D + 1.6W 60° Wind - Sect 13)

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0E - Normal To Face	80.00	0.0205	-0.0005	0.0325
	92.00	0.0277	-0.0005	0.0385
	111.43	0.0425	0.0000	0.0458
	117.14	0.0471	0.0000	0.0453
	120.00	0.0493	0.0000	0.0449
	130.00	0.0571	0.0000	0.0438
0.9D + 1.6W 97 mph Wind at 60° From Face	80.00	1.1463	-0.0252	1.7623
	92.00	1.5425	-0.0234	2.0641
	111.43	2.3397	-0.0385	2.5689
	117.14	2.5933	-0.0399	2.5492
	120.00	2.7208	-0.0410	2.6041
	130.00	3.1657	-0.0387	2.5506
0.9D + 1.6W 97 mph Wind at 90° From Face	80.00	1.1485	-0.0267	1.7726
	92.00	1.5457	-0.0234	2.0740
	111.43	2.3467	0.0252	2.6115
	117.14	2.6015	0.0252	2.5515
	120.00	2.7297	0.0251	2.6592
	130.00	3.1767	0.0251	2.5639
0.9D + 1.6W 97 mph Wind at Normal To Face	80.00	1.1504	-0.0387	1.7647
	92.00	1.5466	-0.0423	2.0476
	111.43	2.3424	-0.0250	2.4609
	117.14	2.5945	-0.0241	2.5604
	120.00	2.7211	-0.0232	2.4544
	130.00	3.1630	0.0236	2.5333

1.0D + 1.0W 60 mph Wind at 60° From Face	80.00	0.2613	0.0057	0.3990
	92.00	0.3510	0.0051	0.4662
	111.43	0.5303	-0.0015	0.5760
	117.14	0.5870	-0.0019	0.5701
	120.00	0.6156	-0.0020	0.5830
	130.00	0.7150	-0.0019	0.5693
1.0D + 1.0W 60 mph Wind at 90° From Face	80.00	0.2680	-0.0063	0.4121
	92.00	0.3602	-0.0055	0.4810
	111.43	0.5454	0.0015	0.6031
	117.14	0.6042	0.0013	0.5882
	120.00	0.6338	-0.0012	0.6137
	130.00	0.7368	0.0012	0.5903
1.0D + 1.0W 60 mph Wind at Normal To Face	80.00	0.2636	0.0078	0.4020
	92.00	0.3536	0.0081	0.4634
	111.43	0.5327	-0.0016	0.5518
	117.14	0.5893	-0.0012	0.5745
	120.00	0.6177	-0.0011	0.5489
	130.00	0.7167	-0.0011	0.5669
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face	80.00	0.3201	0.0067	0.4932
	92.00	0.4313	0.0060	0.5822
	111.43	0.6577	-0.0023	0.7328
	117.14	0.7303	-0.0029	0.7295
	120.00	0.7668	-0.0031	0.7450
	130.00	0.8944	-0.0030	0.7308
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face	80.00	0.3262	-0.0077	0.5065
	92.00	0.4399	-0.0069	0.5965
	111.43	0.6722	0.0024	0.7608
	117.14	0.7467	0.0022	0.7470
	120.00	0.7843	0.0020	0.7770
	130.00	0.9154	0.0020	0.7515
1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	80.00	0.3203	0.0095	0.4954
	92.00	0.4315	0.0100	0.5754
	111.43	0.6565	-0.0026	0.7015
	117.14	0.7284	-0.0021	0.7309
	120.00	0.7646	-0.0019	0.7020
	130.00	0.8910	-0.0018	0.7242
1.2D + 1.0E - Normal To Face	80.00	0.0206	-0.0005	0.0328
	92.00	0.0277	-0.0006	0.0387
	111.43	0.0426	0.0000	0.0459
	117.14	0.0472	0.0000	0.0454
	120.00	0.0494	0.0000	0.0450
	130.00	0.0573	0.0000	0.0439
1.2D + 1.6W 97 mph Wind at 60° From Face	80.00	1.1531	-0.0253	1.7744
	92.00	1.5521	-0.0235	2.0793
	111.43	2.3555	-0.0390	2.5892
	117.14	2.6112	-0.0404	2.5697
	120.00	2.7397	-0.0415	2.6245
	130.00	3.1881	-0.0392	2.5710
1.2D + 1.6W 97 mph Wind at 90° From Face	80.00	1.1553	-0.0269	1.7849
	92.00	1.5552	-0.0236	2.0892
	111.43	2.3625	0.0256	2.6318
	117.14	2.6193	0.0256	2.5720
	120.00	2.7485	0.0255	2.6797
	130.00	3.1991	0.0255	2.5843
1.2D + 1.6W 97 mph Wind at Normal To Face	80.00	1.1572	0.0390	1.7770
	92.00	1.5561	0.0426	2.0625
	111.43	2.3581	0.0253	2.4809
	117.14	2.6121	0.0245	2.5808
	120.00	2.7397	0.0236	2.4746
	130.00	3.1852	0.0240	2.5536

Last revised on March 27, 2019

Mat Foundation Design for Self Supporting Tower

			Date: 6/19/2019
Customer Name:	SBA Communications Corp	EIA/TIA Standard:	EIA-222-G
Site Name:		Structure Height (Ft.):	130
Site Nmber:	CT46126-A-SBA	Engineer Name:	Rama K.
Engr. Number:	76869	Engineer Login ID:	

Foundation Info Obtained from: Drawings/Calculations

Analysis or Design? Analysis

Number of Tower Legs: 3 Legs

Base Reactions (Factored):

(1). Individual Leg:

Axial Load (Kips):	391.7	Uplift Force (Kips):	364.6
Shear Force (Kips):	20.4		

(2). Tower Base:

Total Vertical Load (Kips):	35.7	Total Shear Force (Kips):	30.3
Moment (Kips-ft):	2467.1		

Foundation Geometries:

Leg distance (Center-to-Center ft.):		7.5	Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	Round	3.0	Pier Height A. G. (ft.):	0.50
Tower center to mat center (ft):			Depth of Base BG (ft.):	4.0
Length of Pad (ft.):		26	Width of Pad (ft.):	26
Thickness of Pad (ft):		3.00		

Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	28	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

Rebar at the bottom of the concrete pad:

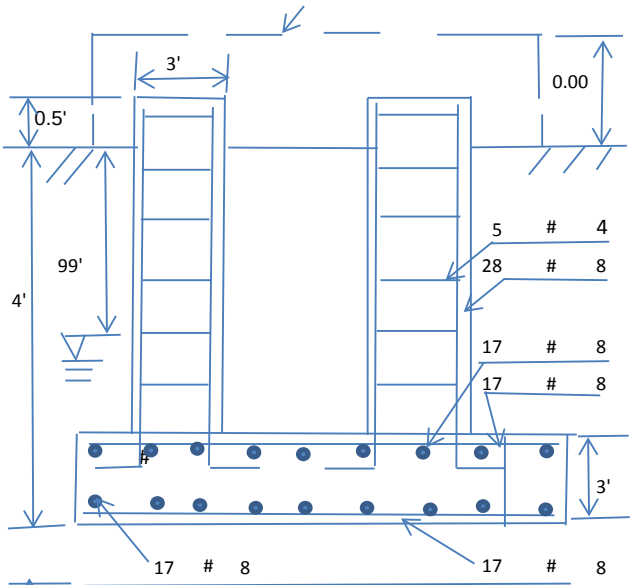
Qty. of Rebar in Pad (L):	17	Qty. of Rebar in Pad (W):	17

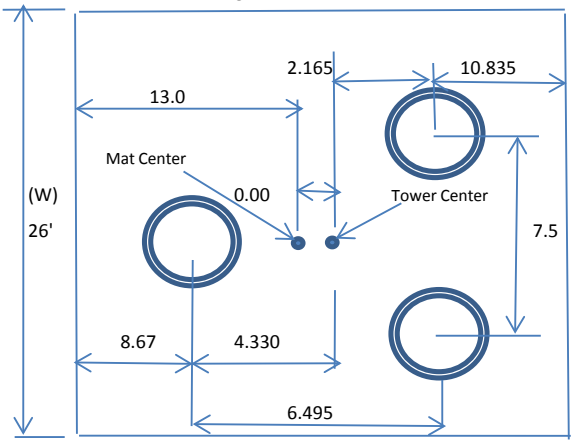
Rebar at the top of the concrete pad:

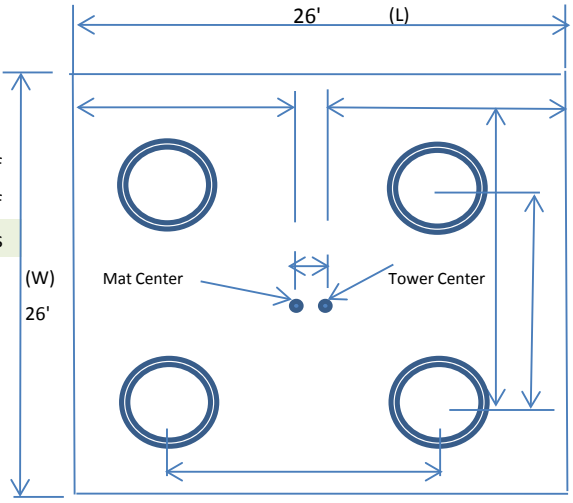
Qty. of Rebar in Pad (L):	17	Qty. of Rebar in Pad (W):	17

Soil Design Parameters:

Soil Unit Weight (pcf):	100.0	Soil Buoyant Weight:	50.0	Pcf
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf
Ultimate Bearing Pressure (psf):	6000	Consider ties in concrete shear strength:	Yes	







Allowable overstress %: 5.00% **TES Engr. Number:** 76869 Page 2/2 Date: 6/19/2019

Apply 1.35 for e/w per G/H: 1

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 Compression Strength Reduction Factor: 0.75

Total Dry Soil Volume (cu. Ft.):	654.79	Total Dry Soil Weight (Kips):	65.48
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	65.48	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	2059.81	Total Dry Concrete Weight (Kips):	308.97
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	308.97	Total Vertical Load on Base (Kips):	410.13

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1644.58	<	Allowable Factored Soil Bearing (psf):	4500	0.37	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	4844.9	>	Design Factored Momont (kips-ft):	2586	0.53	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	1.87	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.00		

(1) Concrete Pier:

					Load/ Capacity Ratio	
Vertical Steel Rebar Area (sq. in./each):	0.79		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	929.6	>	Design Factored Moment (Mu, Kips-Ft)	30.7	0.03	OK!
Calculated Shear Capacity (Kips):	63.7	>	Design Factored Shear (Kips):	20.4	0.32	OK!
Calculated Tension Capacity (Tn, Kips):	1194.5	>	Design Factored Tension (Tu Kips):	364.6	0.31	OK!
Calculated Compression Capacity (Pn, Kips):	1320.4	>	Design Factored Axial Load (Pu Kips):	391.7	0.30	OK!
Moment & Tension Strength Combination:	0.03	OK!	Check Tie Spacing (Design/Req'd):	1		OK!
Pier Reinforcement Ratio:	0.022	Reinforcement Ratio is satisfied per ACI				

(2).Concrete Pad:

One-Way Design Shear Capacity (L or W Direction, Kips):	833.1	>	One-Way Factored Shear (L/W-Dir Kips	206.3	0.25	OK!
One-Way Design Shear Capacity (Diagonal Dir., Kips):	650.6	>	One-Way Factored Shear (Dia. Dir, Kips	184.4	0.28	OK!
Lower Steel Pad Reinforcement Ratio (L or W-Direct.):	0.0013		Lower Steel Reinf. Ratio (Dia. Dir.):	0.0011		
Lower Steel Pad Moment Capacity (L or W-Dir. Kips-ft):	1933.5	>	Moment at Bottom (L-Direct. K-Ft):	1365.5	0.71	OK!
Lower Steel Pad Moment Capacity (Dia. Direction,K-ft):	1937.6	>	Moment at Bottom (Dia. Dir. K-Ft):	1101.5	0.57	OK!
Upper Steel Pad Reinforcement Ratio (L or W -Direction):	0.0013		Upper Steel Reinf. Ratio (Dia. Dir.):	0.0011		
Upper Steel Pad Moment Capacity (L or W-Dir., Kips-ft):	1933.5	>	Moment at the top (L-Dir Kips-Ft):	673.8	0.35	OK!
Upper Steel Pad Moment Capacity (Dia. Direction, K-ft):	1937.6	>	Moment at the top (Dia. Dir., K-Ft):	410.7	0.21	OK!
Punching Failure Capacity (Kips):	1149.2	>	Punch. Failure Factored Shear (K):	391.7	0.34	OK!

April 17, 2019

CENTERLINE COMMUNICATIONS at&t

Centerline Communications
750 West Center Street, Suite #301
West Bridgewater, MA 02379

RE:		
	Site Number:	CT5273 (LTE 3C/4C/5C)
	FA Number:	10071041
	PACE Number:	MRCTB033594
	PT Number:	2051A0JDAY
	Site Name:	GLASTONBURY NW
	Site Address:	2577 Main Street Glastonbury, CT 06033

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by Centerline Communications to perform a mount analysis on the new AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (3) 800-10121 Antennas (54.5"x10.3"x5.9"– Wt. = 45 lbs. /each)
- (2) HPA-65R-BUU-H6 Antennas (72.0"x14.8"x7.4" – Wt. = 51 lbs. /each)
- (1) HPA-65R-BUU-H8 Antennas (92.4"x14.8"x7.4" – Wt. = 68 lbs. /each)
- (6) LGP21401 TMA's (14.4"x9.0"x2.7" – Wt. = 19 lbs. /each)
- (1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each) (Tower Mount)
- **(2) HPA65R-BU6A Antennas (71.1"x11.7"x7.6" – Wt. = 42 lbs. /each)**
- **(1) HPA65R-BU8A Antennas (96.0"x11.7"x7.6" – Wt. = 54 lbs. /each)**
- **(2) 800-10965 Antennas (78.7"x20.0"x6.9"– Wt. = 109 lbs. /each)**
- **(1) 800-10966 Antennas (96.0"x20.0"x6.9"– Wt. = 115 lbs. /each)**
- **(3) RRUS-32 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)**
- **(3) 8843 B2/B66A RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each)**
- **(3) 4449 B5/B12 RRH's (14.9"x13.2"x10.4" – Wt. = 73 lbs. /each)**
- **(1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each) (Tower Mount)**

**Proposed equipment shown in bold*

Fabrication drawings prepared by Sabre Industries Towers and Poles, P/N C10857001C, dated January 20, 2017 were available for the proposed mounts. HDG conducted a ground audit of the existing AT&T antenna mounts on March 26, 2019.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R13.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 125 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.69 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- The mount has been analyzed with load combinations consisting of 250 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.

Based on our evaluation, we have determined that the New Sabre Industries C10857001C mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
New (LTE 3C/4C/5C) Mount Rating	13	LC36	74%	**PASS**

Reference Documents:

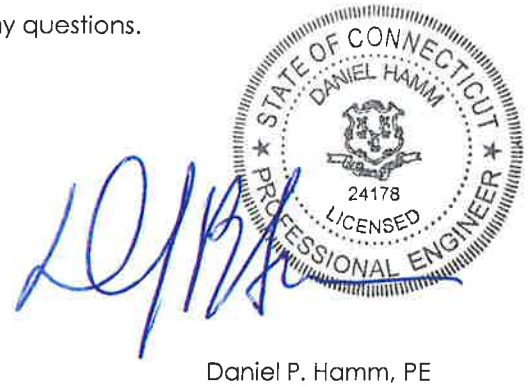
- Fabrication drawings prepared by Sabre Industries Towers and Poles, P/N C10857001C, dated January 20, 2017

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. 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.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Structural Dept. Head

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:
(Existing mount to be removed)






p: 978.557.5553 f: 978.336.5586 a: 45 Beechwood Drive, N. Andover, MA 01845
p: 203.208.3919 f: 203.234.6398 a: 110 Washington Avenue, 4th Floor, North Haven CT 06473






p: 978.557.5553 f: 978.336.5586 a: 45 Beechwood Drive, N. Andover, MA 01845
p: 203.208.3919 f: 203.234.6398 a: 110 Washington Avenue, 4th Floor, North Haven CT 06473

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 4/17/2019
Project Name: GLASTONBURY NW
Project No.: CT5273
Designed By: JN **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01 (z/z_g)^{2/\alpha}$

	z=	110 (ft)
	z_g=	1200 (ft)
K_z= **1.016**	α=	7.0

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c K_t/K_h)]^2$

$K_h = e^{(f*z/H)}$

K_{zt}= **#DIV/0!**

(If Category 1 then K_{zt} =1.0)

Category=	1

	K_h=	#DIV/0!
	K_c=	0 (from Table 2-4)
	K_t=	0 (from Table 2-5)
	f=	0 (from Table 2-5)
	z=	110
	z_s=	35 (Mean elevation of base of structure above sea level)
	H=	0 (Ht. of the crest above surrounding terrain)
	K_{zt}=	1.00 (from 2.6.6.2.1)
	K_e=	1.00 (from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness =	t_i =	1.50 in
Importance Factor =	I=	1.0 (from Table 2-3)
	K_{iz} =	1.13 (from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$

t_{iz} = 1.69 in

Date: 4/17/2019
Project Name: GLASTONBURY NW
Project No.: CT5273
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	130	G_h=	0.85
2.6.9.2 Guyed Masts		G_h=	0.85
2.6.9.3 Pole Structures		G_h=	1.1
2.6.9 Appurtenances		G_h=	1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

$F = q_z * G_h * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

q_z=	**34.48**	K_z=	1.016	(from 2.6.5.2)
$q_{z\ (Ice)}$=	**5.52**	K_{zt}=	1.0	(from 2.6.6.2.1)
$q_{z\ (30)}$=	**1.99**	K_s=	1.0	(from 2.6.7)
		K_e=	1.00	(from 2.6.8)
		K_d=	0.85	(from Table 2-2)
		V_{max}=	125	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

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HUDSON Design Group LLC

Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **1.69 in** **Angle = 0 (deg)** **Equivalent Angle = 180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
800-10121 Antenna	54.5	10.3	5.9	3.90	5.29	1.32	178	40	10
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	6.24	1.37	447	91	26
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	8.21	1.44	387	83	22
800-10966 Antenna	96.0	20.0	6.9	13.33	4.80	1.30	599	116	34
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	4.86	1.31	333	69	19
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	6.08	1.36	271	59	16
800-10965 Antenna	78.7	20.0	6.9	10.93	3.94	1.26	476	93	27
RRUS-32 RRH	27.2	12.1	7.0	2.29	2.25	1.20	95	22	5
RRUS-32 RRH (Shielded)	27.2	0.4	7.0	0.08	68.00	3.43	9	15	1
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.20	47	12	3
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	2.73	1.21	24	7	1
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.43	1.20	45	12	3
4449 B5/B12 RRH (Shielded)	14.9	5.2	13.2	0.54	2.87	1.22	23	7	1
LGP21401 TMA	14.4	2.7	9.0	0.27	5.33	1.33	12	5	1
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	39	10	2

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HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.69	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	178	114	162
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	447	259	400
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	387	277	360
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	599	259	514
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	333	190	297
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	271	191	251
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	476	201	408
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	95	58	85
RRUS-32 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	51	58	52
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	47	57	49
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	24	57	32
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	45	57	48
4449 B5/B12 RRH (Shielded)	14.9	5.2	13.2	0.54	1.37	2.87	1.13	1.22	1.20	23	57	31
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	12	37	19

WIND LOADS WITH ICE:

800-10121 Antenna	57.9	13.7	9.3	5.50	3.73	4.23	6.23	1.28	1.37	39	28	36
HPA-65R-BUU-H8 Antenna	95.8	18.2	10.8	12.10	7.17	5.27	8.88	1.32	1.46	88	58	81
HPA65R-BU8A Antenna	99.4	15.1	11.0	10.41	7.58	6.59	9.05	1.38	1.47	79	61	75
800-10966 Antenna	99.4	23.4	10.3	16.14	7.10	4.25	9.66	1.28	1.49	114	58	100
HPA-65R-BUU-H6 Antenna	75.4	18.2	10.8	9.52	5.65	4.15	6.99	1.27	1.40	67	44	61
HPA65R-BU6A Antenna	74.5	15.1	11.0	7.80	5.68	4.94	6.78	1.31	1.39	56	44	53
800-10965 Antenna	82.1	23.4	10.3	13.33	5.86	3.51	7.98	1.24	1.43	92	46	80
RRUS-32 RRH	30.6	15.5	10.4	3.29	2.21	1.98	2.95	1.20	1.22	22	15	20
RRUS-32 RRH (Shielded)	30.6	7.7	10.4	1.64	2.21	3.95	2.95	1.26	1.22	11	15	12
8843 B2/B66A RRH	18.3	14.3	16.6	1.81	2.11	1.28	1.10	1.20	1.20	12	14	12
8843 B2/B66A RRH (Shielded)	18.3	7.1	16.6	0.91	2.11	2.56	1.10	1.20	1.20	6	14	8
4449 B5/B12 RRH	18.3	13.8	16.6	1.75	2.11	1.33	1.10	1.20	1.20	12	14	12
4449 B5/B12 RRH (Shielded)	18.3	6.9	16.6	0.88	2.11	2.65	1.10	1.21	1.20	6	14	8
LGP21401 TMA	17.8	6.1	12.4	0.75	1.53	2.92	1.44	1.22	1.20	5	10	6

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	10	7	9
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	26	15	23
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	22	16	21
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	34	15	30
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	19	11	17
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	16	11	14
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	27	12	23
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	5	3	5
RRUS-32 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	3	3	3
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	1	3	2
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	3	3	3
4449 B5/B12 RRH (Shielded)	14.9	5.2	13.2	0.54	1.37	2.87	1.13	1.22	1.20	1	3	2
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	2	1

Date: 4/17/2019
Project Name: GLASTONBURY NW
Project No.: CT5273
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 60 (deg) | Ice Thickness = 1.69 in. | Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	178	114	130
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	447	259	306
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	387	277	305
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	599	259	344
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	333	190	226
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	271	191	211
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	476	201	270
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	95	58	67
RRUS-32 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	72	58	61
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	47	57	54
8843 B2/B66A RRH (Shielded)	14.9	8.2	13.2	0.85	1.37	1.82	1.13	1.20	1.20	35	57	51
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	45	57	54
4449 B5/B12 RRH (Shielded)	14.9	7.8	13.2	0.81	1.37	1.91	1.13	1.20	1.20	33	57	51
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	12	37	31

WIND LOADS WITH ICE:

800-10121 Antenna	57.9	13.7	9.3	5.50	3.73	4.23	6.23	1.28	1.37	39	28	31
HPA-65R-BUU-H8 Antenna	95.8	18.2	10.8	12.10	7.17	5.27	8.88	1.32	1.46	88	58	65
HPA65R-BU8A Antenna	99.4	15.1	11.0	10.41	7.58	6.59	9.05	1.38	1.47	79	61	66
800-10966 Antenna	99.4	23.4	10.3	16.14	7.10	4.25	9.66	1.28	1.49	114	58	72
HPA-65R-BUU-H6 Antenna	75.4	18.2	10.8	9.52	5.65	4.15	6.99	1.27	1.40	67	44	49
HPA65R-BU6A Antenna	74.5	15.1	11.0	7.80	5.68	4.94	6.78	1.31	1.39	56	44	47
800-10965 Antenna	82.1	23.4	10.3	13.33	5.86	3.51	7.98	1.24	1.43	92	46	58
RRUS-32 RRH	30.6	15.5	10.4	3.29	2.21	1.98	2.95	1.20	1.22	22	15	17
RRUS-32 RRH (Shielded)	30.6	11.6	10.4	2.47	2.21	2.63	2.95	1.21	1.22	16	15	15
8843 B2/B66A RRH	18.3	14.3	16.6	1.81	2.11	1.28	1.10	1.20	1.20	12	14	13
8843 B2/B66A RRH (Shielded)	18.3	10.7	16.6	1.36	2.11	1.71	1.10	1.20	1.20	9	14	13
4449 B5/B12 RRH	18.3	13.8	16.6	1.75	2.11	1.33	1.10	1.20	1.20	12	14	13
4449 B5/B12 RRH (Shielded)	18.3	10.3	16.6	1.31	2.11	1.77	1.10	1.20	1.20	9	14	13
LGP21401 TMA	17.8	6.1	12.4	0.75	1.53	2.92	1.44	1.22	1.20	5	10	9

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	10	7	7
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	26	15	18
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	22	16	18
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	34	15	20
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	19	11	13
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	16	11	12
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	27	12	16
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	5	3	4
RRUS-32 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	4	3	4
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
8843 B2/B66A RRH (Shielded)	14.9	8.2	13.2	0.85	1.37	1.82	1.13	1.20	1.20	2	3	3
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	3	3	3
4449 B5/B12 RRH (Shielded)	14.9	7.8	13.2	0.81	1.37	1.91	1.13	1.20	1.20	2	3	3
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	2	2

Date: 4/17/2019
Project Name: GLASTONBURY NW
Project No.: CT5273
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.69	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	178	114	114
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	447	259	259
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	387	277	277
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	599	259	259
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	333	190	190
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	271	191	191
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	476	201	201
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	95	58	58
RRUS-32 RRH (Shielded)	27.2	0.4	7.0	0.08	1.32	68.00	3.89	3.43	1.26	9	58	58
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	47	57	57
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	24	57	57
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	45	57	57
4449 B5/B12 RRH (Shielded)	14.9	5.2	13.2	0.54	1.37	2.87	1.13	1.22	1.20	23	57	57
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	12	37	37

WIND LOADS WITH ICE:

800-10121 Antenna	57.9	13.7	9.3	5.50	3.73	4.23	6.23	1.28	1.37	39	28	28
HPA-65R-BUU-H8 Antenna	95.8	18.2	10.8	12.10	7.17	5.27	8.88	1.32	1.46	88	58	58
HPA65R-BU8A Antenna	99.4	15.1	11.0	10.41	7.58	6.59	9.05	1.38	1.47	79	61	61
800-10966 Antenna	99.4	23.4	10.3	16.14	7.10	4.25	9.66	1.28	1.49	114	58	58
HPA-65R-BUU-H6 Antenna	75.4	18.2	10.8	9.52	5.65	4.15	6.99	1.27	1.40	67	44	44
HPA65R-BU6A Antenna	74.5	15.1	11.0	7.80	5.68	4.94	6.78	1.31	1.39	56	44	44
800-10965 Antenna	82.1	23.4	10.3	13.33	5.86	3.51	7.98	1.24	1.43	92	46	46
RRUS-32 RRH	30.6	15.5	10.4	3.29	2.21	1.98	2.95	1.20	1.22	22	15	15
RRUS-32 RRH (Shielded)	30.6	3.8	10.4	0.80	2.21	8.08	2.95	1.44	1.22	6	15	15
8843 B2/B66A RRH	18.3	14.3	16.6	1.81	2.11	1.28	1.10	1.20	1.20	12	14	14
8843 B2/B66A RRH (Shielded)	18.3	8.8	16.6	1.12	2.11	2.07	1.10	1.20	1.20	7	14	14
4449 B5/B12 RRH	18.3	13.8	16.6	1.75	2.11	1.33	1.10	1.20	1.20	12	14	14
4449 B5/B12 RRH (Shielded)	18.3	8.6	16.6	1.09	2.11	2.13	1.10	1.20	1.20	7	14	14
LGP21401 TMA	17.8	6.1	12.4	0.75	1.53	2.92	1.44	1.22	1.20	5	10	10

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	10	7	7
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	26	15	15
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	22	16	16
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	34	15	15
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	19	11	11
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	16	11	11
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	27	12	12
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	5	3	3
RRUS-32 RRH (Shielded)	27.2	0.4	7.0	0.08	1.32	68.00	3.89	3.43	1.26	1	3	3
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	1	3	3
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	3	3	3
4449 B5/B12 RRH (Shielded)	14.9	5.2	13.2	0.54	1.37	2.87	1.13	1.22	1.20	1	3	3
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	2	2

Date: 4/17/2019
Project Name: GLASTONBURY NW
Project No.: CT5273
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.69	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	178	114	130
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	447	259	306
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	387	277	305
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	599	259	344
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	333	190	226
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	271	191	211
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	476	201	270
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	95	58	67
RRUS-32 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	72	58	61
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	47	57	54
8843 B2/B66A RRH (Shielded)	14.9	8.2	13.2	0.85	1.37	1.82	1.13	1.20	1.20	35	57	51
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	45	57	54
4449 B5/B12 RRH (Shielded)	14.9	7.8	13.2	0.81	1.37	1.91	1.13	1.20	1.20	33	57	51
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	12	37	31

WIND LOADS WITH ICE:

800-10121 Antenna	57.9	13.7	9.3	5.50	3.73	4.23	6.23	1.28	1.37	39	28	31
HPA-65R-BUU-H8 Antenna	95.8	18.2	10.8	12.10	7.17	5.27	8.88	1.32	1.46	88	58	65
HPA65R-BU8A Antenna	99.4	15.1	11.0	10.41	7.58	6.59	9.05	1.38	1.47	79	61	66
800-10966 Antenna	99.4	23.4	10.3	16.14	7.10	4.25	9.66	1.28	1.49	114	58	72
HPA-65R-BUU-H6 Antenna	75.4	18.2	10.8	9.52	5.65	4.15	6.99	1.27	1.40	67	44	49
HPA65R-BU6A Antenna	74.5	15.1	11.0	7.80	5.68	4.94	6.78	1.31	1.39	56	44	47
800-10965 Antenna	82.1	23.4	10.3	13.33	5.86	3.51	7.98	1.24	1.43	92	46	58
RRUS-32 RRH	30.6	15.5	10.4	3.29	2.21	1.98	2.95	1.20	1.22	22	15	17
RRUS-32 RRH (Shielded)	30.6	11.6	10.4	2.47	2.21	2.63	2.95	1.21	1.22	16	15	15
8843 B2/B66A RRH	18.3	14.3	16.6	1.81	2.11	1.28	1.10	1.20	1.20	12	14	13
8843 B2/B66A RRH (Shielded)	18.3	10.7	16.6	1.36	2.11	1.71	1.10	1.20	1.20	9	14	13
4449 B5/B12 RRH	18.3	13.8	16.6	1.75	2.11	1.33	1.10	1.20	1.20	12	14	13
4449 B5/B12 RRH (Shielded)	18.3	10.3	16.6	1.31	2.11	1.77	1.10	1.20	1.20	9	14	13
LGP21401 TMA	17.8	6.1	12.4	0.75	1.53	2.92	1.44	1.22	1.20	5	10	9

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	10	7	7
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	26	15	18
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	22	16	18
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	34	15	20
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	19	11	13
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	16	11	12
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	27	12	16
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	5	3	4
RRUS-32 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	4	3	4
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
8843 B2/B66A RRH (Shielded)	14.9	8.2	13.2	0.85	1.37	1.82	1.13	1.20	1.20	2	3	3
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	3	3	3
4449 B5/B12 RRH (Shielded)	14.9	7.8	13.2	0.81	1.37	1.91	1.13	1.20	1.20	2	3	3
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	2	2

Date: 4/17/2019
Project Name: GLASTONBURY NW
Project No.: CT5273
Designed By: JN Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.69	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	178	114	162
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	447	259	400
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	387	277	360
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	599	259	514
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	333	190	297
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	271	191	251
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	476	201	408
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	95	58	85
RRUS-32 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	51	58	52
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	47	57	49
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	24	57	32
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	45	57	48
4449 B5/B12 RRH (Shielded)	14.9	5.2	13.2	0.54	1.37	2.87	1.13	1.22	1.20	23	57	31
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	12	37	19

WIND LOADS WITH ICE:

800-10121 Antenna	57.9	13.7	9.3	5.50	3.73	4.23	6.23	1.28	1.37	39	28	36
HPA-65R-BUU-H8 Antenna	95.8	18.2	10.8	12.10	7.17	5.27	8.88	1.32	1.46	88	58	81
HPA65R-BU8A Antenna	99.4	15.1	11.0	10.41	7.58	6.59	9.05	1.38	1.47	79	61	75
800-10966 Antenna	99.4	23.4	10.3	16.14	7.10	4.25	9.66	1.28	1.49	114	58	100
HPA-65R-BUU-H6 Antenna	75.4	18.2	10.8	9.52	5.65	4.15	6.99	1.27	1.40	67	44	61
HPA65R-BU6A Antenna	74.5	15.1	11.0	7.80	5.68	4.94	6.78	1.31	1.39	56	44	53
800-10965 Antenna	82.1	23.4	10.3	13.33	5.86	3.51	7.98	1.24	1.43	92	46	80
RRUS-32 RRH	30.6	15.5	10.4	3.29	2.21	1.98	2.95	1.20	1.22	22	15	20
RRUS-32 RRH (Shielded)	30.6	7.7	10.4	1.64	2.21	3.95	2.95	1.26	1.22	11	15	12
8843 B2/B66A RRH	18.3	14.3	16.6	1.81	2.11	1.28	1.10	1.20	1.20	12	14	12
8843 B2/B66A RRH (Shielded)	18.3	7.1	16.6	0.91	2.11	2.56	1.10	1.20	1.20	6	14	8
4449 B5/B12 RRH	18.3	13.8	16.6	1.75	2.11	1.33	1.10	1.20	1.20	12	14	12
4449 B5/B12 RRH (Shielded)	18.3	6.9	16.6	0.88	2.11	2.65	1.10	1.21	1.20	6	14	8
LGP21401 TMA	17.8	6.1	12.4	0.75	1.53	2.92	1.44	1.22	1.20	5	10	6

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	10	7	9
HPA-65R-BUU-H8 Antenna	92.4	14.8	7.4	9.50	4.75	6.24	12.49	1.37	1.58	26	15	23
HPA65R-BU8A Antenna	96.0	11.7	7.6	7.80	5.07	8.21	12.63	1.44	1.59	22	16	21
800-10966 Antenna	96.0	20.0	6.9	13.33	4.60	4.80	13.91	1.30	1.63	34	15	30
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	19	11	17
HPA65R-BU6A Antenna	71.1	11.7	7.6	5.78	3.75	6.08	9.36	1.36	1.48	16	11	14
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	27	12	23
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	5	3	5
RRUS-32 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	3	3	3
8843 B2/B66A RRH	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	3	3
8843 B2/B66A RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	1	3	2
4449 B5/B12 RRH	14.9	10.4	13.2	1.08	1.37	1.43	1.13	1.20	1.20	3	3	3
4449 B5/B12 RRH (Shielded)	14.9	5.2	13.2	0.54	1.37	2.87	1.13	1.22	1.20	1	3	2
LGP21401 TMA	14.4	2.7	9.0	0.27	0.90	5.33	1.60	1.33	1.20	1	2	1

Date: 4/17/2019
Project Name: GLASTONBURY NW
Project No.: CT5273
Designed By: JN **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.69 in.
Density of ice: 56 pcf

800-10121 Antenna

Weight of ice based on total radial SF area:

Height (in):	54.5	
Width (in):	10.3	
Depth (in):	5.9	
Total weight of ice on object:		127 lbs
Weight of object:	47.0 lbs	
Combined weight of ice and object:		174 lbs

HPA-65R-BUU-H8 Antenna

Weight of ice based on total radial SF area:

Height (in):	92.4	
Width (in):	14.8	
Depth (in):	7.4	
Total weight of ice on object:		290 lbs
Weight of object:	68.0 lbs	
Combined weight of ice and object:		358 lbs

HPA65R-BU8A Antenna

Weight of ice based on total radial SF area:

Height (in):	96.0	
Width (in):	11.7	
Depth (in):	7.6	
Total weight of ice on object:		258 lbs
Weight of object:	54.0 lbs	
Combined weight of ice and object:		312 lbs

800-10966 Antenna

Weight of ice based on total radial SF area:

Height (in):	96.0	
Width (in):	20.0	
Depth (in):	6.9	
Total weight of ice on object:		377 lbs
Weight of object:	115.0 lbs	
Combined weight of ice and object:		492 lbs

HPA-65R-BUU-H6 Antenna

Weight of ice based on total radial SF area:

Height (in):	72.0	
Width (in):	14.8	
Depth (in):	7.4	
Total weight of ice on object:		226 lbs
Weight of object:	51.0 lbs	
Combined weight of ice and object:		277 lbs

HPA65R-BU6A Antenna

Weight of ice based on total radial SF area:

Height (in):	71.1	
Width (in):	11.7	
Depth (in):	7.6	
Total weight of ice on object:		191 lbs
Weight of object:	42.0 lbs	
Combined weight of ice and object:		233 lbs

800-10965 Antenna

Weight of ice based on total radial SF area:

Height (in):	78.7	
Width (in):	20.0	
Depth (in):	6.9	
Total weight of ice on object:		309 lbs
Weight of object:	109.0 lbs	
Combined weight of ice and object:		418 lbs

RRUS-32 RRH

Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:		73 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		133 lbs

B2/B66A 8843 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	10.9	
Total weight of ice on object:		48 lbs
Weight of object:	72.0 lbs	
Combined weight of ice and object:		120 lbs

4449 B5/B12 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	10.4	
Total weight of ice on object:		47 lbs
Weight of object:	73.0 lbs	
Combined weight of ice and object:		120 lbs

LGP21401 TMA

Weight of ice based on total radial SF area:

Height (in):	14.4	
Width (in):	2.7	
Depth (in):	9.0	
Total weight of ice on object:		27 lbs
Weight of object:	19.0 lbs	
Combined weight of ice and object:		46 lbs

Squid Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	24.0	
Diameter(in):	9.7	
Total weight of ice on object:		47 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		80 lbs

3/4" Round Bar

Per foot weight of ice:

diameter (in):	0.75	
Per foot weight of ice on object:		5 plf

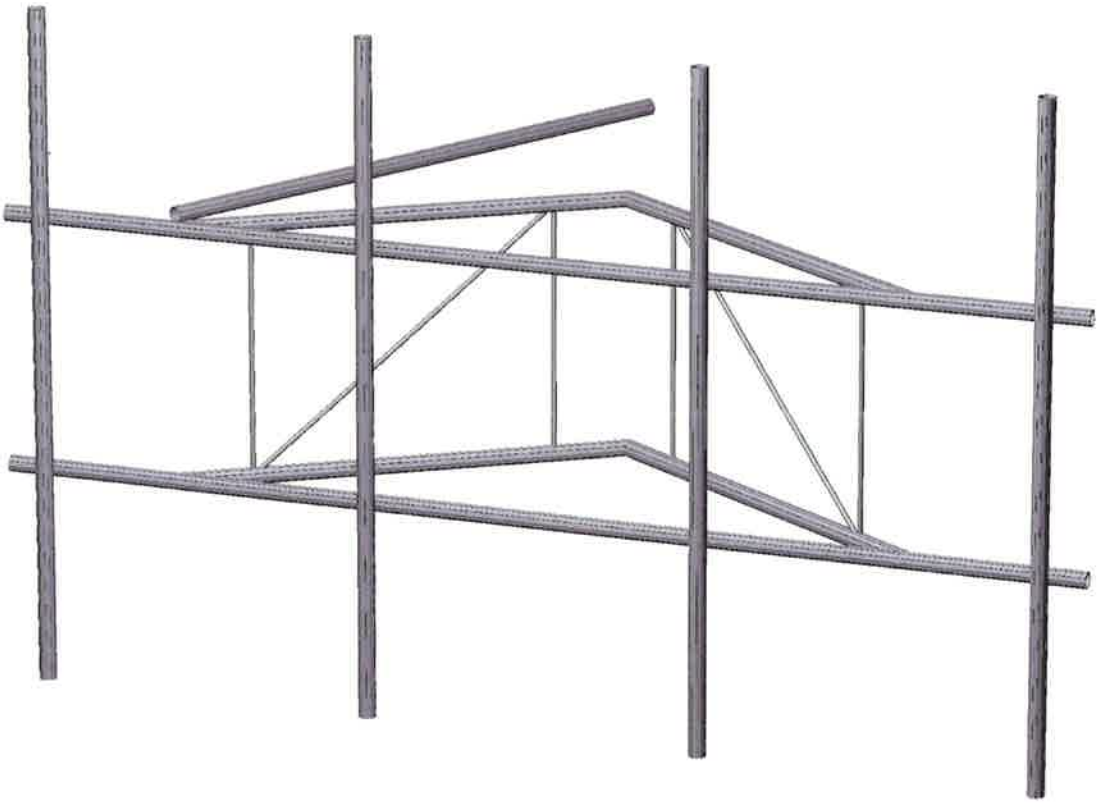
2" pipe

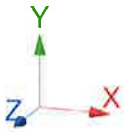
Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		8 plf

HUDSON
Design Group LLC

Mount Calculations
(Proposed Conditions)

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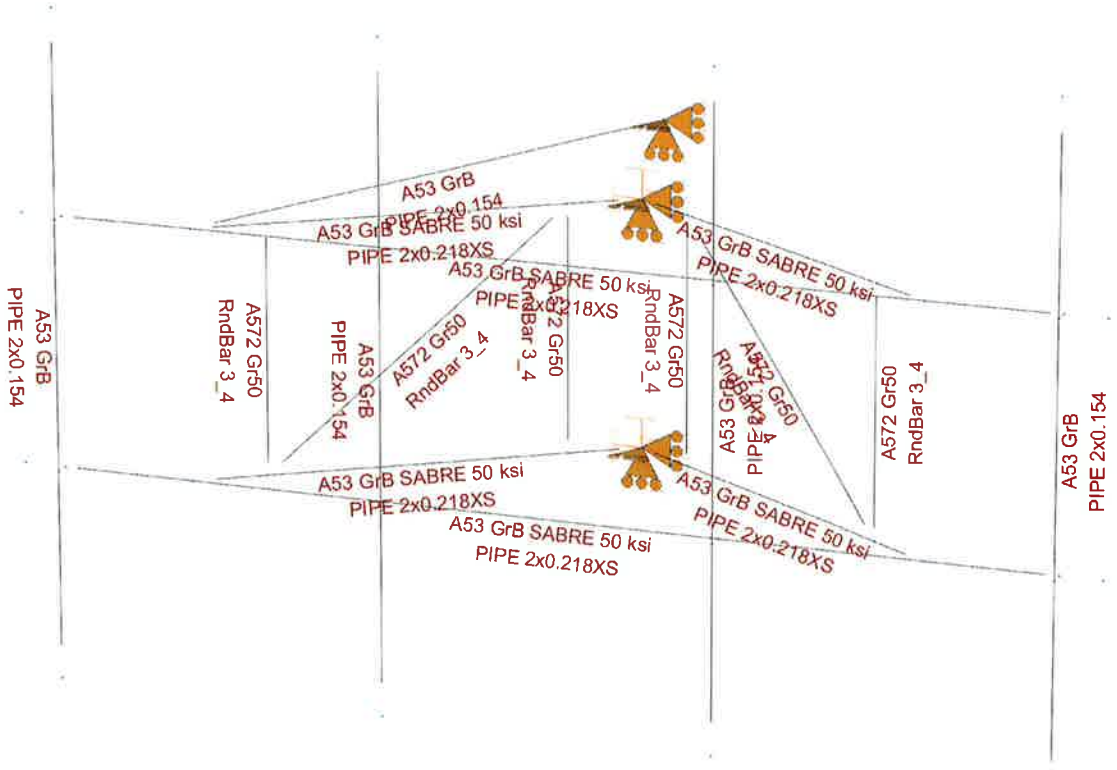
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PIPE 2x0.154
A53 GrB SABRE 50 ksi
PIPE 2x0.218XS
A572 Gr50
RndBar 3_4
A53 GrB SABRE 50 ksi
PIPE 2x0.218XS
A572 Gr50
RndBar 3_4
A53 GrB SABRE 50 ksi
PIPE 2x0.218XS
A572 Gr50
RndBar 3_4
A53 GrB
PIPE 2x0.154
A53 GrB
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RndBar 3_4
A53 GrB
PIPE 2x0.154
A572 Gr50
RndBar 3_4
A53 GrB SABRE 50 ksi
PIPE 2x0.218XS
A53 GrB SABRE 50 ksi
PIPE 2x0.218XS
A53 GrB SABRE 50 ksi
PIPE 2x0.218XS
A572 Gr50
RndBar 3_4
A53 GrB
PIPE 2x0.154
Y
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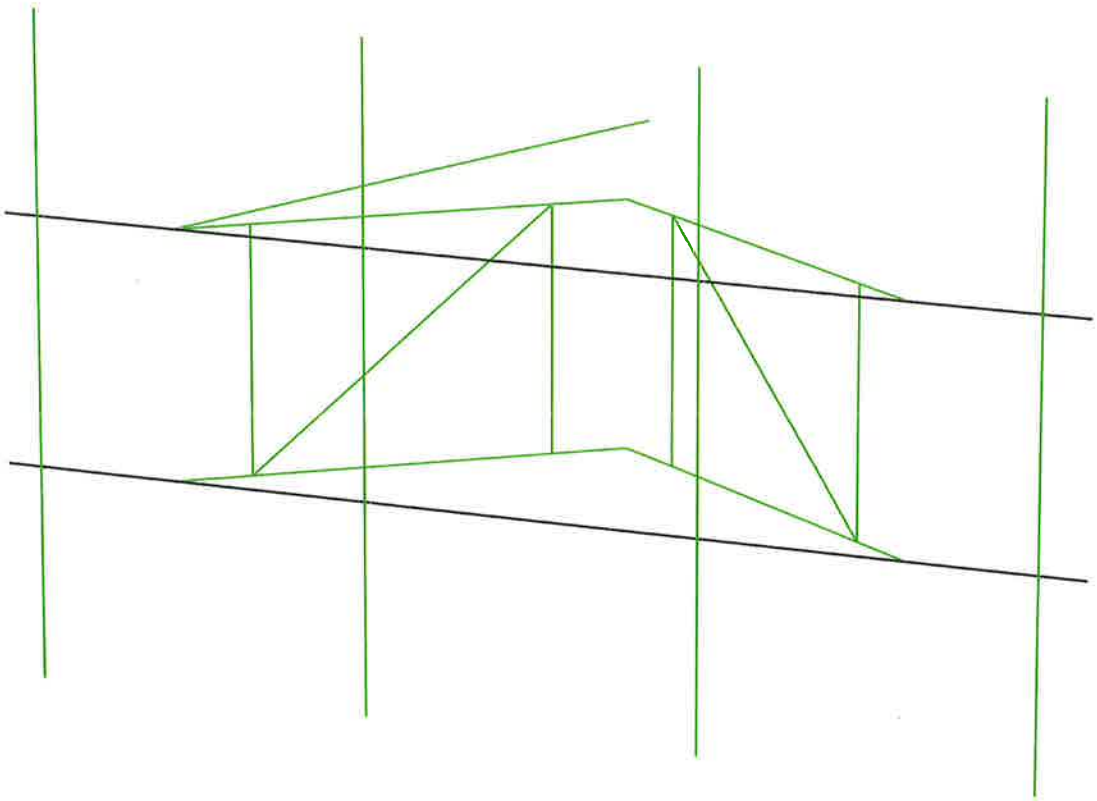
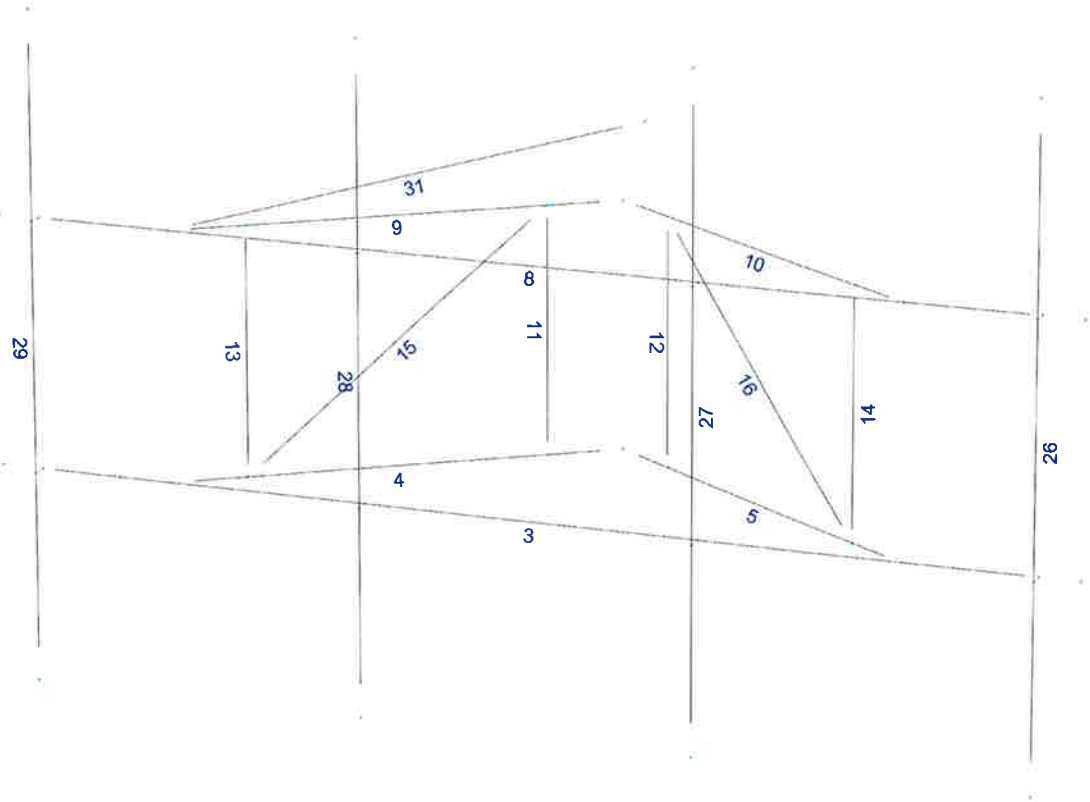
Design status

- Not designed
- Error on design
- Design O.K.
- With warnings

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Bentley Hewlett-Packard Company

Current Date: 4/17/2019 11:33 AM
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Load data

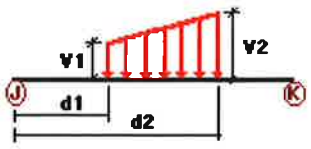
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load Right End of Mount	No	LL
LL3	250 lb Live Load Left End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL
LLa4	250 lb Live Load Antenna 4	No	LL

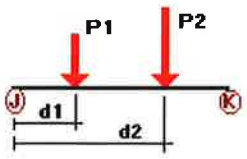
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	3	z	-0.008	0.00	0.00	No	0.00	No
	4	z	-0.008	0.00	0.00	No	0.00	No
	5	z	-0.008	0.00	0.00	No	0.00	No
	8	z	-0.008	0.00	0.00	No	0.00	No
	9	z	-0.008	0.00	0.00	No	0.00	No
	10	z	-0.008	0.00	0.00	No	0.00	No
	11	z	-0.003	0.00	0.00	No	0.00	No
	12	z	-0.003	0.00	0.00	No	0.00	No
	13	z	-0.003	0.00	0.00	No	0.00	No
	14	z	-0.003	0.00	0.00	No	0.00	No
	15	z	-0.003	0.00	0.00	No	0.00	No
	16	z	-0.003	0.00	0.00	No	0.00	No
	31	z	-0.008	0.00	0.00	No	0.00	No
W30	3	z	-0.008	0.00	0.00	No	0.00	No
	4	z	-0.008	0.00	0.00	No	0.00	No
	5	z	-0.008	0.00	0.00	No	0.00	No
	8	z	-0.008	0.00	0.00	No	0.00	No
	9	z	-0.008	0.00	0.00	No	0.00	No
	10	z	-0.008	0.00	0.00	No	0.00	No
	11	z	-0.003	0.00	0.00	No	0.00	No
	12	z	-0.003	0.00	0.00	No	0.00	No
	13	z	-0.003	0.00	0.00	No	0.00	No
	14	z	-0.003	0.00	0.00	No	0.00	No
	15	z	-0.003	0.00	0.00	No	0.00	No
	16	z	-0.003	0.00	0.00	No	0.00	No
	31	z	-0.008	0.00	0.00	No	0.00	No
W60	3	x	-0.008	0.00	0.00	No	0.00	No
	4	x	-0.008	0.00	0.00	No	0.00	No
	5	x	-0.008	0.00	0.00	No	0.00	No
	8	x	-0.008	0.00	0.00	No	0.00	No
	9	x	-0.008	0.00	0.00	No	0.00	No
	10	x	-0.008	0.00	0.00	No	0.00	No
	11	x	-0.003	0.00	0.00	No	0.00	No
	12	x	-0.003	0.00	0.00	No	0.00	No
	13	x	-0.003	0.00	0.00	No	0.00	No
	14	x	-0.003	0.00	0.00	No	0.00	No
	15	x	-0.003	0.00	0.00	No	0.00	No
	16	x	-0.003	0.00	0.00	No	0.00	No
	26	x	-0.008	0.00	0.00	No	0.00	No
	27	x	-0.008	0.00	0.00	No	0.00	No
	28	x	-0.008	0.00	0.00	No	0.00	No
	29	x	-0.008	0.00	0.00	No	0.00	No
	31	x	-0.008	0.00	0.00	No	0.00	No
W90	4	x	-0.008	0.00	0.00	No	0.00	No
	5	x	-0.008	0.00	0.00	No	0.00	No
	9	x	-0.008	0.00	0.00	No	0.00	No
	10	x	-0.008	0.00	0.00	No	0.00	No
	11	x	-0.003	0.00	0.00	No	0.00	No
	12	x	-0.003	0.00	0.00	No	0.00	No
	13	x	-0.003	0.00	0.00	No	0.00	No
	14	x	-0.003	0.00	0.00	No	0.00	No
	15	x	-0.003	0.00	0.00	No	0.00	No
	16	x	-0.003	0.00	0.00	No	0.00	No
	26	x	-0.008	0.00	0.00	No	0.00	No
	27	x	-0.008	0.00	0.00	No	0.00	No
	28	x	-0.008	0.00	0.00	No	0.00	No
	29	x	-0.008	0.00	0.00	No	0.00	No
	31	x	-0.008	0.00	0.00	No	0.00	No
W120	3	x	-0.008	0.00	0.00	No	0.00	No
	4	x	-0.008	0.00	0.00	No	0.00	No

	5	x	-0.008	0.00	0.00	No	0.00	No
	8	x	-0.008	0.00	0.00	No	0.00	No
	9	x	-0.008	0.00	0.00	No	0.00	No
	10	x	-0.008	0.00	0.00	No	0.00	No
	11	x	-0.003	0.00	0.00	No	0.00	No
	12	x	-0.003	0.00	0.00	No	0.00	No
	13	x	-0.003	0.00	0.00	No	0.00	No
	14	x	-0.003	0.00	0.00	No	0.00	No
	15	x	-0.003	0.00	0.00	No	0.00	No
	16	x	-0.003	0.00	0.00	No	0.00	No
	26	x	-0.008	0.00	0.00	No	0.00	No
	27	x	-0.008	0.00	0.00	No	0.00	No
	28	x	-0.008	0.00	0.00	No	0.00	No
	29	x	-0.008	0.00	0.00	No	0.00	No
	31	x	-0.008	0.00	0.00	No	0.00	No
W150	3	z	0.008	0.00	0.00	No	0.00	No
	4	z	0.008	0.00	0.00	No	0.00	No
	5	z	0.008	0.00	0.00	No	0.00	No
	8	z	0.008	0.00	0.00	No	0.00	No
	9	z	0.008	0.00	0.00	No	0.00	No
	10	z	0.008	0.00	0.00	No	0.00	No
	11	z	0.003	0.00	0.00	No	0.00	No
	12	z	0.003	0.00	0.00	No	0.00	No
	13	z	0.003	0.00	0.00	No	0.00	No
	14	z	0.003	0.00	0.00	No	0.00	No
	15	z	0.003	0.00	0.00	No	0.00	No
	16	z	0.003	0.00	0.00	No	0.00	No
	31	z	0.008	0.00	0.00	No	0.00	No
Di	3	y	-0.008	0.00	0.00	No	0.00	No
	4	y	-0.008	0.00	0.00	No	0.00	No
	5	y	-0.008	0.00	0.00	No	0.00	No
	8	y	-0.008	0.00	0.00	No	0.00	No
	9	y	-0.008	0.00	0.00	No	0.00	No
	10	y	-0.008	0.00	0.00	No	0.00	No
	11	y	-0.005	0.00	0.00	No	0.00	No
	12	y	-0.005	0.00	0.00	No	0.00	No
	13	y	-0.005	0.00	0.00	No	0.00	No
	14	y	-0.005	0.00	0.00	No	0.00	No
	15	y	-0.005	0.00	0.00	No	0.00	No
	16	y	-0.005	0.00	0.00	No	0.00	No
	26	y	-0.008	0.00	0.00	No	0.00	No
	27	y	-0.008	0.00	0.00	No	0.00	No
	28	y	-0.008	0.00	0.00	No	0.00	No
	29	y	-0.008	0.00	0.00	No	0.00	No
	31	y	-0.008	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	26	y	-0.024	2.00	No
		y	-0.024	6.00	No
		y	-0.038	4.00	No
	27	y	-0.034	0.50	No
		y	-0.034	7.50	No
	28	y	-0.027	0.50	No
		y	-0.027	7.50	No
		y	-0.06	1.50	No
	29	y	-0.058	0.50	No
		y	-0.058	7.50	No
		y	-0.072	1.50	No
		y	-0.073	1.50	No
Wo	26	z	-0.089	2.00	No
		z	-0.089	6.00	No
	27	z	-0.224	0.50	No
		z	-0.224	7.50	No
	28	z	-0.194	0.50	No
		z	-0.194	7.50	No
		z	-0.009	1.50	No
	29	z	-0.30	0.50	No
		z	-0.30	7.50	No
		z	-0.024	1.50	No
		z	-0.023	1.50	No
W30	26	3	-0.081	2.00	No
		3	-0.081	6.00	No
		3	-0.019	4.00	No
	27	3	-0.201	0.50	No
		3	-0.201	7.50	No
	28	3	-0.18	0.50	No
		3	-0.18	7.50	No
		3	-0.052	1.50	No
	29	3	-0.257	0.50	No
		3	-0.257	7.50	No
		3	-0.032	1.50	No
W60	26	3	-0.065	2.00	No
		3	-0.065	6.00	No
		3	-0.031	4.00	No
	27	3	-0.154	0.50	No
		3	-0.154	7.50	No
	28	3	-0.153	0.50	No
		3	-0.153	7.50	No
		3	-0.061	1.50	No
	29	3	-0.172	0.50	No
		3	-0.172	7.50	No
		3	-0.051	1.50	No
W90	26	x	-0.057	2.00	No
		x	-0.057	6.00	No
		x	-0.037	4.00	No
	27	x	-0.13	0.50	No
		x	-0.13	7.50	No
	28	x	-0.139	0.50	No
		x	-0.139	7.50	No
		x	-0.058	1.50	No
	29	x	-0.13	0.50	No
		x	-0.13	7.50	No
		x	-0.057	1.50	No
W120	26	2	-0.065	2.00	No
		2	-0.065	6.00	No
		2	-0.031	4.00	No
	27	2	-0.154	0.50	No

		2	-0.154	7.50	No
	28	2	-0.153	0.50	No
		2	-0.153	7.50	No
		2	-0.061	1.50	No
	29	2	-0.172	0.50	No
		2	-0.172	7.50	No
		2	-0.051	1.50	No
W150	26	2	-0.081	2.00	No
		2	-0.081	6.00	No
		2	-0.019	4.00	No
	27	2	-0.201	0.50	No
		2	-0.201	7.50	No
	28	2	-0.18	0.50	No
		2	-0.18	7.50	No
		2	-0.052	1.50	No
	29	2	-0.257	0.50	No
		2	-0.257	7.50	No
		2	-0.032	1.50	No
Di	26	y	-0.064	2.00	No
		y	-0.064	6.00	No
		y	-0.054	4.00	No
	27	y	-0.145	0.50	No
		y	-0.145	7.50	No
	28	y	-0.129	0.50	No
		y	-0.129	7.50	No
		y	-0.073	1.50	No
	29	y	-0.189	0.50	No
		y	-0.189	7.50	No
		y	-0.048	1.50	No
		y	-0.047	1.50	No
WI0	26	z	-0.021	2.00	No
		z	-0.021	6.00	No
	27	z	-0.046	0.50	No
		z	-0.046	7.50	No
	28	z	-0.042	0.50	No
		z	-0.042	7.50	No
		z	-0.015	1.50	No
	29	z	-0.058	0.50	No
		z	-0.058	7.50	No
		z	-0.007	1.50	No
		z	-0.007	1.50	No
WI30	26	3	-0.019	2.00	No
		3	-0.019	6.00	No
		3	-0.006	4.00	No
	27	3	-0.041	0.50	No
		3	-0.041	7.50	No
	28	3	-0.038	0.50	No
		3	-0.038	7.50	No
		3	-0.012	1.50	No
	29	3	-0.05	0.50	No
		3	-0.05	7.50	No
		3	-0.008	1.50	No
WI60	26	3	-0.016	2.00	No
		3	-0.016	6.00	No
		3	-0.009	4.00	No
	27	3	-0.033	0.50	No
		3	-0.033	7.50	No
	28	3	-0.033	0.50	No
		3	-0.033	7.50	No
		3	-0.015	1.50	No

	29	3	-0.037	0.50	No
		3	-0.037	7.50	No
		3	-0.013	1.50	No
WI90	26	x	-0.015	2.00	No
		x	-0.015	6.00	No
		x	-0.01	4.00	No
	27	x	-0.029	0.50	No
		x	-0.029	7.50	No
	28	x	-0.031	0.50	No
		x	-0.031	7.50	No
		x	-0.015	1.50	No
	29	x	-0.03	0.50	No
		x	-0.03	7.50	No
		x	-0.014	1.50	No
WI120	26	2	-0.016	2.00	No
		2	-0.016	6.00	No
		2	-0.009	4.00	No
	27	2	-0.033	0.50	No
		2	-0.033	7.50	No
	28	2	-0.033	0.50	No
		2	-0.033	7.50	No
		2	-0.015	1.50	No
	29	2	-0.037	0.50	No
		2	-0.037	7.50	No
		2	-0.013	1.50	No
WI150	26	2	-0.019	2.00	No
		2	-0.019	6.00	No
		2	-0.006	4.00	No
	27	2	-0.041	0.50	No
		2	-0.041	7.50	No
	28	2	-0.038	0.50	No
		2	-0.038	7.50	No
		2	-0.012	1.50	No
	29	2	-0.05	0.50	No
		2	-0.05	7.50	No
		2	-0.008	1.50	No
WL0	26	z	-0.006	2.00	No
		z	-0.006	6.00	No
	27	z	-0.013	0.50	No
		z	-0.013	7.50	No
	28	z	-0.012	0.50	No
		z	-0.012	7.50	No
		z	-0.001	1.50	No
	29	z	-0.018	0.50	No
		z	-0.018	7.50	No
		z	-0.001	1.50	No
		z	-0.001	1.50	No
WL30	26	3	-0.005	2.00	No
		3	-0.005	6.00	No
		3	-0.001	4.00	No
	27	3	-0.012	0.50	No
		3	-0.012	7.50	No
	28	3	-0.011	0.50	No
		3	-0.011	7.50	No
		3	-0.003	1.50	No
	29	3	-0.015	0.50	No
		3	-0.015	7.50	No
		3	-0.002	1.50	No
WL60	26	3	-0.004	2.00	No
		3	-0.004	6.00	No

		3	-0.002	4.00	No
	27	3	-0.009	0.50	No
		3	-0.009	7.50	No
	28	3	-0.009	0.50	No
		3	-0.009	7.50	No
		3	-0.004	1.50	No
	29	3	-0.01	0.50	No
		3	-0.01	7.50	No
		3	-0.003	1.50	No
WL90	26	x	-0.004	2.00	No
		x	-0.004	6.00	No
		x	-0.002	1.50	No
	27	x	-0.008	0.50	No
		x	-0.008	7.50	No
	28	x	-0.008	0.50	No
		x	-0.008	7.50	No
		x	-0.003	1.50	No
	29	x	-0.008	0.50	No
		x	-0.008	7.50	No
		x	-0.003	1.50	No
WL120	26	2	-0.004	2.00	No
		2	-0.004	6.00	No
		2	-0.002	4.00	No
	27	2	-0.009	0.50	No
		2	-0.009	7.50	No
	28	2	-0.009	0.50	No
		2	-0.009	7.50	No
		2	-0.004	1.50	No
	29	2	-0.01	0.50	No
		2	-0.01	7.50	No
		2	-0.003	1.50	No
WL150	26	2	-0.005	2.00	No
		2	-0.005	6.00	No
		2	-0.001	4.00	No
	27	2	-0.012	0.50	No
		2	-0.012	7.50	No
	28	2	-0.011	0.50	No
		2	-0.011	7.50	No
		2	-0.003	1.50	No
	29	2	-0.015	0.50	No
		2	-0.015	7.50	No
		2	-0.002	1.50	No
LL1	8	y	-0.25	50.00	Yes
LL2	8	y	-0.25	100.00	Yes
LL3	8	y	-0.25	0.00	Yes
LLa1	26	y	-0.25	50.00	Yes
LLa2	27	y	-0.25	50.00	Yes
LLa3	28	y	-0.25	50.00	Yes
LLa4	29	y	-0.25	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load Right End of Mount	No	0.00	0.00	0.00
LL3	250 lb Live Load Left End of Mount	No	0.00	0.00	0.00
LLa1	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	0.00	0.00	0.00
Di	0.00	0.00	0.00
WI0	0.00	0.00	0.00
WI30	0.00	0.00	0.00
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	0.00	0.00	0.00

LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

Bentley Hewlett-Packard Company

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC38=1.2D+1.5LL1
LC39=1.2D+1.5LL2
LC40=1.2D+1.5LL3
LC41=1.2D+WL0+1.5LLa1
LC42=1.2D+WL30+1.5LLa1
LC43=1.2D+WL60+1.5LLa1
LC44=1.2D+WL90+1.5LLa1
LC45=1.2D+WL120+1.5LLa1
LC46=1.2D+WL150+1.5LLa1
LC47=1.2D-WL0+1.5LLa1
LC48=1.2D-WL30+1.5LLa1
LC49=1.2D-WL60+1.5LLa1
LC50=1.2D-WL90+1.5LLa1
LC51=1.2D-WL120+1.5LLa1
LC52=1.2D-WL150+1.5LLa1
LC53=1.2D+WL0+1.5LLa2
LC54=1.2D+WL30+1.5LLa2

LC55=1.2D+WL60+1.5LLa2
LC56=1.2D+WL90+1.5LLa2
LC57=1.2D+WL120+1.5LLa2
LC58=1.2D+WL150+1.5LLa2
LC59=1.2D-WL0+1.5LLa2
LC60=1.2D-WL30+1.5LLa2
LC61=1.2D-WL60+1.5LLa2
LC62=1.2D-WL90+1.5LLa2
LC63=1.2D-WL120+1.5LLa2
LC64=1.2D-WL150+1.5LLa2
LC65=1.2D+WL0+1.5LLa3
LC66=1.2D+WL30+1.5LLa3
LC67=1.2D+WL60+1.5LLa3
LC68=1.2D+WL90+1.5LLa3
LC69=1.2D+WL120+1.5LLa3
LC70=1.2D+WL150+1.5LLa3
LC71=1.2D-WL0+1.5LLa3
LC72=1.2D-WL30+1.5LLa3
LC73=1.2D-WL60+1.5LLa3
LC74=1.2D-WL90+1.5LLa3
LC75=1.2D-WL120+1.5LLa3
LC76=1.2D-WL150+1.5LLa3
LC77=1.2D+WL0+1.5LLa4
LC78=1.2D+WL30+1.5LLa4
LC79=1.2D+WL60+1.5LLa4
LC80=1.2D+WL90+1.5LLa4
LC81=1.2D+WL120+1.5LLa4
LC82=1.2D+WL150+1.5LLa4
LC83=1.2D-WL0+1.5LLa4
LC84=1.2D-WL30+1.5LLa4
LC85=1.2D-WL60+1.5LLa4
LC86=1.2D-WL90+1.5LLa4
LC87=1.2D-WL120+1.5LLa4
LC88=1.2D-WL150+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	PIPE 2x0.154	**26**	LC39 at 31.25%	0.34	OK	Eq. H1-1b
		27	LC1 at 68.75%	0.51	OK	Eq. H1-1b
		28	LC1 at 68.75%	0.44	OK	Eq. H1-1b
		29	LC1 at 68.75%	**0.68**	**OK**	Eq. H1-1b
		31	LC14 at 100.00%	0.32	OK	Eq. H1-1b
	PIPE 2x0.218XS	**3**	LC7 at 16.96%	**0.45**	**With warnings**	Eq. H1-1b
		4	LC34 at 100.00%	0.27	OK	Eq. H1-1b
		5	LC4 at 100.00%	0.18	OK	Eq. H1-1b
		8	LC1 at 16.96%	0.35	With warnings	Eq. H1-1b
		9	LC30 at 100.00%	0.31	OK	Eq. H1-1b
		10	LC30 at 100.00%	0.20	OK	Eq. H1-1b
	RndBar 3_4	**11**	LC32 at 100.00%	0.54	OK	Eq. H1-1a
		12	LC26 at 100.00%	0.33	OK	Eq. H1-1a
		13	LC36 at 100.00%	**0.74**	**OK**	Eq. H1-1a
		14	LC25 at 0.00%	0.39	OK	Eq. H1-1a
		15	LC25 at 100.00%	0.33	OK	Eq. H1-1a
		16	LC26 at 100.00%	0.15	OK	Eq. H1-1b

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
8	-4.40	0.00	0.00	0
9	4.40	0.00	0.00	0
10	0.00	0.00	-3.00	0
11	-3.6667	0.00	-0.50	0
12	3.6667	0.00	-0.50	0
13	0.7333	0.00	-2.50	0
14	-0.7333	0.00	-2.50	0
16	6.50	3.00	0.00	0
17	-6.50	3.00	0.00	0
22	-4.40	3.00	0.00	0
23	4.40	3.00	0.00	0
24	0.00	3.00	-3.00	0
25	-3.6667	3.00	-0.50	0
26	3.6667	3.00	-0.50	0
27	0.7333	3.00	-2.50	0
28	-0.7333	3.00	-2.50	0
33	-6.00	5.50	0.20	0
34	6.00	5.50	0.20	0
35	-6.00	-2.50	0.20	0
36	6.00	-2.50	0.20	0

42	2.00	5.50	0.20	0
43	2.00	-2.50	0.20	0
48	-2.00	5.50	0.20	0
49	-2.00	-2.50	0.20	0
51	-1.00	3.00	-6.50	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
10	1	1	1	1	1	1
24	1	1	1	1	1	1
51	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
3	3	2		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
4	8	10		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
5	9	10		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
8	17	16		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
9	22	24		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
10	23	24		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
11	14	28		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
12	27	13		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
13	25	11		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
14	12	26		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
15	28	11		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
16	27	12		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
26	34	36		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
27	42	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
28	48	49		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
29	33	35		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
31	22	51		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
26	315.00	0	0.00	0.00	0.00
27	315.00	0	0.00	0.00	0.00
28	315.00	0	0.00	0.00	0.00
29	315.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
31	0.00	2.00	0.00	0.00	2.00	0.00

Hinges

	Node-J				Node-K						
Member	**M33**	**M22**	**V3**	**V2**	**M33**	**M22**	**V3**	**V2**	**TOR**	**AXL**	**Axial rigidity**
15	0	0	0	0	0	0	0	0	0	0	Tension only
16	0	0	0	0	0	0	0	0	0	0	Tension only

PROJECT INFORMATION

SCOPE OF WORK:	ITEMS TO BE MOUNTED ON EXISTING LATTICE TOWER: • NEW AT&T ANTENNAS (HPA65R-BU6A) @ POS. 3 (TYP. OF 1 PER ALPHA & GAMMA SECTORS, TOTAL OF 2). • NEW AT&T ANTENNAS (800-10965) @ POS. 4 (TYP. OF 1 PER ALPHA & GAMMA SECTORS, TOTAL OF 2). • NEW AT&T ANTENNAS (HPA65R-BU8A) @ POS. 3 (TOTAL OF 1 FOR BETA SECTOR). • NEW AT&T ANTENNAS (800-10966) @ POS. 4 (TOTAL OF 1 FOR BETA SECTOR). • NEW AT&T RRUS B5/B12 4449 (700/850) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T RRUS B2/B66A 8843 (AWS/1900) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T RRUS 32 (WCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T SURGE ARRESTOR (DC6-48-60-18-8C) (TOTAL OF 2). • INSTALL (4) DC POWER CABLES & (1) FIBER RUN (TO FOLLOW EXISTING ROUTE). ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION: • REMOVE EXISTING DC6 & INSTALL (1) OUTDOOR DC12. • INSTALL (24) TELCO FLEX IN PROPOSED CONDUITS TO BE RUN BETWEEN DC12 AND EXISTING POWER PLANT, RE-CABLE EXISTING EQUIPMENT TO PROPOSED DC12. • INSTALL (1) FIBER BOX. • SWITCH BASEBAND TO 5216. • ADD 2ND XMU. • ADD 6630 BASEBAND. • FOLLOW SEC7 OR PD FOR BASEBAND CONFIGURATION. ITEMS TO REMAIN: • (6) ANTENNAS, (6) TMA'S, (1) SURGE ARRESTOR, (12) 1-5/8" COAX, (2) DC POWER & (1) FIBER.
SITE ADDRESS:	2577 MAIN STREET GLASTONBURY, CT 06033
LATITUDE:	41.714191 N, 41° 42' 51.09" N
LONGITUDE:	72.613298 W, 72° 36' 47.87" W
TYPE OF SITE:	LATTICE TOWER / OUTDOOR EQUIPMENT
STRUCTURE HEIGHT:	130'-0"±
RAD CENTER:	110'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLANS	1
A-2	ANTENNA LAYOUTS & ELEVATION	1
A-3	DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1
G-1	GROUNDING DETAILS	1

SBA SITE #: CT46126

SITE NUMBER: CT5273

SITE NAME: GLASTONBURY NW

FA CODE: 10071041

PACE ID: MRCTB033594, MRCTB033648, MRCTB033736, MRCTB033797

PROJECT: LTE 3C_4C_5C_4TX4RX 2019 UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD, TURN LEFT ONTO CAPITAL BLVD, TURN LEFT ONTO WEST ST, TURN LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD, MERGE ONTO CT-3 N via EXIT 25 TOWARD GLASTONBURY, TAKE THE EXIT TOWARD MAIN ST/GLASTONBURY, TURN LEFT ONTO GLASTONBURY BLVD, TURN RIGHT ONTO MAIN ST, 2577 MAIN ST IS ON THE RIGHT

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. 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.
2. 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.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET., SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: CT5273
SITE NAME: GLASTONBURY NW
SBA SITE #: CT46126
2577 MAIN STREET
GLASTONBURY, CT 06033
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	06/21/19	ISSUED FOR CONSTRUCTION	AM	AT	DJC
A	04/01/19	ISSUED FOR REVIEW	AM	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT · DEREK J. CREASEY · No. 25851 · LICENSED PROFESSIONAL ENGINEER

AT&T
TITLE SHEET
(LTE 3C_4C_5C_4TX4RX)

SITE NUMBER	DRAWING NUMBER	REV
CT5273	T-1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO 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 BONDING FITTINGS OR BY BONDING 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 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – CENTERLINE
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

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 MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

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 OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (FY = 36 KSI). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T 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, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF 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 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70-2017)

    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

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

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

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CENTERLINE COMMUNICATIONS
750 WEST CENTER STREET., SUITE #301
WEST BRIDGEWATER, MA 02379

SITE NUMBER: CT5273
SITE NAME: GLASTONBURY NW
SBA SITE #: CT46126
2577 MAIN STREET
GLASTONBURY, CT 06033
HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	06/21/19	ISSUED FOR CONSTRUCTION	AM	AT	DJC
A	04/01/19	ISSUED FOR REVIEW	AM	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT · DEREK J. CREAMER · 26,255 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES
(LTE 3C_4C_5C_4TX4RX)

SITE NUMBER	DRAWING NUMBER	REV
CT5273	GN-1	1

NOTE:

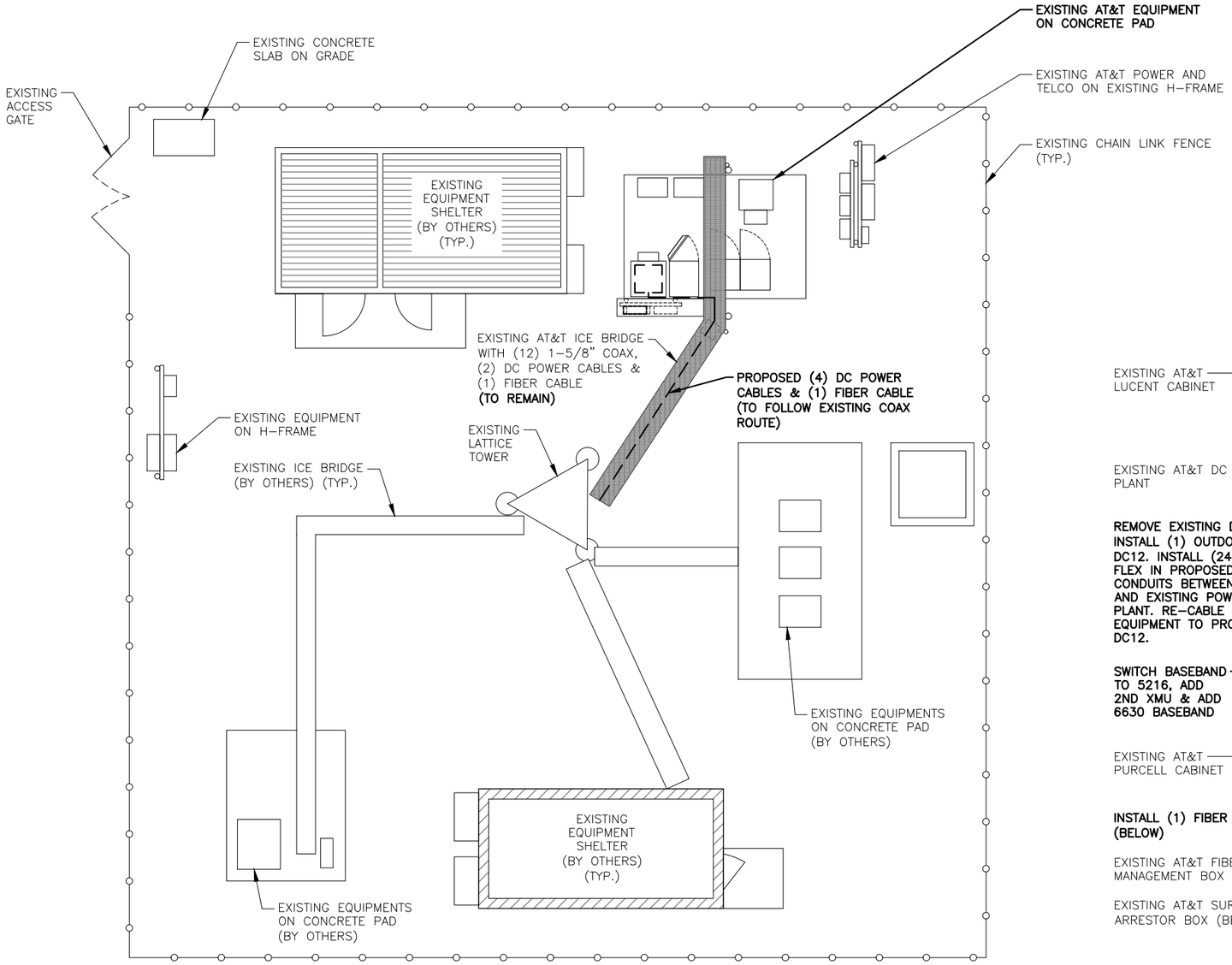
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

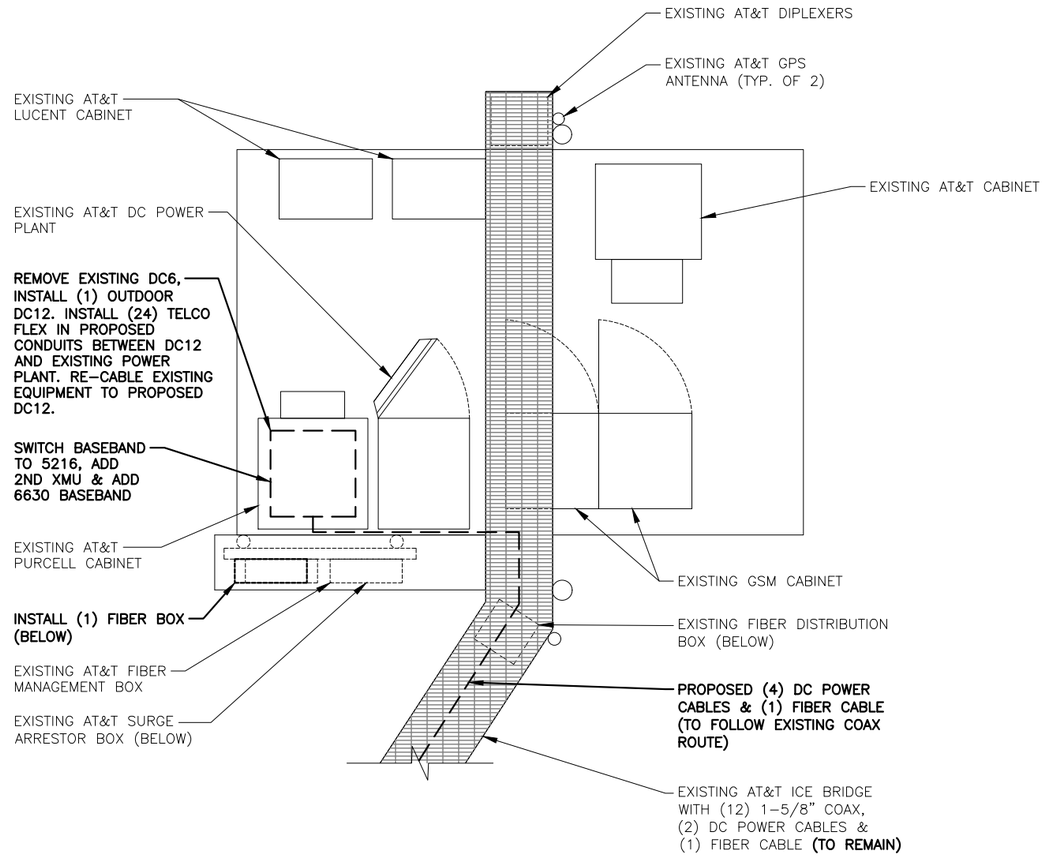
NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: JUNE 20, 2019 (REV. 1)





TRUE NORTH
13°66'
MAGNETIC NORTH

COMPOUND PLAN (1 / A-1)
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"

0 2'-8" 5'-4" 10'-8" 16'-0"

TRUE NORTH
13°66'
MAGNETIC NORTH

EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

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WEST BRIDGEWATER, MA 02379

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at&t
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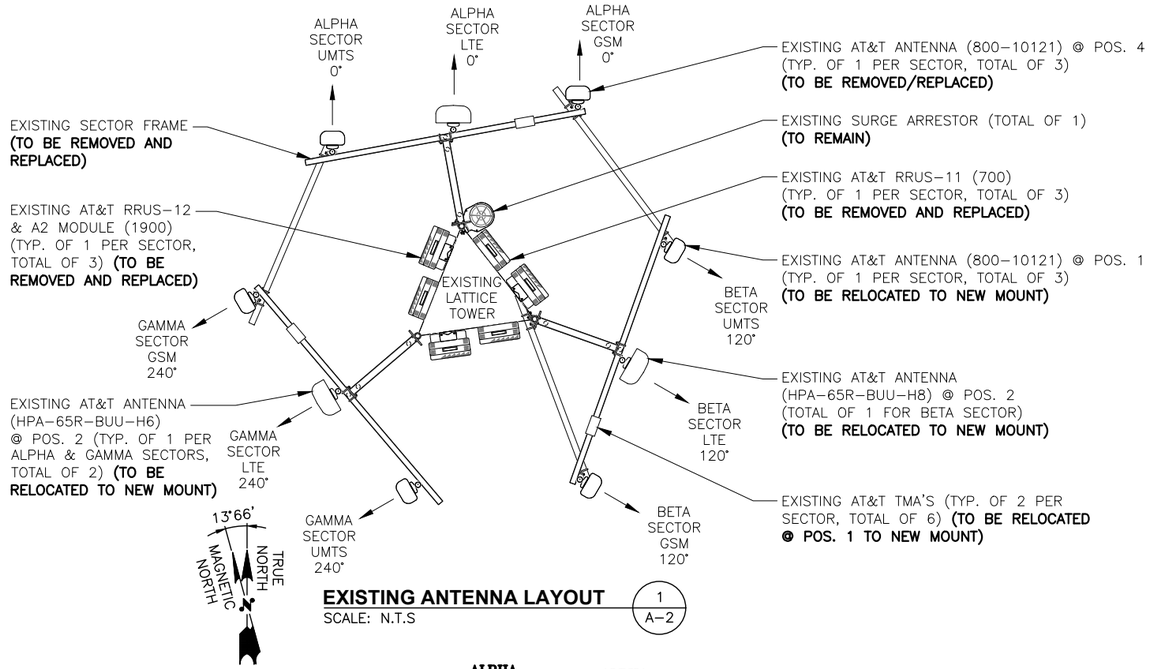
COMPOUND & EQUIPMENT PLANS
(LTE 3C_4C_5C_4TX4RX)

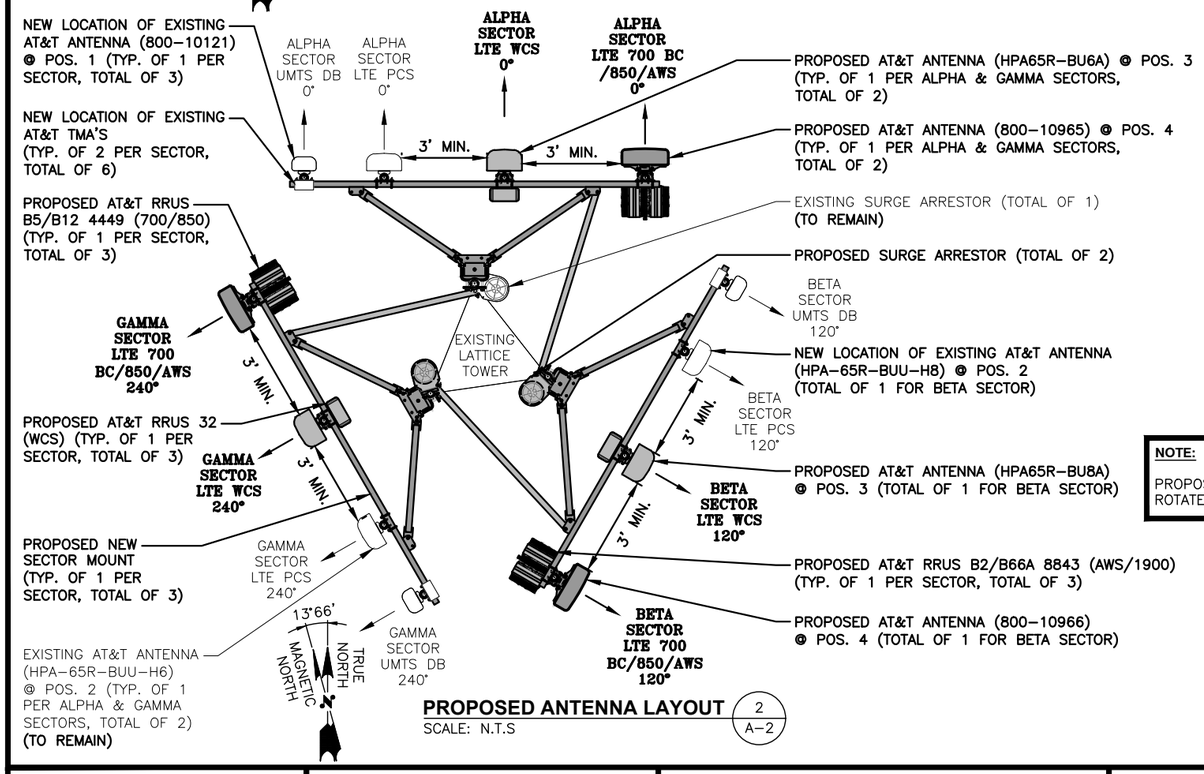
SITE NUMBER	DRAWING NUMBER	REV
CT5273	A-1	1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S

1 / A-2



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

2 / A-2

NOTE:

PROPOSED ANTENNA MOUNT TO BE ROTATED TO MATCH LTE AZIMUTHS

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

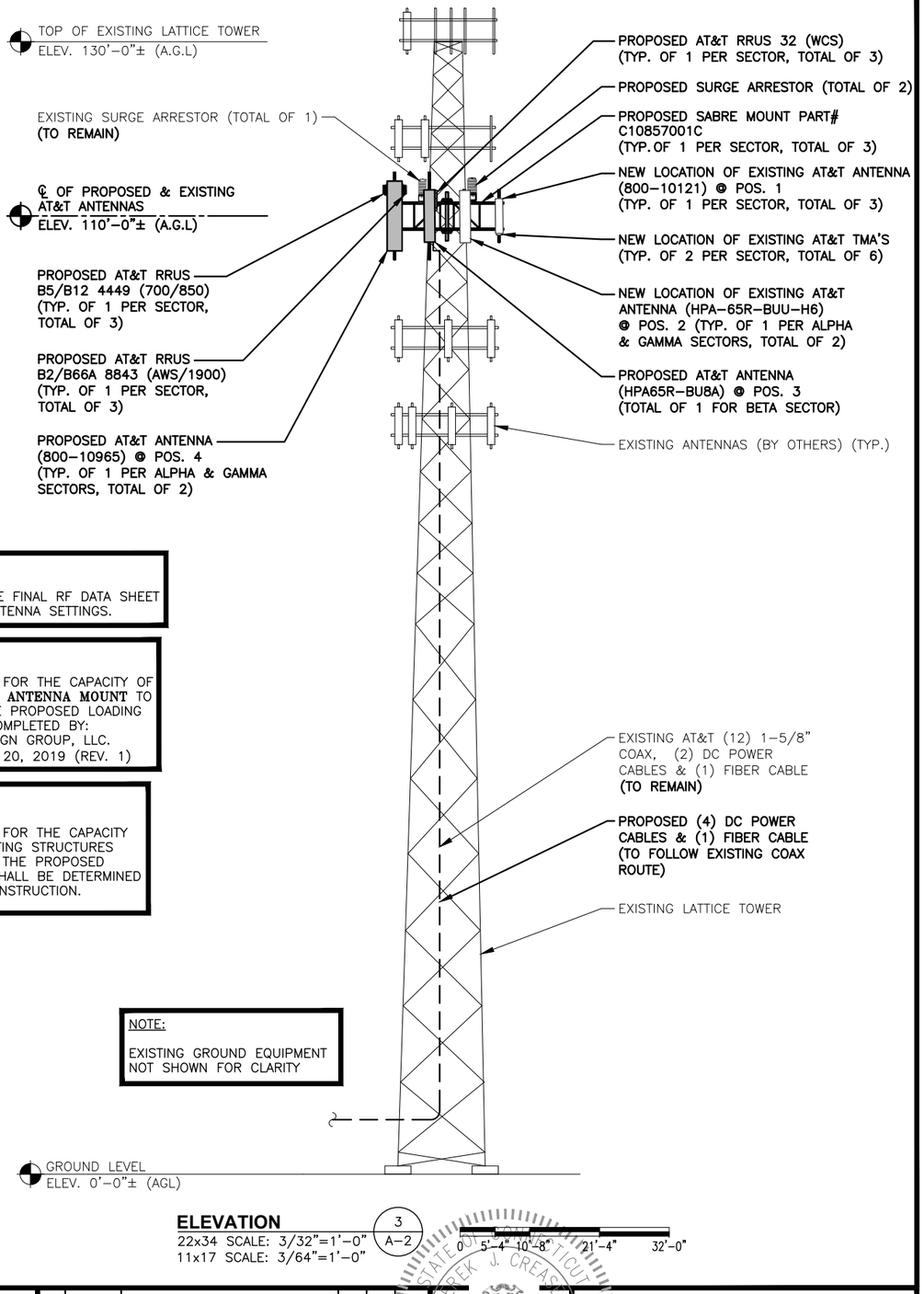
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: JUNE 20, 2019 (REV. 1)

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

EXISTING GROUND EQUIPMENT NOT SHOWN FOR CLARITY



ELEVATION

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

3 / A-2

0 5'-4" 10'-8" 21'-4" 32'-0"

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT — DEREK J. CREASEY — No. 25654 — LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS & ELEVATION (LTE 3C_4C_5C_4TX4RX)

SITE NUMBER	DRAWING NUMBER	REV
CT5273	A-2	1

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
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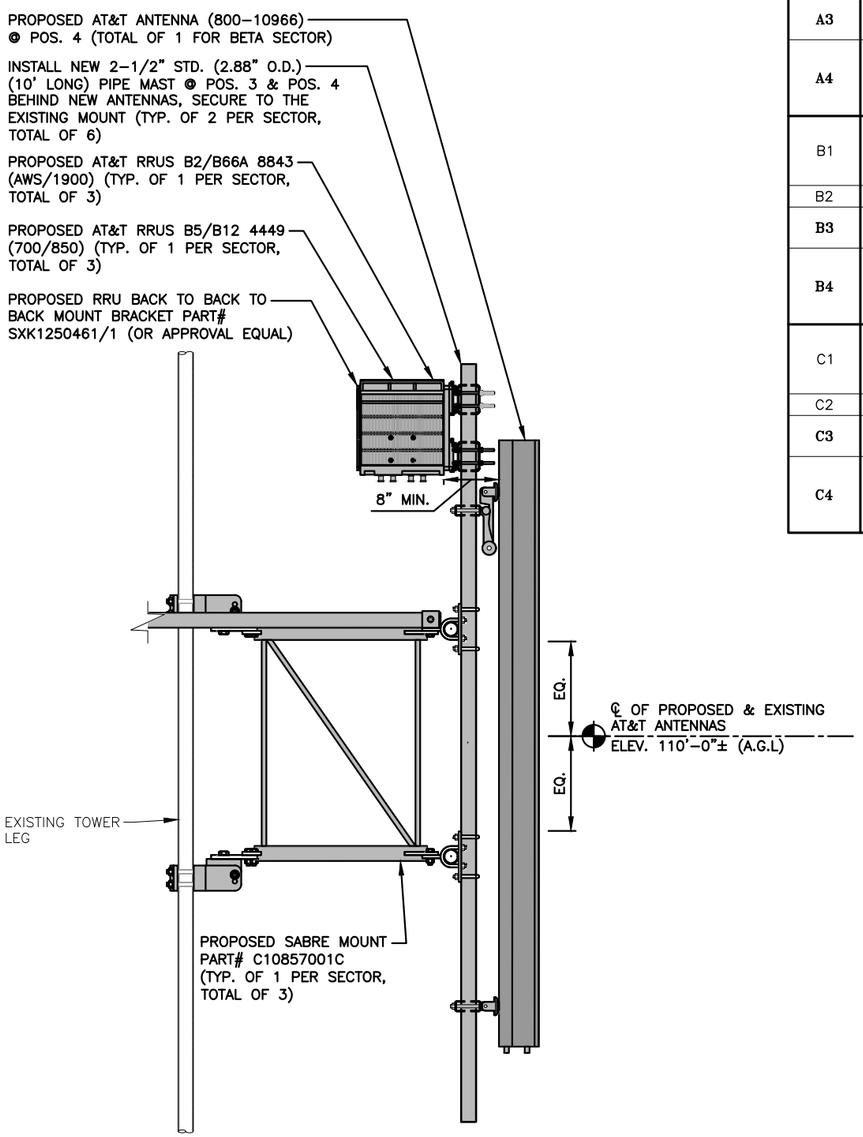
DATED: JUNE 20, 2019 (REV. 1)



PROPOSED ANTENNA & RRH MOUNTING DETAIL (2 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	EXISTING	UMTS DB	800-10121	54.5X10.3X5.9	110'±	0°	(E)(2) POWERWAVE LGP21401 (E)(2)(G) POWERWAVE LGP21901	-	-	(2) 1-5/8" COAX (LENGTH 160'±)	(E)(1) RAYCAP DC6-48-60-18-8C
A2	EXISTING	LTE PCS	HPA-65R-BUU-H6	72X14.8X9	110'±	0°	-	-	-	-	
A3	**PROPOSED**	**LTE WCS**	**HPA65R-BU6A**	**71.2X11.7X8.4**	**110'±**	**0°**	(E)(2)(G) POWERWAVE LGP21901	**(P)(1) RRUS-32 (WCS)**	**27.2X12.1X7.0**	(2) 1-5/8" COAX (LENGTH 160'±)	
A4	**PROPOSED**	**LTE 700 BC/850/AWS**	**800-10965**	**78.7X20X6.9**	**110'±**	**0°**	-	**(P)(1) B5/B12 4449 (700/850) (P)(1) B2/B66A 8843 (1900/AWS)**	**14.9X13.2X10.4 14.9X13.2X10.9**	-	
B1	EXISTING	UMTS DB	800-10121	54.5X10.3X5.9	110'±	120°	(E)(2) POWERWAVE LGP21401 (E)(2)(G) POWERWAVE LGP21901	-	-	(2) 1-5/8" COAX (LENGTH 160'±)	(P)(1) RAYCAP DC6-48-60-18-8C
B2	EXISTING	LTE PCS	HPA-65R-BUU-H8	92.4X14.8X7.4	110'±	120°	-	-	-	-	
B3	**PROPOSED**	**LTE WCS**	**HPA65R-BU8A**	**96X11.7X7.6**	**110'±**	**120°**	(E)(2)(G) POWERWAVE LGP21901	**(P)(1) RRUS-32 (WCS)**	**27.2X12.1X7.0**	(2) 1-5/8" COAX (LENGTH 160'±)	
B4	**PROPOSED**	**LTE 700 BC/850/AWS**	**800-10966**	**90X20X6.9**	**110'±**	**120°**	-	**(P)(1) B5/B12 4449 (700/850) (P)(1) B2/B66A 8843 (1900/AWS)**	**14.9X13.2X10.4 14.9X13.2X10.9**	-	
C1	EXISTING	UMTS DB	800-10121	54.5X10.3X5.9	110'±	240°	(E)(2) POWERWAVE LGP21401 (E)(2)(G) POWERWAVE LGP21901	-	-	(2) 1-5/8" COAX (LENGTH 160'±)	(P)(1) RAYCAP DC6-48-60-18-8C
C2	EXISTING	LTE PCS	HPA-65R-BUU-H6	72X14.8X9	110'±	240°	-	-	-	-	
C3	**PROPOSED**	**LTE WCS**	**HPA65R-BU6A**	**71.2X11.7X8.4**	**110'±**	**240°**	(E)(2)(G) POWERWAVE LGP21901	**(P)(1) RRUS-32 (WCS)**	**27.2X12.1X7.0**	(2) 1-5/8" COAX (LENGTH 160'±)	
C4	**PROPOSED**	**LTE 700 BC/850/AWS**	**800-10965**	**78.7X20X6.9**	**110'±**	**240°**	-	**(P)(1) B5/B12 4449 (700/850) (P)(1) B2/B66A 8843 (1900/AWS)**	**14.9X13.2X10.4 14.9X13.2X10.9**	-	

FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

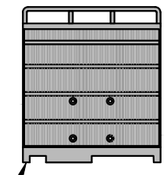
RRU CHART

QUANTITY	MODEL	L	W	D
3(P)	RRUS-32 (WCS)	27.2"	12.1"	7.0"
3(P)	B5/B12 4449 (700/850)	14.9"	13.2"	10.4"
3(P)	B2/B66A 8843 (1900/AWS)	14.9"	13.2"	10.9"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:

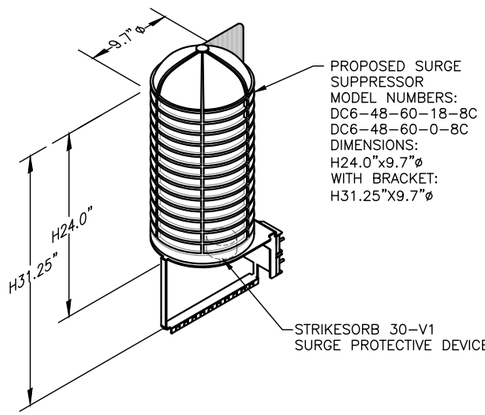
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

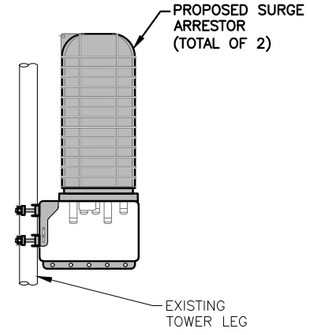
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (3 / A-3)
SCALE: N.T.S



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL (4 / A-3)
SCALE: N.T.S



SURGE SUPPRESSOR MOUNTING DETAIL (5 / A-3)
SCALE: N.T.S

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CENTERLINE COMMUNICATIONS
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SITE NUMBER: CT5273
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HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
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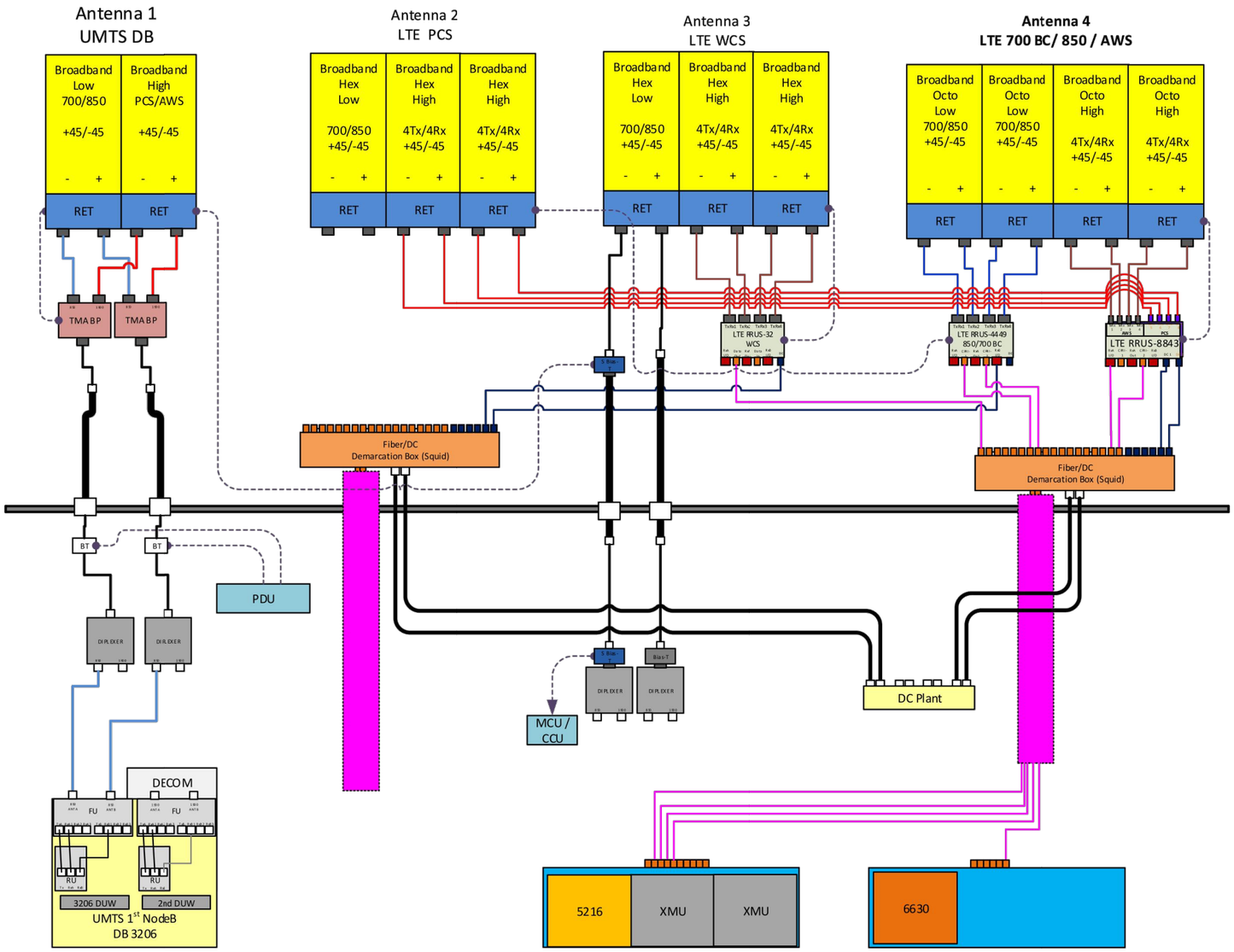
STATE OF CONNECTICUT · DEREK J. CREASEY · No. 25651 · LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS
(LTE 3C_4C_5C_4TX4RX)

SITE NUMBER	DRAWING NUMBER	REV
CT5273	A-5	1



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

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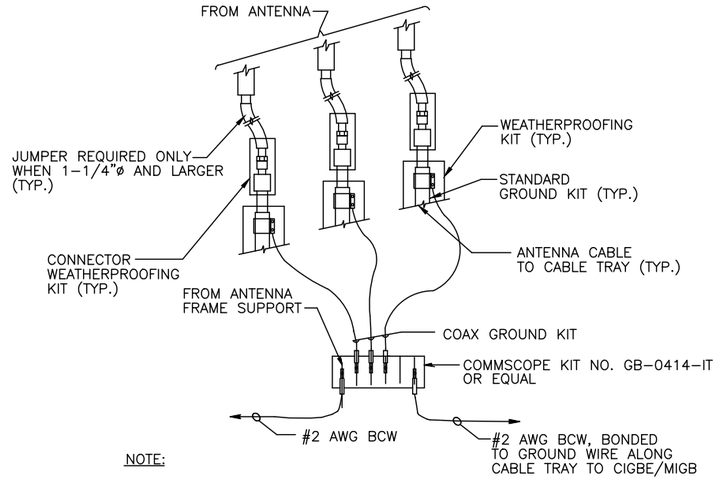
STATE OF CONNECTICUT · DEREK J. CREASER · No. 29358 · LICENSED PROFESSIONAL ENGINEER

AT&T

RF PLUMBING DIAGRAM
(LTE 3C_4C_5C_4TX4RX)

SITE NUMBER	DRAWING NUMBER	REV
CT5273	RF–1	1

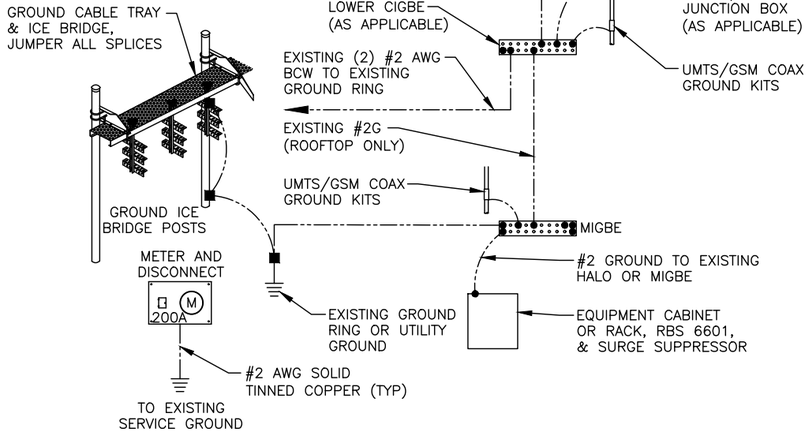


NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

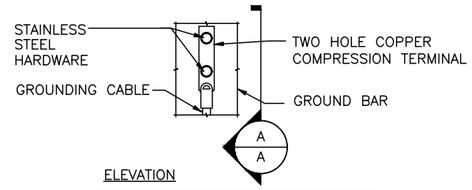
GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

SCALE: N.T.S



GROUNDING RISER DIAGRAM (2 / G-1)

SCALE: N.T.S



NOTE:

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

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G-1)

SCALE: N.T.S

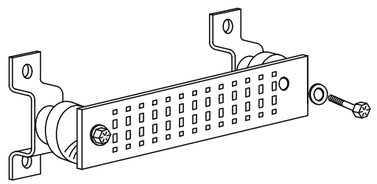
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
BUILDING STEEL (IF AVAILABLE) (#2)



GROUND BAR - DETAIL (4 / G-1)

SCALE: N.T.S

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A	04/01/19	ISSUED FOR REVIEW	AM	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: AM

STATE OF CONNECTICUT · DEREK J. CREASER · No. 25851 · LICENSED PROFESSIONAL ENGINEER

AT&T

GROUNDING DETAILS
(LTE 3C_4C_5C_4TX4RX)

SITE NUMBER	DRAWING NUMBER	REV
CT5273	G-1	1

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CTL05273

Glastonbury NW
2577 Main Street

Glastonbury, CT 06033

June 16, 2019

Centerline Communications Project Number: 950012-222

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**10.07 %**

June 4, 2019

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

Emissions Analysis for Site: **CTL05273 – Glastonbury NW**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **2577 Main Street in Glastonbury, Connecticut** for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

General population/uncontrolled exposure limits apply to situations in which the general population 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 population 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.

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **2577 Main Street in Glastonbury, Connecticut**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
5G	850 MHz	2	25
LTE	850 MHz	2	40
LTE	700 MHz	2	40
LTE	2100 MHz (AWS)	4	30
LTE	1900 MHz (PCS)	4	40
LTE	2300 MHz (WCS)	4	30

Table 1: Channel Data Table

The following antennas listed in Table 2 were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Kathrein 800-10121	110
A	2	CCI HPA-65R-BUU-H6	110
A	3	CCI HPA-65R-BUU-H6	110
A	4	Kathrein 800-10965	110
B	1	Kathrein 800-10121	110
B	2	CCI HPA-65R-BUU-H6	110
B	3	CCI HPA-65R-BUU-H6	110
B	4	Kathrein 800-10965	110
C	1	Kathrein 800-10121	110
C	2	CCI HPA-65R-BUU-H6	110
C	3	CCI HPA-65R-BUU-H6	110
C	4	Kathrein 800-10965	110

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX	ERP (W)	MPE %
Antenna A1	Kaathrein 800-10121	850 MHz	11.25 dBd	2	60	800.11	0.42
Antenna A2	CCI HPA-65R-BUU-H6	1900 MHz / 1900 MHz	14.75 dBd / 14.65 dBd	8	320	9,553.22	2.84
Antenna A3	CCI HPA-65R-BUU-H6	2300 MHz	16.15 dBd	4	120	4,945.17	1.47
Antenna A4	Kathrein 800-10965	700 MHz / 850 MHz / 2100 MHz / 850 MHz	12.65 dBd / 13.45 dBd / 15.95 dBd / 13.45 dBd	10	330	9,072.24	3.85
						Sector A Composite MPE%	**8.57**
Antenna B1	Kaathrein 800-10121	850 MHz	11.25 dBd	2	60	800.11	0.42
Antenna B2	CCI HPA-65R-BUU-H6	1900 MHz / 1900 MHz	14.75 dBd / 14.65 dBd	8	320	9,553.22	2.84
Antenna B3	CCI HPA-65R-BUU-H6	2300 MHz	16.15 dBd	4	120	4,945.17	1.47
Antenna B4	Kathrein 800-10965	700 MHz / 850 MHz / 2100 MHz / 850 MHz	12.65 dBd / 13.45 dBd / 15.95 dBd / 13.45 dBd	10	330	9,072.24	3.85
						Sector B Composite MPE%	**8.57**
Antenna C1	Kaathrein 800-10121	850 MHz	11.25 dBd	2	60	800.11	0.42
Antenna C2	CCI HPA-65R-BUU-H6	1900 MHz / 1900 MHz	14.75 dBd / 14.65 dBd	8	320	9,553.22	2.84
Antenna C3	CCI HPA-65R-BUU-	2300 MHz	16.15 dBd	4	120	4,945.17	1.47
Antenna C4	Kathrein 800-10965	700 MHz / 850 MHz / 2100 MHz / 850 MHz	12.65 dBd / 13.45 dBd / 15.95 dBd / 13.45 dBd	10	330	9,072.24	3.85
						Sector C Composite MPE%	**8.57**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Per Sector Value	**8.57 %**
Metro PCS	0.1376%
Sprint	0.3592%
Clearwire	0.0128%
Nextel	0.0217%
Site Total MPE %:	**10.07 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	8.57 %
AT&T Sector B Total:	8.57 %
AT&T Sector C Total:	8.57 %
Site Total:	10.07 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($i.tW/cm^2$)	Frequency (MHz)	Allowable MPE ($i.tW/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS- Antenna 1	2	400.06	110.0	2.38	850 MHz UMTS	567	0.42%
AT&T 1900 MHz LTE- Antenna 2	4	1194.15	110.0	14.19	1900 MHz LTE	1000	1.42%
AT&T 1900 MHz LTE- Antenna 2	4	1194.15	110.0	14.19	1900 MHz LTE	1000	1.42%
AT&T 2300 MHz LTE WCS- Antenna 3	4	1236.29	110.0	14.69	2300 MHz LTE WCS	1000	1.47%
AT&T 700 MHz LTE- Antenna 3	2	736.31	110.0	4.38	700 MHz LTE	467	0.94%
AT&T 850 MHz LTE - Antenna 3	2	885.24	110.0	5.26	850 MHz LTE	567	0.93%
AT&T 2100 MHz LTE AWS- Antenna 3	4	1180.65	110.0	14.03	2100 MHz LTE AWS	1000	1.40%
						Total:	**8.57 %**

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	8.57 %
Sector B:	8.57 %
Sector C:	8.57 %
AT&T Maximum Total (per sector):	8.57 %
Site Total:	10.07 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **10.07 %** of the allowable FCC established general population 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.

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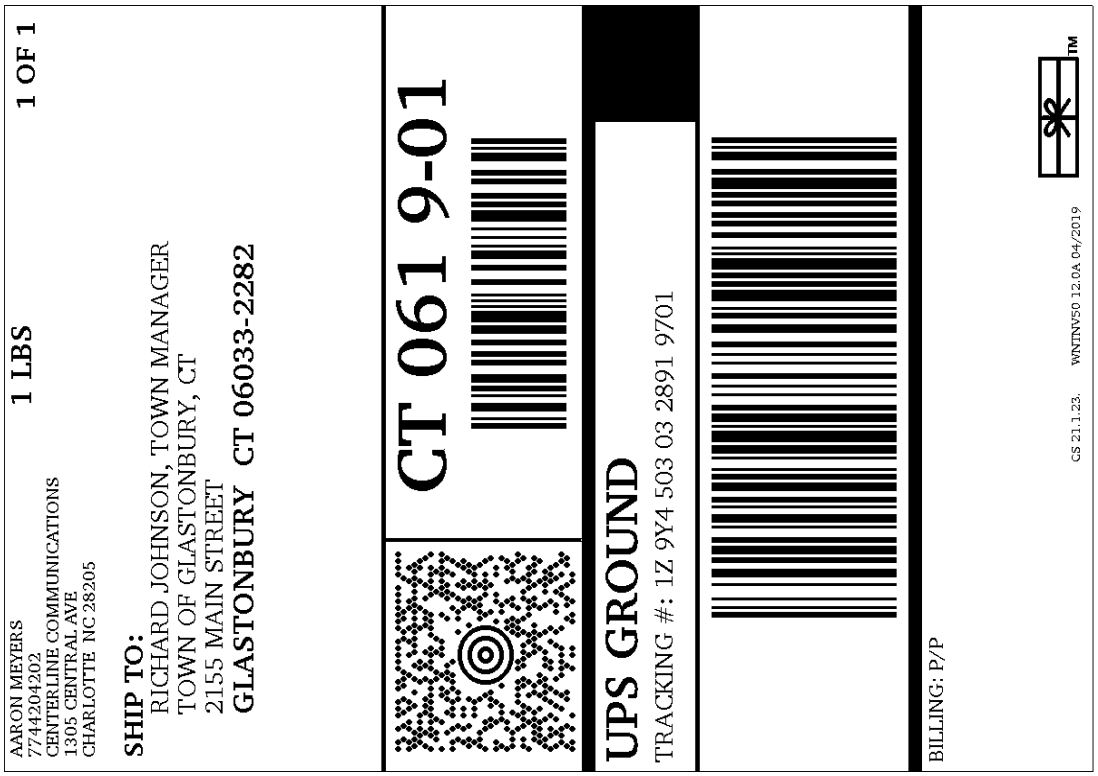

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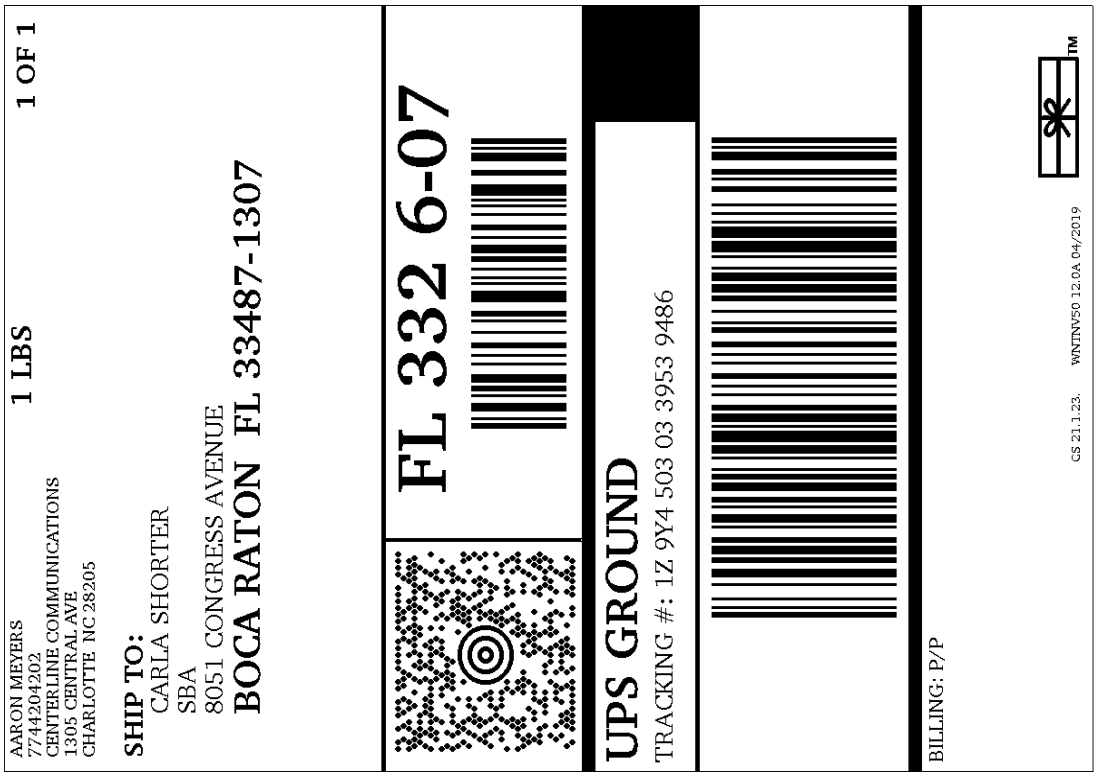

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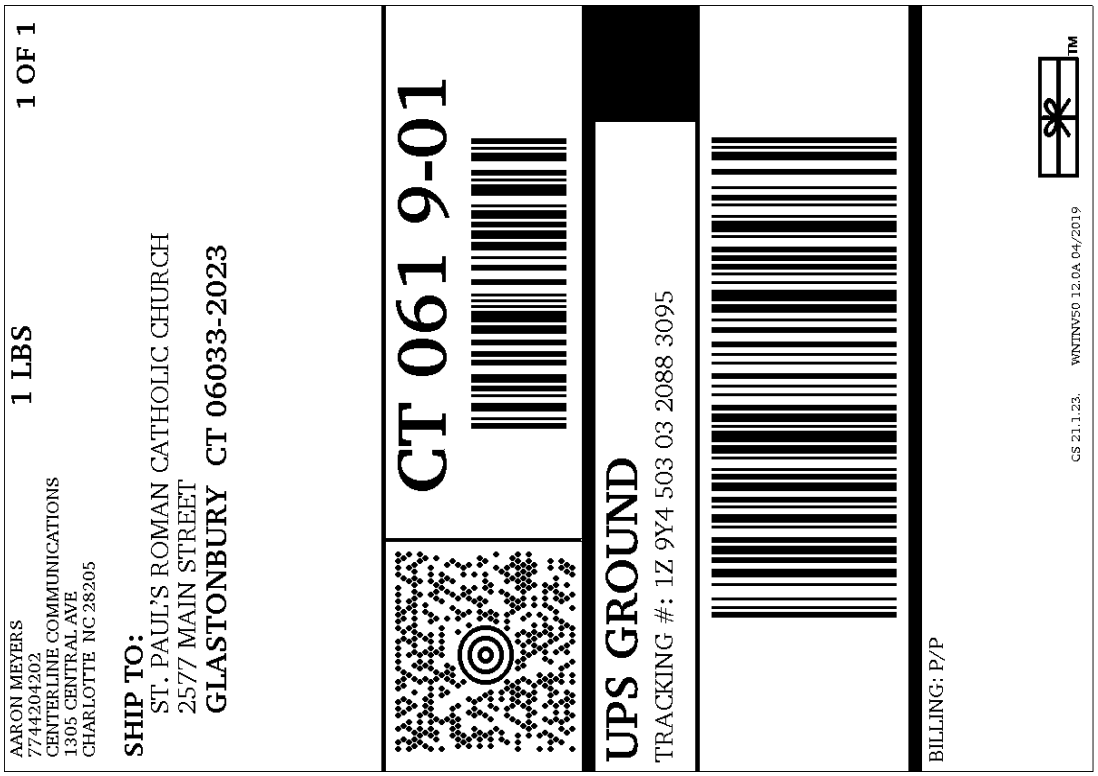

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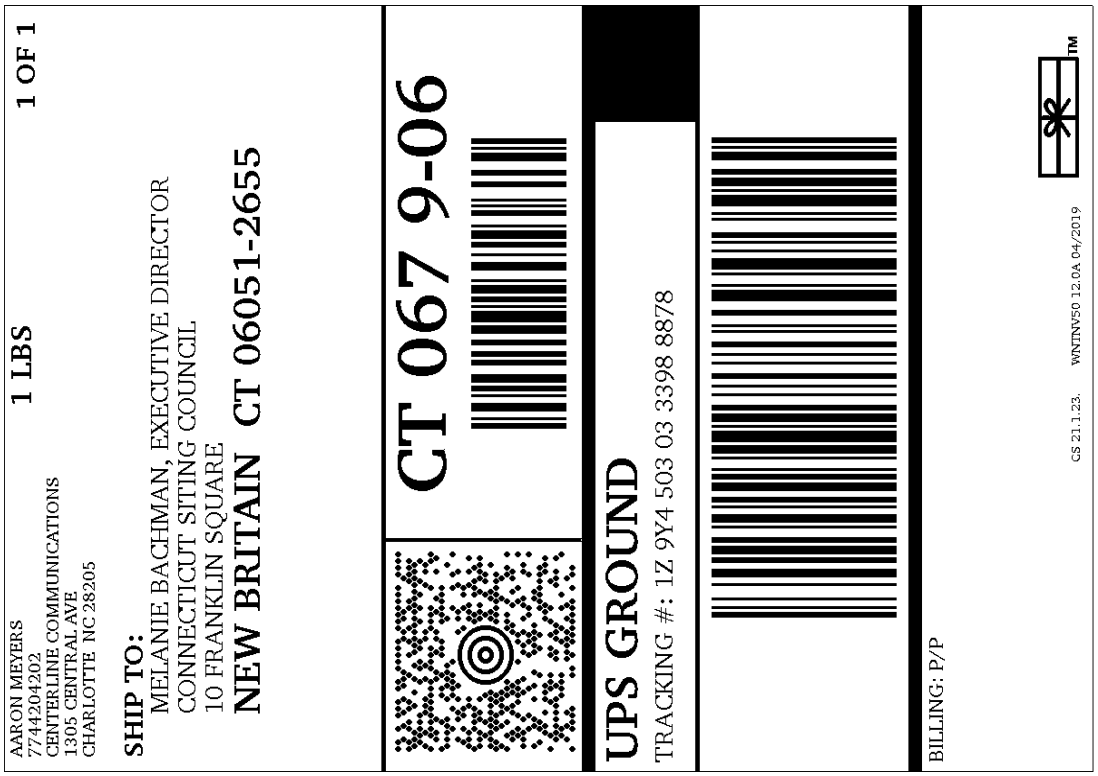

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