QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
Mark.Roberts@QCDevelopment.net

August 26, 2016

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T)
890 Evergreen Ave, Hamden, CT 06518
N 41-24-24
W 72-54-17

Dear Ms. Bachman:

AT&T currently maintains twelve (12) antennas at the 85-foot level of the existing 108-foot Stealth Self Support Silo Structure at 890 Evergreen Ave, Hamden, CT. The tower is owned by Crown Castle and the property is owned by the State of Connecticut Agricultural Experiment Station. AT&T now intends to remove three (3) KMW antennas and replace them with three (3) CCI antennas. These antennas would be installed at the 85-foot level of the tower. AT&T also intends to remove three (3) existing Ericsson RRUS-11 radio heads and install three (3) Ericsson RRUS-32 B2.

This facility was approved by the Connecticut Siting Council, Docket No. 195 on October 8, 1999. There were no conditions that could feasibly be violated by this modification, including the stealth design, total facility height or mounting restrictions. This modification therefore complies with the aforementioned approval.

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 The Honorable Curt B. Leng, Mayor of the Town of Hamden, as well as the property owner and the

tower 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).

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.

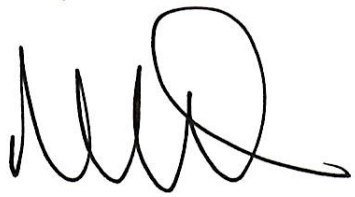
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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).

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,



Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Honorable Curt B. Leng - as elected official
CT Agriculture Experiment Station - as property owner (via e-mail)
Crown Castle - as structure owner (via e-mail)

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							19.77%
AT&T GSM	1	500	85	0.0288	880	0.5867	0.49%
AT&T UMTS	2	500	85	0.0576	1900	1.0000	0.58%
AT&T GSM	1	296	85	0.0341	880	0.5867	0.58%
AT&T LTE	4	427	85	0.0984	1900	1.0000	0.98%
AT&T LTE	1	500	85	0.0288	740	0.4933	0.58%
Site Total							22.99%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							19.77%
AT&T GSM	1	500	85	0.0288	880	0.5867	0.49%
AT&T UMTS	2	500	85	0.0576	1900	1.0000	0.58%
AT&T UMTS	2	500	85	0.0576	880	0.5867	0.98%
AT&T LTE	4	427	85	0.0984	1900	1.0000	0.98%
AT&T LTE	1	500	85	0.0288	740	0.4933	0.58%
Site Total							23.39%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Note: Proposed Loading may also include corrections to certain Existing Loading values

Date: **August 18, 2016**

Charles McGuirt
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6607

GPD Engineering and Architecture
Professional Corporation
520 South Main Street Suite 2531
Akron, Ohio 44311
(216) 927-8663
dpalkovic@gpdgroup.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	**AT&T Co-Locate**	
	Carrier Site Number:	CT2039
	Carrier Site Name:	SNET 5641 - 0265
Crown Castle Designation:	**Crown Castle BU Number:**	800529
	Crown Castle Site Name:	CT HAMDEN NORTH CAC
	Crown Castle JDE Job Number:	383191
	Crown Castle Work Order Number:	1270896
	Crown Castle Application Number:	351118 Rev. 0
Engineering Firm Designation:	**GPD Project Number:**	2016777.800529.05
Site Data:	**890 EVERGREEN AVENUE, Hamden, New Haven County, CT** **Latitude *41° 24' 23.9"*, Longitude *-72° 54' 16.32"*** **100 Foot - Self Support Tower**	

Dear Charles McGuirt,

GPD is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 936061, in accordance with application 351118, Revision 0.

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

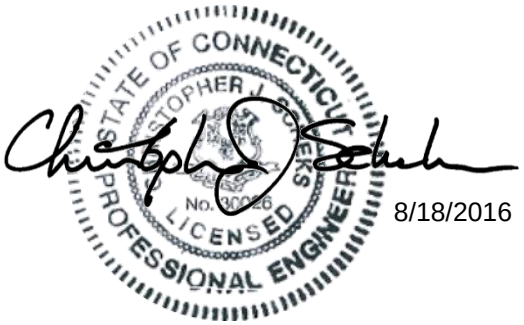
LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the 2003 IBC standard with 2005 Connecticut Building Code based upon a wind speed of 105 mph 3-second gust, exposure category C with topographic category 1 and crest height of 0 feet.

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

Respectfully submitted by:

Christopher J. Scheks
Connecticut # 0030026



8/18/2016

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1) INTRODUCTION

The existing 100 ft self support tower has seven major sections with no taper and X bracing. The top 40' consists of 4 bays and a 4'10" face width, and the lower 60' consists of 3 bays and a 9'6-5/8" face width. The structure is galvanized

This tower is a 100 ft Self Support tower designed by STEALTH NETWORK TECHNOLOGIES INC. in December of 2000. The tower was originally designed for a wind speed of 110 mph per ASCE 7-95.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2003 International Building Code with 2005 Connecticut Building Code Amendments using a 3-second gust wind speed of 105 mph with no ice, 50 mph with 0.75 inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
85.0	85.0	3	CCI	HPA-33R-BUU-H6			
		3	Ericsson	RRUS 32 B2			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
100.0	104.0	3	Andrew	SBNHH-1D65A	18 1	1-5/8 1/2	
		1	Decibel	DB806-XC			
		6	Commscope	ATBT-Bottom-24V			
		3	RFS/Celwave	ATMAA1412D-1A20			
95.0	95.0	3	Alcatel Lucent	RRH2X40-AWS	1 12	1-1/4 1-5/8	
		1	Andrew	LNXC-6514DS-VTM			
		2	Antel	BXA-171063-12BF			
		1	Antel	BXA-171063-12CF-EDIN-2			
		3	Antel	BXA-80080/4CF			
		2	Powerwave	P65-16-XL-M			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		6	RFS Celwave	FD9R6004/2C-3L			
		3	Rymsa Wireless	MG D3-800TV			
85.0	85.0	3	KMW	AM-X-CD-16-65-00T-RET			1
		3	Ericsson	RRUS-11			
		6	Kathrein	860 10025			
		6	CCI	DTMABP7819VG12A	12 2 1 2	7/8 3/4 3/8 2	
		3	Ericsson	RRUS-11			
		3	Kathrein	800 10121			
		6	Kathrein	860 10025			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		3	KMW	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			
75.0	75.0	2	CSA Wireless	A-18A24N-U	11	1-1/4	
		10	Decibel	DB844H90E-XY			
65.0	65.0	3	Kathrein	742 213	6	1-5/8	

Notes:
1) Existing equipment to be removed prior to the installation of the proposed equipment listed in Table 1.

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
95.0	95.0	12	Allgon	7129.16.33		
85.0	85.0	12	Allgon	7120.16		
75.0	75.0	12	Decibel	844H90EXY		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	GPD Project #: 2016777.800529.04, dated 8/10/2016	6400183	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Stealth Job #: 00-065, dated 12/5/2000	671923	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Stealth Job #: 00-065, dated 12/5/2000	605026	CCISITES
4-TOWER STRUCTURAL ANALYSIS LETTER	GPD Project #: 2016777.800529.03, dated 6/17/2016	6316916	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1) and RISA 3D (Version 14.0.0), commercially available analysis software packages, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
L1	100 - 90	Leg	HSS6x6x1/4	M1	7.42	181.658	2.6%	Pass
		Diagonal	2L2x2x3/16x1/2	M10	4.851	29.85	13.0%	Pass
		Top Girt	C6x10.5	M5	1.759	59.887	1.3%	Pass
L2	90 - 80	Leg	HSS6x6x1/4	M18	17.324	181.658	4.8%	Pass
		Diagonal	2L2x2x3/16x1/2	M29	7.591	29.85	25.9%	Pass
		Top Girt	C6x10.5	M21	2.031	59.887	4.9%	Pass
L3	80 - 70	Leg	HSS6x6x1/4	M34	36.403	181.658	23.1%	Pass
		Diagonal	2L2x2x3/16x1/2	M43	11.331	29.85	38.7%	Pass
		Top Girt	C6x10.5	M38	3.628	59.887	6.1%	Pass
L4	70 - 60	Leg	HSS6x6x1/4	M50	68.277	181.658	40.5%	Pass
		Diagonal	2L2x2x3/16x1/2	M61	14.922	29.85	53.9%	Pass
		Top Girt	C6x10.5	M54	4.726	59.887	6.9%	Pass
T1	60 - 40	Leg	HSS8x8x1/4	M66	49.68	199.192	25.7%	Pass
		Diagonal	2L4x4x3/8x1/2	M74	28.474	112.46	26.3%	Pass
		Top Girt	W16x45	M69	10.748	426.018	77.4%	Pass
T2	40 - 20	Leg	HSS8x8x1/4	M82	87.504	199.192	45.6%	Pass
		Diagonal	2L4x4x3/8x1/2	M90	42.032	112.46	38.8%	Pass
		Top Girt	W6x12	M86	22.909	59.891	32.4%	Pass
T3	20 - 0	Leg	HSS8x8x1/4	M98	127.654	199.192	65.4%	Pass
		Diagonal	2L4x4x3/8x1/2	M106	61.074	112.46	56.1%	Pass
		Top Girt	W6x12	M102	38.056	59.891	55.7%	Pass
							Summary	
						Leg (T3)	65.4%	Pass
						Diagonal (T3)	56.1%	Pass
						Top Girt (T1)	77.4%	Pass
						Bolt Checks	78.1%	Pass
						Rating =	78.1%	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0.0	87.3	Pass
1	Base Foundation	0.0	10.5	Pass
1	Base Foundation Soil Interaction	0.0	67.1	Pass

Structure Rating (max from all components) =	87.3%

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

4.1) Recommendations

The existing tower and its foundation are sufficient for the proposed loading and do not require modifications.

5) DISCLAIMER OF WARRANTIES

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

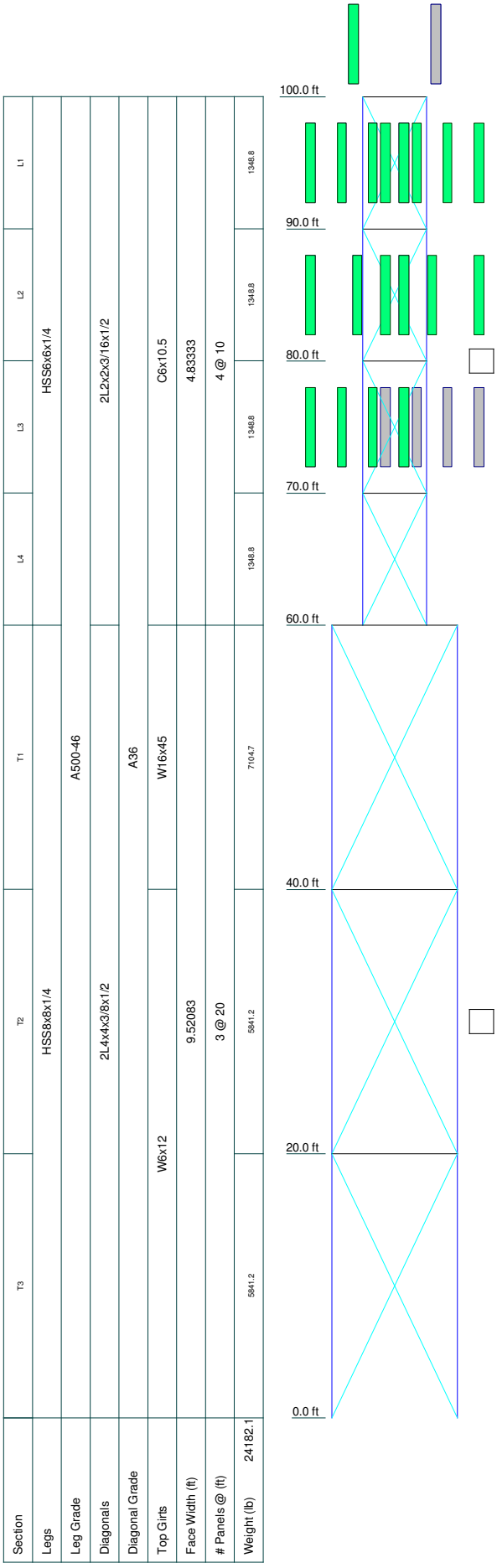
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

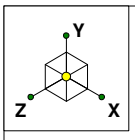
TYPE	ELEVATION	TYPE	ELEVATION
SBNHH-1D65A w/ Mount Pipe	100	AM-X-CD-16-65-00T-RET w/ Mount Pipe	85
DB806-XC	100	AM-X-CD-16-65-00T-RET w/ Mount Pipe	85
SBNHH-1D65A w/ Mount Pipe	100	HPA-33R-BUU-H6 w/ Mount Pipe	85
SBNHH-1D65A w/ Mount Pipe	100	HPA-33R-BUU-H6 w/ Mount Pipe	85
(2) ATMAA1412D-1A20	100	HPA-33R-BUU-H6 w/ Mount Pipe	85
(2) ATMAA1412D-1A20	100	(2) 860 10025	85
(2) ATMAA1412D-1A20	100	(2) 860 10025	85
ATBT-BOTTOM-24V	100	(2) 860 10025	85
ATBT-BOTTOM-24V	100	(2) DTMABP7819VG12A	85
ATBT-BOTTOM-24V	100	(2) DTMABP7819VG12A	85
BXA-171063-12BF w/ Mount Pipe	95	(2) DTMABP7819VG12A	85
BXA-171063-12CF-EDIN-2 w/ Mount Pipe	95	RRUS-11	85
BXA-171063-12BF w/ Mount Pipe	95	RRUS-11	85
P65-16-XL-M w/ Mount Pipe	95	RRUS-11	85
LNXC-6514DS-VTM w/ Mount Pipe	95	RRUS-11	85
P65-16-XL-M w/ Mount Pipe	95	RRUS-11	85
MG D3-800TV w/ mount pipe	95	RRUS-11	85
MG D3-800TV w/ mount pipe	95	RRUS 32 B2	85
MG D3-800TV w/ mount pipe	95	RRUS 32 B2	85
BXA-80080/4CF w/Mount Pipe	95	RRUS 32 B2	85
BXA-80080/4CF w/Mount Pipe	95	DC6-48-60-18-8F Surge Suppression Unit	85
BXA-80080/4CF w/Mount Pipe	95	A-18A24N-U w/ mount pipe	75
(2) FD9R6004/2C-3L	95	A-18A24N-U w/ mount pipe	75
(2) FD9R6004/2C-3L	95	(3) DB844H90E-XY w/ Mount Pipe	75
(2) FD9R6004/2C-3L	95	(4) DB844H90E-XY w/ Mount Pipe	75
RRH2X40-AWS	95	(3) DB844H90E-XY w/ Mount Pipe	75
RRH2X40-AWS	95	742 213 w/ Mount Pipe	65
RRH2X40-AWS	95	742 213 w/ Mount Pipe	65
DB-T1-6Z-8AB-0Z	95	742 213 w/ Mount Pipe	65
800 10121 w/ Mount Pipe	85		
800 10121 w/ Mount Pipe	85		
800 10121 w/ Mount Pipe	85		
AM-X-CD-16-65-00T-RET w/ Mount Pipe	85		

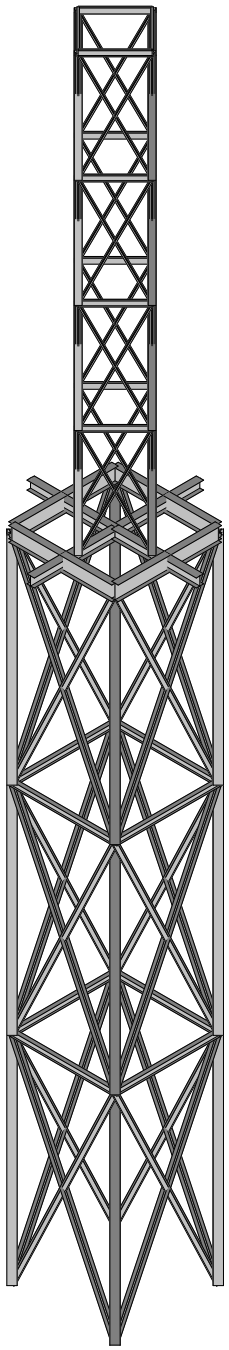
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 110 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

GPD
520 South Main Street Suite 2531
Akron, Ohio 44311
GPD Group
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: 800529 CT HAMDEN NORTH CAC			
Project: 2016777.800529.05			
Client: Crown Castle	Drawn by: tclark	App'd:	
Code: TIA-222-G	Date: 08/18/16	Scale: NTS	
Path: T:\Crown\800529\05\TNX\800529.eri		Dwg No. E-1	





Envelope Only Solution

GPD	800529 CT HAMDEN NORTH CAC	SK - 1
tclark		Aug 18, 2016 at 4:46 PM
2016777.800529.05		800529.rt3

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Component Type*	*Placement* *ft*	*Face Offset* *in*	*Lateral Offset (Frac FW)*	*#*		C_AA_A ft^2/ft	*Weight* *plf*
Feedline Ladder (Af)	B	No	Internal	100.00 - 8.00	0.0000	0	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF7-50A (1-5/8 FOAM)	B	No	Internal	100.00 - 8.00	0.0000	0	18	No Ice	0.00	0.82
								1/2" Ice	0.00	2.33
								1" Ice	0.00	4.46
Feedline Ladder (Af)	A	No	Internal	95.00 - 8.00	0.0000	0	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF7-50A (1-5/8 FOAM)	A	No	Internal	95.00 - 8.00	0.0000	0	12	No Ice	0.00	0.82
								1/2" Ice	0.00	2.33
								1" Ice	0.00	4.46
HB158-1-08U8-S8J18	A	No	Internal	95.00 - 8.00	0.0000	0	1	No Ice	0.00	0.85
								1/2" Ice	0.00	0.93
								1" Ice	0.00	2.23
Feedline Ladder (Af)	C	No	Internal	85.00 - 8.00	0.0000	0	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF5-50A (7/8 FOAM)	C	No	Internal	85.00 - 8.00	0.0000	0	12	No Ice	0.00	0.33
								1/2" Ice	0.00	1.30
								1" Ice	0.00	2.88
3/4" DC Power Line	C	No	Internal	85.00 - 8.00	0.0000	0	2	No Ice	0.00	0.33
								1/2" Ice	0.00	1.09
								1" Ice	0.00	2.47
3/8" Fiber Cable	C	No	Internal	85.00 - 8.00	0.0000	0	1	No Ice	0.00	0.10
								1/2" Ice	0.00	0.63
								1" Ice	0.00	1.78
2" Flex Conduit	C	No	Internal	85.00 - 8.00	0.0000	0	2	No Ice	0.00	0.32
								1/2" Ice	0.00	1.85
								1" Ice	0.00	3.98
Feedline Ladder (Af)	D	No	Internal	75.00 - 8.00	0.0000	0	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF6-50A (1-1/4 FOAM)	D	No	Internal	75.00 - 8.00	0.0000	0	11	No Ice	0.00	0.66
								1/2" Ice	0.00	1.91
								1" Ice	0.00	3.78
Feedline Ladder (Af)	D	No	Internal	65.00 - 8.00	0.0000	0.45	1	No Ice	0.00	8.40
								1/2" Ice	0.00	13.50
								1" Ice	0.00	18.60
LDF7-50A (1-5/8 FOAM)	D	No	Internal	65.00 - 8.00	0.0000	0.45	6	No Ice	0.00	0.82
								1/2" Ice	0.00	2.33
								1" Ice	0.00	4.46
Climbing Ladder (CCI)	B	No	Internal	100.00 - 0.00	0.0000	0.45	1	No Ice	0.00	4.81
								1/2" Ice	0.00	6.97
								1" Ice	0.00	9.48
Safety Line (3/8")	B	No	Internal	100.00 - 0.00	0.0000	0.45	1	No Ice	0.00	0.22
								1/2" Ice	0.00	0.75
								1" Ice	0.00	1.28
LDF4P-50A (1/2 FOAM)	C	No	Internal	100.00 - 8.00	0.0000	0.3	1	No Ice	0.00	0.15
								1/2" Ice	0.00	0.84
								1" Ice	0.00	2.14

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral* *Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
SBNHH-1D65A w/ Mount Pipe	A	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	61.30

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *lb*
			0.00			1/2" Ice	0.00	0.00	115.03
			4.00			1" Ice	0.00	0.00	175.35
DB806-XC	B	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	21.00
			0.00			1/2" Ice	0.00	0.00	29.93
			4.00			1" Ice	0.00	0.00	42.71
SBNHH-1D65A w/ Mount Pipe	B	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	61.30
			0.00			1/2" Ice	0.00	0.00	115.03
			4.00			1" Ice	0.00	0.00	175.35
SBNHH-1D65A w/ Mount Pipe	D	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	61.30
			0.00			1/2" Ice	0.00	0.00	115.03
			4.00			1" Ice	0.00	0.00	175.35
(2) ATMAA1412D-1A20	A	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	13.00
			0.00			1/2" Ice	0.00	0.00	20.62
			4.00			1" Ice	0.00	0.00	30.11
(2) ATMAA1412D-1A20	B	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	13.00
			0.00			1/2" Ice	0.00	0.00	20.62
			4.00			1" Ice	0.00	0.00	30.11
(2) ATMAA1412D-1A20	D	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	13.00
			0.00			1/2" Ice	0.00	0.00	20.62
			4.00			1" Ice	0.00	0.00	30.11
ATBT-BOTTOM-24V	A	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	2.87
			0.00			1/2" Ice	0.00	0.00	4.02
			4.00			1" Ice	0.00	0.00	5.94
ATBT-BOTTOM-24V	B	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	2.87
			0.00			1/2" Ice	0.00	0.00	4.02
			4.00			1" Ice	0.00	0.00	5.94
ATBT-BOTTOM-24V	D	From Leg	1.00	0.0000	100.00	No Ice	0.00	0.00	2.87
			0.00			1/2" Ice	0.00	0.00	4.02
			4.00			1" Ice	0.00	0.00	5.94
BXA-171063-12BF w/ Mount Pipe	A	From	4.00	0.0000	95.00	No Ice	0.00	0.00	40.46
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	86.08
			0.00			1" Ice	0.00	0.00	139.09
BXA-171063-12CF-EDIN-2 w/ Mount Pipe	C	From	4.00	0.0000	95.00	No Ice	0.00	0.00	40.67
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	86.70
			0.00			1" Ice	0.00	0.00	140.17
BXA-171063-12BF w/ Mount Pipe	D	From	4.00	0.0000	95.00	No Ice	0.00	0.00	40.46
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	86.08
			0.00			1" Ice	0.00	0.00	139.09
P65-16-XL-M w/ Mount Pipe	A	From	4.00	0.0000	95.00	No Ice	0.00	0.00	65.90
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	126.31
			0.00			1" Ice	0.00	0.00	194.37
LNXC-6514DS-VTM w/ Mount Pipe	C	From	4.00	0.0000	95.00	No Ice	0.00	0.00	63.65
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	132.65
			0.00			1" Ice	0.00	0.00	209.67
P65-16-XL-M w/ Mount Pipe	D	From	4.00	0.0000	95.00	No Ice	0.00	0.00	65.90
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	126.31
			0.00			1" Ice	0.00	0.00	194.37
MG D3-800TV w/ mount pipe	A	From	4.00	0.0000	95.00	No Ice	0.00	0.00	39.50
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	74.90
			0.00			1" Ice	0.00	0.00	116.22
MG D3-800TV w/ mount pipe	C	From	4.00	0.0000	95.00	No Ice	0.00	0.00	39.50
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	74.90
			0.00			1" Ice	0.00	0.00	116.22
MG D3-800TV w/ mount pipe	D	From	4.00	0.0000	95.00	No Ice	0.00	0.00	39.50
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	74.90
			0.00			1" Ice	0.00	0.00	116.22
BXA-80080/4CF w/Mount Pipe	A	From	4.00	0.0000	95.00	No Ice	0.00	0.00	39.85
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	89.34
			0.00			1" Ice	0.00	0.00	145.14
BXA-80080/4CF w/Mount Pipe	C	From	4.00	0.0000	95.00	No Ice	0.00	0.00	39.85
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	89.34
			0.00			1" Ice	0.00	0.00	145.14
BXA-80080/4CF w/Mount Pipe	D	From	4.00	0.0000	95.00	No Ice	0.00	0.00	39.85
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	89.34
			0.00			1" Ice	0.00	0.00	145.14

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *lb*
(2) FD9R6004/2C-3L	A	From	4.00	0.0000	95.00	No Ice	0.00	0.00	3.10
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	5.40
			0.00			1" Ice	0.00	0.00	8.79
(2) FD9R6004/2C-3L	C	From	4.00	0.0000	95.00	No Ice	0.00	0.00	3.10
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	5.40
			0.00			1" Ice	0.00	0.00	8.79
(2) FD9R6004/2C-3L	D	From	4.00	0.0000	95.00	No Ice	0.00	0.00	3.10
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	5.40
			0.00			1" Ice	0.00	0.00	8.79
RRH2X40-AWS	A	From	4.00	0.0000	95.00	No Ice	0.00	0.00	47.60
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	73.79
			0.00			1" Ice	0.00	0.00	103.40
RRH2X40-AWS	C	From	4.00	0.0000	95.00	No Ice	0.00	0.00	47.60
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	73.79
			0.00			1" Ice	0.00	0.00	103.40
RRH2X40-AWS	D	From	4.00	0.0000	95.00	No Ice	0.00	0.00	47.60
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	73.79
			0.00			1" Ice	0.00	0.00	103.40
DB-T1-6Z-8AB-0Z	A	From	4.00	0.0000	95.00	No Ice	0.00	0.00	44.00
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	80.13
			0.00			1" Ice	0.00	0.00	120.22
800 10121 w/ Mount Pipe	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	64.55
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	110.68
			0.00			1" Ice	0.00	0.00	163.06
800 10121 w/ Mount Pipe	C	From	4.00	0.0000	85.00	No Ice	0.00	0.00	64.55
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	110.68
			0.00			1" Ice	0.00	0.00	163.06
800 10121 w/ Mount Pipe	D	From	4.00	0.0000	85.00	No Ice	0.00	0.00	64.55
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	110.68
			0.00			1" Ice	0.00	0.00	163.06
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	89.03
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	157.32
			0.00			1" Ice	0.00	0.00	234.42
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	89.03
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	157.32
			0.00			1" Ice	0.00	0.00	234.42
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	89.03
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	157.32
			0.00			1" Ice	0.00	0.00	234.42
HPA-33R-BUU-H6 w/ Mount Pipe	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	104.95
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	209.02
			0.00			1" Ice	0.00	0.00	321.92
HPA-33R-BUU-H6 w/ Mount Pipe	C	From	4.00	0.0000	85.00	No Ice	0.00	0.00	104.95
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	209.02
			0.00			1" Ice	0.00	0.00	321.92
HPA-33R-BUU-H6 w/ Mount Pipe	D	From	4.00	0.0000	85.00	No Ice	0.00	0.00	104.95
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	209.02
			0.00			1" Ice	0.00	0.00	321.92
(2) 860 10025	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	1.16
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	2.65
			0.00			1" Ice	0.00	0.00	5.06
(2) 860 10025	C	From	4.00	0.0000	85.00	No Ice	0.00	0.00	1.16
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	2.65
			0.00			1" Ice	0.00	0.00	5.06
(2) 860 10025	D	From	4.00	0.0000	85.00	No Ice	0.00	0.00	1.16
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	2.65
			0.00			1" Ice	0.00	0.00	5.06
(2) DTMABP7819VG12A	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	19.18
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	26.48
			0.00			1" Ice	0.00	0.00	35.63
(2) DTMABP7819VG12A	C	From	4.00	0.0000	85.00	No Ice	0.00	0.00	19.18
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	26.48
			0.00			1" Ice	0.00	0.00	35.63
(2) DTMABP7819VG12A	D	From	4.00	0.0000	85.00	No Ice	0.00	0.00	19.18
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	26.48

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	0.00	0.00	35.63
RRUS-11	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	47.62
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	68.42
			0.00			1" Ice	0.00	0.00	92.25
RRUS-11	C	From	4.00	0.0000	85.00	No Ice	0.00	0.00	47.62
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	68.42
			0.00			1" Ice	0.00	0.00	92.25
RRUS-11	D	From	4.00	0.0000	85.00	No Ice	0.00	0.00	47.62
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	68.42
			0.00			1" Ice	0.00	0.00	92.25
RRUS-11	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	47.62
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	68.42
			0.00			1" Ice	0.00	0.00	92.25
RRUS-11	C	From	4.00	0.0000	85.00	No Ice	0.00	0.00	47.62
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	68.42
			0.00			1" Ice	0.00	0.00	92.25
RRUS-11	D	From	4.00	0.0000	85.00	No Ice	0.00	0.00	47.62
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	68.42
			0.00			1" Ice	0.00	0.00	92.25
RRUS 32 B2	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	52.90
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	73.96
			0.00			1" Ice	0.00	0.00	98.21
RRUS 32 B2	C	From	4.00	0.0000	85.00	No Ice	0.00	0.00	52.90
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	73.96
			0.00			1" Ice	0.00	0.00	98.21
RRUS 32 B2	D	From	4.00	0.0000	85.00	No Ice	0.00	0.00	52.90
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	73.96
			0.00			1" Ice	0.00	0.00	98.21
DC6-48-60-18-8F Surge Suppression Unit	A	From	4.00	0.0000	85.00	No Ice	0.00	0.00	18.90
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	36.62
			0.00			1" Ice	0.00	0.00	56.82
A-18A24N-U w/ mount pipe	A	From	4.00	0.0000	75.00	No Ice	0.00	0.00	43.55
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	88.76
			0.00			1" Ice	0.00	0.00	139.53
A-18A24N-U w/ mount pipe	D	From	4.00	0.0000	75.00	No Ice	0.00	0.00	43.55
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	88.76
			0.00			1" Ice	0.00	0.00	139.53
(3) DB844H90E-XY w/ Mount Pipe	A	From	4.00	0.0000	75.00	No Ice	0.00	0.00	43.20
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	90.60
			0.00			1" Ice	0.00	0.00	144.32
(4) DB844H90E-XY w/ Mount Pipe	B	From	4.00	0.0000	75.00	No Ice	0.00	0.00	43.20
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	90.60
			0.00			1" Ice	0.00	0.00	144.32
(3) DB844H90E-XY w/ Mount Pipe	D	From	4.00	0.0000	75.00	No Ice	0.00	0.00	43.20
		Centroid-Leg	0.00			1/2" Ice	0.00	0.00	90.60
			0.00			1" Ice	0.00	0.00	144.32
742 213 w/ Mount Pipe	A	From Leg	1.00	0.0000	65.00	No Ice	0.00	0.00	51.20
			0.00			1/2" Ice	0.00	0.00	97.45
			0.00			1" Ice	0.00	0.00	151.50
742 213 w/ Mount Pipe	C	From Leg	1.00	0.0000	65.00	No Ice	0.00	0.00	51.20
			0.00			1/2" Ice	0.00	0.00	97.45
			0.00			1" Ice	0.00	0.00	151.50
742 213 w/ Mount Pipe	D	From Leg	1.00	0.0000	65.00	No Ice	0.00	0.00	51.20
			0.00			1/2" Ice	0.00	0.00	97.45
			0.00			1" Ice	0.00	0.00	151.50

ASCE 7-02 Wind Loading
800529 800529 CT HAMDEN NORTH CAC
2016777.800529.05

Structure Information		
Structure Type:	Silo	
Structure Height:	108	ft
Gh (Mount Gust Effect Factor) =	0.85	
Risk Category:	II	

Code Specifications		
IBC Edition:	2003	
TIA/EIA Code:	G	
Nominal Wind Speed (No Ice) =	105	mph (3-s gust)
Nominal Wind Speed (With Ice) =	50	mph (3-s gust)
Ice Thickness	0.75	in
Exposure Category	C	

Topographic Inputs		Consider Temperature Effects if ice?
Topographic Feature:	N/A	No

Section Sets										Height	No Ice	Ice Output	
Mount Components	Member Type	Length (in)	Side (Longest seeing wind) (in)	Other Side (in)	Calculated Dc, for ice weight (in)	Dc, for ice weight (in)	Area Type (Round or Flat)	K_a	User's Wind Multiplier	ft	Normal Wind Pressure (lb/ft^2)*	Normal Ice Wind Force (lb/ft^2)*	Ice Weight (lb/ft)*
Top Cap	Pipe	96.000	192	192		192.00	Round	1.00	1.00	103.4	29.05	5.36	397.88
Tower from 90'-100'	Pipe	120.000	192	192		192.00	Round	1.00	1.00	95	28.53	5.18	394.50
Tower from 80'-90'	Pipe	120.000	192	192		192.00	Round	1.00	1.00	85	27.87	5.06	390.10
Tower from 70'-80'	Pipe	120.000	192	192		192.00	Round	1.00	1.00	75	27.15	4.93	385.20
Tower from 60'-70'	Pipe	120.000	192	192		192.00	Round	1.00	1.00	65	26.34	4.78	379.69
Tower from 40'-60'	Pipe	240.000	192	192		192.00	Round	1.00	1.00	50	24.93	4.52	369.77
Tower from 20'-40'	Pipe	240.000	192	192		192.00	Round	1.00	1.00	30	22.39	4.06	351.22
Tower from 0'-20'	Pipe	240.000	192	192		192.00	Round	1.00	1.00	10	19.37	3.51	314.43

*All forces are unfactored.

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A500-46	29000	11200	.295	.65	.49	46	1.2	58	1.1
2	A36	29000	11200	.295	.65	.49	36	1.5	58	1.2
3	A992-50	29000	11200	.295	.65	.49	50	1.5	65	1.2

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]
1	gen_Conc3NW	3155	1372	.15	.6	.145
2	gen_Conc4NW	3644	1584	.15	.6	.145
3	gen_Conc3LW	2085	906	.15	.6	.11
4	gen_Conc4LW	2408	1047	.15	.6	.11
5	gen_Alum	10600	4077	.3	1.29	.173
6	gen_Steel	29000	11154	.3	.65	.49
7	RIGID	1e+6		.3	0	0

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	TWR_LEG_L1	HSS6x6x1/4	Column	Tube	A500-46	Typical	5.24	28.6	28.6	45.6
2	TWR_TOP_GIRT_L1	C6x10.5	Beam	Channel	A36	Typical	3.07	.86	15.1	.128
3	TWR_DIAG_L1	2L2x2x3/16x1/2	Column	None	A36	Typical	1.43	1.504	.545	.017
4	TWR_LEG_L2	HSS6x6x1/4	Column	Tube	A500-46	Typical	5.24	28.6	28.6	45.6
5	TWR_TOP_GIRT_L2	C6x10.5	Beam	Channel	A36	Typical	3.07	.86	15.1	.128
6	TWR_DIAG_L2	2L2x2x3/16x1/2	Column	None	A36	Typical	1.43	1.504	.545	.017
7	TWR_LEG_L3	HSS6x6x1/4	Column	Tube	A500-46	Typical	5.24	28.6	28.6	45.6
8	TWR_TOP_GIRT_L3	C6x10.5	Beam	Channel	A36	Typical	3.07	.86	15.1	.128
9	TWR_DIAG_L3	2L2x2x3/16x1/2	Column	None	A36	Typical	1.43	1.504	.545	.017
10	TWR_LEG_L4	HSS6x6x1/4	Column	Tube	A500-46	Typical	5.24	28.6	28.6	45.6
11	TWR_TOP_GIRT_L4	C6x10.5	Beam	Channel	A36	Typical	3.07	.86	15.1	.128
12	TWR_DIAG_L4	2L2x2x3/16x1/2	Column	None	A36	Typical	1.43	1.504	.545	.017
13	TWR_LEG_T1	HSS8x8x1/4	Column	Tube	A500-46	Typical	7.1	70.7	70.7	111
14	TWR_TOP_GIRT_T1	W16x45	Beam	Wide Flange	A992-50	Typical	13.3	32.8	586	1.11
15	TWR_INNER_BRAC...	W10x33	Beam	Wide Flange	A992-50	Typical	9.71	36.6	171	.583
16	TWR_DIAG_T1	2L4x4x3/8x1/2	Column	None	A36	Typical	5.719	19.74	8.717	.268
17	TWR_LEG_T2	HSS8x8x1/4	Column	Tube	A500-46	Typical	7.1	70.7	70.7	111
18	TWR_TOP_GIRT_T2	W6x12	Beam	Wide Flange	A992-50	Typical	3.55	2.99	22.1	.09
19	TWR_DIAG_T2	2L4x4x3/8x1/2	Column	None	A36	Typical	5.719	19.74	8.717	.268
20	TWR_LEG_T3	HSS8x8x1/4	Column	Tube	A500-46	Typical	7.1	70.7	70.7	111
21	TWR_TOP_GIRT_T3	W6x12	Beam	Wide Flange	A992-50	Typical	3.55	2.99	22.1	.09
22	TWR_DIAG_T3	2L4x4x3/8x1/2	Column	None	A36	Typical	5.719	19.74	8.717	.268

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1	RE4X4	Beam	gen_Conc...	16	21.333	21.333	31.573

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M9	N2	N3			TWR_DIAG_L1	Column	None	A36	Typical
2	M10	N4	N1			TWR_DIAG_L1	Column	None	A36	Typical
3	M11	N4	N5			TWR_DIAG_L1	Column	None	A36	Typical
4	M12	N6	N3			TWR_DIAG_L1	Column	None	A36	Typical
5	M13	N6	N7			TWR_DIAG_L1	Column	None	A36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
6	M14	N8	N5			TWR_DIAG_L1	Column	None	A36	Typical
7	M15	N8	N1			TWR_DIAG_L1	Column	None	A36	Typical
8	M16	N2	N7			TWR_DIAG_L1	Column	None	A36	Typical
9	M25	N13	N4			TWR_DIAG_L2	Column	None	A36	Typical
10	M26	N14	N2			TWR_DIAG_L2	Column	None	A36	Typical
11	M27	N14	N6			TWR_DIAG_L2	Column	None	A36	Typical
12	M28	N15	N4			TWR_DIAG_L2	Column	None	A36	Typical
13	M29	N15	N8			TWR_DIAG_L2	Column	None	A36	Typical
14	M30	N16	N6			TWR_DIAG_L2	Column	None	A36	Typical
15	M31	N16	N2			TWR_DIAG_L2	Column	None	A36	Typical
16	M32	N13	N8			TWR_DIAG_L2	Column	None	A36	Typical
17	M41	N21	N14			TWR_DIAG_L3	Column	None	A36	Typical
18	M42	N22	N13			TWR_DIAG_L3	Column	None	A36	Typical
19	M43	N22	N15			TWR_DIAG_L3	Column	None	A36	Typical
20	M44	N23	N14			TWR_DIAG_L3	Column	None	A36	Typical
21	M45	N23	N16			TWR_DIAG_L3	Column	None	A36	Typical
22	M46	N24	N15			TWR_DIAG_L3	Column	None	A36	Typical
23	M47	N24	N13			TWR_DIAG_L3	Column	None	A36	Typical
24	M48	N21	N16			TWR_DIAG_L3	Column	None	A36	Typical
25	M57	N29	N22			TWR_DIAG_L4	Column	None	A36	Typical
26	M58	N30	N21			TWR_DIAG_L4	Column	None	A36	Typical
27	M59	N30	N23			TWR_DIAG_L4	Column	None	A36	Typical
28	M60	N31	N22			TWR_DIAG_L4	Column	None	A36	Typical
29	M61	N31	N24			TWR_DIAG_L4	Column	None	A36	Typical
30	M62	N32	N23			TWR_DIAG_L4	Column	None	A36	Typical
31	M63	N32	N21			TWR_DIAG_L4	Column	None	A36	Typical
32	M64	N29	N24			TWR_DIAG_L4	Column	None	A36	Typical
33	M73	N38	N39			TWR_DIAG_T1	Column	None	A36	Typical
34	M74	N40	N37			TWR_DIAG_T1	Column	None	A36	Typical
35	M75	N40	N41			TWR_DIAG_T1	Column	None	A36	Typical
36	M76	N42	N39			TWR_DIAG_T1	Column	None	A36	Typical
37	M77	N42	N43			TWR_DIAG_T1	Column	None	A36	Typical
38	M78	N44	N41			TWR_DIAG_T1	Column	None	A36	Typical
39	M79	N44	N37			TWR_DIAG_T1	Column	None	A36	Typical
40	M80	N38	N43			TWR_DIAG_T1	Column	None	A36	Typical
41	M89	N49	N40			TWR_DIAG_T2	Column	None	A36	Typical
42	M90	N50	N38		360	TWR_DIAG_T2	Column	None	A36	Typical
43	M91	N50	N42			TWR_DIAG_T2	Column	None	A36	Typical
44	M92	N51	N40		360	TWR_DIAG_T2	Column	None	A36	Typical
45	M93	N51	N44			TWR_DIAG_T2	Column	None	A36	Typical
46	M94	N52	N42		360	TWR_DIAG_T2	Column	None	A36	Typical
47	M95	N52	N38			TWR_DIAG_T2	Column	None	A36	Typical
48	M96	N49	N44		360	TWR_DIAG_T2	Column	None	A36	Typical
49	M105	N57	N50			TWR_DIAG_T3	Column	None	A36	Typical
50	M106	N58	N49			TWR_DIAG_T3	Column	None	A36	Typical
51	M107	N58	N51			TWR_DIAG_T3	Column	None	A36	Typical
52	M108	N59	N50			TWR_DIAG_T3	Column	None	A36	Typical
53	M109	N59	N52			TWR_DIAG_T3	Column	None	A36	Typical
54	M110	N60	N51			TWR_DIAG_T3	Column	None	A36	Typical
55	M111	N60	N49			TWR_DIAG_T3	Column	None	A36	Typical
56	M112	N57	N52			TWR_DIAG_T3	Column	None	A36	Typical
57	M1	N2	N1		45	TWR_LEG_L1	Column	Tube	A500-46	Typical
58	M2	N4	N3		135	TWR_LEG_L1	Column	Tube	A500-46	Typical
59	M3	N6	N5		225	TWR_LEG_L1	Column	Tube	A500-46	Typical
60	M4	N8	N7		315	TWR_LEG_L1	Column	Tube	A500-46	Typical
61	M17	N13	N2		45	TWR_LEG_L2	Column	Tube	A500-46	Typical
62	M18	N14	N4		135	TWR_LEG_L2	Column	Tube	A500-46	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
63	M19	N15	N6		225	TWR_LEG_L2	Column	Tube	A500-46	Typical
64	M20	N16	N8		315	TWR_LEG_L2	Column	Tube	A500-46	Typical
65	M33	N21	N13		45	TWR_LEG_L3	Column	Tube	A500-46	Typical
66	M34	N22	N14		135	TWR_LEG_L3	Column	Tube	A500-46	Typical
67	M35	N23	N15		225	TWR_LEG_L3	Column	Tube	A500-46	Typical
68	M36	N24	N16		315	TWR_LEG_L3	Column	Tube	A500-46	Typical
69	M49	N29	N21		45	TWR_LEG_L4	Column	Tube	A500-46	Typical
70	M50	N30	N22		135	TWR_LEG_L4	Column	Tube	A500-46	Typical
71	M51	N31	N23		225	TWR_LEG_L4	Column	Tube	A500-46	Typical
72	M52	N32	N24		315	TWR_LEG_L4	Column	Tube	A500-46	Typical
73	M65	N38	N37		45	TWR_LEG_T1	Column	Tube	A500-46	Typical
74	M66	N40	N39		135	TWR_LEG_T1	Column	Tube	A500-46	Typical
75	M67	N42	N41		225	TWR_LEG_T1	Column	Tube	A500-46	Typical
76	M68	N44	N43		315	TWR_LEG_T1	Column	Tube	A500-46	Typical
77	M81	N49	N38		45	TWR_LEG_T2	Column	Tube	A500-46	Typical
78	M82	N50	N40		135	TWR_LEG_T2	Column	Tube	A500-46	Typical
79	M83	N51	N42		225	TWR_LEG_T2	Column	Tube	A500-46	Typical
80	M84	N52	N44		315	TWR_LEG_T2	Column	Tube	A500-46	Typical
81	M97	N57	N49		45	TWR_LEG_T3	Column	Tube	A500-46	Typical
82	M98	N58	N50		135	TWR_LEG_T3	Column	Tube	A500-46	Typical
83	M99	N59	N51		225	TWR_LEG_T3	Column	Tube	A500-46	Typical
84	M100	N60	N52		315	TWR_LEG_T3	Column	Tube	A500-46	Typical
85	M5	N1	N3		180	TWR_TOP_GIRT_L1	Beam	Channel	A36	Typical
86	M6	N3	N5		180	TWR_TOP_GIRT_L1	Beam	Channel	A36	Typical
87	M7	N5	N7		180	TWR_TOP_GIRT_L1	Beam	Channel	A36	Typical
88	M8	N7	N1		180	TWR_TOP_GIRT_L1	Beam	Channel	A36	Typical
89	M21	N2	N4		180	TWR_TOP_GIRT_L2	Beam	Channel	A36	Typical
90	M22	N4	N6		180	TWR_TOP_GIRT_L2	Beam	Channel	A36	Typical
91	M23	N6	N8		180	TWR_TOP_GIRT_L2	Beam	Channel	A36	Typical
92	M24	N8	N2		180	TWR_TOP_GIRT_L2	Beam	Channel	A36	Typical
93	M37	N13	N14		180	TWR_TOP_GIRT_L3	Beam	Channel	A36	Typical
94	M38	N14	N15		180	TWR_TOP_GIRT_L3	Beam	Channel	A36	Typical
95	M39	N15	N16		180	TWR_TOP_GIRT_L3	Beam	Channel	A36	Typical
96	M40	N16	N13		180	TWR_TOP_GIRT_L3	Beam	Channel	A36	Typical
97	M53	N21	N22		180	TWR_TOP_GIRT_L4	Beam	Channel	A36	Typical
98	M54	N22	N23		180	TWR_TOP_GIRT_L4	Beam	Channel	A36	Typical
99	M55	N23	N24		180	TWR_TOP_GIRT_L4	Beam	Channel	A36	Typical
100	M56	N24	N21		180	TWR_TOP_GIRT_L4	Beam	Channel	A36	Typical
101	M69	N37	N39			TWR_TOP_GIRT_T1	Beam	Wide Flange	A992-50	Typical
102	M70	N39	N41			TWR_TOP_GIRT_T1	Beam	Wide Flange	A992-50	Typical
103	M71	N41	N43			TWR_TOP_GIRT_T1	Beam	Wide Flange	A992-50	Typical
104	M72	N43	N37			TWR_TOP_GIRT_T1	Beam	Wide Flange	A992-50	Typical
105	M85	N38	N40		360	TWR_TOP_GIRT_T2	Beam	Wide Flange	A992-50	Typical
106	M86	N40	N42		360	TWR_TOP_GIRT_T2	Beam	Wide Flange	A992-50	Typical
107	M87	N42	N44		360	TWR_TOP_GIRT_T2	Beam	Wide Flange	A992-50	Typical
108	M88	N44	N38		360	TWR_TOP_GIRT_T2	Beam	Wide Flange	A992-50	Typical
109	M101	N49	N50			TWR_TOP_GIRT_T3	Beam	Wide Flange	A992-50	Typical
110	M102	N50	N51			TWR_TOP_GIRT_T3	Beam	Wide Flange	A992-50	Typical
111	M103	N51	N52			TWR_TOP_GIRT_T3	Beam	Wide Flange	A992-50	Typical
112	M104	N52	N49			TWR_TOP_GIRT_T3	Beam	Wide Flange	A992-50	Typical
113	M113	N67	N65			TWR_INNER_BRACE_T1	Beam	Wide Flange	A992-50	Typical
114	M114	N65	N69			TWR_INNER_BRACE_T1	Beam	Wide Flange	A992-50	Typical
115	M115	N66	N65			TWR_INNER_BRACE_T1	Beam	Wide Flange	A992-50	Typical
116	M116	N65	N68			TWR_INNER_BRACE_T1	Beam	Wide Flange	A992-50	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	L-tor...	Kyy	Kzz	Cb	Function
1	M9	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
2	M10	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
3	M11	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
4	M12	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
5	M13	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
6	M14	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
7	M15	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
8	M16	TWR_DIAG_L1	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
9	M25	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
10	M26	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
11	M27	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
12	M28	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
13	M29	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
14	M30	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
15	M31	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
16	M32	TWR_DIAG_L2	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
17	M41	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
18	M42	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
19	M43	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
20	M44	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
21	M45	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
22	M46	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
23	M47	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
24	M48	TWR_DIAG_L3	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
25	M57	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
26	M58	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
27	M59	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
28	M60	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
29	M61	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
30	M62	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
31	M63	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
32	M64	TWR_DIAG_L4	11.107	4.7	4.7	4.7	4.7	4.7	1.3	1		Lateral
33	M73	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
34	M74	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
35	M75	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
36	M76	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
37	M77	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
38	M78	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
39	M79	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
40	M80	TWR_DIAG_T1	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
41	M89	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
42	M90	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
43	M91	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
44	M92	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
45	M93	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
46	M94	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
47	M95	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
48	M96	TWR_DIAG_T2	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
49	M105	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
50	M106	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
51	M107	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
52	M108	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
53	M109	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
54	M110	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
55	M111	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral
56	M112	TWR_DIAG_T3	22.151	10.02	10.02	10.02	10.02	10.02	1.25	1		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	L-tor...	Kyy	Kzz	Cb	Function
57	M1	TWR_LEG_L1	10	10	10	10	10	10	1	1		Lateral
58	M2	TWR_LEG_L1	10	10	10	10	10	10	1	1		Lateral
59	M3	TWR_LEG_L1	10	10	10	10	10	10	1	1		Lateral
60	M4	TWR_LEG_L1	10	10	10	10	10	10	1	1		Lateral
61	M17	TWR_LEG_L2	10	10	10	10	10	10	1	1		Lateral
62	M18	TWR_LEG_L2	10	10	10	10	10	10	1	1		Lateral
63	M19	TWR_LEG_L2	10	10	10	10	10	10	1	1		Lateral
64	M20	TWR_LEG_L2	10	10	10	10	10	10	1	1		Lateral
65	M33	TWR_LEG_L3	10	10	10	10	10	10	1	1		Lateral
66	M34	TWR_LEG_L3	10	10	10	10	10	10	1	1		Lateral
67	M35	TWR_LEG_L3	10	10	10	10	10	10	1	1		Lateral
68	M36	TWR_LEG_L3	10	10	10	10	10	10	1	1		Lateral
69	M49	TWR_LEG_L4	10	10	10	10	10	10	1	1		Lateral
70	M50	TWR_LEG_L4	10	10	10	10	10	10	1	1		Lateral
71	M51	TWR_LEG_L4	10	10	10	10	10	10	1	1		Lateral
72	M52	TWR_LEG_L4	10	10	10	10	10	10	1	1		Lateral
73	M65	TWR_LEG_T1	20	20	20	20	20	20	1	1		Lateral
74	M66	TWR_LEG_T1	20	20	20	20	20	20	1	1		Lateral
75	M67	TWR_LEG_T1	20	20	20	20	20	20	1	1		Lateral
76	M68	TWR_LEG_T1	20	20	20	20	20	20	1	1		Lateral
77	M81	TWR_LEG_T2	20	20	20	20	20	20	1	1		Lateral
78	M82	TWR_LEG_T2	20	20	20	20	20	20	1	1		Lateral
79	M83	TWR_LEG_T2	20	20	20	20	20	20	1	1		Lateral
80	M84	TWR_LEG_T2	20	20	20	20	20	20	1	1		Lateral
81	M97	TWR_LEG_T3	20	20	20	20	20	20	1	1		Lateral
82	M98	TWR_LEG_T3	20	20	20	20	20	20	1	1		Lateral
83	M99	TWR_LEG_T3	20	20	20	20	20	20	1	1		Lateral
84	M100	TWR_LEG_T3	20	20	20	20	20	20	1	1		Lateral
85	M5	TWR_TOP_GIRT_L1	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
86	M6	TWR_TOP_GIRT_L1	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
87	M7	TWR_TOP_GIRT_L1	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
88	M8	TWR_TOP_GIRT_L1	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
89	M21	TWR_TOP_GIRT_L2	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
90	M22	TWR_TOP_GIRT_L2	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
91	M23	TWR_TOP_GIRT_L2	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
92	M24	TWR_TOP_GIRT_L2	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
93	M37	TWR_TOP_GIRT_L3	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
94	M38	TWR_TOP_GIRT_L3	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
95	M39	TWR_TOP_GIRT_L3	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
96	M40	TWR_TOP_GIRT_L3	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
97	M53	TWR_TOP_GIRT_L4	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
98	M54	TWR_TOP_GIRT_L4	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
99	M55	TWR_TOP_GIRT_L4	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
100	M56	TWR_TOP_GIRT_L4	4.833	4.33	4.33	4.33	4.33	4.33	1	1		Lateral
101	M69	TWR_TOP_GIRT_T1	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
102	M70	TWR_TOP_GIRT_T1	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
103	M71	TWR_TOP_GIRT_T1	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
104	M72	TWR_TOP_GIRT_T1	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
105	M85	TWR_TOP_GIRT_T2	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
106	M86	TWR_TOP_GIRT_T2	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
107	M87	TWR_TOP_GIRT_T2	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
108	M88	TWR_TOP_GIRT_T2	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
109	M101	TWR_TOP_GIRT_T3	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
110	M102	TWR_TOP_GIRT_T3	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
111	M103	TWR_TOP_GIRT_T3	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
112	M104	TWR_TOP_GIRT_T3	9.521	8.85	8.85	8.85	8.85	8.85	1	1		Lateral
113	M113	TWR_INNER_BRACE_T1	7.813	7.813	7.813	7.813	7.813	7.813	2.1	2.1		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	L-tor...	Kyy	Kzz	Cb	Function
114	M114	TWR_INNER_BRACE_T1	7.813	7.813	7.813	7.813	7.813	7.813	2.1	2.1		Lateral
115	M115	TWR_INNER_BRACE_T1	7.813	7.813	7.813	7.813	7.813	7.813	2.1	2.1		Lateral
116	M116	TWR_INNER_BRACE_T1	7.813	7.813	7.813	7.813	7.813	7.813	2.1	2.1		Lateral

Basic Load Cases

	BLC Description	Category	X Grav...	Y Grav...	Z Grav...	Joint	Point	Distrib...	Area(M...	Surfac...
1	Dead	None		-1		56	248	60	4	
2	No Ice Wind 0 deg	None				64				
3	No Ice Wind 45 deg	None				128				
4	No Ice Wind 90 deg	None								
5	Ice	None				56	260	172		
6	Temperature Drop	None						117		
7	Ice Wind 0 deg	None				64				
8	Ice Wind 45 deg	None				128				
9	Ice Wind 90 deg	None								
10	Service Wind 0 deg	None								
11	Service Wind 45 deg	None								
12	Service Wind 90 deg	None								
13	Live Load	None							4	
15	BLC 1 Transient Area L...	None						107		
16	BLC 13 Transient Area ...	None						107		

Load Combinations

	Description	So...	P...	S...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
1	Dead Only	Yes	Y		1	1.4	13	1	14	1	0		0		0		0		0		0	
2	Dead+Wind 0 deg - No Ice	Yes	Y		1	1.2	2	1.6							0		0		0		0	
3	Dead+Wind 45 deg - No ...	Yes	Y		1	1.2	3	1.6	13	1	14	1	0		0		0		0		0	
4	Dead+Wind 90 deg - No ...		Y		1	1	4	1	13	1	14	1	0		0		0		0		0	
5	Dead+Ice+Temp	Yes	Y		1	1	5	1	6	1	13	1	14	1	0		0		0		0	
6	Dead+Wind 0 deg+Ice+T...	Yes	Y		1	1.2	7	1.6	5	1	6	1	13	1	14	1	0		0		0	
7	Dead+Wind 45 deg+Ice+...	Yes	Y		1	1.2	8	1.6	5	1	6	1	13	1	14	1	0		0		0	
8	Dead+Wind 90 deg+Ice+...		Y		1	1	9	1	5	1	6	1	13	1	14	1	0		0		0	
9	Dead+Wind 0 deg - Servi...		Y		1	1	10	1	13	1	14	1	0		0		0		0		0	
10	Dead+Wind 45 deg - Ser...		Y		1	1	11	1	13	1	14	1	0		0		0		0		0	
11	Dead+Wind 90 deg - Ser...		Y		1	1	12	1	13	1	14	1	0		0		0		0		0	

Envelope AISC 13th(360-05): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc...	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z-z.....		Eqn
1	M9	2L2x2x3/...	.083	3.4...	5	.006	5.5...	y	2	29.85	46.322	2.888	1.645	1	H1-1b
2	M10	2L2x2x3/...	.130	5.5...	7	.006	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
3	M11	2L2x2x3/...	.065	5.5...	2	.006	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
4	M12	2L2x2x3/...	.037	5.5...	6	.006	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
5	M13	2L2x2x3/...	.075	5.5...	3	.004	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
6	M14	2L2x2x3/...	.052	5.5...	3	.004	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
7	M15	2L2x2x3/...	.117	5.5...	7	.004	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
8	M16	2L2x2x3/...	.092	3.3...	6	.004	5.5...	y	2	29.85	46.322	2.888	1.645	1	H1-1b
9	M25	2L2x2x3/...	.092	5.5...	3	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
10	M26	2L2x2x3/...	.257	2.6...	3	.005	5.5...	y	2	29.85	46.322	2.888	1.645	1	H1-1a
11	M27	2L2x2x3/...	.239	5.5...	2	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1a
12	M28	2L2x2x3/...	.058	5.5...	3	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
13	M29	2L2x2x3/...	.259	2.6...	3	.005	5.5...	y	2	29.85	46.322	2.888	1.645	1	H1-1a
14	M30	2L2x2x3/...	.091	5.5...	3	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b

Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc...	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z-z.....		Eqn
15	M31	2L2x2x3/...	.086	5.5...	2	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
16	M32	2L2x2x3/...	.069	5.5...	2	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
17	M41	2L2x2x3/...	.234	5.5...	3	.006	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1a
18	M42	2L2x2x3/...	.387	3.3...	2	.005	11....	y	2	29.85	46.322	2.888	1.645	1	H1-1a
19	M43	2L2x2x3/...	.387	3.3...	2	.005	11....	y	2	29.85	46.322	2.888	1.645	1	H1-1a
20	M44	2L2x2x3/...	.111	5.5...	3	.006	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1b
21	M45	2L2x2x3/...	.378	3.4...	3	.005	0	y	2	29.85	46.322	2.888	1.645	1	H1-1a
22	M46	2L2x2x3/...	.246	5.5...	2	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1a
23	M47	2L2x2x3/...	.247	5.5...	2	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1a
24	M48	2L2x2x3/...	.078	7.7...	2	.005	0	y	2	29.85	46.322	2.888	1.645	1	H1-1b
25	M57	2L2x2x3/...	.319	5.5...	3	.007	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1a
26	M58	2L2x2x3/...	.535	5.5...	3	.005	0	y	2	29.85	46.322	2.888	1.645	1	H1-1a
27	M59	2L2x2x3/...	.487	5.5...	2	.008	0	y	3	29.85	46.322	2.888	1.645	1	H1-1a
28	M60	2L2x2x3/...	.109	5.5...	2	.008	0	y	3	29.85	46.322	2.888	1.028	1	H1-1b
29	M61	2L2x2x3/...	.539	5.5...	3	.006	5.5...	y	2	29.85	46.322	2.888	1.645	1	H1-1a
30	M62	2L2x2x3/...	.324	5.5...	2	.005	5.5...	y	2	29.85	46.322	2.888	1.028	1	H1-1a
31	M63	2L2x2x3/...	.324	5.5...	2	.007	5.5...	y	3	29.85	46.322	2.888	1.028	1	H1-1a
32	M64	2L2x2x3/...	.274	5.4...	2	.007	5.5...	y	3	29.85	46.322	2.888	1.028	1	H1-1a
33	M73	2L4x4x3/...	.082	11....	2	.002	11....	y	6	112.46	185.287	20.065	8.225	1	H1-1b
34	M74	2L4x4x3/...	.263	5.5...	3	.002	11....	y	7	112.46	185.287	20.065	13.16	1	H1-1a
35	M75	2L4x4x3/...	.262	5.5...	3	.002	11....	y	6	112.46	185.287	20.065	13.16	1	H1-1a
36	M76	2L4x4x3/...	.112	11....	2	.002	11....	y	7	112.46	185.287	20.065	8.225	1	H1-1b
37	M77	2L4x4x3/...	.102	5.7...	2	.002	11....	y	7	112.46	185.287	20.065	13.16	1	H1-1b
38	M78	2L4x4x3/...	.099	11....	3	.002	11....	y	6	112.46	185.287	20.065	8.225	1	H1-1b
39	M79	2L4x4x3/...	.098	11....	3	.002	11....	y	7	112.46	185.287	20.065	8.225	1	H1-1b
40	M80	2L4x4x3/...	.069	11....	2	.002	11....	y	6	112.46	185.287	20.065	8.225	1	H1-1b
41	M89	2L4x4x3/...	.111	11....	2	.002	11....	y	3	112.46	185.287	20.065	8.225	1	H1-1b
42	M90	2L4x4x3/...	.388	6.4...	3	.002	11....	y	7	112.46	185.287	20.065	13.16	1	H1-1a
43	M91	2L4x4x3/...	.387	6.4...	3	.002	11....	y	2	112.46	185.287	20.065	13.16	1	H1-1a
44	M92	2L4x4x3/...	.324	11....	2	.002	11....	y	3	112.46	185.287	20.065	8.225	1	H1-1a
45	M93	2L4x4x3/...	.250	6.6...	2	.002	11....	y	7	112.46	185.287	20.065	13.16	1	H1-1a
46	M94	2L4x4x3/...	.146	11....	3	.002	11....	y	3	112.46	185.287	20.065	8.225	1	H1-1b
47	M95	2L4x4x3/...	.146	11....	3	.002	11....	y	3	112.46	185.287	20.065	8.225	1	H1-1b
48	M96	2L4x4x3/...	.107	11....	2	.002	11....	y	2	112.46	185.287	20.065	8.225	1	H1-1b
49	M105	2L4x4x3/...	.160	11....	3	.002	11....	y	3	112.46	185.287	20.065	8.225	1	H1-1b
50	M106	2L4x4x3/...	.561	7.3...	3	.002	11....	y	7	112.46	185.287	20.065	13.16	1	H1-1a
51	M107	2L4x4x3/...	.560	7.3...	3	.002	11....	y	2	112.46	185.287	20.065	13.16	1	H1-1a
52	M108	2L4x4x3/...	.523	11....	2	.002	11....	y	3	112.46	185.287	20.065	8.225	1	H1-1a
53	M109	2L4x4x3/...	.310	8.0...	2	.002	22....	y	3	112.46	185.287	20.065	13.16	1	H1-1a
54	M110	2L4x4x3/...	.343	11....	3	.002	11....	y	2	112.46	185.287	20.065	8.225	1	H1-1a
55	M111	2L4x4x3/...	.342	11....	3	.002	11....	y	3	112.46	185.287	20.065	8.225	1	H1-1a
56	M112	2L4x4x3/...	.286	11....	2	.002	22....	y	3	112.46	185.287	20.065	8.225	1	H1-1a
57	M1	HSS6x6x...	.026	0	7	.000	0	z	6	181.658	216.936	38.64	38.64	1	H1-1b
58	M2	HSS6x6x...	.014	0	2	.000	0	y	7	181.658	216.936	38.64	38.64	1	H1-1b
59	M3	HSS6x6x...	.012	0	3	.000	0	y	2	181.658	216.936	38.64	38.64	1	H1-1b
60	M4	HSS6x6x...	.010	0	6	.000	0	z	7	181.658	216.936	38.64	38.64	1	H1-1b
61	M17	HSS6x6x...	.025	0	3	.001	0	z	6	181.658	216.936	38.64	38.64	1	H1-1b
62	M18	HSS6x6x...	.048	0	2	.001	0	y	7	181.658	216.936	38.64	38.64	1	H1-1b
63	M19	HSS6x6x...	.042	0	3	.000	0	z	2	181.658	216.936	38.64	38.64	1	H1-1b
64	M20	HSS6x6x...	.034	10	2	.001	0	z	7	181.658	216.936	38.64	38.64	1	H1-1b
65	M33	HSS6x6x...	.073	0	3	.001	0	z	3	181.658	216.936	38.64	38.64	1	H1-1b
66	M34	HSS6x6x...	.231	0	2	.001	0	y	2	181.658	216.936	38.64	38.64	1	H1-1a
67	M35	HSS6x6x...	.101	0	3	.001	0	z	3	181.658	216.936	38.64	38.64	1	H1-1b
68	M36	HSS6x6x...	.106	0	2	.001	0	y	2	181.658	216.936	38.64	38.64	1	H1-1b
69	M49	HSS6x6x...	.123	10	3	.001	0	z	3	181.658	216.936	38.64	38.64	1	H1-1b
70	M50	HSS6x6x...	.405	10	2	.001	0	y	3	181.658	216.936	38.64	38.64	1	H1-1a
71	M51	HSS6x6x...	.302	10	3	.001	0	z	3	181.658	216.936	38.64	38.64	1	H1-1a

Envelope AISC 13th(360-05): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc...	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn z-z.....		Eqn
72	M52	HSS6x6x...	.318	10	2	.001	0	y	3	181.658	216.936	38.64	38.64	1	H1-1a
73	M65	HSS8x8x...	.059	0	2	.000	0	z	3	199.192	293.94	66.288	66.288	1	H1-1b
74	M66	HSS8x8x...	.257	0	3	.000	0	y	3	199.192	293.94	66.288	66.288	1	H1-1a
75	M67	HSS8x8x...	.100	0	2	.000	0	z	3	199.192	293.94	66.288	66.288	1	H1-1b
76	M68	HSS8x8x...	.076	0	3	.000	0	y	3	199.192	293.94	66.288	66.288	1	H1-1b
77	M81	HSS8x8x...	.117	0	2	.001	0	z	3	199.192	293.94	66.288	66.288	1	H1-1b
78	M82	HSS8x8x...	.456	0	3	.000	0	z	2	199.192	293.94	66.288	66.288	1	H1-1a
79	M83	HSS8x8x...	.337	0	2	.001	0	z	3	199.192	293.94	66.288	66.288	1	H1-1a
80	M84	HSS8x8x...	.271	0	3	.000	0	y	3	199.192	293.94	66.288	66.288	1	H1-1a
81	M97	HSS8x8x...	.298	20	2	.001	0	z	3	199.192	293.94	66.288	66.288	1	H1-1a
82	M98	HSS8x8x...	.654	20	3	.001	0	y	3	199.192	293.94	66.288	66.288	1	H1-1a
83	M99	HSS8x8x...	.480	20	2	.001	0	z	3	199.192	293.94	66.288	66.288	1	H1-1a
84	M100	HSS8x8x...	.408	20	3	.001	0	y	3	199.192	293.94	66.288	66.288	1	H1-1a
85	M5	C6x10.5	.013	2.4...	6	.003	0	y	6	59.887	99.468	2.428	15.224	1	H1-1b
86	M6	C6x10.5	.005	2.4...	6	.003	4.8...	y	6	59.887	99.468	2.428	15.224	1	H1-1b
87	M7	C6x10.5	.006	2.4...	6	.003	4.8...	y	6	59.887	99.468	2.428	15.224	1	H1-1b
88	M8	C6x10.5	.013	2.4...	6	.003	0	y	6	59.887	99.468	2.428	15.224	1	H1-1b
89	M21	C6x10.5	.049	2.5...	6	.014	4.8...	y	6	59.887	99.468	2.428	15.224	1	H1-1b
90	M22	C6x10.5	.044	2.4...	3	.014	4.8...	y	6	59.887	99.468	2.428	15.224	1	H1-1b
91	M23	C6x10.5	.040	2.4...	1	.014	4.8...	y	6	59.887	99.468	2.428	15.224	1	H1-1b
92	M24	C6x10.5	.049	2.4...	6	.013	4.8...	y	7	59.887	99.468	2.428	15.224	1	H1-1b
93	M37	C6x10.5	.044	2.5...	6	.014	4.8...	y	1	59.887	99.468	2.428	15.224	1	H1-1b
94	M38	C6x10.5	.055	2.4...	3	.014	4.8...	y	1	59.887	99.468	2.428	15.224	1	H1-1b
95	M39	C6x10.5	.041	2.4...	1	.014	4.8...	y	1	59.887	99.468	2.428	15.224	1	H1-1b
96	M40	C6x10.5	.061	2.4...	3	.012	0	y	1	59.887	99.468	2.428	15.224	1	H1-1b
97	M53	C6x10.5	.046	2.5...	6	.015	4.8...	y	3	59.887	99.468	2.428	15.224	1	H1-1b
98	M54	C6x10.5	.060	2.4...	3	.014	4.8...	y	1	59.887	99.468	2.428	15.224	1	H1-1b
99	M55	C6x10.5	.043	2.4...	7	.014	4.8...	y	3	59.887	99.468	2.428	15.224	1	H1-1b
100	M56	C6x10.5	.069	2.4...	3	.012	0	y	1	59.887	99.468	2.428	15.224	1	H1-1b
101	M69	W16x45	.678	4.76	3	.168	0	y	3	426.018	598.5	54.375	273.12	1	H1-1b
102	M70	W16x45	.774	4.76	2	.214	9.5...	y	2	426.018	598.5	54.375	273.12	1	H1-1b
103	M71	W16x45	.543	4.76	3	.116	4.76	y	3	426.018	598.5	54.375	273.12	1	H1-1b
104	M72	W16x45	.684	4.76	2	.176	4.76	y	2	426.018	598.5	54.375	273.12	1	H1-1b
105	M85	W6x12	.062	4.76	3	.003	9.5...	y	6	59.891	159.75	8.7	22.79	1	H1-1b
106	M86	W6x12	.079	4.76	2	.003	9.5...	y	7	59.891	159.75	8.7	22.79	1	H1-1b
107	M87	W6x12	.215	4.76	3	.003	9.5...	y	6	59.891	159.75	8.7	22.79	1	H1-1a
108	M88	W6x12	.324	4.76	2	.003	9.5...	y	7	59.891	159.75	8.7	22.79	1	H1-1a
109	M101	W6x12	.096	4.76	3	.003	9.5...	y	6	59.891	159.75	8.7	22.79	1	H1-1b
110	M102	W6x12	.245	4.76	2	.003	9.5...	y	7	59.891	159.75	8.7	22.79	1	H1-1a
111	M103	W6x12	.378	4.76	3	.003	9.5...	y	6	59.891	159.75	8.7	22.79	1	H1-1a
112	M104	W6x12	.557	4.76	2	.003	9.5...	y	7	59.891	159.75	8.7	22.79	1	H1-1a
113	M113	W10x33	.516	4.3...	3	.628	3.0...	y	3	205.996	436.95	52.5	142.087	1	H1-1b
114	M114	W10x33	.374	3.4...	3	.465	3.4...	y	3	205.996	436.95	52.5	142.087	1	H1-1b
115	M115	W10x33	.650	4.3...	2	.803	3.0...	y	2	205.996	436.95	52.5	142.087	1	H1-1b
116	M116	W10x33	.557	3.4...	2	.689	3.4...	y	2	205.996	436.95	52.5	142.087	1	H1-1b

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N57	max	8.405	3	26.071	7	20.761	2	0	1	0	5	0	1
2		min	-11.894	2	-145.409	2	-2.118	1	0	1	-.001	3	0	1
3	N58	max	-1.621	5	238.038	3	-1.537	5	0	1	0	5	0	1
4		min	-26.608	3	16.553	1	-26.537	3	0	1	0	2	0	1
5	N59	max	4.578	3	170.616	2	23.786	2	0	1	.001	3	0	1
6		min	-14.487	2	15.233	3	1.537	5	0	1	0	5	0	1
7	N60	max	2.039	1	24.295	5	2.118	1	0	1	0	2	0	1

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
8		min	-23.698	3	-209.844	3	-23.634	3	0	1	0	3	0	1
9	Totals:	max	0	5	102.012	7	0	2						
10		min	-52.782	2	50.411	2	-37.323	3						

Project #: 2016777.800529.05

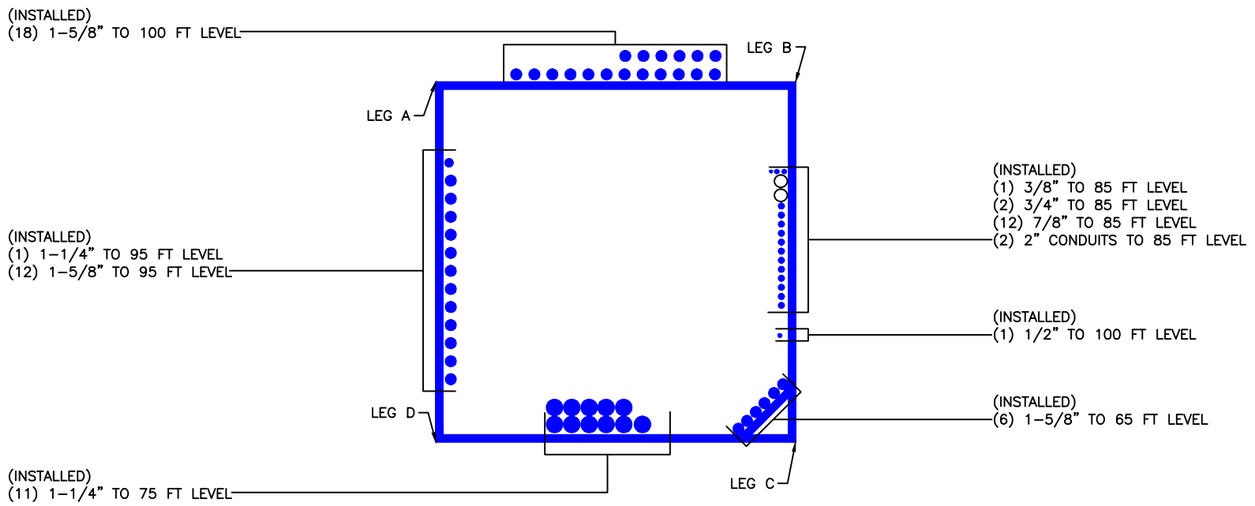
Bolt Checks

Date: 8/18/2016

Section #	Elevation	Component Type	Bolt Grade	Bolt Size (in)	# of Bolts	Maximum Load (k)	Maximum Load per Bolt (k)	Allowable Load per Bolt (k)	Ratio	Allowable Ratio	% Capacity	Criteria
L1	100	Diagonal	A325N	0.875	2	4.851	2.426	15.588	0.156	1.000	15.6%	Member Block Shear
L2	90	Diagonal	A325N	0.875	2	7.591	3.796	15.588	0.243	1.000	24.3%	Member Block Shear
L3	80	Diagonal	A325N	0.875	2	11.331	5.666	15.588	0.363	1.000	36.3%	Member Block Shear
L4	70	Leg	A325N	0.875	4	68.277	17.069	40.589	0.421	1.000	42.1%	Bolt Tension
		Diagonal	A325N	0.875	2	14.922	7.461	15.588	0.479	1.000	47.9%	Member Block Shear
T1	60	Top Girt	A325N	0.875	4	10.748	2.687	24.354	0.110	1.000	11.0%	Bolt Shear
		Diagonal	A325N	0.875	2	28.474	14.237	41.372	0.344	1.000	34.4%	Member Block Shear
T2	40	Top Girt	A325N	0.875	2	22.909	11.454	24.354	0.470	1.000	47.0%	Bolt Shear
		Diagonal	A325N	0.875	2	42.032	21.016	41.372	0.508	1.000	50.8%	Member Block Shear
T3	20	Top Girt	A325N	0.875	2	38.056	19.028	24.354	0.781	1.000	78.1%	Bolt Shear
		Diagonal	A325N	0.875	2	61.074	30.537	41.372	0.738	1.000	73.8%	Member Block Shear
										Maximum Capacity	78.1%	

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 800529 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING

SCALE: N.T.S.

1

PLOT DATE: 7/26/2016 FILE NAME: 800529_BASELEVEL.dwg
R:\Standards - JRE\CAD Standards V5.0\Templates\Typical Blocks For Templates\TITLE BLOCK STD-VER 5.1.dwg

CROWN REGION ADDRESS

USA

30/03/11	AS-BUILT INFORMATION ADDED PER WORK ORDER # 383335 & 390429	AGC
21/06/12	APPLICATION ADDED PER WORK ORDER # 505058	WJM
22/10/12	APPLICATION ADDED PER WORK ORDER # 543686	KAH
31/10/12	APPLICATION ADDED PER WORK ORDER # 548267	AM
20/11/12	AS-BUILT INFORMATION ADDED PER WORK ORDER # 552282	MG
08/02/13	UPDATED PER WORK ORDER # 575982	GDJ
29/7/2014	UPDATED PER WORK ORDER 766581	ADE
25/9/2015	UPDATED PER WORK ORDER 1127105	SAT

DRAWN BY: **AAM**
CHECKED BY:
DRAWING DATE: **19/05/06**

SITE NUMBER:
SITE NAME:

SITE NAME

CT HAMDEN NORTH CAC

BUSINESS UNIT NUMBER

800529

SITE ADDRESS

890 EVERGREEN AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9 Rev. 6.1

Site Data	
Site ID:	800529
Site Name:	CT HAMDEN NORTH CAC
Job #:	2016777.800529.05

Anchor Rod Data		
Qty:	8	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	58	ksi
Yield (Fy):	36	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

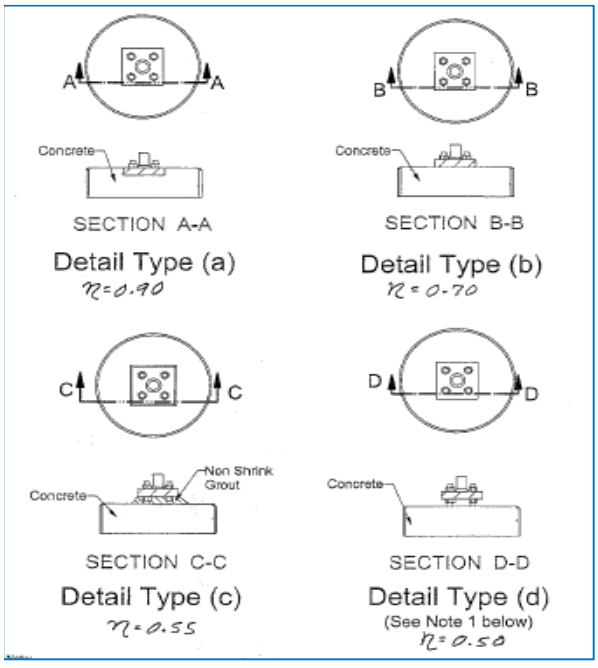


Figure 4-4 of TIA-222-G

Reactions		
Eta Factor, η	0.5	Detail Type
Down load, Pu:	238	kips
Shear, Vu:	38	kips

I_{ar}:		in
$Mu = 0.65*I_{ar}*V_u$		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ń):	39.3	Kips
Design Axial, Φ*Fu*Anet:	45.0	Kips
Anchor Rod Stress Ratio:	87.3%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

Maximum Acceptable Ratio:	105	%
Governing Stress Ratio:	87.3%	**Pass**

Mat Foundation Analysis
800529 CT HAMDEN NORTH CAC
2016777.800529.05

General Info	
TIA Code	TIA-222-G
Soil Code	AASHTO 2010
Concrete Code	ACI 318-02
Seismic Design Category	B
Bearing On	Soil
Foundation Type	Monopole Pad
Pier Type	Round
Reinforcing Known	Yes
Max Bearing Capacity	110%
Max Overturning Capacity	100%

Tower Reactions		
Moment, M	3015	k-ft
Axial, P	59	k
Shear, V	53	k

Pad & Pier Geometry		
Pier Diameter, ø	16	ft
Pad Length, L [y]	24	ft
Pad Width, W [x]	24	ft
Pad Thickness, t	3	ft
Depth, D	4.625	ft
Height Above Grade, HG	0.375	ft
Tower Centroid, X	12	ft
Tower Centroid, Y	12	ft
Tower Eccentricity	0.0000	ft

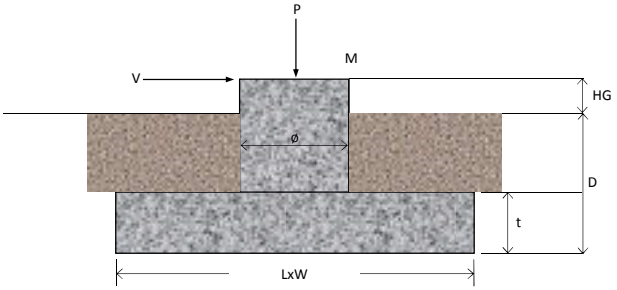
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete F'c	3	ksi
Clear Cover	3	in
Pier Tie Size		
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 8	
Pad Quantity Per Layer	32	
Pier Rebar Size		
Pier Quantity of Rebar		

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	115	pcf
Angle of Friction, ø	30	°
Bearing Type	Gross	
Ultimate Bearing	9	ksf
Water Table Depth	999	ft
Frost Depth	3.5	ft

Bearing Summary			Load Case
Qxmax	2.08	ksf	0.9D+1.6W
Qymax	2.08	ksf	0.9D+1.6W
Qmax @ 45°	2.43	ksf	0.9D+1.6W
Q(all) Gross	6.75	ksf	
Controlling Capacity	**36.1%**	**Pass**	

Overturning Summary			Load Case
Ovtx	67.1%	OK	0.9D+1.6W
Ovty	67.1%	OK	0.9D+1.6W
Ovtxy	46.9%	OK	0.9D+1.6W
Controlling Capacity	**67.1%**	**Pass**	

Reinforcement Summary			Load Case
Moment in Pad	10.5%	OK	0.9D+1.6W
Shear in Pad	10.0%	OK	0.9D+1.6W
Controlling Capacity	**10.5%**	**Pass**	



890 EVERGREEN AVE

Location	890 EVERGREEN AVE	**Mblu**	2930/ 081/ 01/ /
Acct#		**Owner**	CONN AGRICULURAL EXPT STATION
Assessment	$192,920	**Appraisal**	$290,600
PID	123443	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$125,600	$165,000	$290,600
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$87,920	$105,000	$192,920

Owner of Record

Owner	CONN AGRICULURAL EXPT STATION	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	890 EVERGREEN AVE HAMDEN, CT 06518	**Book & Page**	64/ 135
		Sale Date	01/04/1911

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
CONN AGRICULURAL EXPT STATION			64/ 135	01/04/1911

Building Information

Building 1 : Section 1

Year Built: 2000
Living Area: 1473
Building Percent Good: 89

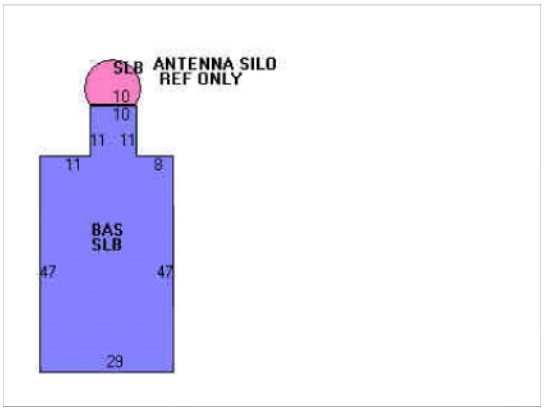
Building Attributes	
Field	**Description**
STYLE	Telephone Bldg
MODEL	Ind/Comm
Grade	C
Stories:	1

Building Photo

Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Hot Air-no Duc
AC Type	None
Bldg Use	RAD/TV TR M96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	4330
Heat/AC	HEAT/AC SPLIT
Frame Type	MASONRY
Baths/Plumbing	NONE
Ceiling/Wall	NONE
Rooms/Prtns	AVERAGE
Wall Height	10
% Comn Wall	

(http://images.vgsi.com/photos2/HamdenCTPhotos//\00\02\79/86.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1473	1473
SLB	Slab	1527	0
		3000	1473

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	4310
Description	TEL REL TW M96
Zone	R4
Neighborhood	110
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0
Frontage	
Depth	
Assessed Value	$105,000
Appraised Value	$165,000

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

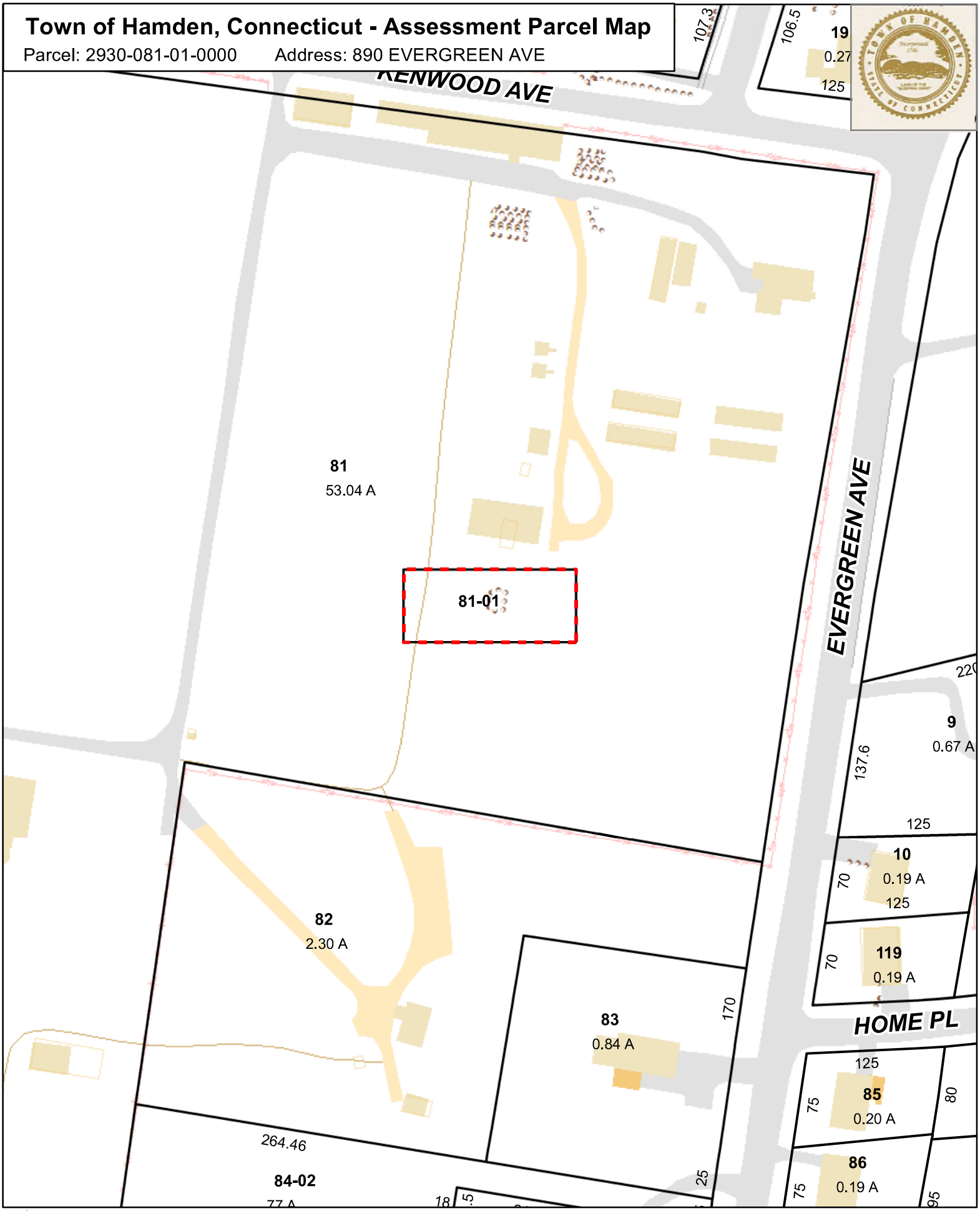
Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$125,600	$165,000	$290,600
2014	$127,100	$165,000	$292,100
2013	$127,100	$165,000	$292,100

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$87,920	$105,000	$192,920
2014	$88,970	$105,000	$193,970
2013	$88,970	$105,000	$193,970

Town of Hamden, Connecticut - Assessment Parcel Map

Parcel: 2930-081-01-0000 Address: 890 EVERGREEN AVE



N

Approximate Scale: 1 inch = 100 feet

0 50 100 150 200 Feet

Map Produced: January 2016

PROJECT INFORMATION

SCOPE OF WORK:	TELECOMMUNICATIONS FACILITY UPGRADE (BWE 2017 UPGRADE):
SITE ADDRESS:	890 EVERGREEN AVENUE HAMDEN, CT 06518
LATITUDE:	41.40671° N 41° 24' 24.17" N
LONGITUDE:	72.90422° W 72° 54' 15.19" W
TYPE OF SITE:	SILO / INDOOR EQUIPMENT
SILO HEIGHT:	108'±
RAD CENTER:	85'±
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

at&t

SITE NUMBER: CT2039

SITE NAME: HAMDEN SR 10

PROJECT: BWE 2017 UPGRADE

DRAWING INDEX

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

CROWN CASTLE SITE NAME: CT HAMDEN NORTH CAC
CROWN CASTLE SITE #: 800529

VICINITY MAP

DIRECTIONS TO SITE:

DEPART ENTERPRISE DR TOWARD CAPITOL BLVD. 0.4 MI. TURN LEFT ONTO CAPITOL BLVD. 0.2 MI. TURN LEFT ONTO WEST ST. 0.3 MI. TAKE RAMP LEFT FOR I-91 S. 22.6 MI. AT EXIT 10, TAKE RAMP RIGHT FOR CT-40 TOWARD HAMDEN / MT. CARMEL. 2.6 MI. BEAR RIGHT ONTO CT-10 / WHITNEY AVE. 0.6 MI. TURN LEFT ONTO EVERGREEN AVE. 0.1 MI. TURN RIGHT ONTO KENWOOD AVE. 480 FT. ARRIVE AT ENTRANCE TO SITE ON THE LEFT.

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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.

72 HOURS

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

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
27 NORTHWESTERN DR.
SALEM, NH 03079

SITE NUMBER: CT2039
SITE NAME: HAMDEN SR 10
CROWN CASTLE SITE #: 800529
890 EVERGREEN AVENUE
HAMDEN, CT 06518
NEW HAVEN COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	07/08/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
A	06/21/16	ISSUED FOR REVIEW	SB	AT	DPH

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

STATE OF CONNECTICUT · DEREK J. CREASER · No. 25551 · LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
(BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT2039	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 – SAI
   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: 2003 IBC WITH 2005 CT SUPPLEMENT, + 2009 & 2013 CT AMENDMENTS
    ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
    LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

    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–F, STRUCTURAL STANDARDS FOR STEEL

    EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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

STATE OF CONNECTICUT
DEREK J. CREASER
No. 28551
LICENSED
PROFESSIONAL ENGINEER

AT&T
GENERAL NOTES
(BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT2039	GN–1	1

NOTE:

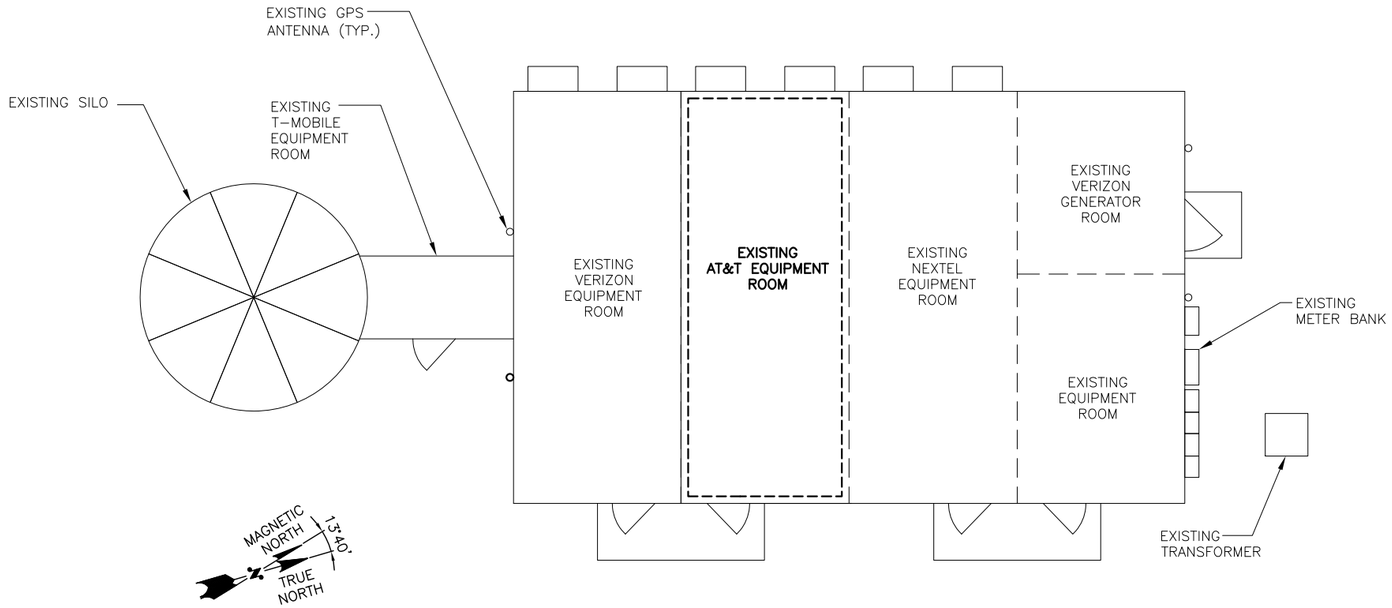
ALL ANTENNAS AND LINES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

NOTE:

REFER TO STRUCTURAL ASSESSMENT LETTER BY: HUDSON DESIGN GROUP, LLC, DATED: JULY 07, 2016, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

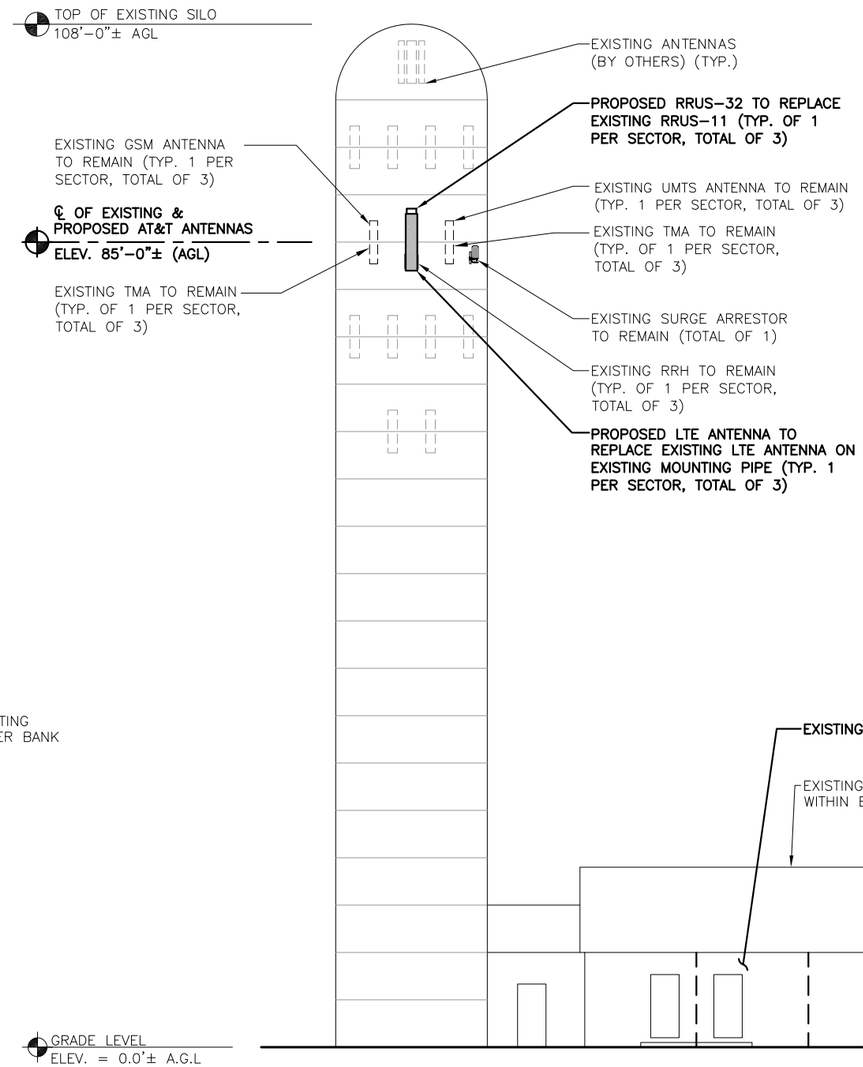
NOTE:

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



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"



ELEVATION (2 / A-1)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

0 4'-0" 8'-0" 16'-0" 24'-0"

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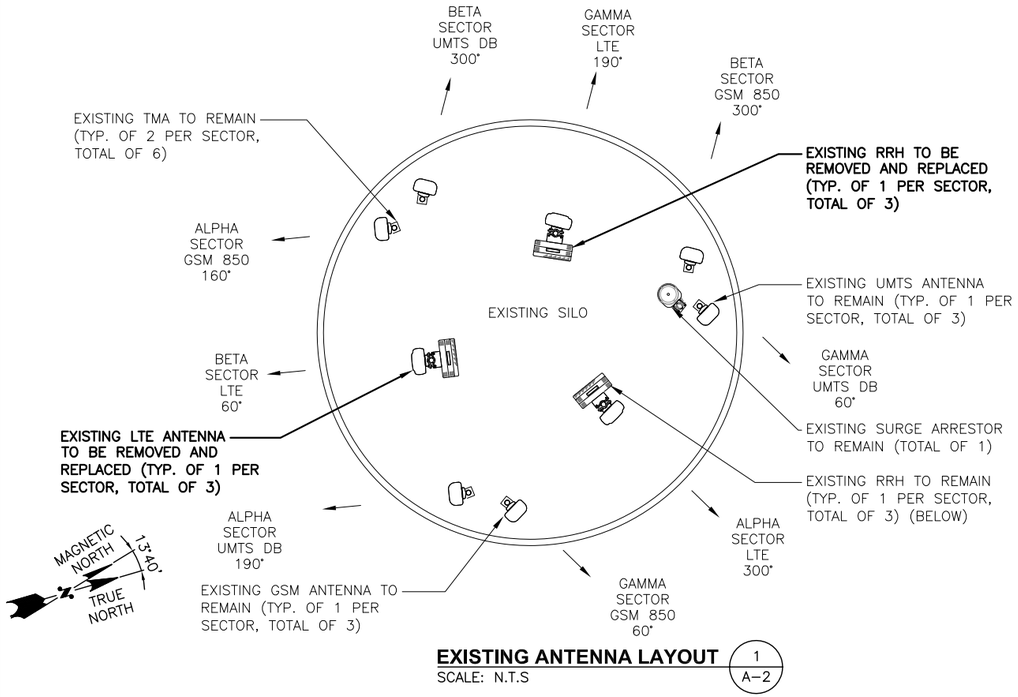
STATE OF CONNECTICUT — DEREK J. CREASER — 16,205 — LICENSED PROFESSIONAL ENGINEER

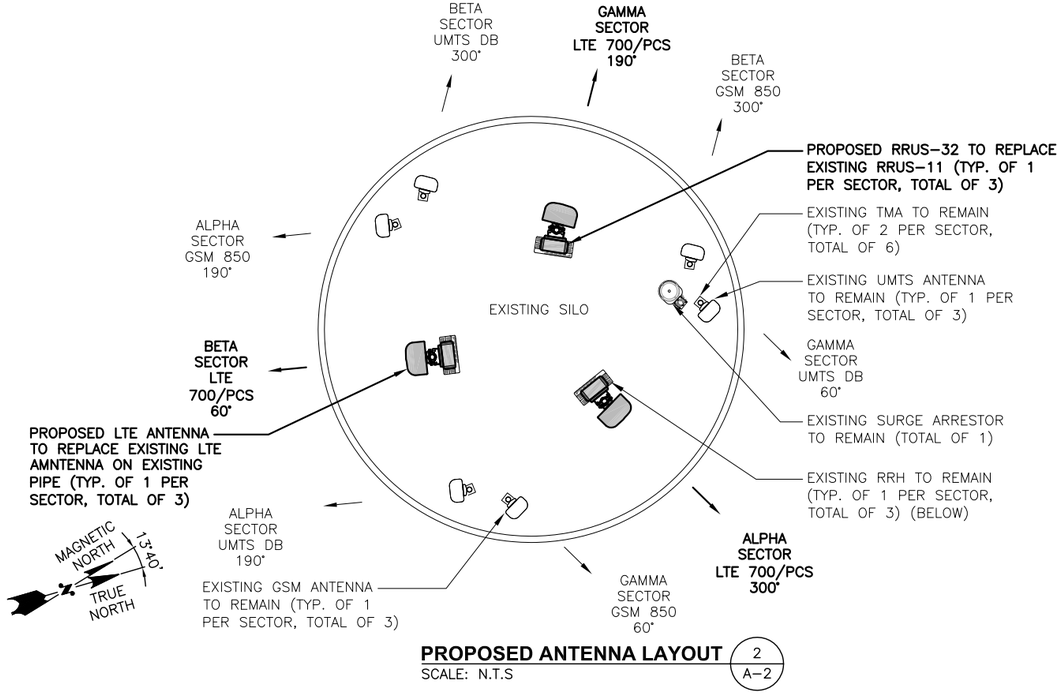
AT&T

COMPOUND PLAN & ELEVATION (BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT2039	A-1	1



EXISTING ANTENNA LAYOUT (1 / A-2)
SCALE: N.T.S



PROPOSED ANTENNA LAYOUT (2 / A-2)
SCALE: N.T.S

EXISTING ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA	KATHREIN	800-10121	54.5x10.3x5.9
	–	–	–
	KMW	AM-X-CD-16-65-00T-RET	72.0x11.8x5.9
	KATHREIN	800-10121	54.5x10.3x5.9
BETA	KATHREIN	800-10121	54.5x10.3x5.9
	–	–	–
	KMW	AM-X-CD-16-65-00T-RET	72.0x11.8x5.9
	KATHREIN	800-10121	54.5x10.3x5.9
GAMMA	KATHREIN	800-10121	54.5x10.3x5.9
	–	–	–
	KMW	AM-X-CD-16-65-00T-RET	72.0x11.8x5.9
	KATHREIN	800-10121	54.5x10.3x5.9

PROPOSED ANTENNA SCHEDULE

SECTOR	MAKE	MODEL#	SIZE (INCHES)
ALPHA	KATHREIN	800-10121	54.5x10.3x5.9
	CCI	HPA-65R-BUU-H6	72.0x14.8x9.0
	–	–	–
	KATHREIN	800-10121	54.5x10.3x5.9
BETA	KATHREIN	800-10121	54.5x10.3x5.9
	CCI	HPA-65R-BUU-H6	72.0x14.8x9.0
	–	–	–
	KATHREIN	800-10121	54.5x10.3x5.9
GAMMA	KATHREIN	800-10121	54.5x10.3x5.9
	CCI	HPA-65R-BUU-H6	72.0x14.8x9.0
	–	–	–
	KATHREIN	800-10121	54.5x10.3x5.9

NOTE:
ALL ANTENNAS AND LINES TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

NOTE:
REFER TO STRUCTURAL ASSESSMENT LETTER BY: HUDSON DESIGN GROUP, LLC, DATED: JULY 07, 2016, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

NOTE:
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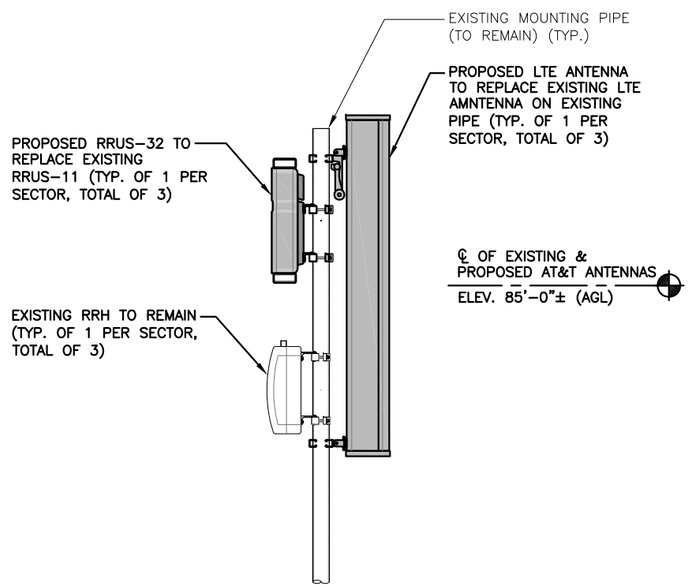


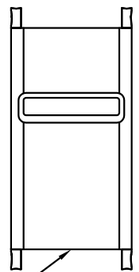
PROPOSED LTE ANTENNA & RRH MOUNTING DETAIL (3 / A-2)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

RRU CHART

QUANTITY	MODEL	L	W	D
3(E)	RRUS-11	19.7"	17.0"	7.2"
–	RRUS-12	20.4"	18.5"	7.5"
3(P)	RRUS-32	26.7"	12.1"	6.7"
–	RRUS-E2	20.4"	18.5"	7.5"
–	LTE-A2	16.4"	15.2"	3.4"

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 RRH DETAIL (4 / A-2)
SCALE: N.T.S

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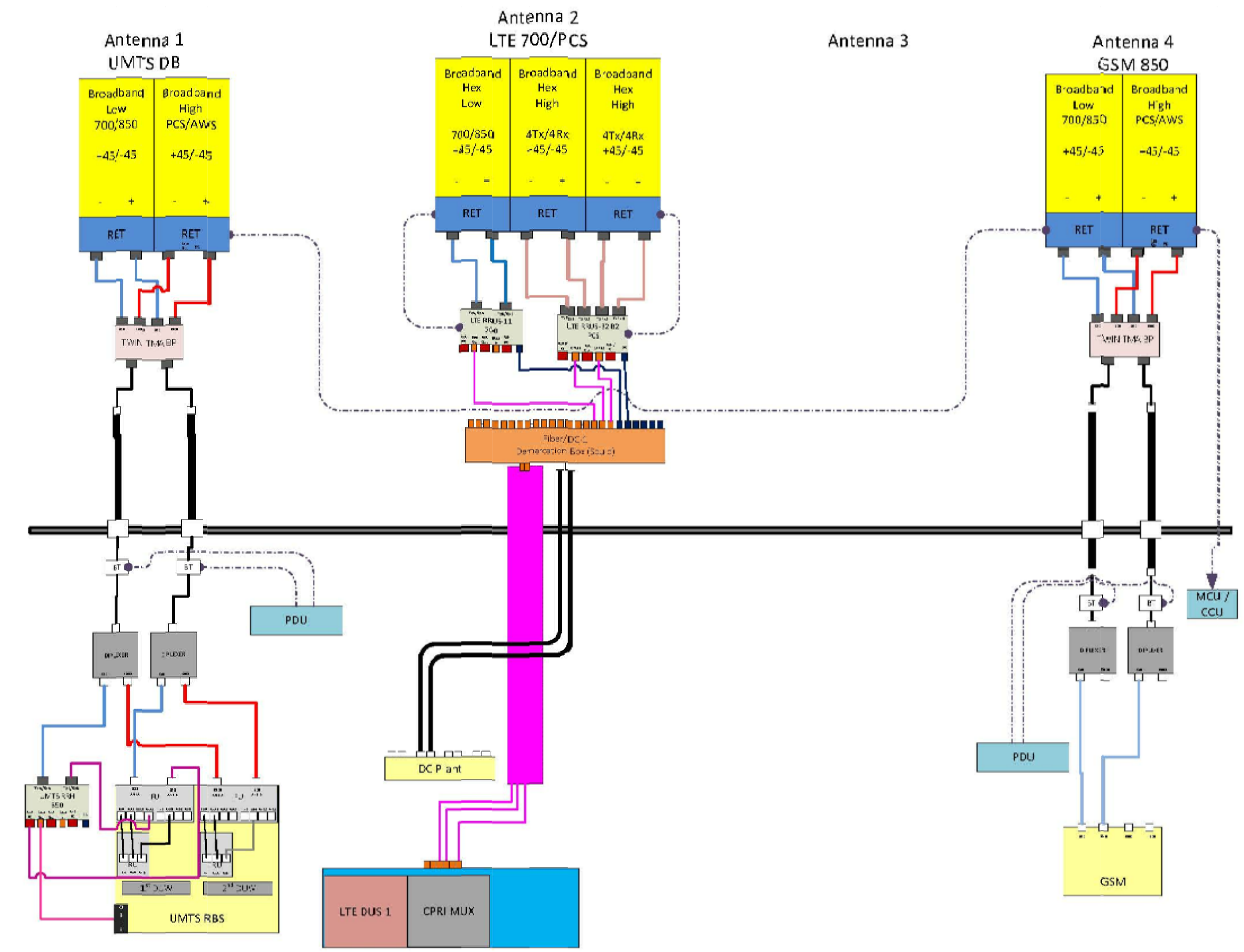
STATE OF CONNECTICUT · DEREK J. CREASER · 26,258 · LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS & DETAILS (BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT2039	A-2	1



RF PLUMBING DIAGRAM
SCALE: N.T.S

1
RF–1

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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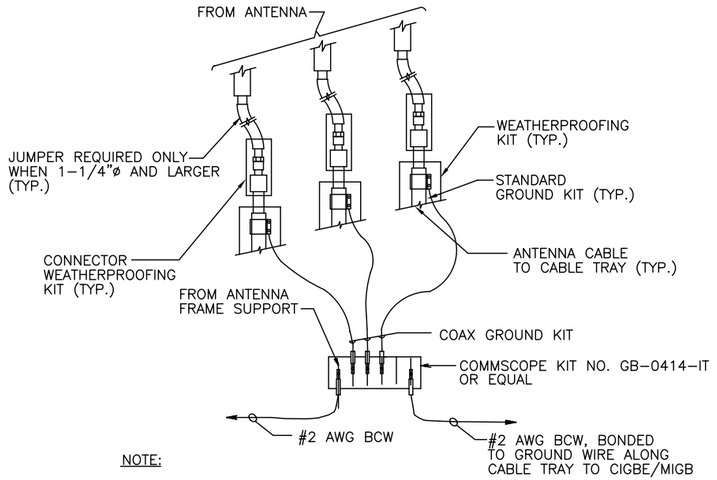
STATE OF CONNECTICUT — DEREK J. CREASER — LICENSED PROFESSIONAL ENGINEER

AT&T
RF PLUMBING DIAGRAM
(BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT2039	RF–1	1

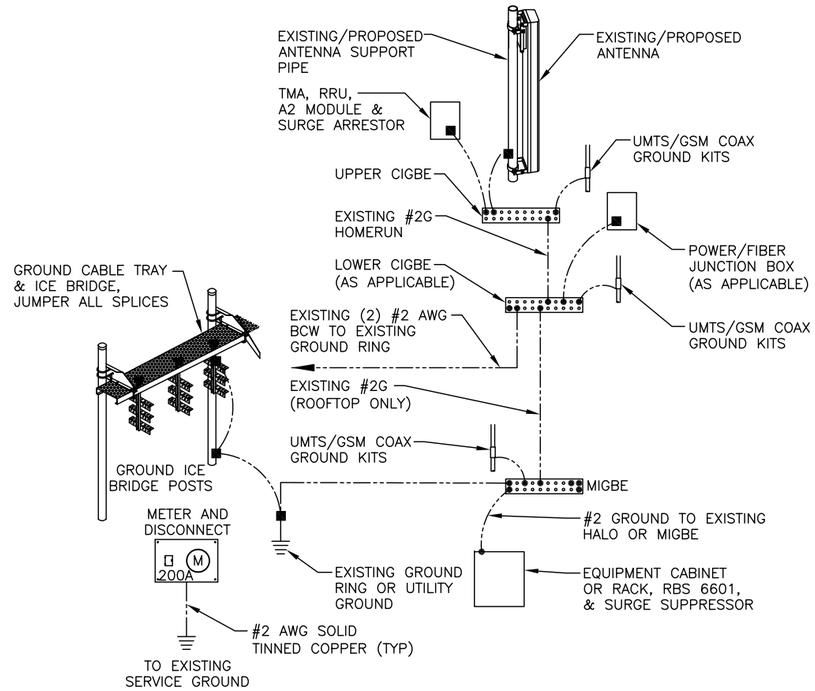


NOTE:

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

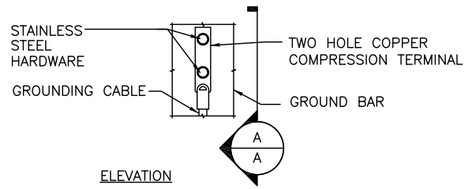
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S — 1 / G–1



GROUNDING RISER DIAGRAM

SCALE: N.T.S — 2 / G–1



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

SCALE: N.T.S — 3 / G–1

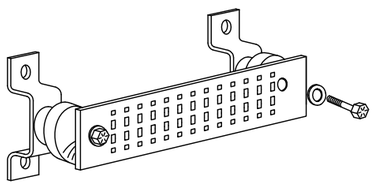
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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

SCALE: N.T.S — 4 / G–1

STATE OF CONNECTICUT — DEREK J. CREASER — LICENSED PROFESSIONAL ENGINEER

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BUILDING 20 NORTH, SUITE 3090
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FAX: (978) 336-5586

27 NORTHWESTERN DR.
SALEM, NH 03079

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

SITE NUMBER: CT2039
SITE NAME: HAMDEN SR 10
CROWN CASTLE SITE #: 800529
890 EVERGREEN AVENUE
HAMDEN, CT 06518
NEW HAVEN COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	07/08/16	ISSUED FOR CONSTRUCTION	EB	AT	DPH
A	06/21/16	ISSUED FOR REVIEW	SB	AT	DPH

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

AT&T

GROUNDING DETAILS (BWE)

SITE NUMBER	DRAWING NUMBER	REV
CT2039	G–1	1