



10 INDUSTRIAL AVE,  
SUITE 3  
MAHWAH NJ 07430

PHONE: 201.684.0055  
FAX: 201.684.0066

June 24, 2016

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

Notice of Exempt Modification  
100 Sunset Ridge Road, East Hartford, CT  
Latitude- 41.77180000  
Longitude- -72.59030000

Dear Ms. Bachman,

T-Mobile currently maintains (9) existing antennas at the 120' level of the existing 140' lattice tower located at 100 Sunset Ridge Road in East Hartford, Connecticut (also known as 100 Sunset Ridge Drive). The tower and property is owned by the Town of East Hartford. T-Mobile now intends to replace (3) of its existing antennas with (3) new 1900 MHz antennas. These antennas would be installed at the same 120' level of the tower. T-Mobile also intends to install (1) new hybrid fiber cable.

Enclosed is a letter from Jeffrey Cormier, Town Planner for the Town of East Hartford, indicating the Town no longer has a record of the original approval for this facility. The Council did not certificate this facility.

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 Mayor of the Town of East Hartford, the Honorable Marcia A. Leclerc, as well as the property and 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 modification 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 modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

*Kyle Richers*

Kyle Richers  
Transcend Wireless  
10 Industrial Ave., Suite 3  
Mahwah, New Jersey 07430  
908-447-4716  
[krichers@transcendwireless.com](mailto:krichers@transcendwireless.com)

cc: Marcia A. Leclerc- as elected official  
Town of East Hartford- as tower and property owner

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Standard Register

MARCIA A. LECLERC  
MAYOR

TOWN OF EAST HARTFORD

740 Main Street  
East Hartford, Connecticut 06108



DEVELOPMENT  
DEPARTMENT  
Phone: 860 291-7300  
Fax: 860 291-7298

June 14, 2016

Kyle Richers  
Transcend Wireless  
10 Industrial Ave, Suite 3  
Mahwah, NJ 07430

Re: 100 Sunset Ridge Road – Conditions of Approval for Wireless Facility

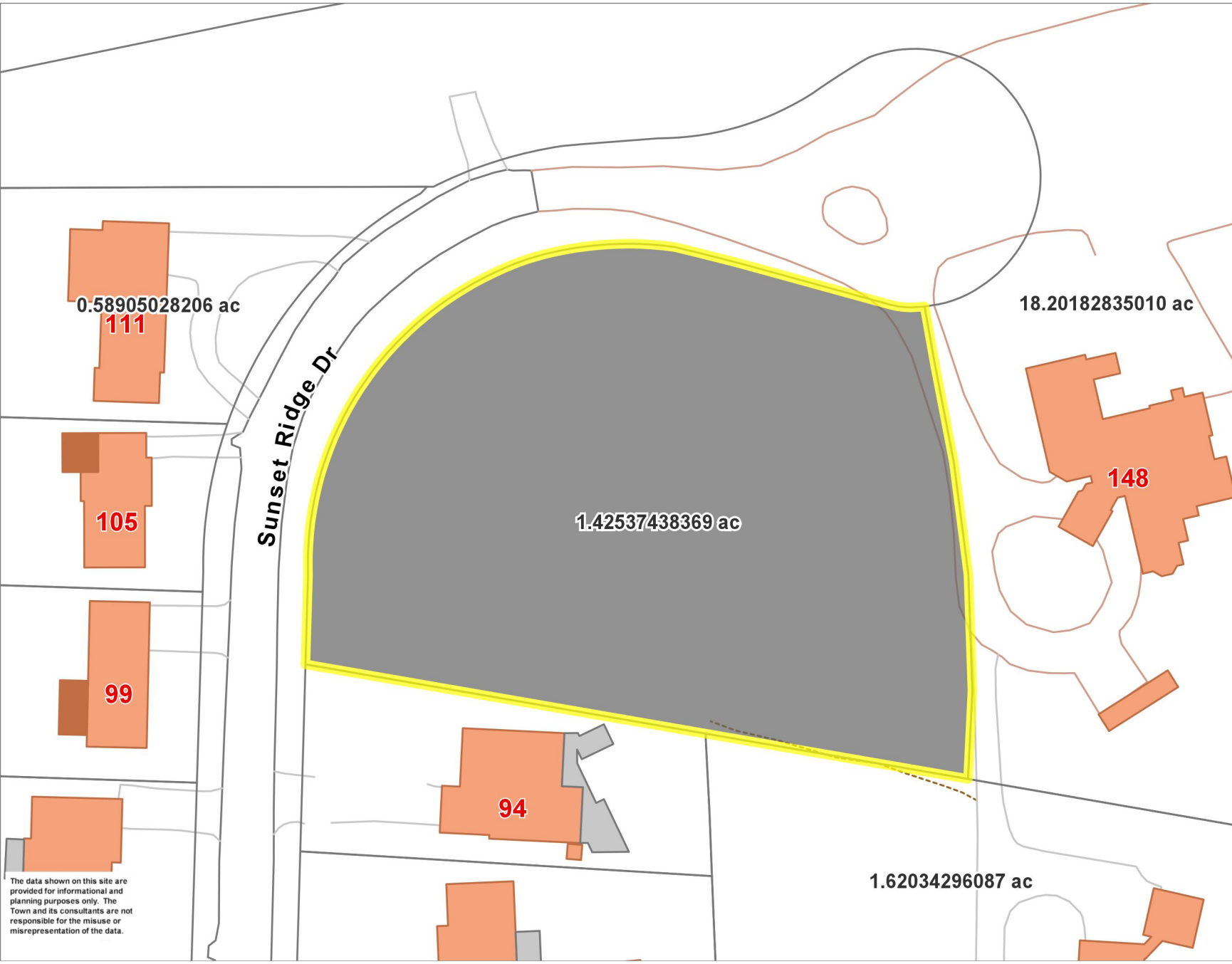
Dear Mr. Richers:

Unfortunately I am unable to locate the original site plan approval for the telecommunications wireless tower facility located at 100 Sunset Ridge Road.

Please contact me with any questions.

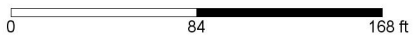
Sincerely,

Jeffrey P. Cormier  
Town Planner



- Town Boundary
- Schools
- Buildings
  - Building
  - Cement
  - Deck
  - Foundation
  - Greenhouse
  - Tank
- Parcels
- Paved Features
  - Driveway
  - Road Edge
  - Parking Lot
  - Sidewalk
  - Trail
  - Tunnel
  - Unpaved
- Water Features Arc
  - Perennial Stream
  - Draining Ditch
  - Culvert
  - Spillway
  - Headwall
  - Dam
  - Directional Flow Arrow
- Water Features Poly
  - Open Water
  - Swamp
  - Pier
- CT Highways
  - Interstate
  - US Highway
  - State Highway
- Abutting Town Labels
- Az
- Abutting Towns
- Streets

The data shown on this site are provided for informational and planning purposes only. The Town and its consultants are not responsible for the misuse or misrepresentation of the data.



Printed on 06/22/2016 at 11:11 AM

# Town of East Hartford Property Summary Report

## 100 SUNSET RIDGE DR

<b>MAP LOT:</b>	57-134A	<b>CAMA PID:</b>	13740
<b>LOCATION:</b>	100 SUNSET RIDGE DR		
<b>OWNER NAME:</b>	TOWN OF EAST HARTFORD / VETERANS MEMORIAL CLUBHSE		



<b>OWNER OF RECORD</b>
TOWN OF EAST HARTFORD VETERANS MEMORIAL CLUBHSE 740 MAIN STREET EAST HARTFORD, CT 06108



<b>LIVING AREA:</b>	6169	<b>ZONING:</b>	R2	<b>ACREAGE:</b>	1.64
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### SALES HISTORY

OWNER	BOOK / PAGE	SALE DATE	SALE PRICE
TOWN OF EAST HARTFORD VETERANS MEMORIAL CLUBHSE	159/ 39	01-Jan-1900	\$0.00

### CURRENT PARCEL ASSESSMENT

<b>TOTAL:</b>	\$807,050.00	<b>IMPROVEMENTS:</b>	\$708,350.00	<b>LAND:</b>	\$98,700.00
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### ASSESSING HISTORY

FISCAL YEAR	TOTAL VALUE	IMPROVEMENT VALUE	LAND VALUE
2015	\$807,050.00	\$708,350.00	\$98,700.00
2014	\$807,050.00	\$708,350.00	\$98,700.00
2013	\$807,050.00	\$708,350.00	\$98,700.00
2012	\$807,050.00	\$708,350.00	\$98,700.00
2011	\$807,050.00	\$708,350.00	\$98,700.00



# Town of East Hartford Property Summary Report

## 100 SUNSET RIDGE DR

<b>MAP LOT:</b>	57-134A	<b>CAMA PID:</b>	13740
<b>LOCATION:</b>	100 SUNSET RIDGE DR		
<b>OWNER NAME:</b>	TOWN OF EAST HARTFORD / VETERANS MEMORIAL CLUBHSE		

### BUILDING # 1

<b>YEAR BUILT</b>	1930	<b>EXT WALL 1</b>	Stone/Masonry
<b>STYLE</b>	Cultural Facility	<b>INT WALLS 1</b>	Plaster
<b>MODEL</b>	Comm/Ind	<b>HEAT FUEL</b>	Other
<b>STORIES</b>	1.0	<b>HEAT TYPE</b>	Steam
<b>OCCUPANCY</b>	Exempt	<b>AC TYPE</b>	None
<b>ROOF</b>	Drmrs/Ex Gable	<b>BEDROOMS</b>	
<b>ROOF COVER</b>	Asphalt	<b>FULL BATHS</b>	15
<b>FLOOR COVER 1</b>	Hardwood	<b>HALF BATHS</b>	
<b>% BSMT</b>	null	<b>TOTAL ROOMS</b>	0
<b>% FIN BSMT</b>	null	<b>% REC RM</b>	null
<b>% SEMI FIN BSMT</b>	null	<b>% ATTIC FINISH</b>	null
<b>BSMT GARAGE</b>	null	<b>FIREPLACES</b>	null



### EXTRA FEATURES

DESCRIPTION	CODE	UNITS
Fin Bsmt	FBM	1567 S.F.
Fireplace	FPL	1 UNITS

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

T-Mobile Existing Facility

Site ID: CT11737C

CT737/E Hartford Town SST  
100 Sunset Ridge Road  
East Hartford, CT 06118

**June 17, 2016**

**EBI Project Number: 6216002848**

Site Compliance Summary	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general public allowable limit:	<b>10.89 %</b>



June 17, 2016

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

Emissions Analysis for Site: **CT11737C – CT737/E Hartford Town SST**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **100 Sunset Ridge Road, East Hartford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

## **CALCULATIONS**

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **100 Sunset Ridge Road, East Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 5) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 6) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the **Ericsson AIR32 B66Aa/B2A & Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR32 B66Aa/B2A** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antenna mounting height centerline of the proposed antennas is **120 feet** above ground level (AGL).
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 12) All calculations were done with respect to uncontrolled / general public threshold limits.

### T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR32 B66Aa/B2A	Make / Model:	Ericsson AIR32 B66Aa/B2A	Make / Model:	Ericsson AIR32 B66Aa/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	2.58	Antenna B1 MPE%	2.58	Antenna C1 MPE%	2.58
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	7,002.81	ERP (W):	7,002.81	ERP (W):	7,002.81
Antenna A2 MPE%	1.94	Antenna B2 MPE%	1.94	Antenna C2 MPE%	1.94
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	120	Height (AGL):	120	Height (AGL):	120
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.51	Antenna B3 MPE%	0.51	Antenna C3 MPE%	0.51

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	5.03 %
Clearwire	0.21 %
AT&T	2.53 %
Public Works	0.62 %
Fire	0.41 %
Fire Admin	0.41 %
Police Channels 1&2	1.02 %
Parks & Rec	0.17 %
Health	0.25 %
800	0.24
<b>Site Total MPE %:</b>	<b>10.89 %</b>

T-Mobile Sector A Total:	5.03 %
T-Mobile Sector B Total:	5.03 %
T-Mobile Sector C Total:	5.03 %
<b>Site Total:</b>	<b>10.89 %</b>

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 1900 MHz (PCS) LTE	2	2,334.27	120	12.91	PCS - 1900 MHz	1000	1.29%
T-Mobile 2100 MHz (AWS) LTE	2	2,334.27	120	12.91	AWS - 2100 MHz	1000	1.29%
T-Mobile 1900 MHz (PCS) GSM	2	1,167.14	120	6.46	PCS - 1900 MHz	1000	0.65%
T-Mobile 1900 MHz (PCS) UMTS	2	1,167.14	120	6.46	PCS - 1900 MHz	1000	0.65%
T-Mobile 2100 MHz (AWS) UMTS	2	1,167.14	120	6.46	AWS - 2100 MHz	1000	0.65%
T-Mobile 700 MHz LTE	1	865.21	120	2.39	700 MHz	467	0.51%
						<b>Total*:</b>	<b>5.03 %</b>

\*Note: Totals may vary by 0.01% due to summing of remainders

## Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	5.03 %
Sector B:	5.03 %
Sector C:	5.03 %
T-Mobile Per Sector Maximum:	5.03 %
Site Total:	10.89 %
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **10.89%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

# STRUCTURAL ANALYSIS REPORT

For

## CT11737C

### CT737/E HARTFORD TOWN SST

100 SUNSET RIDGE ROAD  
EAST HARTFORD, CT 06118

## Antennas Mounted to the Tower



Prepared for:

*Transcend Wireless*

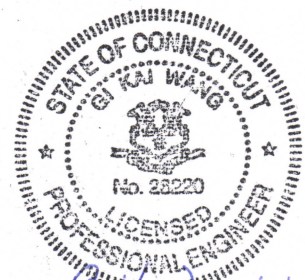
**T-Mobile**

Dated: June 10, 2016

Prepared by:



1600 Osgood Street Bldg. 20N Suite 3090  
North Andover, MA 01845  
(P) 978.557.5553 (F) 978.336.5586  
[www.hudsondesigngroupllc.com](http://www.hudsondesigngroupllc.com)







### SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by T-Mobile to conduct a structural evaluation of the 140' self-supporting tower supporting the proposed T-Mobile's antennas located at elevation 120' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of T-Mobile's existing and proposed antennas listed below.

Record drawings of the existing tower were not available for our use. The previous structural analysis report prepared by EBI Consulting, dated August 6, 2014, was available and obtained for our use.

### CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing tower is in conformance with the ANSI/TIA-222-F Standard for the loading considered under the criteria listed in this report. The tower structure is rated at 59.6% - (Legs at Tower Section T7 from EL.0' to EL.20' Controlling).





**APPURTENANCES CONFIGURATION:**

Tenant	Appurtenances	Elev.	Mount
	Lightning Rod	138'	Tower Leg
	(3) 7' Omni	138'	Side Mount Standoff
	1' Dish	135'	Side Mount Standoff
	(3) 20' Omni	130'	T - Frame
<b>T-Mobile</b>	<b>(3) AIR 21 B2A/B4P Antennas</b>	120'	T - Frame
<b>T-Mobile</b>	<b>(3) LNX-6515DS-A1M Antennas</b>	120'	T - Frame
<b>T-Mobile</b>	<b>(3) RRUS-11</b>	120'	T - Frame
<b>T-Mobile</b>	<b>(3) TMA</b>	120'	T - Frame
<b>T-Mobile</b>	<b>(3) AIR 32 B66Aa/B2a Antennas</b>	120'	T - Frame
	(3) Panel Antennas	100'	Side Mount Standoff
	(3) RRH	100'	Side Mount Standoff
	2' Dish	100'	Side Mount Standoff
	1' Dish	100'	Tower Leg
	(2) 1' Dish	95'	Tower Leg

*\*Proposed T-Mobile Appurtenances shown in Bold.*

**T-MOBILE EXISTING/PROPOSED COAX CABLES:**

Tenant	Coax Cables	Elev.	Mount
<b>T-Mobile</b>	<b>(6) 1 5/8" Cables</b>	120'	Tower Face
<b>T-Mobile</b>	<b>(1) Fiber Cable</b>	120'	Tower Face
<b>T-Mobile</b>	<b>(1) Fiber Cable</b>	120'	Tower Face

*\*Proposed T-Mobile Coax Cables shown in Bold.*

**ANALYSIS RESULTS SUMMARY:**

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Legs	59.6 %	0 - 20	PASS	Controlling
Diagonals	50.1 %	100 - 120	PASS	
Top Girts	0.8 %	120 - 140	PASS	



#### **DESIGN CRITERIA:**

1. EIA/TIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

City/Town: East Hartford  
County: Hartford  
Wind Load: 80 mph (fastest mile)  
                  100 mph (3 second gust)  
Nominal Ice Thickness: 0.5 inch

2. Approximate height above grade to proposed antennas: 120'

**\*Calculations and referenced documents are attached.**

#### **ASSUMPTIONS:**

1. The tower dimensions, member sizes and material strength are as indicated in the previous structural analysis report prepared by EBI Consulting, dated August 6, 2014.
2. The existing appurtenances configuration is as stated in the previous structural analysis report prepared by EBI Consulting, dated August 6, 2014. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
3. The tower and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
4. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.
5. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.
6. The foundation of the tower was not checked due to lack of information. As-built foundation drawings and geotechnical report would be required to determine whether the foundation is capable of supporting the proposed loadings.



#### **SUPPORT RECOMMENDATIONS:**

HDG recommends that the proposed antennas be mounted on the existing T-frame supported by the tower.

#### **ONGOING AND PERIODIC INSPECTION AND MAINTENANCE:**

After the Contractor has successfully completed the installation and the work has been accepted, the Owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

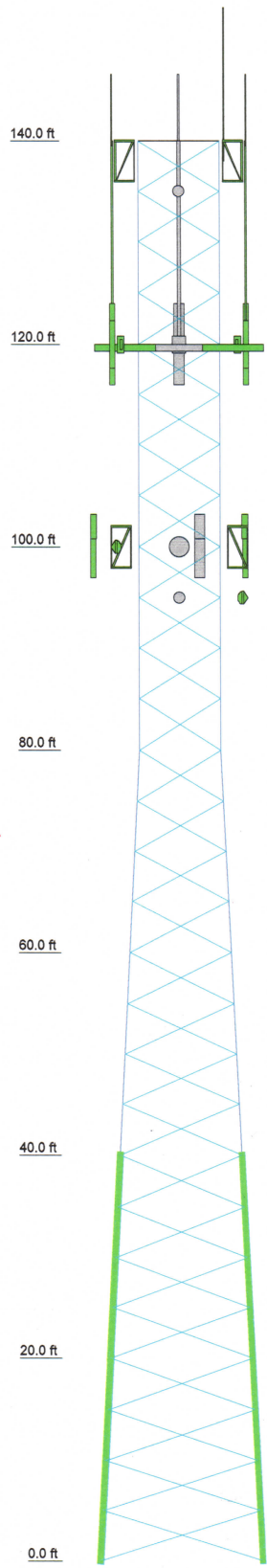


**Photo 1:** Photo illustrating the Tower with Appurtenances shown.



CALCULATIONS

Section	T1	T2	T3	T4	T5	T6	T7
Legs	SR 2 1/4	SR 2 3/4	SR 3	SR 3 1/4	SR 3 1/4	Pirod 105218	Pirod 105219
Leg Grade	L1 3/4x1 3/4x1/8	L1 3/4x1 3/4x1/4	A572-50	A572-50	L3x3x5/16	L3x3x5/16	L3x3x5/16
Diagonals	L3x3x3/8	L3x3x3/8	A36	A36	N.A.	N.A.	N.A.
Diagonal Grade							
Top Girts							
Face Width (ft)	8			10	12	14	16
# Panels @ (ft)				28 @ 5			
Weight (lb) 20081.2	1308.1	1437.8	2837.5	2633.7	3132.6	4184.4	500.1



**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 2"x15"	138	Gen. TMA	120
3' Side Mount Standoff	138	Gen. TMA	120
3' Side Mount Standoff	138	Gen. TMA	120
3' Side Mount Standoff	138	Gen. TMA	120
Omni 2"x7"	138	AIR 32 B66Aa/B2a w/mount pipe (T-Mobile - Proposed)	120
Omni 2"x7"	138	AIR 32 B66Aa/B2a w/mount pipe	120
Omni 2"x7"	138	AIR 32 B66Aa/B2a w/mount pipe	120
3' Side Mount Standoff	135	PIROD 12' T-Frame (T-Mobile - Existing)	120
Andrew VHLP1	135	SO 101-1	100
Omni 3"x20"	130	SO 101-1	100
Omni 3"x20"	130	Panel Antenna 6'x1'x4.5" w/mount pipe	100
Omni 3"x20"	130	Panel Antenna 6'x1'x4.5" w/mount pipe	100
PIROD 12' T-Frame	120	Panel Antenna 6'x1'x4.5" w/mount pipe	100
PIROD 12' T-Frame	120	Panel Antenna 6'x1'x4.5" w/mount pipe	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	Panel Antenna 6'x1'x4.5" w/mount pipe	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	9442 RRH 700	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	9442 RRH 700	100
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	120	9442 RRH 700	100
LNX-6515DS-A1M w/ Mount Pipe	120	SO 101-1	100
LNX-6515DS-A1M w/ Mount Pipe	120	Andrew VHLP2-11	100
LNX-6515DS-A1M w/ Mount Pipe	120	Andrew VHLP1	100
RRUS 11	120	Andrew VHLP1	95
RRUS 11	120	Andrew VHLP1	95
RRUS 11	120		

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

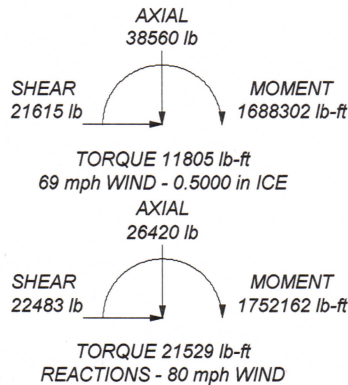
**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 59.6%

**MAX. CORNER REACTIONS AT BASE:**

DOWN: 135258 lb  
SHEAR: 14554 lb

UPLIFT: -110908 lb  
SHEAR: 12270 lb



	<b>Hudson Design Group LLC</b> 1600 Osgood Street Bldg. 20N Suite 3090 North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586		Job: <b>CT11737C EAST HARTFORD, CT</b> Project: <b>140 ft Self Supporting Tower</b>
	Client: T-Mobile Code: TIA/EIA-222-F Path:	Drawn by: kw Date: 06/10/16	App'd: NTS Scale: NTS Dwg No. E-1



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## Tower Input Data

The main tower is a 3x free standing tower with an overall height of 140.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 8.00 ft at the top and 16.00 ft at the base.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 80 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 69 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 50 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Tower Section Geometry

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Assembly Database</i>	<i>Description</i>	<i>Section Width</i>	<i>Number of Sections</i>	<i>Section Length</i>
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	140.00-120.00			8.00	1	20.00
T2	120.00-100.00			8.00	1	20.00
T3	100.00-80.00			8.00	1	20.00
T4	80.00-60.00			8.00	1	20.00
T5	60.00-40.00			10.00	1	20.00
T6	40.00-20.00			12.00	1	20.00
T7	20.00-0.00			14.00	1	20.00

## Tower Section Geometry (cont'd)

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	140.00-120.00	5.00	X Brace	No	No	0.0000	0.0000
T2	120.00-100.00	5.00	X Brace	No	No	0.0000	0.0000
T3	100.00-80.00	5.00	X Brace	No	No	0.0000	0.0000
T4	80.00-60.00	5.00	X Brace	No	No	0.0000	0.0000
T5	60.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T6	40.00-20.00	5.00	X Brace	No	No	0.0000	0.0000
T7	20.00-0.00	5.00	X Brace	No	No	0.0000	0.0000





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### Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 140.00-120.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/8	A36 (36 ksi)
T2 120.00-100.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T3 100.00-80.00	Solid Round	2 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T4 80.00-60.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T5 60.00-40.00	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T6 40.00-20.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 20.00-0.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 140.00-120.00	Equal Angle	L3x3x3/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 140.00-120.00	Equal Angle		A36 (36 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T2 120.00-100.00	Equal Angle		A36 (36 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T3 100.00-80.00	Equal Angle		A36 (36 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T4 80.00-60.00	Equal Angle		A36 (36 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T5 60.00-40.00	Equal Angle		A36 (36 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T6 40.00-20.00	Equal Angle		A36 (36 ksi)	Solid Round	9/16	A572-50 (50 ksi)
T7 20.00-0.00	Equal Angle		A36 (36 ksi)	Solid Round	9/16	A572-50 (50 ksi)

**Feed Line/Linear Appurtenances - Entered As Round Or Flat**



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<b>Client</b>	T-Mobile	<b>Designed by</b>	kw

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Feedline Ladder (Af)	C	Yes	Af (CfAe)	120.00 - 6.00	0.0000	0.45	1	1	0.0000	3.0000	12.0000	8.40
*****												
LDF7-50A (1-5/8 FOAM) (T-Mobile - existing)	C	Yes	Ar (CfAe)	120.00 - 6.00	-2.0000	0.44	6	3	0.0000	1.9800		0.82
1 5/8 Fiber Cable	C	Yes	Ar (CfAe)	120.00 - 6.00	-3.0000	0.46	1	1	1.9800	1.9800		1.04
*****												
1 5/8 Fiber Cable (T-Mobile - proposed)	C	Yes	Ar (CfAe)	120.00 - 6.00	-3.0000	0.47	1	1	0.0000	1.9800		1.04
*****												
3" conduit	C	Yes	Ar (CfAe)	100.00 - 6.00	-4.0000	0.47	3	3	0.0000	3.5000		3.00
VXL5-50 (7/8 FOAM)	C	Yes	Ar (CfAe)	140.00 - 6.00	-4.0000	0.44	7	4	0.0000	1.0800		0.29
*****												

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight lb			
Lightning Rod 2"x15'	B	From Leg	0.50	0.0000	138.00	No Ice	3.00	3.00	80.00		
			0.00						1/2" Ice	4.53	103.14
			7.50								
3' Side Mount Standoff	A	From Leg	1.50	0.0000	138.00	No Ice	1.50	1.50	45.00		
			0.00						1/2" Ice	2.20	70.00
			0.00								
3' Side Mount Standoff	B	From Leg	1.50	0.0000	138.00	No Ice	1.50	1.50	45.00		
			0.00						1/2" Ice	2.20	70.00
			0.00								
3' Side Mount Standoff	C	From Leg	1.50	0.0000	138.00	No Ice	1.50	1.50	45.00		
			0.00						1/2" Ice	2.20	70.00
			0.00								
Omni 2"x7'	A	From Leg	3.00	0.0000	138.00	No Ice	1.40	1.40	30.00		
			0.00						1/2" Ice	2.13	40.92
			5.00								
Omni 2"x7'	B	From Leg	3.00	0.0000	138.00	No Ice	1.40	1.40	30.00		
			0.00						1/2" Ice	2.13	40.92
			5.00								
Omni 2"x7'	C	From Leg	3.00	0.0000	138.00	No Ice	1.40	1.40	30.00		
			0.00						1/2" Ice	2.13	40.92
			5.00								
3' Side Mount Standoff	A	From Leg	1.50	0.0000	135.00	No Ice	1.50	1.50	45.00		
			0.00						1/2" Ice	2.20	70.00
			0.00								
*****											
Omni 3"x20'	A	From Leg	3.00	0.0000	130.00	No Ice	6.00	6.00	50.00		
			0.00						1/2" Ice	8.03	93.17
			0.00								



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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight lb	
Omni 3"x20'	B	From Leg	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 8.03	6.00 8.03	50.00 93.17	
Omni 3"x20'	C	From Leg	3.00 0.00 0.00	0.0000	130.00	No Ice 1/2" Ice 8.03	6.00 8.03	50.00 93.17	
*****									
PiROD 12' T-Frame (T-Mobile - Existing)	A	From Leg	1.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 17.60	12.20 17.60	360.00 490.00	
PiROD 12' T-Frame	B	From Leg	1.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 17.60	12.20 17.60	360.00 490.00	
PiROD 12' T-Frame	C	From Leg	1.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 17.60	12.20 17.60	360.00 490.00	
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 7.41	6.85 6.70	104.90 162.69	
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 7.41	6.85 6.70	104.90 162.69	
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 7.41	6.85 6.70	104.90 162.69	
LNx-6515DS-A1M w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 12.40	11.68 11.37	83.27 172.93	
LNx-6515DS-A1M w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 12.40	11.68 11.37	83.27 172.93	
LNx-6515DS-A1M w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 12.40	11.68 11.37	83.27 172.93	
RRUS 11	A	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 3.49	3.25 1.55	50.70 71.50	
RRUS 11	B	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 3.49	3.25 1.55	50.70 71.50	
RRUS 11	C	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 3.49	3.25 1.55	50.70 71.50	
Gen. TMA	A	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 0.80	0.68 0.56	13.20 18.38	
Gen. TMA	B	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 0.80	0.68 0.56	13.20 18.38	
Gen. TMA	C	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 0.80	0.68 0.56	13.20 18.38	
*****									
AIR 32 B66Aa/B2a w/mount pipe (T-Mobile - Proposed)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 7.97	7.40 7.14	153.90 215.61	
AIR 32 B66Aa/B2a w/mount	B	From Leg	3.00	0.0000	120.00	No Ice	7.40	153.90	



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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight lb
pipe			0.00		1/2" Ice	7.97	7.14	215.61
AIR 32 B66Aa/B2a w/mount pipe	C	From Leg	3.00	0.0000	120.00	No Ice 1/2" Ice	7.40 7.14	153.90 215.61
*****			0.00					
SO 101-1	A	From Leg	2.00	0.0000	100.00	No Ice 1/2" Ice	3.75 4.45	84.00 111.00
SO 101-1	B	From Leg	2.00	0.0000	100.00	No Ice 1/2" Ice	3.75 4.45	84.00 111.00
SO 101-1	C	From Leg	2.00	0.0000	100.00	No Ice 1/2" Ice	3.75 4.45	84.00 111.00
Panel Antenna 6'x1'x4.5" w/mount pipe	A	From Leg	4.00	0.0000	100.00	No Ice 1/2" Ice	8.64 9.29	65.55 127.19
Panel Antenna 6'x1'x4.5" w/mount pipe	B	From Leg	4.00	0.0000	100.00	No Ice 1/2" Ice	8.64 9.29	65.55 127.19
Panel Antenna 6'x1'x4.5" w/mount pipe	C	From Leg	4.00	0.0000	100.00	No Ice 1/2" Ice	8.64 9.29	65.55 127.19
9442 RRH 700	A	From Leg	4.00	0.0000	100.00	No Ice 1/2" Ice	3.53 3.80	44.00 64.97
9442 RRH 700	B	From Leg	4.00	0.0000	100.00	No Ice 1/2" Ice	3.53 3.80	44.00 64.97
9442 RRH 700	C	From Leg	4.00	0.0000	100.00	No Ice 1/2" Ice	3.53 3.80	44.00 64.97
*****			2.00					

## Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft <sup>2</sup>	Weight lb	
Andrew VHLP1	A	Paraboloid w/Radome	From Leg	2.00	0.0000		135.00	1.25	No Ice 1/2" Ice	1.23 1.40	14.00 27.00
Andrew VHLP2-11	A	Paraboloid w/Radome	From Leg	4.00	0.0000		100.00	2.00	No Ice 1/2" Ice	3.14 3.41	31.00 41.00
Andrew VHLP1	A	Paraboloid w/Radome	From Leg	2.00	0.0000		95.00	1.25	No Ice 1/2" Ice	1.23 1.40	14.00 27.00
Andrew VHLP1	B	Paraboloid w/Radome	From Leg	2.00	0.0000		95.00	1.25	No Ice 1/2" Ice	1.23 1.40	14.00 27.00



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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft <sup>2</sup>	Weight lb
Andrew VHLP1	C	Paraboloid w/Radome	From Leg	0.00 2.00 0.00 0.00	0.0000		100.00	1.25	No Ice 1/2" Ice	14.00 27.00

## Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

## Maximum Reactions



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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	10	135258.16	12597.22	-7288.61
	Max. H <sub>x</sub>	10	135258.16	12597.22	-7288.61
	Max. H <sub>z</sub>	17	-95888.00	-19784.31	11426.89
	Min. Vert	4	-108795.88	-10544.19	6099.01
	Min. H <sub>x</sub>	17	-95888.00	-19784.31	11426.89
Leg B	Min. H <sub>z</sub>	10	135258.16	12597.22	-7288.61
	Max. Vert	6	133581.16	-12934.68	-6635.18
	Max. H <sub>x</sub>	25	-98964.08	20004.91	11175.08
	Max. H <sub>z</sub>	25	-98964.08	20004.91	11175.08
	Min. Vert	12	-110466.07	10901.67	5549.75
Leg A	Min. H <sub>x</sub>	6	133581.16	-12934.68	-6635.18
	Min. H <sub>z</sub>	6	133581.16	-12934.68	-6635.18
	Max. Vert	2	133624.40	-734.61	14523.06
	Max. H <sub>x</sub>	10	-54508.76	1052.01	-6132.75
	Max. H <sub>z</sub>	2	133624.40	-734.61	14523.06
	Min. Vert	8	-110908.33	654.45	-12252.92
	Min. H <sub>x</sub>	4	67581.95	-969.02	7243.69
Min. H <sub>z</sub>	21	-99310.78	328.40	-22942.48	

## Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Dead Only	26420.41	0.00	0.00	7746.24	13382.81	0.03
Dead+Wind 0 deg - No Ice	26420.41	0.05	-22482.80	-1729523.31	13423.71	-20046.64
Dead+Wind 30 deg - No Ice	26420.41	10722.30	-18584.88	-1438970.08	-821061.26	-11166.87
Dead+Wind 60 deg - No Ice	26420.41	18265.15	-10541.18	-814412.35	-1411441.66	-268.27
Dead+Wind 90 deg - No Ice	26420.41	21435.44	19.25	9847.70	-1654440.30	10643.10
Dead+Wind 120 deg - No Ice	26420.41	19459.37	11249.64	877332.70	-1489861.49	19666.24
Dead+Wind 150 deg - No Ice	26420.41	10744.90	18608.41	1457110.61	-823430.66	21435.74
Dead+Wind 180 deg - No Ice	26420.41	0.01	21143.51	1658821.54	13429.45	18483.21
Dead+Wind 210 deg - No Ice	26420.41	-10744.90	18608.51	1457125.63	850289.97	11259.68
Dead+Wind 240 deg - No Ice	26420.41	-19459.37	11249.70	877326.19	1516697.14	380.48
Dead+Wind 270 deg - No Ice	26420.41	-21435.31	19.28	9850.28	1681212.10	-10642.55
Dead+Wind 300 deg - No Ice	26420.41	-18264.95	-10541.09	-814353.54	1438198.74	-18214.76
Dead+Wind 330 deg - No Ice	26420.41	-10722.13	-18584.73	-1438888.03	847861.87	-21528.87
Dead+Ice+Temp	38559.55	0.00	-0.00	14030.09	24593.45	-0.00
Dead+Wind 0 deg+Ice+Temp	38559.55	0.06	-21615.27	-1646376.99	24653.32	-11344.29
Dead+Wind 30 deg+Ice+Temp	38559.55	10105.47	-17514.39	-1344299.43	-758931.16	-6134.17
Dead+Wind 60 deg+Ice+Temp	38559.55	17092.31	-9864.78	-753219.55	-1304987.37	-111.17
Dead+Wind 90 deg+Ice+Temp	38559.55	20203.55	16.01	15797.01	-1541614.30	5893.86
Dead+Wind 120 deg+Ice+Temp	38559.55	18710.04	10814.43	845044.13	-1412289.09	11142.84
Dead+Wind 150 deg+Ice+Temp	38559.55	10124.34	17533.72	1374578.06	-760915.74	11728.31
Dead+Wind 180 deg+Ice+Temp	38559.55	0.02	19780.07	1554189.48	24656.76	10028.70
Dead+Wind 210 deg+Ice+Temp	38559.55	-10124.32	17533.81	1374599.34	810235.55	6210.74
Dead+Wind 240 deg+Ice+Temp	38559.55	-18710.03	10814.49	845044.48	1461596.10	201.51
Dead+Wind 270 deg+Ice+Temp	38559.55	-20203.44	16.03	15798.39	1590871.86	-5893.38
Dead+Wind 300 deg+Ice+Temp	38559.55	-17092.14	-9864.70	-753177.94	1354228.66	-9917.27
Dead+Wind 330 deg+Ice+Temp	38559.55	-10105.31	-17514.28	-1344235.67	808200.37	-11805.00
Dead+Wind 0 deg - Service	26420.41	0.02	-8782.34	-670865.23	13410.76	-7831.28
Dead+Wind 30 deg - Service	26420.41	4188.40	-7259.72	-557366.25	-312556.62	-4363.13
Dead+Wind 60 deg - Service	26420.41	7134.82	-4117.65	-313400.71	-543173.96	-104.80
Dead+Wind 90 deg - Service	26420.41	8373.22	7.52	8574.75	-638093.13	4158.55
Dead+Wind 120 deg - Service	26420.41	7601.32	4394.39	347433.90	-573807.46	7682.70
Dead+Wind 150 deg - Service	26420.41	4197.23	7268.91	573912.70	-313485.29	8372.82



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<b>Job</b>	CT11737C EAST HARTFORD, CT	<b>Page</b>	8 of 9
<b>Project</b>	140 ft Self Supporting Tower	<b>Date</b>	08:41:27 06/10/16
<b>Client</b>	T-Mobile	<b>Designed by</b>	kw

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Dead+Wind 180 deg - Service	26420.41	0.01	8259.19	652711.68	13414.65	7219.95
Dead+Wind 210 deg - Service	26420.41	-4197.23	7268.95	573925.21	340316.93	4398.62
Dead+Wind 240 deg - Service	26420.41	-7601.32	4394.41	347437.91	600635.74	148.63
Dead+Wind 270 deg - Service	26420.41	-8373.17	7.53	8575.49	664900.58	-4157.57
Dead+Wind 300 deg - Service	26420.41	-7134.75	-4117.61	-313381.98	569970.90	-7115.09
Dead+Wind 330 deg - Service	26420.41	-4188.33	-7259.66	-557339.40	339364.83	-8409.19

### Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	-0.00	-26420.41	0.00	-0.00	26420.41	-0.00	0.000%
2	0.05	-26420.41	-22482.80	-0.05	26420.41	22482.80	0.000%
3	10722.30	-26420.41	-18584.88	-10722.30	26420.41	18584.88	0.000%
4	18265.15	-26420.41	-10541.18	-18265.15	26420.41	10541.18	0.000%
5	21435.44	-26420.41	19.25	-21435.44	26420.41	-19.25	0.000%
6	19459.37	-26420.41	11249.64	-19459.37	26420.41	-11249.64	0.000%
7	10744.90	-26420.41	18608.41	-10744.90	26420.41	-18608.41	0.000%
8	0.01	-26420.41	21143.51	-0.01	26420.41	-21143.51	0.000%
9	-10744.90	-26420.41	18608.51	10744.90	26420.41	-18608.51	0.000%
10	-19459.37	-26420.41	11249.70	19459.37	26420.41	-11249.70	0.000%
11	-21435.31	-26420.41	19.28	21435.31	26420.41	-19.28	0.000%
12	-18264.95	-26420.41	-10541.09	18264.95	26420.41	10541.09	0.000%
13	-10722.13	-26420.41	-18584.73	10722.13	26420.41	18584.73	0.000%
14	-0.00	-38559.56	0.00	-0.00	38559.55	0.00	0.000%
15	0.04	-38559.56	-21615.32	-0.06	38559.55	21615.27	0.000%
16	10105.48	-38559.56	-17514.44	-10105.47	38559.55	17514.39	0.000%
17	17092.35	-38559.56	-9864.80	-17092.31	38559.55	9864.78	0.000%
18	20203.60	-38559.56	16.02	-20203.55	38559.55	-16.01	0.000%
19	18710.08	-38559.56	10814.47	-18710.04	38559.55	-10814.43	0.000%
20	10124.35	-38559.56	17533.76	-10124.34	38559.55	-17533.72	0.000%
21	0.01	-38559.56	19780.11	-0.02	38559.55	-19780.07	0.000%
22	-10124.35	-38559.56	17533.84	10124.32	38559.55	-17533.81	0.000%
23	-18710.07	-38559.56	10814.51	18710.03	38559.55	-10814.49	0.000%
24	-20203.49	-38559.56	16.04	20203.44	38559.55	-16.03	0.000%
25	-17092.18	-38559.56	-9864.72	17092.14	38559.55	9864.70	0.000%
26	-10105.34	-38559.56	-17514.31	10105.31	38559.55	17514.28	0.000%
27	0.02	-26420.41	-8782.34	-0.02	26420.41	8782.34	0.000%
28	4188.40	-26420.41	-7259.72	-4188.40	26420.41	7259.72	0.000%
29	7134.82	-26420.41	-4117.65	-7134.82	26420.41	4117.65	0.000%
30	8373.22	-26420.41	7.52	-8373.22	26420.41	-7.52	0.000%
31	7601.32	-26420.41	4394.39	-7601.32	26420.41	-4394.39	0.000%
32	4197.23	-26420.41	7268.91	-4197.23	26420.41	-7268.91	0.000%
33	0.01	-26420.41	8259.19	-0.01	26420.41	-8259.19	0.000%
34	-4197.23	-26420.41	7268.95	4197.23	26420.41	-7268.95	0.000%
35	-7601.32	-26420.41	4394.41	7601.32	26420.41	-4394.41	0.000%
36	-8373.17	-26420.41	7.53	8373.17	26420.41	-7.53	0.000%
37	-7134.75	-26420.41	-4117.61	7134.75	26420.41	4117.61	0.000%
38	-4188.33	-26420.41	-7259.66	4188.33	26420.41	7259.66	0.000%

### Maximum Tower Deflections - Service Wind





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<b>Job</b>	CT11737C EAST HARTFORD, CT	<b>Page</b>	9 of 9
<b>Project</b>	140 ft Self Supporting Tower	<b>Date</b>	08:41:27 06/10/16
<b>Client</b>	T-Mobile	<b>Designed by</b>	kw

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	140 - 120	2.555	35	0.1368	0.0290
T2	120 - 100	1.976	35	0.1356	0.0291
T3	100 - 80	1.402	35	0.1240	0.0268
T4	80 - 60	0.903	35	0.1017	0.0229
T5	60 - 40	0.517	35	0.0746	0.0171
T6	40 - 20	0.238	35	0.0504	0.0108
T7	20 - 0	0.069	35	0.0219	0.0054

### Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 2"x15'	35	2.497	0.1368	0.0290	Inf
135.00	Andrew VHLP1	35	2.411	0.1370	0.0292	Inf
130.00	Omni 3"x20'	35	2.266	0.1370	0.0293	604567
120.00	PiROD 12' T-Frame	35	1.976	0.1356	0.0291	431447
100.00	Andrew VHLP2-11	35	1.402	0.1240	0.0268	57395
95.00	Andrew VHLP1	35	1.267	0.1192	0.0259	50101

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P <sub>allow</sub> lb	% Capacity	Pass Fail	
T1	140 - 120	Leg	2 1/4	3	-4191.96	69560.47	6.0	Pass	
T2	120 - 100	Leg	2 1/4	31	-23742.00	69560.47	34.1	Pass	
T3	100 - 80	Leg	2 3/4	58	-53794.30	138703.98	38.8	Pass	
T4	80 - 60	Leg	3	85	-76567.80	178891.26	42.8	Pass	
T5	60 - 40	Leg	3 1/4	112	-95731.50	223278.82	42.9	Pass	
T6	40 - 20	Leg	Pirod 105218	139	-113913.00	258238.08	44.1	Pass	
T7	20 - 0	Leg	Pirod 105219	166	-128054.00	343622.06	59.6	Pass	
T1	140 - 120	Diagonal	L1 3/4x1 3/4x1/8	10	-1006.95	3305.69	30.5	Pass	
T2	120 - 100	Diagonal	L1 3/4x1 3/4x1/4	34	-3088.92	6167.80	50.1	Pass	
T3	100 - 80	Diagonal	L2 1/2x2 1/2x5/16	66	-4779.39	21565.67	22.2	Pass	
T4	80 - 60	Diagonal	L2 1/2x2 1/2x5/16	92	-3221.32	16075.45	20.0	Pass	
T5	60 - 40	Diagonal	L2 1/2x2 1/2x5/16	119	-3484.40	11878.99	29.3	Pass	
T6	40 - 20	Diagonal	L3x3x5/16	146	-4095.20	17842.74	23.0	Pass	
T7	20 - 0	Diagonal	L3x3x5/16	179	-6188.89	14656.47	42.2	Pass	
T1	140 - 120	Top Girt	L3x3x3/8	5	-157.79	20137.10	0.8	Pass	
							Summary		
							Leg (T7)	59.6	Pass
							Diagonal (T2)	50.1	Pass
							Top Girt (T1)	0.8	Pass
							<b>RATING =</b>	<b>59.6</b>	<b>Pass</b>

# SITE NUMBER: CT11737C

100 SUNSET RIDGE ROAD  
EAST HARTFORD, CT 06118  
HARTFORD COUNTY

## SITE NAME: CT737/E HARTFORD TOWN SST

**RF DESIGN GUIDELINE: 792DB**

T-MOBILE TECHNICIAN SITE SAFETY NOTES	
LOCATION	SPECIAL RESTRICTIONS
SECTOR A: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
SECTOR B: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
SECTOR C: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

### T-MOBILE NORTHEAST LLC

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OFFICE: (860) 648-1116

### Transcend Wireless

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1600 OSGOOD STREET  
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N. ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586



CHECKED BY: DR

APPROVED BY: DPH

#### SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	05/10/16	ISSUED FOR CONSTRUCTION	VP
1	04/29/16	ISSUED FOR PERMITTING	VP
0	04/27/16	ISSUED FOR REVIEW	VP

SITE NUMBER:  
CT11737C  
SITE NAME:  
CT737/E HARTFORD  
TOWN SST  
SITE ADDRESS:  
100 SUNSET RIDGE ROAD  
EAST HARTFORD, CT 06118  
HARTFORD COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

#### GENERAL NOTES

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

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

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

#### SPECIAL STRUCTURAL NOTES

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

STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS COMPLETED BY HUDSON DESIGN ON BEHALF OF T-MOBILE ARE INCLUSIVE OF THE ENTIRE ANTENNA SUPPORT STRUCTURE (GLOBAL STRUCTURAL STABILITY ANALYSIS BY OTHERS), EXISTING TOWER PLATFORM, EXISTING ANTENNA MOUNTS AND ALL OTHER ASPECTS OF THE STRUCTURE THAT WILL SUPPORT THE T-MOBILE MODERNIZATION EQUIPMENT DEPLOYMENT AS DEPICTED HEREIN.

HUDSON DESIGN ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES



#### PROJECT SUMMARY

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

ZONING JURISDICTION: BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).

SITE ADDRESS: 100 SUNSET RIDGE ROAD  
EAST HARTFORD, CT 06118

LATITUDE: 41° 46' 18.48" N

LONGITUDE: 72° 35' 25.08" W

JURISDICTION: NATIONAL, STATE & LOCAL CODES OR ORDINANCES

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY

#### APPROVALS

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

#### DRIVING DIRECTIONS:

HEAD NORTHEAST ON GRIFFIN RD S AND TURN RIGHT ONTO DAY HILL RD. USE THE RIGHT LANE TO MERGE ONTO I-91 S. CONTINUE ON I-91 S FOR 3.6 MILES THEN TAKE EXIT 35 FOR I-291 E. CONTINUE ON I-291 E FOR 5.6 MILES THEN TAKE THE I-384 E EXIT. KEEP RIGHT TO CONTINUE ON EXIT 1, FOLLOW SIGNS FOR SILVER LANE/SPENCER ST. TURN RIGHT ONTO STATE HIGHWAY 502/SILVER LANE. TURN RIGHT ONTO RIDGEWOOD RD. SLIGHT RIGHT ONTO SUNSET RIDGE RD. DESTINATION WILL BE ON THE RIGHT.

ARRIVE AT 100 SUNSET RIDGE ROAD EAST HARTFORD, CT 06118.

#### DRAWING INDEX

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A-3	DETAILS	2
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UNDERGROUND SERVICE ALERT



**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 – TRANSCEND WIRELESS  
 SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)  
 OWNER – T-MOBILE
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND 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 T-MOBILE SITES."
  17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
  18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
  19. SINCE THE CELL SITE IS ACTIVE, 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		

**T-MOBILE NORTHEAST LLC**

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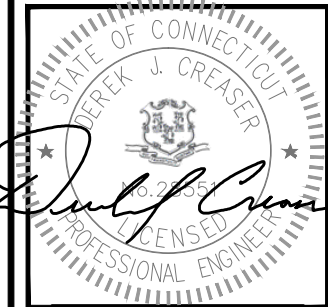
**Transcend Wireless**

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 10 INDUSTRIAL AVE  
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CHECKED BY: DR

APPROVED BY: DPH

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 SITE NAME:  
 CT737/E HARTFORD TOWN SST  
 SITE ADDRESS:  
 100 SUNSET RIDGE ROAD  
 EAST HARTFORD, CT 06118  
 HARTFORD COUNTY

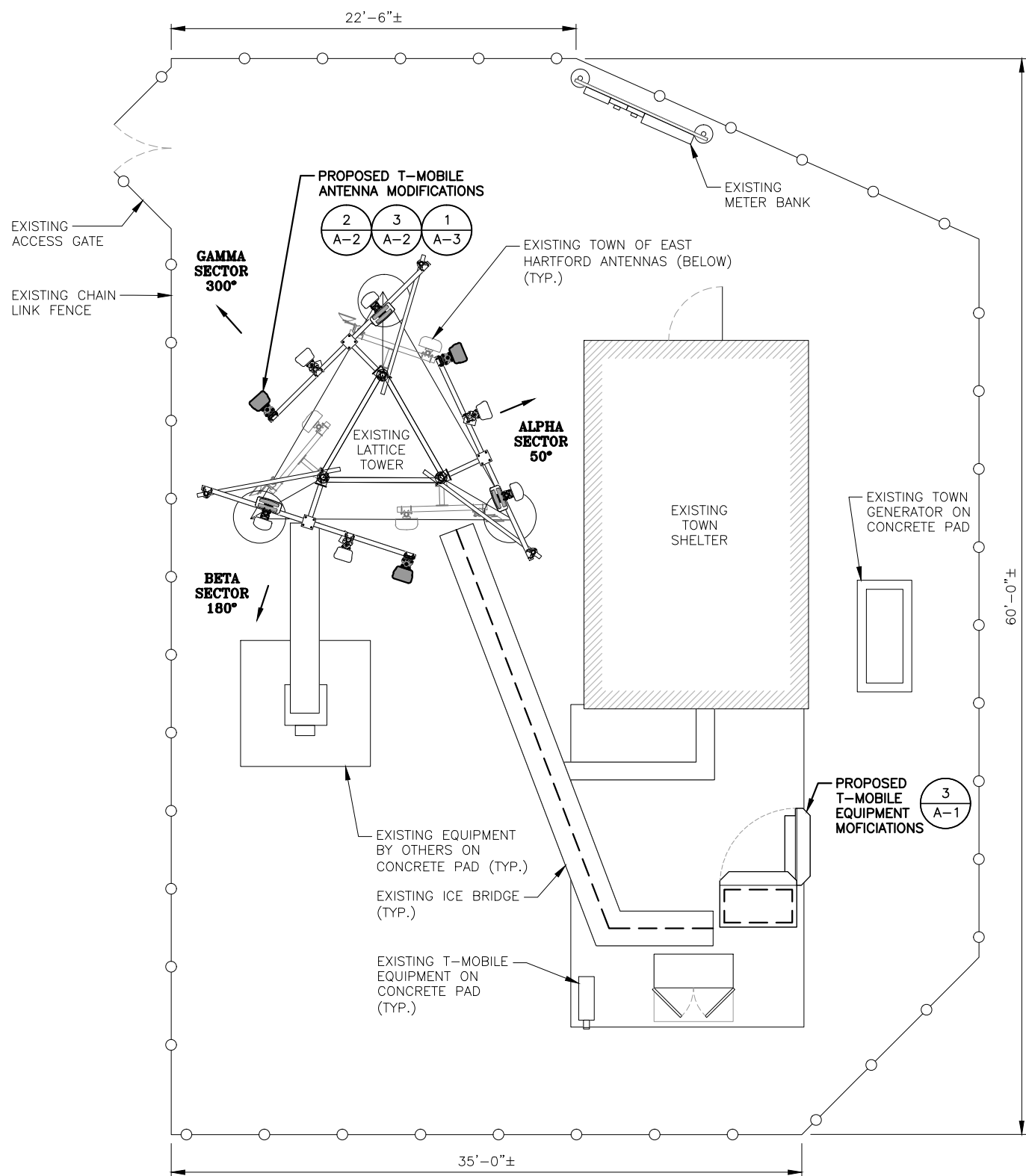
SHEET TITLE  
 GENERAL NOTES

SHEET NUMBER  
**GN-1**



**STRUCTURAL NOTES:**  
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY HDG, DATED: MAY 04, 2016 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

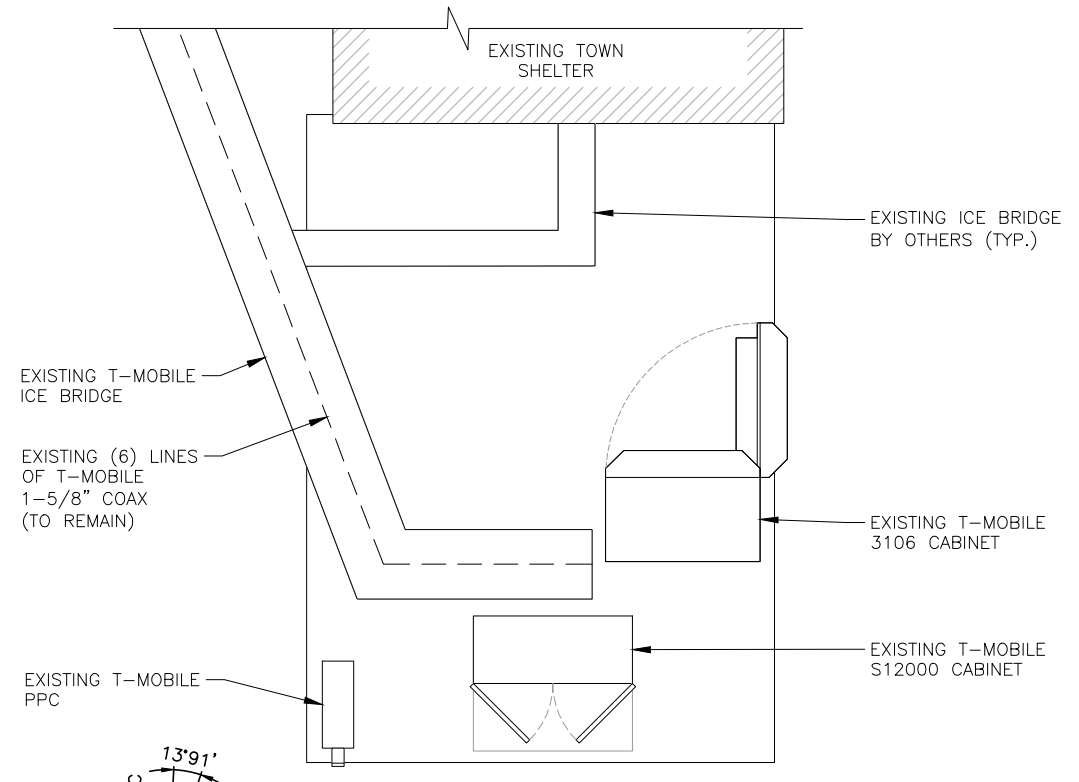
**NOTE:**  
 \*RF DATA BASED ON PRELIMINARY INFORMATION. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



**COMPOUND PLAN** 1 A-1  
 22x34 SCALE: 1/4"=1'-0"  
 11x17 SCALE: 1/8"=1'-0"

MAGNETIC NORTH 13°91' TRUE NORTH

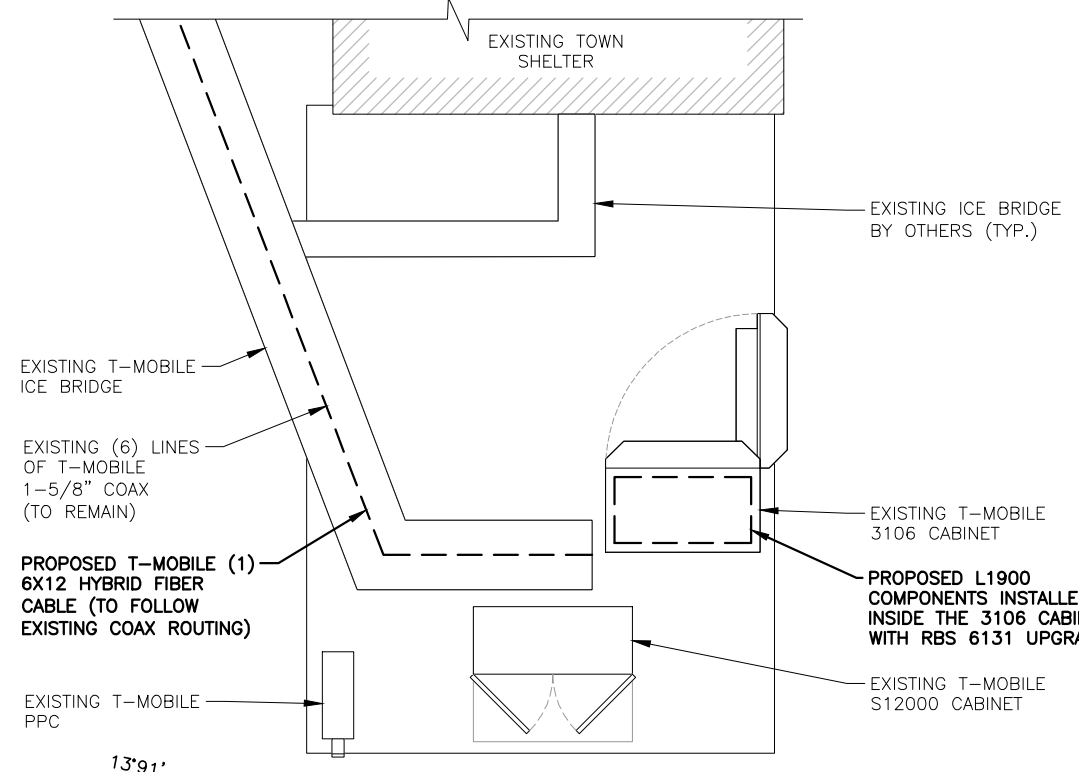
0 2'-0" 4'-0" 8'-0" 12'-0"



**EXISTING EQUIPMENT PLAN** 2 A-1  
 22x34 SCALE: 3/8"=1'-0"  
 11x17 SCALE: 3/16"=1'-0"

MAGNETIC NORTH 13°91' TRUE NORTH

0 1'-4" 2'-8" 5'-4" 8'-0"



**PROPOSED EQUIPMENT PLAN** 3 A-1  
 22x34 SCALE: 3/8"=1'-0"  
 11x17 SCALE: 3/16"=1'-0"

MAGNETIC NORTH 13°91' TRUE NORTH

0 1'-4" 2'-8" 5'-4" 8'-0"

**T-MOBILE NORTHEAST LLC**

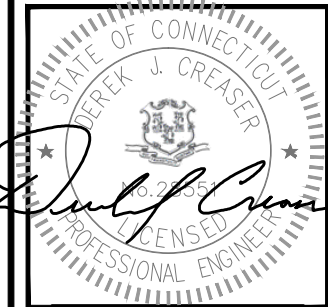
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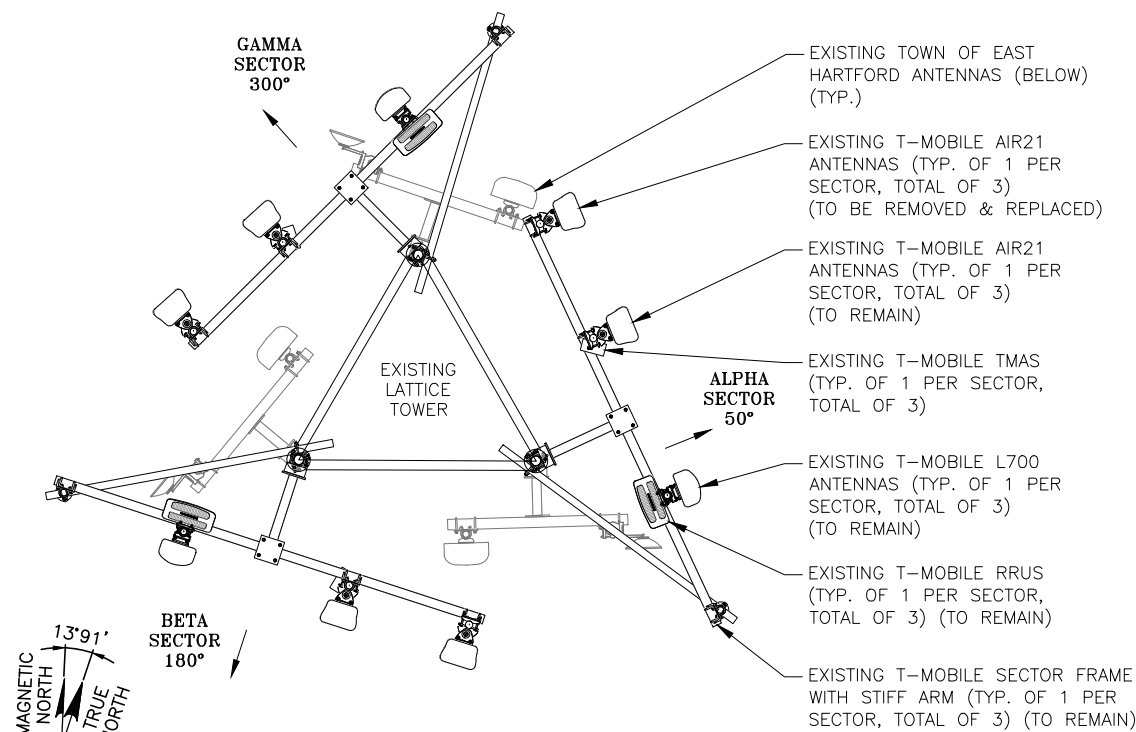
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 CT737/E HARTFORD TOWN SST  
 SITE ADDRESS:  
 100 SUNSET RIDGE ROAD  
 EAST HARTFORD, CT 06118  
 HARTFORD COUNTY

SHEET TITLE  
**COMPOUND & EQUIPMENT PLAN**

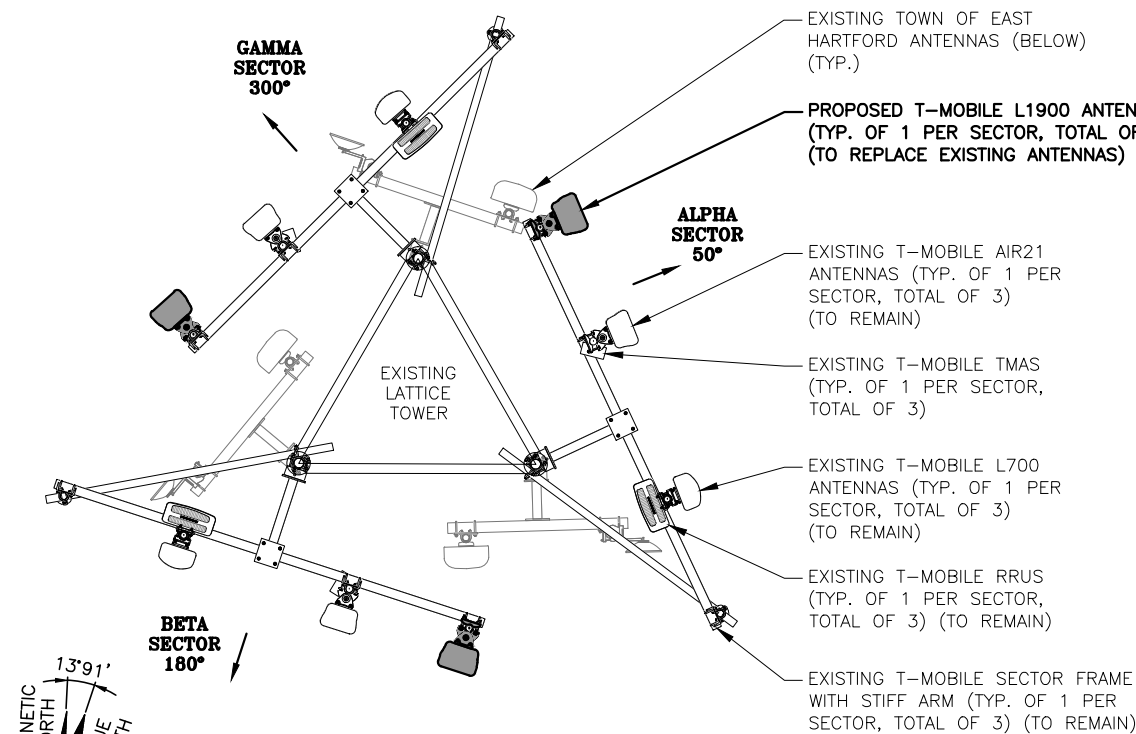
SHEET NUMBER  
**A-1**

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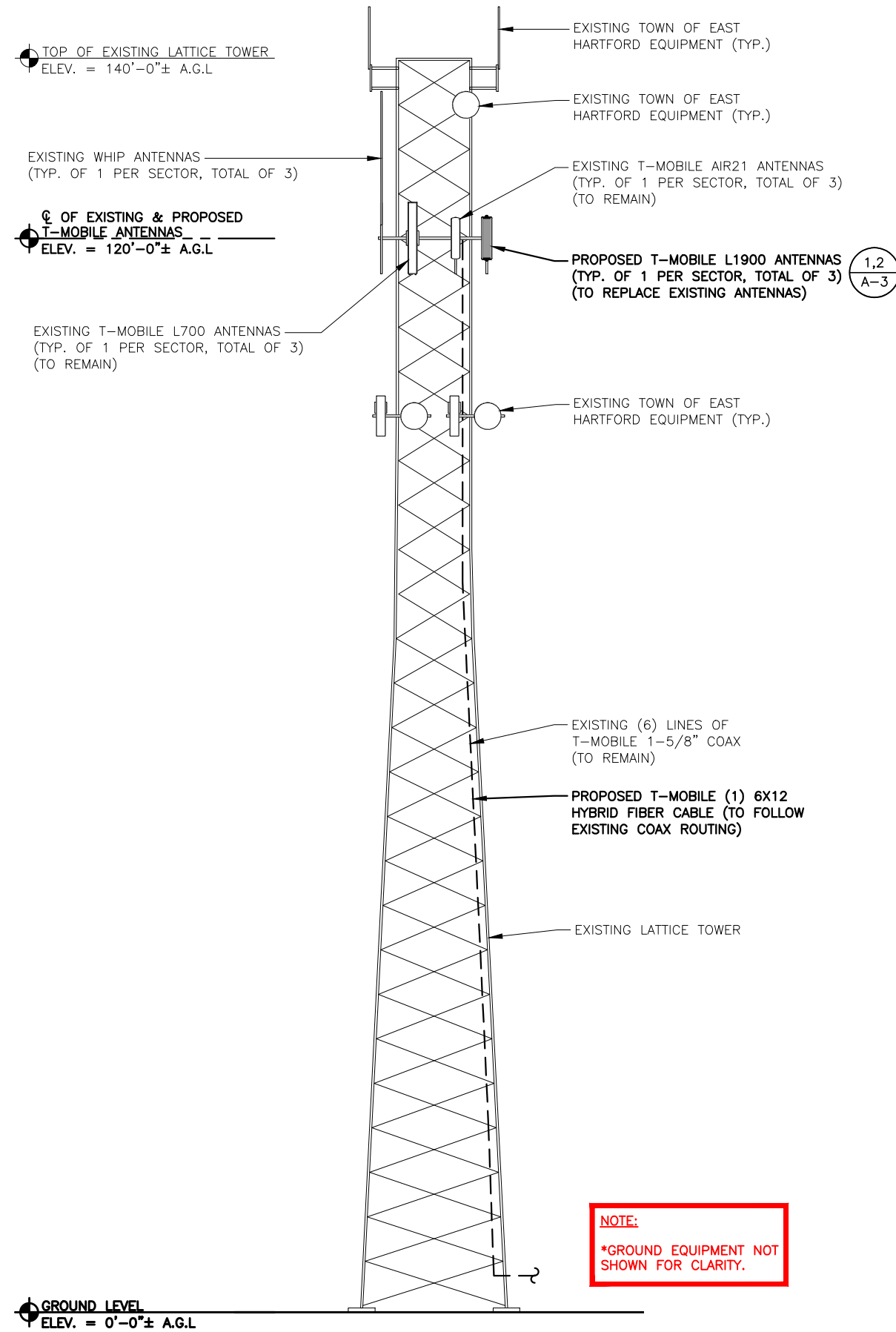
**NOTE:**  
 \*RF DATA BASED ON PRELIMINARY INFORMATION. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



**EXISTING ANTENNA PLAN** 1  
 SCALE: N.T.S. A-2



**PROPOSED ANTENNA PLAN** 2  
 SCALE: N.T.S. A-2



GROUND LEVEL  
 ELEV. = 0'-0"± A.G.L.

**TOWER ELEVATION** 3  
 22x34 SCALE: 1/8"=1'-0"  
 11x17 SCALE: 1/16"=1'-0" A-2

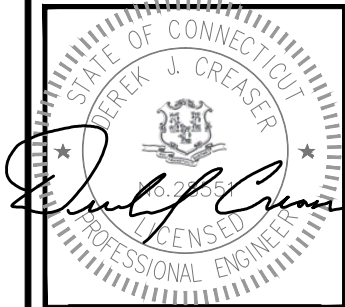


**NOTE:**  
 \*GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

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SHEET TITLE  
 ANTENNA LAYOUT & ELEVATION

SHEET NUMBER  
**A-2**

**STRUCTURAL NOTES:**  
 PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY HDG, DATED: MAY 04, 2016 TO DETERMINE IF THERE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.

**NOTE:**  
 \*RF DATA BASED ON PRELIMINARY INFORMATION. REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

**T-MOBILE  
 NORTHEAST LLC**

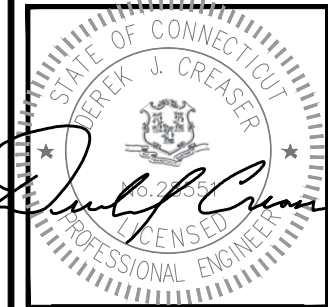
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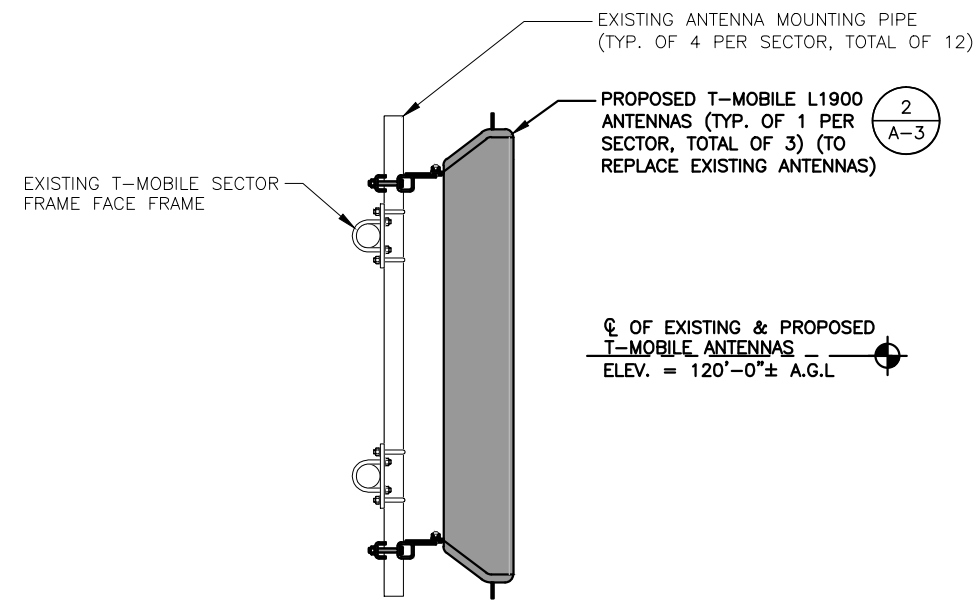
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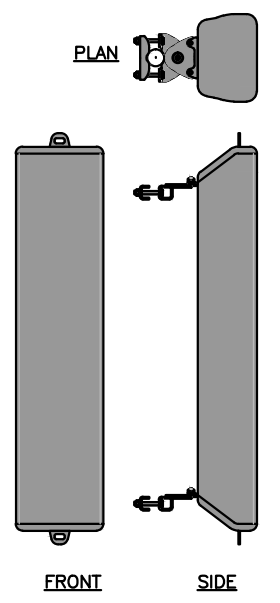
SHEET TITLE  
 DETAILS

SHEET NUMBER  
**A-3**

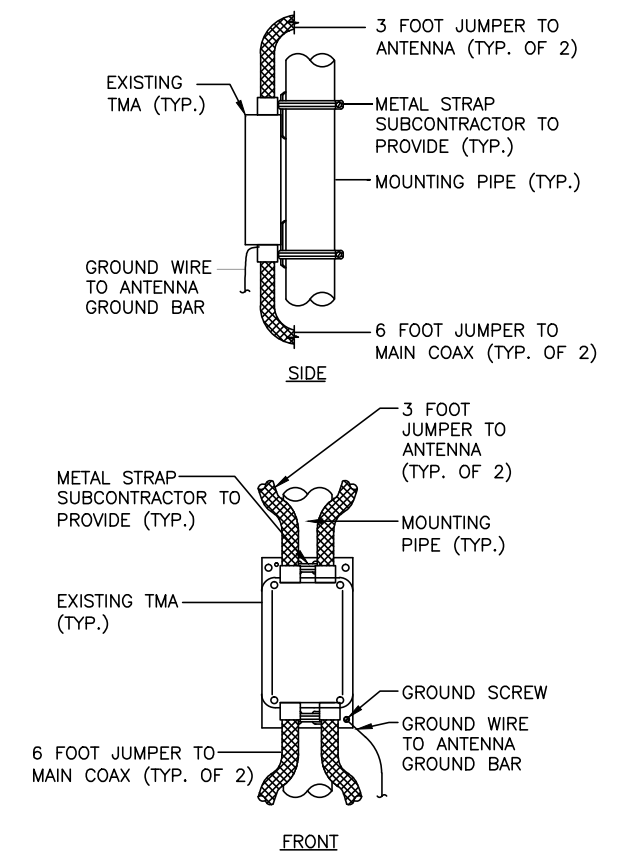
L1900 ANTENNA DIMENSIONS	
MODEL #	AIR 32 B66Aa/B2a
MANUF.	ERICSSON
WIDTH	12.9"
DEPTH	8.7"
HEIGHT	56.6"
WEIGHT	132.2 LBS



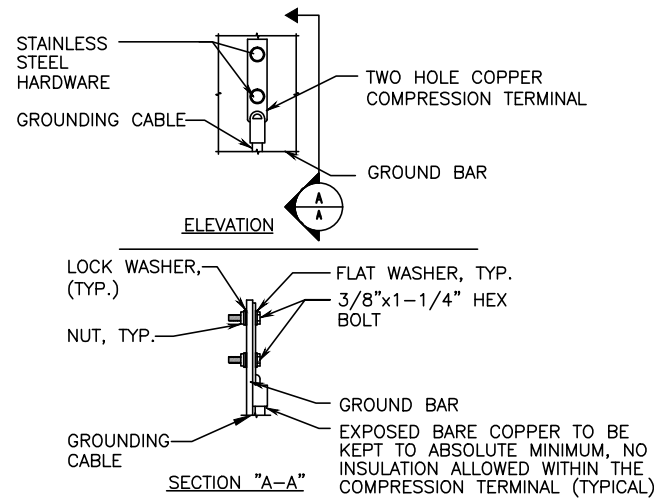
**PROPOSED L1900 ANTENNA MOUNT** 1/A-3  
 22x34 SCALE: 1"=1'-0"  
 11x17 SCALE: 1/2"=1'-0"  
 ELEV. = 120'-0"± A.G.L.



**L1900 ANTENNA DETAIL** 2/A-3  
 SCALE: N.T.S



**TMA MOUNTING DETAIL** 3/A-3  
 SCALE: N.T.S



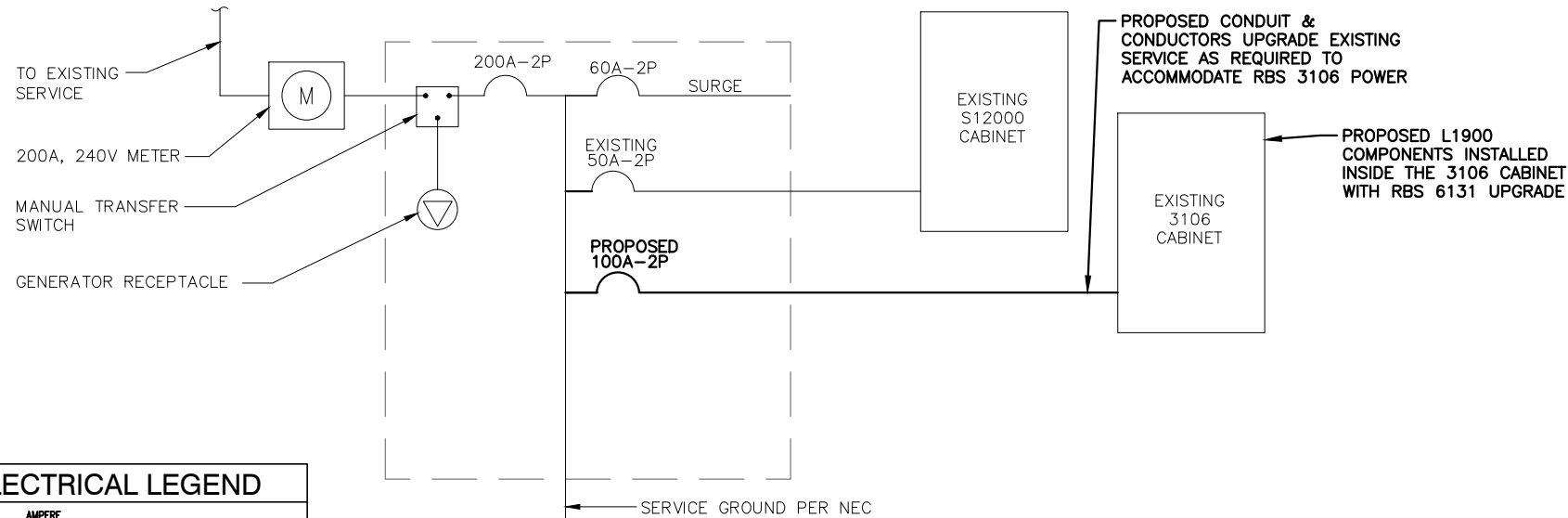
- NOTE:
- "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
  - OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
  - CADWELD DOWNLEADS FROM UPPER AGB/EGB, LOWER EGB, AND MGB.

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

1  
E-1

**NOTE:**

G.C. TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.



**ONE LINE POWER DIAGRAM**  
SCALE: N.T.S

4  
E-1

**ELECTRICAL & GROUNDING NOTES:**

**ELECTRICAL & GROUNDING NOTES**

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

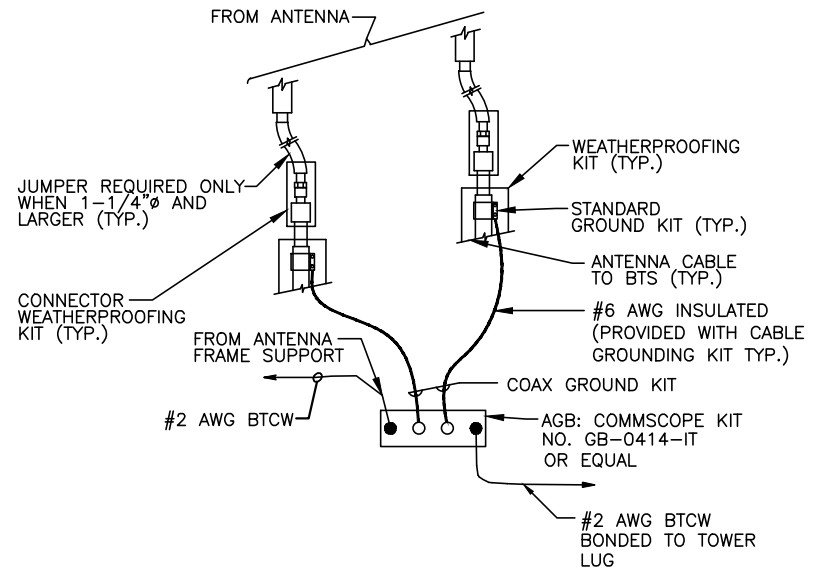
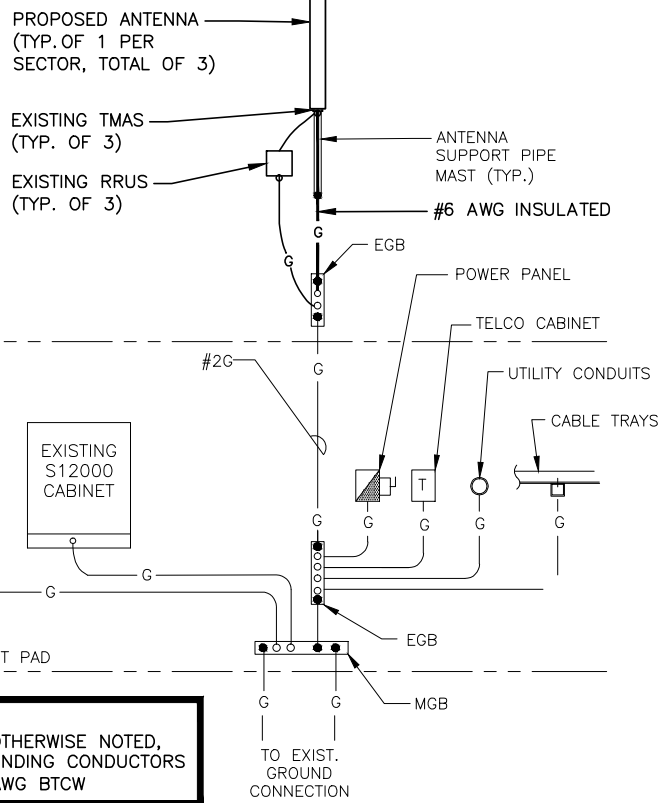
NOTE:  
UNLESS OTHERWISE NOTED,  
ALL GROUNDING CONDUCTORS  
ARE #2 AWG BTCW

**GROUNDING RISER DIAGRAM**  
SCALE: N.T.S

2  
E-1

**ELECTRICAL LEGEND**

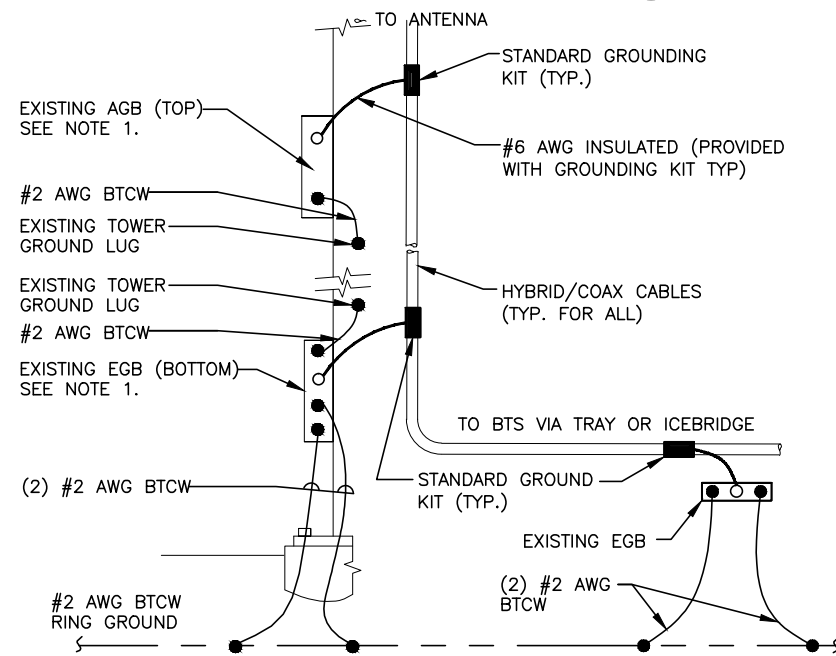
A	AMPERE		
V	VOLT		
KWH	KILOWATT - HOUR		
C	CONDUIT		
GRC	GALVANIZED RIGID CONDUIT		
BTCW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)		
G	GROUND		
MGB	MASTER GROUND BAR		
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR		
G	GROUND COPPER WIRE, SIZE AS NOTED		
—	EXPOSED WIRING		
—	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)		
⊕	5/8" ⌀ COPPER CLAD STAINLESS STEEL GROUND ROD		
⊕	EXOTHERMIC (CAD WELD) OR MECHANICAL CONNECTION		
⊕	MECHANICAL CONNECTION		
⊕	POWER PROTECTION CABINET		
⊕	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL		



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

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

3  
E-1



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

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

5  
E-1

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STATE OF CONNECTICUT  
BEREK J. CREASER  
18,295  
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: DR

APPROVED BY: DPH

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HARTFORD COUNTY

SHEET TITLE  
**GROUNDING DIAGRAM**

SHEET NUMBER  
**E-1**

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