Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

June 20, 2016

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

Notice of Exempt Modification
24 Rockdale Road, West Haven, CT 06516
Latitude- 41.29070100
Longitude- -72.96760600

Dear Ms. Bachman,

T-Mobile currently maintains (9) existing antennas at the 135 foot level of the existing 180 foot self-support tower at 24 Rockdale Road in West Haven, Connecticut. The tower and property is owned by Mr. Andrew Knapp. T-Mobile now intends to replace (3) existing antennas with (3) 1900 MHz antennas. These antennas would be installed at the same 135 foot level of the tower. T-Mobile also intends to install (1) new hybrid cable.

This facility by the Council in Docket No. 56 on April 14, 1986. This approval included the conditions that a fence not lower than 8' shall surround the tower and equipment, and that no lights shall be installed on the tower. This modification complies with the aforementioned conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. 16-50j-73(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 City of West Haven, Edward M. O'Brien, as well as the tower and property 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

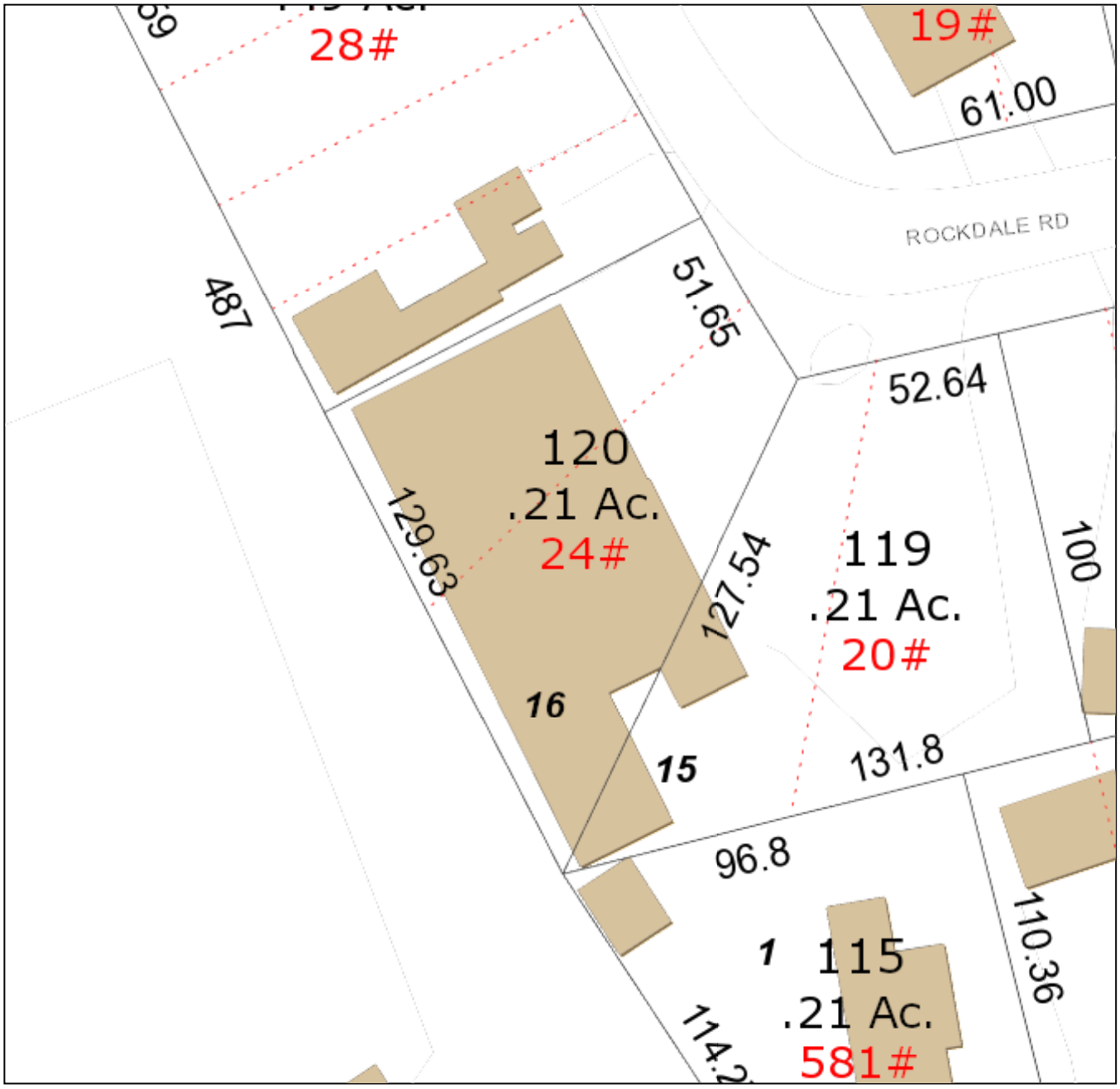
Attachments:

cc: Edward M. O'Brien- as elected official
Andrew Knapp- tower and property owner

City of West Haven

Geographic Information System (GIS)

Date Printed: 6/20/2016



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The City of West Haven and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 40 feet

0 40 Feet

N W E S

24 ROCKDALE RD

Location	24 ROCKDALE RD	**Mblu**	59/ 120/ / /
Acct#	00007905	**Owner**	KNAPP ANDREW + LILLIAN R
Assessment	$568,400	**Appraisal**	$812,000
PID	15185	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$723,200	$88,800	$812,000
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$506,240	$62,160	$568,400

Owner of Record

Owner	KNAPP ANDREW + LILLIAN R	**Sale Price**	$0
Co-Owner	& SV	**Certificate**	
Address	24 ROCKDALE RD WEST HAVEN, CT 06516	**Book & Page**	412/ 375
		Sale Date	

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
KNAPP ANDREW + LILLIAN R	$0		412/ 375	

Building Information

Building 1 : Section 1

Year Built:	1959
Living Area:	8324
Replacement Cost:	$530,675
Building Percent Good:	64
Replacement Cost Less Depreciation:	$339,600

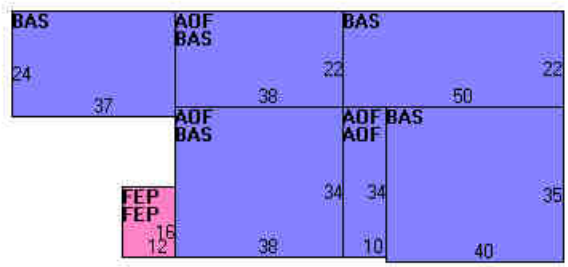
Building Attributes	
Field	**Description**
STYLE	Light Industrial

MODEL	Ind/Comm
Grade	Average +10
Stories:	2
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	Brick/Masonry
Roof Structure	Flat
Roof Cover	T&G/Rubber
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall/Sheet
Interior Floor 1	Concr-Finished
Interior Floor 2	Vinyl/Asphalt
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	None
Bldg Use	SVC SHOP MDL-94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	3320
Heat/AC	HEAT/AC SPLIT
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL & WL
Rooms/Prtns	AVERAGE
Wall Height	12
% Comn Wall	0

Building Photo

(http://images.vgsi.com/photos/WestHavenCTPhotos//\00\02\8

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	5516	5516
AOF	Office	2808	2808
FEP	Porch, Enclosed	384	0
		8708	8324

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
A/C	AIR COND	4100 S.F.	$6,600	1

Land

Land Use

Use Code	3320
Description	SVC SHOP MDL-94

Land Line Valuation

Size (Acres)	0.21
Frontage	52

Zone	R2	**Depth**	0
Neighborhood	C400	**Assessed Value**	$62,160
Alt Land Appr	No	**Appraised Value**	$88,800
Category			

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	PAVING-ASPHALT			4000 S.F.	$4,000	1
CELL	SITE	SI		2 SITES	$373,000	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$868,600	$83,800	$952,400
2013	$868,600	$83,800	$952,400
2012	$868,600	$83,800	$952,400

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2014	$608,020	$58,660	$666,680
2013	$608,020	$58,660	$666,680
2012	$608,020	$58,660	$666,680

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environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11193A

Orange/ Rt-1
24 Rockdale Road
West Haven, CT 06516

June 1, 2016

EBI Project Number: 6216002645

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	89.97 %

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

EBI Consulting
environmental | engineering | due diligence

June 1, 2016

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

Emissions Analysis for Site: **CT11193A – Orange/ Rt-1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **24 Rockdale Road, West Haven, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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 ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the PCS and AWS bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **24 Rockdale Road, West Haven, 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 six 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** & **Ericsson AIR21 B2A/B4P** have a maximum gain of **15.9 dBd** at their 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 at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is **135 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.

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

EBI Consulting

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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):	135	Height (AGL):	135	Height (AGL):	135
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%	2.02	Antenna B1 MPE%	2.02	Antenna C1 MPE%	2.02
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):	135	Height (AGL):	135	Height (AGL):	135
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%	1.51	Antenna B2 MPE%	1.51	Antenna C2 MPE%	1.51
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):	135	Height (AGL):	135	Height (AGL):	135
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%	0.40	Antenna B3 MPE%	0.40	Antenna C3 MPE%	0.40

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**3.93 %**
Antennas 1-17 @ 199'	42.49 %
Antenna 18 @ 102'	8.27 %
Antenna 19 @ 199'	2.27 %
Antenna 20 @ 175 '	0.59 %
TV ch 28	10.75 %
Verizon Wireless	21.67 %
Site Total MPE %:	**89.97 %**

T-Mobile Sector 1 Total:	3.93 %
T-Mobile Sector 2 Total:	3.93 %
T-Mobile Sector 3 Total:	3.93 %
Site Total:	89.97 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2334.27**	**135**	**10.09**	**2100**	**1000**	**1.01 %**
T-Mobile 1900 MHz (PCS) LTE	**2**	**2334.27**	**135**	**10.09**	**1900**	**1000**	**1.01 %**
T-Mobile 1900 MHz (PCS) GSM	**2**	**1167.14**	**135**	**5.04**	**1900**	**1000**	**0.50 %**
T-Mobile 1900 MHz (PCS) UMTS	**2**	**1167.14**	**135**	**5.04**	**1900**	**1000**	**0.50 %**
T-Mobile 2100 MHz (AWS) UMTS	**2**	**1167.14**	**135**	**5.04**	**2100**	**1000**	**0.50 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**135**	**1.87**	**700**	**467**	**0.40 %**
						Total:	**3.43 %**

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 1:	3.93 %
Sector 2:	3.93 %
Sector 3:	3.93 %
T-Mobile Per Sector Maximum:	3.93 %
Site Total:	89.97 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **89.97%** 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

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

West Haven
KM No. 140910.02

180’ Self Support Tower
West Haven, CT

Prepared By:

KM CONSULTING ENGINEERS, INC.
262 Upper Ferry Rd, Ewing, NJ 08628
Ph: (609) 538-0400 www.kmengr.com

May 31, 2016

Prepared to EIA/TIA-222-F June 1996
Structural Standards for Antenna Supporting
Structures and Antennas

Transcend Wireless
West Haven

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

Structure

Tower Manager: Radio Communications, Inc.

Location: 24 Rockdale Road
West Haven, CT 06516

Manufacturer: Rohn

Equipment

Existing tower inventory plus the proposed installation are detailed in Section 2.0 "Tower Inventory."

Synopsis

Load Case No. 1: The existing tower superstructure with the current inventory and proposed T-Mobile installation.

The tower superstructure and foundation have sufficient capacity and therefore meet the current EIA/TIA-222-F standards. The tower superstructure is rated at 81.5% and the base foundation is rated at 79.4%.

2.0 TOWER INVENTORY

TYPE	ELEVATION	TYPE	ELEVATION
20' Dipole	191	ALU RH_2X40-AWS RRH (Verizon)	144.5
10' Whip	183.5	BXA-80063-6BF (Verizon)	144.5
10' Dipole	183	BXA-171063-12BF (Verizon)	144.5
10' Whip	182.5	BXA-80063-6BF (Verizon)	144.5
6' Yagi	182	Stand-Off T-Frame (Verizon)	143.5
PG1N0F-0090-310	182	Stand-Off T-Frame (Verizon)	143.5
16' Whip	182	Stand-Off T-Frame (Verizon)	143.5
6' Yagi	182	Ericsson AIR21 Antenna (T-Mobile)	135
21' Whip	182	Stand-Off T-Frame (T-Mobile)	135
21' Whip	181.5	LNX-6515DS-A1M (T-Mobile)	135
21' Whip	181.5	LNX-6515DS-A1M (T-Mobile)	135
20' Dipole	181.5	LNX-6515DS-A1M (T-Mobile)	135
14' Inverted Whip	180 - 166	Stand-Off T-Frame (T-Mobile)	135
Top Platform	180	Ericsson AIR21 Antenna (T-Mobile)	135
10' Inverted Whip	180 - 170	Ericsson AIR21 Antenna (T-Mobile)	135
TMA	180	Stand-Off T-Frame (T-Mobile)	135
TMA	180	RRUS11 B12 (T-Mobile)	135
(2) Scala Panels	175.5	RRUS11 B12 (T-Mobile)	135
Raycap (Verizon)	148.5	RRUS11 B12 (T-Mobile)	135
BXA-70063-6CF (Verizon)	144.5	AIR32 B66Aa/B2a (T-Mobile)	135
BXA-70040-6CF (Verizon)	144.5	AIR32 B66Aa/B2a (T-Mobile)	135
BXA-70040-6CF (Verizon)	144.5	AIR32 B66Aa/B2a (T-Mobile)	135
BXA-80063-6BF (Verizon)	144.5	TMA (T-Mobile)	135
BXA-171063-8BF (Verizon)	144.5	TMA (T-Mobile)	135
BXA-171063-8BF (Verizon)	144.5	TMA (T-Mobile)	135
BXA-171063-8BF (Verizon)	144.5	Empty Mount	103
BXA-171063-8BF (Verizon)	144.5	2' yagi	102.5
BXA-171063-8BF (Verizon)	144.5	GPS	59.5
ALU RH_2X40-AWS RRH (Verizon)	144.5	(2) GPS	18
ALU RH_2X40-AWS RRH (Verizon)	144.5	(2) GPS	17.67

Proposed T-Mobile Loading:

*(3) AIR32 B66Aa/B2a panel antennas @ 135' AGL
*Removal of (3) existing AIR21 panel antennas @ 135' AGL
*Removal of (6) 1-5/8" coax lines

3.0 COMMENTARY

Our scope of work is to determine if the existing structure is capable of withstanding the additional stresses/forces imposed by the installation of the proposed T-Mobile equipment noted in the tower inventory.

Tower structure information and foundation information was obtained from previous structural analyses by KMCE. The tower has been reinforced as per KMCE drawings in November 1997, July 2002, January 2009, August 2012, and December 2014. The existing tower inventory was determined from a tower climb and mapping completed on February 16, 2015. The proposed loading was obtained from a T-Mobile RFDS dated 4/6/16.

The following report will provide analytical calculations and commentary regarding the capacity of the proposed tower and subsequent recommendations.

4.0 ANALYSIS PROCEDURE

KM Consulting Engineers, Inc. carried out their structural analysis by correlating field inspection and tower member data into proprietary software designed specifically for communication tower analysis.

These programs run in conjunction with the guidelines set down in the EIA/TIA-222-F (1996) Standard entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures."

The existing tower is analyzed by placing wind forces on the structure in 30° positional increments around the tower (ie. wind pressure directly onto the tower corners, faces and parallel to the faces). This enables the user to "create" a three-dimensional representation, yielding results for worst case scenarios. In effect, the production of these results allows the user to study the structural integrity of the tower when influenced by wind forces from any direction.

The proceeding report includes analysis for the tower with the addition of antennas in the scenarios stated. For clarity, the analysis shall include worst case loadings and a typical elevation view with maximum foundation loads tabulated.

Should the client require to be furnished with a full copy of our analysis, we will gladly do so (approximately 80 pages).

Codes and Standards

ACI - American Concrete Institute - *Building Code Requirements for Structural Concrete (ACI 318-05)*, 2005

AISC - American Institute of Steel Construction - *Manual of Steel Construction, Allowable Stress Design*, 14th edition, 2010

TIA - Telecommunications Industry Association – *EIA/TIA-222-F Structural Standards Steel Antenna Towers and Antenna Supporting Structures, 1996*

IBC 2003- International Building Code

5.0 TOWER ANALYSIS RESULTS

The tower was analyzed for the inventory detailed in Section 2.0 “Tower Inventory”.

Structural wind speed is in accordance with EIA/TIA-222-F (1996) listing applicable to New Haven, CT: 85 MPH (fastest mile), no ice and 74 MPH (fastest mile), ½” radial ice.

All allowable capacities have been calculated to comply with the permitted EIA allowable increases (for wind). All bolts loaded in shear assume the threads **are included** in the shear plane.

Load Case No. 1: Proposed T-Mobile addition of (3) AIR32 B66Aa/B2a panel antennas, and removal of (3) existing AIR21 panel antennas and (6) 1-5/8” coax lines.

The tower superstructure and foundation have sufficient capacity and therefore meet the current EIA/TIA-222-F standards. The tower superstructure is rated at 81.5% and the base foundation is rated at 79.4%.

Foundation Capacities		
Actual Uplift	Allowable Uplift	% Use
202.97 kips	255.75 kips	79.4%

6.0 RECOMMENDATIONS

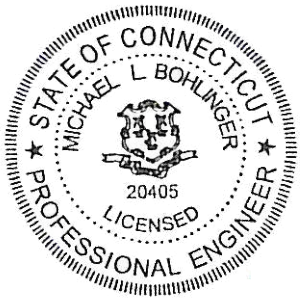
Further to our calculations, we conclude that the tower superstructure and base foundation have adequate capacity and therefore meet the current EIA/TIA-222-F design standards.

Please do not hesitate to contact our office with any questions or concerns regarding this report.

Sincerely,
KM CONSULTING ENGINEERS, INC

Reviewed and Approved by:

Domenic Aversa, EIT
Project Manager



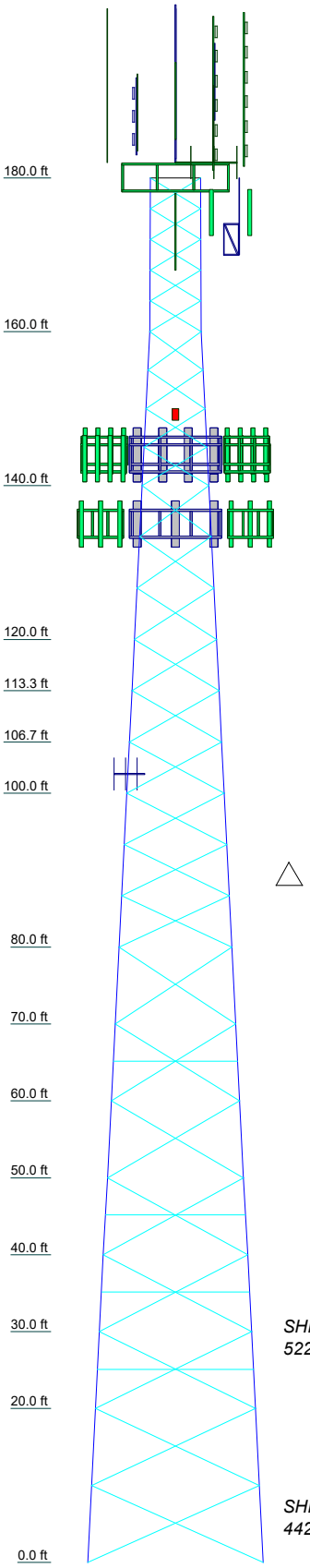
6|20|16

Michael L. Bohlinger, PE
Principal
CT License No. 20405

7.0 APPENDIX

LOAD CASE 1

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14										
Legs		ROHN 2 STD (GR)	A	B	C			D	E		ROHN 5 X-STR (GR) w/ 5/8" Cable				F										
Leg Grade		A572-50																							
Diagonals		L1 1/2x1 1/2x1/8	L1 3/4x1 3/4x1/8	G	H			L3x3x1/4		L3 1/2x3 1/2x1/4			I		4x4x1/4 w/ sch 40										
Diagonal Grade		A572-50																							
Top Girts		L3x3x1/4						N.A.																	
Sec. Horizontals				N.A.						J	N.A.		L3 1/2x3 1/2x1/4		N.A.										
Face Width (ft)	22.8	6.5	6.6	8.625	10.65	11.325	12	12.675	14.7	15.7125	16.725	17.7375	18.75	19.7625	20.775										
# Panels @ (ft)		5 @ 4	4 @ 5	9 @ 6.66667								8 @ 10													
Weight (lb)	28620.1	806.2	890.1	1635.6	537.1	547.8	712.7	2696.0	1378.2	1780.1	1561.2	1906.1	2159.1	2216.3	9793.7										



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' Dipole	191	ALU RH_2X40-AWS RRH (Verizon)	144.5
10' Whip	183.5	BXA-80063-6BF (Verizon)	144.5
10' Dipole	183	BXA-171063-12BF (Verizon)	144.5
10' Whip	182.5	BXA-80063-6BF (Verizon)	144.5
6' Yagi	182	Stand-Off T-Frame (Verizon)	143.5
PG1N0F-0090-310	182	Stand-Off T-Frame (Verizon)	143.5
16' Whip	182	Stand-Off T-Frame (Verizon)	143.5
6' Yagi	182	Ericsson AIR21 Antenna (T-Mobile)	135
21' Whip	182	Stand-Off T-Frame (T-Mobile)	135
21' Whip	181.5	LNX-6515DS-A1M (T-Mobile)	135
21' Whip	181.5	LNX-6515DS-A1M (T-Mobile)	135
20' Dipole	181.5	LNX-6515DS-A1M (T-Mobile)	135
14' Inverted Whip	180 - 166	Stand-Off T-Frame (T-Mobile)	135
Top Platform	180	Ericsson AIR21 Antenna (T-Mobile)	135
10' Inverted Whip	180 - 170	Ericsson AIR21 Antenna (T-Mobile)	135
TMA	180	Stand-Off T-Frame (T-Mobile)	135
TMA	180	RRUS11 B12 (T-Mobile)	135
(2) Scala Panels	175.5	RRUS11 B12 (T-Mobile)	135
Raycap (Verizon)	148.5	RRUS11 B12 (T-Mobile)	135
BXA-70063-6CF (Verizon)	144.5	AIR32 B66Aa/B2a (T-Mobile)	135
BXA-70040-6CF (Verizon)	144.5	AIR32 B66Aa/B2a (T-Mobile)	135
BXA-70040-6CF (Verizon)	144.5	AIR32 B66Aa/B2a (T-Mobile)	135
BXA-80063-6BF (Verizon)	144.5	TMA (T-Mobile)	135
BXA-171063-8BF (Verizon)	144.5	TMA (T-Mobile)	135
BXA-171063-8BF (Verizon)	144.5	TMA (T-Mobile)	135
BXA-171063-8BF (Verizon)	144.5	Empty Mount	103
BXA-171063-8BF (Verizon)	144.5	2' yagi	102.5
BXA-171063-8BF (Verizon)	144.5	GPS	59.5
ALU RH_2X40-AWS RRH (Verizon)	144.5	(2) GPS	18
ALU RH_2X40-AWS RRH (Verizon)	144.5	(2) GPS	17.67

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD (GR) w/ 5/8" Cable	F	ROHN 6 EH (GR) w/ 5/8" Cable (GR)
B	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	G	L2x2x1/8 w/1.5" sch 40 pipe
C	ROHN 3 X-STR (GR) w/ 5/8" Cable	H	L2 1/2x2 1/2x3/16
D	ROHN 4 X-STR (GR) w/ 5/8" Cable	I	L3.5x3.5x1/4 w/ 2x1/4 plate
E	ROHN 5 STD (GR) w/ 5/8" Cable	J	L3 1/2x3 1/2x1/4

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 60 mph wind.
4. Grouted pipe f'c is 8 ksi
5. Tower legs have 5/8" diameter stainless steel cable(40K tension) in grouted leg.
6. TOWER RATING: 81.5%

UPLIFT: -202973 lb
SHEAR: 29919 lb

AXIAL
59568 lb

SHEAR
52284 lb

MOMENT
4752931 lb-ft

TORQUE 21014 lb-ft
74 mph WIND - 0.5000 in ICE

AXIAL
38393 lb

SHEAR
44271 lb

MOMENT
4107416 lb-ft

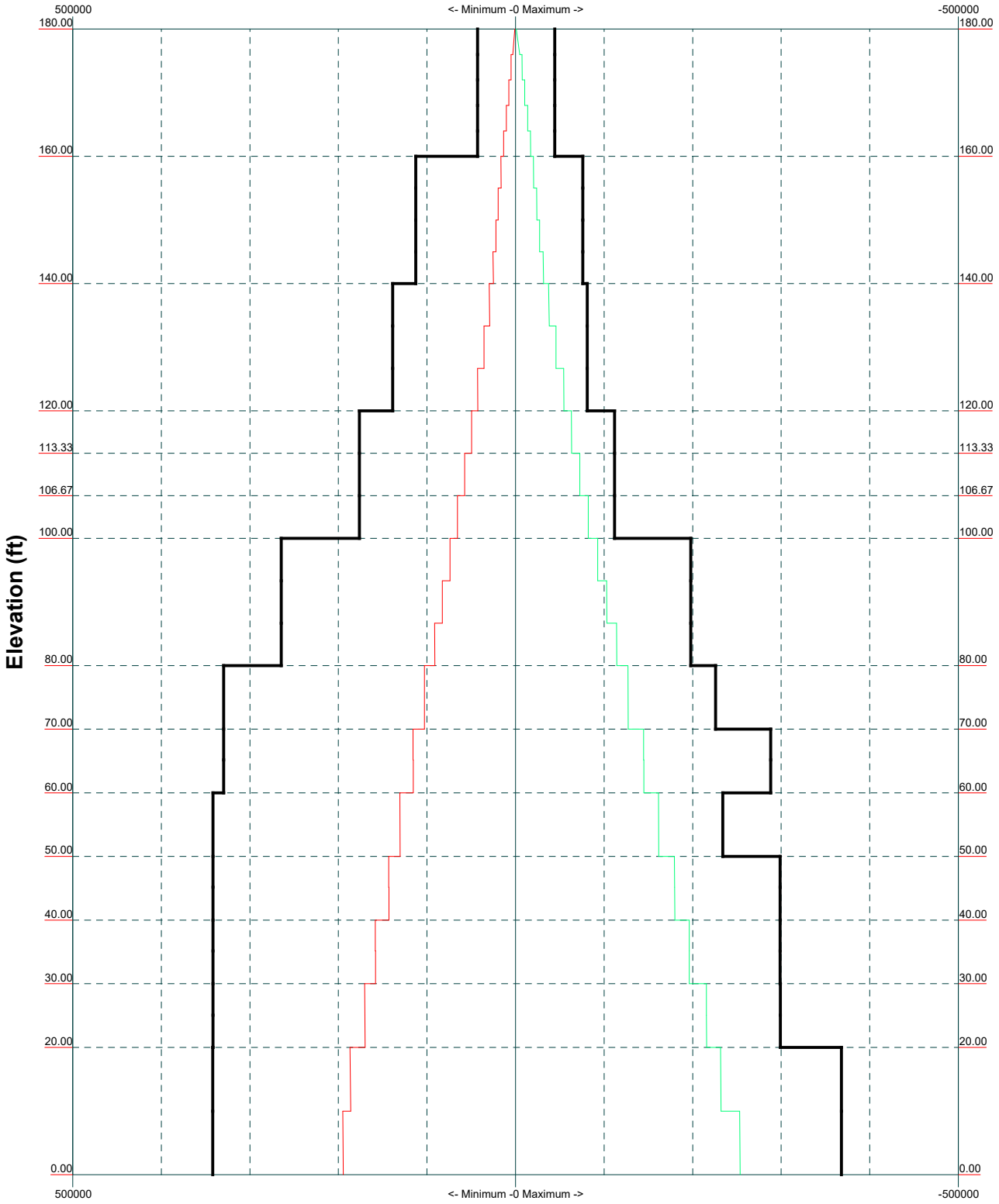
TORQUE 8957 lb-ft
REACTIONS - 85 mph WIND

KM Consulting Engineers
262 Upper Ferry Road
Ewing, NJ 08628
Phone: (609) 538-0400
FAX:
Consulting Engineers

Job:	West Haven LC1		
Project:	180 ft. Self Support Tower		
Client:	Transcend Wireless	Drawn by: Domenic Aversa	App'd:
Code:	TIA/EIA-222-F	Date: 05/31/16	Scale: NTS
Path:	K:\Transcend Wireless\West Haven\Engineering\West Haven LC1.eri		Dwg No. E-1

TIA/EIA-222-F - 85 mph/74 mph 0.5000 in Ice

Leg Capacity ——— **Leg Compression (lb)**



KM Consulting Engineers
262 Upper Ferry Road
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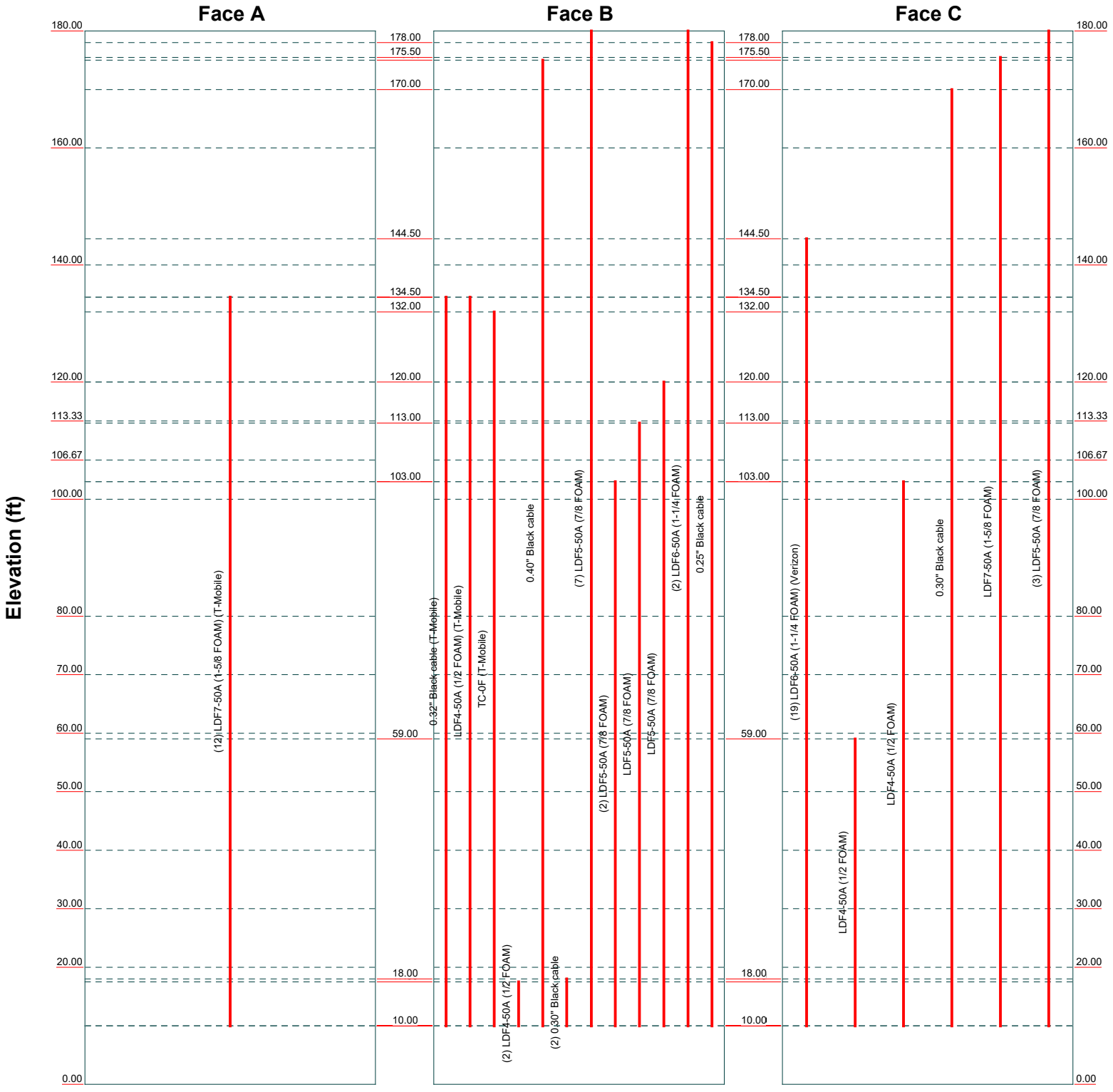
Consulting Engineers

Job: ***West Haven LC1***			
Project: ***180 ft. Self Support Tower***			
Client: Transcend Wireless	Drawn by: Domenic Aversa	App'd:	
Code: TIA/EIA-222-F	Date: 05/31/16	Scale: NTS	
Path: K:\Transcend Wireless\West Haven\Engineering\West Haven LC1.eri		Dwg No. E-3	

Feed Line Distribution Chart
0' - 180'

Round | Flat | App In Face | App Out Face | Truss Leg

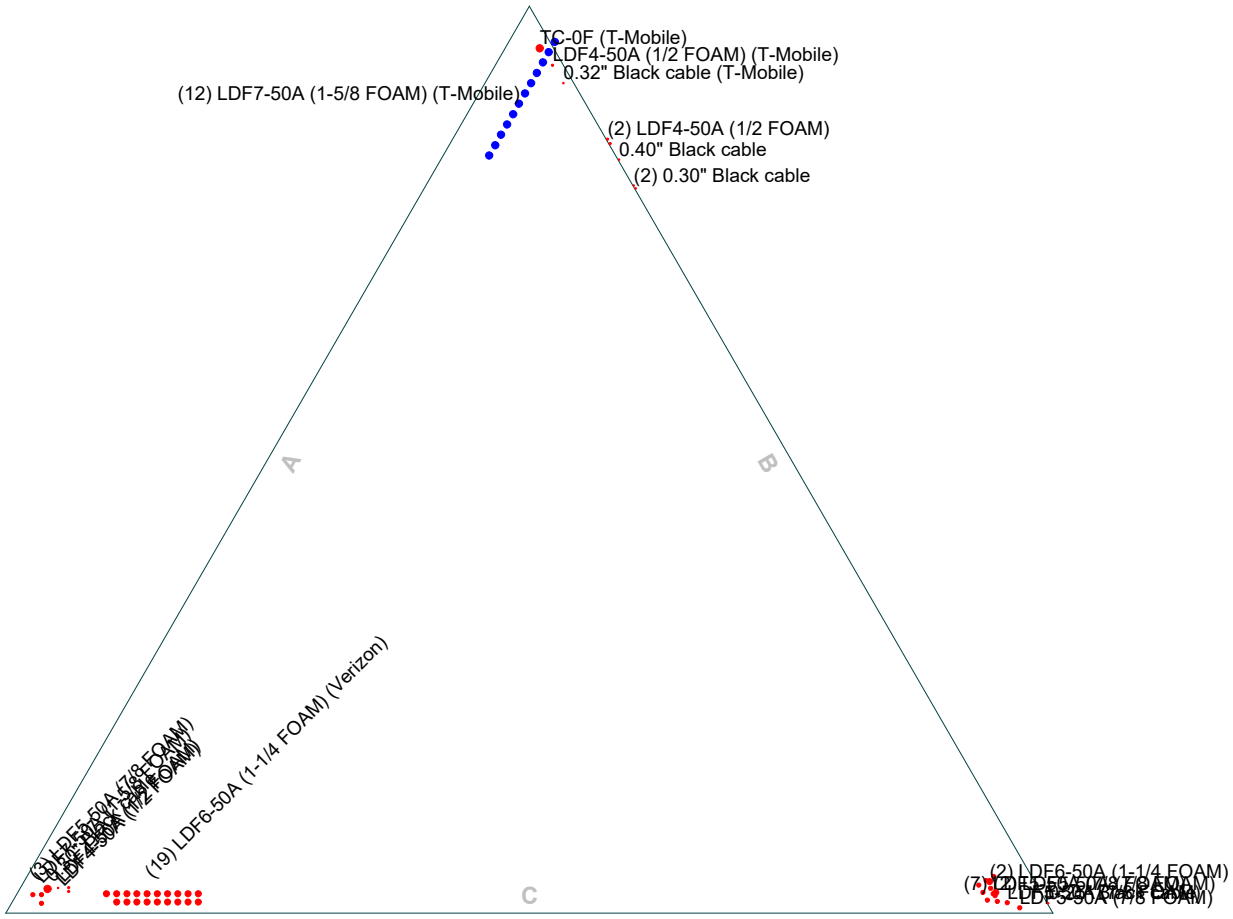


KM Consulting Engineers
262 Upper Ferry Road
Ewing, NJ 08628
Phone: (609) 538-0400
FAX:
Consulting Engineers

Job:	***West Haven LC1***		
Project:	***180 ft. Self Support Tower***		
Client: Transcend Wireless	Drawn by: Domenic Aversa	App'd:	
Code: TIA/EIA-222-F	Date: 05/31/16	Scale: NTS	
Path: K:\Transcend Wireless\West Haven\Engineering\West Haven LC1.eri		Dwg No. E-7	

Feed Line Plan

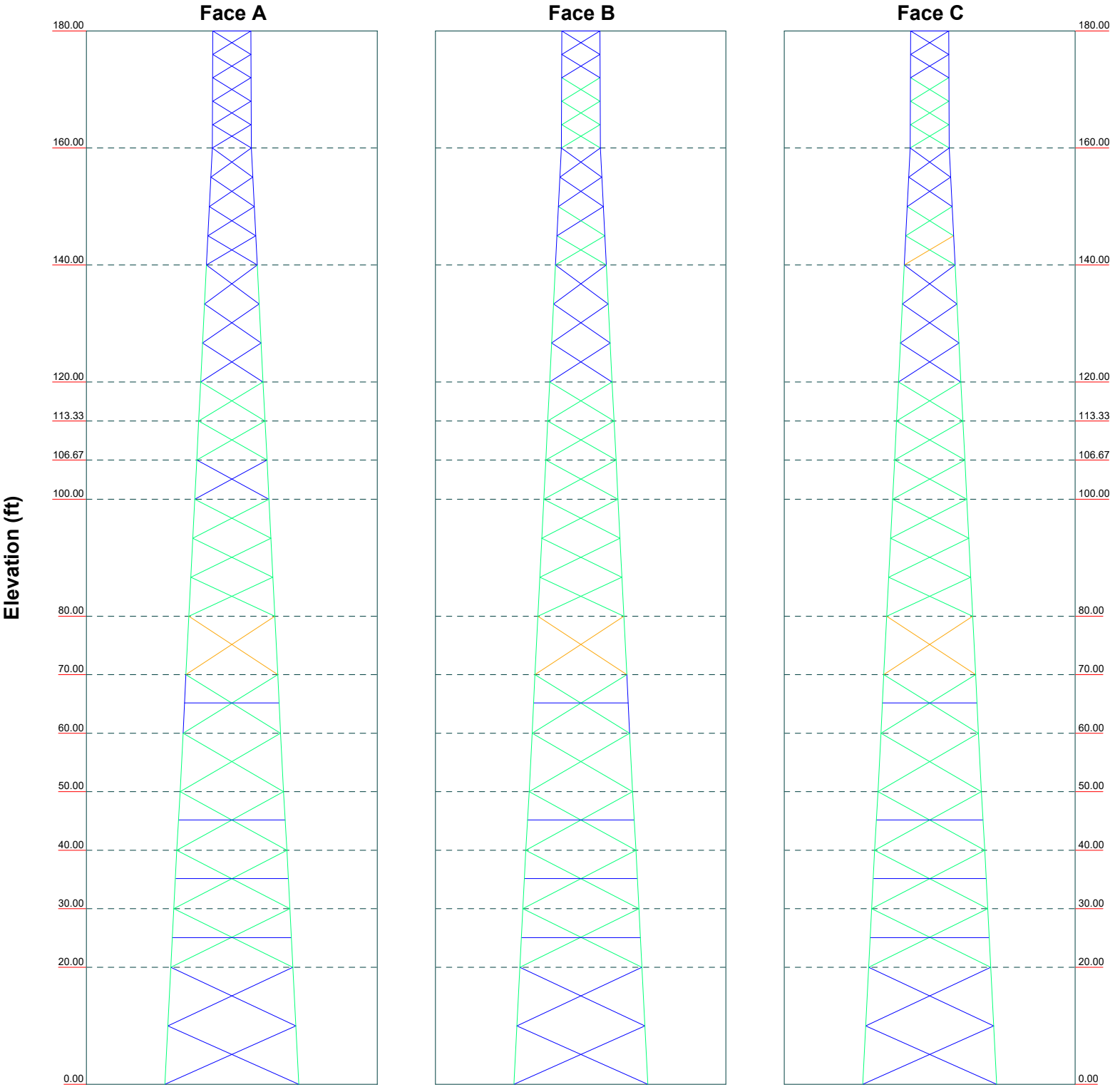
Round Flat App In Face App Out Face



Consulting Engineers	**KM Consulting Engineers** 262 Upper Ferry Road Ewing, NJ 08628 Phone: (609) 538-0400 FAX:	Job: ***West Haven LC1***	
		Project: ***180 ft. Self Support Tower***	
		Client: Transcend Wireless	Drawn by: Domenic Aversa / App'd:
		Code: TIA/EIA-222-F	Date: 05/31/16 / Scale: NTS
		Path: K:\Transcend Wireless\West Haven\Engineering\West Haven LC1.eri	Dwg No. E-7

Stress Distribution Chart
0' - 180'

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress



KM Consulting Engineers
262 Upper Ferry Road
Ewing, NJ 08628
Phone: (609) 538-0400
FAX:
Consulting Engineers

Job: *West Haven LC1*			
Project: *180 ft. Self Support Tower*			
Client: Transcend Wireless	Drawn by: Domenic Aversa	App'd:	
Code: TIA/EIA-222-F	Date: 05/31/16	Scale: NTS	
Path: K:\Transcend Wireless\West Haven\Engineering\West Haven LC1.eri		Dwg No. E-8	

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 2 STD (GR)	2	-16957.20	44248.53	38.3	Pass
		Diagonal	L1 1/2x1 1/2x1/8	7	-2384.64	3699.43	64.5	Pass
		Top Girt	L3x3x1/4	4	-353.74	18407.26	1.9	Pass
T2	160 - 140	Leg	ROHN 2.5 STD (GR) w/ 5/8" Cable	38	-31800.50	75875.29	41.9	Pass
		Diagonal	L1 3/4x1 3/4x1/8	40	-2740.08	3588.40	76.4	Pass
T3	140 - 120	Leg	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	65	-54559.90	80983.88	67.4	Pass
		Diagonal	L2x2x1/8 w/1.5" sch 40 pipe	67	-4460.09	9168.83	48.6	Pass
T4	120 - 113.333	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	86	-63254.50	111684.20	56.6	Pass
		Diagonal	L2 1/2x2 1/2x3/16	91	-4822.75	8571.20	56.3	Pass
T5	113.333 - 106.667	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	95	-72745.10	111684.20	65.1	Pass
		Diagonal	L2 1/2x2 1/2x3/16	100	-5147.91	7969.54	64.6	Pass
T6	106.667 - 100	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	104	-82216.60	111684.34	73.6	Pass
		Diagonal	L3x3x1/4	109	-5763.11	15788.45	36.5 52.4 (b)	Pass
T7	100 - 80	Leg	ROHN 4 X-STR (GR) w/ 5/8" Cable	113	-114282.00	197826.52	57.8	Pass
		Diagonal	L3x3x1/4	118	-6586.53	13085.70	50.3 64.7 (b)	Pass
T8	80 - 70	Leg	ROHN 5 STD (GR) w/ 5/8" Cable	134	-127252.00	225763.54	56.4	Pass
		Diagonal	L3x3x1/4	138	-8422.28	10338.35	81.5	Pass
T9	70 - 60	Leg	ROHN 5 STD (GR) w/ 5/8" Cable	143	-144883.00	288153.27	50.3	Pass
		Diagonal	L3 1/2x3 1/2x1/4	147	-8415.50	14587.02	57.7	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	152	-2365.51	14415.06	16.4	Pass
T10	60 - 50	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	155	-161559.00	233978.81	69.0	Pass
		Diagonal	L3 1/2x3 1/2x1/4	159	-9623.73	13547.55	71.0	Pass
T11	50 - 40	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	164	-179777.00	298831.93	60.2	Pass
		Diagonal	L3 1/2x3 1/2x1/4	168	-9267.85	12601.98	73.5	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	173	-2929.83	12136.74	24.1	Pass
T12	40 - 30	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	176	-196298.00	298913.24	65.7	Pass
		Diagonal	L3.5x3.5x1/4 w/ 2x1/4 plate	180	-11203.10	27391.02	40.9 65.2 (b)	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	185	-3370.53	11195.12	30.1	Pass
T13	30 - 20	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	188	-215726.00	298986.56	72.2	Pass
		Diagonal	L3.5x3.5x1/4 w/ 2x1/4 plate	192	-9685.31	25251.15	38.4 66.6 (b)	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	197	-3355.07	10359.04	32.4	Pass
T14	20 - 0	Leg	ROHN 6 EH (GR) w/ 5/8" Cable (GR)	200	-253610.00	367955.97	68.9	Pass
		Diagonal	4x4x1/4 w/ sch 40	212	-13141.50	68391.03	19.2 40.1 (b)	Pass
						Summary		
						Leg (T6)	73.6	Pass
						Diagonal (T8)	81.5	Pass
						Secondary Horizontal (T13)	32.4	Pass
						Top Girt (T1)	1.9	Pass
						Bolt Checks	66.6	Pass
						RATING =	**81.5**	**Pass**

T-Mobile®

ORANGE/RT-1

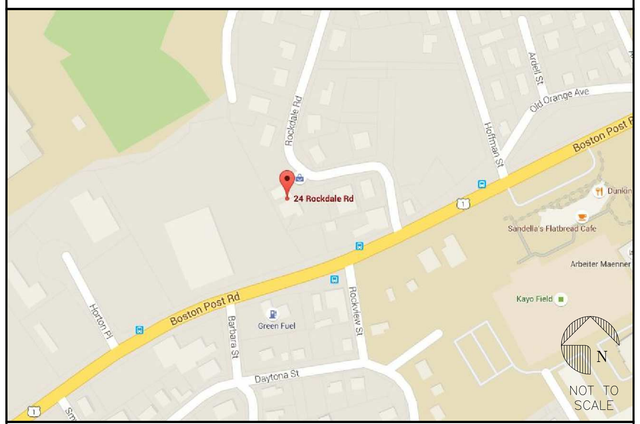
24 ROCKDALE ROAD
WEST HAVEN, CT 06516
SITE ID: CT11193A

SWAP OF ONE ANTENNA PER SECTOR AND REMOVAL OF COAX LINES ON AN EXISTING SELF-SUPPORT TOWER

PROJECT DESCRIPTION

T-MOBILE IS PROPOSING TO SWAP ONE EXISTING AIR21 ANTENNA PER SECTOR WITH A NEW PROPOSED AIR32 B66Aa/B2A PANEL ANTENNA. A TOTAL OF (3) ANTENNAS WILL BE SWAPPED. (1) 6x12 HYBRID CABLE WILL BE ADDED TO THE TOWER AND (6) 1-5/8" COAX LINES WILL BE REMOVED FROM THE TOWER. THE REMAINING ANTENNAS, TMAs, RRUs, AND COAX LINES WILL NOT BE ALTERED.

PROJECT SCOPE: 702CU TO 792DB



LOCATION MAP

DRAWING INDEX

SHEET	SHEET TITLE
T-1	TITLE SHEET
S-1	SITE PLAN
S-2	TOWER ELEVATION
A-1	ANTENNA PLAN AND DETAILS
G-1	GROUNDING DETAILS
GN-1	GENERAL NOTES

SITE INFORMATION

PROPERTY OWNER:	RADIO COMMUNICATIONS SERVICES 24 ROCKDALE ROAD WEST HAVEN, CT 06516	LATITUDE:	41° 17' 26.52" N
APPLICANT:	T-MOBILE NORTHEAST LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002	LONGITUDE:	72° 58' 3.3954" W
ARCHITECT/ ENGINEER:	KM CONSULTING ENGINEERS 262 UPPER FERRY ROAD EWING, NJ 08628	POWER COMPANY:	TBD
SITE ADDRESS:	24 ROCKDALE ROAD WEST HAVEN, CT 06516	T-MOBILE CONTACT:	(860) 648-1116
COUNTY:	LITCHFIELD	EXISTING/PROPOSED USE:	UNMANNED TELECOMMUNICATIONS FACILITY
GROUND ELEVATION:	152'		

APPROVALS

LANDLORD:

CHAIRPERSON:

BOARD SECRETARY:

BOARD ENGINEER:

AERIAL MAP

CLIENT:
Transcend Wireless
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX: (201) 684-0066

KM Consulting Engineers, Inc.
Wireless Engineering and Project Management
262 UPPER FERRY RD.
EWING, NEW JERSEY 08628
PHONE: (609) 538-0400
E-MAIL: info@kmengr.com
WEB PAGE: http://www.kmengr.com
CERTIFICATION OF AUTHORIZATION: 24GA27989600

MICHAEL L. BOHLINGER, PE
CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

STATE OF CONNECTICUT · MICHAEL L. BOHLINGER · 20405 · LICENSED PROFESSIONAL ENGINEER

6/20/16

REVISIONS

NO.	DATE:	DRN.:	DESCRIPTION:
2	5/26/16	JTF	REVISED PER CLIENT
1	5/23/16	JTF	REVISED PER CLIENT

PROJECT PARTICIPANTS

SITE ACQUISITION:
SIGN OFF INITL. DATE:

RF ENGINEER.:
SIGN OFF INITL. DATE:

CONSTR. SUPV.:
SIGN OFF INITL. DATE:

A & E: KM CONSULTING ENGR.'S INC.

P.C.:	CHKD.:	DRN.:	DATE:
	MLB	DJA	5/6/16

PROJECT NAME:
WEST HAVEN

SITE ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

DRAWING TITLE:
TITLE SHEET

SITE ID #:	DRAWING #:	REV. #:
CT11193A	T-1	2

PROJECT #: 140910.02

FILE NAME: T1.dwg

LAST PLOTTED: Thursday, 26-May-2016, 09:12
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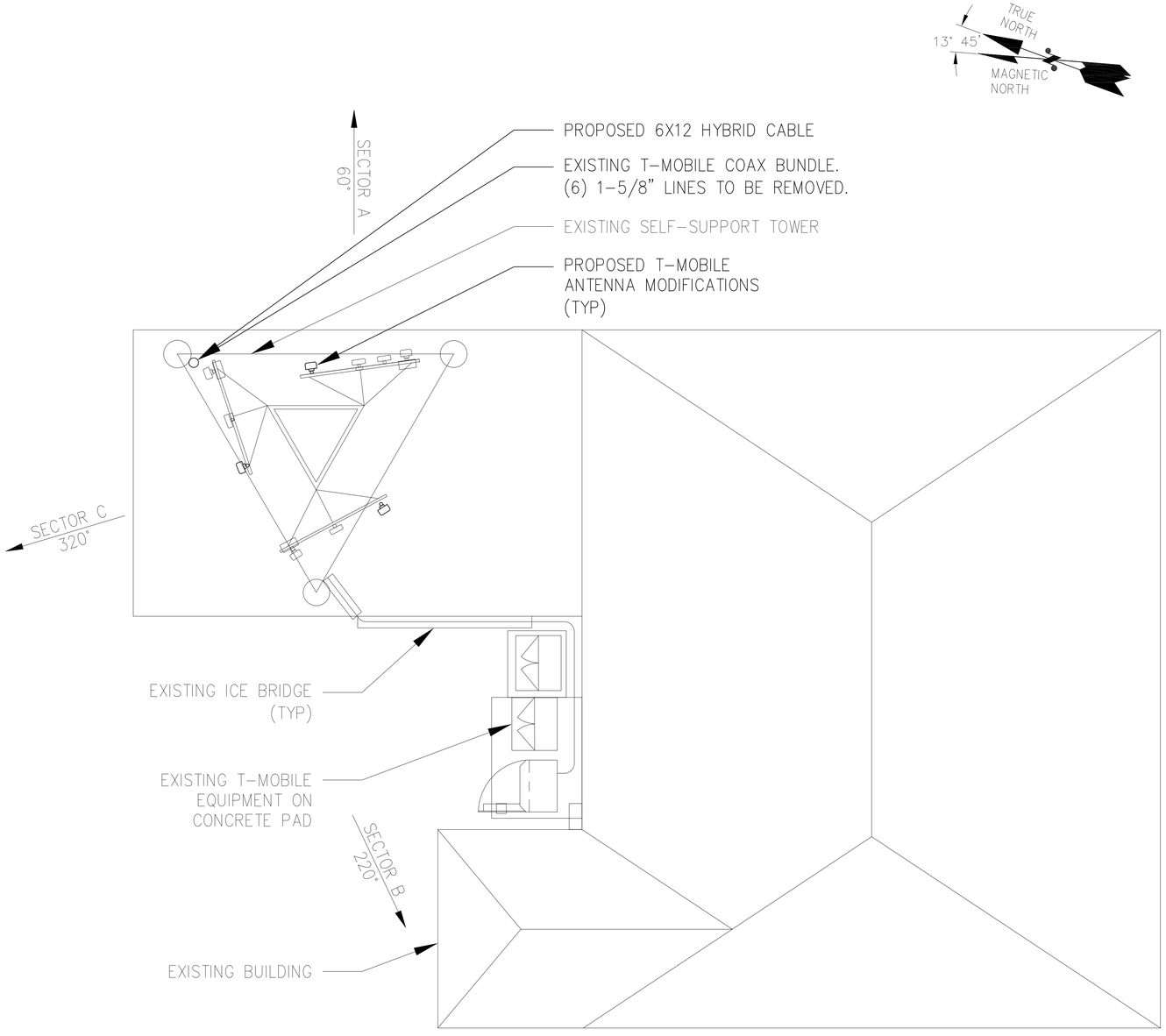

1 / S-1 SITE PLAN

SCALE: 1/2" = 1'-0"

0 4' 8' 16' 24'

NOTE:

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS BY KM CONSULTING ENGINEERS, INC. DATED MAY 12TH, 2016 AND EQUIPMENT INSTALLATION RECOMMENDATIONS PRIOR TO COMMENCING CONSTRUCTION.

GENERAL NOTES:

LIGHTING: EXISTING FACILITY WILL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.

GRADE: EXISTING GRADE WILL BE MAINTAINED FOR PROPOSED CONSTRUCTION.

SIGNAGE: EXTERIOR SIGNS ARE NOT PROPOSED EXCEPT AS REQUIRED BY THE FCC.

STORM WATER CONTROL: THE PROPOSED FACILITY WILL RESULT IN AN INSIGNIFICANT INCREASE IN STORM WATER RUNOFF. CONSEQUENTLY, NO WATER QUALITY CONTROL DEVICES ARE PROPOSED.

UTLITIES: SANITARY SEWER SERVICES AND POTABLE WATER ARE NOT APPLICABLE PER THE USE. IF APPLICABLE, SUBCONTRACTOR SHALL LOCATE ALL UTLITIES PRIOR TO EXCAVATING.

DRIVEWAY: A DRIVEWAY PERMIT IS NOT REQUIRED FOR THIS PROJECT. THE PROJECT WILL NOT REQUIRE RIGHT OF WAY OR PROPERTY TO BE DEDICATED FOR PUBLIC USE.

MISC: NO NOISE, SMOKE, DUST, VAPORS OR ODOR WILL RESULT FROM THIS PROJECT.

CLIENT:

Transcend Wireless

10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX: (201) 684-0066

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EWING, NEW JERSEY 08628
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CERTIFICATION OF AUTHORIZATION: 24GA27989600

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CONNECTICUT PROFESSIONAL ENGINEER
LICENSE # 20405

STATE OF CONNECTICUT
MICHAEL L. BOHLINGER
20405
LICENSED
PROFESSIONAL ENGINEER

6/20/16

REVISIONS

NO.	DATE:	DRN.	DESCRIPTION:
2	5/26/16	JTF	REVISED PER CLIENT
1	5/23/16	JTF	REVISED PER CLIENT

PROJECT PARTICIPANTS

SITE ACQUISITION: _____
SIGN OFF INITL. _____ DATE: _____

RF ENGINEER.: _____
SIGN OFF INITL. _____ DATE: _____

CONSTR. SUPV.: _____
SIGN OFF INITL. _____ DATE: _____

A & E: KM CONSULTING ENGR.'S INC.

P.C.:	CHKD.:	DRN.:	DATE:
	MLB	DJA	5/6/16

PROJECT NAME:
WEST HAVEN

SITE ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

DRAWING TITLE:
SITE PLAN

SITE ID #:	DRAWING #:	REV. #:
CT11193A	S-1	2

PROJECT #: 140910.02

FILE NAME: S1.dwg

LAST PLOTTED: Thursday, 26-May-2016, 09:13
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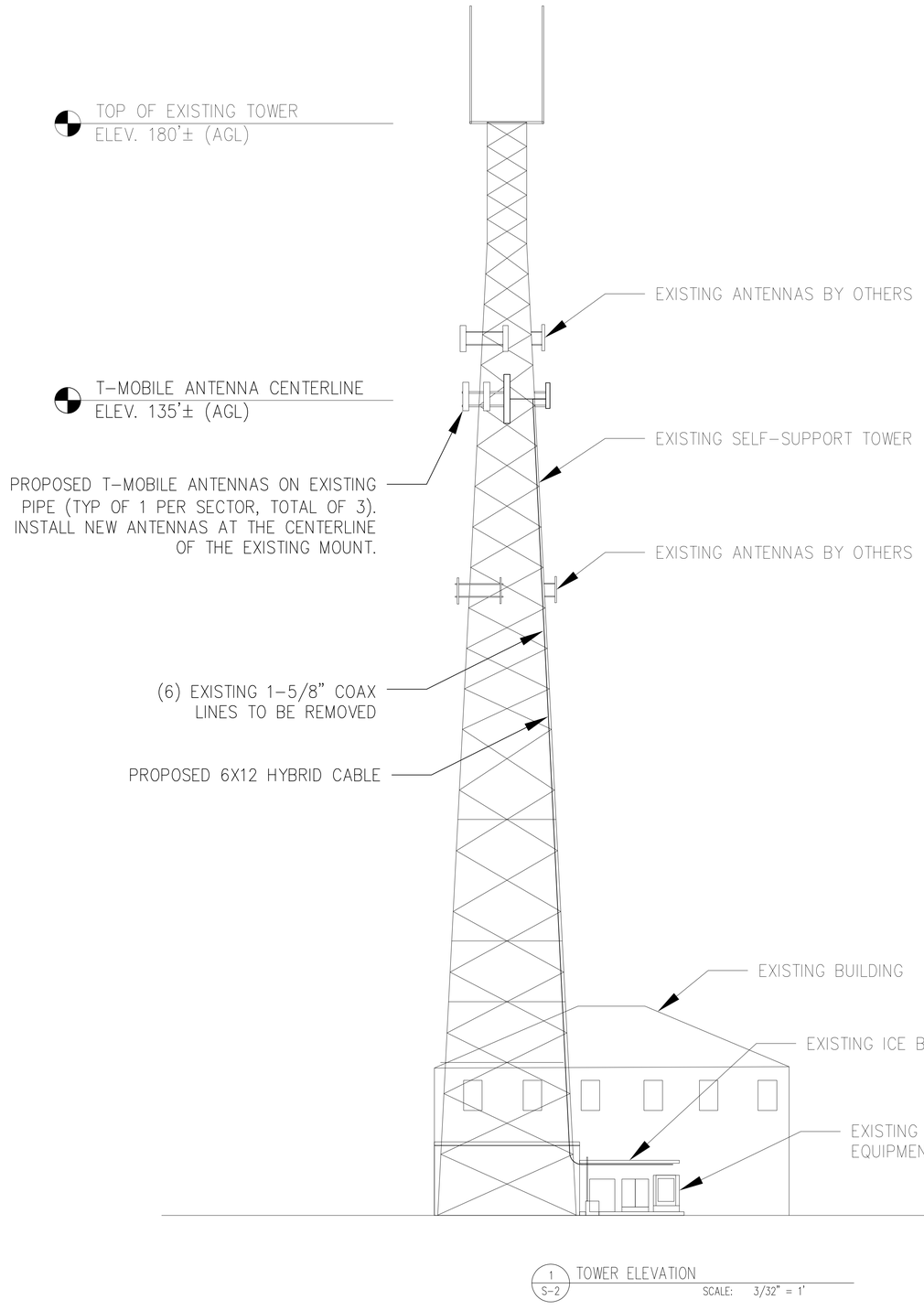

1 / S-2 TOWER ELEVATION
SCALE: 3/32" = 1'

0 8' 16' 32' 48'

NOTE:

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS BY KM CONSULTING ENGINEERS, INC. DATED MAY 12TH, 2016 AND EQUIPMENT INSTALLATION RECOMMENDATIONS PRIOR TO COMMENCING CONSTRUCTION.

LAST PLOTTED: Thursday, 26-May-2016, 09:13
K:\Transcend Wireless\West Haven\CAD

CLIENT:

Transcend Wireless

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LICENSE # 20405

STATE OF CONNECTICUT · MICHAEL L. BOHLINGER · 20405 · LICENSED PROFESSIONAL ENGINEER

6/2016

REVISIONS

NO.	DATE:	DRN.:	DESCRIPTION:
2	5/26/16	JTF	REVISED PER CLIENT
1	5/23/16	JTF	REVISED PER CLIENT

PROJECT PARTICIPANTS

SITE ACQUISITION: _____
SIGN OFF INITL. _____ DATE: _____

RF ENGINEER.: _____
SIGN OFF INITL. _____ DATE: _____

CONSTR. SUPV.: _____
SIGN OFF INITL. _____ DATE: _____

A & E: KM CONSULTING ENGR.'S INC.

P.C.:	CHKD.:	DRN.:	DATE:
	MLB	DJA	5/6/16

PROJECT NAME:
WEST HAVEN

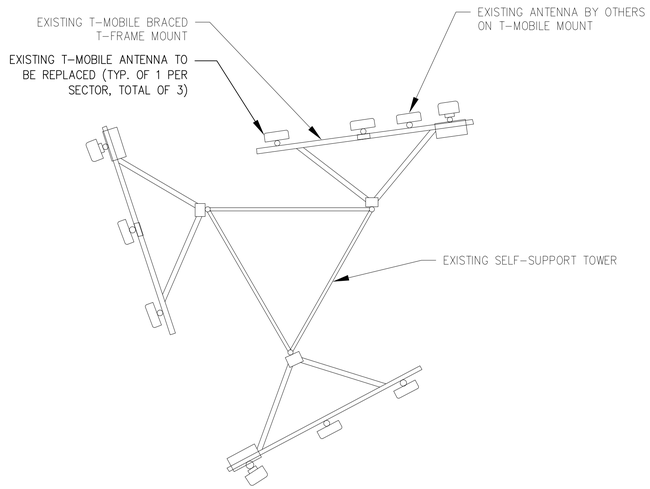
SITE ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

DRAWING TITLE:
TOWER ELEVATION

SITE ID #:	DRAWING #:	REV. #:
CT11193A	S-2	2

PROJECT #.: 140910.02

FILE NAME: S2.dwg



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

NOTE:

GENERAL CONTRACTOR TO REFER TO THE STRUCTURAL ANALYSIS BY KM CONSULTING ENGINEERS, INC. DATED MAY 12TH, 2016 AND EQUIPMENT INSTALLATION RECOMMENDATIONS PRIOR TO COMMENCING CONSTRUCTION.

EXISTING ANTENNA SCHEDULE

SECTOR	MAKE	MODEL #	SIZE (INCHES)
ALPHA	ERICSSON	AIR21 B4A/B2P	55x12x7.9
BETA	ERICSSON	AIR21 B4A/B2P	55x12x7.9
GAMMA	ERICSSON	AIR21 B4A/B2P	55x12x7.9

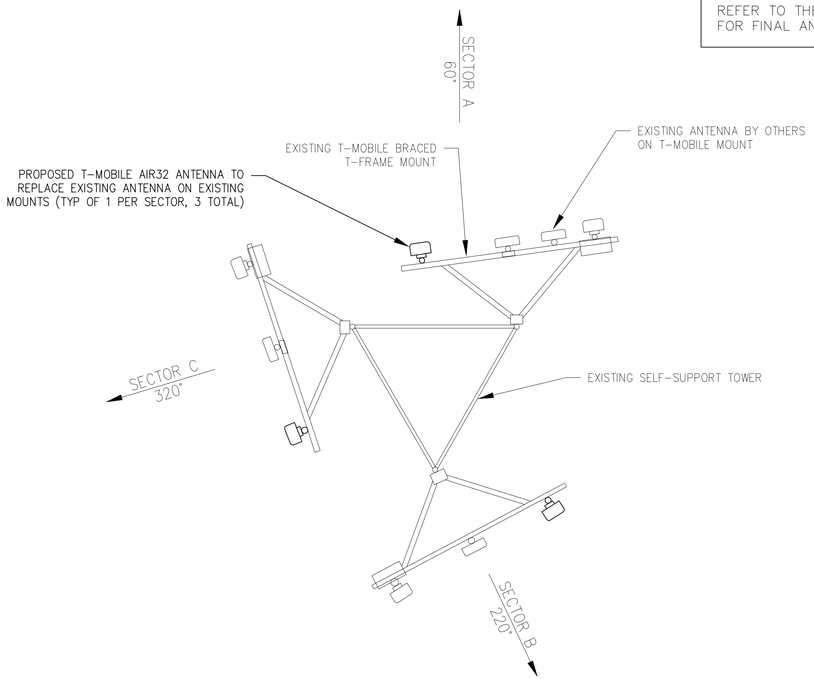
PROPOSED ANTENNA SCHEDULE

SECTOR	MAKE	MODEL #	SIZE (INCHES)
ALPHA	ERICSSON	AIR32 B66Aa/B2a	56.6x12.9x8.7
BETA	ERICSSON	AIR32 B66Aa/B2a	56.6x12.9x8.7
GAMMA	ERICSSON	AIR32 B66Aa/B2a	56.6x12.9x8.7

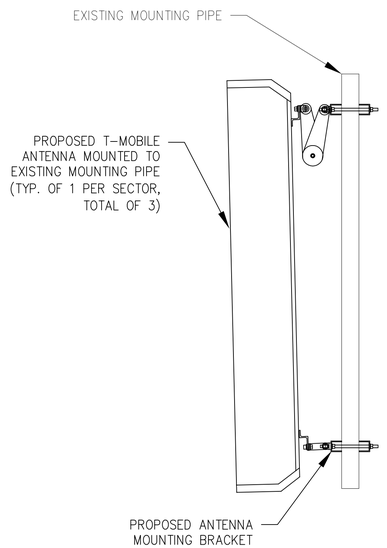
3 A-1 ANTENNA SPECIFICATION TABLE
SCALE: N.T.S.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA CONFIGURATION



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



3 A-1 ANTENNA MOUNTING DETAIL
SCALE: N.T.S.

LAST PLOTTED: Thursday, 26-May-2016, 09:13
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LICENSE # 20405

STATE OF CONNECTICUT · MICHAEL L. BOHLINGER · 20405 · LICENSED PROFESSIONAL ENGINEER

6/20/16

REVISIONS

NO	DATE:	DRN.:	DESCRIPTION:
2	5/26/16	JTF	REVISED PER CLIENT
1	5/23/16	JTF	REVISED PER CLIENT

PROJECT PARTICIPANTS

SITE ACQUISITION: _____
SIGN OFF INITL. _____ DATE: _____

RF ENGINEER.: _____
SIGN OFF INITL. _____ DATE: _____

CONSTR. SUPV.: _____
SIGN OFF INITL. _____ DATE: _____

A & E: KM CONSULTING ENGR.'S INC.

P.C.:	CHKD.:	DRN.:	DATE:
	MLB	DJA	5/6/16

PROJECT NAME:
WEST HAVEN

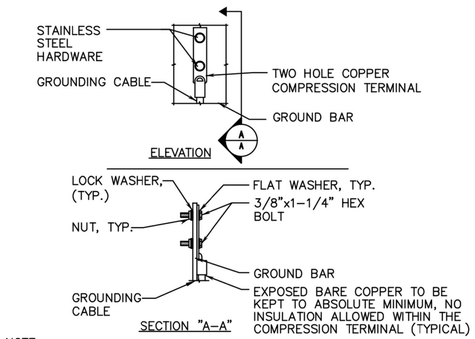
SITE ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

DRAWING TITLE:
ANTENNA PLAN & DETAILS

SITE ID #:	DRAWING #:	REV. #:
CT11193A	A-1	2

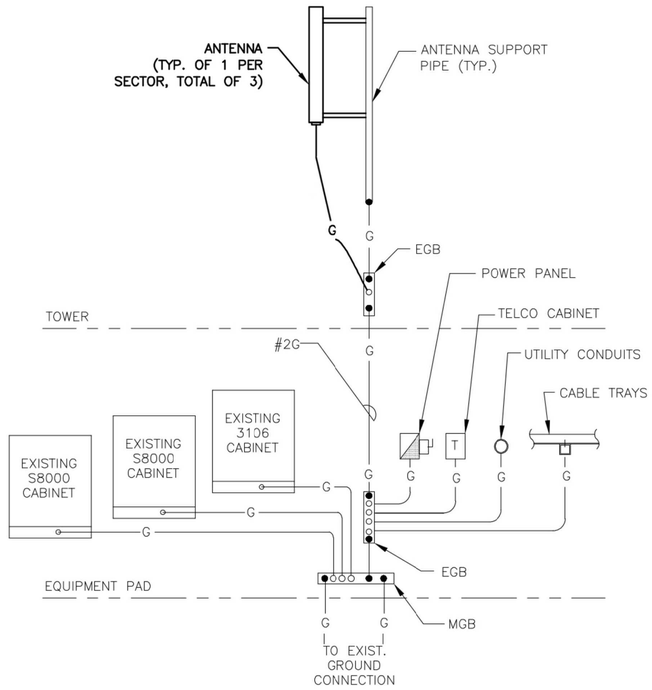
PROJECT #: 140910.02

FILE NAME: A1.dwg

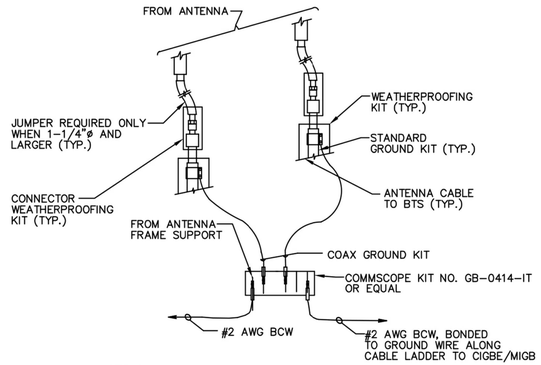


NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

1 G-1 GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.



2 G-1 GROUNDING RISER DIAGRAM
SCALE: N.T.S.



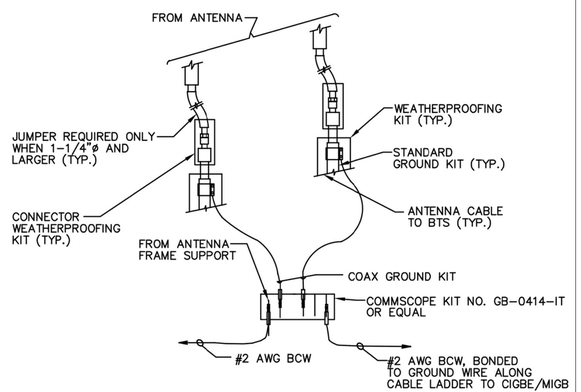
NOTE:

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

3 G-1 GROUND WIRE TO GROUND BAR CONNECTION DETAIL
SCALE: N.T.S.

ELECTRICAL AND GROUNDING NOTES

1. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUNDS); GROUNDING ELECTRODE OR BUILDING STEEL; NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
2. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
3. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
4. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
5. BOND ANTENNA EGB'S AND MGB TO WATER MAIN
6. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
7. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
8. VERIFY PROPOSED SERVICE UPGRADE WITH LOCATION UTILITY COMPANY PRIOR TO CONSTRUCTION.



NOTE:

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

4 G-1 ANTENNA CABLE GROUNDING
SCALE: N.T.S.

LAST PLOTTED: Thursday, 26-May-2016, 09:14
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1	5/23/16	JTF	REVISED PER CLIENT

PROJECT PARTICIPANTS

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SIGN OFF INITL. _____ DATE: _____

RF ENGINEER.: _____
SIGN OFF INITL. _____ DATE: _____

CONSTR. SUPV.: _____
SIGN OFF INITL. _____ DATE: _____

A & E: KM CONSULTING ENGR.'S INC.

P.C.:	CHKD.:	DRN.:	DATE:
	MLB	DJA	5/6/16

PROJECT NAME:
WEST HAVEN

SITE ADDRESS:
24 ROCKDALE ROAD
WEST HAVEN, CT 06516

DRAWING TITLE:
GROUNDING DETAILS

SITE ID #:	DRAWING #:	REV. #:
CT11193A	G-1	2

PROJECT #: 140910.02

FILE NAME: GT.dwg

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 GROUNDING ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATIONS, RADIO, LIGHTNING PROTECTION, AND AC POWER GEC"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 THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RUNG, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTING OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, 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 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 THE 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 PROPOSED 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 DRAWINGS. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTORS 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 PREMISED 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 4000PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE 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) UNLES OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE 3 (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 UMTS 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 WITH ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATIONS. ANY CONSTRUCTIN 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 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 THE CONTRACT AWARD SHALL GOVERN THE DESIGN.

    BUILDING CODE: IBC 2003 W/ 2005 CT SUPPLEMENT + 2009 AMENDMENT.
    ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
    LIGHTNING 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, 9TH EDITION

    TIA/EIA-222-F, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES

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

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DRAWING TITLE:
GENERAL NOTES

SITE ID #:	DRAWING #:	REV. #:
CT11193A	GN-1	2

PROJECT #: 140910.02

FILE NAME: GN1.dwg

LAST PLOTTED: Thursday, 26-May-2016, 09:14
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