Filed by:
Kri Pelletier, Property Specialist - SBA Communications
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September 29, 2017

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

Application for Tower Share
60 Adams Street, Manchester, CT 06042
41.7940481 N
-72.55536 W
T-Mobile #: CTHA039A_NSD

Dear Ms. Bachman:

Please accept this letter as notification pursuant to Connecticut General Statutes § 16-50aa and R.C.S.A § 16-50j-88 of T-Mobile's Application for Tower Sharing at the existing 140-foot Monopole Tower at 60 Adams Street in Manchester, CT.

Per the requirements under R.C.S.A §16-50j-89 please find the following statements in support of T-Mobile's Application:

1. **Facility and Proposed Modifications**

   A. **Existing Facility and Appurtenances**
   - Initial approval was given for this facility on 12/17/98 by the Council in Case # TS-BAM/SCLP-077-981208 and the Town of Manchester on 4/19/99 with Zoning Permit 99-1764
   - Latitude / Longitude: 41.7940481 N / -72.55536 W
   - Height of Tower: 140'
   - Owned/operated by: SBA Towers VIII, LLC
   - Property Owner: Pom-Pom Gali, LLC
   - Size/Components of existing equipment compound:
     - 75' x 74'-6" fenced compound with access double gate containing:
       - Monopole [center of compound]
       - Sprint Equipment Pad [North of monopole w/in compound]
       - Verizon Shelter [West of monopole w/in compound]
       - Verizon Generator [West of monopole w/in compound]
       - Verizon Propane Tank [Southwest of monopole w/in compound]
       - AT&T Shelter [East of monopole w/in compound]
       - H-Frame [Southeast of monopole w/in compound]
       - Underground Telco Box [East of monopole w/in compound]
       - Empty 16'x16' concrete pad (T-Mobile to use 8'x13' portion for equipment) [Southeast of monopole w/in compound]
       - Transformer [Northeast of monopole w/in compound]

- Bollards (9) [Southwest of monopole w/in compound]
- Utility Pole with Guy Anchor [Southeast of monopole w/in compound]
- Abandoned shelter [South of monopole w/in compound]
- Meter Bank [Northeast of monopole w/in compound - T-Mobile to connect at leased area w/in compound]

➢ Components of existing tower:

- AT&T:
  - 114'
    - (1) Platform w/hand rails
  - 129.5'
    - (2) Raycap DC6-48-60-18-8F
  - 125'
    - (3) 7120.16 – Panel Antennas
    - (3) Kathrein 800-10121 – Panel Antennas
    - (3) CCI OPA-65R-LCUU-H6 – Panel Antennas
    - (3) KMW AM-X-CD-16-65-00T-RET – Panel Antennas
    - (3) Ericsson RRUS-32
    - (6) Ericsson RRUS-11
    - (6) CCI DTMABP7819VG12A
    - (6) Kathrein 782 10250
    - (12) 1-1/4" lines
    - (2) .40" fiber
    - (4) .625" DC in
    - (1) 2" Conduit
- Sprint / Clearwire:
  - 125'
    - (1) low profile platform
  - 118.5'
    - (1) Andrew VHLP1-23-DW1 – Dish
    - (1) Andrew VHLP2-23-DW1 – Dish
  - 117'
    - (3) RFS APXVTM14 – Panel Antennas
    - (3) RFS APXVSPP18 – Panel – Panel Antennas
    - (3) Alcatel Lucent RRH8x20-25-FEU
    - (3) Alcatel Lucent RRH1900-4X45
  - 114'
    - (3) Argus LLPX310R-V1 – Panel Antennas
    - (1) 20" x 18" x 9" Junction Box
    - (1) low profile platform
    - (3) 1-1/4" lines
    - (2) 2-1/8" F.C.
    - (1) ¾" fiber
    - (2) 5/8" lines
  - 113'
    - (3) Samsung SPI-22132825WB
  - 112.5'
    - (3) Alcatel Lucent RRH2X50-800

- Verizon:
  - 90'
    - (3) Swedcom SLCP 2x6014 – Panel Antennas
    - (6) Commscope SBNHH-1D65B – Panel Antennas
    - (3) Antel BXA-70063-6CF-EDIN-x – Panel Antennas
    - (3) Alcatel Lucent RRH2X60-AWS
    - (3) Alcatel Lucent RRH2X60-700
    - (3) Alcatel Lucent RRH2X60-PCS
    - (1) RFS DB-T1-6Z-8AB-0Z
    - (1) Platform w/hand rails
    - (12) 1-5/8" lines
    - (2) 1-5/8" fiber

B. Nature and Extent of Proposed Modifications

T-Mobile proposes to install (9) panel antennas at the 135-foot level of the existing 141-foot Monopole Tower and occupy a ground lease area of 12.5' x 16' within the existing fenced compound. T-Mobile's full proposed scope of work is as follows:

Remove: None

Remove and Replace: None

Install:

Tower:

(3) Ericsson AIR32 KRD901146-1_B66A_B2A – Panel Antennas at 135'
(3) Commscope F-65C-R2 – Panel Antennas at 135'
(3) RFS APX16DWV-16DWVS-E-A20 – Panel Antennas at 135'
RX: 698-704, 1735-1740, 1860.2-1864.8 Mhz
TX: 728-734, 1855.2-1864.8, 2135-2140, 2140-2145 Mhz
(3) Ericsson S11B12 RRUs at 135'
(3) Ericsson 32 B66A RRUs at 135'
(3) 15" x 14" x 7.5" RRUS [entitlements only]
(2) 1-1/4" Fiber [inside monopole]
(2) 1-5/8" lines [entitlements only]
(1) Commscope MCG23HDX-10M-9-98 Antenna Mounting Kit [3-sector antenna mount]

Ground:

(1) GPS Antenna (Ground Mount to Ice Bridge Post)
(1) Ice Bridge
(1) RBS 6102 Cabinet
(1) PPC Cabinet
(1) RAC 24 Cabinet
(1) 120 Gallon Stationary Vertical ASME Propane (LP) Storage Tank and associated gas line
(1) 7.5 KW APU
(1) H-Frame

Existing Equipment to Remain: None

C. This Proposal is technically, legally, environmentally, and economically feasible and meets public safety concerns per Connecticut General Statute Section 16-50aa.

T-Mobile proposes to collocate at the above-referenced existing telecommunication facility rather than to require additional tower construction. The 60 Adams Street site sits in a heavily trafficked area serving Route 84, Tolland Turnpike, and the surrounding areas of Manchester. Since the site was built, wireless technology has flourished, resulting in greatly increased consumer usage and data transfer. Three carriers currently share space on the tower.

The proposed collocation meets with all legal and technical requirements. This Application contains all required information and statements per R.C.S.A §16-50j-89 and the proposed installation has been drafted per current code, and studied with regard to structural feasibility and RF emissions output. Drawings and Reports are attached. T-Mobile's proposed collocation presents no known material changes to environmental conditions from those as documented in the Council's original Findings of Fact and presents no known public safety concerns.

2. Engineering Drawings per the requirements under R.C.S.A. §16-50j-89 are enclosed herewith.

3. An Engineering / Structural Analysis per the requirements under R.C.S.A. §16-50j-89 is enclosed herewith.

4. A Letter from SBA, as Owner of the Facility, agreeing to the proposed shared use of the facility, is enclosed herewith.

5. **Description of any potential environmental impact associated with the proposed shared use, including, but not limited to, visibility, wetlands and water resources, air quality and noise. Sources of noise shall be identified and in compliance with state and local noise control regulations**.

   A. T-Mobile's collocation will not have any significant adverse visual impact on the surrounding areas. The antennas should result in only marginal additional equipment visibility from areas that already have views of the existing tower. The proposed work would not require any Federal Aviation Administration obstruction marking or lighting.
   B. The proposed collocation does not affect alter the existing site with regard to wetlands, water resources or air quality.
   C. T-Mobile's collocation proposes the installation of an emergency backup generator within the leased area of the compound. The generator requires to be exercised only twice a year for 20 minutes each cycle, or 40 minutes yearly. There is zero fuel consumption in standby. The proposed 120 gallon stationary vertical ASME propane storage tank adheres to all required safety zones and clearances. While small in footprint (40"H x 42"W x 27"D), the generator would provide backup time of 80 hours in case of emergency. The Town of Manchester's zoning regulations do not have a defined decibel level.

   The proposed work is not thought to have any substantial adverse environmental impact. Public Need for the additional coverage outweighs any minor environmental effects that would result from the construction, operation, and maintenance of the proposed collocation.

6. A Power Density / RF Report per the requirements under R.C.S.A. §16-50j-89 is enclosed herewith.

A. The operation of T-Mobile's new antennas will not increase the total radio frequency electromagnetic power density at the site to a level at or above the applicable standards. The anticipated Maximum Composite contributions from the T-Mobile facility are only 2.87% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 18.34% of the allowable FCC established general public limit sampled at the ground level.

7. An original and fifteen copies of this Tower Share Application are being submitted along with a $625 filing fee per Conn. Gen. Stat. §4-189j; Regs., Conn. State Agencies §16-50v-1a.\
   A. A copy of this Application and all attachments is being sent to:
      i. The Town of Manchester's General Manager, Scott Shanley
      ii. The Town of Manchester's Zoning Enforcement Officer, James Davis
      iii. The Property Owner, Pom-Pom Gali, LLC.
      iv. (Separate notice is not being sent to tower owner, as it belongs to SBA)

Please note, additionally: the planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a significant change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

T-Mobile respectfully submits for the Council's review and approval this Application for Tower Share.

Sincerely,

Kri Pelletier
Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581
508.251.0720 x3804 + T
508.366.2610 + F
203.446.7700 + C
kpelletier@sbasite.com
Attachments
cc: Scott Shanley, General Manager / with attachments
Town of Manchester, 41 Center Street, Manchester, CT 06045
James Davis, Zoning Enforcement Officer / with attachments
Town of Manchester, 41 Center Street, Manchester, CT 06045
Pom-Pom Gali, LLC. / with attachments
79 Boston Post Road, Willimantic, CT 06226

POWER DENSITY

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	136.5	Height (AGL):	136.5	Height (AGL):	136.5
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%	1.97	Antenna B1 MPE%	1.97	Antenna C1 MPE%	1.97
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	136.5	Height (AGL):	136.5	Height (AGL):	136.5
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60	Total TX Power(W):	60	Total TX Power(W):	60
ERP (W):	2,559.48	ERP (W):	2,559.48	ERP (W):	2,559.48
Antenna A2 MPE%	0.54	Antenna B2 MPE%	0.54	Antenna C2 MPE%	0.54
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Commscope FF-65C-R2	Make / Model:	Commscope FF-65C-R2	Make / Model:	Commscope FF-65C-R2
Gain:	14.25 dBd	Gain:	14.25 dBd	Gain:	14.25 dBd
Height (AGL):	136.5	Height (AGL):	136.5	Height (AGL):	136.5
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):	798.22	ERP (W):	798.22	ERP (W):	798.22
Antenna A3 MPE%	0.36	Antenna B3 MPE%	0.36	Antenna C3 MPE%	0.36

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.87 %**
AT&T	4.28 %
Nextel	0.65 %
PageNet	0.40 %
Verizon Wireless	9.91 %
Clearwire	0.16 %
Sprint	0.07 %
Site Total MPE %:	**18.34 %**

T-Mobile Sector A Total:	2.87 %
T-Mobile Sector B Total:	2.87 %
T-Mobile Sector C Total:	2.87 %
Site Total:	18.34 %

T-Mobile _per sector Max Values	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (µW/cm²)	Frequency (MHz)	Allowable MPE (µW/cm²)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	136.5	9.86	AWS - 2100 MHz	1000	0.99%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	136.5	9.86	PCS - 1900 MHz	1000	0.99%
T-Mobile AWS - 2100 MHz UMTS	2	1,279.74	136.5	5.40	AWS - 2100 MHz	1000	0.54%
T-Mobile 700 MHz LTE	1	798.22	136.5	1.69	700 MHz	467	0.36%
						Total:	**2.87%**

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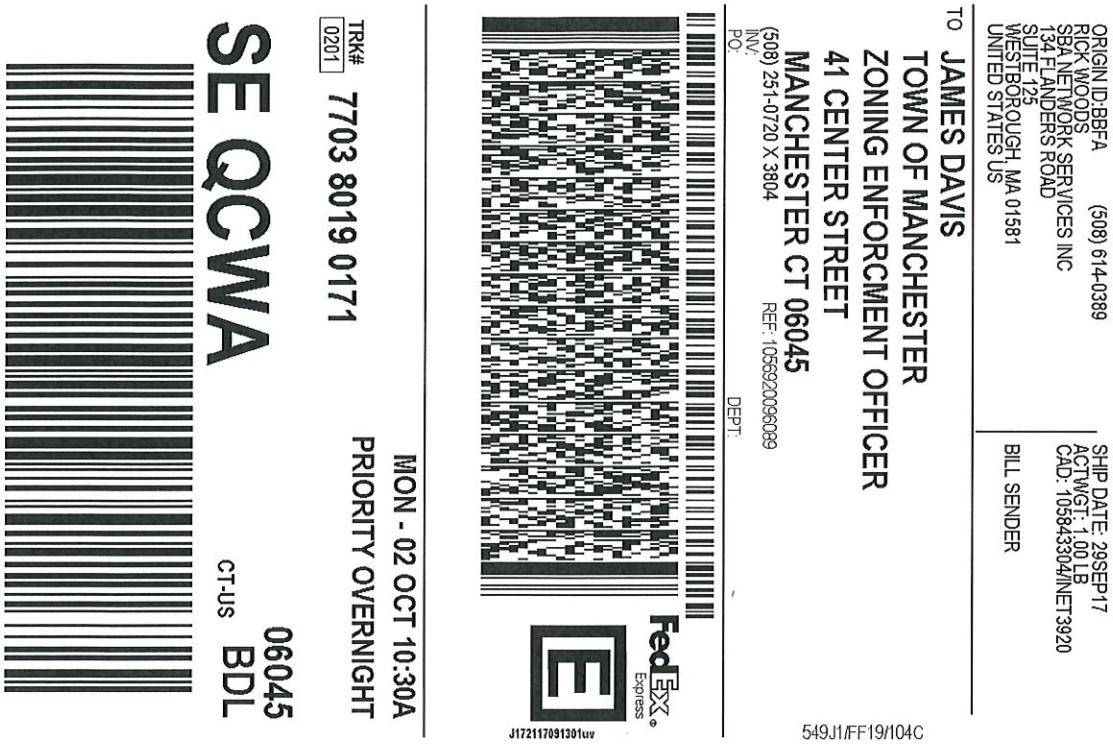
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



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60 ADAMS STREET

Location	60 ADAMS STREET	**Mblu**	28/ 20/ 60/ /
Acct#	002000060	**Owner**	POM-POM GALI LLC
Assessment	$1,144,100	**Appraisal**	$1,634,300
PID	26	**Building Count**	3

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$520,100	$1,114,200	$1,634,300

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$364,200	$779,900	$1,144,100

Owner of Record

Owner POM-POM GALI LLC
Address PO BOX 133
WILLIMANTIC, CT 06226

Sale Price $1,551,222
Certificate C
Book & Page 3204/ 184
Sale Date 12/23/2005
Instrument 36

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
POM-POM GALI LLC	$1,551,222	C	3204/ 184	36	12/23/2005
THORNTON WILLIAM B EST	$0		3130/ 054	35	08/25/2005
THORNTON WILLIAM B	$0		492/ 089		

Building Information

Building 1 : Section 1

Year Built: 1965
Living Area: 1,863
Replacement Cost: $223,203
Replacement Cost Less Depreciation: $84,800

Building Attributes	
Field	**Description**
STYLE	Light Indust

Building Photo

MODEL	Ind/Comm
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Pre-finsh Metl
Exterior Wall 2	Concr/Cinder
Roof Structure	Flat
Roof Cover	Tar + Gravel
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall/Sheetr
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Electr Basebrd
AC Type	None
Bldg Use	Industrial 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	300
Heat/AC	None
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Ceiling & Wall
Rooms/Prtns	Average
Wall Height	9
% Comn Wall	0

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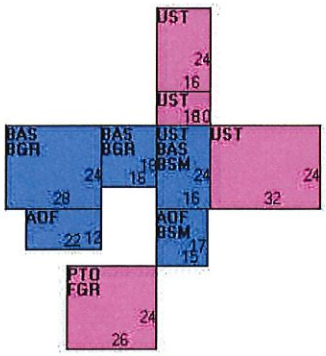
Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,344	1,344
AOF	Office, (Average)	519	519
BGR	Basement Garage	960	0
BSM	Basement	639	0
FGR	Garage	624	0
PTO	Patio	624	0
UST	Utility, Storage, Unfinished	1,696	0
		6,406	1,863

Building 2 : Section 1

Year Built: 1965
Living Area: 8,658
Replacement Cost: $367,995
Replacement Cost Less Depreciation: $139,800

Building Photo

Building Attributes : Bldg 2 of 3	
Field	**Description**
STYLE	Service Shop
MODEL	Serv Station

Grade	Minimum
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Metal/Tin
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Forced Air-Duc
AC Type	None
Bldg Use	Industrial 96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	300
Heat/AC	None
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Ceiling & Wall
Rooms/Prtns	Average
Wall Height	18
% Comn Wall	0

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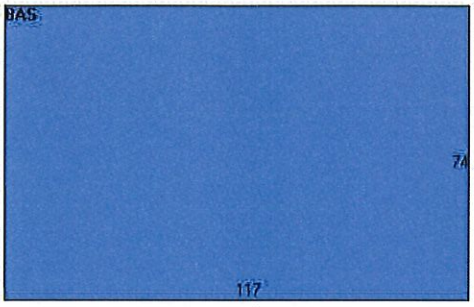
Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	8,658	8,658
		8,658	8,658

Building 3 : Section 1

Year Built: 1965
Living Area: 6,398
Replacement Cost: $454,584
Replacement Cost Less Depreciation: $172,700

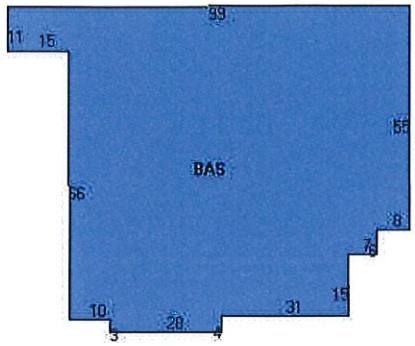
Building Attributes : Bldg 3 of 3	
Field	**Description**
STYLE	Office Bldg
MODEL	Comm/Ind
Grade	Below Average
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Flat

Building Photo

(http://images.vgsi.com/photos2/ManchesterCTPhotos//\00\02\62/32.jpg)

Building Layout

Roof Cover	Metal/Tin
Interior Wall 1	Drywall/Sheetr
Interior Wall 2	
Interior Floor 1	Tile/Vinyl Cmp
Interior Floor 2	Carpet
Heating Fuel	Electric
Heating Type	Electr Basebrd
AC Type	Central
Bldg Use	Industrial 94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	300C
Heat/AC	Heat AC Split
Frame Type	Masonry
Baths/Plumbing	Average
Ceiling/Wall	Susp Ceil & Wl
Rooms/Prtns	Average
Wall Height	10
% Comn Wall	0



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	6,398	6,398
		6,398	6,398

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	300
Description	Industrial 96
Zone	IND
Neighborhood	4000
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	26.45
Frontage	0
Depth	0
Assessed Value	$779,900
Appraised Value	$1,114,200

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
FGR1	Garage Average			1440 S.F.	$13,000	2
PAV2	Paving Concrete			40000 S.F.	$54,000	1
PAV2	Paving Concrete			11498 S.F.	$25,900	3
SHD1	Shed			1680 S.F.	$15,100	1
PAV1	Paving Asphalt			8000 S.F.	$10,000	3

TNK5	Tank Elevated			240 GALS	$400	1
FN4	Fence 8' Chain			290 L.F.	$4,400	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$440,800	$1,114,200	$1,555,000
2010	$527,000	$1,156,400	$1,683,400
2005	$458,400	$795,200	$1,253,600

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$308,600	$779,900	$1,088,500
2010	$369,000	$809,400	$1,178,400
2005	$320,900	$556,600	$877,500

September 28, 2017

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

RE: **Notice of Intent to Allow Shared Use of the Existing SBA Telecommunications Site**
Location: **60 Adams Street, Manchester, CT**
TMO Site No: 3REA226I_NSD
SBA Site No: CT16504

Dear Ms. Bachman:

Please let the following serve as Evidence of Intent to allow T-Mobile's shared use of the existing SBA telecommunications site at 60 Adams Street, Manchester, CT.

SBA Towers VIII, LLC ("Owner") and T-Mobile Northeast LLC ("Tenant") are entering into a Site Lease Agreement. Tenant will be provided ground space within the existing site compound for its base station equipment and space at the height of 135' for antennas and associated equipment.

Thank you,

Rick Woods
Site Development Manager
SBA COMMUNICATIONS CORPORATION
134 Flanders Road, Suite 125
Westboro, MA 01581

508.251.0720 x3800 + T
508.366.2610 + F
508.614.0389 + C
rwoods@sbasite.com

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

T-Mobile Existing Facility

Site ID: CTHA039A

CTHA039A
60 Adams Street
Manchester, CT 06042

August 18, 2017

EBI Project Number: 6217003713

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	18.34 %

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

EBI Consulting
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August 18, 2017

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

Emissions Analysis for Site: **CTHA039A – CTHA039A**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **60 Adams Street, Manchester, 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 population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (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 **60 Adams Street, Manchester, 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 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.

2) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

3) 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

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

6) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A** & **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope FF-65C-R2** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR32 B66A/B2A** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **RFS APX16DWV-16DWVS-E-A20** has a maximum gain of **16.3 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope FF-65C-R2** has a maximum gain of **14.25 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerline of the proposed antennas is **136.5 feet** above ground level (AGL).

9) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

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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 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	136.5	Height (AGL):	136.5	Height (AGL):	136.5
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%	1.97	Antenna B1 MPE%	1.97	Antenna C1 MPE%	1.97
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	136.5	Height (AGL):	136.5	Height (AGL):	136.5
Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)	Frequency Bands	2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60	Total TX Power(W):	60	Total TX Power(W):	60
ERP (W):	2,559.48	ERP (W):	2,559.48	ERP (W):	2,559.48
Antenna A2 MPE%	0.54	Antenna B2 MPE%	0.54	Antenna C2 MPE%	0.54
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope FF-65C-R2	Make / Model:	Commscope FF-65C-R2	Make / Model:	Commscope FF-65C-R2
Gain:	14.25 dBd	Gain:	14.25 dBd	Gain:	14.25 dBd
Height (AGL):	136.5	Height (AGL):	136.5	Height (AGL):	136.5
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):	798.22	ERP (W):	798.22	ERP (W):	798.22
Antenna A3 MPE%	0.36	Antenna B3 MPE%	0.36	Antenna C3 MPE%	0.36

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.87 %**
AT&T	4.28 %
Nextel	0.65 %
PageNet	0.40 %
Verizon Wireless	9.91 %
Clearwire	0.16 %
Sprint	0.07 %
Site Total MPE %:	**18.34 %**

T-Mobile Sector A Total:	2.87 %
T-Mobile Sector B Total:	2.87 %
T-Mobile Sector C Total:	2.87 %
Site Total:	18.34 %

T-Mobile _per sector Max Values	# 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 AWS - 2100 MHz LTE	2	2,334.27	136.5	9.86	AWS - 2100 MHz	1000	0.99%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	136.5	9.86	PCS - 1900 MHz	1000	0.99%
T-Mobile AWS - 2100 MHz UMTS	2	1,279.74	136.5	5.40	AWS - 2100 MHz	1000	0.54%
T-Mobile 700 MHz LTE	1	798.22	136.5	1.69	700 MHz	467	0.36%
						Total:	**2.87%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	2.87 %
Sector B:	2.87 %
Sector C:	2.87 %
T-Mobile Per Sector Maximum:	2.87 %
Site Total:	18.34 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **18.34%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

TES
Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

Post-Mod Structural Analysis Report

Existing 141 ft EEI Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT16504-A

Customer Site Name: Manchester 12, CT

Carrier Name: T-Mobile

Carrier Site ID / Name: CTHA039A / CTHA039A

Site Location: 60 Adams Street

Manchester, Connecticut

Hartford County

Latitude: 41.794100

Longitude: -72.555300

9/15/17

Analysis Result:

Max Structural Usage: 93.9% [Pass]

Max Foundation Usage: 90% [Pass]

Report Prepared By : Ram Kodali

Introduction

The purpose of this report is to summarize the analysis results on the 141 ft EEI Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any existing modification listed under Sources of Information was assumed completed and was included in this analysis.

The proposed modification by **TES** listed under Sources of Information was considered completed and was included in this analysis.

Sources of Information

Tower Drawings	FDH, Mapping Report #15BRLA1500, dated June 15, 2015
Foundation Drawing	FDH, Mapping Report # 15BRLC1500, dated June 16, 2015
Geotechnical Report	FDH, Project # 15BRNG1600, dated June 17, 2015
Proposed Modification	TES Job # 36710

Analysis Criteria

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

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed V_{ult} = 125 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 97 mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.178, S_1 = 0.064

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
7	129.5	2	Raycap DC6-48-60-18-8F	Platform w/ Hand Rails*	(12) 1 1/4" (2) 0.40" Fiber & (4) 0.625" DC in (1) 2" Conduit	AT&T
8	125.0	3	7120.16 - Panel			
9		3	Kathrein 800-10121 - Panel			
10		3	CCI OPA-65R-LCUU-H6 - Panel			
11		3	KMW AM-X-CD-16-65-00T-RET - Panel			
12		3	Ericsson RRUS-32			
13		6	Ericsson RRUS-11			
14		6	CCI DTMABP7819VG12A			
15		6	Kathrein 782 10250			
16	118.5	1	Andrew VHLP1-23-DW1 - Dish	Low Profile Platform**	(3) 1-1/4" (2) 2 1/8" F.C. (1) 3/4" Fiber (2) 5/8"	Sprint-Clearwire
17		1	Andrew VHLP2-23-DW1 - Dish			
18	117.0	3	RFS APXVTM14 - Panel			
19		3	RFS APXVSPP18 - Panel			
20		3	Alcatel Lucent RRH8x20-25-FEU			
21		3	Alcatel Lucent RRH1900-4X45			
22	114.5	3	Argus LLPX310R-V1 - Panel			
23	114.0	1	20" x 18" x 9" Junction Box			
24	113.0	3	Samsung SPI-22132825WB			
25	112.5	3	Alcatel Lucent RRH2X50-800			
26	90.0	3	Swedcom SLCP 2x6014 - Panel	Platform w/ Hand Rails	(12) 1 5/8" (2) 1 5/8" Fiber	Verizon
27		6	Commscope SBNHH-1D65B - Panel			
28		3	Antel BXA-70063-6CF-EDIN-x - Panel			
29		3	Alcatel Lucent RRH2X60-AWS			
30		3	Alcatel Lucent RRH2X60-700			
31		3	Alcatel Lucent RRH2X60-PCS			
32		1	RFS DB-T1-6Z-8AB-0Z			

*At 125'.
**At 114'.

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	135.0	3	Ericsson AIR32 KRD901146-1_B66A_B2A - Panel	(3) Sector Frame (MCG23HDX-10M-9-96)	(2) 1 1/4" Fiber (2) 1 5/8"	T-Mobile
2		3	Commscope F-65C-R2 - Panel			
3		3	RFS APX16DWV-16DWVS-E-A20 - Panel			
4		3	Ericsson S11B12 - RRU			
5		3	Ericsson RRUS 32 B66A - RRU			
6		3	15" X 14" X 7.5" - RRU			

The proposed transmission lines can be installed inside or outside of the pole shafts. If installed outside, the lines shall be strapped tightly to the face of the pole shafts. Stacking of lines is not allowed.

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	**93.9%**	**76.7%**	**59%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Analysis Reactions	3445.4	32.9

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

Operational Condition (Rigidity)

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-G for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 1.8876 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the structure and its foundation will be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the design ANSI/TIA/EIA 222-G standards under a basic wind speed of 97 mph no ice and 50 mph with 1" radial ice after the following proposed modification is successfully completed.

- Proposed modification design drawing by **TES** Job # 36710

Pre-Mod Installation Determination

We have also checked this tower to determine if the proposed T-Mobile equipment loading can be installed prior to the completion of the required modifications. We ran a reduced wind loading case as required by TIA-322 considering a construction period of no more than 6 months.

The tower and foundations passed, so the Carrier can proceed and install their proposed loading prior to the mods completion. Please be aware that this approval is being provided and is based on the method outlined in TIA-322. This approval is not a blanket approval and there is still a risk that the tower will experience a wind event that cannot be predicted by TIA-322 or our Engineers. In the event of an unforeseen wind event, Tower Engineering Solutions will not be liable nor responsible for damage to the tower or the Carriers equipment. Additionally, the tower cannot go beyond the 6 month construction period without the modifications being completed. If the modifications cannot be completed within 6 months from the completed installation of the Carrier's proposed equipment, TES must be notified immediately for further review.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed or/and ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

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

Usage Diagram - Max Ratio 93.93% at 70.0ft

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017
Site Name:	Manchester 12, CT	**Exposure:**	C	
Height:	140.50 (ft)	**Gh:**	1.1	
Base Elev:	0.000 (ft)			Page: 1

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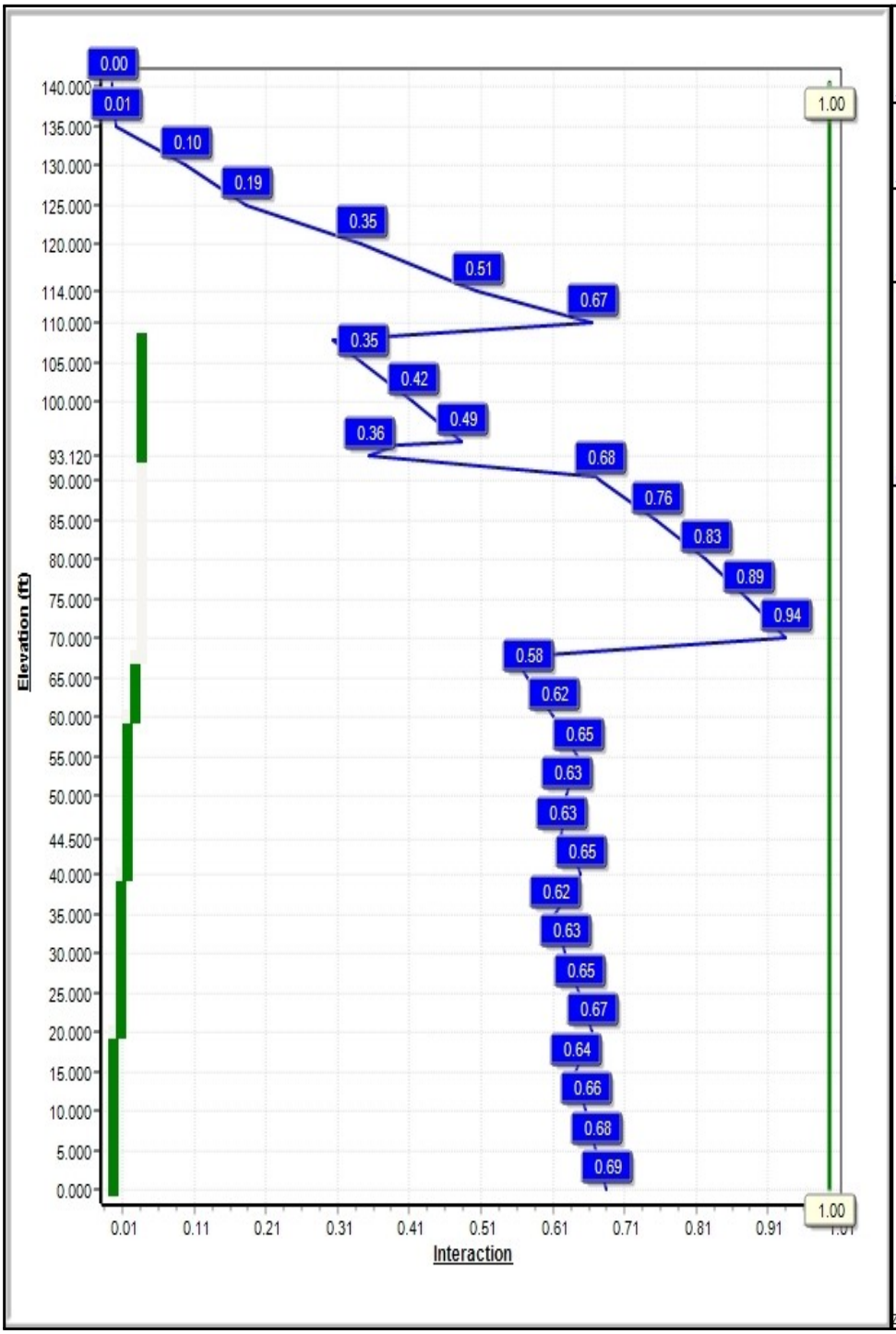
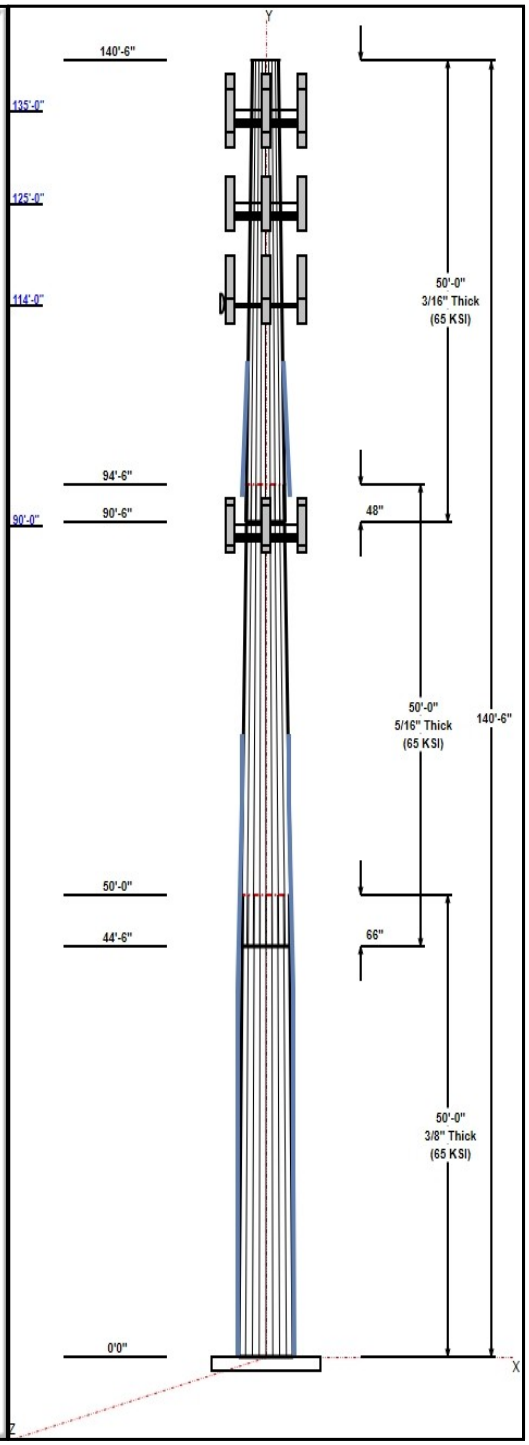
Dead Load Factor:	1.20	**Iterations:**	25
Wind Load Factor:	1.60		

Load Case : 1.2D + 1.6W 97 mph Wind





Structure: CT16504-A-SBA

Type: Tapered
Site Name: Manchester 12, CT
Height: 140.50 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.18206

9/15/2017

Tower Engineering Solutions

Shaft Properties

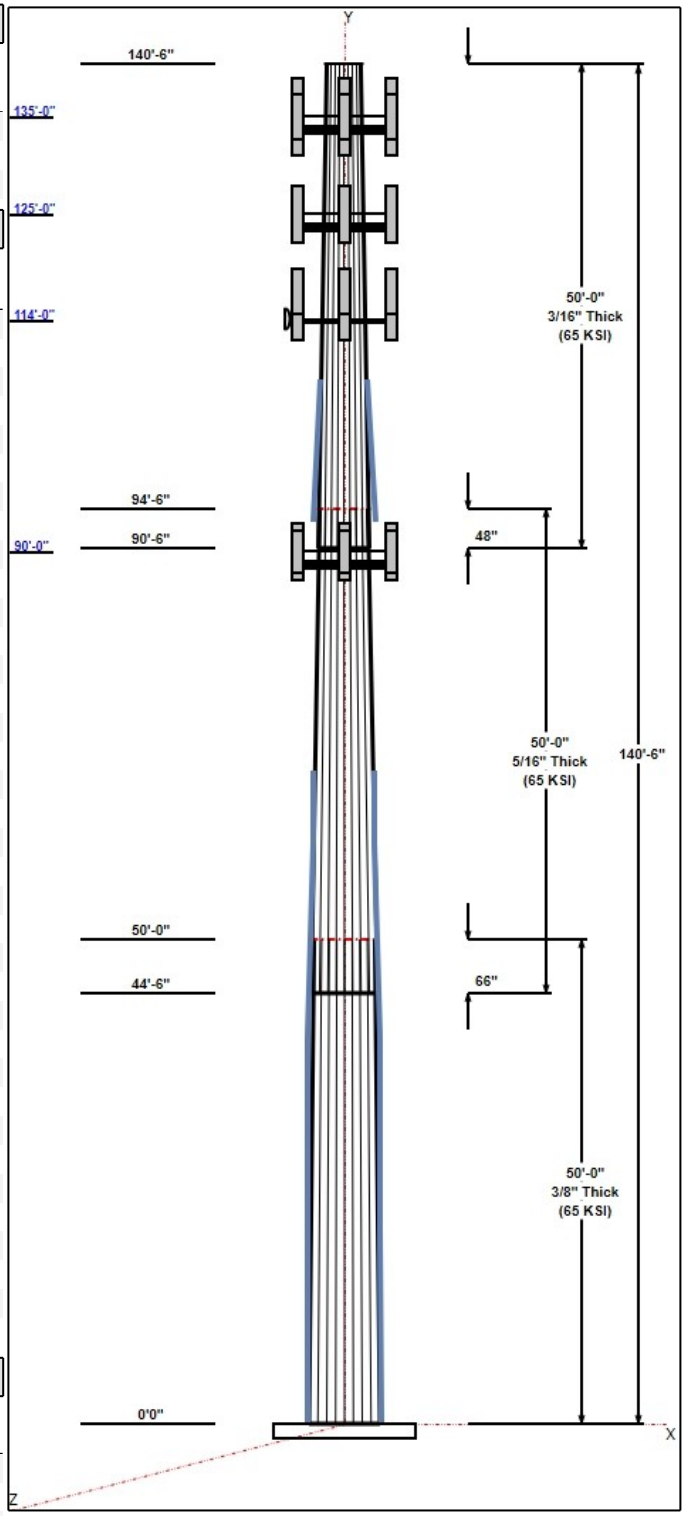
Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	50.00	33.44	42.54	0.375		0.18206	65
2	50.00	25.96	35.06	0.313	Slip	0.18206	65
3	50.00	17.96	27.06	0.188	Slip	0.18206	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
135.00	135.00	3	Ericsson AIR32	T-Mobile
135.00	135.00	3	Commscope F-65C-R2	T-Mobile
135.00	135.00	3	RFS	T-Mobile
135.00	135.00	3	Ericsson S11B12	T-Mobile
135.00	135.00	3	Ericsson RRUS 32 B66A	T-Mobile
135.00	135.00	3	Expansion rights	T-Mobile
135.00	135.00	3	Sector Frame	T-Mobile
125.00	129.50	2	Raycap DC6-48-60-18-8F	AT&T
125.00	125.00	6	CCI DTMABP7819VG12A	AT&T
125.00	125.00	6	Ericsson RRUS-11	AT&T
125.00	125.00	3	Ericsson RRUS-32	AT&T
125.00	125.00	3	Kathrein 800-10121	AT&T
125.00	125.00	3	KMW	AT&T
125.00	125.00	3	7120.16	AT&T
125.00	125.00	3	CCI OPA-65R-LCUU-H6	AT&T
125.00	125.00	6	Kathrein 782 10250	AT&T
125.00	125.00	1	Platform w/ Hand Rails	AT&T
114.00	118.50	1	Andrew VHLP1-23-DW1	Sprint-Clearwire
114.00	118.50	1	Andrew VHLP2-23-DW1	Sprint-Clearwire
114.00	114.50	3	Argus LLPX310R-V1	Sprint-Clearwire
114.00	113.00	3	Samsung	Sprint-Clearwire
114.00	114.00	1	20" x 18" x 9" Junction Box	Sprint-Clearwire
114.00	117.00	3	RFS APXVTM14	Sprint-Clearwire
114.00	115.00	3	RFS APXVSPP18	Sprint-Clearwire
114.00	117.00	3	Alcatel Lucent	Sprint-Clearwire
114.00	112.50	3	Alcatel Lucent	Sprint-Clearwire
114.00	117.00	3	Alcatel Lucent	Sprint-Clearwire
114.00	114.00	1	Low Profile Platform	Sprint-Clearwire
90.00	90.00	3	Swedcom SLCP 2x6014	Verizon
90.00	90.00	6	Commscope	Verizon
90.00	90.00	3	Antel	Verizon
90.00	90.00	3	Alcatel Lucent	Verizon
90.00	90.00	3	Alcatel Lucent	Verizon
90.00	90.00	3	Alcatel Lucent	Verizon
90.00	90.00	1	RFS DB-T1-6Z-8AB-0Z	Verizon
90.00	90.00	1	Platform w/ Hand Rails	Verizon

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	135.00	Outside	1 1/4" Fiber	T-Mobile
0.00	135.00	Outside	1 5/8" Coax	T-Mobile
0.00	125.00	Inside	0.40" Fiber	AT&T
0.00	125.00	Inside	0.625" DC	AT&T
0.00	125.00	Inside	1 1/4" Coax	AT&T
0.00	125.00	Inside	2" Conduit	AT&T
0.00	114.00	Inside	1-1/4"	Sprint-Clearwire



0.00	114.00	Inside	2 1/8" F.C.	Sprint-Clearwire
0.00	114.00	Inside	3/4"	Sprint-Clearwire
0.00	114.00	Inside	5/8"	Sprint-Clearwire
90.50	110.50	Outside	1" Reinforcing plate	
90.50	110.50	Outside	1" Reinforcing plate	
0.00	90.00	Inside	1 5/8" Coax	Verizon
0.00	90.00	Inside	1 5/8" Fiber	Verizon
40.00	70.00	Outside	1" Reinforcing plate	
40.00	70.00	Outside	1" Reinforcing plate	
0.00	40.00	Outside	1.25" Reinforcing plate	
0.00	40.00	Outside	1.25" Reinforcing plate	

Anchor Bolts

Qty	Specifications	Grade (ksi)	Arrangement
12	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.7500	57.0	60.0	Round

Reactions

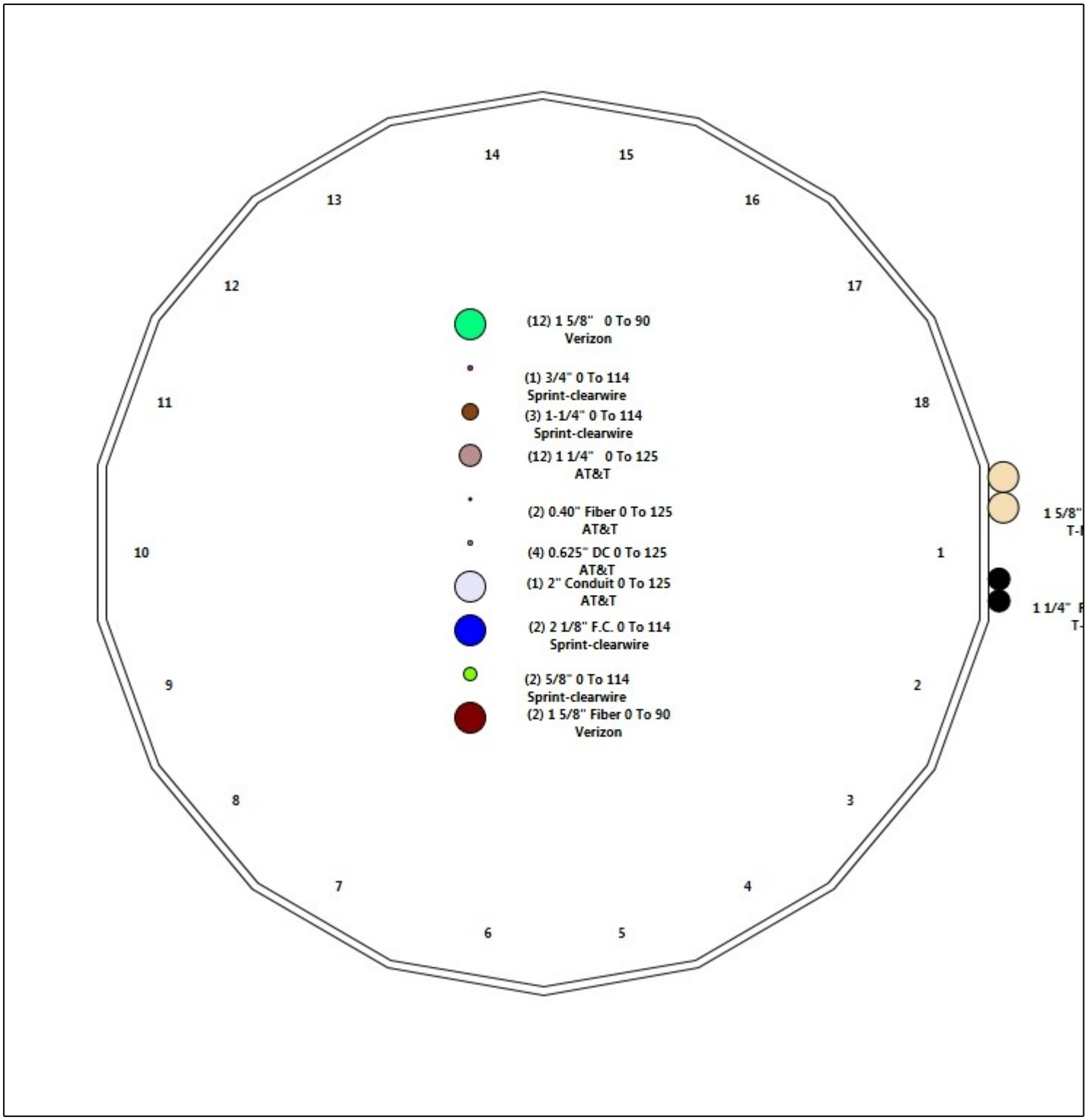
Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 97 mph Wind	3445.4	32.9	39.7
0.9D + 1.6W 97 mph Wind	3400.3	32.8	29.7
1.2D + 1.0Di + 1.0Wi 50 mph Wind	991.0	9.1	81.9
1.2D + 1.0E	172.0	1.5	39.7
0.9D + 1.0E	169.5	1.5	29.8
1.0D + 1.0W 60 mph Wind	818.6	7.9	33.1

Structure: CT16504-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Manchester 12, CT
Height: 140.50 (ft)

9/15/2017

Tower Engineering Solutions



Shaft Properties

Structure:	CT16504-A-SBA		**Code:**	EIA/TIA-222-G	9/15/2017
Site Name:	Manchester 12, CT		**Exposure:**	C	
Height:	140.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	50.000	0.3750	65		0.00	7,617
2	18	50.000	0.3125	65	Slip	66.00	5,096
3	18	50.000	0.1875	65	Slip	48.00	2,260
					Total Shaft Weight:		**14,973**

	Bottom						Top						
Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	42.54	0.00	50.19	11272.80	18.59	113.44	33.44	50.00	39.35	5434.44	14.31	89.16	0.182064
2	35.06	44.50	34.47	5258.76	18.37	112.20	25.96	94.50	25.44	2114.11	13.24	83.07	0.182064
3	27.06	90.50	15.99	1459.57	24.04	144.34	17.96	140.50	10.58	422.08	15.48	95.79	0.182064

Additional Steel

							Intermediate Connectors		Termination Connectors			
Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Fu (ksi)	Offset (in)	Description	Spacing (in)	Description	Spacing (in)	Lower Qty	Upper Qty
0.00	20.00	4	LNP LP7X125-B-20A	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00		
20.00	40.00	4	LNP LP6X125-G-20AB	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00		
40.00	60.00	4	LNP LP6X100-G-20BC	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00		
60.00	67.50	4	LNP LP6X100-G-10CT	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00		
93.12	107.8	3	LNP LP6X100-G-20TT	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00	8	8

Load Summary

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Tower Engineering Solutions

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	135.00	Ericsson AIR32	3	132.20	6.51	0.87	389.88	8.081	0.87	0.00	0.00
2	135.00	Commscope F-65C-R2	3	61.70	14.17	0.84	521.15	16.432	0.84	0.00	0.00
3	135.00	RFS APX16DWV-16DWVS-E-A20	3	40.70	6.46	0.62	234.77	7.960	0.62	0.00	0.00
4	135.00	Ericsson S11B12	3	51.00	2.83	0.70	142.83	3.716	0.70	0.00	0.00
5	135.00	Ericsson RRUS 32 B66A	3	52.90	3.87	0.87	177.13	3.688	0.87	0.00	0.00
6	135.00	Expansion rights (15"X14"X7.5")	3	70.00	3.16	0.88	187.34	4.150	0.88	0.00	0.00
7	135.00	Sector Frame	3	817.00	15.00	0.75	1659.78	24.947	0.75	0.00	0.00
8	125.00	Raycap DC6-48-60-18-8F	2	32.80	1.47	0.90	113.74	2.386	0.90	0.00	4.50
9	125.00	CCI DTMABP7819VG12A	6	19.00	1.14	0.67	52.06	2.147	0.67	0.00	0.00
10	125.00	Ericsson RRUS-11	6	54.00	2.52	0.67	179.10	3.396	0.67	0.00	0.00
11	125.00	Ericsson RRUS-32	3	77.00	2.52	0.75	239.34	4.538	0.75	0.00	0.00
12	125.00	Kathrein 800-10121	3	44.10	5.15	0.79	234.79	6.546	0.79	0.00	0.00
13	125.00	KMW AM-X-CD-16-65-00T-RET	3	48.50	8.02	0.75	311.34	9.750	0.75	0.00	0.00
14	125.00	7120.16	3	15.40	3.94	1.22	228.71	5.206	1.22	0.00	0.00
15	125.00	CCI OPA-65R-LCUU-H6	3	73.00	9.66	0.79	392.78	11.481	0.79	0.00	0.00
16	125.00	Kathrein 782 10250	6	6.40	0.52	0.67	23.14	1.265	0.67	0.00	0.00
17	125.00	Platform w/ Hand Rails	1	2000.00	40.00	1.00	4741.90	67.419	1.00	0.00	0.00
18	114.00	Andrew VHLP1-23-DW1	1	14.00	1.61	1.00	59.93	2.594	1.00	0.00	4.50
19	114.00	Andrew VHLP2-23-DW1	1	31.00	4.69	1.00	157.95	6.346	1.00	0.00	4.50
20	114.00	Argus LLPX310R-V1	3	50.70	4.31	0.69	202.50	5.564	0.69	0.00	0.50
21	114.00	Samsung SPI-22132825WB	3	33.10	1.82	0.76	90.08	3.086	0.76	0.00	-1.00
22	114.00	20" x 18" x 9" Junction Box	1	20.00	3.15	1.00	145.93	4.779	1.00	0.00	0.00
23	114.00	RFS APXVTM14	3	116.70	6.34	0.79	337.46	7.812	0.79	0.00	3.00
24	114.00	RFS APXVSPP18	3	125.30	8.02	0.83	399.38	9.733	0.83	0.00	1.00
25	114.00	Alcatel Lucent RRH8x20-25-FEU	3	70.00	4.05	0.69	222.34	5.129	0.69	0.00	3.00
26	114.00	Alcatel Lucent RRH2X50-800	3	64.00	2.40	0.97	164.15	3.852	0.97	0.00	-1.50
27	114.00	Alcatel Lucent RRH1900-4X45	3	60.00	2.71	0.98	164.76	4.349	0.98	0.00	3.00
28	114.00	Low Profile Platform	1	1800.00	25.00	1.00	3837.57	52.167	1.00	0.00	0.00
29	90.00	Swedcom SLCP 2x6014	3	45.60	6.49	0.89	309.79	7.890	0.89	0.00	0.00
30	90.00	Commscope SBNHH-1D65B	6	76.40	8.08	0.83	344.43	9.718	0.83	0.00	0.00
31	90.00	Antel BXA-70063-6CF-EDIN-x	3	42.60	7.57	0.73	276.01	9.198	0.73	0.00	0.00
32	90.00	Alcatel Lucent RRH2X60-AWS	3	90.00	3.50	0.76	255.88	4.500	0.76	0.00	0.00
33	90.00	Alcatel Lucent RRH2X60-700	3	90.00	3.50	0.76	255.88	4.500	0.76	0.00	0.00
34	90.00	Alcatel Lucent RRH2X60-PCS	3	55.00	1.51	0.90	168.94	3.026	0.90	0.00	0.00
35	90.00	RFS DB-T1-6Z-8AB-0Z	1	44.00	4.80	1.00	234.89	5.927	1.00	0.00	0.00
36	90.00	Platform w/ Hand Rails	1	2200.00	42.00	1.00	5118.61	69.859	1.00	0.00	0.00
		Totals:	**105**	**14,088.90**			**40,817.76**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	135.00	(2) 1 1/4" Fiber	0.00	Outside
0.00	135.00	(2) 1 5/8" Coax	2.00	Outside
0.00	125.00	(2) 0.40" Fiber	0.00	Inside
0.00	125.00	(4) 0.625" DC	0.00	Inside
0.00	125.00	(12) 1 1/4" Coax	0.00	Inside

Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	No Ice CaAa Factor	Ice Weight (lb)	Ice CaAa (sf)	Ice CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
0.00	125.00	(1) 2" Conduit			0.00	Inside					
0.00	114.00	(3) 1-1/4"			0.00	Inside					
0.00	114.00	(2) 2 1/8" F.C.			0.00	Inside					
0.00	114.00	(1) 3/4"			0.00	Inside					
0.00	114.00	(2) 5/8"			0.00	Inside					
90.50	110.50	(2) 1" Reinforcing plate			1.00	Outside					
90.50	110.50	(1) 1" Reinforcing plate			1.00	Outside					
0.00	90.00	(12) 1 5/8" Coax			0.00	Inside					
0.00	90.00	(2) 1 5/8" Fiber			0.00	Inside					
40.00	70.00	(2) 1" Reinforcing plate			1.00	Outside					
40.00	70.00	(2) 1" Reinforcing plate			1.00	Outside					
0.00	40.00	(2) 1.25" Reinforcing plate			1.00	Outside					
0.00	40.00	(2) 1.25" Reinforcing plate			1.00	Outside					

Shaft Section Properties

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Increment Length: **5 (ft)**

Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Additional Reinforcing Area (in^2)	Ixp (in^4)	Iyp (in^4)	Weight (lb)
0.00	RB1	0.3750	42.540	50.185	11272.8	18.59	113.44	65	80	0.0	35.00	9916.9	7009.3	
5.00		0.3750	41.630	49.102	10558.3	18.16	111.01	65	80	844.6	35.00	9511.8	6724.0	595.5
10.00		0.3750	40.719	48.018	9874.7	17.74	108.58	65	81	826.2	35.00	9115.2	6444.8	595.5
15.00		0.3750	39.809	46.935	9221.2	17.31	106.16	65	81	807.8	35.00	8727.1	6171.5	595.5
20.00	RT1 RB2	0.3750	38.899	45.851	8597.3	16.88	103.73	65	82	789.3	30.00	7139.4	5043.9	510.4
25.00		0.3750	37.988	44.768	8002.1	16.45	101.30	65	82	770.9	30.00	6821.4	4819.9	510.4
30.00		0.3750	37.078	43.684	7435.0	16.02	98.87	65	83	752.5	30.00	6510.6	4601.1	510.4
35.00		0.3750	36.168	42.601	6895.4	15.60	96.45	65	83	734.0	30.00	6207.1	4387.4	510.4
40.00	RT2 RB3	0.3750	35.257	41.517	6382.6	15.17	94.02	65	83	715.6	24.00	4664.1	3297.5	408.3
44.50	Bot - Section 2	0.3750	34.438	40.542	5943.3	14.78	91.84	65	83	628.3	24.00	4457.3	3151.9	367.5
45.00		0.3750	34.347	40.434	5895.8	14.74	91.59	65	83	127.5	24.00	4591.6	3246.4	40.8
50.00	Top - Section 1	0.3125	34.062	33.474	4817.1	17.81	109.00	65	80	1255.9	24.00	4363.9	3086.1	408.3
55.00		0.3125	33.151	32.571	4437.8	17.29	106.08	65	81	561.8	24.00	4142.0	2929.9	408.3
60.00	RT3 RB4	0.3125	32.241	31.668	4078.8	16.78	103.17	65	82	546.5	24.00	3926.0	2777.8	408.3
65.00		0.3125	31.331	30.765	3739.8	16.27	100.26	65	82	531.1	24.00	3715.9	2629.8	408.3
67.50	RT4	0.3125	30.876	30.314	3577.6	16.01	98.80	65	83	259.8	24.00	3613.0	2557.4	204.2
70.00		0.3125	30.421	29.862	3420.1	15.75	97.35	65	83	256.0				
75.00		0.3125	29.510	28.959	3119.2	15.24	94.43	65	83	500.4				
80.00		0.3125	28.600	28.057	2836.4	14.73	91.52	65	83	485.0				
85.00		0.3125	27.690	27.154	2571.3	14.21	88.61	65	83	469.7				
90.00		0.3125	26.779	26.251	2323.2	13.70	85.69	65	83	454.3				
90.50	Bot - Section 3	0.3125	26.688	26.160	2299.4	13.65	85.40	65	83	44.6				
93.12	RB5	0.3125	26.211	25.687	2176.8	13.38	83.88	65	83	372.4	18.00	1740.0	1740.0	160.5
94.50	Top - Section 2	0.1875	26.335	15.560	1344.1	23.36	140.45	65	74	193.5	18.00	1708.9	1708.9	84.5
95.00		0.1875	26.244	15.506	1330.1	23.27	139.97	65	74	26.4	18.00	1697.8	1697.8	30.6
100.00		0.1875	25.334	14.965	1195.5	22.41	135.11	65	75	259.2	18.00	1588.0	1588.0	306.2
105.00		0.1875	24.423	14.423	1070.3	21.56	130.26	65	76	250.0	18.00	1482.0	1482.0	306.2
107.87	RT5	0.1875	23.901	14.112	1002.6	21.07	127.47	65	77	139.3	18.00	1422.9	1422.9	175.8
110.00		0.1875	23.513	13.881	954.2	20.70	125.40	65	77	101.4				
114.00		0.1875	22.785	13.448	867.6	20.02	121.52	65	78	186.0				
115.00		0.1875	22.603	13.339	846.8	19.85	120.55	65	78	45.6				
120.00		0.1875	21.692	12.798	747.7	18.99	115.69	65	79	222.3				
125.00		0.1875	20.782	12.256	656.7	18.13	110.84	65	80	213.1				
130.00		0.1875	19.872	11.714	573.5	17.28	105.98	65	81	203.9				
135.00		0.1875	18.961	11.172	497.5	16.42	101.13	65	82	194.7				
140.00		0.1875	18.051	10.631	428.6	15.56	96.27	65	83	185.5				
140.50		0.1875	17.960	10.576	422.1	15.48	95.79	65	83	18.0				
									Total Weight	**14973.2**				**7546.2**

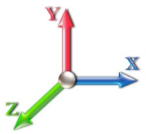
Wind Loading - Shaft

Structure: CT16504-A-SBA
Site Name: Manchester 12, CT
Height: 140.50 (ft)
Base Elev: 0.000 (ft)
Gh: 1.1 **Topography:** 1

Code: EIA/TIA-222-G 9/15/2017
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind
Dead Load Factor 1.20
Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1	1.00	0.85	19.450	21.40	321.92	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	315.03	0.659 *	0.000	5.00	17.806	11.74	401.9	0.0	1013.6
10.00		1.00	0.85	19.450	21.40	308.14	0.664 *	0.000	5.00	17.421	11.57	395.9	0.0	991.4
15.00		1.00	0.85	19.450	21.40	301.25	0.669 *	0.000	5.00	17.036	11.39	389.9	0.0	969.3
20.00	RT1 RB2	1.00	0.90	20.638	22.70	303.21	0.674 *	0.000	5.00	16.650	11.22	407.4	0.0	947.2
25.00		1.00	0.95	21.630	23.79	303.16	0.679 *	0.000	5.00	16.265	11.04	420.3	0.0	925.1
30.00		1.00	0.98	22.477	24.72	301.63	0.684 *	0.000	5.00	15.880	10.87	429.8	0.0	902.9
35.00		1.00	1.01	23.218	25.54	299.03	0.690 *	0.000	5.00	15.495	10.69	436.8	0.0	880.8
40.00	RT2 RB3	1.00	1.04	23.880	26.27	295.63	0.696 *	0.000	5.00	15.110	10.51	441.9	0.0	858.7
44.50	Bot - Section 2	1.00	1.07	24.422	26.86	292.02	0.674 *	0.000	4.50	13.270	8.95	384.6	0.0	753.9
45.00		1.00	1.07	24.479	26.93	291.59	0.677 *	0.000	0.50	1.482	1.00	43.2	0.0	152.9
50.00	Top - Section 1	1.00	1.09	25.029	27.53	287.03	0.681 *	0.000	5.00	14.604	9.94	437.8	0.0	1507.1
55.00		1.00	1.12	25.536	28.09	287.45	0.682 *	0.000	5.00	14.219	9.70	436.1	0.0	674.2
60.00	RT3 RB4	1.00	1.14	26.008	28.61	282.13	0.689 *	0.000	5.00	13.834	9.53	436.1	0.0	655.8
65.00		1.00	1.16	26.450	29.09	276.48	0.695 *	0.000	5.00	13.448	9.35	435.4	0.0	637.3
67.50	RT4	1.00	1.17	26.661	29.33	273.55	0.701 *	0.000	2.50	6.580	4.61	216.3	0.0	311.8
70.00		1.00	1.17	26.866	29.55	270.55	0.704 *	0.000	2.50	6.484	4.57	215.9	0.0	307.1
75.00		1.00	1.19	27.259	29.98	264.37	0.650	0.000	5.00	12.678	8.24	395.4	0.0	600.5
80.00		1.00	1.21	27.632	30.39	257.96	0.650	0.000	5.00	12.293	7.99	388.6	0.0	582.0
85.00		1.00	1.22	27.987	30.79	251.35	0.650	0.000	5.00	11.908	7.74	381.3	0.0	563.6
90.00	Appurtenance(s)	1.00	1.24	28.325	31.16	244.55	0.650	0.000	5.00	11.523	7.49	373.4	0.0	545.2
90.50	Bot - Section 3	1.00	1.24	28.359	31.19	243.86	0.650	0.000	0.50	1.131	0.74	36.7	0.0	53.5
93.12	RB5	1.00	1.25	28.529	31.38	240.23	0.744 *	0.000	2.62	5.947	4.42	222.2	0.0	446.9
94.50	Top - Section 2	1.00	1.25	28.618	31.48	238.29	0.748 *	0.000	1.38	3.090	2.31	116.4	0.0	232.2
95.00		1.00	1.25	28.650	31.51	241.03	0.746 *	0.000	0.50	1.112	0.83	41.8	0.0	31.7
100.00		1.00	1.27	28.961	31.86	233.93	0.751 *	0.000	5.00	10.911	8.20	417.9	0.0	311.1
105.00		1.00	1.28	29.260	32.19	226.69	0.762 *	0.000	5.00	10.526	8.02	413.2	0.0	300.0
107.87	RT5	1.00	1.29	29.426	32.37	222.47	0.771 *	0.000	2.87	5.868	4.53	234.4	0.0	167.2
110.00		1.00	1.29	29.548	32.50	219.31	0.777 *	0.000	2.13	4.273	3.32	172.7	0.0	121.7
114.00	Appurtenance(s)	1.00	1.30	29.771	32.75	213.32	0.650	0.000	4.00	7.835	5.09	266.9	0.0	223.2
115.00		1.00	1.30	29.826	32.81	211.81	0.650	0.000	1.00	1.920	1.25	65.5	0.0	54.7
120.00		1.00	1.32	30.094	33.10	204.19	0.650	0.000	5.00	9.370	6.09	322.6	0.0	266.8
125.00	Appurtenance(s)	1.00	1.33	30.354	33.39	196.46	0.650	0.000	5.00	8.985	5.84	312.0	0.0	255.8
130.00		1.00	1.34	30.605	33.67	188.63	0.650	0.000	5.00	8.600	5.59	301.1	0.0	244.7
135.00	Appurtenance(s)	1.00	1.35	30.850	33.93	180.71	0.651 *	0.000	5.00	8.215	5.35	290.3	0.0	233.6
140.00		1.00	1.36	31.087	34.20	172.69	0.650	0.000	5.00	7.830	5.09	278.5	0.0	222.6
140.50		1.00	1.36	31.110	34.22	171.89	0.650	0.000	0.50	0.762	0.50	27.1	0.0	21.6
								Totals:	**140.50**			**10,987.5**		**17,967.8**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

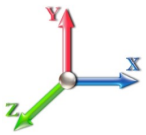
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	135.00	Expansion rights	3	30.850	33.934	0.70	0.80	6.67	252.00	0.000	0.000	362.36	0.00	0.00
2	135.00	Ericsson RRUS 32 B66A	3	30.850	33.934	0.70	0.80	8.08	190.44	0.000	0.000	438.74	0.00	0.00
3	135.00	Ericsson S11B12	3	30.850	33.934	0.56	0.80	4.75	183.60	0.000	0.000	258.14	0.00	0.00
4	135.00	RFS	3	30.850	33.934	0.50	0.80	9.61	146.52	0.000	0.000	521.91	0.00	0.00
5	135.00	Commscope F-65C-R2	3	30.850	33.934	0.67	0.80	28.57	222.12	0.000	0.000	1551.04	0.00	0.00
6	135.00	Ericsson AIR32	3	30.850	33.934	0.70	0.80	13.59	475.92	0.000	0.000	738.03	0.00	0.00
7	135.00	Sector Frame	3	30.850	33.934	0.56	0.75	25.31	2941.20	0.000	0.000	1374.35	0.00	0.00
8	125.00	Kathrein 782 10250	6	30.354	33.389	0.50	0.75	1.57	46.08	0.000	0.000	83.76	0.00	0.00
9	125.00	Raycap DC6-48-60-18-8F	2	30.581	33.639	0.81	0.90	2.38	78.72	0.000	4.500	128.17	0.00	576.77
10	125.00	CCI DTMABP7819VG12A	6	30.354	33.389	0.50	0.75	3.44	136.80	0.000	0.000	183.62	0.00	0.00
11	125.00	CCI OPA-65R-LCUU-H6	3	30.354	33.389	0.59	0.75	17.17	262.80	0.000	0.000	917.30	0.00	0.00
12	125.00	7120.16	3	30.354	33.389	0.92	0.75	10.82	55.44	0.000	0.000	577.78	0.00	0.00
13	125.00	KMW	3	30.354	33.389	0.56	0.75	13.53	174.60	0.000	0.000	723.01	0.00	0.00
14	125.00	Ericsson RRUS-11	6	30.354	33.389	0.50	0.75	7.60	388.80	0.000	0.000	405.89	0.00	0.00
15	125.00	Ericsson RRUS-32	3	30.354	33.389	0.56	0.75	4.25	277.20	0.000	0.000	227.18	0.00	0.00
16	125.00	Kathrein 800-10121	3	30.354	33.389	0.59	0.75	9.15	158.76	0.000	0.000	489.04	0.00	0.00
17	125.00	Platform w/ Hand Rails	1	30.354	33.389	1.00	1.00	40.00	2400.00	0.000	0.000	2136.90	0.00	0.00
18	114.00	Low Profile Platform	1	29.771	32.748	1.00	1.00	25.00	2160.00	0.000	0.000	1309.91	0.00	0.00
19	114.00	Alcatel Lucent	3	29.934	32.927	0.78	0.80	6.37	216.00	0.000	3.000	335.80	0.00	1007.41
20	114.00	Samsung	3	29.716	32.687	0.61	0.80	3.32	119.16	0.000	-1.000	173.62	0.00	-173.62
21	114.00	Andrew VHLP1-23-DW1	1	30.014	33.016	1.00	1.00	1.61	16.80	0.000	4.500	85.05	0.00	382.72
22	114.00	Andrew VHLP2-23-DW1	1	30.014	33.016	1.00	1.00	4.69	37.20	0.000	4.500	247.75	0.00	1114.88
23	114.00	Argus LLPX310R-V1	3	29.798	32.778	0.55	0.80	7.14	182.52	0.000	0.500	374.32	0.00	187.16
24	114.00	Alcatel Lucent	3	29.688	32.657	0.78	0.80	5.59	230.40	0.000	-1.500	291.93	0.00	-437.90
25	114.00	RFS APXVTM14	3	29.934	32.927	0.63	0.80	12.02	420.12	0.000	3.000	633.29	0.00	1899.88
26	114.00	RFS APXVSPP18	3	29.826	32.808	0.66	0.80	15.98	451.08	0.000	1.000	838.62	0.00	838.62
27	114.00	Alcatel Lucent	3	29.934	32.927	0.55	0.80	6.71	252.00	0.000	3.000	353.34	0.00	1060.02
28	114.00	20" x 18" x 9" Junction	1	29.771	32.748	1.00	1.00	3.15	24.00	0.000	0.000	165.05	0.00	0.00
29	90.00	Alcatel Lucent	3	28.325	31.158	0.57	0.75	5.99	324.00	0.000	0.000	298.37	0.00	0.00
30	90.00	Swedcom SLCP 2x6014	3	28.325	31.158	0.67	0.75	13.00	164.16	0.000	0.000	647.90	0.00	0.00
31	90.00	Commscope	6	28.325	31.158	0.62	0.75	30.18	550.08	0.000	0.000	1504.50	0.00	0.00
32	90.00	Antel	3	28.325	31.158	0.55	0.75	12.43	153.36	0.000	0.000	619.86	0.00	0.00
33	90.00	RFS DB-T1-6Z-8AB-0Z	1	28.325	31.158	1.00	1.00	4.80	52.80	0.000	0.000	239.29	0.00	0.00
34	90.00	Alcatel Lucent	3	28.325	31.158	0.57	0.75	5.99	324.00	0.000	0.000	298.37	0.00	0.00
35	90.00	Alcatel Lucent	3	28.325	31.158	0.68	0.75	3.06	198.00	0.000	0.000	152.44	0.00	0.00
36	90.00	Platform w/ Hand Rails	1	28.325	31.158	1.00	1.00	42.00	2640.00	0.000	0.000	2093.82	0.00	0.00
							Totals:		**16,906.68**			**21,780.43**		

Total Applied Force Summary

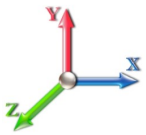
Structure:	CT16504-A-SBA		**Code:**	EIA/TIA-222-G	9/15/2017
Site Name:	Manchester 12, CT		**Exposure:**	C	
Height:	140.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 11

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		401.95	1234.66	0.00	0.00
10.00		395.95	1212.54	0.00	0.00
15.00		389.95	1190.42	0.00	0.00
20.00		407.39	1168.30	0.00	0.00
25.00		420.31	1146.18	0.00	0.00
30.00		429.82	1124.06	0.00	0.00
35.00		436.84	1101.94	0.00	0.00
40.00		441.93	1079.82	0.00	0.00
44.50		384.61	952.92	0.00	0.00
45.00		43.23	175.05	0.00	0.00
50.00		437.78	1728.22	0.00	0.00
55.00		436.10	895.32	0.00	0.00
60.00		436.14	876.89	0.00	0.00
65.00		435.39	858.45	0.00	0.00
67.50		216.35	422.31	0.00	0.00
70.00		215.94	417.70	0.00	0.00
75.00		395.36	821.58	0.00	0.00
80.00		388.59	803.15	0.00	0.00
85.00		381.25	784.72	0.00	0.00
90.00	(23) attachments	6227.92	5172.68	0.00	0.00
90.50		36.69	66.81	0.00	0.00
93.12		222.16	516.64	0.00	0.00
94.50		116.41	268.87	0.00	0.00
95.00		41.82	45.02	0.00	0.00
100.00		417.87	444.09	0.00	0.00
105.00		413.16	433.03	0.00	0.00
107.87		234.41	243.56	0.00	0.00
110.00		172.74	178.41	0.00	0.00
114.00	(25) attachments	5075.54	4438.89	0.00	5879.17
115.00		65.52	72.27	0.00	0.00
120.00		322.60	354.71	0.00	0.00
125.00	(36) attachments	6184.66	4322.85	0.00	576.77
130.00		301.11	265.09	0.00	0.00
135.00	(21) attachments	5534.85	4665.83	0.00	0.00
140.00		278.45	222.57	0.00	0.00
140.50		27.11	21.65	0.00	0.00
	Totals:	**32,767.92**	**39,727.22**	**0.00**	**6,455.94**

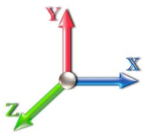
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 12	

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.105	1.015	19.450	0.00	7.92
5.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.105	1.015	19.450	0.00	12.48
5.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.105	1.015	19.450	0.00	0.00
5.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.105	1.015	19.450	0.00	0.00
10.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.107	1.021	19.450	0.00	7.92
10.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.107	1.021	19.450	0.00	12.48
10.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.107	1.021	19.450	0.00	0.00
10.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.107	1.021	19.450	0.00	0.00
15.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.110	1.029	19.450	0.00	7.92
15.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.110	1.029	19.450	0.00	12.48
15.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.110	1.029	19.450	0.00	0.00
15.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.110	1.029	19.450	0.00	0.00
20.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.112	1.036	20.638	0.00	7.92
20.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.112	1.036	20.638	0.00	12.48
20.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.112	1.036	20.638	0.00	0.00
20.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.112	1.036	20.638	0.00	0.00
25.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.115	1.044	21.630	0.00	7.92
25.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.115	1.044	21.630	0.00	12.48
25.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.115	1.044	21.630	0.00	0.00
25.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.115	1.044	21.630	0.00	0.00
30.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.118	1.053	22.477	0.00	7.92
30.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.118	1.053	22.477	0.00	12.48
30.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.118	1.053	22.477	0.00	0.00
30.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.118	1.053	22.477	0.00	0.00
35.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.120	1.061	23.218	0.00	7.92
35.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.120	1.061	23.218	0.00	12.48
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.120	1.061	23.218	0.00	0.00
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.120	1.061	23.218	0.00	0.00
40.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.124	1.071	23.880	0.00	7.92
40.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.124	1.071	23.880	0.00	12.48
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.124	1.071	23.880	0.00	0.00
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.124	1.071	23.880	0.00	0.00
44.50	1 1/4" Fiber	Yes	4.50	0.000	0.00	0.00	0.00	0.112	1.037	24.422	0.00	7.13
44.50	1 5/8" Coax	Yes	4.50	0.000	1.98	0.74	0.00	0.112	1.037	24.422	0.00	11.23
44.50	1" Reinforcing plate	Yes	4.50	0.000	1.00	0.38	0.00	0.112	1.037	24.422	0.00	0.00
44.50	1" Reinforcing plate	Yes	4.50	0.000	1.00	0.38	0.00	0.112	1.037	24.422	0.00	0.00
45.00	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.114	1.042	24.479	0.00	0.79
45.00	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.114	1.042	24.479	0.00	1.25
45.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.114	1.042	24.479	0.00	0.00
45.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.114	1.042	24.479	0.00	0.00
50.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.116	1.047	25.029	0.00	7.92
50.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.116	1.047	25.029	0.00	12.48
50.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.116	1.047	25.029	0.00	0.00
50.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.116	1.047	25.029	0.00	0.00
55.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.117	1.050	25.536	0.00	7.92
55.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.117	1.050	25.536	0.00	12.48
55.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.117	1.050	25.536	0.00	0.00

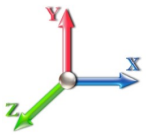
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
55.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.117	1.050	25.536	0.00	0.00
60.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.120	1.060	26.008	0.00	7.92
60.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.120	1.060	26.008	0.00	12.48
60.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.120	1.060	26.008	0.00	0.00
60.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.120	1.060	26.008	0.00	0.00
65.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.123	1.070	26.450	0.00	7.92
65.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.123	1.070	26.450	0.00	12.48
65.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.123	1.070	26.450	0.00	0.00
65.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.123	1.070	26.450	0.00	0.00
67.50	1 1/4" Fiber	Yes	2.50	0.000	0.00	0.00	0.00	0.126	1.078	26.661	0.00	3.96
67.50	1 5/8" Coax	Yes	2.50	0.000	1.98	0.41	0.00	0.126	1.078	26.661	0.00	6.24
67.50	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.126	1.078	26.661	0.00	0.00
67.50	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.126	1.078	26.661	0.00	0.00
70.00	1 1/4" Fiber	Yes	2.50	0.000	0.00	0.00	0.00	0.128	1.084	26.866	0.00	3.96
70.00	1 5/8" Coax	Yes	2.50	0.000	1.98	0.41	0.00	0.128	1.084	26.866	0.00	6.24
70.00	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.128	1.084	26.866	0.00	0.00
70.00	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.128	1.084	26.866	0.00	0.00
75.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.065	0.000	27.259	0.00	7.92
75.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.065	0.000	27.259	0.00	12.48
80.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.067	0.000	27.632	0.00	7.92
80.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.067	0.000	27.632	0.00	12.48
85.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.069	0.000	27.987	0.00	7.92
85.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.069	0.000	27.987	0.00	12.48
90.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.072	0.000	28.325	0.00	7.92
90.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.072	0.000	28.325	0.00	12.48
90.50	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.073	0.000	28.359	0.00	0.79
90.50	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.073	0.000	28.359	0.00	1.25
93.12	1 1/4" Fiber	Yes	2.62	0.000	0.00	0.00	0.00	0.148	1.145	28.529	0.00	4.15
93.12	1 5/8" Coax	Yes	2.62	0.000	1.98	0.43	0.00	0.148	1.145	28.529	0.00	6.54
93.12	1" Reinforcing plate	Yes	2.62	0.000	1.00	0.22	0.00	0.148	1.145	28.529	0.00	0.00
93.12	1" Reinforcing plate	Yes	2.62	0.000	1.00	0.22	0.00	0.148	1.145	28.529	0.00	0.00
94.50	1 1/4" Fiber	Yes	1.38	0.000	0.00	0.00	0.00	0.150	1.151	28.618	0.00	2.19
94.50	1 5/8" Coax	Yes	1.38	0.000	1.98	0.23	0.00	0.150	1.151	28.618	0.00	3.44
94.50	1" Reinforcing plate	Yes	1.38	0.000	1.00	0.11	0.00	0.150	1.151	28.618	0.00	0.00
94.50	1" Reinforcing plate	Yes	1.38	0.000	1.00	0.11	0.00	0.150	1.151	28.618	0.00	0.00
95.00	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.149	1.147	28.650	0.00	0.79
95.00	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.149	1.147	28.650	0.00	1.25
95.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.149	1.147	28.650	0.00	0.00
95.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.149	1.147	28.650	0.00	0.00
100.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.152	1.156	28.961	0.00	7.92
100.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.152	1.156	28.961	0.00	12.48
100.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.152	1.156	28.961	0.00	0.00
100.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.152	1.156	28.961	0.00	0.00
105.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.158	1.173	29.260	0.00	7.92
105.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.158	1.173	29.260	0.00	12.48
105.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.158	1.173	29.260	0.00	0.00
105.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.158	1.173	29.260	0.00	0.00

Linear Appurtenance Segment Forces (Factored)

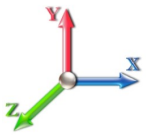
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
107.87	1 1/4" Fiber	Yes	2.87	0.000	0.00	0.00	0.00	0.162	1.187	29.426	0.00	4.55
107.87	1 5/8" Coax	Yes	2.87	0.000	1.98	0.47	0.00	0.162	1.187	29.426	0.00	7.16
107.87	1" Reinforcing plate	Yes	2.87	0.000	1.00	0.24	0.00	0.162	1.187	29.426	0.00	0.00
107.87	1" Reinforcing plate	Yes	2.87	0.000	1.00	0.24	0.00	0.162	1.187	29.426	0.00	0.00
110.00	1 1/4" Fiber	Yes	2.13	0.000	0.00	0.00	0.00	0.165	1.196	29.548	0.00	3.37
110.00	1 5/8" Coax	Yes	2.13	0.000	1.98	0.35	0.00	0.165	1.196	29.548	0.00	5.32
110.00	1" Reinforcing plate	Yes	2.13	0.000	1.00	0.18	0.00	0.165	1.196	29.548	0.00	0.00
110.00	1" Reinforcing plate	Yes	2.13	0.000	1.00	0.18	0.00	0.165	1.196	29.548	0.00	0.00
114.00	1 1/4" Fiber	Yes	4.00	0.000	0.00	0.00	0.00	0.095	0.000	29.771	0.00	6.34
114.00	1 5/8" Coax	Yes	4.00	0.000	1.98	0.66	0.00	0.095	0.000	29.771	0.00	9.98
114.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.095	0.000	29.771	0.00	0.00
114.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.095	0.000	29.771	0.00	0.00
115.00	1 1/4" Fiber	Yes	1.00	0.000	0.00	0.00	0.00	0.086	0.000	29.826	0.00	1.58
115.00	1 5/8" Coax	Yes	1.00	0.000	1.98	0.17	0.00	0.086	0.000	29.826	0.00	2.50
120.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.088	0.000	30.094	0.00	7.92
120.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.088	0.000	30.094	0.00	12.48
125.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.092	0.000	30.354	0.00	7.92
125.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.092	0.000	30.354	0.00	12.48
130.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.096	0.000	30.605	0.00	7.92
130.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.096	0.000	30.605	0.00	12.48
135.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.100	1.001	30.850	0.00	7.92
135.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.100	1.001	30.850	0.00	12.48
										Totals:	**0.0**	**550.8**

Calculated Forces

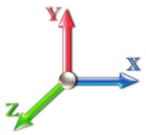
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 15	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 97 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 25

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-39.65	-32.86	0.00	-3445.4	0.00	3445.40	3592.24	1796.12	6217.42	3113.33	0.00	0.000	0.000	0.689
5.00	-38.27	-32.63	0.00	-3281.1	0.00	3281.10	3536.93	1768.47	5988.37	2998.63	0.14	-0.262	0.000	0.675
10.00	-36.91	-32.40	0.00	-3117.9	0.00	3117.95	3480.64	1740.32	5761.86	2885.21	0.55	-0.525	0.000	0.660
15.00	-35.57	-32.16	0.00	-2955.9	0.00	2955.97	3423.37	1711.69	5538.01	2773.12	1.25	-0.790	0.000	0.645
20.00	-34.26	-31.90	0.00	-2795.1	0.00	2795.18	3365.12	1682.56	5316.92	2662.41	2.21	-1.056	0.000	0.668
25.00	-32.97	-31.62	0.00	-2635.6	0.00	2635.69	3305.89	1652.94	5098.71	2553.15	3.47	-1.339	0.000	0.651
30.00	-31.70	-31.31	0.00	-2477.6	0.00	2477.62	3245.52	1622.76	4883.27	2445.26	5.02	-1.622	0.000	0.632
35.00	-30.46	-31.00	0.00	-2321.0	0.00	2321.05	3165.03	1582.51	4642.85	2324.87	6.88	-1.906	0.000	0.616
40.00	-29.25	-30.66	0.00	-2166.0	0.00	2166.07	3084.53	1542.26	4408.49	2207.52	9.02	-2.189	0.000	0.653
44.50	-28.23	-30.31	0.00	-2028.1	0.00	2028.11	3012.08	1506.04	4202.76	2104.51	11.22	-2.466	0.000	0.636
45.00	-27.97	-30.34	0.00	-2012.9	0.00	2012.96	3004.03	1502.02	4180.21	2093.21	11.48	-2.498	0.000	0.626
50.00	-26.10	-29.96	0.00	-1861.2	0.00	1861.25	2423.81	1211.90	3356.59	1680.79	14.25	-2.799	0.000	0.632
55.00	-25.07	-29.62	0.00	-1711.4	0.00	1711.44	2376.14	1188.07	3201.01	1602.88	17.34	-3.097	0.000	0.650
60.00	-24.06	-29.26	0.00	-1563.3	0.00	1563.37	2327.49	1163.75	3047.73	1526.13	20.76	-3.414	0.000	0.616
65.00	-23.12	-28.87	0.00	-1417.0	0.00	1417.06	2277.86	1138.93	2896.88	1450.59	24.50	-3.723	0.000	0.580
67.50	-22.64	-28.68	0.00	-1344.8	0.00	1344.89	2252.16	1126.08	2821.75	1412.97	26.49	-3.877	0.000	0.561
67.50	-22.64	-28.68	0.00	-1344.8	0.00	1344.89	2252.16	1126.08	2821.75	1412.97	26.49	-3.877	0.000	0.561
70.00	-22.07	-28.57	0.00	-1273.1	0.00	1273.19	2218.62	1109.31	2737.91	1370.99	28.55	-4.029	0.000	0.939
75.00	-21.04	-28.29	0.00	-1130.3	0.00	1130.35	2151.54	1075.77	2574.02	1288.93	33.04	-4.528	0.000	0.887
80.00	-20.04	-28.01	0.00	-988.89	0.00	988.89	2084.46	1042.23	2415.20	1209.39	38.04	-5.012	0.000	0.828
85.00	-19.08	-27.70	0.00	-848.86	0.00	848.86	2017.38	1008.69	2261.43	1132.40	43.53	-5.473	0.000	0.760
90.00	-14.46	-21.05	0.00	-710.35	0.00	710.35	1950.30	975.15	2112.72	1057.93	49.49	-5.904	0.000	0.679
90.50	-14.35	-21.04	0.00	-699.82	0.00	699.82	1943.59	971.80	2098.13	1050.62	50.11	-5.947	0.000	0.674
93.12	-13.81	-20.80	0.00	-644.69	0.00	644.69	1908.44	954.22	2022.49	1012.75	53.43	-6.165	0.000	0.359
94.50	-13.54	-20.66	0.00	-615.99	0.00	615.99	1035.36	517.68	1113.15	557.40	55.22	-6.228	0.000	0.395
95.00	-13.45	-20.65	0.00	-605.66	0.00	605.66	1033.16	516.58	1106.89	554.27	55.87	-6.251	0.000	0.488
100.00	-12.97	-20.24	0.00	-502.40	0.00	502.40	1010.63	505.31	1044.65	523.10	62.54	-6.511	0.000	0.420
105.00	-12.53	-19.82	0.00	-401.19	0.00	401.19	987.11	493.55	983.14	492.30	69.47	-6.742	0.000	0.349
107.87	-12.28	-19.58	0.00	-344.30	0.00	344.30	973.17	486.58	948.19	474.80	73.55	-6.861	0.000	0.307
107.87	-12.28	-19.58	0.00	-344.30	0.00	344.30	973.17	486.58	948.19	474.80	73.55	-6.861	0.000	0.307
110.00	-12.05	-19.43	0.00	-302.59	0.00	302.59	962.61	481.31	922.45	461.91	76.63	-6.942	0.000	0.669
114.00	-8.23	-13.87	0.00	-218.99	0.00	218.99	942.31	471.15	874.57	437.94	82.57	-7.257	0.000	0.510
115.00	-8.12	-13.82	0.00	-205.12	0.00	205.12	937.13	468.57	862.70	431.99	84.09	-7.326	0.000	0.484
120.00	-7.76	-13.49	0.00	-136.00	0.00	136.00	910.67	455.33	804.02	402.61	91.91	-7.613	0.000	0.347
125.00	-4.29	-6.79	0.00	-67.97	0.00	67.97	883.23	441.61	746.49	373.80	99.97	-7.807	0.000	0.187
130.00	-4.06	-6.46	0.00	-34.01	0.00	34.01	854.80	427.40	690.24	345.64	108.19	-7.918	0.000	0.103
135.00	-0.20	-0.34	0.00	-1.70	0.00	1.70	825.39	412.70	635.38	318.16	116.49	-7.962	0.000	0.006
140.00	-0.02	-0.03	0.00	-0.01	0.00	0.01	789.80	394.90	578.22	289.54	124.80	-7.964	0.000	0.000
140.50	0.00	-0.03	0.00	0.00	0.00	0.00	785.78	392.89	572.31	286.58	125.63	-7.964	0.000	0.000

Wind Loading - Shaft

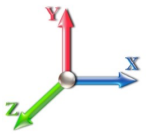
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1	1.00	0.85	19.450	21.40	321.92	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	19.450	21.40	315.03	0.659 *	0.000	5.00	17.806	11.74	401.9	0.0	760.2
10.00		1.00	0.85	19.450	21.40	308.14	0.664 *	0.000	5.00	17.421	11.57	395.9	0.0	743.6
15.00		1.00	0.85	19.450	21.40	301.25	0.669 *	0.000	5.00	17.036	11.39	389.9	0.0	727.0
20.00	RT1 RB2	1.00	0.90	20.638	22.70	303.21	0.674 *	0.000	5.00	16.650	11.22	407.4	0.0	710.4
25.00		1.00	0.95	21.630	23.79	303.16	0.679 *	0.000	5.00	16.265	11.04	420.3	0.0	693.8
30.00		1.00	0.98	22.477	24.72	301.63	0.684 *	0.000	5.00	15.880	10.87	429.8	0.0	677.2
35.00		1.00	1.01	23.218	25.54	299.03	0.690 *	0.000	5.00	15.495	10.69	436.8	0.0	660.6
40.00	RT2 RB3	1.00	1.04	23.880	26.27	295.63	0.696 *	0.000	5.00	15.110	10.51	441.9	0.0	644.0
44.50	Bot - Section 2	1.00	1.07	24.422	26.86	292.02	0.674 *	0.000	4.50	13.270	8.95	384.6	0.0	565.4
45.00		1.00	1.07	24.479	26.93	291.59	0.677 *	0.000	0.50	1.482	1.00	43.2	0.0	114.7
50.00	Top - Section 1	1.00	1.09	25.029	27.53	287.03	0.681 *	0.000	5.00	14.604	9.94	437.8	0.0	1130.3
55.00		1.00	1.12	25.536	28.09	287.45	0.682 *	0.000	5.00	14.219	9.70	436.1	0.0	505.7
60.00	RT3 RB4	1.00	1.14	26.008	28.61	282.13	0.689 *	0.000	5.00	13.834	9.53	436.1	0.0	491.8
65.00		1.00	1.16	26.450	29.09	276.48	0.695 *	0.000	5.00	13.448	9.35	435.4	0.0	478.0
67.50	RT4	1.00	1.17	26.661	29.33	273.55	0.701 *	0.000	2.50	6.580	4.61	216.3	0.0	233.8
70.00		1.00	1.17	26.866	29.55	270.55	0.704 *	0.000	2.50	6.484	4.57	215.9	0.0	230.4
75.00		1.00	1.19	27.259	29.98	264.37	0.650	0.000	5.00	12.678	8.24	395.4	0.0	450.4
80.00		1.00	1.21	27.632	30.39	257.96	0.650	0.000	5.00	12.293	7.99	388.6	0.0	436.5
85.00		1.00	1.22	27.987	30.79	251.35	0.650	0.000	5.00	11.908	7.74	381.3	0.0	422.7
90.00	Appurtenance(s)	1.00	1.24	28.325	31.16	244.55	0.650	0.000	5.00	11.523	7.49	373.4	0.0	408.9
90.50	Bot - Section 3	1.00	1.24	28.359	31.19	243.86	0.650	0.000	0.50	1.131	0.74	36.7	0.0	40.1
93.12	RB5	1.00	1.25	28.529	31.38	240.23	0.744 *	0.000	2.62	5.947	4.42	222.2	0.0	335.2
94.50	Top - Section 2	1.00	1.25	28.618	31.48	238.29	0.748 *	0.000	1.38	3.090	2.31	116.4	0.0	174.1
95.00		1.00	1.25	28.650	31.51	241.03	0.746 *	0.000	0.50	1.112	0.83	41.8	0.0	23.8
100.00		1.00	1.27	28.961	31.86	233.93	0.751 *	0.000	5.00	10.911	8.20	417.9	0.0	233.3
105.00		1.00	1.28	29.260	32.19	226.69	0.762 *	0.000	5.00	10.526	8.02	413.2	0.0	225.0
107.87	RT5	1.00	1.29	29.426	32.37	222.47	0.771 *	0.000	2.87	5.868	4.53	234.4	0.0	125.4
110.00		1.00	1.29	29.548	32.50	219.31	0.777 *	0.000	2.13	4.273	3.32	172.7	0.0	91.3
114.00	Appurtenance(s)	1.00	1.30	29.771	32.75	213.32	0.650	0.000	4.00	7.835	5.09	266.9	0.0	167.4
115.00		1.00	1.30	29.826	32.81	211.81	0.650	0.000	1.00	1.920	1.25	65.5	0.0	41.0
120.00		1.00	1.32	30.094	33.10	204.19	0.650	0.000	5.00	9.370	6.09	322.6	0.0	200.1
125.00	Appurtenance(s)	1.00	1.33	30.354	33.39	196.46	0.650	0.000	5.00	8.985	5.84	312.0	0.0	191.8
130.00		1.00	1.34	30.605	33.67	188.63	0.650	0.000	5.00	8.600	5.59	301.1	0.0	183.5
135.00	Appurtenance(s)	1.00	1.35	30.850	33.93	180.71	0.651 *	0.000	5.00	8.215	5.35	290.3	0.0	175.2
140.00		1.00	1.36	31.087	34.20	172.69	0.650	0.000	5.00	7.830	5.09	278.5	0.0	166.9
140.50		1.00	1.36	31.110	34.22	171.89	0.650	0.000	0.50	0.762	0.50	27.1	0.0	16.2
								Totals:	**140.50**			**10,987.5**		**13,475.8**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

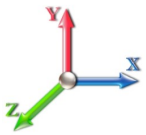
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	135.00	Expansion rights	3	30.850	33.934	0.70	0.80	6.67	189.00	0.000	0.000	362.36	0.00	0.00
2	135.00	Ericsson RRUS 32 B66A	3	30.850	33.934	0.70	0.80	8.08	142.83	0.000	0.000	438.74	0.00	0.00
3	135.00	Ericsson S11B12	3	30.850	33.934	0.56	0.80	4.75	137.70	0.000	0.000	258.14	0.00	0.00
4	135.00	RFS	3	30.850	33.934	0.50	0.80	9.61	109.89	0.000	0.000	521.91	0.00	0.00
5	135.00	Commscope F-65C-R2	3	30.850	33.934	0.67	0.80	28.57	166.59	0.000	0.000	1551.04	0.00	0.00
6	135.00	Ericsson AIR32	3	30.850	33.934	0.70	0.80	13.59	356.94	0.000	0.000	738.03	0.00	0.00
7	135.00	Sector Frame	3	30.850	33.934	0.56	0.75	25.31	2205.90	0.000	0.000	1374.35	0.00	0.00
8	125.00	Kathrein 782 10250	6	30.354	33.389	0.50	0.75	1.57	34.56	0.000	0.000	83.76	0.00	0.00
9	125.00	Raycap DC6-48-60-18-8F	2	30.581	33.639	0.81	0.90	2.38	59.04	0.000	4.500	128.17	0.00	576.77
10	125.00	CCI DTMABP7819VG12A	6	30.354	33.389	0.50	0.75	3.44	102.60	0.000	0.000	183.62	0.00	0.00
11	125.00	CCI OPA-65R-LCUU-H6	3	30.354	33.389	0.59	0.75	17.17	197.10	0.000	0.000	917.30	0.00	0.00
12	125.00	7120.16	3	30.354	33.389	0.92	0.75	10.82	41.58	0.000	0.000	577.78	0.00	0.00
13	125.00	KMW	3	30.354	33.389	0.56	0.75	13.53	130.95	0.000	0.000	723.01	0.00	0.00
14	125.00	Ericsson RRUS-11	6	30.354	33.389	0.50	0.75	7.60	291.60	0.000	0.000	405.89	0.00	0.00
15	125.00	Ericsson RRUS-32	3	30.354	33.389	0.56	0.75	4.25	207.90	0.000	0.000	227.18	0.00	0.00
16	125.00	Kathrein 800-10121	3	30.354	33.389	0.59	0.75	9.15	119.07	0.000	0.000	489.04	0.00	0.00
17	125.00	Platform w/ Hand Rails	1	30.354	33.389	1.00	1.00	40.00	1800.00	0.000	0.000	2136.90	0.00	0.00
18	114.00	Low Profile Platform	1	29.771	32.748	1.00	1.00	25.00	1620.00	0.000	0.000	1309.91	0.00	0.00
19	114.00	Alcatel Lucent	3	29.934	32.927	0.78	0.80	6.37	162.00	0.000	3.000	335.80	0.00	1007.41
20	114.00	Samsung	3	29.716	32.687	0.61	0.80	3.32	89.37	0.000	-1.000	173.62	0.00	-173.62
21	114.00	Andrew VHLP1-23-DW1	1	30.014	33.016	1.00	1.00	1.61	12.60	0.000	4.500	85.05	0.00	382.72
22	114.00	Andrew VHLP2-23-DW1	1	30.014	33.016	1.00	1.00	4.69	27.90	0.000	4.500	247.75	0.00	1114.88
23	114.00	Argus LLPX310R-V1	3	29.798	32.778	0.55	0.80	7.14	136.89	0.000	0.500	374.32	0.00	187.16
24	114.00	Alcatel Lucent	3	29.688	32.657	0.78	0.80	5.59	172.80	0.000	-1.500	291.93	0.00	-437.90
25	114.00	RFS APXVTM14	3	29.934	32.927	0.63	0.80	12.02	315.09	0.000	3.000	633.29	0.00	1899.88
26	114.00	RFS APXVSPP18	3	29.826	32.808	0.66	0.80	15.98	338.31	0.000	1.000	838.62	0.00	838.62
27	114.00	Alcatel Lucent	3	29.934	32.927	0.55	0.80	6.71	189.00	0.000	3.000	353.34	0.00	1060.02
28	114.00	20" x 18" x 9" Junction	1	29.771	32.748	1.00	1.00	3.15	18.00	0.000	0.000	165.05	0.00	0.00
29	90.00	Alcatel Lucent	3	28.325	31.158	0.57	0.75	5.99	243.00	0.000	0.000	298.37	0.00	0.00
30	90.00	Swedcom SLCP 2x6014	3	28.325	31.158	0.67	0.75	13.00	123.12	0.000	0.000	647.90	0.00	0.00
31	90.00	Commscope	6	28.325	31.158	0.62	0.75	30.18	412.56	0.000	0.000	1504.50	0.00	0.00
32	90.00	Antel	3	28.325	31.158	0.55	0.75	12.43	115.02	0.000	0.000	619.86	0.00	0.00
33	90.00	RFS DB-T1-6Z-8AB-0Z	1	28.325	31.158	1.00	1.00	4.80	39.60	0.000	0.000	239.29	0.00	0.00
34	90.00	Alcatel Lucent	3	28.325	31.158	0.57	0.75	5.99	243.00	0.000	0.000	298.37	0.00	0.00
35	90.00	Alcatel Lucent	3	28.325	31.158	0.68	0.75	3.06	148.50	0.000	0.000	152.44	0.00	0.00
36	90.00	Platform w/ Hand Rails	1	28.325	31.158	1.00	1.00	42.00	1980.00	0.000	0.000	2093.82	0.00	0.00
							Totals:		**12,680.01**			**21,780.43**		

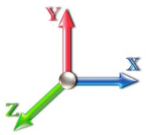
Total Applied Force Summary

Structure:	CT16504-A-SBA		**Code:**	EIA/TIA-222-G	9/15/2017
Site Name:	Manchester 12, CT		**Exposure:**	C	
Height:	140.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 18

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		401.95	926.00	0.00	0.00
10.00		395.95	909.41	0.00	0.00
15.00		389.95	892.82	0.00	0.00
20.00		407.39	876.23	0.00	0.00
25.00		420.31	859.64	0.00	0.00
30.00		429.82	843.04	0.00	0.00
35.00		436.84	826.45	0.00	0.00
40.00		441.93	809.86	0.00	0.00
44.50		384.61	714.69	0.00	0.00
45.00		43.23	131.29	0.00	0.00
50.00		437.78	1296.16	0.00	0.00
55.00		436.10	671.49	0.00	0.00
60.00		436.14	657.66	0.00	0.00
65.00		435.39	643.84	0.00	0.00
67.50		216.35	316.73	0.00	0.00
70.00		215.94	313.28	0.00	0.00
75.00		395.36	616.19	0.00	0.00
80.00		388.59	602.36	0.00	0.00
85.00		381.25	588.54	0.00	0.00
90.00	(23) attachments	6227.92	3879.51	0.00	0.00
90.50		36.69	50.10	0.00	0.00
93.12		222.16	387.48	0.00	0.00
94.50		116.41	201.65	0.00	0.00
95.00		41.82	33.76	0.00	0.00
100.00		417.87	333.07	0.00	0.00
105.00		413.16	324.77	0.00	0.00
107.87		234.41	182.67	0.00	0.00
110.00		172.74	133.80	0.00	0.00
114.00	(25) attachments	5075.54	3329.17	0.00	5879.17
115.00		65.52	54.20	0.00	0.00
120.00		322.60	266.04	0.00	0.00
125.00	(36) attachments	6184.66	3242.14	0.00	576.77
130.00		301.11	198.82	0.00	0.00
135.00	(21) attachments	5534.85	3499.37	0.00	0.00
140.00		278.45	166.93	0.00	0.00
140.50		27.11	16.24	0.00	0.00
	Totals:	**32,767.92**	**29,795.41**	**0.00**	**6,455.94**

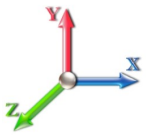
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.105	1.015	19.450	0.00	5.94
5.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.105	1.015	19.450	0.00	9.36
5.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.105	1.015	19.450	0.00	0.00
5.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.105	1.015	19.450	0.00	0.00
10.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.107	1.021	19.450	0.00	5.94
10.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.107	1.021	19.450	0.00	9.36
10.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.107	1.021	19.450	0.00	0.00
10.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.107	1.021	19.450	0.00	0.00
15.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.110	1.029	19.450	0.00	5.94
15.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.110	1.029	19.450	0.00	9.36
15.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.110	1.029	19.450	0.00	0.00
15.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.110	1.029	19.450	0.00	0.00
20.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.112	1.036	20.638	0.00	5.94
20.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.112	1.036	20.638	0.00	9.36
20.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.112	1.036	20.638	0.00	0.00
20.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.112	1.036	20.638	0.00	0.00
25.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.115	1.044	21.630	0.00	5.94
25.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.115	1.044	21.630	0.00	9.36
25.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.115	1.044	21.630	0.00	0.00
25.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.115	1.044	21.630	0.00	0.00
30.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.118	1.053	22.477	0.00	5.94
30.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.118	1.053	22.477	0.00	9.36
30.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.118	1.053	22.477	0.00	0.00
30.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.118	1.053	22.477	0.00	0.00
35.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.120	1.061	23.218	0.00	5.94
35.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.120	1.061	23.218	0.00	9.36
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.120	1.061	23.218	0.00	0.00
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.120	1.061	23.218	0.00	0.00
40.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.124	1.071	23.880	0.00	5.94
40.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.124	1.071	23.880	0.00	9.36
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.124	1.071	23.880	0.00	0.00
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.124	1.071	23.880	0.00	0.00
44.50	1 1/4" Fiber	Yes	4.50	0.000	0.00	0.00	0.00	0.112	1.037	24.422	0.00	5.35
44.50	1 5/8" Coax	Yes	4.50	0.000	1.98	0.74	0.00	0.112	1.037	24.422	0.00	8.42
44.50	1" Reinforcing plate	Yes	4.50	0.000	1.00	0.38	0.00	0.112	1.037	24.422	0.00	0.00
44.50	1" Reinforcing plate	Yes	4.50	0.000	1.00	0.38	0.00	0.112	1.037	24.422	0.00	0.00
45.00	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.114	1.042	24.479	0.00	0.59
45.00	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.114	1.042	24.479	0.00	0.94
45.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.114	1.042	24.479	0.00	0.00
45.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.114	1.042	24.479	0.00	0.00
50.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.116	1.047	25.029	0.00	5.94
50.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.116	1.047	25.029	0.00	9.36
50.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.116	1.047	25.029	0.00	0.00
50.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.116	1.047	25.029	0.00	0.00
55.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.117	1.050	25.536	0.00	5.94
55.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.117	1.050	25.536	0.00	9.36
55.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.117	1.050	25.536	0.00	0.00

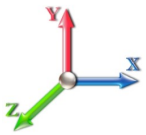
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
55.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.117	1.050	25.536	0.00	0.00
60.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.120	1.060	26.008	0.00	5.94
60.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.120	1.060	26.008	0.00	9.36
60.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.120	1.060	26.008	0.00	0.00
60.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.120	1.060	26.008	0.00	0.00
65.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.123	1.070	26.450	0.00	5.94
65.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.123	1.070	26.450	0.00	9.36
65.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.123	1.070	26.450	0.00	0.00
65.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.123	1.070	26.450	0.00	0.00
67.50	1 1/4" Fiber	Yes	2.50	0.000	0.00	0.00	0.00	0.126	1.078	26.661	0.00	2.97
67.50	1 5/8" Coax	Yes	2.50	0.000	1.98	0.41	0.00	0.126	1.078	26.661	0.00	4.68
67.50	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.126	1.078	26.661	0.00	0.00
67.50	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.126	1.078	26.661	0.00	0.00
70.00	1 1/4" Fiber	Yes	2.50	0.000	0.00	0.00	0.00	0.128	1.084	26.866	0.00	2.97
70.00	1 5/8" Coax	Yes	2.50	0.000	1.98	0.41	0.00	0.128	1.084	26.866	0.00	4.68
70.00	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.128	1.084	26.866	0.00	0.00
70.00	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.128	1.084	26.866	0.00	0.00
75.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.065	0.000	27.259	0.00	5.94
75.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.065	0.000	27.259	0.00	9.36
80.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.067	0.000	27.632	0.00	5.94
80.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.067	0.000	27.632	0.00	9.36
85.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.069	0.000	27.987	0.00	5.94
85.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.069	0.000	27.987	0.00	9.36
90.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.072	0.000	28.325	0.00	5.94
90.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.072	0.000	28.325	0.00	9.36
90.50	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.073	0.000	28.359	0.00	0.59
90.50	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.073	0.000	28.359	0.00	0.94
93.12	1 1/4" Fiber	Yes	2.62	0.000	0.00	0.00	0.00	0.148	1.145	28.529	0.00	3.11
93.12	1 5/8" Coax	Yes	2.62	0.000	1.98	0.43	0.00	0.148	1.145	28.529	0.00	4.90
93.12	1" Reinforcing plate	Yes	2.62	0.000	1.00	0.22	0.00	0.148	1.145	28.529	0.00	0.00
93.12	1" Reinforcing plate	Yes	2.62	0.000	1.00	0.22	0.00	0.148	1.145	28.529	0.00	0.00
94.50	1 1/4" Fiber	Yes	1.38	0.000	0.00	0.00	0.00	0.150	1.151	28.618	0.00	1.64
94.50	1 5/8" Coax	Yes	1.38	0.000	1.98	0.23	0.00	0.150	1.151	28.618	0.00	2.58
94.50	1" Reinforcing plate	Yes	1.38	0.000	1.00	0.11	0.00	0.150	1.151	28.618	0.00	0.00
94.50	1" Reinforcing plate	Yes	1.38	0.000	1.00	0.11	0.00	0.150	1.151	28.618	0.00	0.00
95.00	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.149	1.147	28.650	0.00	0.59
95.00	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.149	1.147	28.650	0.00	0.94
95.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.149	1.147	28.650	0.00	0.00
95.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.149	1.147	28.650	0.00	0.00
100.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.152	1.156	28.961	0.00	5.94
100.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.152	1.156	28.961	0.00	9.36
100.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.152	1.156	28.961	0.00	0.00
100.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.152	1.156	28.961	0.00	0.00
105.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.158	1.173	29.260	0.00	5.94
105.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.158	1.173	29.260	0.00	9.36
105.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.158	1.173	29.260	0.00	0.00
105.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.158	1.173	29.260	0.00	0.00

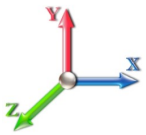
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 21	

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
107.87	1 1/4" Fiber	Yes	2.87	0.000	0.00	0.00	0.00	0.162	1.187	29.426	0.00	3.41
107.87	1 5/8" Coax	Yes	2.87	0.000	1.98	0.47	0.00	0.162	1.187	29.426	0.00	5.37
107.87	1" Reinforcing plate	Yes	2.87	0.000	1.00	0.24	0.00	0.162	1.187	29.426	0.00	0.00
107.87	1" Reinforcing plate	Yes	2.87	0.000	1.00	0.24	0.00	0.162	1.187	29.426	0.00	0.00
110.00	1 1/4" Fiber	Yes	2.13	0.000	0.00	0.00	0.00	0.165	1.196	29.548	0.00	2.53
110.00	1 5/8" Coax	Yes	2.13	0.000	1.98	0.35	0.00	0.165	1.196	29.548	0.00	3.99
110.00	1" Reinforcing plate	Yes	2.13	0.000	1.00	0.18	0.00	0.165	1.196	29.548	0.00	0.00
110.00	1" Reinforcing plate	Yes	2.13	0.000	1.00	0.18	0.00	0.165	1.196	29.548	0.00	0.00
114.00	1 1/4" Fiber	Yes	4.00	0.000	0.00	0.00	0.00	0.095	0.000	29.771	0.00	4.75
114.00	1 5/8" Coax	Yes	4.00	0.000	1.98	0.66	0.00	0.095	0.000	29.771	0.00	7.49
114.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.095	0.000	29.771	0.00	0.00
114.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.095	0.000	29.771	0.00	0.00
115.00	1 1/4" Fiber	Yes	1.00	0.000	0.00	0.00	0.00	0.086	0.000	29.826	0.00	1.19
115.00	1 5/8" Coax	Yes	1.00	0.000	1.98	0.17	0.00	0.086	0.000	29.826	0.00	1.87
120.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.088	0.000	30.094	0.00	5.94
120.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.088	0.000	30.094	0.00	9.36
125.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.092	0.000	30.354	0.00	5.94
125.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.092	0.000	30.354	0.00	9.36
130.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.096	0.000	30.605	0.00	5.94
130.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.096	0.000	30.605	0.00	9.36
135.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.100	1.001	30.850	0.00	5.94
135.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.100	1.001	30.850	0.00	9.36
										Totals:	**0.0**	**413.1**

Calculated Forces

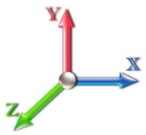
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 0.9D + 1.6W 97 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 25

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-29.72	-32.84	0.00	-3400.2	0.00	3400.25	3592.24	1796.12	6217.42	3113.33	0.00	0.000	0.000	0.679
5.00	-28.65	-32.56	0.00	-3236.0	0.00	3236.07	3536.93	1768.47	5988.37	2998.63	0.14	-0.258	0.000	0.664
10.00	-27.59	-32.29	0.00	-3073.2	0.00	3073.27	3480.64	1740.32	5761.86	2885.21	0.55	-0.518	0.000	0.649
15.00	-26.56	-32.01	0.00	-2911.8	0.00	2911.84	3423.37	1711.69	5538.01	2773.12	1.23	-0.779	0.000	0.634
20.00	-25.54	-31.71	0.00	-2751.8	0.00	2751.81	3365.12	1682.56	5316.92	2662.41	2.18	-1.040	0.000	0.656
25.00	-24.54	-31.39	0.00	-2593.2	0.00	2593.28	3305.89	1652.94	5098.71	2553.15	3.42	-1.319	0.000	0.639
30.00	-23.56	-31.05	0.00	-2436.3	0.00	2436.34	3245.52	1622.76	4883.27	2445.26	4.95	-1.598	0.000	0.620
35.00	-22.59	-30.70	0.00	-2281.0	0.00	2281.08	3165.03	1582.51	4642.85	2324.87	6.78	-1.877	0.000	0.604
40.00	-21.65	-30.33	0.00	-2127.5	0.00	2127.58	3084.53	1542.26	4408.49	2207.52	8.89	-2.155	0.000	0.640
44.50	-20.88	-29.98	0.00	-1991.0	0.00	1991.08	3012.08	1506.04	4202.76	2104.51	11.05	-2.427	0.000	0.623
45.00	-20.66	-29.99	0.00	-1976.0	0.00	1976.09	3004.03	1502.02	4180.21	2093.21	11.31	-2.458	0.000	0.614
50.00	-19.24	-29.59	0.00	-1826.1	0.00	1826.15	2423.81	1211.90	3356.59	1680.79	14.04	-2.754	0.000	0.619
55.00	-18.43	-29.22	0.00	-1678.2	0.00	1678.20	2376.14	1188.07	3201.01	1602.88	17.08	-3.047	0.000	0.636
60.00	-17.65	-28.84	0.00	-1532.1	0.00	1532.11	2327.49	1163.75	3047.73	1526.13	20.43	-3.356	0.000	0.602
65.00	-16.92	-28.43	0.00	-1387.9	0.00	1387.91	2277.86	1138.93	2896.88	1450.59	24.11	-3.659	0.000	0.567
67.50	-16.54	-28.24	0.00	-1316.8	0.00	1316.83	2252.16	1126.08	2821.75	1412.97	26.07	-3.810	0.000	0.548
67.50	-16.54	-28.24	0.00	-1316.8	0.00	1316.83	2252.16	1126.08	2821.75	1412.97	26.07	-3.810	0.000	0.548
70.00	-16.09	-28.10	0.00	-1246.2	0.00	1246.23	2218.62	1109.31	2737.91	1370.99	28.10	-3.959	0.000	0.917
75.00	-15.27	-27.79	0.00	-1105.7	0.00	1105.75	2151.54	1075.77	2574.02	1288.93	32.51	-4.448	0.000	0.866
80.00	-14.48	-27.47	0.00	-966.83	0.00	966.83	2084.46	1042.23	2415.20	1209.39	37.42	-4.921	0.000	0.807
85.00	-13.72	-27.14	0.00	-829.50	0.00	829.50	2017.38	1008.69	2261.43	1132.40	42.81	-5.371	0.000	0.740
90.00	-10.39	-20.60	0.00	-693.81	0.00	693.81	1950.30	975.15	2112.72	1057.93	48.65	-5.792	0.000	0.662
90.50	-10.29	-20.59	0.00	-683.51	0.00	683.51	1943.59	971.80	2098.13	1050.62	49.26	-5.835	0.000	0.656
93.12	-9.88	-20.35	0.00	-629.58	0.00	629.58	1908.44	954.22	2022.49	1012.75	52.52	-6.047	0.000	0.349
94.50	-9.68	-20.22	0.00	-601.50	0.00	601.50	1035.36	517.68	1113.15	557.40	54.27	-6.109	0.000	0.384
95.00	-9.60	-20.20	0.00	-591.39	0.00	591.39	1033.16	516.58	1106.89	554.27	54.91	-6.131	0.000	0.475
100.00	-9.23	-19.78	0.00	-490.41	0.00	490.41	1010.63	505.31	1044.65	523.10	61.46	-6.385	0.000	0.408
105.00	-8.90	-19.36	0.00	-391.50	0.00	391.50	987.11	493.55	983.14	492.30	68.26	-6.611	0.000	0.339
107.87	-8.71	-19.12	0.00	-335.93	0.00	335.93	973.17	486.58	948.19	474.80	72.26	-6.727	0.000	0.298
107.87	-8.71	-19.12	0.00	-335.93	0.00	335.93	973.17	486.58	948.19	474.80	72.26	-6.727	0.000	0.298
110.00	-8.53	-18.97	0.00	-295.20	0.00	295.20	962.61	481.31	922.45	461.91	75.27	-6.806	0.000	0.649
114.00	-5.80	-13.54	0.00	-213.46	0.00	213.46	942.31	471.15	874.57	437.94	81.10	-7.113	0.000	0.494
115.00	-5.71	-13.49	0.00	-199.91	0.00	199.91	937.13	468.57	862.70	431.99	82.59	-7.181	0.000	0.470
120.00	-5.44	-13.16	0.00	-132.47	0.00	132.47	910.67	455.33	804.02	402.61	90.25	-7.460	0.000	0.336
125.00	-3.02	-6.61	0.00	-66.11	0.00	66.11	883.23	441.61	746.49	373.80	98.15	-7.649	0.000	0.181
130.00	-2.86	-6.29	0.00	-33.08	0.00	33.08	854.80	427.40	690.24	345.64	106.20	-7.757	0.000	0.099
135.00	-0.14	-0.33	0.00	-1.65	0.00	1.65	825.39	412.70	635.38	318.16	114.33	-7.800	0.000	0.005
140.00	-0.01	-0.03	0.00	-0.01	0.00	0.01	789.80	394.90	578.22	289.54	122.48	-7.802	0.000	0.000
140.50	0.00	-0.03	0.00	0.00	0.00	0.00	785.78	392.89	572.31	286.58	123.29	-7.802	0.000	0.000

Wind Loading - Shaft

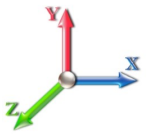
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1	1.00	0.85	5.168	5.68	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	5.168	5.68	0.00	1.217 *	1.656	5.00	19.186	23.36	132.8	449.0	1462.5
10.00		1.00	0.85	5.168	5.68	0.00	1.226 *	1.775	5.00	18.900	23.17	131.7	472.4	1463.8
15.00		1.00	0.85	5.168	5.68	0.00	1.234 *	1.848	5.00	18.576	22.93	130.4	482.2	1451.5
20.00	RT1 RB2	1.00	0.90	5.483	6.03	0.00	1.244 *	1.902	5.00	18.236	22.68	136.8	486.0	1433.2
25.00		1.00	0.95	5.747	6.32	0.00	1.253 *	1.945	5.00	17.886	22.41	141.7	486.4	1411.5
30.00		1.00	0.98	5.972	6.57	0.00	1.263 *	1.981	5.00	17.531	22.14	145.5	484.5	1387.5
35.00		1.00	1.01	6.169	6.79	0.00	1.274 *	2.012	5.00	17.171	21.87	148.4	481.0	1361.8
40.00	RT2 RB3	1.00	1.04	6.345	6.98	0.00	1.285 *	2.039	5.00	16.809	21.60	150.7	476.1	1334.8
44.50	Bot - Section 2	1.00	1.07	6.489	7.14	0.00	1.245 *	2.061	4.50	14.815	18.44	131.6	423.8	1177.8
45.00		1.00	1.07	6.504	7.15	0.00	1.250 *	2.063	0.50	1.653	2.07	14.8	47.8	200.8
50.00	Top - Section 1	1.00	1.09	6.650	7.32	0.00	1.256 *	2.085	5.00	16.341	20.53	150.2	471.8	1979.0
55.00		1.00	1.12	6.785	7.46	0.00	1.260 *	2.105	5.00	15.973	20.12	150.2	464.6	1138.8
60.00	RT3 RB4	1.00	1.14	6.910	7.60	0.00	1.272 *	2.123	5.00	15.603	19.84	150.8	456.8	1112.6
65.00		1.00	1.16	7.028	7.73	0.00	1.284 *	2.140	5.00	15.232	19.56	151.2	448.5	1085.8
67.50	RT4	1.00	1.17	7.084	7.79	0.00	1.294 *	2.148	2.50	7.475	9.67	75.4	222.1	533.8
70.00		1.00	1.17	7.138	7.85	0.00	1.300 *	2.156	2.50	7.382	9.60	75.4	219.9	527.0
75.00		1.00	1.19	7.243	7.97	0.00	1.200	2.171	5.00	14.487	17.38	138.5	430.6	1031.1
80.00		1.00	1.21	7.342	8.08	0.00	1.200	2.185	5.00	14.114	16.94	136.8	421.1	1003.1
85.00		1.00	1.22	7.436	8.18	0.00	1.200	2.198	5.00	13.740	16.49	134.9	411.3	974.9
90.00	Appurtenance(s)	1.00	1.24	7.526	8.28	0.00	1.200	2.211	5.00	13.365	16.04	132.8	401.2	946.4
90.50	Bot - Section 3	1.00	1.24	7.535	8.29	0.00	1.200	2.212	0.50	1.315	1.58	13.1	40.0	93.5
93.12	RB5	1.00	1.25	7.580	8.34	0.00	1.373 *	2.219	2.62	6.916	9.50	79.2	209.6	656.5
94.50	Top - Section 2	1.00	1.25	7.604	8.36	0.00	1.381 *	2.222	1.38	3.601	4.97	41.6	109.6	341.8
95.00		1.00	1.25	7.612	8.37	0.00	1.377 *	2.223	0.50	1.298	1.79	15.0	39.6	71.3
100.00		1.00	1.27	7.695	8.46	0.00	1.387 *	2.234	5.00	12.773	17.72	150.0	385.6	696.6
105.00		1.00	1.28	7.774	8.55	0.00	1.407 *	2.245	5.00	12.397	17.44	149.2	374.8	674.8
107.87	RT5	1.00	1.29	7.819	8.60	0.00	1.424 *	2.251	2.87	6.945	9.89	85.1	211.5	378.7
110.00		1.00	1.29	7.851	8.64	0.00	1.435 *	2.256	2.13	5.074	7.28	62.9	155.0	276.7
114.00	Appurtenance(s)	1.00	1.30	7.910	8.70	0.00	1.200	2.264	4.00	9.345	11.21	97.6	283.9	507.1
115.00		1.00	1.30	7.925	8.72	0.00	1.200	2.266	1.00	2.298	2.76	24.0	70.5	125.2
120.00		1.00	1.32	7.996	8.80	0.00	1.200	2.276	5.00	11.267	13.52	118.9	341.3	608.1
125.00	Appurtenance(s)	1.00	1.33	8.065	8.87	0.00	1.200	2.285	5.00	10.889	13.07	115.9	329.8	585.5
130.00		1.00	1.34	8.132	8.95	0.00	1.200	2.294	5.00	10.512	12.61	112.8	318.1	562.8
135.00	Appurtenance(s)	1.00	1.35	8.197	9.02	0.00	1.202 *	2.303	5.00	10.134	12.18	109.8	306.3	540.0
140.00		1.00	1.36	8.260	9.09	0.00	1.200	2.311	5.00	9.756	11.71	106.4	294.4	516.9
140.50		1.00	1.36	8.266	9.09	0.00	1.200	2.312	0.50	0.954	1.15	10.4	29.3	51.0
								Totals:	**140.50**			**3,852.2**		**29,704.4**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

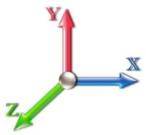
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	135.00	Expansion rights	3	8.197	9.016	0.70	0.80	8.76	538.02	0.000	0.000	79.02	0.00	0.00
2	135.00	Ericsson RRUS 32 B66A	3	8.197	9.016	0.70	0.80	7.70	563.12	0.000	0.000	69.44	0.00	0.00
3	135.00	Ericsson S11B12	3	8.197	9.016	0.56	0.80	6.24	410.79	0.000	0.000	56.29	0.00	0.00
4	135.00	RFS	3	8.197	9.016	0.50	0.80	11.85	728.74	0.000	0.000	106.80	0.00	0.00
5	135.00	Commscope F-65C-R2	3	8.197	9.016	0.67	0.80	33.13	1600.47	0.000	0.000	298.69	0.00	0.00
6	135.00	Ericsson AIR32	3	8.197	9.016	0.70	0.80	16.87	1248.96	0.000	0.000	152.13	0.00	0.00
7	135.00	Sector Frame	3	8.197	9.016	0.56	0.75	42.10	6270.53	0.000	0.000	379.58	0.00	0.00
8	125.00	Kathrein 782 10250	6	8.065	8.872	0.50	0.75	3.81	124.93	0.000	0.000	33.84	0.00	0.00
9	125.00	Raycap DC6-48-60-18-8F	2	8.125	8.938	0.81	0.90	3.87	205.20	0.000	4.500	34.55	0.00	155.48
10	125.00	CCI DTMABP7819VG12A	6	8.065	8.872	0.50	0.75	6.47	301.88	0.000	0.000	57.44	0.00	0.00
11	125.00	CCI OPA-65R-LCUU-H6	3	8.065	8.872	0.59	0.75	20.41	1222.14	0.000	0.000	181.05	0.00	0.00
12	125.00	7120.16	3	8.065	8.872	0.92	0.75	14.29	695.38	0.000	0.000	126.79	0.00	0.00
13	125.00	KMW	3	8.065	8.872	0.56	0.75	16.45	963.13	0.000	0.000	145.96	0.00	0.00
14	125.00	Ericsson RRUS-11	6	8.065	8.872	0.50	0.75	10.24	1139.39	0.000	0.000	90.84	0.00	0.00
15	125.00	Ericsson RRUS-32	3	8.065	8.872	0.56	0.75	7.66	764.21	0.000	0.000	67.94	0.00	0.00
16	125.00	Kathrein 800-10121	3	8.065	8.872	0.59	0.75	11.64	730.84	0.000	0.000	103.23	0.00	0.00
17	125.00	Platform w/ Hand Rails	1	8.065	8.872	1.00	1.00	67.42	4541.90	0.000	0.000	598.11	0.00	0.00
18	114.00	Low Profile Platform	1	7.910	8.701	1.00	1.00	52.17	3797.57	0.000	0.000	453.92	0.00	0.00
19	114.00	Alcatel Lucent	3	7.954	8.749	0.78	0.80	10.23	460.97	0.000	3.000	89.50	0.00	268.50
20	114.00	Samsung	3	7.896	8.685	0.61	0.80	5.63	252.61	0.000	-1.000	48.88	0.00	-48.88
21	114.00	Andrew VHLP1-23-DW1	1	7.975	8.772	1.00	1.00	2.59	52.63	0.000	4.500	22.76	0.00	102.41
22	114.00	Andrew VHLP2-23-DW1	1	7.975	8.772	1.00	1.00	6.35	136.15	0.000	4.500	55.67	0.00	250.53
23	114.00	Argus LLPX310R-V1	3	7.917	8.709	0.55	0.80	9.21	637.92	0.000	0.500	80.24	0.00	40.12
24	114.00	Alcatel Lucent	3	7.888	8.677	0.78	0.80	8.97	464.55	0.000	-1.500	77.81	0.00	-116.71
25	114.00	RFS APXVTM14	3	7.954	8.749	0.63	0.80	14.81	1082.40	0.000	3.000	129.58	0.00	388.75
26	114.00	RFS APXVSPP18	3	7.925	8.717	0.66	0.80	19.39	1273.33	0.000	1.000	169.00	0.00	169.00
27	114.00	Alcatel Lucent	3	7.954	8.749	0.55	0.80	8.49	709.03	0.000	3.000	74.31	0.00	222.93
28	114.00	20" x 18" x 9" Junction	1	7.910	8.701	1.00	1.00	4.78	131.93	0.000	0.000	41.58	0.00	0.00
29	90.00	Alcatel Lucent	3	7.526	8.279	0.57	0.75	7.69	729.85	0.000	0.000	63.70	0.00	0.00
30	90.00	Swedcom SLCP 2x6014	3	7.526	8.279	0.67	0.75	15.80	956.73	0.000	0.000	130.80	0.00	0.00
31	90.00	Commscope	6	7.526	8.279	0.62	0.75	36.30	2158.27	0.000	0.000	300.50	0.00	0.00
32	90.00	Antel	3	7.526	8.279	0.55	0.75	15.11	853.58	0.000	0.000	125.07	0.00	0.00
33	90.00	RFS DB-T1-6Z-8AB-0Z	1	7.526	8.279	1.00	1.00	5.93	243.69	0.000	0.000	49.07	0.00	0.00
34	90.00	Alcatel Lucent	3	7.526	8.279	0.57	0.75	7.69	729.85	0.000	0.000	63.70	0.00	0.00
35	90.00	Alcatel Lucent	3	7.526	8.279	0.68	0.75	6.13	539.83	0.000	0.000	50.73	0.00	0.00
36	90.00	Platform w/ Hand Rails	1	7.526	8.279	1.00	1.00	69.86	5358.61	0.000	0.000	578.35	0.00	0.00
							Totals:		**42,619.14**			**5,186.89**		

Total Applied Force Summary

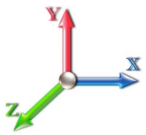
Structure:	CT16504-A-SBA		**Code:**	EIA/TIA-222-G	9/15/2017
Site Name:	Manchester 12, CT		**Exposure:**	C	
Height:	140.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 25

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		132.78	1836.19	0.00	0.00
10.00		131.70	1853.00	0.00	0.00
15.00		130.36	1850.67	0.00	0.00
20.00		136.79	1839.88	0.00	0.00
25.00		141.70	1824.19	0.00	0.00
30.00		145.47	1805.27	0.00	0.00
35.00		148.42	1784.03	0.00	0.00
40.00		150.72	1761.03	0.00	0.00
44.50		131.65	1556.17	0.00	0.00
45.00		14.79	242.86	0.00	0.00
50.00		150.18	2402.89	0.00	0.00
55.00		150.19	1565.66	0.00	0.00
60.00		150.81	1542.11	0.00	0.00
65.00		151.18	1517.87	0.00	0.00
67.50		75.35	750.46	0.00	0.00
70.00		75.38	744.22	0.00	0.00
75.00		138.51	1374.66	0.00	0.00
80.00		136.78	1347.87	0.00	0.00
85.00		134.87	1320.71	0.00	0.00
90.00	(23) attachments	1494.70	12863.63	0.00	0.00
90.50		13.08	119.41	0.00	0.00
93.12		79.20	841.93	0.00	0.00
94.50		41.59	439.55	0.00	0.00
95.00		14.96	106.77	0.00	0.00
100.00		149.98	1052.81	0.00	0.00
105.00		149.19	1032.63	0.00	0.00
107.87		85.05	584.66	0.00	0.00
110.00		62.89	429.84	0.00	0.00
114.00	(25) attachments	1340.83	9726.41	0.00	1276.64
115.00		24.04	168.84	0.00	0.00
120.00		118.92	827.03	0.00	0.00
125.00	(36) attachments	1555.68	11494.25	0.00	155.48
130.00		112.83	715.77	0.00	0.00
135.00	(21) attachments	1251.74	12054.25	0.00	0.00
140.00		106.37	516.95	0.00	0.00
140.50		10.41	50.97	0.00	0.00
	Totals:	**9,039.09**	**81,945.43**	**0.00**	**1,432.12**

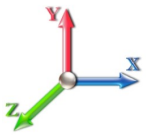
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.105	1.015	5.168	0.00	46.64
5.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.21	0.00	0.105	1.015	5.168	0.00	58.01
5.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	1.90	0.00	0.105	1.015	5.168	0.00	34.16
5.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	1.90	0.00	0.105	1.015	5.168	0.00	34.16
10.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.107	1.021	5.168	0.00	50.57
10.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.30	0.00	0.107	1.021	5.168	0.00	62.33
10.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.00	0.00	0.107	1.021	5.168	0.00	37.80
10.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.00	0.00	0.107	1.021	5.168	0.00	37.80
15.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.110	1.029	5.168	0.00	53.08
15.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.37	0.00	0.110	1.029	5.168	0.00	65.09
15.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.06	0.00	0.110	1.029	5.168	0.00	40.14
15.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.06	0.00	0.110	1.029	5.168	0.00	40.14
20.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.112	1.036	5.483	0.00	54.96
20.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.41	0.00	0.112	1.036	5.483	0.00	67.15
20.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.11	0.00	0.112	1.036	5.483	0.00	41.90
20.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.11	0.00	0.112	1.036	5.483	0.00	41.90
25.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.115	1.044	5.747	0.00	56.49
25.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.45	0.00	0.115	1.044	5.747	0.00	68.82
25.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.14	0.00	0.115	1.044	5.747	0.00	43.33
25.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.14	0.00	0.115	1.044	5.747	0.00	43.33
30.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.118	1.053	5.972	0.00	57.78
30.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.48	0.00	0.118	1.053	5.972	0.00	70.23
30.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.17	0.00	0.118	1.053	5.972	0.00	44.54
30.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.17	0.00	0.118	1.053	5.972	0.00	44.54
35.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.120	1.061	6.169	0.00	58.90
35.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.50	0.00	0.120	1.061	6.169	0.00	71.46
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.20	0.00	0.120	1.061	6.169	0.00	45.59
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.20	0.00	0.120	1.061	6.169	0.00	45.59
40.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.124	1.071	6.345	0.00	59.90
40.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.52	0.00	0.124	1.071	6.345	0.00	72.54
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.22	0.00	0.124	1.071	6.345	0.00	46.52
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	2.22	0.00	0.124	1.071	6.345	0.00	46.52
44.50	1 1/4" Fiber	Yes	4.50	0.000	0.00	0.00	0.00	0.112	1.037	6.489	0.00	54.64
44.50	1 5/8" Coax	Yes	4.50	0.000	1.98	2.29	0.00	0.112	1.037	6.489	0.00	66.08
44.50	1" Reinforcing plate	Yes	4.50	0.000	1.00	1.92	0.00	0.112	1.037	6.489	0.00	38.52
44.50	1" Reinforcing plate	Yes	4.50	0.000	1.00	1.92	0.00	0.112	1.037	6.489	0.00	38.52
45.00	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.114	1.042	6.504	0.00	6.08
45.00	1 5/8" Coax	Yes	0.50	0.000	1.98	0.25	0.00	0.114	1.042	6.504	0.00	7.35
45.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.21	0.00	0.114	1.042	6.504	0.00	4.29
45.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.21	0.00	0.114	1.042	6.504	0.00	4.29
50.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.116	1.047	6.650	0.00	61.61
50.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.56	0.00	0.116	1.047	6.650	0.00	74.41
50.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.15	0.00	0.116	1.047	6.650	0.00	43.60
50.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.15	0.00	0.116	1.047	6.650	0.00	43.60
55.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.117	1.050	6.785	0.00	62.36
55.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.58	0.00	0.117	1.050	6.785	0.00	75.23
55.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.17	0.00	0.117	1.050	6.785	0.00	44.27

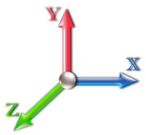
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 27	

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
55.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.17	0.00	0.117	1.050	6.785	0.00	44.27
60.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.120	1.060	6.910	0.00	63.06
60.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.59	0.00	0.120	1.060	6.910	0.00	75.99
60.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.19	0.00	0.120	1.060	6.910	0.00	44.89
60.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.19	0.00	0.120	1.060	6.910	0.00	44.89
65.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.123	1.070	7.028	0.00	63.71
65.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.61	0.00	0.123	1.070	7.028	0.00	76.69
65.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.20	0.00	0.123	1.070	7.028	0.00	45.46
65.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.20	0.00	0.123	1.070	7.028	0.00	45.46
67.50	1 1/4" Fiber	Yes	2.50	0.000	0.00	0.00	0.00	0.126	1.078	7.084	0.00	32.01
67.50	1 5/8" Coax	Yes	2.50	0.000	1.98	1.31	0.00	0.126	1.078	7.084	0.00	38.52
67.50	1" Reinforcing plate	Yes	2.50	0.000	1.00	1.10	0.00	0.126	1.078	7.084	0.00	22.87
67.50	1" Reinforcing plate	Yes	2.50	0.000	1.00	1.10	0.00	0.126	1.078	7.084	0.00	22.87
70.00	1 1/4" Fiber	Yes	2.50	0.000	0.00	0.00	0.00	0.128	1.084	7.138	0.00	32.16
70.00	1 5/8" Coax	Yes	2.50	0.000	1.98	1.31	0.00	0.128	1.084	7.138	0.00	38.68
70.00	1" Reinforcing plate	Yes	2.50	0.000	1.00	1.11	0.00	0.128	1.084	7.138	0.00	23.00
70.00	1" Reinforcing plate	Yes	2.50	0.000	1.00	1.11	0.00	0.128	1.084	7.138	0.00	23.00
75.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.065	0.000	7.243	0.00	64.89
75.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.63	0.00	0.065	0.000	7.243	0.00	77.98
80.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.067	0.000	7.342	0.00	65.44
80.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.65	0.00	0.067	0.000	7.342	0.00	78.57
85.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.069	0.000	7.436	0.00	65.95
85.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.66	0.00	0.069	0.000	7.436	0.00	79.13
90.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.072	0.000	7.526	0.00	66.44
90.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.67	0.00	0.072	0.000	7.526	0.00	79.67
90.50	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.073	0.000	7.535	0.00	6.65
90.50	1 5/8" Coax	Yes	0.50	0.000	1.98	0.27	0.00	0.073	0.000	7.535	0.00	7.97
93.12	1 1/4" Fiber	Yes	2.62	0.000	0.00	0.00	0.00	0.148	1.145	7.580	0.00	34.97
93.12	1 5/8" Coax	Yes	2.62	0.000	1.98	1.40	0.00	0.148	1.145	7.580	0.00	41.91
93.12	1" Reinforcing plate	Yes	2.62	0.000	1.00	1.19	0.00	0.148	1.145	7.580	0.00	27.74
93.12	1" Reinforcing plate	Yes	2.62	0.000	1.00	1.19	0.00	0.148	1.145	7.580	0.00	21.75
94.50	1 1/4" Fiber	Yes	1.38	0.000	0.00	0.00	0.00	0.150	1.151	7.604	0.00	18.46
94.50	1 5/8" Coax	Yes	1.38	0.000	1.98	0.74	0.00	0.150	1.151	7.604	0.00	22.11
94.50	1" Reinforcing plate	Yes	1.38	0.000	1.00	0.63	0.00	0.150	1.151	7.604	0.00	14.65
94.50	1" Reinforcing plate	Yes	1.38	0.000	1.00	0.63	0.00	0.150	1.151	7.604	0.00	11.48
95.00	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.149	1.147	7.612	0.00	6.69
95.00	1 5/8" Coax	Yes	0.50	0.000	1.98	0.27	0.00	0.149	1.147	7.612	0.00	8.02
95.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.23	0.00	0.149	1.147	7.612	0.00	5.31
95.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.23	0.00	0.149	1.147	7.612	0.00	4.16
100.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.152	1.156	7.695	0.00	67.36
100.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.69	0.00	0.152	1.156	7.695	0.00	80.66
100.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.28	0.00	0.152	1.156	7.695	0.00	53.53
100.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.28	0.00	0.152	1.156	7.695	0.00	42.01
105.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.158	1.173	7.774	0.00	67.79
105.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.70	0.00	0.158	1.173	7.774	0.00	81.13
105.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.29	0.00	0.158	1.173	7.774	0.00	53.93
105.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	2.29	0.00	0.158	1.173	7.774	0.00	42.37

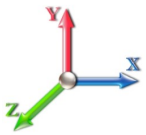
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
107.87	1 1/4" Fiber	Yes	2.87	0.000	0.00	0.00	0.00	0.162	1.187	7.819	0.00	39.05
107.87	1 5/8" Coax	Yes	2.87	0.000	1.98	1.55	0.00	0.162	1.187	7.819	0.00	46.72
107.87	1" Reinforcing plate	Yes	2.87	0.000	1.00	1.32	0.00	0.162	1.187	7.819	0.00	31.09
107.87	1" Reinforcing plate	Yes	2.87	0.000	1.00	1.32	0.00	0.162	1.187	7.819	0.00	24.43
110.00	1 1/4" Fiber	Yes	2.13	0.000	0.00	0.00	0.00	0.165	1.196	7.851	0.00	29.06
110.00	1 5/8" Coax	Yes	2.13	0.000	1.98	1.15	0.00	0.165	1.196	7.851	0.00	34.75
110.00	1" Reinforcing plate	Yes	2.13	0.000	1.00	0.98	0.00	0.165	1.196	7.851	0.00	23.14
110.00	1" Reinforcing plate	Yes	2.13	0.000	1.00	0.98	0.00	0.165	1.196	7.851	0.00	18.19
114.00	1 1/4" Fiber	Yes	4.00	0.000	0.00	0.00	0.00	0.095	0.000	7.910	0.00	54.82
114.00	1 5/8" Coax	Yes	4.00	0.000	1.98	2.17	0.00	0.095	0.000	7.910	0.00	65.54
114.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.23	0.00	0.095	0.000	7.910	0.00	5.46
114.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.23	0.00	0.095	0.000	7.910	0.00	4.30
115.00	1 1/4" Fiber	Yes	1.00	0.000	0.00	0.00	0.00	0.086	0.000	7.925	0.00	13.72
115.00	1 5/8" Coax	Yes	1.00	0.000	1.98	0.54	0.00	0.086	0.000	7.925	0.00	16.40
120.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.088	0.000	7.996	0.00	68.99
120.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.72	0.00	0.088	0.000	7.996	0.00	82.43
125.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.092	0.000	8.065	0.00	69.36
125.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.73	0.00	0.092	0.000	8.065	0.00	82.83
130.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.096	0.000	8.132	0.00	69.72
130.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.74	0.00	0.096	0.000	8.132	0.00	83.22
135.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.100	1.001	8.197	0.00	70.07
135.00	1 5/8" Coax	Yes	5.00	0.000	1.98	2.74	0.00	0.100	1.001	8.197	0.00	83.60
										Totals:	**0.0**	**5,320.0**

Calculated Forces

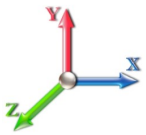
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 29	

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 25

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-81.94	-9.09	0.00	-990.96	0.00	990.96	3592.24	1796.12	6217.42	3113.33	0.00	0.000	0.000	0.210
5.00	-80.09	-9.07	0.00	-945.49	0.00	945.49	3536.93	1768.47	5988.37	2998.63	0.04	-0.075	0.000	0.206
10.00	-78.23	-9.03	0.00	-900.17	0.00	900.17	3480.64	1740.32	5761.86	2885.21	0.16	-0.151	0.000	0.202
15.00	-76.36	-9.00	0.00	-855.00	0.00	855.00	3423.37	1711.69	5538.01	2773.12	0.36	-0.228	0.000	0.198
20.00	-74.51	-8.96	0.00	-810.00	0.00	810.00	3365.12	1682.56	5316.92	2662.41	0.64	-0.305	0.000	0.205
25.00	-72.68	-8.91	0.00	-765.21	0.00	765.21	3305.89	1652.94	5098.71	2553.15	1.00	-0.387	0.000	0.200
30.00	-70.86	-8.85	0.00	-720.66	0.00	720.66	3245.52	1622.76	4883.27	2445.26	1.45	-0.469	0.000	0.195
35.00	-69.06	-8.79	0.00	-676.40	0.00	676.40	3165.03	1582.51	4642.85	2324.87	1.99	-0.552	0.000	0.191
40.00	-67.29	-8.72	0.00	-632.46	0.00	632.46	3084.53	1542.26	4408.49	2207.52	2.61	-0.634	0.000	0.203
44.50	-65.73	-8.62	0.00	-593.24	0.00	593.24	3012.08	1506.04	4202.76	2104.51	3.25	-0.715	0.000	0.198
45.00	-65.48	-8.66	0.00	-588.93	0.00	588.93	3004.03	1502.02	4180.21	2093.21	3.32	-0.725	0.000	0.195
50.00	-63.07	-8.57	0.00	-545.66	0.00	545.66	2423.81	1211.90	3356.59	1680.79	4.13	-0.813	0.000	0.197
55.00	-61.49	-8.49	0.00	-502.81	0.00	502.81	2376.14	1188.07	3201.01	1602.88	5.03	-0.900	0.000	0.204
60.00	-59.94	-8.41	0.00	-460.35	0.00	460.35	2327.49	1163.75	3047.73	1526.13	6.02	-0.993	0.000	0.194
65.00	-58.41	-8.30	0.00	-418.29	0.00	418.29	2277.86	1138.93	2896.88	1450.59	7.11	-1.085	0.000	0.184
67.50	-57.66	-8.26	0.00	-397.53	0.00	397.53	2252.16	1126.08	2821.75	1412.97	7.69	-1.130	0.000	0.178
67.50	-57.66	-8.26	0.00	-397.53	0.00	397.53	2252.16	1126.08	2821.75	1412.97	7.69	-1.130	0.000	0.178
70.00	-56.90	-8.27	0.00	-376.88	0.00	376.88	2218.62	1109.31	2737.91	1370.99	8.29	-1.175	0.000	0.301
75.00	-55.51	-8.24	0.00	-335.55	0.00	335.55	2151.54	1075.77	2574.02	1288.93	9.60	-1.323	0.000	0.286
80.00	-54.15	-8.20	0.00	-294.36	0.00	294.36	2084.46	1042.23	2415.20	1209.39	11.07	-1.467	0.000	0.269
85.00	-52.81	-8.16	0.00	-253.35	0.00	253.35	2017.38	1008.69	2261.43	1132.40	12.68	-1.604	0.000	0.250
90.00	-39.99	-6.33	0.00	-212.57	0.00	212.57	1950.30	975.15	2112.72	1057.93	14.43	-1.733	0.000	0.221
90.50	-39.86	-6.34	0.00	-209.41	0.00	209.41	1943.59	971.80	2098.13	1050.62	14.61	-1.746	0.000	0.220
93.12	-39.02	-6.27	0.00	-192.78	0.00	192.78	1908.44	954.22	2022.49	1012.75	15.58	-1.811	0.000	0.118
94.50	-38.58	-6.22	0.00	-184.13	0.00	184.13	1035.36	517.68	1113.15	557.40	16.11	-1.830	0.000	0.130
95.00	-38.47	-6.23	0.00	-181.02	0.00	181.02	1033.16	516.58	1106.89	554.27	16.30	-1.837	0.000	0.161
100.00	-37.42	-6.10	0.00	-149.87	0.00	149.87	1010.63	505.31	1044.65	523.10	18.27	-1.915	0.000	0.140
105.00	-36.38	-5.94	0.00	-119.39	0.00	119.39	987.11	493.55	983.14	492.30	20.31	-1.983	0.000	0.118
107.87	-35.80	-5.86	0.00	-102.34	0.00	102.34	973.17	486.58	948.19	474.80	21.51	-2.019	0.000	0.105
107.87	-35.80	-5.86	0.00	-102.34	0.00	102.34	973.17	486.58	948.19	474.80	21.51	-2.019	0.000	0.105
110.00	-35.37	-5.82	0.00	-89.86	0.00	89.86	962.61	481.31	922.45	461.91	22.42	-2.043	0.000	0.231
114.00	-25.69	-4.15	0.00	-65.32	0.00	65.32	942.31	471.15	874.57	437.94	24.17	-2.136	0.000	0.176
115.00	-25.52	-4.14	0.00	-61.18	0.00	61.18	937.13	468.57	862.70	431.99	24.62	-2.157	0.000	0.169
120.00	-24.69	-4.02	0.00	-40.48	0.00	40.48	910.67	455.33	804.02	402.61	26.93	-2.242	0.000	0.128
125.00	-13.27	-2.02	0.00	-20.22	0.00	20.22	883.23	441.61	746.49	373.80	29.31	-2.300	0.000	0.069
130.00	-12.56	-1.88	0.00	-10.12	0.00	10.12	854.80	427.40	690.24	345.64	31.74	-2.333	0.000	0.044
135.00	-0.56	-0.14	0.00	-0.71	0.00	0.71	825.39	412.70	635.38	318.16	34.19	-2.346	0.000	0.003
140.00	-0.05	-0.01	0.00	-0.01	0.00	0.01	789.80	394.90	578.22	289.54	36.65	-2.347	0.000	0.000
140.50	0.00	-0.01	0.00	0.00	0.00	0.00	785.78	392.89	572.31	286.58	36.90	-2.347	0.000	0.000

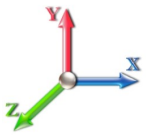
Seismic Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	22
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.26	**SA**	0.03	**S1**	0.06
						Seismic Importance Factor	1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00	RB1	0.00	0.00	0.00	0.00	0.00	
5.00		844.63	0.00	0.03	0.02	18.52	
10.00		826.19	0.01	0.05	0.03	25.06	
15.00		807.76	0.02	0.06	0.04	27.57	
20.00	RT1 RB2	789.32	0.04	0.07	0.04	28.41	
25.00		770.89	0.06	0.07	0.04	28.61	
30.00		752.46	0.09	0.07	0.04	28.66	
35.00		734.02	0.12	0.07	0.03	28.70	
40.00	RT2 RB3	715.59	0.15	0.07	0.03	28.67	
44.50	Bot - Section 2	628.27	0.19	0.06	0.02	25.49	
45.00		127.45	0.19	0.06	0.02	5.17	
50.00	Top - Section 1	1255.9	0.24	0.06	0.02	50.13	
55.00		561.84	0.29	0.05	0.01	20.79	
60.00	RT3 RB4	546.48	0.34	0.03	0.01	16.67	
65.00		531.12	0.40	0.02	0.01	10.24	
67.50	RT4	259.80	0.44	0.01	0.01	3.07	
70.00		255.96	0.47	-0.01	0.01	0.89	
75.00		500.39	0.54	-0.03	0.01	-7.17	
80.00		485.03	0.61	-0.06	0.02	-14.54	
85.00		469.67	0.69	-0.08	0.03	-18.97	
90.00	Appurtenance(s)	4126.3	0.78	-0.11	0.05	-183.59	
90.50	Bot - Section 3	44.59	0.78	-0.11	0.05	-1.99	
93.12	RB5	372.44	0.83	-0.12	0.06	-16.34	
94.50	Top - Section 2	193.46	0.86	-0.12	0.07	-8.29	
95.00		26.43	0.86	-0.12	0.07	-1.12	
100.00		259.21	0.96	-0.12	0.11	-8.92	
105.00		250.00	1.06	-0.09	0.16	-5.22	
107.87	RT5	139.33	1.11	-0.06	0.20	-1.48	
110.00		101.45	1.16	-0.03	0.23	-0.19	
114.00	Appurtenance(s)	3610.3	1.24	0.05	0.29	62.25	
115.00		45.58	1.27	0.08	0.31	1.03	
120.00		222.35	1.38	0.24	0.41	11.70	
125.00	Appurtenance(s)	3529.1	1.50	0.49	0.54	311.83	
130.00		203.91	1.62	0.84	0.69	26.50	
135.00	Appurtenance(s)	3871.1	1.74	1.30	0.89	687.55	
140.00		185.48	1.88	1.91	1.11	42.93	
140.50		18.04	1.89	1.98	1.14	4.28	
	Totals:	**29,062.1**				**1,226.9**	**Total Wind:** **32,767.9**

Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 31	

Tower Engineering Solutions

Load Case: 1.2D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19			**Iterations**	22
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.26	**SA**	0.03			**S1**	0.06
								Seismic Importance Factor	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-39.73	-1.50	0.00	-171.99	0.00	171.99	3592.24	1796.12	6217.42	3113.33		0.00	0.00	0.041
5.00	-38.49	-1.49	0.00	-164.49	0.00	164.49	3536.93	1768.47	5988.37	2998.63		0.01	-0.01	0.040
10.00	-37.28	-1.47	0.00	-157.05	0.00	157.05	3480.64	1740.32	5761.86	2885.21		0.03	-0.03	0.039
15.00	-36.09	-1.45	0.00	-149.69	0.00	149.69	3423.37	1711.69	5538.01	2773.12		0.06	-0.04	0.038
20.00	-34.92	-1.43	0.00	-142.43	0.00	142.43	3365.12	1682.56	5316.92	2662.41		0.11	-0.05	0.040
25.00	-33.77	-1.41	0.00	-135.28	0.00	135.28	3305.89	1652.94	5098.71	2553.15		0.17	-0.07	0.039
30.00	-32.65	-1.39	0.00	-128.23	0.00	128.23	3245.52	1622.76	4883.27	2445.26		0.25	-0.08	0.038
35.00	-31.55	-1.37	0.00	-121.28	0.00	121.28	3165.03	1582.51	4642.85	2324.87		0.35	-0.10	0.038
40.00	-30.47	-1.34	0.00	-114.45	0.00	114.45	3084.53	1542.26	4408.49	2207.52		0.46	-0.11	0.040
44.50	-29.51	-1.32	0.00	-108.41	0.00	108.41	3012.08	1506.04	4202.76	2104.51		0.57	-0.13	0.040
45.00	-29.34	-1.32	0.00	-107.75	0.00	107.75	3004.03	1502.02	4180.21	2093.21		0.58	-0.13	0.039
50.00	-27.61	-1.27	0.00	-101.16	0.00	101.16	2423.81	1211.90	3356.59	1680.79		0.73	-0.14	0.040
55.00	-26.71	-1.26	0.00	-94.79	0.00	94.79	2376.14	1188.07	3201.01	1602.88		0.89	-0.16	0.042
60.00	-25.84	-1.25	0.00	-88.51	0.00	88.51	2327.49	1163.75	3047.73	1526.13		1.06	-0.18	0.041
65.00	-24.98	-1.24	0.00	-82.27	0.00	82.27	2277.86	1138.93	2896.88	1450.59		1.26	-0.20	0.039
67.50	-24.56	-1.24	0.00	-79.18	0.00	79.18	2252.16	1126.08	2821.75	1412.97		1.37	-0.21	0.039
67.50	-24.56	-1.24	0.00	-79.18	0.00	79.18	2252.16	1126.08	2821.75	1412.97		1.37	-0.21	0.039
70.00	-24.14	-1.24	0.00	-76.08	0.00	76.08	2218.62	1109.31	2737.91	1370.99		1.48	-0.21	0.066
75.00	-23.32	-1.25	0.00	-69.86	0.00	69.86	2151.54	1075.77	2574.02	1288.93		1.72	-0.24	0.065
80.00	-22.51	-1.26	0.00	-63.60	0.00	63.60	2084.46	1042.23	2415.20	1209.39		1.99	-0.28	0.063
85.00	-21.73	-1.27	0.00	-57.29	0.00	57.29	2017.38	1008.69	2261.43	1132.40		2.29	-0.31	0.061
90.00	-16.55	-1.24	0.00	-50.94	0.00	50.94	1950.30	975.15	2112.72	1057.93		2.63	-0.34	0.057
90.50	-16.49	-1.25	0.00	-50.32	0.00	50.32	1943.59	971.80	2098.13	1050.62		2.66	-0.34	0.056
93.12	-15.97	-1.25	0.00	-47.05	0.00	47.05	1908.44	954.22	2022.49	1012.75		2.86	-0.35	0.031
94.50	-15.70	-1.25	0.00	-45.33	0.00	45.33	1035.36	517.68	1113.15	557.40		2.96	-0.36	0.034
95.00	-15.66	-1.25	0.00	-44.71	0.00	44.71	1033.16	516.58	1106.89	554.27		3.00	-0.36	0.042
100.00	-15.21	-1.25	0.00	-38.46	0.00	38.46	1010.63	505.31	1044.65	523.10		3.38	-0.38	0.038
105.00	-14.78	-1.25	0.00	-32.21	0.00	32.21	987.11	493.55	983.14	492.30		3.79	-0.40	0.034
107.87	-14.53	-1.25	0.00	-28.62	0.00	28.62	973.17	486.58	948.19	474.80		4.03	-0.41	0.031
107.87	-14.53	-1.25	0.00	-28.62	0.00	28.62	973.17	486.58	948.19	474.80		4.03	-0.41	0.031
110.00	-14.35	-1.26	0.00	-25.95	0.00	25.95	962.61	481.31	922.45	461.91		4.22	-0.41	0.071
114.00	-9.92	-1.16	0.00	-20.93	0.00	20.93	942.31	471.15	874.57	437.94		4.58	-0.44	0.058
115.00	-9.84	-1.16	0.00	-19.77	0.00	19.77	937.13	468.57	862.70	431.99		4.67	-0.45	0.056
120.00	-9.49	-1.15	0.00	-13.95	0.00	13.95	910.67	455.33	804.02	402.61		5.16	-0.48	0.045
125.00	-5.17	-0.81	0.00	-8.18	0.00	8.18	883.23	441.61	746.49	373.80		5.67	-0.50	0.028
130.00	-4.90	-0.78	0.00	-4.14	0.00	4.14	854.80	427.40	690.24	345.64		6.20	-0.51	0.018
135.00	-0.24	-0.05	0.00	-0.25	0.00	0.25	825.39	412.70	635.38	318.16		6.74	-0.52	0.001
140.00	-0.02	0.00	0.00	0.00	0.00	0.00	789.80	394.90	578.22	289.54		7.28	-0.52	0.000
140.50	0.00	0.00	0.00	0.00	0.00	0.00	785.78	392.89	572.31	286.58		7.34	-0.52	0.000

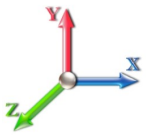
Seismic Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 32	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	22
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.26	**SA**	0.03	**S1**	0.06
						Seismic Importance Factor	1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00	RB1	0.00	0.00	0.00	0.00	0.00	
5.00		844.63	0.00	0.03	0.02	18.52	
10.00		826.19	0.01	0.05	0.03	25.06	
15.00		807.76	0.02	0.06	0.04	27.57	
20.00	RT1 RB2	789.32	0.04	0.07	0.04	28.41	
25.00		770.89	0.06	0.07	0.04	28.61	
30.00		752.46	0.09	0.07	0.04	28.66	
35.00		734.02	0.12	0.07	0.03	28.70	
40.00	RT2 RB3	715.59	0.15	0.07	0.03	28.67	
44.50	Bot - Section 2	628.27	0.19	0.06	0.02	25.49	
45.00		127.45	0.19	0.06	0.02	5.17	
50.00	Top - Section 1	1255.9	0.24	0.06	0.02	50.13	
55.00		561.84	0.29	0.05	0.01	20.79	
60.00	RT3 RB4	546.48	0.34	0.03	0.01	16.67	
65.00		531.12	0.40	0.02	0.01	10.24	
67.50	RT4	259.80	0.44	0.01	0.01	3.07	
70.00		255.96	0.47	-0.01	0.01	0.89	
75.00		500.39	0.54	-0.03	0.01	-7.17	
80.00		485.03	0.61	-0.06	0.02	-14.54	
85.00		469.67	0.69	-0.08	0.03	-18.97	
90.00	Appurtenance(s)	4126.3	0.78	-0.11	0.05	-183.59	
90.50	Bot - Section 3	44.59	0.78	-0.11	0.05	-1.99	
93.12	RB5	372.44	0.83	-0.12	0.06	-16.34	
94.50	Top - Section 2	193.46	0.86	-0.12	0.07	-8.29	
95.00		26.43	0.86	-0.12	0.07	-1.12	
100.00		259.21	0.96	-0.12	0.11	-8.92	
105.00		250.00	1.06	-0.09	0.16	-5.22	
107.87	RT5	139.33	1.11	-0.06	0.20	-1.48	
110.00		101.45	1.16	-0.03	0.23	-0.19	
114.00	Appurtenance(s)	3610.3	1.24	0.05	0.29	62.25	
115.00		45.58	1.27	0.08	0.31	1.03	
120.00		222.35	1.38	0.24	0.41	11.70	
125.00	Appurtenance(s)	3529.1	1.50	0.49	0.54	311.83	
130.00		203.91	1.62	0.84	0.69	26.50	
135.00	Appurtenance(s)	3871.1	1.74	1.30	0.89	687.55	
140.00		185.48	1.88	1.91	1.11	42.93	
140.50		18.04	1.89	1.98	1.14	4.28	
	Totals:	**29,062.1**				**1,226.9**	**Total Wind:** **32,767.9**

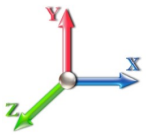
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 33	

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	22		
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18		
Wind Load Factor	0.00	**Structure Frequency**	0.26	**SA**	0.03	**S1**	0.06	**Seismic Importance Factor**	1.00

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-29.80	-1.50	0.00	-169.46	0.00	169.46	3592.24	1796.12	6217.42	3113.33		0.00	0.00	0.038
5.00	-28.87	-1.49	0.00	-161.98	0.00	161.98	3536.93	1768.47	5988.37	2998.63		0.01	-0.01	0.038
10.00	-27.96	-1.47	0.00	-154.55	0.00	154.55	3480.64	1740.32	5761.86	2885.21		0.03	-0.03	0.037
15.00	-27.07	-1.44	0.00	-147.22	0.00	147.22	3423.37	1711.69	5538.01	2773.12		0.06	-0.04	0.036
20.00	-26.19	-1.42	0.00	-140.00	0.00	140.00	3365.12	1682.56	5316.92	2662.41		0.11	-0.05	0.038
25.00	-25.33	-1.40	0.00	-132.89	0.00	132.89	3305.89	1652.94	5098.71	2553.15		0.17	-0.07	0.037
30.00	-24.49	-1.37	0.00	-125.90	0.00	125.90	3245.52	1622.76	4883.27	2445.26		0.25	-0.08	0.036
35.00	-23.66	-1.35	0.00	-119.02	0.00	119.02	3165.03	1582.51	4642.85	2324.87		0.34	-0.10	0.036
40.00	-22.85	-1.33	0.00	-112.27	0.00	112.27	3084.53	1542.26	4408.49	2207.52		0.45	-0.11	0.038
44.50	-22.13	-1.30	0.00	-106.30	0.00	106.30	3012.08	1506.04	4202.76	2104.51		0.56	-0.12	0.038
45.00	-22.00	-1.30	0.00	-105.65	0.00	105.65	3004.03	1502.02	4180.21	2093.21		0.57	-0.13	0.037
50.00	-20.71	-1.25	0.00	-99.14	0.00	99.14	2423.81	1211.90	3356.59	1680.79		0.71	-0.14	0.038
55.00	-20.03	-1.24	0.00	-92.88	0.00	92.88	2376.14	1188.07	3201.01	1602.88		0.87	-0.16	0.040
60.00	-19.38	-1.22	0.00	-86.69	0.00	86.69	2327.49	1163.75	3047.73	1526.13		1.05	-0.18	0.039
65.00	-18.73	-1.22	0.00	-80.57	0.00	80.57	2277.86	1138.93	2896.88	1450.59		1.24	-0.19	0.037
67.50	-18.42	-1.21	0.00	-77.53	0.00	77.53	2252.16	1126.08	2821.75	1412.97		1.34	-0.20	0.037
67.50	-18.42	-1.21	0.00	-77.53	0.00	77.53	2252.16	1126.08	2821.75	1412.97		1.34	-0.20	0.037
70.00	-18.10	-1.22	0.00	-74.50	0.00	74.50	2218.62	1109.31	2737.91	1370.99		1.45	-0.21	0.062
75.00	-17.49	-1.23	0.00	-68.40	0.00	68.40	2151.54	1075.77	2574.02	1288.93		1.69	-0.24	0.061
80.00	-16.88	-1.23	0.00	-62.28	0.00	62.28	2084.46	1042.23	2415.20	1209.39		1.95	-0.27	0.060
85.00	-16.29	-1.24	0.00	-56.12	0.00	56.12	2017.38	1008.69	2261.43	1132.40		2.25	-0.30	0.058
90.00	-12.41	-1.22	0.00	-49.94	0.00	49.94	1950.30	975.15	2112.72	1057.93		2.58	-0.33	0.054
90.50	-12.36	-1.22	0.00	-49.33	0.00	49.33	1943.59	971.80	2098.13	1050.62		2.62	-0.33	0.053
93.12	-11.98	-1.22	0.00	-46.13	0.00	46.13	1908.44	954.22	2022.49	1012.75		2.80	-0.35	0.029
94.50	-11.77	-1.22	0.00	-44.44	0.00	44.44	1035.36	517.68	1113.15	557.40		2.90	-0.35	0.032
95.00	-11.74	-1.22	0.00	-43.83	0.00	43.83	1033.16	516.58	1106.89	554.27		2.94	-0.35	0.040
100.00	-11.41	-1.22	0.00	-37.72	0.00	37.72	1010.63	505.31	1044.65	523.10		3.32	-0.37	0.036
105.00	-11.08	-1.22	0.00	-31.60	0.00	31.60	987.11	493.55	983.14	492.30		3.72	-0.39	0.032
107.87	-10.90	-1.22	0.00	-28.09	0.00	28.09	973.17	486.58	948.19	474.80		3.96	-0.40	0.029
107.87	-10.90	-1.22	0.00	-28.09	0.00	28.09	973.17	486.58	948.19	474.80		3.96	-0.40	0.029
110.00	-10.76	-1.23	0.00	-25.48	0.00	25.48	962.61	481.31	922.45	461.91		4.14	-0.41	0.066
114.00	-7.44	-1.14	0.00	-20.58	0.00	20.58	942.31	471.15	874.57	437.94		4.49	-0.43	0.055
115.00	-7.38	-1.14	0.00	-19.43	0.00	19.43	937.13	468.57	862.70	431.99		4.58	-0.44	0.053
120.00	-7.11	-1.13	0.00	-13.72	0.00	13.72	910.67	455.33	804.02	402.61		5.06	-0.47	0.042
125.00	-3.87	-0.79	0.00	-8.05	0.00	8.05	883.23	441.61	746.49	373.80		5.56	-0.49	0.026
130.00	-3.68	-0.77	0.00	-4.08	0.00	4.08	854.80	427.40	690.24	345.64		6.08	-0.50	0.016
135.00	-0.18	-0.05	0.00	-0.25	0.00	0.25	825.39	412.70	635.38	318.16		6.61	-0.51	0.001
140.00	-0.02	0.00	0.00	0.00	0.00	0.00	789.80	394.90	578.22	289.54		7.15	-0.51	0.000
140.50	0.00	0.00	0.00	0.00	0.00	0.00	785.78	392.89	572.31	286.58		7.20	-0.51	0.000

Wind Loading - Shaft

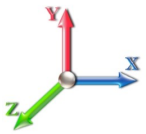
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1	1.00	0.85	7.442	8.19	199.12	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	194.86	0.659 *	0.000	5.00	17.806	11.74	96.1	0.0	844.6
10.00		1.00	0.85	7.442	8.19	190.60	0.664 *	0.000	5.00	17.421	11.57	94.7	0.0	826.2
15.00		1.00	0.85	7.442	8.19	186.34	0.669 *	0.000	5.00	17.036	11.39	93.2	0.0	807.8
20.00	RT1 RB2	1.00	0.90	7.896	8.69	187.56	0.674 *	0.000	5.00	16.650	11.22	97.4	0.0	789.3
25.00		1.00	0.95	8.276	9.10	187.52	0.679 *	0.000	5.00	16.265	11.04	100.5	0.0	770.9
30.00		1.00	0.98	8.600	9.46	186.57	0.684 *	0.000	5.00	15.880	10.87	102.8	0.0	752.5
35.00		1.00	1.01	8.883	9.77	184.97	0.690 *	0.000	5.00	15.495	10.69	104.5	0.0	734.0
40.00	RT2 RB3	1.00	1.04	9.137	10.05	182.87	0.696 *	0.000	5.00	15.110	10.51	105.7	0.0	715.6
44.50	Bot - Section 2	1.00	1.07	9.344	10.28	180.63	0.674 *	0.000	4.50	13.270	8.95	92.0	0.0	628.3
45.00		1.00	1.07	9.366	10.30	180.37	0.677 *	0.000	0.50	1.482	1.00	10.3	0.0	127.5
50.00	Top - Section 1	1.00	1.09	9.576	10.53	177.54	0.681 *	0.000	5.00	14.604	9.94	104.7	0.0	1255.9
55.00		1.00	1.12	9.770	10.75	177.80	0.682 *	0.000	5.00	14.219	9.70	104.3	0.0	561.8
60.00	RT3 RB4	1.00	1.14	9.951	10.95	174.51	0.689 *	0.000	5.00	13.834	9.53	104.3	0.0	546.5
65.00		1.00	1.16	10.120	11.13	171.02	0.695 *	0.000	5.00	13.448	9.35	104.1	0.0	531.1
67.50	RT4	1.00	1.17	10.201	11.22	169.21	0.701 *	0.000	2.50	6.580	4.61	51.7	0.0	259.8
70.00		1.00	1.17	10.279	11.31	167.35	0.704 *	0.000	2.50	6.484	4.57	51.6	0.0	256.0
75.00		1.00	1.19	10.430	11.47	163.53	0.650	0.000	5.00	12.678	8.24	94.5	0.0	500.4
80.00		1.00	1.21	10.572	11.63	159.56	0.650	0.000	5.00	12.293	7.99	92.9	0.0	485.0
85.00		1.00	1.22	10.708	11.78	155.47	0.650	0.000	5.00	11.908	7.74	91.2	0.0	469.7
90.00	Appurtenance(s)	1.00	1.24	10.838	11.92	151.27	0.650	0.000	5.00	11.523	7.49	89.3	0.0	454.3
90.50	Bot - Section 3	1.00	1.24	10.850	11.94	150.84	0.650	0.000	0.50	1.131	0.74	8.8	0.0	44.6
93.12	RB5	1.00	1.25	10.916	12.01	148.59	0.744 *	0.000	2.62	5.947	4.42	53.1	0.0	372.4
94.50	Top - Section 2	1.00	1.25	10.950	12.04	147.40	0.748 *	0.000	1.38	3.090	2.31	27.8	0.0	193.5
95.00		1.00	1.25	10.962	12.06	149.09	0.746 *	0.000	0.50	1.112	0.83	10.0	0.0	26.4
100.00		1.00	1.27	11.081	12.19	144.70	0.751 *	0.000	5.00	10.911	8.20	99.9	0.0	259.2
105.00		1.00	1.28	11.195	12.31	140.22	0.762 *	0.000	5.00	10.526	8.02	98.8	0.0	250.0
107.87	RT5	1.00	1.29	11.259	12.38	137.61	0.771 *	0.000	2.87	5.868	4.53	56.1	0.0	139.3
110.00		1.00	1.29	11.305	12.44	135.65	0.777 *	0.000	2.13	4.273	3.32	41.3	0.0	101.4
114.00	Appurtenance(s)	1.00	1.30	11.391	12.53	131.95	0.650	0.000	4.00	7.835	5.09	63.8	0.0	186.0
115.00		1.00	1.30	11.412	12.55	131.01	0.650	0.000	1.00	1.920	1.25	15.7	0.0	45.6
120.00		1.00	1.32	11.514	12.67	126.30	0.650	0.000	5.00	9.370	6.09	77.1	0.0	222.3
125.00	Appurtenance(s)	1.00	1.33	11.614	12.78	121.52	0.650	0.000	5.00	8.985	5.84	74.6	0.0	213.1
130.00		1.00	1.34	11.710	12.88	116.68	0.650	0.000	5.00	8.600	5.59	72.0	0.0	203.9
135.00	Appurtenance(s)	1.00	1.35	11.803	12.98	111.78	0.651 *	0.000	5.00	8.215	5.35	69.4	0.0	194.7
140.00		1.00	1.36	11.894	13.08	106.82	0.650	0.000	5.00	7.830	5.09	66.6	0.0	185.5
140.50		1.00	1.36	11.903	13.09	106.32	0.650	0.000	0.50	0.762	0.50	6.5	0.0	18.0
								Totals:	**140.50**			**2,627.5**		**14,973.2**

* Cf Adjusted by Linear Load Ra Effect

Discrete Appurtenance Forces

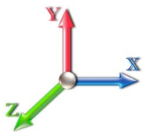
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 35	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	135.00	Expansion rights	3	11.803	12.984	0.70	0.80	6.67	210.00	0.000	0.000	86.65	0.00	0.00
2	135.00	Ericsson RRUS 32 B66A	3	11.803	12.984	0.70	0.80	8.08	158.70	0.000	0.000	104.92	0.00	0.00
3	135.00	Ericsson S11B12	3	11.803	12.984	0.56	0.80	4.75	153.00	0.000	0.000	61.73	0.00	0.00
4	135.00	RFS	3	11.803	12.984	0.50	0.80	9.61	122.10	0.000	0.000	124.81	0.00	0.00
5	135.00	Commscope F-65C-R2	3	11.803	12.984	0.67	0.80	28.57	185.10	0.000	0.000	370.90	0.00	0.00
6	135.00	Ericsson AIR32	3	11.803	12.984	0.70	0.80	13.59	396.60	0.000	0.000	176.49	0.00	0.00
7	135.00	Sector Frame	3	11.803	12.984	0.56	0.75	25.31	2451.00	0.000	0.000	328.65	0.00	0.00
8	125.00	Kathrein 782 10250	6	11.614	12.775	0.50	0.75	1.57	38.40	0.000	0.000	20.03	0.00	0.00
9	125.00	Raycap DC6-48-60-18-8F	2	11.701	12.871	0.81	0.90	2.38	65.60	0.000	4.500	30.65	0.00	137.92
10	125.00	CCI DTMABP7819VG12A	6	11.614	12.775	0.50	0.75	3.44	114.00	0.000	0.000	43.91	0.00	0.00
11	125.00	CCI OPA-65R-LCUU-H6	3	11.614	12.775	0.59	0.75	17.17	219.00	0.000	0.000	219.36	0.00	0.00
12	125.00	7120.16	3	11.614	12.775	0.92	0.75	10.82	46.20	0.000	0.000	138.17	0.00	0.00
13	125.00	KMW	3	11.614	12.775	0.56	0.75	13.53	145.50	0.000	0.000	172.89	0.00	0.00
14	125.00	Ericsson RRUS-11	6	11.614	12.775	0.50	0.75	7.60	324.00	0.000	0.000	97.06	0.00	0.00
15	125.00	Ericsson RRUS-32	3	11.614	12.775	0.56	0.75	4.25	231.00	0.000	0.000	54.33	0.00	0.00
16	125.00	Kathrein 800-10121	3	11.614	12.775	0.59	0.75	9.15	132.30	0.000	0.000	116.94	0.00	0.00
17	125.00	Platform w/ Hand Rails	1	11.614	12.775	1.00	1.00	40.00	2000.00	0.000	0.000	511.00	0.00	0.00
18	114.00	Low Profile Platform	1	11.391	12.530	1.00	1.00	25.00	1800.00	0.000	0.000	313.24	0.00	0.00
19	114.00	Alcatel Lucent	3	11.453	12.598	0.78	0.80	6.37	180.00	0.000	3.000	80.30	0.00	240.90
20	114.00	Samsung	3	11.370	12.507	0.61	0.80	3.32	99.30	0.000	-1.000	41.52	0.00	-41.52
21	114.00	Andrew VHLP1-23-DW1	1	11.484	12.632	1.00	1.00	1.61	14.00	0.000	4.500	20.34	0.00	91.52
22	114.00	Andrew VHLP2-23-DW1	1	11.484	12.632	1.00	1.00	4.69	31.00	0.000	4.500	59.25	0.00	266.60
23	114.00	Argus LLPX310R-V1	3	11.401	12.541	0.55	0.80	7.14	152.10	0.000	0.500	89.51	0.00	44.76
24	114.00	Alcatel Lucent	3	11.359	12.495	0.78	0.80	5.59	192.00	0.000	-1.500	69.81	0.00	-104.72
25	114.00	RFS APXVTM14	3	11.453	12.598	0.63	0.80	12.02	350.10	0.000	3.000	151.44	0.00	454.32
26	114.00	RFS APXVSPP18	3	11.412	12.553	0.66	0.80	15.98	375.90	0.000	1.000	200.54	0.00	200.54
27	114.00	Alcatel Lucent	3	11.453	12.598	0.55	0.80	6.71	210.00	0.000	3.000	84.50	0.00	253.49
28	114.00	20" x 18" x 9" Junction	1	11.391	12.530	1.00	1.00	3.15	20.00	0.000	0.000	39.47	0.00	0.00
29	90.00	Alcatel Lucent	3	10.838	11.921	0.57	0.75	5.99	270.00	0.000	0.000	71.35	0.00	0.00
30	90.00	Swedcom SLCP 2x6014	3	10.838	11.921	0.67	0.75	13.00	136.80	0.000	0.000	154.93	0.00	0.00
31	90.00	Commscope	6	10.838	11.921	0.62	0.75	30.18	458.40	0.000	0.000	359.77	0.00	0.00
32	90.00	Antel	3	10.838	11.921	0.55	0.75	12.43	127.80	0.000	0.000	148.23	0.00	0.00
33	90.00	RFS DB-T1-6Z-8AB-0Z	1	10.838	11.921	1.00	1.00	4.80	44.00	0.000	0.000	57.22	0.00	0.00
34	90.00	Alcatel Lucent	3	10.838	11.921	0.57	0.75	5.99	270.00	0.000	0.000	71.35	0.00	0.00
35	90.00	Alcatel Lucent	3	10.838	11.921	0.68	0.75	3.06	165.00	0.000	0.000	36.45	0.00	0.00
36	90.00	Platform w/ Hand Rails	1	10.838	11.921	1.00	1.00	42.00	2200.00	0.000	0.000	500.70	0.00	0.00
							Totals:		**14,088.90**			**5,208.41**		

Total Applied Force Summary

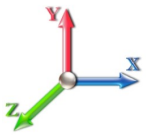
Structure:	CT16504-A-SBA		**Code:**	EIA/TIA-222-G	9/15/2017
Site Name:	Manchester 12, CT		**Exposure:**	C	
Height:	140.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 36

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		96.12	1028.89	0.00	0.00
10.00		94.68	1010.45	0.00	0.00
15.00		93.25	992.02	0.00	0.00
20.00		97.42	973.58	0.00	0.00
25.00		100.51	955.15	0.00	0.00
30.00		102.78	936.72	0.00	0.00
35.00		104.46	918.28	0.00	0.00
40.00		105.68	899.85	0.00	0.00
44.50		91.97	794.10	0.00	0.00
45.00		10.34	145.88	0.00	0.00
50.00		104.69	1440.18	0.00	0.00
55.00		104.28	746.10	0.00	0.00
60.00		104.29	730.74	0.00	0.00
65.00		104.12	715.38	0.00	0.00
67.50		51.74	351.93	0.00	0.00
70.00		51.64	348.09	0.00	0.00
75.00		94.54	684.65	0.00	0.00
80.00		92.92	669.29	0.00	0.00
85.00		91.17	653.93	0.00	0.00
90.00	(23) attachments	1489.30	4310.57	0.00	0.00
90.50		8.77	55.67	0.00	0.00
93.12		53.13	430.53	0.00	0.00
94.50		27.84	224.06	0.00	0.00
95.00		10.00	37.51	0.00	0.00
100.00		99.93	370.07	0.00	0.00
105.00		98.80	360.86	0.00	0.00
107.87		56.05	202.97	0.00	0.00
110.00		41.31	148.67	0.00	0.00
114.00	(25) attachments	1213.73	3699.08	0.00	1405.90
115.00		15.67	60.23	0.00	0.00
120.00		77.14	295.60	0.00	0.00
125.00	(36) attachments	1478.95	3602.38	0.00	137.92
130.00		72.01	220.91	0.00	0.00
135.00	(21) attachments	1323.56	3888.19	0.00	0.00
140.00		66.59	185.48	0.00	0.00
140.50		6.48	18.04	0.00	0.00
	Totals:	**7,835.88**	**33,106.01**	**0.00**	**1,543.83**

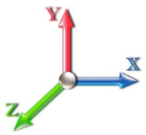
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 37	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
5.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.105	1.015	7.442	0.00	6.60
5.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.105	1.015	7.442	0.00	10.40
5.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.105	1.015	7.442	0.00	0.00
5.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.105	1.015	7.442	0.00	0.00
10.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.107	1.021	7.442	0.00	6.60
10.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.107	1.021	7.442	0.00	10.40
10.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.107	1.021	7.442	0.00	0.00
10.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.107	1.021	7.442	0.00	0.00
15.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.110	1.029	7.442	0.00	6.60
15.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.110	1.029	7.442	0.00	10.40
15.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.110	1.029	7.442	0.00	0.00
15.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.110	1.029	7.442	0.00	0.00
20.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.112	1.036	7.896	0.00	6.60
20.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.112	1.036	7.896	0.00	10.40
20.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.112	1.036	7.896	0.00	0.00
20.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.112	1.036	7.896	0.00	0.00
25.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.115	1.044	8.276	0.00	6.60
25.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.115	1.044	8.276	0.00	10.40
25.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.115	1.044	8.276	0.00	0.00
25.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.115	1.044	8.276	0.00	0.00
30.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.118	1.053	8.600	0.00	6.60
30.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.118	1.053	8.600	0.00	10.40
30.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.118	1.053	8.600	0.00	0.00
30.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.118	1.053	8.600	0.00	0.00
35.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.120	1.061	8.883	0.00	6.60
35.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.120	1.061	8.883	0.00	10.40
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.120	1.061	8.883	0.00	0.00
35.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.120	1.061	8.883	0.00	0.00
40.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.124	1.071	9.137	0.00	6.60
40.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.124	1.071	9.137	0.00	10.40
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.124	1.071	9.137	0.00	0.00
40.00	1.25" Reinforcing	Yes	5.00	0.000	1.25	0.52	0.00	0.124	1.071	9.137	0.00	0.00
44.50	1 1/4" Fiber	Yes	4.50	0.000	0.00	0.00	0.00	0.112	1.037	9.344	0.00	5.94
44.50	1 5/8" Coax	Yes	4.50	0.000	1.98	0.74	0.00	0.112	1.037	9.344	0.00	9.36
44.50	1" Reinforcing plate	Yes	4.50	0.000	1.00	0.38	0.00	0.112	1.037	9.344	0.00	0.00
44.50	1" Reinforcing plate	Yes	4.50	0.000	1.00	0.38	0.00	0.112	1.037	9.344	0.00	0.00
45.00	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.114	1.042	9.366	0.00	0.66
45.00	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.114	1.042	9.366	0.00	1.04
45.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.114	1.042	9.366	0.00	0.00
45.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.114	1.042	9.366	0.00	0.00
50.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.116	1.047	9.576	0.00	6.60
50.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.116	1.047	9.576	0.00	10.40
50.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.116	1.047	9.576	0.00	0.00
50.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.116	1.047	9.576	0.00	0.00
55.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.117	1.050	9.770	0.00	6.60
55.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.117	1.050	9.770	0.00	10.40
55.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.117	1.050	9.770	0.00	0.00

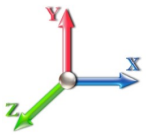
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 38	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
55.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.117	1.050	9.770	0.00	0.00
60.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.120	1.060	9.951	0.00	6.60
60.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.120	1.060	9.951	0.00	10.40
60.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.120	1.060	9.951	0.00	0.00
60.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.120	1.060	9.951	0.00	0.00
65.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.123	1.070	10.120	0.00	6.60
65.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.123	1.070	10.120	0.00	10.40
65.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.123	1.070	10.120	0.00	0.00
65.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.123	1.070	10.120	0.00	0.00
67.50	1 1/4" Fiber	Yes	2.50	0.000	0.00	0.00	0.00	0.126	1.078	10.201	0.00	3.30
67.50	1 5/8" Coax	Yes	2.50	0.000	1.98	0.41	0.00	0.126	1.078	10.201	0.00	5.20
67.50	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.126	1.078	10.201	0.00	0.00
67.50	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.126	1.078	10.201	0.00	0.00
70.00	1 1/4" Fiber	Yes	2.50	0.000	0.00	0.00	0.00	0.128	1.084	10.279	0.00	3.30
70.00	1 5/8" Coax	Yes	2.50	0.000	1.98	0.41	0.00	0.128	1.084	10.279	0.00	5.20
70.00	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.128	1.084	10.279	0.00	0.00
70.00	1" Reinforcing plate	Yes	2.50	0.000	1.00	0.21	0.00	0.128	1.084	10.279	0.00	0.00
75.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.065	0.000	10.430	0.00	6.60
75.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.065	0.000	10.430	0.00	10.40
80.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.067	0.000	10.572	0.00	6.60
80.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.067	0.000	10.572	0.00	10.40
85.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.069	0.000	10.708	0.00	6.60
85.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.069	0.000	10.708	0.00	10.40
90.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.072	0.000	10.838	0.00	6.60
90.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.072	0.000	10.838	0.00	10.40
90.50	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.073	0.000	10.850	0.00	0.66
90.50	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.073	0.000	10.850	0.00	1.04
93.12	1 1/4" Fiber	Yes	2.62	0.000	0.00	0.00	0.00	0.148	1.145	10.916	0.00	3.46
93.12	1 5/8" Coax	Yes	2.62	0.000	1.98	0.43	0.00	0.148	1.145	10.916	0.00	5.45
93.12	1" Reinforcing plate	Yes	2.62	0.000	1.00	0.22	0.00	0.148	1.145	10.916	0.00	0.00
93.12	1" Reinforcing plate	Yes	2.62	0.000	1.00	0.22	0.00	0.148	1.145	10.916	0.00	0.00
94.50	1 1/4" Fiber	Yes	1.38	0.000	0.00	0.00	0.00	0.150	1.151	10.950	0.00	1.82
94.50	1 5/8" Coax	Yes	1.38	0.000	1.98	0.23	0.00	0.150	1.151	10.950	0.00	2.87
94.50	1" Reinforcing plate	Yes	1.38	0.000	1.00	0.11	0.00	0.150	1.151	10.950	0.00	0.00
94.50	1" Reinforcing plate	Yes	1.38	0.000	1.00	0.11	0.00	0.150	1.151	10.950	0.00	0.00
95.00	1 1/4" Fiber	Yes	0.50	0.000	0.00	0.00	0.00	0.149	1.147	10.962	0.00	0.66
95.00	1 5/8" Coax	Yes	0.50	0.000	1.98	0.08	0.00	0.149	1.147	10.962	0.00	1.04
95.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.149	1.147	10.962	0.00	0.00
95.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.149	1.147	10.962	0.00	0.00
100.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.152	1.156	11.081	0.00	6.60
100.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.152	1.156	11.081	0.00	10.40
100.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.152	1.156	11.081	0.00	0.00
100.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.152	1.156	11.081	0.00	0.00
105.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.158	1.173	11.195	0.00	6.60
105.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.158	1.173	11.195	0.00	10.40
105.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.158	1.173	11.195	0.00	0.00
105.00	1" Reinforcing plate	Yes	5.00	0.000	1.00	0.42	0.00	0.158	1.173	11.195	0.00	0.00

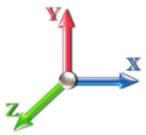
Linear Appurtenance Segment Forces (Factored)

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 39	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Top Elev (ft)	Description	Wind Exposed	Length (ft)	Ca	Exposed Width (in)	Area (sqft)	CaAa (sqft)	Ra	Cf Adjust Factor	qz (psf)	F X (lb)	Dead Load (lb)
107.87	1 1/4" Fiber	Yes	2.87	0.000	0.00	0.00	0.00	0.162	1.187	11.259	0.00	3.79
107.87	1 5/8" Coax	Yes	2.87	0.000	1.98	0.47	0.00	0.162	1.187	11.259	0.00	5.97
107.87	1" Reinforcing plate	Yes	2.87	0.000	1.00	0.24	0.00	0.162	1.187	11.259	0.00	0.00
107.87	1" Reinforcing plate	Yes	2.87	0.000	1.00	0.24	0.00	0.162	1.187	11.259	0.00	0.00
110.00	1 1/4" Fiber	Yes	2.13	0.000	0.00	0.00	0.00	0.165	1.196	11.305	0.00	2.81
110.00	1 5/8" Coax	Yes	2.13	0.000	1.98	0.35	0.00	0.165	1.196	11.305	0.00	4.43
110.00	1" Reinforcing plate	Yes	2.13	0.000	1.00	0.18	0.00	0.165	1.196	11.305	0.00	0.00
110.00	1" Reinforcing plate	Yes	2.13	0.000	1.00	0.18	0.00	0.165	1.196	11.305	0.00	0.00
114.00	1 1/4" Fiber	Yes	4.00	0.000	0.00	0.00	0.00	0.095	0.000	11.391	0.00	5.28
114.00	1 5/8" Coax	Yes	4.00	0.000	1.98	0.66	0.00	0.095	0.000	11.391	0.00	8.32
114.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.095	0.000	11.391	0.00	0.00
114.00	1" Reinforcing plate	Yes	0.50	0.000	1.00	0.04	0.00	0.095	0.000	11.391	0.00	0.00
115.00	1 1/4" Fiber	Yes	1.00	0.000	0.00	0.00	0.00	0.086	0.000	11.412	0.00	1.32
115.00	1 5/8" Coax	Yes	1.00	0.000	1.98	0.17	0.00	0.086	0.000	11.412	0.00	2.08
120.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.088	0.000	11.514	0.00	6.60
120.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.088	0.000	11.514	0.00	10.40
125.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.092	0.000	11.614	0.00	6.60
125.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.092	0.000	11.614	0.00	10.40
130.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.096	0.000	11.710	0.00	6.60
130.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.096	0.000	11.710	0.00	10.40
135.00	1 1/4" Fiber	Yes	5.00	0.000	0.00	0.00	0.00	0.100	1.001	11.803	0.00	6.60
135.00	1 5/8" Coax	Yes	5.00	0.000	1.98	0.82	0.00	0.100	1.001	11.803	0.00	10.40
										Totals:	**0.0**	**459.0**

Calculated Forces

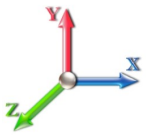
Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 40	

Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 23

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-33.10	-7.85	0.00	-818.57	0.00	818.57	3592.24	1796.12	6217.42	3113.33	0.00	0.000	0.000	0.168
5.00	-32.06	-7.79	0.00	-779.30	0.00	779.30	3536.93	1768.47	5988.37	2998.63	0.03	-0.062	0.000	0.164
10.00	-31.05	-7.73	0.00	-740.34	0.00	740.34	3480.64	1740.32	5761.86	2885.21	0.13	-0.125	0.000	0.160
15.00	-30.05	-7.67	0.00	-701.70	0.00	701.70	3423.37	1711.69	5538.01	2773.12	0.30	-0.188	0.000	0.157
20.00	-29.06	-7.60	0.00	-663.37	0.00	663.37	3365.12	1682.56	5316.92	2662.41	0.53	-0.251	0.000	0.162
25.00	-28.10	-7.53	0.00	-625.38	0.00	625.38	3305.89	1652.94	5098.71	2553.15	0.82	-0.318	0.000	0.158
30.00	-27.16	-7.45	0.00	-587.75	0.00	587.75	3245.52	1622.76	4883.27	2445.26	1.19	-0.385	0.000	0.153
35.00	-26.23	-7.37	0.00	-550.51	0.00	550.51	3165.03	1582.51	4642.85	2324.87	1.63	-0.452	0.000	0.150
40.00	-25.32	-7.28	0.00	-513.66	0.00	513.66	3084.53	1542.26	4408.49	2207.52	2.14	-0.519	0.000	0.159
44.50	-24.52	-7.20	0.00	-480.88	0.00	480.88	3012.08	1506.04	4202.76	2104.51	2.66	-0.585	0.000	0.154
45.00	-24.37	-7.21	0.00	-477.28	0.00	477.28	3004.03	1502.02	4180.21	2093.21	2.73	-0.593	0.000	0.152
50.00	-22.93	-7.11	0.00	-441.25	0.00	441.25	2423.81	1211.90	3356.59	1680.79	3.38	-0.664	0.000	0.153
55.00	-22.17	-7.03	0.00	-405.69	0.00	405.69	2376.14	1188.07	3201.01	1602.88	4.12	-0.735	0.000	0.158
60.00	-21.43	-6.94	0.00	-370.54	0.00	370.54	2327.49	1163.75	3047.73	1526.13	4.93	-0.810	0.000	0.150
65.00	-20.71	-6.85	0.00	-335.83	0.00	335.83	2277.86	1138.93	2896.88	1450.59	5.82	-0.883	0.000	0.141
67.50	-20.36	-6.80	0.00	-318.72	0.00	318.72	2252.16	1126.08	2821.75	1412.97	6.29	-0.920	0.000	0.137
67.50	-20.36	-6.80	0.00	-318.72	0.00	318.72	2252.16	1126.08	2821.75	1412.97	6.29	-0.920	0.000	0.137
70.00	-20.00	-6.77	0.00	-301.71	0.00	301.71	2218.62	1109.31	2737.91	1370.99	6.78	-0.956	0.000	0.229
75.00	-19.31	-6.71	0.00	-267.84	0.00	267.84	2151.54	1075.77	2574.02	1288.93	7.84	-1.074	0.000	0.217
80.00	-18.62	-6.64	0.00	-234.32	0.00	234.32	2084.46	1042.23	2415.20	1209.39	9.03	-1.189	0.000	0.203
85.00	-17.96	-6.56	0.00	-201.14	0.00	201.14	2017.38	1008.69	2261.43	1132.40	10.33	-1.298	0.000	0.187
90.00	-13.68	-4.99	0.00	-168.32	0.00	168.32	1950.30	975.15	2112.72	1057.93	11.75	-1.400	0.000	0.166
90.50	-13.62	-4.98	0.00	-165.83	0.00	165.83	1943.59	971.80	2098.13	1050.62	11.90	-1.410	0.000	0.165
93.12	-13.19	-4.93	0.00	-152.77	0.00	152.77	1908.44	954.22	2022.49	1012.75	12.69	-1.462	0.000	0.088
94.50	-12.97	-4.90	0.00	-145.97	0.00	145.97	1035.36	517.68	1113.15	557.40	13.11	-1.477	0.000	0.097
95.00	-12.93	-4.89	0.00	-143.52	0.00	143.52	1033.16	516.58	1106.89	554.27	13.26	-1.482	0.000	0.120
100.00	-12.56	-4.80	0.00	-119.06	0.00	119.06	1010.63	505.31	1044.65	523.10	14.85	-1.544	0.000	0.103
105.00	-12.19	-4.70	0.00	-95.08	0.00	95.08	987.11	493.55	983.14	492.30	16.50	-1.599	0.000	0.087
107.87	-11.99	-4.64	0.00	-81.60	0.00	81.60	973.17	486.58	948.19	474.80	17.47	-1.627	0.000	0.077
107.87	-11.99	-4.64	0.00	-81.60	0.00	81.60	973.17	486.58	948.19	474.80	17.47	-1.627	0.000	0.077
110.00	-11.84	-4.60	0.00	-71.72	0.00	71.72	962.61	481.31	922.45	461.91	18.20	-1.646	0.000	0.168
114.00	-8.18	-3.29	0.00	-51.90	0.00	51.90	942.31	471.15	874.57	437.94	19.61	-1.721	0.000	0.127
115.00	-8.11	-3.28	0.00	-48.61	0.00	48.61	937.13	468.57	862.70	431.99	19.97	-1.737	0.000	0.121
120.00	-7.82	-3.20	0.00	-32.22	0.00	32.22	910.67	455.33	804.02	402.61	21.83	-1.805	0.000	0.089
125.00	-4.26	-1.61	0.00	-16.09	0.00	16.09	883.23	441.61	746.49	373.80	23.75	-1.851	0.000	0.048
130.00	-4.04	-1.53	0.00	-8.05	0.00	8.05	854.80	427.40	690.24	345.64	25.70	-1.877	0.000	0.028
135.00	-0.20	-0.08	0.00	-0.40	0.00	0.40	825.39	412.70	635.38	318.16	27.67	-1.888	0.000	0.002
140.00	-0.02	-0.01	0.00	0.00	0.00	0.00	789.80	394.90	578.22	289.54	29.65	-1.888	0.000	0.000
140.50	0.00	-0.01	0.00	0.00	0.00	0.00	785.78	392.89	572.31	286.58	29.85	-1.888	0.000	0.000

Final Analysis Summary

Structure:	CT16504-A-SBA	**Code:**	EIA/TIA-222-G	9/15/2017	
Site Name:	Manchester 12, CT	**Exposure:**	C		
Height:	140.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 41	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.6W 97 mph Wind	32.9	0.00	39.65	0.00	0.00	3445.40
0.9D + 1.6W 97 mph Wind	32.8	0.00	29.72	0.00	0.00	3400.25
1.2D + 1.0Di + 1.0Wi 50 mph Wind	9.1	0.00	81.94	0.00	0.00	990.96
1.2D + 1.0E	1.5	0.00	39.73	0.00	0.00	171.99
0.9D + 1.0E	1.5	0.00	29.80	0.00	0.00	169.46
1.0D + 1.0W 60 mph Wind	7.9	0.00	33.10	0.00	0.00	818.57

Max Stresses

Load Case	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Elev (ft)	Stress Ratio
1.2D + 1.6W 97 mph Wind	-22.07	-28.57	0.00	-1273.1	0.00	-1273.1	2218.62	1109.3	2737.91	1370.99	70.00	0.939
0.9D + 1.6W 97 mph Wind	-16.09	-28.10	0.00	-1246.2	0.00	-1246.2	2218.62	1109.3	2737.91	1370.99	70.00	0.917
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-56.90	-8.27	0.00	-376.88	0.00	-376.88	2218.62	1109.3	2737.91	1370.99	70.00	0.301
1.2D + 1.0E	-14.35	-1.26	0.00	-25.95	0.00	-25.95	962.61	481.31	922.45	461.91	110.00	0.071
0.9D + 1.0E	-10.76	-1.23	0.00	-25.48	0.00	-25.48	962.61	481.31	922.45	461.91	110.00	0.066
1.0D + 1.0W 60 mph Wind	-20.00	-6.77	0.00	-301.71	0.00	-301.71	2218.62	1109.3	2737.91	1370.99	70.00	0.229

Additional Steel Summary

			Intermediate Connectors			Lower Termination				Upper Termination				Max Member			
Elev From (ft)	Elev To (ft)	Member	VQ/I (lb/in)	Vu (kips)	phi Vn (kips)	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	MQ/I (kips)	phi Vn (kips)	Num Reqd	Num Actual	Pu (kips)	phi Pn (kips)	phi Tn (kips)	Ratio
0.0	20.0	(4) LNP-LP7X125-B-20A	-354.8	-8.52	25.3	399.5	25.3	16	0	373.1	25.3			399.55	460.8	440.63	0.907
20.0	40.0	(4) LNP-LP6X125-G-20AB	-365.7	-8.78	25.3	342.2	25.3			310.0	25.3			342.21	395.0	365.63	0.936
40.0	60.0	(4) LNP-LP6X100-G-20BC	-391.1	-9.39	25.3	271.5	25.3			250.7	25.3			271.52	297.8	292.50	0.928
60.0	67.5	(4) LNP-LP6X100-G-10CT	-410.0	-9.84	25.3	250.7	25.3			230.7	25.3	10	0	250.71	297.8	292.50	0.857
93.1	107.9	(3) LNP-LP6X100-G-20TT	603.1	14.47	25.3	163.5	25.3	7	8	127.3	25.3	6	8	196.18	297.8	292.50	0.671

Pier Foundation Design For Monopole

			Date: 9/15/2017
Customer Name:	**T-Mobile**	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	140.5
Site Number:	CT16504-A-SBA	**Engineer Name:**	Rama K.
Engr. Number:	36710	**Engineer Login ID:**	

Foundation Info Obtained from: Mapping Operation

Structure Type: Monopole

Analysis or Design? Analysis

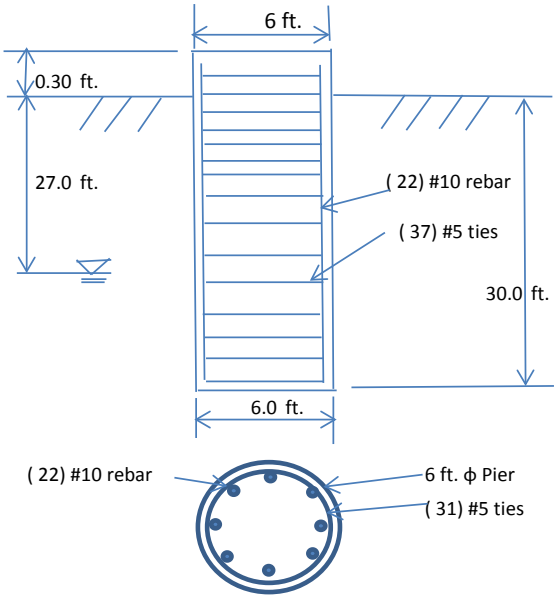
Acceptable overstress (0.0%

Base Reactions (Factored):

Axial Load (Kips):	39.7	Shear Force (Kips):	32.9
Uplift Force (Kips):	0.0	Moment (Kips-ft):	3445.4

Foundation Geometries:

Mods required -Yes/No ?:	No			ft.
Diameter of Pier (ft.):	6.0	Depth of Base B. G. S. :	30.0	ft.
Pier Height A. G. (ft.):	0.30			



Monopole Pier Foundation

Material Properties and Reabr Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield strength:	40	ksi
Vertical Rebar Size #:	10	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	22	Tie Spacing:	12.0	in.
Concrete Cover (in.):	4	Concrete unit weight:	150.0	pcf

Soil Design Parameters:

Water Table B.G.S. (ft):	27.0	Unit weight of water:	62.4	psf
Ratio of Uplift/Axial Skin Friction:	1.0	Pullout failure Angle:	30	(°)

Skin Frictions are to be obtained from: Calculations

Please Enter Ultimate End Bearing Pressure (psf): 11600

Kc = 1.15 For Sand

Kc = 1.0 Silt/Clay

Kt = 0.7 For Sand and Silt

Kt = 0.85 For Clay

Friction δ Between Pier & Soil = 0.95

Depth of Layers (ft) Top	Bottom	γ_{soil} (pcf)	ϕ (°)	Cohesion (psf)			Soil Types	Ultimate Uplift Skin Friction (psf)	Ultimate Axial Skin Friction (psf)	Kc	Kt	α
0.0	1.0	100	0	0		0	Sand			1.15	0.70	
1.0	5.0	135	40	0		0	Sand	175.0	287.5	1.15	0.70	
5.0	7.0	120	33	0		0	Sand	187.6	308.3	1.15	0.70	
7.0	10.0	130	38	0		0	Sand	324.1	532.5	1.15	0.70	
10.0	15.0	128	37	0		0	Sand	470.7	773.3	1.15	0.70	
15.0	30.0	132	39	0		11600	Sand	988.8	1624.5	1.15	0.70	
30.0	35.0	127	36	0		11600	Sand	982.1	1613.4	1.15	0.70	

Soil weight Increase Factor for bouyant soils (1.0 to 1.15): 1.1

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Soil Bearing Strength Reduction Factor:	0.75	
Total Dry Soil Volume from Conical Failure (cu. Ft.):	14255	Dry Soil Weight from Conical Failure:	1845	Kips
Total Buoyant Soil Volume from Conical Failure (cu. Ft.):	58	Buoyant Soil Weight from Conical Failure (Ki	5	Kips
Total Dry Concrete Volume (cu. Ft.):	772	Total Dry Concrete Weight:	115.8	Kips
Total Buoyant Concrete Volume (cu. Ft.):	84.8	Total Buoyant Concrete Weight:	7.43	Kips
Total Effective Concrete Weight (Kips):	123.2	Total Effective Soil Weight:	1849.7	Kips
Total Effective Vertical Load on Base (Kips):	56.8			

Check Soil Capacities:

					Usage	
Allowable Foundation Overturning Resistance (kips-ft.):	16167.9	>	Design Factored Momont (kips-ft):	4128	0.26	OK!
Factor of Safety of Passive Soil Resistance against Moment:	3.92	OK!				

Check the capacities of Reinforceing Concrete:

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

Reinforcing Concrete Pier:

					Usage	
Vertical Steel Rebar Area (sq. in./each):	1.27		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	3931.4	>	Design Factored Moment (Mu, K-Ft):	3538.0	0.90	OK!
Calculated Shear Capacity (Kips):	707.8	>	Design Factored Shear (Kips):	296.3	0.42	OK!
Calculated Tension Capacity (Tn, Kips):	1508.8	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	5362	>	Design Factored Axial Load (Pu Kips):	39.7	0.01	OK!
Moment & Axial Strength Combination:	0.90	OK!	Max. Allowable Tie/Stirrup Spacing:	12.00	in.	
Pier Reinforcement Ratio:	0.007	Reinforcement Ratio is satisfied per ACI				

Michael F. Plahovinsak

Digitally signed by Michael F. Plahovinsak
Date: 2017.09.05 14:21:15 -04'00'

SITE NAME:
CTHA039A
60 ADAMS STREET, MANCHESTER, CT

SITE NUMBER:
CTHA039A

SPECIAL CONSTRUCTION SCHEDULE NOTE (SBA DESIGN-BUILD TOWER MODS REQUIRED):
UNLESS A PRE-MOD CONDITIONAL OR TEMPORARY INSTALLATION IS SPECIFICALLY RECOMMENDED BY SBA TOWER STRUCTURAL ENGINEER AND INCLUDED IN SBA NOTICE-TO-PROCEED, T-MOBILE TOWER TOP EQUIPMENT INSTALLATION IS CONTINGENT UPON COMPLETION OF SBA DESIGN-BUILD FOR ALL REQUIRED TOWER/FOUNDATION STRUCTURAL MODIFICATIONS, ENGINEERING CONSTRUCTION CONTROL INSPECTIONS, AND FINAL ENGINEERING AFFIDAVIT (ALL PREVIOUS ITEMS TO BE DESIGN-BUILD PERFORMED BY SBA UNDER A SEPARATE BUILDING PERMIT).

DESIGN GUIDELINE: T-MOBILE NEW SITE DEVELOPMENT

SITE CONFIG: 797DB2

GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE NORTHEAST, LLC. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST. LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL STRUCTURAL NOTES

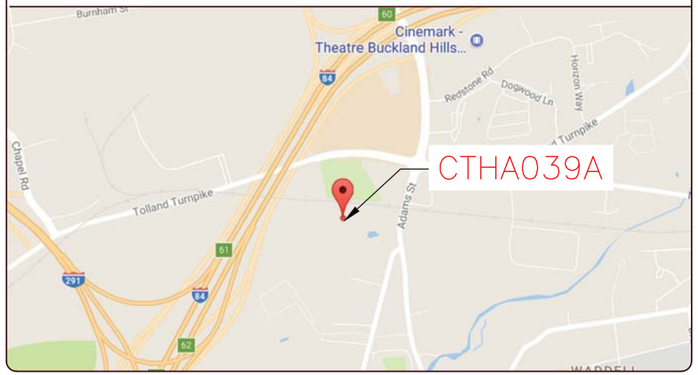
1. TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.
2. TRYLON TSF INC. ASSUMES THAT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

BUILDING CODES

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL AUTHORITIES HAVING JURISDICTION.

1. 2016 CONNECTICUT BUILDING CODE
2. 2014 NATIONAL ELECTRICAL CODE
3. STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

VICINITY MAP



APPROVALS

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

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
SECTOR A:	ACCESS NOT PERMITTED
SECTOR B:	ACCESS NOT PERMITTED
SECTOR C:	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED*
RRU/DIPLEXERS:	UNRESTRICTED**
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

*CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED
**LOW VOLTAGE, 24" NEC WORKSPACE MINIMUM, 36" OSHA ACCESS/EGRESS MINIMUM

CALL BEFORE YOU DIG
CALL 811 OR
203-281-5435

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION
ZONING JURISDICTION:	BASED ON INFORMATION PROVIDED BY T-MOBILE REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW OR ADMINISTRATIVE REVIEW).
SITE ADDRESS:	60 ADAMS STREET, MANCHESTER, CT
LATITUDE:	41.79405000
LONGITUDE:	-72.55599900
JURISDICTION:	TOWN OF MANCHESTER
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
TOWER OWNER:	SBA TOWERS VIII, LLC
SBA SITE ID:	CT16504-A
SBA SITE NAME:	MANCHESTER 12, CT
SBA REGIONAL SITE MANAGER:	STEPHEN ROTH (860) 539-4920; sroth@sbasite.com

SHEET INDEX

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T-Mobile

T-MOBILE NORTHEAST LLC
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BLOOMFIELD, CT 06002

SBA

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STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
REGISTERED PROFESSIONAL ENGINEER
ORIGINAL DOCUMENT
9-5-2017

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Sole Proprietor - Independent Engineer
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SUBMITTALS

REV	DATE	DESCRIPTION	BY
0	07/25/17	ISSUE FOR CONSTRUCTION	MR
1	09/01/17	REVISED AS PER REDLINES	ADB

SITE INFORMATION

SITE NAME:
CTHA039A
SITE NUMBER:
CTHA039A
SITE ADDRESS:
60 ADAMS STREET, MANCHESTER, CT

SHEET DESCRIPTION

TITLE SHEET

SHEET No.

T-1

GENERAL NOTES

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

   CONTRACTOR – TBD.
   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, CUR\BS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE 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 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 LTE 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.

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, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222–G, STRUCTURAL STANDARDS FOR STEEL

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

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

ELECTRICAL DRAWING HAVE BEEN REVIEWED AND SEALED FOR STRUCTURAL PURPOSES ONLY

ABBREVIATIONS					
AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED
EG	EQUIPMENT GROUND	REF	REFERENCE		AND REPLACED
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED	TYP	TYPICAL

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) LIGHTNING 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 SURCUITS 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 ELECTRICL 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

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SUBMITTALS

REV	DATE	DESCRIPTION	BY
0	07/25/17	ISSUE FOR CONSTRUCTION	MR
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SITE INFORMATION

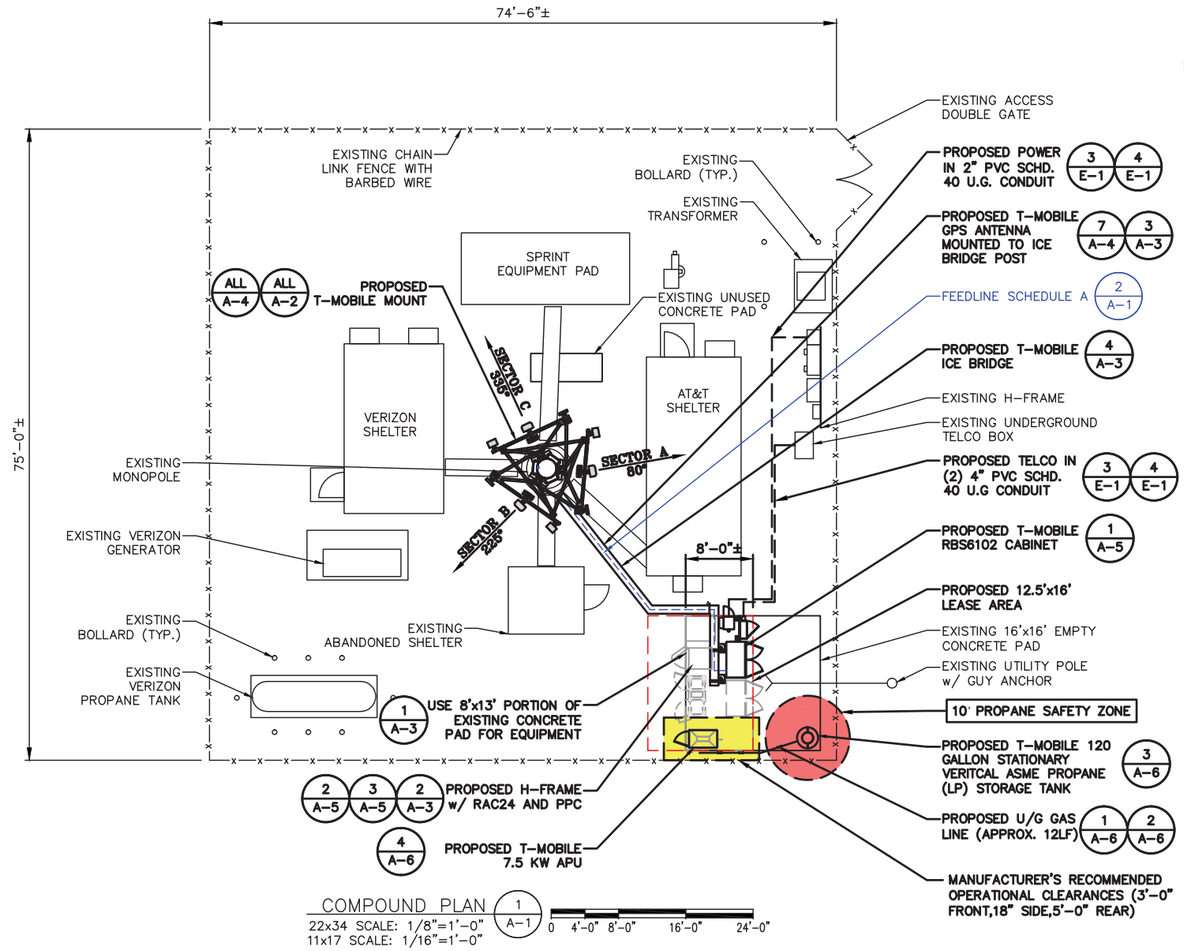
SITE NAME:
CTHA039A
SITE NUMBER:
CTHA039A
SITE ADDRESS:
60 ADAMS STREET,
MANCHESTER, CT

SHEET DESCRIPTION

GENERAL NOTES

SHEET No.

GN–1



COMPOUND PLAN 1 A-1
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"

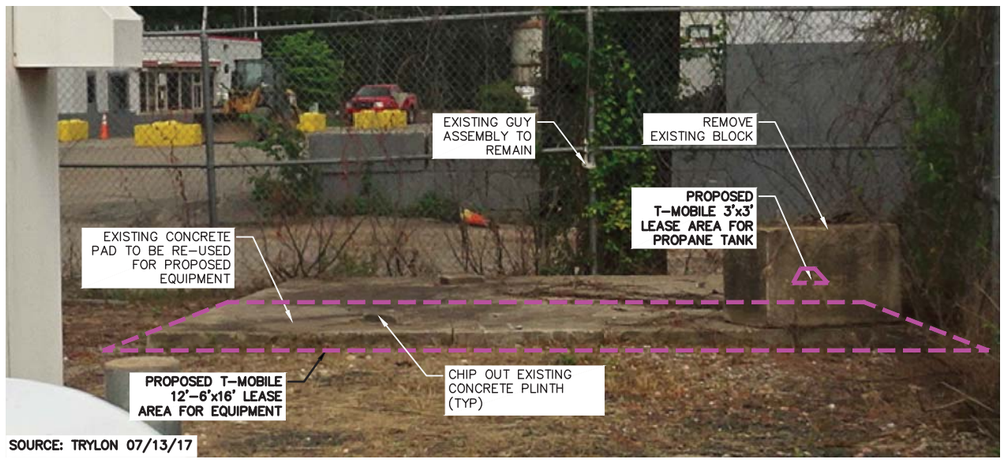
FEEDLINES		
FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	(2) PROPOSED 1-1/4" HCS6x12 6AWG TO T-MOBILE RAD	INSIDE MONOPOLE

FEEDLINE SCHEDULE 2 A-1

TOP OF EXISTING TOWER ELEV. = ± 141' AGL

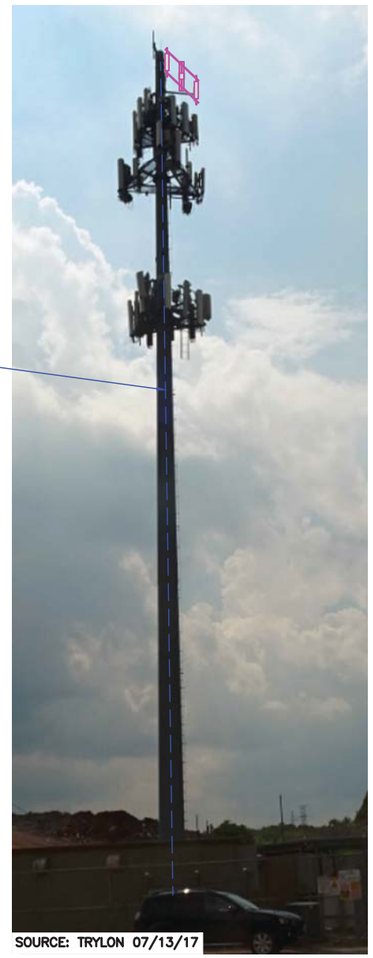
ALL A-4 ALL A-2 PROPOSED T-MOBILE MOUNT ELEV. = ± 136'-6" AGL

2 A-1 SEE FEEDLINE SCHEDULE A



SOURCE: TRYLON 07/13/17

T-MOBILE PROPOSED EQUIPMENT AND PROPANE STORAGE LEASE AREA PHOTO DETAIL 3 A-1
SCALE: N.T.S



SOURCE: TRYLON 07/13/17

ELEVATION PHOTO DETAIL 4 A-1
SCALE: NTS

SPECIAL PRE-CONSTRUCTION WORK NOTE
SPECIAL CONSTRUCTION WORK NOTE (HAND-DUG UTILITY TRENCH EXCAVATION REQUIRED):
EXISTING UNDERGROUND UTILITY LOCATIONS ARE UNKNOWN. GENERAL CONTRACTOR SHALL HAND-EXCAVATE TO REQUIRED SUB-GRADE DEPTH SUFFICIENT TEST HOLES OR AS DIRECTED/REQUIRED BY SBA REGIONAL SITE MANAGER SHALL HAND-EXCAVATE ALL PROPOSED UNDERGROUND UTILITY TRENCHES. GENERAL CONTRACTOR RESPONSIBLE FOR ANY REQUIRED SPECIAL TEMPORARY PROTECTION OF EXISTING UNDERGROUND UTILITIES, PHYSICAL DAMAGE REPAIR, AND SERVICE RESTORATION.

SPECIAL CONSTRUCTION SCHEDULE NOTE (SBA DESIGN-BUILD TOWER MODS REQUIRED):
UNLESS A PRE-MOD CONDITIONAL OR TEMPORARY INSTALLATION IS SPECIFICALLY RECOMMENDED BY SBA TOWER STRUCTURAL ENGINEER AND INCLUDED IN SBA NOTICE-TO-PROCEED, T-MOBILE TOWER TOP EQUIPMENT INSTALLATION IS CONTINGENT UPON COMPLETION OF SBA DESIGN-BUILD FOR ALL REQUIRED TOWER/FOUNDATION STRUCTURAL MODIFICATIONS, ENGINEERING CONSTRUCTION CONTROL INSPECTIONS, AND FINAL ENGINEERING AFFIDAVIT (ALL PREVIOUS ITEMS TO BE DESIGN-BUILD PERFORMED BY SBA UNDER A SEPARATE BUILDING PERMIT).

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

NOTE:
GENERAL CONTRACTOR TO VERIFY LOCATION OF EXISTING GUY ANCHOR PRIOR TO INSTALLATION. IF GUY ANCHOR INTERFERES WITH DOOR SWINGS OF NEW AND FUTURE CABINETS, CONTACT ENGINEER.

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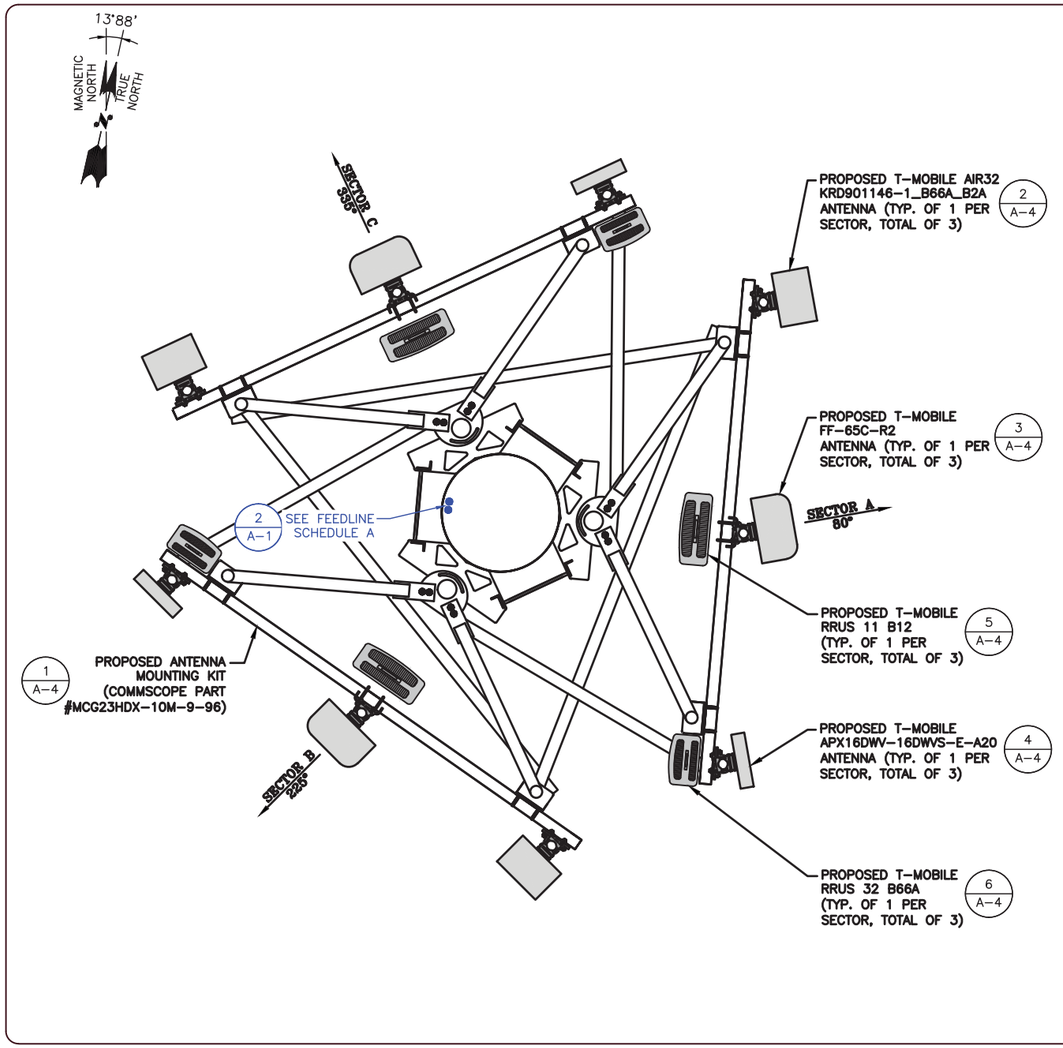
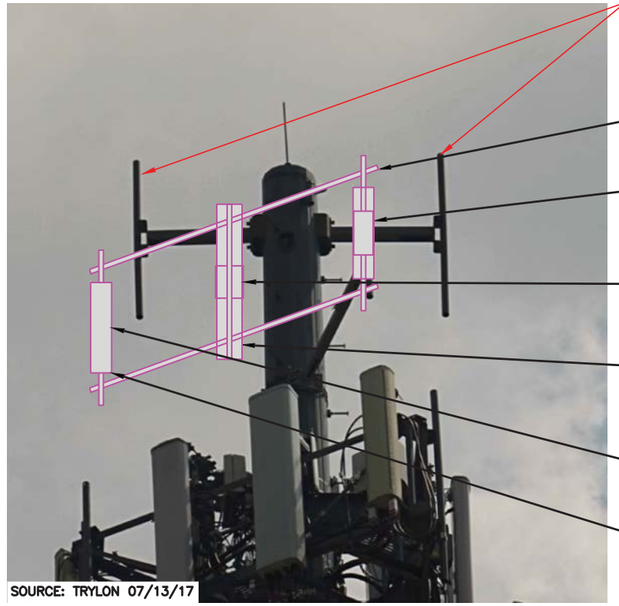
SHEET DESCRIPTION
COMPOUND, EQUIPMENT AND FEEDLINE DETAILS, TOWER ELEVATION

SHEET No.
A-1



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



ANTENNA MOUNT PHOTO DETAIL 2 A-2
SCALE: NTS

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

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

SPECIAL CONSTRUCTION SCHEDULE NOTE (SBA DESIGN-BUILD TOWER MODS REQUIRED):
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SITE NUMBER:
CTHA039A
SITE ADDRESS:
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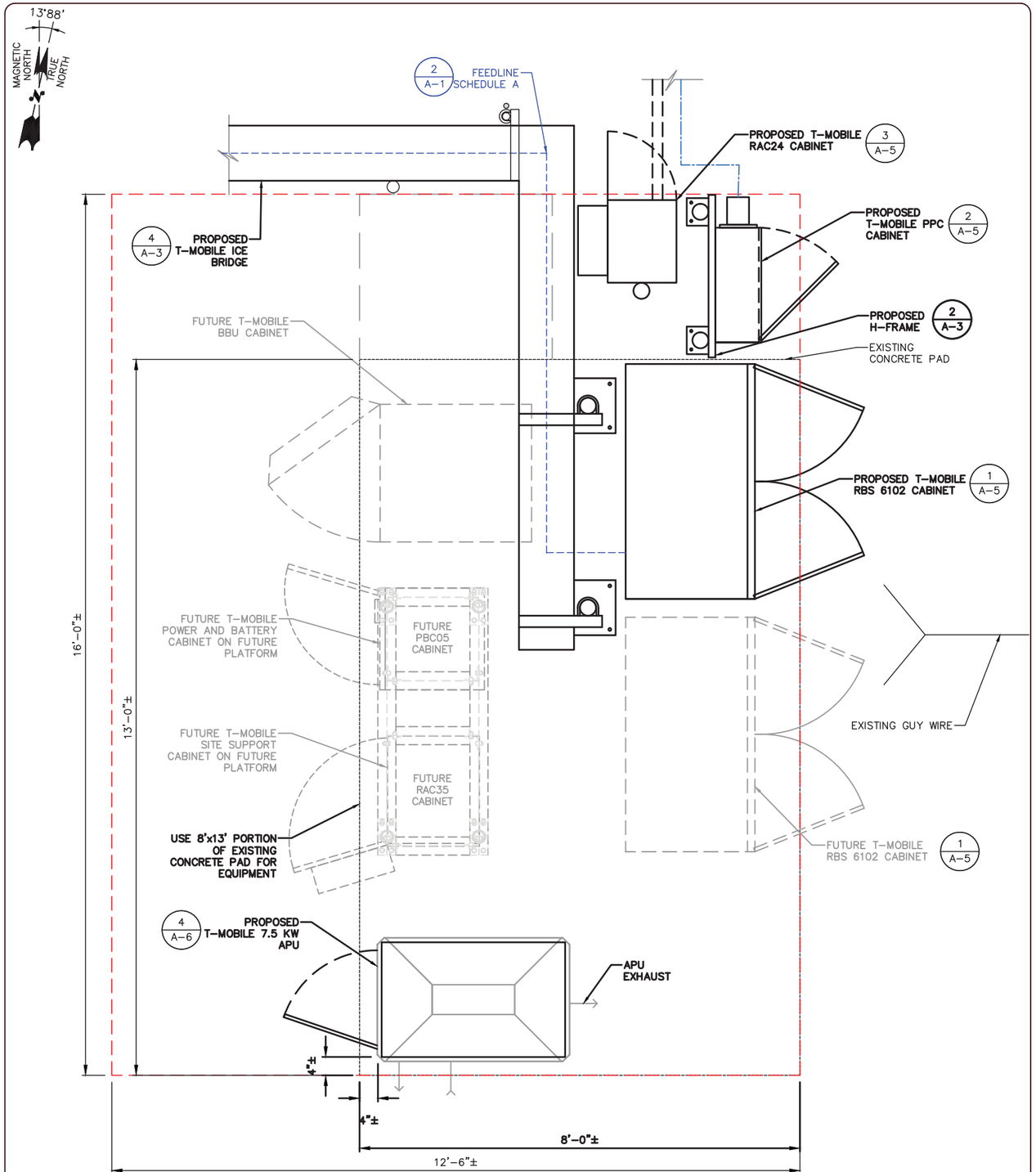
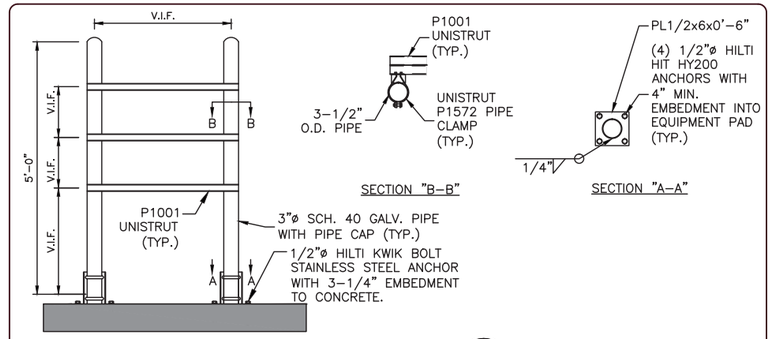
SHEET DESCRIPTION
EXISTING AND PROPOSED ANTENNA PLAN, ANTENNA MOUNT DETAIL

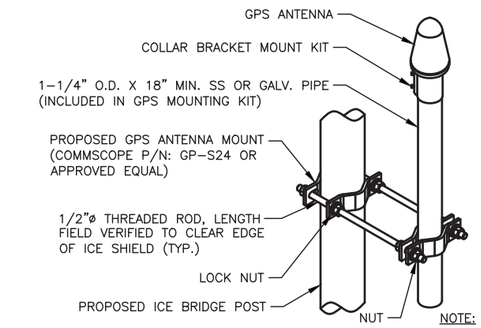
SHEET No.
A-2



EQUIPMENT COMPOUND PLAN (1 A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 0'-6" 1'-0" 2'-0" 3'-0"

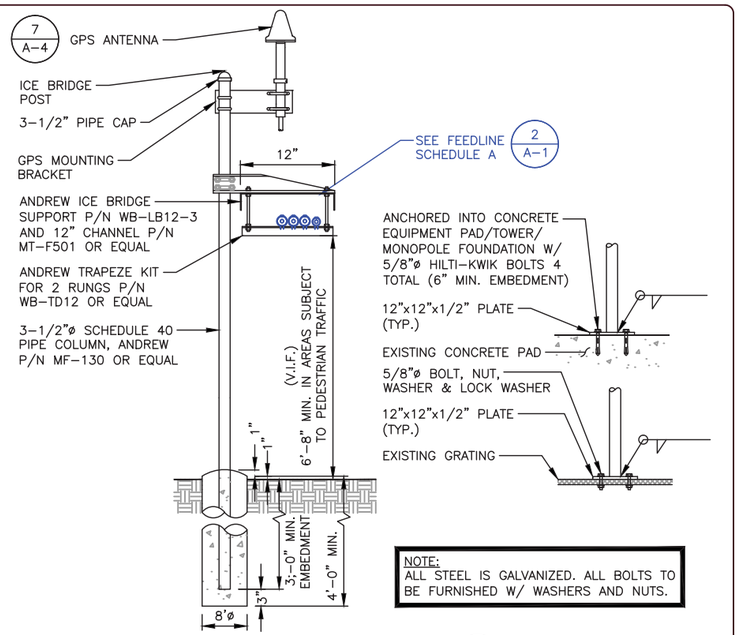


H FRAME DETAIL (2 A-3)
SCALE: NTS



NOTE:
1. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1-1/2"-3-1/2" O.D. GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END.
2. GROUND ANTENNA & COAX MOUNTING FRAMES PER T-MOBILE STANDARDS.

GPS MOUNT DETAIL (3 A-3)
SCALE: NTS



NOTE:
ALL STEEL IS GALVANIZED. ALL BOLTS TO BE FURNISHED W/ WASHERS AND NUTS.

COAX ICE BRIDGE DETAIL (4 A-3)
SCALE: NTS

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SUBMITTALS

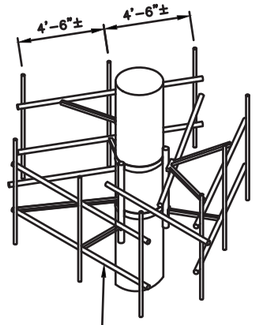
REV	DATE	DESCRIPTION	BY
0	07/25/17	ISSUE FOR CONSTRUCTION	MR
1	09/01/17	REVISED AS PER REDLINES	ADB

SITE INFORMATION

SITE NAME:
CTHA039A
SITE NUMBER:
CTHA039A
SITE ADDRESS:
60 ADAMS STREET, MANCHESTER, CT

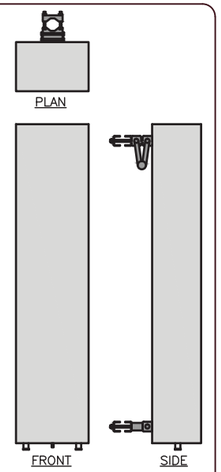
SHEET DESCRIPTION
EQUIPMENT COMPOUND, PROPANE AND GROUND LEASE AREA

SHEET No.
A-3



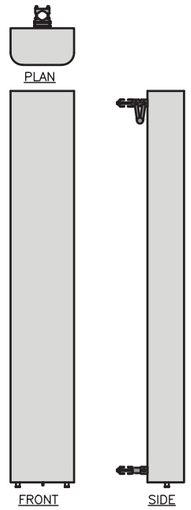
ANTENNA MOUNT DETAIL (1 / A-4)
SCALE: NTS

L1900 AND L2100 ANTENNA DIMENSIONS	
MODEL #	AIR32 KRD901146-1_B66A_B2A
MANUF.	ERICSSON
WIDTH	12.9"
DEPTH	8.7"
HEIGHT	56.6"
WEIGHT	132.2 LBS



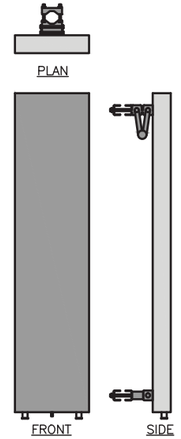
PROPOSED L1900 AND L2100 DETAIL (2 / A-4)
SCALE: NTS

L700 ANTENNA DIMENSIONS	
MODEL #	FF-65C-R2
MANUF.	COMMSCOPE
WIDTH	15.6"
DEPTH	9.0"
HEIGHT	96.0"
WEIGHT	61.7 LBS



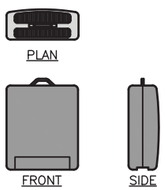
PROPOSED L700 DETAIL (3 / A-4)
SCALE: NTS

U2100 ANTENNA DIMENSIONS	
MODEL #	APX16DWV -16DWVS-E-A20
MANUF.	RFS
WIDTH	13.0"
DEPTH	3.15"
HEIGHT	55.9"
WEIGHT	40.7 LBS



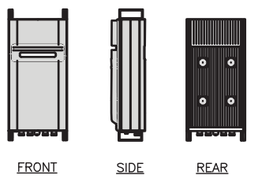
PROPOSED U2100 DETAIL (4 / A-4)
SCALE: NTS

RRU DIMENSIONS	
MODEL #	RRUS S11B12
MANUF.	ERICSSON
WIDTH	17"
DEPTH	7"
HEIGHT	20"
WEIGHT	51.0 LBS

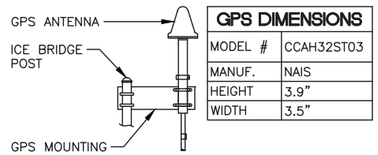


PROPOSED RRU DETAIL (5 / A-4)
SCALE: NTS

RRU DIMENSIONS	
MODEL #	RRUS 32 B66A
MANUF.	ERICSSON
WIDTH	12"
DEPTH	7"
HEIGHT	27"
WEIGHT	51.0 LBS

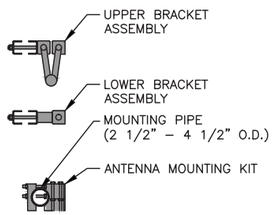


PROPOSED RRU DETAIL (6 / A-5)
SCALE: NTS

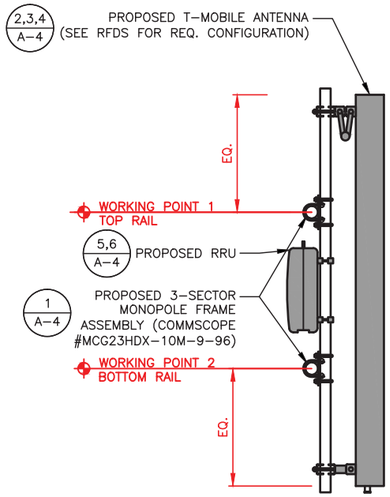


GPS DIMENSIONS	
MODEL #	CCAH32ST03
MANUF.	NAIS
HEIGHT	3.9"
WIDTH	3.5"

GPS ANTENNA MOUNTING DETAIL (7 / A-4)
SCALE: NTS



ANTENNA MOUNTING BRACKET (8 / A-4)
SCALE: NTS



PROPOSED ANTENNA & RRU MOUNTING DETAIL (9 / A-4)
SCALE: N.T.S

STRUCTURAL NOTES
1. ADDITIONAL TOWER MAPPING AND STRUCTURAL ANALYSIS ARE REQUIRED PRIOR TO CONSTRUCTION. DRAWINGS ARE SUBJECT TO CHANGE PENDING OUTCOME OF STRUCTURAL ANALYSIS.
2. MOUNT ALL ANTENNAS, RRU'S, COAX, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS.

T-MOBILE NORTHEAST LLC
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BLOOMFIELD, CT 06002

SBA COMMUNCATIONS CORP.
134 FLANDERS RD, SUITE 125
WESTBOROUGH, MA 01581

1825 W. WALNUT HILL LANE, SUITE 302
IRVING, TEXAS 75038
1-855-669-5421

STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
LICENSED PROFESSIONAL ENGINEER
ORIGINAL
9-5-2017

MICHAEL F. PLAHOVINSAK, P.E. #25849
Sole Proprietor - Independent Engineer
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SITE ADDRESS:
60 ADAMS STREET, MANCHESTER, CT

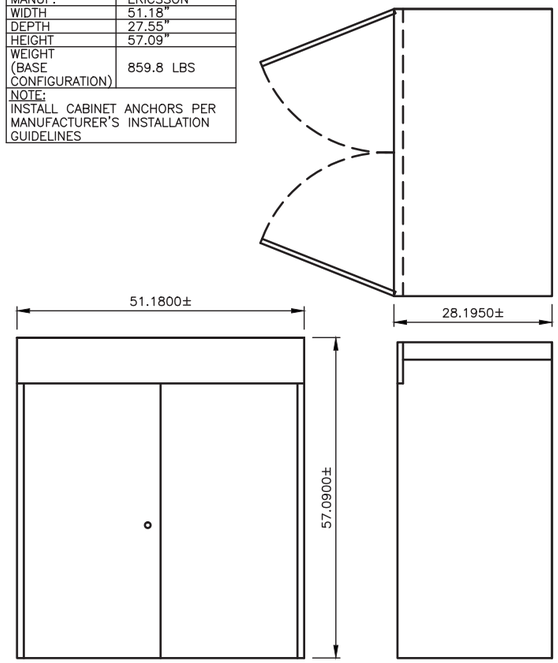
SHEET DESCRIPTION

ANTENNA MOUNT, RRU AND ANTENNA DETAILS

SHEET No.

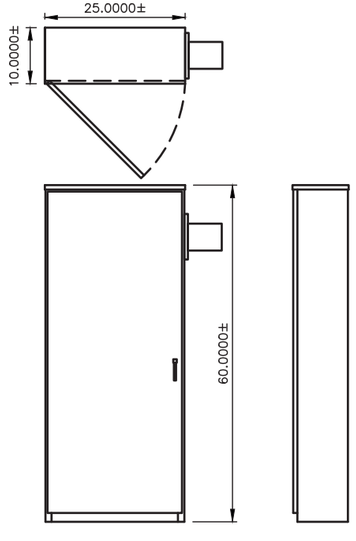
A-4

RBS6102 DIMENSIONS	
MODEL	RBS 6102
MANUF.	ERICSSON
WIDTH	51.18"
DEPTH	27.55"
HEIGHT	57.09"
WEIGHT (BASE CONFIGURATION)	859.8 LBS
NOTE: INSTALL CABINET ANCHORS PER MANUFACTURER'S INSTALLATION GUIDELINES	



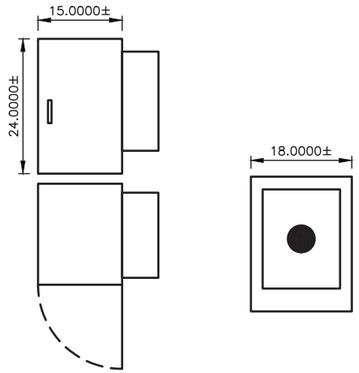
RBS 6102 CABINET (1 / A-5)
SCALE: NTS

PPC DIMENSIONS	
MODEL	CS7S2-W836
MANUF.	EMERSON
WIDTH	25"
DEPTH	10"
HEIGHT	60"
WEIGHT	150 LBS
NOTE: INSTALL CABINET ANCHORS PER MANUFACTURER'S INSTALLATION GUIDELINES	



POWER PROTECTION CABINET (PPC) (2 / A-5)
SCALE: NTS

RAC24 DIMENSIONS	
MODEL	RAC24
MANUF.	PURCELL
WIDTH	15"
DEPTH	18.5"
HEIGHT	24"
WEIGHT (CABINET ONLY)	35 LBS
NOTE: INSTALL CABINET ANCHORS PER MANUFACTURER'S INSTALLATION GUIDELINES	



PURCELL RAC 24 CABINET (3 / A-5)
SCALE: NTS

EQUIPMENT CABINET INSTALLATION NOTE:
GENERAL CONTRACTOR SHALL INSTALL EQUIPMENT CABINET FLOOR-MOUNT KIT AND SHALL FURNISH AND INSTALL ALL FASTENERS/ANCHORS PER MANUFACTURER'S INSTALLATION GUIDELINES.

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STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
REGISTERED PROFESSIONAL ENGINEER
9-5-2017

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CTHA039A
SITE ADDRESS:
60 ADAMS STREET,
MANCHESTER, CT

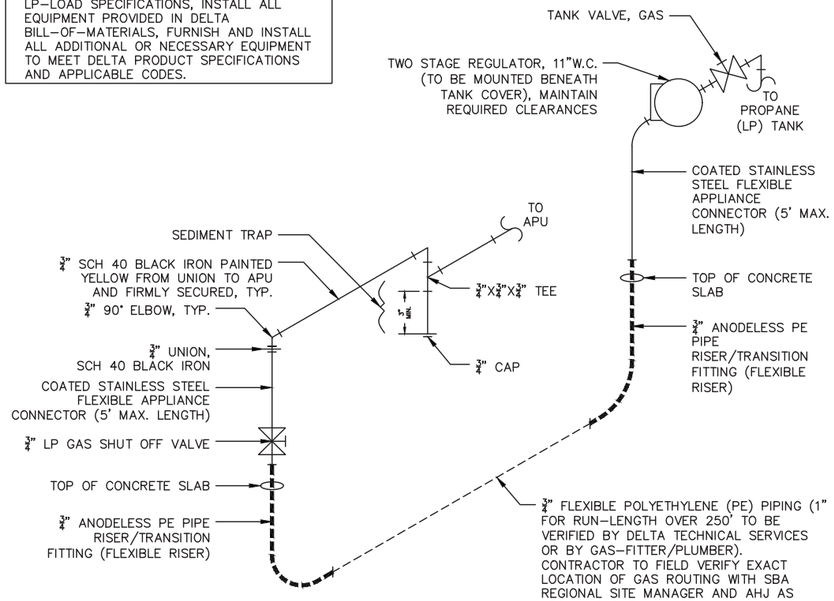
SHEET DESCRIPTION

EQUIPMENT DETAILS

SHEET No.

A-5

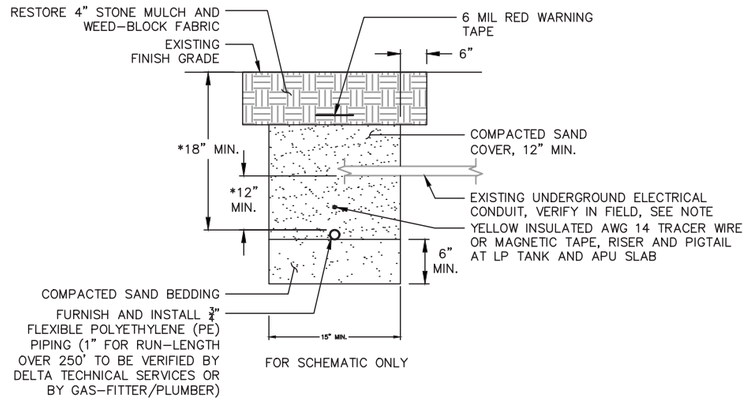
INSTALLATION AND MATERIALS NOTE:
GAS-FITTER/PLUMBER TO DETERMINE/VERIFY PIPE SIZE REQUIREMENTS TO MEET DELTA LP-LOAD SPECIFICATIONS, INSTALL ALL EQUIPMENT PROVIDED IN DELTA BILL-OF-MATERIALS, FURNISH AND INSTALL ALL ADDITIONAL OR NECESSARY EQUIPMENT TO MEET DELTA PRODUCT SPECIFICATIONS AND APPLICABLE CODES.



ISOMETRIC PIPING DIAGRAM (1 / A-6)
SCALE: NTS

SPECIAL CONSTRUCTION WORK NOTE
(HAND-DUG UTILITY TRENCH EXCAVATION REQUIRED):

EXISTING UNDERGROUND UTILITY LOCATIONS ARE UNKNOWN. GENERAL CONTRACTOR SHALL HAND-EXCAVATE TO REQUIRED SUB-GRADE DEPTH, SUFFICIENT TEST HOLES OR AS DIRECTED/REQUIRED BY SBA REGIONAL SITE MANAGER. ALL PROPOSED UNDERGROUND UTILITY TRENCHES SHALL BE HAND-EXCAVATE AS REQUIRED. GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED SPECIAL TEMPORARY PROTECTION OF, PHYSICAL DAMAGE TO, OR REPAIR OF EXISTING UNDERGROUND CONDUIT INCLUDING RESTORATION OF SERVICE.



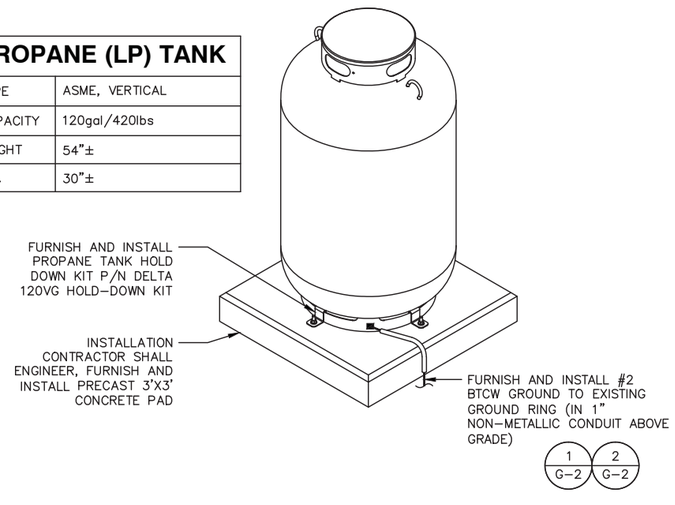
FOR SCHEMATIC ONLY

UNDERGROUND PLUMBING NOTES:
1. A SCH. 80 GALVANIZED PIPE SLEEVE IS TO BE USED TO PROTECT FLEXIBLE UNDERGROUND PIPE UNDER ALL AREAS SUBJECT TO VEHICLE TRAFFIC OR AS DIRECTED BY AHJ.
2. PROPANE (LP) PLUMBING IS NOT TO BE RUN WITHIN THE SAME TRENCH AS ELECTRICAL, ALARM OR CONTROL CONDUIT.
3. *A MINIMUM SEPARATION OF 12" VERTICALLY IS TO BE MAINTAINED WHENEVER CROSSING, TRANSITIONING NEAR, OR TRAVELING ALONG EXISTING ELECTRICAL CONDUIT. ADJUST DEPTH OF PROPANE (LP) PLUMBING SO AS TO MAINTAIN A MINIMUM OF 18" BELOW GRADE
4. ALL NOTED BURIAL DEPTHS ARE THE MINIMUM REQUIRED. LOCAL JURISDICTIONS MAY REQUIRE DEEPER BURIAL DEPTHS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY REQUIREMENTS WITH LOCAL AHJ.

PROPANE GAS PIPE TRENCH DETAIL (2 / A-6)
SCALE: NTS

PROPANE (LP) TANK

TYPE	ASME, VERTICAL
CAPACITY	120gal/420lbs
HEIGHT	54"±
DIA.	30"±

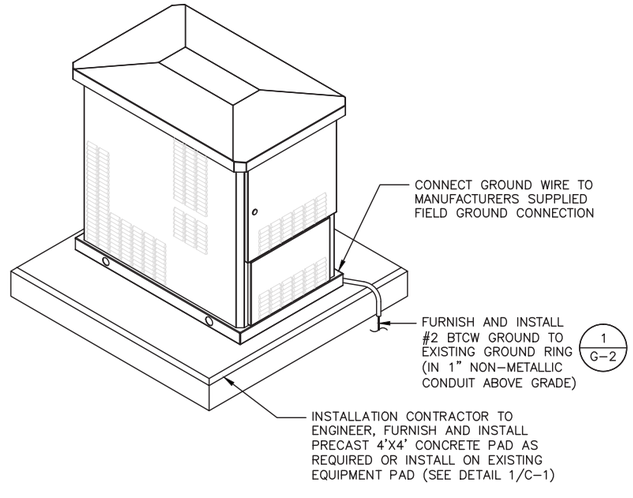


PROPANE TANK (3 / A-6)
SCALE: NTS

GENERATOR SETBACKS REQUIRED:
1. 10' MIN. – DISTANCE FROM EXHAUST TO ANY OPERABLE OPENING IN A BUILDING (IMC-09).
2. 5' MINIMUM – DISTANCE FROM GENERATOR TO ANY STRUCTURE HAVING COMBUSTIBLE WALLS (LESS THAN 1HR RATED) OR ANY OPENINGS IN WALLS (NFPA-37).

APU, DC GENERATOR

TYPE	7.5 KW, 48VDC
MANUFACTURER	DELTA ELECTRONICS, INC.
MODEL	ESOG150-PCA01
FUEL	PROPANE (LP) @ 11" W.C.
HEIGHT	40.1"
WIDTH	27"
DEPTH	42"
FRONT CLEARANCE	36"
SIDE CLEARANCE	18"
REAR CLEARANCE (EXHAUST)	60"



AUXILIARY POWER UNIT (APU) (4 / A-6)
SCALE: NTS

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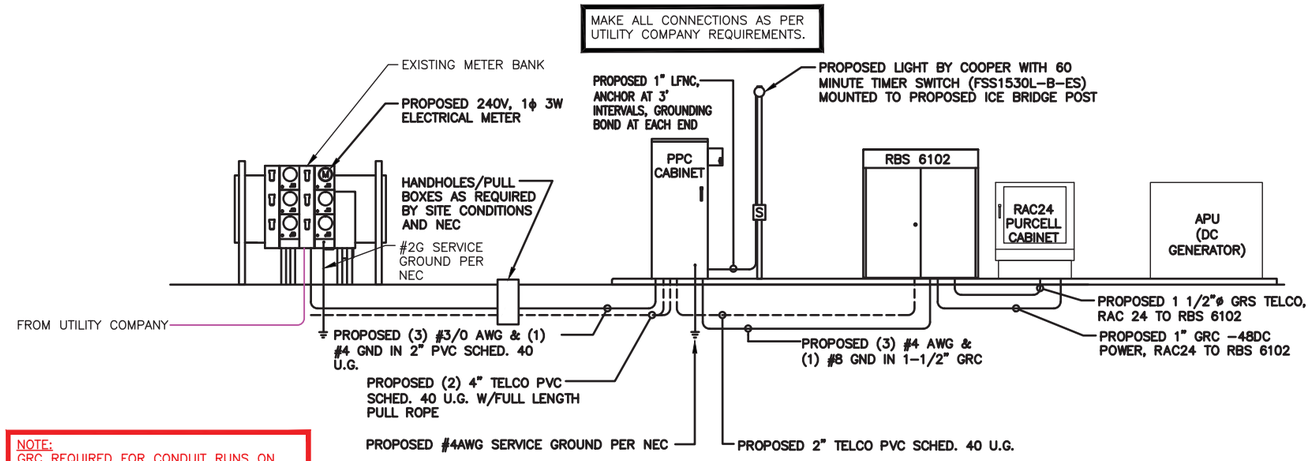
SITE NUMBER:
CTHA039A
SITE ADDRESS:
60 ADAMS STREET,
MANCHESTER, CT

SHEET DESCRIPTION

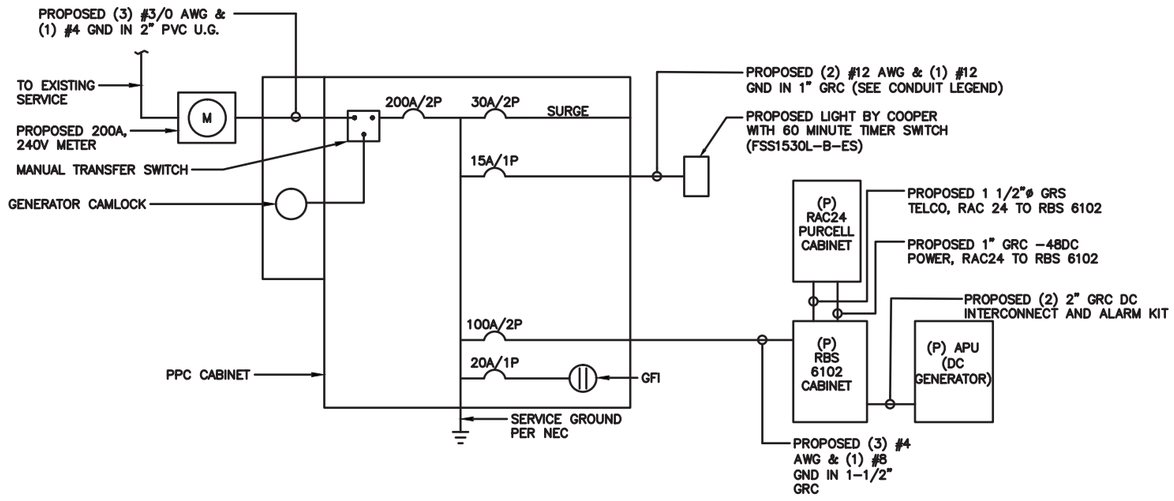
AUXILLARY POWER DETAILS

SHEET No.

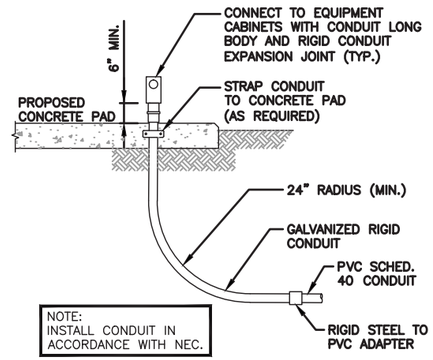
A-6



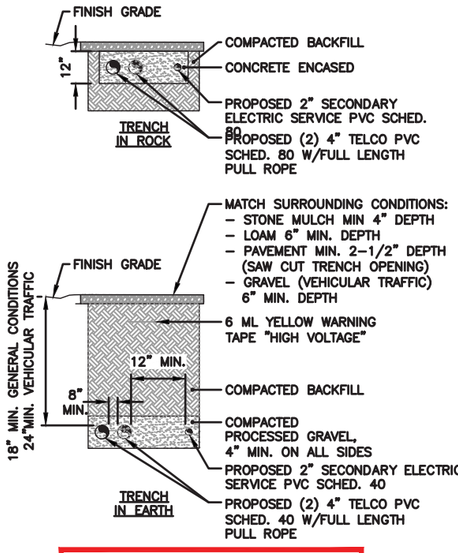
POWER RISER DIAGRAM (1 / E-1)
SCALE: NTS



EQUIPMENT ONE LINE DIAGRAM (2 / E-1)
SCALE: NTS



CONDUIT SWEEP DETAIL (3 / E-1)
SCALE: NTS



BURIED CONDUIT DETAIL (4 / E-1)
SCALE: NTS

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)
⏚	GROUND
MGB	MASTER GROUND BAR ○ MECHANICAL CONNECTION ● CADWELD CONNECTION
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"x10' COPPER CLAD STAINLESS STEEL GROUND ROD
PPC	● EXOTHERMIC (CAD WELD) OR ○ MECHANICAL (COMPRESSION TYPE) CONNECTION; POWER PROTECTION CABINET
⊠	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) 2014 AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. 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.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION AS REQUIRED BY NEC.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. 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.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. 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.
14. 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.
15. 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.
16. 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).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20. BOND ANTENNA EGB'S AND MGB TO WATER MAIN/GROUND RING.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

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STATE OF CONNECTICUT · MICHAEL F. PLAHOVINSAK · No. 25849 · PROFESSIONAL ENGINEER · ORIGINAL DOCUMENT
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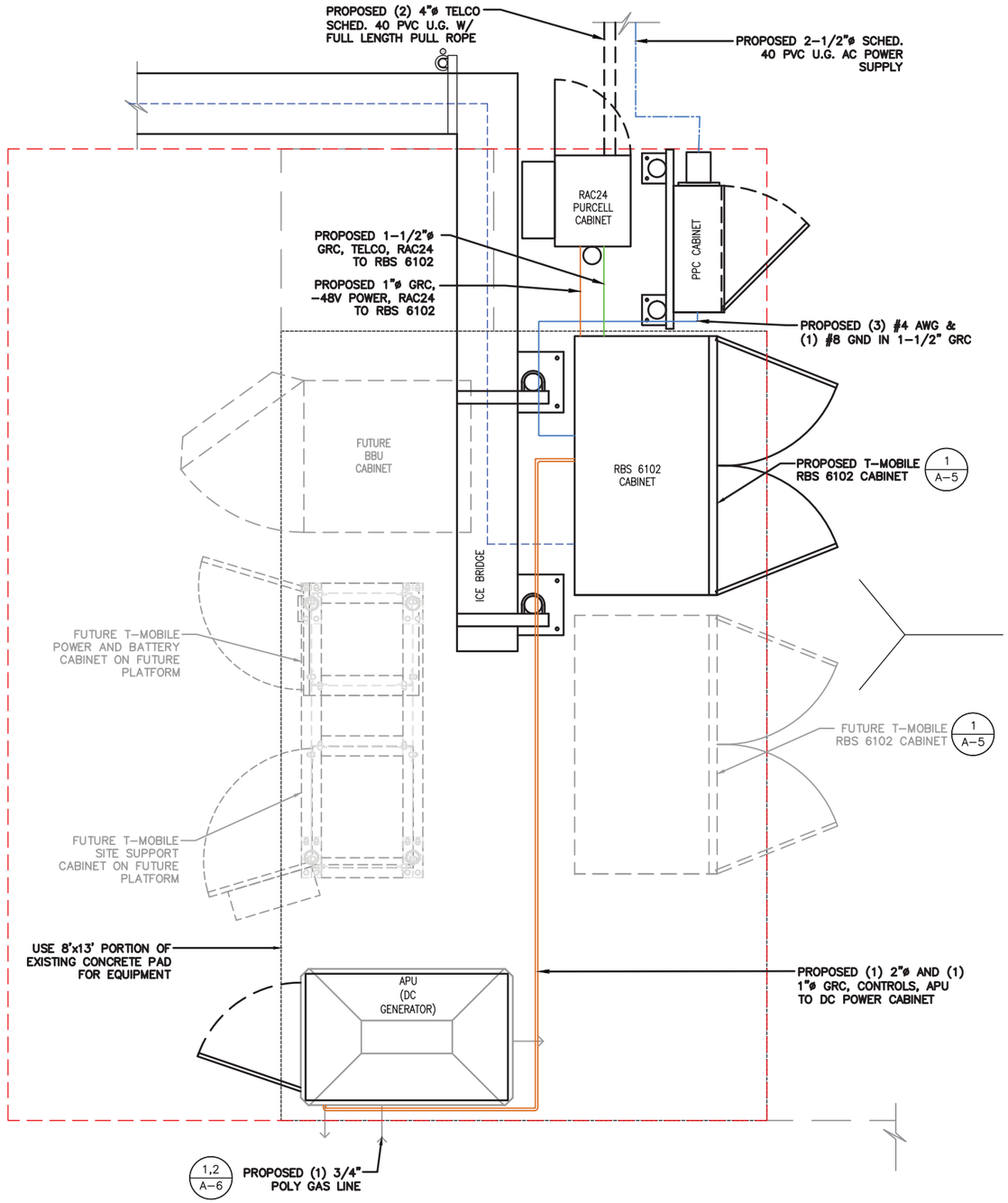
60 ADAMS STREET, MANCHESTER, CT

SHEET DESCRIPTION
ELECTRICAL DETAILS

SHEET No.
E-1

CONDUIT LEGEND	
——·——·——	UNDERGROUND SCHED. 40 PVC CONDUIT, FOR POWER, SIZE AS SHOWN
————	GRC, AC–POWER FOR ACCESSORY LIGHTING, ANCHOR AT 3' INTERVALS, GROUNDING BOND AT EACH END
————	GRC INTERCONNECT KIT ON CONCRETE PAD, ANCHOR AT 3' INTERVALS, GROUNDING BOND AT EACH END, SIZE AS SHOWN
——·——·——	UNDERGROUND SCHED. 40 PVC CONDUIT, FOR FIBER/TELCO/CONTROLS, SIZE AS SHOWN (GRC REQUIRED FOR CONDUIT RUNS ON CONCRETE PAD, BOND CONDUIT AT BOTH ENDS)
————	GRC, TELCO, ANCHOR AT 3' INTERVAL, GROUNDING BOND AT EACH END, SIZE AS SHOWN

NOTE:
CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY TO CONVEY INTENT. ACTUAL ROUTING PATH MAY VARY DUE TO EXISTING FIELD CONDITIONS. ICE BRIDGE (WHICH IS NOT SHOWN FOR CLARITY) CAN BE USED AS NECESSARY TO SUPPORT NEW CONDUITS.



CONDUIT ROUTING PLAN 1 E–2
22x34 SCALE: 1"=1'–0"
11x17 SCALE: 1/2"=1'–0"
0 0'–6" 1'–0" 2'–0" 3'–0"

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STATE OF CONNECTICUT
MICHAEL F. PLAHOVINSAK
No. 25849
LICENSED PROFESSIONAL ENGINEER
9–5–2017

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SITE INFORMATION

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CTHA039A
SITE NUMBER:
CTHA039A
SITE ADDRESS:
60 ADAMS STREET,
MANCHESTER, CT

SHEET DESCRIPTION

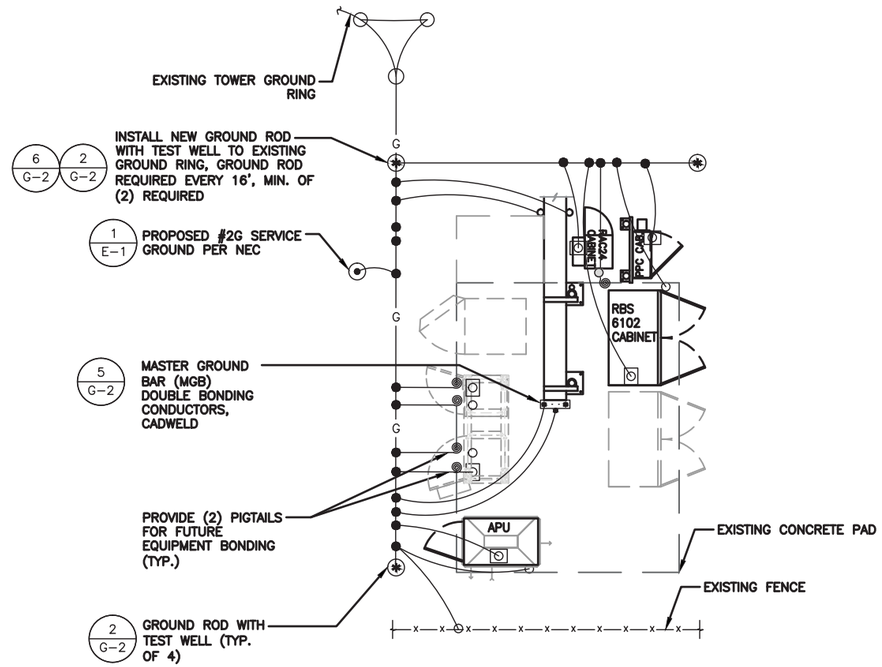
ELECTRICAL DETAILS

SHEET No.

E–2

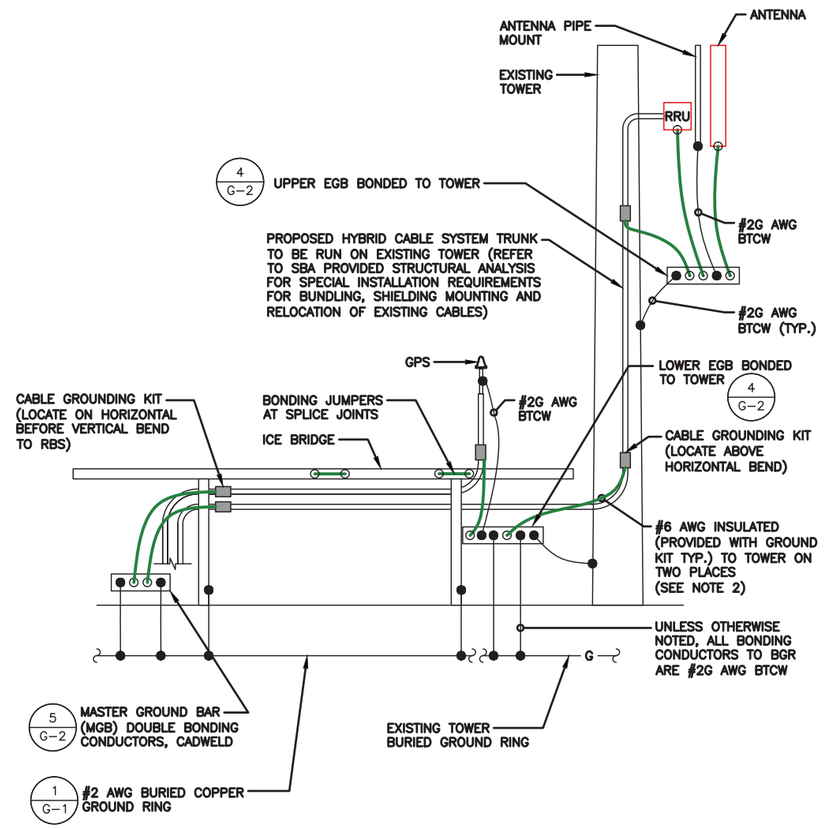
SPECIAL CONSTRUCTION WORK NOTE
(HAND-DUG UTILITY TRENCH EXCAVATION REQUIRED):

EXISTING UNDERGROUND UTILITY LOCATIONS ARE UNKNOWN. GENERAL CONTRACTOR SHALL HAND-EXCAVATE TO REQUIRED SUB-GRADE DEPTH, SUFFICIENT TEST HOLES OR AS DIRECTED/REQUIRED BY SBA REGIONAL SITE MANAGER. ALL PROPOSED UNDERGROUND UTILITY TRENCHES SHALL BE HAND-EXCAVATE AS REQUIRED. GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED SPECIAL TEMPORARY PROTECTION OF, PHYSICAL DAMAGE TO, OR REPAIR OF EXISTING UNDERGROUND CONDUIT INCLUDING RESTORATION OF SERVICE.



NOTE:
ALL EXPOSED BONDING CONDUCTORS ON EQUIPMENT PAD IN 1" NON-METALLIC CONDUIT

EQUIPMENT PLAN GROUNDING RING SCHEMATIC 1 G-1
SCALE: NTS



GROUND RISER DIAGRAM 2 G-1
SCALE: NTS

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)
	GROUND
MGB	MASTER GROUND BAR ○ MECHANICAL CONNECTION ● CADWELD CONNECTION
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
G	GROUND COPPER WIRE, #2 BTCW UNLESS NOTED OTHERWISE
	EXPOSED WIRING
	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
	5/8"x8' COPPER CLAD STAINLESS STEEL GROUND ROD
PPC	● EXOTHERMIC (CAD WELD) OR ○ MECHANICAL (COMPRESSION TYPE) CONNECTION; POWER PROTECTION CABINET
	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL
	PIGTAIL #2 BTCW (FUTURE EQUIPMENT)

ELECTRICAL AND GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) 2014 AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. 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.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION AS REQUIRED BY NEC.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. 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.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. 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.
14. 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.
15. 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.
16. 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).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20. BOND ANTENNA EGB'S AND MGB TO WATER MAIN/GROUND RING.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

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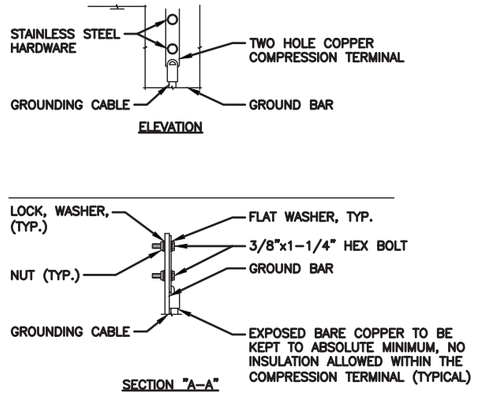
SHEET DESCRIPTION

GROUNDING DETAILS

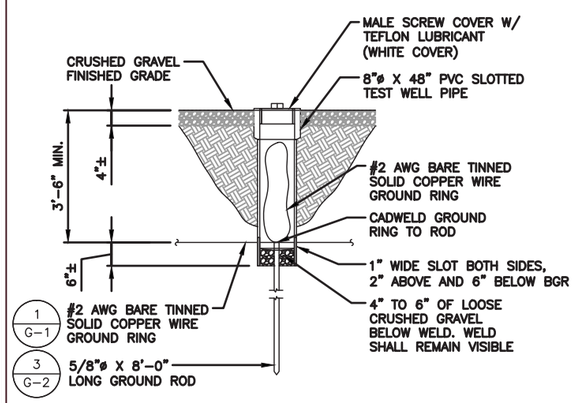
SHEET No.

G-1



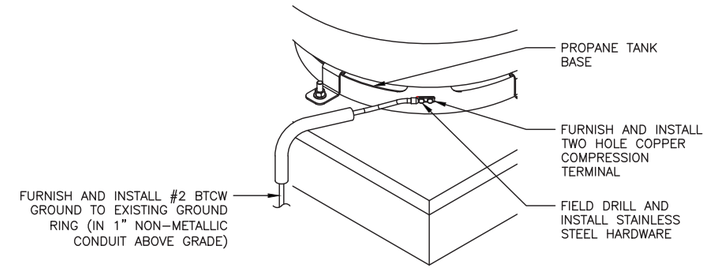
NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL (1 / G-2)
SCALE: NTS



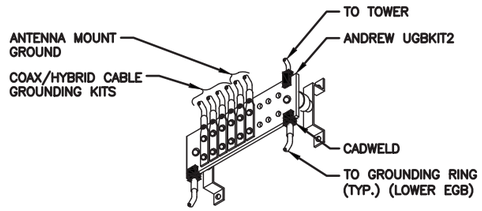
NOTE:
1. PROPOSED BGR TO BE INSTALLED 3'-6" MIN. BELOW GRADE OR BELOW LOCAL FROST DEPTH, WHICHEVER IS GREATER.
2. ONE TEST WELL SHALL BE PROVIDED BETWEEN THE TOWER GROUND LOOP AND TWO ON THE EQUIPMENT GROUND LOOP

GROUND ROD TEST WELL DETAIL (2 / G-2)
SCALE: NTS

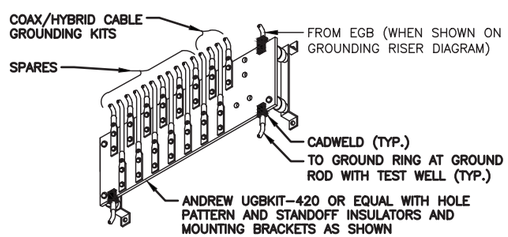


NOTE:
CONNECTION AREA IS TO HAVE PAINT REMOVED. AREA IS TO BE COLD GALV. COATED AFTER INSTALLATION OF MECHANICAL LUG.

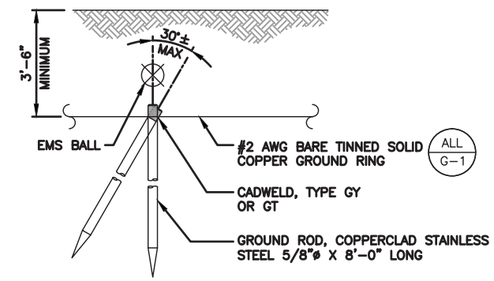
PROPANE TANK GROUNDING DETAIL (3 / G-2)
SCALE: NTS



EQUIPMENT GROUND BAR (EGB) (4 / G-2)
SCALE: NTS



MASTER GROUND BAR (MGB) (5 / G-2)
SCALE: NTS



NOTE:
1. PROPOSED BGR TO BE INSTALLED 3'-6" MIN. BELOW GRADE OR BELOW LOCAL FROST DEPTH, WHICHEVER IS GREATER.
2. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 30 DEGREES FROM THE VERTICAL.

GROUND ROD DETAIL (6 / G-2)
SCALE: NTS

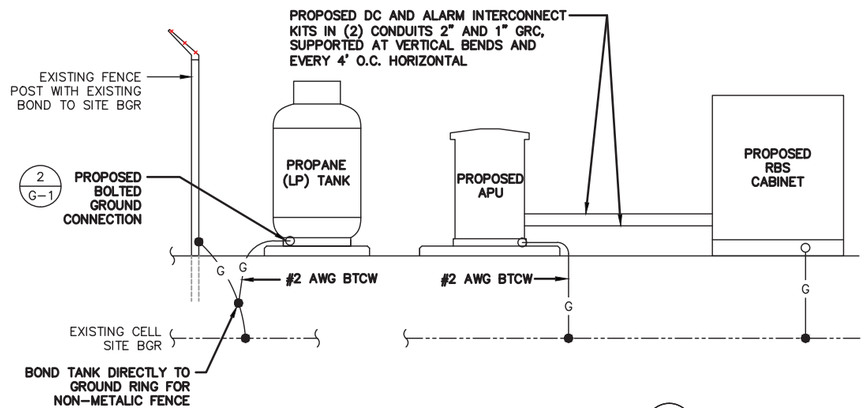
NOTE:
EQUIPMENT BONDING JUMPERS ABOVE GRADE ON CONCRETE SLAB TO BE RUN IN 1" NON-METALLIC CONDUIT.

NOTE:
NO NEW AC ELECTRICAL WORK REQUIRED FOR APU INSTALLATION. ALL NEW ELECTRICAL WORK IS 48V DC

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

GROUNDING LEGEND

○	MECHANICAL LUG
●	CADWELD
—— G ——	GROUND COPPER WIRE (SIZED AS NOTED)
—— — ——	BGR (BURIED GROUND RING)



TYPICAL GROUNDING RISER DIAGRAM (7 / G-2)
SCALE: NTS

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