



Filed by:

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134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3804 - kpelletier@sbsite.com*

March 2, 2018

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

Application for Tower Share
39 Nichols Rd., East Haddam, CT
41.521000 N
-72.423200 W
T-Mobile #: CTHA603B _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 175-foot Monopole Tower at 39 Nichols Road, East Haddam, 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 September 23, 2003 by the Council under Docket 255 with the following conditions:
 - The tower was to be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of the carrier and other entities, both public and private, but not to exceed a height of 175 feet above ground level;
 - The Certificate Holder was to prepare a D&M Plan in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies to be submitted to and approved by the Council prior to the commencement of facility construction
 - The Certificate Holder was to provide the Council a worst-case modeling of electromagnetic radio frequency power densities of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder was to also provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation caused a change in power density above the levels calculated and provided pursuant to the Decision and Order;

- Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility was to be brought into compliance with such standards;
- The Certificate Holder was to permit public or private entities to share space on the proposed tower for fair consideration, or provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. Upon request, the Certificate Holder was to provide space on its tower for Town of East Haddam antennas at no cost to the Town;
- If the facility did not provide wireless services within one year of completion of construction or ceased to provide wireless services for a period of one year, the Decision and Order was to be void;
- Any antenna that becomes obsolete and ceases to function was to be removed within 60 days; and
- Unless otherwise approved by the Council, the Decision and Order was to be void if the facility was not operational within one year or within one year after all appeals to the Decision and Order had been resolved.
- Latitude / Longitude: 41.521000 N / -72.423200 W
- Height of Tower: 175'
- Owned/operated by: MCM Acquisition 2017, LLC
- Property Owner: Town of East Haddam
- Size/Components of existing equipment compound:
 - 100' x 60' fenced compound with access double gate containing:
 - Monopole [center of compound]
 - AT&T Shelter [Southwest of monopole w/in compound]
 - Underground Telco Box [North of monopole w/in compound]
 - Transformer [North of monopole outside of 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:
 - 170'
 - (6) Powerwave 7770.00 P1A1 Panel Antennas
 - (1) Andrew SBNH-1D4545A Panel Antennas
 - (2) KMW AM-X-CD-17-65-00T RET Panel Antennas
 - (6) Powerwave LGP21401 TMAs
 - (3) Ericsson KRC 161 241/1 RRUs
 - (1) Raycap DC6-48-60-18-8F DC Surge
 - (1) Low Profile Platform
 - (12) 1-5/8" lines
 - (2) 3/4" DC lines
 - (1) 3/8" fiber

B. Nature and Extent of Proposed Modifications

T-Mobile proposes to install (12) panel antennas at the 150-foot level of the existing 175-foot Monopole Tower and occupy a ground lease area of 10' x 20' within the existing fenced compound. T-Mobile's full proposed scope of work is as follows:

Remove: None

Remove and Replace: None

Install:

Tower:

At 150'

- (4) Ericsson Air 32 KRD901146-1_B66A_B2A Panel Antennas
- (4) RFS APXVAA24_43-U-A20 Panel Antennas
- (4) RFS APX16DWV-16DWVS-E-A20 Panel Antennas
- (2) Radio Waves SP2-5.2 Dishes
- (8) Microdata Telecom MI-554nn Diplexers
- (4) Ericsson RRU 4478 RRUs
- (4) Ericsson S11B12 RRUs
- (4) Ericsson S11B12 RRUs
- (1) Panasonic VIC100 GPS Receiver
- (1) 4-sided platform with Handrail (SitePro F4P-10W+FRP-HRK10)
- (4) 1-5/8" fiber
- (3) 1/2" coax

Ground:

- (1) GPS Antenna (ground mount to Ice Bridge post)
- (1) Ice Bridge
- (1) RBS 6102 Cabinet
- (1) AAV Purcell Cabinet (on proposed H-Frame)
- (1) PPC (on proposed H-Frame)
- (1) 120 Gallon Stationary Vertical ASME Propane (LP) Storage Tank on proposed 3'x3' pre-cast concrete pad and associated gas line
- (1) 7.5 KW APU on proposed 4'x4' pre-cast concrete pad
- (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 39 Nichols Road site sits in a heavily trafficked area serving the Moodus area of East Haddam along portions of Route 149, the Haddam-Colchester Turnpike, and other local roads in East Haddam and Colchester. Since the site was built, wireless technology has flourished, resulting in greatly increased consumer usage and data transfer. One carrier is currently 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 East Haddam does not have a defined decibel ordinance.

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 3.25% of the allowable FCC established general public limit. The anticipated composite MPE value for this site assuming all carriers present is 4.62% 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 East Haddam's First Selectman, Mark B. Walter as town representative and representative for landowner
 - ii. The Town of East Haddam's Land Use Administrator and Zoning Enforcement Officer, James F. Ventres
 - iii. (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@sbsite.com

Attachments

cc: Mark B. Walter, First Selectman / with attachments
Town of East Haddam, 7 Main Street, East Haddam, CT 06423
James F. Ventres, Land Use Administrator and Zoning Enforcement Officer / with attachments
Town of East Haddam, 7 Main Street, East Haddam, CT 06423



POWER DENSITY

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C	Sector:	D
Antenna #:	1	Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR32 B66A/B2A	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	Gain:	15.9 dBd
Height (AGL):	145	Height (AGL):	145	Height (AGL):	145	Height (AGL):	145
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	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	Channel Count	4
Total TX Power(W):	240	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	ERP (W):	9,337.08
Antenna A1 MPE%	1.74	Antenna B1 MPE%	1.74	Antenna C1 MPE%	1.74	Antenna D1 MPE%	1.74
Antenna #:	2	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	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	145	Height (AGL):	145	Height (AGL):	145	Height (AGL):	145
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	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	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	5,118.95	ERP (W):	5,118.95	ERP (W):	5,118.95	ERP (W):	5,118.95
Antenna A2 MPE%	0.95	Antenna B2 MPE%	0.95	Antenna C2 MPE%	0.95	Antenna D2 MPE%	0.95
Antenna #:	3	Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20
Gain:	13.15 / 13.55 dBd	Gain:	13.15 / 13.55 dBd	Gain:	13.15 / 13.55 dBd	Gain:	13.15 / 13.55 dBd
Height (AGL):	145	Height (AGL):	145	Height (AGL):	145	Height (AGL):	145
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	2	Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60	Total TX Power(W):	60	Total TX Power(W):	60	Total TX Power(W):	60
ERP (W):	1,299.01	ERP (W):	1,299.01	ERP (W):	1,299.01	ERP (W):	1,299.01
Antenna A3 MPE%	0.56	Antenna B3 MPE%	0.56	Antenna C3 MPE%	0.56	Antenna D3 MPE%	0.56

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	3.25 %
AT&T	1.37 %
Site Total MPE %:	4.62 %

T-Mobile Sector A Total:	3.25 %
T-Mobile Sector B Total:	3.25 %
T-Mobile Sector C Total:	3.25 %
T-Mobile Sector D Total:	3.25 %
Site Total:	
	4.62 %

*** Emissions from the proposed RadioWaves SP2-5.2 microwave dish and radio are less than 0.1% of the FCC's allowable limit for exposure to radio frequency emissions at ground level*

ORIGIN ID:BBFA (508) 251-0720
KRI PELLETIER
SBA COMMUNICATIONS CORPORATION
134 FLANDERS RD
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

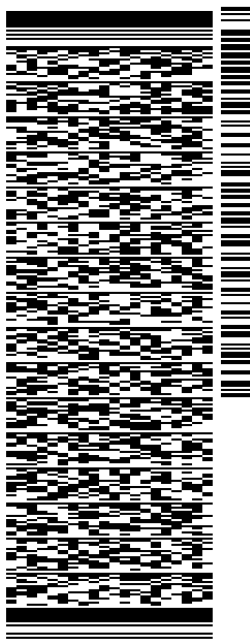
SHIP DATE: 02MAR18
ACTWGT: 1.00 LB
CAD: 105843304/NET3980

BILL SENDER

TO **MARK B. WALTER, FIRST SELECTMAN**
TOWN OF EAST HADDAM
7 MAIN STREET

EAST HADDAM CT 06423

(508) 251-0720 REF: 1056-92009-6089
INV: DEPT:
PO:



J181118012601uv

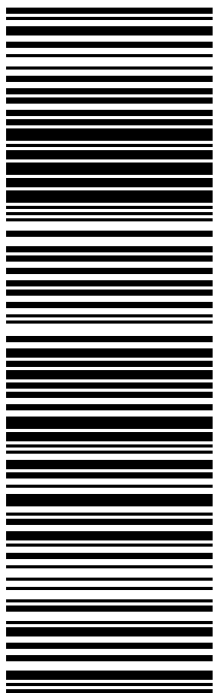
552J1107F5/DCA5

TRK# 7716 8522 1034
0201

MON - 05 MAR 12:00P
PRIORITY OVERNIGHT

SE SKKA

06423
CT-US BDL



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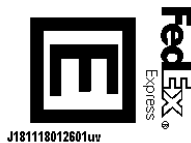
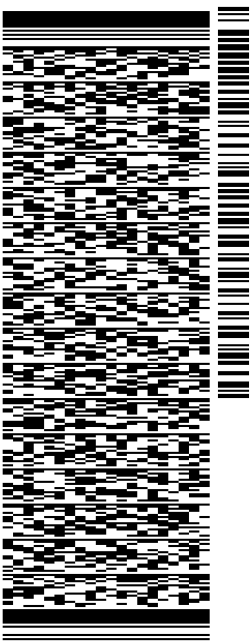
ORIGIN ID:BBFA (508) 251-0720
KRIPELLETTER
SBA COMMUNICATIONS CORPORATION
134 FLANDERS RD
SUITE 125
WESTBOROUGH MA 01581
UNITED STATES US

SHIP DATE: 02MAR18
ACTWGT: 1.00 LB
CAD: 105843304INET3980
BILL SENDER

TO **JAMES F. VENTURES LAND USE ADMIN**
TOWN OF EAST HADDAM
7 MAIN STREET

EAST HADDAM CT 06423

(508) 251-0720 REF: 10-56-92009-6089
INV/ PO: DEPT:



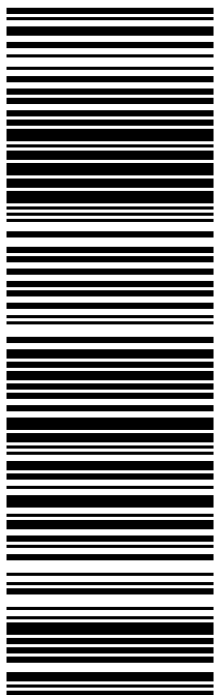
J181118012601uv

552J1.07F5/DCA5

TRK# 7716 8528 7575
0201

MON - 05 MAR 12:00P
PRIORITY OVERNIGHT

SE SKKA
06423
CT-US BDL



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39 NICHOLS RD

Location 39 NICHOLS RD

Mblu M75/ / L021/ /

Acct# 00416200

Owner EAST HADDAM TOWN OF

Assessment \$598,310

Appraisal \$854,720

PID 4621

Building Count 3

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$191,700	\$663,020	\$854,720
Assessment			
Valuation Year	Improvements	Land	Total
2017	\$134,190	\$464,120	\$598,310

Owner of Record

Owner	EAST HADDAM TOWN OF	Sale Price	\$0
Co-Owner	TRANSFER STATION-KENNEL	Certificate	
Address	*	Book & Page	91/ 80
	*	Sale Date	05/09/1969
	MOODUS, CT 06469		

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
EAST HADDAM TOWN OF	\$0		91/ 80	05/09/1969

Building Information

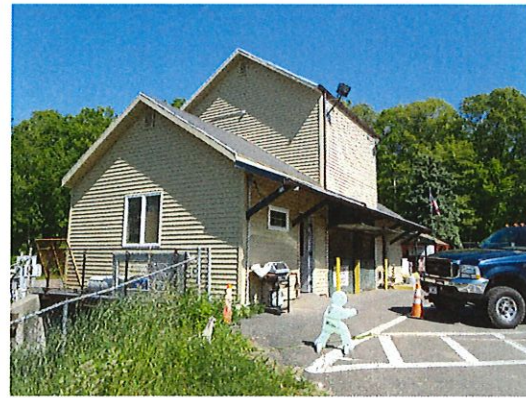
Building 1 : Section 1

Year Built: 1982
Living Area: 798
Replacement Cost: \$44,903
Building Percent 76
Good:
Replacement Cost
Less Depreciation: \$34,100

Building Photo

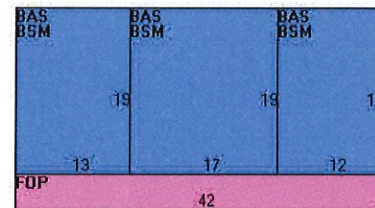
Building Attributes	
Field	Description
STYLE	Light Industrial
MODEL	Ind/Comm

Grade	C
Stories:	2
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Percent	0
Foundation	N/A
Bldg Use	Exempt Ind
Total Rooms	0
Total Bedrms	0
Total Fixtures	6
% Sprinklers	0
Bsmt Area	0
1st Floor Use:	
Heat/AC	Typical
Frame Type	Wood Frame
Baths/Plumbing	Average
Ceiling/Wall	None
Rooms/Prtns	None / N/A
Wall Height	8
% Conn Wall	0



(<http://images.vgsi.com/photos/EastHaddamCTPhotos/\00\00\69\03.jpg>)

Building Layout



Building Sub-Areas (sq ft)			Legend	
Code	Description	Gross Area	Living Area	
BAS	First Floor	798	798	
BSM	Basement	798	0	
FOP	Open Porch	168	0	
		1,764	798	

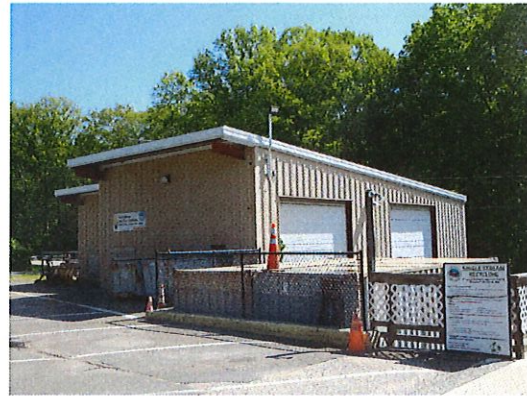
Building 2 : Section 1

Year Built: 2010
Living Area: 1,920
Replacement Cost: \$69,696
Building Percent Good: 93
Replacement Cost Less Depreciation: \$64,800

Building Attributes : Bldg 2 of 3	
Field	Description
STYLE	Pre-Eng Warehs
MODEL	Ind/Comm
Grade	C
Stories:	1
Occupancy	1

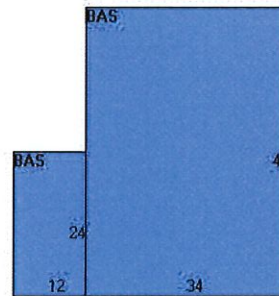
Building Photo

Exterior Wall 1	Pre-Finish Metl
Exterior Wall 2	
Roof Structure	Shed
Roof Cover	Metal
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	None
Heating Type	None
AC Percent	0
Foundation	Slab
Bldg Use	Industrial
Total Rooms	
Total Bedrms	
Total Fixtures	
% Sprinklers	0
Bsmt Area	
1st Floor Use:	
Heat/AC	None
Frame Type	Steel
Baths/Plumbing	Average
Ceiling/Wall	None
Rooms/Prtns	Average
Wall Height	14
% Comn Wall	



(http://images.vgsi.com/photos/EastHaddamCTPhotos/\00\00\69\04.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,920	1,920
		1,920	1,920

Building 3 : Section 1

Year Built: 2012
Living Area: 336
Replacement Cost: \$24,157
Building Percent Good: 95
Replacement Cost Less Depreciation: \$22,900

Building Attributes : Bldg 3 of 3	
Field	Description
STYLE	Kennel
MODEL	Ind/Comm
Grade	C
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	Vinyl Siding

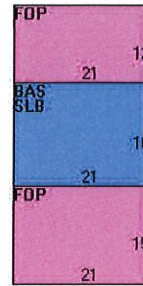
Building Photo



(http://images.vgsi.com/photos/EastHaddamCTPhotos//default)

Building Layout

Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Minimum
Interior Wall 2	
Interior Floor 1	Concrete
Interior Floor 2	
Heating Fuel	Propane
Heating Type	Space Heat
AC Percent	1
Foundation	
Bldg Use	Industrial
Total Rooms	
Total Bedrms	
Total Fixtures	
% Sprinklers	
Bsmt Area	
1st Floor Use:	
Heat/AC	None
Frame Type	Masonry
Baths/Plumbing	None
Ceiling/Wall	None
Rooms/Prtns	None / N/A
Wall Height	7
% Comn Wall	



Building Sub-Areas (sq ft)			Legend	
Code	Description	Gross Area	Living Area	
BAS	First Floor	336	336	
FOP	Open Porch	567	0	
SLB	Slab	336	0	
		1,239	336	

Extra Features

Extra Features		Legend
No Data for Extra Features		

Land

Land Use

Use Code 301E
 Description Exempt Ind
 Zone R2
 Neighborhood
 Alt Land Appr No
 Category

Land Line Valuation

Size (Acres) 120.86
 Frontage
 Depth
 Assessed Value \$464,120
 Appraised Value \$663,020

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	Paving			31080 S.F.	\$46,600	2

SHD1	Shed			200 S.F.	\$1,800	1
SHD1	Shed			80 S.F.	\$700	3
CNP	Canopy			200 S.F.	\$2,000	3
LNT	Lean To			210 S.F.	\$500	1
PAV1	Paving			8500 S.F.	\$7,700	2
SHD1	Shed			160 S.F.	\$1,500	1
SHD1	Shed			120 S.F.	\$800	1
SHP1	WorkShop Heated			200 S.F.	\$3,000	1
GAZ	Gazebo			250 S.F.	\$5,300	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2016	\$125,400	\$668,010	\$793,410
2015	\$125,400	\$668,010	\$793,410
2014	\$125,400	\$668,010	\$793,410

Assessment			
Valuation Year	Improvements	Land	Total
2016	\$87,780	\$467,610	\$555,390
2015	\$87,780	\$467,610	\$555,390
2014	\$87,780	\$467,610	\$555,390

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February 26, 2018

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: 39 Nichols Rd., East Haddam, CT 06469
TMO Site No: CTHA603B_NSD
SBA Site No: CT22076

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 39 Nichols Road, East Haddam, CT.

MCM Acquisition 2017, LLC ("Owner") (an SBA entity), 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 150' 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@sbsite.com



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

T-Mobile Existing Facility

Site ID: CTHA603B

SBA - East Haddam

39 Nichols Road
East Haddam, CT 06469

February 28, 2018

EBI Project Number: 6218001229

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	4.62 %



February 28, 2018

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

Emissions Analysis for Site: **CTHA603B – SBA - East Haddam**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **3 Nichols Road, East Haddam, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz and 700 MHz Band is approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$ respectively, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **3 Nichols Road, East Haddam, 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 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.
- 4) 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.
- 5) 1 LTE channel (600 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.
- 6) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.



- 7) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 9) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A & RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAA24-43-U-A20** for 600 MHz and 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 **RFS APXVAA24-43-U-A20** has a maximum gain of **13.15 dBd** at its main lobe at 600 MHz and a maximum gain of **13.55 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 10) The antenna mounting height centerline of the proposed antennas is **145 feet** above ground level (AGL).
- 11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.
- 12) All calculations were done with respect to uncontrolled / general population threshold limits.



T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C	Sector:	D
Antenna #:	1	Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR32 B66A/B2A	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	Gain:	15.9 dBd
Height (AGL):	145	Height (AGL):	145	Height (AGL):	145	Height (AGL):	145
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	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	Channel Count	4
Total TX Power(W):	240	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	ERP (W):	9,337.08
Antenna A1 MPE%	1.74	Antenna B1 MPE%	1.74	Antenna C1 MPE%	1.74	Antenna D1 MPE%	1.74
Antenna #:	2	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	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	145	Height (AGL):	145	Height (AGL):	145	Height (AGL):	145
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	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	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	5,118.95	ERP (W):	5,118.95	ERP (W):	5,118.95	ERP (W):	5,118.95
Antenna A2 MPE%	0.95	Antenna B2 MPE%	0.95	Antenna C2 MPE%	0.95	Antenna D2 MPE%	0.95
Antenna #:	3	Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20	Make / Model:	RFS APXVAA24-43-U-A20
Gain:	13.15 / 13.55 dBd	Gain:	13.15 / 13.55 dBd	Gain:	13.15 / 13.55 dBd	Gain:	13.15 / 13.55 dBd
Height (AGL):	145	Height (AGL):	145	Height (AGL):	145	Height (AGL):	145
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	2	Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60	Total TX Power(W):	60	Total TX Power(W):	60	Total TX Power(W):	60
ERP (W):	1,299.01	ERP (W):	1,299.01	ERP (W):	1,299.01	ERP (W):	1,299.01
Antenna A3 MPE%	0.56	Antenna B3 MPE%	0.56	Antenna C3 MPE%	0.56	Antenna D3 MPE%	0.56

** Emissions from the proposed RadioWaves SP2-5.2 microwave dish and radio are less than 0.1% of the FCC's allowable limit for exposure to radio frequency emissions at ground level

Site Composite MPE%	
Carrier	MPE%
T-Mobile (Per Sector Max)	3.25 %
AT&T	1.37 %
Site Total MPE %:	4.62 %

T-Mobile Sector A Total:	3.25 %
T-Mobile Sector B Total:	3.25 %
T-Mobile Sector C Total:	3.25 %
T-Mobile Sector D Total:	3.25 %
Site Total:	
	4.62 %



T-Mobile Max Power Values per Sector

T-Mobile _Max Power Values per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	145	8.69	AWS - 2100 MHz	1000	0.87%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	145	8.69	PCS - 1900 MHz	1000	0.87%
T-Mobile AWS - 2100 MHz UMTS	2	1,279.74	145	4.76	AWS - 2100 MHz	1000	0.48%
T-Mobile PCS - 1900 MHz UMTS	2	1,279.74	145	4.76	PCS - 1900 MHz	1000	0.48%
T-Mobile 700 MHz LTE	1	619.61	145	1.15	700 MHz	400	0.29%
T-Mobile 700 MHz LTE	1	679.39	145	1.26	700 MHz	467	0.26%
						Total:	3.25 %

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:	3.25 %
Sector B:	3.25 %
Sector C:	3.25 %
Sector D:	3.25 %
T-Mobile Per Sector Maximum:	3.25 %
Site Total:	4.62 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **4.62%** 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.



Tower Engineering Solutions

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

Structural Analysis Report

Existing 175 ft PIROD Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT22076-A

Customer Site Name: East Haddam (Trowbridge)

Carrier Name: T-Mobile

Carrier Site ID / Name: CTHA603B / CTHA603B

Site Location: 39 Nichols Rd.

East Haddam, Connecticut

MIDDLESEX County

Latitude: 41.521000

Longitude: -72.423200

Analysis Result:

Max Structural Usage: 74.8% [Pass]

Max Foundation Usage: 45.0% [Pass]

Additional Usage Caused by New Mount: +8.20

Report Prepared By: Saroj Dangol



Introduction

The purpose of this report is to summarize the analysis results on the 175 ft PIROD Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Pyrod Inc. Drawing no. 1776649 dated 06/21/2005
Foundation Drawing	Pyrod Inc. Drawing no. 177649 dated 06/21/2005
Geotechnical Report	BL Companies Project# C-3109 dated 02/13/2003
Modification Drawings	N/A

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 $V_{ult} = 130.0$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 101.0$ mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" 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:	$S_S = 0.174$, $S_1 = 0.061$

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	170.0	6	Powerwave 7770.00 P1A1 Panel	Low Profile Platform	(12) 1 5/8" (2) 3/4" DC* (1) 3/8" Fiber*	AT&T
2		1	Andrew SBNH-1D4545A Panel			
3		2	KMW AM-X-CD-17-65-00T RET Panel			
4		6	Powerwave LGP21401 TMA			
5		3	Ericsson KRC 161 241/1 RRU			
6		1	Raycap DC6-48-60-18-8F DC Surge			

*(2) 3/4" DC and (1) 3/8" Fiber runs inside (1) 3" Innerduct

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
7	150.0	4	Ericsson Air 32 KRD901146-1_B66A_B2APanel	Four-Sided Platform w/ Handrail (SitePro F4P-10W+ F4P-HRK10)	(4) 1 5/8" Fiber (3) 1/2" Coax	T-Mobile
8		4	RFS APXVAA24_43-U-A20 Panel			
9		4	RFS APX16DWV-16DWVS-E-A20 Panel			
10		2	Radio Waves SP2-5.2 Dish			
11		8	Microdata Telecom MI-554nn Diplexer			
12		4	Ericsson RRU 4478 RRU			
13		4	Ericsson S11B12 RRU			
14		4	Ericsson S11B12 RRU			
15		1	Panasonic VIC100 GPS Reciever			

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

Analysis Results

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

	Pole shafts	Anchor Bolts	Base Plate
Max. Usage:	74.5%	67.3%	74.8%
Pass/Fail	Pass	Pass	Pass

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Original Design Reactions	7478.9	54.1	77.7
Analysis Reactions	5244.84	47.2	61.75
Factored Reactions*	10096.5	73.0	104.8
% of Design Reactions	51.9%	64.7%	58.9%

* Per section 15.5.1 of the TIA-222-G standard, factored reactions were obtained by multiplying a 1.35 factor to the original design reactions.

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

Operational Condition (Rigidity):

The maximum twist and sway of the microwave dishes under the operational wind speed as specified in the Analysis Criteria are listed in the table below:

Elevation (ft)	Antenna / Dish	Carrier	Twist (deg)	Sway (deg)
150.0	SP2-5.2 - Dish	T-Mobile	0.000	0.997

It is recommended that the carriers review the twist and sway values of the microwave dishes.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-G Standard under the design basic wind speed as specified in the Analysis Criteria.

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 and/or ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
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 74.50% at 0.0ft

Structure: CT22076-A-SBA
Site Name: East Haddam (Trowbridge)
Height: 175.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-G
Exposure: C
Gh: 1.1

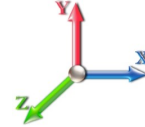
2/16/2018



Page: 1

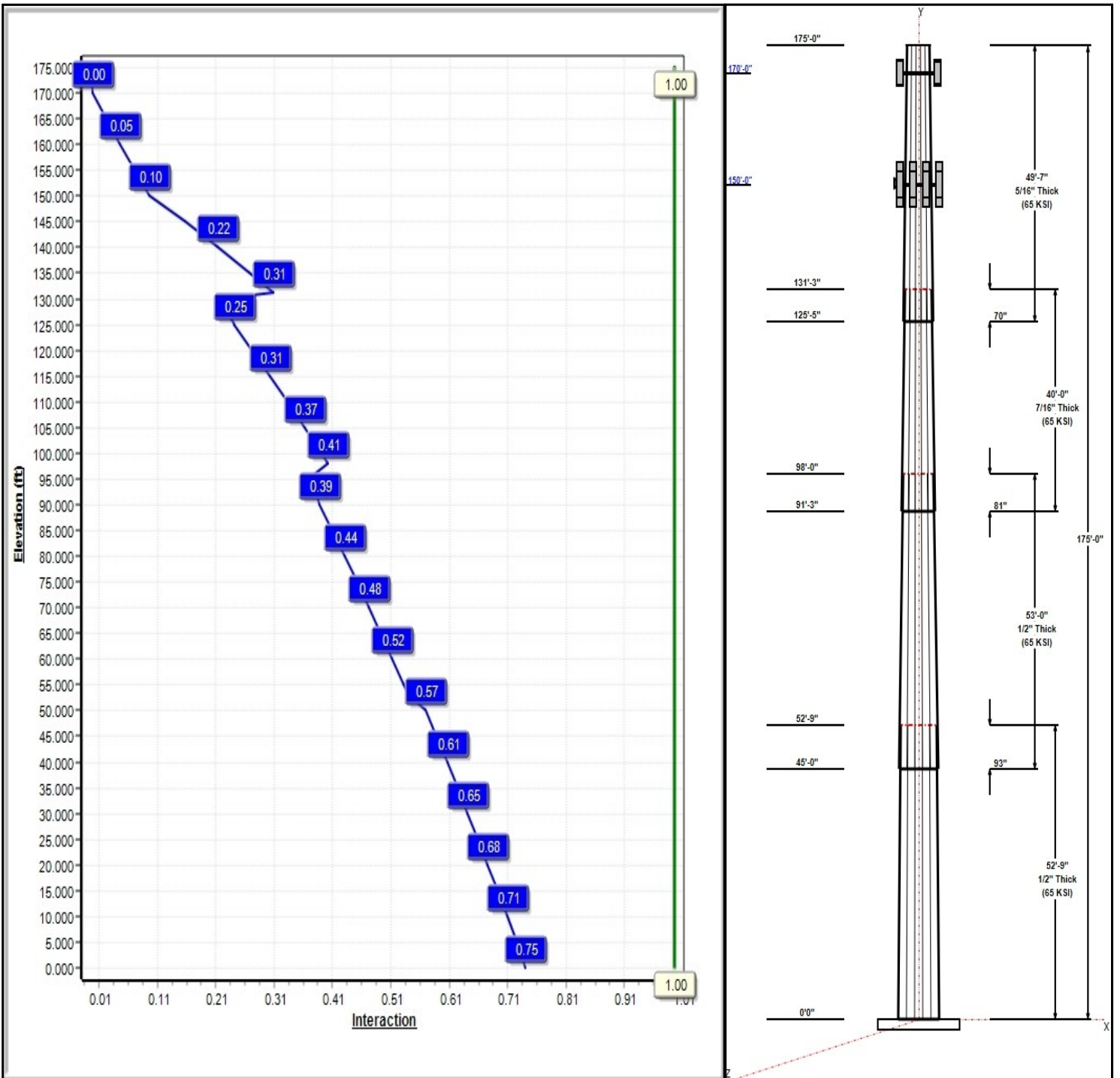
Dead Load Factor: 1.20
Wind Load Factor: 1.60

Load Case : 1.2D + 1.6W 101 mph Wind



Iterations: 23

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Structure: CT22076-A-SBA

Type: Tapered
Site Name: East Haddam (Trowbridge)
Height: 175.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 12 Sided
Taper: 0.18286

2/16/2018

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Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	52.75	48.35	58.00	0.500		0.18286	65
2	53.00	41.08	50.77	0.500	Slip	0.18286	65
3	40.00	35.88	43.19	0.438	Slip	0.18286	65
4	49.58	28.50	37.57	0.313	Slip	0.18286	65

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
175.00	175.00	1	Lightning rod	
170.00	170.00	6	7770.00A	AT&T
170.00	170.00	1	SBNH-1D4545A	AT&T
170.00	170.00	2	AM-X-CD-17-65-00T-RET	AT&T
170.00	170.00	6	LGP21401	AT&T
170.00	170.00	1	DC6-48-60-18-8F	AT&T
170.00	170.00	3	RRUS-11 B12	AT&T
170.00	170.00	1	Low Profile	AT&T
150.00	150.00	4	KRD 9011461-B66A-B2A	T-Mobile
150.00	150.00	4	APXVAA24_43-U-A20	T-Mobile
150.00	150.00	4	APX16DWV-16DWVS-C	T-Mobile
150.00	150.00	2	SP2-5.2	T-Mobile
150.00	150.00	8	MI-554nn	T-Mobile
150.00	150.00	4	RRUS 4478 B14	T-Mobile
150.00	150.00	4	S11B12	T-Mobile
150.00	150.00	4	S11B4	T-Mobile
150.00	150.00	1	VIC100	T-Mobile
150.00	150.00	1	F4P-10W	T-Mobile
150.00	150.00	1	F4P-HRK10	T-Mobile

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	170.00	Inside	1 5/8" Coax	AT&T
0.00	170.00	Inside	3" Innerduct	AT&T
0.00	170.00	Inside	3/4" DC	AT&T
0.00	170.00	Inside	3/8" Fiber	AT&T
0.00	150.00	Inside	1 5/8" Fiber	T-Mobile
0.00	150.00	Inside	1/2" Coax	T-Mobile
0.00	150.00	Inside	1/2" Coax	T-Mobile

Anchor Bolts

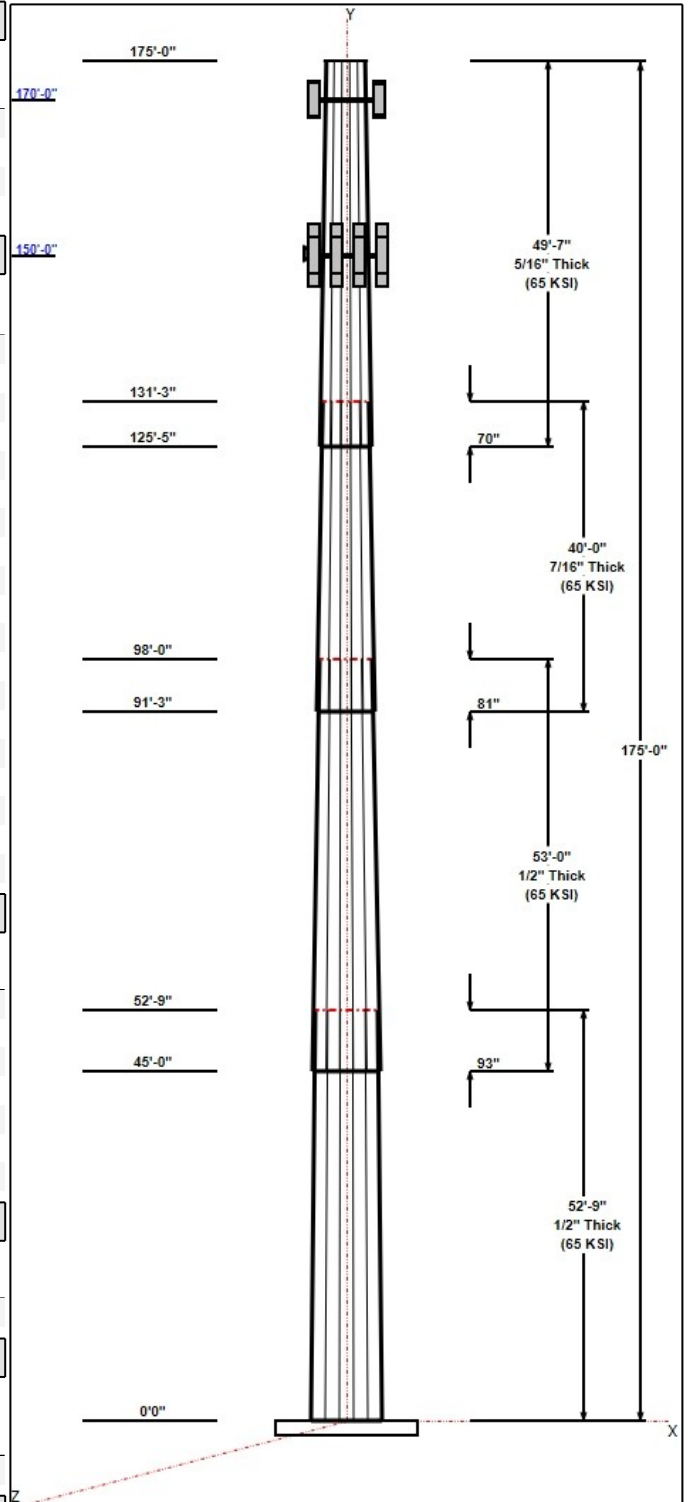
Qty	Specifications	Grade (ksi)	Arrangement
20	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
3.2500	81.8	50.0	Polygon

Reactions

Load Case	Moment (FT-Kips)	Shear (Kips)	Axial (Kips)
1.2D + 1.6W 101 mph Wind	5244.8	47.2	61.7
0.9D + 1.6W 101 mph Wind	5196.9	47.2	46.3



Structure: CT22076-A-SBA

Type: Tapered
Site Name: East Haddam (Trowbridge)
Height: 175.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 12 Sided
Taper: 0.18286

2/16/2018

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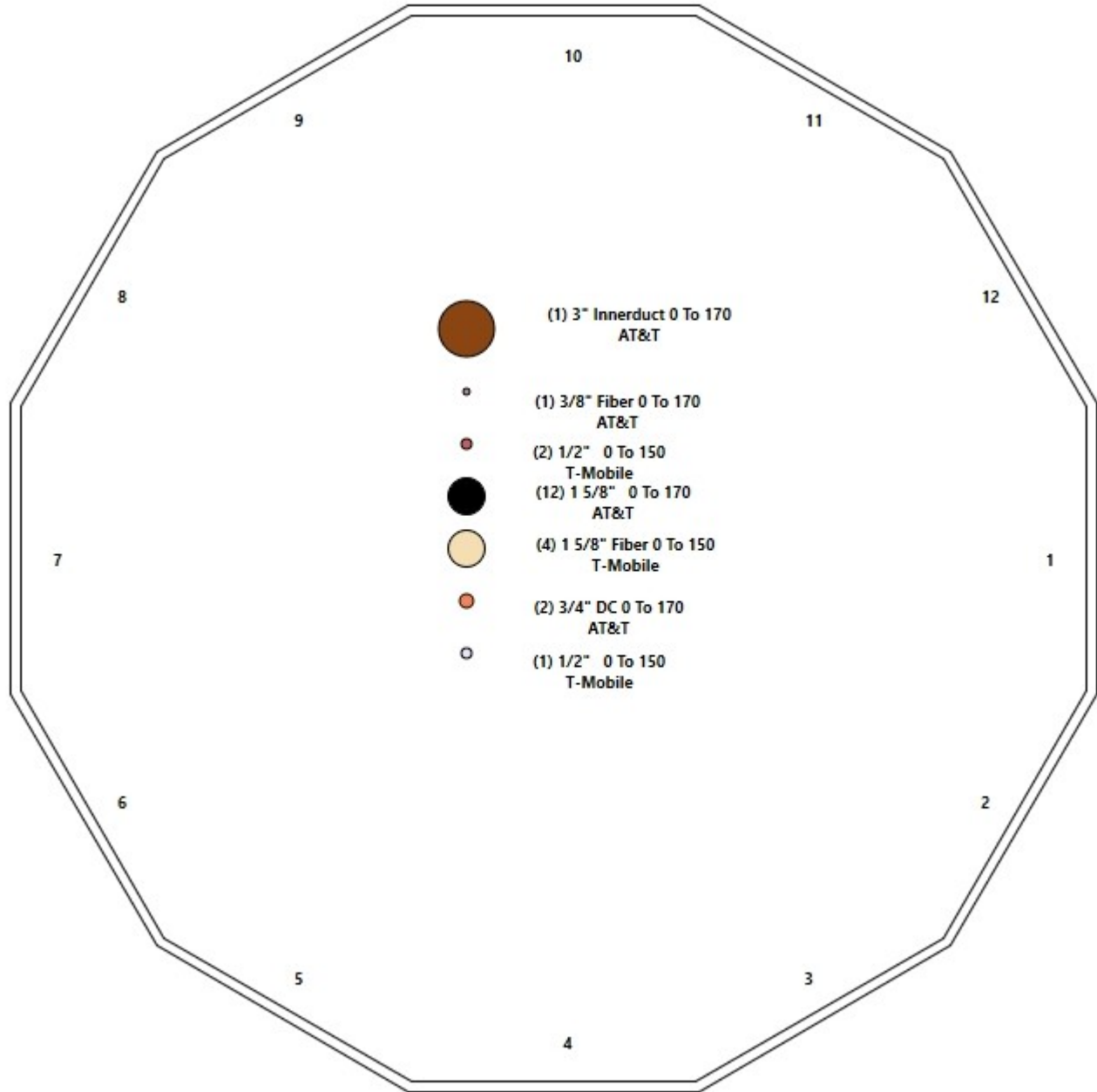
1.2D + 1.0Di + 1.0Wi 50 mph Wind	1187.7	10.1	86.3
1.2D + 1.0E	223.1	1.9	61.8
0.9D + 1.0E	220.8	1.9	46.4
1.0D + 1.0W 60 mph Wind	1150.9	10.4	51.5

Structure: CT22076-A-SBA - Coax Line Placement

Type: Monopole
Site Name: East Haddam (Trowbridge)
Height: 175.00 (ft)

2/16/2018

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Shaft Properties

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	12	52.750	0.5000	65		0.00	15,223
2	12	53.000	0.5000	65	Slip	93.00	13,190
3	12	40.000	0.4375	65	Slip	81.00	7,496
4	12	49.583	0.3125	65	Slip	70.00	5,555
Total Shaft Weight:							41,464

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	58.00	0.00	92.58	39067.48	28.94	116.00	48.35	52.75	77.05	22520.3	23.77	96.71	0.182857
2	50.77	45.00	80.94	26108.11	25.06	101.54	41.08	98.00	65.33	13732.4	19.87	82.16	0.182857
3	43.19	91.25	60.23	14050.20	24.31	98.72	35.88	131.25	49.92	8002.19	19.83	82.00	0.182857
4	37.57	125.4	37.49	6640.74	30.07	120.21	28.50	175.00	28.36	2876.48	22.29	91.20	0.182857

Load Summary

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Discrete Appurtenances

No.	Elev (ft)	Description	Qty	No Ice			Ice			Hor. Ecc. (ft)	Vert Ecc (ft)
				Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor		
1	175.00	Lightning rod	1	12.00	1.25	1.00	37.52	5.681	1.00	0.00	0.00
2	170.00	7770.00A	6	27.00	5.54	0.76	142.74	7.702	0.79	0.00	0.00
3	170.00	SBNH-1D4545A	1	36.40	9.10	0.67	220.81	11.281	0.70	0.00	0.00
4	170.00	AM-X-CD-17-65-00T-RET (48")	2	30.80	5.00	0.79	144.21	6.898	0.81	0.00	0.00
5	170.00	LGP21401	6	14.10	1.29	0.66	39.42	2.136	0.72	0.00	0.00
6	170.00	DC6-48-60-18-8F	1	31.80	0.92	1.00	94.40	1.363	1.00	0.00	0.00
7	170.00	RRUS-11 B12	3	50.00	2.57	0.71	115.74	3.224	0.74	0.00	0.00
8	170.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	2825.40	39.884	1.00	0.00	0.00
9	150.00	KRD 9011461-B66A-B2A	4	132.20	6.51	0.86	315.44	7.632	0.88	0.00	0.00
10	150.00	APXVAA24_43-U-A20	4	99.00	20.24	0.72	526.70	22.140	0.73	0.00	0.00
11	150.00	APX16DWV-16DWVS-C	4	40.70	6.46	0.67	155.71	8.629	0.70	0.00	0.00
12	150.00	SP2-5.2	2	22.00	3.96	1.00	105.29	5.135	1.00	0.00	0.00
13	150.00	MI-554nn	8	8.16	0.62	0.50	32.12	0.987	0.67	0.00	0.00
14	150.00	RRUS 4478 B14	4	59.40	1.65	0.67	100.87	2.168	0.75	0.00	0.00
15	150.00	S11B12	4	51.00	2.83	0.67	120.60	3.502	0.75	0.00	0.00
16	150.00	S11B4	4	51.00	2.83	0.67	120.60	3.502	0.75	0.00	0.00
17	150.00	VIC100	1	0.40	0.10	0.67	5.72	0.287	0.75	0.00	0.00
18	150.00	F4P-10W	1	2396.00	58.98	1.00	4737.66	28.974	1.00	0.00	0.00
19	150.00	F4P-HRK10	1	478.27	9.00	1.00	945.69	19.681	1.00	0.00	0.00
Totals:			58	6,755.55			16,422.96				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	170.00	(12) 1 5/8" Coax	0.00	Inside
0.00	170.00	(1) 3" Innerduct	0.00	Inside
0.00	170.00	(2) 3/4" DC	0.00	Inside
0.00	170.00	(1) 3/8" Fiber	0.00	Inside
0.00	150.00	(4) 1 5/8" Fiber	0.00	Inside
0.00	150.00	(2) 1/2" Coax	0.00	Inside
0.00	150.00	(1) 1/2" Coax	0.00	Inside

Shaft Section Properties

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Fpy (ksi)	S (in ³)	Weight (lb)
0.00		0.5000	58.000	92.575	39067.5	28.94	116.00	73.2	1301.	0.0
5.00		0.5000	57.086	91.103	37233.4	28.45	114.17	73.7	1260.	1562.5
10.00		0.5000	56.171	89.631	35457.6	27.96	112.34	74.2	1219.	1537.5
15.00		0.5000	55.257	88.159	33739.2	27.47	110.51	74.8	1179.	1512.4
20.00		0.5000	54.343	86.687	32077.2	26.98	108.69	75.3	1140.	1487.4
25.00		0.5000	53.429	85.215	30470.7	26.49	106.86	75.8	1101.	1462.4
30.00		0.5000	52.514	83.743	28918.8	26.00	105.03	76.4	1063.	1437.3
35.00		0.5000	51.600	82.271	27420.4	25.51	103.20	76.9	1026.	1412.3
40.00		0.5000	50.686	80.799	25974.8	25.02	101.37	77.4	990.0	1387.2
45.00	Bot - Section 2	0.5000	49.771	79.327	24580.9	24.53	99.54	78.0	954.1	1362.2
50.00		0.5000	48.857	77.855	23237.7	24.04	97.71	78.5	918.8	2701.7
52.75	Top - Section 1	0.5000	49.354	78.655	23961.8	24.31	98.71	0.0	0.0	1464.6
55.00		0.5000	48.943	77.993	23361.5	24.08	97.89	78.4	922.1	599.7
60.00		0.5000	48.029	76.521	22063.6	23.59	96.06	79.0	887.5	1314.4
65.00		0.5000	47.114	75.049	20814.6	23.10	94.23	79.5	853.5	1289.4
70.00		0.5000	46.200	73.577	19613.7	22.61	92.40	80.0	820.1	1264.4
75.00		0.5000	45.286	72.105	18459.9	22.12	90.57	80.6	787.5	1239.3
80.00		0.5000	44.371	70.633	17352.3	21.63	88.74	81.1	755.5	1214.3
85.00		0.5000	43.457	69.161	16289.9	21.15	86.91	81.7	724.2	1189.2
90.00		0.5000	42.543	67.689	15271.7	20.66	85.09	81.9	693.5	1164.2
91.25	Bot - Section 3	0.5000	42.314	67.321	15024.0	20.53	84.63	81.9	685.9	287.1
95.00		0.5000	41.629	66.217	14296.9	20.17	83.26	81.9	663.5	1614.4
98.00	Top - Section 2	0.4375	41.955	58.488	12868.1	23.55	95.90	0.0	0.0	1272.5
100.00		0.4375	41.589	57.973	12531.0	23.33	95.06	79.3	582.1	396.3
105.00		0.4375	40.675	56.685	11714.2	22.77	92.97	79.9	556.4	975.4
110.00		0.4375	39.761	55.397	10933.7	22.21	90.88	80.5	531.2	953.5
115.00		0.4375	38.846	54.109	10188.6	21.65	88.79	81.1	506.7	931.6
120.00		0.4375	37.932	52.821	9478.2	21.09	86.70	81.7	482.7	909.6
125.00		0.4375	37.018	51.533	8801.6	20.53	84.61	81.9	459.3	887.7
125.42	Bot - Section 4	0.4375	36.942	51.425	8746.8	20.48	84.44	81.9	457.4	73.0
130.00		0.4375	36.104	50.245	8158.0	19.97	82.52	81.9	436.5	1370.9
131.25	Top - Section 3	0.3125	36.500	36.414	6086.5	29.15	116.80	0.0	0.0	368.4
135.00		0.3125	35.814	35.724	5747.0	28.56	114.61	73.6	310.0	460.3
140.00		0.3125	34.900	34.804	5314.3	27.78	111.68	74.4	294.2	600.0
145.00		0.3125	33.986	33.884	4903.9	27.00	108.75	75.3	278.8	584.3
150.00		0.3125	33.071	32.964	4515.2	26.21	105.83	76.1	263.8	568.7
155.00		0.3125	32.157	32.044	4147.6	25.43	102.90	77.0	249.2	553.0
160.00		0.3125	31.243	31.124	3800.6	24.65	99.98	77.8	235.0	537.4
165.00		0.3125	30.329	30.204	3473.4	23.86	97.05	78.7	221.2	521.7
170.00		0.3125	29.414	29.284	3165.6	23.08	94.13	79.5	207.9	506.1
175.00		0.3125	28.500	28.364	2876.5	22.29	91.20	80.4	195.0	490.4

41464.4

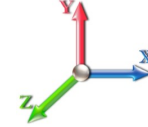
Wind Loading - Shaft

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60



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		1.00	0.85	21.088	23.20	465.94	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	458.60	1.000	0.000	5.00	24.822	24.82	921.2	0.0	1875.0
10.00		1.00	0.85	21.088	23.20	451.25	1.000	0.000	5.00	24.428	24.43	906.6	0.0	1845.0
15.00		1.00	0.85	21.088	23.20	443.91	1.000	0.000	5.00	24.033	24.03	892.0	0.0	1814.9
20.00		1.00	0.90	22.375	24.61	449.69	1.000	0.000	5.00	23.639	23.64	930.9	0.0	1784.9
25.00		1.00	0.95	23.451	25.80	452.63	1.000	0.000	5.00	23.244	23.24	959.4	0.0	1754.8
30.00		1.00	0.98	24.369	26.81	453.51	1.000	0.000	5.00	22.850	22.85	980.0	0.0	1724.8
35.00		1.00	1.01	25.172	27.69	452.90	1.000	0.000	5.00	22.456	22.46	994.9	0.0	1694.7
40.00		1.00	1.04	25.890	28.48	451.17	1.000	0.000	5.00	22.061	22.06	1005.3	0.0	1664.7
45.00	Bot - Section 2	1.00	1.07	26.540	29.19	448.56	1.000	0.000	5.00	21.667	21.67	1012.1	0.0	1634.6
50.00		1.00	1.09	27.135	29.85	445.23	1.000	0.000	5.00	21.704	21.70	1036.5	0.0	3242.0
52.75	Top - Section 1	1.00	1.11	27.443	30.19	443.14	1.000	0.000	2.75	11.769	11.77	568.4	0.0	1757.5
55.00		1.00	1.12	27.685	30.45	450.51	1.000	0.000	2.25	9.540	9.54	464.9	0.0	719.6
60.00		1.00	1.14	28.197	31.02	446.16	1.000	0.000	5.00	20.915	20.92	1037.9	0.0	1577.3
65.00		1.00	1.16	28.676	31.54	441.37	1.000	0.000	5.00	20.521	20.52	1035.7	0.0	1547.3
70.00		1.00	1.17	29.127	32.04	436.20	1.000	0.000	5.00	20.126	20.13	1031.7	0.0	1517.2
75.00		1.00	1.19	29.553	32.51	430.68	1.000	0.000	5.00	19.732	19.73	1026.3	0.0	1487.2
80.00		1.00	1.21	29.958	32.95	424.86	1.000	0.000	5.00	19.337	19.34	1019.6	0.0	1457.1
85.00		1.00	1.22	30.342	33.38	418.77	1.000	0.000	5.00	18.943	18.94	1011.6	0.0	1427.1
90.00		1.00	1.24	30.710	33.78	412.44	1.000	0.000	5.00	18.549	18.55	1002.5	0.0	1397.0
91.25	Bot - Section 3	1.00	1.24	30.799	33.88	410.82	1.000	0.000	1.25	4.576	4.58	248.0	0.0	344.6
95.00		1.00	1.25	31.061	34.17	405.88	1.000	0.000	3.75	13.862	13.86	757.8	0.0	1937.2
98.00	Top - Section 2	1.00	1.26	31.265	34.39	401.84	1.000	0.000	3.00	10.930	10.93	601.4	0.0	1527.0
100.00		1.00	1.27	31.399	34.54	407.69	1.000	0.000	2.00	7.208	7.21	398.3	0.0	475.5
105.00		1.00	1.28	31.723	34.89	400.78	1.000	0.000	5.00	17.743	17.74	990.6	0.0	1170.5
110.00		1.00	1.29	32.035	35.24	393.69	1.000	0.000	5.00	17.349	17.35	978.1	0.0	1144.2
115.00		1.00	1.30	32.336	35.57	386.45	1.000	0.000	5.00	16.954	16.95	964.9	0.0	1117.9
120.00		1.00	1.32	32.627	35.89	379.04	1.000	0.000	5.00	16.560	16.56	950.9	0.0	1091.6
125.00		1.00	1.33	32.909	36.20	371.50	1.000	0.000	5.00	16.165	16.17	936.3	0.0	1065.3
125.42	Bot - Section 4	1.00	1.33	32.932	36.22	370.87	1.000	0.000	0.42	1.329	1.33	77.0	0.0	87.6
130.00		1.00	1.34	33.182	36.50	363.82	1.000	0.000	4.58	14.689	14.69	857.8	0.0	1645.1
131.25	Top - Section 3	1.00	1.34	33.249	36.57	361.89	1.000	0.000	1.25	3.949	3.95	231.1	0.0	442.1
135.00		1.00	1.35	33.446	36.79	362.35	1.000	0.000	3.75	11.698	11.70	688.6	0.0	552.3
140.00		1.00	1.36	33.703	37.07	354.45	1.000	0.000	5.00	15.252	15.25	904.7	0.0	720.0
145.00		1.00	1.37	33.953	37.35	346.44	1.000	0.000	5.00	14.857	14.86	887.8	0.0	701.2
150.00	Appurtenance(s)	1.00	1.38	34.196	37.62	338.33	1.000	0.000	5.00	14.463	14.46	870.5	0.0	682.4
155.00		1.00	1.39	34.433	37.88	330.11	1.000	0.000	5.00	14.069	14.07	852.6	0.0	663.6
160.00		1.00	1.40	34.664	38.13	321.80	1.000	0.000	5.00	13.674	13.67	834.3	0.0	644.8
165.00		1.00	1.41	34.890	38.38	313.40	1.000	0.000	5.00	13.280	13.28	815.5	0.0	626.0
170.00	Appurtenance(s)	1.00	1.42	35.110	38.62	304.90	1.000	0.000	5.00	12.885	12.89	796.2	0.0	607.3
175.00	Appurtenance(s)	1.00	1.42	35.324	38.86	296.33	1.000	0.000	5.00	12.491	12.49	776.6	0.0	588.5
Totals:								175.00	33,256.6	49,757.2				

Discrete Appurtenance Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60



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	175.00	Lightning rod	1	35.324	38.857	1.00	1.00	1.25	14.40	0.000	0.000	77.71	0.00	0.00
2	170.00	Low Profile	1	35.110	38.620	1.00	1.00	22.00	1800.00	0.000	0.000	1359.44	0.00	0.00
3	170.00	RRUS-11 B12	3	35.110	38.620	0.57	0.80	4.37	180.00	0.000	0.000	269.85	0.00	0.00
4	170.00	DC6-48-60-18-8F	1	35.110	38.620	0.80	0.80	0.74	38.16	0.000	0.000	45.48	0.00	0.00
5	170.00	LGP21401	6	35.110	38.620	0.53	0.80	4.09	101.52	0.000	0.000	252.53	0.00	0.00
6	170.00	AM-X-CD-17-65-00T-RET	2	35.110	38.620	0.63	0.80	6.32	73.92	0.000	0.000	390.53	0.00	0.00
7	170.00	SBNH-1D4545A	1	35.110	38.620	0.54	0.80	4.88	43.68	0.000	0.000	301.40	0.00	0.00
8	170.00	7770.00A	6	35.110	38.620	0.61	0.80	20.21	194.40	0.000	0.000	1248.83	0.00	0.00
9	150.00	F4P-HRK10	1	34.196	37.616	1.00	1.00	9.00	573.92	0.000	0.000	541.67	0.00	0.00
10	150.00	KRD 9011461-B66A-B2A	4	34.196	37.616	0.65	0.75	16.80	634.56	0.000	0.000	1010.87	0.00	0.00
11	150.00	F4P-10W	1	34.196	37.616	1.00	1.00	58.98	2875.20	0.000	0.000	3549.76	0.00	0.00
12	150.00	VIC100	1	34.196	37.616	0.50	0.75	0.05	0.48	0.000	0.000	3.02	0.00	0.00
13	150.00	S11B12	4	34.196	37.616	0.50	0.75	5.69	244.80	0.000	0.000	342.35	0.00	0.00
14	150.00	S11B4	4	34.196	37.616	0.50	0.75	5.69	244.80	0.000	0.000	342.35	0.00	0.00
15	150.00	RRUS 4478 B14	4	34.196	37.616	0.50	0.75	3.32	285.12	0.000	0.000	199.61	0.00	0.00
16	150.00	MI-554nn	8	34.196	37.616	0.38	0.75	1.86	78.34	0.000	0.000	111.95	0.00	0.00
17	150.00	SP2-5.2	2	34.196	37.616	0.75	0.75	5.94	52.80	0.000	0.000	357.50	0.00	0.00
18	150.00	APX16DWV-16DWVS-C	4	34.196	37.616	0.50	0.75	12.98	195.36	0.000	0.000	781.49	0.00	0.00
19	150.00	APXVAA24_43-U-A20	4	34.196	37.616	0.54	0.75	43.72	475.20	0.000	0.000	2631.23	0.00	0.00
Totals:									8,106.66			13,817.56		

Total Applied Force Summary

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.6W 101 mph Wind

Dead Load Factor 1.20
Wind Load Factor 1.60



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		921.24	1995.05	0.00	0.00
10.00		906.61	1964.99	0.00	0.00
15.00		891.97	1934.94	0.00	0.00
20.00		930.88	1904.89	0.00	0.00
25.00		959.38	1874.83	0.00	0.00
30.00		980.01	1844.78	0.00	0.00
35.00		994.86	1814.73	0.00	0.00
40.00		1005.25	1784.67	0.00	0.00
45.00		1012.07	1754.62	0.00	0.00
50.00		1036.53	3362.00	0.00	0.00
52.75		568.44	1823.48	0.00	0.00
55.00		464.87	773.60	0.00	0.00
60.00		1037.95	1697.33	0.00	0.00
65.00		1035.68	1667.28	0.00	0.00
70.00		1031.75	1637.22	0.00	0.00
75.00		1026.33	1607.17	0.00	0.00
80.00		1019.58	1577.12	0.00	0.00
85.00		1011.61	1547.06	0.00	0.00
90.00		1002.54	1517.01	0.00	0.00
91.25		248.02	374.56	0.00	0.00
95.00		757.80	2027.22	0.00	0.00
98.00		601.43	1598.96	0.00	0.00
100.00		398.30	523.55	0.00	0.00
105.00		990.62	1290.46	0.00	0.00
110.00		978.14	1264.16	0.00	0.00
115.00		964.89	1237.87	0.00	0.00
120.00		950.93	1211.57	0.00	0.00
125.00		936.29	1185.27	0.00	0.00
125.42		77.05	97.59	0.00	0.00
130.00		857.82	1755.08	0.00	0.00
131.25		231.06	472.08	0.00	0.00
135.00		688.59	642.30	0.00	0.00
140.00		904.71	839.97	0.00	0.00
145.00		887.85	821.18	0.00	0.00
150.00	(37) attachments	10742.27	6462.98	0.00	0.00
155.00		852.60	754.34	0.00	0.00
160.00		834.25	735.55	0.00	0.00
165.00		815.46	716.77	0.00	0.00
170.00	(20) attachments	4664.28	3129.67	0.00	0.00
175.00	(1) attachments	854.30	602.88	0.00	0.00
Totals:		47,074.20	61,826.78	0.00	0.00

Calculated Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



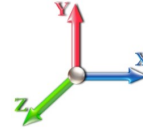
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Load Case: 1.2D + 1.6W 101 mph Wind

Iterations 23

Dead Load Factor 1.20

Wind Load Factor 1.60



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	-61.75	-47.18	0.00	-5244.8	0.00	5244.84	6094.92	3047.46	14456.0	7139.28	0.00	0.000	0.000	0.745
5.00	-59.60	-46.45	0.00	-5008.9	0.00	5008.96	6041.82	3020.91	14100.2	6963.58	0.10	-0.187	0.000	0.729
10.00	-57.49	-45.72	0.00	-4776.7	0.00	4776.73	5987.31	2993.65	13745.2	6788.27	0.40	-0.374	0.000	0.714
15.00	-55.42	-44.99	0.00	-4548.1	0.00	4548.14	5931.38	2965.69	13391.2	6613.44	0.89	-0.561	0.000	0.697
20.00	-53.38	-44.21	0.00	-4323.1	0.00	4323.19	5874.03	2937.02	13038.3	6439.15	1.58	-0.748	0.000	0.681
25.00	-51.38	-43.39	0.00	-4102.1	0.00	4102.12	5815.27	2907.64	12686.7	6265.50	2.46	-0.934	0.000	0.664
30.00	-49.42	-42.54	0.00	-3885.1	0.00	3885.15	5755.10	2877.55	12336.5	6092.55	3.54	-1.121	0.000	0.646
35.00	-47.49	-41.66	0.00	-3672.4	0.00	3672.45	5693.50	2846.75	11987.9	5920.39	4.81	-1.307	0.000	0.629
40.00	-45.60	-40.76	0.00	-3464.1	0.00	3464.14	5630.49	2815.25	11641.0	5749.10	6.28	-1.492	0.000	0.611
45.00	-43.74	-39.84	0.00	-3260.3	0.00	3260.33	5566.07	2783.04	11296.1	5578.76	7.94	-1.676	0.000	0.592
50.00	-40.32	-38.80	0.00	-3061.1	0.00	3061.13	5500.23	2750.11	10953.3	5409.44	9.80	-1.859	0.000	0.573
52.75	-38.45	-38.23	0.00	-2954.4	0.00	2954.42	5536.21	2768.10	11139.4	5501.37	10.90	-1.960	0.000	0.544
55.00	-37.61	-37.83	0.00	-2868.4	0.00	2868.40	5506.46	2753.23	10985.3	5425.27	11.84	-2.043	0.000	0.536
60.00	-35.85	-36.83	0.00	-2679.2	0.00	2679.27	5439.34	2719.67	10644.5	5256.96	14.07	-2.212	0.000	0.516
65.00	-34.12	-35.83	0.00	-2495.1	0.00	2495.12	5370.80	2685.40	10306.1	5089.82	16.48	-2.379	0.000	0.497
70.00	-32.43	-34.82	0.00	-2315.9	0.00	2315.99	5300.84	2650.42	9970.29	4923.95	19.06	-2.543	0.000	0.477
75.00	-30.78	-33.81	0.00	-2141.9	0.00	2141.90	5229.47	2614.74	9637.14	4759.42	21.81	-2.705	0.000	0.456
80.00	-29.16	-32.79	0.00	-1972.8	0.00	1972.87	5156.68	2578.34	9306.86	4596.31	24.73	-2.863	0.000	0.435
85.00	-27.58	-31.78	0.00	-1808.9	0.00	1808.92	5082.48	2541.24	8979.62	4434.70	27.81	-3.018	0.000	0.413
90.00	-26.07	-30.73	0.00	-1650.0	0.00	1650.04	4989.36	2494.68	8625.31	4259.72	31.05	-3.169	0.000	0.393
91.25	-25.67	-30.50	0.00	-1611.6	0.00	1611.62	4962.23	2481.12	8531.23	4213.26	31.88	-3.207	0.000	0.388
95.00	-23.64	-29.67	0.00	-1497.2	0.00	1497.25	4880.86	2440.43	8252.09	4075.40	34.45	-3.318	0.000	0.372
98.00	-22.05	-29.00	0.00	-1408.2	0.00	1408.25	4159.95	2079.97	7111.13	3511.92	36.56	-3.404	0.000	0.406
100.00	-21.50	-28.61	0.00	-1350.2	0.00	1350.25	4136.05	2068.02	7007.35	3460.67	38.00	-3.462	0.000	0.396
105.00	-20.20	-27.59	0.00	-1207.1	0.00	1207.19	4075.31	2037.66	6749.44	3333.30	41.70	-3.607	0.000	0.367
110.00	-18.94	-26.58	0.00	-1069.2	0.00	1069.23	4013.16	2006.58	6493.86	3207.07	45.55	-3.745	0.000	0.338
115.00	-17.71	-25.57	0.00	-936.33	0.00	936.33	3949.59	1974.80	6240.77	3082.08	49.54	-3.875	0.000	0.308
120.00	-16.52	-24.58	0.00	-808.46	0.00	808.46	3884.61	1942.31	5990.33	2958.40	53.66	-3.997	0.000	0.278
125.00	-15.38	-23.57	0.00	-685.58	0.00	685.58	3798.47	1899.23	5713.02	2821.44	57.90	-4.109	0.000	0.247
125.42	-15.26	-23.50	0.00	-675.76	0.00	675.76	3790.55	1895.28	5689.10	2809.63	58.26	-4.119	0.000	0.245
130.00	-13.55	-22.53	0.00	-568.03	0.00	568.03	3703.53	1851.76	5429.36	2681.36	62.26	-4.211	0.000	0.216
131.25	-13.08	-22.28	0.00	-539.86	0.00	539.86	2389.73	1194.86	3567.35	1761.78	63.37	-4.235	0.000	0.312
135.00	-12.46	-21.56	0.00	-456.31	0.00	456.31	2365.06	1182.53	3463.05	1710.27	66.72	-4.302	0.000	0.272
140.00	-11.66	-20.62	0.00	-348.49	0.00	348.49	2330.94	1165.47	3324.42	1641.81	71.28	-4.401	0.000	0.218
145.00	-10.89	-19.68	0.00	-245.41	0.00	245.41	2295.39	1147.70	3186.42	1573.65	75.93	-4.481	0.000	0.161
150.00	-5.28	-8.47	0.00	-147.01	0.00	147.01	2258.44	1129.22	3049.21	1505.89	80.65	-4.538	0.000	0.100
155.00	-4.59	-7.56	0.00	-104.67	0.00	104.67	2220.06	1110.03	2912.95	1438.60	85.42	-4.577	0.000	0.075
160.00	-3.92	-6.67	0.00	-66.87	0.00	66.87	2180.27	1090.14	2777.81	1371.86	90.22	-4.607	0.000	0.051
165.00	-3.27	-5.80	0.00	-33.51	0.00	33.51	2139.07	1069.53	2643.95	1305.75	95.05	-4.626	0.000	0.027
170.00	-0.53	-0.90	0.00	-4.50	0.00	4.50	2096.45	1048.22	2511.52	1240.35	99.90	-4.633	0.000	0.004
175.00	0.00	-0.85	0.00	0.00	0.00	0.00	2052.41	1026.20	2380.70	1175.74	104.75	-4.634	0.000	0.000

Wind Loading - Shaft

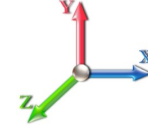
Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



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		1.00	0.85	21.088	23.20	465.94	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	21.088	23.20	458.60	1.000	0.000	5.00	24.822	24.82	921.2	0.0	1406.3
10.00		1.00	0.85	21.088	23.20	451.25	1.000	0.000	5.00	24.428	24.43	906.6	0.0	1383.7
15.00		1.00	0.85	21.088	23.20	443.91	1.000	0.000	5.00	24.033	24.03	892.0	0.0	1361.2
20.00		1.00	0.90	22.375	24.61	449.69	1.000	0.000	5.00	23.639	23.64	930.9	0.0	1338.7
25.00		1.00	0.95	23.451	25.80	452.63	1.000	0.000	5.00	23.244	23.24	959.4	0.0	1316.1
30.00		1.00	0.98	24.369	26.81	453.51	1.000	0.000	5.00	22.850	22.85	980.0	0.0	1293.6
35.00		1.00	1.01	25.172	27.69	452.90	1.000	0.000	5.00	22.456	22.46	994.9	0.0	1271.0
40.00		1.00	1.04	25.890	28.48	451.17	1.000	0.000	5.00	22.061	22.06	1005.3	0.0	1248.5
45.00	Bot - Section 2	1.00	1.07	26.540	29.19	448.56	1.000	0.000	5.00	21.667	21.67	1012.1	0.0	1226.0
50.00		1.00	1.09	27.135	29.85	445.23	1.000	0.000	5.00	21.704	21.70	1036.5	0.0	2431.5
52.75	Top - Section 1	1.00	1.11	27.443	30.19	443.14	1.000	0.000	2.75	11.769	11.77	568.4	0.0	1318.1
55.00		1.00	1.12	27.685	30.45	450.51	1.000	0.000	2.25	9.540	9.54	464.9	0.0	539.7
60.00		1.00	1.14	28.197	31.02	446.16	1.000	0.000	5.00	20.915	20.92	1037.9	0.0	1183.0
65.00		1.00	1.16	28.676	31.54	441.37	1.000	0.000	5.00	20.521	20.52	1035.7	0.0	1160.5
70.00		1.00	1.17	29.127	32.04	436.20	1.000	0.000	5.00	20.126	20.13	1031.7	0.0	1137.9
75.00		1.00	1.19	29.553	32.51	430.68	1.000	0.000	5.00	19.732	19.73	1026.3	0.0	1115.4
80.00		1.00	1.21	29.958	32.95	424.86	1.000	0.000	5.00	19.337	19.34	1019.6	0.0	1092.8
85.00		1.00	1.22	30.342	33.38	418.77	1.000	0.000	5.00	18.943	18.94	1011.6	0.0	1070.3
90.00		1.00	1.24	30.710	33.78	412.44	1.000	0.000	5.00	18.549	18.55	1002.5	0.0	1047.8
91.25	Bot - Section 3	1.00	1.24	30.799	33.88	410.82	1.000	0.000	1.25	4.576	4.58	248.0	0.0	258.4
95.00		1.00	1.25	31.061	34.17	405.88	1.000	0.000	3.75	13.862	13.86	757.8	0.0	1452.9
98.00	Top - Section 2	1.00	1.26	31.265	34.39	401.84	1.000	0.000	3.00	10.930	10.93	601.4	0.0	1145.2
100.00		1.00	1.27	31.399	34.54	407.69	1.000	0.000	2.00	7.208	7.21	398.3	0.0	356.7
105.00		1.00	1.28	31.723	34.89	400.78	1.000	0.000	5.00	17.743	17.74	990.6	0.0	877.8
110.00		1.00	1.29	32.035	35.24	393.69	1.000	0.000	5.00	17.349	17.35	978.1	0.0	858.1
115.00		1.00	1.30	32.336	35.57	386.45	1.000	0.000	5.00	16.954	16.95	964.9	0.0	838.4
120.00		1.00	1.32	32.627	35.89	379.04	1.000	0.000	5.00	16.560	16.56	950.9	0.0	818.7
125.00		1.00	1.33	32.909	36.20	371.50	1.000	0.000	5.00	16.165	16.17	936.3	0.0	799.0
125.42	Bot - Section 4	1.00	1.33	32.932	36.22	370.87	1.000	0.000	0.42	1.329	1.33	77.0	0.0	65.7
130.00		1.00	1.34	33.182	36.50	363.82	1.000	0.000	4.58	14.689	14.69	857.8	0.0	1233.8
131.25	Top - Section 3	1.00	1.34	33.249	36.57	361.89	1.000	0.000	1.25	3.949	3.95	231.1	0.0	331.6
135.00		1.00	1.35	33.446	36.79	362.35	1.000	0.000	3.75	11.698	11.70	688.6	0.0	414.2
140.00		1.00	1.36	33.703	37.07	354.45	1.000	0.000	5.00	15.252	15.25	904.7	0.0	540.0
145.00		1.00	1.37	33.953	37.35	346.44	1.000	0.000	5.00	14.857	14.86	887.8	0.0	525.9
150.00	Appurtenance(s)	1.00	1.38	34.196	37.62	338.33	1.000	0.000	5.00	14.463	14.46	870.5	0.0	511.8
155.00		1.00	1.39	34.433	37.88	330.11	1.000	0.000	5.00	14.069	14.07	852.6	0.0	497.7
160.00		1.00	1.40	34.664	38.13	321.80	1.000	0.000	5.00	13.674	13.67	834.3	0.0	483.6
165.00		1.00	1.41	34.890	38.38	313.40	1.000	0.000	5.00	13.280	13.28	815.5	0.0	469.5
170.00	Appurtenance(s)	1.00	1.42	35.110	38.62	304.90	1.000	0.000	5.00	12.885	12.89	796.2	0.0	455.4
175.00	Appurtenance(s)	1.00	1.42	35.324	38.86	296.33	1.000	0.000	5.00	12.491	12.49	776.6	0.0	441.4
Totals:								175.00			33,256.6	37,317.9		

Discrete Appurtenance Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



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	175.00	Lightning rod	1	35.324	38.857	1.00	1.00	1.25	10.80	0.000	0.000	77.71	0.00	0.00
2	170.00	Low Profile	1	35.110	38.620	1.00	1.00	22.00	1350.00	0.000	0.000	1359.44	0.00	0.00
3	170.00	RRUS-11 B12	3	35.110	38.620	0.57	0.80	4.37	135.00	0.000	0.000	269.85	0.00	0.00
4	170.00	DC6-48-60-18-8F	1	35.110	38.620	0.80	0.80	0.74	28.62	0.000	0.000	45.48	0.00	0.00
5	170.00	LGP21401	6	35.110	38.620	0.53	0.80	4.09	76.14	0.000	0.000	252.53	0.00	0.00
6	170.00	AM-X-CD-17-65-00T-RET	2	35.110	38.620	0.63	0.80	6.32	55.44	0.000	0.000	390.53	0.00	0.00
7	170.00	SBNH-1D4545A	1	35.110	38.620	0.54	0.80	4.88	32.76	0.000	0.000	301.40	0.00	0.00
8	170.00	7770.00A	6	35.110	38.620	0.61	0.80	20.21	145.80	0.000	0.000	1248.83	0.00	0.00
9	150.00	F4P-HRK10	1	34.196	37.616	1.00	1.00	9.00	430.44	0.000	0.000	541.67	0.00	0.00
10	150.00	KRD 9011461-B66A-B2A	4	34.196	37.616	0.65	0.75	16.80	475.92	0.000	0.000	1010.87	0.00	0.00
11	150.00	F4P-10W	1	34.196	37.616	1.00	1.00	58.98	2156.40	0.000	0.000	3549.76	0.00	0.00
12	150.00	VIC100	1	34.196	37.616	0.50	0.75	0.05	0.36	0.000	0.000	3.02	0.00	0.00
13	150.00	S11B12	4	34.196	37.616	0.50	0.75	5.69	183.60	0.000	0.000	342.35	0.00	0.00
14	150.00	S11B4	4	34.196	37.616	0.50	0.75	5.69	183.60	0.000	0.000	342.35	0.00	0.00
15	150.00	RRUS 4478 B14	4	34.196	37.616	0.50	0.75	3.32	213.84	0.000	0.000	199.61	0.00	0.00
16	150.00	MI-554nn	8	34.196	37.616	0.38	0.75	1.86	58.75	0.000	0.000	111.95	0.00	0.00
17	150.00	SP2-5.2	2	34.196	37.616	0.75	0.75	5.94	39.60	0.000	0.000	357.50	0.00	0.00
18	150.00	APX16DWV-16DWVS-C	4	34.196	37.616	0.50	0.75	12.98	146.52	0.000	0.000	781.49	0.00	0.00
19	150.00	APXVAA24_43-U-A20	4	34.196	37.616	0.54	0.75	43.72	356.40	0.000	0.000	2631.23	0.00	0.00
Totals:									6,080.00			13,817.56		

Total Applied Force Summary

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.6W 101 mph Wind

Dead Load Factor 0.90
Wind Load Factor 1.60



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		921.24	1496.28	0.00	0.00
10.00		906.61	1473.74	0.00	0.00
15.00		891.97	1451.20	0.00	0.00
20.00		930.88	1428.66	0.00	0.00
25.00		959.38	1406.12	0.00	0.00
30.00		980.01	1383.58	0.00	0.00
35.00		994.86	1361.04	0.00	0.00
40.00		1005.25	1338.50	0.00	0.00
45.00		1012.07	1315.96	0.00	0.00
50.00		1036.53	2521.50	0.00	0.00
52.75		568.44	1367.61	0.00	0.00
55.00		464.87	580.20	0.00	0.00
60.00		1037.95	1273.00	0.00	0.00
65.00		1035.68	1250.46	0.00	0.00
70.00		1031.75	1227.92	0.00	0.00
75.00		1026.33	1205.38	0.00	0.00
80.00		1019.58	1182.84	0.00	0.00
85.00		1011.61	1160.30	0.00	0.00
90.00		1002.54	1137.76	0.00	0.00
91.25		248.02	280.92	0.00	0.00
95.00		757.80	1520.42	0.00	0.00
98.00		601.43	1199.22	0.00	0.00
100.00		398.30	392.66	0.00	0.00
105.00		990.62	967.84	0.00	0.00
110.00		978.14	948.12	0.00	0.00
115.00		964.89	928.40	0.00	0.00
120.00		950.93	908.68	0.00	0.00
125.00		936.29	888.95	0.00	0.00
125.42		77.05	73.19	0.00	0.00
130.00		857.82	1316.31	0.00	0.00
131.25		231.06	354.06	0.00	0.00
135.00		688.59	481.73	0.00	0.00
140.00		904.71	629.97	0.00	0.00
145.00		887.85	615.89	0.00	0.00
150.00	(37) attachments	10742.27	4847.23	0.00	0.00
155.00		852.60	565.75	0.00	0.00
160.00		834.25	551.66	0.00	0.00
165.00		815.46	537.58	0.00	0.00
170.00	(20) attachments	4664.28	2347.25	0.00	0.00
175.00	(1) attachments	854.30	452.16	0.00	0.00
Totals:		47,074.20	46,370.08	0.00	0.00

Calculated Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

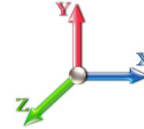


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Load Case: 0.9D + 1.6W 101 mph Wind

Iterations 23

Dead Load Factor 0.90
Wind Load Factor 1.60



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	-46.29	-47.15	0.00	-5196.9	0.00	5196.91	6094.92	3047.46	14456.0	7139.28	0.00	0.000	0.000	0.736
5.00	-44.65	-46.37	0.00	-4961.1	0.00	4961.17	6041.82	3020.91	14100.2	6963.58	0.10	-0.185	0.000	0.720
10.00	-43.03	-45.60	0.00	-4729.3	0.00	4729.31	5987.31	2993.65	13745.2	6788.27	0.39	-0.370	0.000	0.704
15.00	-41.44	-44.83	0.00	-4501.3	0.00	4501.34	5931.38	2965.69	13391.2	6613.44	0.88	-0.555	0.000	0.688
20.00	-39.88	-44.01	0.00	-4277.2	0.00	4277.20	5874.03	2937.02	13038.3	6439.15	1.56	-0.740	0.000	0.671
25.00	-38.35	-43.15	0.00	-4057.1	0.00	4057.16	5815.27	2907.64	12686.7	6265.50	2.44	-0.925	0.000	0.654
30.00	-36.85	-42.27	0.00	-3841.4	0.00	3841.40	5755.10	2877.55	12336.5	6092.55	3.50	-1.109	0.000	0.637
35.00	-35.38	-41.36	0.00	-3630.0	0.00	3630.07	5693.50	2846.75	11987.9	5920.39	4.77	-1.293	0.000	0.620
40.00	-33.94	-40.43	0.00	-3423.2	0.00	3423.28	5630.49	2815.25	11641.0	5749.10	6.22	-1.476	0.000	0.602
45.00	-32.52	-39.48	0.00	-3221.1	0.00	3221.15	5566.07	2783.04	11296.1	5578.76	7.86	-1.658	0.000	0.583
50.00	-29.94	-38.44	0.00	-3023.7	0.00	3023.73	5500.23	2750.11	10953.3	5409.44	9.70	-1.839	0.000	0.565
52.75	-28.53	-37.88	0.00	-2918.0	0.00	2918.01	5536.21	2768.10	11139.4	5501.37	10.79	-1.939	0.000	0.536
55.00	-27.89	-37.45	0.00	-2832.7	0.00	2832.79	5506.46	2753.23	10985.3	5425.27	11.72	-2.021	0.000	0.527
60.00	-26.55	-36.44	0.00	-2645.5	0.00	2645.53	5439.34	2719.67	10644.5	5256.96	13.92	-2.187	0.000	0.508
65.00	-25.24	-35.43	0.00	-2463.3	0.00	2463.31	5370.80	2685.40	10306.1	5089.82	16.30	-2.352	0.000	0.489
70.00	-23.96	-34.42	0.00	-2286.1	0.00	2286.15	5300.84	2650.42	9970.29	4923.95	18.85	-2.514	0.000	0.469
75.00	-22.71	-33.40	0.00	-2114.0	0.00	2114.07	5229.47	2614.74	9637.14	4759.42	21.57	-2.674	0.000	0.449
80.00	-21.49	-32.38	0.00	-1947.0	0.00	1947.07	5156.68	2578.34	9306.86	4596.31	24.46	-2.830	0.000	0.428
85.00	-20.30	-31.37	0.00	-1785.1	0.00	1785.16	5082.48	2541.24	8979.62	4434.70	27.50	-2.983	0.000	0.407
90.00	-19.17	-30.34	0.00	-1628.3	0.00	1628.32	4989.36	2494.68	8625.31	4259.72	30.71	-3.132	0.000	0.386
91.25	-18.86	-30.10	0.00	-1590.4	0.00	1590.40	4962.23	2481.12	8531.23	4213.26	31.53	-3.170	0.000	0.381
95.00	-17.34	-29.28	0.00	-1477.5	0.00	1477.54	4880.86	2440.43	8252.09	4075.40	34.06	-3.279	0.000	0.366
98.00	-16.14	-28.63	0.00	-1389.6	0.00	1389.69	4159.95	2079.97	7111.13	3511.92	36.15	-3.364	0.000	0.400
100.00	-15.72	-28.24	0.00	-1332.4	0.00	1332.42	4136.05	2068.02	7007.35	3460.67	37.57	-3.421	0.000	0.389
105.00	-14.75	-27.23	0.00	-1191.2	0.00	1191.21	4075.31	2037.66	6749.44	3333.30	41.23	-3.564	0.000	0.361
110.00	-13.81	-26.23	0.00	-1055.0	0.00	1055.06	4013.16	2006.58	6493.86	3207.07	45.04	-3.700	0.000	0.333
115.00	-12.89	-25.23	0.00	-923.93	0.00	923.93	3949.59	1974.80	6240.77	3082.08	48.98	-3.829	0.000	0.303
120.00	-12.00	-24.24	0.00	-797.78	0.00	797.78	3884.61	1942.31	5990.33	2958.40	53.05	-3.949	0.000	0.273
125.00	-11.15	-23.26	0.00	-676.57	0.00	676.57	3798.47	1899.23	5713.02	2821.44	57.25	-4.060	0.000	0.243
125.42	-11.06	-23.19	0.00	-666.87	0.00	666.87	3790.55	1895.28	5689.10	2809.63	57.60	-4.069	0.000	0.240
130.00	-9.79	-22.25	0.00	-560.60	0.00	560.60	3703.53	1851.76	5429.36	2681.36	61.55	-4.161	0.000	0.212
131.25	-9.44	-22.00	0.00	-532.79	0.00	532.79	2389.73	1194.86	3567.35	1761.78	62.64	-4.184	0.000	0.307
135.00	-8.98	-21.29	0.00	-450.30	0.00	450.30	2365.06	1182.53	3463.05	1710.27	65.95	-4.250	0.000	0.267
140.00	-8.38	-20.35	0.00	-343.86	0.00	343.86	2330.94	1165.47	3324.42	1641.81	70.45	-4.348	0.000	0.213
145.00	-7.81	-19.43	0.00	-242.10	0.00	242.10	2295.39	1147.70	3186.42	1573.65	75.05	-4.427	0.000	0.158
150.00	-3.81	-8.35	0.00	-144.95	0.00	144.95	2258.44	1129.22	3049.21	1505.89	79.71	-4.483	0.000	0.098
155.00	-3.31	-7.45	0.00	-103.22	0.00	103.22	2220.06	1110.03	2912.95	1438.60	84.43	-4.522	0.000	0.073
160.00	-2.82	-6.58	0.00	-65.96	0.00	65.96	2180.27	1090.14	2777.81	1371.86	89.17	-4.551	0.000	0.049
165.00	-2.35	-5.72	0.00	-33.06	0.00	33.06	2139.07	1069.53	2643.95	1305.75	93.95	-4.569	0.000	0.026
170.00	-0.38	-0.89	0.00	-4.44	0.00	4.44	2096.45	1048.22	2511.52	1240.35	98.73	-4.577	0.000	0.004
175.00	0.00	-0.85	0.00	0.00	0.00	0.00	2052.41	1026.20	2380.70	1175.74	103.52	-4.578	0.000	0.000

Wind Loading - Shaft

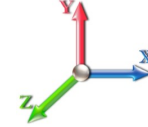
Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 22

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		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	1.200	1.242	5.00	25.857	31.03	176.4	469.3	2344.3
10.00		1.00	0.85	5.168	5.68	0.00	1.200	1.331	5.00	25.537	30.64	174.2	495.8	2340.8
15.00		1.00	0.85	5.168	5.68	0.00	1.200	1.386	5.00	25.188	30.23	171.8	508.6	2323.5
20.00		1.00	0.90	5.483	6.03	0.00	1.200	1.427	5.00	24.828	29.79	179.7	515.3	2300.2
25.00		1.00	0.95	5.747	6.32	0.00	1.200	1.459	5.00	24.460	29.35	185.6	518.6	2273.4
30.00		1.00	0.98	5.972	6.57	0.00	1.200	1.486	5.00	24.088	28.91	189.9	519.6	2244.4
35.00		1.00	1.01	6.169	6.79	0.00	1.200	1.509	5.00	23.713	28.46	193.1	518.9	2213.6
40.00		1.00	1.04	6.345	6.98	0.00	1.200	1.529	5.00	23.336	28.00	195.4	517.0	2181.7
45.00	Bot - Section 2	1.00	1.07	6.504	7.15	0.00	1.200	1.547	5.00	22.956	27.55	197.1	514.2	2148.8
50.00		1.00	1.09	6.650	7.32	0.00	1.200	1.564	5.00	23.007	27.61	202.0	520.6	3762.6
52.75	Top - Section 1	1.00	1.11	6.726	7.40	0.00	1.200	1.572	2.75	12.490	14.99	110.9	285.1	2042.6
55.00		1.00	1.12	6.785	7.46	0.00	1.200	1.579	2.25	10.132	12.16	90.7	232.4	952.0
60.00		1.00	1.14	6.910	7.60	0.00	1.200	1.592	5.00	22.242	26.69	202.9	511.6	2089.0
65.00		1.00	1.16	7.028	7.73	0.00	1.200	1.605	5.00	21.858	26.23	202.8	506.4	2053.6
70.00		1.00	1.17	7.138	7.85	0.00	1.200	1.617	5.00	21.474	25.77	202.3	500.7	2017.9
75.00		1.00	1.19	7.243	7.97	0.00	1.200	1.628	5.00	21.089	25.31	201.6	494.6	1981.8
80.00		1.00	1.21	7.342	8.08	0.00	1.200	1.639	5.00	20.703	24.84	200.6	488.2	1945.3
85.00		1.00	1.22	7.436	8.18	0.00	1.200	1.649	5.00	20.317	24.38	199.4	481.5	1908.5
90.00		1.00	1.24	7.526	8.28	0.00	1.200	1.658	5.00	19.931	23.92	198.0	474.5	1871.5
91.25	Bot - Section 3	1.00	1.24	7.548	8.30	0.00	1.200	1.661	1.25	4.922	5.91	49.0	118.2	462.7
95.00		1.00	1.25	7.612	8.37	0.00	1.200	1.667	3.75	14.904	17.88	149.8	357.6	2294.8
98.00	Top - Section 2	1.00	1.26	7.662	8.43	0.00	1.200	1.672	3.00	11.766	14.12	119.0	283.4	1810.4
100.00		1.00	1.27	7.695	8.46	0.00	1.200	1.676	2.00	7.766	9.32	78.9	187.7	663.3
105.00		1.00	1.28	7.774	8.55	0.00	1.200	1.684	5.00	19.146	22.98	196.5	461.8	1632.2
110.00		1.00	1.29	7.851	8.64	0.00	1.200	1.692	5.00	18.759	22.51	194.4	454.0	1598.1
115.00		1.00	1.30	7.925	8.72	0.00	1.200	1.699	5.00	18.370	22.04	192.2	446.0	1563.9
120.00		1.00	1.32	7.996	8.80	0.00	1.200	1.707	5.00	17.982	21.58	189.8	437.9	1529.4
125.00		1.00	1.33	8.065	8.87	0.00	1.200	1.714	5.00	17.593	21.11	187.3	429.6	1494.9
125.42	Bot - Section 4	1.00	1.33	8.071	8.88	0.00	1.200	1.714	0.42	1.448	1.74	15.4	35.7	123.3
130.00		1.00	1.34	8.132	8.95	0.00	1.200	1.720	4.58	16.003	19.20	171.8	392.4	2037.5
131.25	Top - Section 3	1.00	1.34	8.148	8.96	0.00	1.200	1.722	1.25	4.307	5.17	46.3	106.5	548.6
135.00		1.00	1.35	8.197	9.02	0.00	1.200	1.727	3.75	12.777	15.33	138.2	314.7	867.0
140.00		1.00	1.36	8.260	9.09	0.00	1.200	1.733	5.00	16.696	20.04	182.0	410.9	1130.9
145.00		1.00	1.37	8.321	9.15	0.00	1.200	1.739	5.00	16.307	19.57	179.1	402.1	1103.3
150.00	Appurtenance(s)	1.00	1.38	8.381	9.22	0.00	1.200	1.745	5.00	15.917	19.10	176.1	393.2	1075.6
155.00		1.00	1.39	8.439	9.28	0.00	1.200	1.751	5.00	15.528	18.63	173.0	384.2	1047.8
160.00		1.00	1.40	8.495	9.34	0.00	1.200	1.757	5.00	15.138	18.17	169.8	375.0	1019.9
165.00		1.00	1.41	8.551	9.41	0.00	1.200	1.762	5.00	14.748	17.70	166.5	365.8	991.9
170.00	Appurtenance(s)	1.00	1.42	8.604	9.46	0.00	1.200	1.767	5.00	14.358	17.23	163.1	356.5	963.8
175.00	Appurtenance(s)	1.00	1.42	8.657	9.52	0.00	1.200	1.772	5.00	13.968	16.76	159.6	347.1	935.6
Totals:								175.00				6,572.2		65,890.2

Discrete Appurtenance Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 22

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	175.00	Lightning rod	1	8.657	9.523	1.00	1.00	5.68	25.92	0.000	0.000	54.10	0.00	0.00
2	170.00	Low Profile	1	8.604	9.465	1.00	1.00	39.88	2825.40	0.000	0.000	377.50	0.00	0.00
3	170.00	RRUS-11 B12	3	8.604	9.465	0.59	0.80	5.73	333.72	0.000	0.000	54.19	0.00	0.00
4	170.00	DC6-48-60-18-8F	1	8.604	9.465	0.80	0.80	1.09	83.06	0.000	0.000	10.32	0.00	0.00
5	170.00	LGP21401	6	8.604	9.465	0.58	0.80	7.38	210.82	0.000	0.000	69.88	0.00	0.00
6	170.00	AM-X-CD-17-65-00T-RET	2	8.604	9.465	0.65	0.80	8.94	236.34	0.000	0.000	84.61	0.00	0.00
7	170.00	SBNH-1D4545A	1	8.604	9.465	0.56	0.80	6.32	175.89	0.000	0.000	59.79	0.00	0.00
8	170.00	7770.00A	6	8.604	9.465	0.63	0.80	29.20	692.61	0.000	0.000	276.42	0.00	0.00
9	150.00	F4P-HRK10	1	8.381	9.219	1.00	1.00	19.68	1519.62	0.000	0.000	181.43	0.00	0.00
10	150.00	KRD 9011461-B66A-B2A	4	8.381	9.219	0.66	0.75	20.15	1367.52	0.000	0.000	185.73	0.00	0.00
11	150.00	F4P-10W	1	8.381	9.219	1.00	1.00	128.97	4525.86	0.000	0.000	1188.98	0.00	0.00
12	150.00	VIC100	1	8.381	9.219	0.56	0.75	0.16	4.20	0.000	0.000	1.49	0.00	0.00
13	150.00	S11B12	4	8.381	9.219	0.56	0.75	7.88	458.81	0.000	0.000	72.63	0.00	0.00
14	150.00	S11B4	4	8.381	9.219	0.56	0.75	7.88	458.81	0.000	0.000	72.63	0.00	0.00
15	150.00	RRUS 4478 B14	4	8.381	9.219	0.56	0.75	4.88	413.39	0.000	0.000	44.98	0.00	0.00
16	150.00	MI-554nn	8	8.381	9.219	0.50	0.75	3.97	269.99	0.000	0.000	36.56	0.00	0.00
17	150.00	SP2-5.2	2	8.381	9.219	0.75	0.75	7.70	171.77	0.000	0.000	71.01	0.00	0.00
18	150.00	APX16DWV-16DWVS-C	4	8.381	9.219	0.52	0.75	18.12	523.81	0.000	0.000	167.05	0.00	0.00
19	150.00	APXVAA24_43-U-A20	4	8.381	9.219	0.55	0.75	48.49	2186.01	0.000	0.000	446.99	0.00	0.00
Totals:									16,483.54			3,456.30		

Total Applied Force Summary

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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

Dead Load Factor 1.20
Wind Load Factor 1.00



Iterations 22

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		176.39	2464.30	0.00	0.00
10.00		174.21	2460.78	0.00	0.00
15.00		171.83	2443.50	0.00	0.00
20.00		179.71	2420.20	0.00	0.00
25.00		185.56	2393.42	0.00	0.00
30.00		189.89	2364.35	0.00	0.00
35.00		193.10	2333.65	0.00	0.00
40.00		195.44	2301.70	0.00	0.00
45.00		197.09	2268.78	0.00	0.00
50.00		201.96	3882.64	0.00	0.00
52.75		110.88	2108.59	0.00	0.00
55.00		90.75	1005.99	0.00	0.00
60.00		202.89	2208.96	0.00	0.00
65.00		202.77	2173.63	0.00	0.00
70.00		202.34	2137.88	0.00	0.00
75.00		201.62	2101.76	0.00	0.00
80.00		200.64	2065.30	0.00	0.00
85.00		199.43	2028.55	0.00	0.00
90.00		198.00	1991.53	0.00	0.00
91.25		49.04	492.74	0.00	0.00
95.00		149.76	2384.79	0.00	0.00
98.00		119.00	1882.37	0.00	0.00
100.00		78.88	711.29	0.00	0.00
105.00		196.48	1752.23	0.00	0.00
110.00		194.40	1718.14	0.00	0.00
115.00		192.17	1683.87	0.00	0.00
120.00		189.80	1649.44	0.00	0.00
125.00		187.30	1614.86	0.00	0.00
125.42		15.43	133.33	0.00	0.00
130.00		171.78	2147.52	0.00	0.00
131.25		46.33	578.58	0.00	0.00
135.00		138.24	956.98	0.00	0.00
140.00		182.04	1250.87	0.00	0.00
145.00		179.11	1223.28	0.00	0.00
150.00	(37) attachments	2645.57	13095.37	0.00	0.00
155.00		172.97	1138.50	0.00	0.00
160.00		169.75	1110.59	0.00	0.00
165.00		166.46	1082.58	0.00	0.00
170.00	(20) attachments	1095.80	5612.32	0.00	0.00
175.00	(1) attachments	213.72	961.49	0.00	0.00
Totals:		10,028.51	86,336.63	0.00	0.00

Calculated Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

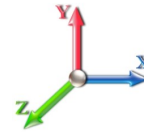


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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind

Iterations 22

Dead Load Factor 1.20
Wind Load 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	-86.33	-10.06	0.00	-1187.7	0.00	1187.71	6094.92	3047.46	14456.0	7139.28	0.00	0.000	0.000	0.181
5.00	-83.86	-9.95	0.00	-1137.4	0.00	1137.41	6041.82	3020.91	14100.2	6963.58	0.02	-0.042	0.000	0.177
10.00	-81.39	-9.83	0.00	-1087.6	0.00	1087.69	5987.31	2993.65	13745.2	6788.27	0.09	-0.085	0.000	0.174
15.00	-78.94	-9.71	0.00	-1038.5	0.00	1038.55	5931.38	2965.69	13391.2	6613.44	0.20	-0.127	0.000	0.170
20.00	-76.52	-9.58	0.00	-989.99	0.00	989.99	5874.03	2937.02	13038.3	6439.15	0.36	-0.170	0.000	0.167
25.00	-74.12	-9.44	0.00	-942.08	0.00	942.08	5815.27	2907.64	12686.7	6265.50	0.56	-0.213	0.000	0.163
30.00	-71.75	-9.30	0.00	-894.86	0.00	894.86	5755.10	2877.55	12336.5	6092.55	0.81	-0.256	0.000	0.159
35.00	-69.41	-9.15	0.00	-848.37	0.00	848.37	5693.50	2846.75	11987.9	5920.39	1.10	-0.299	0.000	0.155
40.00	-67.10	-8.99	0.00	-802.64	0.00	802.64	5630.49	2815.25	11641.0	5749.10	1.43	-0.342	0.000	0.152
45.00	-64.82	-8.82	0.00	-757.70	0.00	757.70	5566.07	2783.04	11296.1	5578.76	1.81	-0.384	0.000	0.147
50.00	-60.94	-8.63	0.00	-713.58	0.00	713.58	5500.23	2750.11	10953.3	5409.44	2.24	-0.427	0.000	0.143
52.75	-58.83	-8.53	0.00	-689.85	0.00	689.85	5536.21	2768.10	11139.4	5501.37	2.49	-0.451	0.000	0.136
55.00	-57.82	-8.46	0.00	-670.67	0.00	670.67	5506.46	2753.23	10985.3	5425.27	2.71	-0.470	0.000	0.134
60.00	-55.61	-8.27	0.00	-628.39	0.00	628.39	5439.34	2719.67	10644.5	5256.96	3.22	-0.509	0.000	0.130
65.00	-53.43	-8.09	0.00	-587.03	0.00	587.03	5370.80	2685.40	10306.1	5089.82	3.78	-0.549	0.000	0.125
70.00	-51.29	-7.90	0.00	-546.60	0.00	546.60	5300.84	2650.42	9970.29	4923.95	4.37	-0.587	0.000	0.121
75.00	-49.18	-7.71	0.00	-507.12	0.00	507.12	5229.47	2614.74	9637.14	4759.42	5.01	-0.626	0.000	0.116
80.00	-47.12	-7.51	0.00	-468.59	0.00	468.59	5156.68	2578.34	9306.86	4596.31	5.68	-0.663	0.000	0.111
85.00	-45.08	-7.32	0.00	-431.03	0.00	431.03	5082.48	2541.24	8979.62	4434.70	6.40	-0.700	0.000	0.106
90.00	-43.09	-7.11	0.00	-394.44	0.00	394.44	4989.36	2494.68	8625.31	4259.72	7.15	-0.736	0.000	0.101
91.25	-42.60	-7.07	0.00	-385.55	0.00	385.55	4962.23	2481.12	8531.23	4213.26	7.35	-0.745	0.000	0.100
95.00	-40.21	-6.90	0.00	-359.04	0.00	359.04	4880.86	2440.43	8252.09	4075.40	7.94	-0.772	0.000	0.096
98.00	-38.33	-6.77	0.00	-338.33	0.00	338.33	4159.95	2079.97	7111.13	3511.92	8.43	-0.792	0.000	0.106
100.00	-37.62	-6.70	0.00	-324.79	0.00	324.79	4136.05	2068.02	7007.35	3460.67	8.77	-0.806	0.000	0.103
105.00	-35.86	-6.50	0.00	-291.30	0.00	291.30	4075.31	2037.66	6749.44	3333.30	9.63	-0.841	0.000	0.096
110.00	-34.15	-6.30	0.00	-258.80	0.00	258.80	4013.16	2006.58	6493.86	3207.07	10.53	-0.875	0.000	0.089
115.00	-32.46	-6.10	0.00	-227.32	0.00	227.32	3949.59	1974.80	6240.77	3082.08	11.46	-0.906	0.000	0.082
120.00	-30.81	-5.90	0.00	-196.83	0.00	196.83	3884.61	1942.31	5990.33	2958.40	12.43	-0.936	0.000	0.074
125.00	-29.20	-5.69	0.00	-167.35	0.00	167.35	3798.47	1899.23	5713.02	2821.44	13.42	-0.963	0.000	0.067
125.42	-29.07	-5.68	0.00	-164.98	0.00	164.98	3790.55	1895.28	5689.10	2809.63	13.51	-0.965	0.000	0.066
130.00	-26.92	-5.48	0.00	-138.96	0.00	138.96	3703.53	1851.76	5429.36	2681.36	14.45	-0.988	0.000	0.059
131.25	-26.34	-5.43	0.00	-132.12	0.00	132.12	2389.73	1194.86	3567.35	1761.78	14.71	-0.994	0.000	0.086
135.00	-25.38	-5.28	0.00	-111.77	0.00	111.77	2365.06	1182.53	3463.05	1710.27	15.49	-1.010	0.000	0.076
140.00	-24.14	-5.08	0.00	-85.38	0.00	85.38	2330.94	1165.47	3324.42	1641.81	16.57	-1.035	0.000	0.062
145.00	-22.91	-4.89	0.00	-59.95	0.00	59.95	2295.39	1147.70	3186.42	1573.65	17.66	-1.054	0.000	0.048
150.00	-9.87	-2.00	0.00	-35.51	0.00	35.51	2258.44	1129.22	3049.21	1505.89	18.77	-1.068	0.000	0.028
155.00	-8.73	-1.81	0.00	-25.49	0.00	25.49	2220.06	1110.03	2912.95	1438.60	19.90	-1.077	0.000	0.022
160.00	-7.63	-1.62	0.00	-16.44	0.00	16.44	2180.27	1090.14	2777.81	1371.86	21.03	-1.085	0.000	0.015
165.00	-6.55	-1.43	0.00	-8.33	0.00	8.33	2139.07	1069.53	2643.95	1305.75	22.17	-1.089	0.000	0.009
170.00	-0.96	-0.23	0.00	-1.16	0.00	1.16	2096.45	1048.22	2511.52	1240.35	23.31	-1.091	0.000	0.001
175.00	0.00	-0.21	0.00	0.00	0.00	0.00	2052.41	1026.20	2380.70	1175.74	24.45	-1.092	0.000	0.000

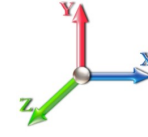
Seismic Segment Forces (Factored)

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E					Iterations 21
Gust Response Factor	1.10	Seismic Load Factor	1.00	Sds 0.19	Ss 0.17
Dead Load Factor	1.20	Structure Frequency	0.34	Sd1 0.10	S1 0.06
Wind Load Factor	0.00	Seismic Importance Factor	1.00	SA 0.03	



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1562.5	0.00	0.03	0.02	25.51	
10.00		1537.4	0.01	0.05	0.03	37.47	
15.00		1512.4	0.01	0.06	0.03	43.39	
20.00		1487.4	0.02	0.07	0.04	46.23	
25.00		1462.3	0.04	0.07	0.04	47.48	
30.00		1437.3	0.06	0.07	0.04	47.99	
35.00		1412.2	0.08	0.07	0.04	48.21	
40.00		1387.2	0.10	0.07	0.04	48.34	
45.00	Bot - Section 2	1362.1	0.12	0.07	0.03	48.43	
50.00		2701.6	0.15	0.07	0.03	97.67	
52.75	Top - Section 1	1464.5	0.17	0.07	0.03	53.27	
55.00		599.67	0.19	0.06	0.02	21.86	
60.00		1314.4	0.22	0.06	0.02	47.52	
65.00		1289.4	0.26	0.05	0.02	44.94	
70.00		1264.3	0.30	0.04	0.01	40.56	
75.00		1239.3	0.35	0.03	0.01	33.90	
80.00		1214.2	0.39	0.02	0.01	24.68	
85.00		1189.2	0.45	0.00	0.01	13.07	
90.00		1164.1	0.50	-0.02	0.01	-0.06	
91.25	Bot - Section 3	287.13	0.51	-0.02	0.01	-0.84	
95.00		1614.3	0.56	-0.04	0.01	-18.69	
98.00	Top - Section 2	1272.4	0.59	-0.05	0.01	-23.03	
100.00		396.29	0.62	-0.06	0.02	-8.75	
105.00		975.38	0.68	-0.08	0.03	-29.48	
110.00		953.47	0.75	-0.10	0.04	-33.49	
115.00		931.55	0.82	-0.11	0.06	-33.91	
120.00		909.64	0.89	-0.12	0.08	-30.90	
125.00		887.73	0.96	-0.12	0.11	-24.73	
125.42	Bot - Section 4	72.99	0.97	-0.12	0.12	-1.98	
130.00		1370.9	1.04	-0.10	0.15	-24.85	
131.25	Top - Section 3	368.40	1.06	-0.09	0.17	-5.58	
135.00		460.25	1.12	-0.05	0.20	-2.22	
140.00		599.97	1.21	0.01	0.26	7.22	
145.00		584.32	1.30	0.12	0.33	18.97	
150.00	Appurtenance(s)	5285.8	1.39	0.26	0.42	298.67	
155.00		553.01	1.48	0.46	0.52	46.58	
160.00		537.36	1.58	0.72	0.64	62.16	
165.00		521.71	1.68	1.05	0.78	78.75	
170.00	Appurtenance(s)	2532.4	1.78	1.46	0.95	481.42	
175.00	Appurtenance(s)	502.40	1.89	1.98	1.14	117.17	
Totals:		48,219.9				1,642.9	Total Wind: 47,074.2

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

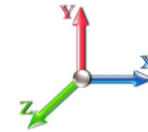
Calculated Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E						Iterations 21
Gust Response Factor	1.10		Sds	0.19		Ss 0.17
Dead Load Factor	1.20	Seismic Load Factor	1.00	Sd1	0.10	S1 0.06
Wind Load Factor	0.00	Structure Frequency	0.34	SA	0.03	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	-61.83	-1.89	0.00	-223.08	0.00	223.08	6094.92	3047.46	14456.0	7139.28	0.00	0.00	0.00	0.041
5.00	-59.83	-1.87	0.00	-213.66	0.00	213.66	6041.82	3020.91	14100.2	6963.58	0.00	-0.01	0.041	
10.00	-57.87	-1.84	0.00	-204.32	0.00	204.32	5987.31	2993.65	13745.2	6788.27	0.02	-0.02	0.040	
15.00	-55.93	-1.80	0.00	-195.13	0.00	195.13	5931.38	2965.69	13391.2	6613.44	0.04	-0.02	0.039	
20.00	-54.03	-1.76	0.00	-186.12	0.00	186.12	5874.03	2937.02	13038.3	6439.15	0.07	-0.03	0.038	
25.00	-52.15	-1.72	0.00	-177.30	0.00	177.30	5815.27	2907.64	12686.7	6265.50	0.11	-0.04	0.037	
30.00	-50.31	-1.68	0.00	-168.70	0.00	168.70	5755.10	2877.55	12336.5	6092.55	0.15	-0.05	0.036	
35.00	-48.49	-1.64	0.00	-160.30	0.00	160.30	5693.50	2846.75	11987.9	5920.39	0.21	-0.06	0.036	
40.00	-46.71	-1.59	0.00	-152.13	0.00	152.13	5630.49	2815.25	11641.0	5749.10	0.27	-0.06	0.035	
45.00	-44.95	-1.55	0.00	-144.17	0.00	144.17	5566.07	2783.04	11296.1	5578.76	0.34	-0.07	0.034	
50.00	-41.59	-1.45	0.00	-136.42	0.00	136.42	5500.23	2750.11	10953.3	5409.44	0.42	-0.08	0.033	
52.75	-39.77	-1.40	0.00	-132.44	0.00	132.44	5536.21	2768.10	11139.4	5501.37	0.47	-0.09	0.031	
55.00	-38.99	-1.38	0.00	-129.29	0.00	129.29	5506.46	2753.23	10985.3	5425.27	0.51	-0.09	0.031	
60.00	-37.29	-1.33	0.00	-122.40	0.00	122.40	5439.34	2719.67	10644.5	5256.96	0.61	-0.10	0.030	
65.00	-35.63	-1.29	0.00	-115.74	0.00	115.74	5370.80	2685.40	10306.1	5089.82	0.71	-0.10	0.029	
70.00	-33.99	-1.25	0.00	-109.29	0.00	109.29	5300.84	2650.42	9970.29	4923.95	0.83	-0.11	0.029	
75.00	-32.38	-1.22	0.00	-103.03	0.00	103.03	5229.47	2614.74	9637.14	4759.42	0.95	-0.12	0.028	
80.00	-30.81	-1.19	0.00	-96.94	0.00	96.94	5156.68	2578.34	9306.86	4596.31	1.08	-0.13	0.027	
85.00	-29.26	-1.18	0.00	-90.97	0.00	90.97	5082.48	2541.24	8979.62	4434.70	1.21	-0.13	0.026	
90.00	-27.74	-1.18	0.00	-85.06	0.00	85.06	4989.36	2494.68	8625.31	4259.72	1.36	-0.14	0.026	
91.25	-27.37	-1.18	0.00	-83.59	0.00	83.59	4962.23	2481.12	8531.23	4213.26	1.40	-0.14	0.025	
95.00	-25.34	-1.18	0.00	-79.16	0.00	79.16	4880.86	2440.43	8252.09	4075.40	1.51	-0.15	0.025	
98.00	-23.74	-1.18	0.00	-75.63	0.00	75.63	4159.95	2079.97	7111.13	3511.92	1.61	-0.15	0.027	
100.00	-23.22	-1.18	0.00	-73.28	0.00	73.28	4136.05	2068.02	7007.35	3460.67	1.67	-0.16	0.027	
105.00	-21.93	-1.18	0.00	-67.39	0.00	67.39	4075.31	2037.66	6749.44	3333.30	1.84	-0.17	0.026	
110.00	-20.66	-1.17	0.00	-61.52	0.00	61.52	4013.16	2006.58	6493.86	3207.07	2.02	-0.17	0.024	
115.00	-19.42	-1.17	0.00	-55.64	0.00	55.64	3949.59	1974.80	6240.77	3082.08	2.21	-0.18	0.023	
120.00	-18.21	-1.17	0.00	-49.78	0.00	49.78	3884.61	1942.31	5990.33	2958.40	2.40	-0.19	0.022	
125.00	-17.03	-1.17	0.00	-43.92	0.00	43.92	3798.47	1899.23	5713.02	2821.44	2.60	-0.20	0.020	
125.42	-16.93	-1.17	0.00	-43.43	0.00	43.43	3790.55	1895.28	5689.10	2809.63	2.62	-0.20	0.020	
130.00	-15.17	-1.16	0.00	-38.07	0.00	38.07	3703.53	1851.76	5429.36	2681.36	2.81	-0.20	0.018	
131.25	-14.70	-1.16	0.00	-36.61	0.00	36.61	2389.73	1194.86	3567.35	1761.78	2.87	-0.20	0.027	
135.00	-14.06	-1.16	0.00	-32.25	0.00	32.25	2365.06	1182.53	3463.05	1710.27	3.03	-0.21	0.025	
140.00	-13.22	-1.15	0.00	-26.43	0.00	26.43	2330.94	1165.47	3324.42	1641.81	3.25	-0.22	0.022	
145.00	-12.40	-1.13	0.00	-20.66	0.00	20.66	2295.39	1147.70	3186.42	1573.65	3.48	-0.22	0.019	
150.00	-5.94	-0.81	0.00	-15.00	0.00	15.00	2258.44	1129.22	3049.21	1505.89	3.72	-0.23	0.013	
155.00	-5.18	-0.76	0.00	-10.95	0.00	10.95	2220.06	1110.03	2912.95	1438.60	3.96	-0.23	0.010	
160.00	-4.45	-0.70	0.00	-7.15	0.00	7.15	2180.27	1090.14	2777.81	1371.86	4.20	-0.23	0.007	
165.00	-3.73	-0.61	0.00	-3.67	0.00	3.67	2139.07	1069.53	2643.95	1305.75	4.45	-0.24	0.005	
170.00	-0.60	-0.12	0.00	-0.60	0.00	0.60	2096.45	1048.22	2511.52	1240.35	4.70	-0.24	0.001	
175.00	0.00	-0.12	0.00	0.00	0.00	0.00	2052.41	1026.20	2380.70	1175.74	4.95	-0.24	0.000	

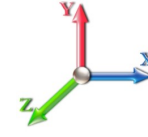
Seismic Segment Forces (Factored)

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E				Iterations 20
Gust Response Factor	1.10	Sds	0.19	Ss 0.17
Dead Load Factor	0.90	Seismic Load Factor	1.00	S1 0.06
Wind Load Factor	0.00	Structure Frequency	0.34	SA 0.03
				Seismic Importance Factor 1.00



Top Elev (ft)	Description	Wz (lb)	a	b	c	Lateral Fs (lb)	R: 1.50
0.00		0.00	0.00	0.00	0.00	0.00	
5.00		1562.5	0.00	0.03	0.02	25.51	
10.00		1537.4	0.01	0.05	0.03	37.47	
15.00		1512.4	0.01	0.06	0.03	43.39	
20.00		1487.4	0.02	0.07	0.04	46.23	
25.00		1462.3	0.04	0.07	0.04	47.48	
30.00		1437.3	0.06	0.07	0.04	47.99	
35.00		1412.2	0.08	0.07	0.04	48.21	
40.00		1387.2	0.10	0.07	0.04	48.34	
45.00	Bot - Section 2	1362.1	0.12	0.07	0.03	48.43	
50.00		2701.6	0.15	0.07	0.03	97.67	
52.75	Top - Section 1	1464.5	0.17	0.07	0.03	53.27	
55.00		599.67	0.19	0.06	0.02	21.86	
60.00		1314.4	0.22	0.06	0.02	47.52	
65.00		1289.4	0.26	0.05	0.02	44.94	
70.00		1264.3	0.30	0.04	0.01	40.56	
75.00		1239.3	0.35	0.03	0.01	33.90	
80.00		1214.2	0.39	0.02	0.01	24.68	
85.00		1189.2	0.45	0.00	0.01	13.07	
90.00		1164.1	0.50	-0.02	0.01	-0.06	
91.25	Bot - Section 3	287.13	0.51	-0.02	0.01	-0.84	
95.00		1614.3	0.56	-0.04	0.01	-18.69	
98.00	Top - Section 2	1272.4	0.59	-0.05	0.01	-23.03	
100.00		396.29	0.62	-0.06	0.02	-8.75	
105.00		975.38	0.68	-0.08	0.03	-29.48	
110.00		953.47	0.75	-0.10	0.04	-33.49	
115.00		931.55	0.82	-0.11	0.06	-33.91	
120.00		909.64	0.89	-0.12	0.08	-30.90	
125.00		887.73	0.96	-0.12	0.11	-24.73	
125.42	Bot - Section 4	72.99	0.97	-0.12	0.12	-1.98	
130.00		1370.9	1.04	-0.10	0.15	-24.85	
131.25	Top - Section 3	368.40	1.06	-0.09	0.17	-5.58	
135.00		460.25	1.12	-0.05	0.20	-2.22	
140.00		599.97	1.21	0.01	0.26	7.22	
145.00		584.32	1.30	0.12	0.33	18.97	
150.00	Appurtenance(s)	5285.8	1.39	0.26	0.42	298.67	
155.00		553.01	1.48	0.46	0.52	46.58	
160.00		537.36	1.58	0.72	0.64	62.16	
165.00		521.71	1.68	1.05	0.78	78.75	
170.00	Appurtenance(s)	2532.4	1.78	1.46	0.95	481.42	
175.00	Appurtenance(s)	502.40	1.89	1.98	1.14	117.17	
Totals:		48,219.9				1,642.9	Total Wind: 47,074.2

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

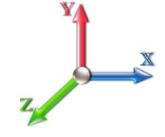
Calculated Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 0.9D + 1.0E										Iterations 20	
Gust Response Factor	1.10							Sds	0.19	Ss	0.17
Dead Load Factor	0.90	Seismic Load Factor	1.00	Sd1	0.10					S1	0.06
Wind Load Factor	0.00	Structure Frequency	0.34	SA	0.03	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	-46.37	-1.88	0.00	-220.77	0.00	220.77	6094.92	3047.46	14456.0	7139.28	0.00	0.00	0.00	0.039
5.00	-44.87	-1.86	0.00	-211.35	0.00	211.35	6041.82	3020.91	14100.2	6963.58	0.00	-0.01	0.038	
10.00	-43.40	-1.83	0.00	-202.03	0.00	202.03	5987.31	2993.65	13745.2	6788.27	0.02	-0.02	0.037	
15.00	-41.95	-1.79	0.00	-192.87	0.00	192.87	5931.38	2965.69	13391.2	6613.44	0.04	-0.02	0.036	
20.00	-40.52	-1.75	0.00	-183.90	0.00	183.90	5874.03	2937.02	13038.3	6439.15	0.07	-0.03	0.035	
25.00	-39.11	-1.71	0.00	-175.14	0.00	175.14	5815.27	2907.64	12686.7	6265.50	0.10	-0.04	0.035	
30.00	-37.73	-1.67	0.00	-166.59	0.00	166.59	5755.10	2877.55	12336.5	6092.55	0.15	-0.05	0.034	
35.00	-36.37	-1.62	0.00	-158.26	0.00	158.26	5693.50	2846.75	11987.9	5920.39	0.20	-0.06	0.033	
40.00	-35.03	-1.58	0.00	-150.15	0.00	150.15	5630.49	2815.25	11641.0	5749.10	0.27	-0.06	0.032	
45.00	-33.71	-1.53	0.00	-142.27	0.00	142.27	5566.07	2783.04	11296.1	5578.76	0.34	-0.07	0.032	
50.00	-31.19	-1.43	0.00	-134.61	0.00	134.61	5500.23	2750.11	10953.3	5409.44	0.42	-0.08	0.031	
52.75	-29.82	-1.38	0.00	-130.67	0.00	130.67	5536.21	2768.10	11139.4	5501.37	0.46	-0.08	0.029	
55.00	-29.24	-1.36	0.00	-127.56	0.00	127.56	5506.46	2753.23	10985.3	5425.27	0.50	-0.09	0.029	
60.00	-27.97	-1.32	0.00	-120.76	0.00	120.76	5439.34	2719.67	10644.5	5256.96	0.60	-0.10	0.028	
65.00	-26.72	-1.27	0.00	-114.18	0.00	114.18	5370.80	2685.40	10306.1	5089.82	0.70	-0.10	0.027	
70.00	-25.49	-1.23	0.00	-107.83	0.00	107.83	5300.84	2650.42	9970.29	4923.95	0.82	-0.11	0.027	
75.00	-24.29	-1.20	0.00	-101.67	0.00	101.67	5229.47	2614.74	9637.14	4759.42	0.94	-0.12	0.026	
80.00	-23.10	-1.17	0.00	-95.67	0.00	95.67	5156.68	2578.34	9306.86	4596.31	1.06	-0.13	0.025	
85.00	-21.94	-1.16	0.00	-89.80	0.00	89.80	5082.48	2541.24	8979.62	4434.70	1.20	-0.13	0.025	
90.00	-20.81	-1.16	0.00	-83.98	0.00	83.98	4989.36	2494.68	8625.31	4259.72	1.34	-0.14	0.024	
91.25	-20.52	-1.16	0.00	-82.53	0.00	82.53	4962.23	2481.12	8531.23	4213.26	1.38	-0.14	0.024	
95.00	-19.00	-1.16	0.00	-78.18	0.00	78.18	4880.86	2440.43	8252.09	4075.40	1.49	-0.15	0.023	
98.00	-17.80	-1.16	0.00	-74.70	0.00	74.70	4159.95	2079.97	7111.13	3511.92	1.59	-0.15	0.026	
100.00	-17.41	-1.16	0.00	-72.38	0.00	72.38	4136.05	2068.02	7007.35	3460.67	1.65	-0.16	0.025	
105.00	-16.44	-1.16	0.00	-66.59	0.00	66.59	4075.31	2037.66	6749.44	3333.30	1.82	-0.16	0.024	
110.00	-15.50	-1.16	0.00	-60.80	0.00	60.80	4013.16	2006.58	6493.86	3207.07	2.00	-0.17	0.023	
115.00	-14.57	-1.16	0.00	-55.01	0.00	55.01	3949.59	1974.80	6240.77	3082.08	2.18	-0.18	0.022	
120.00	-13.66	-1.16	0.00	-49.23	0.00	49.23	3884.61	1942.31	5990.33	2958.40	2.37	-0.19	0.020	
125.00	-12.77	-1.15	0.00	-43.45	0.00	43.45	3798.47	1899.23	5713.02	2821.44	2.57	-0.19	0.019	
125.42	-12.70	-1.15	0.00	-42.97	0.00	42.97	3790.55	1895.28	5689.10	2809.63	2.59	-0.19	0.019	
130.00	-11.38	-1.15	0.00	-37.68	0.00	37.68	3703.53	1851.76	5429.36	2681.36	2.78	-0.20	0.017	
131.25	-11.03	-1.15	0.00	-36.25	0.00	36.25	2389.73	1194.86	3567.35	1761.78	2.83	-0.20	0.025	
135.00	-10.54	-1.15	0.00	-31.94	0.00	31.94	2365.06	1182.53	3463.05	1710.27	2.99	-0.21	0.023	
140.00	-9.91	-1.14	0.00	-26.19	0.00	26.19	2330.94	1165.47	3324.42	1641.81	3.21	-0.21	0.020	
145.00	-9.30	-1.12	0.00	-20.49	0.00	20.49	2295.39	1147.70	3186.42	1573.65	3.44	-0.22	0.017	
150.00	-4.45	-0.80	0.00	-14.89	0.00	14.89	2258.44	1129.22	3049.21	1505.89	3.67	-0.22	0.012	
155.00	-3.89	-0.75	0.00	-10.87	0.00	10.87	2220.06	1110.03	2912.95	1438.60	3.91	-0.23	0.009	
160.00	-3.33	-0.69	0.00	-7.10	0.00	7.10	2180.27	1090.14	2777.81	1371.86	4.15	-0.23	0.007	
165.00	-2.80	-0.61	0.00	-3.64	0.00	3.64	2139.07	1069.53	2643.95	1305.75	4.39	-0.23	0.004	
170.00	-0.45	-0.12	0.00	-0.59	0.00	0.59	2096.45	1048.22	2511.52	1240.35	4.64	-0.23	0.001	
175.00	0.00	-0.12	0.00	0.00	0.00	0.00	2052.41	1026.20	2380.70	1175.74	4.89	-0.23	0.000	

Wind Loading - Shaft

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 22

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		1.00	0.85	7.442	8.19	276.80	1.000	0.000	0.00	0.000	0.00	0.0	0.0	0.0	
5.00		1.00	0.85	7.442	8.19	272.44	1.000	0.000	5.00	24.822	24.82	203.2	0.0	1562.5	
10.00		1.00	0.85	7.442	8.19	268.07	1.000	0.000	5.00	24.428	24.43	200.0	0.0	1537.5	
15.00		1.00	0.85	7.442	8.19	263.71	1.000	0.000	5.00	24.033	24.03	196.7	0.0	1512.4	
20.00		1.00	0.90	7.896	8.69	267.14	1.000	0.000	5.00	23.639	23.64	205.3	0.0	1487.4	
25.00		1.00	0.95	8.276	9.10	268.89	1.000	0.000	5.00	23.244	23.24	211.6	0.0	1462.4	
30.00		1.00	0.98	8.600	9.46	269.41	1.000	0.000	5.00	22.850	22.85	216.2	0.0	1437.3	
35.00		1.00	1.01	8.883	9.77	269.05	1.000	0.000	5.00	22.456	22.46	219.4	0.0	1412.3	
40.00		1.00	1.04	9.137	10.05	268.02	1.000	0.000	5.00	22.061	22.06	221.7	0.0	1387.2	
45.00	Bot - Section 2	1.00	1.07	9.366	10.30	266.47	1.000	0.000	5.00	21.667	21.67	223.2	0.0	1362.2	
50.00		1.00	1.09	9.576	10.53	264.50	1.000	0.000	5.00	21.704	21.70	228.6	0.0	2701.7	
52.75	Top - Section 1	1.00	1.11	9.685	10.65	263.25	1.000	0.000	2.75	11.769	11.77	125.4	0.0	1464.6	
55.00		1.00	1.12	9.770	10.75	267.63	1.000	0.000	2.25	9.540	9.54	102.5	0.0	599.7	
60.00		1.00	1.14	9.951	10.95	265.05	1.000	0.000	5.00	20.915	20.92	228.9	0.0	1314.4	
65.00		1.00	1.16	10.120	11.13	262.20	1.000	0.000	5.00	20.521	20.52	228.4	0.0	1289.4	
70.00		1.00	1.17	10.279	11.31	259.13	1.000	0.000	5.00	20.126	20.13	227.6	0.0	1264.4	
75.00		1.00	1.19	10.430	11.47	255.85	1.000	0.000	5.00	19.732	19.73	226.4	0.0	1239.3	
80.00		1.00	1.21	10.572	11.63	252.39	1.000	0.000	5.00	19.337	19.34	224.9	0.0	1214.3	
85.00		1.00	1.22	10.708	11.78	248.78	1.000	0.000	5.00	18.943	18.94	223.1	0.0	1189.2	
90.00		1.00	1.24	10.838	11.92	245.01	1.000	0.000	5.00	18.549	18.55	221.1	0.0	1164.2	
91.25	Bot - Section 3	1.00	1.24	10.869	11.96	244.05	1.000	0.000	1.25	4.576	4.58	54.7	0.0	287.1	
95.00		1.00	1.25	10.962	12.06	241.12	1.000	0.000	3.75	13.862	13.86	167.1	0.0	1614.4	
98.00	Top - Section 2	1.00	1.26	11.034	12.14	238.72	1.000	0.000	3.00	10.930	10.93	132.7	0.0	1272.5	
100.00		1.00	1.27	11.081	12.19	242.19	1.000	0.000	2.00	7.208	7.21	87.9	0.0	396.3	
105.00		1.00	1.28	11.195	12.31	238.09	1.000	0.000	5.00	17.743	17.74	218.5	0.0	975.4	
110.00		1.00	1.29	11.305	12.44	233.88	1.000	0.000	5.00	17.349	17.35	215.7	0.0	953.5	
115.00		1.00	1.30	11.412	12.55	229.57	1.000	0.000	5.00	16.954	16.95	212.8	0.0	931.6	
120.00		1.00	1.32	11.514	12.67	225.17	1.000	0.000	5.00	16.560	16.56	209.7	0.0	909.6	
125.00		1.00	1.33	11.614	12.78	220.69	1.000	0.000	5.00	16.165	16.17	206.5	0.0	887.7	
125.42	Bot - Section 4	1.00	1.33	11.622	12.78	220.32	1.000	0.000	0.42	1.329	1.33	17.0	0.0	73.0	
130.00		1.00	1.34	11.710	12.88	216.13	1.000	0.000	4.58	14.689	14.69	189.2	0.0	1370.9	
131.25	Top - Section 3	1.00	1.34	11.734	12.91	214.98	1.000	0.000	1.25	3.949	3.95	51.0	0.0	368.4	
135.00		1.00	1.35	11.803	12.98	215.26	1.000	0.000	3.75	11.698	11.70	151.9	0.0	460.3	
140.00		1.00	1.36	11.894	13.08	210.56	1.000	0.000	5.00	15.252	15.25	199.5	0.0	600.0	
145.00		1.00	1.37	11.982	13.18	205.81	1.000	0.000	5.00	14.857	14.86	195.8	0.0	584.3	
150.00	Appurtenance(s)	1.00	1.38	12.068	13.27	200.99	1.000	0.000	5.00	14.463	14.46	192.0	0.0	568.7	
155.00		1.00	1.39	12.152	13.37	196.11	1.000	0.000	5.00	14.069	14.07	188.1	0.0	553.0	
160.00		1.00	1.40	12.233	13.46	191.17	1.000	0.000	5.00	13.674	13.67	184.0	0.0	537.4	
165.00		1.00	1.41	12.313	13.54	186.18	1.000	0.000	5.00	13.280	13.28	179.9	0.0	521.7	
170.00	Appurtenance(s)	1.00	1.42	12.390	13.63	181.13	1.000	0.000	5.00	12.885	12.89	175.6	0.0	506.1	
175.00	Appurtenance(s)	1.00	1.42	12.466	13.71	176.04	1.000	0.000	5.00	12.491	12.49	171.3	0.0	490.4	
Totals:								175.00			7,335.3	41,464.4			

Discrete Appurtenance Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 22

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	175.00	Lightning rod	1	12.466	13.713	1.00	1.00	1.25	12.00	0.000	0.000	17.14	0.00	0.00	
2	170.00	Low Profile	1	12.390	13.629	1.00	1.00	22.00	1500.00	0.000	0.000	299.85	0.00	0.00	
3	170.00	RRUS-11 B12	3	12.390	13.629	0.57	0.80	4.37	150.00	0.000	0.000	59.52	0.00	0.00	
4	170.00	DC6-48-60-18-8F	1	12.390	13.629	0.80	0.80	0.74	31.80	0.000	0.000	10.03	0.00	0.00	
5	170.00	LGP21401	6	12.390	13.629	0.53	0.80	4.09	84.60	0.000	0.000	55.70	0.00	0.00	
6	170.00	AM-X-CD-17-65-00T-RET	2	12.390	13.629	0.63	0.80	6.32	61.60	0.000	0.000	86.14	0.00	0.00	
7	170.00	SBNH-1D4545A	1	12.390	13.629	0.54	0.80	4.88	36.40	0.000	0.000	66.48	0.00	0.00	
8	170.00	7770.00A	6	12.390	13.629	0.61	0.80	20.21	162.00	0.000	0.000	275.45	0.00	0.00	
9	150.00	F4P-HRK10	1	12.068	13.275	1.00	1.00	9.00	478.27	0.000	0.000	119.47	0.00	0.00	
10	150.00	KRD 9011461-B66A-B2A	4	12.068	13.275	0.65	0.75	16.80	528.80	0.000	0.000	222.96	0.00	0.00	
11	150.00	F4P-10W	1	12.068	13.275	1.00	1.00	58.98	2396.00	0.000	0.000	782.96	0.00	0.00	
12	150.00	VIC100	1	12.068	13.275	0.50	0.75	0.05	0.40	0.000	0.000	0.67	0.00	0.00	
13	150.00	S11B12	4	12.068	13.275	0.50	0.75	5.69	204.00	0.000	0.000	75.51	0.00	0.00	
14	150.00	S11B12	4	12.068	13.275	0.50	0.75	5.69	204.00	0.000	0.000	75.51	0.00	0.00	
15	150.00	RRUS 4478 B14	4	12.068	13.275	0.50	0.75	3.32	237.60	0.000	0.000	44.03	0.00	0.00	
16	150.00	MI-554nn	8	12.068	13.275	0.38	0.75	1.86	65.28	0.000	0.000	24.69	0.00	0.00	
17	150.00	SP2-5.2	2	12.068	13.275	0.75	0.75	5.94	44.00	0.000	0.000	78.85	0.00	0.00	
18	150.00	APX16DWV-16DWVS-C	4	12.068	13.275	0.50	0.75	12.98	162.80	0.000	0.000	172.37	0.00	0.00	
19	150.00	APXVAA24_43-U-A20	4	12.068	13.275	0.54	0.75	43.72	396.00	0.000	0.000	580.36	0.00	0.00	
Totals:									6,755.55						3,047.69

Total Applied Force Summary

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations 22

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		203.20	1662.54	0.00	0.00
10.00		199.97	1637.49	0.00	0.00
15.00		196.74	1612.45	0.00	0.00
20.00		205.32	1587.41	0.00	0.00
25.00		211.61	1562.36	0.00	0.00
30.00		216.16	1537.32	0.00	0.00
35.00		219.43	1512.27	0.00	0.00
40.00		221.73	1487.23	0.00	0.00
45.00		223.23	1462.18	0.00	0.00
50.00		228.62	2801.67	0.00	0.00
52.75		125.38	1519.57	0.00	0.00
55.00		102.53	644.67	0.00	0.00
60.00		228.94	1414.44	0.00	0.00
65.00		228.44	1389.40	0.00	0.00
70.00		227.57	1364.35	0.00	0.00
75.00		226.37	1339.31	0.00	0.00
80.00		224.88	1314.26	0.00	0.00
85.00		223.13	1289.22	0.00	0.00
90.00		221.13	1264.18	0.00	0.00
91.25		54.71	312.13	0.00	0.00
95.00		167.14	1689.35	0.00	0.00
98.00		132.66	1332.46	0.00	0.00
100.00		87.85	436.29	0.00	0.00
105.00		218.50	1075.38	0.00	0.00
110.00		215.74	1053.47	0.00	0.00
115.00		212.82	1031.55	0.00	0.00
120.00		209.74	1009.64	0.00	0.00
125.00		206.51	987.73	0.00	0.00
125.42		16.99	81.32	0.00	0.00
130.00		189.21	1462.56	0.00	0.00
131.25		50.96	393.40	0.00	0.00
135.00		151.88	535.25	0.00	0.00
140.00		199.55	699.97	0.00	0.00
145.00		195.83	684.32	0.00	0.00
150.00	(37) attachments	2369.39	5385.82	0.00	0.00
155.00		188.05	628.61	0.00	0.00
160.00		184.01	612.96	0.00	0.00
165.00		179.86	597.31	0.00	0.00
170.00	(20) attachments	1028.78	2608.06	0.00	0.00
175.00	(1) attachments	188.43	502.40	0.00	0.00
	Totals:	10,383.00	51,522.31	0.00	0.00

Calculated Forces

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II

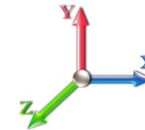


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Load Case: 1.0D + 1.0W 60 mph Wind

Iterations 22

Dead Load Factor 1.00
Wind Load 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	-51.52	-10.40	0.00	-1150.9	0.00	1150.90	6094.92	3047.46	14456.0	7139.28	0.00	0.000	0.000	0.170
5.00	-49.85	-10.23	0.00	-1098.8	0.00	1098.89	6041.82	3020.91	14100.2	6963.58	0.02	-0.041	0.000	0.166
10.00	-48.20	-10.07	0.00	-1047.7	0.00	1047.73	5987.31	2993.65	13745.2	6788.27	0.09	-0.082	0.000	0.162
15.00	-46.59	-9.90	0.00	-997.40	0.00	997.40	5931.38	2965.69	13391.2	6613.44	0.20	-0.123	0.000	0.159
20.00	-44.99	-9.72	0.00	-947.90	0.00	947.90	5874.03	2937.02	13038.3	6439.15	0.35	-0.164	0.000	0.155
25.00	-43.42	-9.54	0.00	-899.29	0.00	899.29	5815.27	2907.64	12686.7	6265.50	0.54	-0.205	0.000	0.151
30.00	-41.88	-9.34	0.00	-851.61	0.00	851.61	5755.10	2877.55	12336.5	6092.55	0.78	-0.246	0.000	0.147
35.00	-40.36	-9.15	0.00	-804.88	0.00	804.88	5693.50	2846.75	11987.9	5920.39	1.06	-0.287	0.000	0.143
40.00	-38.87	-8.94	0.00	-759.15	0.00	759.15	5630.49	2815.25	11641.0	5749.10	1.38	-0.327	0.000	0.139
45.00	-37.40	-8.74	0.00	-714.43	0.00	714.43	5566.07	2783.04	11296.1	5578.76	1.74	-0.367	0.000	0.135
50.00	-34.60	-8.51	0.00	-670.74	0.00	670.74	5500.23	2750.11	10953.3	5409.44	2.15	-0.408	0.000	0.130
52.75	-33.08	-8.38	0.00	-647.34	0.00	647.34	5536.21	2768.10	11139.4	5501.37	2.39	-0.430	0.000	0.124
55.00	-32.43	-8.29	0.00	-628.47	0.00	628.47	5506.46	2753.23	10985.3	5425.27	2.60	-0.448	0.000	0.122
60.00	-31.01	-8.07	0.00	-587.01	0.00	587.01	5439.34	2719.67	10644.5	5256.96	3.09	-0.485	0.000	0.117
65.00	-29.62	-7.85	0.00	-546.64	0.00	546.64	5370.80	2685.40	10306.1	5089.82	3.61	-0.521	0.000	0.113
70.00	-28.25	-7.63	0.00	-507.39	0.00	507.39	5300.84	2650.42	9970.29	4923.95	4.18	-0.557	0.000	0.108
75.00	-26.91	-7.40	0.00	-469.25	0.00	469.25	5229.47	2614.74	9637.14	4759.42	4.78	-0.593	0.000	0.104
80.00	-25.59	-7.18	0.00	-432.23	0.00	432.23	5156.68	2578.34	9306.86	4596.31	5.42	-0.628	0.000	0.099
85.00	-24.30	-6.96	0.00	-396.33	0.00	396.33	5082.48	2541.24	8979.62	4434.70	6.10	-0.662	0.000	0.094
90.00	-23.04	-6.73	0.00	-361.54	0.00	361.54	4989.36	2494.68	8625.31	4259.72	6.81	-0.695	0.000	0.089
91.25	-22.73	-6.68	0.00	-353.13	0.00	353.13	4962.23	2481.12	8531.23	4213.26	6.99	-0.703	0.000	0.088
95.00	-21.04	-6.50	0.00	-328.08	0.00	328.08	4880.86	2440.43	8252.09	4075.40	7.55	-0.727	0.000	0.085
98.00	-19.70	-6.35	0.00	-308.59	0.00	308.59	4159.95	2079.97	7111.13	3511.92	8.02	-0.746	0.000	0.093
100.00	-19.27	-6.27	0.00	-295.89	0.00	295.89	4136.05	2068.02	7007.35	3460.67	8.33	-0.759	0.000	0.090
105.00	-18.19	-6.04	0.00	-264.55	0.00	264.55	4075.31	2037.66	6749.44	3333.30	9.14	-0.791	0.000	0.084
110.00	-17.14	-5.82	0.00	-234.33	0.00	234.33	4013.16	2006.58	6493.86	3207.07	9.99	-0.821	0.000	0.077
115.00	-16.11	-5.60	0.00	-205.22	0.00	205.22	3949.59	1974.80	6240.77	3082.08	10.86	-0.849	0.000	0.071
120.00	-15.10	-5.38	0.00	-177.21	0.00	177.21	3884.61	1942.31	5990.33	2958.40	11.77	-0.876	0.000	0.064
125.00	-14.11	-5.17	0.00	-150.29	0.00	150.29	3798.47	1899.23	5713.02	2821.44	12.70	-0.901	0.000	0.057
125.42	-14.03	-5.15	0.00	-148.14	0.00	148.14	3790.55	1895.28	5689.10	2809.63	12.78	-0.903	0.000	0.056
130.00	-12.57	-4.94	0.00	-124.54	0.00	124.54	3703.53	1851.76	5429.36	2681.36	13.65	-0.923	0.000	0.050
131.25	-12.18	-4.89	0.00	-118.36	0.00	118.36	2389.73	1194.86	3567.35	1761.78	13.90	-0.928	0.000	0.072
135.00	-11.64	-4.73	0.00	-100.04	0.00	100.04	2365.06	1182.53	3463.05	1710.27	14.63	-0.943	0.000	0.063
140.00	-10.94	-4.52	0.00	-76.40	0.00	76.40	2330.94	1165.47	3324.42	1641.81	15.63	-0.965	0.000	0.051
145.00	-10.26	-4.32	0.00	-53.80	0.00	53.80	2295.39	1147.70	3186.42	1573.65	16.65	-0.982	0.000	0.039
150.00	-4.92	-1.86	0.00	-32.22	0.00	32.22	2258.44	1129.22	3049.21	1505.89	17.69	-0.995	0.000	0.024
155.00	-4.29	-1.66	0.00	-22.94	0.00	22.94	2220.06	1110.03	2912.95	1438.60	18.73	-1.003	0.000	0.018
160.00	-3.68	-1.46	0.00	-14.66	0.00	14.66	2180.27	1090.14	2777.81	1371.86	19.79	-1.010	0.000	0.012
165.00	-3.09	-1.27	0.00	-7.35	0.00	7.35	2139.07	1069.53	2643.95	1305.75	20.85	-1.014	0.000	0.007
170.00	-0.50	-0.20	0.00	-0.99	0.00	0.99	2096.45	1048.22	2511.52	1240.35	21.91	-1.016	0.000	0.001
175.00	0.00	-0.19	0.00	0.00	0.00	0.00	2052.41	1026.20	2380.70	1175.74	22.98	-1.016	0.000	0.000

Final Analysis Summary

Structure: CT22076-A-SBA	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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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 101 mph Wind	47.2	0.00	61.75	0.00	0.00	5244.84
0.9D + 1.6W 101 mph Wind	47.2	0.00	46.29	0.00	0.00	5196.91
1.2D + 1.0Di + 1.0Wi 50 mph Wind	10.1	0.00	86.33	0.00	0.00	1187.71
1.2D + 1.0E	1.9	0.00	61.83	0.00	0.00	223.08
0.9D + 1.0E	1.9	0.00	46.37	0.00	0.00	220.77
1.0D + 1.0W 60 mph Wind	10.4	0.00	51.52	0.00	0.00	1150.90

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 101 mph Wind	-61.75	-47.18	0.00	-5244.8	0.00	-5244.8	6094.92	3047.4	14456.0	7139.28	0.00	0.745
0.9D + 1.6W 101 mph Wind	-46.29	-47.15	0.00	-5196.9	0.00	-5196.9	6094.92	3047.4	14456.0	7139.28	0.00	0.736
1.2D + 1.0Di + 1.0Wi 50 mph Wind	-86.33	-10.06	0.00	-1187.7	0.00	-1187.7	6094.92	3047.4	14456.0	7139.28	0.00	0.181
1.2D + 1.0E	-61.83	-1.89	0.00	-223.08	0.00	-223.08	6094.92	3047.4	14456.0	7139.28	0.00	0.041
0.9D + 1.0E	-46.37	-1.88	0.00	-220.77	0.00	-220.77	6094.92	3047.4	14456.0	7139.28	0.00	0.039
1.0D + 1.0W 60 mph Wind	-51.52	-10.40	0.00	-1150.9	0.00	-1150.9	6094.92	3047.4	14456.0	7139.28	0.00	0.170


Base Plate Summary

Structure: CT22076-A-SB	Code: EIA/TIA-222-G	2/16/2018
Site Name: East Haddam (Trowbridge)	Exposure: C	
Height: 175.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 1.1	Topography: 1	Struct Class: II



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Reactions	Base Plate	Anchor Bolts
Original Design	Yield (ksi): 50.00	Bolt Circle: 75.83
Moment (kip-ft): 7478.92	Width (in): 81.83	Number Bolts: 20.00
Axial (kip): 77.65	Style: Polygon	Bolt Type: 2.25" 18J
Shear (kip): 54.08	Polygon Sides: 12.00	Bolt Diameter (in): 2.25
Analysis	Clip Length (in): 0.00	Yield (ksi): 75.00
Moment (kip-ft): 5244.84	Effective Len (in): 17.08	Ultimate (ksi): 100.00
Axial (kip): 86.33	Moment (kip-in): 1518.35	Arrangement: Radial
Shear (kip): 47.18	Allow Stress (ksi): 67.50	Cluster Dist (in): 0.00
	Applied Stress (ksi): 0.00	Start Angle (deg): 0.00
Moment Design %: 70.13	Stress Ratio: 0.75	Compression
		Force (kip): 170.31
		Allowable (kip): 260.00
		Ratio: 0.67
		Tension
		Force (kip): 161.68
		Allowable (kip): 260.00
		Ratio: 0.64

	Monopole Mat Foundation Design		Date	
			2/16/2018	
	Customer Name:	T-Mobile	EIA/TIA Standard:	EIA-222-G
	Site Name:		Structure Height (Ft.):	175
	Site Number:	CT22076-A-SBA	Engineer Name:	K. Wyant
Engr. Number:	47637	Engineer Login ID:		

Foundation Info Obtained from:

Drawings/Calculations
Monopole
Analysis

Structure Type:

Analysis or Design?

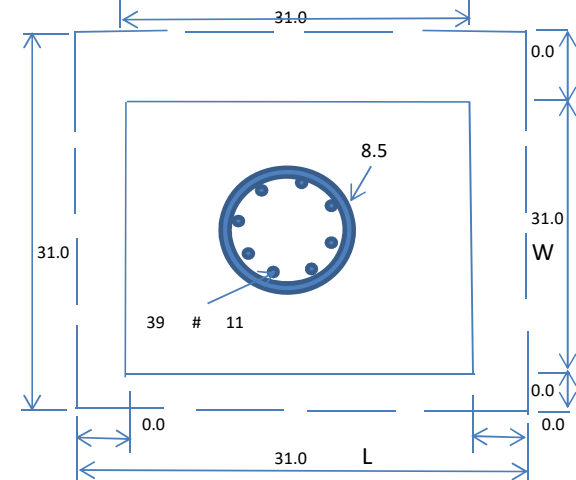
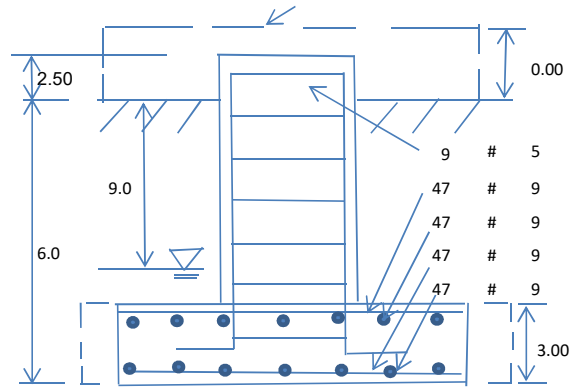
Base Reactions (Factored):

Axial Load (Kips):	61.8	Shear Force (Kips):	47.2
Uplift Force (Kips):	0.0	Moment (Kips-ft):	5244.8

Allowable overstress %: 5.0%

Foundation Geometries:

Diameter of Pier (ft.):	8.5	Mods required -Yes/No ?:	No
Pier Height A. G. (ft.):	2.50	Depth of Base BG (ft.):	6.0
Length of Pad (ft.):	31	Thickness of Pad (ft.):	3.00
		Width of Pad (ft.):	31
Final Length of pad (ft)	31.0	Final width of pad (ft):	31.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Rebar Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	11	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	39	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	47	Qty. of Rebar in Pad (W):	47	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	47	Qty. of Rebar in Pad (W):	47	

Apply 1.35 factor for e/w Per G: 1.35

Soil Design Parameters:

Soil Unit Weight (pcf):	140.0	Soil Buoyant Weight:	50.0	Pcf	
Water Table B.G.S. (ft):	9.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad: 30
Ultimate Bearing Pressure (psf):	14000	Ultimate Skin Friction:	0	Psf	Angle from Bottom of Pad: 25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottom of Pad: 25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00		

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	2712.76	Total Dry Soil Weight (Kips):	379.79
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	379.79	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3195.10	Total Dry Concrete Weight (Kips):	479.26
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	479.26	Total Vertical Load on Base (Kips):	920.80

Check Soil Capacities:

Calculated Maximum Net Soil Pressure under the base (psf):	2019	<	Allowable Factored Soil Bearing (psf):	10500	0.19	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	12940.9	>	Design Factored Moment (kips-ft):	5646	0.44	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.29					OK!

Load/
Capacity
Ratio

Check the capacities of Reinforcing Concrete:

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

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	1.56	Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	12178.8	>	Design Factored Moment (Mu, Kips-Ft)	5504.4	0.45 OK!
Calculated Shear Capacity (Kips):	1028.2	>	Design Factored Shear (Kips):	47.2	0.05 OK!
Calculated Tension Capacity (Tn, Kips):	3285.4	>	Design Factored Tension (Tu Kips):	0.0	0.00 OK!
Calculated Compression Capacity (Pn, Kips):	14339.3	>	Design Factored Axial Load (Pu Kips):	61.8	0.00 OK!
Moment & Axial Strength Combination:	0.45	OK!	Check Tie Spacing (Design/Required):		1 OK!
Pier Reinforcement Ratio:	0.007		Reinforcement Ratio is satisfied per ACI		

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1144.8	>	One-Way Factored Shear (L-D. Kips):	306.8	0.27 OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1144.8	>	One-Way Factored Shear (W-D., Kips):	306.8	0.27 OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1105.4	>	One-Way Factored Shear (C-C, Kips):	292.9	0.26 OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0039	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0039	
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	6624.8	>	Moment at Bottom (L-Dir. K-Ft):	2010.5	0.30 OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	6624.8	>	Moment at Bottom (W-Dir. K-Ft):	2010.5	0.30 OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	9288.6	>	Moment at Bottom (C-C Dir. K-Ft):	2843.3	0.31 OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0039	OK!	Upper Steel Reinf. Ratio (W-Dir.):	0.0039	
Upper Steel Pad Moment Capacity (L-Direc. Kips-ft):	6624.8	>	Moment at the top (L-Dir K-Ft):	893.5	0.13 OK!
Upper Steel Pad Moment Capacity (W-Direc. Kips-ft):	6624.8	>	Moment at the top (W-Dir K-Ft):	893.5	0.13 OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	9288.6	>	Moment at the top (C-C Dir. K-Ft):	837.7	0.09 OK!

(3).Check Punching Shear Capacity due to Moment in the Pier:

Moment transferred by punching shear:	2097.9	k-ft.	Max. factored shear stress $v_{u,CD}$:	3.0	Psi
Max. factored shear stress $v_{u,AB}$:	10.3	Psi	Factored shear Strength ϕv_n :	189.7	Psi
Max. factored shear stress v_u :	10.3	Psi	Check Usage of Punching Shear Capacity:	0.05	OK!



SITE NAME: CTHA603B

**39 Nichols Road
East Haddam, CT 06469**

SITE NUMBER: CTHA603B

PROJECT: T-MOBILE L700

CONFIGURATION: 4SEC-6797DB2_1xAIR+2QP

T-MOBILE TECHNICIAN SITE SAFETY NOTES	
LOCATION	SPECIAL RESTRICTIONS
ANTENNA/TMA/RRU	
SECTOR A:	ACCESS NOT PERMITTED
SECTOR B:	ACCESS NOT PERMITTED
SECTOR C:	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED*
	(*CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED)
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

T-Mobile

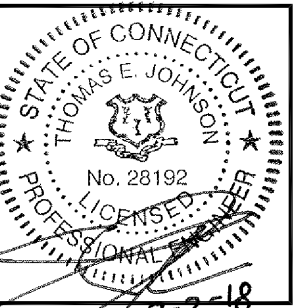
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116



SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581 TEL: (508) 251-0720

ProTerra
DESIGN GROUP, LLC

4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413) 320-4918



CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
0	02/02/18	ISSUED FOR CONSTRUCTION	JEB

SITE NUMBER:
CTHA603B
SITE NAME:
CTHA603B

SITE ADDRESS:
**39 Nichols Road
East Haddam, CT 06469**

SHEET TITLE
TITLE SHEET

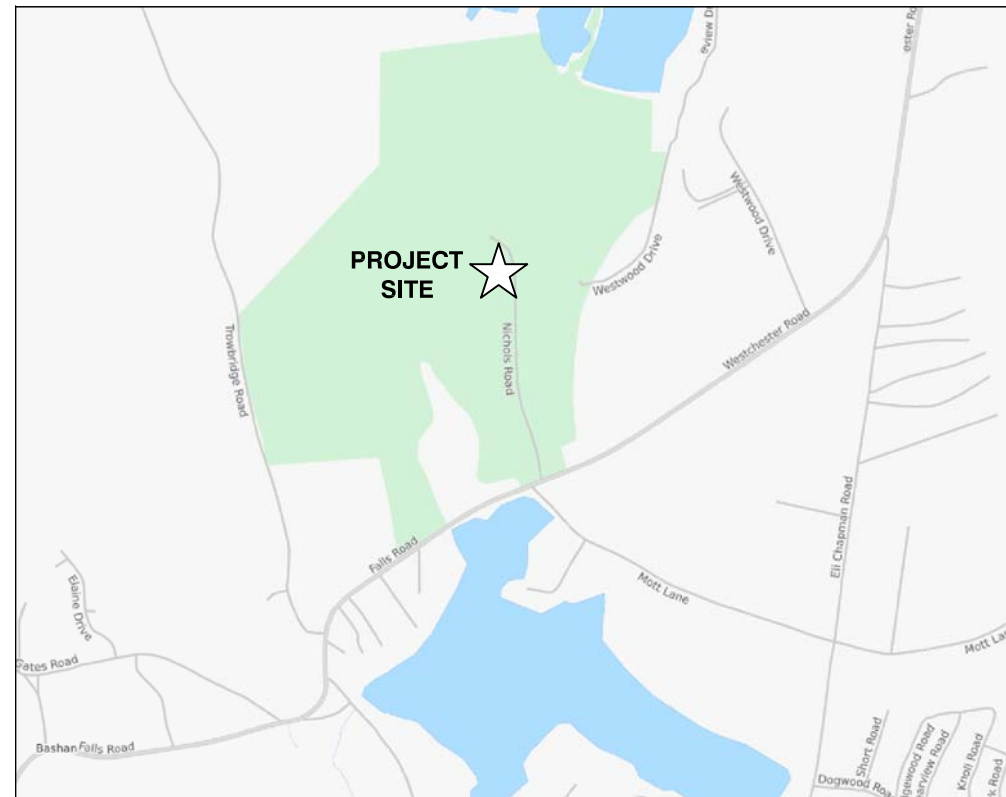
SHEET NUMBER
T-1

GENERAL NOTES

- 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.
- THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL CONSTRUCTION NOTES

- TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.
- PROTERRA DESIGN GROUP ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES



PROJECT INFORMATION

SCOPE OF WORK: UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE COLLOCATION
ZONING JURISDICTION: TOWN OF EAST HADDAM, CT SITING COUNCIL

T-MOBILE E911 ADDRESS: 39 NICHOLS ROAD MOODUS, CT 06469

SBA BUSINESS ADDRESS: 3 NICHOLS ROAD EAST HADDAM, CT 06469

LATITUDE: 41° 31' 15.60" N (FROM SBA RECORD)
LONGITUDE: 72° 25' 23.70" W (FROM SBA RECORD)
JURISDICTION: TOWN OF EAST HADDAM, CT SITING COUNCIL

BUILDING CODE: 2016 CONNECTICUT STATE BUILDING CODE WITH AMENDMENTS
ELECTRICAL CODE: 2014 NATIONAL ELECTRICAL CODE AND AMENDMENTS
CURRENT USE: TELECOMMUNICATIONS FACILITY
PROPOSED USE: TELECOMMUNICATIONS FACILITY

PROPERTY OWNER: N/F TOWN OF EAST HADDAM, TRANSFER STATION - KENNEL 7 MAIN STREET, POST OFFICE BOX K EAST HADDAM, CT 06423

TOWER OWNER: MCM ACQUISITION 2017, LLC
SBA SITE ID: CT22076-A
SBA SITE NAME: EAST HADDAM (TROWBRIDGE)
SBA REGIONAL SITE MANAGER: STEPHEN ROTH (860) 539-4920

APPROVALS

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



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CALL BEFORE YOU DIG
(CT): 1-800-922-4455

UNDERGROUND SERVICE ALERT

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
GN-1	GENERAL NOTES	0
A-1	COMPOUND PLAN	0
A-2	ELEVATIONS & PROPOSED ANTENNA PLAN	0
A-3	ANTENNA MOUNTING DETAILS	0
A-4 TO A-6	DETAILS	0
S-1	STRUCTURAL DETAILS	0
E-1 TO E-2	ELECTRICAL & GROUNDING DETAILS	0

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 SURCIRTS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND 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 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

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

CONTRACTOR – SBA COMMUNICATIONS CORP.
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
OWNER – T-MOBILE
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF 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 = 35 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 UMS 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), STEEL CONSTRUCTION MANUAL, 14TH 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.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BTCW	BARE TINNED SOLID COPPER WIRE	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BGR	BURIED GROUND RING	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BTS	BASE TRANSCEIVER STATION	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
EXISTING	EXISTING OR (E)	PROPOSED	NEW OR (P)	TYP	TYPICAL
EGB	EQUIPMENT GROUND BAR	N.T.S.	NOT TO SCALE	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	RAD	RADIATION CENTERLINE (ANTENNA)		
		REF	REFERENCE		

T-Mobile

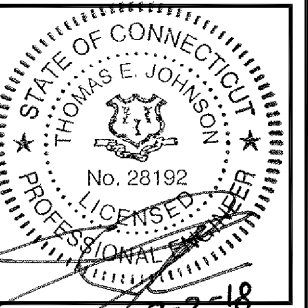
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116



SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720

ProTerra
DESIGN GROUP, LLC

4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413)320-4918



CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	02/02/18	ISSUED FOR CONSTRUCTION	JEB

SITE NUMBER:

CTHA603B
SITE NAME:

CTHA603B

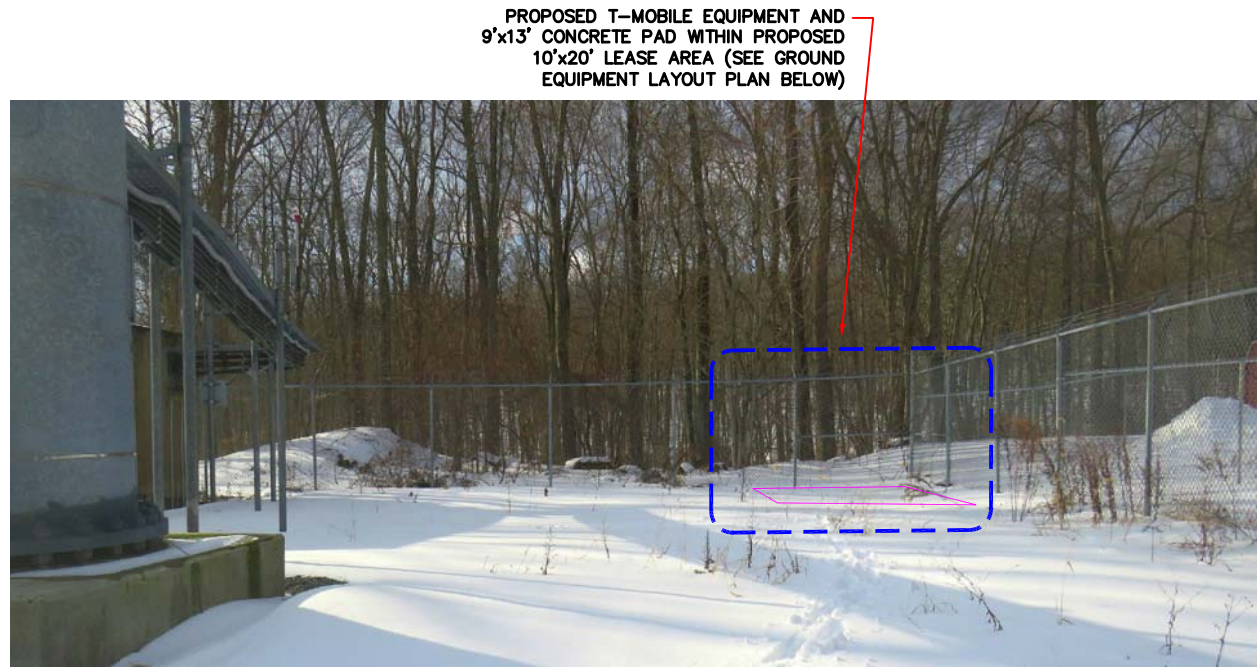
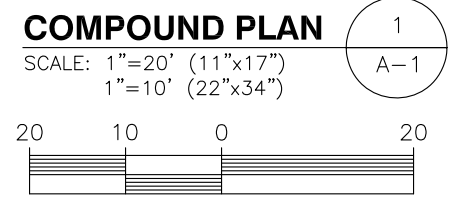
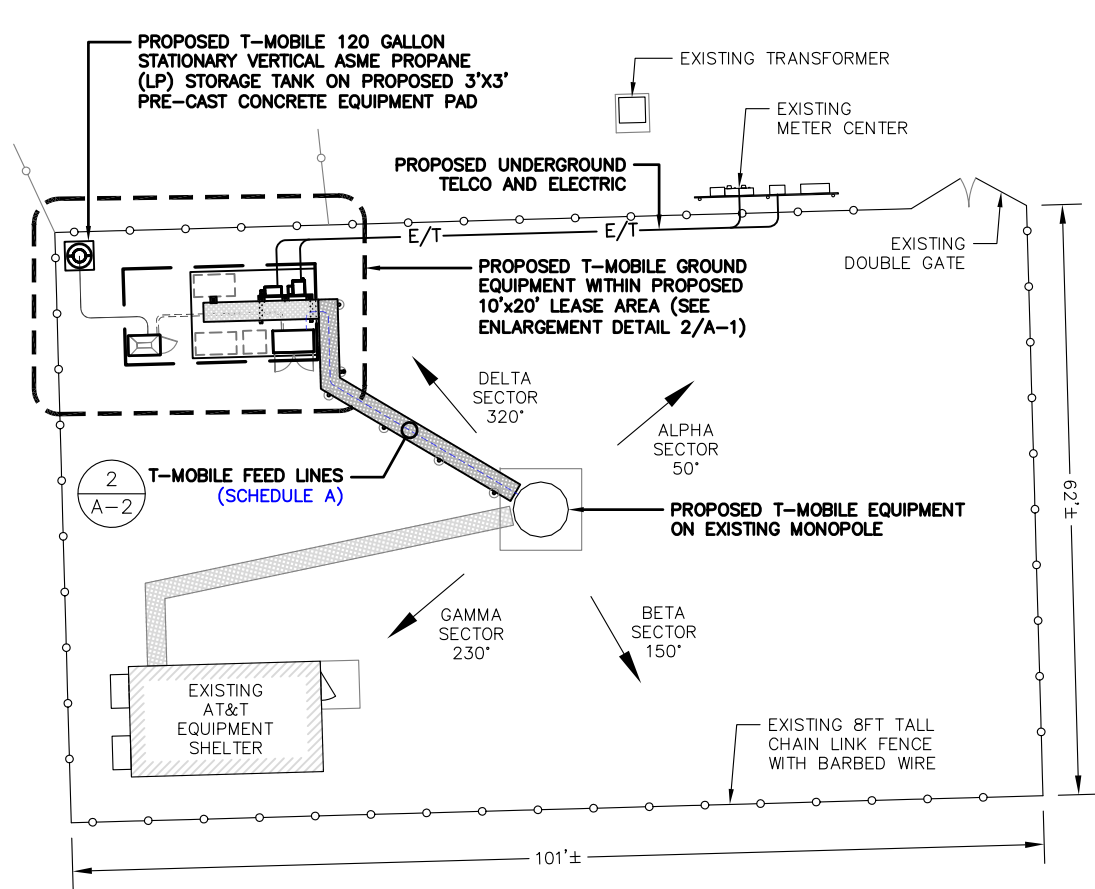
SITE ADDRESS:
39 Nichols Road
East Haddam, CT 06469

SHEET TITLE

GENERAL NOTES

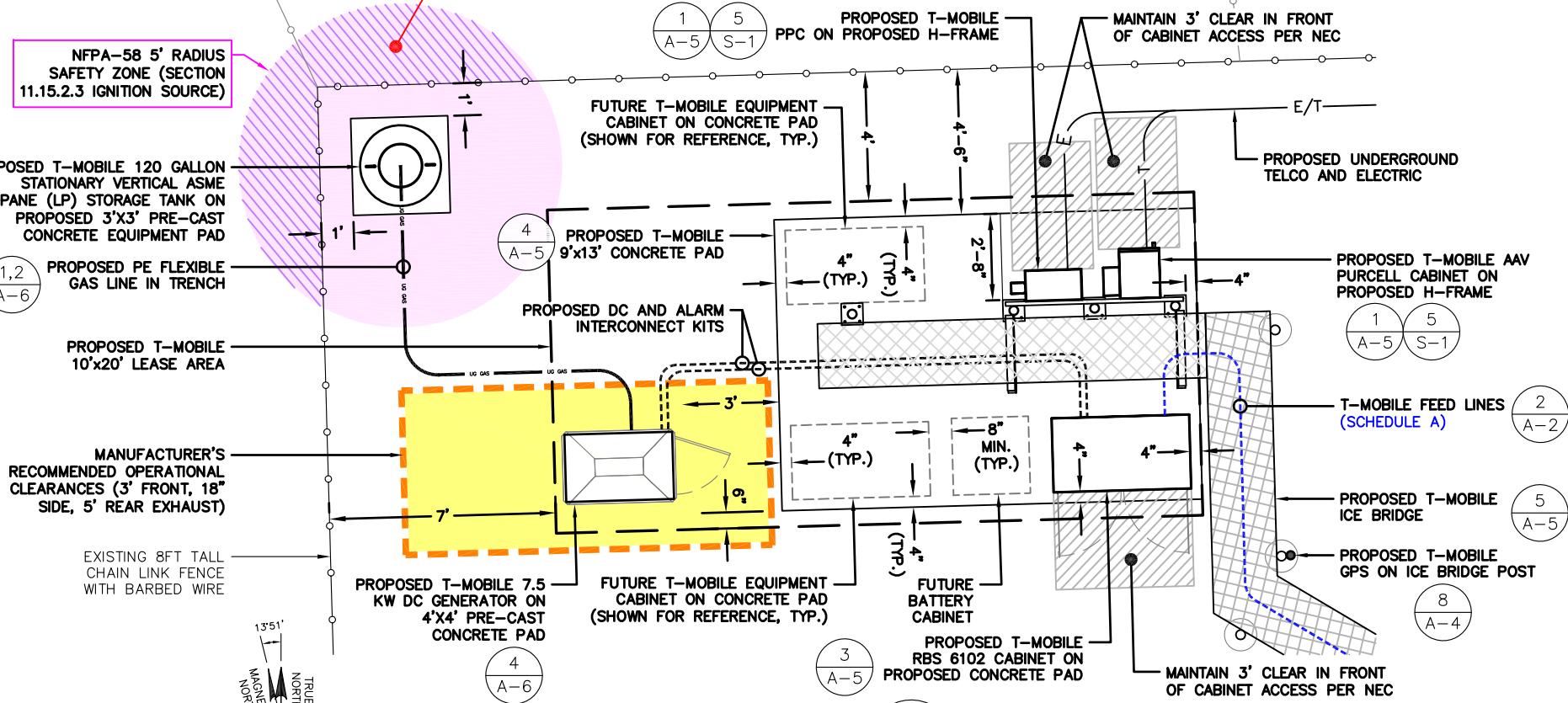
SHEET NUMBER

GN-1



PROPOSED EQUIPMENT AREA PHOTO DETAIL
SCALE: N.T.S. 2
A-1

SPECIAL OPERATIONS & MAINTENANCE NOTE (VEGETATION MANAGEMENT):
WITHIN THE DESIGNATED PROPANE SAFETY ZONE, T-MOBILE SHALL BE RESPONSIBLE FOR ALL LABOR AND MATERIALS FOR INITIAL VEGETATION MANAGEMENT AND FOR ROUTINE VEGETATION MAINTENANCE THEREAFTER (REQUIRED BY SBA COMMUNICATIONS CORPORATION AND BY NFPA-58 SETBACK STANDARDS TO COMBUSTIBLE MATERIALS).



SAFETY ZONE REDUCTION NOTE:
REDUCTION TO A 5' RADIUS SAFETY ZONE FROM IGNITION SOURCE REQUIRES CONFORMANCE WITH NFPA-58 2011, SECTION 11.15.2.3 WHICH ALLOWS REDUCTION ONLY FOR CONTAINERS FOR STATIONARY ENGINES INSTALLED WITH A FILL VALVE WITH AN INTEGRAL MANUAL SHUTOFF VALVE.

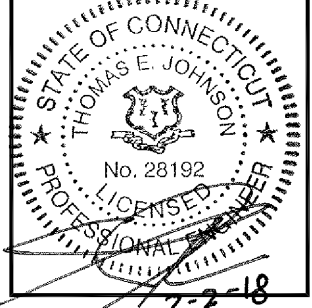
NOTE:
REGULATOR AND FILL VALVE MUST BE INSTALLED NO CLOSER THAN 5' TO AN IGNITION SOURCE.

GROUND EQUIPMENT LAYOUT PLAN
SCALE: 1"=5' (11"x17"), 1"=2.5' (22"x34") 3
A-1

T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
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OFFICE: (860) 648-1116

SBA
SBA COMMUNICATIONS CORP.
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ProTerra
DESIGN GROUP, LLC
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APPROVED BY: JMM/TEJ

SUBMITTALS			
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0	02/02/18	ISSUED FOR CONSTRUCTION	JEB

SITE NUMBER:
CTHA603B
SITE NAME:
CTHA603B
SITE ADDRESS:
39 Nichols Road
East Haddam, CT 06469

SHEET TITLE
COMPOUND & ELEVATION PLAN

SHEET NUMBER
A-1

- EXISTING HIGHEST APPURTENANCE
ELEV.= 184'± AGL
- TOP MONOPOLE
ELEV.= 177'± AGL (SBA RECORD)
- EXISTING ANTENNAS (OTHERS)
ELEV.= 171'± AGL
- PROPOSED ANTENNAS TIP HEIGHT
ELEV.= 149'± AGL
- CL OF PROPOSED T-MOBILE ANTENNAS
ELEV.= 145'± AGL
(T-MOBILE RFDS & SBA COLLOCATION APP)
- PROPOSED BOTTOM ANTENNAS
ELEV.= 141'± AGL

FEEDLINE SCHEDULE A

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY

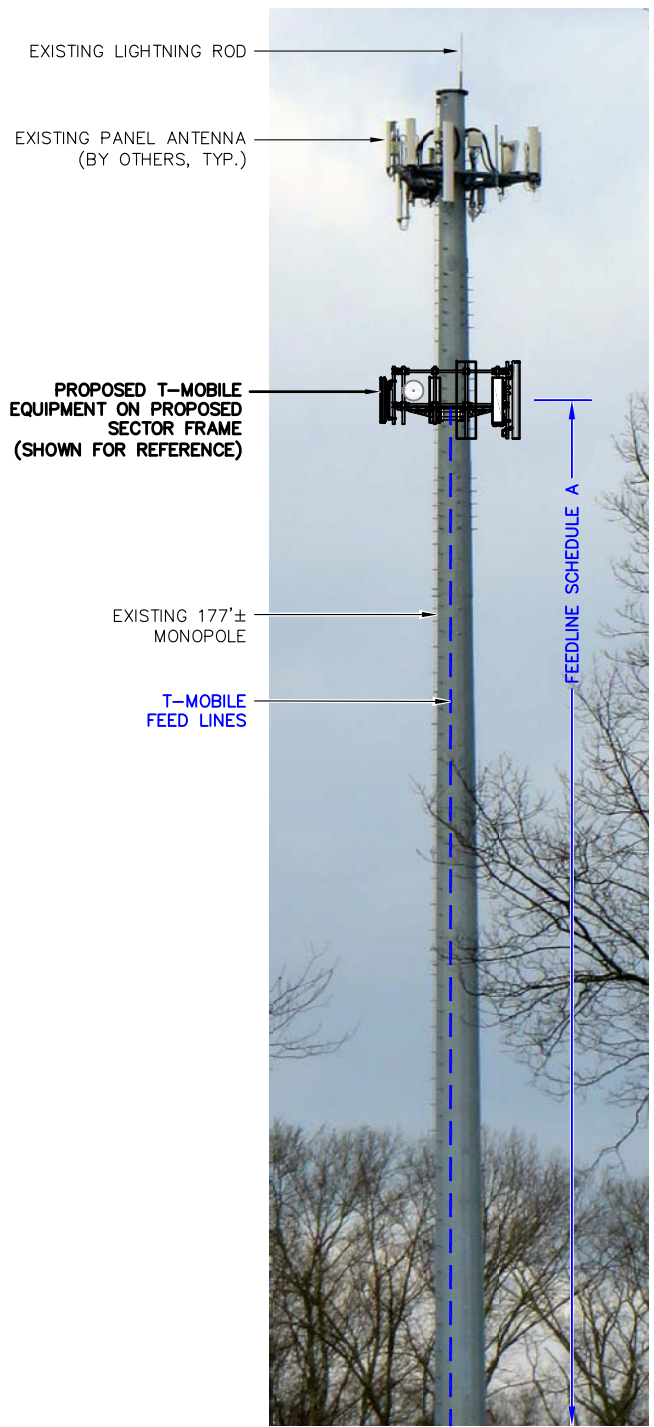


IMAGE SOURCE: PROTERRA 01/09/2018

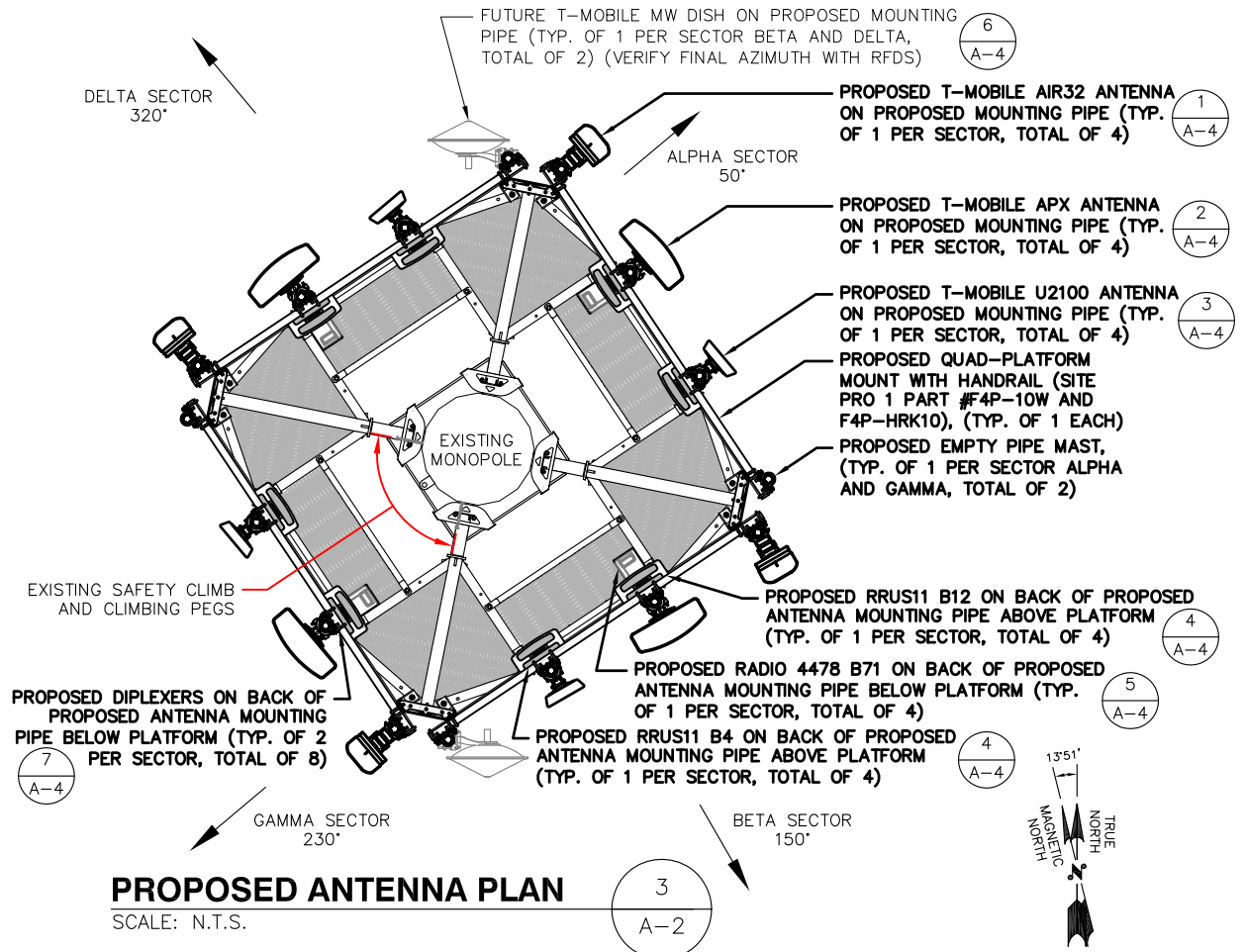
FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	PROPOSED: (4) HYBRID TO 145' RAD; (2) 1/2" COAX TO 145' RAD	UP MONOPOLE TOWER TO RAD

NOTE:
PROPOSED T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON COLOCATION APPLICATION. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.

TOWER ELEVATION PHOTO DETAIL

SCALE: N.T.S.

2
A-2



PROPOSED ANTENNA PLAN

SCALE: N.T.S.

3
A-2

SPECIAL CONSTRUCTION NOTE:
T-MOBILE WORK IS CONTINGENT ON THE FOLLOWING:
* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS.
* COMPLETION OF AN MOUNT STRUCTURAL ANALYSIS.
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED GLOBAL AND MOUNT ANALYSIS.

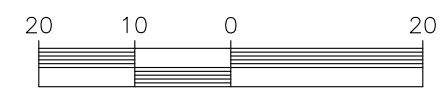
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

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.

ELEVATION DETAIL

SCALE: 1"=20' (11"x17")
1"=10' (22"x34")

1
A-2



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Hadley, MA 01035 Ph: (413) 320-4918

STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER
7-2-18

CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

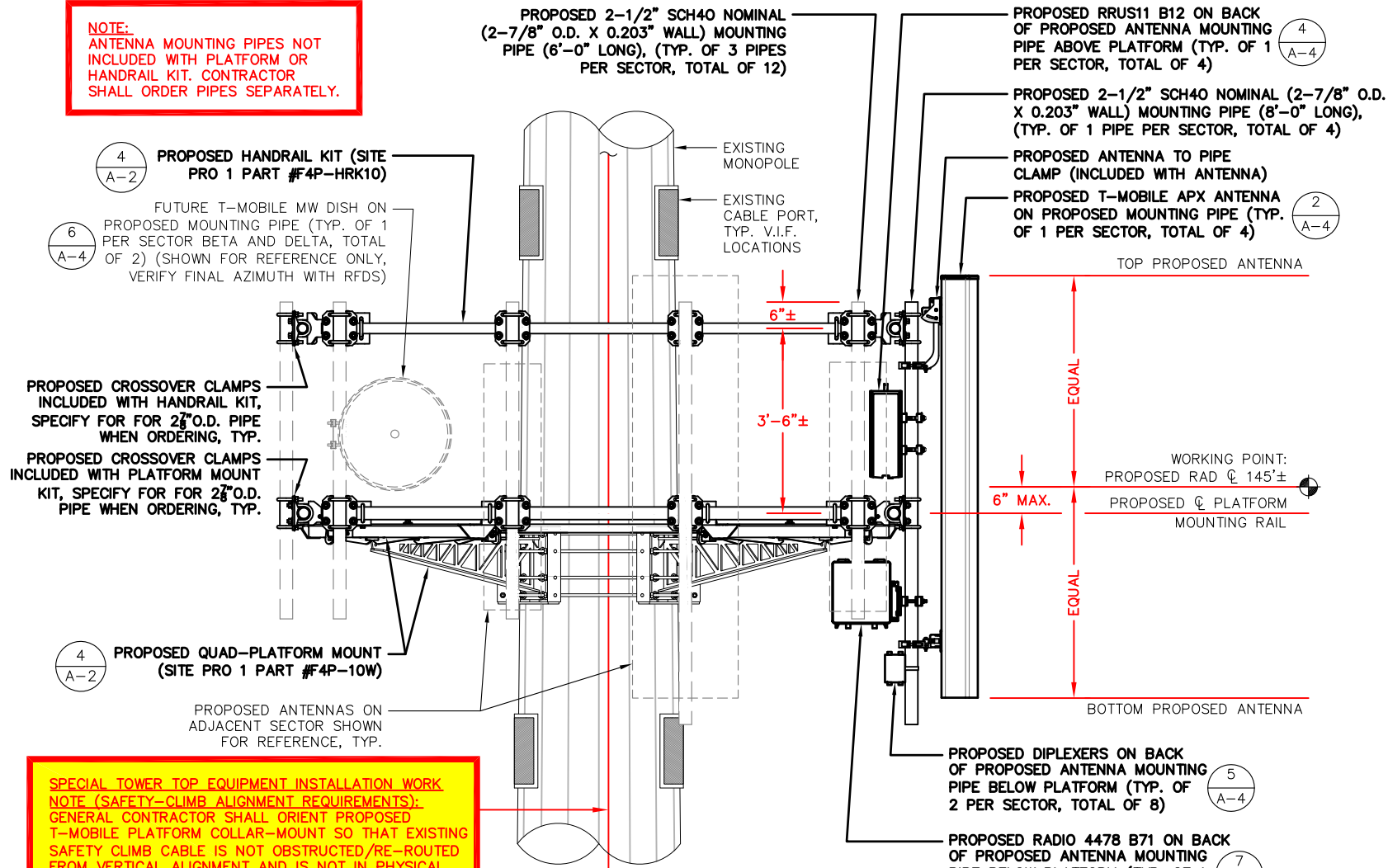
REV.	DATE	DESCRIPTION	BY
0	02/02/18	ISSUED FOR CONSTRUCTION	JEB

SITE NUMBER:
CTHA603B
SITE NAME:
CTHA603B
SITE ADDRESS:
39 Nichols Road
East Haddam, CT 06469

SHEET TITLE
ELEVATIONS AND
PROPOSED ANTENNA
PLAN

SHEET NUMBER
A-2

NOTE:
ANTENNA MOUNTING PIPES NOT INCLUDED WITH PLATFORM OR HANDRAIL KIT. CONTRACTOR SHALL ORDER PIPES SEPARATELY.



PROPOSED APX ANTENNA AND PLATFORM MOUNTING DETAIL

SCALE: N.T.S.

SPECIAL TOWER TOP EQUIPMENT INSTALLATION WORK NOTE (SAFETY-CLIMB ALIGNMENT REQUIREMENTS):
GENERAL CONTRACTOR SHALL ORIENT PROPOSED T-MOBILE PLATFORM COLLAR-MOUNT SO THAT EXISTING SAFETY CLIMB CABLE IS NOT OBSTRUCTED/RE-ROUTED FROM VERTICAL ALIGNMENT AND IS NOT IN PHYSICAL CONTACT WITH PROPOSED COLLAR-MOUNT HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY-CLIMB CABLE GUIDES IF ADDITIONAL CLEARANCE IS REQUIRED. ADDITIONAL CABLE GUIDES SHALL BE ATTACHED SECURELY TO THE POLE USING MECHANICAL FASTENERS OR FIELD WELDED BY A CERTIFIED WELDING TECHNICIAN.

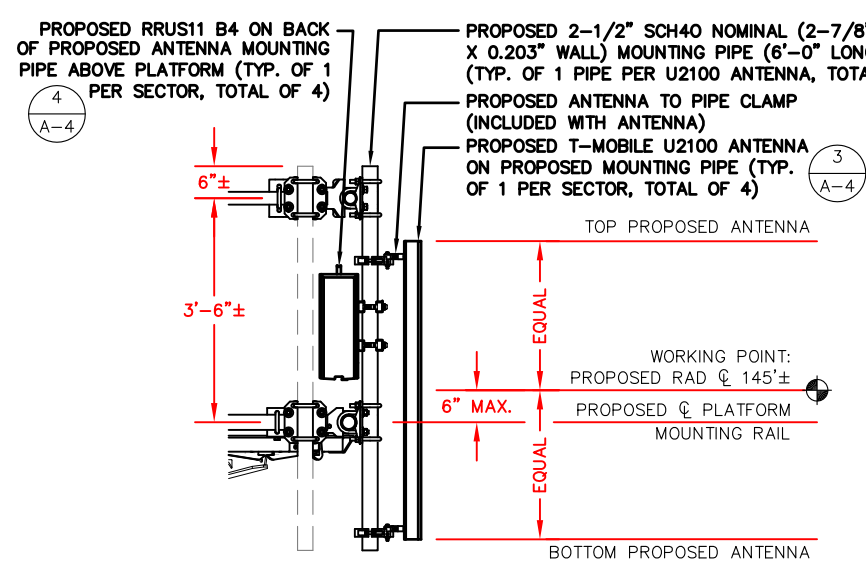
SPECIAL CONSTRUCTION NOTE:
T-MOBILE WORK IS CONTINGENT ON THE FOLLOWING:
* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS.
* COMPLETION OF AN MOUNT STRUCTURAL ANALYSIS.
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED GLOBAL AND MOUNT ANALYSIS.

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

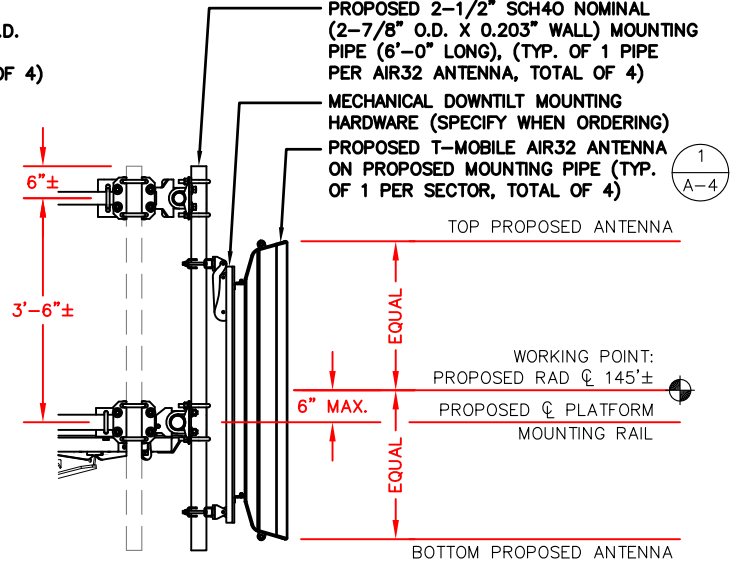


IMAGE SOURCE: PROTERRA 01/09/2018
NOTE: ONE SECTOR SHOWN FOR CLARITY



PROPOSED U2100 ANTENNA MOUNTING DETAIL

SCALE: N.T.S.



PROPOSED AIR32 ANTENNA MOUNTING DETAIL

SCALE: N.T.S.

- 3 A-4 PROPOSED T-MOBILE U2100 ANTENNA ON PROPOSED MOUNTING PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 4)
- 2 A-4 PROPOSED T-MOBILE APX ANTENNA ON PROPOSED MOUNTING PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 4)
- 4 A-4 PROPOSED RRUS11 B12 ON BACK OF PROPOSED ANTENNA MOUNTING PIPE ABOVE PLATFORM (TYP. OF 1 PER SECTOR, TOTAL OF 4)
- 1 A-4 PROPOSED T-MOBILE AIR32 ANTENNA ON PROPOSED MOUNTING PIPE (TYP. OF 1 PER SECTOR, TOTAL OF 4)
- 4 A-2 PROPOSED HANDRAIL KIT (SITE PRO 1 PART #F4P-HRK10)
- 6 A-4 FUTURE T-MOBILE MW DISH ON PROPOSED MOUNTING PIPE (TYP. OF 1 PER SECTOR BETA AND DELTA, TOTAL OF 2) (SHOWN FOR REFERENCE ONLY, VERIFY FINAL AZIMUTH WITH RFDS)
- 4 A-2 PROPOSED QUAD-PLATFORM MOUNT (SITE PRO 1 PART #F4P-10W)
- 4 A-4 PROPOSED RRUS11 B4 ON BACK OF PROPOSED ANTENNA MOUNTING PIPE ABOVE PLATFORM (TYP. OF 1 PER SECTOR, TOTAL OF 4)
- 5 A-4 PROPOSED RADIO 4478 B71 ON BACK OF PROPOSED ANTENNA MOUNTING PIPE BELOW PLATFORM (TYP. OF 1 PER SECTOR, TOTAL OF 4)
- 7 A-4 PROPOSED DIPLEXERS ON BACK OF PROPOSED ANTENNA MOUNTING PIPE BELOW PLATFORM (TYP. OF 2 PER SECTOR, TOTAL OF 8)

ANTENNA PHOTO DETAIL

SCALE: N.T.S.

T-Mobile
T-MOBILE NORTHEAST LLC
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BLOOMFIELD, CT 06002
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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
PROFESSIONAL ENGINEER
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CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

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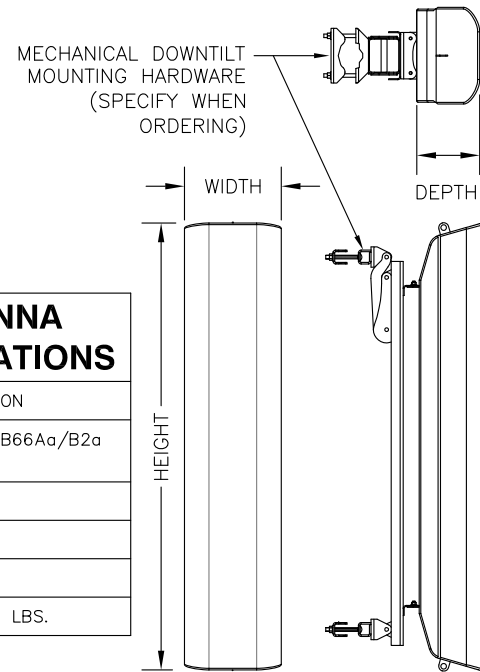
SITE NUMBER:
CTHA603B
SITE NAME:
CTHA603B
SITE ADDRESS:
39 Nichols Road
East Haddam, CT 06469

SHEET TITLE
ANTENNA MOUNTING DETAILS

SHEET NUMBER
A-3

AIR ANTENNA SPECIFICATIONS

MANUF.	ERICSSON
MODEL #	AIR32 B66Aa/B2a (Octa)
HEIGHT	56.6"
WIDTH	12.9"
DEPTH	8.7"
WEIGHT	132.2± LBS.



AIR32 ANTENNA DETAIL

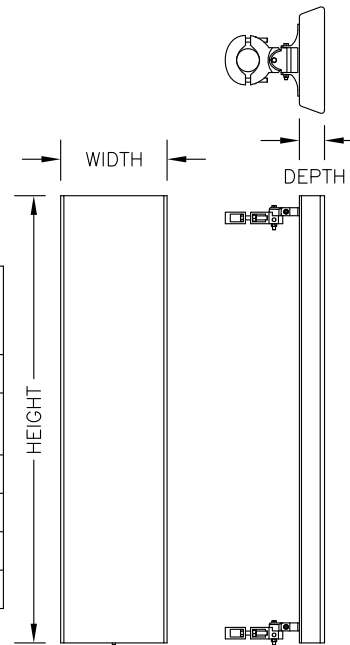
SCALE: N.T.S.

1

A-4

U2100 ANTENNA SPECIFICATIONS

MANUF.	RFS
MODEL #	APX16DWV-16DWV-S-E-A20 (Quad)
HEIGHT	55.9"
WIDTH	13"
DEPTH	3.15"
WEIGHT	40.7± LBS.



U2100 ANTENNA DETAIL

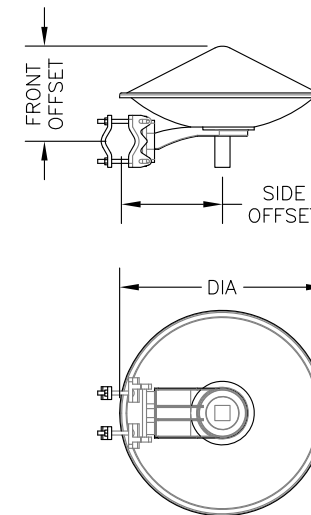
SCALE: N.T.S.

3

A-4

DISH ANTENNA SPECIFICATIONS

MANUF.	RADIO WAVES
MODEL #	SP2-5.2
DIA.	25.7"
FRONT OFFSET	11.9"
SIDE OFFSET	13.3"
WEIGHT	22± LBS.



SP2-5.2 DISH ANTENNA DETAIL

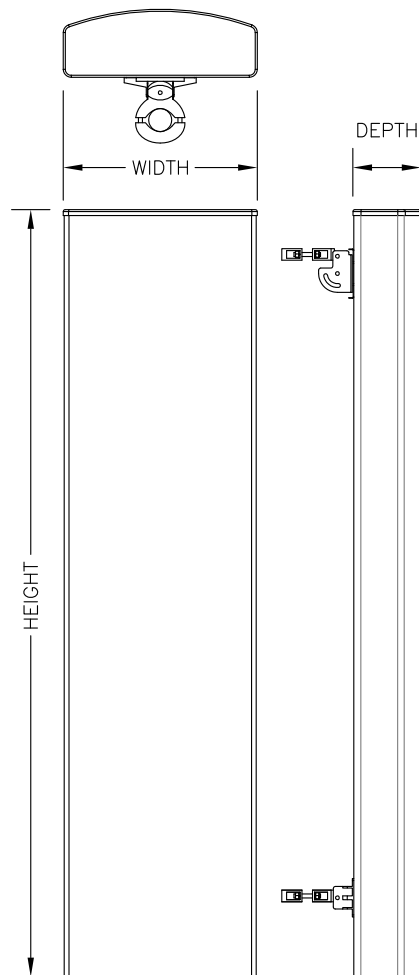
SCALE: N.T.S.

6

A-4

APX ANTENNA SPECIFICATIONS

MANUF.	ANDREW
MODEL #	APXVAA24_43-U-A20
HEIGHT	95.9"
WIDTH	24.0"
DEPTH	8.5"
WEIGHT	124.3± LBS.



APX ANTENNA DETAIL

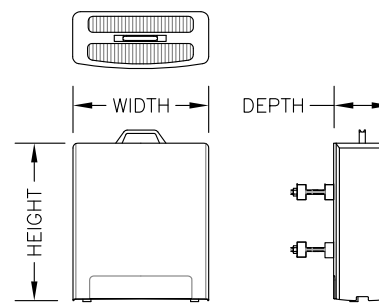
SCALE: N.T.S.

2

A-4

RRUS11 SPECIFICATIONS

MANUF.	ERICSSON
MODEL #	RRUS11 B4 & B12
HEIGHT	20.7"
WIDTH	17"
DEPTH	7"
WEIGHT	50.7± LBS.



RRU DETAIL

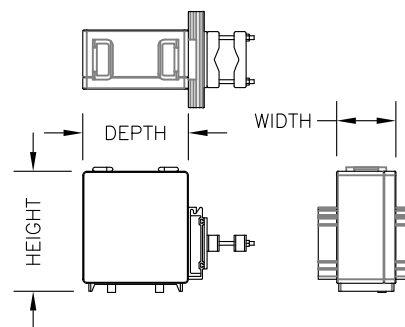
SCALE: N.T.S.

4

A-4

4478 SPECIFICATIONS

MANUF.	ERICSSON
MODEL #	4478
HEIGHT	15"
WIDTH	7.4"
DEPTH	13.2"
WEIGHT	60± LBS.



RRU DETAIL

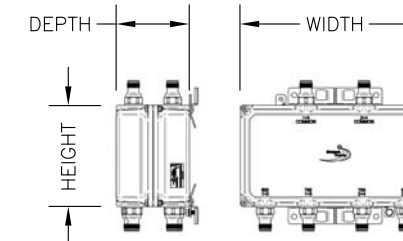
SCALE: N.T.S.

5

A-4

DIPLEXER SPECIFICATIONS

MANUF.	MICRODATA TELECOM
MODEL #	MI-5544nn
HEIGHT	6.3"
WIDTH	11.81"
DEPTH	4.57"
WEIGHT	12± LBS.



DIPLEXER DETAIL

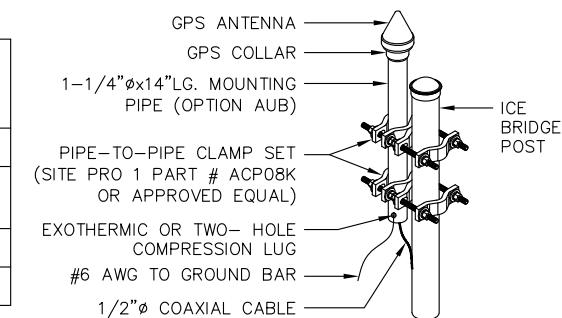
SCALE: N.T.S.

7

A-4

GPS ANTENNA

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



GPS DETAIL

SCALE: N.T.S.

8

A-4



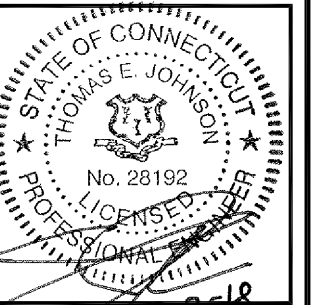
T-MOBILE NORTHEAST LLC
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SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
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SITE NAME:
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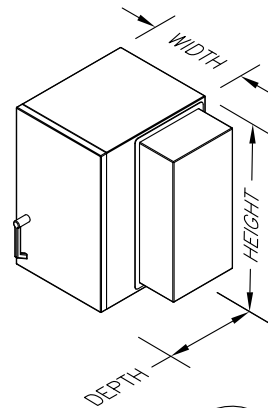
SITE ADDRESS:
39 Nichols Road
East Haddam, CT 06469

SHEET TITLE
DETAILS

SHEET NUMBER
A-4

SSC SPECIFICATIONS

MANUF.	PURCELL
MODEL #	RAC24
HEIGHT	24.0" (37.1" WITH PLINTH)
WIDTH	25.4"
DEPTH	20.0"
WEIGHT	85± LBS. (EMPTY) 388± LBS. (MAX.)



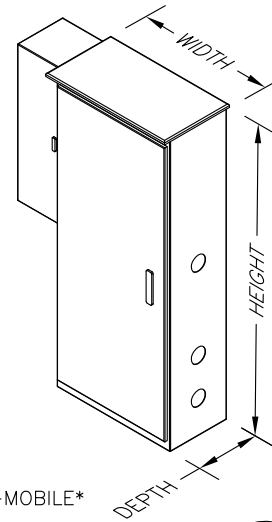
SITE SUPPORT CABINET (SSC)

SCALE: N.T.S.

1
A-5

PPC SPECIFICATIONS

MANUF.	DELTA
MODEL #	3799340400
HEIGHT	40"
WIDTH	20"
DEPTH	10"
WEIGHT	75± LBS.



POWER PROTECTION CABINET (PPC)

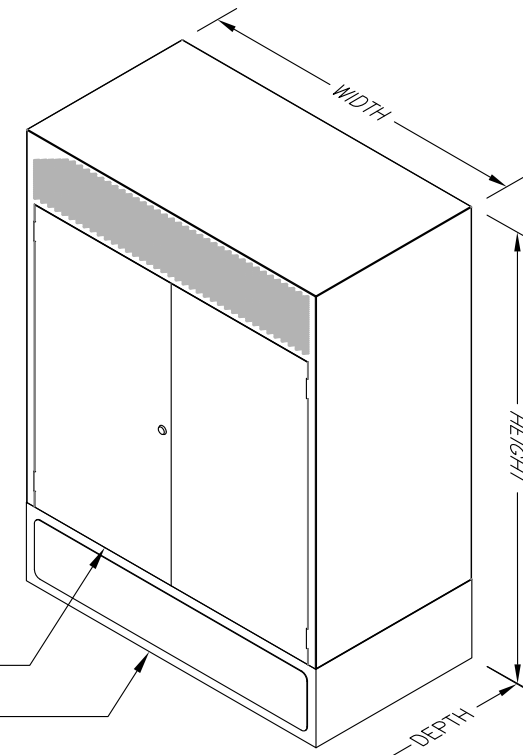
SCALE: N.T.S.

2
A-5

TO BE PROVIDED BY T-MOBILE

RBS SPECIFICATIONS

MANUF.	ERICSSON
MODEL #	RBS 6102
HEIGHT	57.1"
WIDTH	51.2"
DEPTH	27.6"
WEIGHT	728± LBS. W/O BATTERIES
MAX WEIGHT	1850LBS



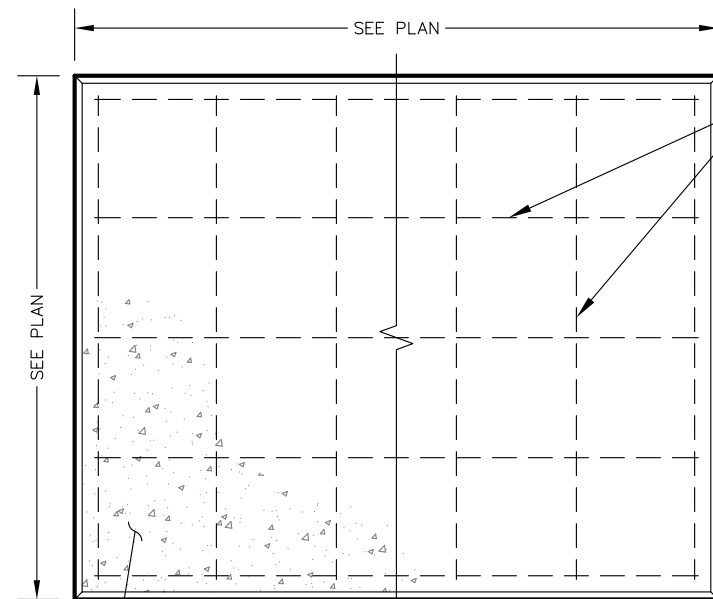
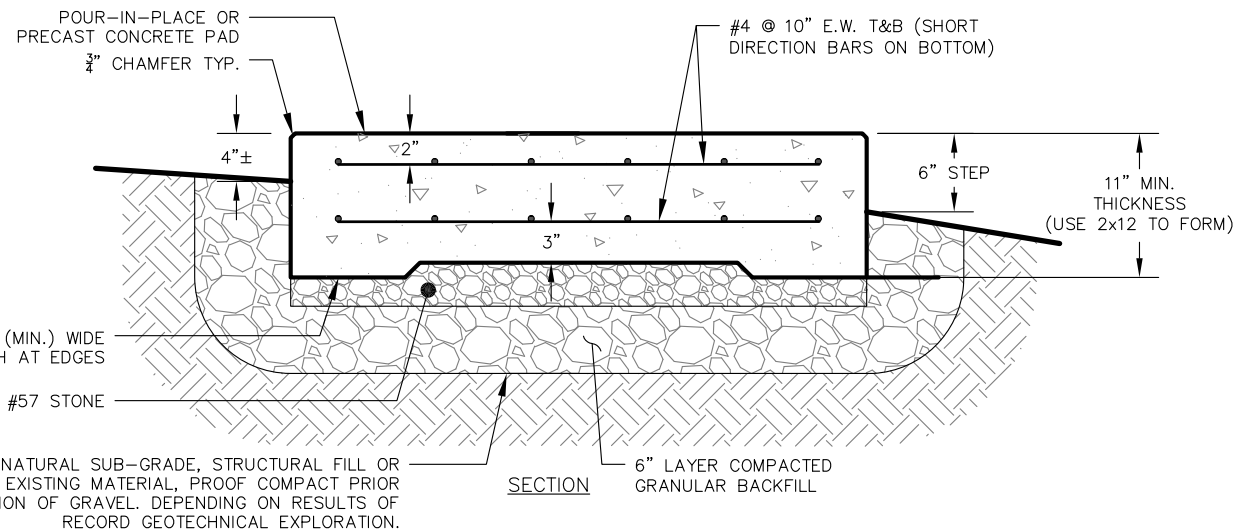
ATTACH RBS CABINET TO BASE FRAME PER MANUFACTURER'S GUIDELINES

RBS BASE FRAME (DIMENSIONS TBD). ANCHOR TO CONCRETE PAD WITH HILTI HDI 1/2" SS 303 DROP-IN ANCHORS (TYP. OF 8) OR EQUAL PER MANUFACTURER'S GUIDELINES

RBS 6102

SCALE: N.T.S.

3
A-5



CONCRETE PAD

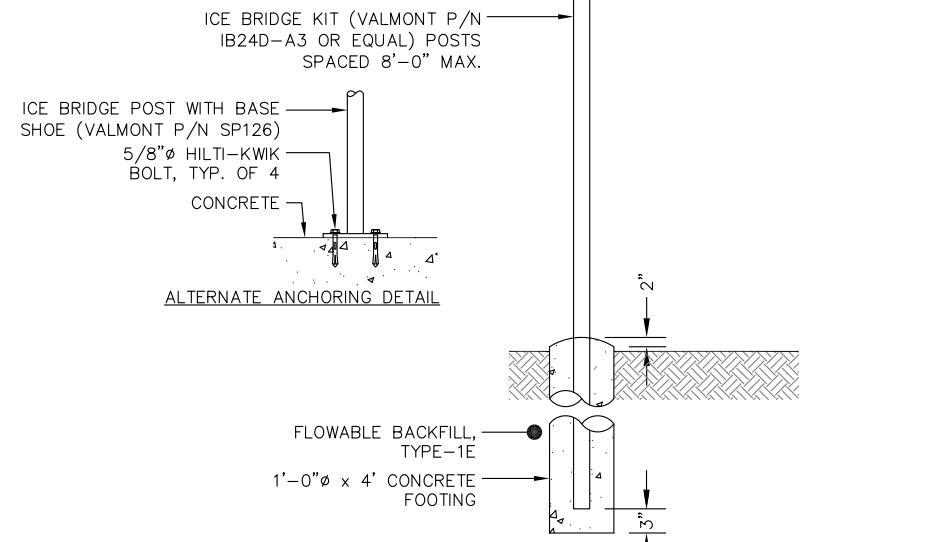
SCALE: N.T.S.

4
A-5

NOTES:

1. BEARING STRATA MEDIUM TO DENSE INSET GRANULAR MATERIAL OR COMPACTED FILL. 95% COMPACTION.
2. SUBGRADE AND FILL SHALL CONSIST OF CLEAN SOIL. NO DELETERIOUS MATERIALS OR ORGANICS TO BE USED.
3. CONCRETE FORM WORK SHALL BE CONSTRUCTED USING MINIMUM 2"x8" NOMINAL SIZE LUMBER. STRIP AND REMOVE UPON COMPLETION.
4. CONCRETE SHALL HAVE 4000PSI 28-DAY COMPRESSIVE STRENGTH WITH 5(±1)% AIR ENTRAINMENT, 4(±1)" SLUMP AND BRISTLE BROOM FINISH.
5. SEE CONCRETE NOTES ON GN-1.

1. ALL COMPONENTS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
2. CONTRACTOR SHALL DETERMINE REQUIRED QUANTITY OF ALL ICE BRIDGE COMPONENTS
3. SNAP-IN HANGERS, SPLICE KITS, HINGE KITS, EXTENSION KITS, STIFFENERS, AND OTHER MISCELLANEOUS HARDWARE SHALL BE PROVIDED BY THE CONTRACTOR AS REQUIRED.
4. ICE BRIDGE SHALL BE ROUTED TO ACCOMMODATE THE MINIMUM BENDING RADIUS OF THE COAXIAL CABLE.
5. ICE BRIDGE COMPONENTS SHOWN ARE SCHEMATIC. CONSULT MANUFACTURER FOR EXACT AND CURRENT SPECIFICATIONS.



ICE BRIDGE

SCALE: N.T.S.

5
A-5



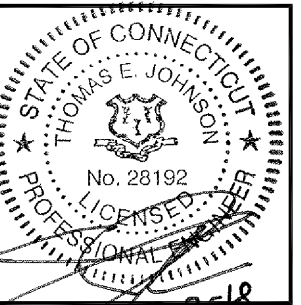
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116



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Hadley, MA 01035 Ph: (413)320-4918



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SUBMITTALS

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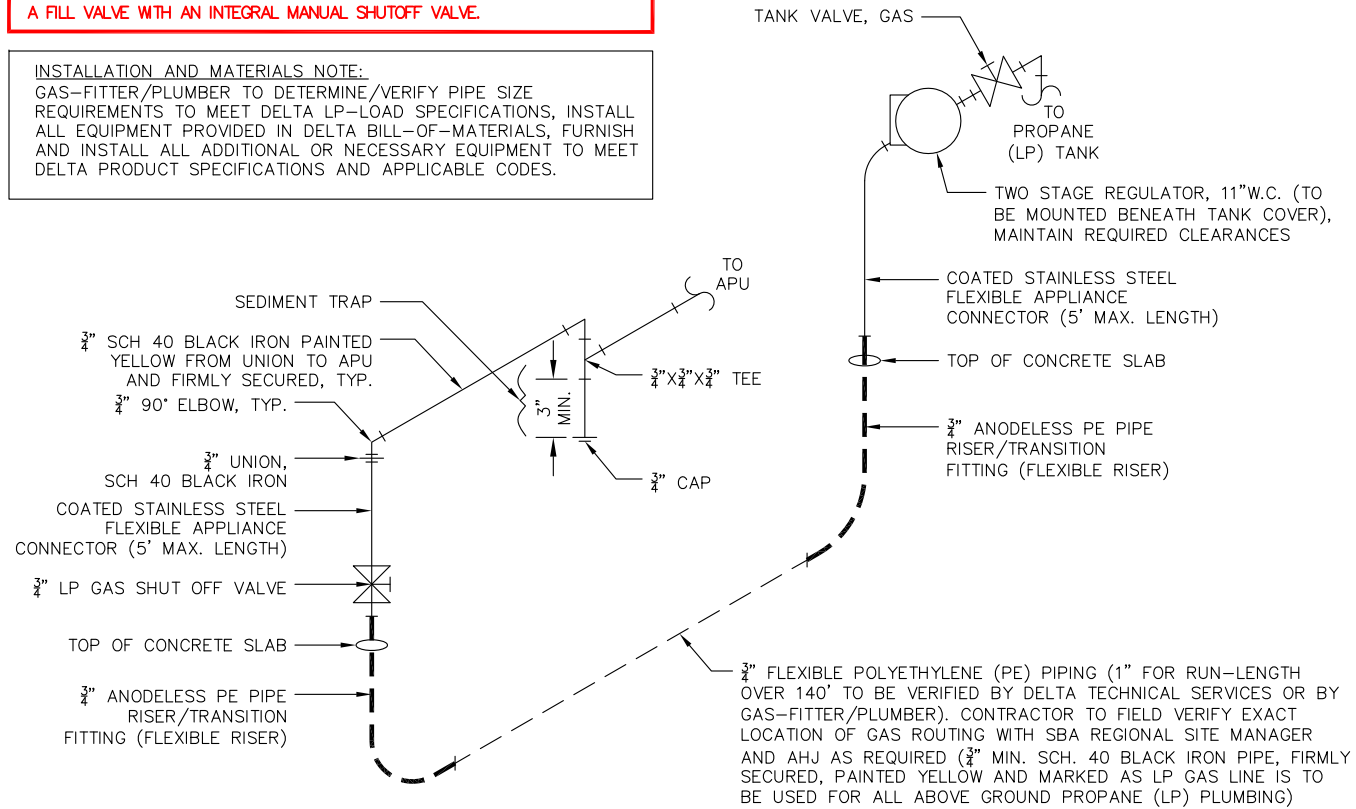
SITE NUMBER:
CTHA603B
SITE NAME:
CTHA603B
SITE ADDRESS:
39 Nichols Road
East Haddam, CT 06469

SHEET TITLE
DETAILS

SHEET NUMBER
A-5

SAFETY ZONE REDUCTION NOTE:
 REDUCTION TO A 5' RADIUS SAFETY ZONE FROM IGNITION SOURCE REQUIRES CONFORMANCE WITH NFPA-58 2011, SECTION 11.15.2.3 WHICH ALLOWS REDUCTION ONLY FOR CONTAINERS FOR STATIONARY ENGINES INSTALLED WITH A FILL VALVE WITH AN INTEGRAL MANUAL SHUTOFF VALVE.

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.



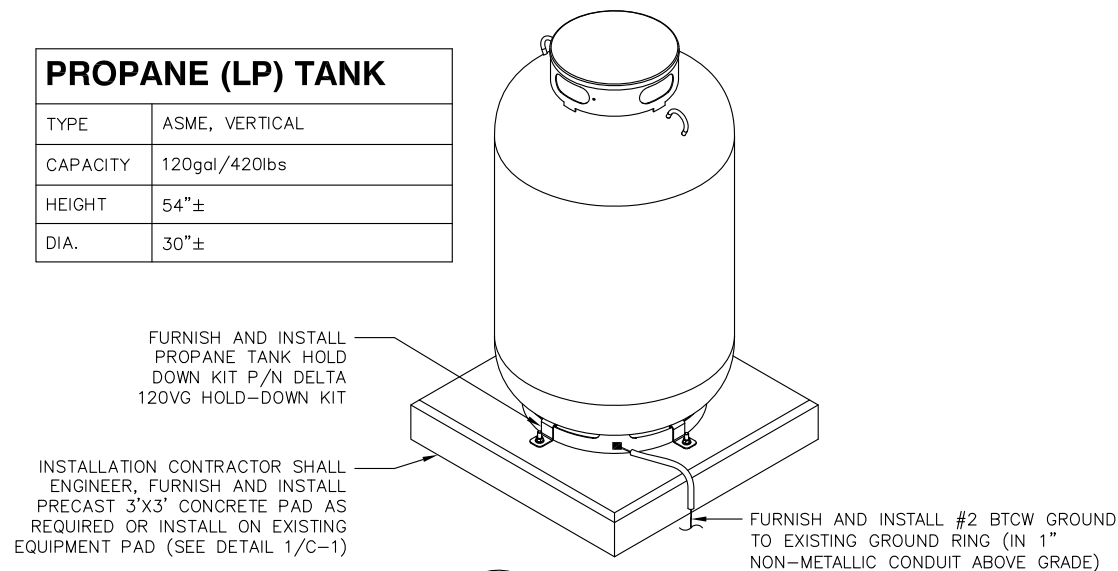
ISOMETRIC PIPING DIAGRAM

SCALE: N.T.S.

1
A-6

PROPANE (LP) TANK

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



PROPANE (LP) TANK

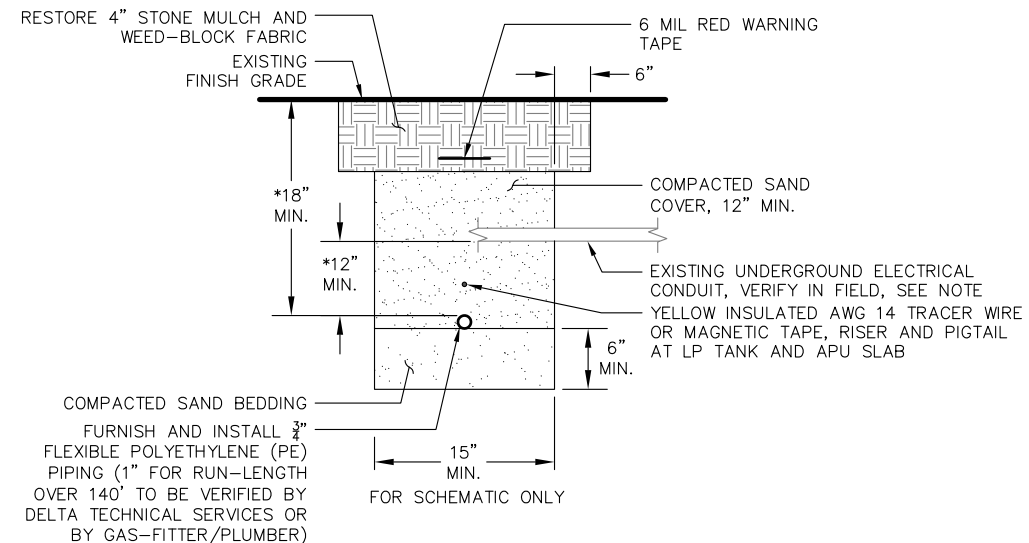
SCALE: N.T.S.

3
A-6

1,2
G-1

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.



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. A MINIMUM SEPARATION OF 12" HORIZONTALLY IS TO BE MAINTAINED WHENEVER RUNNING PARALLEL TO OTHER BURIED UTILITIES AND CONDUITS.
5. 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 (LP) GAS PIPE TRENCH DETAIL

SCALE: N.T.S.

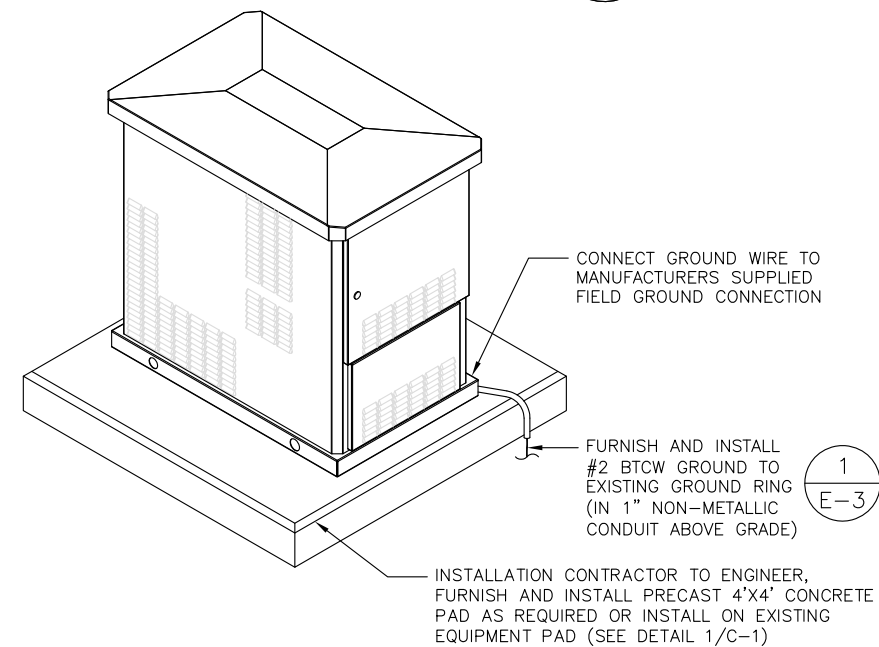
2
A-6

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)

SCALE: N.T.S.

4
A-6

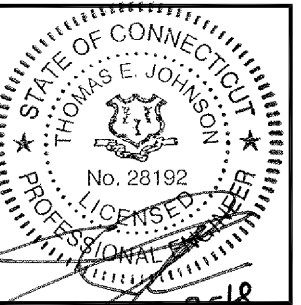
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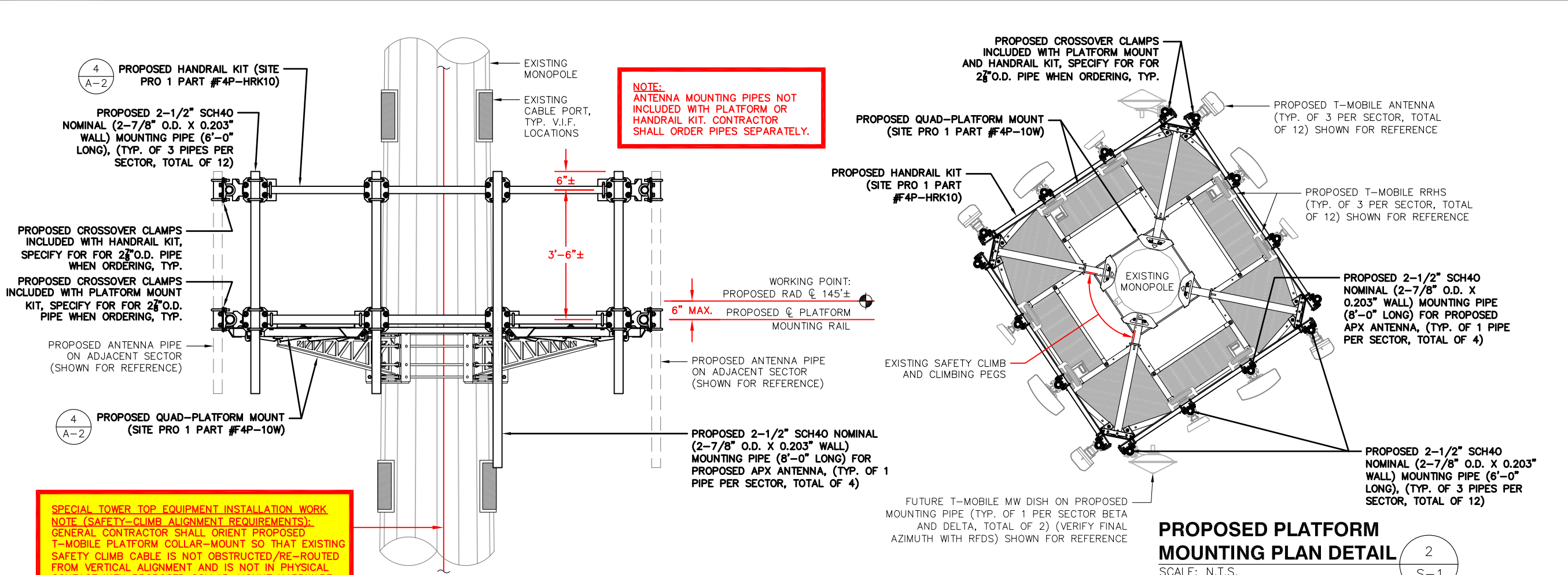
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 East Haddam, CT 06469**

SHEET TITLE
DETAILS

SHEET NUMBER
A-6

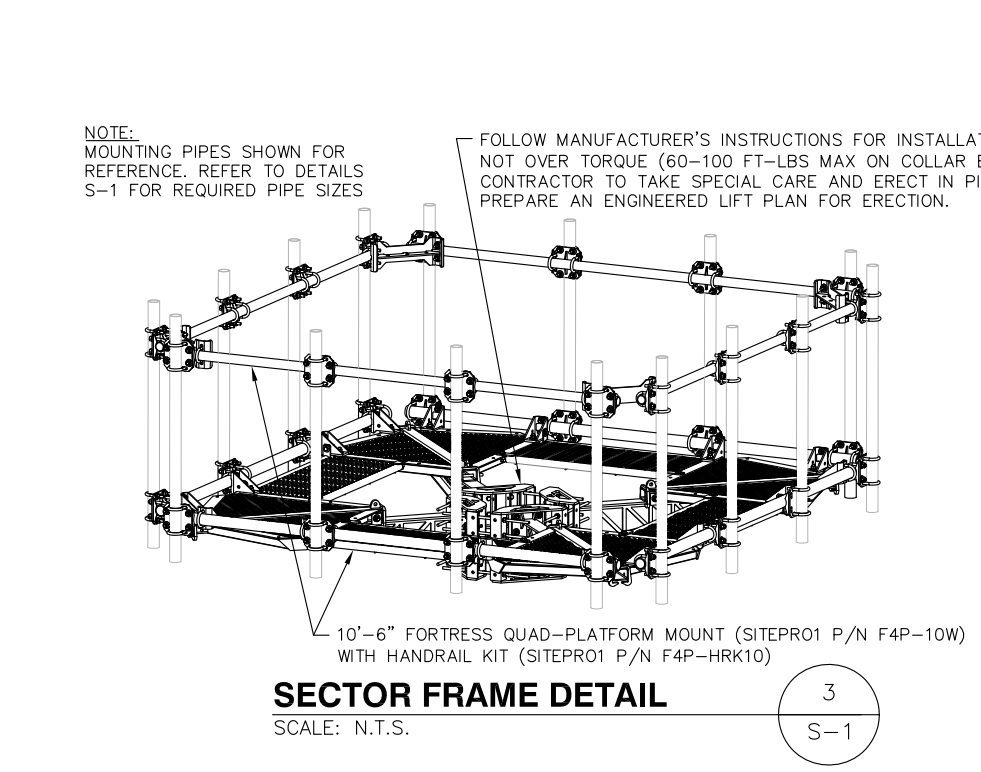


PROPOSED PLATFORM MOUNTING PLAN DETAIL
SCALE: N.T.S.

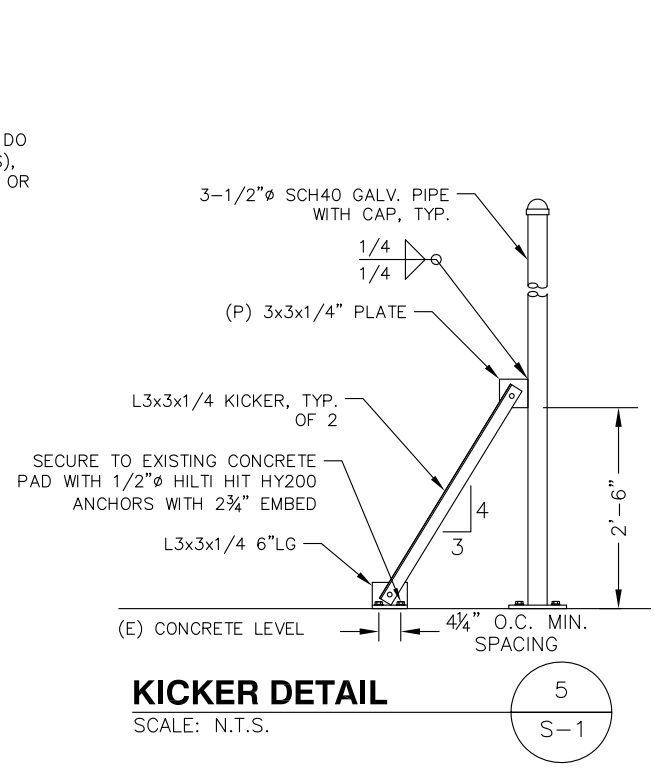


PROPOSED PLATFORM MOUNTING DETAIL
SCALE: N.T.S.

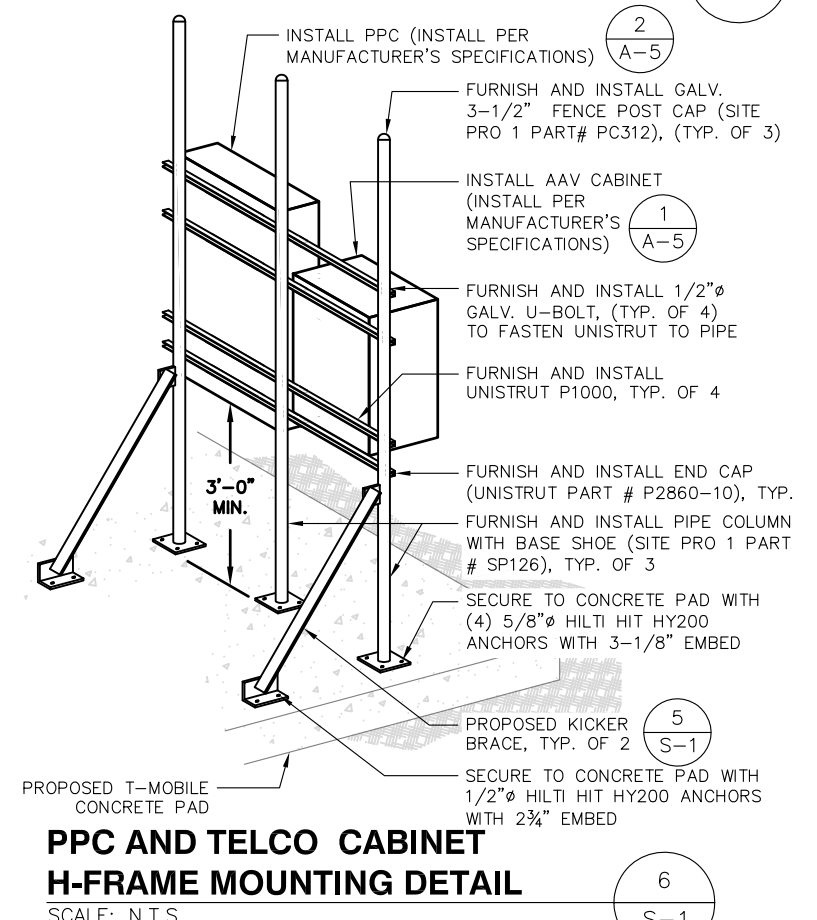
SPECIAL TOWER TOP EQUIPMENT INSTALLATION WORK NOTE (SAFETY-CLIMB ALIGNMENT REQUIREMENTS):
GENERAL CONTRACTOR SHALL ORIENT PROPOSED T-MOBILE PLATFORM COLLAR-MOUNT SO THAT EXISTING SAFETY CLIMB CABLE IS NOT OBSTRUCTED/RE-ROUTED FROM VERTICAL ALIGNMENT AND IS NOT IN PHYSICAL CONTACT WITH PROPOSED COLLAR-MOUNT HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY-CLIMB CABLE GUIDES IF ADDITIONAL CLEARANCE IS REQUIRED. ADDITIONAL CABLE GUIDES SHALL BE ATTACHED SECURELY TO THE POLE USING MECHANICAL FASTENERS OR FIELD WELDED BY A CERTIFIED WELDING TECHNICIAN.



SECTOR FRAME DETAIL
SCALE: N.T.S.



KICKER DETAIL
SCALE: N.T.S.

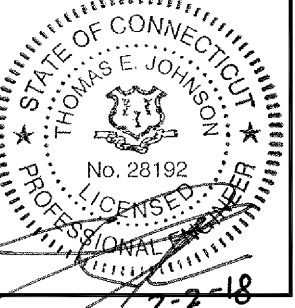


PPC AND TELCO CABINET H-FRAME MOUNTING DETAIL
SCALE: N.T.S.

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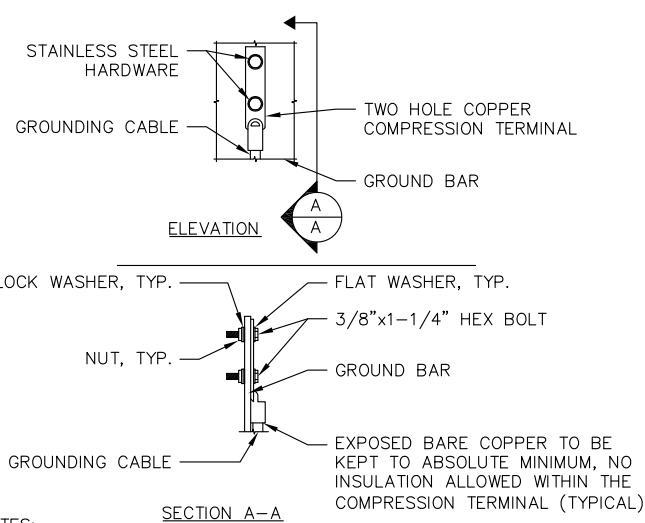
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APPROVED BY: JMM/TEJ

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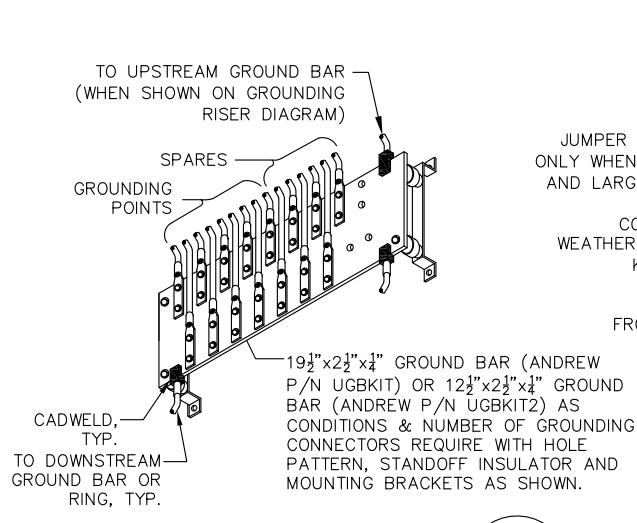
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STRUCTURAL DETAILS

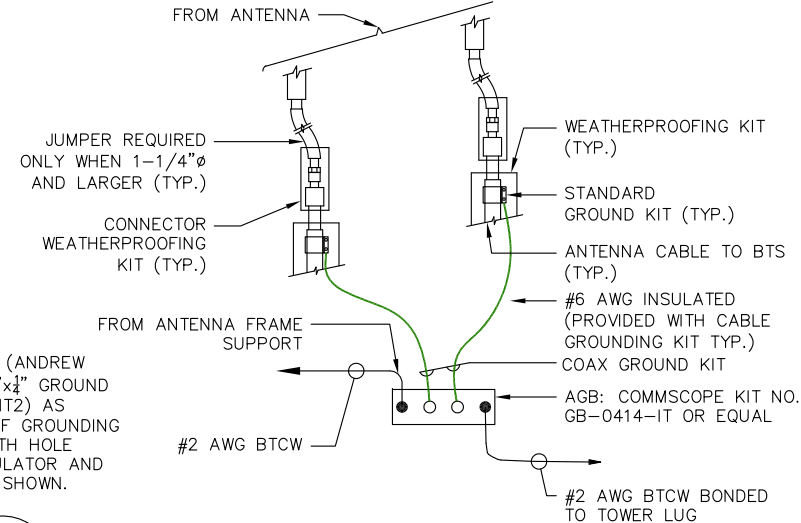
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S-1



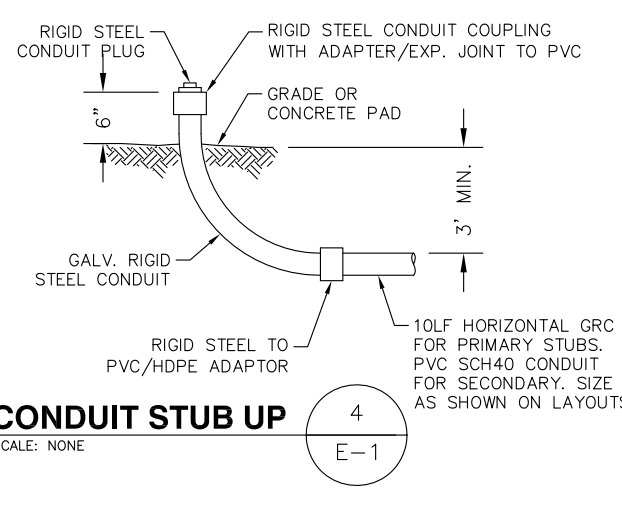
- NOTES:
 1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
 2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
 3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.



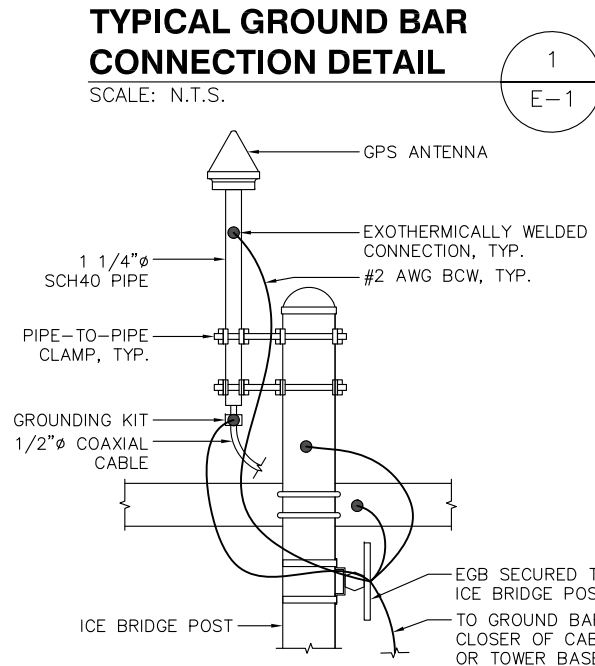
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E-1



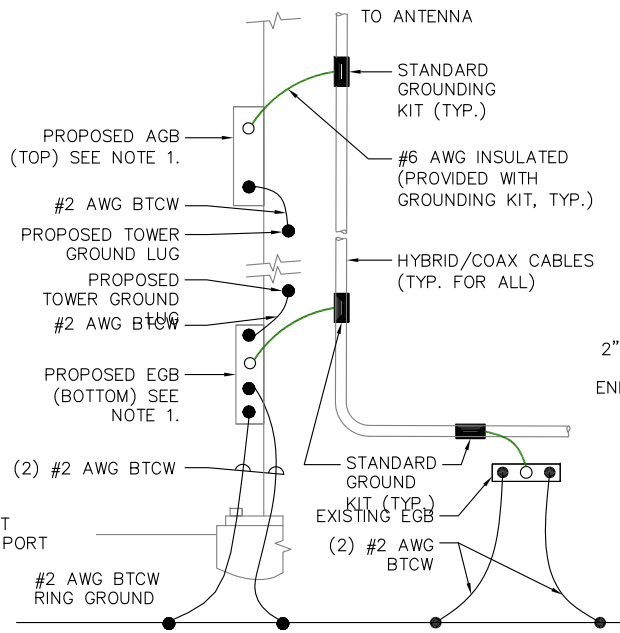
3
E-1



4
E-1

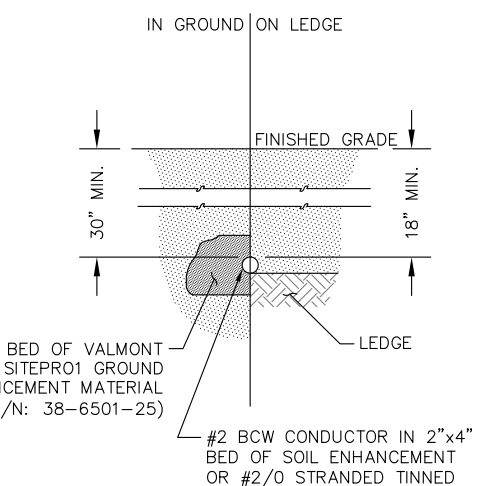


5
E-1

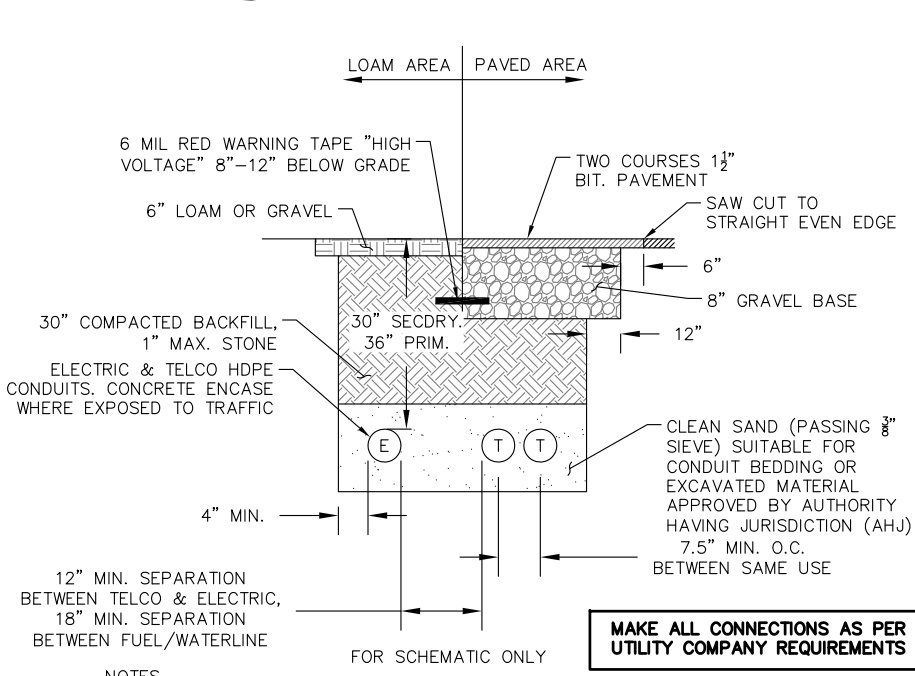


- NOTE:
 1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE ADDITIONAL AGB/EGB AS REQUIRED.
 2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

6
E-1



7
E-1



- NOTES:
 1. MAKE ALL CONNECTIONS AS PER UTILITY COMPANY REQUIREMENTS.
 2. VERIFY CONDUIT SIZE WITH UTILITY COMPANY.
 3. CONTRACTOR SHALL FURNISH AND INSTALL AN APPROVED 2,500 POUND TEST TAPE IN EACH PRIMARY CONDUIT RUN OR PER UTILITY COMPANY REQUIREMENTS.

8
E-1

ELECTRICAL LEGEND

A	AMPERE		
V	VOLT		
KWH	KILOWATT - HOUR		
C	CONDUIT		
GRC	GALVANIZED RIGID CONDUIT		
BTCW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)		
G	GROUND		
⊕	GROUND		
MGB	MASTER GROUND BAR	○	MECHANICAL CONNECTION
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR	●	CADWELD CONNECTION
—	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		
○	EXOTHERMIC (CAD WELD) OR MECHANICAL (COMPRESSION TYPE) CONNECTION		
PPC	POWER PROTECTION CABINET		
⊗	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL		

ELECTRICAL & GROUNDING NOTES:

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) 2014 AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION AS REQUIRED BY NEC.
- 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.
- RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- GROUNDING SHALL COMPLY WITH NEC ART. 250.
- GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
- ALL GROUND CONNECTIONS TO BE BURNDY HYGROND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
- CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LYGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
- BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
- BOND ANTENNA EGB'S AND MGB TO WATER MAIN/GROUND RING.
- TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
- VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

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STATE OF CONNECTICUT
 THOMAS E. JOHNSON
 No. 28192
 LICENSED PROFESSIONAL ENGINEER
 7-2-18

CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

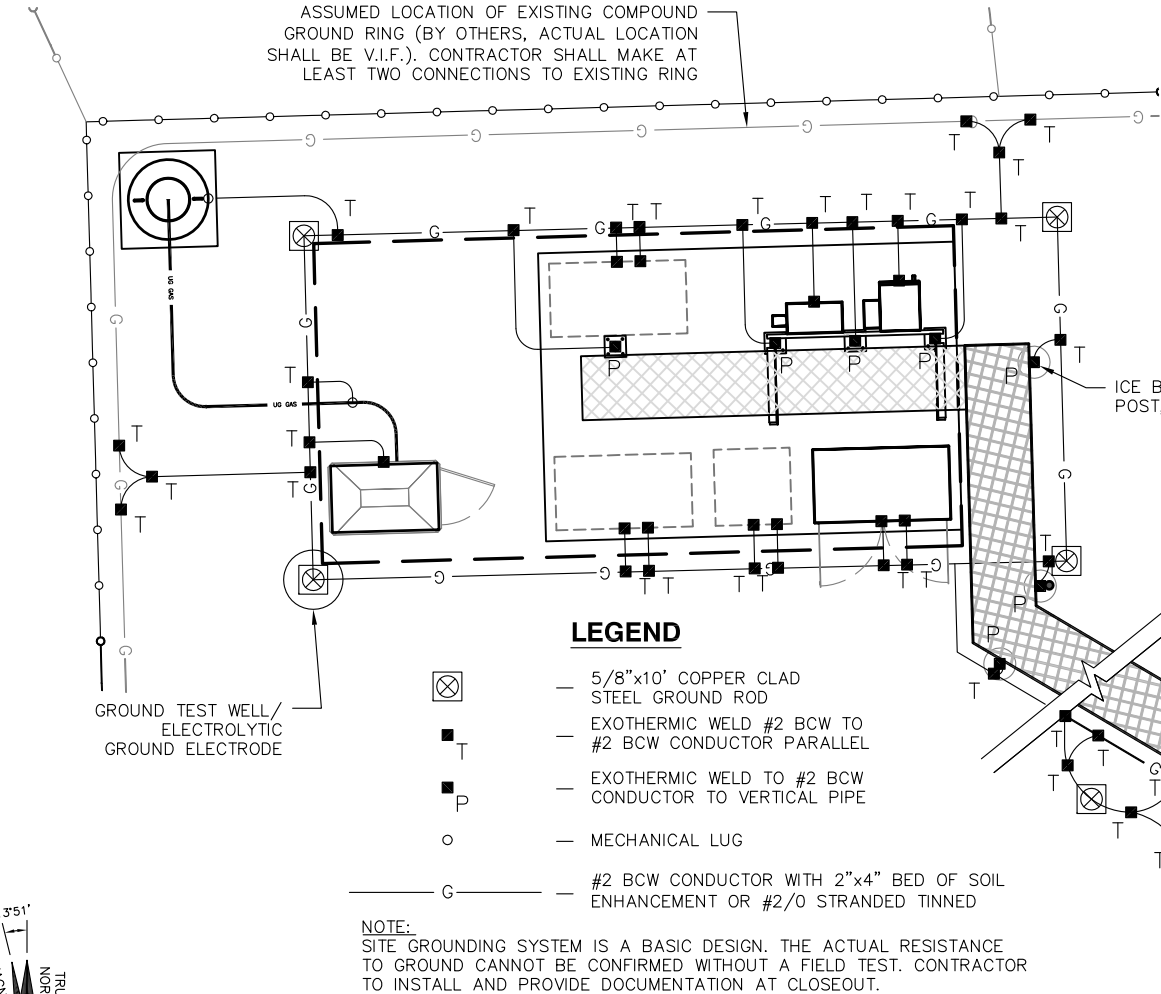
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ELECTRICAL & GROUNDING DETAILS

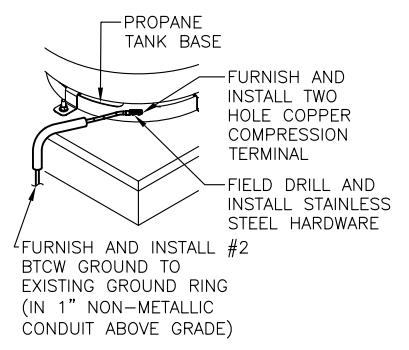
SHEET NUMBER
E-1



GROUND EQUIPMENT GROUNDING SCHEMATIC

SCALE: 1"=6' (11"x17")
1"=3' (22"x34")

1
E-2

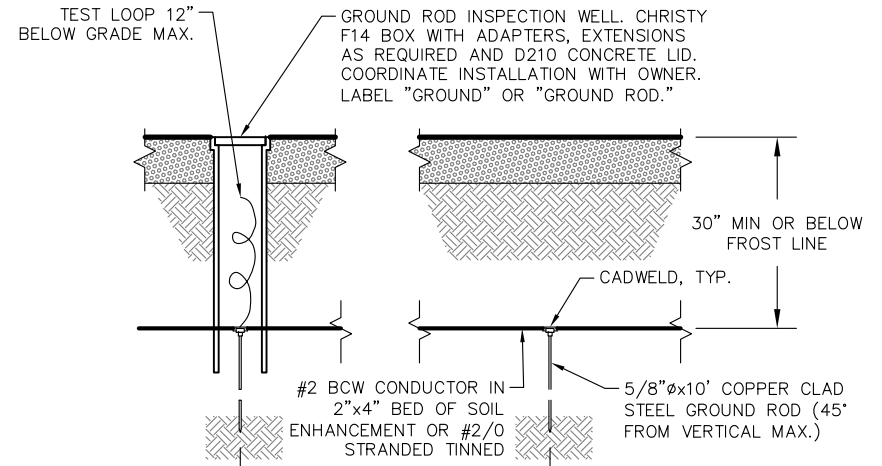


NOTE: CONNECTION AREA IS TO HAVE PAINT REMOVED. AREA IS TO BE COLD GALV. COATED AFTER INSTALLATION OF MECHANICAL LUG.

PROPANE (LP) TANK GROUNDING DETAIL

SCALE: N.T.S.

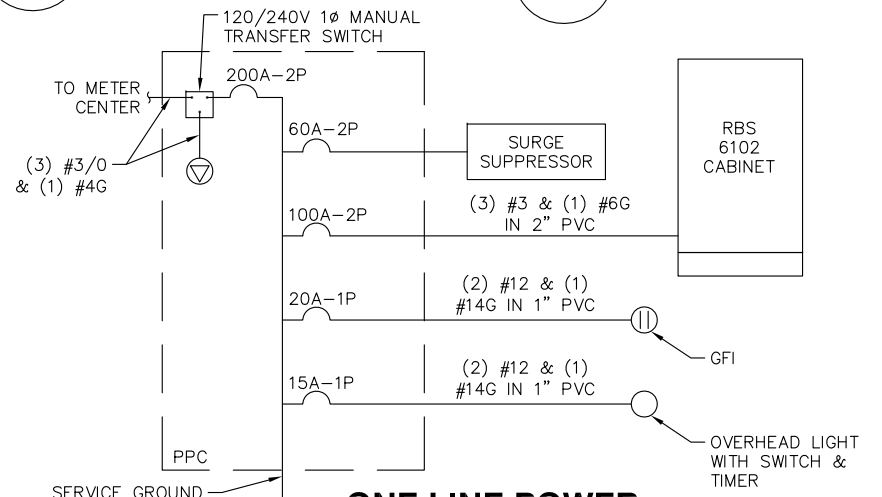
2
E-2



GROUND ROD

SCALE: NONE

3
E-2



ONE LINE POWER SCHEMATIC

SCALE: N.T.S.

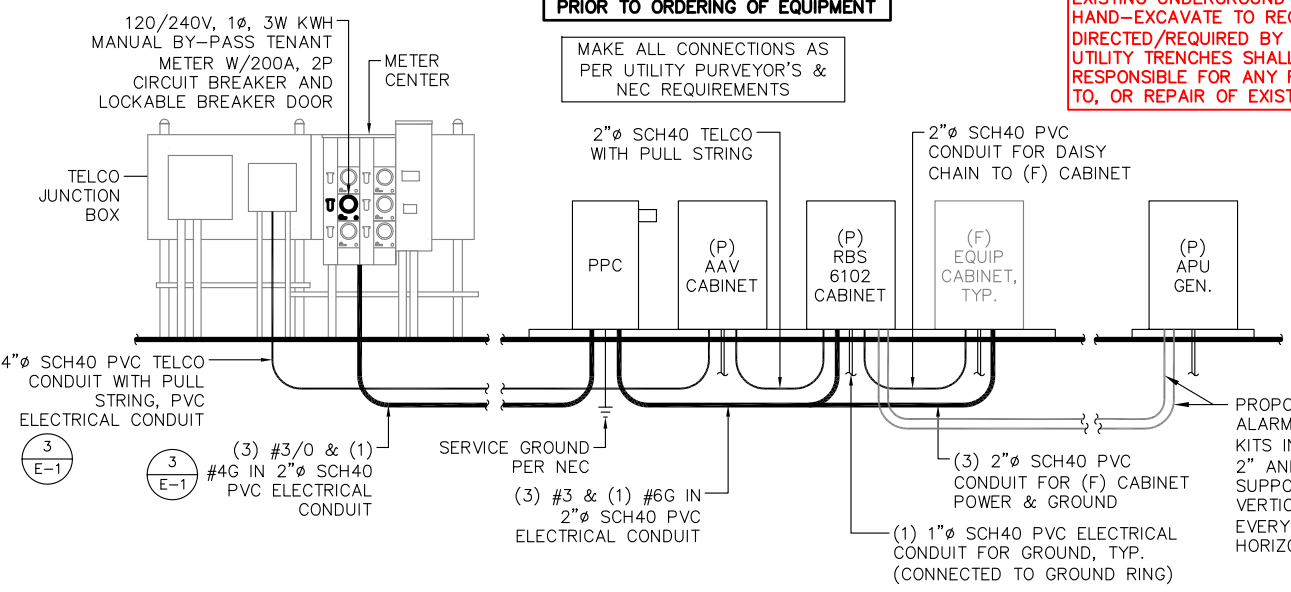
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E-2

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CONTRACTOR TO VERIFY THE POWER FEED & PHASE OF METER BANK PRIOR TO ORDERING OF EQUIPMENT

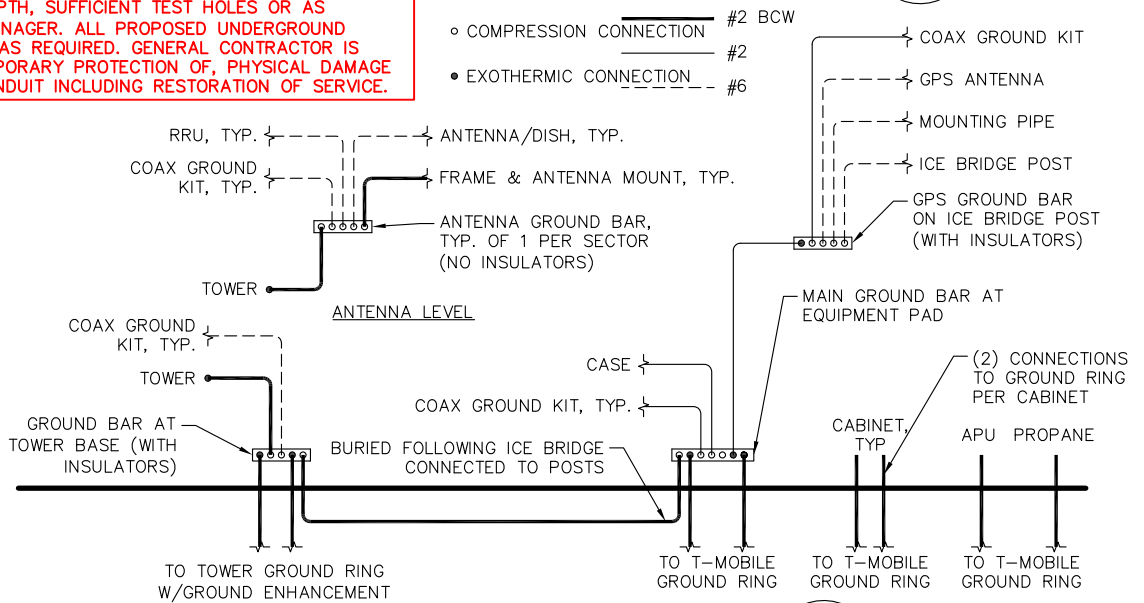
MAKE ALL CONNECTIONS AS PER UTILITY PURVEYOR'S & NEC REQUIREMENTS



UTILITY RISER SCHEMATIC

SCALE: NONE

4
E-2



GROUNDING RISER DIAGRAM

SCALE: NONE

6
E-2

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STATE OF CONNECTICUT
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FOR SCHEMATIC ONLY
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