NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
199 Brickyard Rd Farmington, CT 06032
860-209-4690
denise@northeastsitesolutions.com

April 13, 2017

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Tower Share Application
113 BRUSH HILL ROAD, GOSHEN, CT 06756
Latitude: 41.797172
Longitude: -73.221674
T-Mobile Site#: CTNH548A-NSD-ROB

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile plans to install antennas and related equipment at the tower site located at 113 Brush Hill Road in Goshen, Connecticut.

T-Mobile will install three (3) 700MHz antenna, three (3) 1900/2100 MHz antennas and nine (9) RRUs at the 160-foot level of the existing 195-foot support tower Two (2) hybrid cables will also be installed. T-Mobile's equipment cabinets will be placed within T-Mobile's 159 sq ft lease area, which includes a 8x8 equipment pad and 3x3 propane tank pad. Included are plans by SMW Engineering, dated April 10, 2017. **Exhibit C**. Also included is a structural analysis prepared by Tower Engineering Solutions, dated October 13, 2016, confirming that the existing tower is structurally capable of supporting the proposed equipment. Attached as **Exhibit D.**

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of T-Mobile's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Robert P. Valentine, First Selectman and Martin J. Connor, Land Use Official of the Town of Goshen, as well as the tower owner (SBA) and property owner (Woodridge Sewer District).

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the support tower is 195-feet; T-Mobile's proposed antennas will be located at a center line height of 160-feet.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 3.60% as evidenced by **Exhibit E.**

NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, T-Mobile respectfully indicates that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting T-Mobile's proposed loading. The structural analysis is included as **Exhibit D**.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Sharon. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as **Exhibit F**, authorizing T-Mobile to file this application for shared use.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of T-Mobile equipment at the 160-foot level of the existing 195-foot tower would have an insignificant visual impact on the area around the tower. T-Mobile's ground equipment would be installed within the existing facility compound. T-Mobile's shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by **Exhibit E**, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. T-Mobile will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist T-Mobile with this tower sharing application.

E. Public Safety Concerns. As discussed above, the guyed tower is structurally capable of supporting T-Mobile's proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing guyed tower. T-Mobile's intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Goshen.

Sincerely,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 199 Brickyard Rd, Farmington, CT 06032
Email: denise@northeastsitesolutions.com

Attachments

cc: Robert P. Valentine, First Selectman, as elected official
Martin J. Connor, Land Use Official
SBA - as tower owner
Woodridge Sewer District - property owner

Exhibit A

Filing Guides
Meetings & Minutes
Public Participation
Audio Link to New Britain Hearing Rooms
Programs & Services
Telecommunications Database
Publications
Other Resources
Statutes & Regulations
Electric Transmission Upgrade Projects
Frequently Asked Questions

Robert Stein,
Chairman

Melanie Bachman,
Acting Executive Director

Decisions

Printable Version

DOCKET NO. 260 – Bay Communications Inc. application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a telecommunications facility in Goshen, Connecticut.	}	Connecticut
	}	Siting
	}	Council

November 20, 2003

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Sprint Spectrum, L.P. (Sprint) for the construction, maintenance and operation of a wireless telecommunications facility at a site located at 113 Brush Hill Road, Goshen, Connecticut. The Council denies certification of the site located at 416 Old Middle Street, Goshen, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole not to exceed a height of 195 feet above ground level.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include:

   a) a detailed site development plan that depicts the location of the access road, compound, tower, and utility line;
   b) specifications for the tower, tower foundation, antennas, equipment building, and security fence;
   c) construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council 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 shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. Upon request, the Certificate Holder shall provide space on its tower for Town of Goshen antennas at no cost to the Town.

6. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Waterbury Republican and in the Torrington Register Citizen.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	Its Representative
Sprint Spectrum, L.P. d/b/a Sprint PCS	Thomas J. Regan, Esquire Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402

Content Last Modified on 6/14/2005 9:26:19 AM

Exhibit B

Town of Goshen, CT

Property Listing Report

Map Block Lot: 04-006-007-00 | Account: 00023400

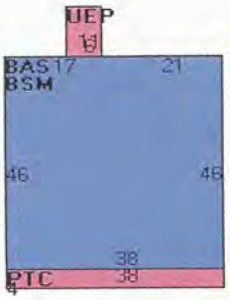
Property Information

Property Location	113 BRUSH HILL ROAD
Owner	WOODRIDGE SEWER DIST
Co-Owner	
Mailing Address	113 BRUSH HILL RD GOSHEN CT 06756
Land Use	937 Sewer Treatmnt
Land Class	E
Zoning Code	RA5
Town Clerk Map #	VOL 7 PG 17
Subdiv. Lot #	P-A, P-E, P-F

Neighborhood	700
Acreage	114.67
Utilities	
Lot Setting/Desc	
Survey Map	
Additional Info	

Photo

Sketch



Primary Construction Details

Year Built	1974
Stories	1
Building Style	Commercial
Building Use	Commercial
Building Condition	C
Floors	Concr-Finished
Total Rooms	

Bedrooms	
Full Bathrooms	0
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Flat
Roof Cover	T & G/Rubber

Exterior Walls	Concr/Cinder
Interior Walls	Minim/Masonry
Heating Type	Forced Air-Duc
Heating Fuel	Oil
AC Type	None
Gross Bldg Area	3714
Total Living Area	1748

Report Created On 3/8/2017

Town of Goshen, CT

Property Listing Report | Map Block Lot 04-006-007-00 | Account 00023400

Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	65000	45500
Extras	0	0
Outbuildings	587000	410900
Land	864790	605350
Total	1516790	1061750

Outbuilding and Extra Items

Type	Description
Sewer Plant	100000.00 GALS
Fence 8'	1125.00 L.F.
Paving Asph.	3000.00 S.F.
Light (1)	1.00 UNITS
Light (2)	2.00 UNITS
Garage	1496.00 S.F.
Paving Asph.	1200.00 S.F.
Pump House Comm	308.00 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Unfinished Enclosed Porch	66	0
Basement	1748	0
Patio - Concrete	152	0
First Floor	1748	1748
Total Area	3714	1748

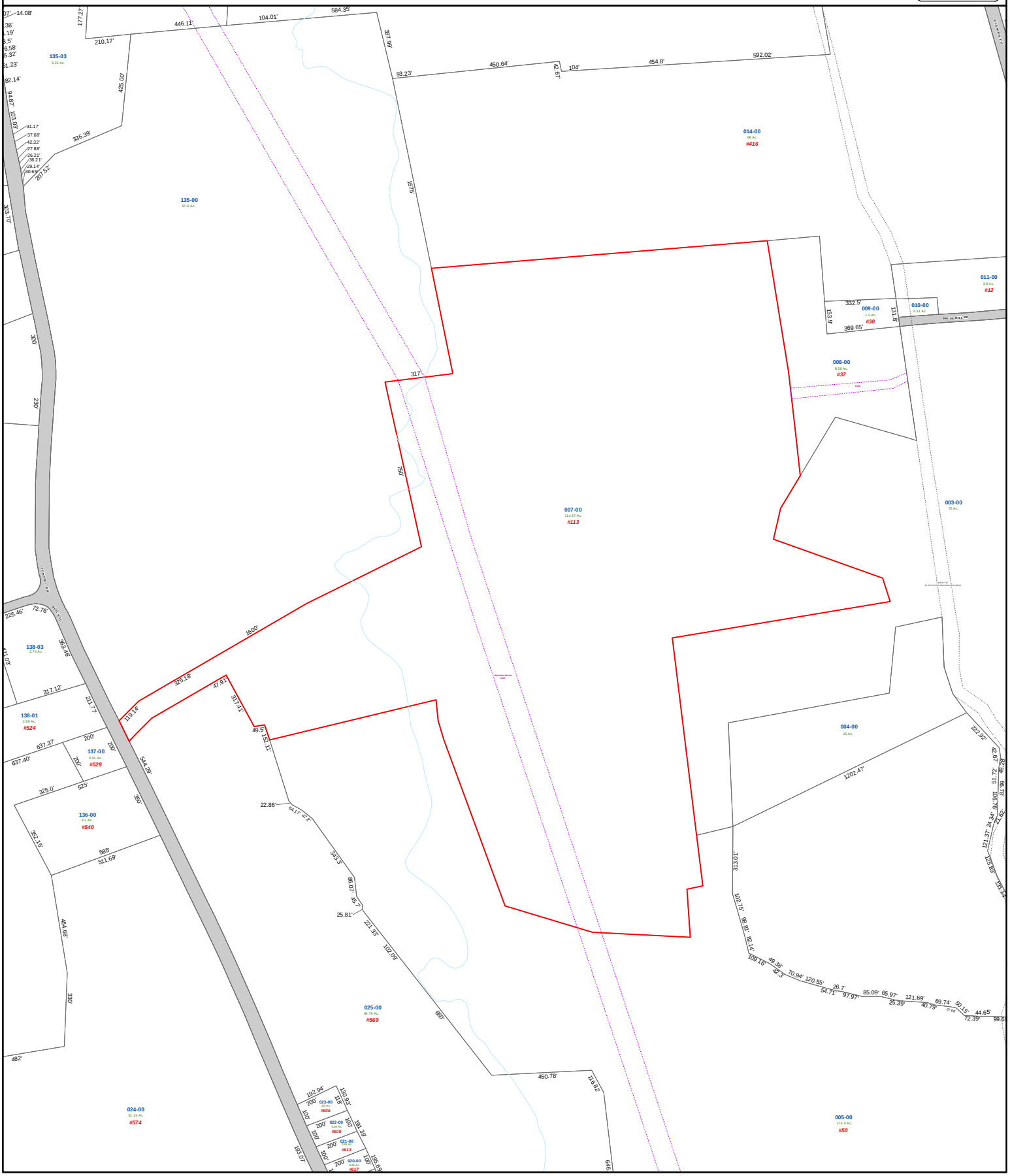
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
WOODRIDGE SEWER DIST	55/ 121	12/15/1975	0

Report Created On 3/8/2017

Town of Goshen, Connecticut - Assessment Parcel Map

Parcel: 04-006-007-00 **Location: 113 BRUSH HILL ROAD**



Approximate Scale: 1 inch = 581 feet

0 300 600 900 1,200 Feet

Map Produced: December 2015

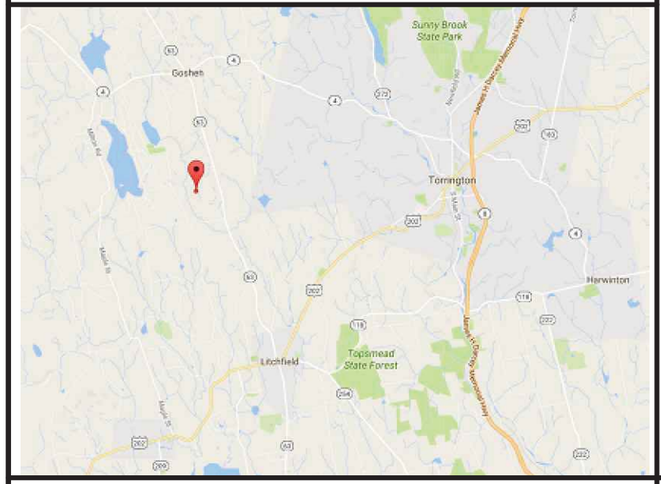
Disclaimer: This map is for informational purposes only All information is subject to verification by any user. The Town of Goshen and its mapping contractors assume no legal responsibility for the information contained herein.

Exhibit C

GENERAL NOTES

1. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTORS 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.
2. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
3. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
4. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
5. 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.
6. THE 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.
7. THE SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
8. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWING MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
9. ALL SAFETY PRECAUTIONS MUCH 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.

LOCATION MAP



HANDICAP REQUIREMENTS

FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAP ACCESS IS NOT REQUIRED.

PLUMBING REQUIREMENTS

FACILITY HAS NO SANITARY OR POTABLE WATER

T-Mobile

INFILL/ROB/GREENFIELD

T-MOBILE SITE NUMBER

CTNH548A

195' MONOPOLE

SBA SITE NUMBER

CT12210-A

SITE ADDRESS

113 BRUSH HILL ROAD
GOSHEN, CT 06756

SITE SUMMARY

SITE TYPE:	PROPOSED EQUIPMENT INSTALLATION
TECHNOLOGY TYPE:	U1900/L2100/L700
SITE ADDRESS:	113 BRUSH HILL ROAD GOSHEN, CT 06756
SITE LATITUDE:	41° 47' 49.825"
SITE LONGITUDE:	-73° 13' 18.059"
JURISDICTION:	TOWN OF GOSHEN
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	TO BE DETERMINED
TOWER OWNER:	SBA COMMUNICATIONS CORPORATION 8051 CONGRESS AVENUE BOCA RATON, FL 33487-1307 (561) 995-7670
TOWER MANAGER:	NORTHEAST SITE SOLUTIONS, LLC 420 MAIN STREET, BUILDING 4 STURBRIDGE MA 01566 SHELDON FREINCLE (201) 776-8521
WIRELESS CARRIER:	T-MOBILE 35 GRIFFIN RD S BLOOMFIELD, CT 06002 OFFICE: 860-692-7100 FAX: 860-692-7159
ENGINEER:	SMW ENGINEERING GROUP N.C., PLLC 158 BUSINESS CENTER DRIVE BIRMINGHAM, AL 35244 CONTACT: ALVIN A. KRAFT, PE PHONE: 205-252-6985

BUILDING CODES

ALL CONSTRUCTION SHALL COMPLY WITH THE LATEST EDITION OF THE (AS ADOPTED BY LOCAL JURISDICTION):

- 2016 CONNECTICUT BUILDING CODE
- 2012 INTERNATIONAL BUILDING CODE W/AMENDMENTS
- 2009 ICC/ANSI A117.1 W/AMENDMENTS
- 2012 INTERNATIONAL EXISTING BUILDING CODE W/AMENDMENTS
- 2012 INTERNATIONAL PLUMBING CODE WITH AMENDMENTS
- 2012 INTERNATIONAL MECHANICAL CODE W/AMENDMENTS
- 2012 INTERNATIONAL ENERGY CONSERVATION CODE W/AMENDMENTS
- 2014 NFPA 70, NATIONAL ELECTRICAL CODE W/AMENDMENTS
- 2012 INTERNATIONAL RESIDENTIAL CODE W/AMENDMENTS

APPROVALS

DEPARTMENT	NAME/SIGNATURE	DATE
DEVELOPMENT MANAGER		
PROPERTY/TOWER OWNER		
SITE ACQUISITION MANAGER		
CONSTRUCTION MANAGER		
RF ENGINEER		
OPERATIONS MANAGER		

PROJECT SCOPE

THE PROPOSED PROJECT SCOPE WILL CONSIST OF CONSTRUCTING A NEW TELECOMMUNICATIONS BASE STATION INSTALLATION ON AN EXISTING TOWER SITE. THE PROPOSED CONSTRUCTION WILL INCLUDE THE INSTALLATION OF ANTENNA, RADIOS, CABLES AND RELATED EQUIPMENT ON THE TOWER AS WELL AS THE RADIOS, CABINETS, UTILITIES AND ANCILLARY EQUIPMENT ON THE GROUND.

SHEET INDEX

CALL BEFORE YOU DIG

811 Know what's below. Call before you dig.

CONNECTICUT CALL BEFORE YOU DIG
STATE WIDE
1-800-922-4455 OR 811
HTTP://WWW.CBYD.COM/#

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
ALVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

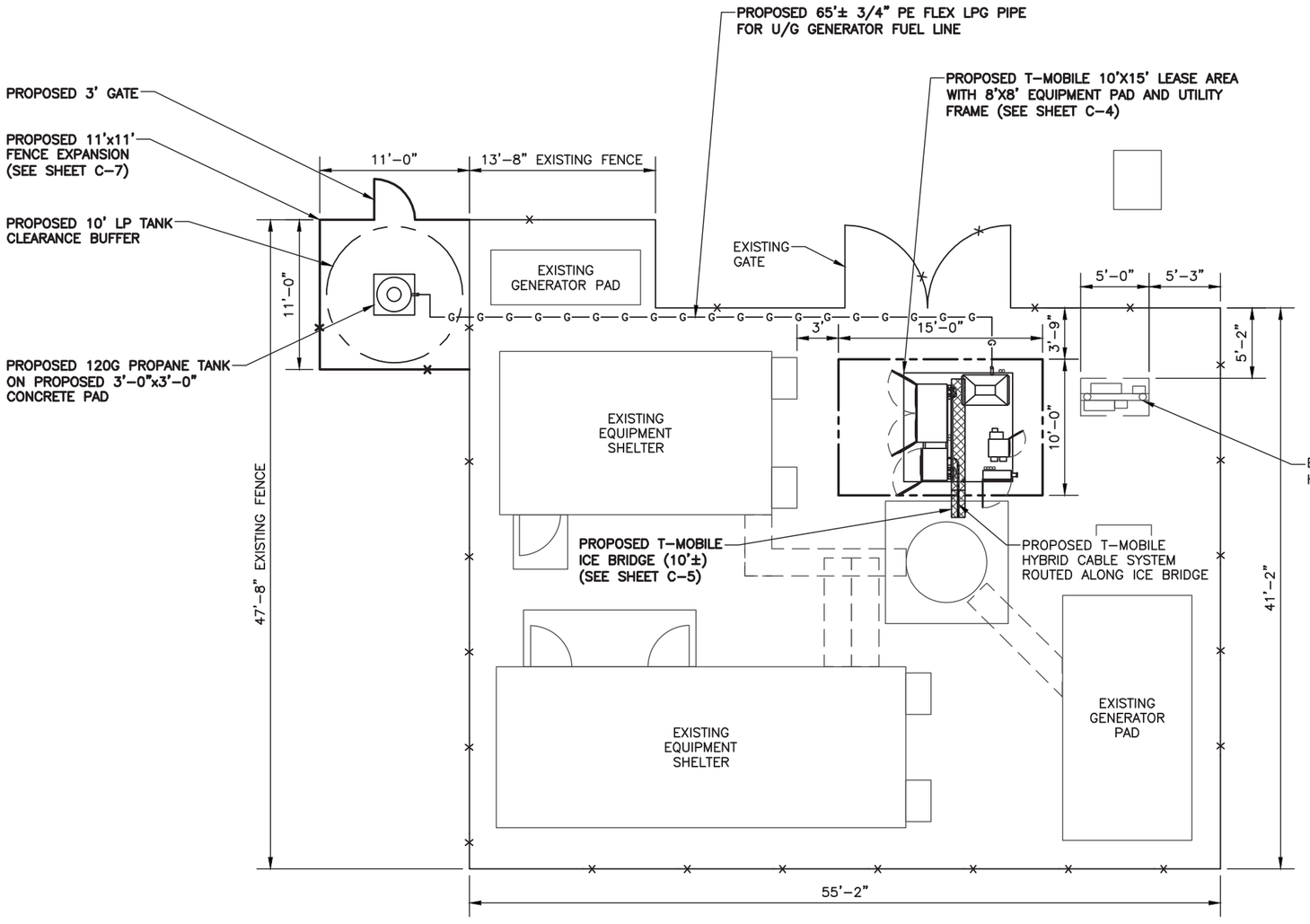
T-MOBILE SITE ID:	SBA SITE ID:
CTNH548A	CT12210-A

SHEET NAME:
TITLE SHEET

SMW #:	SHEET NUMBER:
16-2562	T-1
DESIGNER: BMD	
CHECKED BY: RTB	
ENGINEER: JDS	

NOTE TO CONTRACTORS:
DIGGING AND/OR TRENCHING INSIDE COMPOUND, MUST BE DONE BY HAND.

UTILITY NOTE:
THERE ARE NOT ANY EXISTING STORM OR SANITARY SEWER LINES OR BURIED UTILITIES ON THE PARENT TRACK WITHIN THE VICINITY OF THE PROPOSED CONSTRUCTION.



N

0' 10' 20' 30'
1" = 10' (11"x17")

1 / C-1 OVERALL SITE PLAN
SCALE: 1" = 10'

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

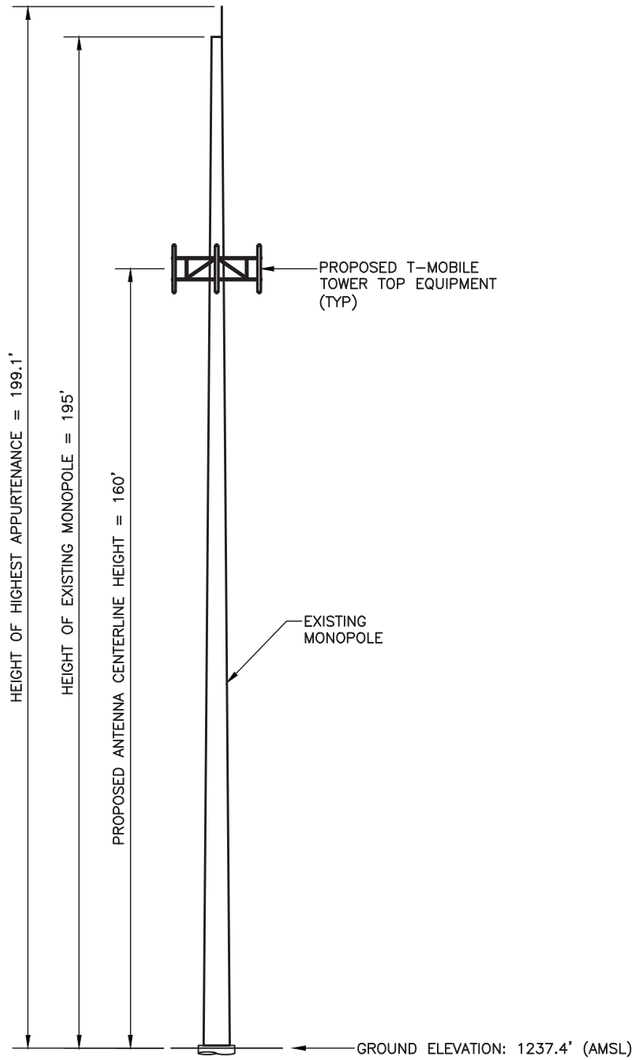
SHEET NAME:
OVERALL SITE PLAN

SMW #: 16-2562

DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

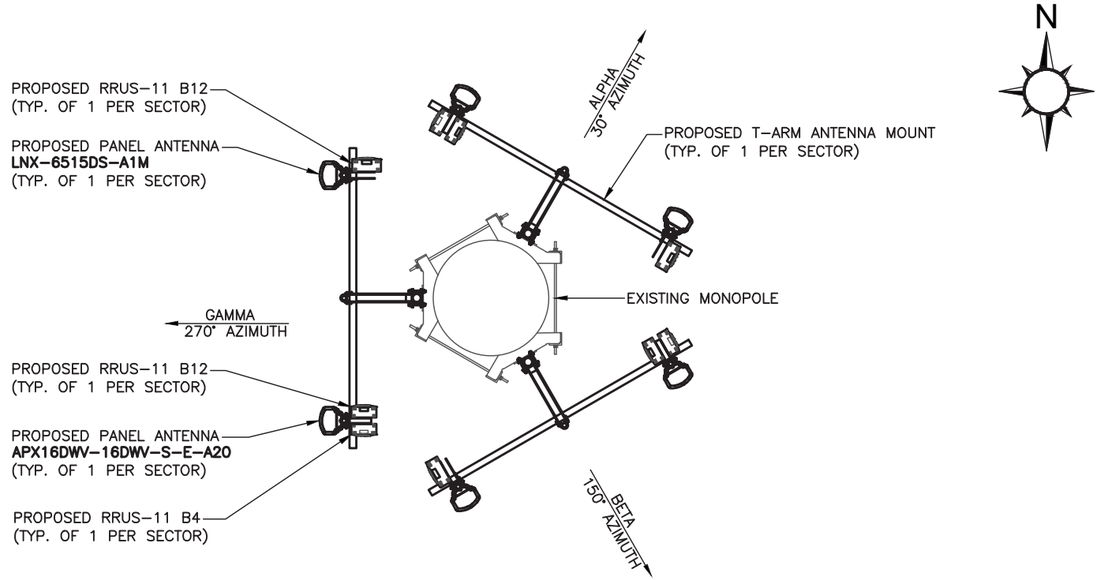
SHEET NUMBER: C-1

STRUCTURAL ANALYSIS COMPLETED BY TOWER ENGINEERING SOLUTIONS DATED 10/13/16, TEP PROJECT #:26817 REV 1

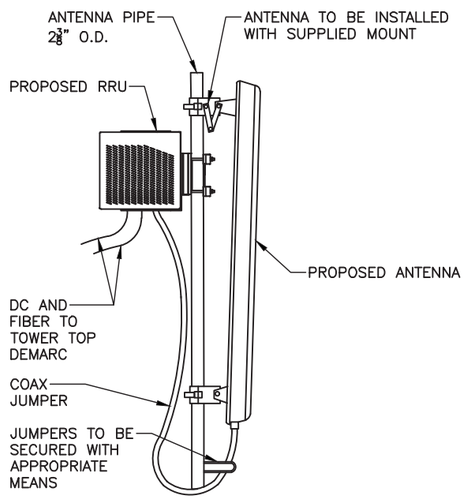


NOTES:
1. SMW HAS NOT PERFORMED A STRUCTURAL ANALYSIS OF THE EXISTING TOWER OR PROPOSED ANTENNA MOUNT. REFER TO STRUCTURAL ANALYSIS OR STRUCTURAL LETTER BY OTHERS FOR ADDITIONAL INFORMATION.
2. IF THE TOWER STRUCTURAL ANALYSIS SHOWS THE NEED FOR TOWER REINFORCEMENT REFER TO TOWER REINFORCEMENT DESIGN PRIOR TO THE INSTALLATION OF ANY PROPOSED EQUIPMENT.
3. REFER TO TOWER STRUCTURAL ANALYSIS FOR PROPOSED CABLE ROUTING AND ATTACHMENT DETAILS.
4. TOWER ELEVATION SHOWN IS NOT DRAWN TO SCALE AND IS INTENDED ONLY FOR REFERENCE PURPOSES. REFER TO ORIGINAL TOWER DESIGN FOR ADDITIONAL INFORMATION.

1 / C-2 TOWER ELEVATION
NOT TO SCALE



2 / C-2 PROPOSED ANTENNA ORIENTATION PLAN
NOT TO SCALE



3 / C-2 ANTENNA MOUNT DETAIL
NOT TO SCALE

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT · KEVIN A. KRAFT · No. 20787 · LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID:	SBA SITE ID:
CTNH548A	CT12210-A

SHEET NAME:
TOWER ELEVATION & ANTENNA PLAN

SMW #:	
16-2562	
DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER:
C-2

707C_TOWER_1QP_1DP / U1900/L2100/L700 – TOWER TOP EQUIPMENT SCHEDULE							
ANTENNA SECTOR	ANTENNA MARK	ANTENNA AZIMUTH	ANTENNA MODEL	RRU MODEL	TMA MODEL	TOWER TOP COVP MODEL	ANTENNA CABLE DESCRIPTION
ALPHA	A1	30°	APX16DWV-16DWV-S-E-A20 (QUAD)	(1) RRUS-11 B2 (P) (1) RRUS-11 B4 (P)	--	--	(1) 1 5/8" HYBRID CABLE SYSTEM (P)
	A2	30°	--	--	--	--	--
	A3	30°	LNX-6515DS-A1M (DUAL)	(1) RRUS-11 B12 (P)	--	--	--
BETA	B1	150°	APX16DWV-16DWV-S-E-A20 (QUAD)	(1) RRUS-11 B2 (P) (1) RRUS-11 B4 (P)	--	--	(1) 1 5/8" HYBRID CABLE SYSTEM (P)
	B2	150°	--	--	--	--	--
	B3	150°	LNX-6515DS-A1M (DUAL)	(1) RRUS-11 B12 (P)	--	--	--
GAMMA	C1	270°	APX16DWV-16DWV-S-E-A20 (QUAD)	(1) RRUS-11 B2 (P) (1) RRUS-11 B4 (P)	--	--	--
	C2	270°	--	--	--	--	--
	C3	270°	LNX-6515DS-A1M (DUAL)	(1) RRUS-11 B12 (P)	--	--	--

NOTE:
(P) DENOTES PROPOSED EQUIPMENT
(E) DENOTES EXISTING EQUIPMENT

NOTE:
1. THE HYBRID CABLE LENGTH SHOWN IS ONLY AN ESTIMATE AND SHOULD NOT BE USED FOR ORDERING MATERIALS. CONFIRM THE REQUIRED HYBRID CABLE LENGTH WITH T-MOBILE PRIOR TO ORDERING OR INSTALLATION.
2. THE CONTRACTOR SHALL TEST THE OPTICAL FIBER AFTER INSTALLATION IN ACCORDANCE WITH T-MOBILE STANDARDS AND SUPPLY THE RESULTS TO T-MOBILE.
3. THE CONTRACTOR SHALL CONFIRM THE TOWER TOP EQUIPMENT LIST ABOVE WITH THE FINAL T-MOBILE RFDS PRIOR TO INSTALLATION.
4. ALL EXISTING AND PROPOSED ANTENNA CABLES SHALL BE COLOR CODED PER T-MOBILE MARKET STANDARDS.
5. REFER MANUFACTURERS INSTALLATION STANDARDS FOR ADDITIONAL INFORMATION.
6. REFER TO EQUIPMENT MANUFACTURER'S SPECIFICATION SHEETS FOR ADDITIONAL INFORMATION NOT LISTED ABOVE.

TOWER LOADING SUMMARY		
EQUIPMENT TYPE	ADD QUANITY	TOTAL QUANITY
PANEL ANTENNA	6	6
COAX CABLE	0	0
RRUS	9	9
HYBRID CABLE	2	2
COVP	0	0

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

04/10/17

SITE INFORMATION:

CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

SHEET NAME:
TOWER TOP EQUIPMENT SCHEDULE

SMW #: 16-2562

DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER: C-3

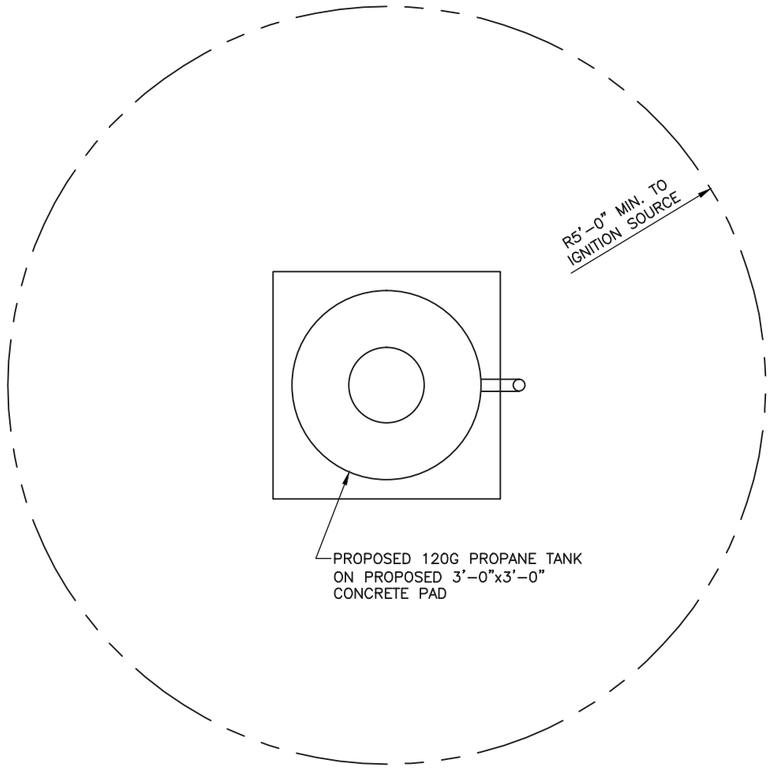
① 2"ø CONDUIT (ABOVE SLAB)

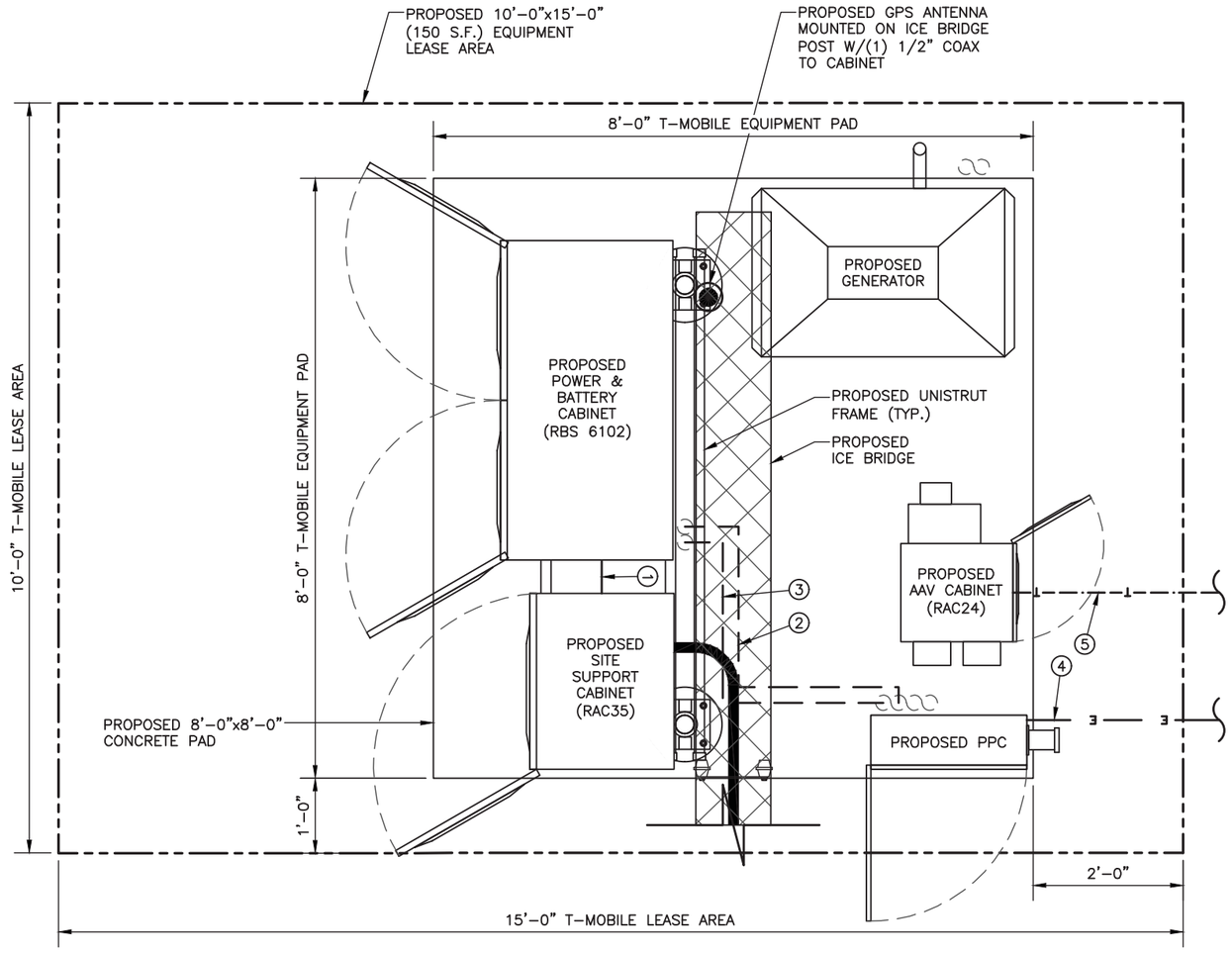
② 2"ø U/G CONDUIT (UNDER CONCRETE) FROM PROPOSED PPC TO PROPOSED PBC CABINETS

③ 2"ø U/G CONDUIT (UNDER CONCRETE) FROM PROPOSED PPC DAISY-CHAINING SSC CAGINETS

④ 2"ø PVC CONDUIT WITH (3) 3/0 + #4G FROM PROPOSED METER TO PPC CABINET. COORDINATE WITH THE LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.

⑤ 2"ø PVC CONDUIT WITH PULLSTRING FOR TELCO FROM PROPOSED AAV CABINET TO EXISTING TELCO SERVICE. COORDINATE WITH THE LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.





N

0' 2' 4' 6'

1" = 2' (11"x17")

1/C-4 GROUND EQUIPMENT DETAIL
SCALE: 1" = 2'

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT KEVIN A. KRAFT No. 20787 LICENSED PROFESSIONAL ENGINEER
04/10/17

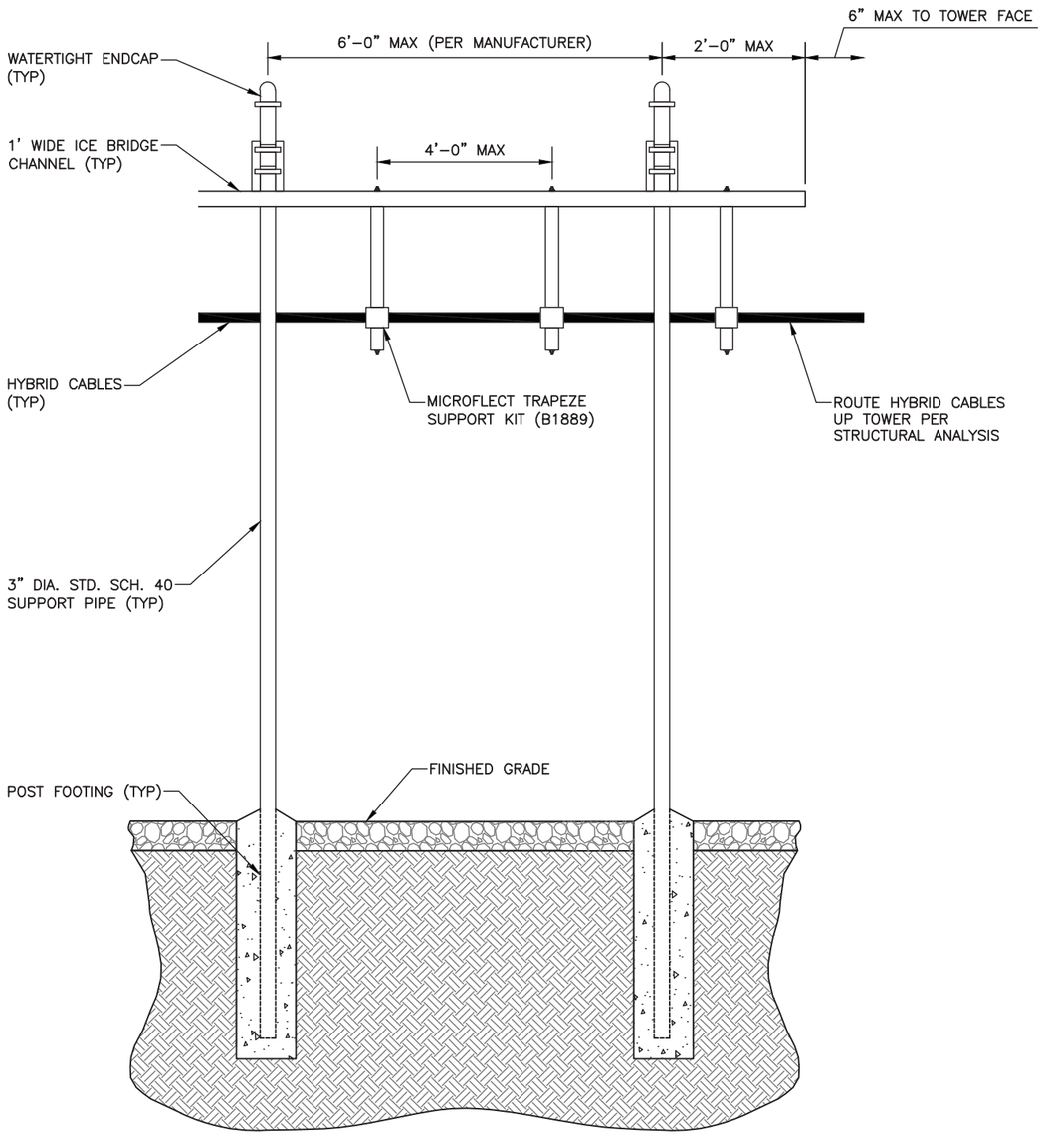
SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

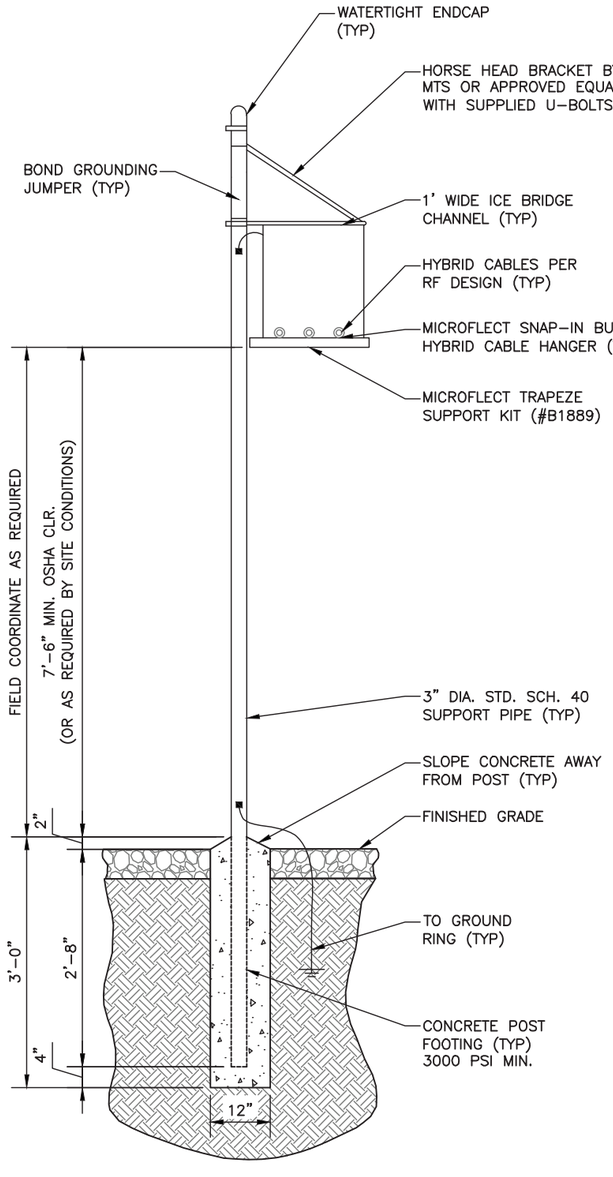
T-MOBILE SITE ID:	SBA SITE ID:
CTNH548A	CT12210-A

SHEET NAME:
GROUND EQUIPMENT DETAIL

SMW #:	SHEET NUMBER:
16-2562	C-4
DESIGNER: BMD	
CHECKED BY: RTB	
ENGINEER: JDS	



1 C-5 ICE BRIDGE ELEVATION
NOT TO SCALE



2 C-5 ICE BRIDGE SECTION (WITH 1 SUPPORT POST)
NOT TO SCALE

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:

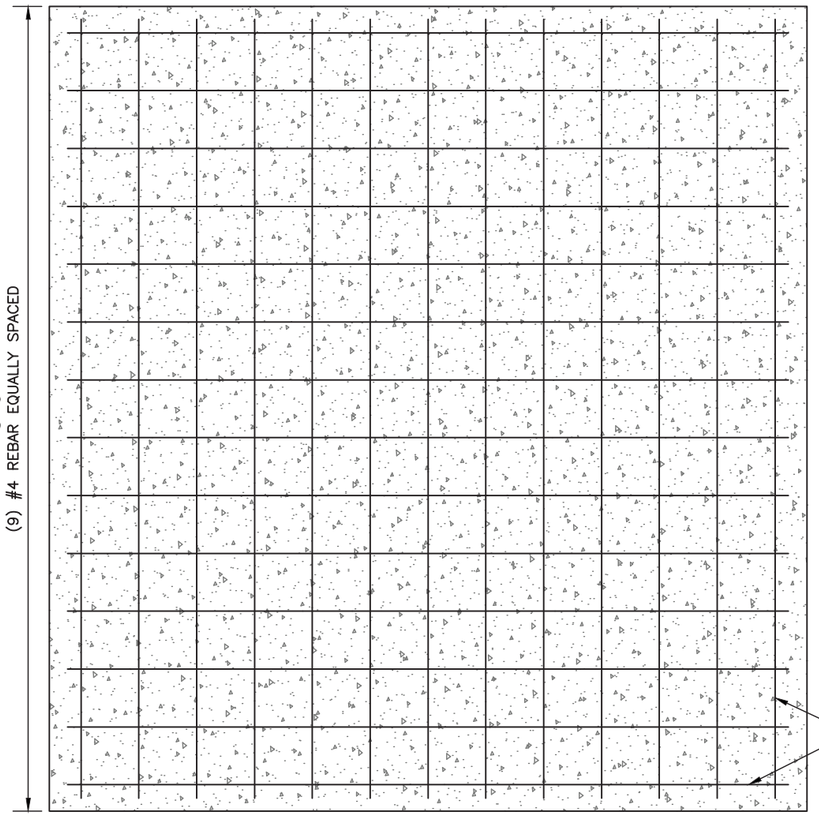
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

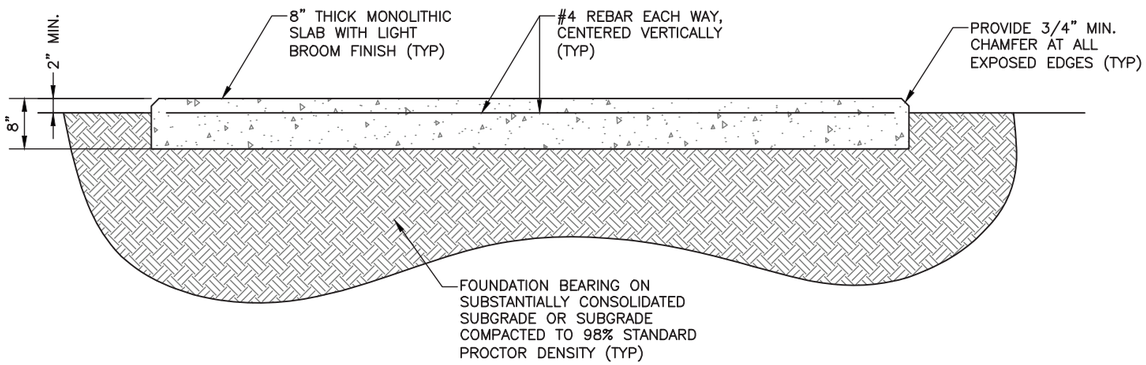
#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID:	SBA SITE ID:
CTNH548A	CT12210-A

SHEET NAME:
ICE BRIDGE DETAILS

SMW #:	SHEET NUMBER:
16-2562	C-5
DESIGNER: BMD	
CHECKED BY: RTB	
ENGINEER: JDS	





1 C-6 MONOLITHIC EQUIPMENT SLAB DETAIL
NOT TO SCALE

REINFORCED CONCRETE NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI SPECIFICATIONS FOR THE DESIGN & CONSTRUCTION OF CAST-IN-PLACE CONCRETE, AND WHERE CODES CONFLICT THE MORE STRINGENT NATIONAL OR LOCAL CODE SHALL GOVERN.

2. SITECAST CONCRETE FOR SLABS AND POST FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS. CONCRETE TESTING IS NOT REQUIRED FOR SLABS AND POST FOOTINGS UNLESS NOTED OTHERWISE.

   SLUMP – 4" MIN. / 6" MAX.
   AIR ENTRAINMENT – 2% TO 3% BY VOLUME

CLASSES OF CONCRETE				
CLASS	28 DAY STRENGTH (PSI)	MAX WATER/CEMENT RATIO	PLACEMENT LOCATION	NOTES
TYPE I	3000	0.55	SLABS & POST FOOTINGS	NORMAL WEIGHT
TYPE II*	5000	0.45	SLABS & POST FOOTINGS	HIGH EARLY STRENGTH

   *IF REQUIRED BY THE CONSTRUCTION SCHEDULE THE CONTRACTOR MAY SUBSTITUTE TYPE III HIGH EARLY STRENGTH CONCRETE WITH THE APPROVAL OF THE CONSTRUCTION MANAGER.

3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES FOR REBAR SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO. LAPS FOR WELDED WIRE FABRIC SHALL BE AST LEAST 8", UNO.

4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

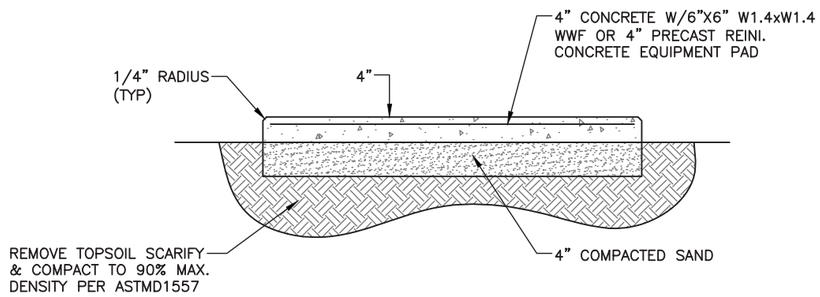
   CONCRETE CAST AGAINST EARTH.....3"
   CONCRETE EXPOSED TO EARTH OR WEATHER
   #6 AND LARGER.....2"
   #5 AND SMALLER & W.W.F.....1-1/2"

5. MAXIMUM COARSE AGGREGATE SIZE SHALL BE 3/4"

6. INSTALLATION OF CONCRETE ANCHORS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN SPECIFICATIONS. THE ANCHOR BOLT, DOWEL, OR ROD SHALL CONFORM TO THE ANCHOR MANUFACTURER'S SPECIFICATIONS FOR MATERIAL STRENGTH, EMBEDMENT DEPTH, SPACING, AND EDGE DISTANCE OR AS DETAILED ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ENGINEERING APPROVAL WHEN DRILLING HOLES IN CONCRETE. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD, HILTI, OR APPROVED EQUAL. IF THE MANUFACTURER'S SPECIFICATIONS AND DETAILS ARE FOUND TO CONFLICT WITH THAT SHOWN HEREIN, THE ENGINEER SHAL LBE NOTIFIED IMMEDIATELY.

7. THE CONTRACTOR SHALL VERIFY FROST LINE AND FOOTING DEPTH REQUIREMENTS WITH THE JURISDICTION HAVING AUTHORITY PRIOR TO CONSTRUCTION AND CONSULT THE ENGINEER ACCORDINGLY.

8. THE CONTRACTOR SHALL VERIFY ALL ELECTRICAL CONDUIT SIZES AND PENETRATION LOCATIONS PRIOR TO POURING THE SLAB.



2 C-6 3'x3' TANK SLAB
NOT TO SCALE

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

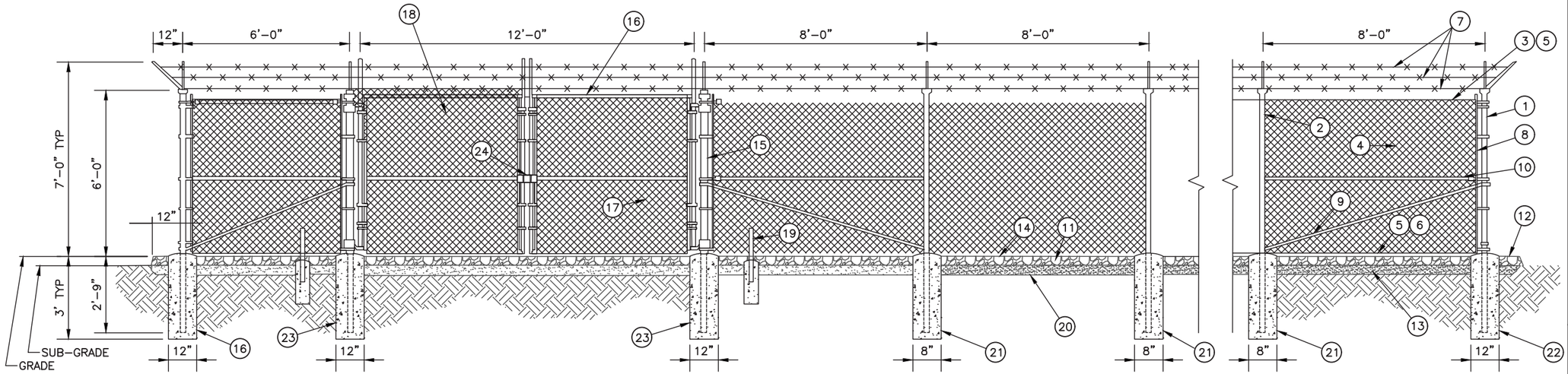
T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

SHEET NAME:
FOUNDATION DETAILS & NOTES

SMW #: 16-2562

DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER: C-6



1 / C-7 FENCE DETAIL
NOT TO SCALE

FOR REFERENCE ONLY

GENERAL NOTES:

1. INSTALL FENCING PER ASTM F-567
2. INSTALL SWING GATES PER ASTM-900
3. LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT SHALL BE COMPLIED IF REQUIRED
4. POST & GATE PIPE SIZES ARE INDUSTRY STANDARDS. ALL PIPE TO BE 1 1/2" GALV. (HOT DIP, ASTM A120 GRADE "A" STEEL) ALL GATE FRAMES SHALL BE WELDED, ALL WELDING SHALL BE COATED WITH (3) COATS OF COLD GALV, (OR EQUAL)
5. ALL OPEN POSTS SHALL HAVE END-CAPS
6. USE GALVANIZED HOG-RING WORE TO MOUNT ALL SIGNS
7. ALL SIGNS MUST BE MOUNTED ON INSIDE OF FENCE FABRIC
8. USE COMMERCIAL GRADE MATERIALS ONLY

REFERENCE NOTES:

1. CORNER END OR PULL POST 3" NOMINAL SCHEDULE 40 PIPE.
2. LINE POST: 2 1/2"SCHEDULE 40 PIPE, PER ASTM-F1083. LINE POSTS SHALL BE EQUALLY SPACED AT MAXIMUM 8'-0" O.C.
3. TOP RAIL & BRACE RAIL: 1 1/2" PIPE, PER ASTM-F1083
4. FABRIC" 9GA CORE WIRE SIZE 2' MESH, CONFORMING TO ASTM-A392
5. TIE WIRE: MINIMUM II GA GALVANIZED STEEL AT POSTS AND RAILS A SINGLE WRAP OF FABRIC TIE END AT TENSIONS WIRE BU HOG RINGS SPACED AX. AT 24" O.C.
6. TENSION WIRE: 9GA GALVANIZE STEEL
7. BARBED WIRE: DOUBLE STRAND 12 1/2" OD TWISTED WIRE TO MATCH WITH FABRIC 14GA, 4PT. BARBS SPACE ON APPROX.5" CENTERS
8. STRETCHER BAR
9. 3/8" DIAGONAL ROD WITH GALVANIZED STEEL TURNBUCKLE OR DIAGONAL THREADED ROD
10. FENCE CORNER POST BRACE: 1 5/8" DIAZ. EACH CORNER EACH WAY
11. 1 1/2" MAXIMUM CLEARANCE FROM GRADE
12. 2" FINISH OR AS DETERMINED BY CONSTRUCTION MANAGER DURING BID WALK
13. 4" COMPACTED 95% BASE MATERIAL OR AS DETERMINED BY CONSTRUCTION MANAGER DURING BID WALK.
14. FINISH GRADE SHALL BE UNIFORM AND LEVEL
15. GATE POST 4" SCHEDULE 40 PIPE. FOR GATE WIDTHS UP THRU 7 FEET OR 4 FEET FOR DOUBLE SWING GATE, PER ASTM-F1083
16. GATE FRAME: 1 1/2" PIPE, PER ASTM-F1083
17. GATE FRAME: 1 5/8" PIPE, PER ASTM-F1083
18. GATE DIAGONAL GALVANIZED STEEL 1 1/2" PIPE
19. DUCK BILL OPEN GATE HOLDER. VERIFY LOCATION IN FIELD PRIOR TO INSTALLATION
20. GEOMETRIES FABRIC
21. LINE POST: CONCRETE FOUNDATION (2000 PSI)
22. CORNER POST: CONCRETE FOUNDATION (2000 PSI
23. GATE POST" CONCRETE FOUNDATION (2000 PSI)
24. STYMIE LOCK OR EQUIVALENT

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

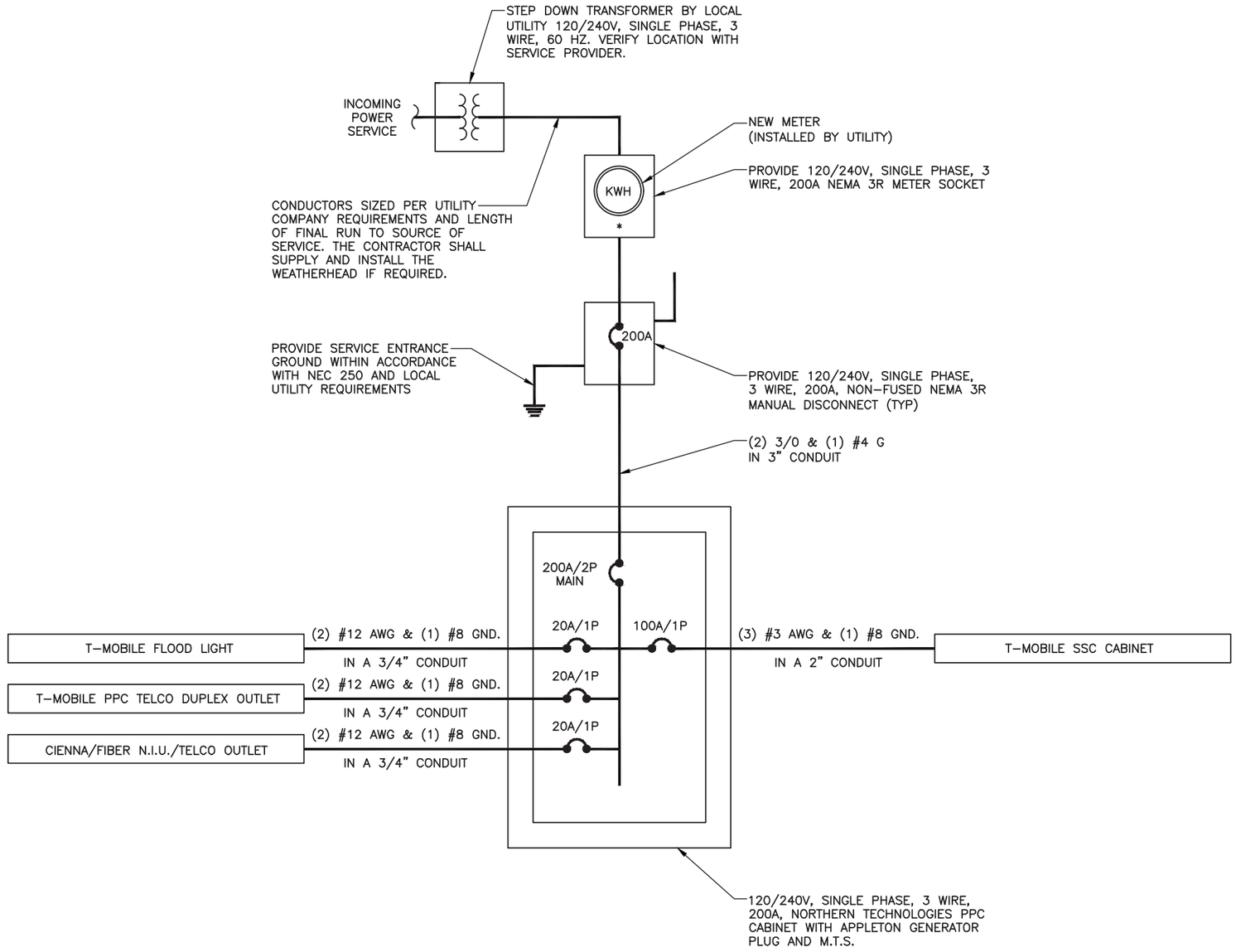
T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

SHEET NAME:
FENCE DETAILS

SMW #: 16-2562

DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER: C-7



1/E-1 ONE-LINE DIAGRAM
NOT TO SCALE

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

04/10/17

SITE INFORMATION:

CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

SHEET NAME: ONE-LINE DIAGRAM

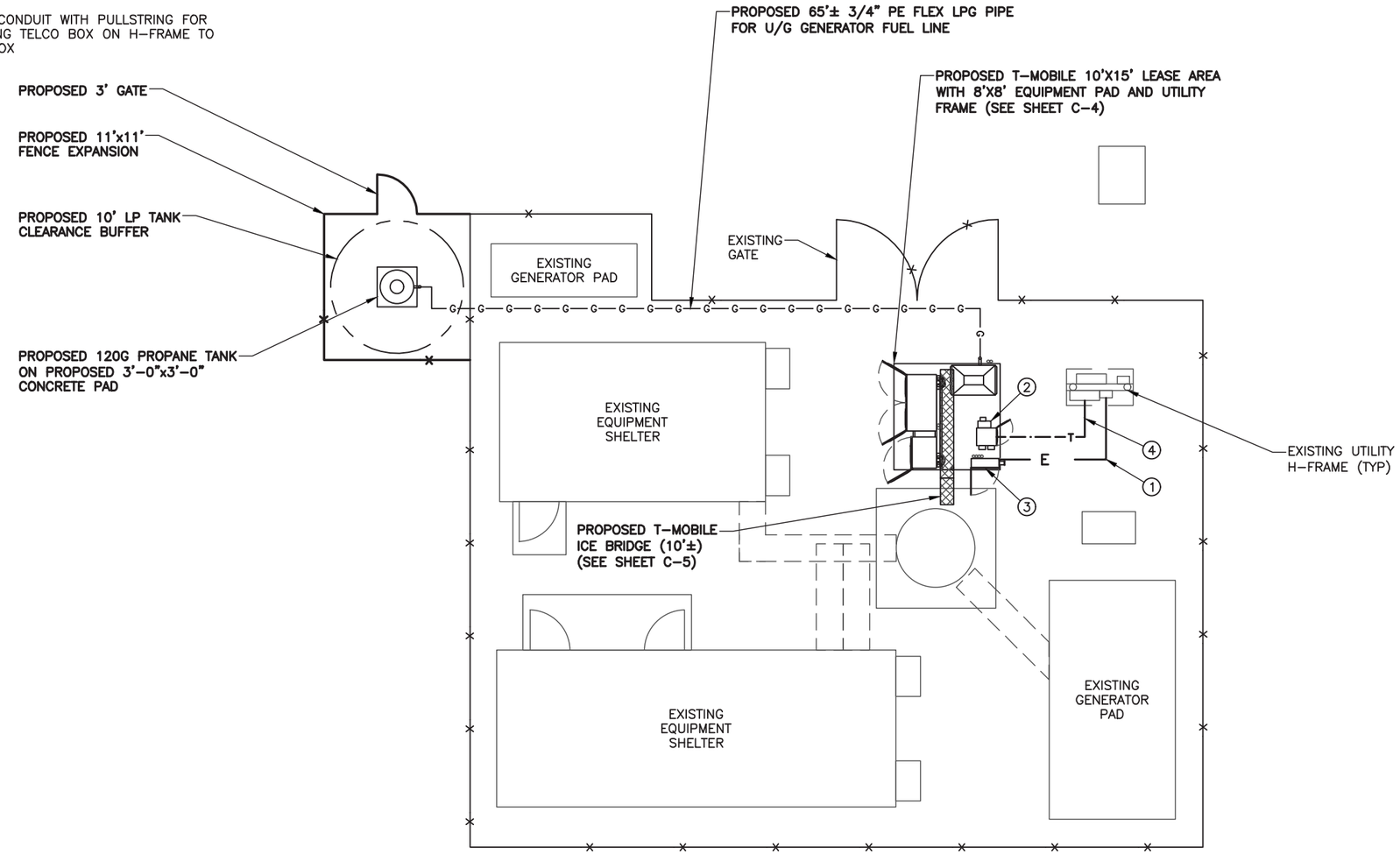
SMW #: 16-2562

DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER: E-1

ELECTRICAL KEY NOTES:

1. PROPOSED 3" PVC CONDUIT WITH (3) 3/0 + #4G FROM EXISTING UTILITY POLE TO METER BASE. THE CONTRACTOR SHALL PROVIDE AND INSTALL THE WEATHERHEAD WITH COILED EXCESS CONDUCTORS. COORDINATE WITH THE LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.
2. PROPOSED METER & 200A MANUAL DISCONNECT. COORDINATE WITH LOCAL UTILITY COMPANY REGARDING FINAL SERVICE CONNECTION.
3. PROPOSED 200A NORTHERN TECHNOLOGIES PPC CABINET WITH INTEGRATED 200A APPLETON GENERATOR BACKUP PLUG.
4. PROPOSED 2" PVC CONDUIT WITH PULLSTRING FOR TELCO FROM EXISTING TELCO BOX ON H-FRAME TO PROPOSED TELCO BOX



N

0' 10' 20' 30'

1" = 10' (11"x17")

1/E-2 ELECTRICAL UTILITY PLAN
SCALE: 1" = 10'

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

SHEET NAME:
ELECTRICAL UTILITY PLAN

SMW #: 16-2562

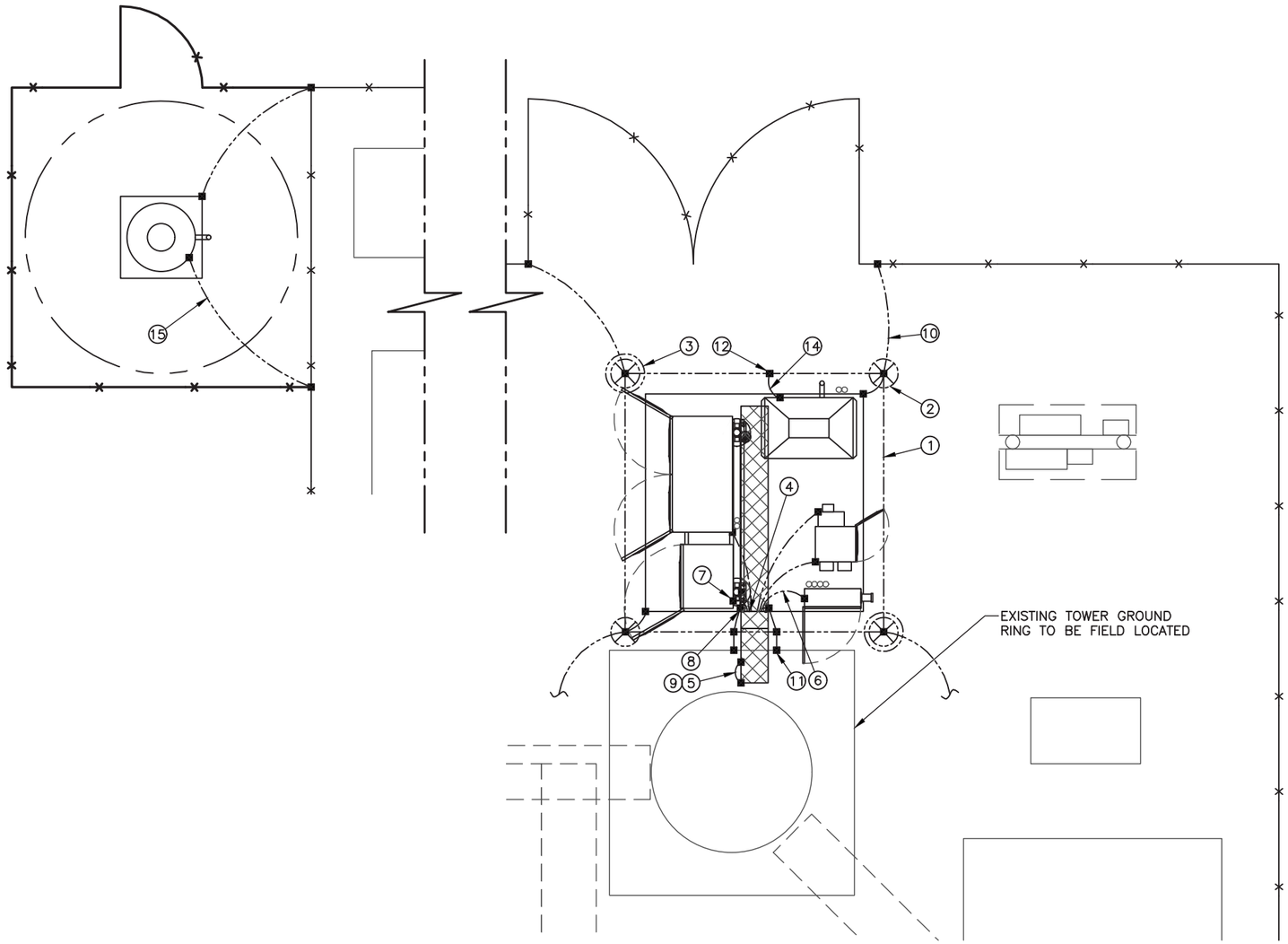
DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER: E-2

GROUNDING KEY NOTES:

1. PROPOSED #2 BARE TINNED SOLID COPPER GROUND RING (TYP)
2. PROPOSED 5/8" DIA. X 8' LONG STEEL SHAFT COPPER CLAD GROUND ROD (TYP)
3. PROPOSED GROUND ROD WITH COVERED PVC TEST WELL (TYP)
4. GROUND PROPOSED UTILITY FRAME POST WITH CADWELD CONNECTION TO BASE PLATE (TYP)
5. GROUND PROPOSED ICE BRIDGE POST WITH CADWELD CONNECTION TO BASE (TYP)
6. GROUND PROPOSED PPC POWER PANEL PER NEC 250 AND LOCAL UTILITY REQUIREMENTS (TYP)
7. GROUND PROPOSED SSC CABINET MAIN GROUND BAR WITH 2-HOLE LUG CONNECTION (TYP)
8. PROVIDE 12 POSITION MAIN EQUIPMENT COLLECTOR GROUND BAR ATTACHED TO UNISTRUT FRAME WITH STANDOFF INSULATORS, GROUND WITH (2) CADWELDED CONNECTIONS, 1 PER SITE (TYP)
9. GROUND ICE BRIDGE CHANNEL SECTIONS WITH 2-HOLE LUG CONNECTION. BOND ADJOINING CHANNEL SECTIONS TOGETHER WITH 2-HOLE LUG JUMPERS (TYP)
10. GROUND TO ALL METALLIC OBJECTS WITHIN 6' OF THE PROPOSED EQUIPMENT AND BURIED GROUND RING (TYP)
11. GROUND PROPOSED T-MOBILE BURIED EQUIPMENT GROUND RING TO EXISTING SITE GROUND RING. CONDUCT GROUNDING SYSTEM TEST AND INCLUDE IN THE CLOSEOUT PACKAGE TO T-MOBILE. ADDITIONAL GROUNDING MAY BE REQUIRED PENDING THE RESULTS OF THE GROUNDING SYSTEM TEST (TYP x2)'
12. CADWELD CONNECTION (SEE SHEET E-6)
13. GROUND PROPOSED DISCONNECT PER NEC 250 AND LOCAL UTILITY REQUIREMENTS (TYP)
14. GROUND PROPOSED GENERATOR PER NEC 250 AND LOCAL UTILITY REQUIREMENTS (TYP)
15. GROUND PROPOSED TANK & PAD PER NEC 250 AND LOCAL UTILITY REQUIREMENTS (TYP)

NOTE TO CONTRACTORS:
DIGGING AND/OR TRENCHING INSIDE COMPOUND, MUST BE DONE BY HAND.



N

1 / E-3 GROUNDING PLAN
NOT TO SCALE

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:

CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

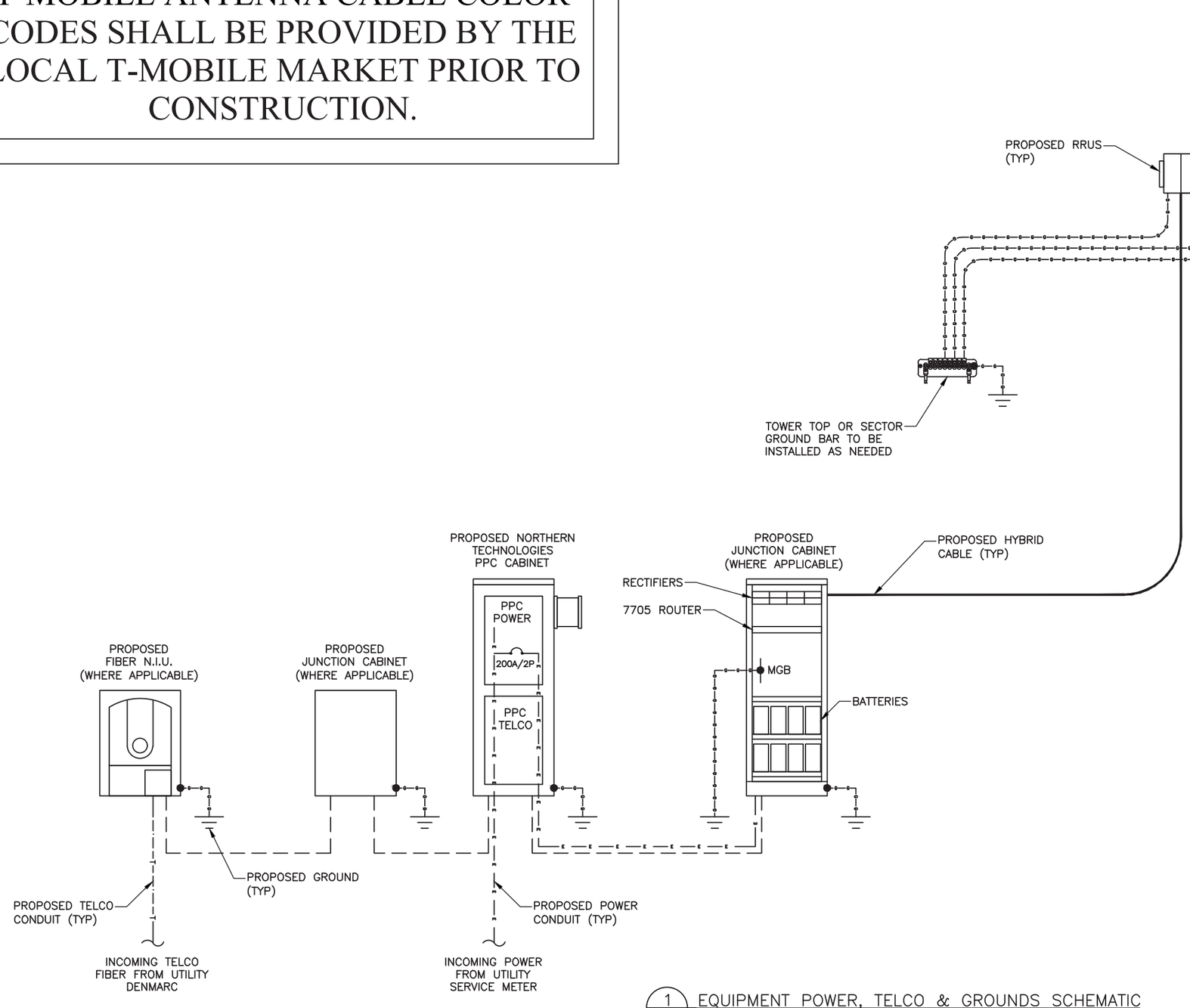
SHEET NAME:
GROUNDING PLAN

SMW #: 16-2562

DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER: E-3

T-MOBILE ANTENNA CABLE COLOR CODES SHALL BE PROVIDED BY THE LOCAL T-MOBILE MARKET PRIOR TO CONSTRUCTION.



1 E-4 EQUIPMENT POWER, TELCO & GROUNDS SCHEMATIC
NOT TO SCALE

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

04/10/17

SITE INFORMATION:

CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

SHEET NAME:
EQUIPMENT SCHEMATIC

SMW #: 16-2562

DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER: E-4

1. ALL WORK IS TO COMPLY WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE (NEC) AND ANY LOCAL ORDINANCES, CODES, AND ALL OTHER ADMINISTRATIVE AUTHORITIES HAVING JURISDICTION. THE CONTRACTOR SHALL FURNISH AND PAY FOR ALL PERMITS AND RELATED FEES.

2. ALL EQUIPMENT AND MATERIAL FURNISHED AND INSTALLED UNDER THIS CONTRACT SHALL BE UNDERWRITERS LABORATORIES (U.L.) LISTED, NEW, FREE FROM DEFECTS, AND SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY OWNER OR HIS REPRESENTATIVE. SHOULD ANY TROUBLE DEVELOP DURING THIS PERIOD DUE TO FAULTY WORKMANSHIP, MATERIAL, OR EQUIPMENT, THE CONTRACTOR SHALL FURNISH ALL NECESSARY MATERIALS AND LABOR TO CORRECT THE TROUBLE WITHOUT COST TO THE OWNER.

3. ALL WORK SHALL BE EXECUTED IN A WORKMAN LIKE MANNER AND SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED. CONTRACTOR SHOULD AVOID DAMAGE TO EXISTING UTILITIES WHEREVER POSSIBLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING RELATED TO ELECTRICAL WORK, AND SHALL RESTORE ALL EXISTING LANDSCAPING, SPRINKLER SYSTEMS, CONDUITS, WIRING, PIPING, ETC. DAMAGED BY THE ELECTRICAL WORK TO MATCH EXISTING CONDITIONS.

4. ELECTRICAL WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, ALL LABOR, MATERIALS AND EQUIPMENT REQUIRED TO COMPLETE ELECTRICAL POWER AND LIGHTING SYSTEMS, TELEPHONE AND COMMUNICATION SYSTEMS, PANELBOARDS, CONDUIT, CONTROL WIRING, GROUNDING, ETC. AS INDICATED ON ELECTRICAL DRAWINGS AND/OR AS REQUIRED BY GOVERNING CODES.

5. PRIOR TO INSTALLING ANY ELECTRICAL WORK, THE CONTRACTOR SHALL VISIT THE JOB SITE AND VERIFY EXISTING SITE LOCATIONS AND CONDITIONS AND UTILITY SERVICE REQUIREMENTS OF THE JOB, AND BY REFERENCE TO ENGINEERING AND EQUIPMENT SUPPLIERS' DRAWINGS. SHOULD THERE BE ANY QUESTION OR PROBLEM CONCERNING THE NECESSARY PROVISIONS TO BE MADE. PROPER DIRECTIONS SHALL BE OBTAINED BEFORE PROCEEDING WITH ANY WORK.

6. PROVIDE POWER AND TELEPHONE TO SERVICE POINTS PER UTILITY COMPANY REQUIREMENTS. CONTRACTOR SHALL CONTACT UTILITY SERVICE PLANNERS AND OBTAIN ALL SERVICE REQUIREMENTS AND INCLUDE COSTS FOR SUCH IN THEIR BID.

7. SERVICE EQUIPMENT SHALL HAVE A SHORT CIRCUIT WITHSTAND RATING EXCEEDING THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SUPPLY TERMINAL ON THE UTILITY TRANSFORMER SECONDARY, THE INSULATION SHALL BE FREE FROM ANY SHORT CIRCUITS AND GROUNDS. CONTRACTOR TO OBTAIN THE AVAILABLE SHORT CIRCUIT CURRENT FROM THE ELECTRICAL SERVICE PROVIDER.

8. ALL WIRES SHALL BE STRANDED COPPER WITH THHN/THWN AND 600 VOLTS INSULATION. ALL GROUND CONDUCTORS TO BE PROPERLY SIZED COPPER. (STRANDED OR SOLID)

9. IN THE EVENT OF ANY CONFLICT OR INCONSISTENCY BETWEEN ITEMS SHOWN ON THE PLANS AND/OR SPECIFICATIONS, THE NOTE, SPECIFICATION OR CODE WHICH PRESCRIBES AND ESTABLISHES THE HIGHEST STANDARD OF PERFORMANCE SHALL PREVAIL.

10. SERVICE CONDUITS SHALL HAVE NO MORE THAN (4) –50° BENDS IN ANY SINGLE RUN. THE CONTRACTOR SHALL PROVIDE PULL BOXES AS NEEDED WHERE CONDUIT REQUIREMENTS EXCEED THESE CONDITIONS. PULL WIRES AND CAPS SHALL BE PROVIDED AT ALL SPARE CONDUITS FOR FUTURE USE.

11. ALL ELECTRICAL EQUIPMENT SHALL BE ANCHORED TO WITHSTAND LOCAL WIND SPEED REQUIREMENTS AND DESIGNED FOR OUTDOOR EXPOSURE.

12. ALL COAX, POWER AND TELEPHONE SYSTEM CONDUITS SHALL HAVE A MINIMUM 24" SCH. 80 PVC RADIUS SWEEPS TO EQUIPMENT, PULLBOXES, GUY, ETC., UNLESS OTHERWISE NOTED, OR AS REQUIRED BY UTILITY COMPANIES.

13. FUSE TYPE SHALL BE BUSSMAN RKI LOW PEAK FUSE (LPN–RK–140).

14. UPON COMPLETION OF THE JOB, THE CONTRACTOR SHALL FURNISH AS–BUILT DRAWINGS TO THE OWNER.

15. GENERAL GROUNDING CRITERIA
    1ST STEP: GROUND TO EXISTING BUILDING STRUCTURAL STEEL AND TO THE EXISTING COLD WATER METAL PIPE LINE. (WHERE APPLICABLE) THEN TEST GROUNDING RESISTANCE FOR 5 OHMS OR LESS OVERALL GROUND RESISTANCE. WHERE THE EFFECTIVE RESISTANCE DOES NOT MEET THIS CRITERIA, PROVIDE SUPPLEMENTAL GROUNDING AND RE–TEST UNTIL GROUND RESISTANCE FALLS BELOW THIS LEVEL.

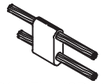
16. SUPPLEMENTAL GROUND MAY CONSIST OF ONE OR MORE OF THE FOLLOWING:
    COUNTERPOISE, USER GROUND, GROUND ROD AND/OR GROUND WELL IN EXTREMELY ADVERSE SOIL CONDITIONS. WHERE THE EXISTING BUILDING STEEL DOES NOT PROVIDE AN EFFECTIVE GROUND RESISTANCE, THEN THE CONTRACTOR SHALL PROVIDE A SEPARATE GROUND CONDUCTOR FROM ROOF MOUNTED BTS EQUIPMENT LOCATIONS EITHER DOWN THROUGH THE INSIDE OF THE BUILDING OR DOWN THE OUTSIDE OF THE BUILDING, DEPENDING UPON OWNER PREFERENCE. WHERE THE GROUND CONDUCTOR FROM THE ROOF MOUNTED EQUIPMENT IS ROUTED IN CONDUIT, THE CONDUIT SHALL BE EFFECTIVELY GROUNDED TO THE GROUND CONDUCTOR AT BOTH ENDS OF THE CONDUIT. (GUY INSTALLATIONS):

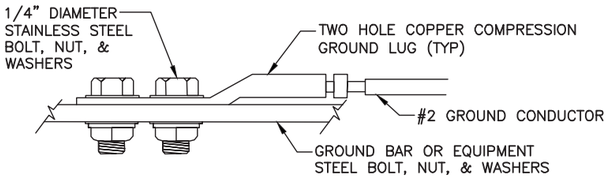
    FOR INSTALLATIONS WHERE WOODEN STRUCTURES, TOWERS, CONCRETE SILOS ETC. ARE ENCOUNTERED A PARATE DOWNLEAD SHALL BE PROVIDED FROM THE 3 ANTENNAS SEPARATED BY A MINIMUM OF 12 INCHES FROM THE COAXIAL CABLES. THE GROUND CONDUCTOR SHALL BE SECURELY FASTENED TO THE EXTERIOR OF OUTSIDE STRUCTURES WITH NONMETALLIC GROUND STRAPS EVERY 10 FEET. AGAIN, AS FOR TENANT IMPROVEMENT PROJECTS, TEST THE GROUND RESISTANCE FOR GUY INSTALLATIONS AND PROCEED PER THE ABOVE STEPS.

17. CONTRACTOR TO COLOR PHASE CONDUCTORS BLACK (B PHASE), RED (A PHASE), WHITE (NEUTRAL), AND GREEN (GROUND).

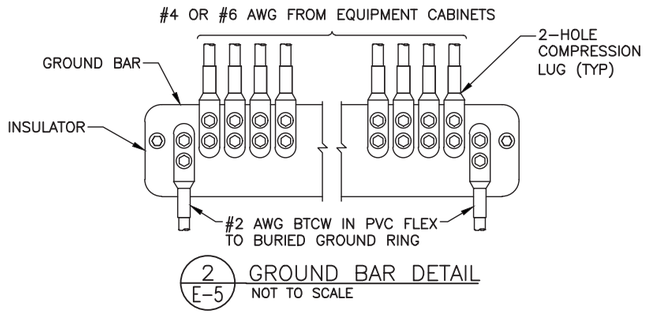
18. CONTRACTOR TO PROVIDE GUTTER TAP.

19. THERE SHALL BE A MINIMUM CLEARANCE OF 48" BETWEEN FRONT OF ELECTRICAL EQUIPMENT AND ANY WALL OR OBSTRUCTION.

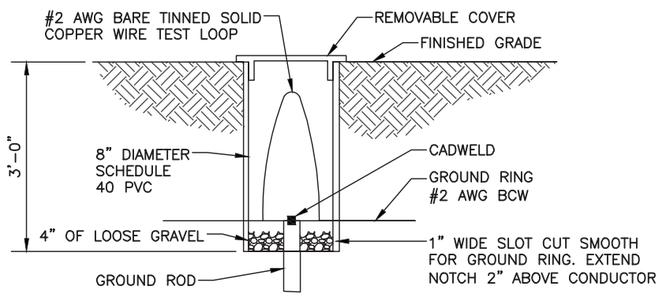
CADWELD CONNECTIONS OR APPROVED EQUAL			BURNDY CONNECTIONS OR APPROVED EQUAL
 PARALLEL HORIZONTAL CONDUCTORS PARALLEL THROUGH CONNECTION OF HORIZONTAL CABLES TYPE PT	 HORIZONTAL STEEL SURFACE TO FLAT STEEL SURFACE OR HORIZONTAL PIPE TYPE HS	 VERTICAL PIPE CABLE DOWN AT 45° TO RANGE OF VERTICAL PIPES TYPE VS	 BOND JUMPER FIELD FABRICATED GREEN STRANDED INSULATED TYPE 2–YA–2
 THROUGH CABLE TO GROUND ROD THROUGH CABLE TO TOP OF GROUND ROD TYPE GT	 VERTICAL STEEL SURFACE CABLE DOWN AT 45° TO VERTICAL STEEL SURFACE INCLUDING PIPE TYPE VS		 COPPER LUGS TWO HOLE – LONG BARREL LENGTH TYPE YA–2



1 / E–5 TWO HOLE LUG CONNECTION DETAIL
NOT TO SCALE



2 / E–5 GROUND BAR DETAIL
NOT TO SCALE



3 / E–5 TEST WELL DETAIL
NOT TO SCALE

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860–692–7100
FAX: 860–692–7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677–1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

STATE OF CONNECTICUT
KEVIN A. KRAFT
No. 20787
LICENSED PROFESSIONAL ENGINEER
04/10/17

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

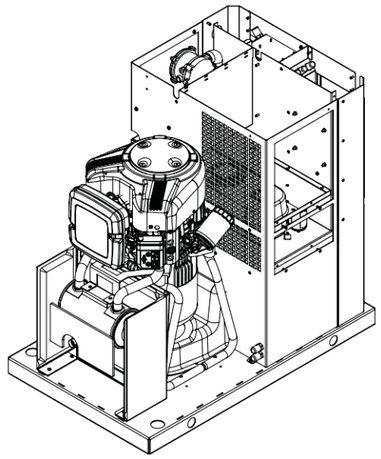
T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210–A

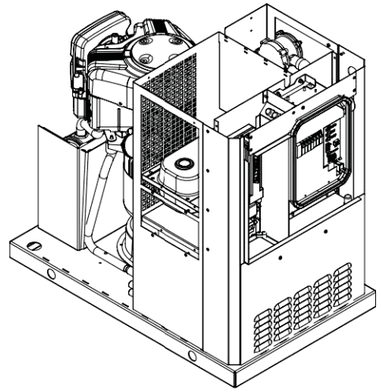
SHEET NAME:
ELECTRICAL & GROUNDING DETAILS

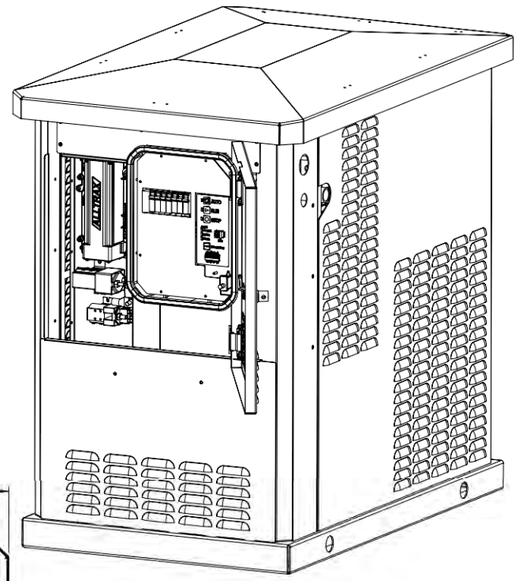
SMW #: 16–2562

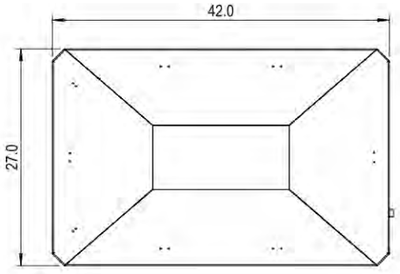
DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

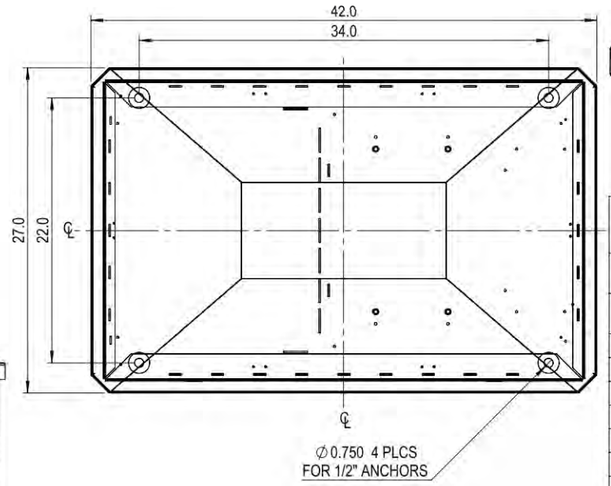
SHEET NUMBER: E-5

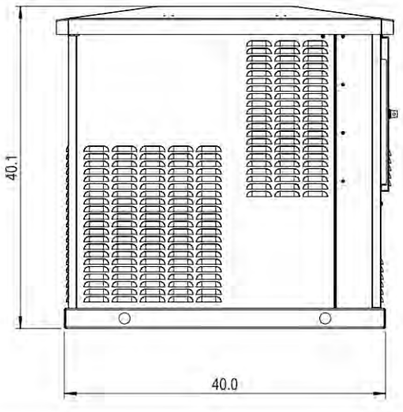


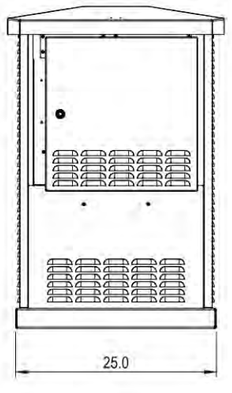












Item	Part NO.	Q'ty	Description
J	McMaster Carr 90221A418	4	RIVET NYLON RIBBED SHANK 1/2"
I	McMaster Carr 93880A245	4	SCREW #10-16x1/2" TYPE B THREAD FORMING, HEX SLOT
H	McMaster Carr 93776A401	4	NUT HEX FLANGE 10-32 STAINLESS STEEL
G	IN01265	1	INSULATOR, ROOF
F	-	-	-
E	-	-	-
D	-	-	-
C	-	-	-
B	CH01274	1	ROOF PLATE
A	CAB01269	1	CABINET ASSY

台達電子工業股份有限公司
DELTA ELECTRONICS, INC.

DIMENSIONAL TOLERANCES — HOLES : ±0.05 ANGLES : ±0.5°

( )		( )		( )		( )	
<30	±0.25	DECIMALS		UP~100	±0.2	250~300	±0.4	UP~600	±1.5
>30~100	±0.35	X	±0.3	100~150	±0.25	300~350	±0.45	600~900	±2.4
>100~300	±0.5	X.X	±0.2	150~200	±0.3	350~400	±0.5	900~OVER	±3.1
ABOVE 300	±0.6	X.XX	±0.1	200~250	±0.35				

SCALE 1:3 | UNIT in | USED ON -

THIRD ANGLE PROJECTION

A3 SIZE

Drawn: 03/25/2014 Vince Byrne

Design: 03/25/2014 Vince Byrne

Description: APU ASSY

Part No. ESOG150-PCA01 REV. 0E

SHEET 1 OF 2 | ISSUE DATE: 03/25/2014

X:\0_Projects\TMO_APU\CAB01270-APU_assy (closed)
X:\0_Projects\TMO_APU\CAB01270-APU_assy

FRAME NAME:DF-MEA3H-1R01.SLDDRT

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

SHEET NAME: ATTACHMENTS

SMW #: 16-2562
DESIGNER: BMD
CHECKED BY: RTB
ENGINEER: JDS

SHEET NUMBER: A-1

Product Feature

- Reliable 52V DC backup solution
- Extremely simple installation
- Extended run times (over 72 hours)
- Automated exercising routines
- Intelligent control panel monitoring
- Minimal maintenance

Specifications

1. General	
Construction	Aluminum enclosure with Pre-galvanized steel base
Dimensions (W x H x D)	**27 x 40 x 42 in (686 x 1016 x 1067 mm)**
Weight	350 lbs (159 kg) (without optional start batteries)
Mounting options	**Pad-mount**
Finish	Polyester Powder Paint (Gray)
Fuel options	**Propane (LPG) or Natural Gas**
Safety	UL2200 Listed (Pending)
2. Environment	
Operating temperature	-20°C to +46°C (-4F to +115F)
Protection class	**IP55 electronics enclosure**
Altitude	< 4000m above mean sea level
Acoustics	**76 dB(A) at 23 feet (7m)**
3. Generator Specifications	
Output Power (W)	7500W
Output Voltage (V)	**52V DC**
Output Voltage Regulation	≤ ± 250mV
Engine	**570cc Air Cooled Engine**
DC Motor	Permanent Magnet Brushed DC Motor
RPM	**3450 to 3750**
Fuel consumption	1.2 lbs/hr @ 5kW, LPG
Gas inlet pressure	**11 in-H2O (0.40 psi)**
Output connections	¼"-20, 5/8" C-C threaded stud interface for 1/0 2-hole lugs
Output protection	**200A Circuit Breaker**
4. Batteries	
Site	Start-up from site batteries (50A@49V for <2min)
Start-up (optional)	**Start-up with no energy from site batteries**
5. Control and Interface	
Controls	Auto, Run, Stop
Alarms	**Critical, Major, Minor alarm relays (Form-C)**
Craft Interface	RJ45 Ethernet
Automated Exercise	**Automated periodic exercising with weekend and holiday blackout**
6. Ordering information	
ESOG150-PCA01	PowerGen 7500 with Large Oil Reservoir
ESOG150-PCA02	**PowerGen 7500 with Standard Oil Reservoir**
	Battery Heater Kit
	Battery String, 48V, PWL12V38

*All specifications are subject to change without prior notice.

Delta Group Website:
www.deltaww.com

Product Website:
www.deltapowersolutions.com

United States of America & Canada
Delta Greentech (USA) Corp.
2360 Campbell Creek Blvd. #530
Richardson (Texas) 75082
Phone: 972-437-7900
DLDGASales@delta-corp.com

Central America
Delta Electronics International Mexico, S.A. de C.V.
Via Gustavo Baz No. 2160
Col. Industrial La Loma Tlainepartla
CP 54060, Edo de Mexico

South America
Delta Greentech (Brasil) S.A
Rua Itapeva, 26 - 3 andar - Bela Vista
01332-000 - São Paulo - SP - Brasil

Asia Pacific
Delta Electronics, Inc.
3 Tungyuan Road, Chungli Industrial Zone,
Taoyuan County 32063, Taiwan

China
Delta Electronics (Shanghai) Co., Ltd
No.182 Minyu Road, Pudong
Shanghai, P.R.C., China

Japan
Delta Electronics (Japan), Inc.
2-1-14 Minato-ku shibadamin, Tokyo
105-0012, Japan

Russia
Delta Energy Systems LLC
Vereyskaya Plaza II, office 401
121357 Moscow, Russia

Europe
Delta Energy Systems (Switzerland) AG
Freiburgstrasse 251
3010 Bern-Bümpliz, Switzerland

EN_V3 / VB

1 GENERATOR SPECIFICATIONS — NOT TO SCALE

100# MINI ASME, 200# & 420# PORTABLES

DOT VS. ASME COMPARISON

- The DOT 200#, 420# and ASME 100#, 200# & 420# cylinders can be transported with 80% of total container volume.
- The weight of an ASME 420# is 13 lbs. more than a DOT 420#. This thicker steel provides the customer greater longevity of the 420# assets.
- ASME code does not mandate a retest period. DOT retest periods are 12 years after manufacturing, then each 5 year period thereafter.
- State-of-the-art powder coating system cylinder finish, called "Armor Clad II - THE NEXT GENERATION," which improves the durability of the tank by 150%!
- Vacuum Pre-purged tank saves in the cost to prepare a tank for customer use.
- HDPE (High Density Polyethylene) Lids. Extremely durable rust-proof and dent-proof. So reliable, they come with a 10 year guarantee!

Lifting Lugs standard on 200# & 420#

100#/ASME MINI — 200# DOT/57 GAL. ASME — 420# DOT/120 GAL. ASME

	Catalog No.	Product Data	Propane Capacities Lb	Propane Capacities Gal	Water Capacity Lb	Length OL In	Height H In	Diameter D In	Diameter B In	Tare Weight Lb	Skid Quantity
		DOT									
	14205TC.11HL	200# DOT 4BW240 Vertical - Multi - Valve w/ Gauge	200	45.6	476	41.9	34.1	24	20.0	152	16
	1499TC.11HL	420# DOT 4BW240 Vertical - Quickfill Valve	420	95.9	1000	53.8	45.6	30	23.1	278	9
			kg	Liter	Kg	mm	mm	mm	mm	Kg	
	14205TC.11HL	200# DOT 4BW240 Vertical - Multi - Valve w/ Gauge	90.7	172.9	256.7	1064	865	610	508	66.7	16
	1499TC.11HL	420# DOT 4BW240 Vertical - Quickfill Valve	190.5	363.0	453.6	1366	1159	762	587	126.1	9
6		**ASME**	Lb	Gal	Lb	In	In	In	In	Lb	
	68143HL	28.6 (100#) ASME MINI Vertical - 250 PSI 2 hole w/Gauge	100	22.9	238	37.1	29.8	18	15.5	85	20
	6765.11HL	57 gal. (200#) ASME Vertical - 250 PSI Multi Valve w/ Gauge	200	45.6	476	41.9	34.1	24	20.0	188	16
TANK SIZE →	6762.11HL	120 gal. (420#) ASME Vertical - 250 PSI Quadrifitt Valve	420	95.9	1000	53.8	45.6	30	23.1	291	9
			Kg	Liter	Kg	mm	mm	mm	mm	Kg	
	68143HL	28.6 (100#) ASME MINI Vertical - 250 PSI 2 hole w/Gauge	45.4	86.6	108.3	942	756	457	394	38.6	20
	6765.11HL	57 gal. (200#) ASME Vertical - 250 PSI Multi Valve w/ Gauge	90.7	172.9	256.7	1064	865	610	508	85.3	16
	6762.11HL	120 gal. (420#) ASME Vertical - 250 PSI Quadrifitt Valve	190.5	363.0	453.6	1366	1159	762	587	132.0	9

2 120 GALLON PROPANE TANK SPECIFICATIONS — NOT TO SCALE

T-Mobile
35 GRIFFIN RD S
BLOOMFIELD, CT 06002
OFFICE: 860-692-7100
FAX: 860-692-7159

PLANS PREPARED BY:
NSS NORTHEAST SITE SOLUTIONS
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN STREET, BUILDING 4
STURBRIDGE MA 01566
(860) 677-1999

SMW ENGINEERING GROUP, INC.
TOGETHER PLANNING A BETTER TOMORROW

SITE INFORMATION:
CTNH548A
113 BRUSH HILL ROAD
GOSHEN, CT 06756

#	DATE	DESCRIPTION:
0	04/06/07	ISSUED FOR CLIENT REV.
1	04/10/17	ISSUED FOR CONSTRUCTION

T-MOBILE SITE ID: CTNH548A
SBA SITE ID: CT12210-A

SHEET NAME:
ATTACHMENTS

SMW #: 16-2562

DESIGNER:	BMD
CHECKED BY:	RTB
ENGINEER:	JDS

SHEET NUMBER:
A-2

Exhibit D

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

Structural Analysis Report

Existing 194 ft EEI Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT12210-A

Customer Site Name: Goshen 3, CT

Carrier Name: T-Mobile

Carrier Site ID / Name: CTNH548A / ROB8

Site Location: 113 Brush Hill Road

Goshen, Connecticut

Litchfield County

Latitude: 41.797172

Longitude: -73.221674

10/13/16

Analysis Result:

Max Structural Usage: 70.7% [Pass]

Max Foundation Usage: 54.0% [Pass]

Report Prepared by: Matthew Baker

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

Structural Analysis Report

Existing 194 ft EEI Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT12210-A

Customer Site Name: Goshen 3, CT

Carrier Name: T-Mobile

Carrier Site ID / Name: CTNH548A / ROB8

Site Location: 113 Brush Hill Road

Goshen, Connecticut

Litchfield County

Latitude: 41.797172

Longitude: -73.221674

Analysis Result:

Max Structural Usage: 70.7% [Pass]

Max Foundation Usage: 54.0% [Pass]

Report Prepared by: Matthew Baker

Introduction

The purpose of this report is to summarize the analysis results on the 194 ft EEI 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	Engineered Endeavors Incorporated Project #12782, Drawing #GS55363, Dated 07/28/04
Foundation Drawing	Engineered Endeavors Incorporated Project #12782, Drawing #12782-195, Dated 07/28/04
Geotechnical Report	Dr. Clarence Welti, PE, PC Geotechnical Report, Dated 12/18/03
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} = 115 mph (3-Sec. Gust)/ Nominal Design Wind Speed V_{asd} = 89.0 mph (3-Sec. Gust)
Wind Speed with Ice:	40 mph (3-Sec. Gust) with 1" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-G / 2012 IBC / 2016 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.182, S_1 = 0.065

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	196.0	3	RFS - APXVSPP18-C-A20 - Panel	Low Profile Platform	(4) 1 1/4"	Sprint
2		3	RFS - APXVTM14-C-120 - Panel			
3	195.0	3	ALU - 1900MHz RRH - RRU			
4		3	ALU - 800 MHz RRH - RRU			
5		3	ALU - TD-RRH8x20-25 - RRU			
6		3	ALU - 800 MHz Filter - Filter			
7		4	RFS - ACU-A20-N - RET			
8	185.0	4	Amphenol - LPA-80080/6CF - Panel	Low Profile Platform	(18) 1 5/8" (2) 1/2"	Verizon
9		3	Amphenol - BXA-70063-6-CF - Panel			
10		3	Amphenol - BXA-171063-12BF - Panel			
11		2	Amphenol - LPA-80063-6 CF - Panel			
12		1	Andrew - FPA5250 - Dish			
13		1	GPS			
14	175.0	6	Powerwave - 7770.00 - Panel	Low Profile Platform	(12) 1 5/8" (2) 3/4" DC and (1) 7/16" Fiber inside (1) 3" Innerduct	AT&T
15		3	KMW - AM-X-CD-16-65-00T-RET - Panel			
16		12	Powerwave - LGP21401 - TMA			
17		6	Powerwave - LGP13519 - TMA			
18		6	Ericsson - RRUS 11 - RRU			
19		1	Raycap - DC6-48-60-18-8F - SP			
20		1	Commscope - ABT-DFDM-ADBH – Bias-T			

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
21	160.0	3	Commscope - LNX-6515DS-A1M - Panel	(3) T-Arm	(2) 1 5/8" Hybrid	T-Mobile
22		3	RFS - APX16DWV-16DWVS-E-A20 - Panel			
23		3	Ericsson - RRUS 11 (Band 4) - RRU			
24		3	Ericsson - RRUS 11 (Band 12) - RRU			
25		3	Ericsson - RRUS 11 - RRU			
26	50.0	1	Symmetricom - 58532A - GPS	Direct	(1) 1/2"	

All transmission lines are considered running inside of the pole shafts.

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:	**60.2%**	**54.0%**	**70.7%**
Pass/Fail	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)	Axial (Kips)
Analysis Reactions	4408.1	31.3	98.6

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)
185.0	Andrew - FPA5250 - Dish	Verizon	0.000	2.069

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 61.75% at 53.3ft

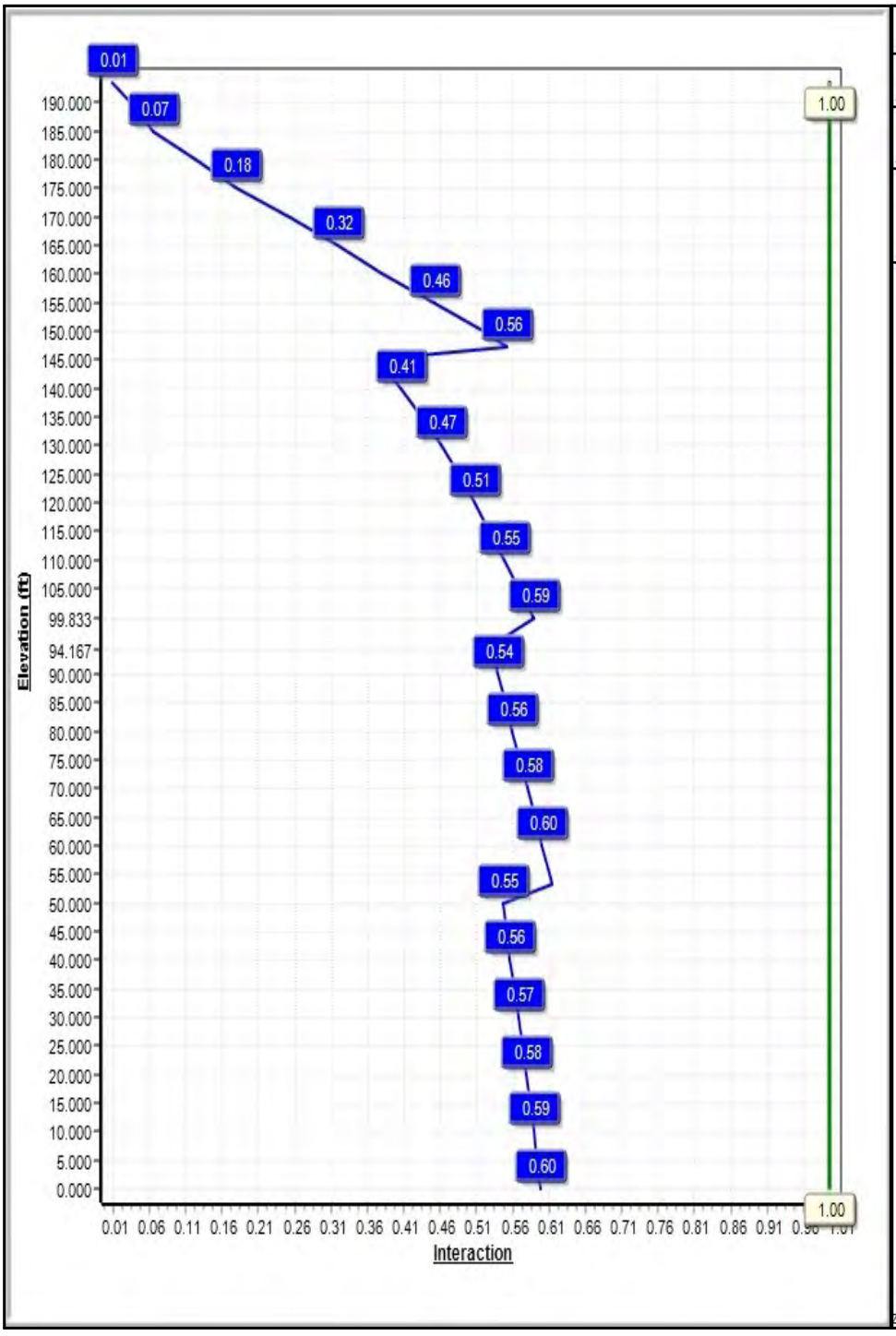
Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Gh:**	1.1		
Base Elev:	0.000 (ft)			Page: 1	

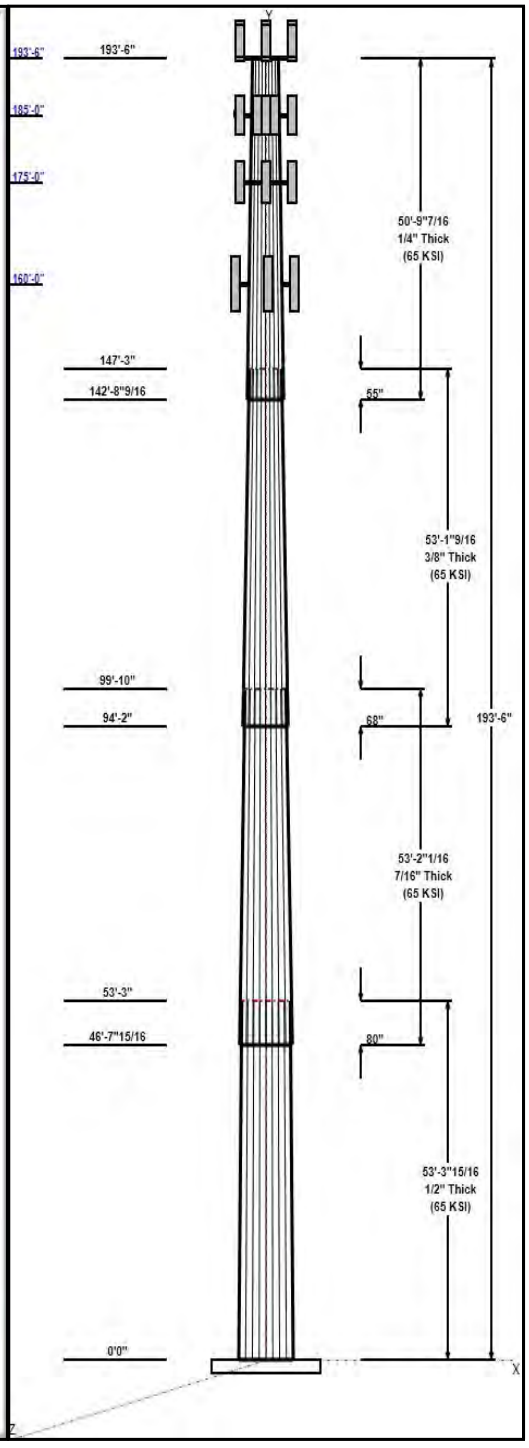
Tower Engineering Solutions

Dead Load Factor:	1.20
Wind Load Factor:	1.60

Load Case : 1.2D + 1.6W 89 mph Wind

Iterations: 26





Structure: CT12210-A-SBA

Type: Tapered
Site Name: Goshen 3, CT
Height: 193.50 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.18928

10/13/2016

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	53.33	46.91	57.00	0.500		0.18928	65
2	53.17	38.98	49.04	0.438	Slip	0.18928	65
3	53.13	30.75	40.80	0.375	Slip	0.18928	65
4	50.79	22.50	32.11	0.250	Slip	0.18928	65

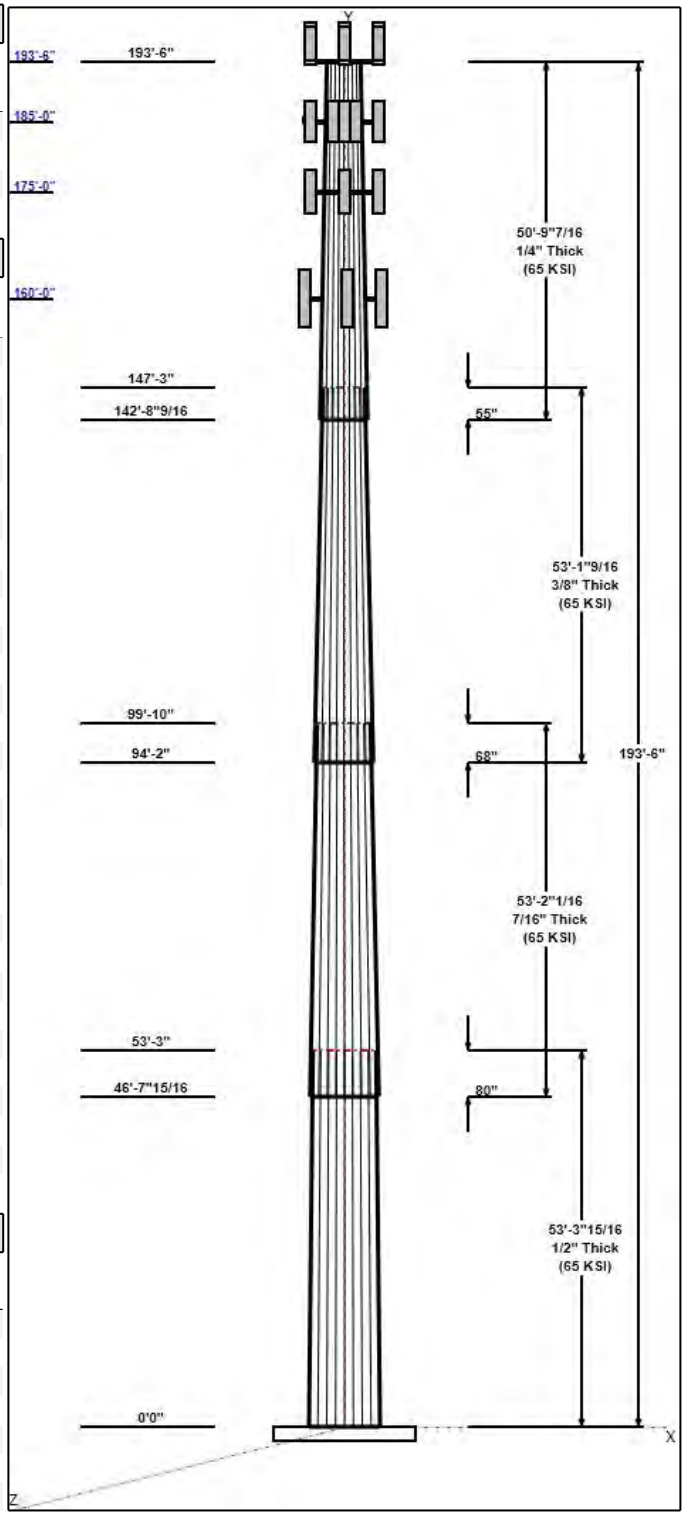
Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
193.50	195.00	1	Low Profile Platform-flat	Sprint
193.50	196.00	3	APXVSPP18-C-A20	Sprint
193.50	196.00	3	APXVTM14-C-120	Sprint
193.50	196.00	3	1900MHz RRH	Sprint
193.50	193.50	3	800 MHz RRH	Sprint
193.50	196.00	3	TD-RRH8x20-25	Sprint
193.50	195.00	3	800 MHz Filter	Sprint
193.50	195.00	4	ACU-A20-N	Sprint
185.00	185.00	1	Low Profile	Verizon
185.00	185.00	4	LPA-80080/6CF	Verizon
185.00	185.00	3	BXA-70063-6-CF	Verizon
185.00	185.00	3	BXA-171063-12BF	Verizon
185.00	185.00	2	LPA-8006366 CF	Verizon
185.00	185.00	1	FPA5250	Verizon
185.00	185.00	1	GPS	Verizon
175.00	175.00	1	Low Profile	AT&T
175.00	175.00	6	7770.00	AT&T
175.00	175.00	3	AM-X-CD-16-65-00T-RET	AT&T
175.00	175.00	12	LGP21401	AT&T
175.00	175.00	6	LGP13519	AT&T
175.00	175.00	6	RRUS 11	AT&T
175.00	175.00	1	DC6-48-60-18-8F	AT&T
175.00	175.00	1	ABT-DMDF-ADBH	AT&T
160.00	160.00	3	T-Arm (Round)	T-Mobile
160.00	160.00	3	LNX-6515DS-A1M	T-Mobile
160.00	160.00	3	APX16DWV-16DWVS-E-A	T-Mobile
160.00	160.00	3	RRUS 11 (Band 4)	T-Mobile
160.00	160.00	3	RRUS 11 (Band 12)	T-Mobile
160.00	160.00	3	RRUS 11	T-Mobile
50.00	50.00	1	58532A	T-Mobile

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	193.50	Inside	1 1/4"	Sprint
0.00	185.00	Inside	1 5/8"	Verizon
0.00	185.00	Inside	1/2"	Verizon
0.00	175.00	Inside	1 5/8"	AT&T
0.00	175.00	Inside	3" Innerduct	AT&T
0.00	175.00	Inside	3/4" DC	AT&T
0.00	175.00	Inside	7/16" Fiber	AT&T
0.00	160.00	Inside	1 5/8" Hybrid	T-Mobile
0.00	50.00	Inside	1/2"	T-Mobile

Anchor Bolts



Qty	Specifications	Grade (ksi)	Arrangement
24	2.25" 18J	75.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
2.2500	72.0	60.0	Round

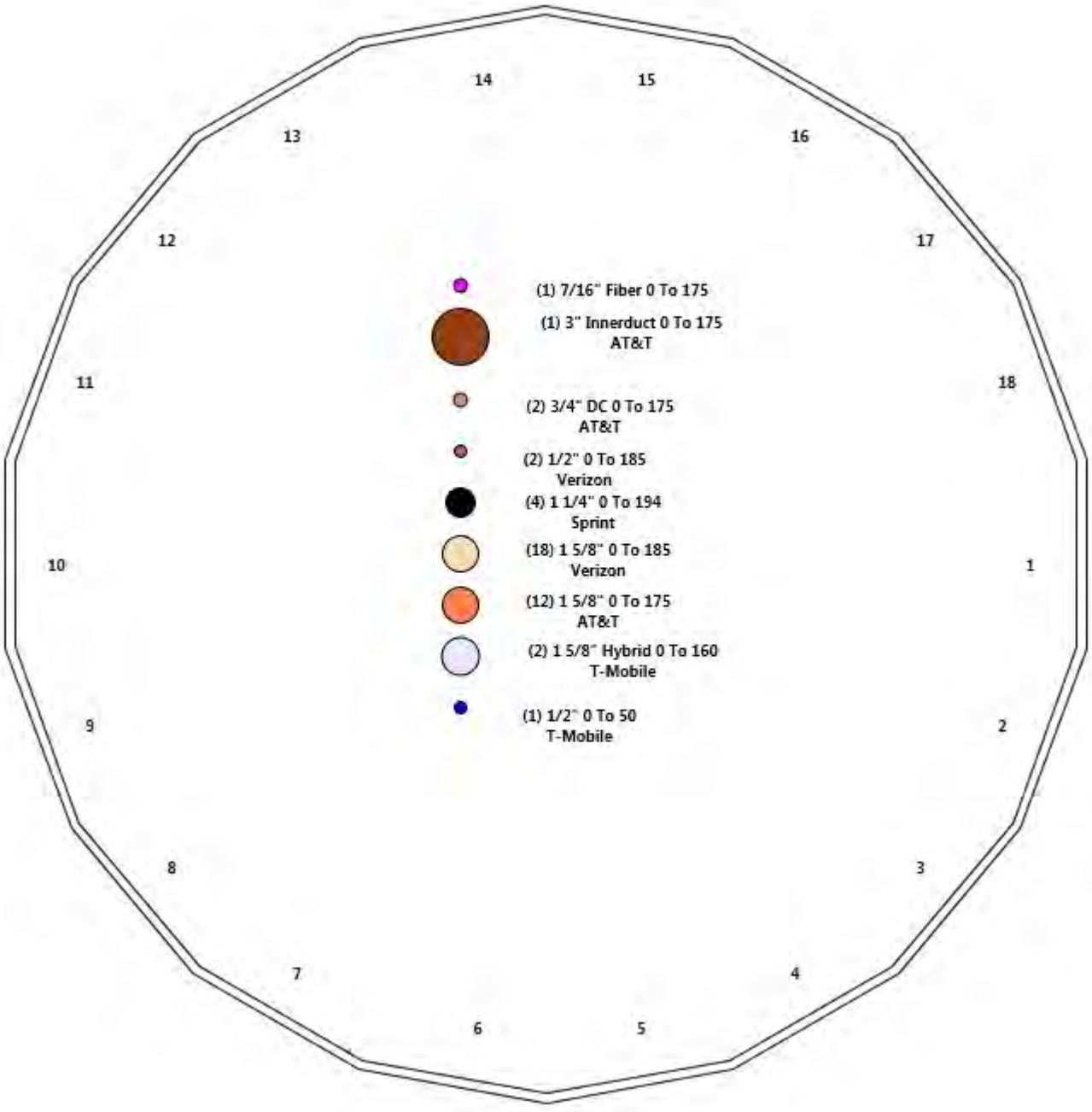
Reactions

Load Case	Moment	Shear	Axial
1.2D + 1.6W 89 mph Wind	4408.1	31.3	62.2
0.9D + 1.6W 89 mph Wind	4339.9	31.3	46.7
1.2D + 1.0Di + 1.0Wi 40 mph Wind	1081.5	7.4	98.6
1.2D + 1.0E	325.4	2.3	62.3
0.9D + 1.0E	320.0	2.3	46.7
1.0D + 1.0W 60 mph Wind	1241.6	8.9	51.9

Structure: CT12210-A-SBA - Coax Line Placement

Type: Monopole
Site Name: Goshen 3, CT
Height: 193.50 (ft)

10/13/2016



Shaft Properties

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 5

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	53.330	0.5000	65		0.00	14,818
2	18	53.170	0.4375	65	Slip	80.00	10,947
3	18	53.130	0.3750	65	Slip	68.00	7,617
4	18	50.787	0.2500	65	Slip	55.00	3,710
					Total Shaft Weight:		**37,091**

	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	57.00	0.00	89.66	36162.61	18.69	114.00	46.91	53.33	73.64	20037.0	15.13	93.81	0.189276
2	49.04	46.66	67.49	20145.19	18.36	112.10	38.98	99.83	53.52	10043.9	14.30	89.09	0.189276
3	40.80	94.17	48.12	9935.12	17.77	108.80	30.75	147.30	36.15	4212.30	13.05	81.99	0.189276
4	32.11	142.7	25.28	3242.90	21.24	128.45	22.50	193.50	17.65	1104.27	14.46	90.00	0.189276

Load Summary

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 6	

Discrete Appurtenances

				No Ice			Ice				
No.	Elev (ft)	Description	Qty	Weight (lb)	CaAa (sf)	CaAa Factor	Weight (lb)	CaAa (sf)	CaAa Factor	Hor. Ecc. (ft)	Vert Ecc (ft)
1	193.50	Low Profile Platform-flat	1	1200.00	25.00	1.00	2632.18	53.644	1.00	0.00	1.50
2	193.50	APXVSPP18-C-A20	3	57.00	8.02	0.83	293.41	11.841	0.86	0.00	2.50
3	193.50	APXVTM14-C-120	3	56.00	6.34	0.79	281.42	7.896	0.82	0.00	2.50
4	193.50	1900MHz RRH	3	44.00	3.80	0.50	193.31	5.701	0.50	0.00	2.50
5	193.50	800 MHz RRH	3	53.00	2.49	0.50	154.16	4.054	0.50	0.00	0.00
6	193.50	TD-RRH8x20-25	3	70.00	4.05	0.50	210.55	5.199	0.50	0.00	2.50
7	193.50	800 MHz Filter	3	10.00	0.42	0.67	30.40	0.891	0.67	0.00	1.50
8	193.50	ACU-A20-N	4	1.00	0.14	0.50	6.88	0.546	0.50	0.00	1.50
9	185.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	3282.20	46.048	1.00	0.00	0.00
10	185.00	LPA-80080/6CF	4	21.00	4.33	1.50	307.04	6.001	1.40	0.00	0.00
11	185.00	BXA-70063-6-CF	3	17.00	7.57	0.75	209.95	11.333	0.79	0.00	0.00
12	185.00	BXA-171063-12BF	3	15.00	4.74	0.88	144.26	7.939	0.90	0.00	0.00
13	185.00	LPA-8006366 CF	2	27.00	9.60	0.95	409.36	11.489	0.95	0.00	0.00
14	185.00	FPA5250	1	10.00	1.20	1.00	39.88	2.190	1.00	0.00	0.00
15	185.00	GPS	1	10.00	1.00	0.67	49.92	1.970	0.67	0.00	0.00
16	175.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	3272.33	45.915	1.00	0.00	0.00
17	175.00	7770.00	6	35.00	5.50	0.77	226.32	6.966	0.81	0.00	0.00
18	175.00	AM-X-CD-16-65-00T-RET	3	48.50	8.02	0.80	268.23	11.803	0.82	0.00	0.00
19	175.00	LGP21401	12	14.10	1.29	0.67	47.95	2.422	0.67	0.00	0.00
20	175.00	LGP13519	6	5.30	0.34	0.67	18.16	0.955	0.67	0.00	0.00
21	175.00	RRUS 11	6	50.70	2.52	0.50	183.40	3.428	0.50	0.00	0.00
22	175.00	DC6-48-60-18-8F	1	31.80	0.92	1.00	115.51	1.513	1.00	0.00	0.00
23	175.00	ABT-DMDF-ADBH	1	1.10	0.05	0.67	4.12	0.311	0.67	0.00	0.00
24	160.00	T-Arm (Round)	3	350.00	8.00	1.00	677.88	17.368	1.00	0.00	0.00
25	160.00	LNX-6515DS-A1M	3	49.80	11.47	0.84	357.85	15.854	0.86	0.00	0.00
26	160.00	APX16DWV-16DWVS-E-A20	3	40.70	6.61	0.66	197.79	9.533	0.71	0.00	0.00
27	160.00	RRUS 11 (Band 4)	3	44.00	2.52	0.50	127.68	3.370	0.50	0.00	0.00
28	160.00	RRUS 11 (Band 12)	3	44.00	2.52	0.50	127.68	3.370	0.50	0.00	0.00
29	160.00	RRUS 11	3	51.00	2.52	0.50	147.99	3.370	0.50	0.00	0.00
30	50.00	58532A	1	0.40	0.22	0.67	9.96	0.662	0.67	0.00	0.00
		Totals:	**93**	**7,960.50**			**24,890.88**				

Linear Appurtenances

Bottom Elev. (ft)	Top Elev. (ft)	Description	Exposed Width	Exposed
0.00	193.50	(4) 1 1/4"	0.00	Inside
0.00	185.00	(18) 1 5/8"	0.00	Inside
0.00	185.00	(2) 1/2"	0.00	Inside
0.00	175.00	(12) 1 5/8"	0.00	Inside
0.00	175.00	(1) 3" Innerduct	0.00	Inside
0.00	175.00	(2) 3/4" DC	0.00	Inside
0.00	175.00	(1) 7/16" Fiber	0.00	Inside
0.00	160.00	(2) 1 5/8" Hybrid	0.00	Inside
0.00	50.00	(1) 1/2"	0.00	Inside

Shaft Section Properties

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 7	

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	57.000	89.662	36162.6	18.69	114.00	79.4	1249.	0.0
5.00		0.5000	56.054	88.160	34375.7	18.36	112.11	79.8	1207.	1512.7
10.00		0.5000	55.107	86.659	32648.6	18.02	110.21	80.2	1166.	1487.2
15.00		0.5000	54.161	85.157	30980.4	17.69	108.32	80.6	1126.	1461.6
20.00		0.5000	53.214	83.655	29370.0	17.36	106.43	81.0	1087.	1436.1
25.00		0.5000	52.268	82.153	27816.4	17.02	104.54	81.4	1048.	1410.5
30.00		0.5000	51.322	80.651	26318.6	16.69	102.64	81.8	1010.	1385.0
35.00		0.5000	50.375	79.149	24875.5	16.35	100.75	82.2	972.6	1359.4
40.00		0.5000	49.429	77.647	23486.1	16.02	98.86	82.5	935.9	1333.9
45.00		0.5000	48.483	76.146	22149.5	15.69	96.97	82.5	899.8	1308.3
46.66	Bot - Section 2	0.5000	48.168	75.646	21716.4	15.58	96.34	82.5	888.0	429.6
50.00		0.5000	47.536	74.644	20864.6	15.35	95.07	82.5	864.5	1614.5
53.33	Top - Section 1	0.4375	47.781	65.740	18616.6	17.85	109.21	0.0	0.0	1590.0
55.00		0.4375	47.465	65.301	18246.2	17.72	108.49	80.6	757.2	372.3
60.00		0.4375	46.518	63.987	17166.7	17.34	106.33	81.0	726.8	1099.8
65.00		0.4375	45.572	62.673	16130.5	16.96	104.16	81.5	697.2	1077.5
70.00		0.4375	44.626	61.359	15137.0	16.57	102.00	81.9	668.1	1055.1
75.00		0.4375	43.679	60.044	14185.1	16.19	99.84	82.4	639.6	1032.8
80.00		0.4375	42.733	58.730	13274.0	15.81	97.68	82.5	611.8	1010.4
85.00		0.4375	41.786	57.416	12402.7	15.43	95.51	82.5	584.6	988.1
90.00		0.4375	40.840	56.102	11570.5	15.05	93.35	82.5	558.0	965.7
94.17	Bot - Section 3	0.4375	40.051	55.007	10906.0	14.73	91.55	82.5	536.3	787.7
95.00		0.4375	39.894	54.788	10776.3	14.67	91.19	82.5	532.0	291.8
99.83	Top - Section 2	0.3750	39.729	46.839	9165.1	17.27	105.94	0.0	0.0	1669.9
100.00		0.3750	39.697	46.802	9143.1	17.26	105.86	81.1	453.6	26.6
105.00		0.3750	38.751	45.675	8498.7	16.81	103.34	81.6	432.0	786.7
110.00		0.3750	37.805	44.549	7885.3	16.37	100.81	82.2	410.8	767.5
115.00		0.3750	36.858	43.423	7302.2	15.92	98.29	82.5	390.2	748.4
120.00		0.3750	35.912	42.296	6748.6	15.48	95.76	82.5	370.1	729.2
125.00		0.3750	34.965	41.170	6223.6	15.03	93.24	82.5	350.6	710.0
130.00		0.3750	34.019	40.043	5726.7	14.59	90.72	82.5	331.6	690.9
135.00		0.3750	33.073	38.917	5256.9	14.14	88.19	82.5	313.1	671.7
140.00		0.3750	32.126	37.791	4813.5	13.70	85.67	82.5	295.1	652.5
142.71	Bot - Section 4	0.3750	31.613	37.179	4583.7	13.45	84.30	82.5	285.6	346.1
145.00		0.3750	31.180	36.664	4395.8	13.25	83.15	82.5	277.7	482.7
147.30	Top - Section 3	0.2500	31.245	24.594	2985.2	20.63	124.98	0.0	0.0	478.1
150.00		0.2500	30.734	24.188	2839.7	20.27	122.93	77.6	182.0	224.4
155.00		0.2500	29.787	23.437	2583.4	19.60	119.15	78.3	170.8	405.1
160.00		0.2500	28.841	22.686	2342.9	18.93	115.36	79.1	160.0	392.4
165.00		0.2500	27.894	21.935	2117.9	18.26	111.58	79.9	149.5	379.6
170.00		0.2500	26.948	21.184	1907.7	17.60	107.79	80.7	139.4	366.8
175.00		0.2500	26.002	20.433	1712.0	16.93	104.01	81.5	129.7	354.0
180.00		0.2500	25.055	19.682	1530.1	16.26	100.22	82.3	120.3	341.3
185.00		0.2500	24.109	18.931	1361.5	15.59	96.44	82.5	111.2	328.5
190.00		0.2500	23.162	18.180	1205.9	14.93	92.65	82.5	102.5	315.7
193.50		0.2500	22.500	17.655	1104.3	14.46	90.00	82.5	96.7	213.4
										37091.4

Wind Loading - Shaft

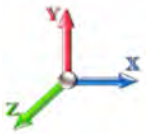
Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 8	

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 89 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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	16.374	18.01	395.77	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	16.374	18.01	389.20	0.650	0.000	5.00	23.916	15.55	448.0	0.0	1815.3
10.00		1.00	0.85	16.374	18.01	382.63	0.650	0.000	5.00	23.516	15.29	440.5	0.0	1784.6
15.00		1.00	0.85	16.374	18.01	376.06	0.650	0.000	5.00	23.115	15.02	433.0	0.0	1753.9
20.00		1.00	0.90	17.374	19.11	380.59	0.650	0.000	5.00	22.715	14.76	451.5	0.0	1723.3
25.00		1.00	0.95	18.209	20.03	382.71	0.650	0.000	5.00	22.315	14.50	464.8	0.0	1692.6
30.00		1.00	0.98	18.922	20.81	383.06	0.650	0.000	5.00	21.914	14.24	474.4	0.0	1662.0
35.00		1.00	1.01	19.546	21.50	382.15	0.650	0.000	5.00	21.514	13.98	481.1	0.0	1631.3
40.00		1.00	1.04	20.103	22.11	380.28	0.650	0.000	5.00	21.113	13.72	485.6	0.0	1600.6
45.00		1.00	1.07	20.608	22.67	377.65	0.650	0.000	5.00	20.713	13.46	488.3	0.0	1570.0
46.66	Bot - Section 2	1.00	1.08	20.766	22.84	376.63	0.650	0.000	1.66	6.802	4.42	161.6	0.0	515.5
50.00	Appurtenance(s)	1.00	1.09	21.070	23.18	374.41	0.650	0.000	3.34	13.758	8.94	331.6	0.0	1937.4
53.33	Top - Section 1	1.00	1.11	21.358	23.49	371.96	0.650	0.000	3.33	13.553	8.81	331.1	0.0	1908.0
55.00		1.00	1.12	21.497	23.65	377.62	0.650	0.000	1.67	6.730	4.37	165.5	0.0	446.8
60.00		1.00	1.14	21.895	24.08	373.49	0.650	0.000	5.00	19.882	12.92	498.0	0.0	1319.8
65.00		1.00	1.16	22.267	24.49	368.99	0.650	0.000	5.00	19.481	12.66	496.3	0.0	1293.0
70.00		1.00	1.17	22.617	24.88	364.16	0.650	0.000	5.00	19.081	12.40	493.7	0.0	1266.2
75.00		1.00	1.19	22.948	25.24	359.03	0.650	0.000	5.00	18.681	12.14	490.4	0.0	1239.3
80.00		1.00	1.21	23.262	25.59	353.65	0.650	0.000	5.00	18.280	11.88	486.5	0.0	1212.5
85.00		1.00	1.22	23.561	25.92	348.03	0.650	0.000	5.00	17.880	11.62	481.9	0.0	1185.7
90.00		1.00	1.24	23.846	26.23	342.20	0.650	0.000	5.00	17.479	11.36	476.8	0.0	1158.8
94.17	Bot - Section 3	1.00	1.25	24.074	26.48	337.19	0.650	0.000	4.17	14.260	9.27	392.7	0.0	945.2
95.00		1.00	1.25	24.119	26.53	336.18	0.650	0.000	0.83	2.872	1.87	79.2	0.0	350.2
99.83	Top - Section 2	1.00	1.27	24.372	26.81	330.19	0.650	0.000	4.83	16.436	10.68	458.3	0.0	2003.9
100.00		1.00	1.27	24.381	26.82	336.33	0.650	0.000	0.17	0.560	0.36	15.6	0.0	31.9
105.00		1.00	1.28	24.632	27.10	330.01	0.650	0.000	5.00	16.596	10.79	467.7	0.0	944.0
110.00		1.00	1.29	24.875	27.36	323.53	0.650	0.000	5.00	16.195	10.53	460.9	0.0	921.0
115.00		1.00	1.30	25.109	27.62	316.91	0.650	0.000	5.00	15.795	10.27	453.7	0.0	898.0
120.00		1.00	1.32	25.335	27.87	310.16	0.650	0.000	5.00	15.394	10.01	446.2	0.0	875.0
125.00		1.00	1.33	25.553	28.11	303.28	0.650	0.000	5.00	14.994	9.75	438.3	0.0	852.0
130.00		1.00	1.34	25.765	28.34	296.30	0.650	0.000	5.00	14.593	9.49	430.1	0.0	829.1
135.00		1.00	1.35	25.971	28.57	289.20	0.650	0.000	5.00	14.193	9.23	421.7	0.0	806.1
140.00		1.00	1.36	26.170	28.79	282.00	0.650	0.000	5.00	13.793	8.97	412.9	0.0	783.1
142.71	Bot - Section 4	1.00	1.36	26.276	28.90	278.05	0.650	0.000	2.71	7.317	4.76	220.0	0.0	415.3
145.00		1.00	1.37	26.364	29.00	274.71	0.650	0.000	2.29	6.172	4.01	186.1	0.0	579.2
147.30	Top - Section 3	1.00	1.37	26.452	29.10	271.33	0.650	0.000	2.30	6.114	3.97	185.0	0.0	573.7
150.00		1.00	1.38	26.553	29.21	271.74	0.650	0.000	2.70	7.089	4.61	215.3	0.0	269.2
155.00		1.00	1.39	26.737	29.41	264.29	0.650	0.000	5.00	12.803	8.32	391.6	0.0	486.2
160.00	Appurtenance(s)	1.00	1.40	26.917	29.61	256.74	0.650	0.000	5.00	12.403	8.06	381.9	0.0	470.8
165.00		1.00	1.41	27.091	29.80	249.13	0.650	0.000	5.00	12.002	7.80	372.0	0.0	455.5
170.00		1.00	1.42	27.262	29.99	241.43	0.650	0.000	5.00	11.602	7.54	361.8	0.0	440.2
175.00	Appurtenance(s)	1.00	1.42	27.429	30.17	233.66	0.650	0.000	5.00	11.201	7.28	351.5	0.0	424.8
180.00		1.00	1.43	27.592	30.35	225.83	0.650	0.000	5.00	10.801	7.02	340.9	0.0	409.5
185.00	Appurtenance(s)	1.00	1.44	27.752	30.53	217.93	0.650	0.000	5.00	10.401	6.76	330.2	0.0	394.2
190.00		1.00	1.45	27.908	30.70	209.96	0.650	0.000	5.00	10.000	6.50	319.3	0.0	378.8
193.50	Appurtenance(s)	1.00	1.45	28.016	30.82	204.35	0.650	0.000	3.50	6.762	4.40	216.7	0.0	256.1

Wind Loading - Shaft

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 9	

Totals:	**193.50**	**16,930.3**	**44,509.7**

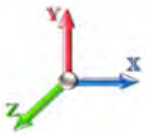
Discrete Appurtenance Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 10	

Load Case: 1.2D + 1.6W 89 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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	193.50	1900MHz RRH	3	28.091	30.901	0.50	1.00	5.70	158.40	0.000	2.500	281.81	0.00	704.53
2	193.50	Low Profile Platform-flat	1	28.061	30.867	1.00	1.00	25.00	1440.00	0.000	1.500	1234.69	0.00	1852.04
3	193.50	APXVSPP18-C-A20	3	28.091	30.901	0.83	1.00	19.97	205.20	0.000	2.500	987.33	0.00	2468.31
4	193.50	APXVTM14-C-120	3	28.091	30.901	0.79	1.00	15.03	201.60	0.000	2.500	742.89	0.00	1857.22
5	193.50	ACU-A20-N	4	28.061	30.867	0.50	1.00	0.28	4.80	0.000	1.500	13.83	0.00	20.74
6	193.50	800 MHz RRH	3	28.016	30.817	0.50	1.00	3.74	190.80	0.000	0.000	184.16	0.00	0.00
7	193.50	TD-RRH8x20-25	3	28.091	30.901	0.50	1.00	6.07	252.00	0.000	2.500	300.35	0.00	750.88
8	193.50	800 MHz Filter	3	28.061	30.867	0.67	1.00	0.84	36.00	0.000	1.500	41.69	0.00	62.54
9	185.00	GPS	1	27.752	30.527	0.54	0.80	0.54	12.00	0.000	0.000	26.18	0.00	0.00
10	185.00	FPA5250	1	27.752	30.527	1.00	1.00	1.20	12.00	0.000	0.000	58.61	0.00	0.00
11	185.00	LPA-8006366 CF	2	27.752	30.527	0.76	0.80	14.59	64.80	0.000	0.000	712.72	0.00	0.00
12	185.00	BXA-171063-12BF	3	27.752	30.527	0.70	0.80	10.01	54.00	0.000	0.000	488.97	0.00	0.00
13	185.00	BXA-70063-6-CF	3	27.752	30.527	0.60	0.80	13.63	61.20	0.000	0.000	665.54	0.00	0.00
14	185.00	LPA-80080/6CF	4	27.752	30.527	1.20	0.80	20.78	100.80	0.000	0.000	1015.16	0.00	0.00
15	185.00	Low Profile	1	27.752	30.527	1.00	1.00	22.00	1800.00	0.000	0.000	1074.55	0.00	0.00
16	175.00	ABT-DMDF-ADBH	1	27.429	30.172	0.54	0.80	0.03	1.32	0.000	0.000	1.29	0.00	0.00
17	175.00	AM-X-CD-16-65-00T-RET	3	27.429	30.172	0.64	0.80	15.40	174.60	0.000	0.000	743.36	0.00	0.00
18	175.00	Low Profile	1	27.429	30.172	1.00	1.00	22.00	1800.00	0.000	0.000	1062.06	0.00	0.00
19	175.00	7770.00	6	27.429	30.172	0.62	0.80	20.33	252.00	0.000	0.000	981.34	0.00	0.00
20	175.00	DC6-48-60-18-8F	1	27.429	30.172	0.80	0.80	0.74	38.16	0.000	0.000	35.53	0.00	0.00
21	175.00	LGP21401	12	27.429	30.172	0.54	0.80	8.30	203.04	0.000	0.000	400.55	0.00	0.00
22	175.00	LGP13519	6	27.429	30.172	0.54	0.80	1.09	38.16	0.000	0.000	52.79	0.00	0.00
23	175.00	RRUS 11	6	27.429	30.172	0.40	0.80	6.05	365.04	0.000	0.000	291.97	0.00	0.00
24	160.00	RRUS 11	3	26.917	29.608	0.40	0.80	3.02	183.60	0.000	0.000	143.26	0.00	0.00
25	160.00	RRUS 11 (Band 12)	3	26.917	29.608	0.40	0.80	3.02	158.40	0.000	0.000	143.26	0.00	0.00
26	160.00	RRUS 11 (Band 4)	3	26.917	29.608	0.40	0.80	3.02	158.40	0.000	0.000	143.26	0.00	0.00
27	160.00	APX16DWV-16DWVS-E-	3	26.917	29.608	0.53	0.80	10.47	146.52	0.000	0.000	496.01	0.00	0.00
28	160.00	LNX-6515DS-A1M	3	26.917	29.608	0.67	0.80	23.12	179.28	0.000	0.000	1095.43	0.00	0.00
29	160.00	T-Arm (Round)	3	26.917	29.608	0.75	0.75	18.00	1260.00	0.000	0.000	852.72	0.00	0.00
30	50.00	58532A	1	21.070	23.177	0.54	0.80	0.12	0.48	0.000	0.000	4.37	0.00	0.00
							Totals:		**9,552.60**			**14,275.69**		

Total Applied Force Summary

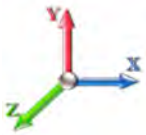
Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 11

Tower Engineering Solutions

Load Case: 1.2D + 1.6W 89 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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		448.00	2043.69	0.00	0.00
10.00		440.50	2013.03	0.00	0.00
15.00		433.00	1982.37	0.00	0.00
20.00		451.47	1951.70	0.00	0.00
25.00		464.85	1921.04	0.00	0.00
30.00		474.37	1890.38	0.00	0.00
35.00		481.06	1859.72	0.00	0.00
40.00		485.57	1829.05	0.00	0.00
45.00		488.32	1798.39	0.00	0.00
46.66		161.59	591.47	0.00	0.00
50.00	(1) attachments	336.00	2090.33	0.00	0.00
53.33		331.14	2059.50	0.00	0.00
55.00		165.50	522.77	0.00	0.00
60.00		498.00	1547.27	0.00	0.00
65.00		496.26	1520.44	0.00	0.00
70.00		493.70	1493.61	0.00	0.00
75.00		490.41	1466.78	0.00	0.00
80.00		486.47	1439.95	0.00	0.00
85.00		481.92	1413.12	0.00	0.00
90.00		476.83	1386.29	0.00	0.00
94.17		392.74	1134.75	0.00	0.00
95.00		79.23	388.12	0.00	0.00
99.83		458.26	2223.81	0.00	0.00
100.00		15.62	39.45	0.00	0.00
105.00		467.65	1171.50	0.00	0.00
110.00		460.86	1148.50	0.00	0.00
115.00		453.69	1125.50	0.00	0.00
120.00		446.17	1102.51	0.00	0.00
125.00		438.32	1079.51	0.00	0.00
130.00		430.15	1056.51	0.00	0.00
135.00		421.68	1033.51	0.00	0.00
140.00		412.94	1010.52	0.00	0.00
142.71		219.96	538.75	0.00	0.00
145.00		186.15	683.23	0.00	0.00
147.30		185.03	678.15	0.00	0.00
150.00		215.34	392.22	0.00	0.00
155.00		391.61	713.63	0.00	0.00
160.00	(18) attachments	3255.83	2784.50	0.00	0.00
165.00		371.98	669.77	0.00	0.00
170.00		361.84	654.43	0.00	0.00
175.00	(36) attachments	3920.38	3511.42	0.00	0.00
180.00		340.94	539.59	0.00	0.00
185.00	(15) attachments	4371.93	2629.06	0.00	0.00
190.00		319.27	394.69	0.00	0.00
193.50	(23) attachments	4003.48	2755.96	0.00	7716.28

Total Applied Force Summary

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 12

Tower Engineering Solutions

Totals:	**31,206.03**	**62,280.50**	**0.00**	**7,716.28**

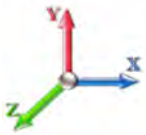
Calculated Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 13	

Load Case: 1.2D + 1.6W 89 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.60



Iterations 26

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	-62.23	-31.30	0.00	-4408.1	0.00	4408.12	6408.64	3204.32	14863.6	7442.88	0.00	0.000	0.000	0.602
5.00	-60.10	-31.03	0.00	-4251.6	0.00	4251.62	6332.44	3166.22	14438.7	7230.12	0.09	-0.170	0.000	0.598
10.00	-57.99	-30.75	0.00	-4096.4	0.00	4096.49	6255.18	3127.59	14017.4	7019.15	0.36	-0.343	0.000	0.593
15.00	-55.92	-30.48	0.00	-3942.7	0.00	3942.72	6176.86	3088.43	13599.8	6810.05	0.81	-0.518	0.000	0.588
20.00	-53.88	-30.18	0.00	-3790.3	0.00	3790.33	6097.47	3048.74	13186.1	6602.88	1.45	-0.696	0.000	0.583
25.00	-51.87	-29.85	0.00	-3639.4	0.00	3639.45	6017.03	3008.51	12776.3	6397.69	2.28	-0.876	0.000	0.578
30.00	-49.89	-29.50	0.00	-3490.2	0.00	3490.22	5935.52	2967.76	12370.7	6194.55	3.29	-1.058	0.000	0.572
35.00	-47.95	-29.14	0.00	-3342.7	0.00	3342.71	5852.95	2926.48	11969.2	5993.52	4.50	-1.243	0.000	0.566
40.00	-46.04	-28.76	0.00	-3197.0	0.00	3197.02	5768.82	2884.41	11571.1	5794.16	5.90	-1.430	0.000	0.560
45.00	-44.19	-28.32	0.00	-3053.2	0.00	3053.21	5657.24	2828.62	11125.6	5571.07	7.50	-1.619	0.000	0.556
46.66	-43.56	-28.22	0.00	-3006.1	0.00	3006.10	5620.12	2810.06	10979.3	5497.83	8.07	-1.684	0.000	0.555
50.00	-41.42	-27.91	0.00	-2911.9	0.00	2911.94	5545.66	2772.83	10688.8	5352.37	9.30	-1.813	0.000	0.552
53.33	-39.32	-27.58	0.00	-2818.9	0.00	2818.99	4757.51	2378.75	9242.35	4628.04	10.61	-1.943	0.000	0.618
55.00	-38.74	-27.49	0.00	-2772.9	0.00	2772.93	4734.55	2367.28	9135.77	4574.68	11.30	-2.009	0.000	0.614
60.00	-37.11	-27.08	0.00	-2635.4	0.00	2635.47	4665.11	2332.55	8818.95	4416.03	13.52	-2.220	0.000	0.605
65.00	-35.51	-26.65	0.00	-2500.0	0.00	2500.09	4594.60	2297.30	8505.61	4259.13	15.95	-2.433	0.000	0.595
70.00	-33.94	-26.22	0.00	-2366.8	0.00	2366.84	4523.04	2261.52	8195.87	4104.03	18.62	-2.648	0.000	0.584
75.00	-32.40	-25.78	0.00	-2235.7	0.00	2235.75	4450.41	2225.20	7889.86	3950.80	21.50	-2.864	0.000	0.573
80.00	-30.90	-25.34	0.00	-2106.8	0.00	2106.84	4363.37	2181.68	7564.56	3787.90	24.62	-3.082	0.000	0.563
85.00	-29.42	-24.89	0.00	-1980.1	0.00	1980.15	4265.74	2132.87	7228.13	3619.44	27.96	-3.301	0.000	0.554
90.00	-27.97	-24.43	0.00	-1855.6	0.00	1855.69	4168.10	2084.05	6899.36	3454.81	31.53	-3.521	0.000	0.544
94.17	-26.82	-24.02	0.00	-1753.8	0.00	1753.89	4086.74	2043.37	6631.22	3320.54	34.69	-3.705	0.000	0.535
95.00	-26.39	-23.98	0.00	-1733.8	0.00	1733.88	4070.47	2035.23	6578.23	3294.01	35.34	-3.743	0.000	0.533
99.83	-24.15	-23.41	0.00	-1618.0	0.00	1618.00	3418.29	1709.14	5518.43	2763.32	39.23	-3.957	0.000	0.593
100.00	-24.06	-23.45	0.00	-1614.1	0.00	1614.10	3416.28	1708.14	5510.73	2759.46	39.37	-3.965	0.000	0.592
105.00	-22.83	-23.00	0.00	-1496.8	0.00	1496.85	3355.57	1677.79	5281.30	2644.58	43.65	-4.207	0.000	0.573
110.00	-21.63	-22.54	0.00	-1381.8	0.00	1381.87	3293.81	1646.90	5055.01	2531.26	48.18	-4.448	0.000	0.553
115.00	-20.45	-22.08	0.00	-1269.1	0.00	1269.17	3226.08	1613.04	4824.64	2415.91	52.96	-4.687	0.000	0.532
120.00	-19.30	-21.63	0.00	-1158.7	0.00	1158.75	3142.39	1571.20	4576.34	2291.57	57.99	-4.923	0.000	0.512
125.00	-18.18	-21.17	0.00	-1050.6	0.00	1050.62	3058.71	1529.35	4334.61	2170.52	63.27	-5.156	0.000	0.490
130.00	-17.08	-20.71	0.00	-944.79	0.00	944.79	2975.02	1487.51	4099.43	2052.76	68.78	-5.384	0.000	0.466
135.00	-16.02	-20.25	0.00	-841.24	0.00	841.24	2891.34	1445.67	3870.81	1938.28	74.53	-5.606	0.000	0.440
140.00	-15.00	-19.78	0.00	-739.98	0.00	739.98	2807.65	1403.83	3648.75	1827.09	80.51	-5.820	0.000	0.411
142.71	-14.45	-19.54	0.00	-686.30	0.00	686.30	2762.24	1381.12	3530.99	1768.12	83.85	-5.934	0.000	0.394
145.00	-13.76	-19.30	0.00	-641.63	0.00	641.63	2723.97	1361.98	3433.25	1719.18	86.71	-6.029	0.000	0.378
147.30	-13.07	-19.07	0.00	-597.30	0.00	597.30	1707.44	853.72	2174.15	1088.69	89.63	-6.121	0.000	0.557
150.00	-12.64	-18.85	0.00	-545.75	0.00	545.75	1688.50	844.25	2114.25	1058.70	93.11	-6.225	0.000	0.523
155.00	-11.90	-18.43	0.00	-451.49	0.00	451.49	1652.64	826.32	2004.58	1003.78	99.76	-6.475	0.000	0.457
160.00	-9.46	-14.91	0.00	-359.33	0.00	359.33	1615.71	807.86	1896.48	949.65	106.65	-6.698	0.000	0.385
165.00	-8.79	-14.49	0.00	-284.76	0.00	284.76	1577.73	788.87	1790.06	896.36	113.75	-6.894	0.000	0.324
170.00	-8.15	-14.08	0.00	-212.29	0.00	212.29	1538.69	769.34	1685.46	843.98	121.05	-7.061	0.000	0.257
175.00	-5.13	-9.76	0.00	-141.91	0.00	141.91	1498.58	749.29	1582.80	792.58	128.50	-7.193	0.000	0.183
180.00	-4.62	-9.36	0.00	-93.11	0.00	93.11	1457.41	728.71	1482.21	742.21	136.07	-7.290	0.000	0.129
185.00	-2.57	-4.69	0.00	-46.31	0.00	46.31	1406.50	703.25	1375.31	688.68	143.72	-7.355	0.000	0.069
190.00	-2.22	-4.32	0.00	-22.85	0.00	22.85	1350.71	675.36	1267.83	634.86	151.42	-7.391	0.000	0.038
193.50	0.00	-4.00	0.00	-7.72	0.00	7.72	1311.66	655.83	1195.19	598.48	156.83	-7.404	0.000	0.013

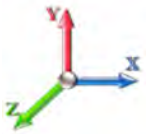
Wind Loading - Shaft

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 14	

Load Case: 0.9D + 1.6W 89 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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	16.374	18.01	395.77	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	16.374	18.01	389.20	0.650	0.000	5.00	23.916	15.55	448.0	0.0	1361.5
10.00		1.00	0.85	16.374	18.01	382.63	0.650	0.000	5.00	23.516	15.29	440.5	0.0	1338.5
15.00		1.00	0.85	16.374	18.01	376.06	0.650	0.000	5.00	23.115	15.02	433.0	0.0	1315.5
20.00		1.00	0.90	17.374	19.11	380.59	0.650	0.000	5.00	22.715	14.76	451.5	0.0	1292.5
25.00		1.00	0.95	18.209	20.03	382.71	0.650	0.000	5.00	22.315	14.50	464.8	0.0	1269.5
30.00		1.00	0.98	18.922	20.81	383.06	0.650	0.000	5.00	21.914	14.24	474.4	0.0	1246.5
35.00		1.00	1.01	19.546	21.50	382.15	0.650	0.000	5.00	21.514	13.98	481.1	0.0	1223.5
40.00		1.00	1.04	20.103	22.11	380.28	0.650	0.000	5.00	21.113	13.72	485.6	0.0	1200.5
45.00		1.00	1.07	20.608	22.67	377.65	0.650	0.000	5.00	20.713	13.46	488.3	0.0	1177.5
46.66	Bot - Section 2	1.00	1.08	20.766	22.84	376.63	0.650	0.000	1.66	6.802	4.42	161.6	0.0	386.6
50.00	Appurtenance(s)	1.00	1.09	21.070	23.18	374.41	0.650	0.000	3.34	13.758	8.94	331.6	0.0	1453.1
53.33	Top - Section 1	1.00	1.11	21.358	23.49	371.96	0.650	0.000	3.33	13.553	8.81	331.1	0.0	1431.0
55.00		1.00	1.12	21.497	23.65	377.62	0.650	0.000	1.67	6.730	4.37	165.5	0.0	335.1
60.00		1.00	1.14	21.895	24.08	373.49	0.650	0.000	5.00	19.882	12.92	498.0	0.0	989.9
65.00		1.00	1.16	22.267	24.49	368.99	0.650	0.000	5.00	19.481	12.66	496.3	0.0	969.7
70.00		1.00	1.17	22.617	24.88	364.16	0.650	0.000	5.00	19.081	12.40	493.7	0.0	949.6
75.00		1.00	1.19	22.948	25.24	359.03	0.650	0.000	5.00	18.681	12.14	490.4	0.0	929.5
80.00		1.00	1.21	23.262	25.59	353.65	0.650	0.000	5.00	18.280	11.88	486.5	0.0	909.4
85.00		1.00	1.22	23.561	25.92	348.03	0.650	0.000	5.00	17.880	11.62	481.9	0.0	889.2
90.00		1.00	1.24	23.846	26.23	342.20	0.650	0.000	5.00	17.479	11.36	476.8	0.0	869.1
94.17	Bot - Section 3	1.00	1.25	24.074	26.48	337.19	0.650	0.000	4.17	14.260	9.27	392.7	0.0	708.9
95.00		1.00	1.25	24.119	26.53	336.18	0.650	0.000	0.83	2.872	1.87	79.2	0.0	262.7
99.83	Top - Section 2	1.00	1.27	24.372	26.81	330.19	0.650	0.000	4.83	16.436	10.68	458.3	0.0	1503.0
100.00		1.00	1.27	24.381	26.82	336.33	0.650	0.000	0.17	0.560	0.36	15.6	0.0	23.9
105.00		1.00	1.28	24.632	27.10	330.01	0.650	0.000	5.00	16.596	10.79	467.7	0.0	708.0
110.00		1.00	1.29	24.875	27.36	323.53	0.650	0.000	5.00	16.195	10.53	460.9	0.0	690.8
115.00		1.00	1.30	25.109	27.62	316.91	0.650	0.000	5.00	15.795	10.27	453.7	0.0	673.5
120.00		1.00	1.32	25.335	27.87	310.16	0.650	0.000	5.00	15.394	10.01	446.2	0.0	656.3
125.00		1.00	1.33	25.553	28.11	303.28	0.650	0.000	5.00	14.994	9.75	438.3	0.0	639.0
130.00		1.00	1.34	25.765	28.34	296.30	0.650	0.000	5.00	14.593	9.49	430.1	0.0	621.8
135.00		1.00	1.35	25.971	28.57	289.20	0.650	0.000	5.00	14.193	9.23	421.7	0.0	604.5
140.00		1.00	1.36	26.170	28.79	282.00	0.650	0.000	5.00	13.793	8.97	412.9	0.0	587.3
142.71	Bot - Section 4	1.00	1.36	26.276	28.90	278.05	0.650	0.000	2.71	7.317	4.76	220.0	0.0	311.5
145.00		1.00	1.37	26.364	29.00	274.71	0.650	0.000	2.29	6.172	4.01	186.1	0.0	434.4
147.30	Top - Section 3	1.00	1.37	26.452	29.10	271.33	0.650	0.000	2.30	6.114	3.97	185.0	0.0	430.3
150.00		1.00	1.38	26.553	29.21	271.74	0.650	0.000	2.70	7.089	4.61	215.3	0.0	201.9
155.00		1.00	1.39	26.737	29.41	264.29	0.650	0.000	5.00	12.803	8.32	391.6	0.0	364.6
160.00	Appurtenance(s)	1.00	1.40	26.917	29.61	256.74	0.650	0.000	5.00	12.403	8.06	381.9	0.0	353.1
165.00		1.00	1.41	27.091	29.80	249.13	0.650	0.000	5.00	12.002	7.80	372.0	0.0	341.6
170.00		1.00	1.42	27.262	29.99	241.43	0.650	0.000	5.00	11.602	7.54	361.8	0.0	330.1
175.00	Appurtenance(s)	1.00	1.42	27.429	30.17	233.66	0.650	0.000	5.00	11.201	7.28	351.5	0.0	318.6
180.00		1.00	1.43	27.592	30.35	225.83	0.650	0.000	5.00	10.801	7.02	340.9	0.0	307.1
185.00	Appurtenance(s)	1.00	1.44	27.752	30.53	217.93	0.650	0.000	5.00	10.401	6.76	330.2	0.0	295.6
190.00		1.00	1.45	27.908	30.70	209.96	0.650	0.000	5.00	10.000	6.50	319.3	0.0	284.1
193.50	Appurtenance(s)	1.00	1.45	28.016	30.82	204.35	0.650	0.000	3.50	6.762	4.40	216.7	0.0	192.1

Wind Loading - Shaft

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 15

Totals:	**193.50**	**16,930.3**	**33,382.3**

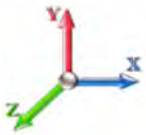
Discrete Appurtenance Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 16	

Load Case: 0.9D + 1.6W 89 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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	193.50	1900MHz RRH	3	28.091	30.901	0.50	1.00	5.70	118.80	0.000	2.500	281.81	0.00	704.53
2	193.50	Low Profile Platform-flat	1	28.061	30.867	1.00	1.00	25.00	1080.00	0.000	1.500	1234.69	0.00	1852.04
3	193.50	APXVSPP18-C-A20	3	28.091	30.901	0.83	1.00	19.97	153.90	0.000	2.500	987.33	0.00	2468.31
4	193.50	APXVTM14-C-120	3	28.091	30.901	0.79	1.00	15.03	151.20	0.000	2.500	742.89	0.00	1857.22
5	193.50	ACU-A20-N	4	28.061	30.867	0.50	1.00	0.28	3.60	0.000	1.500	13.83	0.00	20.74
6	193.50	800 MHz RRH	3	28.016	30.817	0.50	1.00	3.74	143.10	0.000	0.000	184.16	0.00	0.00
7	193.50	TD-RRH8x20-25	3	28.091	30.901	0.50	1.00	6.07	189.00	0.000	2.500	300.35	0.00	750.88
8	193.50	800 MHz Filter	3	28.061	30.867	0.67	1.00	0.84	27.00	0.000	1.500	41.69	0.00	62.54
9	185.00	GPS	1	27.752	30.527	0.54	0.80	0.54	9.00	0.000	0.000	26.18	0.00	0.00
10	185.00	FPA5250	1	27.752	30.527	1.00	1.00	1.20	9.00	0.000	0.000	58.61	0.00	0.00
11	185.00	LPA-8006366 CF	2	27.752	30.527	0.76	0.80	14.59	48.60	0.000	0.000	712.72	0.00	0.00
12	185.00	BXA-171063-12BF	3	27.752	30.527	0.70	0.80	10.01	40.50	0.000	0.000	488.97	0.00	0.00
13	185.00	BXA-70063-6-CF	3	27.752	30.527	0.60	0.80	13.63	45.90	0.000	0.000	665.54	0.00	0.00
14	185.00	LPA-80080/6CF	4	27.752	30.527	1.20	0.80	20.78	75.60	0.000	0.000	1015.16	0.00	0.00
15	185.00	Low Profile	1	27.752	30.527	1.00	1.00	22.00	1350.00	0.000	0.000	1074.55	0.00	0.00
16	175.00	ABT-DMDF-ADBH	1	27.429	30.172	0.54	0.80	0.03	0.99	0.000	0.000	1.29	0.00	0.00
17	175.00	AM-X-CD-16-65-00T-RET	3	27.429	30.172	0.64	0.80	15.40	130.95	0.000	0.000	743.36	0.00	0.00
18	175.00	Low Profile	1	27.429	30.172	1.00	1.00	22.00	1350.00	0.000	0.000	1062.06	0.00	0.00
19	175.00	7770.00	6	27.429	30.172	0.62	0.80	20.33	189.00	0.000	0.000	981.34	0.00	0.00
20	175.00	DC6-48-60-18-8F	1	27.429	30.172	0.80	0.80	0.74	28.62	0.000	0.000	35.53	0.00	0.00
21	175.00	LGP21401	12	27.429	30.172	0.54	0.80	8.30	152.28	0.000	0.000	400.55	0.00	0.00
22	175.00	LGP13519	6	27.429	30.172	0.54	0.80	1.09	28.62	0.000	0.000	52.79	0.00	0.00
23	175.00	RRUS 11	6	27.429	30.172	0.40	0.80	6.05	273.78	0.000	0.000	291.97	0.00	0.00
24	160.00	RRUS 11	3	26.917	29.608	0.40	0.80	3.02	137.70	0.000	0.000	143.26	0.00	0.00
25	160.00	RRUS 11 (Band 12)	3	26.917	29.608	0.40	0.80	3.02	118.80	0.000	0.000	143.26	0.00	0.00
26	160.00	RRUS 11 (Band 4)	3	26.917	29.608	0.40	0.80	3.02	118.80	0.000	0.000	143.26	0.00	0.00
27	160.00	APX16DWV-16DWVS-E-	3	26.917	29.608	0.53	0.80	10.47	109.89	0.000	0.000	496.01	0.00	0.00
28	160.00	LNX-6515DS-A1M	3	26.917	29.608	0.67	0.80	23.12	134.46	0.000	0.000	1095.43	0.00	0.00
29	160.00	T-Arm (Round)	3	26.917	29.608	0.75	0.75	18.00	945.00	0.000	0.000	852.72	0.00	0.00
30	50.00	58532A	1	21.070	23.177	0.54	0.80	0.12	0.36	0.000	0.000	4.37	0.00	0.00
							Totals:		**7,164.45**			**14,275.69**		

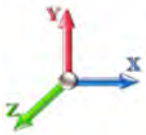
Total Applied Force Summary

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 17

Load Case: 0.9D + 1.6W 89 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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		448.00	1532.77	0.00	0.00
10.00		440.50	1509.77	0.00	0.00
15.00		433.00	1486.78	0.00	0.00
20.00		451.47	1463.78	0.00	0.00
25.00		464.85	1440.78	0.00	0.00
30.00		474.37	1417.78	0.00	0.00
35.00		481.06	1394.79	0.00	0.00
40.00		485.57	1371.79	0.00	0.00
45.00		488.32	1348.79	0.00	0.00
46.66		161.59	443.60	0.00	0.00
50.00	(1) attachments	336.00	1567.74	0.00	0.00
53.33		331.14	1544.63	0.00	0.00
55.00		165.50	392.07	0.00	0.00
60.00		498.00	1160.45	0.00	0.00
65.00		496.26	1140.33	0.00	0.00
70.00		493.70	1120.21	0.00	0.00
75.00		490.41	1100.09	0.00	0.00
80.00		486.47	1079.96	0.00	0.00
85.00		481.92	1059.84	0.00	0.00
90.00		476.83	1039.72	0.00	0.00
94.17		392.74	851.06	0.00	0.00
95.00		79.23	291.09	0.00	0.00
99.83		458.26	1667.86	0.00	0.00
100.00		15.62	29.58	0.00	0.00
105.00		467.65	878.62	0.00	0.00
110.00		460.86	861.37	0.00	0.00
115.00		453.69	844.13	0.00	0.00
120.00		446.17	826.88	0.00	0.00
125.00		438.32	809.63	0.00	0.00
130.00		430.15	792.38	0.00	0.00
135.00		421.68	775.14	0.00	0.00
140.00		412.94	757.89	0.00	0.00
142.71		219.96	404.06	0.00	0.00
145.00		186.15	512.43	0.00	0.00
147.30		185.03	508.61	0.00	0.00
150.00		215.34	294.17	0.00	0.00
155.00		391.61	535.22	0.00	0.00
160.00	(18) attachments	3255.83	2088.37	0.00	0.00
165.00		371.98	502.32	0.00	0.00
170.00		361.84	490.83	0.00	0.00
175.00	(36) attachments	3920.38	2633.57	0.00	0.00
180.00		340.94	404.69	0.00	0.00
185.00	(15) attachments	4371.93	1971.80	0.00	0.00
190.00		319.27	296.02	0.00	0.00
193.50	(23) attachments	4003.48	2066.97	0.00	7716.28

Total Applied Force Summary

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 18

Tower Engineering Solutions

Totals:	**31,206.03**	**46,710.38**	**0.00**	**7,716.28**

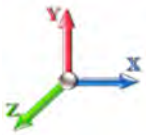
Calculated Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 19	

Load Case: 0.9D + 1.6W 89 mph Wind

Dead Load Factor 0.90

Wind Load Factor 1.60



Iterations 26

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	-46.66	-31.27	0.00	-4339.8	0.00	4339.86	6408.64	3204.32	14863.6	7442.88	0.00	0.000	0.000	0.590
5.00	-45.04	-30.96	0.00	-4183.4	0.00	4183.49	6332.44	3166.22	14438.7	7230.12	0.09	-0.168	0.000	0.586
10.00	-43.44	-30.64	0.00	-4028.7	0.00	4028.71	6255.18	3127.59	14017.4	7019.15	0.36	-0.338	0.000	0.581
15.00	-41.87	-30.32	0.00	-3875.5	0.00	3875.51	6176.86	3088.43	13599.8	6810.05	0.80	-0.510	0.000	0.576
20.00	-40.32	-29.98	0.00	-3723.9	0.00	3723.90	6097.47	3048.74	13186.1	6602.88	1.43	-0.684	0.000	0.571
25.00	-38.79	-29.62	0.00	-3574.0	0.00	3574.01	6017.03	3008.51	12776.3	6397.69	2.24	-0.861	0.000	0.565
30.00	-37.29	-29.24	0.00	-3425.9	0.00	3425.93	5935.52	2967.76	12370.7	6194.55	3.24	-1.040	0.000	0.559
35.00	-35.81	-28.84	0.00	-3279.7	0.00	3279.76	5852.95	2926.48	11969.2	5993.52	4.42	-1.221	0.000	0.553
40.00	-34.36	-28.43	0.00	-3135.5	0.00	3135.55	5768.82	2884.41	11571.1	5794.16	5.80	-1.405	0.000	0.547
45.00	-32.96	-27.98	0.00	-2993.3	0.00	2993.38	5657.24	2828.62	11125.6	5571.07	7.37	-1.590	0.000	0.543
46.66	-32.48	-27.86	0.00	-2946.8	0.00	2946.84	5620.12	2810.06	10979.3	5497.83	7.94	-1.654	0.000	0.542
50.00	-30.86	-27.55	0.00	-2853.8	0.00	2853.87	5545.66	2772.83	10688.8	5352.37	9.14	-1.780	0.000	0.539
53.33	-29.28	-27.22	0.00	-2762.1	0.00	2762.14	4757.51	2378.75	9242.35	4628.04	10.42	-1.908	0.000	0.603
55.00	-28.83	-27.11	0.00	-2716.6	0.00	2716.69	4734.55	2367.28	9135.77	4574.68	11.10	-1.973	0.000	0.600
60.00	-27.59	-26.67	0.00	-2581.1	0.00	2581.15	4665.11	2332.55	8818.95	4416.03	13.28	-2.179	0.000	0.591
65.00	-26.38	-26.22	0.00	-2447.8	0.00	2447.82	4594.60	2297.30	8505.61	4259.13	15.67	-2.388	0.000	0.581
70.00	-25.19	-25.77	0.00	-2316.7	0.00	2316.71	4523.04	2261.52	8195.87	4104.03	18.29	-2.598	0.000	0.570
75.00	-24.02	-25.32	0.00	-2187.8	0.00	2187.84	4450.41	2225.20	7889.86	3950.80	21.12	-2.810	0.000	0.559
80.00	-22.87	-24.87	0.00	-2061.2	0.00	2061.24	4363.37	2181.68	7564.56	3787.90	24.17	-3.023	0.000	0.550
85.00	-21.75	-24.41	0.00	-1936.9	0.00	1936.92	4265.74	2132.87	7228.13	3619.44	27.45	-3.237	0.000	0.540
90.00	-20.65	-23.94	0.00	-1814.8	0.00	1814.88	4168.10	2084.05	6899.36	3454.81	30.96	-3.452	0.000	0.530
94.17	-19.78	-23.54	0.00	-1715.1	0.00	1715.12	4086.74	2043.37	6631.22	3320.54	34.05	-3.633	0.000	0.521
95.00	-19.45	-23.48	0.00	-1695.5	0.00	1695.50	4070.47	2035.23	6578.23	3294.01	34.68	-3.670	0.000	0.520
99.83	-17.77	-22.95	0.00	-1582.0	0.00	1582.02	3418.29	1709.14	5518.43	2763.32	38.51	-3.879	0.000	0.578
100.00	-17.69	-22.97	0.00	-1578.1	0.00	1578.19	3416.28	1708.14	5510.73	2759.46	38.64	-3.886	0.000	0.577
105.00	-16.76	-22.51	0.00	-1463.3	0.00	1463.36	3355.57	1677.79	5281.30	2644.58	42.83	-4.123	0.000	0.559
110.00	-15.84	-22.05	0.00	-1350.8	0.00	1350.82	3293.81	1646.90	5055.01	2531.26	47.28	-4.359	0.000	0.539
115.00	-14.95	-21.59	0.00	-1240.5	0.00	1240.57	3226.08	1613.04	4824.64	2415.91	51.96	-4.592	0.000	0.518
120.00	-14.08	-21.14	0.00	-1132.6	0.00	1132.61	3142.39	1571.20	4576.34	2291.57	56.89	-4.823	0.000	0.499
125.00	-13.23	-20.68	0.00	-1026.9	0.00	1026.93	3058.71	1529.35	4334.61	2170.52	62.06	-5.051	0.000	0.478
130.00	-12.40	-20.23	0.00	-923.51	0.00	923.51	2975.02	1487.51	4099.43	2052.76	67.46	-5.274	0.000	0.454
135.00	-11.59	-19.78	0.00	-822.36	0.00	822.36	2891.34	1445.67	3870.81	1938.28	73.09	-5.491	0.000	0.428
140.00	-10.82	-19.33	0.00	-723.46	0.00	723.46	2807.65	1403.83	3648.75	1827.09	78.95	-5.700	0.000	0.400
142.71	-10.41	-19.09	0.00	-671.02	0.00	671.02	2762.24	1381.12	3530.99	1768.12	82.21	-5.812	0.000	0.383
145.00	-9.89	-18.86	0.00	-627.38	0.00	627.38	2723.97	1361.98	3433.25	1719.18	85.02	-5.904	0.000	0.369
147.30	-9.37	-18.64	0.00	-584.05	0.00	584.05	1707.44	853.72	2174.15	1088.69	87.87	-5.994	0.000	0.542
150.00	-9.05	-18.43	0.00	-533.65	0.00	533.65	1688.50	844.25	2114.25	1058.70	91.29	-6.096	0.000	0.510
155.00	-8.48	-18.01	0.00	-441.53	0.00	441.53	1652.64	826.32	2004.58	1003.78	97.80	-6.340	0.000	0.445
160.00	-6.72	-14.57	0.00	-351.46	0.00	351.46	1615.71	807.86	1896.48	949.65	104.54	-6.559	0.000	0.375
165.00	-6.22	-14.16	0.00	-278.63	0.00	278.63	1577.73	788.87	1790.06	896.36	111.50	-6.750	0.000	0.315
170.00	-5.74	-13.76	0.00	-207.83	0.00	207.83	1538.69	769.34	1685.46	843.98	118.65	-6.913	0.000	0.250
175.00	-3.59	-9.55	0.00	-139.05	0.00	139.05	1498.58	749.29	1582.80	792.58	125.94	-7.043	0.000	0.178
180.00	-3.21	-9.17	0.00	-91.29	0.00	91.29	1457.41	728.71	1482.21	742.21	133.35	-7.138	0.000	0.125
185.00	-1.80	-4.59	0.00	-45.46	0.00	45.46	1406.50	703.25	1375.31	688.68	140.85	-7.202	0.000	0.067
190.00	-1.55	-4.23	0.00	-22.53	0.00	22.53	1350.71	675.36	1267.83	634.86	148.39	-7.237	0.000	0.037
193.50	0.00	-4.00	0.00	-7.72	0.00	7.72	1311.66	655.83	1195.19	598.48	153.69	-7.250	0.000	0.013

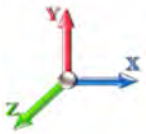
Wind Loading - Shaft

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 20	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

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	3.308	3.64	0.00	1.200	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	3.308	3.64	0.00	1.200	1.656	5.00	25.296	30.36	110.4	598.6	2413.9
10.00		1.00	0.85	3.308	3.64	0.00	1.200	1.775	5.00	24.995	29.99	109.1	632.4	2417.0
15.00		1.00	0.85	3.308	3.64	0.00	1.200	1.848	5.00	24.656	29.59	107.6	648.4	2402.4
20.00		1.00	0.90	3.509	3.86	0.00	1.200	1.902	5.00	24.300	29.16	112.6	656.7	2380.0
25.00		1.00	0.95	3.678	4.05	0.00	1.200	1.945	5.00	23.936	28.72	116.2	660.5	2353.1
30.00		1.00	0.98	3.822	4.20	0.00	1.200	1.981	5.00	23.565	28.28	118.9	661.3	2323.3
35.00		1.00	1.01	3.948	4.34	0.00	1.200	2.012	5.00	23.190	27.83	120.9	660.1	2291.4
40.00		1.00	1.04	4.061	4.47	0.00	1.200	2.039	5.00	22.812	27.37	122.3	657.2	2257.8
45.00		1.00	1.07	4.163	4.58	0.00	1.200	2.063	5.00	22.432	26.92	123.3	653.1	2223.0
46.66	Bot - Section 2	1.00	1.08	4.195	4.61	0.00	1.200	2.071	1.66	7.376	8.85	40.8	216.7	732.2
50.00	Appurtenance(s)	1.00	1.09	4.256	4.68	0.00	1.200	2.085	3.34	14.917	17.90	83.8	440.0	2377.4
53.33	Top - Section 1	1.00	1.11	4.314	4.75	0.00	1.200	2.098	3.33	14.717	17.66	83.8	436.5	2344.6
55.00		1.00	1.12	4.342	4.78	0.00	1.200	2.105	1.67	7.316	8.78	41.9	218.2	665.0
60.00		1.00	1.14	4.423	4.86	0.00	1.200	2.123	5.00	21.651	25.98	126.4	646.8	1966.6
65.00		1.00	1.16	4.498	4.95	0.00	1.200	2.140	5.00	21.265	25.52	126.3	639.5	1932.5
70.00		1.00	1.17	4.569	5.03	0.00	1.200	2.156	5.00	20.878	25.05	125.9	631.7	1897.8
75.00		1.00	1.19	4.635	5.10	0.00	1.200	2.171	5.00	20.490	24.59	125.4	623.4	1862.7
80.00		1.00	1.21	4.699	5.17	0.00	1.200	2.185	5.00	20.101	24.12	124.7	614.6	1827.1
85.00		1.00	1.22	4.759	5.24	0.00	1.200	2.198	5.00	19.712	23.65	123.8	605.5	1791.2
90.00		1.00	1.24	4.817	5.30	0.00	1.200	2.211	5.00	19.322	23.19	122.9	596.1	1754.9
94.17	Bot - Section 3	1.00	1.25	4.863	5.35	0.00	1.200	2.221	4.17	15.803	18.96	101.4	489.9	1435.1
95.00		1.00	1.25	4.872	5.36	0.00	1.200	2.223	0.83	3.180	3.82	20.5	99.5	449.7
99.83	Top - Section 2	1.00	1.27	4.923	5.42	0.00	1.200	2.234	4.83	18.236	21.88	118.5	567.5	2571.4
100.00		1.00	1.27	4.925	5.42	0.00	1.200	2.234	0.17	0.622	0.75	4.0	19.6	51.4
105.00		1.00	1.28	4.976	5.47	0.00	1.200	2.245	5.00	18.467	22.16	121.3	576.4	1520.4
110.00		1.00	1.29	5.025	5.53	0.00	1.200	2.256	5.00	18.075	21.69	119.9	565.8	1486.9
115.00		1.00	1.30	5.072	5.58	0.00	1.200	2.266	5.00	17.683	21.22	118.4	555.1	1453.1
120.00		1.00	1.32	5.117	5.63	0.00	1.200	2.276	5.00	17.291	20.75	116.8	544.1	1419.1
125.00		1.00	1.33	5.162	5.68	0.00	1.200	2.285	5.00	16.898	20.28	115.1	532.9	1384.9
130.00		1.00	1.34	5.204	5.72	0.00	1.200	2.294	5.00	16.505	19.81	113.4	521.5	1350.5
135.00		1.00	1.35	5.246	5.77	0.00	1.200	2.303	5.00	16.112	19.33	111.6	509.9	1316.0
140.00		1.00	1.36	5.286	5.81	0.00	1.200	2.311	5.00	15.718	18.86	109.7	498.2	1281.3
142.71	Bot - Section 4	1.00	1.36	5.308	5.84	0.00	1.200	2.315	2.71	8.364	10.04	58.6	266.9	682.2
145.00		1.00	1.37	5.325	5.86	0.00	1.200	2.319	2.29	7.056	8.47	49.6	225.7	804.9
147.30	Top - Section 3	1.00	1.37	5.343	5.88	0.00	1.200	2.323	2.30	7.004	8.40	49.4	224.2	797.9
150.00		1.00	1.38	5.364	5.90	0.00	1.200	2.327	2.70	8.137	9.76	57.6	260.4	529.6
155.00		1.00	1.39	5.401	5.94	0.00	1.200	2.335	5.00	14.748	17.70	105.1	469.4	955.6
160.00	Appurtenance(s)	1.00	1.40	5.437	5.98	0.00	1.200	2.342	5.00	14.354	17.23	103.0	457.1	928.0
165.00		1.00	1.41	5.472	6.02	0.00	1.200	2.349	5.00	13.960	16.75	100.8	444.7	900.2
170.00		1.00	1.42	5.507	6.06	0.00	1.200	2.356	5.00	13.565	16.28	98.6	432.2	872.3
175.00	Appurtenance(s)	1.00	1.42	5.541	6.09	0.00	1.200	2.363	5.00	13.171	15.80	96.3	419.5	844.4
180.00		1.00	1.43	5.574	6.13	0.00	1.200	2.370	5.00	12.776	15.33	94.0	406.7	816.3
185.00	Appurtenance(s)	1.00	1.44	5.606	6.17	0.00	1.200	2.376	5.00	12.381	14.86	91.6	393.9	788.0
190.00		1.00	1.45	5.637	6.20	0.00	1.200	2.383	5.00	11.986	14.38	89.2	380.9	759.7
193.50	Appurtenance(s)	1.00	1.45	5.659	6.22	0.00	1.200	2.387	3.50	8.154	9.79	60.9	260.2	516.3

Wind Loading - Shaft

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT		**Exposure:**	C		
Height:	193.50 (ft)		**Crest Height:**	0.00		
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 21	

Totals:	**193.50**	**4,392.4**	**66,129.2**

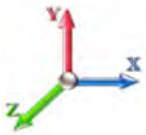
Discrete Appurtenance Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 22	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

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	193.50	1900MHz RRH	3	5.674	6.242	0.50	1.00	8.55	512.72	0.000	2.500	53.38	0.00	133.44
2	193.50	Low Profile Platform-flat	1	5.668	6.235	1.00	1.00	53.64	2572.18	0.000	1.500	334.47	0.00	501.70
3	193.50	APXVSPP18-C-A20	3	5.674	6.242	0.86	1.00	30.55	765.94	0.000	2.500	190.68	0.00	476.71
4	193.50	APXVTM14-C-120	3	5.674	6.242	0.82	1.00	19.42	770.16	0.000	2.500	121.24	0.00	303.09
5	193.50	ACU-A20-N	4	5.668	6.235	0.50	1.00	1.09	23.10	0.000	1.500	6.81	0.00	10.21
6	193.50	800 MHz RRH	3	5.659	6.225	0.50	1.00	6.08	430.97	0.000	0.000	37.86	0.00	0.00
7	193.50	TD-RRH8x20-25	3	5.674	6.242	0.50	1.00	7.80	607.66	0.000	2.500	48.67	0.00	121.68
8	193.50	800 MHz Filter	3	5.668	6.235	0.67	1.00	1.79	86.71	0.000	1.500	11.17	0.00	16.75
9	185.00	GPS	1	5.606	6.166	0.54	0.80	1.06	43.92	0.000	0.000	6.51	0.00	0.00
10	185.00	FPA5250	1	5.606	6.166	1.00	1.00	2.19	35.68	0.000	0.000	13.50	0.00	0.00
11	185.00	LPA-8006366 CF	2	5.606	6.166	0.76	0.80	17.46	883.53	0.000	0.000	107.68	0.00	0.00
12	185.00	BXA-171063-12BF	3	5.606	6.166	0.72	0.80	17.15	360.18	0.000	0.000	105.74	0.00	0.00
13	185.00	BXA-70063-6-CF	3	5.606	6.166	0.63	0.80	21.49	518.25	0.000	0.000	132.50	0.00	0.00
14	185.00	LPA-80080/6CF	4	5.606	6.166	1.12	0.80	26.88	1328.95	0.000	0.000	165.78	0.00	0.00
15	185.00	Low Profile	1	5.606	6.166	1.00	1.00	46.05	3282.20	0.000	0.000	283.95	0.00	0.00
16	175.00	ABT-DMDF-ADBH	1	5.541	6.095	0.54	0.80	0.17	3.64	0.000	0.000	1.01	0.00	0.00
17	175.00	AM-X-CD-16-65-00T-RET	3	5.541	6.095	0.66	0.80	23.23	694.29	0.000	0.000	141.57	0.00	0.00
18	175.00	Low Profile	1	5.541	6.095	1.00	1.00	45.91	3272.33	0.000	0.000	279.83	0.00	0.00
19	175.00	7770.00	6	5.541	6.095	0.65	0.80	27.08	1609.93	0.000	0.000	165.07	0.00	0.00
20	175.00	DC6-48-60-18-8F	1	5.541	6.095	0.80	0.80	1.21	104.17	0.000	0.000	7.38	0.00	0.00
21	175.00	LGP21401	12	5.541	6.095	0.54	0.80	15.58	524.07	0.000	0.000	94.93	0.00	0.00
22	175.00	LGP13519	6	5.541	6.095	0.54	0.80	3.07	99.12	0.000	0.000	18.71	0.00	0.00
23	175.00	RRUS 11	6	5.541	6.095	0.40	0.80	8.23	1069.44	0.000	0.000	50.13	0.00	0.00
24	160.00	RRUS 11	3	5.437	5.981	0.40	0.80	4.04	426.56	0.000	0.000	24.19	0.00	0.00
25	160.00	RRUS 11 (Band 12)	3	5.437	5.981	0.40	0.80	4.04	366.23	0.000	0.000	24.19	0.00	0.00
26	160.00	RRUS 11 (Band 4)	3	5.437	5.981	0.40	0.80	4.04	366.23	0.000	0.000	24.19	0.00	0.00
27	160.00	APX16DWV-16DWVS-E-	3	5.437	5.981	0.57	0.80	16.24	517.28	0.000	0.000	97.15	0.00	0.00
28	160.00	LNX-6515DS-A1M	3	5.437	5.981	0.69	0.80	32.72	906.03	0.000	0.000	195.70	0.00	0.00
29	160.00	T-Arm (Round)	3	5.437	5.981	0.75	0.75	39.08	2033.65	0.000	0.000	233.71	0.00	0.00
30	50.00	58532A	1	4.256	4.682	0.54	0.80	0.36	7.64	0.000	0.000	1.66	0.00	0.00
							Totals:		**24,222.78**			**2,979.35**		

Total Applied Force Summary

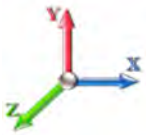
Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 23

Tower Engineering Solutions

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



Iterations 26

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		110.44	2642.34	0.00	0.00
10.00		109.13	2645.42	0.00	0.00
15.00		107.64	2630.80	0.00	0.00
20.00		112.57	2608.41	0.00	0.00
25.00		116.21	2581.55	0.00	0.00
30.00		118.89	2551.73	0.00	0.00
35.00		120.86	2519.79	0.00	0.00
40.00		122.28	2486.25	0.00	0.00
45.00		123.26	2451.44	0.00	0.00
46.66		40.84	808.18	0.00	0.00
50.00	(1) attachments	85.47	2537.47	0.00	0.00
53.33		83.81	2496.05	0.00	0.00
55.00		41.93	741.00	0.00	0.00
60.00		126.40	2194.04	0.00	0.00
65.00		126.25	2159.94	0.00	0.00
70.00		125.90	2125.29	0.00	0.00
75.00		125.37	2090.16	0.00	0.00
80.00		124.68	2054.60	0.00	0.00
85.00		123.83	2018.64	0.00	0.00
90.00		122.85	1982.34	0.00	0.00
94.17		101.44	1624.68	0.00	0.00
95.00		20.45	487.57	0.00	0.00
99.83		118.50	2791.27	0.00	0.00
100.00		4.04	59.00	0.00	0.00
105.00		121.29	1747.89	0.00	0.00
110.00		119.88	1714.35	0.00	0.00
115.00		118.38	1680.57	0.00	0.00
120.00		116.80	1646.58	0.00	0.00
125.00		115.13	1612.39	0.00	0.00
130.00		113.39	1578.01	0.00	0.00
135.00		111.57	1543.45	0.00	0.00
140.00		109.68	1508.73	0.00	0.00
142.71		58.60	805.62	0.00	0.00
145.00		49.60	908.97	0.00	0.00
147.30		49.40	902.35	0.00	0.00
150.00		57.61	652.59	0.00	0.00
155.00		105.14	1183.05	0.00	0.00
160.00	(18) attachments	702.14	5771.41	0.00	0.00
165.00		100.84	1114.48	0.00	0.00
170.00		98.61	1086.61	0.00	0.00
175.00	(36) attachments	854.95	8435.62	0.00	0.00
180.00		93.99	946.33	0.00	0.00
185.00	(15) attachments	907.27	7370.83	0.00	0.00
190.00		89.19	775.56	0.00	0.00
193.50	(23) attachments	865.18	6296.82	0.00	1563.59

Total Applied Force Summary

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 24	

Totals:	**7,371.70**	**98,570.18**	**0.00**	**1,563.59**

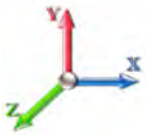
Calculated Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 25	

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph Wind

Dead Load Factor 1.20

Wind Load Factor 1.00



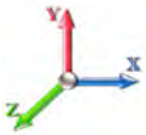
Iterations 26

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	-98.57	-7.41	0.00	-1081.4	0.00	1081.46	6408.64	3204.32	14863.6	7442.88	0.00	0.000	0.000	0.161
5.00	-95.92	-7.37	0.00	-1044.4	0.00	1044.42	6332.44	3166.22	14438.7	7230.12	0.02	-0.042	0.000	0.160
10.00	-93.27	-7.32	0.00	-1007.5	0.00	1007.59	6255.18	3127.59	14017.4	7019.15	0.09	-0.084	0.000	0.158
15.00	-90.63	-7.28	0.00	-970.96	0.00	970.96	6176.86	3088.43	13599.8	6810.05	0.20	-0.127	0.000	0.157
20.00	-88.02	-7.23	0.00	-934.56	0.00	934.56	6097.47	3048.74	13186.1	6602.88	0.36	-0.171	0.000	0.156
25.00	-85.43	-7.17	0.00	-898.42	0.00	898.42	6017.03	3008.51	12776.3	6397.69	0.56	-0.216	0.000	0.155
30.00	-82.88	-7.11	0.00	-862.56	0.00	862.56	5935.52	2967.76	12370.7	6194.55	0.81	-0.261	0.000	0.153
35.00	-80.35	-7.04	0.00	-827.03	0.00	827.03	5852.95	2926.48	11969.2	5993.52	1.11	-0.306	0.000	0.152
40.00	-77.86	-6.96	0.00	-791.84	0.00	791.84	5768.82	2884.41	11571.1	5794.16	1.45	-0.352	0.000	0.150
45.00	-75.41	-6.87	0.00	-757.02	0.00	757.02	5657.24	2828.62	11125.6	5571.07	1.85	-0.399	0.000	0.149
46.66	-74.59	-6.85	0.00	-745.60	0.00	745.60	5620.12	2810.06	10979.3	5497.83	1.99	-0.415	0.000	0.149
50.00	-72.05	-6.79	0.00	-722.74	0.00	722.74	5545.66	2772.83	10688.8	5352.37	2.29	-0.448	0.000	0.148
53.33	-69.56	-6.71	0.00	-700.14	0.00	700.14	4757.51	2378.75	9242.35	4628.04	2.61	-0.480	0.000	0.166
55.00	-68.81	-6.71	0.00	-688.93	0.00	688.93	4734.55	2367.28	9135.77	4574.68	2.78	-0.496	0.000	0.165
60.00	-66.61	-6.62	0.00	-655.40	0.00	655.40	4665.11	2332.55	8818.95	4416.03	3.33	-0.549	0.000	0.163
65.00	-64.45	-6.53	0.00	-622.29	0.00	622.29	4594.60	2297.30	8505.61	4259.13	3.94	-0.602	0.000	0.160
70.00	-62.32	-6.44	0.00	-589.63	0.00	589.63	4523.04	2261.52	8195.87	4104.03	4.59	-0.655	0.000	0.157
75.00	-60.22	-6.35	0.00	-557.42	0.00	557.42	4450.41	2225.20	7889.86	3950.80	5.31	-0.709	0.000	0.155
80.00	-58.16	-6.25	0.00	-525.67	0.00	525.67	4363.37	2181.68	7564.56	3787.90	6.08	-0.763	0.000	0.152
85.00	-56.14	-6.16	0.00	-494.41	0.00	494.41	4265.74	2132.87	7228.13	3619.44	6.91	-0.818	0.000	0.150
90.00	-54.16	-6.05	0.00	-463.63	0.00	463.63	4168.10	2084.05	6899.36	3454.81	7.80	-0.873	0.000	0.147
94.17	-52.53	-5.95	0.00	-438.42	0.00	438.42	4086.74	2043.37	6631.22	3320.54	8.58	-0.919	0.000	0.145
95.00	-52.04	-5.95	0.00	-433.47	0.00	433.47	4070.47	2035.23	6578.23	3294.01	8.74	-0.929	0.000	0.144
99.83	-49.25	-5.81	0.00	-404.71	0.00	404.71	3418.29	1709.14	5518.43	2763.32	9.71	-0.982	0.000	0.161
100.00	-49.19	-5.83	0.00	-403.74	0.00	403.74	3416.28	1708.14	5510.73	2759.46	9.74	-0.984	0.000	0.161
105.00	-47.44	-5.73	0.00	-374.59	0.00	374.59	3355.57	1677.79	5281.30	2644.58	10.80	-1.045	0.000	0.156
110.00	-45.72	-5.62	0.00	-345.95	0.00	345.95	3293.81	1646.90	5055.01	2531.26	11.93	-1.105	0.000	0.151
115.00	-44.03	-5.52	0.00	-317.83	0.00	317.83	3226.08	1613.04	4824.64	2415.91	13.12	-1.165	0.000	0.145
120.00	-42.38	-5.41	0.00	-290.24	0.00	290.24	3142.39	1571.20	4576.34	2291.57	14.37	-1.224	0.000	0.140
125.00	-40.77	-5.30	0.00	-263.19	0.00	263.19	3058.71	1529.35	4334.61	2170.52	15.68	-1.282	0.000	0.135
130.00	-39.19	-5.19	0.00	-236.68	0.00	236.68	2975.02	1487.51	4099.43	2052.76	17.06	-1.339	0.000	0.128
135.00	-37.64	-5.08	0.00	-210.73	0.00	210.73	2891.34	1445.67	3870.81	1938.28	18.49	-1.395	0.000	0.122
140.00	-36.14	-4.96	0.00	-185.34	0.00	185.34	2807.65	1403.83	3648.75	1827.09	19.98	-1.449	0.000	0.114
142.71	-35.33	-4.89	0.00	-171.89	0.00	171.89	2762.24	1381.12	3530.99	1768.12	20.81	-1.477	0.000	0.110
145.00	-34.42	-4.83	0.00	-160.70	0.00	160.70	2723.97	1361.98	3433.25	1719.18	21.53	-1.501	0.000	0.106
147.30	-33.52	-4.78	0.00	-149.60	0.00	149.60	1707.44	853.72	2174.15	1088.69	22.25	-1.524	0.000	0.157
150.00	-32.86	-4.73	0.00	-136.69	0.00	136.69	1688.50	844.25	2114.25	1058.70	23.12	-1.550	0.000	0.149
155.00	-31.68	-4.62	0.00	-113.05	0.00	113.05	1652.64	826.32	2004.58	1003.78	24.78	-1.613	0.000	0.132
160.00	-25.93	-3.78	0.00	-89.95	0.00	89.95	1615.71	807.86	1896.48	949.65	26.50	-1.668	0.000	0.111
165.00	-24.81	-3.66	0.00	-71.06	0.00	71.06	1577.73	788.87	1790.06	896.36	28.27	-1.717	0.000	0.095
170.00	-23.73	-3.55	0.00	-52.74	0.00	52.74	1538.69	769.34	1685.46	843.98	30.10	-1.759	0.000	0.078
175.00	-15.32	-2.44	0.00	-35.00	0.00	35.00	1498.58	749.29	1582.80	792.58	31.96	-1.792	0.000	0.054
180.00	-14.38	-2.32	0.00	-22.80	0.00	22.80	1457.41	728.71	1482.21	742.21	33.85	-1.816	0.000	0.041
185.00	-7.04	-1.18	0.00	-11.20	0.00	11.20	1406.50	703.25	1375.31	688.68	35.76	-1.831	0.000	0.021
190.00	-6.27	-1.07	0.00	-5.30	0.00	5.30	1350.71	675.36	1267.83	634.86	37.68	-1.840	0.000	0.013
193.50	0.00	-0.87	0.00	-1.56	0.00	1.56	1311.66	655.83	1195.19	598.48	39.03	-1.843	0.000	0.003

Seismic Segment Forces (Factored)

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 26	

Load Case: 1.2D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	24
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.27	**SA**	0.03	**S1**	0.07
						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		1512.7	0.00	0.03	0.01	27.37	
10.00		1487.1	0.01	0.04	0.03	39.85	
15.00		1461.6	0.01	0.06	0.03	46.12	
20.00		1436.0	0.02	0.06	0.04	49.20	
25.00		1410.5	0.03	0.07	0.04	50.58	
30.00		1384.9	0.05	0.07	0.04	51.09	
35.00		1359.4	0.06	0.07	0.04	51.20	
40.00		1333.8	0.08	0.07	0.04	51.18	
45.00		1308.3	0.10	0.07	0.04	51.16	
46.66	Bot - Section 2	429.57	0.11	0.07	0.04	16.91	
50.00	Appurtenance(s)	1614.9	0.13	0.07	0.03	64.36	
53.33	Top - Section 1	1590.0	0.14	0.07	0.03	64.11	
55.00		372.33	0.15	0.07	0.03	15.09	
60.00		1099.8	0.18	0.06	0.03	45.07	
65.00		1077.4	0.21	0.06	0.02	44.09	
70.00		1055.1	0.25	0.06	0.02	42.23	
75.00		1032.7	0.28	0.05	0.01	39.08	
80.00		1010.4	0.32	0.04	0.01	34.20	
85.00		988.05	0.36	0.03	0.01	27.23	
90.00		965.69	0.41	0.02	0.01	18.04	
94.17	Bot - Section 3	787.67	0.45	0.00	0.01	7.44	
95.00		291.84	0.46	0.00	0.01	2.17	
99.83	Top - Section 2	1669.9	0.50	-0.02	0.01	-8.13	
100.00		26.55	0.50	-0.02	0.01	-0.14	
105.00		786.70	0.56	-0.04	0.01	-14.18	
110.00		767.53	0.61	-0.06	0.02	-22.41	
115.00		748.37	0.67	-0.08	0.02	-28.17	
120.00		729.20	0.73	-0.09	0.04	-31.23	
125.00		710.04	0.79	-0.11	0.05	-31.68	
130.00		690.88	0.85	-0.12	0.07	-29.77	
135.00		671.71	0.92	-0.12	0.10	-25.79	
140.00		652.55	0.99	-0.11	0.13	-19.99	
142.71	Bot - Section 4	346.09	1.03	-0.10	0.15	-8.71	
145.00		482.67	1.06	-0.09	0.16	-9.60	
147.30	Top - Section 3	478.06	1.10	-0.07	0.18	-6.68	
150.00		224.37	1.14	-0.05	0.21	-1.39	
155.00		405.14	1.21	0.02	0.26	4.24	
160.00	Appurtenance(s)	2130.8	1.29	0.11	0.33	64.17	
165.00		379.59	1.37	0.24	0.41	20.04	
170.00		366.81	1.46	0.40	0.50	28.81	
175.00	Appurtenance(s)	2747.6	1.55	0.62	0.60	295.16	
180.00		341.26	1.64	0.89	0.72	47.61	
185.00	Appurtenance(s)	2082.4	1.73	1.23	0.86	364.18	
190.00		315.71	1.82	1.64	1.02	67.42	
193.50	Appurtenance(s)	2287.3	1.89	1.98	1.14	555.08	

Seismic Segment Forces (Factored)

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 27

Totals:	**45,051.9**	**2,046.6**	**Total Wind:** **31,206.0**

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

Calculated Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 28	

Load Case: 1.2D + 1.0E

Gust Response Factor	1.10			**Sds**	0.19			**Iterations**	24
Dead Load Factor	1.20	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.27	**SA**	0.03			**S1**	0.07
								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	-62.28	-2.29	0.00	-325.36	0.00	325.36	6408.64	3204.32	14863.6	7442.88		0.00	0.00	0.053
5.00	-60.24	-2.28	0.00	-313.91	0.00	313.91	6332.44	3166.22	14438.7	7230.12		0.01	-0.01	0.053
10.00	-58.22	-2.25	0.00	-302.53	0.00	302.53	6255.18	3127.59	14017.4	7019.15		0.03	-0.03	0.052
15.00	-56.24	-2.21	0.00	-291.28	0.00	291.28	6176.86	3088.43	13599.8	6810.05		0.06	-0.04	0.052
20.00	-54.29	-2.18	0.00	-280.21	0.00	280.21	6097.47	3048.74	13186.1	6602.88		0.11	-0.05	0.051
25.00	-52.37	-2.14	0.00	-269.33	0.00	269.33	6017.03	3008.51	12776.3	6397.69		0.17	-0.06	0.051
30.00	-50.48	-2.09	0.00	-258.66	0.00	258.66	5935.52	2967.76	12370.7	6194.55		0.24	-0.08	0.050
35.00	-48.62	-2.05	0.00	-248.18	0.00	248.18	5852.95	2926.48	11969.2	5993.52		0.33	-0.09	0.050
40.00	-46.79	-2.01	0.00	-237.92	0.00	237.92	5768.82	2884.41	11571.1	5794.16		0.44	-0.11	0.049
45.00	-44.99	-1.96	0.00	-227.88	0.00	227.88	5657.24	2828.62	11125.6	5571.07		0.55	-0.12	0.049
46.66	-44.40	-1.95	0.00	-224.62	0.00	224.62	5620.12	2810.06	10979.3	5497.83		0.60	-0.12	0.049
50.00	-42.30	-1.89	0.00	-218.11	0.00	218.11	5545.66	2772.83	10688.8	5352.37		0.69	-0.13	0.048
53.33	-40.25	-1.82	0.00	-211.83	0.00	211.83	4757.51	2378.75	9242.35	4628.04		0.78	-0.14	0.054
55.00	-39.72	-1.81	0.00	-208.78	0.00	208.78	4734.55	2367.28	9135.77	4574.68		0.84	-0.15	0.054
60.00	-38.17	-1.78	0.00	-199.71	0.00	199.71	4665.11	2332.55	8818.95	4416.03		1.00	-0.17	0.053
65.00	-36.65	-1.74	0.00	-190.83	0.00	190.83	4594.60	2297.30	8505.61	4259.13		1.18	-0.18	0.053
70.00	-35.16	-1.70	0.00	-182.14	0.00	182.14	4523.04	2261.52	8195.87	4104.03		1.38	-0.20	0.052
75.00	-33.69	-1.67	0.00	-173.64	0.00	173.64	4450.41	2225.20	7889.86	3950.80		1.60	-0.21	0.052
80.00	-32.25	-1.64	0.00	-165.31	0.00	165.31	4363.37	2181.68	7564.56	3787.90		1.83	-0.23	0.051
85.00	-30.84	-1.61	0.00	-157.13	0.00	157.13	4265.74	2132.87	7228.13	3619.44		2.08	-0.25	0.051
90.00	-29.45	-1.60	0.00	-149.07	0.00	149.07	4168.10	2084.05	6899.36	3454.81		2.35	-0.27	0.050
94.17	-28.32	-1.59	0.00	-142.42	0.00	142.42	4086.74	2043.37	6631.22	3320.54		2.59	-0.28	0.050
95.00	-27.93	-1.59	0.00	-141.10	0.00	141.10	4070.47	2035.23	6578.23	3294.01		2.64	-0.28	0.050
99.83	-25.70	-1.58	0.00	-133.42	0.00	133.42	3418.29	1709.14	5518.43	2763.32		2.94	-0.30	0.056
100.00	-25.67	-1.59	0.00	-133.16	0.00	133.16	3416.28	1708.14	5510.73	2759.46		2.95	-0.30	0.056
105.00	-24.49	-1.59	0.00	-125.23	0.00	125.23	3355.57	1677.79	5281.30	2644.58		3.28	-0.32	0.055
110.00	-23.34	-1.59	0.00	-117.29	0.00	117.29	3293.81	1646.90	5055.01	2531.26		3.62	-0.34	0.053
115.00	-22.22	-1.59	0.00	-109.34	0.00	109.34	3226.08	1613.04	4824.64	2415.91		3.99	-0.36	0.052
120.00	-21.11	-1.59	0.00	-101.38	0.00	101.38	3142.39	1571.20	4576.34	2291.57		4.39	-0.38	0.051
125.00	-20.03	-1.59	0.00	-93.43	0.00	93.43	3058.71	1529.35	4334.61	2170.52		4.80	-0.40	0.050
130.00	-18.98	-1.59	0.00	-85.47	0.00	85.47	2975.02	1487.51	4099.43	2052.76		5.23	-0.42	0.048
135.00	-17.94	-1.59	0.00	-77.52	0.00	77.52	2891.34	1445.67	3870.81	1938.28		5.69	-0.44	0.046
140.00	-16.93	-1.59	0.00	-69.58	0.00	69.58	2807.65	1403.83	3648.75	1827.09		6.17	-0.46	0.044
142.71	-16.39	-1.58	0.00	-65.28	0.00	65.28	2762.24	1381.12	3530.99	1768.12		6.43	-0.48	0.043
145.00	-15.71	-1.58	0.00	-61.65	0.00	61.65	2723.97	1361.98	3433.25	1719.18		6.66	-0.48	0.042
147.30	-15.03	-1.58	0.00	-58.02	0.00	58.02	1707.44	853.72	2174.15	1088.69		6.90	-0.49	0.062
150.00	-14.64	-1.58	0.00	-53.76	0.00	53.76	1688.50	844.25	2114.25	1058.70		7.18	-0.50	0.059
155.00	-13.93	-1.57	0.00	-45.87	0.00	45.87	1652.64	826.32	2004.58	1003.78		7.72	-0.53	0.054
160.00	-11.14	-1.49	0.00	-38.00	0.00	38.00	1615.71	807.86	1896.48	949.65		8.29	-0.55	0.047
165.00	-10.47	-1.46	0.00	-30.57	0.00	30.57	1577.73	788.87	1790.06	896.36		8.88	-0.57	0.041
170.00	-9.82	-1.43	0.00	-23.24	0.00	23.24	1538.69	769.34	1685.46	843.98		9.49	-0.59	0.034
175.00	-6.31	-1.10	0.00	-16.08	0.00	16.08	1498.58	749.29	1582.80	792.58		10.11	-0.61	0.025
180.00	-5.77	-1.05	0.00	-10.58	0.00	10.58	1457.41	728.71	1482.21	742.21		10.75	-0.62	0.018
185.00	-3.14	-0.66	0.00	-5.33	0.00	5.33	1406.50	703.25	1375.31	688.68		11.40	-0.62	0.010
190.00	-2.75	-0.59	0.00	-2.05	0.00	2.05	1350.71	675.36	1267.83	634.86		12.06	-0.63	0.005
193.50	0.00	-0.56	0.00	0.00	0.00	0.00	1311.66	655.83	1195.19	598.48		12.52	-0.63	0.000

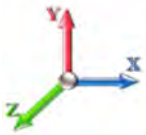
Calculated Forces

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT		**Exposure:**	C		
Height:	193.50 (ft)		**Crest Height:**	0.00		
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 29	

Seismic Segment Forces (Factored)

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 30	

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19	**Iterations**	24
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10	**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.27	**SA**	0.03	**S1**	0.07
						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		1512.7	0.00	0.03	0.01	27.37	
10.00		1487.1	0.01	0.04	0.03	39.85	
15.00		1461.6	0.01	0.06	0.03	46.12	
20.00		1436.0	0.02	0.06	0.04	49.20	
25.00		1410.5	0.03	0.07	0.04	50.58	
30.00		1384.9	0.05	0.07	0.04	51.09	
35.00		1359.4	0.06	0.07	0.04	51.20	
40.00		1333.8	0.08	0.07	0.04	51.18	
45.00		1308.3	0.10	0.07	0.04	51.16	
46.66	Bot - Section 2	429.57	0.11	0.07	0.04	16.91	
50.00	Appurtenance(s)	1614.9	0.13	0.07	0.03	64.36	
53.33	Top - Section 1	1590.0	0.14	0.07	0.03	64.11	
55.00		372.33	0.15	0.07	0.03	15.09	
60.00		1099.8	0.18	0.06	0.03	45.07	
65.00		1077.4	0.21	0.06	0.02	44.09	
70.00		1055.1	0.25	0.06	0.02	42.23	
75.00		1032.7	0.28	0.05	0.01	39.08	
80.00		1010.4	0.32	0.04	0.01	34.20	
85.00		988.05	0.36	0.03	0.01	27.23	
90.00		965.69	0.41	0.02	0.01	18.04	
94.17	Bot - Section 3	787.67	0.45	0.00	0.01	7.44	
95.00		291.84	0.46	0.00	0.01	2.17	
99.83	Top - Section 2	1669.9	0.50	-0.02	0.01	-8.13	
100.00		26.55	0.50	-0.02	0.01	-0.14	
105.00		786.70	0.56	-0.04	0.01	-14.18	
110.00		767.53	0.61	-0.06	0.02	-22.41	
115.00		748.37	0.67	-0.08	0.02	-28.17	
120.00		729.20	0.73	-0.09	0.04	-31.23	
125.00		710.04	0.79	-0.11	0.05	-31.68	
130.00		690.88	0.85	-0.12	0.07	-29.77	
135.00		671.71	0.92	-0.12	0.10	-25.79	
140.00		652.55	0.99	-0.11	0.13	-19.99	
142.71	Bot - Section 4	346.09	1.03	-0.10	0.15	-8.71	
145.00		482.67	1.06	-0.09	0.16	-9.60	
147.30	Top - Section 3	478.06	1.10	-0.07	0.18	-6.68	
150.00		224.37	1.14	-0.05	0.21	-1.39	
155.00		405.14	1.21	0.02	0.26	4.24	
160.00	Appurtenance(s)	2130.8	1.29	0.11	0.33	64.17	
165.00		379.59	1.37	0.24	0.41	20.04	
170.00		366.81	1.46	0.40	0.50	28.81	
175.00	Appurtenance(s)	2747.6	1.55	0.62	0.60	295.16	
180.00		341.26	1.64	0.89	0.72	47.61	
185.00	Appurtenance(s)	2082.4	1.73	1.23	0.86	364.18	
190.00		315.71	1.82	1.64	1.02	67.42	
193.50	Appurtenance(s)	2287.3	1.89	1.98	1.14	555.08	

Seismic Segment Forces (Factored)

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 31

Totals:	**45,051.9**	**2,046.6**	**Total Wind:** **31,206.0**

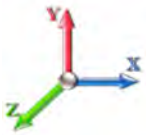
Seismic Base Shear is Less Than 50% of Wind Force - An Analysis is NOT Required

Calculated Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 32

Tower Engineering Solutions

Load Case: 0.9D + 1.0E



Gust Response Factor	1.10			**Sds**	0.19			**Iterations**	24
Dead Load Factor	0.90	**Seismic Load Factor**	1.00	**Sd1**	0.10			**Ss**	0.18
Wind Load Factor	0.00	**Structure Frequency**	0.27	**SA**	0.03			**S1**	0.07
								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	-46.71	-2.29	0.00	-320.04	0.00	320.04	6408.64	3204.32	14863.6	7442.88		0.00	0.00	0.050
5.00	-45.18	-2.27	0.00	-308.60	0.00	308.60	6332.44	3166.22	14438.7	7230.12		0.01	-0.01	0.050
10.00	-43.67	-2.24	0.00	-297.25	0.00	297.25	6255.18	3127.59	14017.4	7019.15		0.03	-0.02	0.049
15.00	-42.18	-2.20	0.00	-286.04	0.00	286.04	6176.86	3088.43	13599.8	6810.05		0.06	-0.04	0.049
20.00	-40.72	-2.16	0.00	-275.03	0.00	275.03	6097.47	3048.74	13186.1	6602.88		0.11	-0.05	0.048
25.00	-39.27	-2.12	0.00	-264.22	0.00	264.22	6017.03	3008.51	12776.3	6397.69		0.17	-0.06	0.048
30.00	-37.86	-2.07	0.00	-253.63	0.00	253.63	5935.52	2967.76	12370.7	6194.55		0.24	-0.08	0.047
35.00	-36.46	-2.03	0.00	-243.26	0.00	243.26	5852.95	2926.48	11969.2	5993.52		0.33	-0.09	0.047
40.00	-35.09	-1.98	0.00	-233.11	0.00	233.11	5768.82	2884.41	11571.1	5794.16		0.43	-0.10	0.046
45.00	-33.74	-1.94	0.00	-223.18	0.00	223.18	5657.24	2828.62	11125.6	5571.07		0.54	-0.12	0.046
46.66	-33.30	-1.92	0.00	-219.96	0.00	219.96	5620.12	2810.06	10979.3	5497.83		0.59	-0.12	0.046
50.00	-31.73	-1.86	0.00	-213.55	0.00	213.55	5545.66	2772.83	10688.8	5352.37		0.68	-0.13	0.046
53.33	-30.18	-1.80	0.00	-207.35	0.00	207.35	4757.51	2378.75	9242.35	4628.04		0.77	-0.14	0.051
55.00	-29.79	-1.79	0.00	-204.35	0.00	204.35	4734.55	2367.28	9135.77	4574.68		0.82	-0.15	0.051
60.00	-28.63	-1.75	0.00	-195.42	0.00	195.42	4665.11	2332.55	8818.95	4416.03		0.98	-0.16	0.050
65.00	-27.49	-1.71	0.00	-186.70	0.00	186.70	4594.60	2297.30	8505.61	4259.13		1.16	-0.18	0.050
70.00	-26.37	-1.67	0.00	-178.17	0.00	178.17	4523.04	2261.52	8195.87	4104.03		1.36	-0.19	0.049
75.00	-25.27	-1.63	0.00	-169.83	0.00	169.83	4450.41	2225.20	7889.86	3950.80		1.57	-0.21	0.049
80.00	-24.19	-1.60	0.00	-161.68	0.00	161.68	4363.37	2181.68	7564.56	3787.90		1.80	-0.23	0.048
85.00	-23.13	-1.58	0.00	-153.68	0.00	153.68	4265.74	2132.87	7228.13	3619.44		2.04	-0.24	0.048
90.00	-22.09	-1.56	0.00	-145.80	0.00	145.80	4168.10	2084.05	6899.36	3454.81		2.31	-0.26	0.048
94.17	-21.24	-1.55	0.00	-139.30	0.00	139.30	4086.74	2043.37	6631.22	3320.54		2.54	-0.28	0.047
95.00	-20.95	-1.55	0.00	-138.01	0.00	138.01	4070.47	2035.23	6578.23	3294.01		2.59	-0.28	0.047
99.83	-19.28	-1.55	0.00	-130.52	0.00	130.52	3418.29	1709.14	5518.43	2763.32		2.88	-0.30	0.053
100.00	-19.25	-1.55	0.00	-130.26	0.00	130.26	3416.28	1708.14	5510.73	2759.46		2.89	-0.30	0.053
105.00	-18.37	-1.55	0.00	-122.51	0.00	122.51	3355.57	1677.79	5281.30	2644.58		3.21	-0.32	0.052
110.00	-17.51	-1.55	0.00	-114.76	0.00	114.76	3293.81	1646.90	5055.01	2531.26		3.55	-0.34	0.051
115.00	-16.66	-1.55	0.00	-107.00	0.00	107.00	3226.08	1613.04	4824.64	2415.91		3.91	-0.36	0.049
120.00	-15.83	-1.55	0.00	-99.24	0.00	99.24	3142.39	1571.20	4576.34	2291.57		4.30	-0.38	0.048
125.00	-15.02	-1.55	0.00	-91.48	0.00	91.48	3058.71	1529.35	4334.61	2170.52		4.70	-0.40	0.047
130.00	-14.23	-1.55	0.00	-83.71	0.00	83.71	2975.02	1487.51	4099.43	2052.76		5.13	-0.42	0.046
135.00	-13.46	-1.55	0.00	-75.95	0.00	75.95	2891.34	1445.67	3870.81	1938.28		5.57	-0.44	0.044
140.00	-12.70	-1.55	0.00	-68.20	0.00	68.20	2807.65	1403.83	3648.75	1827.09		6.04	-0.46	0.042
142.71	-12.29	-1.55	0.00	-64.00	0.00	64.00	2762.24	1381.12	3530.99	1768.12		6.30	-0.47	0.041
145.00	-11.78	-1.54	0.00	-60.46	0.00	60.46	2723.97	1361.98	3433.25	1719.18		6.53	-0.47	0.039
147.30	-11.27	-1.54	0.00	-56.91	0.00	56.91	1707.44	853.72	2174.15	1088.69		6.76	-0.48	0.059
150.00	-10.98	-1.54	0.00	-52.74	0.00	52.74	1688.50	844.25	2114.25	1058.70		7.04	-0.49	0.056
155.00	-10.44	-1.54	0.00	-45.03	0.00	45.03	1652.64	826.32	2004.58	1003.78		7.57	-0.52	0.051
160.00	-8.35	-1.46	0.00	-37.33	0.00	37.33	1615.71	807.86	1896.48	949.65		8.12	-0.54	0.044
165.00	-7.85	-1.44	0.00	-30.04	0.00	30.04	1577.73	788.87	1790.06	896.36		8.70	-0.56	0.038
170.00	-7.36	-1.40	0.00	-22.86	0.00	22.86	1538.69	769.34	1685.46	843.98		9.30	-0.58	0.032
175.00	-4.73	-1.08	0.00	-15.84	0.00	15.84	1498.58	749.29	1582.80	792.58		9.91	-0.59	0.023
180.00	-4.32	-1.03	0.00	-10.42	0.00	10.42	1457.41	728.71	1482.21	742.21		10.54	-0.60	0.017
185.00	-2.36	-0.65	0.00	-5.26	0.00	5.26	1406.50	703.25	1375.31	688.68		11.17	-0.61	0.009
190.00	-2.06	-0.58	0.00	-2.02	0.00	2.02	1350.71	675.36	1267.83	634.86		11.82	-0.62	0.005
193.50	0.00	-0.56	0.00	0.00	0.00	0.00	1311.66	655.83	1195.19	598.48		12.27	-0.62	0.000

Calculated Forces

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT		**Exposure:**	C		
Height:	193.50 (ft)		**Crest Height:**	0.00		
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil		
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 33	

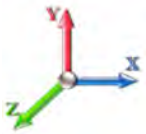
Wind Loading - Shaft

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 34	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		1.00	0.85	7.442	8.19	266.81	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		1.00	0.85	7.442	8.19	262.38	0.650	0.000	5.00	23.916	15.55	127.3	0.0	1512.7
10.00		1.00	0.85	7.442	8.19	257.95	0.650	0.000	5.00	23.516	15.29	125.1	0.0	1487.2
15.00		1.00	0.85	7.442	8.19	253.52	0.650	0.000	5.00	23.115	15.02	123.0	0.0	1461.6
20.00		1.00	0.90	7.896	8.69	256.58	0.650	0.000	5.00	22.715	14.76	128.2	0.0	1436.1
25.00		1.00	0.95	8.276	9.10	258.01	0.650	0.000	5.00	22.315	14.50	132.0	0.0	1410.5
30.00		1.00	0.98	8.600	9.46	258.24	0.650	0.000	5.00	21.914	14.24	134.7	0.0	1385.0
35.00		1.00	1.01	8.883	9.77	257.63	0.650	0.000	5.00	21.514	13.98	136.6	0.0	1359.4
40.00		1.00	1.04	9.137	10.05	256.37	0.650	0.000	5.00	21.113	13.72	137.9	0.0	1333.9
45.00		1.00	1.07	9.366	10.30	254.60	0.650	0.000	5.00	20.713	13.46	138.7	0.0	1308.3
46.66	Bot - Section 2	1.00	1.08	9.438	10.38	253.91	0.650	0.000	1.66	6.802	4.42	45.9	0.0	429.6
50.00	Appurtenance(s)	1.00	1.09	9.576	10.53	252.41	0.650	0.000	3.34	13.758	8.94	94.2	0.0	1614.5
53.33	Top - Section 1	1.00	1.11	9.707	10.68	250.76	0.650	0.000	3.33	13.553	8.81	94.1	0.0	1590.0
55.00		1.00	1.12	9.770	10.75	254.57	0.650	0.000	1.67	6.730	4.37	47.0	0.0	372.3
60.00		1.00	1.14	9.951	10.95	251.79	0.650	0.000	5.00	19.882	12.92	141.5	0.0	1099.8
65.00		1.00	1.16	10.120	11.13	248.76	0.650	0.000	5.00	19.481	12.66	141.0	0.0	1077.5
70.00		1.00	1.17	10.279	11.31	245.50	0.650	0.000	5.00	19.081	12.40	140.2	0.0	1055.1
75.00		1.00	1.19	10.430	11.47	242.04	0.650	0.000	5.00	18.681	12.14	139.3	0.0	1032.8
80.00		1.00	1.21	10.572	11.63	238.41	0.650	0.000	5.00	18.280	11.88	138.2	0.0	1010.4
85.00		1.00	1.22	10.708	11.78	234.63	0.650	0.000	5.00	17.880	11.62	136.9	0.0	988.1
90.00		1.00	1.24	10.838	11.92	230.70	0.650	0.000	5.00	17.479	11.36	135.4	0.0	965.7
94.17	Bot - Section 3	1.00	1.25	10.941	12.04	227.32	0.650	0.000	4.17	14.260	9.27	111.6	0.0	787.7
95.00		1.00	1.25	10.962	12.06	226.64	0.650	0.000	0.83	2.872	1.87	22.5	0.0	291.8
99.83	Top - Section 2	1.00	1.27	11.077	12.18	222.60	0.650	0.000	4.83	16.436	10.68	130.2	0.0	1669.9
100.00		1.00	1.27	11.081	12.19	226.74	0.650	0.000	0.17	0.560	0.36	4.4	0.0	26.6
105.00		1.00	1.28	11.195	12.31	222.48	0.650	0.000	5.00	16.596	10.79	132.8	0.0	786.7
110.00		1.00	1.29	11.305	12.44	218.11	0.650	0.000	5.00	16.195	10.53	130.9	0.0	767.5
115.00		1.00	1.30	11.412	12.55	213.65	0.650	0.000	5.00	15.795	10.27	128.9	0.0	748.4
120.00		1.00	1.32	11.514	12.67	209.09	0.650	0.000	5.00	15.394	10.01	126.7	0.0	729.2
125.00		1.00	1.33	11.614	12.78	204.46	0.650	0.000	5.00	14.994	9.75	124.5	0.0	710.0
130.00		1.00	1.34	11.710	12.88	199.75	0.650	0.000	5.00	14.593	9.49	122.2	0.0	690.9
135.00		1.00	1.35	11.803	12.98	194.97	0.650	0.000	5.00	14.193	9.23	119.8	0.0	671.7
140.00		1.00	1.36	11.894	13.08	190.11	0.650	0.000	5.00	13.793	8.97	117.3	0.0	652.5
142.71	Bot - Section 4	1.00	1.36	11.942	13.14	187.45	0.650	0.000	2.71	7.317	4.76	62.5	0.0	346.1
145.00		1.00	1.37	11.982	13.18	185.20	0.650	0.000	2.29	6.172	4.01	52.9	0.0	482.7
147.30	Top - Section 3	1.00	1.37	12.022	13.22	182.92	0.650	0.000	2.30	6.114	3.97	52.6	0.0	478.1
150.00		1.00	1.38	12.068	13.27	183.20	0.650	0.000	2.70	7.089	4.61	61.2	0.0	224.4
155.00		1.00	1.39	12.152	13.37	178.17	0.650	0.000	5.00	12.803	8.32	111.2	0.0	405.1
160.00	Appurtenance(s)	1.00	1.40	12.233	13.46	173.09	0.650	0.000	5.00	12.403	8.06	108.5	0.0	392.4
165.00		1.00	1.41	12.313	13.54	167.95	0.650	0.000	5.00	12.002	7.80	105.7	0.0	379.6
170.00		1.00	1.42	12.390	13.63	162.76	0.650	0.000	5.00	11.602	7.54	102.8	0.0	366.8
175.00	Appurtenance(s)	1.00	1.42	12.466	13.71	157.53	0.650	0.000	5.00	11.201	7.28	99.8	0.0	354.0
180.00		1.00	1.43	12.540	13.79	152.24	0.650	0.000	5.00	10.801	7.02	96.8	0.0	341.3
185.00	Appurtenance(s)	1.00	1.44	12.613	13.87	146.92	0.650	0.000	5.00	10.401	6.76	93.8	0.0	328.5
190.00		1.00	1.45	12.684	13.95	141.55	0.650	0.000	5.00	10.000	6.50	90.7	0.0	315.7
193.50	Appurtenance(s)	1.00	1.45	12.733	14.01	137.76	0.650	0.000	3.50	6.762	4.40	61.6	0.0	213.4

Wind Loading - Shaft

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 35

Totals:	**193.50**	**4,809.1**	**37,091.4**

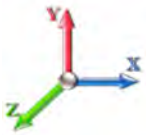
Discrete Appurtenance Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 36	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa x Ka	Ka	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	193.50	1900MHz RRH	3	12.767	14.044	0.50	1.00	5.70	132.00	0.000	2.500	80.05	0.00	200.13
2	193.50	Low Profile Platform-flat	1	12.753	14.029	1.00	1.00	25.00	1200.00	0.000	1.500	350.72	0.00	526.08
3	193.50	APXVSPP18-C-A20	3	12.767	14.044	0.83	1.00	19.97	171.00	0.000	2.500	280.45	0.00	701.14
4	193.50	APXVTM14-C-120	3	12.767	14.044	0.79	1.00	15.03	168.00	0.000	2.500	211.02	0.00	527.55
5	193.50	ACU-A20-N	4	12.753	14.029	0.50	1.00	0.28	4.00	0.000	1.500	3.93	0.00	5.89
6	193.50	800 MHz RRH	3	12.733	14.006	0.50	1.00	3.74	159.00	0.000	0.000	52.31	0.00	0.00
7	193.50	TD-RRH8x20-25	3	12.767	14.044	0.50	1.00	6.07	210.00	0.000	2.500	85.32	0.00	213.29
8	193.50	800 MHz Filter	3	12.753	14.029	0.67	1.00	0.84	30.00	0.000	1.500	11.84	0.00	17.76
9	185.00	GPS	1	12.613	13.874	0.54	0.80	0.54	10.00	0.000	0.000	7.44	0.00	0.00
10	185.00	FPA5250	1	12.613	13.874	1.00	1.00	1.20	10.00	0.000	0.000	16.65	0.00	0.00
11	185.00	LPA-8006366 CF	2	12.613	13.874	0.76	0.80	14.59	54.00	0.000	0.000	202.45	0.00	0.00
12	185.00	BXA-171063-12BF	3	12.613	13.874	0.70	0.80	10.01	45.00	0.000	0.000	138.89	0.00	0.00
13	185.00	BXA-70063-6-CF	3	12.613	13.874	0.60	0.80	13.63	51.00	0.000	0.000	189.05	0.00	0.00
14	185.00	LPA-80080/6CF	4	12.613	13.874	1.20	0.80	20.78	84.00	0.000	0.000	288.36	0.00	0.00
15	185.00	Low Profile	1	12.613	13.874	1.00	1.00	22.00	1500.00	0.000	0.000	305.23	0.00	0.00
16	175.00	ABT-DMDF-ADBH	1	12.466	13.713	0.54	0.80	0.03	1.10	0.000	0.000	0.37	0.00	0.00
17	175.00	AM-X-CD-16-65-00T-RET	3	12.466	13.713	0.64	0.80	15.40	145.50	0.000	0.000	211.16	0.00	0.00
18	175.00	Low Profile	1	12.466	13.713	1.00	1.00	22.00	1500.00	0.000	0.000	301.68	0.00	0.00
19	175.00	7770.00	6	12.466	13.713	0.62	0.80	20.33	210.00	0.000	0.000	278.75	0.00	0.00
20	175.00	DC6-48-60-18-8F	1	12.466	13.713	0.80	0.80	0.74	31.80	0.000	0.000	10.09	0.00	0.00
21	175.00	LGP21401	12	12.466	13.713	0.54	0.80	8.30	169.20	0.000	0.000	113.78	0.00	0.00
22	175.00	LGP13519	6	12.466	13.713	0.54	0.80	1.09	31.80	0.000	0.000	14.99	0.00	0.00
23	175.00	RRUS 11	6	12.466	13.713	0.40	0.80	6.05	304.20	0.000	0.000	82.94	0.00	0.00
24	160.00	RRUS 11	3	12.233	13.457	0.40	0.80	3.02	153.00	0.000	0.000	40.69	0.00	0.00
25	160.00	RRUS 11 (Band 12)	3	12.233	13.457	0.40	0.80	3.02	132.00	0.000	0.000	40.69	0.00	0.00
26	160.00	RRUS 11 (Band 4)	3	12.233	13.457	0.40	0.80	3.02	132.00	0.000	0.000	40.69	0.00	0.00
27	160.00	APX16DWV-16DWVS-E-	3	12.233	13.457	0.53	0.80	10.47	122.10	0.000	0.000	140.89	0.00	0.00
28	160.00	LNX-6515DS-A1M	3	12.233	13.457	0.67	0.80	23.12	149.40	0.000	0.000	311.16	0.00	0.00
29	160.00	T-Arm (Round)	3	12.233	13.457	0.75	0.75	18.00	1050.00	0.000	0.000	242.22	0.00	0.00
30	50.00	58532A	1	9.576	10.534	0.54	0.80	0.12	0.40	0.000	0.000	1.24	0.00	0.00
							Totals:		**7,960.50**			**4,055.08**		

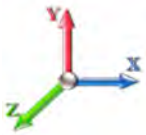
Total Applied Force Summary

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 37

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		127.26	1703.08	0.00	0.00
10.00		125.13	1677.53	0.00	0.00
15.00		123.00	1651.97	0.00	0.00
20.00		128.24	1626.42	0.00	0.00
25.00		132.04	1600.87	0.00	0.00
30.00		134.75	1575.32	0.00	0.00
35.00		136.65	1549.76	0.00	0.00
40.00		137.93	1524.21	0.00	0.00
45.00		138.71	1498.66	0.00	0.00
46.66		45.90	492.89	0.00	0.00
50.00	(1) attachments	95.44	1741.94	0.00	0.00
53.33		94.06	1716.25	0.00	0.00
55.00		47.01	435.64	0.00	0.00
60.00		141.46	1289.39	0.00	0.00
65.00		140.96	1267.04	0.00	0.00
70.00		140.24	1244.68	0.00	0.00
75.00		139.30	1222.32	0.00	0.00
80.00		138.18	1199.96	0.00	0.00
85.00		136.89	1177.60	0.00	0.00
90.00		135.45	1155.24	0.00	0.00
94.17		111.56	945.62	0.00	0.00
95.00		22.51	323.44	0.00	0.00
99.83		130.17	1853.18	0.00	0.00
100.00		4.44	32.87	0.00	0.00
105.00		132.84	976.25	0.00	0.00
110.00		130.91	957.08	0.00	0.00
115.00		128.87	937.92	0.00	0.00
120.00		126.74	918.75	0.00	0.00
125.00		124.51	899.59	0.00	0.00
130.00		122.19	880.43	0.00	0.00
135.00		119.78	861.26	0.00	0.00
140.00		117.30	842.10	0.00	0.00
142.71		62.48	448.96	0.00	0.00
145.00		52.88	569.36	0.00	0.00
147.30		52.56	565.13	0.00	0.00
150.00		61.17	326.85	0.00	0.00
155.00		111.24	594.69	0.00	0.00
160.00	(18) attachments	924.84	2320.41	0.00	0.00
165.00		105.66	558.14	0.00	0.00
170.00		102.78	545.36	0.00	0.00
175.00	(36) attachments	1113.60	2926.19	0.00	0.00
180.00		96.85	449.66	0.00	0.00
185.00	(15) attachments	1241.87	2190.88	0.00	0.00
190.00		90.69	328.91	0.00	0.00
193.50	(23) attachments	1137.21	2296.63	0.00	2191.85

Total Applied Force Summary

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 38	

Totals:	**8,864.23**	**51,900.42**	**0.00**	**2,191.85**

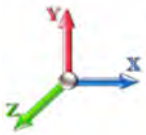
Calculated Forces

Structure:	CT12210-A-SBA	**Code:**	EIA/TIA-222-G	10/13/2016	
Site Name:	Goshen 3, CT	**Exposure:**	C		
Height:	193.50 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	1.1 **Topography:** 1	**Struct Class:**	II	Page: 39	

Load Case: 1.0D + 1.0W 60 mph Wind

Dead Load Factor 1.00

Wind Load Factor 1.00



Iterations 25

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (-) (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation Sway (deg)	Rotation Twist (deg)	Stress Ratio
0.00	-51.90	-8.89	0.00	-1241.6	0.00	1241.65	6408.64	3204.32	14863.6	7442.88	0.00	0.000	0.000	0.175
5.00	-50.19	-8.80	0.00	-1197.2	0.00	1197.22	6332.44	3166.22	14438.7	7230.12	0.03	-0.048	0.000	0.174
10.00	-48.50	-8.71	0.00	-1153.2	0.00	1153.23	6255.18	3127.59	14017.4	7019.15	0.10	-0.097	0.000	0.172
15.00	-46.84	-8.63	0.00	-1109.6	0.00	1109.66	6176.86	3088.43	13599.8	6810.05	0.23	-0.146	0.000	0.171
20.00	-45.21	-8.53	0.00	-1066.5	0.00	1066.52	6097.47	3048.74	13186.1	6602.88	0.41	-0.196	0.000	0.169
25.00	-43.60	-8.44	0.00	-1023.8	0.00	1023.85	6017.03	3008.51	12776.3	6397.69	0.64	-0.246	0.000	0.167
30.00	-42.02	-8.33	0.00	-981.67	0.00	981.67	5935.52	2967.76	12370.7	6194.55	0.93	-0.298	0.000	0.166
35.00	-40.46	-8.22	0.00	-940.02	0.00	940.02	5852.95	2926.48	11969.2	5993.52	1.27	-0.350	0.000	0.164
40.00	-38.93	-8.11	0.00	-898.91	0.00	898.91	5768.82	2884.41	11571.1	5794.16	1.66	-0.402	0.000	0.162
45.00	-37.43	-7.98	0.00	-858.36	0.00	858.36	5657.24	2828.62	11125.6	5571.07	2.11	-0.455	0.000	0.161
46.66	-36.93	-7.95	0.00	-845.08	0.00	845.08	5620.12	2810.06	10979.3	5497.83	2.27	-0.474	0.000	0.160
50.00	-35.19	-7.86	0.00	-818.55	0.00	818.55	5545.66	2772.83	10688.8	5352.37	2.62	-0.510	0.000	0.159
53.33	-33.47	-7.77	0.00	-792.37	0.00	792.37	4757.51	2378.75	9242.35	4628.04	2.99	-0.547	0.000	0.178
55.00	-33.03	-7.74	0.00	-779.39	0.00	779.39	4734.55	2367.28	9135.77	4574.68	3.18	-0.565	0.000	0.177
60.00	-31.73	-7.62	0.00	-740.69	0.00	740.69	4665.11	2332.55	8818.95	4416.03	3.80	-0.625	0.000	0.175
65.00	-30.46	-7.50	0.00	-702.60	0.00	702.60	4594.60	2297.30	8505.61	4259.13	4.49	-0.684	0.000	0.172
70.00	-29.21	-7.37	0.00	-665.12	0.00	665.12	4523.04	2261.52	8195.87	4104.03	5.24	-0.745	0.000	0.169
75.00	-27.98	-7.24	0.00	-628.27	0.00	628.27	4450.41	2225.20	7889.86	3950.80	6.05	-0.805	0.000	0.165
80.00	-26.77	-7.12	0.00	-592.05	0.00	592.05	4363.37	2181.68	7564.56	3787.90	6.93	-0.867	0.000	0.162
85.00	-25.59	-6.99	0.00	-556.46	0.00	556.46	4265.74	2132.87	7228.13	3619.44	7.87	-0.928	0.000	0.160
90.00	-24.43	-6.86	0.00	-521.51	0.00	521.51	4168.10	2084.05	6899.36	3454.81	8.87	-0.990	0.000	0.157
94.17	-23.48	-6.74	0.00	-492.93	0.00	492.93	4086.74	2043.37	6631.22	3320.54	9.76	-1.042	0.000	0.154
95.00	-23.16	-6.73	0.00	-487.31	0.00	487.31	4070.47	2035.23	6578.23	3294.01	9.94	-1.053	0.000	0.154
99.83	-21.30	-6.58	0.00	-454.79	0.00	454.79	3418.29	1709.14	5518.43	2763.32	11.04	-1.113	0.000	0.171
100.00	-21.27	-6.58	0.00	-453.69	0.00	453.69	3416.28	1708.14	5510.73	2759.46	11.08	-1.115	0.000	0.171
105.00	-20.29	-6.46	0.00	-420.77	0.00	420.77	3355.57	1677.79	5281.30	2644.58	12.28	-1.183	0.000	0.165
110.00	-19.32	-6.33	0.00	-388.49	0.00	388.49	3293.81	1646.90	5055.01	2531.26	13.56	-1.251	0.000	0.159
115.00	-18.38	-6.20	0.00	-356.86	0.00	356.86	3226.08	1613.04	4824.64	2415.91	14.90	-1.318	0.000	0.153
120.00	-17.46	-6.07	0.00	-325.86	0.00	325.86	3142.39	1571.20	4576.34	2291.57	16.32	-1.384	0.000	0.148
125.00	-16.56	-5.94	0.00	-295.51	0.00	295.51	3058.71	1529.35	4334.61	2170.52	17.80	-1.450	0.000	0.142
130.00	-15.67	-5.82	0.00	-265.80	0.00	265.80	2975.02	1487.51	4099.43	2052.76	19.36	-1.514	0.000	0.135
135.00	-14.81	-5.69	0.00	-236.72	0.00	236.72	2891.34	1445.67	3870.81	1938.28	20.98	-1.576	0.000	0.127
140.00	-13.97	-5.56	0.00	-208.28	0.00	208.28	2807.65	1403.83	3648.75	1827.09	22.66	-1.637	0.000	0.119
142.71	-13.52	-5.49	0.00	-193.20	0.00	193.20	2762.24	1381.12	3530.99	1768.12	23.60	-1.669	0.000	0.114
145.00	-12.95	-5.43	0.00	-180.64	0.00	180.64	2723.97	1361.98	3433.25	1719.18	24.40	-1.695	0.000	0.110
147.30	-12.38	-5.36	0.00	-168.18	0.00	168.18	1707.44	853.72	2174.15	1088.69	25.23	-1.721	0.000	0.162
150.00	-12.05	-5.30	0.00	-153.68	0.00	153.68	1688.50	844.25	2114.25	1058.70	26.21	-1.751	0.000	0.152
155.00	-11.45	-5.19	0.00	-127.17	0.00	127.17	1652.64	826.32	2004.58	1003.78	28.08	-1.821	0.000	0.134
160.00	-9.16	-4.20	0.00	-101.24	0.00	101.24	1615.71	807.86	1896.48	949.65	30.02	-1.884	0.000	0.112
165.00	-8.60	-4.08	0.00	-80.26	0.00	80.26	1577.73	788.87	1790.06	896.36	32.03	-1.939	0.000	0.095
170.00	-8.06	-3.96	0.00	-59.86	0.00	59.86	1538.69	769.34	1685.46	843.98	34.08	-1.986	0.000	0.076
175.00	-5.17	-2.75	0.00	-40.04	0.00	40.04	1498.58	749.29	1582.80	792.58	36.18	-2.023	0.000	0.054
180.00	-4.72	-2.64	0.00	-26.28	0.00	26.28	1457.41	728.71	1482.21	742.21	38.32	-2.051	0.000	0.039
185.00	-2.58	-1.32	0.00	-13.07	0.00	13.07	1406.50	703.25	1375.31	688.68	40.48	-2.069	0.000	0.021
190.00	-2.25	-1.22	0.00	-6.46	0.00	6.46	1350.71	675.36	1267.83	634.86	42.65	-2.079	0.000	0.012
193.50	0.00	-1.14	0.00	-2.19	0.00	2.19	1311.66	655.83	1195.19	598.48	44.17	-2.083	0.000	0.004

Final Analysis Summary

Structure:	CT12210-A-SBA		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 40

Tower Engineering Solutions

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 89 mph Wind	31.3	0.00	62.23	0.00	0.00	4408.12
0.9D + 1.6W 89 mph Wind	31.3	0.00	46.66	0.00	0.00	4339.86
1.2D + 1.0Di + 1.0Wi 40 mph Wind	7.4	0.00	98.57	0.00	0.00	1081.46
1.2D + 1.0E	2.3	0.00	62.28	0.00	0.00	325.36
0.9D + 1.0E	2.3	0.00	46.71	0.00	0.00	320.04
1.0D + 1.0W 60 mph Wind	8.9	0.00	51.90	0.00	0.00	1241.65

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 89 mph Wind	-39.32	-27.58	0.00	-2818.9	0.00	-2818.9	4757.51	2378.7	9242.35	4628.04	53.33	0.618
0.9D + 1.6W 89 mph Wind	-29.28	-27.22	0.00	-2762.1	0.00	-2762.1	4757.51	2378.7	9242.35	4628.04	53.33	0.603
1.2D + 1.0Di + 1.0Wi 40 mph Wind	-69.56	-6.71	0.00	-700.14	0.00	-700.14	4757.51	2378.7	9242.35	4628.04	53.33	0.166
1.2D + 1.0E	-15.03	-1.58	0.00	-58.02	0.00	-58.02	1707.44	853.72	2174.15	1088.69	147.30	0.062
0.9D + 1.0E	-11.27	-1.54	0.00	-56.91	0.00	-56.91	1707.44	853.72	2174.15	1088.69	147.30	0.059
1.0D + 1.0W 60 mph Wind	-33.47	-7.77	0.00	-792.37	0.00	-792.37	4757.51	2378.7	9242.35	4628.04	53.33	0.178

Base Plate Summary

Structure:	CT12210-A-SB		**Code:**	EIA/TIA-222-G	10/13/2016
Site Name:	Goshen 3, CT		**Exposure:**	C	
Height:	193.50 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	1.1	**Topography:** 1	**Struct Class:**	II	Page: 41

Reactions	
Original Design	
Moment (kip-ft):	4719.00
Axial (kip):	33.60
Shear (kip):	51.50
Analysis	
Moment (kip-ft):	4408.12
Axial (kip):	98.57
Shear (kip):	31.30
Moment Design %:	93.41

Base Plate	
Yield (ksi):	60.00
Width (in):	72.00
Style:	Round
Polygon Sides:	0.00
Clip Length (in):	0.00
Effective Len (in):	12.82
Moment (kip-in):	619.59
Allow Stress (ksi):	81.00
Applied Stress (ksi):	0.00
Stress Ratio:	0.71

Anchor Bolts	
Bolt Circle:	66.00
Number Bolts:	24.00
Bolt Type:	2.25" 18J
Bolt Diameter (in):	2.25
Yield (ksi):	75.00
Ultimate (ksi):	100.00
Arrangement:	Radial
Cluster Dist (in):	0.00
Start Angle (deg):	0.00
Compression	
Force (kip):	137.69
Allowable (kip):	260.00
Ratio:	0.54
Tension	
Force (kip):	129.47
Allowable (kip):	260.00
Ratio:	0.51

Monopole Mat Foundation Design

			Date: 10/11/2016
Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-G
Site Name:		**Structure Height (Ft.):**	193.5
Site Number:	CT12210-A-SBA	**Engineer Name:**	M. Baker
Engr. Number:	26817	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

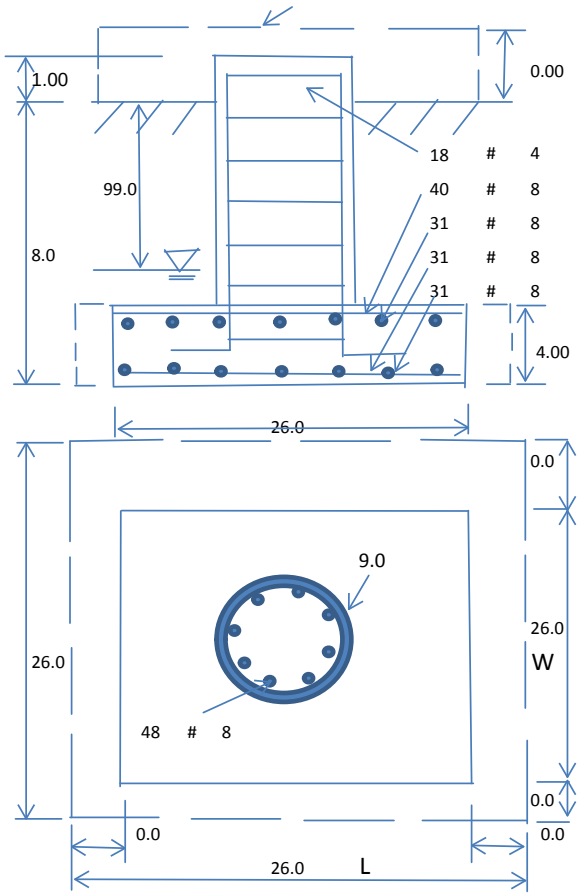
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	62.2	Shear Force (Kips):	31.3
Uplift Force (Kips):	0.0	Moment (Kips-ft):	4408.1
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	9.0	Depth of Base BG (ft.):	8.0
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	4.00
Length of Pad (ft.):	26	Width of Pad (ft.):	26
Final Length of pad (ft)	26.0	Final width of pad (ft):	26.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	8	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	48	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
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):	40	Qty. of Rebar in Pad (W):	40	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	31	Qty. of Rebar in Pad (W):	31	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Ultimate Bearing Pressure (psf):	12000	Ultimate Skin Friction:		Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm 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.):	2449.53	Total Dry Soil Weight (Kips):	306.19
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	306.19	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	3022.09	Total Dry Concrete Weight (Kips):	453.31
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	453.31	Total Vertical Load on Base (Kips):	821.73

Check Soil Capacities:

				Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	2840	<	Allowable Factored Soil Bearing (psf): 9000	0.32	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	9695.2	>	Design Factored Momont (kips-ft): 4690	0.48	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.07	OK!			

Check the capacities of Reinforceing Concrete:

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

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	0.79		Tie / Stirrup Area (sq. in./each):	0.20		
Calculated Moment Capacity (Mn,Kips-Ft):	8510.3	>	Design Factored Moment (Mu, Kips-Ft	4564.6	0.54	OK!
Calculated Shear Capacity (Kips):	1214.7	>	Design Factored Shear (Kips):	31.3	0.03	OK!
Calculated Tension Capacity (Tn, Kips):	2047.7	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	16129.4	>	Design Factored Axial Load (Pu Kips):	62.2	0.00	OK!
Moment & Axial Strength Combination:	0.54	OK!	Check Tie Spacing (Design/Required):		0.5	OK!
Pier Reinforcement Ratio:	0.004		Reinforcement Ratio is too small			

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1317.2	>	One-Way Factored Shear (L-D. Kips):	227.3	0.17	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1317.2	>	One-Way Factored Shear (W-D., Kips)	227.3	0.17	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	1406.8	>	One-Way Factored Shear (C-C, Kips):	213.3	0.15	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0023	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0023		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	6200.8	>	Moment at Bottom (L-Direct. K-Ft):	544.5	0.09	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	6200.8	>	Moment at Bottom (W-Direct. K-Ft):	544.5	0.09	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	8711.0	>	Moment at Bottom (C-C Dir. K-Ft):	770.1	0.09	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0018	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0018		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	4827.8	>	Moment at the top (L-Dir Kips-Ft):	326.0	0.07	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	4827.8	>	Moment at the top (W-Dir Kips-Ft):	326.0	0.07	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	6792.6	>	Moment at the top (C-C Direc. K-Ft):	474.8	0.07	OK!

Exhibit E

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CTNH548A

CTNH548A
113 Brush Hill Road
Goshen, CT 06756

March 31, 2017

EBI Project Number: 6217001270

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	3.60 %

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

EBI Consulting
environmental | engineering | due diligence

March 31, 2017

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

Emissions Analysis for Site: **CTNH548A – CTNH548A**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **113 Brush Hill Road, Goshen, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **113 Brush Hill Road, Goshen, 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 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

3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

4) 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.

5) 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.

6) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWVS-E-A20** has a maximum gain of **16.3 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline of the proposed antennas is **160 feet** above ground level (AGL).

8) 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.

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

EBI Consulting

environmental | engineering | due diligence

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	160	Height (AGL):	160	Height (AGL):	160
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	7,678.43	ERP (W):	7,678.43	ERP (W):	7,678.43
Antenna A1 MPE%	1.16	Antenna B1 MPE%	1.16	Antenna C1 MPE%	1.16
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	160	Height (AGL):	160	Height (AGL):	160
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A2 MPE%	0.28	Antenna B2 MPE%	0.28	Antenna C2 MPE%	0.28

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**1.44 %**
Sprint	0.17 %
Verizon Wireless	0.83 %
AT&T	1.16 %
Site Total MPE %:	**3.60 %**

T-Mobile Sector A Total:	1.44 %
T-Mobile Sector B Total:	1.44 %
T-Mobile Sector C Total:	1.44 %
Site Total:	3.60 %

T-Mobile _Max Values per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1950 MHz UMTS	2	1,279.74	160	3.88	PCS - 1950 MHz	1000	0.39%
T-Mobile AWS - 2100 MHz LTE	2	2,559.48	160	7.76	AWS - 2100 MHz	1000	0.78%
T-Mobile 700 MHz LTE	1	865.21	160	1.31	700 MHz	467	0.28%
						Total*:	**1.44%**

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

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	1.44 %
Sector B:	1.44 %
Sector C:	1.44 %
T-Mobile Per Sector Maximum:	1.44 %
Site Total:	3.60 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **3.60%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Exhibit F

SBA Communications Corporation
8051 Congress Avenue
Boca Raton, FL 33487-1307

T + 561.995.7670
F + 561.995.7626

sbasite.com

LETTER OF AUTHORIZATION

SBA Site ID: CT12210-A, Goshen 3, CT

Property Located at: 113 Brush Hill Road, Goshen, CT,

THE CITY/COUNTY OF: Goshen / Litchfield/Goshen

APPLICATION FOR ZONING/USE/BUILDING PERMIT

This letter authorizes T-Mobile and its authorized agents to file for all necessary zoning, planning and building permits (local, state and federal) for the purposes of installing, operating and maintaining a telecommunications facility on the existing tower on the property referenced above on behalf of Woodridge Lake Sewer District.

All approval conditions that may be granted to T-Mobile in connection with above referenced facility relating to this specific application are the sole responsibility of T-Mobile.

SBA Towers V, LLC

Jason Silberstein

Executive VP, Site Leasing

Date: 3/31/2017