EVERSOURCE ENERGY

56 Prospect Street,
P.O. Box 270
Hartford, CT 06103

Kathleen M. Shanley
Manager – Transmission Siting
Tel: (860) 728-4527

October 1, 2020

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

RE: **Notice of Exempt Modification**
Eversource Site # ES-003 Long Hill
207 Garden Circle, Waterbury, CT 06704
Latitude: 41-34-11.0 N / Longitude: 73-1-3.0 W

Dear Ms. Bachman:

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") currently maintains multiple antennas and microwave dishes at various mounting heights on an existing 280-foot guyed tower located at 207 Garden Circle in Waterbury. See Attachment A, Parcel Map and Property Card. The tower and property are owned by the SBA Properties Inc., doing business as SBA Communications Corporation ("SBA"). Eversource and SBA have entered into an agreement allowing the modification of Eversource's equipment on the existing tower. See Attachment B, Letter of Authorization. Eversource plans to install one 12-foot 7-inch tall omni-directional antenna, to be mounted at 143 feet above ground level ("AGL"), and two 7/8-inch diameter coaxial cables. There will be no changes to the fenced compound, the tower or the existing antennas and equipment on the tower. The tower and existing and proposed equipment are depicted on Attachment C, Construction Drawings, dated June 18, 2020 and Attachment D, Structural Analysis, dated March 4, 2020. The Connecticut Siting Council approved Eversource's use of the tower at this location in Petition No. 1006 in October 2011.

The proposed installation is part of Eversource's program to update the current obsolete analog voice radio communications system to a modern digital voice communications system. The new system will enable the highest level of voice communications under all operating conditions, including during critical emergency and storm restoration activities. The new radio system will also provide for remote control of distribution safety equipment.

Please accept this letter as notification, pursuant to Regulations of Connecticut State Agencies ("R.C.S.A.") §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this notice is being delivered to Neil M. O'Leary, Mayor of the City of Waterbury and Robert Nerney, City Planner for the City of Waterbury via private carrier. Proof of delivery is attached. See Attachment E, Proof of Delivery of Notice.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2):

1. There will be no change to the height of the existing tower.
2. The proposed modifications will not require extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the new antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard as shown in the attached Radio Frequency Emissions Report, dated June 25, 2020 (Attachment F – Power Density Report).
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Eversource respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2). One original copy of this notice has been provided via courier to the Council.

Communications regarding this Notice of Exempt Modification should be directed to Kathleen Shanley at (860) 728-4527.

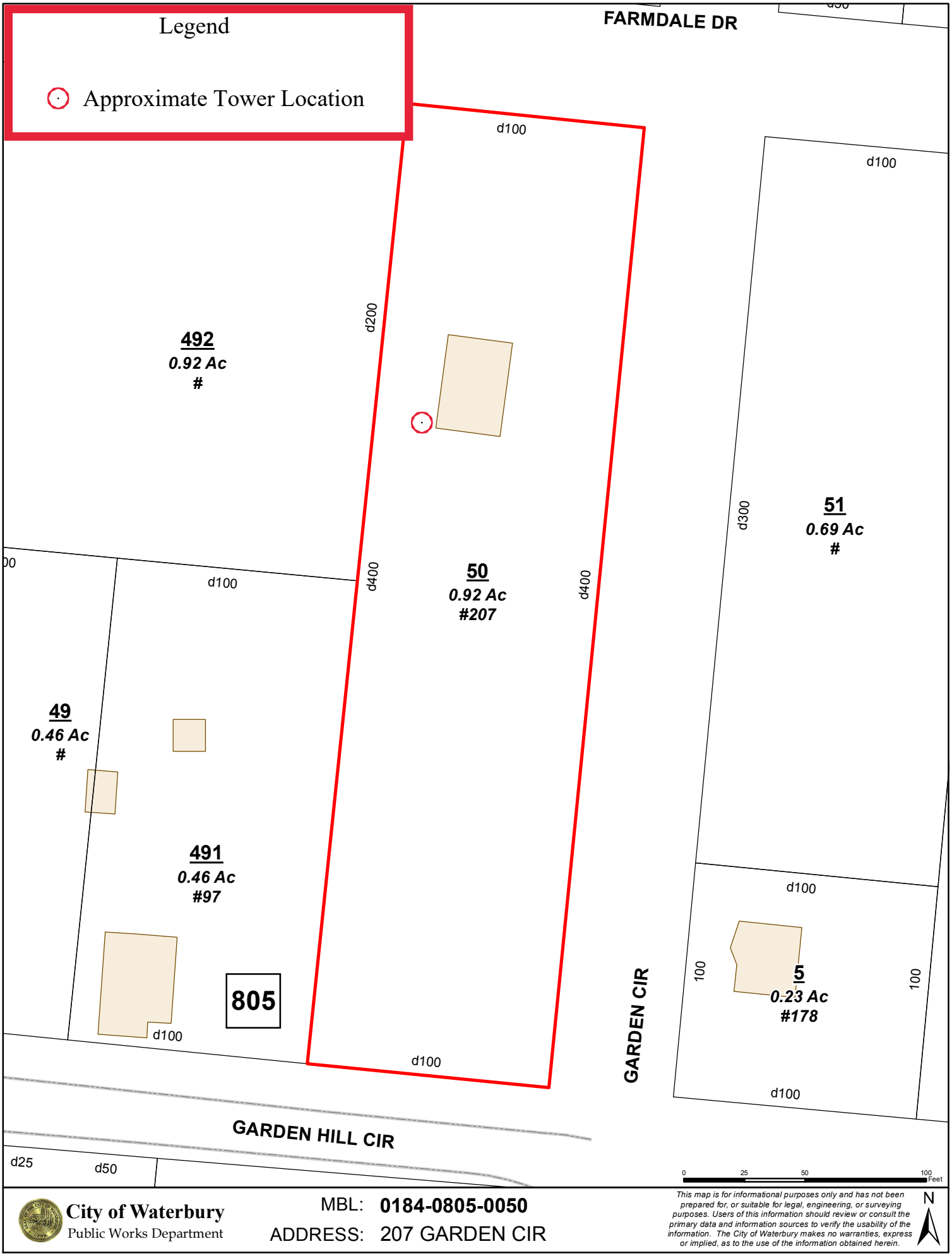
By: _____
Kathleen M. Shanley
Manager – Transmission Siting

cc: Honorable Neil M. O'Leary, Mayor, City of Waterbury
Robert Nerney, City Planner, City of Waterbury
SBA

Attachments

A. Parcel Map and Property Card
B. Letter of Authorization
C. Construction Drawings
D. Structural Analysis
E. Proof of Delivery of Notice
F. Power Density Report

ATTACHMENT A – PARCEL MAP AND PROPERTY CARD



City of Waterbury
Public Works Department

MBL: **0184-0805-0050**

ADDRESS: 207 GARDEN CIR

N

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2017.

CITY OF WATERBURY

Information on the Property Records for the Municipality of Waterbury was last updated on 4/24/2020.

Parcel Information

Location:	207 GARDEN CIR	Property Use:	Residential	Primary Use:	Residential
Unique ID:	018408050050	Map Block Lot:	0184-0805-0050	Acres:	0.92
490 Acres:	0.00	Zone:	RL	Volume / Page:	4307/ 9
Developers Map / Lot:		Census:			

Value Information

	Appraised Value	Assessed Value
Land	194,391	136,070
Buildings	0	0
Detached Outbuildings	0	0
Total	194,391	136,070

Owner's Information

Owner's Data
SBA PROPERTIES INC 8051 CONGRESS AVE ATTN: CT.4877 BOCA RATON FL 33487-1307

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
SBA PROPERTIES INC	4307	9	01/28/2002	Other	No	$0
EMAC COMUNICATIONS INC			06/04/1985		No	$22,500

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
2018.2965	Comm Renovations	10/17/2018		Open Permit	REPLACE 3 CELL SITE ANTENNAS ON EXISTING TELECOM FACILITY
2018.1575	Electrical	06/12/2018		Closed	INSTALL AND WIRE GENERATOR
2013.2794	Electrical	09/19/2016		Closed	ADD 3 ANTENNAS TO EXISTING CELL SITE
2016.2793	Electrical	09/19/2016		Closed	MODIFICATION TO EXISTING CELL SITE ADD CABINET WITH 100A BREAKER
2015.3458	Comm Renovations	11/17/2015		Closed	REPLACE 3 EXISTING ANTENNAS WITH 3 NEW ANTENNAS
2015.3459	Comm Renovations	11/17/2015		Closed	UPGRADE & REPLACEMENT OF EQUIPMENT IN EXISTING SHELTER. SEE SUBMITTED PLAN

ATTACHMENT B – LETTER OF AUTHORIZATION

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: CT04877-A, Waterbury 2, CT

Property Located at: 207 Garden Circle, Waterbury, CT, 06704-2844

THE CITY/COUNTY OF: Waterbury / New Haven

APPLICATION FOR ZONING/USE/BUILDING PERMIT

This letter authorizes Connecticut Light & Power 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 SBA Properties, LLC.

All approval conditions that may be granted to Connecticut Light & Power in connection with above referenced facility relating to this specific application are the sole responsibility of Connecticut Light & Power.

SBA Properties, LLC

Jason Silberstein

Executive VP, Site Leasing

Date: 4/14/2020

ATTACHMENT C – CONSTRUCTION DRAWINGS

EVERSOURCE ENERGY

LONG HILL
207 GARDEN CIRCLE
WATERBURY, CT 06704

PROJECT SUMMARY

THE GENERAL SCOPE OF WORK CONSISTS OF THE FOLLOWING:

1. INSTALL (1) NEW OMNI/WHIP ANTENNA AT ELEVATION 155'–1"± AGL
2. INSTALL (1) NEW RACK WITH DMR EQUIPMENT IN EXISTING TELECOM ROOM

GOVERNING CODES

2018 CONNECTICUT STATE BUILDING CODE (2015 IBC BASIS)
2017 NATIONAL ELECTRIC CODE
TIA–222–H

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE; NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

SITE INFORMATION

SITE NAME:	LONG HILL
SITE ID NUMBER:	018408050050
SITE ADDRESS:	207 GARDEN CIRCLE WATERBURY, CT 06704
MAP:	0184
BLOCK:	0805
LOT:	0050
ZONE:	RL
LATITUDE:	41° 34' 11.0" N
LONGITUDE:	73° 1' 3.0" W
ELEVATION:	826'± AMSL
FEMA/FIRM DESIGNATION:	X
ACREAGE:	0.92± AC (BOOK: 4307, PAGE: 0009)

CONTACT INFORMATION

APPLICANTS:
EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037

PROPERTY OWNER:
SBA PROPERTIES INC
8051 CONGRESS AVE
BOCA RATON, FL 33487

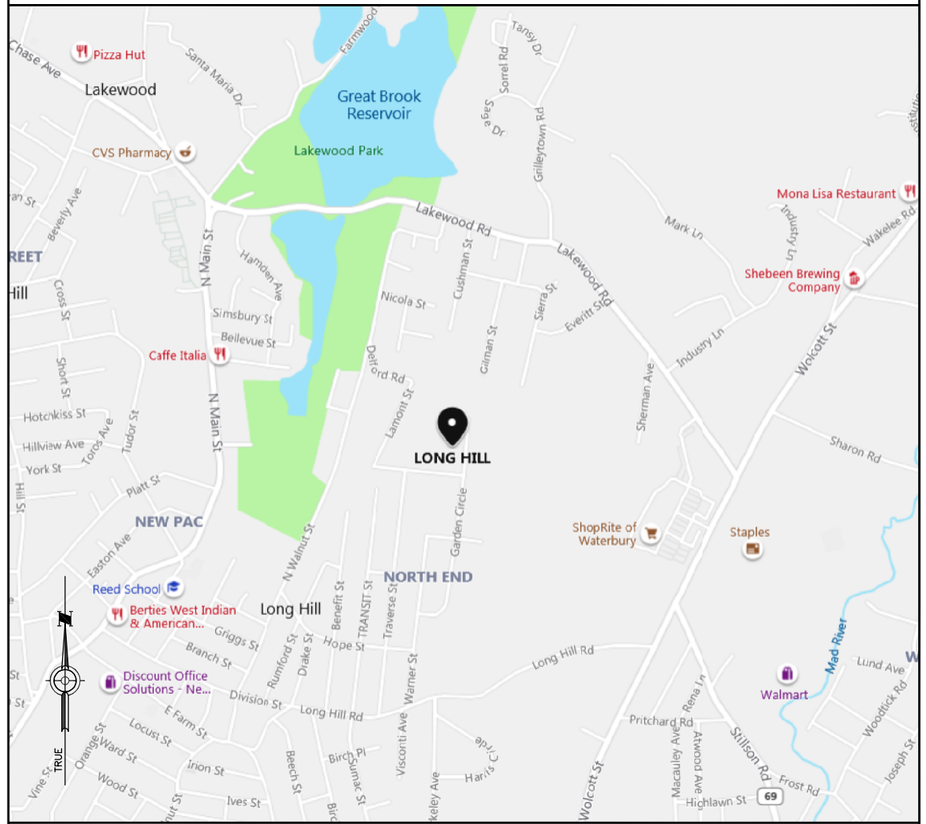
EVERSOURCE ENERGY
PROJECT MANAGER:
NIKOLL PRECI
(860) 655–3079

POWER PROVIDER:
EVERSOURCE ENERGY
(800) 286–2000

TELCO PROVIDER:
FRONTIER
(800) 921–8102

CALL BEFORE YOU DIG:
(800) 922–4455

LOCATION MAP



NO SCALE

DESIGN TYPE

SITE UPGRADE
GUYED TOWER

DRAWING INDEX

SHEET NO:	SHEET TITLE
T–1	TITLE SHEET
C–1	SITE PLAN
C–2	TOWER ELEVATION
G–1	GROUNDING DETAILS
N–1	NOTES & SPECIFICATIONS
N–2	NOTES & SPECIFICATIONS
N–3	NOTES & SPECIFICATIONS

DO NOT SCALE DRAWINGS

SUBCONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME

UNDERGROUND SERVICE ALERT
UTILITIES PROTECTION CENTER, INC.
811
48 HOURS BEFORE YOU DIG

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458–2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	CG

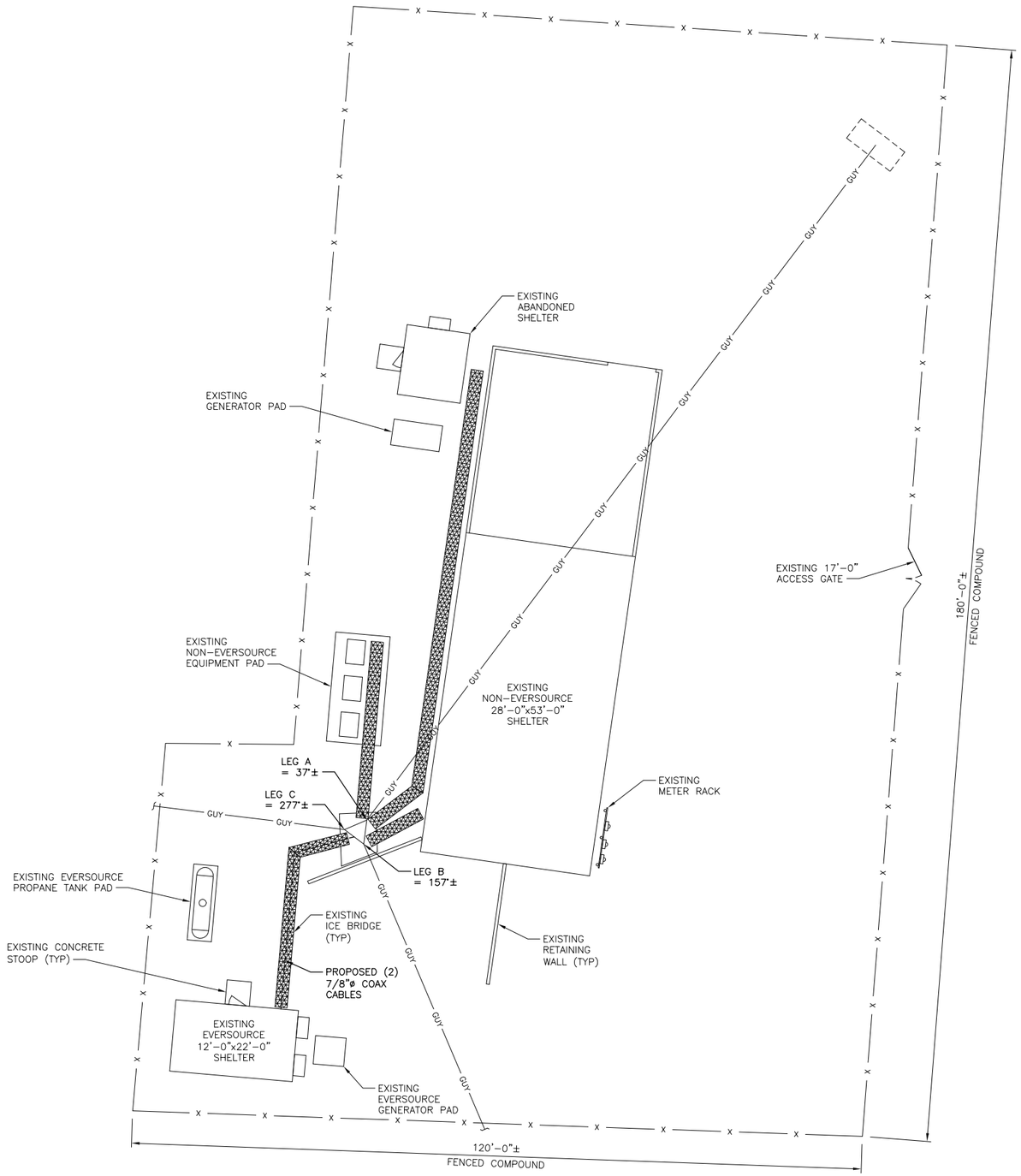
REV	DATE	DESCRIPTION
0	06/18/20	ISSUED FOR FILING

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED PROFESSIONAL ENGINEER
06/18/2020

LONG HILL
207 GARDEN CIRCLE
WATERBURY, CT 06704

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



SITE PLAN
NO SCALE

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
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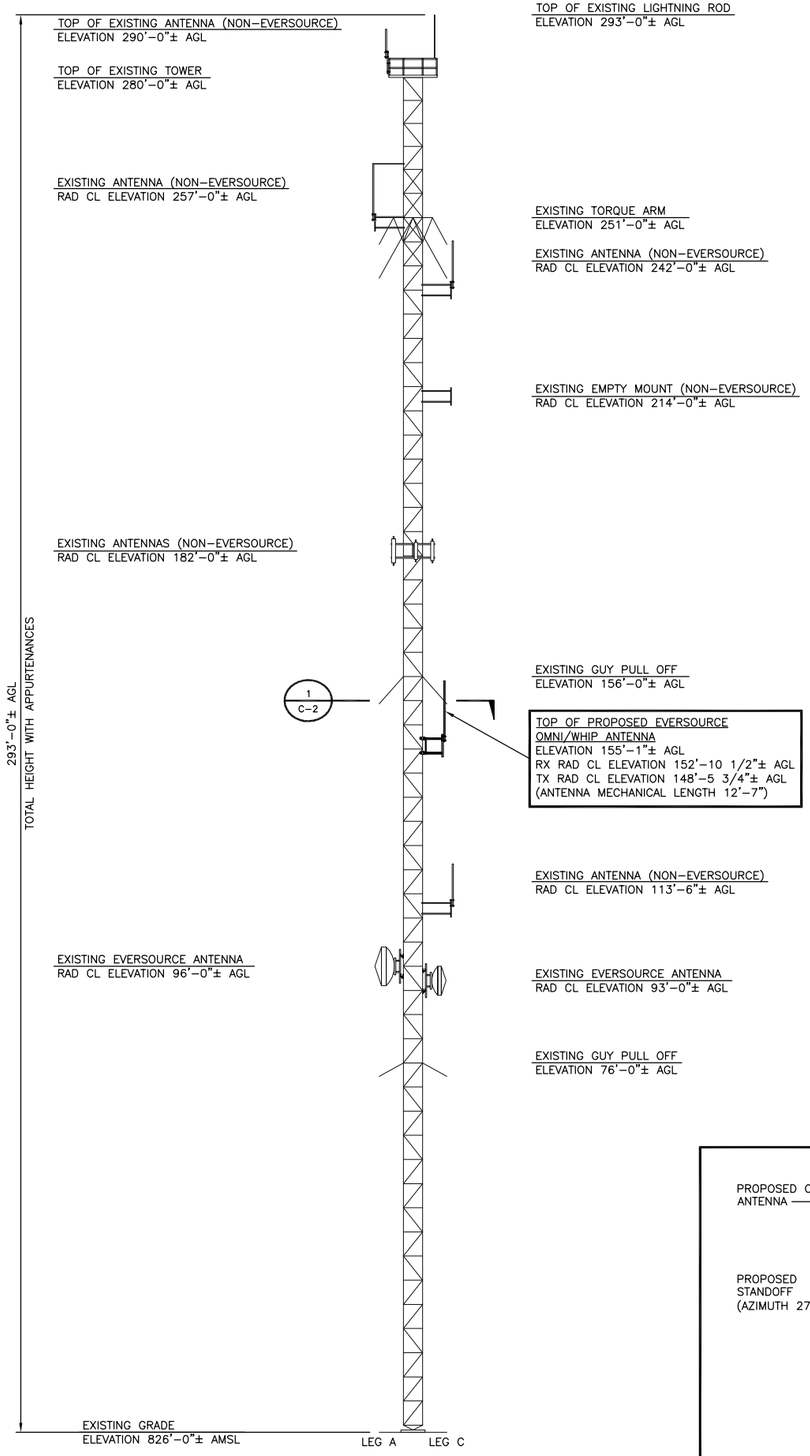
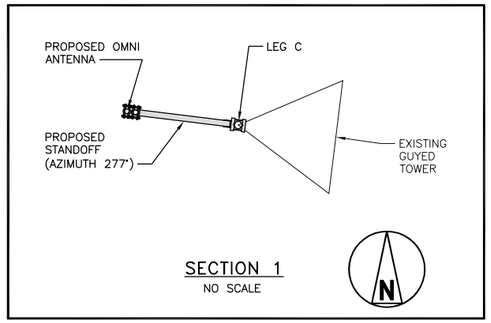
SHEET TITLE
SITE PLAN

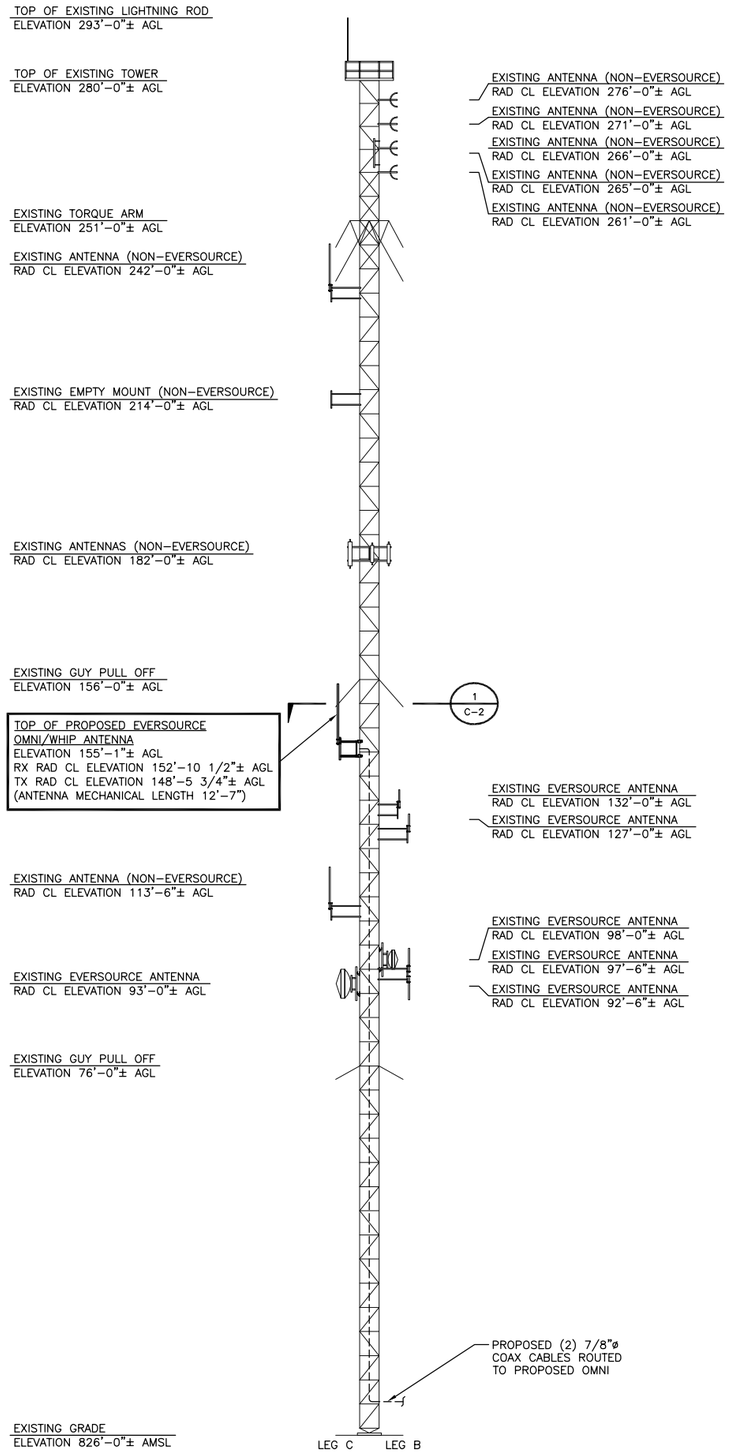
SHEET NUMBER
C-1



TOWER ELEVATION FACE AC
NO SCALE



SECTION 1
NO SCALE



TOWER ELEVATION FACE CB
NO SCALE

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286–2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458–2522

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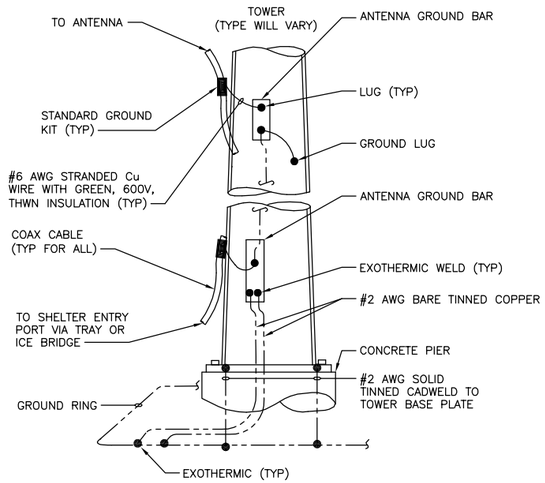
STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED PROFESSIONAL ENGINEER
06/18/2020

LONG HILL
207 GARDEN CIRCLE
WATERBURY, CT 06704

SHEET TITLE
TOWER ELEVATION & ANTENNA EQUIPMENT

SHEET NUMBER
C-2

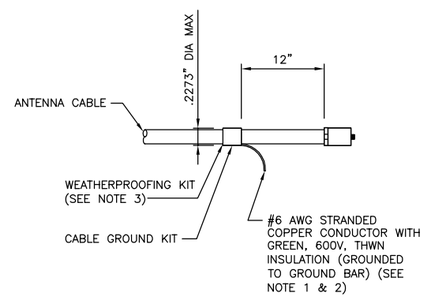


NOTE

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

ANTENNA CABLE GROUNDING

NO SCALE

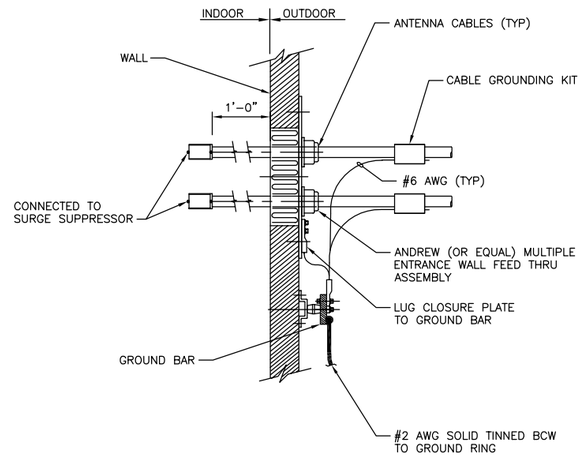


NOTES

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.

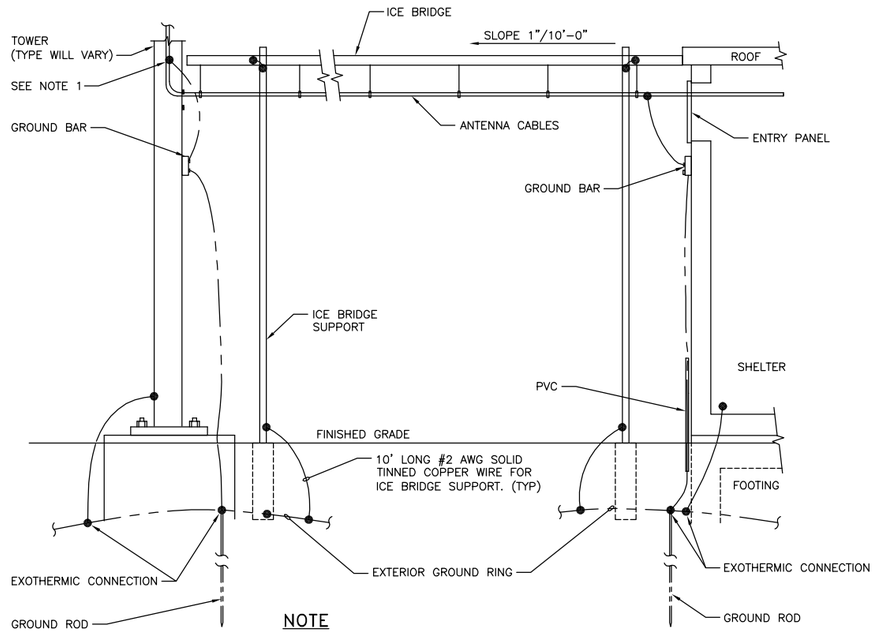
CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NO SCALE



CABLE INSTALLATION WITH WALL FEED THRU ASSEMBLY

NO SCALE



NOTE

1. PROVIDE GROUND KIT 6" BEFORE TURN

ICE BRIDGE AND ANTENNA CABLE DETAIL

NO SCALE

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BERLIN, CT 06037
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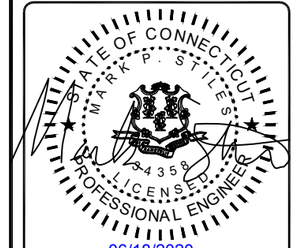

06/18/2020

LONG HILL
207 GARDEN CIRCLE
WATERBURY, CT 06704

SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-1

DESIGN BASIS

1. GOVERNING CODE: 2018 CONNECTICUT STATE BUILDING CODE (2015 IBC BASIS).

GENERAL CONDITIONS

1. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL BUILDING CODES, PERMIT CONDITIONS AND SAFETY CODES DURING CONSTRUCTION.

2. THE ENGINEER IS NOT: A GUARANTOR OF THE INSTALLING CONTRACTOR'S WORK; RESPONSIBLE FOR SAFETY IN, ON OR ABOUT THE WORK SITE; IN CONTROL OF THE SAFETY OR ADEQUACY OF ANY BUILDING COMPONENT, SCAFFOLDING OR SUPERINTENDING THE WORK.

3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL PERMITS, INSPECTIONS, TESTING AND CERTIFICATES NEEDED FOR LEGAL OCCUPANCY OF THE FINISHED PROJECT.

4. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THIS COMPLETE PLAN SET AND VERIFY THE EXISTING CONDITIONS SHOWN IN THESE PLANS AS THEY RELATE TO THE WORK PRIOR TO SUBMITTING PRICE. SIGNIFICANT DEVIATIONS FROM WHAT IS SHOWN AFFECTING THE WORK SHALL BE REPORTED IMMEDIATELY TO THE CONSTRUCTION MANAGER.

5. DETAILS INCLUDED IN THIS PLAN SET ARE TYPICAL AND APPLY TO SIMILAR CONDITIONS.

6. EXISTING ELECTRICAL AND MECHANICAL FIXTURES, PIPING, WIRING, AND EQUIPMENT OBSTRUCTING THE WORK SHALL BE REMOVED AND/OR RELOCATED AS DIRECTED BY THE CONSTRUCTION MANAGER. TEMPORARY SERVICE INTERRUPTIONS MUST BE COORDINATED WITH OWNER.

7. THE CONTRACTOR SHALL DILIGENTLY PROTECT THE EXISTING BUILDING/SITE CONDITIONS AND THOSE OF ANY ADJOINING BUILDING/SITES AND RESTORE ANY DAMAGE CAUSED BY HIS ACTIVITIES TO THE PRE-CONSTRUCTION CONDITION.

8. THE CONTRACTOR SHALL SAFEGUARD AGAINST: CREATING A FIRE HAZARD, AFFECTING TENANT EGRESS OR COMPROMISING BUILDING SITE SECURITY MEASURES.

9. THE CONTRACTOR SHALL REMOVE ALL DEBRIS AND CONSTRUCTION WASTE FROM THE SITE EACH DAY. WORK AREAS SHALL BE SWEPT AND MADE CLEAN AT THE END OF EACH WORK DAY.

10. THE CONTRACTOR'S HOURS OF WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES AND BE APPROVED BY OWNER.

11. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER IF ASBESTOS IS ENCOUNTERED DURING THE EXECUTION OF HIS WORK. THE CONTRACTOR SHALL CEASE ALL ACTIVITIES WHERE THE ASBESTOS MATERIAL IS FOUND UNTIL NOTIFIED BY THE CONSTRUCTION MANAGER TO RESUME OPERATIONS.

THERMAL & MOISTURE PROTECTION

1. FIRE-STOP ALL PENETRATIONS FOR ELECTRICAL CONDUITS OR WAVEGUIDE CABLING THROUGH BUILDING WALLS, FLOORS, AND CEILINGS SHALL BE FIRESTOPPED WITH ACCEPTED MATERIALS TO MAINTAIN THE FIRE RATING OF THE EXISTING ASSEMBLY. ALL FILL MATERIAL SHALL BE SHAPED, FITTED, AND PERMANENTLY SECURED IN PLACE. FIRESTOPPING SHALL BE INSTALLED IN ACCORDANCE WITH ASTM E814.

2. HILTI CP620 FIRE FOAM OR 3M FIRE BARRIER FILL, VOID OR CAVITY MATERIAL OR ACCEPTED EQUAL SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ASSOCIATED UNDERWRITERS LABORATORIES (UL) SYSTEM NUMBER.

3. FIRESTOPPING SHALL BE APPLIED AS SOON AS PRACTICABLE AFTER PENETRATIONS ARE MADE AND EQUIPMENT INSTALLED.

4. FIRESTOPPED PENETRATIONS SHALL BE LEFT EXPOSED AND MADE AVAILABLE FOR INSPECTION BEFORE CONCEALING SUCH PENETRATIONS. FIRESTOPPING MATERIAL CERTIFICATES SHALL BE MADE AVAILABLE AT THE TIME OF INSPECTION.

5. ANY BUILDING ROOF PENETRATION AND/OR RESTORATION SHALL BE PERFORMED SO THAT THE ROOF WARRANTY IN PLACE IS NOT COMPROMISED. CONTRACTOR SHALL ARRANGE FOR OWNER'S ROOFING CONTRACTOR TO PERFORM ANY AND ALL ROOFING WORK IF SO REQUIRED BY EXISTING ROOF WARRANTY. OTHERWISE, ROOF SHALL BE MADE WATERTIGHT WITH LIKE CONSTRUCTION AS SOON AS PRACTICABLE AND AT COMPLETION OF CONSTRUCTION.

6. ALL PENETRATIONS INTO AND/OR THROUGH BUILDING EXTERIOR WALLS SHALL BE SEALED WITH SILICONE SEALER.

7. WHERE CONDUIT AND CABLES PENETRATES FIRE RATED WALLS AND FLOORS, FIRE GROUT ALL PENETRATIONS IN ORDER TO MAINTAIN THE FIRE RATING USING A LISTED FIRE SEALING DEVICE OR GROUT.

8. CONTRACTOR TO REMOVE AND RE-INSTALL ALL FIRE PROOFING AS REQUIRED DURING CONSTRUCTION.

SUBMITTALS

1. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO FABRICATION.

2. CONTRACTOR TO NOTIFY ENGINEER FOR INSPECTION PRIOR TO CLOSING PENETRATIONS.

3. CONTRACTORS SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. THE ENGINEER SHALL BE NOTIFIED OF ANY CONDITIONS WHICH PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

4. ALL STEEL MATERIAL EXPOSED TO WEATHER SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 " ZINC (HOT-DIPPED GALVANIZED) COATINGS" ON IRON AND STEEL PRODUCTS.

5. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS FOR REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

STEEL

1. MATERIAL:

WIDE FLANGE:	ASTM A572, GR 50
TUBING:	ASTM A500, GR C
PIPE:	ASTM A53, GR B AND ASTM 572, GR 50
ANGLE:	ASTM A570, GR 50 AND ASTM A36
BOLTS:	ASTM A325
GRATING:	TYPE GW-2 (1"x3/16" BARS)
MISC. MATERIAL:	ASTM A36

ALL STEEL SHAPES SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 WITH A COATING WEIGHT OF 2 OZ/SF.

2. DAMAGED GALVANIZED SURFACES SHALL BE CLEANED WITH A WIRE BRUSH AND PAINTED WITH TWO COATS OF COLD ZINC, "GALVANOX", "DRY GALV", "ZINC IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES. TOUCH UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT IN SHOP OR FIELD.

3. DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC "MANUAL OF STEEL CONSTRUCTION" 13TH EDITION.

4. THE STEEL STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER COMPLETION. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION.

5. ALL STEEL ELEMENTS SHALL BE INSTALLED PLUMB AND LEVEL.

6. TOWER MANUFACTURER'S DESIGNS SHALL PREVAIL FOR TOWER.

SITE GENERAL

1. CONTRACTOR SHALL FOLLOW CONDITIONS OF ALL APPLICABLE PERMITS AND WORK IN ACCORDANCE WITH OSHA REGULATIONS.

2. THESE PLANS DEPICT KNOWN UNDERGROUND STRUCTURES, CONDUITS, AND/OR PIPELINES. THE LOCATIONS FOR THESE ELEMENTS ARE BASED UPON THE VARIOUS RECORD DRAWINGS AVAILABLE. THE CONTRACTOR IS HEREBY ADVISED THAT THESE DRAWINGS MAY NOT ACCURATELY DEPICT AS-BUILT LOCATIONS AND OTHER UNKNOWN STRUCTURES. THE CONTRACTOR SHALL THEREFORE DETERMINE THE EXACT LOCATION OF EXISTING UNDERGROUND ELEMENTS AND EXCAVATE WITH CARE AFTER CALLING MARKOUT SERVICE AT 1-800-272-4480 48 HOURS BEFORE DIGGING, DRILLING OR BLASTING.

3. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, AND OTHER UTILITIES WHERE ENCOUNTERED, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION, SHALL BE RELOCATED AS DIRECTED BY ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL HAND DIG UTILITIES AS NEEDED. CONTRACTOR SHALL PROVIDE, BUT IS NOT LIMITED TO, APPROPRIATE A) FALL PROTECTION, B) CONFINED SPACE ENTRY, C) ELECTRICAL SAFETY, AND D) TRENCHING AND EXCAVATION.

4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.

5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, OR OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT THE POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF THE CONSTRUCTION MANAGER.

6. CONTRACTOR IS RESPONSIBLE FOR REPAIRING OR REPLACING STRUCTURES OR UTILITIES DAMAGED DURING CONSTRUCTION.

7. CONTRACTOR SHALL PROTECT EXISTING PAVED AND GRAVEL SURFACES, CURBS, LANDSCAPE AND STRUCTURES AND RESTORE SITE OR PRE-CONSTRUCTION CONDITION WITH AS GOOD, OR BETTER, MATERIALS. NEW MATERIALS SHALL MATCH EXISTING THICKNESS AND TYPE.

8. THE CONTRACTOR SHALL SHORE ALL TRENCH EXCAVATIONS GREATER THAN 5 FEET IN DEPTH OR LESS WHERE SOIL CONDITIONS ARE DEEMED UNSTABLE. ALL SHEETING AND/OR SHORING METHODS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.

9. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING GROUNDWATER LEVELS IN THE VICINITY OF EXCAVATIONS TO PROTECT ADJACENT PROPERTIES AND NEW WORK. GROUNDWATER SHALL BE DRAINED IN ACCORDANCE WITH LOCAL SEDIMENTATION AND EROSION CONTROL GUIDELINES.

EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037
PHONE: (800) 286-2000

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-2522

PROJECT NO:	405025
DRAWN BY:	TYW
CHECKED BY:	CG

REV	DATE	DESCRIPTION
0	06/18/20	ISSUED FOR FILING

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED PROFESSIONAL ENGINEER
06/18/2020

LONG HILL
207 GARDEN CIRCLE
WATERBURY, CT 06704

SHEET TITLE
NOTES
& SPECIFICATIONS

SHEET NUMBER
N-1

ELECTRICAL

1. CONTRACTOR SHALL VERIFY EXISTING ELECTRIC SERVICE TYPE AND CAPACITY AND ORDER NEW ELECTRIC SERVICE FROM LOCAL ELECTRIC UTILITY, WHERE APPLICABLE.
2. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES, AND SHALL BE ACCEPTABLE TO ALL AUTHORITIES HAVING JURISDICTION. WHERE A CONFLICT EXISTS BETWEEN CODES, PLAN AND SPECIFICATIONS, OR AUTHORITIES HAVING JURISDICTION, THE MORE STRINGENT AUTHORITIES SHALL APPLY.
3. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC, FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN AND/OR OTHERWISE REQUIRED.
4. ALL ELECTRICAL CONDUCTORS SHALL BE 100% COPPER AND SHALL HAVE TYPE THHN INSULATION UNLESS INDICATED OTHERWISE.
5. CONDUIT SHALL BE THREADED RIGID GALVANIZED STEEL OR EMT WITH ONLY COMPRESSION TYPE COUPLINGS AND CONNECTORS, ALL MADE UP WRENCH TIGHT.
6. ALL BURIED CONDUIT SHALL BE MINIMUM SCH 40 PVC UNLESS NOTED OTHERWISE, OR AS PER LOCAL CODE REQUIREMENTS.
7. PROVIDE FLEXIBLE STEEL CONDUIT OR LIQUID TIGHT FLEXIBLE STEEL CONDUIT TO ALL VIBRATING EQUIPMENT, INCLUDING HVAC UNITS, TRANSFORMERS, MOTORS, ETC, OR WHERE EQUIPMENT IS PLACED UPON A SLAB ON GRADE.
8. ALL BRANCH CIRCUITS AND FEEDERS SHALL HAVE A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR BONDED TO ALL ENCLOSURES, PULLBOXES, ETC.
9. CONDUIT AND CABLE WITHIN CORRIDORS SHALL BE CONCEALED AND EXPOSED ELSEWHERE, UNLESS NOTED OTHERWISE.
10. ELECTRICAL MATERIALS INSTALLED ON ROOFTOP SHALL BE LISTED FOR NEMA 3R USE. –AND ALL WIRING WITHIN A VENTILATION DUCT SHALL BE LISTED FOR SUCH USE. IN GENERAL WIRING METHODS WITHIN A DUCT SHALL BE AN MC CABLE WITH SMOOTH OR CORRUGATED METAL JACKET AND HAVE NO OUTER COVERING OVER THE METAL JACKET. INTERLOCKED ARMOR TYPE OF MC CABLE IS NOT ACCEPTABLE FOR THIS APPLICATION. CONTRACTOR CAN ALSO USE TYPE MI CABLE IN THE VENTILATION DUCT PROVIDED IT DOES NOT HAVE ANY OUTER COVERINGS OVER THE METAL EXTERIOR.
11. WIRING DEVICES SHALL BE SPECIFICATION GRADE, AND WIRING DEVICE COVER PLATES SHALL BE PLASTIC WITH ENGRAVING AS SPECIFIED.

GROUNDING

1. #6 THWN SHALL BE STRANDED #6 COPPER WITH GREEN THWN INSULATION SUITABLE FOR WET INSTALLATIONS.
2. #2 THWN SHALL BE STRANDED #2 COPPER WITH THWN INSULATION SUITABLE FOR WET INSTALLATIONS.
3. #2 BARE TINNED SHALL BE SOLID COPPER TINNED. ALL BURIED WIRE SHALL MEET THIS CRITERIA.
4. ALL LUGS SHALL BE 2–HOLE, LONG BARREL, TINNED SOLID COPPER UNLESS OTHERWISE SPECIFIED, LUGS SHALL BE THOMAS AND BETTS SERIES 548##BE OR EQUIVALENT (IE #2 THWN – 54856BE, #2 SOLID – 54856BE, AND #6 THWN – 54852BE).
5. ALL HARDWARE, BOLTS, NUTS, AND WASHERS SHALL BE 18–8 STAINLESS STEEL. EVERY CONNECTION SHALL BE BOLT–FLAT WASHER–BUSS–LUG–FLAT WASHER–BELLEVILLE WASHER–NUT IN THAT EXACT ORDER. BACK–TO–BACK LUGGING, BOLT–FLAT WASHER–LUG–BUSS–LUG–FLAT WASHER–BELLEVILLE WASHER–NUT, IN THAT EXACT ORDER, IS ACCEPTED WHERE NECESSARY TO CONNECT MANY LUGS TO A BUSS BAR. STACKING OF LUGS, BUSS–LUG–LUG, IS NOT ACCEPTABLE.
6. WHERE CONNECTIONS ARE MADE TO STEEL OR DISSIMILAR METALS, A THOMAS AND BETTS DRAGON TOOTH WASHER MODEL DTWXXX SHALL BE USED BETWEEN THE LUG AND THE STEEL, BOLT–FLAT WASHER–STEEL–DRAGON TOOTH WASHER–LUG–FLAT WASHER–BELEVILE WASHER–NUT.
7. ALL CONNECTIONS, INTERIOR AND EXTERIOR, SHALL BE MADE WITH THOMAS AND BETTS KPOR–SHIELD. COAT ALL WIRES BEFORE LUGGING AND COAT ALL SURFACES BEFORE CONNECTING.
8. THE MINIMUM BEND RADIUS SHALL BE 8 INCHES FOR #6 WIRE AND SMALLER AND 12 INCHES FOR WIRE LARGER THAN #6.
9. ALL CONNECTIONS TO THE GROUND RING SHALL BE EXOTHERMIC WELD.
10. BOND THE FENCE TO THE GROUND RING AT EACH CORNER, AND AT EACH GATE POST WITH #2 SOLID TINNED WIRE. EXOTHERMIC WELD BOTH ENDS.
11. GROUND KITS SHALL BE SOLID COPPER STRAP WITH #6 WIRE 2–HOLE COMPRESSION CRIMPED LUGS AND SHALL BE SEALED ACCORDING TO MANUFACTURER INSTRUCTIONS.
12. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL BE USED.
13. GROUND BARS SHALL BE FURNISHED AND INSTALLED WITH PRE–DRILLED HOLE DIAMETERS AND SPACINGS. GROUND BARS SHALL NEITHER BE FIELD FABRICATED NOR NEW HOLES DRILLED. GROUND LUGS SHALL MATCH THE SPACING ON THE BAR. HARDWARE DIAMETER SHALL BE MINIMUM 3.8 INCH.
14. MGB GROUND CONNECTION SHALL BE EXOTHERMIC WELDED TO THE GROUND SYSTEM.
15. ALL CABLE TRAY AND/OR PLATFORM STEEL SHALL BE BONDED TOGETHER WITH JUMPERS (#6 IN EQUIPMENT ROOM, #2 ELSEWHERE AND HOMERUN).

ANTENNA & CABLE NOTES

1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL TRANSMISSION CABLES, JUMPERS, CONNECTORS, GROUNDING STRAPS, ANTENNAS, MOUNTS AND HARDWARE. ALL MATERIALS SHALL BE INSPECTED BY THE CONTRACTOR FOR DAMAGE UPON DELIVERY. JUMPERS SHALL BE SUPPLIED AT ANTENNAS AND EQUIPMENT INSIDE SHELTER COORDINATE LENGTH OF JUMP CABLES WITH EVERSOURCE. COORDINATE AND VERIFY ALL OF THE MATERIALS TO BE PROVIDED WITH EVERSOURCE PRIOR TO SUBMITTING BID AND ORDERING MATERIALS.
2. AFTER INSTALLATION, THE TRANSMISSION LINE SYSTEM SHALL BE PIM/SWEEP TESTED FOR PROPER INSTALLATION AND DAMAGE WITH ANTENNAS CONNECTED. CONTRACTOR TO OBTAIN LATEST TESTING PROCEDURES FROM EVERSOURCE PRIOR TO BIDDING.
3. ANTENNA CABLES SHALL BE COLOR CODED AT THE FOLLOWING LOCATIONS:
   – AT THE ANTENNAS.
   – AT THE WAVEGUIDE ENTRY PLATE ON BOTH SIDES OF THE EQUIPMENT SHELTER WALL.
   – JUMPER CABLES AT THE EQUIPMENT ENTER.
4. SYSTEM INSTALLATION:
   THE CONTRACTOR SHALL INSTALL ALL CABLES AND ANTENNAS TO THE MANUFACTURER'S SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR THE PROCUREMENT AND INSTALLATION OF THE FOLLOWING:
   – ALL CONNECTORS, ASSOCIATED CABLE MOUNTING, AND GROUNDING HARDWARE.
   – WALL MOUNTS, STANDOFFS, AND ASSOCIATED HARDWARE.
   – 1/2 INCH HELIAX ANTENNA JUMPERS OF APPROPRIATE LENGTHS.
5. MINIMUM BENDING RADIUS FOR COAXIAL CABLES:
   – 7/8 INCH, RMIN = 15 INCHES
   – 1 5/8 INCH, RMIN = 25 INCHES
6. CABLE SHALL BE INSTALLED WITH A MINIMUM NUMBER OF BENDS WHERE POSSIBLE. CABLE SHALL NOT BE LEFT UNTERMINATED AND SHALL BE SEALED IMMEDIATELY AFTER BEING INSTALLED.
7. ALL CABLE CONNECTIONS OUTSIDE SHALL BE COVERED WITH WATERPROOF SPLICING KIT.
8. CONTRACTOR SHALL VERIFY EXACT LENGTH AND DIRECTION OF TRAVEL IN FIELD PRIOR TO CONSTRUCTION.
9. CABLE SHALL BE FURNISHED WITHOUT SPLICES AND WITH CONNECTORS AT EACH END.

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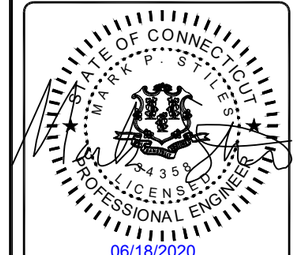

06/18/2020

LONG HILL
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SHEET TITLE
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SHEET NUMBER
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SYMBOLS

●	EXOTHERMIC CONNECTION
■	COMPRESSION CONNECTION
	5/8"ø x 10'-0" COPPER CLAD STEEL GROUND ROD.
	TEST GROUND ROD WITH INSPECTION SLEEVE
— — —	GROUNDING CONDUCTOR
(A)	KEY NOTES
CHAINLINK FENCE	— X — X — X — X — X —
WOOD FENCE	—□—□—□—□—□—□—□—□—
LEASE AREA	— — — — — — — — — — — — — —
ICE BRIDGE	
CABLE TRAY	
GAS LINE	— G — G — G — G — G —
UNDERGROUND ELECTRICAL/TELCO	— E/T — E/T — E/T — E/T —
UNDERGROUND ELECTRICAL/CONTROL	— E/C — E/C — E/C — E/C —
UNDERGROUND ELECTRICAL	— E — E — E — E — E —
UNDERGROUND TELCO	— T — T — T — T — T —
PROPERTY LINE (PL)	— – – — – – — – – — – – —

ABBREVIATIONS

AC	ALTERNATING CURRENT	MGB	MASTER GROUNDING BAR
AIC	AMPERAGE INTERRUPTION CAPACITY	MIN	MINIMUM
ANI	AUXILIARY NETWORK INTERFACE	MW	MICROWAVE
ATM	ASYNCHRONOUS TRANSFER MODE	MTS	MANUAL TRANSFER SWITCH
ATS	AUTOMATIC TRANSFER SWITCH	NEC	NATIONAL ELECTRICAL CODE
AWG	AMERICAN WIRE GAUGE	OC	ON CENTER
AWS	ADVANCED WIRELESS SERVICES	PP	POLARIZING PRESERVING
BATT	BATTERY	PCU	PRIMARY CONTROL UNIT
BBU	BASEBAND UNIT	PDU	PROTOCOL DATA UNIT
BTC	BARE TINNED COPPER CONDUCTOR	PWR	POWER
BTS	BASE TRANSCEIVER STATION	RECT	RECTIFIER
CCU	CLIMATE CONTROL UNIT	RET	REMOTE ELECTRICAL TILT
CDMA	CODE DIVISION MULTIPLE ACCESS	RMC	RIGID METALLIC CONDUIT
CHG	CHARGING	RF	RADIO FREQUENCY
CLU	CLIMATE UNIT	RUC	RACK USER COMMISSIONING
COMM	COMMON	RRH	REMOTE RADIO HEAD
DC	DIRECT CURRENT	RRU	REMOTE RADIO UNIT
DIA	DIAMETER	RWY	RACEWAY
DWG	DRAWING	SFP	SMALL FORM-FACTOR PLUGGABLE
EC	ELECTRICAL CONDUCTOR	SIAD	SMART INTEGRATED ACCESS DEVICE
EMT	ELECTRICAL METALLIC TUBING	SSC	SITE SOLUTIONS CABINET
FIF	FACILITY INTERFACE FRAME	T1	1544KBPS DIGITAL LINE
GEN	GENERATOR	TDMA	TIME-DIVISION MULTIPLE ACCESS
GPS	GLOBAL POSITIONING SYSTEM	TMA	TOWER MOUNT AMPLIFIER
GSM	GLOBAL SYSTEM FOR MOBILE	TVSS	TRANSIENT VOLTAGE SUPPRESSION SYSTEM
HVAC	HEAT/VENTILATION/AIR CONDITIONING	TYP	TYPICAL
ICF	INTERCONNECTION FRAME	UMTS	UNIVERSAL MOBILE TELECOMMUNICATION SYSTEM
IGR	INTERIOR GROUNDING RING (HALO)	UPS	UNINTERRUPTIBLE POWER SUPPLY (DC POWER PLANT)
LTE	LONG TERM EVOLUTION		

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N-3

REFERENCE CUTSHEETS

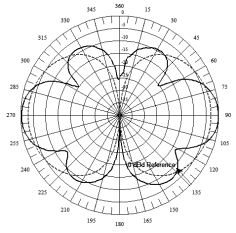
VHF Omni Antennas (160-222 MHz)

		160-174 MHz						217-222 MHz									
	Model Number	**DS1G03F36U-N**	**DS1G03F36U-D**	**DS1G06F36U-N**	**DS1G06F36U-D**	**DS1G03F36D-N**	**DS1G03F36D-D**	**DS2C00F36U-N**	**DS2C00F36U-D**	**DS2C03F36U-N**	**DS2C03F36U-D**	**DS2C06F36U-N**	**DS2C06F36U-D**	**DS2C00F36D-N**	**DS2C00F36D-D**	**DS2C03F36D-N**	**DS2C03F36D-D**
	Input Connector	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN
	Type	Single		Single		Dual		Single		Single		Single		Dual		Dual	
ELECTRICAL	**Bandwidth**, MHz	14		14		14		5		5		5		5		5	
ELECTRICAL	**Power**, Watts	500		500		350		500		500		500		350		350	
ELECTRICAL	**Gain**, dBd	3		6		3		0		3		6		0		3	
ELECTRICAL	**Horizontal Beamwidth**, degrees	360		360		360		360		360		360		360		360	
ELECTRICAL	**Vertical Beamwidth**, degrees	30		16		30		60		30		16		60		30	
ELECTRICAL	**Beam Tilt**, degrees	0		0		0		0		0		0		0		0	
ELECTRICAL	**Isolation (minimum)**, dB	N/A		N/A		30		N/A		N/A		N/A		30		30	
MECHANICAL	**Number of Connectors**	1		1		2		1		1		1		2		2	
MECHANICAL	**Flat Plate Area**, ft^2	2.10		3.63		3.69		1.28		1.64		2.58		2.09		3.08	
MECHANICAL	**Lateral Windload Thrust**lbf	88		152		155		54		69		109		88		129	
MECHANICAL	**Wind Speed Rating without ice**, mph	190		150		150		250		225		175		190		160	
MECHANICAL	**Mounting Hardware** included	DSH3V3R		DSH3V3N		DSH3V3N		DSH2V3R		DSH2V3R		DSH3V3N		DSH3V3R		DSH3V3N	
DIMENSIONS	**Length**, ft(m)	12.7 (3.9)		21.9 (6.7)		22.3 (6.8)		7.7 (2.3)		9.9 (3)		15.6 (4.8)		12.6 (3.8)		18.6 (5.7)	
DIMENSIONS	**Radome O.D.**, in(cm)	3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)	
DIMENSIONS	**Mast O.D.**, in(cm)	2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)	
DIMENSIONS	**Net Weight** w/o bracket, lb(kg)	37 (16.8)		60 (27.2)		63 (28.6)		19 (8.6)		26 (11.8)		47 (21.3)		40 (18.1)		70 (31.8)	
DIMENSIONS	**Shipping Weight**, lb(kg)	67 (30.4)		90 (40.8)		93 (42.2)		39 (17.7)		56 (25.4)		77 (34.9)		70 (31.8)		100 (45.4)	

DS2C00F36D-D

VERTICAL PATTERNS

DS1G03F36U-N
DS1G03F36U-D



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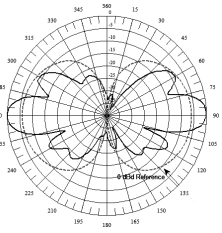

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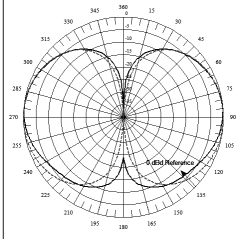

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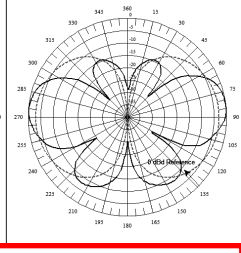

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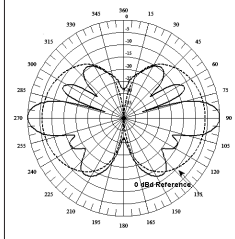

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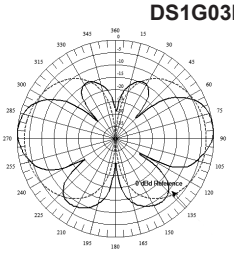

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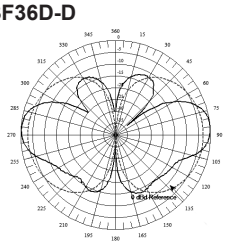

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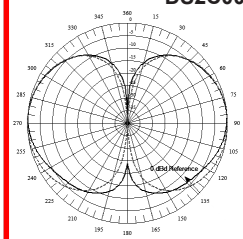

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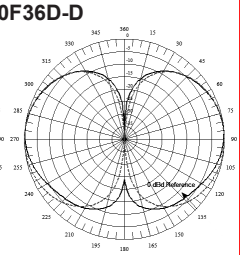

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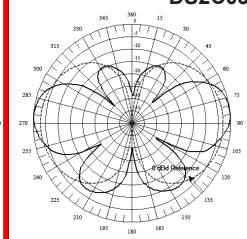

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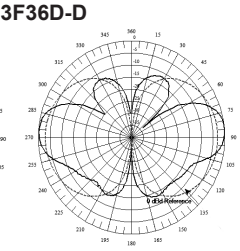

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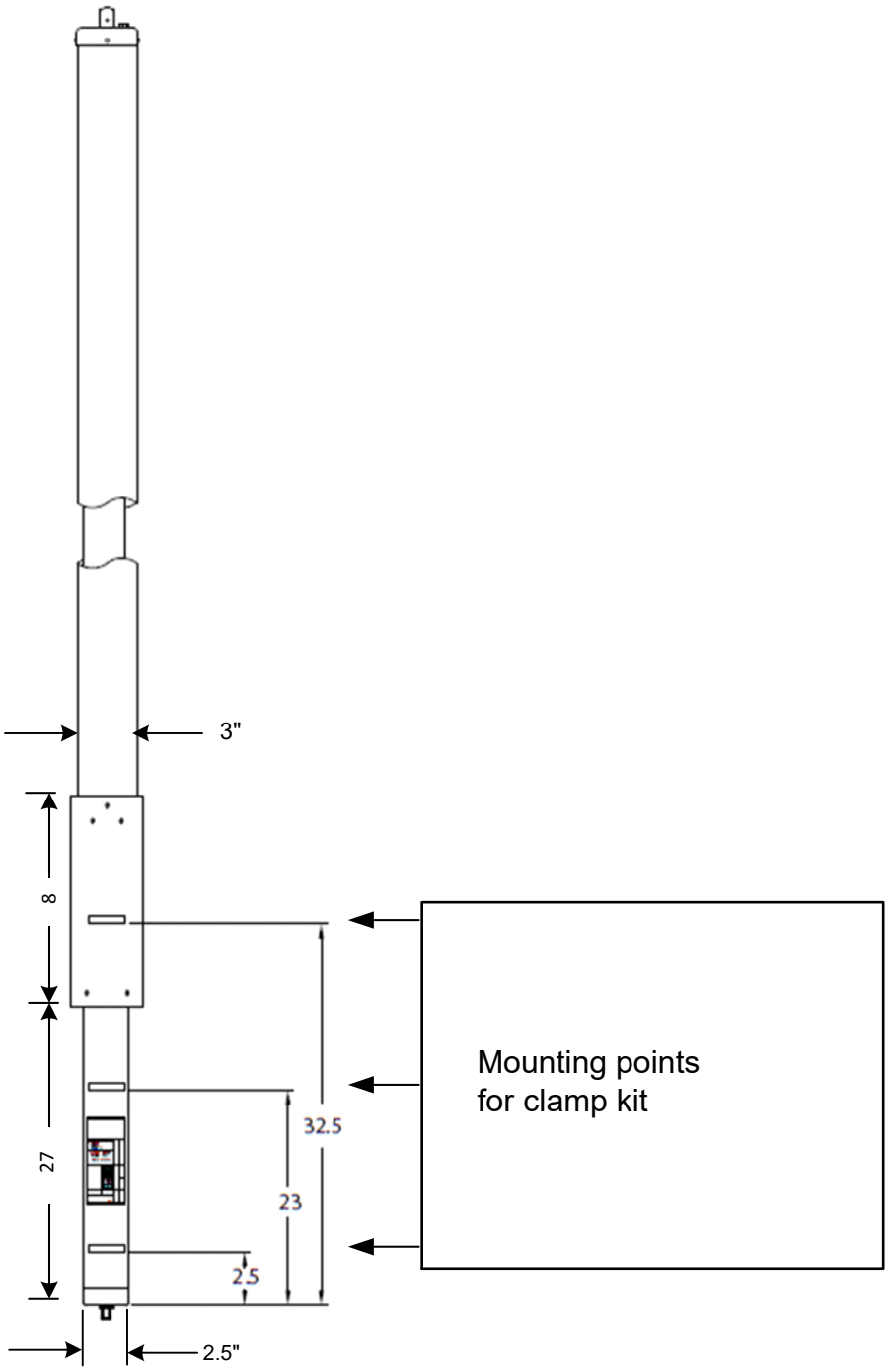

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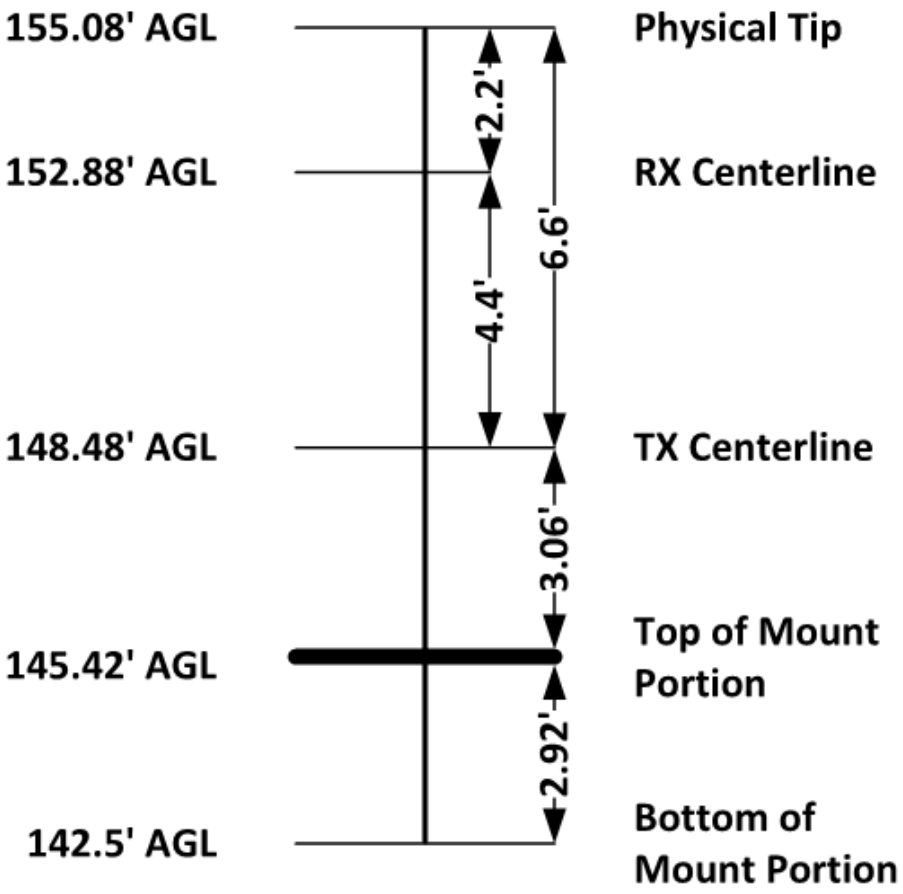
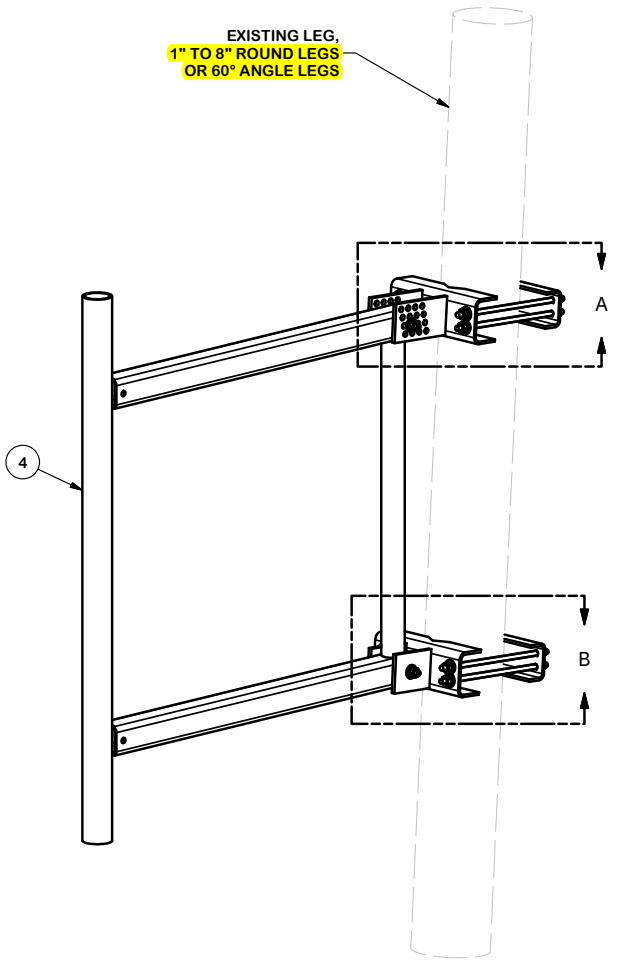
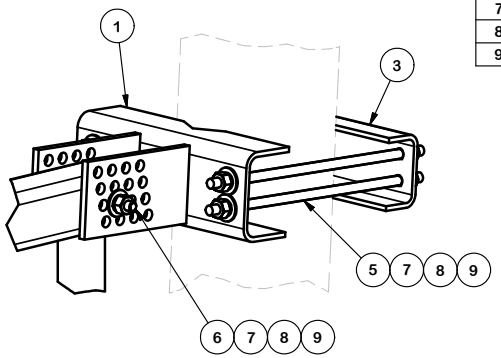


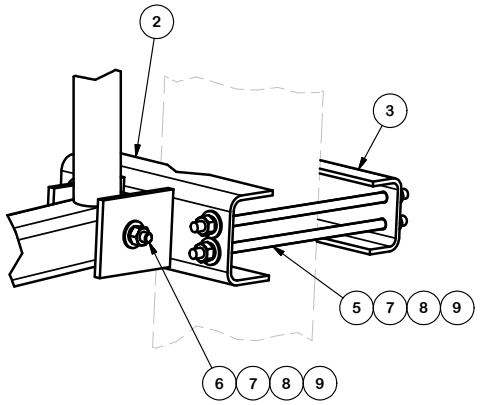
TOWER/MAST SIZE AT PROPOSED ANTENNA ATTACHMENT = 2.5" ± DIAMETER.

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	CFM	UPPER GATE FOOT WELDMENT		13.90	13.90
2	1	CFS	LOWER GATE FOOT WELDMENT		12.72	12.72
3	2	GBB	GATE BACKING BAR		4.53	9.06
4	1	4PBG	48" PIPE MOUNT STANDOFF ARM		113.96	113.96
5	8	G12R-12	1/2" x 12" GALV. THREADED ROD		0.67	5.35
5	8	G12R-15	1/2" x 15" GALV. THREADED ROD		0.84	6.69
6	2	A1205	1/2" x 5" A325 HDG BOLT		0.34	0.69
7	18	G12FW	1/2" HDG USS FLATWASHER		0.03	0.61
8	18	G12LW	1/2" HDG LOCKWASHER		0.01	0.25
9	18	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.29
					TOTAL WT. #	164.53





DETAIL A



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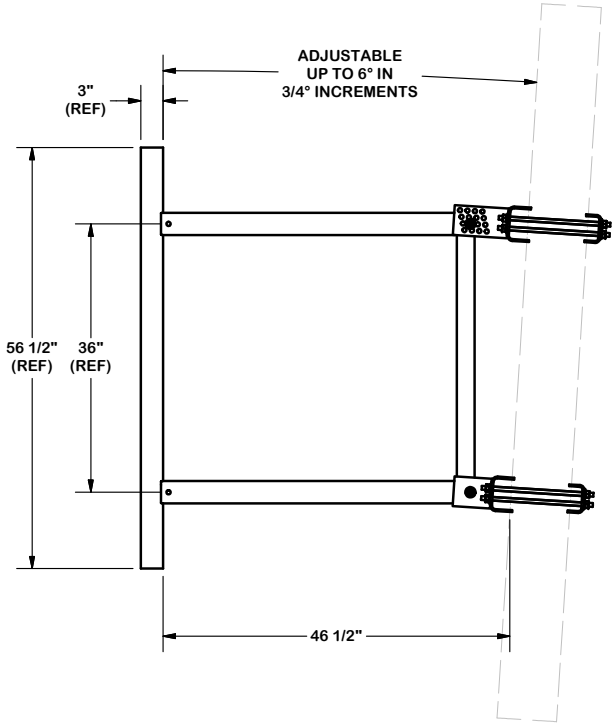

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION: 48" ULTIMATE UNIVERSAL STANDOFF FRAME

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	RCH 2/4/2011		USF-4U	1 OF 1

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	01	CUSTOMER	BMC 2/16/2011	USF-4U

ATTACHMENT D – STRUCTURAL ANALYSIS REPORT

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 280 ft Stainless Guyed Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT04877-A

Customer Site Name: Waterbury 2, CT

Carrier Name: Connecticut Light & Power (App#: 104046, v5)

Carrier Site ID / Name: ES-003 / LongHill

Site Location: 207 Garden Circle

Waterbury, Connecticut

New Haven County

Latitude: 41.569722

Longitude: -73.017499

3/4/2020

Analysis Result:

Max Structural Usage: 63.7% [Pass]

Max Foundation Usage: 24.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification: N/A

Report Prepared By: Cesar Rojas

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

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Longitude: -73.017499

Analysis Result:

Max Structural Usage: 63.7% [Pass]

Max Foundation Usage: 24.0% [Pass]

Additional Usage Caused by New Mount/Mount Modification: N/A

Report Prepared By: Cesar Rojas

Introduction

The purpose of this report is to summarize the analysis results on the 280 ft Stainless Guyed Tower 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	Stainless, Inc., Report #3329 dated May 2, 1987
Foundation Drawing	Stainless, Inc., Report #3329 dated March 16, 1987
Geotechnical Report	FDH Engineering, Inc., Project #12-09101EG1 dated October 23, 2012
Modification Drawings	Paul J. Ford and Co., Job # A00-T155 dated July 20, 2001 FDH Engineering, Project #11-02333E S1 dated March 30, 2011 FDH Engineering, Project #12-09101E S3 dated March 21, 2013

Analysis Criteria

The comprehensive analysis was performed in accordance with the requirements and stipulations of the TIA-222-H**.** In accordance with this standard, the structure was analyzed using **TESTowers,** 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:	117.0 mph (3-Sec. Gust) (Ultimate wind speed)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 1" radial ice concurrent
Service Load Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	S_S = 0.192, S_1 = 0.054

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

Existing Antennas, Mounts and Transmission Lines

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

Items	Antenna Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	285.0		-	(1) Empty 1.5' Standoff	-	-
2	284.0		-	(1) Empty 3.6' Pipe Mount	-	-
3	283.0		-	(1) Empty 5' Pipe Mount	-	-
4	280.0	-	-	8' Platform w/ Handrail	-	-
5	268.5	1	Dielectric DCRT4	Leg Mount	(1) 7/8"	Full Power Radio
6	257.0	2	Celwave TDE6082A	(1) 4.7' Standoff	(2) 7/8"	Campion Ambulance Service
7	182.0	3	Ericsson KRD9011461-B66A-B2A (Octa) - Panel	(3) T-Frames	(12) 1 5/8" (2) 1 5/8" Hybrid	T-Mobile
8		3	RFS APXVAARR24_43-U-NA20 (Octa) - Panel			
9		3	Ericsson AIR 3246 B66 (Octa) - Panel			
10		3	Ericsson KRY 112 144/2 – TMA			
11		3	Ericsson KRY 112 489/2 - TMA			
12		3	Ericsson Radio 4449 B71 + B12			
-	135.0	1	Andrew VHLP800-11-6GR - Dish	Pipe	(1) EW65	Connecticut Light & Power
-	130.0	1	RFS MA0528-28AN	Leg Mount	(1) EW65	
-	132	1	Telewave ANT150F2	(1) Standoff Mount	(1) 7/8"	
-	127.5	1	Telewave ANT150F2	(1) Commscope DB5004 @125'	(1) 7/8"	
-	98.0	1	RFS SP4-107BC1C1R - Dish	Pipe	(1) EW65	
-	97.5	1	Decibel DB586	(1) Commscope DB5004 @95'	(1) 7/8"	
-	96.0	1	RFS PAL8-65A - Dish	Leg Mount	(1) EW65	
-	95.0	1	Bird 422 series	(1) Commscope DB5004	(1) 1/2"	
-	93.0	1	RFS PAD6-107A - Dish	Pipe	(1) EW65	
-	92.5	1	Decibel DB586	(1) Standoff	(1) 7/8"	

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
13	150	1	dbSpectra DS2C00-F-36-D	(1)Commscope DB5004 @129.5' (1)SitePro USF-4U@143' (1) Commscope DB5004 @119.5'	(2) 7/8"	Connecticut Light & Power
14	132.0	1	Telewave ANT150F2 Omni		(1) 7/8"	
15	122.0	1	Telewave ANT150F2		(1) 7/8"	
16	98.0	1	RFS SP4-107BC1C1R	Leg mount	(1) EW65	
17	97.5	1	Decibel DB586		(1) 7/8"	
	96.0	1	RFS PAL8-65-A	Leg Mount	(1) EW65	
18	95.0	1	Bird 422 series	(1) Commscope DB5004@95'	(1) 1/2"	
19	92.5	1	Decibel DB586		(1) 7/8"	

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

Analysis Results

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

Tower Component	Legs	Diagonals	Horizontals	Guy Wires
Max. Usage:	**54.2%**	**63.7%**	**48.6%**	**52.5%**
Pass/Fail	**Pass**	**Pass**	**Pass**	**Pass**

Foundations

	Base Reactions		Inner Anchors	
Reactions (kips)	Axial	Shear	Uplift	Shear
Analysis Reactions	141.0	2.4	45.8	38.4

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.

Service Load 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)
98.0	SP4-107BC1C1R w/ Radome - Dish	Connecticut Light & Power	0.224	0.043
96.0	PAL8-65A w/ Radome - Dish		0.224	0.043

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-H 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 structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.

3. 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 ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

4. 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.

5. 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.

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

Structure: CT04877-A-SBA

Site Name:	Waterbury 2, CT			**Code:**	EIA/TIA-222-H	3/4/2020
Type:	Guyed	**Base Shape:**	Triangle	**Basic WS:**	117.00	
Height:	280.00 (ft)	**Base Width:**	0.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	4.00	**Operational WS:**	60.00	Page: 1

Tower Engineering Solutions

Section Properties

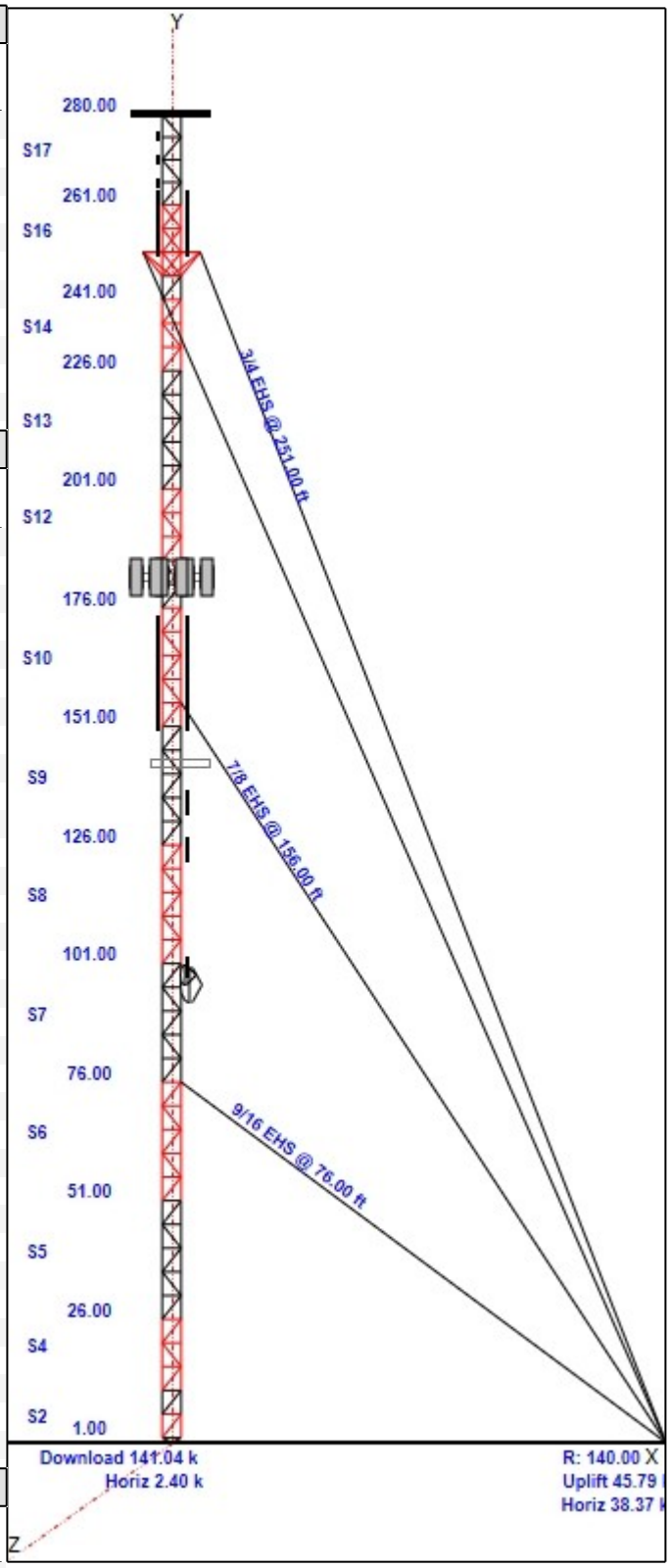
Sect	Leg Members	Diagonal Members	Horizontal Members
1	WBM W18 x 46		WBM W18 x 46
2	SOL 2 1/2" SOLID	PSP ROHN 1 1/2X11GA	PSP ROHN 1 1/2X11GA
3	SOL 2 1/2" SOLID	SAE 2X2X0.375	PSP ROHN 1 1/2X11GA
4-5	SOL 2 1/2" SOLID	PSP ROHN 1 1/2X11GA	PSP ROHN 1 1/2X11GA
6-7	SOL 2 1/2" SOLID	DAE 2X2X0.1875	PSP ROHN 1 1/2X11GA
8	SOL 2 1/2" SOLID	PSP ROHN 1 1/2X11GA	PSP ROHN 1 1/2X11GA
9-10	SOL 2 1/2" SOLID	DAE 2X2X0.1875	PSP ROHN 1 1/2X11GA
11	SOL 2 1/4" SOLID	SAE 2.5X2.5X0.1875	PSP ROHN 1 1/2X11GA
12-13	SOL 2 1/4" SOLID	PSP ROHN 1 1/2X11GA	PSP ROHN 1 1/2X11GA
14	SOL 2 1/4" SOLID	SAE 2.5X2.5X0.1875	PSP ROHN 1 1/2X11GA
15-17	SOL 2 1/4" SOLID	DAE 2X2X0.1875	PSP ROHN 1 1/2X11GA

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
280.00	280.00	1	Beacon
280.00	280.00	1	Lightning Rod
280.00	280.00	1	Platform w/ Hand Rails (flat)
280.00	284.00	1	3.6'x2.4" Pipe Mount
280.00	285.00	1	1.5' Standoff
280.00	283.00	1	5'x2.4" Pipe Mount
275.00	275.00	1	DCRT-4
270.00	270.00	1	DCRT-4
265.00	265.00	1	DCRT-4
260.00	260.00	1	DCRT-4
250.00	253.00	1	4.7' Standoff
250.00	257.00	2	Celwave TDE6082A
182.00	182.00	3	Light Sector Frame-Flat
182.00	182.00	3	KRD 9011461-B66A-B2A (Octa)
182.00	182.00	3	APXVAARR24_43-U-NA20 (Octa)
182.00	182.00	3	AIR 3246 B66 (Octa)
182.00	182.00	3	KRY 112 144/2
182.00	182.00	3	KRY 112 489/2
182.00	182.00	3	Radio 4449 B71 + B12
150.00	162.15	1	DS2C00-F-36-D
143.00	143.00	1	USF-4U
132.00	134.50	1	ANT150F2
129.50	129.50	1	DB5004 Side Arm
125.00	126.00	1	2' Standoff (Commscope S-200)
122.00	124.50	1	ANT150F2
119.50	119.50	1	DB5004 Side Arm
98.00	98.00	1	SP4-107BC1C1R w/ Radome
97.50	100.00	1	DB586-Y
96.00	96.00	1	PAL8-65A w/ Radome
95.00	95.00	1	DB5004 Side Arm
95.00	95.00	1	Bird 422 Series
92.50	95.00	1	DB586-Y
90.00	90.00	1	4' Pipe Mount

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	280.00	1	Climbing Ladder
0.00	280.00	1	Safety Cable



Structure: CT04877-A-SBA

Site Name:	Waterbury 2, CT			**Code:**	EIA/TIA-222-H	3/4/2020
Type:	Guyed	**Base Shape:**	Triangle	**Basic WS:**	117.00	
Height:	280.00 (ft)	**Base Width:**	0.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	4.00	**Operational WS:**	60.00	Page: 2

Tower Engineering Solutions

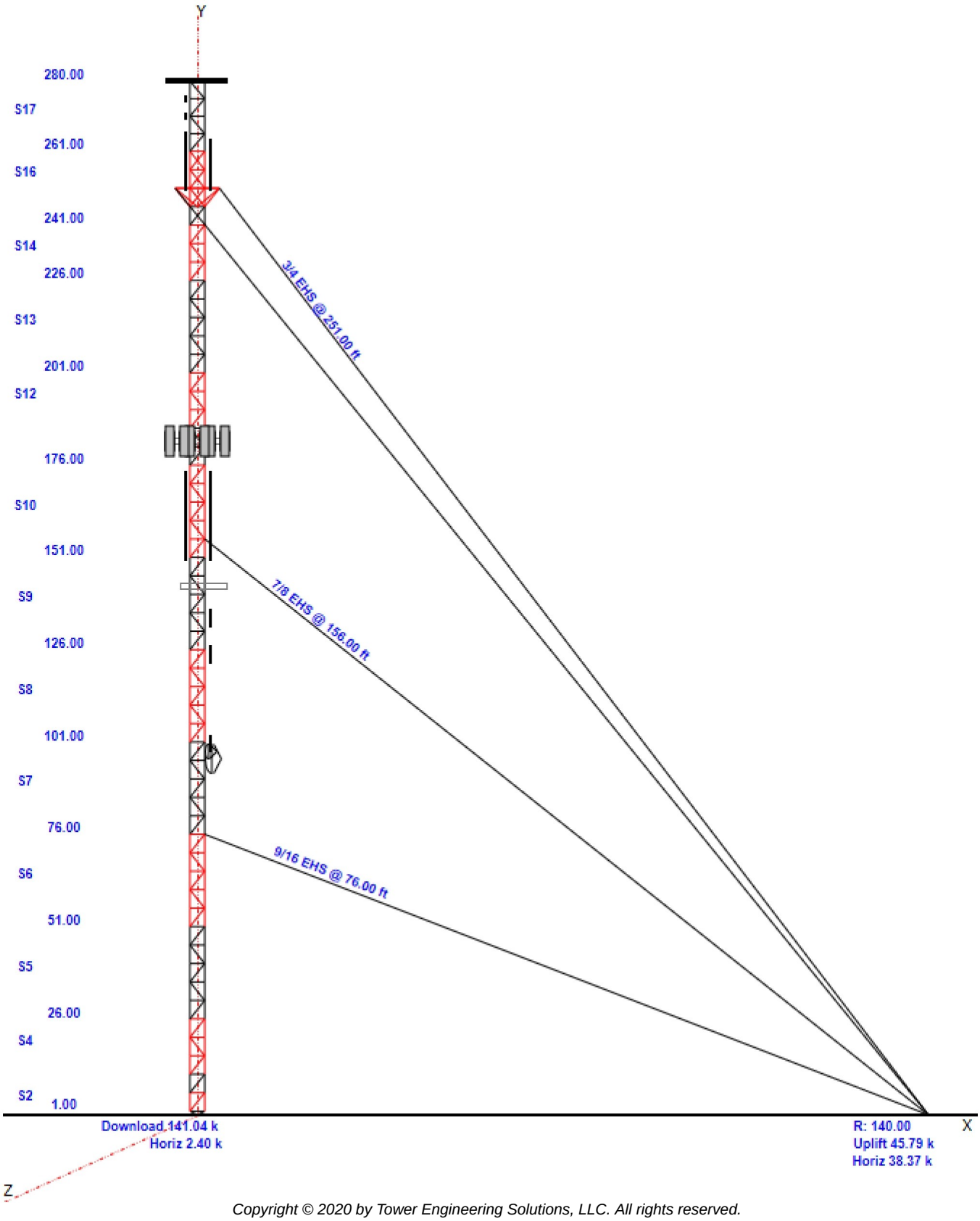
0.00	280.00	1	W/G Ladder
0.00	280.00	1	W/G Ladder
0.00	268.50	1	7/8" Coax
0.00	250.00	2	7/8" Coax
0.00	182.00	12	1 5/8" Coax
0.00	182.00	2	1 5/8" Hybrid
0.00	140.30	2	7/8" Coax
0.00	125.00	1	7/8" Coax
0.00	101.60	1	7/8" Coax
0.00	101.00	1	W/G Ladder
0.00	98.00	1	EW65
0.00	97.50	1	7/8" Coax
0.00	96.00	1	EW65
0.00	95.00	1	1/2" Coax
0.00	92.50	1	7/8" Coax

Max Guy Wire

52.46% @ 76 ft - 9/16 EHS

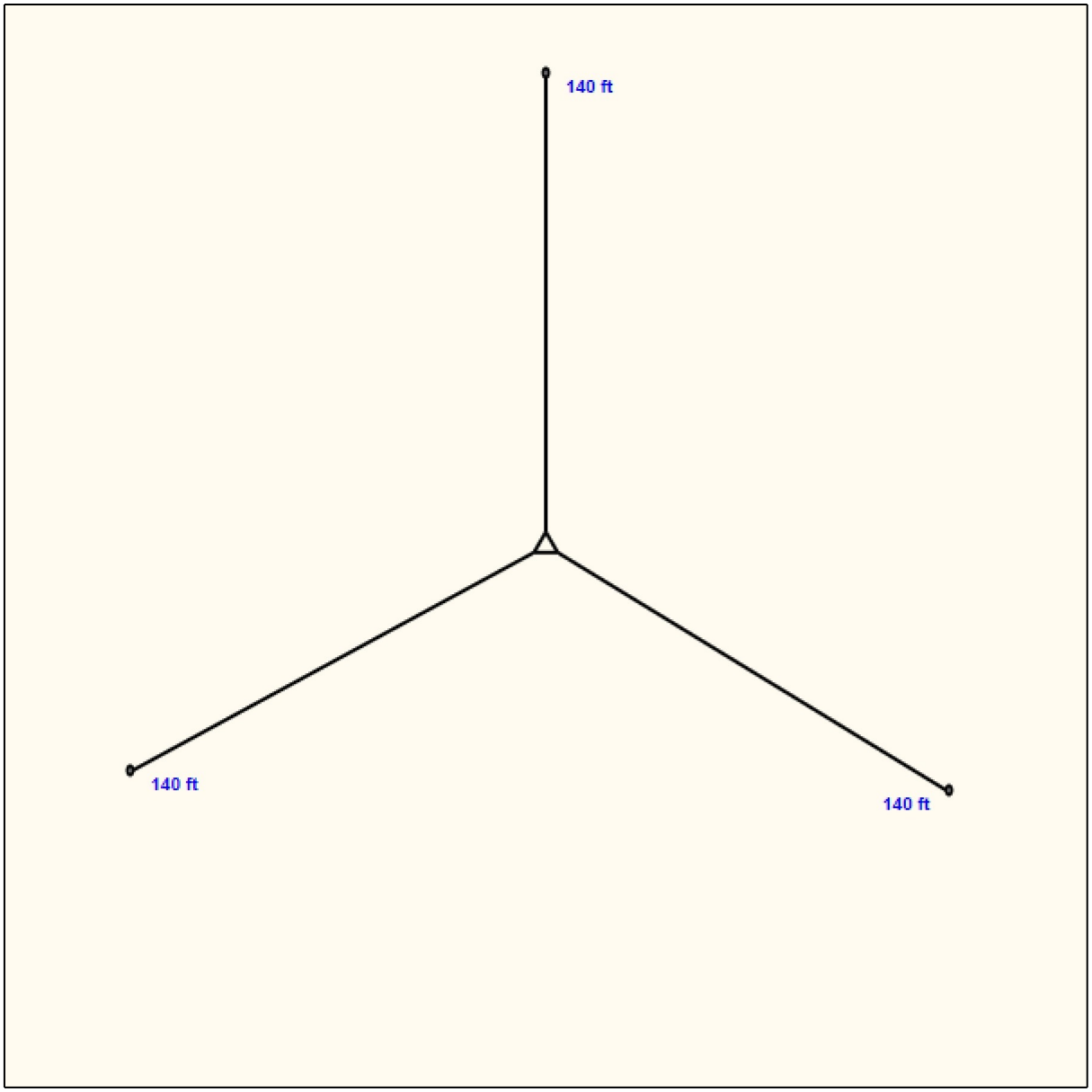
Structure: CT04877-A-SBA

Site Name:	Waterbury 2, CT			**Code:**	EIA/TIA-222-H	3/4/2020
Type:	Guyed	**Base Shape:**	Triangle	**Basic WS:**	117.00	
Height:	280.00 (ft)	**Base Width:**	0.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	4.00	**Operational WS:**	60.00	Page: 3



Anchor Drops with Guy Radius - Structure: CT04877-A-SBA

Site Name:	Waterbury 2, CT			**Code:**	EIA_H	3/4/2020
Type:	Guyed	**Base Shape:**	Triangle	**Basic WS:**	117.00	
Height:	280.00 (ft)	**Base Width:**	0.00	**Basic Ice WS:**	50.00	
Base Elev:	0.00 (ft)	**Top Width:**	4.00	**Operational WS:**	60.00	Page: 4

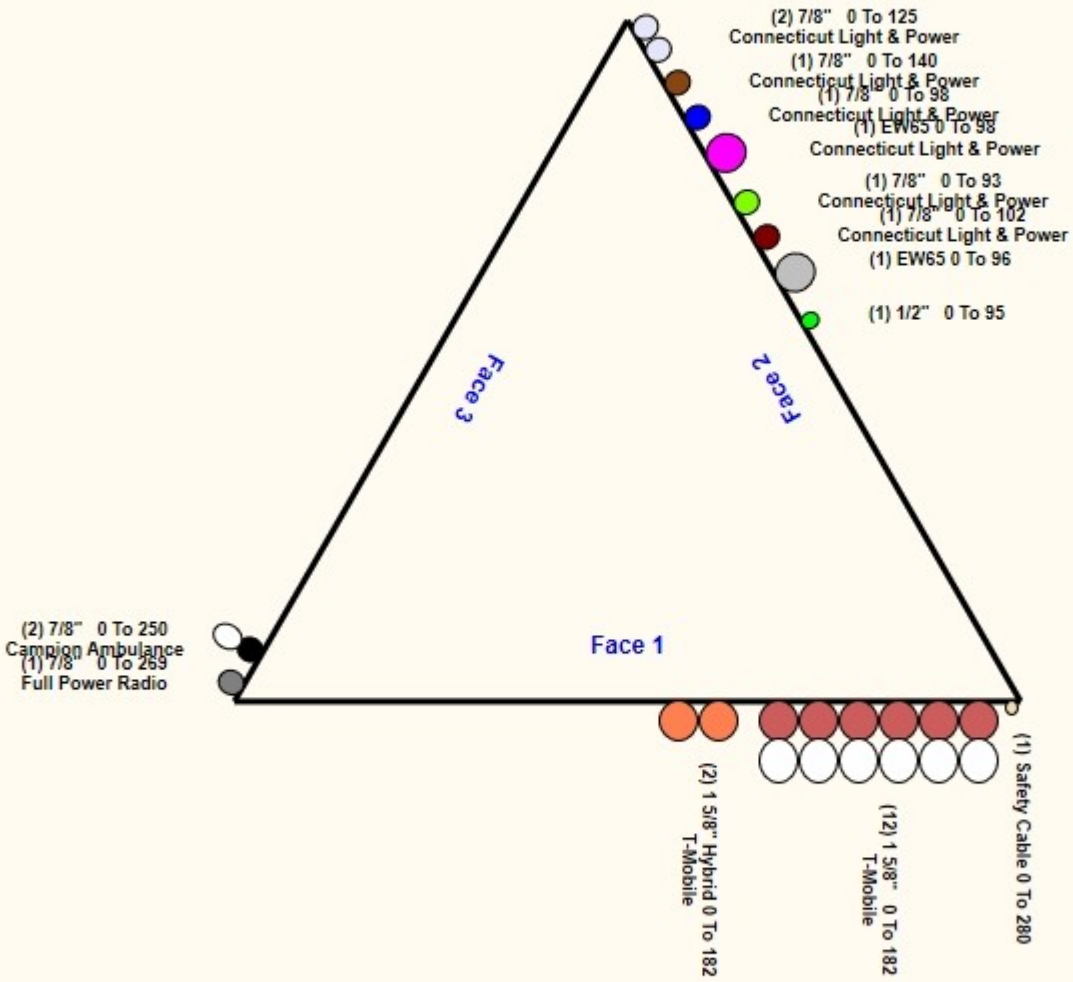


Structure: CT04877-A-SBA - Coax Line Placement

Type: Guyed
Site Name: Waterbury 2, CT
Height: 280.00 (ft)

3/4/2020

Tower Engineering Solutions



Loading Summary

Structure:	CT04877-A-SBA		**Code:**	EIA/TIA-222-H	3/4/2020
Site Name:	Waterbury 2, CT		**Exposure:**	B	
Height:	280.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 6

Tower Engineering Solutions

Discrete Appurtenances Properties

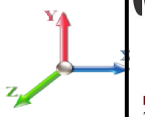
Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice CaAa (sf)	Ice Weight (lb)	Ice CaAa (sf)	Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
280.00	Beacon	1	36.00	2.720	130.19	3.391	28.000	17.500	17.500	1.00	1.00	0.000
280.00	Lightning Rod	1	5.00	0.500	19.81	1.734	72.000	1.000	1.000	1.00	1.00	0.000
280.00	Platform w/ Hand Rails (flat)	1	1210.0	34.800	2105.99	47.684	0.000	0.000	0.000	1.00	1.00	0.000
280.00	3.6'x2.4" Pipe Mount	1	60.00	0.650	89.62	0.971	43.200	2.400	2.400	1.00	1.00	4.000
280.00	1.5' Standoff	1	60.00	2.960	89.62	4.421	18.000	2.400	2.400	1.00	1.00	5.000
280.00	5'x2.4" Pipe Mount	1	60.00	1.210	89.62	1.807	43.200	2.400	2.400	1.00	1.00	3.000
275.00	DCRT-4	1	44.00	4.100	240.27	6.928	27.500	27.500	13.300	1.00	1.00	0.000
270.00	DCRT-4	1	44.00	4.100	240.27	6.928	27.500	27.500	13.300	1.00	1.00	0.000
265.00	DCRT-4	1	44.00	4.100	240.27	6.928	27.500	27.500	13.300	1.00	1.00	0.000
260.00	DCRT-4	1	44.00	4.100	239.00	6.909	27.500	27.500	13.300	1.00	1.00	0.000
250.00	4.7' Standoff	1	70.00	2.970	104.33	4.427	48.000	2.400	2.400	1.00	1.00	3.000
250.00	Celwave TDE6082A	2	40.00	4.200	114.39	7.714	168.000	3.000	3.000	1.00	1.00	7.000
182.00	Light Sector Frame-Flat	3	500.00	17.500	974.22	26.961	0.000	0.000	0.000	0.75	0.75	0.000
182.00	KRD 9011461-B66A-B2A (Octa)	3	132.20	6.510	249.45	7.255	56.600	12.900	8.700	0.80	0.87	0.000
182.00	APXVAARR24_43-U-NA20 (Octa)	3	128.00	20.240	400.42	21.515	95.900	24.000	7.800	0.80	0.70	0.000
182.00	AIR 3246 B66 (Octa)	3	180.00	7.940	316.92	8.742	58.100	15.700	9.400	0.80	0.83	0.000
182.00	KRY 112 144/2	3	11.00	0.410	18.32	0.733	6.900	6.100	2.700	0.80	0.50	0.000
182.00	KRY 112 489/2	3	11.30	0.690	23.12	1.109	10.500	6.800	3.500	0.80	0.50	0.000
182.00	Radio 4449 B71 + B12	3	70.00	1.650	112.63	2.002	15.000	13.200	9.300	0.80	0.67	0.000
150.00	DS2C00-F-36-D	1	71.00	7.290	191.86	12.978	291.600	3.000	0.000	1.00	1.00	12.15
143.00	USF-4U	1	80.00	2.500	131.71	4.578	0.000	0.000	0.000	1.00	1.00	0.000
132.00	ANT150F2	1	12.00	1.290	35.74	1.990	60.000	2.800	2.800	1.00	1.00	2.500
129.50	DB5004 Side Arm	1	60.00	1.320	87.70	1.929	48.000	3.000	3.000	1.00	1.00	0.000
125.00	2' Standoff (Commscope S-200)	1	110.00	2.960	159.79	4.300	18.000	2.400	2.400	1.00	1.00	1.000
122.00	ANT150F2	1	12.00	1.290	35.27	1.976	60.000	2.800	2.800	1.00	1.00	2.500
119.50	DB5004 Side Arm	1	60.00	1.320	87.16	1.917	48.000	3.000	3.000	1.00	1.00	0.000
98.00	SP4-107BC1C1R w/ Radome	1	83.00	11.630	299.56	12.667	49.700	49.700	9.800	1.00	1.00	0.000
97.50	DB586-Y	1	8.30	1.010	11.96	1.456	59.000	0.000	1.500	1.00	1.00	2.500
96.00	PAL8-65A w/ Radome	1	380.00	43.390	1172.83	45.401	96.000	96.000	0.000	1.00	1.00	0.000
95.00	DB5004 Side Arm	1	60.00	1.320	86.49	1.903	48.000	3.000	3.000	1.00	1.00	0.000
95.00	Bird 422 Series	1	50.00	3.450	100.61	5.212	18.000	6.000	6.000	1.00	1.00	0.000
92.50	DB586-Y	1	8.30	1.010	11.96	1.456	59.000	0.000	1.500	1.00	1.00	2.500
90.00	4' Pipe Mount	1	60.00	1.320	86.49	1.903	48.000	3.000	3.000	1.00	1.00	0.000
	Totals:	**48**	**5,909.10**		**12,602.10**						**Number of Appurtenances :**	**33**

Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	280.00	Climbing Ladder	1	3.00	6.90	100.00	1	Individual NR		N	1.00	1.00	
0.00	280.00	Safety Cable	1	0.38	0.27	100.00	1	Individual NR		N	1.00	1.00	
0.00	280.00	W/G Ladder	1	2.00	6.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	280.00	W/G Ladder	1	2.00	6.00	100.00	3	Individual NR		N	1.00	1.00	
0.00	268.50	7/8" Coax	1	1.11	0.52	100.00	3	Individual NR		N	1.00	1.00	
0.00	250.00	7/8" Coax	2	1.11	0.52	50.00	3	Block		N	1.00	1.00	
0.00	182.00	1 5/8" Coax	12	1.98	1.04	50.00	1	Block		N	0.50	1.00	
0.00	182.00	1 5/8" Hybrid	2	2.00	1.10	100.00	1	Individual NR		N	1.00	1.00	
0.00	140.30	7/8" Coax	2	1.11	0.52	100.00	2	Individual NR		N	1.00	1.00	
0.00	125.00	7/8" Coax	1	1.11	0.52	100.00	2	Individual NR		N	1.00	1.00	
0.00	101.60	7/8" Coax	1	1.11	0.52	100.00	2	Individual NR		N	1.00	1.00	
0.00	101.00	W/G Ladder	1	3.00	6.00	100.00	2	Individual NR		N	1.00	1.00	
0.00	98.00	EW65	1	2.00	0.50	100.00	2	Individual NR		N	1.00	1.00	
0.00	97.50	7/8" Coax	1	1.11	0.52	100.00	2	Individual NR		N	1.00	1.00	
0.00	96.00	EW65	1	2.00	0.50	100.00	2	Individual NR		N	1.00	1.00	
0.00	95.00	1/2" Coax	1	0.65	0.16	100.00	2	Individual NR		N	1.00	1.00	
0.00	92.50	7/8" Coax	1	1.11	0.52	100.00	2	Individual NR		N	1.00	1.00	

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 8	



Tower Engineering Solutions

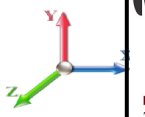
Load Case: 1.2D + 1.0W Normal Wind — 1.2D + 1.0W 117 mph Wind at Normal To Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	20.65	12.800	0.00	0.00	1.00	2.10	1.00	1.00	0.00	12.80	3.52	0.00	1,134.0	0.0	471.77	0.00	92.14
2	3.5	20.65	0.000	3.31	0.00	0.16	2.74	1.00	1.00	0.00	1.92	17.62	0.00	641.1	0.0	92.62	267.61	360.23
3	8.5	20.65	1.032	2.56	0.00	0.17	2.70	1.00	1.00	0.00	2.50	17.62	0.00	708.6	0.0	118.57	267.61	386.18
4	18.5	20.65	0.000	9.99	0.00	0.16	2.74	1.00	1.00	0.00	5.77	52.86	0.00	1,923.3	0.0	277.60	802.82	1,080.42
5	38.5	22.19	0.000	16.66	0.00	0.16	2.74	1.00	1.00	0.00	9.62	88.09	0.00	3,205.5	0.0	497.27	1438.09	1,935.36
6	63.5	25.60	5.829	12.31	0.00	0.17	2.69	1.00	1.00	0.00	12.91	88.09	0.00	3,608.7	0.0	755.90	1659.11	2,415.01
7	88.5	28.15	5.162	12.79	0.00	0.17	2.70	1.00	1.00	0.00	12.52	85.33	0.00	3,550.5	0.0	808.27	1776.48	2,584.75
8	113.5	30.22	0.000	16.66	0.00	0.16	2.74	1.00	1.00	0.00	9.62	65.18	0.00	2,943.7	0.0	677.24	1457.68	2,134.93
9	138.5	31.99	5.162	12.79	0.00	0.17	2.70	1.00	1.00	0.00	12.52	60.93	0.00	3,273.4	0.0	918.61	1459.68	2,378.29
10	163.5	33.55	5.829	12.31	0.00	0.17	2.69	1.00	1.00	0.00	12.91	58.28	0.00	3,300.3	0.0	990.42	1476.24	2,466.66
11	181.0	34.54	2.588	4.70	0.00	0.17	2.68	1.00	1.00	0.00	5.30	17.19	0.00	1,034.1	0.0	417.48	453.08	870.57
12	193.5	35.20	0.000	9.39	0.00	0.15	2.77	1.00	1.00	0.00	5.41	11.99	0.00	1,302.7	0.0	448.63	337.66	786.30
13	213.5	36.20	0.000	15.64	0.00	0.15	2.77	1.00	1.00	0.00	9.01	19.99	0.00	2,171.1	0.0	769.03	578.81	1,347.84
14	233.5	37.14	3.885	7.05	0.00	0.17	2.68	1.00	1.00	0.00	7.95	11.99	0.00	1,392.6	0.0	673.73	356.29	1,030.01
15	243.5	37.59	1.036	2.35	0.00	0.16	2.73	1.00	1.00	0.00	2.39	4.00	0.00	505.9	0.0	208.10	120.19	328.29
16	253.5	38.02	6.216	7.05	0.00	0.21	2.56	1.00	1.00	0.00	10.32	10.98	0.00	1,841.5	0.0	853.79	335.15	1,188.94
17	270.5	38.74	4.015	9.03	0.00	0.16	2.72	1.00	1.00	0.00	9.21	12.37	0.00	1,905.6	0.0	824.89	393.37	1,218.25
														34,442.7	**0.0**			**22,604.17**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 9	



Tower Engineering Solutions

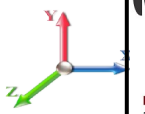
Load Case: 1.2D + 1.0W 60° Wind — 1.2D + 1.0W 117 mph Wind at 60° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	20.65	12.800	0.00	0.00	1.00	2.10	0.80	1.00	0.00	10.24	3.52	0.00	1,134.0	0.0	377.41	0.00	377.41
2	3.5	20.65	0.000	3.31	0.00	0.16	2.74	0.80	1.00	0.00	1.92	17.62	0.00	641.1	0.0	92.62	267.61	360.23
3	8.5	20.65	1.032	2.56	0.00	0.17	2.70	0.80	1.00	0.00	2.30	17.62	0.00	708.6	0.0	108.80	267.61	376.40
4	18.5	20.65	0.000	9.99	0.00	0.16	2.74	0.80	1.00	0.00	5.77	52.86	0.00	1,923.3	0.0	277.60	802.82	1,080.42
5	38.5	22.19	0.000	16.66	0.00	0.16	2.74	0.80	1.00	0.00	9.62	88.09	0.00	3,205.5	0.0	497.27	1438.09	1,935.36
6	63.5	25.60	5.829	12.31	0.00	0.17	2.69	0.80	1.00	0.00	11.74	88.09	0.00	3,608.7	0.0	687.63	1659.11	2,346.74
7	88.5	28.15	5.162	12.79	0.00	0.17	2.70	0.80	1.00	0.00	11.49	85.33	0.00	3,550.5	0.0	741.64	1776.48	2,518.12
8	113.5	30.22	0.000	16.66	0.00	0.16	2.74	0.80	1.00	0.00	9.62	65.18	0.00	2,943.7	0.0	677.24	1457.68	2,134.93
9	138.5	31.99	5.162	12.79	0.00	0.17	2.70	0.80	1.00	0.00	11.49	60.93	0.00	3,273.4	0.0	842.88	1459.68	2,302.56
10	163.5	33.55	5.829	12.31	0.00	0.17	2.69	0.80	1.00	0.00	11.74	58.28	0.00	3,300.3	0.0	900.97	1476.24	2,377.22
11	181.0	34.54	2.588	4.70	0.00	0.17	2.68	0.80	1.00	0.00	4.78	17.19	0.00	1,034.1	0.0	376.69	453.08	829.78
12	193.5	35.20	0.000	9.39	0.00	0.15	2.77	0.80	1.00	0.00	5.41	11.99	0.00	1,302.7	0.0	448.63	337.66	786.30
13	213.5	36.20	0.000	15.64	0.00	0.15	2.77	0.80	1.00	0.00	9.01	19.99	0.00	2,171.1	0.0	769.03	578.81	1,347.84
14	233.5	37.14	3.885	7.05	0.00	0.17	2.68	0.80	1.00	0.00	7.17	11.99	0.00	1,392.6	0.0	607.87	356.29	964.16
15	243.5	37.59	1.036	2.35	0.00	0.16	2.73	0.80	1.00	0.00	2.18	4.00	0.00	505.9	0.0	190.04	120.19	310.23
16	253.5	38.02	6.216	7.05	0.00	0.21	2.56	0.80	1.00	0.00	9.08	10.98	0.00	1,841.5	0.0	750.98	335.15	1,086.13
17	270.5	38.74	4.015	9.03	0.00	0.16	2.72	0.80	1.00	0.00	8.41	12.37	0.00	1,905.6	0.0	752.95	393.37	1,146.32
														34,442.7	**0.0**			**22,280.15**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 10	



Tower Engineering Solutions

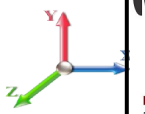
Load Case: 1.2D + 1.0W 90° Wind — 1.2D + 1.0W 117 mph Wind at 90° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	20.65	12.800	0.00	0.00	1.00	2.10	0.85	1.00	0.00	10.88	3.52	0.00	1,134.0	0.0	401.00	0.00	401.00
2	3.5	20.65	0.000	3.31	0.00	0.16	2.74	0.85	1.00	0.00	1.92	17.62	0.00	641.1	0.0	92.62	267.61	360.23
3	8.5	20.65	1.032	2.56	0.00	0.17	2.70	0.85	1.00	0.00	2.35	17.62	0.00	708.6	0.0	111.24	267.61	378.85
4	18.5	20.65	0.000	9.99	0.00	0.16	2.74	0.85	1.00	0.00	5.77	52.86	0.00	1,923.3	0.0	277.60	802.82	1,080.42
5	38.5	22.19	0.000	16.66	0.00	0.16	2.74	0.85	1.00	0.00	9.62	88.09	0.00	3,205.5	0.0	497.27	1438.09	1,935.36
6	63.5	25.60	5.829	12.31	0.00	0.17	2.69	0.85	1.00	0.00	12.03	88.09	0.00	3,608.7	0.0	704.70	1659.11	2,363.81
7	88.5	28.15	5.162	12.79	0.00	0.17	2.70	0.85	1.00	0.00	11.75	85.33	0.00	3,550.5	0.0	758.30	1776.48	2,534.78
8	113.5	30.22	0.000	16.66	0.00	0.16	2.74	0.85	1.00	0.00	9.62	65.18	0.00	2,943.7	0.0	677.24	1457.68	2,134.93
9	138.5	31.99	5.162	12.79	0.00	0.17	2.70	0.85	1.00	0.00	11.75	60.93	0.00	3,273.4	0.0	861.81	1459.68	2,321.49
10	163.5	33.55	5.829	12.31	0.00	0.17	2.69	0.85	1.00	0.00	12.03	58.28	0.00	3,300.3	0.0	923.33	1476.24	2,399.58
11	181.0	34.54	2.588	4.70	0.00	0.17	2.68	0.85	1.00	0.00	4.91	17.19	0.00	1,034.1	0.0	386.89	453.08	839.98
12	193.5	35.20	0.000	9.39	0.00	0.15	2.77	0.85	1.00	0.00	5.41	11.99	0.00	1,302.7	0.0	448.63	337.66	786.30
13	213.5	36.20	0.000	15.64	0.00	0.15	2.77	0.85	1.00	0.00	9.01	19.99	0.00	2,171.1	0.0	769.03	578.81	1,347.84
14	233.5	37.14	3.885	7.05	0.00	0.17	2.68	0.85	1.00	0.00	7.37	11.99	0.00	1,392.6	0.0	624.34	356.29	980.62
15	243.5	37.59	1.036	2.35	0.00	0.16	2.73	0.85	1.00	0.00	2.23	4.00	0.00	505.9	0.0	194.55	120.19	314.75
16	253.5	38.02	6.216	7.05	0.00	0.21	2.56	0.85	1.00	0.00	9.39	10.98	0.00	1,841.5	0.0	776.68	335.15	1,111.83
17	270.5	38.74	4.015	9.03	0.00	0.16	2.72	0.85	1.00	0.00	8.61	12.37	0.00	1,905.6	0.0	770.94	393.37	1,164.30
														34,442.7	**0.0**			**22,456.06**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 11	



Tower Engineering Solutions

Load Case: 0.9D + 1.0W Normal Wind — 0.9D + 1.0W 117 mph Wind at Normal To Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	20.65	12.800	0.00	0.00	1.00	2.10	1.00	1.00	0.00	12.80	3.52	0.00	850.5	0.0	471.77	0.00	471.77
2	3.5	20.65	0.000	3.31	0.00	0.16	2.74	1.00	1.00	0.00	1.92	17.62	0.00	480.8	0.0	92.62	267.61	360.23
3	8.5	20.65	1.032	2.56	0.00	0.17	2.70	1.00	1.00	0.00	2.50	17.62	0.00	531.5	0.0	118.57	267.61	386.18
4	18.5	20.65	0.000	9.99	0.00	0.16	2.74	1.00	1.00	0.00	5.77	52.86	0.00	1,442.5	0.0	277.60	802.82	1,080.42
5	38.5	22.19	0.000	16.66	0.00	0.16	2.74	1.00	1.00	0.00	9.62	88.09	0.00	2,404.1	0.0	497.27	1438.09	1,935.36
6	63.5	25.60	5.829	12.31	0.00	0.17	2.69	1.00	1.00	0.00	12.91	88.09	0.00	2,706.6	0.0	755.90	1659.11	2,415.01
7	88.5	28.15	5.162	12.79	0.00	0.17	2.70	1.00	1.00	0.00	12.52	85.33	0.00	2,662.9	0.0	808.27	1776.48	2,584.75
8	113.5	30.22	0.000	16.66	0.00	0.16	2.74	1.00	1.00	0.00	9.62	65.18	0.00	2,207.7	0.0	677.24	1457.68	2,134.93
9	138.5	31.99	5.162	12.79	0.00	0.17	2.70	1.00	1.00	0.00	12.52	60.93	0.00	2,455.0	0.0	918.61	1459.68	2,378.29
10	163.5	33.55	5.829	12.31	0.00	0.17	2.69	1.00	1.00	0.00	12.91	58.28	0.00	2,475.3	0.0	990.42	1476.24	2,466.66
11	181.0	34.54	2.588	4.70	0.00	0.17	2.68	1.00	1.00	0.00	5.30	17.19	0.00	775.6	0.0	417.48	453.08	870.57
12	193.5	35.20	0.000	9.39	0.00	0.15	2.77	1.00	1.00	0.00	5.41	11.99	0.00	977.0	0.0	448.63	337.66	786.30
13	213.5	36.20	0.000	15.64	0.00	0.15	2.77	1.00	1.00	0.00	9.01	19.99	0.00	1,628.4	0.0	769.03	578.81	1,347.84
14	233.5	37.14	3.885	7.05	0.00	0.17	2.68	1.00	1.00	0.00	7.95	11.99	0.00	1,044.4	0.0	673.73	356.29	1,030.01
15	243.5	37.59	1.036	2.35	0.00	0.16	2.73	1.00	1.00	0.00	2.39	4.00	0.00	379.4	0.0	208.10	120.19	328.29
16	253.5	38.02	6.216	7.05	0.00	0.21	2.56	1.00	1.00	0.00	10.32	10.98	0.00	1,381.1	0.0	853.79	335.15	1,188.94
17	270.5	38.74	4.015	9.03	0.00	0.16	2.72	1.00	1.00	0.00	9.21	12.37	0.00	1,429.2	0.0	824.89	393.37	1,218.25
														25,832.0	**0.0**			**22,983.79**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

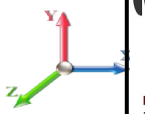
Load Case: 0.9D + 1.0W 60° Wind — 0.9D + 1.0W 117 mph Wind at 60° From Face

Wind Load Factor: 1.00
Dead Load Factor: 0.90
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	20.65	12.800	0.00	0.00	1.00	2.10	0.80	1.00	0.00	10.24	3.52	0.00	850.5	0.0	377.41	0.00	377.41
2	3.5	20.65	0.000	3.31	0.00	0.16	2.74	0.80	1.00	0.00	1.92	17.62	0.00	480.8	0.0	92.62	267.61	360.23
3	8.5	20.65	1.032	2.56	0.00	0.17	2.70	0.80	1.00	0.00	2.30	17.62	0.00	531.5	0.0	108.80	267.61	376.40
4	18.5	20.65	0.000	9.99	0.00	0.16	2.74	0.80	1.00	0.00	5.77	52.86	0.00	1,442.5	0.0	277.60	802.82	1,080.42
5	38.5	22.19	0.000	16.66	0.00	0.16	2.74	0.80	1.00	0.00	9.62	88.09	0.00	2,404.1	0.0	497.27	1438.09	1,935.36
6	63.5	25.60	5.829	12.31	0.00	0.17	2.69	0.80	1.00	0.00	11.74	88.09	0.00	2,706.6	0.0	687.63	1659.11	2,346.74
7	88.5	28.15	5.162	12.79	0.00	0.17	2.70	0.80	1.00	0.00	11.49	85.33	0.00	2,662.9	0.0	741.64	1776.48	2,518.12
8	113.5	30.22	0.000	16.66	0.00	0.16	2.74	0.80	1.00	0.00	9.62	65.18	0.00	2,207.7	0.0	677.24	1457.68	2,134.93
9	138.5	31.99	5.162	12.79	0.00	0.17	2.70	0.80	1.00	0.00	11.49	60.93	0.00	2,455.0	0.0	842.88	1459.68	2,302.56
10	163.5	33.55	5.829	12.31	0.00	0.17	2.69	0.80	1.00	0.00	11.74	58.28	0.00	2,475.3	0.0	900.97	1476.24	2,377.22
11	181.0	34.54	2.588	4.70	0.00	0.17	2.68	0.80	1.00	0.00	4.78	17.19	0.00	775.6	0.0	376.69	453.08	829.78
12	193.5	35.20	0.000	9.39	0.00	0.15	2.77	0.80	1.00	0.00	5.41	11.99	0.00	977.0	0.0	448.63	337.66	786.30
13	213.5	36.20	0.000	15.64	0.00	0.15	2.77	0.80	1.00	0.00	9.01	19.99	0.00	1,628.4	0.0	769.03	578.81	1,347.84
14	233.5	37.14	3.885	7.05	0.00	0.17	2.68	0.80	1.00	0.00	7.17	11.99	0.00	1,044.4	0.0	607.87	356.29	964.16
15	243.5	37.59	1.036	2.35	0.00	0.16	2.73	0.80	1.00	0.00	2.18	4.00	0.00	379.4	0.0	190.04	120.19	310.23
16	253.5	38.02	6.216	7.05	0.00	0.21	2.56	0.80	1.00	0.00	9.08	10.98	0.00	1,381.1	0.0	750.98	335.15	1,086.13
17	270.5	38.74	4.015	9.03	0.00	0.16	2.72	0.80	1.00	0.00	8.41	12.37	0.00	1,429.2	0.0	752.95	393.37	1,146.32
														25,832.0	**0.0**			**22,280.15**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 13	



Tower Engineering Solutions

Load Case: 0.9D + 1.0W 90° Wind — 0.9D + 1.0W 117 mph Wind at 90° From Face

Wind Load Factor: 1.00
Dead Load Factor: 0.90
Ice Dead Load Factor: 0.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	20.65	12.800	0.00	0.00	1.00	2.10	0.85	1.00	0.00	10.88	3.52	0.00	850.5	0.0	401.00	0.00	401.00
2	3.5	20.65	0.000	3.31	0.00	0.16	2.74	0.85	1.00	0.00	1.92	17.62	0.00	480.8	0.0	92.62	267.61	360.23
3	8.5	20.65	1.032	2.56	0.00	0.17	2.70	0.85	1.00	0.00	2.35	17.62	0.00	531.5	0.0	111.24	267.61	378.85
4	18.5	20.65	0.000	9.99	0.00	0.16	2.74	0.85	1.00	0.00	5.77	52.86	0.00	1,442.5	0.0	277.60	802.82	1,080.42
5	38.5	22.19	0.000	16.66	0.00	0.16	2.74	0.85	1.00	0.00	9.62	88.09	0.00	2,404.1	0.0	497.27	1438.09	1,935.36
6	63.5	25.60	5.829	12.31	0.00	0.17	2.69	0.85	1.00	0.00	12.03	88.09	0.00	2,706.6	0.0	704.70	1659.11	2,363.81
7	88.5	28.15	5.162	12.79	0.00	0.17	2.70	0.85	1.00	0.00	11.75	85.33	0.00	2,662.9	0.0	758.30	1776.48	2,534.78
8	113.5	30.22	0.000	16.66	0.00	0.16	2.74	0.85	1.00	0.00	9.62	65.18	0.00	2,207.7	0.0	677.24	1457.68	2,134.93
9	138.5	31.99	5.162	12.79	0.00	0.17	2.70	0.85	1.00	0.00	11.75	60.93	0.00	2,455.0	0.0	861.81	1459.68	2,321.49
10	163.5	33.55	5.829	12.31	0.00	0.17	2.69	0.85	1.00	0.00	12.03	58.28	0.00	2,475.3	0.0	923.33	1476.24	2,399.58
11	181.0	34.54	2.588	4.70	0.00	0.17	2.68	0.85	1.00	0.00	4.91	17.19	0.00	775.6	0.0	386.89	453.08	839.98
12	193.5	35.20	0.000	9.39	0.00	0.15	2.77	0.85	1.00	0.00	5.41	11.99	0.00	977.0	0.0	448.63	337.66	786.30
13	213.5	36.20	0.000	15.64	0.00	0.15	2.77	0.85	1.00	0.00	9.01	19.99	0.00	1,628.4	0.0	769.03	578.81	1,347.84
14	233.5	37.14	3.885	7.05	0.00	0.17	2.68	0.85	1.00	0.00	7.37	11.99	0.00	1,044.4	0.0	624.34	356.29	980.62
15	243.5	37.59	1.036	2.35	0.00	0.16	2.73	0.85	1.00	0.00	2.23	4.00	0.00	379.4	0.0	194.55	120.19	314.75
16	253.5	38.02	6.216	7.05	0.00	0.21	2.56	0.85	1.00	0.00	9.39	10.98	0.00	1,381.1	0.0	776.68	335.15	1,111.83
17	270.5	38.74	4.015	9.03	0.00	0.16	2.72	0.85	1.00	0.00	8.61	12.37	0.00	1,429.2	0.0	770.94	393.37	1,164.30
														25,832.0	**0.0**			**22,456.06**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 14	

Tower Engineering Solutions

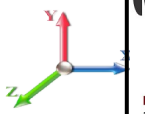
Load Case: 1.2D + 1.0Di + 1.0Wi Normal Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	3.77	12.800	0.99	0.99	1.00	2.10	1.00	1.00	0.66	13.79	4.07	1.53	1,493.3	359.3	92.82	0.00	92.82
2	3.5	3.77	0.000	6.03	2.72	0.28	2.36	1.00	1.00	0.80	3.61	20.95	9.32	1,073.7	432.6	27.30	90.17	117.47
3	8.5	3.77	1.032	5.53	2.97	0.30	2.29	1.00	1.00	0.87	4.36	21.26	10.19	1,216.3	507.6	32.04	91.98	124.02
4	18.5	3.77	0.000	19.62	9.63	0.30	2.30	1.00	1.00	0.94	11.84	64.65	33.03	3,506.6	1583.3	87.20	285.99	373.19
5	38.5	4.05	0.000	33.92	17.27	0.31	2.27	1.00	1.00	1.02	20.58	109.25	59.24	6,093.9	2888.4	160.95	525.68	686.63
6	63.5	4.68	5.829	30.47	18.15	0.33	2.22	1.00	1.00	1.07	24.45	110.34	62.28	6,472.7	2863.9	215.43	610.77	826.21
7	88.5	5.14	5.162	31.55	18.77	0.33	2.21	1.00	1.00	1.10	24.50	108.32	59.60	6,480.1	2929.6	236.46	654.23	890.69
8	113.5	5.52	0.000	35.90	19.24	0.33	2.23	1.00	1.00	1.13	21.97	84.04	37.64	5,600.0	2656.4	229.64	512.00	741.64
9	138.5	5.84	5.162	32.41	19.62	0.34	2.19	1.00	1.00	1.15	25.11	80.16	29.55	5,646.6	2373.2	273.27	489.94	763.20
10	163.5	6.13	5.829	32.27	19.95	0.35	2.18	1.00	1.00	1.17	25.72	77.84	24.45	5,604.3	2303.9	292.13	482.44	774.57
11	181.0	6.31	2.588	12.77	8.06	0.35	2.17	1.00	1.00	1.19	10.48	24.30	8.30	2,019.4	985.3	122.01	159.96	281.97
12	193.5	6.43	0.000	21.56	12.18	0.33	2.22	1.00	1.00	1.19	13.20	20.94	8.95	2,295.1	992.4	160.43	157.59	318.02
13	213.5	6.61	0.000	36.14	20.49	0.33	2.22	1.00	1.00	1.21	22.14	35.06	15.07	3,848.3	1677.1	276.27	271.44	547.71
14	233.5	6.78	3.885	19.46	12.41	0.35	2.16	1.00	1.00	1.22	15.95	21.11	9.12	2,585.9	1193.3	198.75	165.41	364.16
15	243.5	6.87	1.036	6.50	4.15	0.34	2.19	1.00	1.00	1.22	5.04	7.05	3.05	804.6	298.7	64.34	56.32	120.66
16	253.5	6.94	6.216	23.49	16.43	0.45	1.97	1.00	1.00	1.23	21.76	17.92	9.20	2,785.9	944.4	253.27	135.50	388.77
17	270.5	7.07	4.015	25.25	16.22	0.35	2.17	1.00	1.00	1.23	19.63	20.19	9.36	2,920.8	1015.2	256.20	174.25	430.45
														60,447.6	**26004.9**			**7,842.16**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 15	



Tower Engineering Solutions

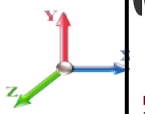
Load Case: 1.2D + 1.0Di + 1.0Wi 60° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	3.77	12.800	0.99	0.99	1.00	2.10	0.80	1.00	0.66	11.23	4.07	1.53	1,493.3	359.3	75.59	0.00	75.59
2	3.5	3.77	0.000	6.03	2.72	0.28	2.36	0.80	1.00	0.80	3.61	20.95	9.32	1,073.7	432.6	27.30	90.17	117.47
3	8.5	3.77	1.032	5.53	2.97	0.30	2.29	0.80	1.00	0.87	4.15	21.26	10.19	1,216.3	507.6	30.52	91.98	122.50
4	18.5	3.77	0.000	19.62	9.63	0.30	2.30	0.80	1.00	0.94	11.84	64.65	33.03	3,506.6	1583.3	87.20	285.99	373.19
5	38.5	4.05	0.000	33.92	17.27	0.31	2.27	0.80	1.00	1.02	20.58	109.25	59.24	6,093.9	2888.4	160.95	525.68	686.63
6	63.5	4.68	5.829	30.47	18.15	0.33	2.22	0.80	1.00	1.07	23.29	110.34	62.28	6,472.7	2863.9	205.16	610.77	815.94
7	88.5	5.14	5.162	31.55	18.77	0.33	2.21	0.80	1.00	1.10	23.47	108.32	59.60	6,480.1	2929.6	226.50	654.23	880.73
8	113.5	5.52	0.000	35.90	19.24	0.33	2.23	0.80	1.00	1.13	21.97	84.04	37.64	5,600.0	2656.4	229.64	512.00	741.64
9	138.5	5.84	5.162	32.41	19.62	0.34	2.19	0.80	1.00	1.15	24.08	80.16	29.55	5,646.6	2373.2	262.03	489.94	751.97
10	163.5	6.13	5.829	32.27	19.95	0.35	2.18	0.80	1.00	1.17	24.56	77.84	24.45	5,604.3	2303.9	278.89	482.44	761.33
11	181.0	6.31	2.588	12.77	8.06	0.35	2.17	0.80	1.00	1.19	9.96	24.30	8.30	2,019.4	985.3	115.98	159.96	275.94
12	193.5	6.43	0.000	21.56	12.18	0.33	2.22	0.80	1.00	1.19	13.20	20.94	8.95	2,295.1	992.4	160.43	157.59	318.02
13	213.5	6.61	0.000	36.14	20.49	0.33	2.22	0.80	1.00	1.21	22.14	35.06	15.07	3,848.3	1677.1	276.27	271.44	547.71
14	233.5	6.78	3.885	19.46	12.41	0.35	2.16	0.80	1.00	1.22	15.17	21.11	9.12	2,585.9	1193.3	189.07	165.41	354.48
15	243.5	6.87	1.036	6.50	4.15	0.34	2.19	0.80	1.00	1.22	4.83	7.05	3.05	804.6	298.7	61.69	56.32	118.02
16	253.5	6.94	6.216	23.49	16.43	0.45	1.97	0.80	1.00	1.23	20.52	17.92	9.20	2,785.9	944.4	238.80	135.50	374.30
17	270.5	7.07	4.015	25.25	16.22	0.35	2.17	0.80	1.00	1.23	18.83	20.19	9.36	2,920.8	1015.2	245.72	174.25	419.97
														60,447.6	**26004.9**			**7,735.40**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 16	



Tower Engineering Solutions

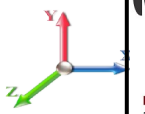
Load Case: 1.2D + 1.0Di + 1.0Wi 90° Wind — 1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00
Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	3.77	12.800	0.99	0.99	1.00	2.10	0.85	1.00	0.66	11.87	4.07	1.53	1,493.3	359.3	79.90	0.00	79.90
2	3.5	3.77	0.000	6.03	2.72	0.28	2.36	0.85	1.00	0.80	3.61	20.95	9.32	1,073.7	432.6	27.30	90.17	117.47
3	8.5	3.77	1.032	5.53	2.97	0.30	2.29	0.85	1.00	0.87	4.21	21.26	10.19	1,216.3	507.6	30.90	91.98	122.88
4	18.5	3.77	0.000	19.62	9.63	0.30	2.30	0.85	1.00	0.94	11.84	64.65	33.03	3,506.6	1583.3	87.20	285.99	373.19
5	38.5	4.05	0.000	33.92	17.27	0.31	2.27	0.85	1.00	1.02	20.58	109.25	59.24	6,093.9	2888.4	160.95	525.68	686.63
6	63.5	4.68	5.829	30.47	18.15	0.33	2.22	0.85	1.00	1.07	23.58	110.34	62.28	6,472.7	2863.9	207.73	610.77	818.50
7	88.5	5.14	5.162	31.55	18.77	0.33	2.21	0.85	1.00	1.10	23.73	108.32	59.60	6,480.1	2929.6	228.99	654.23	883.22
8	113.5	5.52	0.000	35.90	19.24	0.33	2.23	0.85	1.00	1.13	21.97	84.04	37.64	5,600.0	2656.4	229.64	512.00	741.64
9	138.5	5.84	5.162	32.41	19.62	0.34	2.19	0.85	1.00	1.15	24.33	80.16	29.55	5,646.6	2373.2	264.84	489.94	754.78
10	163.5	6.13	5.829	32.27	19.95	0.35	2.18	0.85	1.00	1.17	24.85	77.84	24.45	5,604.3	2303.9	282.20	482.44	764.64
11	181.0	6.31	2.588	12.77	8.06	0.35	2.17	0.85	1.00	1.19	10.09	24.30	8.30	2,019.4	985.3	117.49	159.96	277.45
12	193.5	6.43	0.000	21.56	12.18	0.33	2.22	0.85	1.00	1.19	13.20	20.94	8.95	2,295.1	992.4	160.43	157.59	318.02
13	213.5	6.61	0.000	36.14	20.49	0.33	2.22	0.85	1.00	1.21	22.14	35.06	15.07	3,848.3	1677.1	276.27	271.44	547.71
14	233.5	6.78	3.885	19.46	12.41	0.35	2.16	0.85	1.00	1.22	15.37	21.11	9.12	2,585.9	1193.3	191.49	165.41	356.90
15	243.5	6.87	1.036	6.50	4.15	0.34	2.19	0.85	1.00	1.22	4.89	7.05	3.05	804.6	298.7	62.35	56.32	118.68
16	253.5	6.94	6.216	23.49	16.43	0.45	1.97	0.85	1.00	1.23	20.83	17.92	9.20	2,785.9	944.4	242.42	135.50	377.92
17	270.5	7.07	4.015	25.25	16.22	0.35	2.17	0.85	1.00	1.23	19.03	20.19	9.36	2,920.8	1015.2	248.34	174.25	422.59
														60,447.6	**26004.9**			**7,762.09**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 17	



Tower Engineering Solutions

Load Case: 1.0D + 1.0W Normal Wind — 1.0D + 1.0W 60 mph Wind at Normal To Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

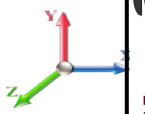
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	5.43	12.800	0.00	0.00	1.00	2.10	1.00	1.00	0.00	12.80	3.52	0.00	945.0	0.0	124.07	0.00	124.07
2	3.5	5.43	0.000	3.31	0.00	0.16	2.74	1.00	1.00	0.00	1.92	17.62	0.00	534.3	0.0	24.36	70.38	94.73
3	8.5	5.43	1.032	2.56	0.00	0.17	2.70	1.00	1.00	0.00	2.50	17.62	0.00	590.5	0.0	31.18	70.38	101.56
4	18.5	5.43	0.000	9.99	0.00	0.16	2.74	1.00	1.00	0.00	5.77	52.86	0.00	1,602.8	0.0	73.01	211.13	284.13
5	38.5	5.84	0.000	16.66	0.00	0.16	2.74	1.00	1.00	0.00	9.62	88.09	0.00	2,671.3	0.0	130.77	378.20	508.97
6	63.5	6.73	5.829	12.31	0.00	0.17	2.69	1.00	1.00	0.00	12.91	88.09	0.00	3,007.3	0.0	198.79	436.32	635.11
7	88.5	7.40	5.162	12.79	0.00	0.17	2.70	1.00	1.00	0.00	12.52	85.33	0.00	2,958.8	0.0	212.56	467.19	679.75
8	113.5	7.95	0.000	16.66	0.00	0.16	2.74	1.00	1.00	0.00	9.62	65.18	0.00	2,453.0	0.0	178.11	383.35	561.45
9	138.5	8.41	5.162	12.79	0.00	0.17	2.70	1.00	1.00	0.00	12.52	60.93	0.00	2,727.8	0.0	241.58	383.87	625.45
10	163.5	8.82	5.829	12.31	0.00	0.17	2.69	1.00	1.00	0.00	12.91	58.28	0.00	2,750.3	0.0	260.46	388.23	648.69
11	181.0	9.08	2.588	4.70	0.00	0.17	2.68	1.00	1.00	0.00	5.30	17.19	0.00	861.7	0.0	109.79	119.15	228.95
12	193.5	9.26	0.000	9.39	0.00	0.15	2.77	1.00	1.00	0.00	5.41	11.99	0.00	1,085.6	0.0	117.98	88.80	206.78
13	213.5	9.52	0.000	15.64	0.00	0.15	2.77	1.00	1.00	0.00	9.01	19.99	0.00	1,809.3	0.0	202.24	152.22	354.46
14	233.5	9.77	3.885	7.05	0.00	0.17	2.68	1.00	1.00	0.00	7.95	11.99	0.00	1,160.5	0.0	177.18	93.70	270.88
15	243.5	9.89	1.036	2.35	0.00	0.16	2.73	1.00	1.00	0.00	2.39	4.00	0.00	421.6	0.0	54.73	31.61	86.34
16	253.5	10.00	6.216	7.05	0.00	0.21	2.56	1.00	1.00	0.00	10.32	10.98	0.00	1,534.6	0.0	224.53	88.14	312.67
17	270.5	10.19	4.015	9.03	0.00	0.16	2.72	1.00	1.00	0.00	9.21	12.37	0.00	1,588.0	0.0	216.93	103.45	320.38
														28,702.2	**0.0**			**6,044.39**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 18	



Tower Engineering Solutions

Load Case: 1.0D + 1.0W 60° Wind — 1.0D + 1.0W 60 mph Wind at 60° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

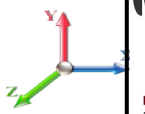
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	5.43	12.800	0.00	0.00	1.00	2.10	0.80	1.00	0.00	10.24	3.52	0.00	945.0	0.0	99.25	0.00	99.25
2	3.5	5.43	0.000	3.31	0.00	0.16	2.74	0.80	1.00	0.00	1.92	17.62	0.00	534.3	0.0	24.36	70.38	94.73
3	8.5	5.43	1.032	2.56	0.00	0.17	2.70	0.80	1.00	0.00	2.30	17.62	0.00	590.5	0.0	28.61	70.38	98.99
4	18.5	5.43	0.000	9.99	0.00	0.16	2.74	0.80	1.00	0.00	5.77	52.86	0.00	1,602.8	0.0	73.01	211.13	284.13
5	38.5	5.84	0.000	16.66	0.00	0.16	2.74	0.80	1.00	0.00	9.62	88.09	0.00	2,671.3	0.0	130.77	378.20	508.97
6	63.5	6.73	5.829	12.31	0.00	0.17	2.69	0.80	1.00	0.00	11.74	88.09	0.00	3,007.3	0.0	180.84	436.32	617.16
7	88.5	7.40	5.162	12.79	0.00	0.17	2.70	0.80	1.00	0.00	11.49	85.33	0.00	2,958.8	0.0	195.04	467.19	662.23
8	113.5	7.95	0.000	16.66	0.00	0.16	2.74	0.80	1.00	0.00	9.62	65.18	0.00	2,453.0	0.0	178.11	383.35	561.45
9	138.5	8.41	5.162	12.79	0.00	0.17	2.70	0.80	1.00	0.00	11.49	60.93	0.00	2,727.8	0.0	221.66	383.87	605.54
10	163.5	8.82	5.829	12.31	0.00	0.17	2.69	0.80	1.00	0.00	11.74	58.28	0.00	2,750.3	0.0	236.94	388.23	625.17
11	181.0	9.08	2.588	4.70	0.00	0.17	2.68	0.80	1.00	0.00	4.78	17.19	0.00	861.7	0.0	99.06	119.15	218.22
12	193.5	9.26	0.000	9.39	0.00	0.15	2.77	0.80	1.00	0.00	5.41	11.99	0.00	1,085.6	0.0	117.98	88.80	206.78
13	213.5	9.52	0.000	15.64	0.00	0.15	2.77	0.80	1.00	0.00	9.01	19.99	0.00	1,809.3	0.0	202.24	152.22	354.46
14	233.5	9.77	3.885	7.05	0.00	0.17	2.68	0.80	1.00	0.00	7.17	11.99	0.00	1,160.5	0.0	159.86	93.70	253.56
15	243.5	9.89	1.036	2.35	0.00	0.16	2.73	0.80	1.00	0.00	2.18	4.00	0.00	421.6	0.0	49.98	31.61	81.59
16	253.5	10.00	6.216	7.05	0.00	0.21	2.56	0.80	1.00	0.00	9.08	10.98	0.00	1,534.6	0.0	197.50	88.14	285.64
17	270.5	10.19	4.015	9.03	0.00	0.16	2.72	0.80	1.00	0.00	8.41	12.37	0.00	1,588.0	0.0	198.02	103.45	301.46
														28,702.2	**0.0**			**5,859.34**

Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 19	



Tower Engineering Solutions

Load Case: 1.0D + 1.0W 90° Wind — 1.0D + 1.0W 60 mph Wind at 90° From Face

Wind Load Factor: 1.00 — **Wind Importance Factor:** 1.00

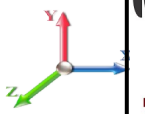
Dead Load Factor: 1.00

Ice Dead Load Factor: 0.00 — **Ice Importance Factor:** 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	0.5	5.43	12.800	0.00	0.00	1.00	2.10	0.85	1.00	0.00	10.88	3.52	0.00	945.0	0.0	105.46	0.00	105.46
2	3.5	5.43	0.000	3.31	0.00	0.16	2.74	0.85	1.00	0.00	1.92	17.62	0.00	534.3	0.0	24.36	70.38	94.73
3	8.5	5.43	1.032	2.56	0.00	0.17	2.70	0.85	1.00	0.00	2.35	17.62	0.00	590.5	0.0	29.25	70.38	99.63
4	18.5	5.43	0.000	9.99	0.00	0.16	2.74	0.85	1.00	0.00	5.77	52.86	0.00	1,602.8	0.0	73.01	211.13	284.13
5	38.5	5.84	0.000	16.66	0.00	0.16	2.74	0.85	1.00	0.00	9.62	88.09	0.00	2,671.3	0.0	130.77	378.20	508.97
6	63.5	6.73	5.829	12.31	0.00	0.17	2.69	0.85	1.00	0.00	12.03	88.09	0.00	3,007.3	0.0	185.33	436.32	621.65
7	88.5	7.40	5.162	12.79	0.00	0.17	2.70	0.85	1.00	0.00	11.75	85.33	0.00	2,958.8	0.0	199.42	467.19	666.61
8	113.5	7.95	0.000	16.66	0.00	0.16	2.74	0.85	1.00	0.00	9.62	65.18	0.00	2,453.0	0.0	178.11	383.35	561.45
9	138.5	8.41	5.162	12.79	0.00	0.17	2.70	0.85	1.00	0.00	11.75	60.93	0.00	2,727.8	0.0	226.64	383.87	610.52
10	163.5	8.82	5.829	12.31	0.00	0.17	2.69	0.85	1.00	0.00	12.03	58.28	0.00	2,750.3	0.0	242.82	388.23	631.05
11	181.0	9.08	2.588	4.70	0.00	0.17	2.68	0.85	1.00	0.00	4.91	17.19	0.00	861.7	0.0	101.75	119.15	220.90
12	193.5	9.26	0.000	9.39	0.00	0.15	2.77	0.85	1.00	0.00	5.41	11.99	0.00	1,085.6	0.0	117.98	88.80	206.78
13	213.5	9.52	0.000	15.64	0.00	0.15	2.77	0.85	1.00	0.00	9.01	19.99	0.00	1,809.3	0.0	202.24	152.22	354.46
14	233.5	9.77	3.885	7.05	0.00	0.17	2.68	0.85	1.00	0.00	7.37	11.99	0.00	1,160.5	0.0	164.19	93.70	257.89
15	243.5	9.89	1.036	2.35	0.00	0.16	2.73	0.85	1.00	0.00	2.23	4.00	0.00	421.6	0.0	51.16	31.61	82.77
16	253.5	10.00	6.216	7.05	0.00	0.21	2.56	0.85	1.00	0.00	9.39	10.98	0.00	1,534.6	0.0	204.25	88.14	292.39
17	270.5	10.19	4.015	9.03	0.00	0.16	2.72	0.85	1.00	0.00	8.61	12.37	0.00	1,588.0	0.0	202.74	103.45	306.19
														28,702.2	**0.0**			**5,905.60**

Force/Stress Compression Summary

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 20	



Tower Engineering Solutions

LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	1	WBM - W18 x 46	-109.52	1.2D + 1.0Di + 1.0Wi 60° Wind	2.52	100	100	100	23.41	50.00	583.64	18.8	Member Y
2	6	SOL - 2 1/2" SOLID	-47.59	1.2D + 1.0Di + 1.0Wi 60° Wind	5.00	100	100	100	96.00	36.00	97.90	48.6	Member X
3	11	SOL - 2 1/2" SOLID	-48.75	1.2D + 1.0Di + 1.0Wi 60° Wind	5.00	100	100	100	96.00	36.00	97.90	49.8	Member X
4	26	SOL - 2 1/2" SOLID	-51.88	1.2D + 1.0W 90° Wind	5.00	100	100	100	96.00	36.00	97.90	53.0	Member X
5	51	SOL - 2 1/2" SOLID	-53.04	1.2D + 1.0W 90° Wind	5.00	100	100	100	96.00	36.00	97.90	54.2	Member X
6	76	SOL - 2 1/2" SOLID	-49.75	1.2D + 1.0W 90° Wind	5.00	100	100	100	96.00	36.00	97.90	50.8	Member X
7	101	SOL - 2 1/2" SOLID	-45.99	1.2D + 1.0W 90° Wind	5.00	100	100	100	96.00	36.00	97.90	47.0	Member X
8	126	SOL - 2 1/2" SOLID	-46.64	1.2D + 1.0W 90° Wind	5.00	100	100	100	96.00	36.00	97.90	47.6	Member X
9	151	SOL - 2 1/2" SOLID	-40.10	1.2D + 1.0W Normal Wind	5.00	100	100	100	96.00	36.00	97.90	41.0	Member X
10	176	SOL - 2 1/2" SOLID	-46.79	1.2D + 1.0W Normal Wind	5.00	100	100	100	96.00	36.00	97.90	47.8	Member X
11	186	SOL - 2 1/4" SOLID	-26.33	1.2D + 1.0W 90° Wind	5.00	100	100	100	106.67	36.00	70.77	37.2	Member X
12	201	SOL - 2 1/4" SOLID	-28.41	1.2D + 1.0W 60° Wind	5.00	100	100	100	106.67	36.00	70.77	40.1	Member X
13	226	SOL - 2 1/4" SOLID	-28.84	1.2D + 1.0W 60° Wind	5.00	100	100	100	106.67	36.00	70.77	40.7	Member X
14	241	SOL - 2 1/4" SOLID	-22.32	1.2D + 1.0W 90° Wind	5.00	100	100	100	106.67	36.00	70.77	31.5	Member X
15	246	SOL - 2 1/4" SOLID	-19.54	1.2D + 1.0W Normal Wind	5.00	100	100	100	106.67	36.00	70.77	27.6	Member X
16	261	SOL - 2 1/4" SOLID	-24.43	1.2D + 1.0W Normal Wind	5.00	100	100	100	106.67	36.00	70.77	34.5	Member X
17	280	SOL - 2 1/4" SOLID	-12.60	1.2D + 1.0W Normal Wind	4.75	100	100	100	101.33	36.00	75.03	16.8	Member X

HORIZONTAL MEMBERS

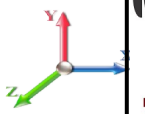
Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	1										0.00	0	0				
2	6	PSP - ROHN 1 1/2X11G	-1.71	1.2D + 1.0W 90° Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		16.9	Member X
3	11	PSP - ROHN 1 1/2X11G	-1.54	1.2D + 1.0W 90° Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		15.1	Member X
4	26	PSP - ROHN 1 1/2X11G	-0.70	1.2D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		6.9	Member X
5	51	PSP - ROHN 1 1/2X11G	-0.58	1.2D + 1.0W 60° Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		5.7	Member X
6	76	PSP - ROHN 1 1/2X11G	-0.12	0.9D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		1.1	Member X
7	101	PSP - ROHN 1 1/2X11G	-0.15	0.9D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		1.5	Member X
8	126	PSP - ROHN 1 1/2X11G	-0.52	1.2D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		5.1	Member X
9	151	PSP - ROHN 1 1/2X11G	-1.80	1.2D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		17.7	Member X
10	176	PSP - ROHN 1 1/2X11G	-2.72	0.9D + 1.0W 90° Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		26.8	Member X
11	186	PSP - ROHN 1 1/2X11G	-1.23	1.2D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		12.1	Member X
12	201	PSP - ROHN 1 1/2X11G	-0.08	0.9D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		0.8	Member X
13	226	PSP - ROHN 1 1/2X11G	-0.16	0.9D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		1.6	Member X
14	241	PSP - ROHN 1 1/2X11G	-0.78	0.9D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		7.7	Member X
15	246	PSP - ROHN 1 1/2X11G	-2.37	0.9D + 1.0W 90° Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		23.3	Member X
16	261	PSP - ROHN 1 1/2X11G	-2.75	0.9D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		27.1	Member X
17	280	PSP - ROHN 1 1/2X11G	-0.74	1.2D + 1.0W Normal Wind	4.00	100	100	100	98.16	36.00	10.15	1	1	13.81		7.3	Member X

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
1	1				0.00						0.00	0	0				
2	6	PSP - ROHN 1 1/2X11G	-2.76	1.2D + 1.0W Normal Wind	6.40	100	100	100	157.13	36.00	4.76	1	1	13.81		58.1	Member X
3	11	SAE - 2X2X0.375	-2.38	1.2D + 1.0W Normal Wind	6.40	100	100	100	197.53	36.00	9.98	1	1	13.81	22.1	23.8	Member Z
4	26	PSP - ROHN 1 1/2X11G	-2.17	1.2D + 1.0W Normal Wind	6.40	100	100	100	157.13	36.00	4.76	1	1	13.81		45.6	Member X
5	51	PSP - ROHN 1 1/2X11G	-1.05	1.2D + 1.0W Normal Wind	6.40	100	100	100	157.13	36.00	4.76	1	1	13.81		22.1	Member X
6	76	DAE - 2X2X0.1875	-3.51	1.2D + 1.0W 90° Wind	6.40	100	100	50	125.27	36.00	26.08	2	1	27.62	50.2	13.5	Member Y
7	101	DAE - 2X2X0.1875	-4.28	1.2D + 1.0W 90° Wind	6.40	100	100	50	125.27	36.00	26.08	2	1	27.62	50.2	16.4	Member Y

Force/Stress Compression Summary

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 21	



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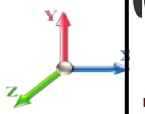
DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
8	126	PSP - ROHN 1 1/2X11G	-3.03	1.2D + 1.0W Normal Wind	6.40	100	100	100	157.13	36.00	4.76	1	1	13.81		63.7	Member X
9	151	DAE - 2X2X0.1875	-5.86	1.2D + 1.0W 90° Wind	6.40	100	100	50	125.27	36.00	26.08	2	1	27.62	50.2	22.5	Member Y
10	176	DAE - 2X2X0.1875	-6.79	1.2D + 1.0W 60° Wind	6.40	100	100	50	125.27	36.00	26.08	2	1	27.62	50.2	26.0	Member Y
11	186	SAE - 2.5X2.5X0.1875	-5.36	1.2D + 1.0W 60° Wind	6.40	100	100	100	155.23	36.00	10.71	1	1	13.81	9.79	54.7	Bolt Bear
12	201	PSP - ROHN 1 1/2X11G	-2.03	1.2D + 1.0W 60° Wind	6.40	100	100	100	157.13	36.00	4.76	1	1	13.81		42.6	Member X
13	226	PSP - ROHN 1 1/2X11G	-2.36	1.2D + 1.0W Normal Wind	6.40	100	100	100	157.13	36.00	4.76	1	1	13.81		49.6	Member X
14	241	SAE - 2.5X2.5X0.1875	-3.25	1.2D + 1.0W Normal Wind	6.40	100	100	100	155.23	36.00	10.71	1	1	13.81	9.79	33.2	Bolt Bear
15	246	DAE - 2X2X0.1875	-3.58	1.2D + 1.0W Normal Wind	6.40	100	100	50	125.27	36.00	26.08	2	1	27.62	50.2	13.7	Member Y
16	261	DAE - 2X2X0.1875	-3.41	1.2D + 1.0W 60° Wind	6.40	100	100	50	125.27	36.00	26.08	2	1	27.62	50.2	13.1	Member Y
17	280	DAE - 2X2X0.1875	-3.01	1.2D + 1.0W 60° Wind	6.21	100	100	50	121.49	36.00	27.59	2	1	27.62	50.2	10.9	Member Y

Force/Stress Tension Summary

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 22	



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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	1				0	0.00		
2	6				0	0.00		
3	11				0	0.00		
4	26				0	0.00		
5	51				0	0.00		
6	76				0	0.00		
7	101				0	0.00		
8	126				0	0.00		
9	151				0	0.00		
10	176	SOL - 2 1/2" SOLID	9.44	0.9D + 1.0W 60° Wind	36	159.04	5.9	Member
11	186				0	0.00		
12	201				0	0.00		
13	226				0	0.00		
14	241				0	0.00		
15	246				0	0.00		
16	261	SOL - 2 1/4" SOLID	18.84	0.9D + 1.0W 60° Wind	36	128.83	14.6	Member
17	280	SOL - 2 1/4" SOLID	10.10	0.9D + 1.0W 60° Wind	36	128.83	7.8	Member

HORIZONTAL MEMBERS

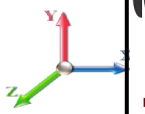
Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	1	WBM - W18 x 46	57.12	1.2D + 1.0Di + 1.0Wi 60	36	437.40	0	0				13.1	Member
2	6	PSP - ROHN 1 1/2X11GA	1.62	1.2D + 1.0W Normal Wi	36	16.85	1	1	13.81			11.7	Bolt Shear
3	11	PSP - ROHN 1 1/2X11GA	1.36	1.2D + 1.0W Normal Wi	36	16.85	1	1	13.81			9.9	Bolt Shear
4	26	PSP - ROHN 1 1/2X11GA	0.73	1.2D + 1.0W Normal Wi	36	16.85	1	1	13.81			5.3	Bolt Shear
5	51	PSP - ROHN 1 1/2X11GA	0.78	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			5.6	Bolt Shear
6	76	PSP - ROHN 1 1/2X11GA	0.33	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			2.4	Bolt Shear
7	101	PSP - ROHN 1 1/2X11GA	1.95	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			14.1	Bolt Shear
8	126	PSP - ROHN 1 1/2X11GA	2.11	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			15.3	Bolt Shear
9	151	PSP - ROHN 1 1/2X11GA	3.82	1.2D + 1.0W 90° Wind	36	16.85	1	1	13.81			27.6	Bolt Shear
10	176	PSP - ROHN 1 1/2X11GA	3.54	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			25.6	Bolt Shear
11	186	PSP - ROHN 1 1/2X11GA	1.29	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			9.3	Bolt Shear
12	201	PSP - ROHN 1 1/2X11GA	0.86	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			6.2	Bolt Shear
13	226	PSP - ROHN 1 1/2X11GA	1.53	1.2D + 1.0W Normal Wi	36	16.85	1	1	13.81			11.1	Bolt Shear
14	241	PSP - ROHN 1 1/2X11GA	2.09	1.2D + 1.0W Normal Wi	36	16.85	1	1	13.81			15.1	Bolt Shear
15	246	PSP - ROHN 1 1/2X11GA			36	0.00	0	0					
16	261	PSP - ROHN 1 1/2X11GA	6.72	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			48.6	Bolt Shear
17	280	PSP - ROHN 1 1/2X11GA	0.63	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			4.5	Bolt Shear

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	1	-	0.00		50	0.00	0	0					
2	6	PSP - ROHN 1 1/2X11GA	2.85	1.2D + 1.0W 90° Wind	36	16.85	1	1	13.81			20.6	Bolt Shear
3	11	SAE - 2X2X0.375	2.81	1.2D + 1.0W 90° Wind	36	44.06	1	1	13.81	22.19	17.01	20.3	Bolt Shear
4	26	PSP - ROHN 1 1/2X11GA	2.06	1.2D + 1.0W 90° Wind	36	16.85	1	1	13.81			14.9	Bolt Shear
5	51	PSP - ROHN 1 1/2X11GA	0.86	1.2D + 1.0W Normal Wi	36	16.85	1	1	13.81			6.3	Bolt Shear
6	76	DAE - 2X2X0.1875	2.88	1.2D + 1.0W 60° Wind	36	46.33	2	1	27.62	50.24	29.31	10.4	Bolt Shear
7	101	DAE - 2X2X0.1875	4.49	1.2D + 1.0W 90° Wind	36	46.33	2	1	27.62	50.24	29.31	16.2	Bolt Shear
8	126	PSP - ROHN 1 1/2X11GA	2.35	1.2D + 1.0W Normal Wi	36	16.85	1	1	13.81			17.0	Bolt Shear

Force/Stress Tension Summary

Structure:	CT04877-A-SBA		**Code:**	EIA/TIA-222-H	3/4/2020
Site Name:	Waterbury 2, CT		**Exposure:**	B	
Height:	280.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 23



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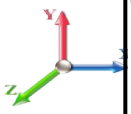
DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
9	151	DAE - 2X2X0.1875	5.01	1.2D + 1.0W Normal Wi	36	46.33	2	1	27.62	50.24	29.31	18.1	Bolt Shear
10	176	DAE - 2X2X0.1875	6.89	1.2D + 1.0W 60° Wind	36	46.33	2	1	27.62	50.24	29.31	24.9	Bolt Shear
11	186	SAE - 2.5X2.5X0.1875	4.10	0.9D + 1.0W 90° Wind	36	29.22	1	1	13.81	9.79	10.30	41.9	Bolt Bear
12	201	PSP - ROHN 1 1/2X11GA	1.60	1.2D + 1.0W 60° Wind	36	16.85	1	1	13.81			11.6	Bolt Shear
13	226	PSP - ROHN 1 1/2X11GA	2.00	1.2D + 1.0W Normal Wi	36	16.85	1	1	13.81			14.5	Bolt Shear
14	241	SAE - 2.5X2.5X0.1875	2.85	1.2D + 1.0W Normal Wi	36	29.22	1	1	13.81	9.79	10.30	29.1	Bolt Bear
15	246	DAE - 2X2X0.1875	1.39	0.9D + 1.0W Normal Wi	36	46.33	2	1	27.62	50.24	29.31	5.0	Bolt Shear
16	261	DAE - 2X2X0.1875	3.56	0.9D + 1.0W 90° Wind	36	46.33	2	1	27.62	50.24	29.31	12.9	Bolt Shear
17	280	DAE - 2X2X0.1875	2.72	1.2D + 1.0W Normal Wi	36	46.33	2	1	27.62	50.24	29.31	9.8	Bolt Shear

Seismic Section Forces

Structure:	CT04877-A-SBA	**Code:**	EIA/TIA-222-H	3/4/2020	
Site Name:	Waterbury 2, CT	**Exposure:**	B		
Height:	280.00 (ft)	**Crest Height:**	0.00		
Base Elev:	0.000 (ft)	**Site Class:**	D - Stiff Soil		
Gh:	0.85 **Topography:** 1	**Struct Class:**	II	Page: 24	



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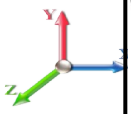
Load Case: 1.2D + 1.0Ev + 1.0Eh

Dead Load Factor	1.20	**Sds**	0.204	**Ss**	0.1920	**Fa**	1.6000	**Ke**	1.0000	**TL**	6.0000
Seismic Load Factor	1.00	**Sd1**	0.086	**S1**	0.0540	**Fv**	2.4000	**Kg**	0.0064	**Cs**	0.0594
Seismic Importance Factor	1.00	**W1**	0.000	**R**	3.0000	**Vs**	2.3142	**T**	0.4850	**f1**	2.0620

Sect #	Elev (ft)	Wz (lb)	Lateral Fsz (lbs)	Vertical Ev (lbs)
1	0.50	944.99	0.23	38.73
2	3.50	534.25	0.90	21.89
3	8.50	590.53	2.43	24.20
4	18.50	1602.7	14.34	65.68
5	38.50	2671.2	49.74	109.47
6	63.50	3007.2	92.36	123.24
7	88.50	3608.3	154.45	147.87
8	113.50	2635.0	144.65	107.99
9	138.50	2950.8	197.67	120.93
10	163.50	2750.2	217.49	112.71
11	181.00	3959.2	346.60	162.25
12	193.50	1085.5	101.60	44.49
13	213.50	1809.2	186.83	74.15
14	233.50	1160.4	131.06	47.56
15	243.50	421.60	49.65	17.28
16	253.50	1728.5	211.94	70.84
17	270.50	3151.0	412.25	129.13

Seismic Section Forces

Structure:	CT04877-A-SBA		**Code:**	EIA/TIA-222-H	3/4/2020
Site Name:	Waterbury 2, CT		**Exposure:**	B	
Height:	280.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 25



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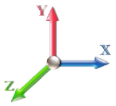
Load Case: 0.9D + 1.0Ev + 1.0Eh

Dead Load Factor	0.90	**Sds**	0.204	**Ss**	0.1920	**Fa**	1.6000	**Ke**	1.0000	**TL**	6.0000
Seismic Load Factor	1.00	**Sd1**	0.086	**S1**	0.0540	**Fv**	2.4000	**Kg**	0.0064	**Cs**	0.0683
Seismic Importance Factor	1.00	**W1**	0.000	**R**	3.0000	**Vs**	2.6602	**T**	0.4200	**f1**	2.3812

Sect #	Elev (ft)	Wz (lb)	Lateral Fsz (lbs)	Vertical Ev (lbs)
1	0.50	944.99	0.26	38.73
2	3.50	534.25	1.04	21.89
3	8.50	590.53	2.79	24.20
4	18.50	1602.7	16.49	65.68
5	38.50	2671.2	57.18	109.47
6	63.50	3007.2	106.17	123.24
7	88.50	3608.3	177.55	147.87
8	113.50	2635.0	166.28	107.99
9	138.50	2950.8	227.23	120.93
10	163.50	2750.2	250.01	112.71
11	181.00	3959.2	398.43	162.25
12	193.50	1085.5	116.79	44.49
13	213.50	1809.2	214.77	74.15
14	233.50	1160.4	150.66	47.56
15	243.50	421.60	57.08	17.28
16	253.50	1728.5	243.63	70.84
17	270.50	3151.0	473.89	129.13

Support Forces Summary

Structure:	CT04877-A-SBA		**Code:**	EIA/TIA-222-H	3/4/2020
Site Name:	Waterbury 2, CT		**Exposure:**	B	
Height:	280.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 26



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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.0W Normal Wind	1	0.01	126.07	-2.05	
	A1	0.00	-3.77	1.76	
	A1b	27.66	-38.81	-17.16	
	A1a	-27.67	-38.83	-17.14	
1.2D + 1.0W 60° Wind	1	-1.99	113.24	-1.16	
	A1	-0.88	-11.55	7.98	
	A1b	6.46	-11.58	-4.75	
	A1a	-33.21	-45.73	-19.16	
1.2D + 1.0W 90° Wind	1	-2.29	120.83	-0.02	
	A1	-1.14	-25.45	20.59	
	A1b	2.48	-5.59	-1.95	
	A1a	-33.41	-45.27	-18.63	
0.9D + 1.0W Normal Wind	1	0.01	115.78	-2.40	
	A1	0.00	-3.80	1.78	
	A1b	27.63	-38.81	-17.14	
	A1a	-27.64	-38.82	-17.12	
0.9D + 1.0W 60° Wind	1	-2.03	103.18	-1.18	
	A1	-0.88	-11.64	8.04	
	A1b	6.52	-11.68	-4.79	
	A1a	-33.24	-45.79	-19.18	
0.9D + 1.0W 90° Wind	1	-2.35	110.60	-0.01	
	A1	-1.14	-25.47	20.58	
	A1b	2.51	-5.65	-1.97	
	A1a	-33.39	-45.27	-18.62	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.01	140.10	-0.87	
	A1	0.00	-11.39	9.65	
	A1b	17.63	-23.81	-10.91	
	A1a	-17.64	-23.83	-10.91	
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-0.66	141.04	-0.40	
	A1	-0.63	-15.94	13.42	
	A1b	11.30	-15.95	-7.25	
	A1a	-21.21	-28.28	-12.25	
1.2D + 1.0Di + 1.0Wi 90° Wind	1	-0.80	140.61	0.02	
	A1	-0.76	-19.87	17.06	
	A1b	9.09	-12.77	-5.62	
	A1a	-20.49	-27.01	-11.45	
1.2D + 1.0Ev + 1.0Eh	1	0.00	100.57	0.01	
	A1	0.00	-16.13	13.73	
	A1b	13.89	-19.26	-8.03	
	A1a	-13.89	-19.26	-8.03	
0.9D + 1.0Ev + 1.0Eh	1	0.00	90.89	0.01	
	A1	0.00	-16.03	13.65	
	A1b	14.12	-19.62	-8.16	
	A1a	-14.13	-19.62	-8.16	

1.0D + 1.0W Normal Wind	1	0.01	84.02	-0.69
	A1	0.00	-9.34	7.21
	A1b	13.10	-18.49	-7.84
	A1a	-13.11	-18.51	-7.84
1.0D + 1.0W 60° Wind	1	-0.56	84.25	-0.33
	A1	-0.23	-12.55	9.95
	A1b	8.50	-12.56	-5.18
	A1a	-15.49	-21.53	-8.94
1.0D + 1.0W 90° Wind	1	-0.66	84.13	0.00
	A1	-0.28	-15.49	12.58
	A1b	6.85	-10.29	-4.10
	A1a	-14.95	-20.70	-8.49

Max Reactions (kips)	Base	Anchor 1
Vertical	141.04	45.79
Horizontal	2.40	38.37

Cable Forces Summary

Structure:	CT04877-A-SBA		**Code:**	EIA/TIA-222-H	3/4/2020
Site Name:	Waterbury 2, CT		**Exposure:**	B	
Height:	280.00 (ft)		**Crest Height:**	0.00	
Base Elev:	0.000 (ft)		**Site Class:**	D - Stiff Soil	
Gh:	0.85	**Topography:** 1	**Struct Class:**	II	Page: 28

Tower Engineering Solutions

Load Case	Elevation (ft)	Cable	Node 1	Node 2	Allow Tension (kips)	Applied Tension (kips)	Use %
1.2D + 1.0W Normal	76.00	9/16 EHS	A1	17	21.00	0.20	1
			A1b	17a	21.00	9.34	44
			A1a	17b	21.00	9.32	44
	156.00	7/8 EHS	A1	33	47.82	0.47	1
			A1b	33a	47.82	19.37	41
			A1a	33b	47.82	19.37	41
	251.00	3/4 EHS	A1	T3	34.98	2.19	6
			A1a	T3b	34.98	12.06	34
			A1b	T3a	34.98	11.46	33
			A1b	T3	34.98	12.40	35
			A1a	T3a	34.98	11.83	34
			A1	T3b	34.98	2.22	6
1.2D + 1.0W 60° Wind	76.00	9/16 EHS	A1	17	21.00	1.52	7
			A1b	17a	21.00	1.50	7
			A1a	17b	21.00	10.75	51
	156.00	7/8 EHS	A1	33	47.82	3.86	8
			A1b	33a	47.82	3.83	8
			A1a	33b	47.82	22.58	47
	251.00	3/4 EHS	A1	T3	34.98	5.00	14
			A1a	T3b	34.98	14.07	40
			A1b	T3a	34.98	4.78	14
			A1b	T3	34.98	5.12	15
			A1a	T3a	34.98	14.33	41
			A1	T3b	34.98	4.82	14
1.2D + 1.0W 90° Wind	76.00	9/16 EHS	A1	17	21.00	5.64	27
			A1b	17a	21.00	0.39	2
			A1a	17b	21.00	11.02	52
	156.00	7/8 EHS	A1	33	47.82	11.91	25
			A1b	33a	47.82	1.25	3
			A1a	33b	47.82	22.82	48
	251.00	3/4 EHS	A1	T3	34.98	8.68	25
			A1a	T3b	34.98	13.53	39
			A1b	T3a	34.98	2.81	8
			A1b	T3	34.98	2.94	8
			A1a	T3a	34.98	13.96	40
			A1	T3b	34.98	8.08	23
0.9D + 1.0W Normal	76.00	9/16 EHS	A1	17	21.00	0.21	1
			A1b	17a	21.00	9.30	44
			A1a	17b	21.00	9.29	44
	156.00	7/8 EHS	A1	33	47.82	0.47	1
			A1b	33a	47.82	19.35	40
			A1a	33b	47.82	19.35	40
	251.00	3/4 EHS	A1	T3	34.98	2.20	6
			A1a	T3b	34.98	12.07	35
			A1b	T3a	34.98	11.48	33
			A1b	T3	34.98	12.41	35
			A1a	T3a	34.98	11.84	34
			A1	T3b	34.98	2.24	6
0.9D + 1.0W 60° Wind	76.00	9/16 EHS	A1	17	21.00	1.53	7
			A1b	17a	21.00	1.51	7
			A1a	17b	21.00	10.74	51
	156.00	7/8 EHS	A1	33	47.82	3.89	8
			A1b	33a	47.82	3.87	8

0.9D + 1.0W 60° Wind	156.00	7/8 EHS	A1a	33b	47.82	22.60	47
	251.00	3/4 EHS	A1	T3	34.98	5.04	14
			A1a	T3b	34.98	14.10	40
			A1b	T3a	34.98	4.81	14
			A1b	T3	34.98	5.16	15
			A1a	T3a	34.98	14.36	41
			A1	T3b	34.98	4.85	14
0.9D + 1.0W 90° Wind	76.00	9/16 EHS	A1	17	21.00	5.62	27
			A1b	17a	21.00	0.39	2
			A1a	17b	21.00	10.98	52
	156.00	7/8 EHS	A1	33	47.82	11.90	25
			A1b	33a	47.82	1.26	3
			A1a	33b	47.82	22.80	48
	251.00	3/4 EHS	A1	T3	34.98	8.70	25
			A1a	T3b	34.98	13.56	39
			A1b	T3a	34.98	2.83	8
			A1b	T3	34.98	2.96	8
			A1a	T3a	34.98	13.98	40
			A1	T3b	34.98	8.11	23
1.2D + 1.0Di + 1.0Wi	76.00	9/16 EHS	A1	17	21.00	3.02	14
			A1b	17a	21.00	6.15	29
			A1a	17b	21.00	6.14	29
	156.00	7/8 EHS	A1	33	47.82	5.48	11
			A1b	33a	47.82	11.38	24
			A1a	33b	47.82	11.43	24
	251.00	3/4 EHS	A1	T3	34.98	4.74	14
			A1a	T3b	34.98	8.85	25
			A1b	T3a	34.98	8.55	24
			A1b	T3	34.98	8.92	26
			A1a	T3a	34.98	8.61	25
			A1	T3b	34.98	4.84	14
1.2D + 1.0Di + 1.0Wi	76.00	9/16 EHS	A1	17	21.00	3.97	19
			A1b	17a	21.00	3.96	19
			A1a	17b	21.00	7.02	33
	156.00	7/8 EHS	A1	33	47.82	7.37	15
			A1b	33a	47.82	7.31	15
			A1a	33b	47.82	13.57	28
	251.00	3/4 EHS	A1	T3	34.98	6.52	19
			A1a	T3b	34.98	10.14	29
			A1b	T3a	34.98	6.24	18
			A1b	T3	34.98	6.59	19
			A1a	T3a	34.98	10.20	29
			A1	T3b	34.98	6.23	18
1.2D + 1.0Di + 1.0Wi	76.00	9/16 EHS	A1	17	21.00	5.06	24
			A1b	17a	21.00	3.23	15
			A1a	17b	21.00	6.81	32
	156.00	7/8 EHS	A1	33	47.82	9.36	20
			A1b	33a	47.82	5.91	12
			A1a	33b	47.82	12.99	27
	251.00	3/4 EHS	A1	T3	34.98	7.75	22
			A1a	T3b	34.98	9.66	28
			A1b	T3a	34.98	5.24	15
			A1b	T3	34.98	5.44	16
			A1a	T3a	34.98	9.83	28
			A1	T3b	34.98	7.37	21
1.2D + 1.0Ev + 1.0Eh	76.00	9/16 EHS	A1	17	21.00	4.40	21
			A1b	17a	21.00	4.79	23
			A1a	17b	21.00	4.79	23
	156.00	7/8 EHS	A1	33	47.82	7.90	17
			A1b	33a	47.82	9.37	20
			A1a	33b	47.82	9.37	20
	251.00	3/4 EHS	A1	T3	34.98	5.10	15
			A1a	T3b	34.98	6.16	18
			A1b	T3a	34.98	6.14	18
			A1b	T3	34.98	6.19	18
			A1a	T3a	34.98	6.17	18
			A1	T3b	34.98	5.12	15

0.9D + 1.0Ev + 1.0Eh	76.00	9/16 EHS	A1	17	21.00	4.39	21
			A1b	17a	21.00	4.83	23
			A1a	17b	21.00	4.83	23
	156.00	7/8 EHS	A1	33	47.82	7.85	16
			A1b	33a	47.82	9.54	20
			A1a	33b	47.82	9.54	20
	251.00	3/4 EHS	A1	T3	34.98	5.07	15
			A1a	T3b	34.98	6.29	18
			A1b	T3a	34.98	6.27	18
			A1b	T3	34.98	6.31	18
			A1a	T3a	34.98	6.29	18
			A1	T3b	34.98	5.09	15
1.0D + 1.0W Normal	76.00	9/16 EHS	A1	17	21.00	1.74	8
			A1b	17a	21.00	4.23	20
			A1a	17b	21.00	4.22	20
	156.00	7/8 EHS	A1	33	47.82	4.03	8
			A1b	33a	47.82	8.82	18
			A1a	33b	47.82	8.84	18
	251.00	3/4 EHS	A1	T3	34.98	3.53	10
			A1a	T3b	34.98	6.19	18
			A1b	T3a	34.98	6.03	17
			A1b	T3	34.98	6.27	18
			A1a	T3a	34.98	6.11	17
			A1	T3b	34.98	3.63	10
1.0D + 1.0W 60° Wind	76.00	9/16 EHS	A1	17	21.00	2.55	12
			A1b	17a	21.00	2.55	12
			A1a	17b	21.00	5.00	24
	156.00	7/8 EHS	A1	33	47.82	5.64	12
			A1b	33a	47.82	5.61	12
			A1a	33b	47.82	10.43	22
	251.00	3/4 EHS	A1	T3	34.98	4.58	13
			A1a	T3b	34.98	6.97	20
			A1b	T3a	34.98	4.42	13
			A1b	T3	34.98	4.65	13
			A1a	T3a	34.98	7.03	20
			A1	T3b	34.98	4.45	13
1.0D + 1.0W 90° Wind	76.00	9/16 EHS	A1	17	21.00	3.38	16
			A1b	17a	21.00	1.96	9
			A1a	17b	21.00	4.80	23
	156.00	7/8 EHS	A1	33	47.82	7.22	15
			A1b	33a	47.82	4.45	9
			A1a	33b	47.82	10.01	21
	251.00	3/4 EHS	A1	T3	34.98	5.42	16
			A1a	T3b	34.98	6.71	19
			A1b	T3a	34.98	3.82	11
			A1b	T3	34.98	3.94	11
			A1a	T3a	34.98	6.82	19
			A1	T3b	34.98	5.23	15

Max Reactions

Base:	141.04 (Vertical)	2.40 (Horizontal)
Anchor 1:	45.79 (Vertical)	38.37 (Horizontal)

Max Usages

Max Leg: 54.2% (1.2D + 1.0W 90° Wind - Sect 5)
Max Diag: 63.7% (1.2D + 1.0W Normal Wind - Sect 8)
Max Horiz: 48.6% (1.2D + 1.0W 60° Wind - Sect 16)
Max Cable: 52.5% (1.2D + 1.0W 90° Wind) - Elev: 76 ft

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0Ev + 1.0Eh - Normal To Face	91.00	0.0102	0.2281	0.0163
	96.00	0.0195	0.2178	0.0184
	121.00	0.0247	0.1669	0.0181
	126.00	0.0200	0.1568	0.0512
	131.00	0.0263	0.1467	0.0191
	141.00	0.0256	0.1265	0.0187
	151.00	0.0380	0.1069	0.0492
	181.00	0.0499	0.0747	0.0367
	251.00	0.0676	-0.0085	0.0179
	261.00	0.0693	-0.0083	0.0214
	265.75	0.0710	-0.0083	0.0214
	270.50	0.0728	-0.0084	0.0221
	275.25	0.0747	-0.0084	0.0220
	280.00	0.0781	-0.0086	0.0226
0.9D + 1.0W 117 mph Wind at 60° From Face	91.00	0.3769	-0.2386	0.1790
	96.00	0.3899	-0.5495	0.1715
	121.00	0.4374	-0.5089	0.1095
	126.00	0.4446	-0.2890	0.0992
	131.00	0.4524	-0.4928	0.0950
	141.00	0.4641	-0.3675	0.0651
	151.00	0.4768	-0.4609	0.1159
	181.00	0.5642	-0.3780	0.2047
	251.00	0.6837	-0.0944	0.1083
	261.00	0.6991	-0.0886	0.1396
	265.75	0.7115	-0.0877	0.1555
	270.50	0.7244	-0.0869	0.1553
	275.25	0.7376	-0.0860	0.1695
	280.00	0.7561	-0.0892	0.1440

0.9D + 1.0W 117 mph Wind at 90° From Face	91.00	0.4930	0.2745	0.2322
	96.00	0.5122	0.3683	0.2285
	121.00	0.5848	0.1867	0.1423
	126.00	0.5946	0.1504	0.1187
	131.00	0.6045	0.1143	0.1221
	141.00	0.6215	0.0421	0.0885
	151.00	0.6381	-0.0685	0.0404
	181.00	0.7279	-0.0495	0.2012
	251.00	0.8281	0.0336	0.0392
	261.00	0.8449	0.0339	0.1094
	265.75	0.8549	0.0340	0.1337
	270.50	0.8654	0.0341	0.1258
	275.25	0.8759	0.0342	0.1530
	280.00	0.8867	0.0342	0.0626
0.9D + 1.0W 117 mph Wind at Normal To Face	91.00	0.5915	-0.2634	0.2752
	96.00	0.6115	-0.5788	0.2453
	121.00	0.6910	-0.5472	0.1449
	126.00	0.7030	-0.3230	0.1666
	131.00	0.7162	-0.5347	0.1296
	141.00	0.7359	-0.4047	0.1188
	151.00	0.7542	-0.5099	0.2292
	181.00	0.8550	-0.4308	0.2260
	251.00	0.9693	-0.1579	0.1922
	261.00	0.9855	-0.1562	0.1472
	265.75	0.9976	-0.1561	0.1475
	270.50	1.0103	-0.1561	0.1618
	275.25	1.0234	-0.1561	0.1400
	280.00	1.0421	-0.1576	0.2377
1.0D + 1.0W 60 mph Wind at 60° From Face	91.00	0.0822	0.0701	0.0402
	96.00	0.0838	0.0909	0.0433
	121.00	0.0943	-0.0382	0.0257
	126.00	0.0956	0.0125	0.0382
	131.00	0.0977	-0.0460	0.0201
	141.00	0.0988	-0.0255	0.0059
	151.00	0.0999	-0.0608	0.0465
	181.00	0.1161	-0.0550	0.0390
	251.00	0.1231	-0.0246	0.0255
	261.00	0.1234	-0.0237	0.0164
	265.75	0.1248	-0.0236	0.0200
	270.50	0.1266	-0.0236	0.0203
	275.25	0.1282	-0.0235	0.0232
	280.00	0.1314	-0.0244	0.0243
1.0D + 1.0W 60 mph Wind at 90° From Face	91.00	0.0797	0.2059	0.0383
	96.00	0.0906	0.2241	0.0435
	121.00	0.0998	0.1452	0.0226
	126.00	0.0934	0.1296	0.0362
	131.00	0.0981	0.1140	0.0172
	141.00	0.0957	0.0831	0.0035
	151.00	0.1004	0.0524	0.0494
	181.00	0.1106	0.0277	0.0345
	251.00	0.1106	0.0012	0.0364
	261.00	0.1110	0.0011	0.0120
	265.75	0.1119	0.0011	0.0149
	270.50	0.1129	0.0010	0.0137
	275.25	0.1139	0.0010	0.0192
	280.00	0.1151	0.0010	0.0136

1.0D + 1.0W 60 mph Wind at Normal To Face	91.00	0.0861	0.0460	0.0393
	96.00	0.0874	0.0672	0.0333
	121.00	0.0956	-0.0581	0.0164
	126.00	0.0971	-0.0089	0.0361
	131.00	0.0990	-0.0660	0.0125
	141.00	0.0990	-0.0459	0.0025
	151.00	0.0987	-0.0824	0.0481
	181.00	0.1103	-0.0679	0.0307
	251.00	0.1003	-0.0374	0.0194
	261.00	0.0989	-0.0358	0.0061
	265.75	0.0993	-0.0354	0.0054
	270.50	0.0999	-0.0351	0.0093
	275.25	0.1006	-0.0349	0.0039
	280.00	0.1026	-0.0352	0.0301
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face	91.00	0.1161	0.2149	0.0525
	96.00	0.1309	0.2223	0.0596
	121.00	0.1432	0.1344	0.0326
	126.00	0.1349	0.1169	0.0605
	131.00	0.1411	0.0994	0.0270
	141.00	0.1395	0.0646	0.0084
	151.00	0.1452	0.0297	0.0688
	181.00	0.1637	0.0039	0.0543
	251.00	0.1794	-0.0285	0.0371
	261.00	0.1791	-0.0272	0.0187
	265.75	0.1805	-0.0272	0.0205
	270.50	0.1822	-0.0272	0.0222
	275.25	0.1839	-0.0272	0.0232
	280.00	0.1873	-0.0285	0.0309
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face	91.00	0.1206	0.3624	0.0491
	96.00	0.1436	0.3677	0.0581
	121.00	0.1526	0.2692	0.0245
	126.00	0.1359	0.2496	0.0583
	131.00	0.1477	0.2300	0.0184
	141.00	0.1362	0.1909	0.0159
	151.00	0.1465	0.1519	0.0880
	181.00	0.1505	0.1107	0.0393
	251.00	0.1321	0.0304	0.0910
	261.00	0.1309	0.0305	0.0581
	265.75	0.1311	0.0305	0.0512
	270.50	0.1316	0.0306	0.0535
	275.25	0.1323	0.0306	0.0512
	280.00	0.1331	0.0307	0.0664
1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	91.00	0.1301	0.1843	0.0463
	96.00	0.1359	0.1920	0.0389
	121.00	0.1425	0.1059	0.0221
	126.00	0.1395	0.0888	0.0439
	131.00	0.1407	0.0717	0.0256
	141.00	0.1371	0.0377	0.0198
	151.00	0.1349	-0.0063	0.0465
	181.00	0.1295	-0.0238	0.0253
	251.00	0.0536	-0.0467	0.0651
	261.00	0.0396	-0.0458	0.0603
	265.75	0.0345	-0.0458	0.0613
	270.50	0.0296	-0.0458	0.0564
	275.25	0.0249	-0.0459	0.0625
	280.00	0.0223	-0.0469	0.0383

1.2D + 1.0Ev + 1.0Eh - Normal To Face	91.00	0.0083	0.2427	0.0146
	96.00	0.0181	0.2316	0.0174
	121.00	0.0221	0.1763	0.0171
	126.00	0.0165	0.1654	0.0522
	131.00	0.0230	0.1544	0.0177
	141.00	0.0217	0.1325	0.0166
	151.00	0.0340	0.1112	0.0494
	181.00	0.0438	0.0772	0.0331
	251.00	0.0591	-0.0089	0.0162
	261.00	0.0603	-0.0087	0.0187
	265.75	0.0618	-0.0088	0.0186
	270.50	0.0634	-0.0088	0.0193
	275.25	0.0650	-0.0088	0.0192
	280.00	0.0683	-0.0090	0.0199
1.2D + 1.0W 117 mph Wind at 60° From Face	91.00	0.3782	-0.2244	0.1801
	96.00	0.3911	-0.5362	0.1733
	121.00	0.4391	-0.4999	0.1109
	126.00	0.4465	-0.2809	0.1026
	131.00	0.4544	-0.4856	0.0964
	141.00	0.4663	-0.3620	0.0659
	151.00	0.4791	-0.4572	0.1184
	181.00	0.5671	-0.3761	0.2058
	251.00	0.6875	-0.0956	0.1090
	261.00	0.7030	-0.0897	0.1403
	265.75	0.7155	-0.0889	0.1564
	270.50	0.7284	-0.0881	0.1563
	275.25	0.7417	-0.0872	0.1702
	280.00	0.7604	-0.0903	0.1453
1.2D + 1.0W 117 mph Wind at 90° From Face	91.00	0.4978	0.2896	0.2348
	96.00	0.5172	0.3825	0.2319
	121.00	0.5914	0.1965	0.1449
	126.00	0.6007	0.1592	0.1215
	131.00	0.6108	0.1223	0.1244
	141.00	0.6281	0.0483	0.0899
	151.00	0.6449	-0.0641	0.0440
	181.00	0.7353	-0.0468	0.2026
	251.00	0.8361	0.0333	0.0391
	261.00	0.8530	0.0335	0.1097
	265.75	0.8630	0.0336	0.1343
	270.50	0.8735	0.0337	0.1264
	275.25	0.8841	0.0338	0.1535
	280.00	0.8949	0.0339	0.0629
1.2D + 1.0W 117 mph Wind at Normal To Face	91.00	0.5966	-0.2488	0.2779
	96.00	0.6167	-0.5651	0.2478
	121.00	0.6973	-0.5379	0.1470
	126.00	0.7096	-0.3146	0.1713
	131.00	0.7231	-0.5273	0.1315
	141.00	0.7431	-0.3989	0.1206
	151.00	0.7616	-0.5060	0.2332
	181.00	0.8635	-0.4287	0.2280
	251.00	0.9799	-0.1591	0.1939
	261.00	0.9964	-0.1573	0.1490
	265.75	1.0086	-0.1573	0.1494
	270.50	1.0215	-0.1572	0.1637
	275.25	1.0348	-0.1572	0.1419
	280.00	1.0537	-0.1588	0.2400

Guyed Tower Base Design

			Date: 3/4/2020
Customer Name:	SBA Communications Corp	**EIA/TIA Standard:**	EIA-222-H
Site Name:		**Structure Height (Ft.):**	280
Site Nmber:	CT04877-A-SBA	**Engineer Name:**	J. Tibbetts
Engr. Number:	92321	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Guyed Tower

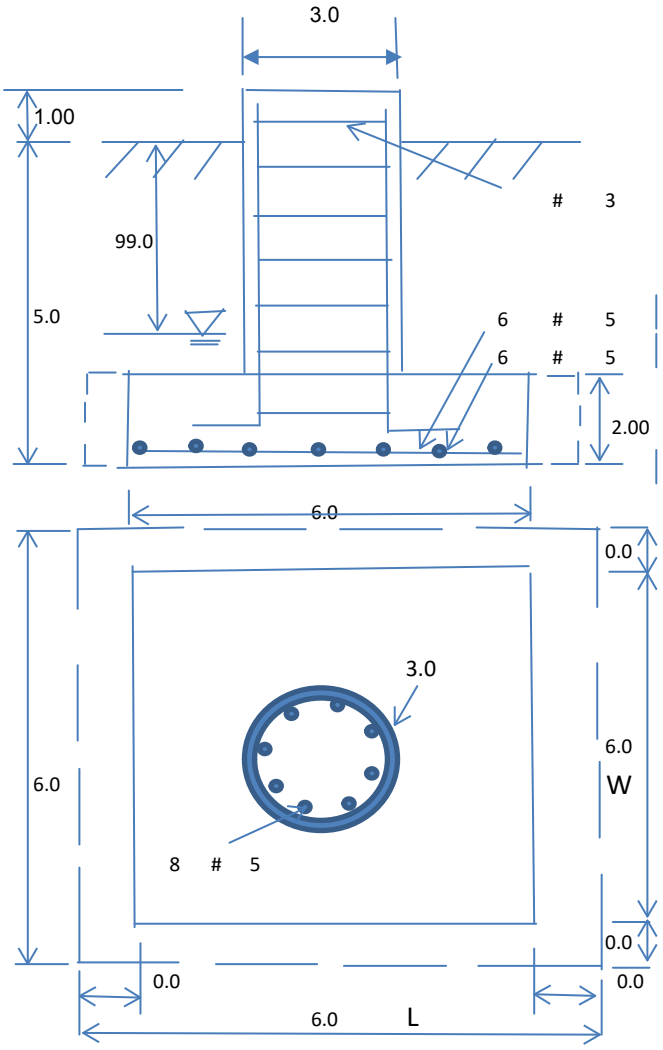
Analysis or Design? Analysis

Base Reactions (Factored):

Axial Load (Kips):	141.0	Shear Force (Kips):	2.4
Uplift Force (Kips):	0.0	Moment (Kips-ft):	
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	3.0	Depth of Base BG (ft.):	5.0
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	2.00
Length of Pad (ft.):	6	Width of Pad (ft.):	6
Final Length of pad (ft)	6.0	Final width of pad (ft):	6.0



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 #:	5	Tie / Stirrup Size #:	3	
Qty. of Vertical Rebars:	8	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	5	
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):	6	Qty. of Rebar in Pad (W):	6	

Soil Design Parameters:

Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	62.6	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):	30000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:	30
					Angle from Bottm of Pad:	25

Foundation Analysis and Design: Uplift Strength Reduction Factor: 0.75 — Compression Strength Reduction Factor: 0.6

Total Dry Soil Volume (cu. Ft.):	86.79	Total Dry Soil Weight (Kips):	10.85
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	10.85	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	100.27	Total Dry Concrete Weight (Kips):	15.04
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	15.04	Total Vertical Load on Base (Kips):	166.87

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	4234.0	<	Allowable Factored Soil Bearing (psf):	18000	0.24	OK!
Calculated Foundation Allowable Axail Capacity (Kips):	648.0	>	Design Factored Axial Load (Kips):	145	0.22	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			
					Load/ Capacity Ratio	
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	0.31		Tie / Stirrup Area (sq. in./each):	0.11		
Calculated Moment Capacity (Mn,Kips-Ft):	163.2	>	Design Factored Moment (Mu, Kips-Ft	9.6	0.06	OK!
Calculated Shear Capacity (Kips):	128.2	>	Design Factored Shear (Kips):	2.4	0.02	OK!
Calculated Tension Capacity (Tn, Kips):	133.9	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	1795.2	>	Design Factored Axial Load (Pu Kips):	141.0	0.08	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.14	OK!				
Pier Reinforcement Ratio:	0.002					
(2).Concrete Pad:						
One-Way Design Shear Capacity (L-Dir. Kips);	141.3	>	One-Way Factored Shear (L-Dir Kips):	0.0	0.00	OK!
One-Way Design Shear Capacity (W-Dir. Kips):	141.3	>	One-Way Factored Shear (W-Dir Kips)	0.0	0.00	OK!
Two-Way Design Shear Capacity (Kips):	699.0	>	Two-Way Factored Shear (Kips):	71.5	0.10	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0012	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0012		OK!
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	171.2	>	Moment at Bottom (L-Direct. K-Ft):	27.1	0.16	OK!
Lower Steel Pad Moment Capacity (W-Dir. Kips-ft):	171.2	>	Moment at Bottom (W-Dir. Kips-Ft):	27.1	0.16	OK!

ATTACHMENT E – PROOF OF DELIVERY OF NOTICE

Ref: CT587100-ES-003 Date: 01Oct20
Dep: BL GRAPHICS Wgt: 0.80 LBS

DV:

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
0.00 TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3346 4703

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 01OCT20
ACTWGT: 0.80 LB MAN
CAD: 0765627/CAFE3311

BILL THIRD PARTY

TO **CT 4877**
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVENUE

BOCA RATON FL 33487

REF: CT587100-ES-003 LONG HILL

DEPT: BL GRAPHICS

565C2/A27E/05A2

FedEx Express

J191219082001uv

FRI - 02 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **9151 3346 4703**

XH BCTA

33487
FL-US **FLL**

Ref: CT587100-ES-003 Date: 01Oct20
Dep: BL GRAPHICS Wgt: 0.80 LBS

DV:

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
0.00 TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3346 4699

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 01OCT20
ACTWGT: 0.80 LB
CAD: 0765627/CAFE3311

BILL THIRD PARTY

TO **ROBERT NERNEY, CITY PLANNER**
CITY OF WATERBURY
235 GRAND STREET

WATERBURY CT 06702

REF: CT587100-ES-003 LONG HILL

DEPT: BL GRAPHICS

565C2/A27E/05A2

FedEx Express

J191219082001uv

FRI - 02 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **9151 3346 4699**

00 BNHA

06702
CT-US **BDL**

Ref: CT587100-ES-003 Date: 01Oct20
Dep: BL GRAPHICS Wgt: 0.80 LBS

DV: 0.00

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
TOTAL: 0.00

Svcs: PRIORITY OVERNIGHT
TRCK: 9151 3346 4688

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 01OCT20
ACTWGT: 0.80 LB MAN
CAD: 0765627/CAFE3311

BILL THIRD PARTY

TO **HONORABLE NEIL M. O'LEARY, MAYOR**
CITY OF WATERBURY
235 GRAND STREET

WATERBURY CT 06702

REF: CT587100-ES-003 LONG HILL

DEPT: BL GRAPHICS

5GSC2/A27E/05A2

FedEx Express

J191219082001uv

TRK# 0201 **9151 3346 4688**

FRI - 02 OCT 10:30A
PRIORITY OVERNIGHT

00 BNHA

06702
CT-US **BDL**

Ref: CT587100-ES-003 Date: 01Oct20
Dep: BL GRAPHICS Wgt: 0.80 LBS

DV: 0.00

SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
TOTAL: 0.00

SVCS: PRIORITY OVERNIGHT
TRCK: 9151 3346 4677

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 01OCT20
ACTWGT: 0.80 LB
CAD: 0765627/CAFE3311

BILL THIRD PARTY

565C2/027E/05A2

TO

CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051

REF: CT587100-ES-003 LONG HILL

DEPT: BL GRAPHICS

FedEx Express

J191219082001uv

FRI - 02 OCT 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **9151 3346 4677**

00 BDLA

06051
CT-US **BDL**

ATTACHMENT F - POWER DENSITY REPORT

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
603-644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

ES-003

207 Garden Circle

Waterbury, CT 06704

June 25, 2020

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed Eversource installation on the guyed tower at 207 Garden Circle in Waterbury, CT. Eversource is proposing to install one omnidirectional antenna as part of its 220 MHz communications system.

This report considers the proposed antenna configuration as detailed by Eversource along with % MPE (Maximum Permissible Exposure) measurements around the existing tower to determine FCC compliance of the facility. Please note that there are multiple towers and a water tank with antennas in close proximity to the subject tower, all of which would contribute to the % MPE measurements recorded during the field survey.

Figure 1: View of ES-003 Long Hill

Site Address	207 Garden Circle
Latitude	41° 34' 11.0" N
Longitude	73° 1' 3.0" W
Site Elevation AMSL	826’
Survey Engineer	Marc Salas
Survey Date/Time	6/23/2020; 10:00 AM – 11:00 AM

Table 1: Survey Information

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached “FCC Limits for Maximum Permissible Exposure (MPE)” in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

4. Power Density Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65, and Connecticut Siting Council recommendations:

$$\text{Power Density} = \left(\frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power = 1.64 x ERP

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and full power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. As a result, the calculated power density and corresponding % MPE levels reported below are much higher than the actual levels will be from the final installation.

5. Proposed Antenna Configuration

Table 2 below lists the technical details of the proposed Eversource installation. These parameters are applied to the above calculation methods in order to calculate the % MPE values of the proposed equipment.

Operator	Antenna Model	TX Freq. (MHz)	Ant Gain (dBd)	Power ERP (Watts)	Number of Channels	Vertical Beamwidth	Length (ft)	Antenna Centerline Height (ft)
Eversource	dBSpectra DS2C00F36D	217	0	124	4	60°	12.6	147

Table 2: Eversource Antenna Configuration (Proposed)[1] [2]

[1] Transmit power assumes 0 dB of cable loss.

[2] Transmit antenna height listed for the proposed antenna is based on the Tower Engineering Solutions Structural Analysis Report dated March 4, 2020 and the overall mechanical length of the antenna. The proposed antenna consists of two internally stacked antennas – upper is for receive, lower is for transmit. In cases where the digital antenna pattern is unavailable, a similar antenna pattern was substituted in the calculations.

6. Measurement Procedure

Frequencies from 300 KHz to 50 GHz were measured using the Narda Probe EA 5091, E-Field, shaped, FCC probe in conjunction with the NBM550 survey meter. The EA 5091 probe is “shaped” such that in a mixed signal environment (i.e.: more than one frequency band is used in a particular location), it accurately measures the percent of MPE.

From FCC OET Bulletin No. 65 - Edition 97-01 – “A useful characteristic of broadband probes used in multiple-frequency RF environments is a frequency-dependent response that corresponds to the variation in MPE limits with frequency. Broadband probes having such a "shaped" response permit direct assessment of compliance at sites where RF fields result from antennas transmitting over a wide range of frequencies. Such probes can express the composite RF field as a percentage of the applicable MPEs”.

Probe Description - As suggested in FCC OET Bulletin No. 65 - Edition 97-01, the response of the measurement instrument should be essentially isotropic, (i.e., independent of orientation or rotation angle of the probe). For this reason, the Narda EA 5091 probe was used for these measurements.

Sampling Description - At each measurement location, a spatially averaged measurement is collected over the height of an average human body. The NBM550 survey meter performs a time average measurement while the user slowly moves the probe over a distance range of 20 cm to 200 cm (about 6 feet) above ground level. The results recorded at each measurement location include average values over the spatial distance.

Instrumentation Information - A summary of specifications for the equipment used is provided in the table below.

Manufacturer	Narda Microwave			
Probe	EA 5091, Serial# 0116			
Calibration Date	May 2020			
Calibration Interval	24 Months			
Meter	NBM550, Serial# E-1069			
Calibration Date	May 2020			
Calibration Interval	24 Months			
Probe Specifications	**Frequency Range**	**Field Measured**	**Standard**	**Measurement Range**
	300 KHz-50 GHz	Electric Field	U.S. FCC 1997 Occupational/Controlled	0.2 – 600 % of Standard

Table 3: Instrumentation Information

Instrument Measurement Uncertainty - The total measurement uncertainty of the NARDA measurement probe and meter is no greater than ±3 dB (0.5% to 6%), ±1 dB (6% to 100%), ±2 dB (100% to 600%). The factors which contribute to this include the probe’s frequency response deviation, calibration uncertainty, ellipse ratio, and isotropic response[3]. Every effort is taken to reduce the overall uncertainty during measurement collection including pointing the probe directly at the likely highest source of emissions.

[3] For further details, please refer to Narda Safety Test Solutions NBM550 Probe Specifications, pg. 64
http://www.narda-sts.us/pdf_files/DataSheets/NBM-Probes_DataSheet.pdf

7. Surveyed and Calculated % MPE Results

Measured and calculated results and a description of each survey location are detailed in the table below. Measurements were recorded on June 23, 2020 between 10:00 AM and 11:00 AM. The calculated % MPE contribution from the proposed equipment modifications was then added to the measured % MPE values in the "Composite % MPE" column. These calculated values incorporate the antenna pattern of the antenna model specified by Eversource to determine the "Off Beam Loss" factor shown in the power density formula from Section 4. All % MPE values are in reference to the FCC Uncontrolled/General Population exposure limit.

Table 4 below lists 14 measurements recorded in the vicinity of the tower. The highest spatially averaged measurement was 6.46% (Average Uncontrolled/General Population MPE) and was recorded at Location 6 by the west side of the guyed tower compound. The highest composite (measured + calculated) % MPE value is calculated to be 7.92% (Average Uncontrolled/General Population) and is calculated to occur at Location 5 by the northwest corner of the guyed tower compound.

Meas. Location	Location Description	Latitude	Longitude	Dist. From Site (feet)	Measured % MPE (Uncontrolled / General)	Calculated % MPE (Eversource Proposed)	Composite % MPE (Uncontrolled / General)
1	Compound access gate	41.56985	-73.01673	119	1.21%	2.57%	3.78%
2	SE corner of fenced compound	41.56956	-73.01670	134	4.98%	2.33%	7.32%
3	SW corner of fenced compound	41.56960	-73.01727	60	1.25%	1.35%	2.59%
4	NE corner of fenced compound	41.57008	-73.01672	171	1.88%	1.90%	3.78%
5	NW corner of fenced compound	**41.57011**	**-73.01710**	**141**	**5.63%**	**2.29%**	**7.92%**
6	W side of fenced compound	**41.56979**	**-73.01723**	**35**	**6.46%**	**0.69%**	**7.14%**
7	NE of fenced compound on Garden Circle by Lattice Tower	41.57025	-73.01655	248	4.30%	1.12%	5.42%
8	End of Garden Circle (North of water tank)	41.57074	-73.01643	417	3.02%	0.41%	3.43%
9	NW corner of fenced compound	41.57017	-73.01719	163	2.08%	1.98%	4.06%
10	SE of fenced compound, on Garden Circle	41.56948	-73.01668	155	1.93%	2.03%	3.96%
11	Intersection of Garden Hill Cir. / Carden Cir.	41.56893	-73.01680	306	1.64%	0.75%	2.39%
12	Intersection of Garden Hill Cir. / Traverse St.	41.56906	-73.01883	526	4.25%	0.26%	4.51%
13	Corner of Garden Hill Cir. / Lamont St.	41.56915	-73.02013	846	4.30%	0.10%	4.40%
14	181 Lamont St. (Corner of Delford Rd.)	41.57150	-73.01860	760	2.36%	0.12%	2.48%

Table 4: Measured and Calculated % MPE Results [4]

[4] Due to measurement uncertainty at low levels (See Table 3), any readings outside the measurement range of the probe (< 1.00 % FCC General Population/Uncontrolled MPE) are noted as such.

Figures 2 and 3 below are aerial views[5] of the tower location and the surrounding area, along with the measurement locations listed in Table 4.

Figure 2: Measurement Points – Zoom In

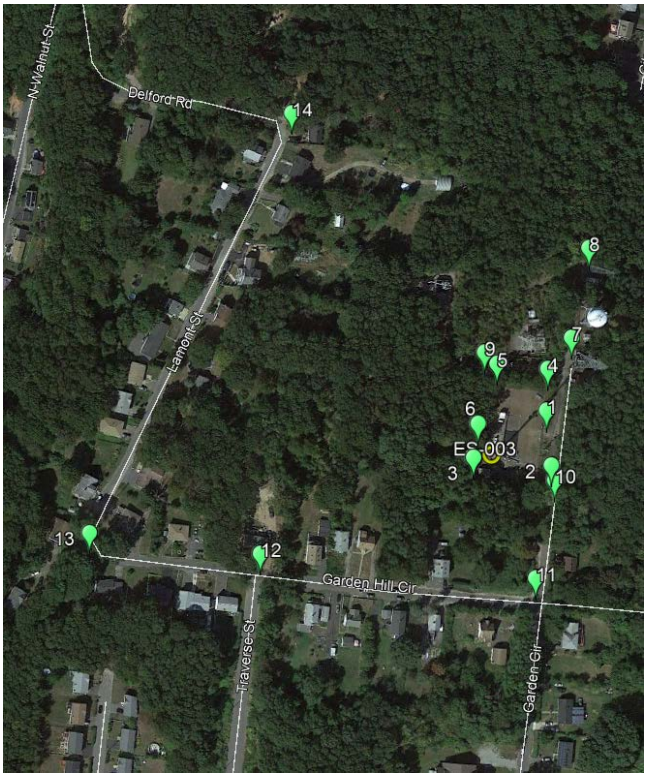


Figure 3: All Measurement Points

[5] Map showing location of telecommunications facility and the surrounding area. *Google Earth*, https://earth.google.com/web/.

8. Conclusion

A number of accessible areas around the tower at 207 Garden Circle in Waterbury, CT were surveyed and found to be well within the mandated General Population/Uncontrolled limits for Maximum Permissible Exposure, as delineated in the Federal Communications Commission's Radio Frequency exposure rules published in 47 CFR 1.1307(b)(1)-(b)(3).

The highest spatially averaged % MPE measurement of all surveyed points based on the 1997 FCC standard for exposure to the general population is 6.46% MPE. This measurement was recorded at Location 6 by the west side of the guyed tower compound.

The highest composite (measured + calculated) power density is **7.95% of the FCC General Population MPE limit** with the proposed Eversource equipment is calculated to occur at Location 5 by the northwest corner of the guyed tower compound.

The above analysis concludes that RF exposure at ground level around the tower, both currently and with the proposed antenna installation, will be below the maximum power density limits as outlined by the FCC in the OET Bulletin 65 Ed. 97-01.

As noted previously, the calculated % MPE levels are more conservative (higher) than the actual levels will be from the finished installation.

9. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in FCC OET Bulletin 65 Edition 97-01, IEEE Std. C95.1, and IEEE Std. C95.3.

Report Prepared By: Cory Goulet
Associate RF Engineer
C Squared Systems, LLC

June 25, 2020
Date

Reviewed/Approved By: Keith Vellante
Director of RF Services
C Squared Systems, LLC

June 26, 2020
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[6]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[7]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 5: FCC Limits for Maximum Permissible Exposure (MPE)

[6] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[7] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

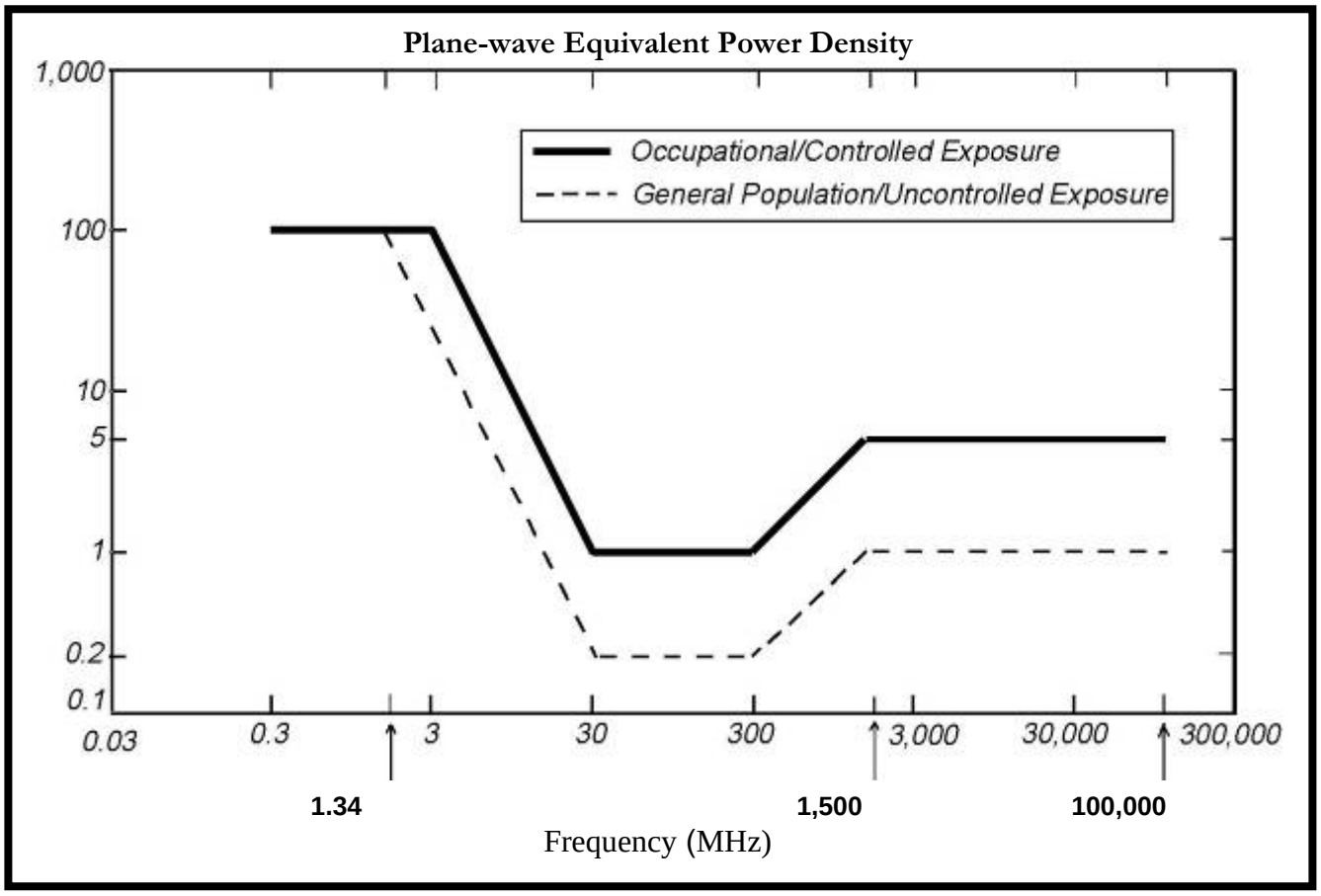
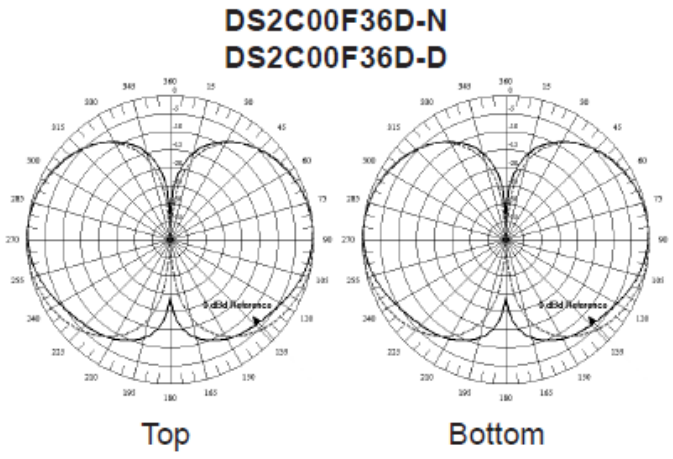


Figure 4: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Eversource Antenna Data Sheet and Electrical Patterns[8]

217 MHz

Manufacturer:	dbSpectra
Model #:	DS2C00F36D
Frequency Band:	160 - 222 MHz
Gain:	0 dBd
Vertical Beamwidth:	60°
Horizontal Beamwidth:	360°
Polarization:	Vertical-Polarization
Length:	12.6’



[8] In the case where pattern data was unavailable from the manufacturer, vertical patterns shown are for antennas with similar specifications.