STATE OF CONNECTICUT
DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION
Division of Statewide Emergency Telecommunications

April 15, 2020

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

RE: Tower Share Application
Location: 7 Hoskins Road (access via 5 St. Andrews Road), Bloomfield, CT 06002
Latitude: 41-53-33.49 N
Longitude: -72-45-56.47 W
Eversource Site Identification: Bloomfield North Talcott

Dear Attorney Bachman:

The State of Connecticut Department of Emergency Services and Public Protection (DESPP) Division of Statewide Emergency Telecommunications (DSET) intends to install antennas and add a shelter with supporting equipment on the tower site located at 7 Hoskins Road in Bloomfield, Connecticut. This property is also referred to as 5 St. Andrews Road in some of the supporting documents accompanying this letter, which happens to be the address that provides access to the tower. The municipal Assessor's card and associated maps are included to provide clarification, attached as **Exhibit A**.

With this letter and corresponding exhibits, DSET respectfully requests the Siting Council to support the proposed tower share on the existing self-supported, lattice tower owned by Eversource Energy. The proposed antennas will be used by the Town of Bloomfield Police Department and enhance coverage of the Connecticut Land Mobile Radio Network (CLMRN). The CLMRN is used by the Connecticut State Police and available for other public safety partners to enable interoperable communication across the entire state.

DSET is proposing to install on the existing Eversource tower and within the existing compound:

a. three (3) 700/800 MHz antennas at a mounting height of 183 feet on the existing 185 foot self-supporting, lattice tower:
   - a Tx Omni (14.2' x 3") with a centerline height of 192.1 feet,
   - an Rx Omni (14.2' x 3") with a centerline height of 177.9 feet, and
   - an Rx Omni (14.2' x 3") with a centerline height of 177.9 feet;

b. one (1) Tower Top Amplifier (TTA) (15" x 12" x 7.5");

c. ½" LDF and 1 5/8" AVA transmission lines in approximately 235' lengths;

d. PVC conduit along the existing Eversource ice bridge;

e. a separate 260 sq. ft. shelter adjacent to the tower, which will contain equipment cabinets; and

f. one (1) EPA Certified Generac 80 kW DC generator, one (1) 1,000 gallon propane tank with fuel sensor, and a UPS battery bank as a redundant power supply. The generator will be operated weekly, mid-morning in 20-minute run cycles, for preventative maintenance.

Included are plans by Centek Engineering for Pyramid Network and Motorola Solutions, dated April 14, 2020, attached as **Exhibit B**. Also included is the full structural analysis prepared by All-Points Technology Corporation for SAI Communications, Inc. dated February 21, 2020, confirming the existing tower is structurally capable of supporting the proposed equipment, attached as **Exhibit C.**

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of DSET's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Steven J. Florio, Telecomm Engineer for the property owner, Eversource Energy; Bloomfield's Mayor, Suzette DeBeatham-Brown; and Jose Giner, Director of Land Use, Town of Bloomfield (**copied via e-mail in this submission to the Siting Council**).

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

1. The proposed modification will not result in an increase in the height of the existing tower. The top of the self-supporting lattice tower is 185-feet; DSET's proposed antennas will be mounted at a height of 183-feet.
2. The proposed modifications will result in a modest increase, 1,670 square feet (13%), of the site compound as depicted on the attached site plan. The proposed site addition includes:
    a. one (1) 12' x 34', three room shelter installed on a concrete slab-on-grade supported by concrete footings;
    b. one (1) 1,000 gallon propane tank installed on a 5' x 6" x 18' concrete slab-on-grade platform supported by concrete footings with an underground gas line; and
    c. will be enclosed by an 8' tall chain link fence (approx. 130 linear feet).
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. The incremental effect of the proposed changes will be negligent.
4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached Radio Frequency Emissions Analysis Report prepared by Pinnacle Telecom Group, dated April 2, 2020, the combined site

operations will result in a total power density of 3.2246% general population MPE limit, as evidenced by **Exhibit F.**

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter and corresponding exhibits, DSET asserts that the shared use of this facility satisfies these criteria. Such sharing meets public safety concerns, will avoid the unnecessary proliferation of towers, and is in the public interest.

1. **Technical Feasibility:** The existing self-supporting lattice tower has been deemed structurally capable of supporting DSET's proposed loading. The structural analysis was done in accordance with the Connecticut State Building Code and the Telecommunications Industry Association's TIA-222, Revision G, structural standard for antenna supporting structures and antennas. The structural analysis is included as **Exhibit C**. Note: This report was conducted by All-Points Technology Corporation on February 21, 2020 for AT&T and accounts for the addition of three antennas for AT&T in addition to the three proposed by DSET (highlighted in yellow on p. 2).
2. **Legal Feasibility:** As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this self-supporting lattice tower in Bloomfield. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit DSET to obtain a building permit for the proposed installation. Further, a Letter of Authorization (dated March 19, 2020) from the tower owner is included as **Exhibit D**, authorizing DSET to file this application for shared use.
3. **Environmental Feasibility:** The proposed shared use of this facility would have a minimal environmental impact according to the attached FCC Exclusions Analysis, attached as **Exhibit E**. The undertaking will not substantially increase the height of the existing tower. The installation of one DSET antenna, at the 183' position of the existing 185-foot tower, has a center line height of 191.2'. This would have an insignificant visual impact on the area around the tower.
   DSET proposes to expand the existing 13,015 sq.' facility compound a modest 1,670 sq.' to install a new, three room shelter, which will be used to store equipment related to the proposed new antennas, and a 1,000 gallon propane tank installed on a concrete slab. The existing compound contains five (5) equipment shelters and supporting equipment for the various companies sharing use of the tower. DSET's shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing tower and equipment compound.
   Additionally, as evidenced by **Exhibit F,** the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.
4. **Economic Feasibility:** DSET will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of

Authorization has been provided by the owner to assist DSET with this tower sharing application.

5. **Public Safety Concerns:** As discussed above, the self-supporting lattice tower is structurally capable of supporting DSET's proposed loading. DSET is not aware of any public safety concerns relative to the proposed sharing of the existing self-supporting lattice tower. DSET's addition of three antennas will allow the Bloomfield Police Department to improve coverage and reliability of their radio network. It will also enhance the coverage and reliability of the State's land mobile radio network used by the Connecticut State Police (Troop H) as well as other federal, municipal, and private, public-safety partners.

The Division of Statewide Emergency Communications is confident that the proposed shared tower use complies with the requirements of Connecticut General Statutes 16-50aa and R.C.S.A. §16-50j-89. We look forward to an affirming response from the Siting Council and will promptly respond to any questions or further requests of the council if needed.

Sincerely,

Mark Gorka
Grants and Contracts Specialist

Department of Emergency Services and Public Protection
Division of Statewide Emergency Telecommunications
1111 Country Club Road, Middletown, CT 06457

Office: (860) 685-8107
Fax: (860) 685-8362
Mobile: (860) 508-9684

Attachments: Exhibit A – Property & Site Specific Details
Exhibit B – Stamped Set of Engineering Plans
Exhibit C – Structural Analysis
Exhibit D – Letter of Owner Authorization
Exhibit E – Environmental (FCC) Exclusions Analysis
Exhibit F – FCC Radio Frequency Compliance Report

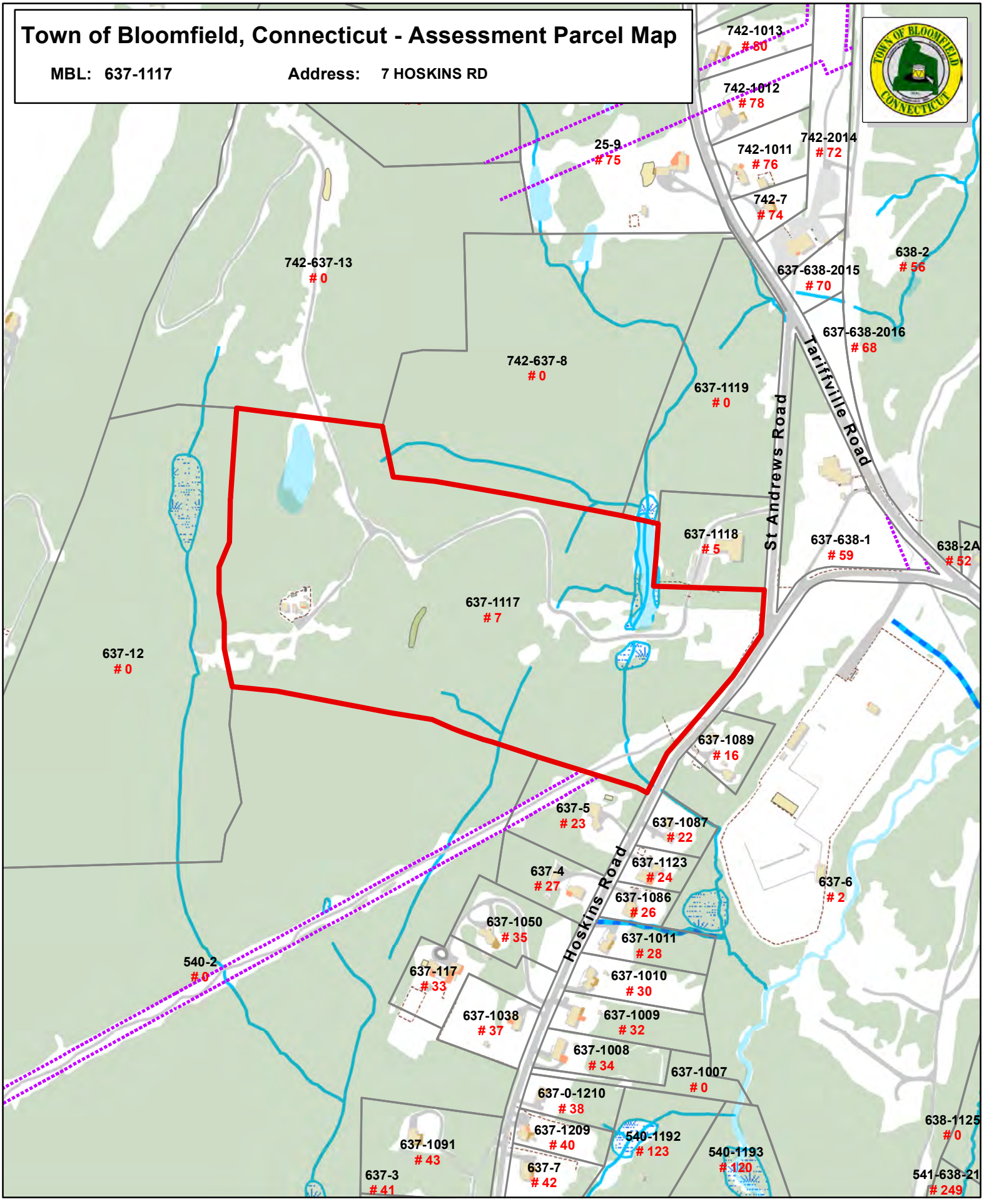
cc: Steven J. Florio, Eversource Energy (as property & tower owner)
Suzette DeBeatham-Brown, Mayor, Town of Bloomfield
Jose Giner, Director of Land Use, Town of Bloomfield

Exhibit A

Property & Site Specific Details

Town of Bloomfield, Connecticut - Assessment Parcel Map

MBL: 637-1117 **Address:** 7 HOSKINS RD



Approximate Scale:

1 inch = 450 feet

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

Map Produced October 2019

Parcels labeled by Unique ID

Town of Bloomfield, CT

Property Listing Report

Map Block Lot	637-1117	Building #	1	PID	8110	Account	R93240

Property Information

Property Location	7 HOSKINS RD
Owner	CONN LIGHT & POWER CO
Co-Owner	ATTN: PROPERTY TAX DEPT
Mailing Address	P O BOX 270 HARTFORD CT 06141
Land Use	201 Comm Land
Land Class	C
Zoning Code	R-80
Census Tract	0000

Site Index	4
Acreage	38.33
Utilities	
Lot Setting/Desc	
Fire District	C
Book / Page	

Photo

Sketch

Primary Construction Details

Year Built	1962
Building Desc.	Vacant with OutBldg
Building Style	UNKNOWN
Building Grade	
Stories	
Occupancy	
Exterior Walls	
Exterior Walls 2	NA
Roof Style	
Roof Cover	
Interior Walls	
Interior Walls 2	NA
Interior Floors 1	
Interior Floors 2	

Heating Fuel	
Heating Type	
AC Type	
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	NA
Bsmt Fin Area	0
Rec Rm Area	0
Bsmt Gar	0
Fireplaces	0

(*Industrial / Commercial Details)

Building Use	Vacant
Building Condition	A
Sprinkler %	NA
Heat / AC	NA
Frame Type	NA
Baths / Plumbing	NA
Ceiling / Wall	NA
Rooms / Prtns	NA
Wall Height	NA
First Floor Use	NA
Foundation	POURED CONC.

Report Created On 4/13/2020

Town of Bloomfield, CT

Property Listing Report | Map Block Lot 637-1117 | Building # 1 | PID 8110 | Account R93240

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Improvements		
Outbuildings	883200	618240
Land	540800	275180
Total	1424000	893420

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Outbuilding and Extra Features

Type	Description
Cell Shed	480 S.F.
Cell Shed	120 S.F.
Cell Tower	4 UNITS

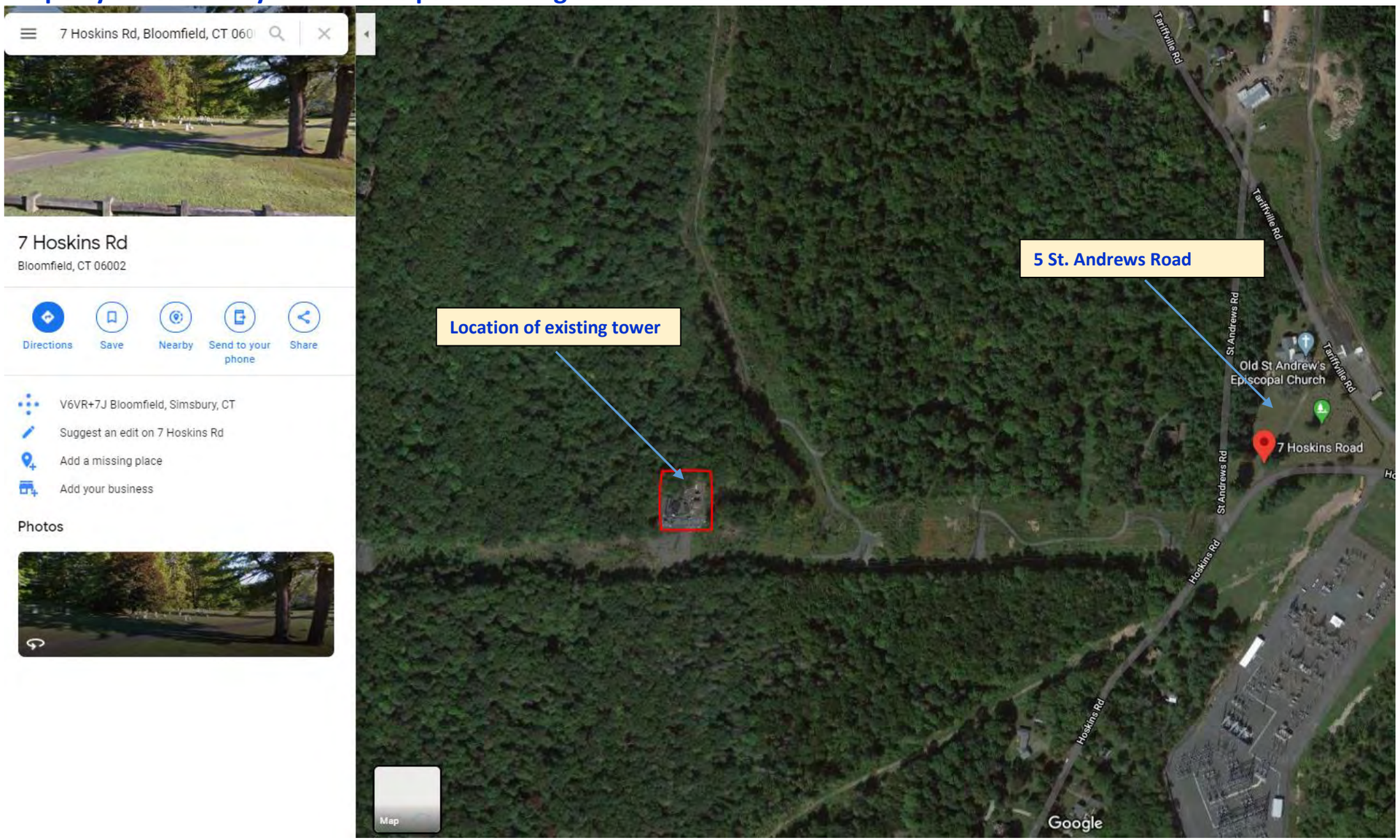
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CONN LIGHT & POWER CO	0292/0097		0

Report Created On 4/13/2020

Google Map: 7 Hoskins Road, Bloomfield

Property accessible by bituminous path starting at 5 St. Andrews Road



Map created: 4/13/20

Site Plan: 7 Hoskins Road, Bloomfield

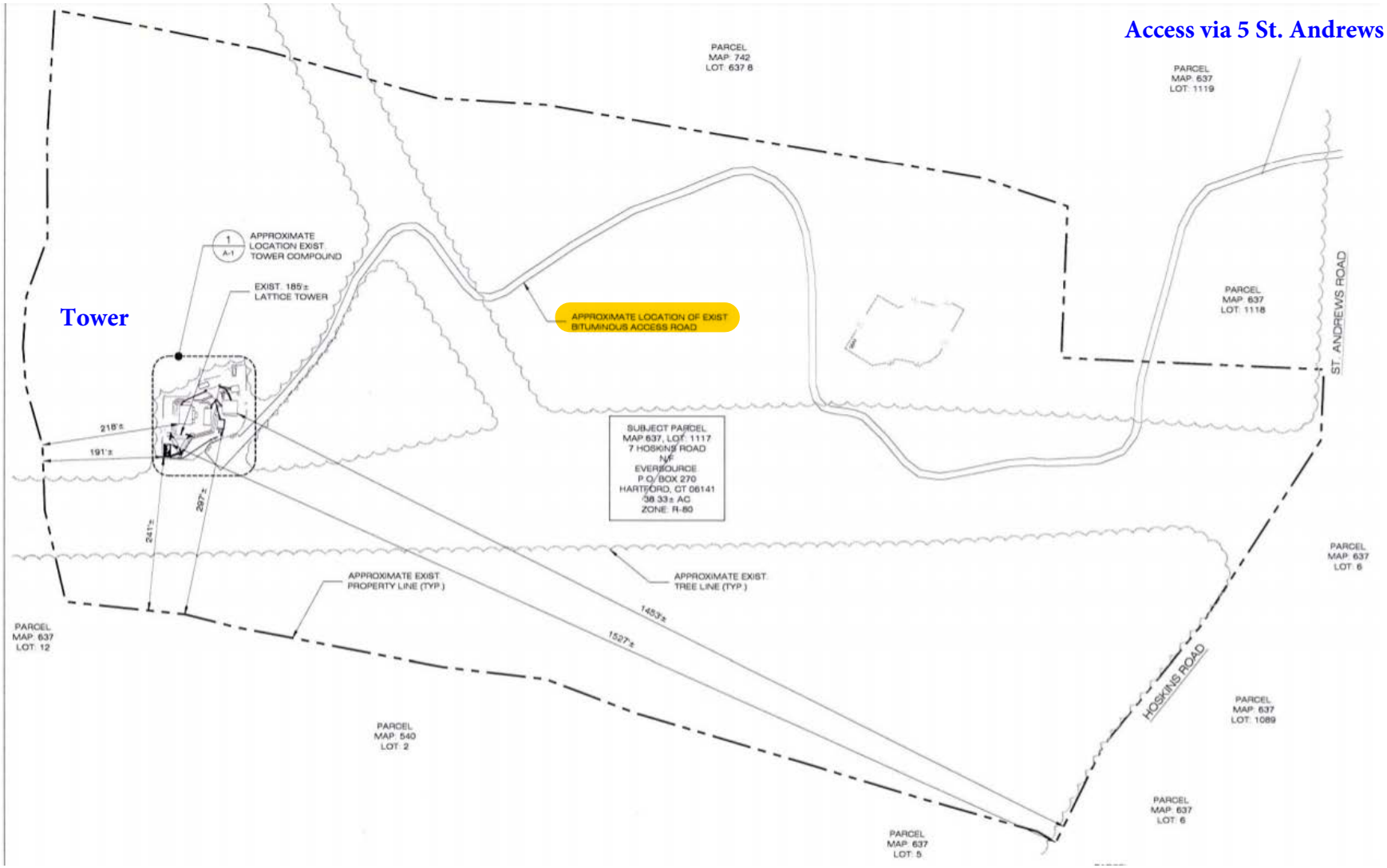


Exhibit B

Stamped Set of Engineering Plans

CONNECTICUT DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION (DESPP)

COMMUNICATIONS UPGRADE PROJECT

BLOOMFIELD (EVERSOURCE)

5 ST. ANDREWS ROAD
BLOOMFIELD, CT 06002

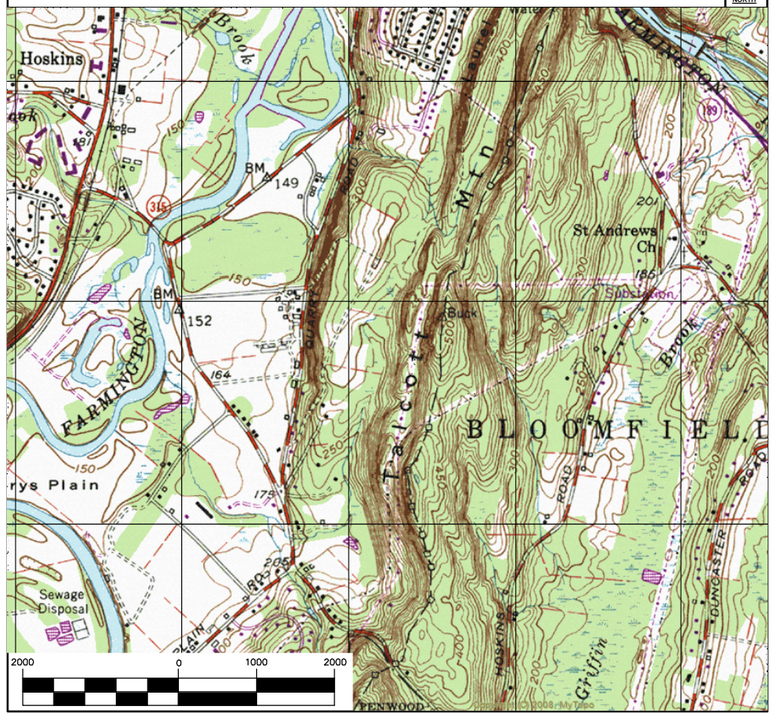
SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	0
N-1	NOTES AND SPECIFICATIONS	0
N-2	NOTES AND SPECIFICATIONS	0
C-0	SITE LOCATION MAP	0
C-1	SITE PLAN	0
C-2	TOWER ELEVATION	0
C-3	ANTENNA DETAILS	D
C-4	TYPICAL DETAILS	0
C-5	TYPICAL DETAILS	0
C-6	EQUIPMENT SHELTER ELEVATIONS	0
C-7	CONDUIT PENETRATION DETAILS	0
C-8	TYPICAL DETAILS	0
S-1	FOUNDATION PLANS AND DETAILS	0
E-1	SITE PLAN	0
E-2	ELECTRICAL RISER DIAGRAM	0
E-3	ELECTRICAL SCHEMATIC DIAGRAM	0
E-4	ELECTRICAL GROUNDING DIAGRAM	0
E-5	ELECTRICAL DETAILS	0
E-6	ELECTRICAL DETAILS	0
E-7	ELECTRICAL SPECIFICATIONS	0
E-8	ELECTRICAL SPECIFICATIONS	0

SITE COORDINATES: LATITUDE: 41° 53' 33.49" N
LONGITUDE: 72° 45' 56.47" W
GROUND ELEVATION: ±399' AMSL

COORDINATES AND GROUND ELEVATION PROVIDED BY PYRAMID NETWORK SERVICES

VICINITY MAP SCALE: 1" = 2000' NORTH



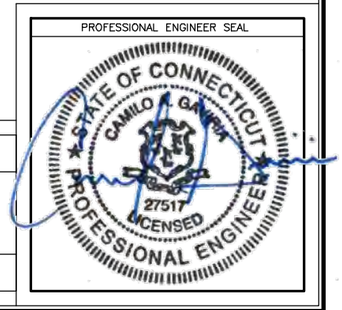
PROJECT SCOPE

1. INSTALL (1) NEW TX ANTENNA
2. INSTALL (2) NEW RX ANTENNA
3. INSTALL (1) TOWER TOP AMPLIFER
4. INSTALL (1) NEW SITE-PRO VFA10-HD ANTENNA SECTOR FRAMES
5. INSTALL (1) NEW 12'x34' EQUIPMENT SHELTER W/ 80kW GENERATOR IN GENERATOR ROOM ON CONCRETE SLAB-ON-GRADE.
6. INSTALL (1) NEW COAX CABLE ICE BRIDGE
7. INSTALL (1) 1000 GAL. PROPANE TANK ON CONCRETE SLAB-ON-GRADE
8. INSTALL (1) NEW 4" PVC INTERCONNECT CONDUIT
9. INSTALL ±130' OF NEW 8' CHAINLINK FENCE TO EXPAND COMPOUND FROM ±13015 SQ.FT. TO ±14685 SQ.FT.

PROJECT SUMMARY

SITE NAME:	BLOOMFIELD (EVERSOURCE)
SITE ADDRESS:	5 ST. ANDREWS ROAD BLOOMFIELD, CT 06002
PROPERTY OWNER:	EVERSOURCE P.O BOX 270 HARTFORD, CT 06141
CUSTOMER CONTACT:	CONNECTICUT DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION (DESPP) P.O BOX 270 (860) 685-8090
PROJECT MANAGER:	MOTOROLA SOLUTIONS GARY FLEISCH (203) 231-1397 PYRAMID NETWORK SERVICES, LLC ROB MCCABE (315) 373-3040
PROJECT ENGINEER:	MOTOROLA SOUTIONS ROB CADY (860) 456-4091
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CAMILO A. GAVIRIA, PE (203) 488-0580 EXT. 119

PROFESSIONAL ENGINEER SEAL



PYRAMID Network Services, LLC
MOTOROLA SOLUTIONS

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/14/20	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

Project Name:
BLOOMFIELD (EVERSOURCE)

Location:
5 ST. ANDREWS DRIVE
BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: TITLE SHEET

Dwg. No.: T - 1

Sheet 1 of 21

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 116 MPH (3 SECOND GUST)
- RISK CATEGORY: III (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 97 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA-222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2018 CONNECTICUT FIRE SAFETY CODE AND 2017 NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "DIG SAFE" (DIAL 811) AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. ALL RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED OFF SITE AND BE LEGALLY DISPOSED, AT NO ADDITIONAL COST.
4. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE EQUIPMENT AND TOWER AREAS.
5. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
6. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
7. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
8. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
9. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

EARTHWORK NOTES

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.
2. CRUSHED STONE FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED VIBRATORY PLATE COMPACTOR WITH A MINIMUM OF 2 PAQSSES OF COMPACTOR PER LIFT.
3. COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1 ½"	100
No. 4	40-70
No. 100	5-20
No. 200	4-8

4. CRUSHED STONE TO BE UNIFORMLY GRADED, CLEAN, HARD PROCESS AGGREGATE MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1"	100
¾"	90-100
½"	0-15
⅜"	0-5

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".
6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 8" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.
7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED EQUAL.

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · CAMILO A. GARCIA · 27517 · LICENSED PROFESSIONAL ENGINEER

PYRAMID Network Services, LLC

MOTOROLA SOLUTIONS

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/14/20	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

Project Name:
BLOOMFIELD (EVERSOURCE)

Location:
5 ST. ANDREWS DRIVE
BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: NOTES AND SPECIFICATIONS

Dwg. No.: N - 1

NOTES AND SPECIFICATIONS

SLAB ON GRADE CONSTRUCTION:

1. PLACE AND COMPACT GRAVEL FILL IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL, BUT NOT LESS THAN ONE (1) PER LAYER, TO ENSURE COMPACTION TO 95% OF MAXIMUM DRY DENSITY.

2. SAW CUT CONTROL JOINTS 1 /8" WIDE AND TO A DEPTH EQUAL TO 1 /4 OF THE SLAB THICKNESS. CONSTRUCTION JOINTS AS REQUIRED SHALL BE KEYED AND LOCATED AT CONTROL JOINT INTERVALS. ALL CONTROL JOINTS SHALL BE FILLED WITH EUCO EPOXY #600 EPOXY JOINT FILLER AS MANUFACTURED BY EUCLID CHEMICAL CO. OR APPROVED EQUAL.

3. SAW CUT CONTROL JOINTS AT 20'–0" ON CENTER MAXIMUM WITHIN 12 HOURS OF CONCRETE PLACEMENT.

4. SLABS ON GRADE FINISHES: STEEL TROWEL FINISH AS DEFINED IN ACI 301. CURE SLAB WITH SONNEBORN KURE–N–SEAL WB OR APPROVED EQUAL, APPLIED AS RECOMMENDED BY MANUFACTURER.

5. CONSTRUCTION JOINT SPACING IN FOUNDATION WALLS SHALL NOT EXCEED 40 FEET NOR 20 FEET FROM ANY CORNER. JOINTS SHALL BE KEYED AND HORIZONTAL BARS SHALL EXTEND THRU JOINT AND BE 48 BAR DIAMETER SPLICED.

6. IN REINFORCED CONCRETE WALLS AND FOOTINGS, PROVIDE CORNER DOWELS OF THE SAME SIZE AND AT THE SAME SPACING AS HORIZONTAL REINFORCING. DOWELS SHALL HAVE A 48 BAR DIAMETER SPLICE WITH HORIZONTAL REINFORCING EACH DIRECTION.

7. WHERE FOOTINGS ARE IN CLOSE PROXIMITY TO SUBSURFACE PIPING, TOP OF FOOTING SHALL BE LOWERED TO PROVIDE A MINIMUM OF 8" BELOW INVERT ELEVATION OF PIPING.

8. CONCRETE PIERS (IF PROVIDED): PLACE CONCRETE PIERS AND WALLS TOGETHER, SET PIER STEEL AND EXTEND WALL STEEL THROUGH PIER VERTICAL BARS. PROVIDE DOWELS WITH STANDARD HOOK FROM FOOTINGS AT ALL PIERS. SIZE AND QUANTITY OF DOWELS TO MATCH VERTICAL PIER REINFORCING.

9. PROVIDE CORROSION RESISTANT ACCESSORIES IN ALL EXPOSED CONCRETE.

10. RUB ALL EXPOSED CONCRETE SURFACES SMOOTH AND FINISH WITH CEMENT GROUT.

11. PROVIDE AIR ENTRAINMENT IN ALL EXTERIOR CONCRETE AS WELL AS GARAGE AND PORCH SLABS THAT WILL BE EXPOSED TO DEICING SALTS.

FOUNDATION CONSTRUCTION NOTES

1. ALL FOOTINGS SHALL BE PLACED ON SUITABLE, COMPACTED SOIL HAVING ADEQUATE BEARING CAPACITY AND FREE OF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED.

2. SUBGRADE PREPARATION: IF UNSUITABLE SOIL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIALS FROM BELOW PROPOSED STRUCTURE FOUNDATIONS AND COMPACT EXPOSED SOIL SURFACES. PLACE AND COMPACT APPROVED GRAVEL FILL. PLACEMENT OF ALL COMPACTED FILL MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABORATORY. FILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557–70 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167–66 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL. BUT NOT LESS THAN ONE (1) PER LAYER, TO INSURE COMPACTION TO 95% OF MAX. DRY DENSITY.

3. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE KEPT REASONABLY DRY AND PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.

4. WHERE GROUNDWATER IS ENCOUNTERED, DEWATERING SHALL BE ACCOMPLISHED CONTINUOUSLY AND COMPLETELY DURING FOUNDATION CONSTRUCTION. PROVIDE CRUSHED STONE AS REQUIRED TO STABILIZE FOOTING SUBGRADE.

5. ALL FOOTINGS ARE TO REST ON FIRM SOIL, REGARDLESS OF ELEVATIONS SHOWN ON THE DRAWINGS, BUT IN NO CASE MAY FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.

6. FOUNDATION WATERPROOFING AND DAMPPROOFING SHALL COMPLY WITH BUILDING CODE REQUIREMENTS UNLESS A MORE SUBSTANTIAL SYSTEM IS INDICATED OR SPECIFIED.

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REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/14/20	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

Project Name:
BLOOMFIELD (EVERSOURCE)

Location:
5 ST. ANDREWS DRIVE
BLOOMFIELD, CT 06002

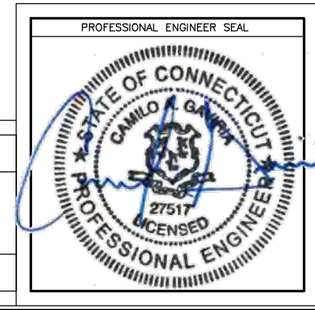
Centek Project No.: 19160.01

Drawing Title.: NOTES AND SPECIFICATIONS

Dwg. No.: N – 2

Sheet 3 of 21

PROFESSIONAL ENGINEER SEAL



1 / C-0 **SITE LOCATION MAP**

SCALE: 1" = 300'

NORTH

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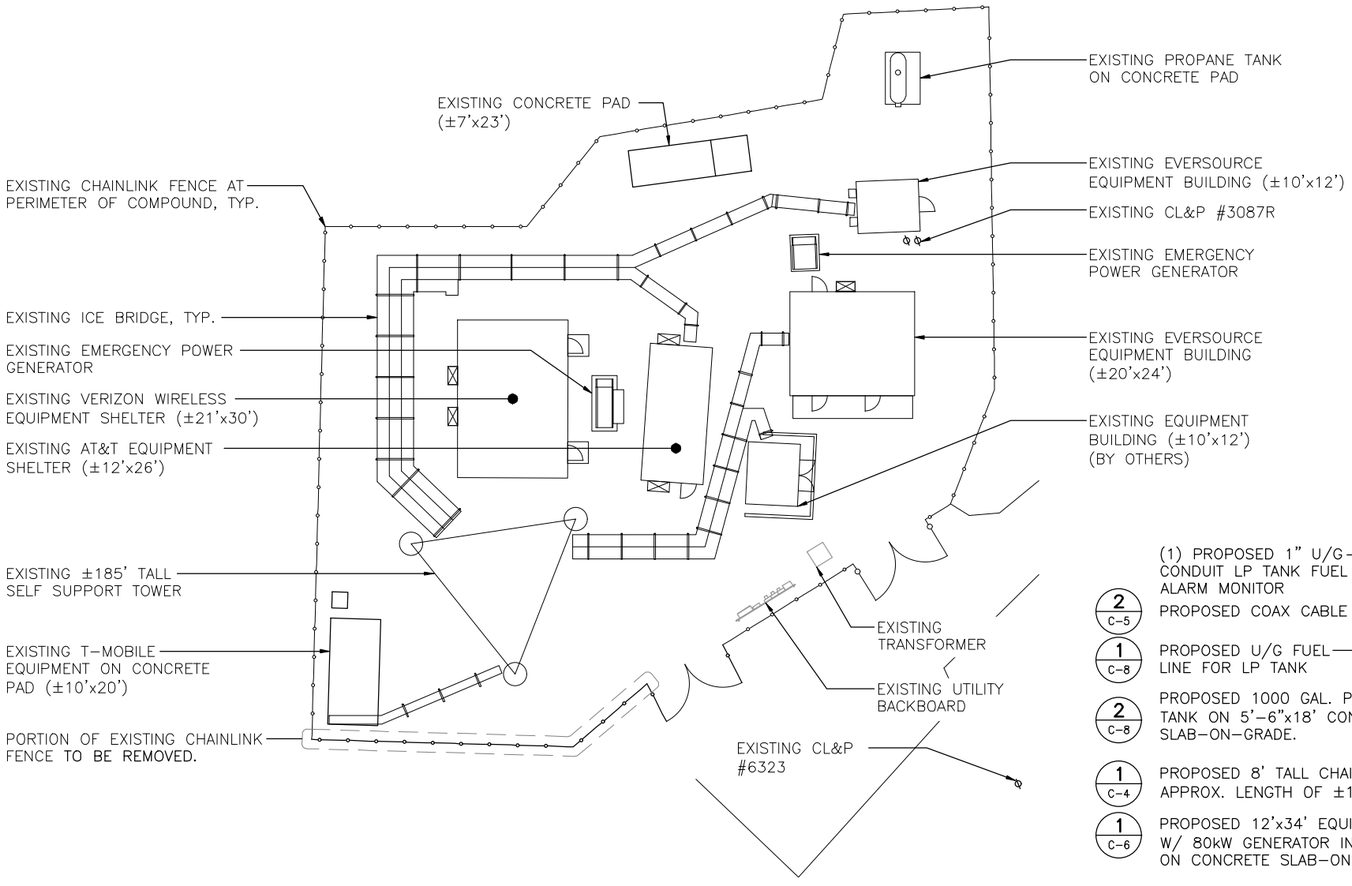
Centek Project No.: 19160.01

Drawing Title.: SITE LOCATION MAP

Dwg. No.: C - 0

Sheet 4 of 21

EXISTING COMPOUND SIZE: 13,015 SQUARE FEET



1 / C-1 **SITE PLAN - EXISTING**

SCALE: 1" = 30'- 0"

APPROXIMATE NORTH

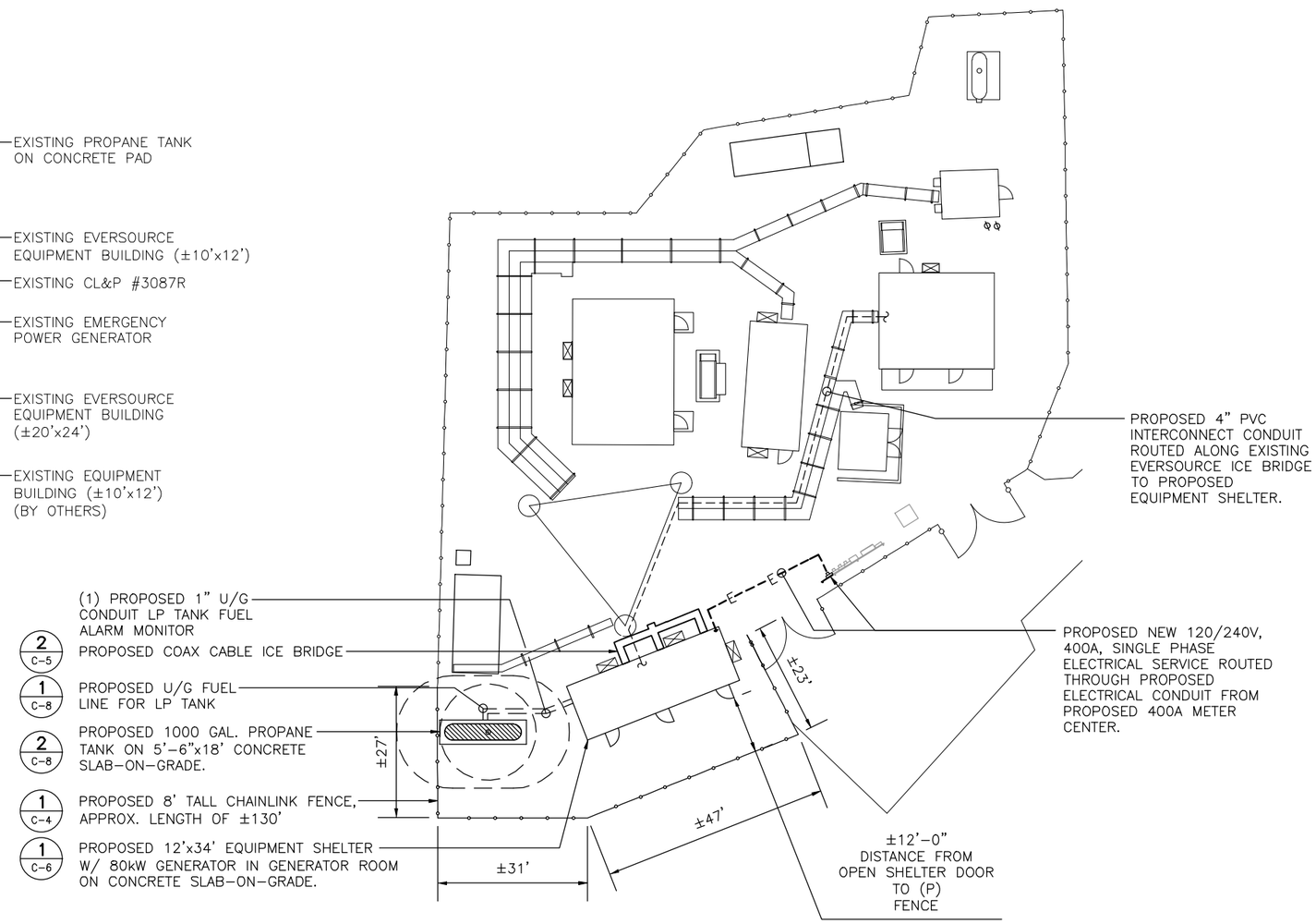
GRAPHIC SCALE

30 0 15 30 60

(IN FEET)

1 inch = 30 ft.

PROPOSED COMPOUND SIZE: 14,685 SQUARE FEET



2 / C-1 **SITE PLAN - PROPOSED**

SCALE: 1" = 30'- 0"

APPROXIMATE NORTH

GRAPHIC SCALE

30 0 15 30 60

(IN FEET)

1 inch = 30 ft.

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Project Name:
BLOOMFIELD (EVERSOURCE)

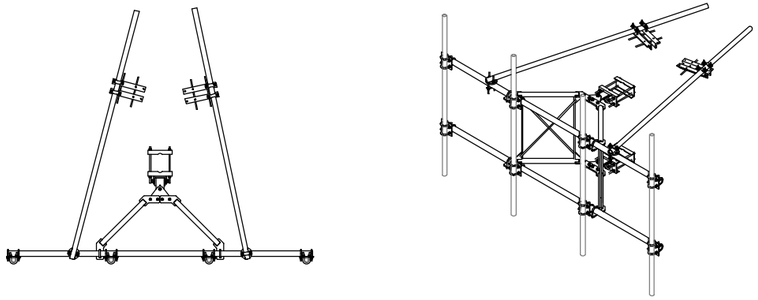
Location:
5 ST. ANDREWS DRIVE
BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: PARTIAL SITE PLAN

Dwg. No.: C - 1

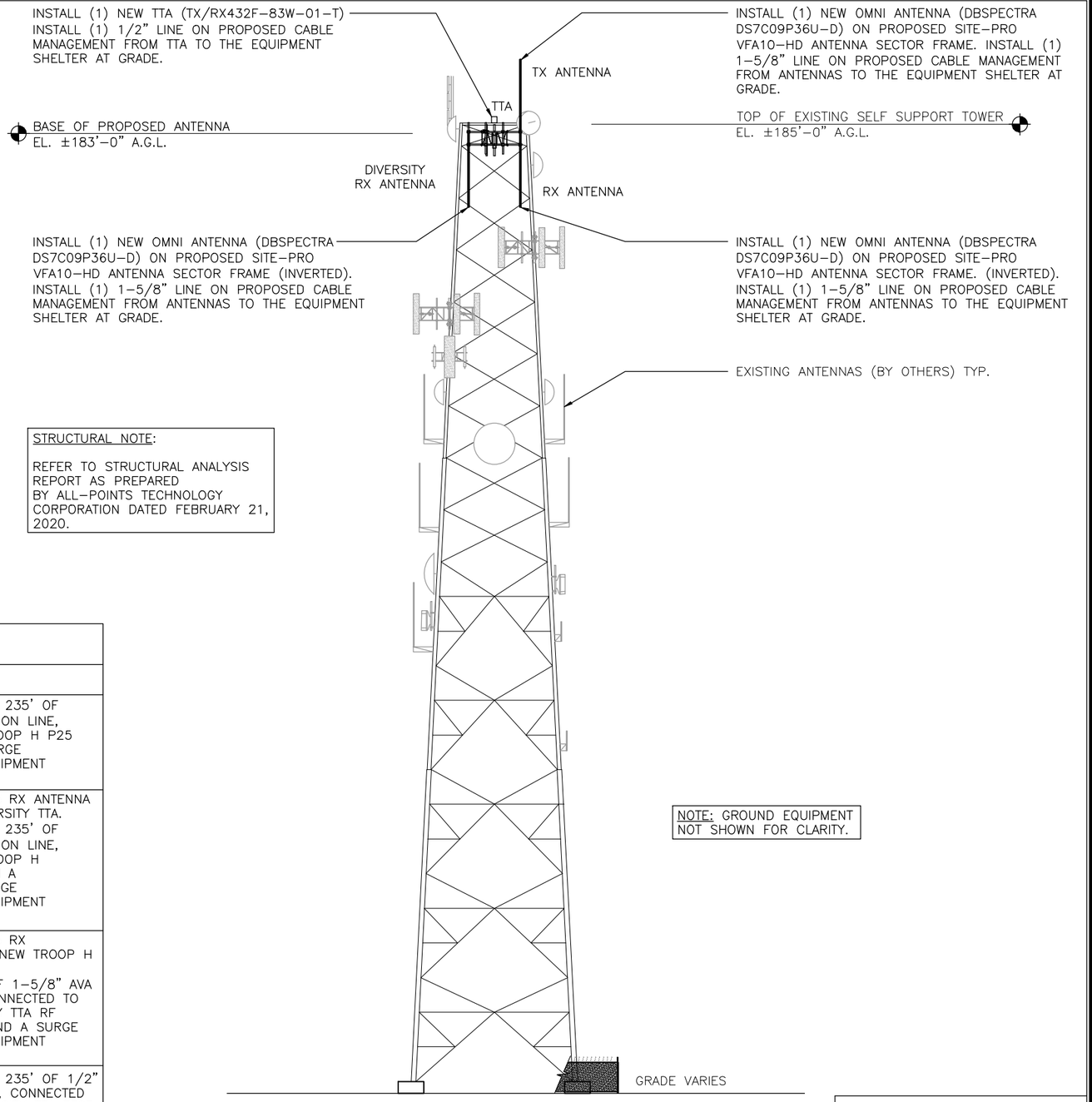
Sheet 5 of 21



SITEPRO: (P/N: VFA10-HD)

2 / C-2 10' SECTOR V-FRAME DETAIL

SCALE: NOT TO SCALE



STRUCTURAL NOTE:

REFER TO STRUCTURAL ANALYSIS REPORT AS PREPARED BY ALL-POINTS TECHNOLOGY CORPORATION DATED FEBRUARY 21, 2020.

NOTE: GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

1 / C-2 PROPOSED TOWER ELEVATION

SCALE: 1" = 25'- 0"

ANTENNA SCHEDULE

ANTENNA	ANTENNA MODEL	BASE HEIGHT	ANTENNA SIZE	ANTENNA TYPE	AZIMUTH	QUANTITY	LINE TYPE	LINE SIZE	NOTES
TROOP H P25 TX	DBSPECTRA DS7C09P36U-D	183'	14.2'L x 3"ø	TX OMNI	0°	1	AVA TRANSMISSION	(1) 1-5/8"	INSTALL APPROXIMATELY 235' OF 1-5/8" AVA TRANSMISSION LINE, CONNECTED TO THE TROOP H P25 TX ANTENNA AND A SURGE PROTECTOR IN THE EQUIPMENT SHELTER.
TROOP H P25 RX	DBSPECTRA DS7C09P36U-D (PROPOSED AS INVERTED)	183'	14.2'L x 3"ø	RX OMNI	0°	1	AVA TRANSMISSION	(1) 1-5/8"	CONNECT TROOP H P25 RX ANTENNA TO NEW TROOP H DIVERSITY TTA. INSTALL APPROXIMATELY 235' OF 1-5/8" AVA TRANSMISSION LINE, CONNECTED TO THE TROOP H DIVERSITY TTA RF DOWN A CONNECTOR AND A SURGE PROTECTOR IN THE EQUIPMENT SHELTER.
TROOP H P25 DIVERSITY RX	DBSPECTRA DS7C09P36U-D (PROPOSED AS INVERTED)	183'	14.2'L x 3"ø	RX OMNI	0°	1	AVA TRANSMISSION	(1) 1-5/8"	CONNECT TROOP H P25 RX DIVERSITY ANTENNA TO NEW TROOP H DIVERSITY TTA, INSTALL APPROXIMATELY 235' OF 1-5/8" AVA TRANSMISSION LINE, CONNECTED TO THE TROOP H DIVERSITY TTA RF DOWN B CONNECTOR AND A SURGE PROTECTOR IN THE EQUIPMENT SHELTER.
TROOP H DIVERSITY TTA	TX/RX 432F-83W-01-T	185'	15"LX12"WX7.5"D	TTA	0°	1	LDF TRANSMISSION	(1) 1/2"	INSTALL APPROXIMATELY 235' OF 1/2" LDF TRANSMISSION LINE, CONNECTED TO THE TROOP H DIVERSITY TTA TEST CONNECTOR AND A SURGE PROTECTOR IN THE EQUIPMENT SHELTER.

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Project Name: BLOOMFIELD (EVERSOURCE)

Location: 5 ST. ANDREWS DRIVE BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: TOWER ELEVATION

Dwg. No.: C - 2

DB SPECTRA: DSC09P36U-D

PROPOSED ANTENNAS		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: DB SPECTRA MODEL: DS7C09P36U-D	14.2"L x 2.5"ø	66 LBS.

1 / C-3 ANTENNA DETAILS
SCALE: NOT TO SCALE

PROPOSED TX/RX AMPLIFIER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: TX/RX MODEL 432F-83W-01-T	11.3"L x 7"W X 10.2"D	25 LBS.

2 / C-3 TX/RX AMPLIFIER DETAIL
SCALE: NOT TO SCALE

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BLOOMFIELD (EVERSOURCE)

Location:
5 ST. ANDREWS DRIVE
BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: TYPICAL DETAILS

Dwg. No.: C - 3

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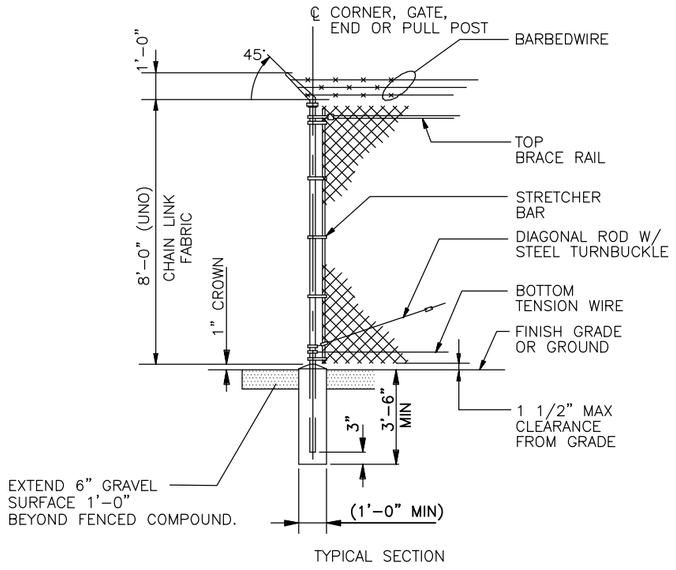

TYPICAL SECTION

1 / C-4 **WOVEN WIRE FENCE DETAIL**

NOT TO SCALE

WOVEN WIRE FENCE NOTES:

1. GATE POST, CORNER, TERMINAL OR PULL POST 2 ½"ø SCHEDULE 40 PIPE FOR GATE WIDTHS UP THRU 6 FEET OR 12 FEET FOR DOUBLE SWING GATE PER ASTM–F1083.
2. LINE POST: 2"ø SCHEDULE 40 PIPE PER ASTM–F1083.
3. GATE FRAME: 1 ½"ø SCHEDULE 40 PIPE PER ASTM–F1083.
4. TOP RAIL & BRACE RAIL: 1 ½"ø SCHEDULE 40 PIPE PER ASTM–F1083.
5. FABRIC: 12 GA. CORE WIRE SIZE 1 ¼" MESH, CONFORMING TO ASTM–A392.
6. TIE WIRE: MINIMUM 11 GA. GALVANIZED STEEL AT POSTS AND RAILS. A SINGLE WRAP OF FABRIC TIE AND TENSION WIRE BY HOG RINGS SPACED 24" INTERVALS.
7. TENSION WIRE: 7 GA. GALVANIZED STEEL.
8. GATE LATCH: DROP DOWN LOCKABLE FORK HATCH AND LOCK, KEYED TO OWNER'S REQUIREMENTS.
9. HEIGHT TO MATCH EXISTING.

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Location: 5 ST. ANDREWS DRIVE
BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: TYPICAL DETAILS

Dwg. No.: C - 4

Sheet 8 of 21

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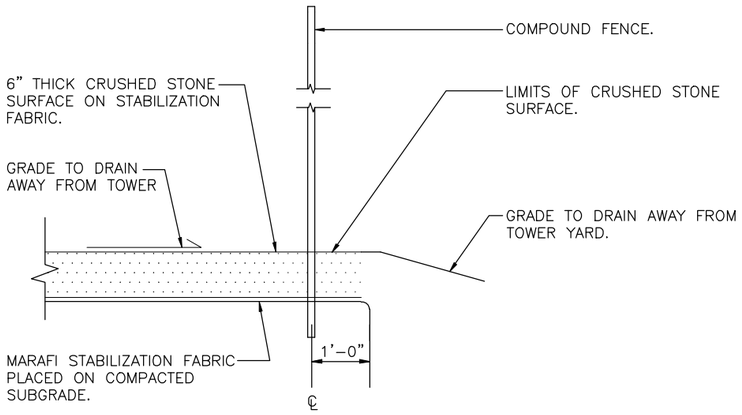
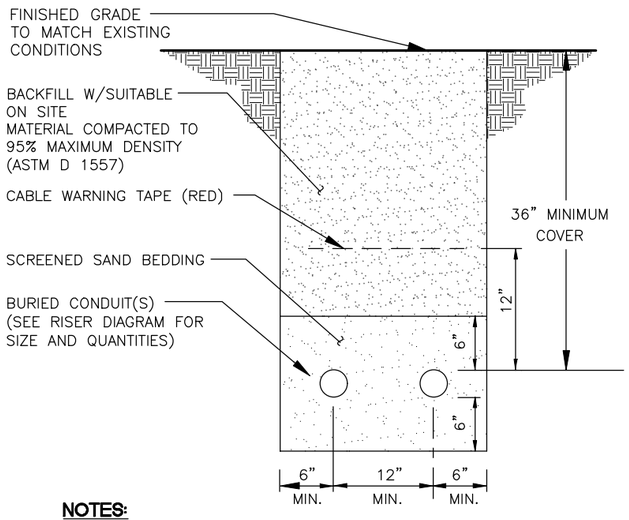


1 C-5 **COMPOUND SURFACING DETAIL**

NOT TO SCALE



NOTES:

1. WHERE EXISTING UTILITIES ARE LIKELY TO BE ENCOUNTERED, CONTRACTOR SHALL HAND DIG AND PROTECT EXISTING UTILITIES.
2. WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN UTILITY SOURCE AND SERVICE EQUIPMENT, COORDINATE WITH UTILITY COMPANY FOR BURIAL DEPTH REQUIREMENTS.
3. COORDINATE WITH ELECTRICAL ENGINEER WHERE SHALLOW BEDROCK IS ENCOUNTERED BETWEEN SERVICE EQUIPMENT AND EQUIPMENT SHELTER.

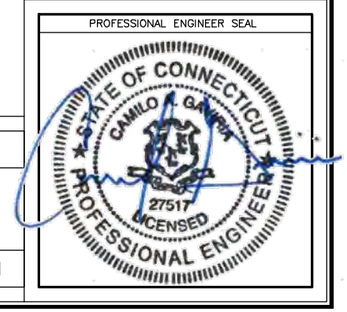
4 C-5 **TYPICAL ELECTRICAL TRENCH DETAIL**

NOT TO SCALE

2 C-5 **SINGLE-POST ICE BRIDGE DETAIL**

NOT TO SCALE

PROFESSIONAL ENGINEER SEAL



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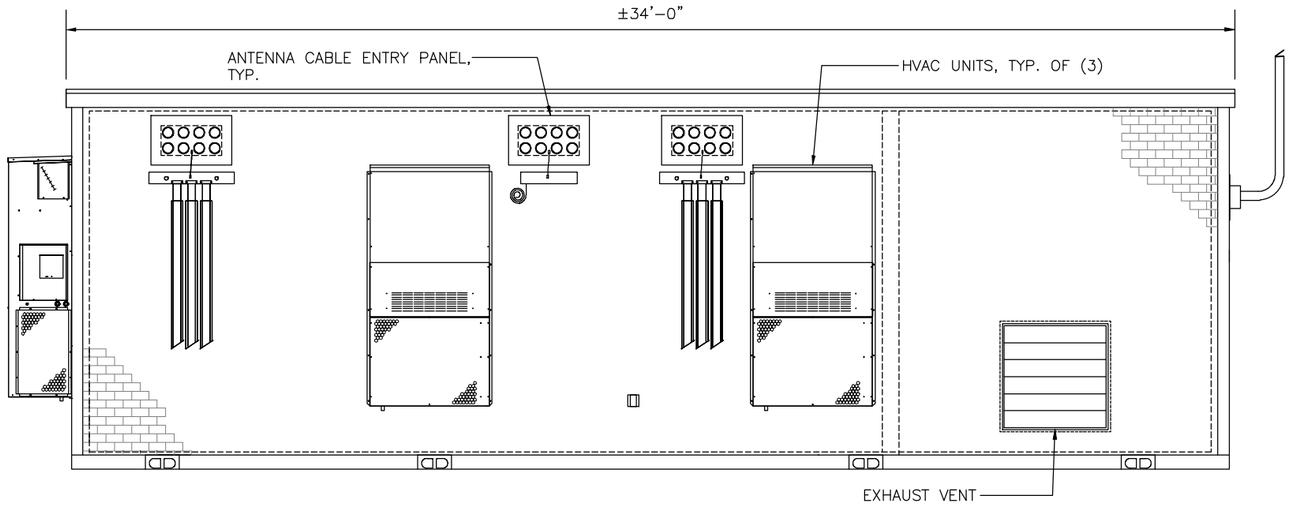
Location:
5 ST. ANDREWS DRIVE
BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

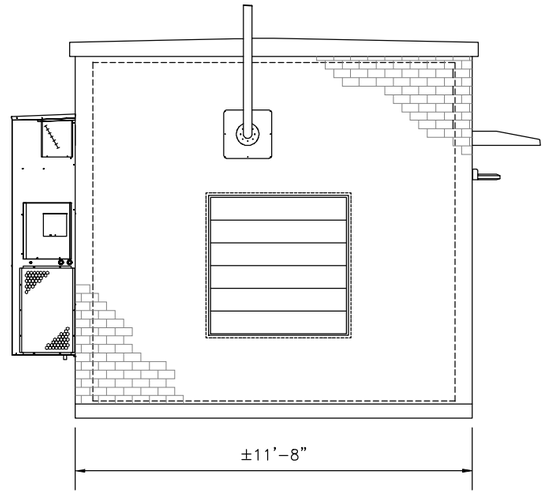
Drawing Title.: TYPICAL DETAILS

Dwg. No.: C - 5

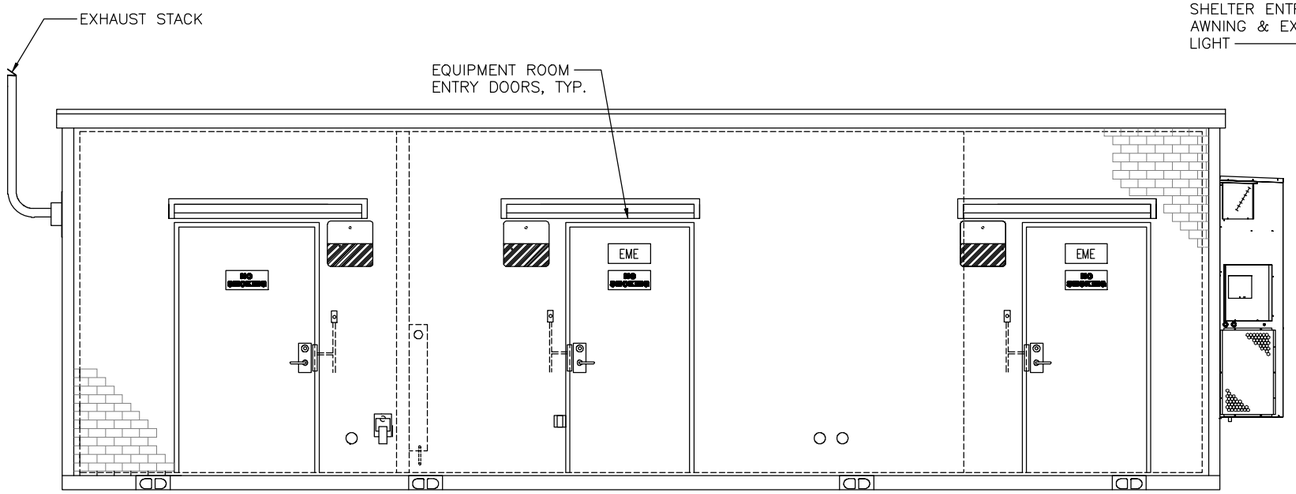
Sheet 9 of 21



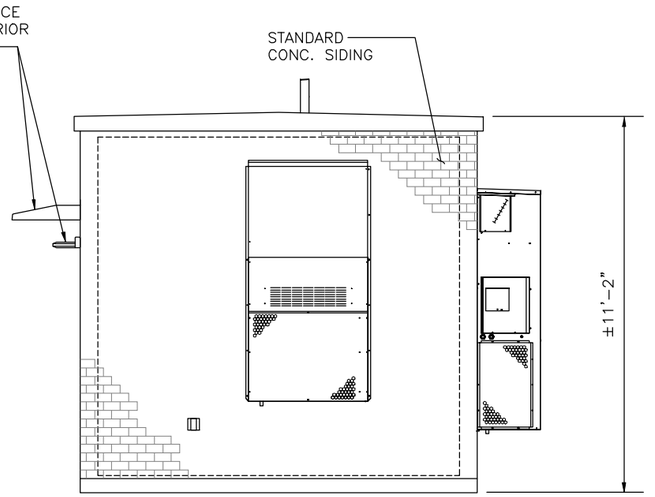
REAR WALL ELEVATION



LEFT WALL ELEVATION



FRONT WALL ELEVATION



RIGHT WALL ELEVATION

1 / C-6

EQUIPMENT SHELTER ELEVATIONS

SCALE: NOT TO SCALE

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Centek Project No.: 19160.01

Drawing Title.: EQUIPMENT SHELTER ELEVATIONS

Dwg. No.: C - 6

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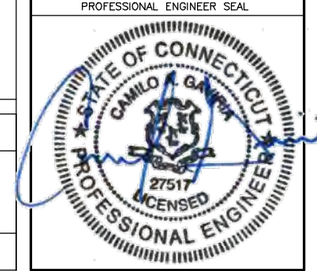
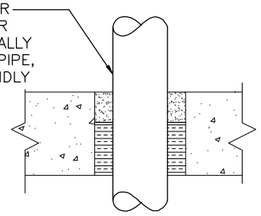


FLOOR OR WALL	MIN. THICK.	MAX. PIPE DIA.	MIN. ANNULAR SPACE	MAX. ANNULAR SPACE	MIN. FILL MAT. THICK.	MIN. FORM. MAT. THICK.	F RATING
F	3 3/4"	1 1/2"	3/8"	2 1/8"	1"	2 3/4"	2
F	3 3/4"	6"	3/8"	3/4"	1"	2 3/4"	2
F	3 3/4"	6"	3/8"	1"	2"	1 3/4"	2
F	4 1/2"	1 1/2"	3/8"	2 1/8"	1"	3 1/2"	3
F	4 1/2"	6"	3/8"	3/4"	1"	3 1/2"	3
F	4 1/2"	6"	3/8"	1"	2"	2 1/2"	3
W	5 1/2"	1 1/2"	3/8"	2 1/8"	1"	3 1/2"	3
W	5 1/2"	6"	3/8"	3/4"	1"	3 1/2"	3
W	6 1/2"	1 1/2"	3/8"	2 1/8"	2"	2 1/2"	3
W	6 1/2"	6"	3/8"	1"	2"	2 1/2"	3

THROUGH PENETRANTS

ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL.



FORMING MATERIAL SHALL BE A MIN. OF 1 1/2" THICK OF MIN. 4.0 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED IN OPENING, USG INTERIORS–TYPE SAF

THICKNESS OF SEALANT APPLIED FLUSH W/THE TOP SURFACE OF BOTH SIDES OF FLOOR/WALL (SEE TABLE), USG INTERIORS–TYPE SS

UL SYSTEM NUMBER: CAJ1020

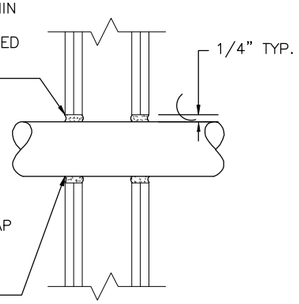
F RATING – 3 HR.

4 / C–7 PIPE AND CONDUIT PENETRATION DETAIL IN CONCRETE OR MASONRY

N.T.S.

MAX. DIA. OF THROUGH PENETRANT	NOMINAL ANNULAR SPACE IN.	FILL MATERIAL TYPE
1"	1/2"	FSP 1100 PUTTY
2"	1"	FS 1900 SEALANT

ONE 2"ø SCHEDULE 40 PVC PIPE TO BE CENTERED WITHIN FIRESTOP SYSTEM. PIPE SHALL BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL/FLOOR ASSEMBLY



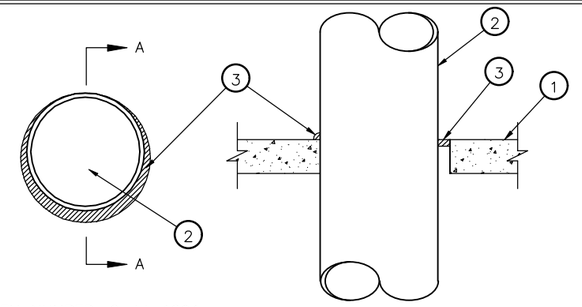
SEALANT, MIN. OF 1 1/4" THICK, FLUSH WITH BOTH SURFACES OF WALL FOR 2 HR. ASSEMBLY, 5/8" THICK FOF 1 HR. ASSEMBLY. A 5/8" CROWN AROUND CONDUIT WITH A 1" MIN. LAP AROUND OPENING SEALANT: INTERNAT'L PROTECTIVE COATINGS CORP–FSP 110 PUTTY OR FS1900 SEALANT

UL SYSTEM NUMBER: WL2038

F RATING – 1 & 2 HR.

5 / C–7 PVC CONDUIT PENETRATION DETAIL IN GYPSUM WALLBOARD

N.T.S.



UL SYSTEM NUMBER: C–AJ–1291

F RATING – 2–HR

SECTION A–A

3 / C–7 METAL PIPE THROUGH CONCRETE FLOOR/ WALL OR BLOCK WALL

N.T.S.

NOTES:

1. FLOOR OR WALL ASSEMBLY – MIN 2–1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100–150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 30–7/8 IN. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

   A. STEEL FLOOR UNIT/FLOOR ASSEMBLY (NOT SHOWN) – AS AN ALTERNATE TO ITEM 1, THE FLOOR ASSEMBLY MAY CONSIST OF A FLUTED STEEL FLOOR UNIT/ CONCRETE FLOOR ASSEMBLY. THE FLOOR ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL FLOOR CEILING DESIGN IN THE FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   B. CONCRETE – MIN 2–1/2 IN. THICK REINFORCED LIGHTWEIGHT ON NORMAL WEIGHT (100–150 PCF) CONCRETE, AS MEASURED FROM THE TOP PLANE OF THE FLOOR UNITS.

   C. STEEL FLOOR AND FORM UNITS* – COMPOSITE OR NON–COMPOSITE 1–1/2 TO 3 IN. DEEP FLUTED GALV STEEL UNITS AS SPECIFIED IN THE INDIVIDUAL FLOOR–CEILING DESIGN. MAX DIAM OF OPENING IS 30–7/8 IN.

2. THROUGH–PENETRANT – ONE METALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. TO MAX 7/8 IN. PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR CONDUITS MAY BE USED:

   A. STEEL PIPE NOM 30 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. IRON PIPE NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.

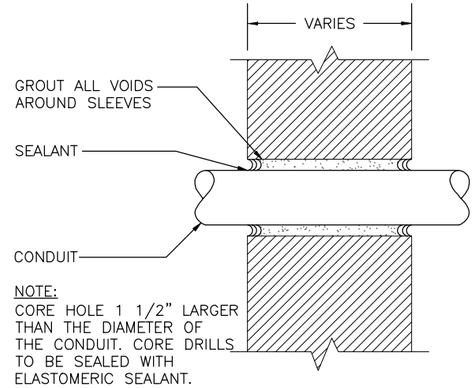
   C. COPPER PIPE NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

   D. COPPER TUBING NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   E. CONDUIT NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT.

   F. CONDUIT NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT).

3. FILL, VOID OR CAVITY MATERIAL* – SEALANT – MIN 1/2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL. AT THE POINT CONTACT LOCATION BETWEEN PIPE AND CONCRETE, A MIN 1/4 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE/PIPE INTERFACE ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL.



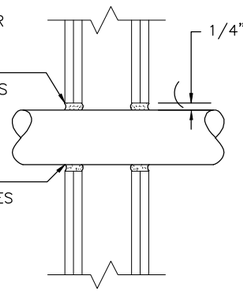
NOTE:
CORE HOLE 1 1/2" LARGER THAN THE DIAMETER OF THE CONDUIT. CORE DRILLS TO BE SEALED WITH ELASTOMERIC SEALANT.

1 / C–7 PIPE AND CONDUIT PENETRATION DETAIL IN NON-RATED PARTITION

N.T.S.

PIPE OR CONDUIT	ANNULAR SPACE IN.	MIN. FILL MATERIAL THICKNESS	F RATING HR
PIPE	3/4"	1 1/4"	2
CONDUIT	3/4"	3/4"	1

ONE 2"ø METALLIC PIPE OR CONDUIT TO BE CENTERED WITHIN FIRESTOP SYSTEM. PIPE SHALL BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL/FLOOR ASSEMBLY



FILL VOID WITH CAULK, FLUSH WITH BOTH SURFACES OF WALL (SEE TABLE) SEALANT: TREMCO INC, TREMSTOP–WBM

UL SYSTEM NUMBER: WL1051

F RATING – 1 & 2 HR.

2 / C–7 PIPE AND CONDUIT PENETRATION DETAIL IN GYPSUM WALLBOARD

N.T.S.

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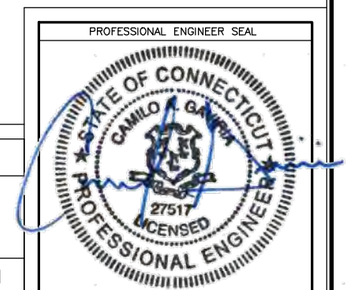

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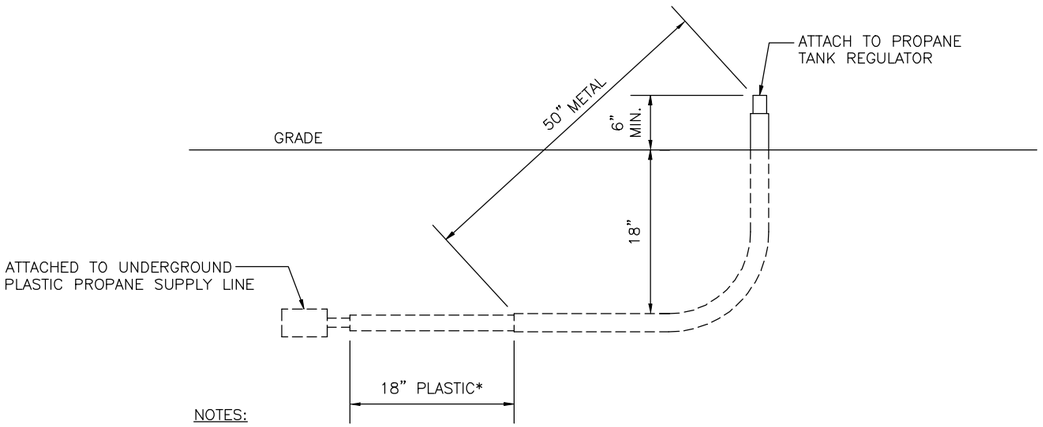
Project Name: BLOOMFIELD (EVERSOURCE)

Location: 5 ST. ANDREWS DRIVE BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: CONDUIT PENETRATION DETAILS

Dwg. No.: C - 7

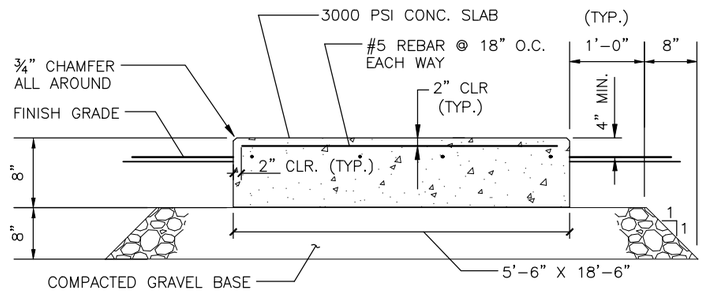


NOTES:

1. *PLASTIC PROPANE SUPPLY LINE MUST BE PROTECTED WITH CONDUIT IF IT CAN NOT BE BURIED 18" OR MORE DEEP WITH SAND TO PROTECT IT (AT LEAST 1" OF SAND AROUND THE PIPE REQUIRED FOR PLASTIC)
2. POLYETHYLENE PIPE AND TUBING AND THERMOPLASTIC COMPRESSION-TYPE MECHANICAL FITTINGS SHALL BE INSTALLED OUTSIDE UNDERGROUND WITH A MINIMUM 18 IN. (460mm) OF COVER. THE COVER SHALL BE PERMITTED TO BE REDUCED TO 12 IN. (300mm) IF EXTERNAL DAMAGE TO THE PIPE OR TUBING IS NOT LIKELY TO RESULT. IF A MINIMUM OF 12 IN. (300mm) OF COVER CANNOT BE MAINTAINED, THE PIPING SHALL BE INSTALLED IN CONDUIT OR BRIDGED (SHIELDED). UNDERGROUND POLYETHYLENE PIPING SYSTEMS SHALL REQUIRE ASSEMBLED ANODELESS RISERS TO TERMINATE ABOVE GROUND. THE HORIZONTAL PORTION OF RISERS SHALL BE BURIED AT LEAST 12 IN. (300mm) BELOW GRADE AND THE CASING MATERIAL USED FOR THE RISERS SHALL BE PROTECTED AGAINST CORROSION.

1 / C-8 **PROPANE SUPPLY LINE DETAIL**

SCALE: 1" = 1'- 0"



NOTES:

1. TOP OF SLAB TOLERANCE IS 1/4"±.
2. PROVIDE PVC SLEEVES FOR UTILITY CONDUIT PASSAGE THROUGH PAD OR CAST CONDUITS IN PLACE AS APPLICABLE. COORDINATE SLEEVE/CONDUIT LOCATIONS WITH CONSTRUCTION MANAGER.
3. COORDINATE HOLD-DOWN HARDWARE WITH TANK MANUFACTURER.
4. REFER TO NOTES ON SHEET N-2 FOR ADDITIONAL REQUIREMENTS.

2 / C-8 **PROPANE TANK PAD DETAIL**

NOT TO SCALE

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Centek Project No.: 19160.01

Drawing Title.: TYPICAL DETAILS

Dwg. No.: C - 8

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27517
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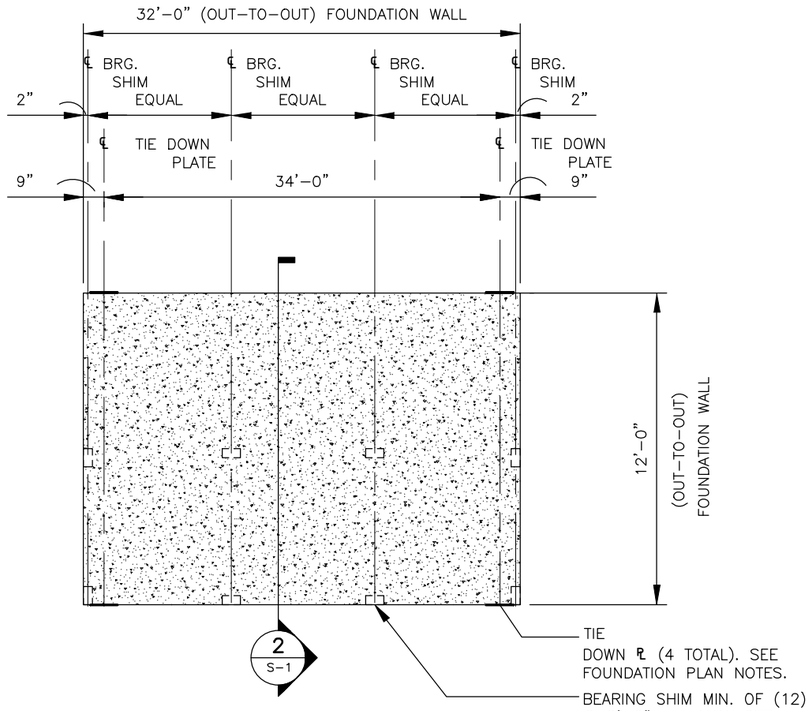
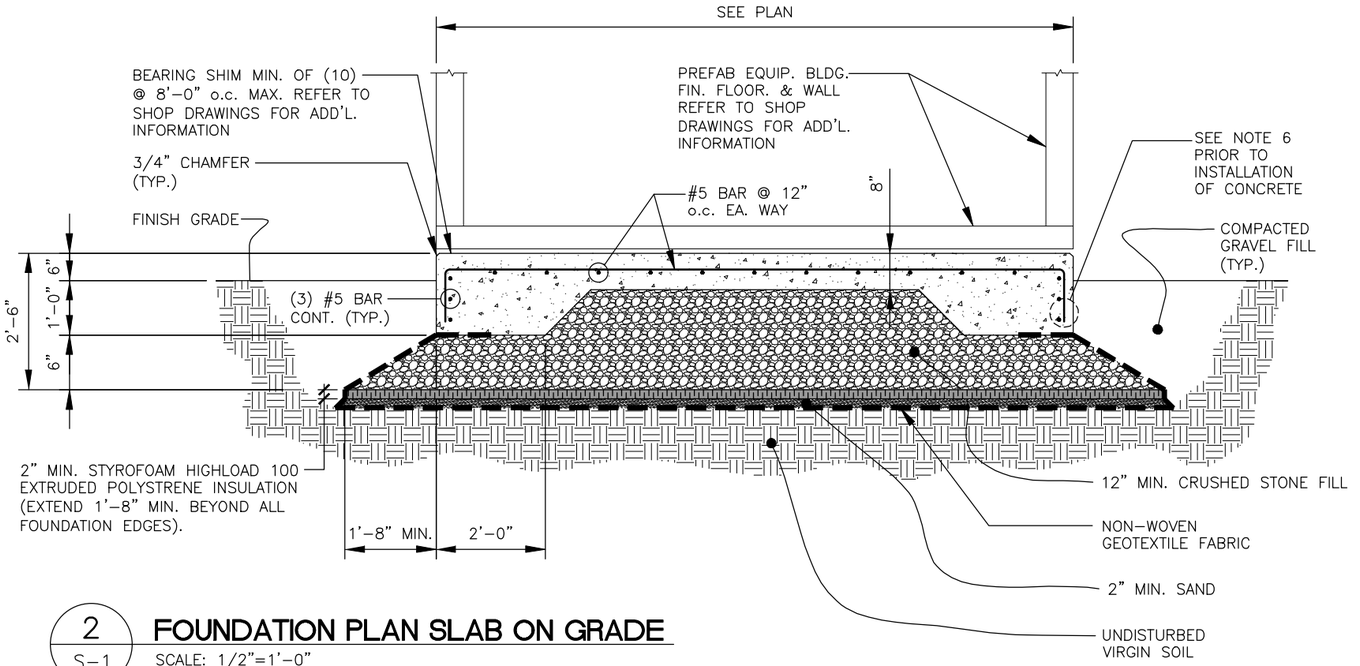
EQUIPMENT SHELTER BY OTHERS. VERIFY ALL SHELTER DIMENSIONS, EQUIPMENT DIMENSIONS, EQUIPMENT LOCATIONS AND UTILITY OPENINGS WITH BUILDING SHOP DRAWINGS PRIOR TO COMMENCEMENT OF WORK.



1 S-1 **FOUNDATION PLAN**
SCALE: NTS

FOUNDATION PLAN NOTES:

1. BEARING SHIMS, TIE-DOWN PLATES AND ASSOCIATED INSTALLATION ANCHORS PROVIDED BY SHELTER MANUFACTURER. CONTRACTOR SHALL VERIFY ALL SHIM & TIE-DOWN QUANTITIES AND LOCATIONS WITH MANUFACTURER PRIOR TO PERFORMING FOUNDATION WORK.
2. SLAB/ TOP OF WALL TOLERANCE IS 1/4"±
3. TOP 8" OF FOUNDATION SIDES MUST BE FORMED FLAT TO ACCEPT TIE-DOWN PLATES.
4. REFER TO NOTES ON N-2 FOR ADDITIONAL REQUIREMENTS.
5. PER NEC REQUIREMENTS, THE REBAR IN FOUNDATION AND FOOTING SHALL BE BONDED TO GROUND RING WITH A #2 AWG SOLID CONDUCTOR USING LISTED AND APPROVED METHODS.
6. PROVIDE PVC SLEEVES FOR UTILITY CONDUIT PASSAGE THROUGH FOUNDATION OR CAST CONDUITS IN PLACE. REFER TO ELECTRICAL DRAWINGS FOR CONDUIT SIZES AND QUANTITIES.



2 S-1 **FOUNDATION PLAN SLAB ON GRADE**
SCALE: 1/2"=1'-0"

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Project Name:
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Location:
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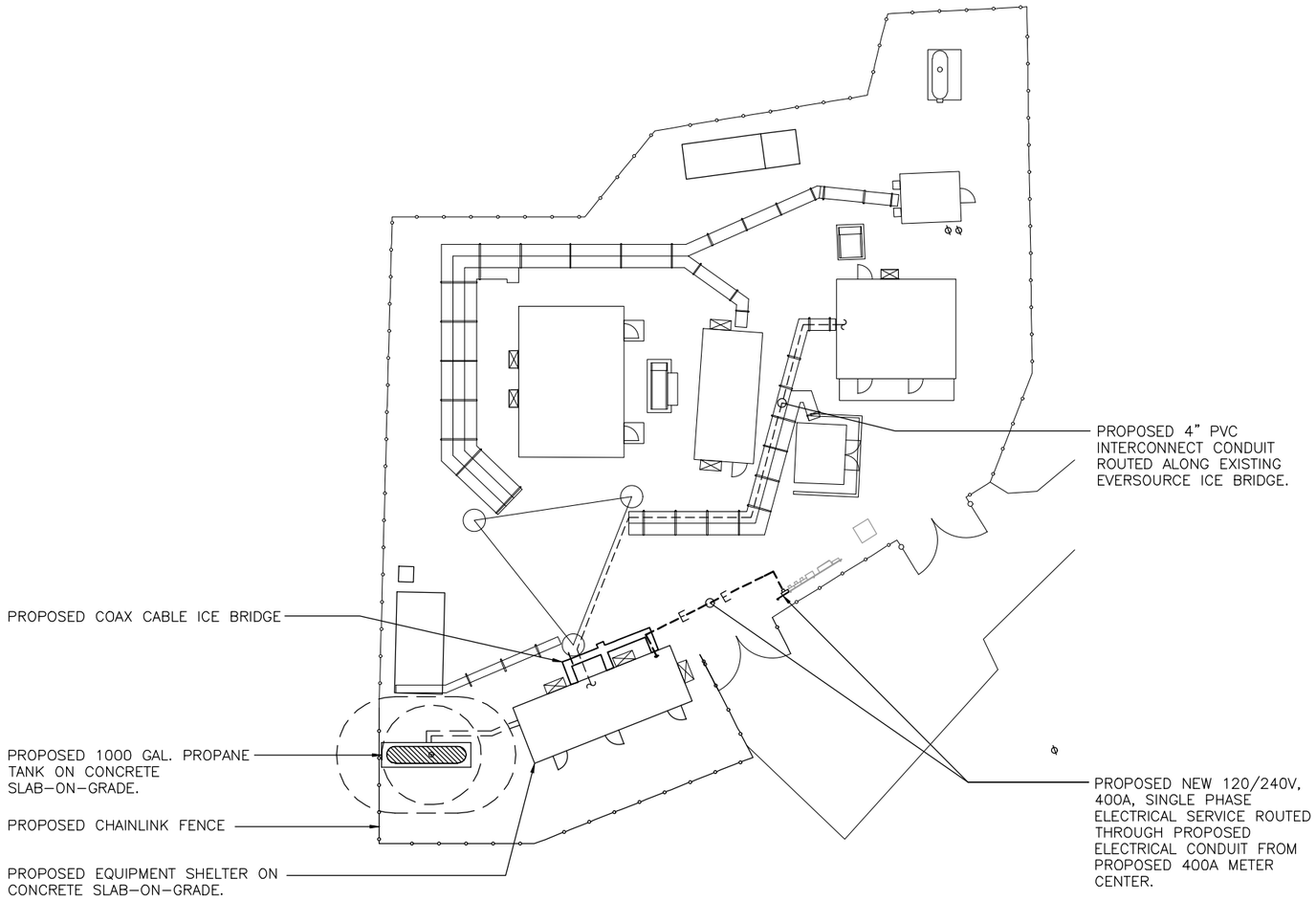
Centek Project No.: 19160.01
Drawing Title: FOUNDATION PLAN AND NOTES
Dwg. No.: S - 1



1 / E-1 **SITE PLAN**
SCALE: 1" = 30'- 0"

APPROXIMATE NORTH

GRAPHIC SCALE
30 0 15 30 60
(IN FEET)
1 inch = 30 ft.

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Drawing Title.: SITE PLAN

Dwg. No.: E - 1

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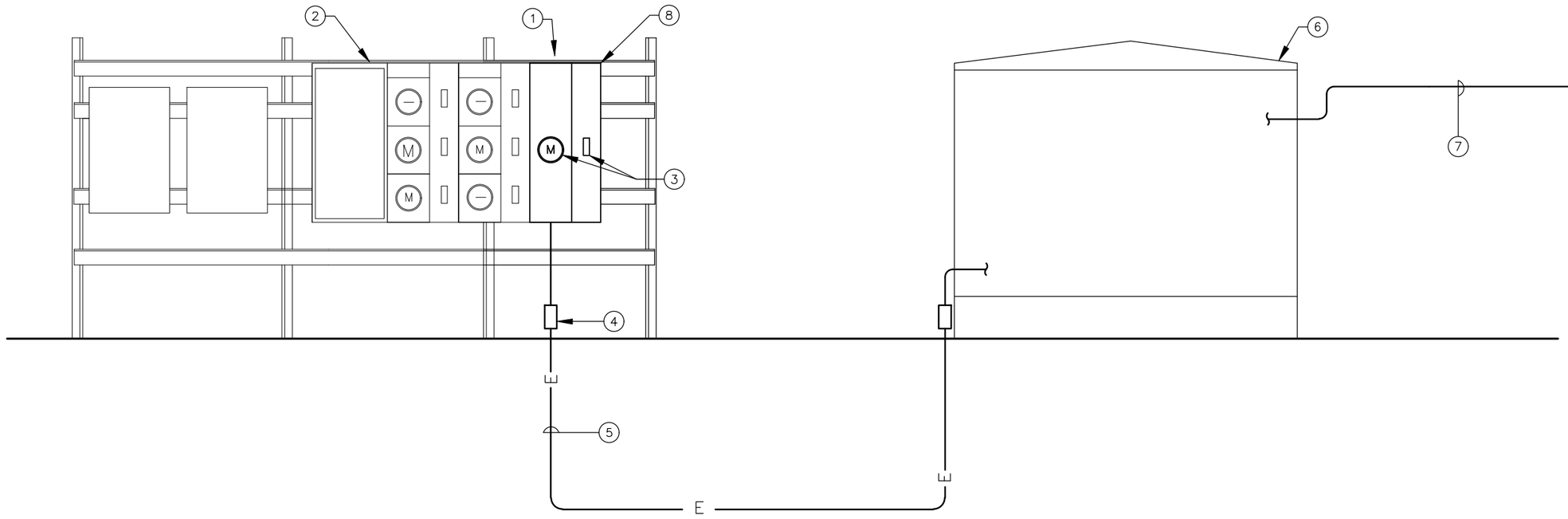
ELECTRICAL RISER NOTES

1. EXISTING UTILITY BACKBOARD BE EXTENDED TO ACCOMMODATE NEW METERING EQUIPMENT, COORDINATE WITH CIVIL DRAWINGS.
2. EXISTING 6-GANG METER CENTER.
3. 400A, 120/240V, SINGLE PHASE, 3 WIRE UTILITY COMPANY APPROVED METER AND 400A/ 2P CIRCUIT BREAKER IN SPARE POSITION IN METER.
4. EXPANSION COUPLINGS (TYP.).
5. (3) 600 KCMIL, (1) #3 AWG GROUND, 4" CONDUIT, CONNECT TO NORMAL LUGS IN AUTOMATIC TRANSFER SWITCH LOCATED IN PREFABRICATED SHELTER.
6. PREFABRICATED SHELTER.
7. 4" PVC INTERCONNECT CONDUIT WITH PULL ROPE COMING IN OVERHEAD ON ICE BRIDGE TO SHELTER. REFER TO SITE PLAN FOR ROUTING. COORDINATE REQUIREMENTS WITH CONSTRUCTION MANAGER.
8. SINGLE GANG METER CENTER BRANCH DEVICE WITH 240V, 1P, 3W, 400A RATED METER SOCKET. (SQUARE-D: EZML111400 OR APPROVED EQUIVALENT). MUST BE UTILITY COMPANY APPROVED.



1 / E-2 ELECTRICAL RISER DIAGRAM

SCALE: NOT TO SCALE

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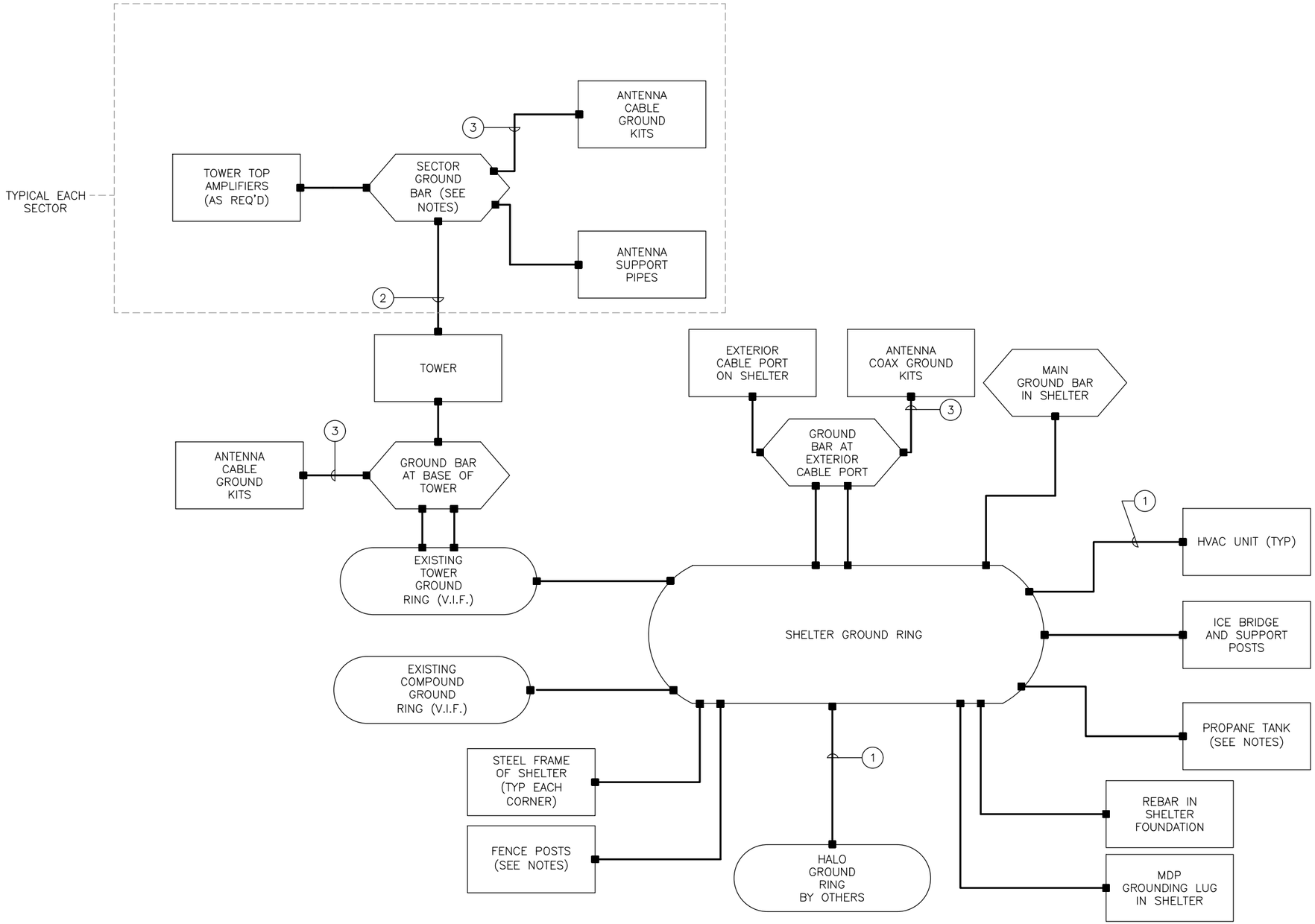
Centek Project No.: 19160.01

Drawing Title.: ELECTRICAL RISER DIAGRAM

Dwg. No.: E - 2



GROUNDING SCHEMATIC NOTES

1. #2 AWG GREEN INSULATED
2. #2/0 GREEN INSULATED
3. #6 AWG

GENERAL NOTES:

1. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
2. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
3. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
4. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
5. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
6. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
7. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
8. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
9. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
10. ALL FENCE POSTS WITHIN 6' OF EQUIPMENT SHELTER SHALL BE BONDED TO GROUND RING.
11. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
12. ALL EXPOSED METAL OBJECTS IN SHELTER SHALL BE BONDED TO THE HALO GROUND WITHIN THAT ROOM.
13. BOND PROPANE TANK TO GROUND RING PER NEC AND MANUFACTURERS SPECIFICATIONS. COORDINATE WITH TANK MANUFACTURER FOR REQUIREMENTS PRIOR TO INSTALLATION.
14. COORDINATE WITH TOWER OWNER BEFORE INSTALLING ANY GROUNDING ELEMENTS ON TOWER OR BONDING TO EXISTING TOWER GROUND RING.

1 / E-3 **ELECTRICAL SCHEMATIC DIAGRAM**

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Drawing Title.: ELECTRICAL SCHEMATIC DIAGRAM

Dwg. No.: E - 3

Sheet 16 of 21

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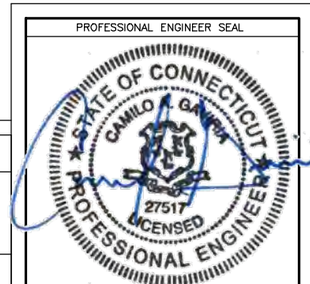

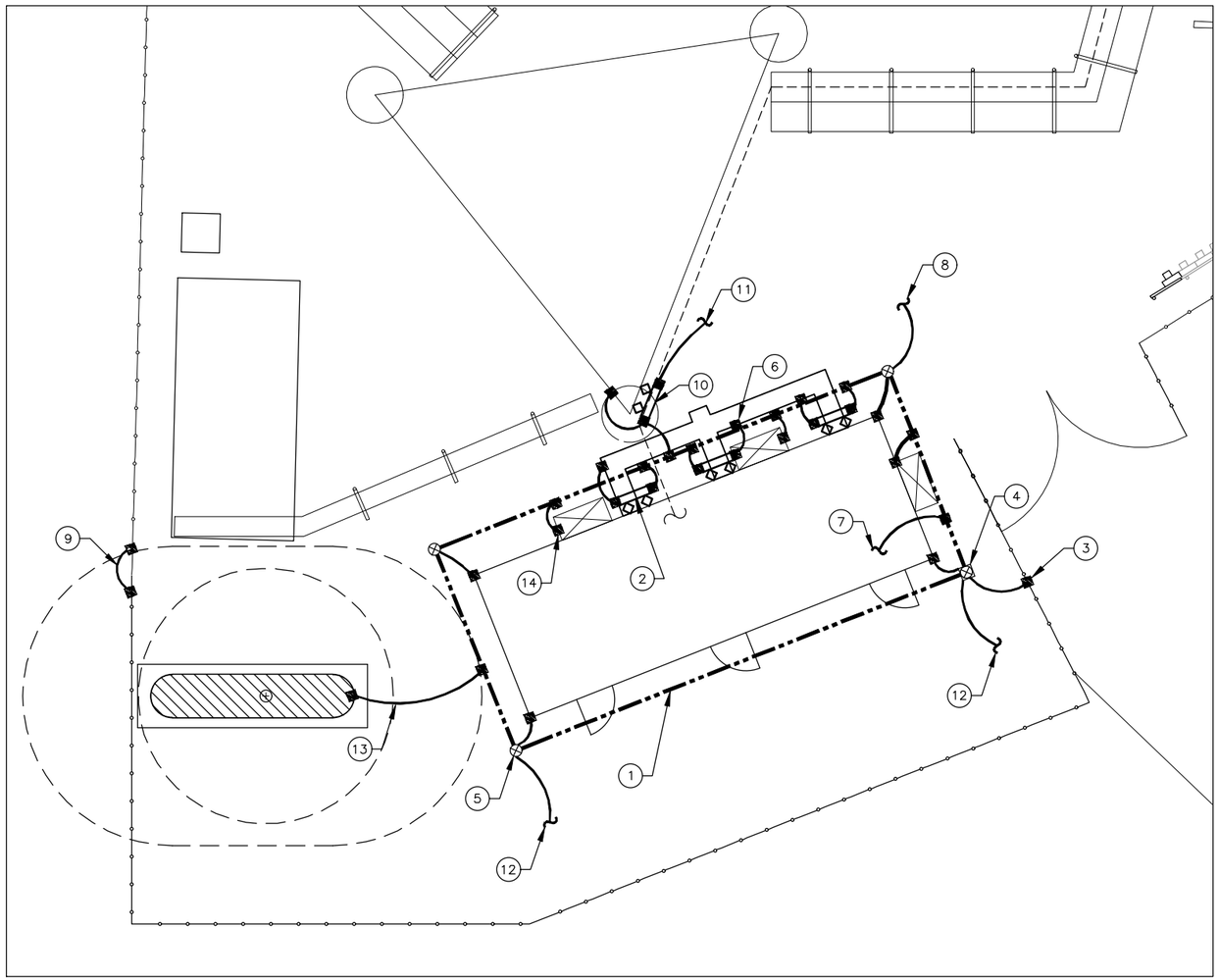

1 / E-4 **ELECTRICAL GROUNDING PLAN**

SCALE: NOT TO SCALE

GROUNDING PLAN NOTES

1. #2 SOLID TINNED BCW GROUND RING (2'-0" FROM OUTSIDE EDGE OF EQUIPMENT SHELTERFOUNDATION) (TYP.).
2. GROUND BAR PER DETAILS.
3. CONNECT FENCE TO GROUNDING RING.
4. GROUNDING ROD WITH ACCESS (TYP.) PER DETAILS.
5. GROUNDING ROD (TYP.) PER DETAILS.
6. ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING PERDETAILS.
7. EXTEND GROUND RING PIGTAIL THROUGH SHELTER AND BOND TO HALO GROUND DOWNLEAD. (TYP. 1 PLACE)
8. BOND SHELTER GND RING TO EXISTING TOWER GROUND RING WITH #2 AWG BCW.
9. BOND NEW SECTION OF FENCE TO EXISTING SECTION OF FENCE (TYP. EACH SECTION).
10. LOWER TOWER MOUNTED GROUND BAR PER DETAILS.
11. BOND TO EXISTING TOWER GROUND RING.
12. BOND SHELTER GROUND RING TO EXISTING COMPOUND GROUND RING. (MINIMUM TWO PLACES.)
13. BOND PROPANE TANK TO GROUND RING PER NEC AND MANUFACTURERS SPECIFICATIONS.
14. BOND HVAC UNIT TO GROUND RING (TYP).

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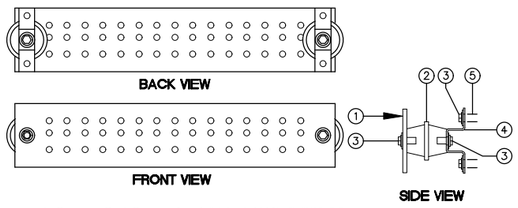
BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: ELECTRICAL GROUNDING PLAN

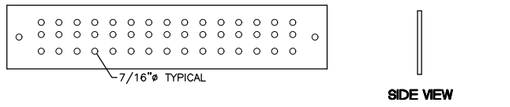
Dwg. No.: E - 4



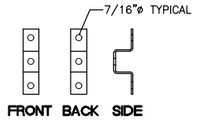
NOTES

1. HIGH CONDUCTIVITY TINNED COPPER BAR 1'-8"Lx4"Wx1/4"D.
2. RED COLORED STANDOFF INSULATOR PLASTIC #1872-1A.
3. STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS, SPLIT LOCKWASHER AND FLAT WASHER.
4. 1"Wx1/8"T STAINLESS STEEL TYPE 304 BRACKET.
5. STAINLESS STEEL TYPE 304 HARDWARE – 3/8"ø EXPANSION BOLT FOR CONCRETE.

TYPICAL GROUND BAR ASSEMBLY
N.T.S.

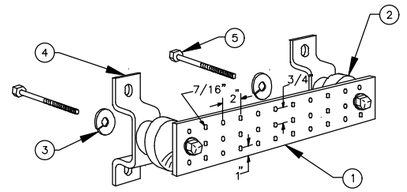


TYPICAL GROUND BAR - DIMENSIONS
N.T.S.



BRACKET FOR GROUND BAR-DIMENSIONS
N.T.S.

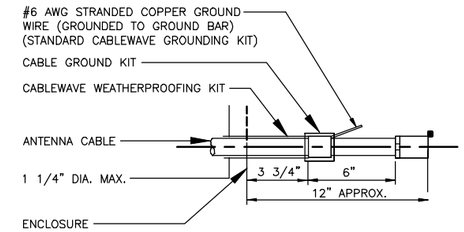
1 E-5 MAIN/EQUIPMENT GROUND BAR DETAILS
N.T.S.



NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

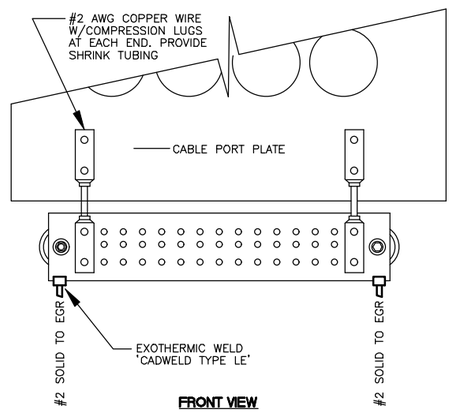
2 E-5 GROUND BAR DETAIL
NOT TO SCALE



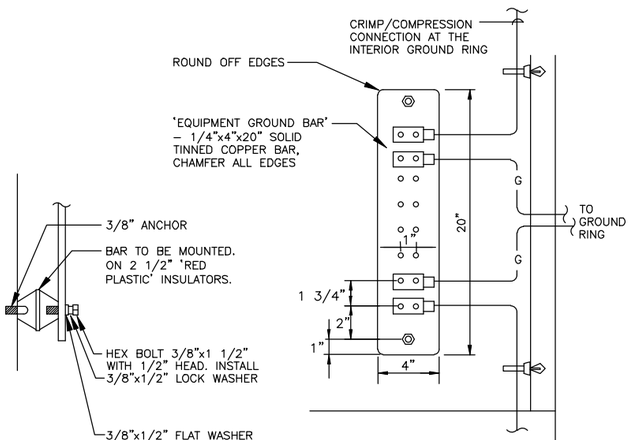
NOTES:

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

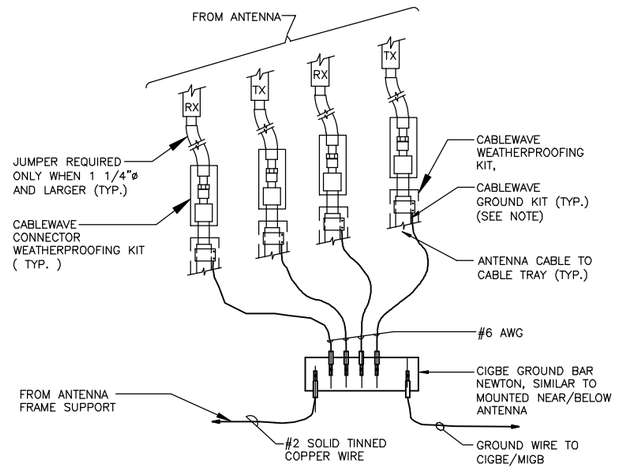
3 E-5 ANTENNA CABLE GROUNDING DETAIL
NOT TO SCALE



4 E-5 CABLEPORT GROUND BAR LUG CONNECTION
NOT TO SCALE



5 E-5 EQUIPMENT GROUND BAR DETAIL
NOT TO SCALE



NOTES:

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

6 E-5 CONNECTION OF GROUND WIRES TO GROUND BAR
NOT TO SCALE

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REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	04/14/20	KAWJR	CAG	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

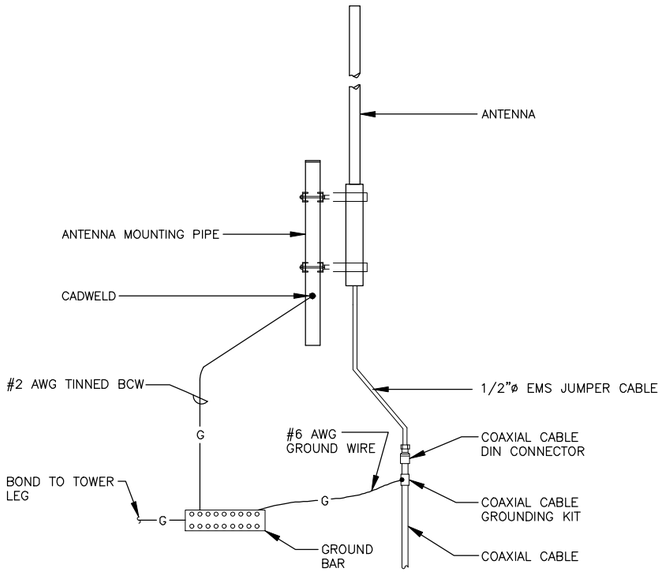
Project Name: BLOOMFIELD (EVERSOURCE)

Location: 5 ST. ANDREWS DRIVE BLOOMFIELD, CT 06002

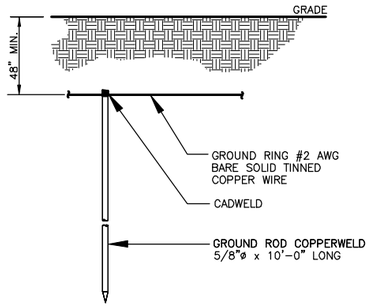
Centek Project No.: 19160.01

Drawing Title.: ELECTRICAL DETAILS

Dwg. No.: E - 5



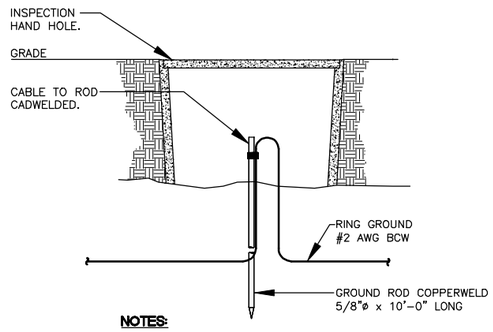
1 E-6 **TYPICAL ANTENNA GROUNDING DETAIL**
NOT TO SCALE



NOTES:

1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

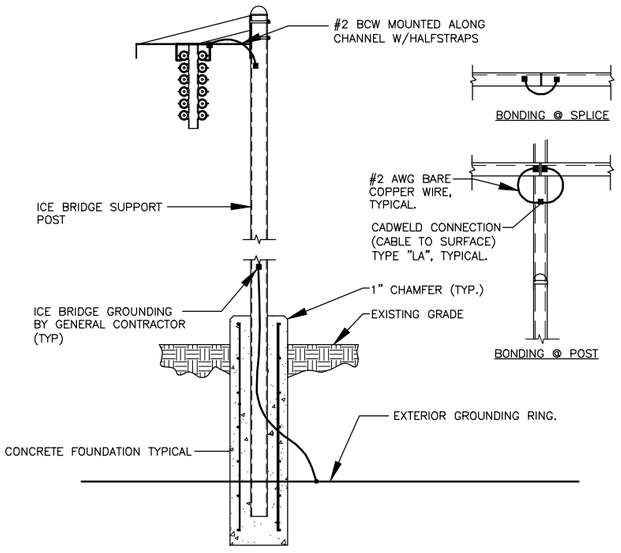
2 E-6 **GROUND ROD DETAIL**
NOT TO SCALE



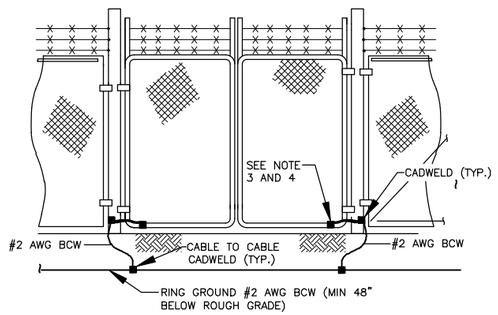
NOTES:

1. INSPECTION HAND HOLE MAY BE CONCRETE OR PVC AND SHALL BE A MINIMUM OF 12" DIA x 18" DEEP.

3 E-6 **GROUND ROD WITH ACCESS DETAIL**
NOT TO SCALE



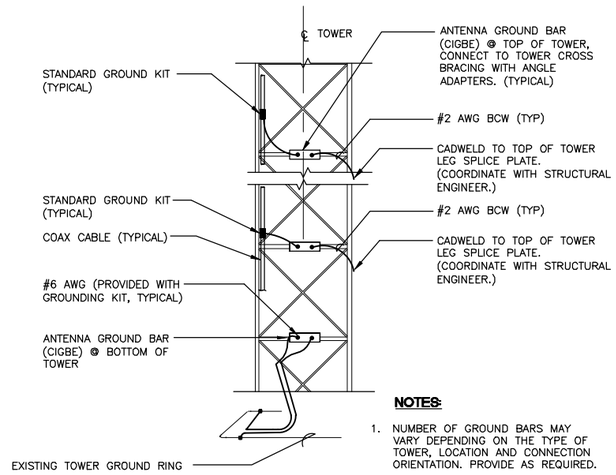
4 E-6 **ICE BRIDGE BONDING DETAIL**
NOT TO SCALE



NOTES:

1. THE #2 AWG, BCW, FROM THE RING GROUND SHALL BE CADWELDED TO THE POST, ABOVE GRADE.
2. BOND EACH HORIZONTAL POLE/BRACE TO EACH OTHER AND TO EACH VERTICAL POLE BONDED TO THE EXTERIOR GROUND RING.
3. GATE JUMPER SHALL BE #4/0 AWG WELDING CABLE OR FLEXIBLE COPPER BRAID BURNDY TYPE B WITH SLEEVES ON EACH END DESIGNED FOR EXOTHERMIC WELDING.
4. GATE JUMPER SHALL BE INSTALLED SO THAT IT WILL NOT BE SUBJECTED TO DAMAGING STRAIN WHEN GATE IS FULLY OPEN IN EITHER DIRECTION.

5 E-6 **FENCE GATE GROUNDING**
NOT TO SCALE



NOTES:

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

6 E-6 **ANTENNA CABLE GROUNDING - LATTICE TOWER**
NOT TO SCALE

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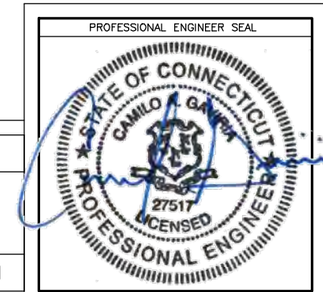

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Project Name:
BLOOMFIELD (EVERSOURCE)

Location:
5 ST. ANDREWS DRIVE
BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: ELECTRICAL DETAILS

Dwg. No.: E - 6

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.01. SCOPE OF WORK

A. WORK SHALL INCLUDE ALL LABOR, EQUIPMENT AND SERVICES REQUIRED TO COMPLETE (MAKE READY FOR OPERATION) ALL THE ELECTRICAL WORK INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:

1. INSTALL NEW 400A, 240/120V, 1P, 3 WIRE ELECTRIC SERVICE WITH REVENUE METER AND 400A MAIN CIRCUIT BREAKER FOR OWNER AND ASSOCIATED DISTRIBUTION EQUIPMENT. (AS REQUIRED BY UTILITY CO.)
2. GENERATOR/TRANSFER SWITCH.
3. FEEDERS AND BRANCH CIRCUIT WIRING TO PANELS, RECEPTACLES, EQUIPMENT, LIGHTING FIXTURES, ETC. AS INDICATED OR NOTED ON PLANS.
4. GROUNDING SYSTEMS, CONSISTING OF ANTENNA GROUNDING, GROUND RING, GROUND BARS, ETC.
5. FIELD MEASURE EXISTING ELECTRICAL SERVICES TO CONFIRM AVAILABLE EXISTING POWER.
6. COORDINATE ALL WORK SHOWN, ON THESE PLANS WITH LOCAL UTILITY COMPANIES.

B. CONTRACTOR SHALL CONFER WITH LOCAL UTILITY COMPANIES TO ASCERTAIN THE LIMITS OF THEIR WORK AND SHALL INCLUDE IN BID ANY CHARGES OR FEES MADE BY THE UTILITY COMPANIES FOR THEIR PORTION OF THE WORK AND SHALL PROVIDE AND INSTALL ALL ITEMS REQUIRED, BUT NOT PROVIDED BY UTILITY COMPANY.

C. ELECTRICAL CONTRACTOR SHALL COORDINATE ELECTRICAL INSTALLATION WITH ELECTRIC UTILITY CO. PRIOR TO INSTALLATION.

D. CONTRACTOR SHALL COORDINATE WITH TELEPHONE UTILITY COMPANY FOR LOCATION OF TELEPHONE SERVICE AND TO DETERMINE ANY REQUIRED EQUIPMENT TO BE INSTALLED BY CONTRACTOR.

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH LOCAL TELEPHONE COMPANY THAT MAY BE REQUIRED FOR THE INSTALLATION OF TELEPHONE SERVICE TO THE PROPOSED CELLULAR SITE.

F. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

G. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

H. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

I. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

J. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

K. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

L. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.
2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.
3. COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". ONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

CONDUIT MATERIAL SHALL BE AS FOLLOWS:

1. ELECTRIC METALLIC TUBING (EMT) – BRANCH CIRCUITS INSIDE PREFABRICATED SHELTER
2. GALVANIZED RIGID CONDUIT (GRC) – FEEDERS AND CIRCUITS EXPOSED TO EXTERIOR & UNDERGROUND.
3. LIQUID TIGHT FLEXIBLE METAL CONDUIT – FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT (HVAC UNITS, MOTORS, ETC.) IN WET LOCATIONS.
4. FLEXIBLE METAL CONDUIT – FOR SHORT LENGTHS (MAX. 3'-0") WIRING TO VIBRATING EQUIPMENT IN DRY LOCATIONS.
5. PVC CONDUIT – WHERE SHOWN ON GROUNDING DETAILS.

SECTION 16114

1.01. CABLE TRAY

A. CABLE TRAY SHALL BE SOLID SIDE BAR, 18" WIDE (NEWTON INSTRUMENT COMPANY, INC.). TRAY SHALL BE INSTALLED AS SHOWN ON CONTRACT DOCUMENTS.

B. CROSSWISE RUNS SHALL BE COORDINATED WITH THE SPECIFIC EQUIPMENT THE TRAY SHALL SERVE.

C. ALL PROTRUDING CABLE TRAY SUPPORT RODS SHALL BE FILED SMOOTH WITH NO SHARP EDGES. ALL SUPPORT RODS SHALL BE CAD-PLATED FOR RUST RESISTANCE AND A MINIMUM 1/2" DIAMETER.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)
2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE
3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE
4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES – ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

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Location: 5 ST. ANDREWS DRIVE BLOOMFIELD, CT 06002

Centek Project No.: 19160.01

Drawing Title.: ELECTRICAL SPECIFICATIONS

Dwg. No.: E - 7

ELECTRICAL SPECIFICATIONS CONT.

D. PROVIDE NAMEPLATE FOR PORTABLE ENGINE/GENERATOR CONNECTION SHOWING VOLTAGE KVA/KW RATING, # PHASE, AND # OF WIRES. PLATE TO BE PLASTIC ENGRAVED, RED WITH WHITE LETTERS.

E. ALL RECEPTACLES, SWITCHES, DISCONNECT SWITCHES, ETC. SHALL BE LABELED WITH THE CORRECT BRANCH CIRCUIT NUMBER SERVED BY MEANS OF PERMANENT PRESSED TYPE BLACK 1/4" TRANSFER LETTERING. (FOR EXAMPLE: "MDP-5", ETC.).

F. PROVIDE A NAMEPLATE AT THE SERVICE EQUIPMENT INDICATING THE TYPE AND LOCATION OF THE ON SITE GENERATOR.

SECTION 16450

1.1. GROUNDING

A. GROUNDING SHALL CONFORM WITH THE MOTOROLA R56 STANDARD LATEST VERSION AND ALL FEDERAL, STATE, AND LOCAL CODES. IN THE EVENT OF A CONFLICT, MEET THE MOST STRINGENT REQUIREMENT.

B. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

C. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.
2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.
3. REFER TO PANEL SCHEDULE "BRANCH CIRCUIT" DATA FOR EQUIPMENT GROUND CONDUCTOR SIZE FOR EACH BRANCH CIRCUIT.
4. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

F. GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS
2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).
3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S WIRELESS PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16620
(SUPPLIED BY OWNER, INSTALLED BY CONTRACTOR)

1.01. GENERATOR SET

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

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Centek Project No.: 19160.01

Drawing Title.: ELECTRICAL SPECIFICATIONS

Dwg. No.: E - 8

SG080 | 9.0L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

DEMAND RESPONSE READY

Standby Power Rating
80 kW, 100 kVA, 60 Hz

Prime Power Rating*
72 kW, 90 kVA, 60 Hz

ISO 9001:2008

USA ENGINEERED & BUILT*
*Assembled in the USA using domestic and foreign parts

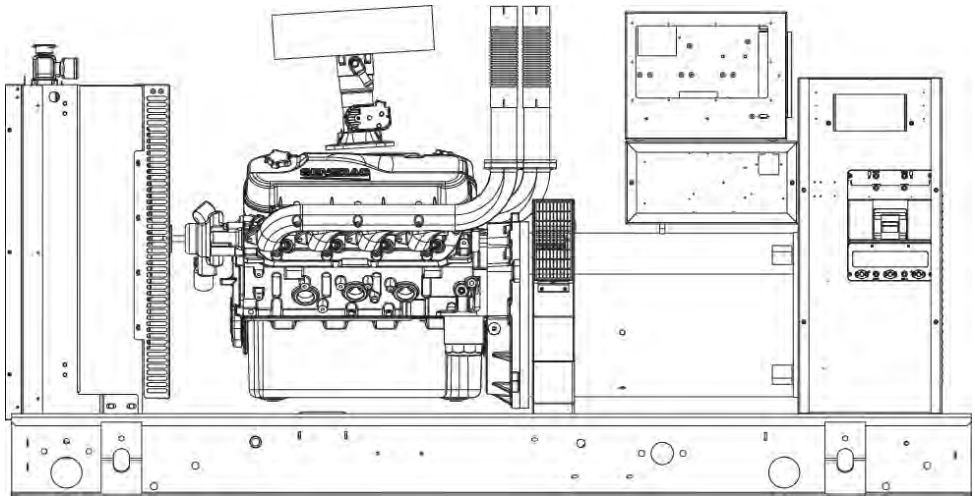

Image used for illustration purposes only

*EPA Certified Prime ratings are not available in the US or its Territories

Codes and Standards

Not all codes and standards apply to all configurations. Contact factory for details.

- UL2200, UL508, UL489
- CSA C22.2
- BS5514 and DIN 6271
- SAE J1349
- NFPA 37, 70, 99, 110
- NEC700, 701, 702, 708
- ISO 3046, 7637, 8528, 9001
- NEMA ICS10, MG1, 250, ICS6, AB1
- ANSI C62.41
- IBC 2009, CBC 2010, IBC 2012, ASCE 7-05, ASCE 7-10, ICC-ES AC-156 (2012)

Powering Ahead

Generac ensures superior quality by designing and manufacturing most of its generator components, such as alternators, enclosures, control systems and communications software. Generac also makes its own spark-ignited engines, and you'll find them on every Generac gaseous-fueled generator. We engineer and manufacture them from the block up — all at our facilities throughout Wisconsin. Applying natural gas and LP-fueled engines to generators requires advanced engineering expertise to ensure reliability, durability and necessary performance. By designing specifically for these dry, hotter-burning fuels, the engines last longer and require less maintenance. Building our own engines also means we control every step of the supply chain and delivery process, so you benefit from single-source responsibility.

Plus, Generac Industrial Power's distribution network provides all parts and service so you don't have to deal with third-party suppliers. It all leads to a positive owner experience and higher confidence level. Generac spark-ignited engines give you more options in commercial and industrial generator applications as well as extended run time from utility-supplied natural gas.

SG080 | 9.0L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

STANDARD FEATURES

DEMAND RESPONSE READY

ENGINE SYSTEM

- Oil Drain Extension
- Air Cleaner
- Fan Guard
- Stainless Steel Flexible Exhaust Connection
- Factory Filled Oil and Coolant
- Radiator Duct Adapter (Open Set Only)
- Critical Silencer (Enclosed Units Only)

Fuel System

- NPT Fuel Connection on Frame
- Primary and Secondary Fuel Shutoff

Cooling System

- Closed Coolant Recovery System
- UV/Ozone Resistant Hoses
- Factory-Installed Radiator
- 50/50 Ethylene Glycol Antifreeze
- Radiator Drain Extension

Electrical System

- Battery Charging Alternator
- Battery Cables
- Battery Tray
- Rubber-Booted Engine Electrical Connections
- Solenoid Activated Starter Motor

ALTERNATOR SYSTEM

- UL2200 GENprotect™
- Class H Insulation Material
- 2/3 Pitch
- Skewed Stator
- Brushless Excitation
- Sealed Bearings
- Amortisseur Winding
- Full Load Capacity Alternator

GENERATOR SET

- Internal Genset Vibration Isolation
- Separation of Circuits - High/Low Voltage
- Separation of Circuits - Multiple Breakers
- Wrapped Exhaust Piping
- Standard Factory Testing
- 2 Year Limited Warranty (Standby Rated Units)
- 1 Year Warranty (Prime Rated Units)
- Silencer Mounted in the Discharge Hood (Enclosed Units Only)

ENCLOSURE (If Selected)

- Rust-Proof Fasteners with Nylon Washers to Protect Finish
- High Performance Sound-Absorbing Material (Sound Attenuated Enclosures)
- Gasketed Doors
- Stamped Air-Intake Louvers
- Upward Facing Discharge Hoods (Radiator and Exhaust)
- Stainless Steel Lift Off Door Hinges
- Stainless Steel Lockable Handles
- RhinoCoat™ - Textured Polyester Powder Coat Paint

CONTROL SYSTEM

Digital H Control Panel- Dual 4x20 Display

Program Functions

- Programmable Crank Limiter
- 7-Day Programmable Exerciser
- Special Applications Programmable Logic Controller
- RS-232/485 Communications
- All Phase Sensing Digital Voltage Regulator
- 2-Wire Start Capability
- Date/Time Fault History (Event Log)
- Isochronous Governor Control
- Waterproof/Sealed Connectors
- Audible Alarms and Shutdowns
- Not in Auto (Flashing Light)
- Auto/Off/Manual Switch
- E-Stop (Red Mushroom-Type)
- NFPA110 Level I and II (Programmable)
- Customizable Alarms, Warnings, and Events
- Modbus® Protocol
- Predictive Maintenance Algorithm
- Sealed Boards
- Password Parameter Adjustment Protection
- Single Point Ground
- 16 Channel Remote Trending
- 0.2 msec High Speed Remote Trending
- Alarm Information Automatically Annunciated on the Display

Full System Status Display

- Power Output (kW)
- Power Factor
- kW Hours, Total, and Last Run
- Real/Reactive/Apparent Power
- All Phase AC Voltage
- All Phase Currents
- Oil Pressure
- Coolant Temperature
- Coolant Level
- Engine Speed
- Battery Voltage
- Frequency

Alarms and Warnings

- Oil Pressure
- Coolant Temperature
- Coolant Level
- Low Fuel Pressure
- Engine Overspeed
- Battery Voltage
- Alarms and Warnings Time and Date Stamped
- Snap Shots of Key Operation Parameters During Alarms and Warnings
- Alarms and Warnings Spelled Out (No Alarm Codes)

SG080 | 9.0L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

CONFIGURABLE OPTIONS

DEMAND RESPONSE READY

ENGINE SYSTEM

- ○ Engine Block Heater
- ○ Oil Heater
- ○ Air Filter Restriction Indicator
- ○ Radiator Stone Guard (Open Set Only)
- ○ Baseframe Cover/Rodent Guard
- ○ Fan and Belt Guards
- ○ Shipped Loose Critical Silencer (Open Set Only)

ELECTRICAL SYSTEM

- ○ 10A UL Listed Battery Charger
- ○ Battery Warmer

ALTERNATOR SYSTEM

- ○ Alternator Upsizing
- ○ Anti-Condensation Heater
- ○ Tropical Coating
- ○ Permanent Magnet Excitation

CIRCUIT BREAKER OPTIONS

- ○ Main Line Circuit Breaker
- ○ 2nd Main Line Circuit Breaker
- ○ Shunt Trip and Auxiliary Contact
- ○ Electronic Trip Breakers

GENERATOR SET

- ○ Demand Response Rating
- ○ GenLink® Communications Software (English Only)
- ○ Extended Factory Testing (3-Phase Only)
- ○ IBC Seismic Certification
- ○ 8 Position Load Center

ENCLOSURE

- ○ Weather Protected Enclosure
- ○ Level 1 Sound Attenuation
- ○ Level 2 Sound Attenuation
- ○ Level 2 Sound Attenuation with Motorized Dampers
- ○ Steel Enclosure
- ○ Aluminum Enclosure
- ○ AC/DC Enclosure Lighting Kit
- ○ Enclosure Heater
- ○ Pad Vibration Isolation
- ○ Up to 200 MPH Wind Load Rating (Contact Factory for Availability)
- ○ Door Alarm Switch

CONTROL SYSTEM

- ○ NFPA 110 Compliant Level 1 21-Light Annunciator
- ○ Remote Relay Assembly (8 or 16)
- ○ Oil Temperature Indication and Alarm
- ○ Remote E-Stop (Break Glass-Type, Surface Mount)
- ○ Remote E-Stop (Red Mushroom-Type, Surface Mount)
- ○ Remote E-Stop (Red Mushroom-Type, Flush Mount)
- ○ Remote Communication - Modem
- ○ 10A Engine Run Relay
- ○ Ground Fault Annunciator
- ○ 100 dB Alarm Horn
- ○ 120 V GFCI and 240 V Outlets
- ○ Damper Alarm Contacts
- ○ Spare Inputs (x4)/Outputs (x4)

WARRANTY (Standby Gensets Only)

- ○ 2 Year Extended Limited Warranty
- ○ 5 Year Limited Warranty
- ○ 5 Year Extended Limited Warranty
- ○ 7 Year Extended Limited Warranty
- ○ 10 Year Extended Limited Warranty

ENGINEERED OPTIONS

ENGINE SYSTEM

- ○ Coolant Heater Ball Valves
- ○ Fluid Containment Pan

ALTERNATOR SYSTEM

- ○ 3rd Breaker System

CONTROL SYSTEM

- ○ Battery Disconnect Switch

GENERATOR SET

- ○ Special Testing
- ○ Battery Box

SG080 | 9.0L | 80 kW

INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

GENERAC | INDUSTRIAL POWER

APPLICATION AND ENGINEERING DATA

DEMAND RESPONSE READY

ENGINE SPECIFICATIONS

General

Make	Generac
Cylinder #	8
Type	V
Displacement - Cu In (L)	543 (8.9)
Bore - in (mm)	4.49 (114.3)
Stroke - in (mm)	4.25 (107.95)
Compression Ratio	9.9:1
Intake Air Method	Naturally Aspirated
Number of Main Bearings	5
Connecting Rods	Forged Steel
Cylinder Head	Cast Iron
Cylinder Liners	No
Ignition	High Energy
Piston Type	Aluminum Alloy
Crankshaft Type	Forged Steel
Lifter Type	Hydraulic Roller
Intake Valve Material	Steel Alloy
Exhaust Valve Material	Stainless Steel
Hardened Valve Seats	Yes

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	±0.25%

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full-Flow Spin-On Cartridge
Crankcase Capacity - qts (L)	10 (9.5)

Cooling System

Cooling System Type	Pressurized Closed Recovery
Fan Type	Pusher
Fan Speed - RPM	2,386
Fan Diameter - in (mm)	22 (558.8)

Fuel System

Fuel Type	Natural Gas, Propane Vapor
Carburetor	Down Draft
Secondary Fuel Regulator	Standard
Fuel Shut Off Solenoid	Standard
Operating Fuel Pressure - in H_2O (kPa)	11 - 14 (2.7 - 3.5)
Optional Operating Fuel Pressure - in H_2O (kPa)	7 - 11 (1.7 - 2.7)

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	K0080124Y21
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	<5% (3-Phase)
Telephone Interference Factor (TIF)	<50

Standard Excitation	Synchronous Brushless
Bearings	Sealed Ball
Coupling	Direct Drive
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

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INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

OPERATING DATA

DEMAND RESPONSE READY

POWER RATINGS - NATURAL GAS/PROPANE VAPOR

	Standby/Demand Response	
Single-Phase 120/240 VAC @1.0pf	80 kW	Amps: 333
Three-Phase 120/208 VAC @0.8pf	80 kW	Amps: 278
Three-Phase 120/240 VAC @0.8pf	80 kW	Amps: 241
Three-Phase 277/480 VAC @0.8pf	80 kW	Amps: 120
Three-Phase 346/600 VAC @0.8pf	80 kW	Amps: 96

MOTOR STARTING CAPABILITIES (skVA)

skVA vs. Voltage Dip

277/480 VAC	30%	208/240 VAC	30%
K0080124Y21	172	K0080124Y21	132
K0100124Y21	227	K0100124Y21	171
K0130124Y21	327	K0130124Y21	327

FUEL CONSUMPTION RATES*

Natural Gas – scfh (m^3/hr)

Percent Load	Standby/Demand Response
25%	415.0 (11.7)
50%	720.0 (20.4)
75%	989.0 (28.0)
100%	1,247.0 (35.3)

Propane Vapor – scfh (m^3/hr)

Percent Load	Standby/Demand Response
25%	191.0 (5.4)
50%	298.0 (8.4)
75%	409.0 (11.5)
100%	519.0 (14.7)

Propane Liquid – gph (Lph)

Percent Load	Standby/Demand Response
25%	4.0 (15.1)
50%	7.6 (28.8)
75%	10.5 (39.7)
100%	13.6 (51.5)

* Fuel supply installation must accommodate fuel consumption rates at 100% load.

COOLING

		Standby/Demand Response
Air Flow (Fan Air Flow Across Radiator)	scfm (m^3/min)	6,107 (173)
Coolant System Capacity	gal (L)	5.5 (20.8)
Coolant Flow	gal/min (L/min)	27.5 (104.1)
Maximum Operating Ambient Temperature	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)		See Bulletin No. 0199270SSD
Maximum Radiator Backpressure	in H_2O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby/Demand Response
Flow at Rated Power scfm (m^3/min)	185.0 (5.2)

ENGINE

		Standby/Demand Response
Rated Engine Speed	RPM	1,800
Horsepower at Rated kW**	hp	122
Piston Speed	ft/min (m/min)	1,275 (389)
BMEP	psi (kPa)	99.9 (689)

EXHAUST

		Standby/Demand Response
Exhaust Flow (Rated Output)	scfm (m^3/min)	599 (16.9)
Maximum Exhaust Backpressure	inHg (kPa)	0.75 (2.54)
Exhaust Temp (Rated Output - Post Catalyst)	°F (°C)	1,288 (698)

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

Deration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.
Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528, and DIN6271 standards.
Standby - See Bulletin 0187500SSB
Prime - See Bulletin 10000018926
Demand Response - See Bulletin 10000018250

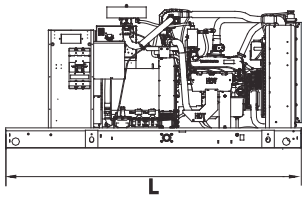
SG080 | 9.0L | 80 kW

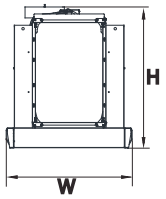
INDUSTRIAL SPARK-IGNITED GENERATOR SET

EPA Certified Stationary Emergency

DIMENSIONS AND WEIGHTS*

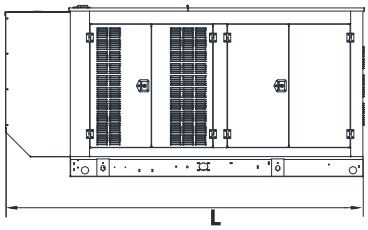
DEMAND RESPONSE READY

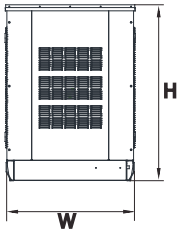




OPEN SET (Includes Exhaust Flex)

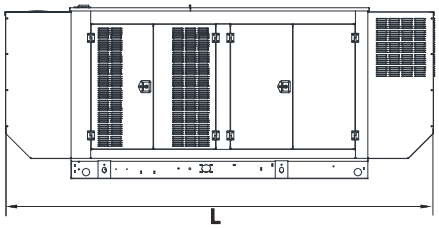
L x W x H - in (mm)	94.2 (2,394) x 40.0 (1,016) x 47.6 (1,208)
Weight - lbs (kg)	2,543 (1,153)

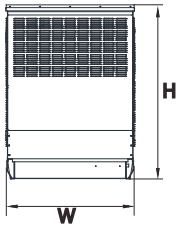




WEATHER PROTECTED ENCLOSURE

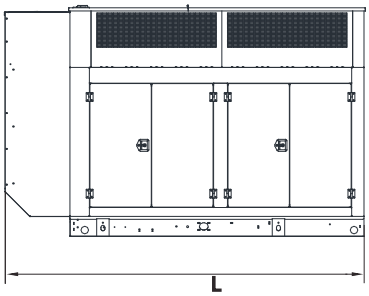
L x W x H - in (mm)	111.8 (2,840) x 40.5 (1,028) x 56.2 (1,427)
Weight - lbs (kg)	Steel: 3,075 (1,393) Aluminum: 2,802 (1,271)

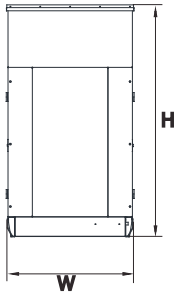




LEVEL 1 ACOUSTIC ENCLOSURE

L x W x H - in (mm)	129.4 (3,287) x 40.5 (1,028) x 56.2 (1,427)
Weight - lbs (kg)	Steel: 3,233 (1,466) Aluminum: 2,873 (1,303)





LEVEL 2 ACOUSTIC ENCLOSURE

L x W x H - in (mm)	111.8 (2,840) x 40.5 (1,028) x 68.6 (1,743)
Weight - lbs (kg)	Steel: 3,360 (1,524) Aluminum: 2,928 (1,328)

* All measurements are approximate and for estimation purposes only.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

SPEC SHEET

Generac Power Systems, Inc. | P.O. Box 8 | Waukesha, WI 53189
P: (262) 544-4811

Part No. 0K4290
Rev. D 11/14/18

Exhibit C

Structural Analysis

STRUCTURAL ANALYSIS REPORT
185' SELF-SUPPORTING TOWER
BLOOMFIELD, CONNECTICUT

Prepared for
SAI Communications Inc.

AT&T Site #CTV1001

February 21, 2020

Legs	69%
Bracing	82%
Foundation	46%

APT Project #CT1931600

. 3 SADDLEBROOK DRIVE · KILLINGWORTH, CT 06419 · PHONE 860-663-1697 · FAX 860-663-0935
⊗ 116 GRANDVIEW ROAD · CONWAY, NH 03818 · PHONE 603-496-5853 · FAX 603-447-2124

STRUCTURAL ANALYSIS REPORT
185' SELF-SUPPORTING TOWER
BLOOMFIELD, CONNECTICUT
prepared for
SAI Communications

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a structural analysis of Northeast Utilities' (Eversource Energy) 185-foot self-supporting tower. The analysis was performed for AT&T's proposed installation of six additional panel antennas, nine additional remote radio heads (RRHs) and three additional "squid" power-fiber distribution boxes (D-boxes) fed by six 2-1/4" feed lines, three fiber and twelve power lines as detailed below.

APT's analysis indicates the tower meets the requirements of the Connecticut State Building Code and TIA-222-G with AT&T's proposed equipment changes. The tower base foundation was also evaluated and found to be adequately sized. Deflection values were found to be within Northeast Utilities Substation Standards requirements. Usage values are as follows:

Legs	69%
Bracing	82%
Foundation	46%

INTRODUCTION:

A structural analysis was performed on the above-mentioned communications tower by APT for SAI Communications. The tower is located at 8 Hoskins Road in Bloomfield, Connecticut. The structure is a 185-foot galvanized steel self-supporting tower manufactured by Sabre Communications Corporation. The tower features pipe legs with angle steel bracing members.

APT did not perform a site visit for this analysis. The analysis relied solely on the following documents:

Document	Remarks	Date	Source
Geotechnical Testing Report	Design Earth Technology #2014.15	10/14/2014	Eversource
Structural Design Report	Sabre Communications #127272	8/19/2015	Eversource
Final Erection Drawings	Sabre Communications #127272	9/26/2015	Eversource
Feedline Plan	Centek Engineering	12/7/2016	T-Mobile
Construction Drawings	APT Filing no. CT409140	12/9/2016	APT
RFDS/antenna rec	T-Mobile site no. CTHA142A	2/14/2017	T-Mobile

Structural Analysis Report	APT Filing no. CT1071511	2/27/2017	APT
RFDS/antenna rec	AT&T site no. CTV1001	6/29/2018	AT&T
Existing equipment inventory	Compiled by Eversource Energy	3/12/2019	Eversource
Mount analysis	Hudson Design Group, LLC	1/22/2020	SAI Comm.

The analysis was performed in accordance with TIA-222-G using the following antenna inventory (AT&T's equipment shown in **bold** text; reserved equipment shown in *italic* text):

Carrier	Elev.	Antenna	Mount	Feed Line
-	185'	LED beacon	Leg	3/8"
Eversource	185'	20' omnidirectional whip (DS9A09F36D-N) with TTA, 14' omnidirectional whip (Kreco CO-41HD)	Pipes on legs	(2) 1-5/8", 1/2", 7/8"
Bloomfield PD/FD	185'	BA8080-67 16-bay dipole	Pipe on leg	(2) 7/8"
	183'	24' omnidirectional whip (DS2C03F36D)	12' sector mount	(2) 7/8"
CSP	183'	(3) 14' omnidirectional whip (DB Spectra-DS7C09P36U-D; two are inverted)	Above sector mount	(3) 1-5/8", 1/2"
Eversource	183'	(2) 8' dishes with radomes (PADX8-59A)	(2) Pipes on legs	(4) EW-63
Simsbury PD	181'	10', 4-bay dipole (DB 411; inverted)	Pipe on leg	7/8"
Eversource	177'	4' dish with radome (PA4-57A)	Pipe on leg	EW-90
Eversource	172'	8' dish with radome (PADX8-59A)	Pipe on leg	(2) EW-63
Eversource	171'	8' dish with radome (PADX8-59A)	Pipe on leg	(2) EW-63
Simsbury PD	165'	PR-900 Paraflector	Pipe on leg	7/8"
Eversource	165'	ANT150F6 omnidirectional whip	3' sidearm	7/8"
AT&T	**160'**	(3) 7770.00, (2) OPA-65R-LCUU-H8, (1) OPA-65R-LCUU-H6**, (4) 800-10966, (2) 800-10965 panels,** (3) RRUS-32 RRHs, (3) RRUS-E2 RRHs, **(3) B14 4478 RRHs, (3) B2/B66A 8843 RRHs, (3) 4449 B5 RRHs,** (3) TT08-19DB111-001 TMAs, (3) 'Squid' D-boxes, **(3) DC6-48-60-18-8C-EV D-boxes** [1]	(3) 12' sector mounts	(6) 2-1/4", (3) fiber, **(12)** power
Verizon	150'	(3) BXA-70063/6, (6) BXA-171063/12, (6) LPA-80080/4 panels, (3) RRH2x40-700 RRHs, (3) RRH2x40-AWS RRHs, (1) DB-T1-6Z-8AB-0Z D-box	(3) 12' sector mounts	(6) 1-5/8", (2) 1-5/8" hybrid
T-Mobile	140'	(3) APXV18-206516, (3) LNX-6515DS & (3) APXV18-206517 panels, (6) RRUS-11 RRHs, (1) cylindrical 'squid' D-box, (1) IBR1300 Radio	(3) 12' sector mounts	(3) 1-1/4", 6x12 hybrid
Eversource	*135'*	*(2) 6' dishes with radomes*	*(2) Pipes on legs*	*(4) EW-63*

Eversource	125'	8' dish with radome (PADX8-59A)	Pipe on leg	EW-63
Eversource	125'	ANT150F6 omnidirectional whip, 12' single dipole (Comprod 531-70HD)	(2) 6' sidearms	(2) 7/8"
Eversource	109'	12' single dipole (Comprod 531-70HD)	6' sidearm	7/8"
Eversource	108'	14' omnidirectional whip (Kreco CO-41HD)	6' sidearm	7/8"
-	103'	(3) Obstruction lights	Legs	3/8"
Eversource	100'	8' dish with radome (PADX8-59A)	Pipe on leg	EW-63
Bloomfield PD/FD	98'	3' high-performance dish (SC3-W100XGT1C)	3' sidearm	3/8" LMR
Bloomfield PD/FD	91	3' high-performance dish (SC3-W100XGT1C)	3' sidearm	3/8" LMR
Eversource	87'	5' omnidirectional whip (ANT150F2)	3' sidearm	7/8"
Eversource	85'	12' single dipole (Comprod 531-70HD)	6' sidearm	7/8"
Bloomfield PD/FD	66'	18" square panel (Motorola WB2619)	3' sidearm	Cat5e

[1] Currently installed – three 7770.00, two OPA-65R-LCUU-H8 & one OPA-65R-LCUU-H6 panel antennas, three RRUS-32 RRHs, three RRUS-E2 RRHs, three TT08-19DB111-001 TMAs and three 'Squid' D-boxes fed by six 1-1/4" feed lines, six power and three fiber lines.

RIGOROUS STRUCTURAL ANALYSIS:

Methodology:

The structural analysis was done in accordance with the Connecticut State Building Code and TIA-222, Revision G (TIA), Structural Standard for Antenna Supporting Structures and Antennas.

The analysis was conducted using a 3-second gust wind speed of 130 miles per hour (Ultimate) with no ice and 50-mph with 1" radial ice in accordance with Appendix N of the Connecticut State Building Code. The following additional design criteria were used:

Structure Class:	III
Topographic Category:	2
Exposure Category:	B
Crest Height:	200'

Analysis Results:

Analysis of the tower was conducted in accordance with the criteria outlined herein with antenna changes as previously described. The following table summarizes the results of the analysis based on stresses of individual leg and bracing members:

Elevation	Leg Capacity	Bracing Capacity
180'-185'	4%	19%
160'-180'	10%	58%
140'-160'	28%	48%
120'-140'	53%	70%
100'-120'	51%	76%
80'-100'	58%	56%
60'-80'	52%	62%
40'-60'	69%	72%
20'-40'	62%	82%
0'-20'	62%	75%

Bracing, Splice and Anchor Bolts:

Bracing, splice and anchor bolts were evaluated under the proposed loading. All evaluated bolts were found to be adequately sized to support the proposed loads.

Base Foundation:

Evaluation of the existing base foundation was performed from original Sabre foundation drawings. The base foundation was found to be adequately sized to support the proposed equipment. Factored base reactions imposed with the additional antennas were calculated as follows:

Reaction	Original Design	Calculated
Compression	775 k	577.3 k
Uplift	656 k	-477.4 k
Shear	132 k	101.1 k
OTM	23,690 ft-k	17,369 ft-k

Deflection:

Combined twist and sway was evaluated per Northeast Utilities Substation Standard SUB 090, Section 7 under service wind as well as design wind speeds. The tower was found to be within the allowable 0.5 degree total maximum. Results are summarized as follows:

Load Case	Tilt	Twist	Combined Max.
Service Wind – 60-mph	0.0801˚	0.0041˚	0.0802˚
Design Wind – 105-mph	0.3622˚	0.0204˚	0.3628˚

CONCLUSIONS AND RECOMMENDATIONS:

APT's structural analysis indicates that the 185-foot self-supporting tower located at 8 Hoskins Road in Bloomfield, Connecticut meets the requirements of the Connecticut State Building Code and TIA-222-G with AT&T's proposed equipment changes.

The tower base foundation was also evaluated and determined to be adequately sized. Additionally, deflection values were found to be within Northeast Utilities Substation Standards requirements.

LIMITATIONS:

This report is based on the following:

1. Tower is properly installed and maintained.
2. All members are in an undeteriorated condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Tower is in plumb condition.
6. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

All-Points Technology Corporation, P.C. (APT) is not responsible for modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

1. Replacing or strengthening bracing members.
2. Reinforcing vertical members in any manner.
3. Adding or relocating torque arms or guys.
4. Installing antenna mounting gates or side arms.

APT hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which is contrary to that which is contained herein, or you are aware of any defects arising from the original design, material, fabrication and erection deficiencies, you should disregard this report and immediately contact APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

01/06/2020	Eversource Energy, 5-7 St. Andrews Street, Bloomfield, CT. 06002 (Hartford County)						Sabre Industries Project # 15-5551-RAM-R2, dated 01/05/2015				
	185'-0" S.S. Tower. Datum NAD83 – Lat: 41'-53'-33.5" N Long: -072'-45'-56.5" W					ASR# 1295813		Leg Apex- Leg A-60deg, Leg B-180deg, Leg C-300deg.			
Antenna Type Make/Model	**Top of Mount Elev.**	**Antenna Center Elev.**	**Antenna Mount Type**	**Azimuth**	**Coaxial Cable Type**	**License**	**Frequency - MHz**	**Leg**	**ERP**	**Color Code & Line #**	**Comments**
(1)-DB DS9A09F36D-N, 20' Omni W/ TTA	185'-0"	195'-0"	Pipe to pipe mount off leg		(2)-1-5/8, (1) ½" coax	ES	900	B		(1)-white-RX, (2)-white-TX, (1)-white test cable	DSCADA w/TTA
(1)-Kreco CO-41HD, 14' Omni	185'-0"	189'-0"	Pipe to pipe mount off leg		(1)-7/8" coax	ES	48.20	B-C		(4)-white	Hartford Repeater
(1)-BA8080-67, 16'6", 16 bay Dipole	185	193'-0"	Pipe to pipe mount off leg	284.5	(2)-7/8" coax	Bloomfield PD/ FD	350-520 TX 460.2125-5125 RX	B-C		(1)-yellow RX, (2)-yellow TX	Bloomfield PD/FD
(1)-DB Spectra-DS2C03F36D 24'-3" Omni, Upright	183'-0"	195'-6"	(1)-12' Antenna sector frame mount	300	(2)-7/8" coax	ES	220MHz	C			ES Voice Radio
(1)-DB Spectra-DS7C09P36U-D 8.8 Upright TX, 14'-0" Omni (2)- DB Spectra-DS7C09P36U-D 8.8 Inverted RX, 14'-0" Omni	183'-0" 183'-0"	190'-0" 176'-0"	Shared antenna sector frame with above	300	(3)-1-5/8" coax (1)-1/2" coax	CSP	700MHz	C			CSP Troop H
(1)-DB 411, 4-bay 10' dipole (inverted)	181'-0"	191	Pipe to pipe mount off leg	270	(1)-7/8" coax	Simsbury PD	460 MHz	C		(3)-yellow	Primary Radio Simsbury PD
(1)-ITL Dual LED Flash Head	185'-0"	185'-0"	Top of Leg		(1)-3/8" power cable	ES		C			
(1)-RFS PADX8-59A- Dish w/Radome	183'-0"	183'-0"	Pipe Mount w/6" offset and tie back	128.1	(2)-EW-63 elliptical	ES	6256.54 Tx-H 6004.50 Rx-H	A		(1)-orange	Manchester Sub [WQWB585]
(1) -RFS-PA4-57A Dish w/Radome	177'-0"	177'-0"	Pipe Mount w/6" offset and tie back	125.8	(1)-EW-90 elliptical	ES	11235.00 Tx-V 10745.00 Rx-V	A		(1)-green	Windsor [WQWB585]
(1)-RFS PADX8-59A- Dish w/Radome	183'-0"	183'-0"	Pipe Mount w/6" offset and tie back	209.2	(2)-EW-63 elliptical	ES	6286.19 Tx 6034.15 Rx 6226.89 Tx 5974.85 Rx	B		(3)-orange	South Mountain 2 Radios 1 Dish Horizontal Polarity [WQWB585]
(1)-RFS PADX8-59A- Dish w/Radome	172'-0"	172'-0"	Pipe Mount w/6" offset and tie back	173.0	(2)-EW-63 elliptical	ES	6315.84 TX-V 6063.80 RX-V	B		(4)-orange	Berlin [WQWB585]
(1)-RFS-PADX8 -59A Dish w/Radome	171'-0"	171'-0"	Pipe Mount w/6" offset and tie back	285	(2)-WE-63 elliptical	ES		C			**Future Microwave Dish**
(1)-Kathrein Scala PR-900 paraflector	165'-0"	165'-0"	Pipe Mount w/6" offset and tie back	270	(1)-7/8" coax	Simsbury PD	890-960 MHz	C		(4)-yellow	Primary Microwave Simsbury PD
(1)-Telewave ANT150F-6, 20' Omni	165'-0"	175'-0"	3'-0" Side Arm		(1)-7/8" coax	ES	154.46375 MHz	A		(1)-white, (1)-orange	Load Management
(4)-CCI OPA-65R-LCUU-HB (2)-OPA-65-LCUU-H6 (3)-PowerWave 7770 (6)-Andrew TMA's (12)-Ericsson RRUs (3)-Ericsson A2 Modules (3)-Raycap Surge Arrestors (6)-Kaeluls Diplexers.	160'-0"	160'-0"	(3) 12'-0" Antenna sector frame mounts	0-120-240	(6) 2-1/4" coax (6) DC cables (3) Fiber cables	AT&T	850 and 700MHz 1900MHz	A-B-C			AT&T – Site # CT1001
(3)-BXA 70063/6CF, (6)-BXA-1711063-12CF, (6)-LPA-80080-4CF (3)-ALU RRH 2x40-700 (3)-ALU RRH 2x40-AWS (1)-RFS DB-T1-6Z-8AB-0Z	150'-0"	150'-0"	(3) 12'-0" Antenna sector frame mounts	20-180-270	(6) 1-5/8" coax (2) 1-5/8" hybrid	Verizon	Tx 869-880, 890-892 Rx 824-834,845-847MHz Tx 1970-1975 Rx 1890-1895MHz Tx 746-757 Rx 776-787MHz Tx 2145-2155 Rx 1745-1755	A-B-C			Verizon – Site name, Tariffville
(3)-APXV18-206516 (3)-LNX-6515DS (3)-APXV18-206517 (6)-RRUS-11 RRHs (1)-Cylindrical "Squid" D-Box, (1)-IBR1300 radio	140'-6"	140'-6"	(3) 12'-0" Antenna sector frame mounts	20-130-280	(3) 1-1/4" coax, (1) 6x12 Hybrid	T-Mobile		A-B-C			T-Mobile – Site # CTHA142A
(1)-RFS-PADX6-59A Dish w/Radome	135'-0"	135'-0"	Pipe Mount w/6" offset and tie back	265.2	(2)-EW63 elliptical	ES		C			**Future Microwave Dish**
(1)-RFS-PADX6-59A Dish w/Radome	135'-0"	135'-0"	Pipe Mount w/6" offset and tie back		(2)-EW63 elliptical	ES		B			**Future Microwave Dish**
(1)-RFS-PADX8 -59A Dish w/Radome	125'-0"	125'-0"	Pipe Mount w/6" offset and tie back	161.6	(1)-EW-63 elliptical	ES	6152.75 – Rx H 6404.79 – Tx H	B		(2)-green	Goose Hill, Main, 32.7 miles (Horizontal) [WQWB585]
Vertical Section of Dual Polarity Feed					(1)-EW-63 elliptical	ES	6555 Tx V 6725 Rx V			(2)-orange	Goose Hill Main Alt Polarity (Vertical) [WQWB585] Same Dish as above additional waveguide
(1)-Telewave ANT150F-6, 20' Omni	125'-0"	135'-0"	6'-0" Side Arm		(1)-7/8" coax	ES	153.695	C		(1)-White (2)-orange	Alarm Dialer
(1)-Comprod 531-70HD, 12' Dipole	125'-0"	125'-0"	6'-0" Side Arm	90	(1)- 7/8" coax	ES	47.84	A		(1)-White, (3)-orange	Windsor / Tolland
(1)-Comprod 531-70HD, 12' Dipole	109'-0"	111'-0"	6'-0" Side Arm		(1)-7/8" coax	ES	37.60	A		(1)-white, (1)-green	CCN

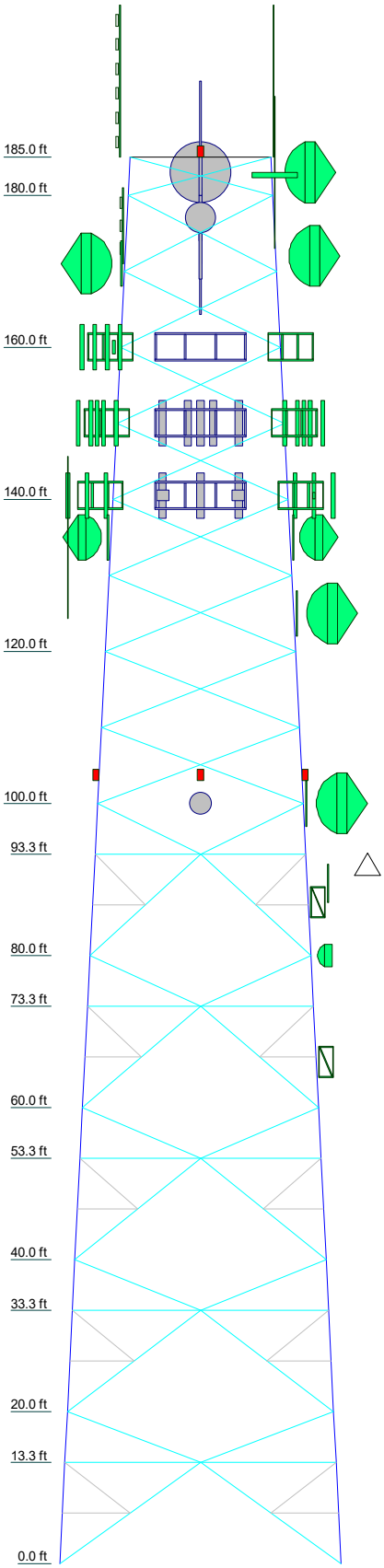
(1)-Kreco CO-41HD 14' Omni	108'-0"	114'-6"	6'-0" Side Arm	180	(1) -7/8" coax	ES	49.20	B		(1)-white, (2)-green	Hartford
(3) IT L-810, LED sidelights	103'-0"	103'-0"	(1) sidelight per leg	0-120-240	(1)- 3/8" power cable	ES		A-B-C		Sidelight Cable	ITL LED Sidelights
(1) RFS-PADX8 -59A Dish w/Radome	100'-0"	100'-0"	Pipe Mount w/6" offset and tie back	161.6	(1)- EW-63 elliptical	ES	6152.75 – Rx H	B		(3)-green	Goose Hill Diversity 32.7 miles
Vertical Section of Dual Polarity Feed					(1)- EW-63 elliptical	ES	6725.00 – Rx V			(5) Orange	Goose Hill Diversity Alt Polarity (Vertical) Same Dish as above additional waveguide
(1)-RFS-SC3-W100XGT1C, 3' Dish	98'-0"	98'-0"	3'-Side Arm	159.76	(1)-3/8" LMR	BFD	11GHz	A			Bloomfield Fire Dept.
(1)-RFS-SC3-W100XGT1C, 3' Dish	91'-0"	91'-0"	3'-Side Arm	144.48	(1)-3/8" LMR	BFD	11GHz	A			Bloomfield Fire Dept.
(1)-Telewave ANT150F-2, 5' Omni	87'-0"	90'-6"	3' Side Arm	120	(1)-7/8" coax	ES	173.250	B		(1)-white, (3)-green	Yankee Gas - Windsor
(1)-Comprod 531-70HD, Dipole	85'-0"	87'-0"	6'-0" Side Arm	90	(1)-7/8" coax	ES	37.74	A		(1)-orange, (1)-green	Tolland Meter & Service
(1)-Motorola WB2619, 18" x 18" Flat Panel	66'-0"	66'-0"	3'-0" Side Arm	120	(1)-CAT5 ¼" cable	Bloom/ Simsbury		B		(1)-red	Backup microwave Bloomfield PD/FD

Eversource- Green/ Orange/ White. Bloomfield, Simsbury – Red/ Yellow. FCC FRN# 0003583721

Appendix A

Tower Schematic

Section	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P12.75x.5		P10.75x.5		P10.75x.365		P8.625x.5		P8.625x.322				P6.625x.280		
Leg Grade	A572-50														
Diagonals	L6x6x1/2				L6x6x3/8				L4x6x1/2	B	L5x5x3/8		L5x5x5/16	L4x4x1/4	A
Diagonal Grade	A36														
Top Girts	N.A.														C
Horizontals	L5x5x5/16	N.A.	L5x5x5/16	N.A.	L5x5x5/16	N.A.	L4x4x5/16	N.A.	L4x4x5/16				N.A.		
Red. Horizontals	L3 1/2x4x5/16	N.A.	L3x3x5/16	N.A.	L3x3x5/16	N.A.	L3x3x1/4	N.A.	L3x3x1/4				N.A.		
Red. Diagonals	L3 1/2x4x5/16	N.A.	L3x3x5/16	N.A.	L3x3x5/16	N.A.	L3x3x1/4	N.A.	L3x3x1/4				N.A.		
Red. Hips	L3 1/2x3 1/2x1/4	N.A.	L3 1/2x3 1/2x1/4	N.A.	L3 1/2x3 1/2x1/4	N.A.	L3x3x1/4	N.A.	L3x3x1/4				N.A.		
Face Width (ft)	37	35	33.6667	33	31.6667	31	29.6667	29	27.6667	27	25	23	21	19	18.5
# Panels @ (ft)	1 @ 13.3333	D	1 @ 13.3333	D	1 @ 13.3333	D	1 @ 13.3333	D	1 @ 13.3333	D	8 @ 10				1 @ 5
Weight (lb) 59558.4	7427.4	3428.3	6612.9	2620.1	5254.3	2252.8	4877.9	2237.1	4302.4	1886.4	5798.4	4335.3	4106.6	2895.6	1522.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LED beacon (NU)	185	OPA-65R-LCUU-H8 (AT∐ existing)	160
20' x 3" omni whip (NU)	185	OPA-65R-LCUU-H6 (AT∐ existing)	160
Tower Top Amplifier (NU)	185	7770.00 (AT∐ existing)	160
14' x 3" Dia Omni (NU)	185	(2) BXA-171063/12 (Verizon)	150
BA8080-67 16' 16 Bay Dipole (Bloomfield PD)	185	(2) LPA-80080/4 (Verizon)	150
		(2) LPA-80080/4 (Verizon)	150
6'x4 1/2" Pipe Mount (NU)	183	(2) LPA-80080/4 (Verizon)	150
24' x 2" omni whip	183	ALU RRH2x40-700U (Verizon)	150
12' T-frame sector mnt	183	ALU RRH2x40-700U (Verizon)	150
14' x 2" omni whip (NU)	183	ALU RRH2x40-700U (Verizon)	150
14' x 2" omni whip (NU)	183	ALU RRH2x40-AWS (Verizon)	150
14' x 2" omni whip (NU)	183	ALU RRH2x40-AWS (Verizon)	150
8' dish with radome (NU)	183	ALU RRH2x40-AWS (Verizon)	150
8' dish with radome (NU)	183	RFS DB-T1-6Z-8AB-0Z D-box (Verizon)	150
6'x4 1/2" Pipe Mount (NU)	181		
10' 4-bay dipole (NU)	181 - 171	Rohn 6' x 12' Boom Gate (1) (Verizon)	150
6'x4 1/2" Pipe Mount (NU)	177	Rohn 6' x 12' Boom Gate (1) (Verizon)	150
4' dish with radome (NU)	177	Rohn 6' x 12' Boom Gate (1) (Verizon)	150
6'x4 1/2" Pipe Mount (NU)	172	BXA-70063/6 (Verizon)	150
8' dish with radome (NU)	172	BXA-70063/6 (Verizon)	150
6'x4 1/2" Pipe Mount (NU)	171	BXA-70063/6 (Verizon)	150
8' dish with radome (NU)	171	(2) BXA-171063/12 (Verizon)	150
ROHN 3-ft Side Arm (NU)	165	(2) BXA-171063/12 (Verizon)	150
6'x3" Pipe Mount (Simsbury PD)	165	APXV18-206517 (T-Mobile)	140.5
PR-900 (Simsbury PD)	165	LNX-6515DS-T4M (T-Mobile)	140.5
Telewave ANT150F6 (NU)	165	LNX-6515DS-T4M (T-Mobile)	140.5
OPA-65R-LCUU-H8 (AT∐ existing)	160	LNX-6515DS-T4M (T-Mobile)	140.5
(2) 800-10966 (AT∐)	160	(2) Ericsson RRUS-11 (T-Mobile)	140.5
(2) 800-10965 (AT∐)	160	(2) Ericsson RRUS-11 (T-Mobile)	140.5
(2) 800-10966 (AT∐)	160	(2) Ericsson RRUS-11 (T-Mobile)	140.5
RRUS-32 (AT∐ existing)	160	T-Mobile Mini-Squid (T-Mobile)	140.5
RRUS-32 (AT∐ existing)	160	Fastback IBR 1300 (T-Mobile)	140.5
RRUS-32 (AT∐ existing)	160	4'x2 7/8" Pipe Mount (T-Mobile)	140.5
RRUS-E2 (AT∐ existing)	160	12' T-frame sector mnt	140.5
RRUS-E2 (AT∐ existing)	160	12' T-frame sector mnt	140.5
RRUS-E2 (AT∐ existing)	160	12' T-frame sector mnt	140.5
Ericsson RRUS B14 4478 (AT∐)	160	APXV18-206516 (T-Mobile)	140.5
Ericsson RRUS B14 4478 (AT∐)	160	APXV18-206516 (T-Mobile)	140.5
Ericsson RRUS B14 4478 (AT∐)	160	APXV18-206516 (T-Mobile)	140.5
Ericsson RRUS 8843 (AT∐)	160	APXV18-206517 (T-Mobile)	140.5
Ericsson RRUS 8843 (AT∐)	160	APXV18-206517 (T-Mobile)	140.5
Ericsson RRUS 8843 (AT∐)	160	6'x4 1/2" Pipe Mount (NU)	135
Ericsson RRUS B5 4449 (AT∐)	160	6'x4 1/2" Pipe Mount (NU)	135
Ericsson RRUS B5 4449 (AT∐)	160	6' dish with radome (NU)	135
Ericsson RRUS B5 4449 (AT∐)	160	6' dish with radome (NU)	135
TT08-19DB111 TMA (AT∐ existing)	160	12' single dipole (NU)	125
TT08-19DB111 TMA (AT∐ existing)	160	Rohn 6' Side-Arm(1) (NU)	125
TT08-19DB111 TMA (AT∐ existing)	160	6'x4 1/2" Pipe Mount (NU)	125
Raycap DC6-48-60-18-8F surge suppressor (AT∐ existing)	160	Telewave ANT150F6 (NU)	125
		Rohn 6' Side-Arm(1) (NU)	125
Raycap DC6-48-60-18-8F surge suppressor (AT∐ existing)	160	8' dish with radome (NU)	125
		12' Dipole (NU)	109
Raycap DC6-48-60-18-8F surge suppressor (AT∐ existing)	160	Rohn 6' Side-Arm(1) (NU)	109
		14' x 3" Dia Omni (NU)	108
Raycap DC6-48-60-18-8C-EV (AT∐ existing)	160	Rohn 6' Side-Arm(1) (NU)	108
		Obstruction light (NU)	103
Raycap DC6-48-60-18-8C-EV (AT∐ existing)	160	Obstruction light (NU)	103
		Obstruction light (NU)	103
Raycap DC6-48-60-18-8C-EV (AT∐ existing)	160	6'x4 1/2" Pipe Mount (NU)	100
		8' dish with radome (NU)	100
SitePro VFA12-HD (AT∐ existing)	160	3' HP dish (Bloomfield PD/FD)	100
SitePro VFA12-HD (AT∐ existing)	160	Telewave ANT150F2 (NU)	87
SitePro VFA12-HD (AT∐ existing)	160	3' sidearm (NU)	87
(2) 5'x2-3/8" Pipe Mount (AT∐ new)	160	12' Dipole (NU)	85
(2) 5'x2-3/8" Pipe Mount (AT∐ new)	160	Rohn 6' Side-Arm(1) (NU)	85
(2) 5'x2-3/8" Pipe Mount (AT∐ new)	160	3' HP dish (Bloomfield PD/FD)	80
7770.00 (AT∐ existing)	160	3' sidearm (NU)	66
7770.00 (AT∐ existing)	160	18" square panel (NU)	66

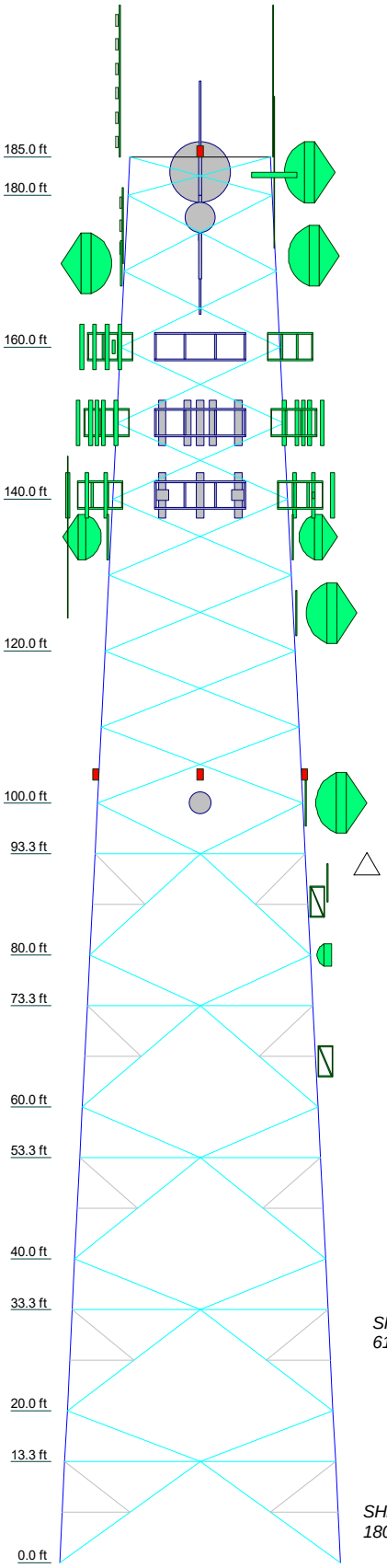
SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L3 1/2x3 1/2x1/4	C	L5x5x5/16
B	L6x6x3/8	D	1 @ 6.66667

All-Points Technology Corp., P.C.
116 Grandview Road
Conway, NH 03818
Phone: (603) 496-5853
FAX: 603) 447-2124

Job: ***185' Self-Supporting Tower***			
Project: ***CT1931600 Bloomfield***			
Client: SAI; AT&T Site #CT1001	Drawn by: Rob Adair	App'd:	
Code: TIA-222-G	Date: 02/21/20	Scale: NTS	
Path: Z:\Shared\NH Office\Jobs\3 AT&T\CT1931600 Bloomfield CT1001\CT1931600 Bloomfield.en		Dwg No. E-1	

Section	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P12.75x.5		P10.75x.5		P10.75x.365		P8.625x.5		P8.625x.322				P6.625x.280		
Leg Grade	A572-50														
Diagonals	L6x6x1/2		L6x6x3/8						L4x6x1/2	B	L5x5x3/8	L5x5x5/16		L4x4x1/4	A
Diagonal Grade	A36														
Top Girts	N.A.														C
Horizontals	L5x5x5/16	N.A.	L5x5x5/16	N.A.	L5x5x5/16	N.A.	L4x4x5/16	N.A.	L4x4x5/16			N.A.			
Red. Horizontals	L3 1/2x4x5/16	N.A.	L3x3x5/16	N.A.	L3x3x5/16	N.A.	L3x3x1/4	N.A.	L3x3x1/4			N.A.			
Red. Diagonals	L3 1/2x4x5/16	N.A.	L3x3x5/16	N.A.	L3x3x5/16	N.A.	L3x3x1/4	N.A.	L3x3x1/4			N.A.			
Red. Hips	L3 1/2x3 1/2x1/4	N.A.	L3 1/2x3 1/2x1/4	N.A.	L3 1/2x3 1/2x1/4	N.A.	L3x3x1/4	N.A.	L3x3x1/4			N.A.			
Face Width (ft)	37	35	33.6667	33	31.6667	31	29.6667	29	27.6667	27	25	23	21	19	18.5
# Panels @ (ft)	1 @ 13.3333	D	1 @ 13.3333	D	1 @ 13.3333	D	1 @ 13.3333	D	1 @ 13.3333	D		8 @ 10			1 @ 5
Weight (lb) 59558.4	7427.4	3428.3	6612.9	2620.1	5254.3	2252.8	4877.9	2237.1	4302.4	1886.4	5798.4	4335.3	4106.6	2895.6	1522.9



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L3 1/2x3 1/2x1/4	C	L5x5x5/16
B	L6x6x3/8	D	1 @ 6.66667

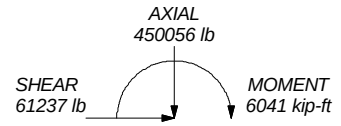
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

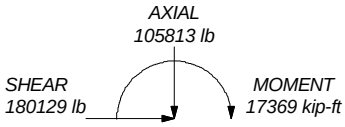
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 577321 lb
SHEAR: 101126 lb

UPLIFT: -477437 lb
SHEAR: 87893 lb



TORQUE 117 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 136 kip-ft
REACTIONS - 101 mph WIND

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Conway, NH 03818
Phone: (603) 496-5853
FAX: 603) 447-2124

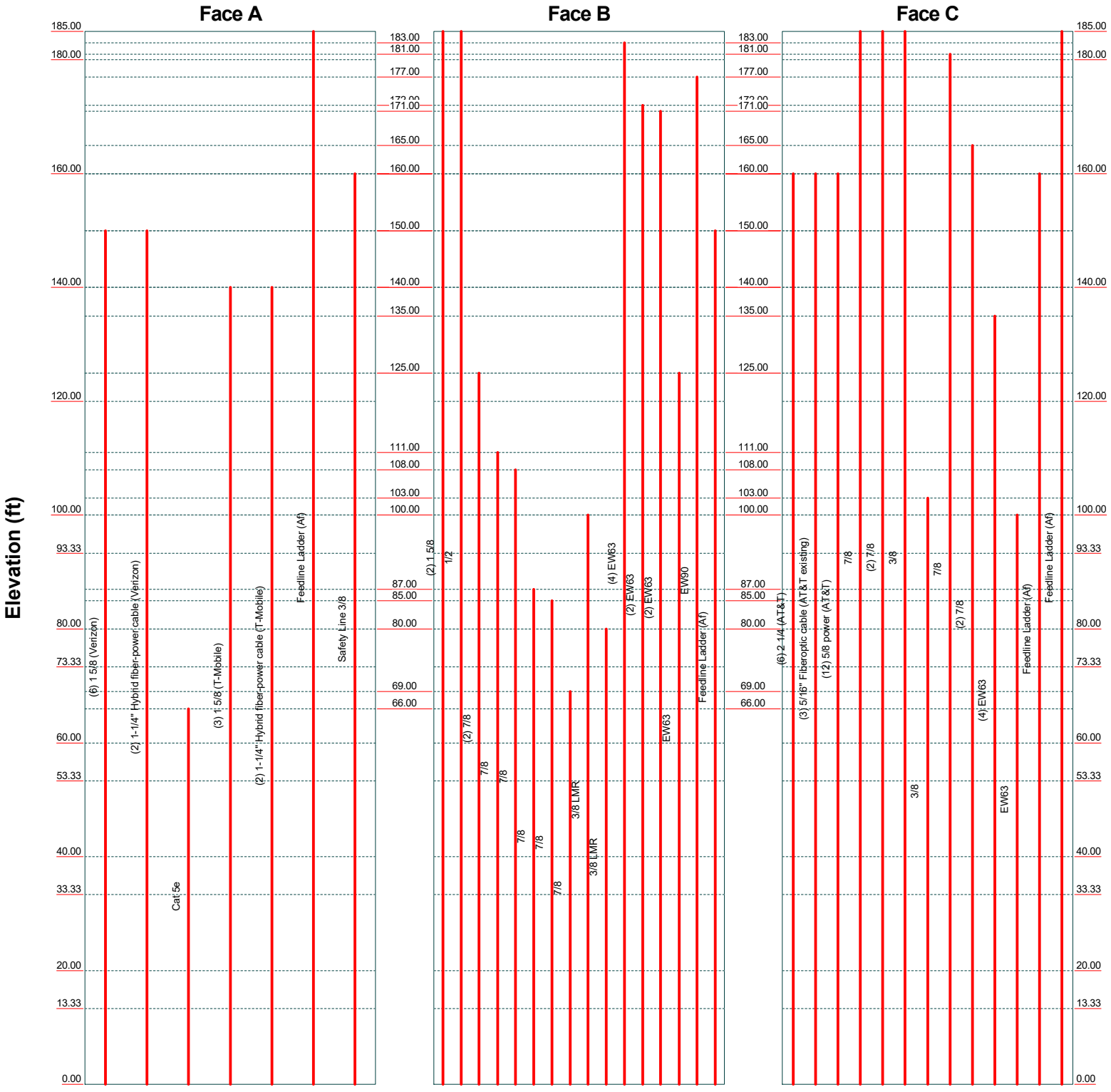
Job: ***185' Self-Supporting Tower***			
Project: ***CT1931600 Bloomfield***			
Client: SAI; AT&T Site #CT1001	Drawn by: Rob Adair	App'd:	
Code: TIA-222-G	Date: 02/21/20	Scale: NTS	
Path: Z:\Shared\NH Office\Jobs\3 AT&T\CT1931600 Bloomfield CT1001\CT1931600 Bloomfield.eri		Dwg No. E-1	

Appendix B

Calculations

Feed Line Distribution Chart
0' - 185'

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



All-Points Technology Corp., P.C.
116 Grandview Road
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Job: ***185' Self-Supporting Tower***			
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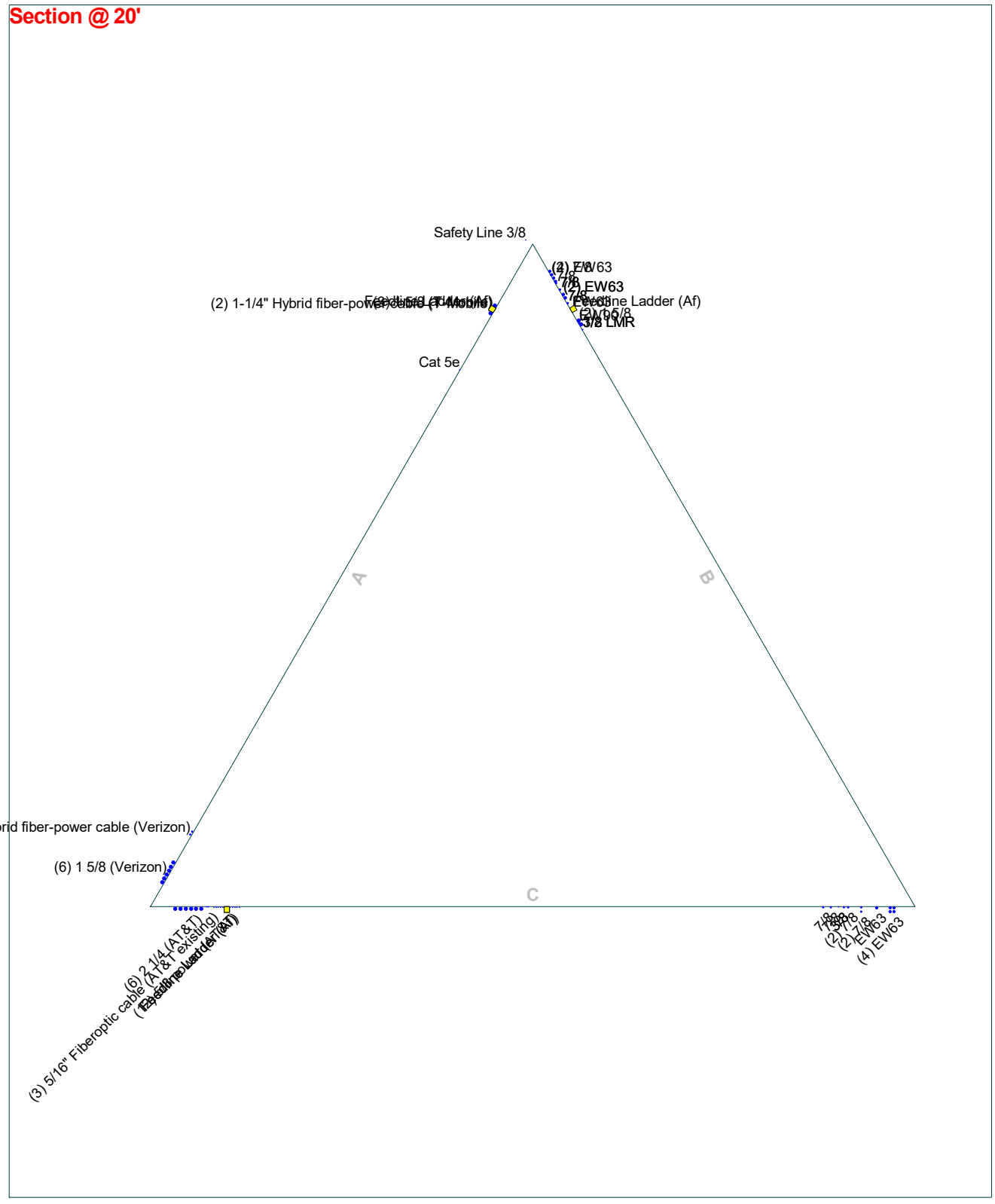
Client: SAI; AT&T Site #CT1001	Drawn by: Rob Adair	App'd:	
Code: TIA-222-G	Date: 02/21/20	Scale: NTS	
Path: Z:\Shared\NH Office\Jobs\3 AT&T\CT1931600 Bloomfield CT1001\CT1931600 Bloomfield.en		Dwg No. E-7	

Feed Line Plan
20'

Round Flat App In Face App Out Face



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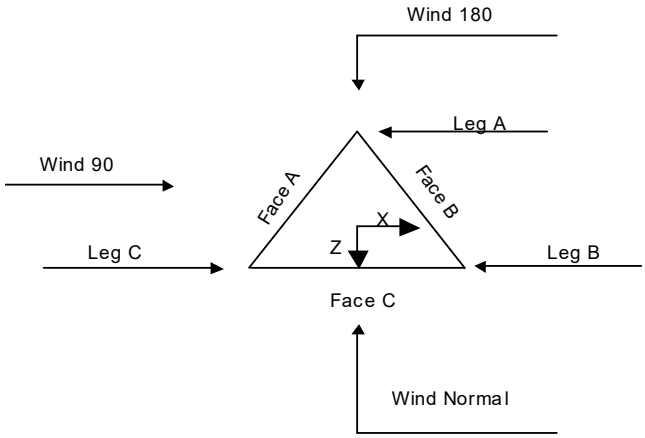
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 185.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 18.50 ft at the top and 37.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Ultimate wind speed of 130 mph.
Basic wind speed of 101 mph.
Structure Class III.
Exposure Category C.
Topographic Category 2.
Crest Height 200.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz		Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	185.00-180.00			18.50	1	5.00
T2	180.00-160.00			19.00	1	20.00
T3	160.00-140.00			21.00	1	20.00
T4	140.00-120.00			23.00	1	20.00
T5	120.00-100.00			25.00	1	20.00
T6	100.00-93.33			27.00	1	6.67
T7	93.33-80.00			27.67	1	13.33
T8	80.00-73.33			29.00	1	6.67
T9	73.33-60.00			29.67	1	13.33
T10	60.00-53.33			31.00	1	6.67
T11	53.33-40.00			31.67	1	13.33
T12	40.00-33.33			33.00	1	6.67
T13	33.33-20.00			33.67	1	13.33
T14	20.00-13.33			35.00	1	6.67
T15	13.33-0.00			35.67	1	13.33

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	185.00-180.00	5.00	X Brace	No	No	0.0000	0.0000
T2	180.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T3	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T4	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T5	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	100.00-93.33	6.67	Diamond	No	Yes	0.0000	0.0000
T7	93.33-80.00	13.33	K1 Down	No	Yes	0.0000	0.0000
T8	80.00-73.33	6.67	Diamond	No	Yes	0.0000	0.0000
T9	73.33-60.00	13.33	K1 Down	No	Yes	0.0000	0.0000
T10	60.00-53.33	6.67	Diamond	No	Yes	0.0000	0.0000
T11	53.33-40.00	13.33	K1 Down	No	Yes	0.0000	0.0000
T12	40.00-33.33	6.67	Diamond	No	Yes	0.0000	0.0000
T13	33.33-20.00	13.33	K1 Down	No	Yes	0.0000	0.0000
T14	20.00-13.33	6.67	Diamond	No	Yes	0.0000	0.0000
T15	13.33-0.00	13.33	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 185.00-180.00	Pipe	P6.625x.280	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T2 180.00-160.00	Pipe	P6.625x.280	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T3 160.00-140.00	Pipe	P6.625x.280	A572-50 (50 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T4 140.00-120.00	Pipe	P6.625x.280	A572-50 (50 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T5 120.00-100.00	Pipe	P8.625x.322	A572-50 (50 ksi)	Equal Angle	L5x5x3/8	A36 (36 ksi)
T6 100.00-93.33	Pipe	P8.625x.322	A572-50 (50 ksi)	Equal Angle	L6x6x3/8	A36 (36 ksi)
T7 93.33-80.00	Pipe	P8.625x.322	A572-50 (50 ksi)	Single Angle	L4x6x1/2	A36 (36 ksi)
T8 80.00-73.33	Pipe	P8.625x.5	A572-50 (50 ksi)	Equal Angle	L6x6x3/8	A36 (36 ksi)
T9 73.33-60.00	Pipe	P8.625x.5	A572-50 (50 ksi)	Equal Angle	L6x6x3/8	A36 (36 ksi)
T10 60.00-53.33	Pipe	P10.75x.365	A572-50 (50 ksi)	Equal Angle	L6x6x3/8	A36 (36 ksi)
T11 53.33-40.00	Pipe	P10.75x.365	A572-50 (50 ksi)	Equal Angle	L6x6x3/8	A36 (36 ksi)
T12 40.00-33.33	Pipe	P10.75x.5	A572-50 (50 ksi)	Equal Angle	L6x6x3/8	A36 (36 ksi)
T13 33.33-20.00	Pipe	P10.75x.5	A572-50 (50 ksi)	Equal Angle	L6x6x1/2	A36 (36 ksi)
T14 20.00-13.33	Pipe	P12.75x.5	A572-50 (50 ksi)	Equal Angle	L6x6x1/2	A36 (36 ksi)
T15 13.33-0.00	Pipe	P12.75x.5	A572-50 (50 ksi)	Equal Angle	L6x6x1/2	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 185.00-180.00	Equal Angle	L5x5x5/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T6 100.00-93.33	None	Single Angle		A36 (36 ksi)	Solid Round	None	A36 (36 ksi)
T7 93.33-80.00	None	Single Angle		A36 (36 ksi)	Equal Angle	L4x4x5/16	A36 (36 ksi)
T8 80.00-73.33	None	Single Angle		A36 (36 ksi)	Solid Round	None	A36 (36 ksi)
T9 73.33-60.00	None	Single Angle		A36 (36 ksi)	Equal Angle	L4x4x5/16	A36 (36 ksi)
T10 60.00-53.33	None	Single Angle		A36 (36 ksi)	Solid Round	None	A36 (36 ksi)
T11 53.33-40.00	None	Single Angle		A36 (36 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T12 40.00-33.33	None	Single Angle		A36 (36 ksi)	Solid Round	None	A36 (36 ksi)
T13 33.33-20.00	None	Single Angle		A36 (36 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T14 20.00-13.33	None	Single Angle		A36 (36 ksi)	Solid Round	None	A36 (36 ksi)
T15 13.33-0.00	None	Single Angle		A36 (36 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T7	A36	Horizontal (1)	Equal Angle	L3x3x1/4	1
93.33-80.00	(36 ksi)	Diagonal (1)	Equal Angle	L3x3x1/4	1
		Hip (1)	Equal Angle	L3x3x1/4	1
T9	A36	Horizontal (1)	Equal Angle	L3x3x1/4	1
73.33-60.00	(36 ksi)	Diagonal (1)	Equal Angle	L3x3x1/4	1
		Hip (1)	Equal Angle	L3x3x1/4	1
T11	A36	Horizontal (1)	Equal Angle	L3x3x5/16	1
53.33-40.00	(36 ksi)	Diagonal (1)	Equal Angle	L3x3x5/16	1
		Hip (1)	Equal Angle	L3 1/2x3 1/2x1/4	1
T13	A36	Horizontal (1)	Equal Angle	L3x3x5/16	1
33.33-20.00	(36 ksi)	Diagonal (1)	Equal Angle	L3x3x5/16	1
		Hip (1)	Equal Angle	L3 1/2x3 1/2x1/4	1
T15	A36	Horizontal (1)	Single Angle	L3 1/2x4x5/16	1
13.33-0.00	(36 ksi)	Diagonal (1)	Single Angle	L3 1/2x4x5/16	1
		Hip (1)	Equal Angle	L3 1/2x3 1/2x1/4	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
185.00-180.00			(36 ksi)						
T2	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
180.00-160.00			(36 ksi)						
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
160.00-140.00			(36 ksi)						
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
140.00-120.00			(36 ksi)						
T5	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
120.00-100.00			(36 ksi)						
T6	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
100.00-93.33			(36 ksi)						
T7 93.33-80.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T8 80.00-73.33	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T9 73.33-60.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T10	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
60.00-53.33			(36 ksi)						
T11	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
53.33-40.00			(36 ksi)						
T12	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
40.00-33.33			(36 ksi)						
T13	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
33.33-20.00			(36 ksi)						
T14	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
20.00-13.33			(36 ksi)						
T15 13.33-0.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
185.00-180.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
100.00-93.33				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
93.33-80.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
80.00-73.33				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
73.33-60.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
60.00-53.33				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
53.33-40.00				1	1	1	1	1	1	1
T12	Yes	Yes	1	1	1	1	1	1	1	1
40.00-33.33				1	1	1	1	1	1	1
T13	Yes	Yes	1	1	1	1	1	1	1	1
33.33-20.00				1	1	1	1	1	1	1
T14	Yes	Yes	1	1	1	1	1	1	1	1
20.00-13.33				1	1	1	1	1	1	1
T15	Yes	Yes	1	1	1	1	1	1	1	1
13.33-0.00				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 185.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T2 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 100.00-93.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 93.33-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 80.00-73.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 73.33-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 60.00-53.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T11 53.33-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T12 40.00-33.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T13 33.33-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T14 20.00-13.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T15 13.33-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 185.00-180.00	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T2 180.00-160.00	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T3 160.00-140.00	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T4 140.00-120.00	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T5 120.00-100.00	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000	0.0000
T6 100.00-93.33	3.0000	0.0000	3.0000	4.0000	0.0000	4.0000	0.0000	0.0000
T7 93.33-80.00	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000	0.0000	0.0000
T8 80.00-73.33	0.0000	0.0000	0.0000	8.0000	0.0000	8.0000	0.0000	0.0000
T9 73.33-60.00	0.0000	0.0000	0.0000	0.0000	0.0000	4.0000	0.0000	0.0000
T10 60.00-53.33	0.0000	0.0000	0.0000	9.0000	0.0000	9.0000	0.0000	0.0000
T11 53.33-40.00	0.0000	0.0000	0.0000	0.0000	0.0000	5.0000	0.0000	0.0000
T12 40.00-33.33	0.0000	0.0000	0.0000	9.0000	0.0000	9.0000	0.0000	0.0000
T13 33.33-20.00	0.0000	0.0000	0.0000	0.0000	0.0000	5.0000	0.0000	0.0000
T14 20.00-13.33	0.0000	0.0000	0.0000	9.0000	0.0000	9.0000	0.0000	0.0000
T15 13.33-0.00	0.0000	0.0000	0.0000	0.0000	0.0000	5.0000	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 185.00-180.00	Flange	1.2500 A325N	6	0.7500 A325X	1	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	1.2500 A325N	6	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	1.2500 A325N	6	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	1.2500 A325N	8	0.6250 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T5 120.00-100.00	Flange	1.5000 A325N	8	0.7500 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T6 100.00-93.33	Flange	0.0000 A325N	0	1.0000 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T7 93.33-80.00	Flange	1.5000 A325N	8	1.0000 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	1.0000 A325N	2	0.6250 A325N	0
T8 80.00-73.33	Flange	0.0000 A325N	0	0.8750 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	0	0.6250 A325N	0
T9 73.33-60.00	Flange	1.5000 A325N	8	0.8750 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.8750 A325X	2	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T10 60.00-53.33	Flange	0.0000 A325N	0	0.8750 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325X	0	0.6250 A325N	0
T11 53.33-40.00	Flange	1.5000 A325N	8	0.8750 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.8750 A325X	2	0.6250 A325N	0
T12 40.00-33.33	Flange	0.0000 A325N	0	1.0000 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.0000 A325X	0	0.6250 A325N	0
T13 33.33-20.00	Flange	1.5000 A325N	8	1.0000 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	1.0000 A325X	2	0.6250 A325N	0
T14 20.00-13.33	Flange	0.0000 A325N	0	1.0000 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.0000 A325X	0	0.6250 A325N	0
T15 13.33-0.00	Flange	1.7500 F1554-105	6	1.0000 A325X	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	1.0000 A325X	2	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
2 1/4 (AT&T)	C	No	No	Ar (CaAa)	160.00 - 0.00	0.0000	0.45	6	6	0.5000	2.3800		1.16
5/16" Fiberoptic cable (AT&T existing)	C	No	No	Ar (CaAa)	160.00 - 0.00	0.0000	0.425	3	3	0.3125	0.3125		0.25
5/8 power (AT&T)	C	No	No	Ar (CaAa)	160.00 - 0.00	0.0000	0.4	12	12	0.6450	0.6450		0.40
1 5/8 (Verizon)	A	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	-0.45	6	6	0.5000	1.9800		1.04
1-1/4" Hybrid fiber-power cable (Verizon)	A	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	-0.39	2	2	0.5000	1.2500		1.30
1 5/8	B	No	No	Ar (CaAa)	185.00 - 0.00	0.0000	-0.38	2	2	0.5000	1.9800		1.04
7/8	C	No	No	Ar (CaAa)	185.00 - 0.00	0.0000	-0.39	1	1	1.1100	1.1100		0.54
7/8	C	No	No	Ar (CaAa)	185.00 - 0.00	0.0000	-0.41	2	2	1.1100	1.1100		0.54
3/8	C	No	No	Ar (CaAa)	185.00 - 0.00	0.0000	-0.4	1	1	0.4400	0.4400		0.08
3/8	C	No	No	Ar (CaAa)	103.00 - 0.00	0.0000	-0.4	1	1	0.4400	0.4400		0.08
1/2	B	No	No	Ar (CaAa)	185.00 - 0.00	0.0000	-0.37	1	1	0.5800	0.5800		0.25
7/8	C	No	No	Ar (CaAa)	181.00 - 0.00	0.0000	-0.38	1	1	1.1100	1.1100		0.54
7/8	C	No	No	Ar (CaAa)	165.00 - 0.00	0.0000	-0.43	2	1	1.1100	1.1100		0.54
7/8	B	No	No	Ar (CaAa)	125.00 - 0.00	0.0000	-0.45	2	2	1.1100	1.1100		0.54
7/8	B	No	No	Ar (CaAa)	111.00 - 0.00	0.0000	-0.41	1	1	1.1100	1.1100		0.54
7/8	B	No	No	Ar (CaAa)	108.00 - 0.00	0.0000	-0.41	1	1	1.1100	1.1100		0.54
7/8	B	No	No	Ar (CaAa)	87.00 - 0.00	0.0000	-0.43	1	1	1.1100	1.1100		0.54

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8	B	No	No	Ar (CaAa)	85.00 - 0.00	0.0000	-0.43	1	1	1.1100	1.1100		0.54
7/8	B	No	No	Ar (CaAa)	69.00 - 0.00	0.0000	-0.44	1	1	1.1100	1.1100		0.54
Cat 5e	A	No	No	Ar (CaAa)	66.00 - 0.00	0.0000	0.31	1	1	0.3125	0.3125		0.02
3/8 LMR	B	No	No	Ar (CaAa)	100.00 - 0.00	0.0000	-0.37	1	1	0.4400	0.4400		0.08
3/8 LMR	B	No	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.37	1	1	0.4400	0.4400		0.08
EW63	B	No	No	Ar (CaAa)	183.00 - 0.00	0.0000	-0.45	4	4	0.5000	1.5742		0.51
EW63	B	No	No	Ar (CaAa)	172.00 - 0.00	0.0000	-0.42	2	2	0.5000	1.5742		0.51
EW63	B	No	No	Ar (CaAa)	171.00 - 0.00	0.0000	-0.42	2	2	0.5000	1.5742		0.51
EW63	B	No	No	Ar (CaAa)	125.00 - 0.00	0.0000	-0.4	1	1	0.5000	1.5742		0.51
EW90	B	No	No	Ar (CaAa)	177.00 - 0.00	0.0000	-0.38	1	1	0.5000	0.9869		0.32
EW63	C	No	No	Ar (CaAa)	135.00 - 0.00	0.0000	-0.47	4	2	0.5000	1.5742		0.51
EW63	C	No	No	Ar (CaAa)	100.00 - 0.00	0.0000	-0.45	1	1	0.5000	1.5742		0.51
1 5/8 (T-Mobile)	A	No	No	Ar (CaAa)	140.00 - 0.00	0.0000	0.4	3	3	0.5000	1.9800		1.04
1-1/4" Hybrid fiber-power cable (T-Mobile)	A	No	No	Ar (CaAa)	140.00 - 0.00	0.0000	0.4	2	2	0.5000	1.2500		1.30
Feedline Ladder (Af)	C	No	No	Af (CaAa)	160.00 - 0.00	0.0000	0.4	1	1	0.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	No	Af (CaAa)	150.00 - 0.00	0.0000	-0.4	1	1	0.0000	3.0000		8.40
Feedline Ladder (Af)	A	No	No	Af (CaAa)	185.00 - 0.00	0.0000	0.4	1	1	0.0000	3.0000		8.40
Feedline Ladder (Af)	C	No	No	Af (CaAa)	185.00 - 0.00	0.0000	0.4	1	1	0.0000	3.0000		8.40
Safety Line 3/8	A	No	No	Ar (CaAa)	160.00 - 0.00	4.0000	0.5	1	1	0.3750	0.3750		0.22

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	185.00-180.00	A	0.000	0.000	2.500	0.000	42.00
		B	0.000	0.000	4.159	0.000	17.77
		C	0.000	0.000	4.496	0.000	51.04
T2	180.00-160.00	A	0.000	0.000	10.000	0.000	168.00
		B	0.000	0.000	30.593	0.000	116.30
		C	0.000	0.000	20.870	0.000	218.20
T3	160.00-140.00	A	0.000	0.000	25.130	0.000	260.80
		B	0.000	0.000	41.241	0.000	218.60
		C	0.000	0.000	80.115	0.000	652.60
T4	140.00-120.00	A	0.000	0.000	56.390	0.000	463.60
		B	0.000	0.000	48.138	0.000	310.55
		C	0.000	0.000	89.560	0.000	683.20
T5	120.00-100.00	A	0.000	0.000	56.390	0.000	463.60
		B	0.000	0.000	55.939	0.000	344.66
		C	0.000	0.000	92.841	0.000	693.64
T6	100.00-93.33	A	0.000	0.000	18.797	0.000	154.53

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B	0.000	0.000	19.717	0.000	119.20
		C	0.000	0.000	32.246	0.000	235.07
T7	93.33-80.00	A	0.000	0.000	37.593	0.000	309.07
		B	0.000	0.000	40.765	0.000	244.88
		C	0.000	0.000	64.491	0.000	470.13
T8	80.00-73.33	A	0.000	0.000	18.797	0.000	154.53
		B	0.000	0.000	21.490	0.000	126.93
		C	0.000	0.000	32.246	0.000	235.07
T9	73.33-60.00	A	0.000	0.000	37.781	0.000	309.20
		B	0.000	0.000	43.979	0.000	258.73
		C	0.000	0.000	64.491	0.000	470.13
T10	60.00-53.33	A	0.000	0.000	19.005	0.000	154.68
		B	0.000	0.000	22.230	0.000	130.53
		C	0.000	0.000	32.246	0.000	235.07
T11	53.33-40.00	A	0.000	0.000	38.010	0.000	309.36
		B	0.000	0.000	44.460	0.000	261.07
		C	0.000	0.000	64.491	0.000	470.13
T12	40.00-33.33	A	0.000	0.000	19.005	0.000	154.68
		B	0.000	0.000	22.230	0.000	130.53
		C	0.000	0.000	32.246	0.000	235.07
T13	33.33-20.00	A	0.000	0.000	38.010	0.000	309.36
		B	0.000	0.000	44.460	0.000	261.07
		C	0.000	0.000	64.491	0.000	470.13
T14	20.00-13.33	A	0.000	0.000	19.005	0.000	154.68
		B	0.000	0.000	22.230	0.000	130.53
		C	0.000	0.000	32.246	0.000	235.07
T15	13.33-0.00	A	0.000	0.000	38.010	0.000	309.36
		B	0.000	0.000	44.460	0.000	261.07
		C	0.000	0.000	64.491	0.000	470.13

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	185.00-180.00	A	3.246	0.000	0.000	5.746	0.000	195.30
		B		0.000	0.000	18.344	0.000	341.24
		C		0.000	0.000	21.536	0.000	498.40
T2	180.00-160.00	A	3.245	0.000	0.000	22.981	0.000	780.97
		B		0.000	0.000	139.726	0.000	2557.48
		C		0.000	0.000	106.051	0.000	2455.88
T3	160.00-140.00	A	3.243	0.000	0.000	80.149	0.000	1941.38
		B		0.000	0.000	180.921	0.000	3436.46
		C		0.000	0.000	297.053	0.000	6698.05
T4	140.00-120.00	A	3.240	0.000	0.000	193.773	0.000	4065.02
		B		0.000	0.000	204.058	0.000	4041.59
		C		0.000	0.000	323.736	0.000	7191.61
T5	120.00-100.00	A	3.234	0.000	0.000	193.552	0.000	4055.25
		B		0.000	0.000	253.478	0.000	5025.84
		C		0.000	0.000	334.381	0.000	7384.29
T6	100.00-93.33	A	3.227	0.000	0.000	64.434	0.000	1348.06
		B		0.000	0.000	94.254	0.000	1890.41
		C		0.000	0.000	120.574	0.000	2666.32
T7	93.33-80.00	A	3.219	0.000	0.000	128.686	0.000	2688.13
		B		0.000	0.000	197.245	0.000	3978.41
		C		0.000	0.000	240.795	0.000	5315.56
T8	80.00-73.33	A	3.209	0.000	0.000	64.218	0.000	1338.58
		B		0.000	0.000	108.480	0.000	2203.55
		C		0.000	0.000	120.155	0.000	2646.07

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T9	73.33-60.00	A	3.194	0.000	0.000	132.113	0.000	2744.30
		B		0.000	0.000	222.982	0.000	4533.01
		C		0.000	0.000	239.641	0.000	5259.93
T10	60.00-53.33	A	3.174	0.000	0.000	68.247	0.000	1410.86
		B		0.000	0.000	112.584	0.000	2282.00
		C		0.000	0.000	119.356	0.000	2607.67
T11	53.33-40.00	A	3.145	0.000	0.000	135.744	0.000	2789.29
		B		0.000	0.000	223.668	0.000	4502.10
		C		0.000	0.000	237.402	0.000	5152.76
T12	40.00-33.33	A	3.104	0.000	0.000	67.329	0.000	1371.33
		B		0.000	0.000	110.748	0.000	2206.60
		C		0.000	0.000	117.752	0.000	2531.40
T13	33.33-20.00	A	3.041	0.000	0.000	133.006	0.000	2672.57
		B		0.000	0.000	218.194	0.000	4279.84
		C		0.000	0.000	232.622	0.000	4927.61
T14	20.00-13.33	A	2.936	0.000	0.000	65.127	0.000	1278.84
		B		0.000	0.000	106.344	0.000	2030.99
		C		0.000	0.000	113.908	0.000	2353.10
T15	13.33-0.00	A	2.713	0.000	0.000	124.389	0.000	2321.30
		B		0.000	0.000	200.949	0.000	3616.69
		C		0.000	0.000	217.574	0.000	4251.21

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	185.00-180.00	-0.4218	-5.5764	3.1697	-4.1694
T2	180.00-160.00	0.7197	-16.0919	10.5296	-18.1855
T3	160.00-140.00	-18.8782	-9.4987	-14.4089	-11.8804
T4	140.00-120.00	-18.7445	-13.7202	-14.6225	-18.3412
T5	120.00-100.00	-17.7222	-16.1764	-12.9528	-24.3770
T6	100.00-93.33	-17.2040	-17.2594	-9.1125	-26.6599
T7	93.33-80.00	-17.5912	-18.5729	-8.7567	-28.0758
T8	80.00-73.33	-17.6776	-20.1808	-8.6961	-34.1318
T9	73.33-60.00	-16.5221	-19.6936	-8.3259	-34.6061
T10	60.00-53.33	-17.8572	-21.5543	-9.1531	-38.9002
T11	53.33-40.00	-16.3459	-19.8659	-8.7479	-36.8819
T12	40.00-33.33	-18.4607	-22.3213	-9.7384	-40.5307
T13	33.33-20.00	-16.8691	-20.5333	-9.3542	-38.2005
T14	20.00-13.33	-18.6719	-22.5465	-10.4791	-41.3543
T15	13.33-0.00	-16.8525	-20.5005	-10.4105	-38.2438

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	9	1 5/8	180.00 - 185.00	0.6000	0.3928
T1	10	7/8	180.00 - 185.00	0.6000	0.3928
T1	11	7/8	180.00 - 185.00	0.6000	0.3928
T1	12	3/8	180.00 - 185.00	0.6000	0.3928
T1	14	1/2	180.00 - 185.00	0.6000	0.3928

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	15	7/8	180.00 - 181.00	0.6000	0.3928
T1	26	EW63	180.00 - 183.00	0.6000	0.3928
T1	38	Feedline Ladder (Af)	180.00 - 185.00	0.6000	0.3928
T1	39	Feedline Ladder (Af)	180.00 - 185.00	0.6000	0.3928
T2	9	1 5/8	160.00 - 180.00	0.6000	0.6000
T2	10	7/8	160.00 - 180.00	0.6000	0.6000
T2	11	7/8	160.00 - 180.00	0.6000	0.6000
T2	12	3/8	160.00 - 180.00	0.6000	0.6000
T2	14	1/2	160.00 - 180.00	0.6000	0.6000
T2	15	7/8	160.00 - 180.00	0.6000	0.6000
T2	16	7/8	160.00 - 165.00	0.6000	0.6000
T2	26	EW63	160.00 - 180.00	0.6000	0.6000
T2	27	EW63	160.00 - 172.00	0.6000	0.6000
T2	28	EW63	160.00 - 171.00	0.6000	0.6000
T2	30	EW90	160.00 - 177.00	0.6000	0.6000
T2	38	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T2	39	Feedline Ladder (Af)	160.00 - 180.00	0.6000	0.6000
T3	2	2 1/4	140.00 - 160.00	0.6000	0.6000
T3	3	5/16" Fiberoptic cable	140.00 - 160.00	0.6000	0.6000
T3	5	5/8 power	140.00 - 160.00	0.6000	0.6000
T3	7	1 5/8	140.00 - 150.00	0.6000	0.6000
T3	8	1-1/4" Hybrid fiber-power cable	140.00 - 150.00	0.6000	0.6000
T3	9	1 5/8	140.00 - 160.00	0.6000	0.6000
T3	10	7/8	140.00 - 160.00	0.6000	0.6000
T3	11	7/8	140.00 - 160.00	0.6000	0.6000
T3	12	3/8	140.00 - 160.00	0.6000	0.6000
T3	14	1/2	140.00 - 160.00	0.6000	0.6000
T3	15	7/8	140.00 - 160.00	0.6000	0.6000
T3	16	7/8	140.00 - 160.00	0.6000	0.6000
T3	26	EW63	140.00 - 160.00	0.6000	0.6000
T3	27	EW63	140.00 - 160.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	28	EW63	140.00 - 160.00	0.6000	0.6000
T3	30	EW90	140.00 - 160.00	0.6000	0.6000
T3	36	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	37	Feedline Ladder (Af)	140.00 - 150.00	0.6000	0.6000
T3	38	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	39	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.6000
T3	40	Safety Line 3/8	140.00 - 160.00	1.0000	1.0000
T4	2	2 1/4	120.00 - 140.00	0.6000	0.6000
T4	3	5/16" Fiberoptic cable	120.00 - 140.00	0.6000	0.6000
T4	5	5/8 power	120.00 - 140.00	0.6000	0.6000
T4	7	1 5/8	120.00 - 140.00	0.6000	0.6000
T4	8	1-1/4" Hybrid fiber-power cable	120.00 - 140.00	0.6000	0.6000
T4	9	1 5/8	120.00 - 140.00	0.6000	0.6000
T4	10	7/8	120.00 - 140.00	0.6000	0.6000
T4	11	7/8	120.00 - 140.00	0.6000	0.6000
T4	12	3/8	120.00 - 140.00	0.6000	0.6000
T4	14	1/2	120.00 - 140.00	0.6000	0.6000
T4	15	7/8	120.00 - 140.00	0.6000	0.6000
T4	16	7/8	120.00 - 140.00	0.6000	0.6000
T4	17	7/8	120.00 - 125.00	0.6000	0.6000
T4	26	EW63	120.00 - 140.00	0.6000	0.6000
T4	27	EW63	120.00 - 140.00	0.6000	0.6000
T4	28	EW63	120.00 - 140.00	0.6000	0.6000
T4	29	EW63	120.00 - 125.00	0.6000	0.6000
T4	30	EW90	120.00 - 140.00	0.6000	0.6000
T4	31	EW63	120.00 - 135.00	0.6000	0.6000
T4	33	1 5/8	120.00 - 140.00	0.6000	0.6000
T4	34	1-1/4" Hybrid fiber-power cable	120.00 - 140.00	0.6000	0.6000
T4	36	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	37	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	38	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	39	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.6000
T4	40	Safety Line 3/8	120.00 - 140.00	1.0000	1.0000
T5	2	2 1/4	100.00 - 120.00	0.6000	0.6000
T5	3	5/16" Fiberoptic cable	100.00 - 120.00	0.6000	0.6000
T5	5	5/8 power	100.00 - 120.00	0.6000	0.6000
T5	7	1 5/8	100.00 - 120.00	0.6000	0.6000
T5	8	1-1/4" Hybrid fiber-power cable	100.00 - 120.00	0.6000	0.6000
T5	9	1 5/8	100.00 - 120.00	0.6000	0.6000
T5	10	7/8	100.00 - 120.00	0.6000	0.6000
T5	11	7/8	100.00 - 120.00	0.6000	0.6000
T5	12	3/8	100.00 - 120.00	0.6000	0.6000
T5	13	3/8	100.00 - 103.00	0.6000	0.6000
T5	14	1/2	100.00 - 120.00	0.6000	0.6000
T5	15	7/8	100.00 - 120.00	0.6000	0.6000
T5	16	7/8	100.00 - 120.00	0.6000	0.6000
T5	17	7/8	100.00 - 120.00	0.6000	0.6000
T5	18	7/8	100.00 - 111.00	0.6000	0.6000
T5	19	7/8	100.00 - 108.00	0.6000	0.6000
T5	26	EW63	100.00 - 120.00	0.6000	0.6000
T5	27	EW63	100.00 - 120.00	0.6000	0.6000
T5	28	EW63	100.00 - 120.00	0.6000	0.6000
T5	29	EW63	100.00 - 120.00	0.6000	0.6000
T5	30	EW90	100.00 - 120.00	0.6000	0.6000
T5	31	EW63	100.00 - 120.00	0.6000	0.6000
T5	33	1 5/8	100.00 - 120.00	0.6000	0.6000
T5	34	1-1/4" Hybrid fiber-power cable	100.00 - 120.00	0.6000	0.6000
T5	36	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	37	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	38	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	39	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T5	40	Safety Line 3/8	100.00 - 120.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	2	2 1/4	93.33 - 100.00	0.6000	0.6000
T6	3	5/16" Fiberoptic cable	93.33 - 100.00	0.6000	0.6000
T6	5	5/8 power	93.33 - 100.00	0.6000	0.6000
T6	7	1 5/8	93.33 - 100.00	0.6000	0.6000
T6	8	1-1/4" Hybrid fiber-power cable	93.33 - 100.00	0.6000	0.6000
T6	9	1 5/8	93.33 - 100.00	0.6000	0.6000
T6	10	7/8	93.33 - 100.00	0.6000	0.6000
T6	11	7/8	93.33 - 100.00	0.6000	0.6000
T6	12	3/8	93.33 - 100.00	0.6000	0.6000
T6	13	3/8	93.33 - 100.00	0.6000	0.6000
T6	14	1/2	93.33 - 100.00	0.6000	0.6000
T6	15	7/8	93.33 - 100.00	0.6000	0.6000
T6	16	7/8	93.33 - 100.00	0.6000	0.6000
T6	17	7/8	93.33 - 100.00	0.6000	0.6000
T6	18	7/8	93.33 - 100.00	0.6000	0.6000
T6	19	7/8	93.33 - 100.00	0.6000	0.6000
T6	24	3/8 LMR	93.33 - 100.00	0.6000	0.6000
T6	26	EW63	93.33 - 100.00	0.6000	0.6000
T6	27	EW63	93.33 - 100.00	0.6000	0.6000
T6	28	EW63	93.33 - 100.00	0.6000	0.6000
T6	29	EW63	93.33 - 100.00	0.6000	0.6000
T6	30	EW90	93.33 - 100.00	0.6000	0.6000
T6	31	EW63	93.33 - 100.00	0.6000	0.6000
T6	32	EW63	93.33 - 100.00	0.6000	0.6000
T6	33	1 5/8	93.33 - 100.00	0.6000	0.6000
T6	34	1-1/4" Hybrid fiber-power cable	93.33 - 100.00	0.6000	0.6000
T6	36	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	37	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	38	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	39	Feedline Ladder (Af)	93.33 - 100.00	0.6000	0.6000
T6	40	Safety Line 3/8	93.33 - 100.00	1.0000	1.0000
T7	2	2 1/4	80.00 - 93.33	0.6000	0.6000
T7	3	5/16" Fiberoptic cable	80.00 - 93.33	0.6000	0.6000
T7	5	5/8 power	80.00 - 93.33	0.6000	0.6000
T7	7	1 5/8	80.00 - 93.33	0.6000	0.6000
T7	8	1-1/4" Hybrid fiber-power cable	80.00 - 93.33	0.6000	0.6000
T7	9	1 5/8	80.00 - 93.33	0.6000	0.6000
T7	10	7/8	80.00 - 93.33	0.6000	0.6000
T7	11	7/8	80.00 - 93.33	0.6000	0.6000
T7	12	3/8	80.00 - 93.33	0.6000	0.6000
T7	13	3/8	80.00 - 93.33	0.6000	0.6000
T7	14	1/2	80.00 - 93.33	0.6000	0.6000
T7	15	7/8	80.00 - 93.33	0.6000	0.6000
T7	16	7/8	80.00 - 93.33	0.6000	0.6000
T7	17	7/8	80.00 - 93.33	0.6000	0.6000
T7	18	7/8	80.00 - 93.33	0.6000	0.6000
T7	19	7/8	80.00 - 93.33	0.6000	0.6000
T7	20	7/8	80.00 - 87.00	0.6000	0.6000
T7	21	7/8	80.00 - 85.00	0.6000	0.6000
T7	24	3/8 LMR	80.00 - 93.33	0.6000	0.6000
T7	26	EW63	80.00 - 93.33	0.6000	0.6000
T7	27	EW63	80.00 - 93.33	0.6000	0.6000
T7	28	EW63	80.00 - 93.33	0.6000	0.6000
T7	29	EW63	80.00 - 93.33	0.6000	0.6000
T7	30	EW90	80.00 - 93.33	0.6000	0.6000
T7	31	EW63	80.00 - 93.33	0.6000	0.6000
T7	32	EW63	80.00 - 93.33	0.6000	0.6000
T7	33	1 5/8	80.00 - 93.33	0.6000	0.6000
T7	34	1-1/4" Hybrid fiber-power	80.00 - 93.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		cable			
T7	36	Feedline Ladder (Af)	80.00 - 93.33	0.6000	0.6000
T7	37	Feedline Ladder (Af)	80.00 - 93.33	0.6000	0.6000
T7	38	Feedline Ladder (Af)	80.00 - 93.33	0.6000	0.6000
T7	39	Feedline Ladder (Af)	80.00 - 93.33	0.6000	0.6000
T7	40	Safety Line 3/8	80.00 - 93.33	1.0000	1.0000
T8	2	2 1/4	73.33 - 80.00	0.6000	0.6000
T8	3	5/16" Fiberoptic cable	73.33 - 80.00	0.6000	0.6000
T8	5	5/8 power	73.33 - 80.00	0.6000	0.6000
T8	7	1 5/8	73.33 - 80.00	0.6000	0.6000
T8	8	1-1/4" Hybrid fiber-power cable	73.33 - 80.00	0.6000	0.6000
T8	9	1 5/8	73.33 - 80.00	0.6000	0.6000
T8	10	7/8	73.33 - 80.00	0.6000	0.6000
T8	11	7/8	73.33 - 80.00	0.6000	0.6000
T8	12	3/8	73.33 - 80.00	0.6000	0.6000
T8	13	3/8	73.33 - 80.00	0.6000	0.6000
T8	14	1/2	73.33 - 80.00	0.6000	0.6000
T8	15	7/8	73.33 - 80.00	0.6000	0.6000
T8	16	7/8	73.33 - 80.00	0.6000	0.6000
T8	17	7/8	73.33 - 80.00	0.6000	0.6000
T8	18	7/8	73.33 - 80.00	0.6000	0.6000
T8	19	7/8	73.33 - 80.00	0.6000	0.6000
T8	20	7/8	73.33 - 80.00	0.6000	0.6000
T8	21	7/8	73.33 - 80.00	0.6000	0.6000
T8	24	3/8 LMR	73.33 - 80.00	0.6000	0.6000
T8	25	3/8 LMR	73.33 - 80.00	0.6000	0.6000
T8	26	EW63	73.33 - 80.00	0.6000	0.6000
T8	27	EW63	73.33 - 80.00	0.6000	0.6000
T8	28	EW63	73.33 - 80.00	0.6000	0.6000
T8	29	EW63	73.33 - 80.00	0.6000	0.6000
T8	30	EW90	73.33 - 80.00	0.6000	0.6000
T8	31	EW63	73.33 - 80.00	0.6000	0.6000
T8	32	EW63	73.33 - 80.00	0.6000	0.6000
T8	33	1 5/8	73.33 - 80.00	0.6000	0.6000
T8	34	1-1/4" Hybrid fiber-power cable	73.33 - 80.00	0.6000	0.6000
T8	36	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T8	37	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T8	38	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T8	39	Feedline Ladder (Af)	73.33 - 80.00	0.6000	0.6000
T8	40	Safety Line 3/8	73.33 - 80.00	1.0000	1.0000
T9	2	2 1/4	60.00 - 73.33	0.6000	0.6000
T9	3	5/16" Fiberoptic cable	60.00 - 73.33	0.6000	0.6000
T9	5	5/8 power	60.00 - 73.33	0.6000	0.6000
T9	7	1 5/8	60.00 - 73.33	0.6000	0.6000
T9	8	1-1/4" Hybrid fiber-power cable	60.00 - 73.33	0.6000	0.6000
T9	9	1 5/8	60.00 - 73.33	0.6000	0.6000
T9	10	7/8	60.00 - 73.33	0.6000	0.6000
T9	11	7/8	60.00 - 73.33	0.6000	0.6000
T9	12	3/8	60.00 - 73.33	0.6000	0.6000
T9	13	3/8	60.00 - 73.33	0.6000	0.6000
T9	14	1/2	60.00 - 73.33	0.6000	0.6000
T9	15	7/8	60.00 - 73.33	0.6000	0.6000
T9	16	7/8	60.00 - 73.33	0.6000	0.6000
T9	17	7/8	60.00 - 73.33	0.6000	0.6000
T9	18	7/8	60.00 - 73.33	0.6000	0.6000
T9	19	7/8	60.00 - 73.33	0.6000	0.6000
T9	20	7/8	60.00 - 73.33	0.6000	0.6000
T9	21	7/8	60.00 - 73.33	0.6000	0.6000
T9	22	7/8	60.00 - 69.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	23	Cat 5e	60.00 - 66.00	0.6000	0.6000
T9	24	3/8 LMR	60.00 - 73.33	0.6000	0.6000
T9	25	3/8 LMR	60.00 - 73.33	0.6000	0.6000
T9	26	EW63	60.00 - 73.33	0.6000	0.6000
T9	27	EW63	60.00 - 73.33	0.6000	0.6000
T9	28	EW63	60.00 - 73.33	0.6000	0.6000
T9	29	EW63	60.00 - 73.33	0.6000	0.6000
T9	30	EW90	60.00 - 73.33	0.6000	0.6000
T9	31	EW63	60.00 - 73.33	0.6000	0.6000
T9	32	EW63	60.00 - 73.33	0.6000	0.6000
T9	33	1 5/8	60.00 - 73.33	0.6000	0.6000
T9	34	1-1/4" Hybrid fiber-power cable	60.00 - 73.33	0.6000	0.6000
T9	36	Feedline Ladder (Af)	60.00 - 73.33	0.6000	0.6000
T9	37	Feedline Ladder (Af)	60.00 - 73.33	0.6000	0.6000
T9	38	Feedline Ladder (Af)	60.00 - 73.33	0.6000	0.6000
T9	39	Feedline Ladder (Af)	60.00 - 73.33	0.6000	0.6000
T9	40	Safety Line 3/8	60.00 - 73.33	1.0000	1.0000
T10	2	2 1/4	53.33 - 60.00	0.6000	0.6000
T10	3	5/16" Fiberoptic cable	53.33 - 60.00	0.6000	0.6000
T10	5	5/8 power	53.33 - 60.00	0.6000	0.6000
T10	7	1 5/8	53.33 - 60.00	0.6000	0.6000
T10	8	1-1/4" Hybrid fiber-power cable	53.33 - 60.00	0.6000	0.6000
T10	9	1 5/8	53.33 - 60.00	0.6000	0.6000
T10	10	7/8	53.33 - 60.00	0.6000	0.6000
T10	11	7/8	53.33 - 60.00	0.6000	0.6000
T10	12	3/8	53.33 - 60.00	0.6000	0.6000
T10	13	3/8	53.33 - 60.00	0.6000	0.6000
T10	14	1/2	53.33 - 60.00	0.6000	0.6000
T10	15	7/8	53.33 - 60.00	0.6000	0.6000
T10	16	7/8	53.33 - 60.00	0.6000	0.6000
T10	17	7/8	53.33 - 60.00	0.6000	0.6000
T10	18	7/8	53.33 - 60.00	0.6000	0.6000
T10	19	7/8	53.33 - 60.00	0.6000	0.6000
T10	20	7/8	53.33 - 60.00	0.6000	0.6000
T10	21	7/8	53.33 - 60.00	0.6000	0.6000
T10	22	7/8	53.33 - 60.00	0.6000	0.6000
T10	23	Cat 5e	53.33 - 60.00	0.6000	0.6000
T10	24	3/8 LMR	53.33 - 60.00	0.6000	0.6000
T10	25	3/8 LMR	53.33 - 60.00	0.6000	0.6000
T10	26	EW63	53.33 - 60.00	0.6000	0.6000
T10	27	EW63	53.33 - 60.00	0.6000	0.6000
T10	28	EW63	53.33 - 60.00	0.6000	0.6000
T10	29	EW63	53.33 - 60.00	0.6000	0.6000
T10	30	EW90	53.33 - 60.00	0.6000	0.6000
T10	31	EW63	53.33 - 60.00	0.6000	0.6000
T10	32	EW63	53.33 - 60.00	0.6000	0.6000
T10	33	1 5/8	53.33 - 60.00	0.6000	0.6000
T10	34	1-1/4" Hybrid fiber-power cable	53.33 - 60.00	0.6000	0.6000
T10	36	Feedline Ladder (Af)	53.33 - 60.00	0.6000	0.6000
T10	37	Feedline Ladder (Af)	53.33 - 60.00	0.6000	0.6000
T10	38	Feedline Ladder (Af)	53.33 - 60.00	0.6000	0.6000
T10	39	Feedline Ladder (Af)	53.33 - 60.00	0.6000	0.6000
T10	40	Safety Line 3/8	53.33 - 60.00	1.0000	1.0000
T11	2	2 1/4	40.00 - 53.33	0.6000	0.6000
T11	3	5/16" Fiberoptic cable	40.00 - 53.33	0.6000	0.6000
T11	5	5/8 power	40.00 - 53.33	0.6000	0.6000
T11	7	1 5/8	40.00 - 53.33	0.6000	0.6000
T11	8	1-1/4" Hybrid fiber-power cable	40.00 - 53.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	9	1 5/8	40.00 - 53.33	0.6000	0.6000
T11	10	7/8	40.00 - 53.33	0.6000	0.6000
T11	11	7/8	40.00 - 53.33	0.6000	0.6000
T11	12	3/8	40.00 - 53.33	0.6000	0.6000
T11	13	3/8	40.00 - 53.33	0.6000	0.6000
T11	14	1/2	40.00 - 53.33	0.6000	0.6000
T11	15	7/8	40.00 - 53.33	0.6000	0.6000
T11	16	7/8	40.00 - 53.33	0.6000	0.6000
T11	17	7/8	40.00 - 53.33	0.6000	0.6000
T11	18	7/8	40.00 - 53.33	0.6000	0.6000
T11	19	7/8	40.00 - 53.33	0.6000	0.6000
T11	20	7/8	40.00 - 53.33	0.6000	0.6000
T11	21	7/8	40.00 - 53.33	0.6000	0.6000
T11	22	7/8	40.00 - 53.33	0.6000	0.6000
T11	23	Cat 5e	40.00 - 53.33	0.6000	0.6000
T11	24	3/8 LMR	40.00 - 53.33	0.6000	0.6000
T11	25	3/8 LMR	40.00 - 53.33	0.6000	0.6000
T11	26	EW63	40.00 - 53.33	0.6000	0.6000
T11	27	EW63	40.00 - 53.33	0.6000	0.6000
T11	28	EW63	40.00 - 53.33	0.6000	0.6000
T11	29	EW63	40.00 - 53.33	0.6000	0.6000
T11	30	EW90	40.00 - 53.33	0.6000	0.6000
T11	31	EW63	40.00 - 53.33	0.6000	0.6000
T11	32	EW63	40.00 - 53.33	0.6000	0.6000
T11	33	1 5/8	40.00 - 53.33	0.6000	0.6000
T11	34	1-1/4" Hybrid fiber-power cable	40.00 - 53.33	0.6000	0.6000
T11	36	Feedline Ladder (Af)	40.00 - 53.33	0.6000	0.6000
T11	37	Feedline Ladder (Af)	40.00 - 53.33	0.6000	0.6000
T11	38	Feedline Ladder (Af)	40.00 - 53.33	0.6000	0.6000
T11	39	Feedline Ladder (Af)	40.00 - 53.33	0.6000	0.6000
T11	40	Safety Line 3/8	40.00 - 53.33	1.0000	1.0000
T12	2	2 1/4	33.33 - 40.00	0.6000	0.6000
T12	3	5/16" Fiberoptic cable	33.33 - 40.00	0.6000	0.6000
T12	5	5/8 power	33.33 - 40.00	0.6000	0.6000
T12	7	1 5/8	33.33 - 40.00	0.6000	0.6000
T12	8	1-1/4" Hybrid fiber-power cable	33.33 - 40.00	0.6000	0.6000
T12	9	1 5/8	33.33 - 40.00	0.6000	0.6000
T12	10	7/8	33.33 - 40.00	0.6000	0.6000
T12	11	7/8	33.33 - 40.00	0.6000	0.6000
T12	12	3/8	33.33 - 40.00	0.6000	0.6000
T12	13	3/8	33.33 - 40.00	0.6000	0.6000
T12	14	1/2	33.33 - 40.00	0.6000	0.6000
T12	15	7/8	33.33 - 40.00	0.6000	0.6000
T12	16	7/8	33.33 - 40.00	0.6000	0.6000
T12	17	7/8	33.33 - 40.00	0.6000	0.6000
T12	18	7/8	33.33 - 40.00	0.6000	0.6000
T12	19	7/8	33.33 - 40.00	0.6000	0.6000
T12	20	7/8	33.33 - 40.00	0.6000	0.6000
T12	21	7/8	33.33 - 40.00	0.6000	0.6000
T12	22	7/8	33.33 - 40.00	0.6000	0.6000
T12	23	Cat 5e	33.33 - 40.00	0.6000	0.6000
T12	24	3/8 LMR	33.33 - 40.00	0.6000	0.6000
T12	25	3/8 LMR	33.33 - 40.00	0.6000	0.6000
T12	26	EW63	33.33 - 40.00	0.6000	0.6000
T12	27	EW63	33.33 - 40.00	0.6000	0.6000
T12	28	EW63	33.33 - 40.00	0.6000	0.6000
T12	29	EW63	33.33 - 40.00	0.6000	0.6000
T12	30	EW90	33.33 - 40.00	0.6000	0.6000
T12	31	EW63	33.33 - 40.00	0.6000	0.6000
T12	32	EW63	33.33 - 40.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	33	1 5/8	33.33 - 40.00	0.6000	0.6000
T12	34	1-1/4" Hybrid fiber-power cable	33.33 - 40.00	0.6000	0.6000
T12	36	Feedline Ladder (Af)	33.33 - 40.00	0.6000	0.6000
T12	37	Feedline Ladder (Af)	33.33 - 40.00	0.6000	0.6000
T12	38	Feedline Ladder (Af)	33.33 - 40.00	0.6000	0.6000
T12	39	Feedline Ladder (Af)	33.33 - 40.00	0.6000	0.6000
T12	40	Safety Line 3/8	33.33 - 40.00	1.0000	1.0000
T13	2	2 1/4	20.00 - 33.33	0.6000	0.6000
T13	3	5/16" Fiberoptic cable	20.00 - 33.33	0.6000	0.6000
T13	5	5/8 power	20.00 - 33.33	0.6000	0.6000
T13	7	1 5/8	20.00 - 33.33	0.6000	0.6000
T13	8	1-1/4" Hybrid fiber-power cable	20.00 - 33.33	0.6000	0.6000
T13	9	1 5/8	20.00 - 33.33	0.6000	0.6000
T13	10	7/8	20.00 - 33.33	0.6000	0.6000
T13	11	7/8	20.00 - 33.33	0.6000	0.6000
T13	12	3/8	20.00 - 33.33	0.6000	0.6000
T13	13	3/8	20.00 - 33.33	0.6000	0.6000
T13	14	1/2	20.00 - 33.33	0.6000	0.6000
T13	15	7/8	20.00 - 33.33	0.6000	0.6000
T13	16	7/8	20.00 - 33.33	0.6000	0.6000
T13	17	7/8	20.00 - 33.33	0.6000	0.6000
T13	18	7/8	20.00 - 33.33	0.6000	0.6000
T13	19	7/8	20.00 - 33.33	0.6000	0.6000
T13	20	7/8	20.00 - 33.33	0.6000	0.6000
T13	21	7/8	20.00 - 33.33	0.6000	0.6000
T13	22	7/8	20.00 - 33.33	0.6000	0.6000
T13	23	Cat 5e	20.00 - 33.33	0.6000	0.6000
T13	24	3/8 LMR	20.00 - 33.33	0.6000	0.6000
T13	25	3/8 LMR	20.00 - 33.33	0.6000	0.6000
T13	26	EW63	20.00 - 33.33	0.6000	0.6000
T13	27	EW63	20.00 - 33.33	0.6000	0.6000
T13	28	EW63	20.00 - 33.33	0.6000	0.6000
T13	29	EW63	20.00 - 33.33	0.6000	0.6000
T13	30	EW90	20.00 - 33.33	0.6000	0.6000
T13	31	EW63	20.00 - 33.33	0.6000	0.6000
T13	32	EW63	20.00 - 33.33	0.6000	0.6000
T13	33	1 5/8	20.00 - 33.33	0.6000	0.6000
T13	34	1-1/4" Hybrid fiber-power cable	20.00 - 33.33	0.6000	0.6000
T13	36	Feedline Ladder (Af)	20.00 - 33.33	0.6000	0.6000
T13	37	Feedline Ladder (Af)	20.00 - 33.33	0.6000	0.6000
T13	38	Feedline Ladder (Af)	20.00 - 33.33	0.6000	0.6000
T13	39	Feedline Ladder (Af)	20.00 - 33.33	0.6000	0.6000
T13	40	Safety Line 3/8	20.00 - 33.33	1.0000	1.0000
T14	2	2 1/4	13.33 - 20.00	0.6000	0.6000
T14	3	5/16" Fiberoptic cable	13.33 - 20.00	0.6000	0.6000
T14	5	5/8 power	13.33 - 20.00	0.6000	0.6000
T14	7	1 5/8	13.33 - 20.00	0.6000	0.6000
T14	8	1-1/4" Hybrid fiber-power cable	13.33 - 20.00	0.6000	0.6000
T14	9	1 5/8	13.33 - 20.00	0.6000	0.6000
T14	10	7/8	13.33 - 20.00	0.6000	0.6000
T14	11	7/8	13.33 - 20.00	0.6000	0.6000
T14	12	3/8	13.33 - 20.00	0.6000	0.6000
T14	13	3/8	13.33 - 20.00	0.6000	0.6000
T14	14	1/2	13.33 - 20.00	0.6000	0.6000
T14	15	7/8	13.33 - 20.00	0.6000	0.6000
T14	16	7/8	13.33 - 20.00	0.6000	0.6000
T14	17	7/8	13.33 - 20.00	0.6000	0.6000
T14	18	7/8	13.33 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	19	7/8	13.33 - 20.00	0.6000	0.6000
T14	20	7/8	13.33 - 20.00	0.6000	0.6000
T14	21	7/8	13.33 - 20.00	0.6000	0.6000
T14	22	7/8	13.33 - 20.00	0.6000	0.6000
T14	23	Cat 5e	13.33 - 20.00	0.6000	0.6000
T14	24	3/8 LMR	13.33 - 20.00	0.6000	0.6000
T14	25	3/8 LMR	13.33 - 20.00	0.6000	0.6000
T14	26	EW63	13.33 - 20.00	0.6000	0.6000
T14	27	EW63	13.33 - 20.00	0.6000	0.6000
T14	28	EW63	13.33 - 20.00	0.6000	0.6000
T14	29	EW63	13.33 - 20.00	0.6000	0.6000
T14	30	EW90	13.33 - 20.00	0.6000	0.6000
T14	31	EW63	13.33 - 20.00	0.6000	0.6000
T14	32	EW63	13.33 - 20.00	0.6000	0.6000
T14	33	1 5/8	13.33 - 20.00	0.6000	0.6000
T14	34	1-1/4" Hybrid fiber-power cable	13.33 - 20.00	0.6000	0.6000
T14	36	Feedline Ladder (Af)	13.33 - 20.00	0.6000	0.6000
T14	37	Feedline Ladder (Af)	13.33 - 20.00	0.6000	0.6000
T14	38	Feedline Ladder (Af)	13.33 - 20.00	0.6000	0.6000
T14	39	Feedline Ladder (Af)	13.33 - 20.00	0.6000	0.6000
T14	40	Safety Line 3/8	13.33 - 20.00	1.0000	1.0000
T15	2	2 1/4	0.00 - 13.33	0.6000	0.6000
T15	3	5/16" Fiberoptic cable	0.00 - 13.33	0.6000	0.6000
T15	5	5/8 power	0.00 - 13.33	0.6000	0.6000
T15	7	1 5/8	0.00 - 13.33	0.6000	0.6000
T15	8	1-1/4" Hybrid fiber-power cable	0.00 - 13.33	0.6000	0.6000
T15	9	1 5/8	0.00 - 13.33	0.6000	0.6000
T15	10	7/8	0.00 - 13.33	0.6000	0.6000
T15	11	7/8	0.00 - 13.33	0.6000	0.6000
T15	12	3/8	0.00 - 13.33	0.6000	0.6000
T15	13	3/8	0.00 - 13.33	0.6000	0.6000
T15	14	1/2	0.00 - 13.33	0.6000	0.6000
T15	15	7/8	0.00 - 13.33	0.6000	0.6000
T15	16	7/8	0.00 - 13.33	0.6000	0.6000
T15	17	7/8	0.00 - 13.33	0.6000	0.6000
T15	18	7/8	0.00 - 13.33	0.6000	0.6000
T15	19	7/8	0.00 - 13.33	0.6000	0.6000
T15	20	7/8	0.00 - 13.33	0.6000	0.6000
T15	21	7/8	0.00 - 13.33	0.6000	0.6000
T15	22	7/8	0.00 - 13.33	0.6000	0.6000
T15	23	Cat 5e	0.00 - 13.33	0.6000	0.6000
T15	24	3/8 LMR	0.00 - 13.33	0.6000	0.6000
T15	25	3/8 LMR	0.00 - 13.33	0.6000	0.6000
T15	26	EW63	0.00 - 13.33	0.6000	0.6000
T15	27	EW63	0.00 - 13.33	0.6000	0.6000
T15	28	EW63	0.00 - 13.33	0.6000	0.6000
T15	29	EW63	0.00 - 13.33	0.6000	0.6000
T15	30	EW90	0.00 - 13.33	0.6000	0.6000
T15	31	EW63	0.00 - 13.33	0.6000	0.6000
T15	32	EW63	0.00 - 13.33	0.6000	0.6000
T15	33	1 5/8	0.00 - 13.33	0.6000	0.6000
T15	34	1-1/4" Hybrid fiber-power cable	0.00 - 13.33	0.6000	0.6000
T15	36	Feedline Ladder (Af)	0.00 - 13.33	0.6000	0.6000
T15	37	Feedline Ladder (Af)	0.00 - 13.33	0.6000	0.6000
T15	38	Feedline Ladder (Af)	0.00 - 13.33	0.6000	0.6000
T15	39	Feedline Ladder (Af)	0.00 - 13.33	0.6000	0.6000
T15	40	Safety Line 3/8	0.00 - 13.33	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
LED beacon	C	None		0.0000	185.00	No Ice	0.40	0.40	30.00
(NU)						1/2" Ice	0.68	0.68	43.19
						1" Ice	0.80	0.80	58.50
20' x 3" omni whip	B	From Leg	1.00	0.0000	185.00	No Ice	5.60	5.60	50.00
(NU)			1.00			1/2" Ice	8.03	8.03	93.17
			10.00			1" Ice	10.08	10.08	149.01
Tower Top Amplifier	B	From Leg	1.00	0.0000	185.00	No Ice	3.11	1.17	40.00
(NU)			1.00			1/2" Ice	3.35	1.34	58.76
			0.00			1" Ice	3.60	1.52	80.44
14' x 3" Dia Omni	C	From Leg	1.00	0.0000	185.00	No Ice	4.20	4.20	40.00
(NU)			-1.00			1/2" Ice	5.63	5.63	70.34
			7.00			1" Ice	7.08	7.08	109.69
BA8080-67 16' 16 Bay	C	From Leg	1.00	0.0000	185.00	No Ice	4.00	4.00	55.00
Dipole			1.00			1/2" Ice	6.00	6.00	100.00
(Bloomfield PD)			10.00			1" Ice	8.00	8.00	145.00
6'x4 1/2" Pipe Mount	A	From Leg	0.50	0.0000	183.00	No Ice	1.58	1.58	64.70
(NU)			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
24' x 2" omni whip	B	From Leg	0.50	0.0000	183.00	No Ice	10.20	5.10	465.00
			0.00			1/2" Ice	13.80	6.90	600.00
			0.00			1" Ice	17.40	8.70	735.00
12' T-frame sector mnt	B	From Leg	0.50	0.0000	183.00	No Ice	10.20	5.10	465.00
			0.00			1/2" Ice	13.80	6.90	600.00
			0.00			1" Ice	17.40	8.70	735.00
14' x 2" omni whip	A	From Leg	0.50	0.0000	183.00	No Ice	2.80	2.80	75.00
(NU)			0.00			1/2" Ice	4.22	4.22	96.61
			-7.00			1" Ice	5.67	5.67	127.13
14' x 2" omni whip	A	From Leg	0.50	0.0000	183.00	No Ice	2.80	2.80	75.00
(NU)			0.00			1/2" Ice	4.22	4.22	96.61
			-7.00			1" Ice	5.67	5.67	127.13
14' x 2" omni whip	A	From Leg	0.50	0.0000	183.00	No Ice	2.80	2.80	75.00
(NU)			0.00			1/2" Ice	4.22	4.22	96.61
			7.00			1" Ice	5.67	5.67	127.13
6'x4 1/2" Pipe Mount	A	From Leg	0.50	0.0000	177.00	No Ice	1.58	1.58	64.70
(NU)			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
10' 4-bay dipole	C	From Leg	0.50	0.0000	171.00 - 181.00	No Ice	2.50	2.50	75.00
(NU)			0.00			1/2" Ice	3.53	3.53	93.64
			0.00			1" Ice	4.58	4.58	118.79
6'x4 1/2" Pipe Mount	C	From Leg	0.50	0.0000	181.00	No Ice	1.58	1.58	64.70
(NU)			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
6'x4 1/2" Pipe Mount	A	From Leg	0.50	0.0000	172.00	No Ice	1.58	1.58	64.70
(NU)			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
6'x4 1/2" Pipe Mount	C	From Leg	0.50	0.0000	171.00	No Ice	1.58	1.58	64.70
(NU)			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
PR-900	C	From Leg	0.50	0.0000	165.00	No Ice	6.35	6.35	38.00
(Simsbury PD)			0.00			1/2" Ice	11.43	11.43	49.40
			0.00			1" Ice	16.51	16.51	60.80
6'x3" Pipe Mount	C	From Leg	0.50	0.0000	165.00	No Ice	1.77	1.77	30.00
(Simsbury PD)			0.00			1/2" Ice	2.13	2.13	47.98
			0.00			1" Ice	2.50	2.50	65.33

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Telewave ANT150F6	A	From Leg	3.00	0.0000	165.00	No Ice	5.87	5.87	35.00
(NU)			0.00			1/2" Ice	8.03	8.03	77.71
			10.00			1" Ice	10.21	10.21	133.89
ROHN 3-ft Side Arm	A	From Leg	1.50	0.0000	165.00	No Ice	3.10	3.10	70.00
(NU)			0.00			1/2" Ice	5.00	5.00	100.00
			0.00			1" Ice	6.90	6.90	130.00
7770.00	A	From Leg	3.00	0.0000	160.00	No Ice	5.51	2.93	35.00
(AT&T existing)			0.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
7770.00	B	From Leg	3.00	0.0000	160.00	No Ice	5.51	2.93	35.00
(AT&T existing)			0.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
7770.00	C	From Leg	3.00	0.0000	160.00	No Ice	5.51	2.93	35.00
(AT&T existing)			0.00			1/2" Ice	5.87	3.27	67.63
			0.00			1" Ice	6.23	3.63	105.06
OPA-65R-LCUU-H8	A	From Leg	3.00	0.0000	160.00	No Ice	12.75	7.25	90.00
(AT&T existing)			0.00			1/2" Ice	13.33	7.82	161.29
			0.00			1" Ice	13.92	8.40	240.16
OPA-65R-LCUU-H6	B	From Leg	3.00	0.0000	160.00	No Ice	9.66	5.52	75.00
(AT&T existing)			0.00			1/2" Ice	10.13	5.97	133.43
			0.00			1" Ice	10.61	6.43	198.17
OPA-65R-LCUU-H8	C	From Leg	3.00	0.0000	160.00	No Ice	12.75	7.25	90.00
(AT&T existing)			0.00			1/2" Ice	13.33	7.82	161.29
			0.00			1" Ice	13.92	8.40	240.16
(2) 800-10966	A	From Leg	3.00	0.0000	160.00	No Ice	17.36	7.50	125.00
(AT&T)			0.00			1/2" Ice	17.99	8.09	217.18
			0.00			1" Ice	18.63	8.69	317.51
(2) 800-10965	B	From Leg	3.00	0.0000	160.00	No Ice	13.81	5.83	45.00
(AT&T)			0.00			1/2" Ice	14.35	6.32	121.53
			0.00			1" Ice	14.89	6.82	205.11
(2) 800-10966	C	From Leg	3.00	0.0000	160.00	No Ice	17.36	7.50	125.00
(AT&T)			0.00			1/2" Ice	17.99	8.09	217.18
			0.00			1" Ice	18.63	8.69	317.51
RRUS-32	A	From Leg	3.00	0.0000	160.00	No Ice	3.87	2.76	80.00
(AT&T existing)			0.00			1/2" Ice	4.15	3.02	104.93
			0.00			1" Ice	4.44	3.29	136.47
RRUS-32	B	From Leg	3.00	0.0000	160.00	No Ice	3.87	2.76	80.00
(AT&T existing)			0.00			1/2" Ice	4.15	3.02	104.93
			0.00			1" Ice	4.44	3.29	136.47
RRUS-32	C	From Leg	3.00	0.0000	160.00	No Ice	3.87	2.76	80.00
(AT&T existing)			0.00			1/2" Ice	4.15	3.02	104.93
			0.00			1" Ice	4.44	3.29	136.47
RRUS-E2	A	From Leg	3.00	0.0000	160.00	No Ice	3.67	1.49	60.00
(AT&T existing)			0.00			1/2" Ice	3.93	1.67	81.22
			0.00			1" Ice	4.19	1.87	107.65
RRUS-E2	B	From Leg	3.00	0.0000	160.00	No Ice	3.67	1.49	60.00
(AT&T existing)			0.00			1/2" Ice	3.93	1.67	81.22
			0.00			1" Ice	4.19	1.87	107.65
RRUS-E2	C	From Leg	3.00	0.0000	160.00	No Ice	3.67	1.49	60.00
(AT&T existing)			0.00			1/2" Ice	3.93	1.67	81.22
			0.00			1" Ice	4.19	1.87	107.65
Ericsson RRUS B14 4478	A	From Leg	3.00	0.0000	160.00	No Ice	1.84	1.06	65.00
(AT&T)			0.00			1/2" Ice	2.01	1.20	80.88
			0.00			1" Ice	2.19	1.34	99.39
Ericsson RRUS B14 4478	B	From Leg	3.00	0.0000	160.00	No Ice	1.84	1.06	65.00
(AT&T)			0.00			1/2" Ice	2.01	1.20	80.88
			0.00			1" Ice	2.19	1.34	99.39

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Ericsson RRUS B14 4478	C	From Leg	3.00	0.0000	160.00	No Ice	1.84	1.06	65.00
(AT&T)			0.00			1/2" Ice	2.01	1.20	80.88
			0.00			1" Ice	2.19	1.34	99.39
Ericsson RRUS 8843	A	From Leg	3.00	0.0000	160.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
Ericsson RRUS 8843	B	From Leg	3.00	0.0000	160.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
Ericsson RRUS 8843	C	From Leg	3.00	0.0000	160.00	No Ice	1.64	1.35	72.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
Ericsson RRUS B5 4449	A	From Leg	3.00	0.0000	160.00	No Ice	1.64	1.30	73.00
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
Ericsson RRUS B5 4449	B	From Leg	3.00	0.0000	160.00	No Ice	1.64	1.30	73.00
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
Ericsson RRUS B5 4449	C	From Leg	3.00	0.0000	160.00	No Ice	1.64	1.30	73.00
(AT&T)			0.00			1/2" Ice	1.80	1.45	90.19
			0.00			1" Ice	1.97	1.60	110.08
TT08-19DB111 TMA	A	From Leg	3.00	0.0000	160.00	No Ice	0.79	0.64	20.00
(AT&T existing)			0.00			1/2" Ice	0.91	0.75	27.63
			0.00			1" Ice	1.04	0.87	37.15
TT08-19DB111 TMA	B	From Leg	3.00	0.0000	160.00	No Ice	0.79	0.64	20.00
(AT&T existing)			0.00			1/2" Ice	0.91	0.75	27.63
			0.00			1" Ice	1.04	0.87	37.15
TT08-19DB111 TMA	C	From Leg	3.00	0.0000	160.00	No Ice	0.79	0.64	20.00
(AT&T existing)			0.00			1/2" Ice	0.91	0.75	27.63
			0.00			1" Ice	1.04	0.87	37.15
Raycap DC6-48-60-18-8F	A	From Leg	1.00	0.0000	160.00	No Ice	0.74	0.74	30.00
surge suppressor			0.00			1/2" Ice	1.20	1.20	44.34
(AT&T existing)			0.00			1" Ice	1.37	1.37	60.93
Raycap DC6-48-60-18-8F	B	From Leg	1.00	0.0000	160.00	No Ice	0.74	0.74	30.00
surge suppressor			0.00			1/2" Ice	1.20	1.20	44.34
(AT&T existing)			0.00			1" Ice	1.37	1.37	60.93
Raycap DC6-48-60-18-8F	C	From Leg	1.00	0.0000	160.00	No Ice	0.74	0.74	30.00
surge suppressor			0.00			1/2" Ice	1.20	1.20	44.34
(AT&T existing)			0.00			1" Ice	1.37	1.37	60.93
Raycap	A	From Leg	1.00	0.0000	160.00	No Ice	0.74	0.74	30.00
DC6-48-60-18-8C-EV			0.00			1/2" Ice	1.20	1.20	44.34
(AT&T existing)			0.00			1" Ice	1.37	1.37	60.93
Raycap	B	From Leg	1.00	0.0000	160.00	No Ice	0.74	0.74	30.00
DC6-48-60-18-8C-EV			0.00			1/2" Ice	1.20	1.20	44.34
(AT&T existing)			0.00			1" Ice	1.37	1.37	60.93
Raycap	C	From Leg	1.00	0.0000	160.00	No Ice	0.74	0.74	30.00
DC6-48-60-18-8C-EV			0.00			1/2" Ice	1.20	1.20	44.34
(AT&T existing)			0.00			1" Ice	1.37	1.37	60.93
SitePro VFA12-HD	A	From Leg	1.50	0.0000	160.00	No Ice	13.20	9.20	650.00
(AT&T existing)			0.00			1/2" Ice	19.50	14.60	800.00
			0.00			1" Ice	25.80	19.50	950.00
SitePro VFA12-HD	B	From Leg	1.50	0.0000	160.00	No Ice	13.20	9.20	650.00
(AT&T existing)			0.00			1/2" Ice	19.50	14.60	800.00
			0.00			1" Ice	25.80	19.50	950.00
SitePro VFA12-HD	C	From Leg	1.50	0.0000	160.00	No Ice	13.20	9.20	650.00
(AT&T existing)			0.00			1/2" Ice	19.50	14.60	800.00
			0.00			1" Ice	25.80	19.50	950.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) 5'x2-3/8" Pipe Mount (AT&T new)	A	From Leg	1.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	1.19 1.50 1.81	1.19 1.50 1.81	20.00 29.07 41.59
(2) 5'x2-3/8" Pipe Mount (AT&T new)	B	From Leg	1.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	1.19 1.50 1.81	1.19 1.50 1.81	20.00 29.07 41.59
(2) 5'x2-3/8" Pipe Mount (AT&T new)	C	From Leg	1.50 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice	1.19 1.50 1.81	1.19 1.50 1.81	20.00 29.07 41.59
BXA-70063/6 (Verizon)	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	7.57 8.02 8.47	3.76 4.19 4.63	25.00 65.60 112.01
BXA-70063/6 (Verizon)	B	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	7.57 8.02 8.47	3.76 4.19 4.63	25.00 65.60 112.01
BXA-70063/6 (Verizon)	C	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	7.57 8.02 8.47	3.76 4.19 4.63	25.00 65.60 112.01
(2) BXA-171063/12 (Verizon)	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.79 5.24 5.70	3.62 4.06 4.50	25.00 52.45 85.45
(2) BXA-171063/12 (Verizon)	B	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.79 5.24 5.70	3.62 4.06 4.50	25.00 52.45 85.45
(2) BXA-171063/12 (Verizon)	C	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.79 5.24 5.70	3.62 4.06 4.50	25.00 52.45 85.45
(2) LPA-80080/4 (Verizon)	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.62 2.92 3.23	5.40 5.73 6.06	20.00 53.12 90.72
(2) LPA-80080/4 (Verizon)	B	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.62 2.92 3.23	5.40 5.73 6.06	20.00 53.12 90.72
(2) LPA-80080/4 (Verizon)	C	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.62 2.92 3.23	5.40 5.73 6.06	20.00 53.12 90.72
ALU RRH2x40-700U (Verizon)	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.67 1.84 2.01	51.00 75.56 103.37
ALU RRH2x40-700U (Verizon)	B	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.67 1.84 2.01	51.00 75.56 103.37
ALU RRH2x40-700U (Verizon)	C	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.83 3.04 3.26	1.67 1.84 2.01	51.00 75.56 103.37
ALU RRH2x40-AWS (Verizon)	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.29	1.42 1.59 1.77	131.00 151.90 175.92
ALU RRH2x40-AWS (Verizon)	B	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.29	1.42 1.59 1.77	131.00 151.90 175.92
ALU RRH2x40-AWS (Verizon)	C	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	2.85 3.06 3.29	1.42 1.59 1.77	131.00 151.90 175.92
RFS DB-T1-6Z-8AB-0Z D-box (Verizon)	A	From Leg	3.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice	4.80 5.07 5.35	2.00 2.19 2.39	45.00 81.13 121.22

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Rohn 6' x 12' Boom Gate (1)	A	From Leg	1.50	0.0000	150.00	No Ice	16.60	16.60	560.00
(Verizon)			0.00			1/2" Ice	19.80	19.80	700.00
			0.00			1" Ice	23.00	23.00	840.00
Rohn 6' x 12' Boom Gate (1)	B	From Leg	1.50	0.0000	150.00	No Ice	16.60	16.60	560.00
(Verizon)			0.00			1/2" Ice	19.80	19.80	700.00
			0.00			1" Ice	23.00	23.00	840.00
Rohn 6' x 12' Boom Gate (1)	C	From Leg	1.50	0.0000	150.00	No Ice	16.60	16.60	560.00
(Verizon)			0.00			1/2" Ice	19.80	19.80	700.00
			0.00			1" Ice	23.00	23.00	840.00
APXV18-206516	A	From Leg	4.00	0.0000	140.50	No Ice	3.57	2.00	15.00
(T-Mobile)			0.00			1/2" Ice	3.91	2.33	34.86
			0.00			1" Ice	4.25	2.66	58.99
APXV18-206516	B	From Leg	4.00	0.0000	140.50	No Ice	3.57	2.00	15.00
(T-Mobile)			0.00			1/2" Ice	3.91	2.33	34.86
			0.00			1" Ice	4.25	2.66	58.99
APXV18-206516	C	From Leg	4.00	0.0000	140.50	No Ice	3.57	2.00	15.00
(T-Mobile)			0.00			1/2" Ice	3.91	2.33	34.86
			0.00			1" Ice	4.25	2.66	58.99
APXV18-206517	A	From Leg	4.00	0.0000	140.50	No Ice	5.17	3.04	30.00
(T-Mobile)			0.00			1/2" Ice	5.62	3.47	56.60
			0.00			1" Ice	6.08	3.91	88.70
APXV18-206517	B	From Leg	4.00	0.0000	140.50	No Ice	5.17	3.04	30.00
(T-Mobile)			0.00			1/2" Ice	5.62	3.47	56.60
			0.00			1" Ice	6.08	3.91	88.70
APXV18-206517	C	From Leg	4.00	0.0000	140.50	No Ice	5.17	3.04	30.00
(T-Mobile)			0.00			1/2" Ice	5.62	3.47	56.60
			0.00			1" Ice	6.08	3.91	88.70
LNX-6515DS-T4M	A	From Leg	4.00	0.0000	140.50	No Ice	11.39	7.66	50.00
(T-Mobile)			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
LNX-6515DS-T4M	B	From Leg	4.00	0.0000	140.50	No Ice	11.39	7.66	50.00
(T-Mobile)			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
LNX-6515DS-T4M	C	From Leg	4.00	0.0000	140.50	No Ice	11.39	7.66	50.00
(T-Mobile)			0.00			1/2" Ice	12.01	8.25	115.61
			0.00			1" Ice	12.63	8.84	188.87
(2) Ericsson RRUS-11	A	From Leg	3.50	0.0000	140.50	No Ice	2.79	1.02	55.00
(T-Mobile)			0.00			1/2" Ice	3.00	1.16	75.86
			0.00			1" Ice	3.21	1.30	99.77
(2) Ericsson RRUS-11	B	From Leg	3.50	0.0000	140.50	No Ice	2.79	1.02	55.00
(T-Mobile)			0.00			1/2" Ice	3.00	1.16	75.86
			0.00			1" Ice	3.21	1.30	99.77
(2) Ericsson RRUS-11	C	From Leg	3.50	0.0000	140.50	No Ice	2.79	1.02	55.00
(T-Mobile)			0.00			1/2" Ice	3.00	1.16	75.86
			0.00			1" Ice	3.21	1.30	99.77
T-Mobile Mini-Squid	C	None		0.0000	140.50	No Ice	0.13	0.13	4.00
(T-Mobile)						1/2" Ice	0.24	0.24	6.69
						1" Ice	0.31	0.31	10.38
Fastback IBR 1300	B	From Leg	4.00	0.0000	140.50	No Ice	0.67	0.31	10.00
(T-Mobile)			0.00			1/2" Ice	0.78	0.38	15.42
			0.00			1" Ice	0.89	0.47	22.44
4'x2 7/8" Pipe Mount	B	From Leg	4.00	0.0000	140.50	No Ice	0.95	0.95	23.20
(T-Mobile)			0.00			1/2" Ice	1.22	1.22	31.83
			0.00			1" Ice	1.48	1.48	43.35
12' T-frame sector mnt	A	From Leg	2.00	0.0000	140.50	No Ice	10.20	5.10	600.00
			0.00			1/2" Ice	13.80	6.90	750.00
			0.00			1" Ice	17.40	8.70	900.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
12' T-frame sector mnt	B	From Leg	2.00	0.0000	140.50	No Ice	10.20	5.10	600.00
			0.00			1/2" Ice	13.80	6.90	750.00
			0.00			1" Ice	17.40	8.70	900.00
12' T-frame sector mnt	C	From Leg	2.00	0.0000	140.50	No Ice	10.20	5.10	600.00
			0.00			1/2" Ice	13.80	6.90	750.00
			0.00			1" Ice	17.40	8.70	900.00
6'x4 1/2" Pipe Mount (NU)	B	From Leg	0.50	0.0000	135.00	No Ice	1.57	1.57	64.70
			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
6'x4 1/2" Pipe Mount (NU)	C	From Leg	0.50	0.0000	135.00	No Ice	1.57	1.57	64.70
			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
6'x4 1/2" Pipe Mount (NU)	B	From Leg	0.50	0.0000	125.00	No Ice	1.57	1.57	64.70
			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
Telewave ANT150F6 (NU)	C	From Leg	6.00	0.0000	125.00	No Ice	5.87	5.87	35.00
			0.00			1/2" Ice	8.03	8.03	77.71
			10.00			1" Ice	10.21	10.21	133.89
Rohn 6' Side-Arm(1) (NU)	C	From Leg	3.00	0.0000	125.00	No Ice	10.60	10.60	140.00
			0.00			1/2" Ice	15.40	15.40	212.00
			0.00			1" Ice	20.20	20.20	284.00
12' single dipole (NU)	A	From Leg	6.00	0.0000	125.00	No Ice	2.25	2.25	30.00
			0.00			1/2" Ice	4.83	4.83	51.65
			0.00			1" Ice	7.43	7.43	89.22
Rohn 6' Side-Arm(1) (NU)	A	From Leg	3.00	0.0000	125.00	No Ice	10.60	10.60	140.00
			0.00			1/2" Ice	15.40	15.40	212.00
			0.00			1" Ice	20.20	20.20	284.00
12' Dipole (NU)	A	From Leg	6.00	0.0000	109.00	No Ice	6.00	6.00	70.00
			0.00			1/2" Ice	8.00	8.00	90.00
			0.00			1" Ice	10.00	10.00	110.00
Rohn 6' Side-Arm(1) (NU)	A	From Leg	3.00	0.0000	109.00	No Ice	10.60	10.60	140.00
			0.00			1/2" Ice	15.40	15.40	212.00
			0.00			1" Ice	20.20	20.20	284.00
14' x 3" Dia Omni (NU)	B	From Leg	6.00	0.0000	108.00	No Ice	4.20	4.20	40.00
			0.00			1/2" Ice	5.63	5.63	70.34
			7.00			1" Ice	7.08	7.08	109.69
Rohn 6' Side-Arm(1) (NU)	B	From Leg	3.00	0.0000	108.00	No Ice	10.60	10.60	140.00
			0.00			1/2" Ice	15.40	15.40	212.00
			0.00			1" Ice	20.20	20.20	284.00
Obstruction light (NU)	A	From Leg	0.50	0.0000	103.00	No Ice	0.13	0.13	8.00
			0.00			1/2" Ice	0.22	0.22	10.47
			0.00			1" Ice	0.29	0.29	13.91
Obstruction light (NU)	B	From Leg	0.50	0.0000	103.00	No Ice	0.13	0.13	8.00
			0.00			1/2" Ice	0.22	0.22	10.47
			0.00			1" Ice	0.29	0.29	13.91
Obstruction light (NU)	C	From Leg	0.50	0.0000	103.00	No Ice	0.13	0.13	8.00
			0.00			1/2" Ice	0.22	0.22	10.47
			0.00			1" Ice	0.29	0.29	13.91
6'x4 1/2" Pipe Mount (NU)	B	From Leg	0.50	0.0000	100.00	No Ice	1.56	1.56	64.70
			0.00			1/2" Ice	2.62	2.62	83.80
			0.00			1" Ice	3.00	3.00	107.17
Telewave ANT150F2 (NU)	B	From Leg	3.00	0.0000	87.00	No Ice	1.29	1.29	15.00
			0.00			1/2" Ice	1.60	1.60	25.28
			2.50			1" Ice	1.91	1.91	39.06
3' sidearm (NU)	B	From Leg	1.50	0.0000	87.00	No Ice	1.43	0.72	30.00
			0.00			1/2" Ice	2.18	1.09	65.00
			0.00			1" Ice	2.93	1.47	105.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
12' Dipole (NU)	A	From Leg	6.00	0.00	0.0000	85.00	No Ice	6.00	6.00	70.00
			0.00				1/2" Ice	8.00	8.00	90.00
			0.00				1" Ice	10.00	10.00	110.00
Rohn 6' Side-Arm(1) (NU)	A	From Leg	3.00	0.00	0.0000	85.00	No Ice	10.60	10.60	140.00
			0.00				1/2" Ice	15.40	15.40	212.00
			0.00				1" Ice	20.20	20.20	284.00
18" square panel (NU)	B	From Leg	3.00	0.00	0.0000	66.00	No Ice	2.70	0.51	22.00
			0.00				1/2" Ice	2.90	0.63	37.30
			0.00				1" Ice	3.11	0.75	55.31
3' sidearm (NU)	B	From Leg	1.50	0.00	0.0000	66.00	No Ice	1.43	0.72	30.00
			0.00				1/2" Ice	2.18	1.09	65.00
			0.00				1" Ice	2.93	1.47	105.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
8' dish with radome (NU)	A	Paraboloid w/Radome	From Leg	2.00	0.00	Worst		183.00	8.00	No Ice	50.27	450.00
				0.00						1/2" Ice	51.32	713.43
				0.00						1" Ice	52.37	976.86
8' dish with radome (NU)	B	Paraboloid w/Radome	From Leg	2.00	0.00	Worst		183.00	8.00	No Ice	50.27	450.00
				0.00						1/2" Ice	51.32	713.43
				0.00						1" Ice	52.37	976.86
4' dish with radome (NU)	A	Paraboloid w/Radome	From Leg	1.00	0.00	Worst		177.00	4.00	No Ice	12.57	150.00
				0.00						1/2" Ice	13.10	217.22
				0.00						1" Ice	13.62	284.44
8' dish with radome (NU)	B	Paraboloid w/Radome	From Leg	2.00	0.00	Worst		172.00	8.00	No Ice	50.27	450.00
				0.00						1/2" Ice	51.32	713.43
				0.00						1" Ice	52.37	976.86
8' dish with radome (NU)	C	Paraboloid w/Radome	From Leg	2.00	0.00	Worst		171.00	8.00	No Ice	50.27	450.00
				0.00						1/2" Ice	51.32	713.43
				0.00						1" Ice	52.37	976.86
6' dish with radome (NU)	B	Paraboloid w/Radome	From Leg	1.50	0.00	Worst		135.00	6.00	No Ice	28.27	250.00
				0.00						1/2" Ice	29.07	400.00
				0.00						1" Ice	29.86	550.00
6' dish with radome (NU)	C	Paraboloid w/Radome	From Leg	1.50	0.00	Worst		135.00	6.00	No Ice	28.27	250.00
				0.00						1/2" Ice	29.07	400.00
				0.00						1" Ice	29.86	550.00
8' dish with radome (NU)	B	Paraboloid w/Radome	From Leg	2.00	0.00	Worst		125.00	8.00	No Ice	50.27	450.00
				0.00						1/2" Ice	51.32	713.43
				0.00						1" Ice	52.37	976.86
8' dish with radome (NU)	B	Paraboloid w/Radome	From Leg	2.00	0.00	Worst		100.00	8.00	No Ice	50.27	450.00
				0.00						1/2" Ice	51.32	713.43
				0.00						1" Ice	52.37	976.86
3' HP dish (Bloomfield PD/FD)	A	Paraboloid w/Shroud (HP)	From Leg	1.00	0.00	Worst		100.00	3.00	No Ice	7.07	75.00
				0.00						1/2" Ice	7.47	113.33
				0.00						1" Ice	7.86	153.33
3' HP dish (Bloomfield PD/FD)	B	Paraboloid w/Shroud (HP)	From Leg	1.00	0.00	Worst		80.00	3.00	No Ice	7.07	75.00
				0.00						1/2" Ice	7.47	113.33
				0.00						1" Ice	7.86	153.33

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	2.044	39	0.0801	0.0041
T2	180 - 160	1.968	39	0.0798	0.0038
T3	160 - 140	1.639	39	0.0782	0.0037
T4	140 - 120	1.314	39	0.0738	0.0040
T5	120 - 100	1.002	39	0.0648	0.0034
T6	100 - 93.3333	0.721	39	0.0555	0.0029
T7	93.3333 - 80	0.635	39	0.0516	0.0029
T8	80 - 73.3333	0.490	39	0.0436	0.0027
T9	73.3333 - 60	0.418	39	0.0403	0.0026
T10	60 - 53.3333	0.294	39	0.0337	0.0022
T11	53.3333 - 40	0.236	39	0.0295	0.0021
T12	40 - 33.3333	0.146	39	0.0211	0.0015
T13	33.3333 - 20	0.104	39	0.0175	0.0013
T14	20 - 13.3333	0.048	39	0.0102	0.0008
T15	13.3333 - 0	0.025	43	0.0068	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	LED beacon	39	2.044	0.0801	0.0041	97932
183.00	8' dish with radome	39	2.014	0.0800	0.0040	97932
181.00	10' 4-bay dipole	39	1.983	0.0799	0.0039	97932
177.00	4' dish with radome	39	1.920	0.0796	0.0037	96821
176.00	10' 4-bay dipole	39	1.904	0.0796	0.0036	103929
172.00	8' dish with radome	39	1.839	0.0793	0.0035	162135
171.00	8' dish with radome	39	1.822	0.0792	0.0035	188739
165.00	PR-900	39	1.722	0.0787	0.0033	Inf
160.00	7770.00	39	1.639	0.0782	0.0037	262873
150.00	BXA-70063/6	39	1.475	0.0766	0.0040	372274
140.50	APXV18-206516	39	1.322	0.0740	0.0040	837543
135.00	6' dish with radome	39	1.234	0.0718	0.0039	350987
125.00	8' dish with radome	39	1.077	0.0671	0.0036	138976
109.00	12' Dipole	39	0.844	0.0599	0.0029	172610
108.00	14' x 3" Dia Omni	39	0.830	0.0594	0.0028	182869
103.00	Obstruction light	39	0.762	0.0571	0.0029	243514
100.00	8' dish with radome	39	0.721	0.0555	0.0029	155379
87.00	Telewave ANT150F2	39	0.564	0.0476	0.0029	101938
85.00	12' Dipole	39	0.542	0.0464	0.0028	263087
80.00	3' HP dish	39	0.490	0.0436	0.0027	207905
66.00	18" square panel	39	0.347	0.0369	0.0024	135091

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	9.270	2	0.3622	0.0204
T2	180 - 160	8.922	2	0.3612	0.0202
T3	160 - 140	7.428	2	0.3550	0.0190
T4	140 - 120	5.953	2	0.3344	0.0181
T5	120 - 100	4.537	2	0.2937	0.0164

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	100 - 93.3333	3.267	2	0.2515	0.0144
T7	93.3333 - 80	2.876	2	0.2336	0.0141
T8	80 - 73.3333	2.218	2	0.1974	0.0125
T9	73.3333 - 60	1.893	2	0.1826	0.0120
T10	60 - 53.3333	1.330	2	0.1528	0.0101
T11	53.3333 - 40	1.067	2	0.1337	0.0094
T12	40 - 33.3333	0.661	2	0.0954	0.0070
T13	33.3333 - 20	0.470	2	0.0792	0.0059
T14	20 - 13.3333	0.216	2	0.0461	0.0036
T15	13.3333 - 0	0.115	3	0.0308	0.0027

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	LED beacon	2	9.270	0.3622	0.0204	22098
183.00	8' dish with radome	2	9.132	0.3618	0.0203	22098
181.00	10' 4-bay dipole	2	8.992	0.3614	0.0202	22098
177.00	4' dish with radome	2	8.706	0.3606	0.0200	21895
176.00	10' 4-bay dipole	2	8.633	0.3604	0.0200	23530
172.00	8' dish with radome	2	8.336	0.3595	0.0197	37036
171.00	8' dish with radome	2	8.261	0.3592	0.0197	43289
165.00	PR-900	2	7.807	0.3573	0.0193	517179
160.00	7770.00	2	7.428	0.3550	0.0190	59956
150.00	BXA-70063/6	2	6.684	0.3474	0.0184	84386
140.50	APXV18-206516	2	5.990	0.3352	0.0181	188713
135.00	6' dish with radome	2	5.591	0.3254	0.0176	77458
125.00	8' dish with radome	2	4.879	0.3043	0.0169	30802
109.00	12' Dipole	2	3.823	0.2715	0.0152	38338
108.00	14' x 3" Dia Omni	2	3.760	0.2695	0.0151	40627
103.00	Obstruction light	2	3.450	0.2586	0.0146	54656
100.00	8' dish with radome	2	3.267	0.2515	0.0144	34617
87.00	Telewave ANT150F2	2	2.552	0.2158	0.0134	22486
85.00	12' Dipole	2	2.456	0.2103	0.0131	58503
80.00	3' HP dish	2	2.218	0.1974	0.0125	45387
66.00	18" square panel	2	1.573	0.1671	0.0110	30031

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	185	Leg	A325N	1.2500	6	462.91	82835.00	0.006 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	1	2639.30	17835.00	0.148 ✔	1	Member Bearing
		Top Girt	A325X	0.7500	1	1263.34	21868.40	0.058 ✔	1	Bolt Shear
T2	180	Leg	A325N	1.2500	6	1965.27	82835.00	0.024 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	1	8432.26	17835.00	0.473 ✔	1	Member Bearing
T3	160	Leg	A325N	1.2500	6	6544.98	82835.00	0.079 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	1	14971.60	21868.40	0.685 ✔	1	Bolt Shear
T4	140	Leg	A325N	1.2500	8	10371.00	82835.00	0.125 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325X	0.6250	2	10677.50	15186.40	0.703 ✔	1	Bolt Shear
T5	120	Leg	A325N	1.5000	8	17148.90	119282.00	0.144 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	2	12596.90	21868.40	0.576 ✔	1	Bolt Shear
T6	100	Diagonal	A325X	1.0000	2	14082.80	33603.80	0.419 ✔	1	Member Bearing
T7	93.3333	Leg	A325N	1.5000	8	20985.00	119282.00	0.176 ✔	1	Bolt Tension
		Diagonal	A325X	1.0000	2	18010.50	38877.20	0.463 ✔	1	Bolt Shear
		Horizontal	A325N	1.0000	2	1811.64	28003.10	0.065 ✔	1	Member Bearing
T8	80	Diagonal	A325X	0.8750	2	15250.50	29765.40	0.512 ✔	1	Bolt Shear
T9	73.3333	Leg	A325N	1.5000	8	28698.20	119282.00	0.241 ✔	1	Bolt Tension
		Diagonal	A325X	0.8750	2	19478.50	29765.40	0.654 ✔	1	Bolt Shear
		Horizontal	A325X	0.8750	2	2447.39	24468.80	0.100 ✔	1	Member Bearing
T10	60	Diagonal	A325X	0.8750	2	16718.70	29765.40	0.562 ✔	1	Bolt Shear
T11	53.3333	Leg	A325N	1.5000	8	36480.40	119282.00	0.306 ✔	1	Bolt Tension
		Diagonal	A325X	0.8750	2	21854.50	29765.40	0.734 ✔	1	Bolt Shear
		Horizontal	A325X	0.8750	2	3090.46	24468.80	0.126 ✔	1	Member Bearing
T12	40	Diagonal	A325X	1.0000	2	18510.10	33603.80	0.551 ✔	1	Member Bearing
T13	33.3333	Leg	A325N	1.5000	8	44830.60	119282.00	0.376 ✔	1	Bolt Tension
		Diagonal	A325X	1.0000	2	23870.40	38877.20	0.614 ✔	1	Bolt Shear
		Horizontal	A325X	1.0000	2	3784.46	28003.10	0.135 ✔	1	Member Bearing
T14	20	Diagonal	A325X	1.0000	2	20138.40	38877.20	0.518 ✔	1	Bolt Shear
T15	13.3333	Leg	F1554-105	1.7500	6	71208.20	169121.00	0.421 ✔	1	Bolt Tension
		Diagonal	A325X	1.0000	2	26089.50	38877.20	0.671 ✔	1	Bolt Shear
		Horizontal	A325X	1.0000	2	4501.60	28003.10	0.161 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	P6.625x.280	5.01	5.01	26.8 K=1.00	5.5813	-8332.34	238344.00	0.035 [1] ✔
T2	180 - 160	P6.625x.280	20.03	10.02	53.5 K=1.00	5.5813	-19808.30	203686.00	0.097 [1] ✔
T3	160 - 140	P6.625x.280	20.03	10.02	53.5 K=1.00	5.5813	-56737.10	203686.00	0.279 [1] ✔
T4	140 - 120	P6.625x.280	20.03	10.02	53.5 K=1.00	5.5813	-108817.00	203686.00	0.534 [1] ✔
T5	120 - 100	P8.625x.322	20.03	10.02	40.9 K=1.00	8.3993	-171654.00	334421.00	0.513 [1] ✔
T6	100 - 93.3333	P8.625x.322	6.68	6.68	27.3	8.3993	-208847.00	357954.00	0.583 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				✔
T7	93.3333 - 80	P8.625x.322	13.36	6.68	27.3	8.3993	-208929.00	357954.00	0.584 [1]
					K=1.00				✔
T8	80 - 73.3333	P8.625x.5	6.68	6.68	27.8	12.7627	-282248.00	542674.00	0.520 [1]
					K=1.00				✔
T9	73.3333 - 60	P8.625x.5	13.36	6.68	27.8	12.7627	-282112.00	542674.00	0.520 [1]
					K=1.00				✔
T10	60 - 53.3333	P10.75x.365	6.68	6.68	21.8	11.9083	-356411.00	517553.00	0.689 [1]
					K=1.00				✔
T11	53.3333 - 40	P10.75x.365	13.36	6.68	21.8	11.9083	-355345.00	517553.00	0.687 [1]
					K=1.00				✔
T12	40 - 33.3333	P10.75x.5	6.68	6.68	22.1	16.1007	-436447.00	699144.00	0.624 [1]
					K=1.00				✔
T13	33.3333 - 20	P10.75x.5	13.36	6.68	22.1	16.1007	-435345.00	699144.00	0.623 [1]
					K=1.00				✔
T14	20 - 13.3333	P12.75x.5	6.68	6.68	18.5	19.2423	-519152.00	844532.00	0.615 [1]
					K=1.00				✔
T15	13.3333 - 0	P12.75x.5	13.36	6.68	18.5	19.2423	-518851.00	844532.00	0.614 [1]
					K=1.00				✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L3 1/2x3 1/2x1/4	19.28	9.60	166.1	1.6900	-2655.46	13846.40	0.192 [1]
					K=1.00				✔
T2	180 - 160	L4x4x1/4	22.60	11.41	172.2	1.9400	-8585.90	14783.50	0.581 [1]
					K=1.00				✔
T3	160 - 140	L5x5x5/16	24.43	12.32	148.7	3.0300	-14908.30	30957.70	0.482 [1]
					K=1.00				✔
T4	140 - 120	L5x5x5/16	26.28	13.16	149.7	3.0300	-21233.20	30550.20	0.695 [1]
					K=0.94				✔
T5	120 - 100	L5x5x3/8	28.15	14.08	158.7	3.6100	-24673.00	32396.50	0.762 [1]
					K=0.93				✔
T6	100 - 93.3333	L6x6x3/8	14.76	14.18	134.1	4.3600	-29042.90	54670.60	0.531 [1]
					K=0.94				✔
T7	93.3333 - 80	L4x6x1/2	19.58	9.50	128.4	4.7500	-36021.00	64584.40	0.558 [1]
					K=0.98				✔
T8	80 - 73.3333	L6x6x3/8	15.36	14.81	138.0	4.3600	-29864.00	51708.80	0.578 [1]
					K=0.92				✔
T9	73.3333 - 60	L6x6x3/8	20.20	19.65	123.3	4.3600	-38957.10	62971.70	0.619 [1]
					K=0.98				✔
T10	60 - 53.3333	L6x6x3/8	16.19	15.64	143.2	4.3600	-33369.00	48054.80	0.694 [1]
					K=0.91				✔
T11	53.3333 - 40	L6x6x3/8	20.90	20.34	126.1	4.3600	-43709.00	60823.50	0.719 [1]
					K=0.97				✔
T12	40 - 33.3333	L6x6x3/8	17.10	16.52	148.7	4.3600	-36596.50	44572.30	0.821 [1]
					K=0.89				

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T13	33.3333 - 20	L6x6x1/2	21.67	21.09	129.9 K=0.95	5.7500	-47740.80	76651.80	0.623 [1]
T14	20 - 13.3333	L6x6x1/2	18.03	17.45	155.3 K=0.88	5.7500	-40203.50	53853.40	0.747 [1]
T15	13.3333 - 0	L6x6x1/2	22.47	21.89	133.0 K=0.94	5.7500	-52178.90	73370.50	0.711 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	93.3333 - 80	L4x4x5/16	27.67	13.18	181.0 K=0.91	2.4000	-3623.28	16552.00	0.219 [1]
T9	73.3333 - 60	L4x4x5/16	29.67	14.21	192.9 K=0.89	2.4000	-4894.77	14569.50	0.336 [1]
T11	53.3333 - 40	L5x5x5/16	31.67	15.13	167.7 K=0.92	3.0300	-6180.93	24328.80	0.254 [1]
T13	33.3333 - 20	L5x5x5/16	33.67	16.09	176.6 K=0.91	3.0300	-7568.91	21936.00	0.345 [1]
T15	13.3333 - 0	L5x5x5/16	35.67	17.01	185.1 K=0.90	3.0300	-9003.20	19982.70	0.451 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L5x5x5/16	18.50	17.68	213.4 K=1.00	3.0300	-1263.34	15030.40	0.084 [1]
		KL/R > 200 (C) - 5							

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	93.3333 - 80	L3x3x1/4	6.92	6.56	132.9 K=1.00	1.4400	-3623.28	18406.80	0.197 [1]
T9	73.3333 - 60	L3x3x1/4	7.42	7.06	143.1	1.4400	-4892.42	15896.70	0.308 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T11	53.3333 - 40	L3x3x5/16	7.92	7.47	152.2 K=1.00	1.7800	-6162.45	17367.30	0.355 [1] ✔
T13	33.3333 - 20	L3x3x5/16	8.42	7.97	162.4 K=1.00	1.7800	-7549.81	15256.20	0.495 [1] ✔
T15	13.3333 - 0	L3 1/2x4x5/16	8.92	8.39	137.8 K=1.00	2.2500	-8997.98	26752.00	0.336 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	93.3333 - 80	L3x3x1/4	9.37	8.86	179.6 K=1.00	1.4400	-2454.57	10086.00	0.243 [1] ✔
T9	73.3333 - 60	L3x3x1/4	9.73	9.24	187.2 K=1.00	1.4400	-3210.45	9282.13	0.346 [1] ✔
T11	53.3333 - 40	L3x3x5/16	10.10	9.50	193.6 K=1.00	1.7800	-3942.36	10728.60	0.367 [1] ✔
T13	33.3333 - 20	L3x3x5/16	10.48	9.90	201.7 K=1.00	1.7800	-4712.02	9886.45	0.477 [1] ✔
T15	13.3333 - 0	L3 1/2x4x5/16	10.87	10.20	167.6 K=1.00	2.2500	-5487.70	18089.80	0.303 [1] ✔

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	93.3333 - 80	L3x3x1/4	6.92	6.92	140.2 K=1.00	1.4400	-109.03	16549.70	0.007 [1] ✔
T9	73.3333 - 60	L3x3x1/4	7.42	7.42	150.3 K=1.00	1.4400	-114.97	14393.50	0.008 [1] ✔
T11	53.3333 - 40	L3 1/2x3 1/2x1/4	7.92	7.92	136.9 K=1.00	1.6900	-116.83	20375.00	0.006 [1] ✔
T13	33.3333 - 20	L3 1/2x3 1/2x1/4	8.42	8.42	145.5 K=1.00	1.6900	-127.01	18026.10	0.007 [1] ✔
T15	13.3333 - 0	L3 1/2x3 1/2x1/4	8.92	8.92	154.2 K=1.00	1.6900	-122.37	16061.20	0.008 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	P6.625x.280	5.01	5.01	26.8	5.5813	488.39	251161.00	0.002 [1] ✔
T2	180 - 160	P6.625x.280	20.03	10.02	53.5	5.5813	11791.60	251161.00	0.047 [1] ✔
T3	160 - 140	P6.625x.280	20.03	10.02	53.5	5.5813	39269.90	251161.00	0.156 [1] ✔
T4	140 - 120	P6.625x.280	20.03	10.02	53.5	5.5813	82967.90	251161.00	0.330 [1] ✔
T5	120 - 100	P8.625x.322	20.03	10.02	40.9	8.3993	137191.00	377967.00	0.363 [1] ✔
T6	100 - 93.3333	P8.625x.322	6.68	6.68	27.3	8.3993	169874.00	377967.00	0.449 [1] ✔
T7	93.3333 - 80	P8.625x.322	13.36	6.68	27.3	8.3993	168139.00	377967.00	0.445 [1] ✔
T8	80 - 73.3333	P8.625x.5	6.68	6.68	27.8	12.7627	231801.00	574322.00	0.404 [1] ✔
T9	73.3333 - 60	P8.625x.5	13.36	6.68	27.8	12.7627	229887.00	574322.00	0.400 [1] ✔
T10	60 - 53.3333	P10.75x.365	6.68	6.68	21.8	11.9083	295041.00	535873.00	0.551 [1] ✔
T11	53.3333 - 40	P10.75x.365	13.36	6.68	21.8	11.9083	292202.00	535873.00	0.545 [1] ✔
T12	40 - 33.3333	P10.75x.5	6.68	6.68	22.1	16.1007	362315.00	724530.00	0.500 [1] ✔
T13	33.3333 - 20	P10.75x.5	13.36	6.68	22.1	16.1007	359118.00	724530.00	0.496 [1] ✔
T14	20 - 13.3333	P12.75x.5	6.68	6.68	18.5	19.2423	430830.00	865902.00	0.498 [1] ✔
T15	13.3333 - 0	P12.75x.5	13.36	6.68	18.5	19.2423	427690.00	865902.00	0.494 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L3 1/2x3 1/2x1/4	19.28	9.60	107.6	1.6900	2639.30	54756.00	0.048 [1] ✔
T2	180 - 160	L4x4x1/4	22.60	11.41	111.1	1.9400	8432.26	62856.00	0.134 [1] ✔
T3	160 - 140	L5x5x5/16	24.43	12.32	95.4	3.0300	14971.60	98172.00	0.153 [1] ✔
T4	140 - 120	L5x5x5/16	26.28	13.16	102.5	3.0300	21354.90	98172.00	0.218 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	120 - 100	L5x5x3/8	28.15	14.08	110.3	3.6100	25193.70	116964.00	0.215 [1]
T6	100 - 93.3333	L6x6x3/8	14.76	14.18	94.2	4.3600	28165.70	141264.00	0.199 [1]
T7	93.3333 - 80	L4x6x1/2	19.58	9.50	123.0	4.7500	34799.80	153900.00	0.226 [1]
T8	80 - 73.3333	L6x6x3/8	15.36	14.81	98.0	4.3600	30501.00	141264.00	0.216 [1]
T9	73.3333 - 60	L6x6x3/8	20.20	19.65	128.9	4.3600	38454.10	141264.00	0.272 [1]
T10	60 - 53.3333	L6x6x3/8	16.19	15.64	103.3	4.3600	33437.30	141264.00	0.237 [1]
T11	53.3333 - 40	L6x6x3/8	20.90	20.34	133.4	4.3600	42694.70	141264.00	0.302 [1]
T12	40 - 33.3333	L6x6x3/8	17.10	16.52	109.2	4.3600	37020.30	141264.00	0.262 [1]
T13	33.3333 - 20	L6x6x1/2	21.67	21.09	139.8	5.7500	46784.00	186300.00	0.251 [1]
T14	20 - 13.3333	L6x6x1/2	18.03	17.45	116.3	5.7500	40276.70	186300.00	0.216 [1]
T15	13.3333 - 0	L6x6x1/2	22.47	21.89	145.0	5.7500	50643.90	186300.00	0.272 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	93.3333 - 80	L4x4x5/16	27.67	13.18	195.6	2.4000	3623.28	77760.00	0.047 [1]
T9	73.3333 - 60	L4x4x5/16	29.67	14.21	210.1	2.4000	4894.77	77760.00	0.063 [1]
T11	53.3333 - 40	L5x5x5/16	31.67	15.13	176.4	3.0300	6180.93	98172.00	0.063 [1]
T13	33.3333 - 20	L5x5x5/16	33.67	16.09	187.9	3.0300	7568.91	98172.00	0.077 [1]
T15	13.3333 - 0	L5x5x5/16	35.67	17.01	198.4	3.0300	9003.20	98172.00	0.092 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	185 - 180	L5x5x5/16	18.50	17.68	137.2	3.0300	279.35	98172.00	0.003 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T7	93.3333 - 80	L3x3x1/4	6.92	6.56	84.6	1.4400	3623.28	46656.00	0.078 [1] ✔
T9	73.3333 - 60	L3x3x1/4	7.42	7.06	91.1	1.4400	4892.42	46656.00	0.105 [1] ✔
T11	53.3333 - 40	L3x3x5/16	7.92	7.47	97.2	1.7800	6162.45	57672.00	0.107 [1] ✔
T13	33.3333 - 20	L3x3x5/16	8.42	7.97	103.7	1.7800	7549.81	57672.00	0.131 [1] ✔
T15	13.3333 - 0	L3 1/2x4x5/16	8.92	8.39	94.0	2.2500	8997.98	72900.00	0.123 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T7	93.3333 - 80	L3x3x1/4	9.37	8.86	114.3	1.4400	2454.57	46656.00	0.053 [1] ✔
T9	73.3333 - 60	L3x3x1/4	9.73	9.24	119.2	1.4400	3210.45	46656.00	0.069 [1] ✔
T11	53.3333 - 40	L3x3x5/16	10.10	9.50	123.7	1.7800	3942.36	57672.00	0.068 [1] ✔
T13	33.3333 - 20	L3x3x5/16	10.48	9.90	128.8	1.7800	4712.02	57672.00	0.082 [1] ✔
T15	13.3333 - 0	L3 1/2x4x5/16	10.87	10.20	114.4	2.2500	5487.70	72900.00	0.075 [1] ✔

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	93.3333 - 80	L3x3x1/4	6.92	6.92	89.2	1.4400	1.16	46656.00	0.000 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	**185 - 180**	**Leg**	**P6.625x.280**	**2**	**-8332.34**	**238344.00**	**3.5**	**Pass**
		Diagonal	L3 1/2x3 1/2x1/4	10	-2655.46	13846.40	19.2	Pass
		Top Girt	L5x5x5/16	5	-1263.34	15030.40	8.4	Pass
T2	**180 - 160**	**Leg**	**P6.625x.280**	**14**	**-19808.30**	**203686.00**	**9.7**	**Pass**
		Diagonal	L4x4x1/4	19	-8585.90	14783.50	58.1	Pass
T3	**160 - 140**	**Leg**	**P6.625x.280**	**29**	**-56737.10**	**203686.00**	**27.9**	**Pass**
		Diagonal	L5x5x5/16	34	-14908.30	30957.70	48.2	Pass
							68.5 (b)	
T4	**140 - 120**	**Leg**	**P6.625x.280**	**43**	**-108817.00**	**203686.00**	**53.4**	**Pass**
		Diagonal	L5x5x5/16	47	-21233.20	30550.20	69.5	Pass
							70.3 (b)	
T5	**120 - 100**	**Leg**	**P8.625x.322**	**60**	**-171654.00**	**334421.00**	**51.3**	**Pass**
		Diagonal	L5x5x3/8	65	-24673.00	32396.50	76.2	Pass
T6	**100 - 93.3333**	**Leg**	**P8.625x.322**	**74**	**-208847.00**	**357954.00**	**58.3**	**Pass**
		Diagonal	L6x6x3/8	80	-29042.90	54670.60	53.1	Pass
T7	**93.3333 - 80**	**Leg**	**P8.625x.322**	**87**	**-208929.00**	**357954.00**	**58.4**	**Pass**
		Diagonal	L4x6x1/2	94	-36021.00	64584.40	55.8	Pass
		Horizontal	L4x4x5/16	82	-3623.28	16552.00	21.9	Pass
		Redund Horz 1 Bracing	L3x3x1/4	98	-3623.28	18406.80	19.7	Pass
		Redund Diag 1 Bracing	L3x3x1/4	99	-2454.57	10086.00	24.3	Pass
		Redund Hip 1 Bracing	L3x3x1/4	100	-109.03	16549.70	0.8	Pass
T8	**80 - 73.3333**	**Leg**	**P8.625x.5**	**111**	**-282248.00**	**542674.00**	**52.0**	**Pass**
		Diagonal	L6x6x3/8	117	-29864.00	51708.80	57.8	Pass
T9	**73.3333 - 60**	**Leg**	**P8.625x.5**	**123**	**-282112.00**	**542674.00**	**52.0**	**Pass**
		Diagonal	L6x6x3/8	137	-38957.10	62971.70	61.9	Pass
							65.4 (b)	
		Horizontal	L4x4x5/16	118	-4894.77	14569.50	33.6	Pass
		Redund Horz 1 Bracing	L3x3x1/4	138	-4892.42	15896.70	30.8	Pass
		Redund Diag 1 Bracing	L3x3x1/4	139	-3210.45	9282.13	34.6	Pass
		Redund Hip 1 Bracing	L3x3x1/4	143	-113.89	14393.50	0.9	Pass
T10	**60 - 53.3333**	**Leg**	**P10.75x.365**	**147**	**-356411.00**	**517553.00**	**68.9**	**Pass**
		Diagonal	L6x6x3/8	156	-33369.00	48054.80	69.4	Pass
T11	**53.3333 - 40**	**Leg**	**P10.75x.365**	**159**	**-355345.00**	**517553.00**	**68.7**	**Pass**
		Diagonal	L6x6x3/8	173	-43709.00	60823.50	71.9	Pass
							73.4 (b)	
		Horizontal	L5x5x5/16	151	-6180.93	24328.80	25.4	Pass
		Redund Horz 1 Bracing	L3x3x5/16	170	-6162.45	17367.30	35.5	Pass
		Redund Diag 1	L3x3x5/16	171	-3942.36	10728.60	36.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Bracing						
		Redund Hip 1 Bracing	L3 1/2x3 1/2x1/4	172	-116.83	20375.00	0.9	Pass
T12	**40 - 33.3333**	**Leg**	**P10.75x.5**	**183**	**-436447.00**	**699144.00**	**62.4**	**Pass**
		Diagonal	L6x6x3/8	192	-36596.50	44572.30	82.1	Pass
T13	**33.3333 - 20**	**Leg**	**P10.75x.5**	**195**	**-435345.00**	**699144.00**	**62.3**	**Pass**
		Diagonal	L6x6x1/2	209	-47740.80	76651.80	62.3	Pass
		Horizontal	L5x5x5/16	187	-7568.91	21936.00	34.5	Pass
		Redund Horz 1 Bracing	L3x3x5/16	210	-7549.81	15256.20	49.5	Pass
		Redund Diag 1 Bracing	L3x3x5/16	207	-4712.02	9886.45	47.7	Pass
		Redund Hip 1 Bracing	L3 1/2x3 1/2x1/4	215	-126.06	18026.10	0.9	Pass
T14	**20 - 13.3333**	**Leg**	**P12.75x.5**	**219**	**-519152.00**	**844532.00**	**61.5**	**Pass**
		Diagonal	L6x6x1/2	228	-40203.50	53853.40	74.7	Pass
T15	**13.3333 - 0**	**Leg**	**P12.75x.5**	**231**	**-518851.00**	**844532.00**	**61.4**	**Pass**
		Diagonal	L6x6x1/2	245	-52178.90	73370.50	71.1	Pass
		Horizontal	L5x5x5/16	223	-9003.20	19982.70	45.1	Pass
		Redund Horz 1 Bracing	L3 1/2x4x5/16	242	-8997.98	26752.00	33.6	Pass
		Redund Diag 1 Bracing	L3 1/2x4x5/16	243	-5487.70	18089.80	30.3	Pass
		Redund Hip 1 Bracing	L3 1/2x3 1/2x1/4	252	-122.37	16061.20	0.8	Pass
							Summary	
						Leg (T10)	68.9	Pass
						Diagonal (T12)	82.1	Pass
						Horizontal (T15)	45.1	Pass
						Top Girt (T1)	8.4	Pass
						Redund Horz 1 Bracing (T13)	49.5	Pass
						Redund Diag 1 Bracing (T13)	47.7	Pass
						Redund Hip 1 Bracing (T13)	0.9	Pass
						Bolt Checks	73.4	Pass
						RATING =	**82.1**	**Pass**

All-Points Technology Corp., P.C.
116 Grandview Road
Conway, NH 03818
(603) 496-5853

Client:	**SAI Communications**	Site No.:	**CTV1001**
Job:	**Bloomfield**	Job No.:	**CT1931600**
Calculated By:	**R. Adair**	Date:	**21-Feb-20**

Mat Foundation Analysis

Program assumes:

Mat is square in plan view.
Water table is below bottom of mat.
Unit weight of concrete = 150 pcf
Unit weight of soil = 100 pcf
Self-supporting tower with 3 piers

Information to be provided:

Pier is round or square in plan dimension ("R" or "S")	Shape =	R	
OTM = Overturning Moment to be resisted	OTM =	17369	ft-kips
H = Height from ground surface to top of mat (if buried	H =	5.0	ft.
P_M = Projection of pier above mat	P_M =	5.5	ft.
y = Thickness of mat	y =	1.50	ft.
x = Width of mat	x =	45.50	ft.
d = Diameter of round pier	d =	6.0	ft.
S = Size of tension bars	S =	7	

Mass of tower and appurtenances (below)

Results:

Component	Mass	Moment Arm	Moment Resist.
Pier	23.3 kips	22.75 ft.	530.7 ft-kips
Overburden	1160.6 kips	22.75 ft.	26403.2 ft-kips
Mat	465.8 kips	22.75 ft.	10597.1 ft-kips

Overturning Moment Resistance = 37530.93 ft-kips
Factor of Safety = 2.16 SATISFACTORY
Concrete Quantity = 132.3 c.y.

Exhibit D

Letter of Owner Authorization

EVERSOURCE ENERGY

107 Selden Street
Berlin, CT 06037

March 19, 2020

Mr. Northgraves
Connecticut Department of Emergency Services and Protection
1111 Country Club Road
Middletown, New Connecticut. 06457

RE: Letter of Authorization

Project: Connecticut Department of Emergency Services and Protection (DESPP)
5 Saint Andrews Road
Bloomfield, CT. 06002

Owner: Eversource Energy

Dear Mr. Northgraves,

Eversource Energy, owner of the tower facility located at the address identified above, do hereby authorize, Connecticut Department of Emergency Services and Protection, and/ or it's agent, to use this authorization letter for the sole purpose of filing and consummating any land-use or building permit application(s) as may be required by the applicable permitting authorities for the Licensee's telecommunication's installation.

Sincerely,

Ryan Fitterman
Eversource Energy

REF: CENTEK Engineering, LLC
Project Drawing # 19160.01

REF: All-Points Technology Corporation
Structural Analysis Project # 1931600, (Prepared for AT&T to include proposed DESPP loading).
Rev. Date 02/21/2020

Exhibit E

Environmental (FCC) Exclusions Analysis

FCC EXCLUSION ANALYSIS

"Bloomfield (Eversource)"
5 ST. Andrews Road
Bloomfield, CT 06002
CBRE Project # TS00223239

Prepared For:

PYRAMID
Network Services, LLC

www.cbre.com/Assessment

CBRE

FCC EXCLUSION ANALYSIS

47 CFR § 1.1320 - Review of Commission undertakings that may affect historic properties.
Nationwide Programmatic Agreement for the Collocation of Wireless Antennas.
Nationwide Programmatic Agreement for Review of Effect on Historic Properties for certain Undertakings approved by the FCC.

Project Name: Bloomfield (Eversource)	**CBRE Project #:** TS00223239	**Date:** March 5, 2020
Address: 5 ST. Andrews Road	**City:** Bloomfield	**State:** CT

SECTION 106 ANALYSIS

COLLOCATION AGREEMENT CHECKLIST	
Exclusion III. COLLOCATION OF ANTENNAS ON TOWERS CONSTRUCTED ON OR BEFORE MARCH 16, 2001	
Are any of the stipulations listed below (No. 1 – 4) true?	Yes ○ No ○
A. An antenna may be mounted on an existing tower constructed on or before March 16, 2001 without such collocation being reviewed through the Section 106 process set forth in the NPA, unless: 1. The mounting of the antenna will result in a substantial increase in the size of the tower as defined in Stipulation I.E; or 2. The tower has been determined by the FCC to have an adverse effect on one or more historic properties, where such effect has not been avoided or mitigated through a conditional no adverse effect determination, a Memorandum of Agreement, a programmatic agreement, or a finding of compliance with Section 106 and the NPA; or 3. The tower is the subject of a pending environmental review or related proceeding before the FCC involving compliance with Section 106 of the National Historic Preservation Act; or 4. The collocation licensee or the owner of the tower has received written or electronic notification that the FCC is in receipt of a complaint from a member of the public, an Indian Tribe, a SHPO or the Council, that the collocation has an adverse effect on one or more historic properties. Any such complaint must be in writing and supported by substantial evidence describing how the effect from the collocation is adverse to the attributes that qualify any affected historic property for eligibility or potential eligibility for the National Register.	
If "Yes", further review is required including Section 106 Consultation.	
Exclusion IV. COLLOCATION OF ANTENNAS ON TOWERS CONSTRUCTED AFTER MARCH 16, 2001	
Are any of the stipulations listed below (No. 1 – 4) true?	Yes ○ No ●
A. An antenna may be mounted on an existing tower constructed after March 16, 2001 without such collocation being reviewed through the Section 106 process set forth in the NPA, unless: 1. The Section 106 review process for the existing tower set forth in 36 CFR Part 800 (including any applicable program alternative approved by the Council pursuant to 36 C.F.R. § 800.14) and any associated environmental reviews required by the FCC have not been completed; or 2. The mounting of the new antenna will result in a substantial increase in the size of the tower as defined in Stipulation I.E, or 3. The tower as built or proposed has been determined by the FCC to have an adverse effect on one or more historic properties, where such effect has not been avoided or mitigated through a conditional no adverse effect determination, a Memorandum of Agreement, a Programmatic Agreement, or otherwise in compliance with Section 106 and the NPA; or 4. The collocation licensee or the owner of the tower has received written or electronic notification that the FCC is in receipt of a complaint from a member of the public, an Indian Tribe, a SHPO or the Council, that the collocation has an adverse effect on one or more historic properties. Any such complaint must be in writing and supported by substantial evidence describing how the effect from the collocation is adverse to the attributes that qualify any affected historic property for eligibility or potential eligibility for the National Register.	
If "Yes", further review is required including Section 106 Consultation.	
Exclusion V. COLLOCATION OF ANTENNAS ON BUILDINGS AND NON-TOWER STRUCTURES	
Are any of the stipulations listed below (No. 1 – 4) true?	Yes ○ No ○

A. An antenna may be mounted on a building or non-tower structure without such collocation being reviewed through the Section 106 process set forth in the NPA, unless:
   1. The building or structure is over 45 years old, and the collocation does not meet the criteria established in Stipulation VI herein for collocations of small antennas; or
   2. The building or structure is inside the boundary of a historic district, or if the antenna is visible from the ground level of a historic district, the building or structure is within 250 feet of the boundary of the historic district, and the collocation does not meet the criteria established in Stipulation VII herein for collocations of small or minimally visible antennas; or,
   3. The building or non-tower structure is a designated National Historic Landmark, or listed in or eligible for listing in the National Register of Historic Places based upon the review of the FCC, licensee, tower company or applicant for an antenna license, and the collocation does not meet the criteria established in Stipulation VII herein for collocations of small or minimally visible antennas; or,
   4. The collocation licensee or the owner of the building or non-tower structure has received written or electronic notification that the FCC is in receipt of a complaint from a member of the public, an Indian Tribe, a SHPO or the Council, that the collocation has an adverse effect on one or more historic properties. Any such complaint must be in writing and supported by substantial evidence describing how the effect from the collocation is adverse to the attributes that qualify any affected historic property for eligibility or potential eligibility for the National Register.

If "Yes", further review is required including Section 106 Consultation.

Exclusion VI. ADDITIONAL EXCLUSION FOR COLLOCATION OF SMALL WIRELESS ANTENNAS AND ASSOCIATED EQUIPMENT ON BUILDINGS AND NON-TOWER STRUCTURES THAT ARE OUTSIDE OF HISTORIC DISTRICTS AND ARE NOT HISTORIC PROPERTIES

Are any of the stipulations listed below (No. 1 – 5) true?	Yes ❍ No ❍

A. A small wireless antenna (including associated equipment included in the definition of Antenna in Stipulation I.A.) may be mounted on an existing building or non-tower structure or in the interior of a building regardless of the building's or structure's age without such collocation being reviewed through the Section 106 process set forth in the NPA unless:
   1. The building or structure is inside the boundary of a historic district, or if the antenna is visible from the ground level of a historic district, the building or structure is within 250 feet of the boundary of the historic district, and the collocation does not meet the criteria established in Stipulation VII herein for collocations of small or minimally visible antennas; or,
   2. The building or non-tower structure is a designated National Historic Landmark; or,
   3. The building or non-tower structure is listed in or eligible for listing in the National Register of Historic Places, and the collocation does not meet the criteria established in Stipulation VII herein for collocations of small or minimally visible antennas; or,
   4. The collocation licensee or the owner of the building or non-tower structure has received written or electronic notification that the FCC is in receipt of a complaint from a member of the public, an Indian Tribe, a SHPO or the Council, that the collocation has an adverse effect on one or more historic properties. Any such complaint must be in writing and supported by substantial evidence describing how the effect from the collocation is adverse to the attributes that qualify any affected historic property for eligibility or potential eligibility for the National Register; or,
   5. The antennas and associated equipment exceed the volume limits specified below:
      a. Each individual antenna, excluding the associated equipment (as defined in the definition of Antenna in Stipulation I.A.), that is part of the collocation must fit within an enclosure (or if the antenna is exposed, within an imaginary enclosure, i.e., one that would be the correct size to contain the equipment) that is individually no more than three cubic feet in volume, and all antennas on the structure, including any pre-existing antennas on the structure, must in aggregate fit within enclosures (or if the antennas are exposed, within imaginary enclosures, i.e., ones that would be the correct size to contain the equipment) that total no more than six cubic feet in volume; and,
      b. All other wireless equipment associated with the structure, including pre-existing enclosures and including equipment on the ground associated with antennas on the structure, but excluding cable runs for the connection of power and other services, may not cumulatively exceed:
         i. 28 cubic feet for collocations on all non-pole structures (including but not limited to buildings and water tanks) that can support fewer than 3 providers; or,
         ii. 21 cubic feet for collocations on all pole structures (including but not limited to light poles, traffic signal poles, and utility poles) that can support fewer than 3 providers; or,
         iii. 35 cubic feet for non-pole collocations that can support at least 3 providers; or,
         iv. 28 cubic feet for pole collocations that can support at least 3 providers; or,
   6. The depth and width of any proposed ground disturbance associated with the collocation exceeds the depth and width of any previous ground disturbance (including footings and other anchoring mechanisms). Up to four lightning grounding rods of no more than three-quarters of an inch in diameter may be installed per project regardless of the extent of previous ground disturbance.

Special Note B. The volume of any deployed equipment that is not visible from public spaces at the ground level from 250 feet or less may be omitted from the calculation of volumetric limits cited in this Section.

If "Yes", further review is required including Section 106 Consultation.

Exclusion VII.A. ADDITIONAL EXCLUSIONS FOR COLLOCATION OF SMALL OR MINIMALLY VISIBLE WIRELESS ANTENNAS AND ASSOCIATED EQUIPMENT IN HISTORIC DISTRICTS OR ON HISTORIC PROPERTIES (Buildings & Other Non-Tower Structures)

Are any of the stipulations listed below (No. 1 – 4) false?	Yes ❍ No ❍

A. A small antenna (including associated equipment included in the definition of Antenna in Stipulation I.A.) may be mounted on a building or non-tower structure or in the interior of a building that is (1) a historic property (including a property listed in or eligible for listing in the National Register of Historic Places) or (2) inside or within 250 feet of the boundary of a historic district without being reviewed through the Section 106 process set forth in the NPA, provided that:

1. The property on which the equipment will be deployed is not a designated National Historic Landmark.
2. The antenna or antenna enclosure (including any existing antenna), excluding associated equipment, is the only equipment that is visible from the ground level, or from public spaces within the building (if the antenna is mounted in the interior of a building), and provided that the following conditions are met:
    a. No other antennas on the building or non-tower structure are visible from the ground level, or from public spaces within the building (for an antenna mounted in the interior of a building);
    b. The antenna that is part of the collocation fits within an enclosure (or if the antenna is exposed, within an imaginary enclosure i.e., one that would be the correct size to contain the equipment) that is no more than three cubic feet in volume; and,
    c. The antenna is installed using stealth techniques that match or complement the structure on which or within which it is deployed;
3. The antenna's associated equipment is not visible from:
    a. The ground level anywhere in a historic district (if the antenna is located inside or within 250 feet of the boundary of a historic district); or,
    b. Immediately adjacent streets or public spaces at ground level (if the antenna is on a historic property that is not in a historic district); or,
    c. Public spaces within the building (if the antenna is mounted in the interior of a building).
4. The facilities (including antenna(s) and associated equipment identified in the definition of Antenna in Stipulation I.A.) are installed in a way that does not damage historic materials and permits removal of such facilities without damaging historic materials;
5. The depth and width of any proposed ground disturbance associated with the collocation does not exceed the depth and width of any previous ground disturbance (including footings and other anchoring mechanisms). Up to four lightning grounding rods of no more than three-quarters of an inch in diameter may be installed per project, regardless of the extent of previous ground disturbance; and
6. The collocation licensee or the owner of the building or non-tower structure has not received written or electronic notification that the FCC is in receipt of a complaint from a member of the public, an Indian Tribe, a SHPO or the Council, that the collocation has an adverse effect on one or more historic properties. Any such complaint must be in writing and supported by substantial evidence describing how the effect from the collocation is adverse to the attributes that qualify any affected historic property for eligibility or potential eligibility for the National Register.

If "Yes", further review is required including Section 106 Consultation.

Exclusion VII.B. ADDITIONAL EXCLUSIONS FOR COLLOCATION OF SMALL OR MINIMALLY VISIBLE WIRELESS ANTENNAS AND ASSOCIATED EQUIPMENT IN HISTORIC DISTRICTS OR ON HISTORIC PROPERTIES (Utility Poles)

Are any of the stipulations listed below (No. 1 – 3) false?	Yes ❍ No ❍

B. A small antenna (including associated equipment included in the definition of Antenna in Stipulation I.A.) may be mounted on a utility pole or electric transmission tower (but not including light poles, lamp posts, and other structures whose primary purpose is to provide public lighting) that is in active use by a utility company (as defined in Section 224 of the Communications Act) or by a cooperatively-owned, municipal, or other governmental agency and is either: (1) a historic property (including a property listed in or eligible for listing in the National Register of Historic Places); (2) located on a historic property (including a property listed in or eligible for listing in the National Register of Historic Places); or (3) located inside or within 250 feet of the boundary of a historic district, without being reviewed through the Section 106 process set forth in the NPA, provided that:

1. The utility pole or electric transmission tower on which the equipment will be deployed is not located on a designated National Historic Landmark;
2. The antenna, excluding the associated equipment, fits within an enclosure (or if the antenna is exposed, within an imaginary enclosure, i.e., one that would be the correct size to contain the equipment) that is no more than three cubic feet in volume, with a cumulative limit of 6 cubic feet if there is more than one antenna/antenna enclosure on the structure;
3. The wireless equipment associated with the antenna and any pre-existing antennas and associated equipment on the structure, but excluding cable runs for the connection of power and other services, are cumulatively no more than 21 cubic feet in volume;
4. The depth and width of any proposed ground disturbance associated with the collocation does not exceed the depth and width of any previous ground disturbance (including footings and other anchoring mechanisms). Up to four lightning grounding rods of no more than three-quarters of an inch in diameter may be installed per project, regardless of the extent of previous ground disturbance; and
5. The collocation licensee or the owner of the utility pole or electric transmission tower has not received written or electronic notification that the FCC is in receipt of a complaint from a member of the public, an Indian Tribe, a SHPO or the Council, that the collocation has an adverse effect on one or more historic properties. Any such complaint must be in writing and supported by substantial evidence describing how the effect from the collocation is adverse to the attributes that qualify any affected historic property for eligibility or potential eligibility for the National Register.

If "Yes", further review is required including Section 106 Consultation.

Exclusion VII.C. ADDITIONAL EXCLUSIONS FOR COLLOCATION OF SMALL OR MINIMALLY VISIBLE WIRELESS ANTENNAS AND ASSOCIATED EQUIPMENT IN HISTORIC DISTRICTS OR ON HISTORIC PROPERTIES (Light and Traffic Poles)

Have the following procedures not been completed?	Yes ❍ No ❍

C. Proposals to mount a small antenna on a traffic control structure (i.e., traffic light) or on a light pole, lamp post or other structure whose primary purpose is to provide public lighting, where the structure is located inside or within 250 feet of the boundary of a historic district, are generally subject to review through the Section 106 process set forth in the NPA. These proposed collocations will be excluded from such review on a case-by-case basis, if (1) the collocation licensee or the owner of the structure has not received written or electronic notification that the FCC is in receipt of a complaint from a member of the public, an Indian Tribe, a SHPO or the Council, that the collocation has an adverse effect on one or more historic properties; and (2) the structure is not historic (not a designated National Historic Landmark or a property listed in or eligible for listing in the National Register of Historic Places) or considered a contributing or compatible element within the historic district, under the following procedures:

1. The applicant must request in writing that the SHPO concur with the applicant's determination that the structure is not a contributing or compatible element within the historic district.
2. The applicant's written request must specify the traffic control structure, light pole, or lamp post on which the applicant proposes to collocate and explain why the structure is not a contributing element based on the age and type of structure, as well as other relevant factors.
3. The SHPO has thirty days from its receipt of such written notice to inform the applicant whether it disagrees with the applicant's determination that the structure is not a contributing or compatible element within the historic district.
4. If within the thirty-day period, the SHPO informs the applicant that the structure is a contributing element or compatible element within the historic district or that the applicant has not provided sufficient information for a determination, the applicant may not deploy its facilities on that structure without completing the Section 106 review process.
5. If, within the thirty day period, the SHPO either informs the applicant that the structure is not a contributing or compatible element within the historic district, or the SHPO fails to respond to the applicant within the thirty-day period, the applicant has no further Section 106 review obligations, provided that the collocation meets the following requirements:
    a. The antenna, excluding the associated equipment, fits within an enclosure (or if the antenna is exposed, within an imaginary enclosure, i.e., one that would be the correct size to contain the equipment) that is no more than three cubic feet in volume, with a cumulative limit of 6 cubic feet if there is more than one antenna/antenna enclosure on the structure;
    b. The wireless equipment associated with the antenna and any pre-existing antennas and associated equipment on the structure, but excluding cable runs for the connection of power and other services, are cumulatively no more than 21 cubic feet in volume; and,
    c. The depth and width of any proposed ground disturbance associated with the collocation does not exceed the depth and width of any previous ground disturbance (including footings and other anchoring mechanisms). Up to four lightning grounding rods of no more than three-quarters of an inch in diameter may be installed per project, regardless of the extent of previous ground disturbance.

If "Yes", further review is required including formal Section 106 Consultation.

Exclusion VIII. REPLACEMENTS OF SMALL WIRELESS ANTENNAS AND ASSOCIATED EQUIPMENT

Are any of the stipulations listed below (No. 1 – 3) false?	Yes ❍ No ❍

A. An existing small antenna that is mounted on a building or non-tower structure or in the interior of a building that is (1) a historic property (including a designated National Historic Landmark or a property listed in or eligible for listing in the National Register of Historic Places); (2) inside or within 250 feet of the boundary of a historic district; or (3) located on or inside a building or non-tower structure that is over 45 years of age, regardless of visibility, may be replaced without being reviewed through the Section 106 process set forth in the NPA, provided that:

1. The antenna deployment being replaced has undergone Section 106 review, unless either (a) such review was not required at the time that the antenna being replaced was installed, or (b) for deployments on towers, review is not required pursuant to Stipulation III above.
2. The facility is a replacement for an existing facility, and it does not exceed the greater of:
    a. The size of the existing antenna/antenna enclosure and associated equipment that is being replaced; or,
    b. The following limits for the antenna and its associated equipment:
        i. The antenna, excluding the associated equipment, fits within an enclosure (or if the antenna is exposed, within an imaginary enclosure, i.e., one that would be the correct size to contain the equipment) that is no more than three cubic feet in volume, with a cumulative limit of 6 cubic feet if there is more than one antenna/antenna enclosure on the structure; and,
        ii. The wireless equipment associated with the antenna and any pre-existing antennas and associated equipment on the structure, but excluding cable runs for the connection of power and other services, are cumulatively no more than 21 cubic feet in volume; and,
3. The replacement of the facilities (including antenna(s) and associated equipment as defined in Stipulation I.A.) does not damage historic materials and permits removal of such facilities without damaging historic materials; and,
4. The depth and width of any proposed ground disturbance associated with the collocation does not exceed the depth and width of any previous ground disturbance (including footings and other anchoring mechanisms). Up to four lightning grounding rods of no more than three-quarters of an inch in diameter may be installed per project, regardless of the extent of previous ground disturbance.

If "Yes", further review is required including Section 106 Consultation.

FINDINGS	
Section 106 consultation is required In accordance with 47 CFR Part 1.1301-1.1320 of the FCC regulations.	Yes ❍ No ●

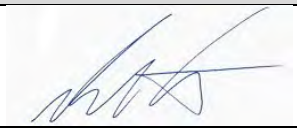
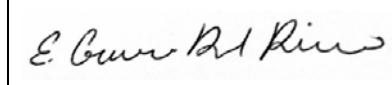
According to this review, the proposed Undertaking meets the following exemptions:

Exclusion IV. COLLOCATION OF ANTENNAS ON TOWERS CONSTRUCTED AFTER MARCH 16, 2001

The Undertaking is a collocation on an existing tower which was constructed after March 16, 2001, has documentation that it underwent Section 106 Review and the FCC has not determined that the tower has, will have or potentially will have an "adverse effect" on historic properties. Additionally, the Undertaking will not result in a substantial increase in size of the tower and the licensee or tower owner has not received notification of complaint from the public, SHPO or Council that the collocation will have an adverse effect on historic properties.

Summary

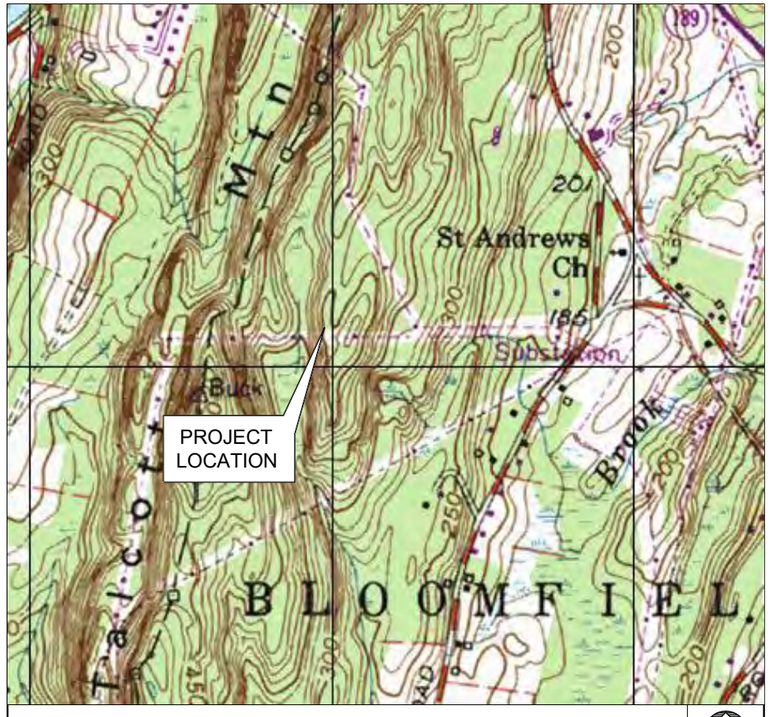
It is CBRE's professional opinion that the proposed undertaking is ***exempt*** from the consultation process set forth under Subpart B of 36 CFR Part 800 and under the provisions of the NPA and/or CNPA and that no further Section 106 consultation is required.

PERSONNEL			
Completed By:	 David Akerblom Managing Director	**Reviewed By:**	 E. Gio Del Rivero Director, NEPA

SUPPORTING DOCUMENTATION

CONNECTICUT DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION (DESPP) COMMUNICATIONS UPGRADE PROJECT

BLOOMFIELD (EVERSOURCE)
5 ST. ANDREWS ROAD
BLOOMFIELD, CT 06002



VICINITY MAP

NORTH

PROJECT SUMMARY

SITE ADDRESS:	5 ST. ANDREWS ROAD BLOOMFIELD, CT 06002
PROJECT COORDINATES:	LAT: 41°–53'–33.49"N LON: 72°–45'–56.47"W ELEV: ±399' AMSL
PROPERTY OWNER:	EVERSOURCE P.O BOX 270 HARTFORD, CT 06141
CUSTOMER CONTACT:	CONNECTICUT DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION (DESPP) (860) 685–8090
PROJECT MANAGER:	MOTOROLA SOLUTIONS GARY FLEISCH (203) 231–1397 PYRAMID NETWORK SERVICES, LLC ROB MCCABE (315) 373–3040
PROJECT ENGINEER:	MOTOROLA SOLUTIONS ROB CADY (860) 456–4091
SITE NAME:	BLOOMFIELD (EVERSOURCE)
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CAMILO GAVIRIA (203) 433–7511 EXT 119

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T–1	TITLE SHEET	B
L–1	SITE PLAN	B
L–2	TOWER ELEVATION	B

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
B	01/15/20	KAWJR	CJC	LE – REVISED
A	01/02/20	LGL	TJR	LE – ISSUED FOR LEASING

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

PYRAMID NETWORK SERVICES
BLOOMFIELD (EVERSOURCE)
5 ST. ANDREWS ROAD
BLOOMFIELD, CT 06002

DATE: 01/02/20
SCALE: AS SHOWN
JOB NO. 19160.01

SHEET NO.
T–1

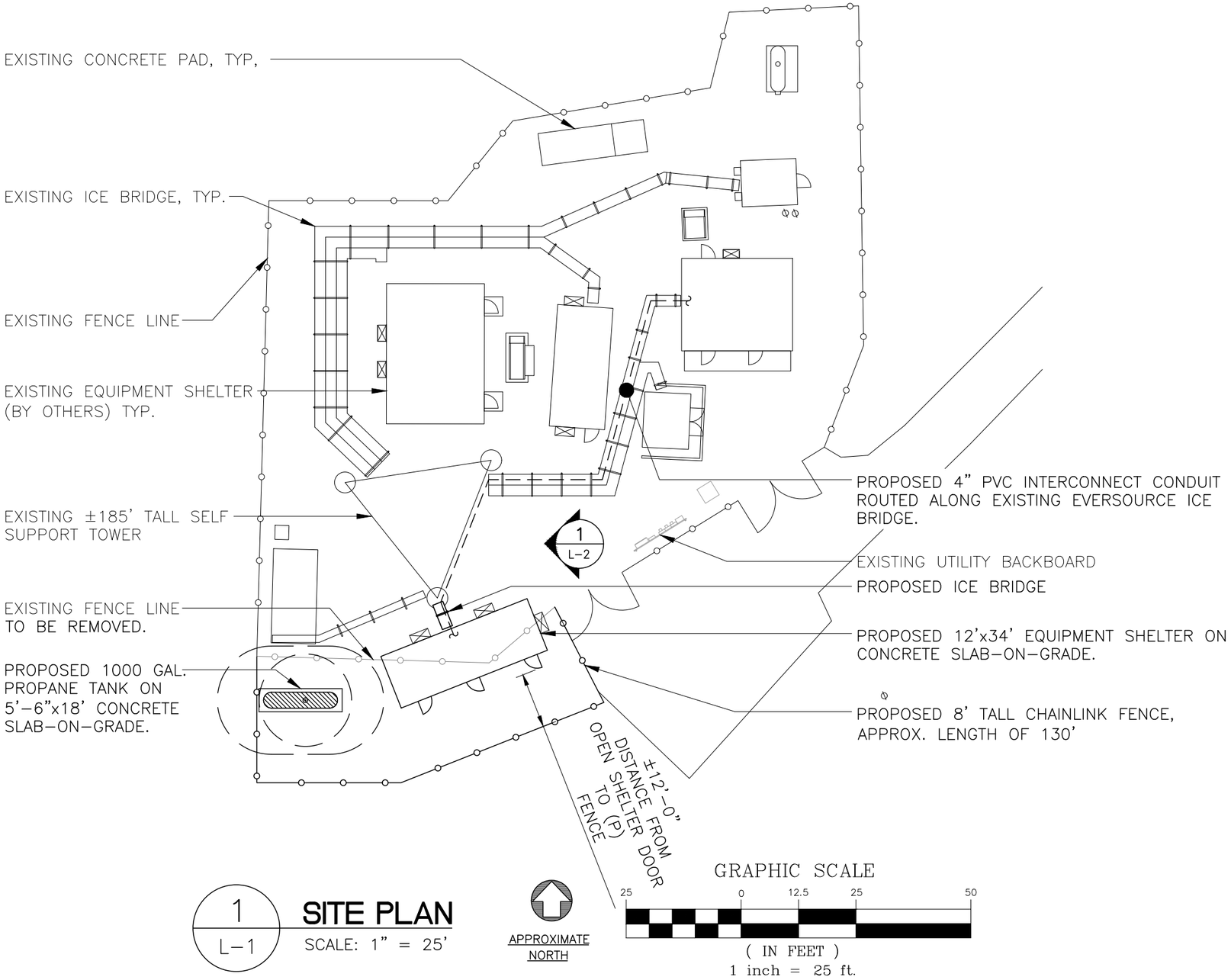
NOTES:

1. PROPOSED INSTALLATION WILL CONSIST OF (1) NEW TX ANTENNA MOUNTED TO A NEW ~~BOGNER 6' SIDE ARM MOUNT WITH STIFF ARMS~~ AND TRANSMISSION LINE AND (2) NEW RX ANTENNAS MOUNTED TO A ~~NEW BOGNER 6' SIDE ARM MOUNT WITH STIFF ARMS~~ AND TRANSMISSION LINE AND THE INSTALLATION OF (1) TOWER TOP AMPLIFIER. IN ADDITION, THE INSTALLATION OF A NEW 12'x34' EQUIPMENT SHELTER ON A CONCRETE SLAB-ON-GRADE, ALONG WITH A NEW COAX CABLE ICE BRIDGE, A 1000 GAL. PROPANE TANK ON A NEW 5'-6"x18' CONCRETE SLAB-ON-GRADE, NEW 120/240V 400A UNDERGROUND ELECTRICAL SERVICE FROM EXISTING UTILITY BACKBOARD, AS WELL AS ONE (1) NEW 4" PVC INTERCONNECT CONDUIT FROM EXISTING EVERSOURCE SHELTER TO NEW EQUIPMENT SHELTER ROUTED ALONG THE EXISTING EVERSOURCE ICE BRIDGE.

(1) Site-Pro VFA10-HD Antenna Sector Frame

LEASE PLAN

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED EMERGENCY COMMUNICATION FACILITY.



1 / L-1 **SITE PLAN**

SCALE: 1" = 25'

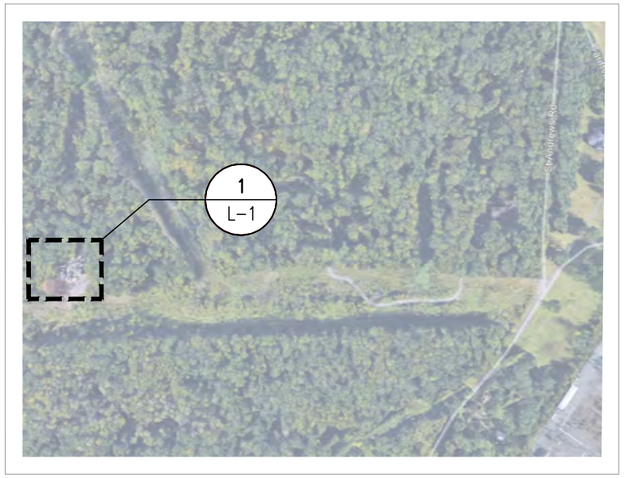
APPROXIMATE NORTH

GRAPHIC SCALE

25 0 12.5 25 50

(IN FEET)

1 inch = 25 ft.



SITE KEY PLAN

SCALE: 1" = 500'

APPROXIMATE NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
B	01/15/20	KAWJR	CJC	LE - REVISED
A	01/02/20	LGL	TJR	LE - ISSUED FOR LEASING

CONNECTICUT DEPARTMENT OF EMERGENCY SERVICES AND PUBLIC PROTECTION

PYRAMID Network Services, LLC

MOTOROLA SOLUTIONS

CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

PYRAMID NETWORK SERVICES

BLOOMFIELD (EVERSOURCE)

5 ST. ANDREWS ROAD
BLOOMFIELD, CT 06002

DATE:	01/02/20
SCALE:	AS SHOWN
JOB NO.	19160.01

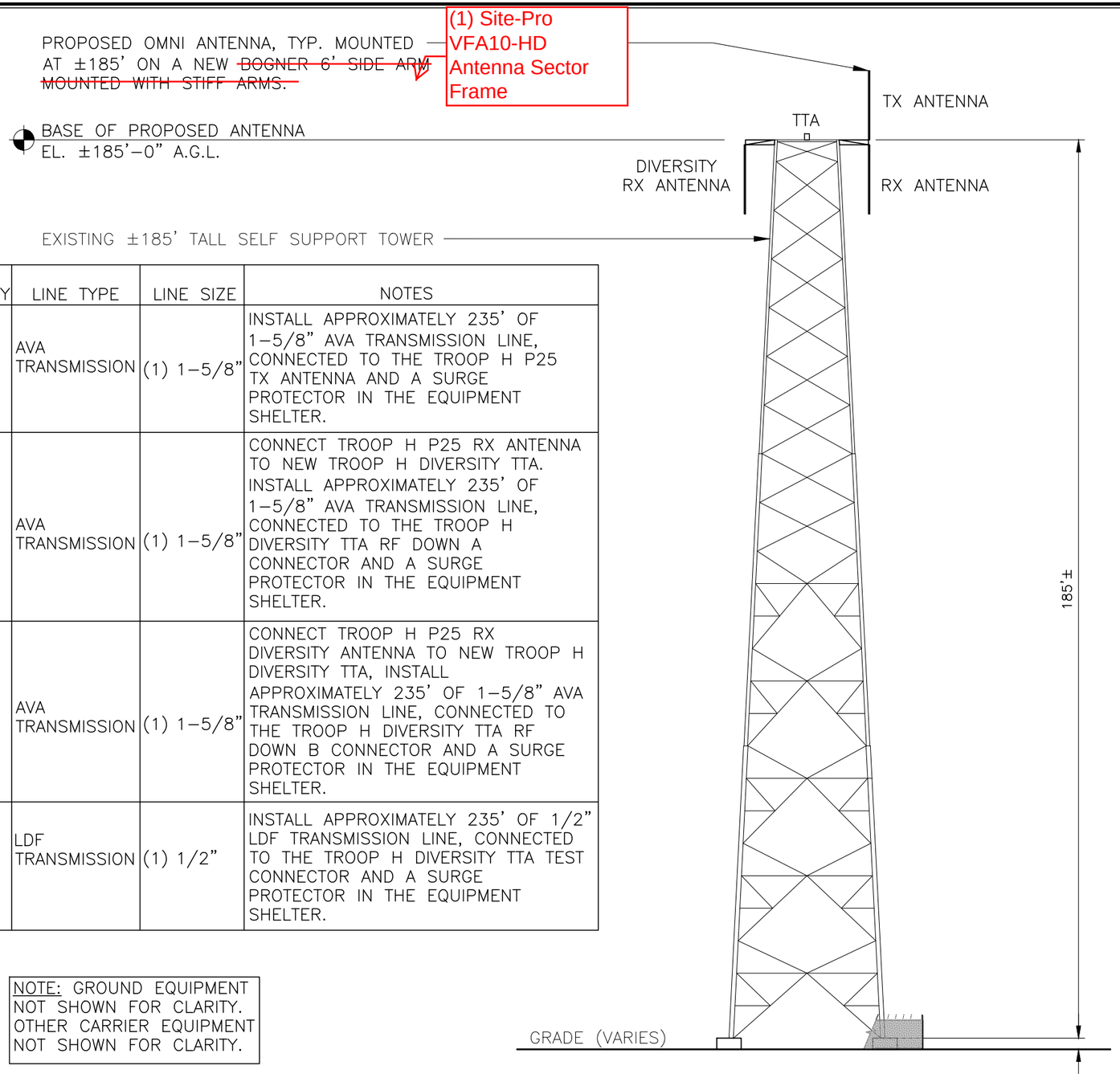
SHEET NO. L-1

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED EMERGENCY COMMUNICATION FACILITY.

ANTENNA	ANTENNA MODEL	BASE HEIGHT	ANTENNA SIZE	ANTENNA TYPE	QUANTITY	LINE TYPE	LINE SIZE	NOTES
TROOP H P25 TX	DBSPECTRA DS7C09P36U-D	185'	14.2'L x 3"ø	TX OMNI	1	AVA TRANSMISSION	(1) 1-5/8"	INSTALL APPROXIMATELY 235' OF 1-5/8" AVA TRANSMISSION LINE, CONNECTED TO THE TROOP H P25 TX ANTENNA AND A SURGE PROTECTOR IN THE EQUIPMENT SHELTER.
TROOP H P25 RX	DBSPECTRA DS7C09P36U-D (PROPOSED AS INVERTED)	185'	14.2'L x 3"ø	RX OMNI	1	AVA TRANSMISSION	(1) 1-5/8"	CONNECT TROOP H P25 RX ANTENNA TO NEW TROOP H DIVERSITY TTA. INSTALL APPROXIMATELY 235' OF 1-5/8" AVA TRANSMISSION LINE, CONNECTED TO THE TROOP H DIVERSITY TTA RF DOWN A CONNECTOR AND A SURGE PROTECTOR IN THE EQUIPMENT SHELTER.
TROOP H P25 DIVERSITY RX	DBSPECTRA DS7C09P36U-D (PROPOSED AS INVERTED)	185'	14.2'L x 3"ø	RX OMNI	1	AVA TRANSMISSION	(1) 1-5/8"	CONNECT TROOP H P25 RX DIVERSITY ANTENNA TO NEW TROOP H DIVERSITY TTA, INSTALL APPROXIMATELY 235' OF 1-5/8" AVA TRANSMISSION LINE, CONNECTED TO THE TROOP H DIVERSITY TTA RF DOWN B CONNECTOR AND A SURGE PROTECTOR IN THE EQUIPMENT SHELTER.
TROOP H DIVERSITY TTA	TX/RX 437-831-01-T	185'	15"LX12"WX7.5"D	TTA	1	LDF TRANSMISSION	(1) 1/2"	INSTALL APPROXIMATELY 235' OF 1/2" LDF TRANSMISSION LINE, CONNECTED TO THE TROOP H DIVERSITY TTA TEST CONNECTOR AND A SURGE PROTECTOR IN THE EQUIPMENT SHELTER.

NOTE: GROUND EQUIPMENT NOT SHOWN FOR CLARITY. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY.



1 / L-2 **TOWER ELEVATION**

SCALE: 1" = 25'-0"

GRAPHIC SCALE

25 0 12.5 25 50

(IN FEET)

1 inch = 25 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
B	01/15/20	KAWJR	CJC	LE - REVISED
A	01/02/20	LGL	TJR	LE - ISSUED FOR LEASING

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PYRAMID NETWORK SERVICES

BLOOMFIELD (EVERSOURCE)

5 ST. ANDREWS ROAD
BLOOMFIELD, CT 06002

DATE: 01/02/20
SCALE: AS SHOWN
JOB NO. 19160.01

SHEET NO.
L-2

EVERSOURCE ENERGY

107 Selden Street
Berlin, CT 06037

Date April 16, 2015

RE: Collocation of **Verizon** Wireless VZW Tariffville CT Relo on CL&P /Eversource Tower. Address: **Saint Andrews Road, Bloomfield CT 06002**

Dear Cellco Partnership d/b/a Verizon Wireless,

In accordance with the Nationwide Programmatic Agreement for the Collocation of Wireless Antennas executed by the Federal Communications Commission (FCC), the National Conference of State Historic Preservation Officers (NCSHPOs) and the Advisory Council on Historic Preservation (Council), Owner makes the following statements with regard to the above-referenced tower:

1. The above-referenced tower was built on or after March 16, 2001; and
2. The Section 106 review process and any associated environmental reviews required by the FCC has been completed; and
3. To the best of Owner's actual knowledge, the above-referenced tower has not been determined by the FCC to have an effect on one or more historic properties, or such effect has been found to be not adverse through a no adverse effect finding, or if found to be adverse or potentially adverse, has been resolved, such as through a conditional no adverse effect determination, a Memorandum of Agreement, a programmatic agreement, or otherwise in compliance with Section 106 and Subpart B of 36 CFR Part 800; and
4. To the best of Owner's actual knowledge, the Owner has not received written or electronic notification that the FCC is in receipt of a complaint from a member of the public, a State Historic Preservation Officer or the Council, that the proposed collocation has an adverse affect on one or more historic properties.

Sincerely,

Steven J. Florio
Eversource Energy
107 Selden Street. Berlin, CT. 06037

PROJECT PERSONNEL PROFILES

ASSESSMENT AND CONSULTING SERVICES

David M. Akerblom

Education: B.A. Environmental Studies, New England College

Years of Experience: 14+ years

Summary of Professional Experience

Mr. Akerblom is a Director of Project Management at IVI Telecom, a CBRE Company with over 10 + years of experience in the environmental assessment, Site Acquisition, and consulting industry. He has conducted environmental due diligence and Environmental Site Assessments (ESAs), Limited Site Inspections, as well as Asbestos and Lead-Based Paint Surveys, Visual Impact Assessments, and Wildlife Habitat Assessments. Additionally, Mr. Akerblom has been involved with over 1,000 National Environmental Policy Act (NEPA) Reports for clients in the telecommunications industry across the country.

His technical experience includes a wide range of chemistry, biology, and geographical analyses. He has conducted a variety of field work including surveying plant and animal species, sampling and testing water, and analyzing GIS data. Additionally, Mr. Akerblom has managed thousands of projects for various telecommunications clients across the country which include Phase I/II assessments, NEPA, NEPA audits, and FAA/FCC analysis.

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CBRE

ASSESSMENT AND CONSULTING SERVICES

E. Gio Del Rivero

Education: B.S., Earth and Environmental Science, University of Illinois

Years of Experience: 7+ years

Summary of Professional Experience

Mr. Del Rivero holds a Bachelor's of Science Degree in Earth and Environmental Science. He has more than 7 years of experience as an Environmental Professional in the telecommunications field, providing environmental and regulatory due diligence under the National Historic Preservation Act, the National Environmental Policy Act, and the Endangered Species Act. As a Project Scientist, he completed hundreds of Section 106 and NEPA reports throughout the United States, as well as Phase I Environmental Site Assessments. In his previous role as Project Manager, Mr. Del Rivero has provided quality control, conducted Natural Resources reviews nationwide, managed portfolios, and acted as a client liaison. In consultation with carriers and USFWS field offices, Mr. Del Rivero has developed mitigation strategies to avoid potential adverse effects to endangered species.

In addition to his experience working with natural resources and environmental due diligence, Mr. Del Rivero has also conducted numerous Phase II Environmental Site Assessments for telecommunications projects and geotechnical investigations for new roadway development projects.

Exhibit F

FCC Radio Frequency
Compliance Report

Pinnacle Telecom Group
Professional and Technical Services

Antenna Site FCC RF Compliance Assessment and Report

prepared for

Connecticut Department of Emergency Services and Public Protection

"Bloomfield (Eversource)" Site
5 St. Andrews Road
Bloomfield, CT

April 2, 2020

14 Ridgedale Avenue - Suite 260 • Cedar Knolls, NJ 07927 • 973-451-1630

Contents

Introduction and Summary

At the request of the Connecticut Department of Emergency Services and Public Protection (DESPP) and related to its "Communications Upgrade Project", Pinnacle Telecom Group has performed an independent expert assessment of radiofrequency (RF) levels and related FCC compliance for proposed modifications to existing antenna operations on an existing lattice tower located at 5 St. Andrews Road in Bloomfield, CT. The DESPP refers to the antenna site as "Bloomfield (Eversource)".

The FCC requires all wireless antenna operators to perform an assessment of potential human exposure to radiofrequency (RF) fields emanating from all the transmitting antennas at a site whenever antenna operations are added or modified, and to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC regulations. In this case, there are several other existing antenna operations to include in the compliance assessment. Note that FCC regulations require any future antenna collocators to assess and assure continuing compliance based on the RF effects of all proposed and then-existing antennas at the site.

This report describes a mathematical analysis of RF levels resulting around the site in areas of unrestricted public access, that is, at ground level around the site. The compliance analysis employs a standard FCC formula for calculating the effects of the antennas in a very conservative manner, in order to overstate the RF levels and to ensure "safe-side" conclusions regarding compliance with the FCC limit for safe continuous exposure of the general public.

The results of a compliance assessment can be explained in layman's terms by describing the calculated RF levels as simple percentages of the FCC MPE limit. If the reference for that limit is 100 percent, then calculated RF levels higher than 100 percent indicate the MPE limit is exceeded, while calculated RF levels consistently lower than 100 percent serve as a clear and sufficient demonstration of compliance with the MPE limit.

The results of the FCC RF compliance assessment in this case are as follows:

- At street level around the site, the conservatively calculated maximum RF level from the combination of proposed and existing antenna operations is 3.2446 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance. In other words, the worst-case RF level is more than 30 times below the limit established as safe for continuous human exposure to the RF emissions from antennas.
- The results of the calculations provide a clear demonstration that the RF levels from the combination of proposed and existing antenna operations will be in compliance with the applicable FCC regulations and MPE limit. Moreover, because of the conservative methodology and operational assumptions incorporated in the calculations, RF levels actually caused by the antennas will be even less significant than these calculations indicate.

The remainder of this report provides the following:

- relevant technical data on the proposed and existing antenna operations at the site;
- a description of the applicable FCC mathematical model for assessing MPE compliance, and application of the relevant data to those models; and
- an analysis of the results, and a compliance conclusion for the antenna operations at this site.

In addition, Appendix A provides background on the FCC MPE limit, along with a list of FCC references on compliance. Appendix **C** provides a summary of the qualifications of the expert certifying FCC compliance for this site.

Antenna and Transmission Data

Relevant compliance-related antenna and transmission data for the proposed DESPP antenna operations is provided in the table that follows.

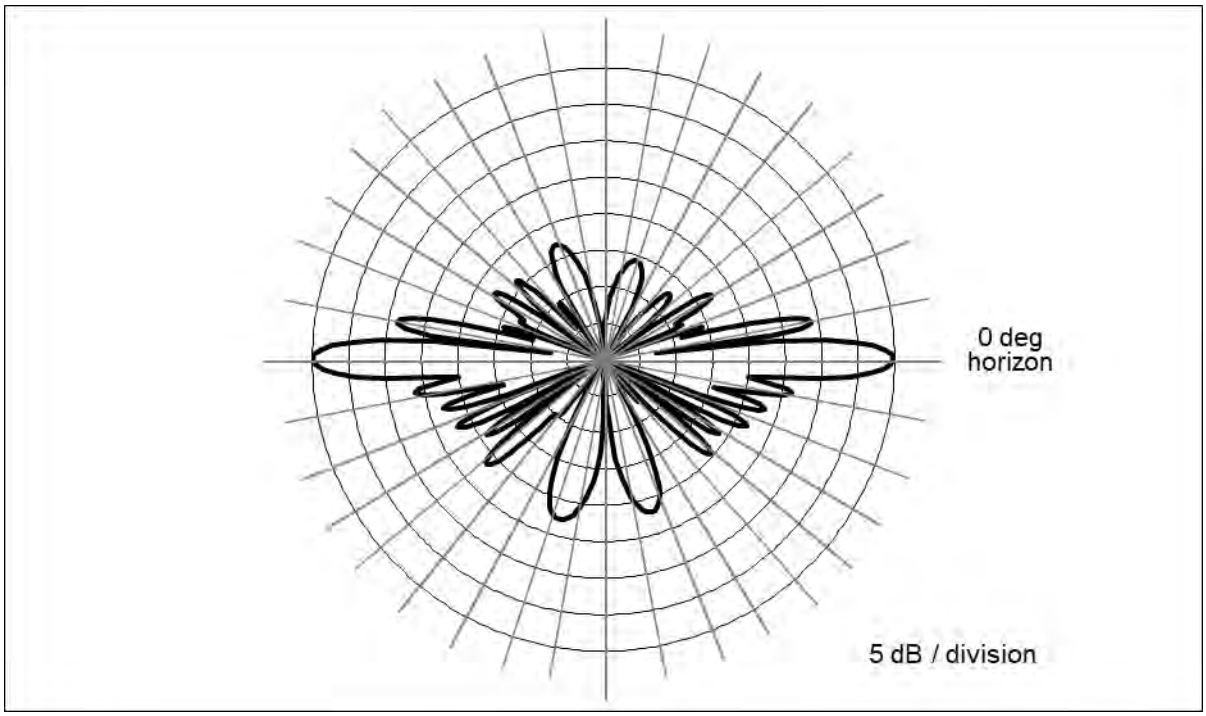
Antenna Data	
Service Coverage Type	Omnidirectional
Antenna Model	dbSpectra DS7C09P36U-D
Antenna Mounting Height	185 ft.
Max. Antenna Gain	8.8 dBd
Frequency Band	769 – 853 MHz
Max. Transmitter Power	100 watts
Max. No. of RF Channels	12
Antenna Line Loss	3.07 dB

The area below the antennas, at street level, is of interest in terms of potential "uncontrolled" exposure of the general public, so the antenna's vertical-plane emission characteristic is used in the compliance calculations, as it is a key determinant in the relative level of RF emissions in the "downward" direction.

By way of illustration, Figure 1 that follows shows the vertical-plane radiation pattern of the antenna model to be used by DESPP. In this type of antenna radiation pattern diagram, the antenna is effectively pointed at the three o'clock position (the horizon) and the pattern at different angles is described using decibel units. Note that the use of a decibel scale in the diagrams incidentally visually understates the relative directionality characteristic of the antenna in the vertical plane.

Where the antenna pattern reads 20 dB, the relative RF energy emitted at the corresponding downward angle is 1/100th of the maximum that occurs in the main beam (at 0 degrees); at 30 dB, the energy is 1/1000th of the maximum. Note that the automatic pattern-scaling feature of our internal software may skew side-by-side visual comparisons of different antenna models, or even different parties' depictions of the same antenna model.

Figure 1. dbSpectra DS7C09P36U-D –Vertical-plane Pattern



As noted at the outset, there are existing antenna operations to include in the compliance assessment. For each of the wireless carriers, we will conservatively assume operation with maximum channel capacity and at maximum transmitter power in each of their respective FCC-licensed frequency bands. For each of the other operators, we will rely on the transmission parameters in their respective FCC licenses.

The table that follows summarizes the compliance-related transmission data for the existing antenna operations.

Licensee	***Freq Band***	***Max Effective Radiated Power (ERP)***
Bloomfield Center Fire Department	11 GHz	2,323 watts
The Town of Bloomfield	452 MHz	110 watts
Eversource Energy Services	153 MHz 154 MHz 37 MHz 37 MHz 451 MHz	18 watts 990 watts 100 watts 150 watts 30 watts

Licensee	*Freq Band*	*Max Effective Radiated Power (ERP)*
Eversource Energy Services	451 MHz 461 MHz 48 MHz 6 GHz 935 MHz	247 watts 100 watts 250 watts 4,131 watts 240 watts
Town of Simsbury	453 MHz 957 MHz	30 watts 81 watts
Yankee Gas Services	173 MHz	380 watts
AT&T	700 MHz 800 MHz 1900 MHz 2100 MHz 2300 MHz	2,139 watts 2,400 watts 5.756 watts 5.890 watts 4,131 watts
T-Mobile	700 MHz 1900 MHz 2100 MHz	1,143 watts 6,399 watts 8,531 watts
Verizon Wireless	746 MHz 869 MHz 1900 MHz 2100 MHz	2,400 watts 2,755 watts 5,372 watts 5,625 watts

Compliance Analysis

FCC Office of Engineering and Technology Bulletin 65 ("OET Bulletin 65") provides guidelines for mathematical models to calculate the RF levels at various points around transmitting antennas.

At street-level around an antenna site (in what is called the "far field" of the antennas), the RF levels are directly proportional to the total antenna input power and the relative antenna gain in the downward direction of interest – and the levels are otherwise inversely proportional to the square of the straight-line distance to the antenna.

Conservative calculations also assume the potential RF exposure is enhanced by reflection of the RF energy from the intervening ground. Our calculations will assume a 100% "perfect", mirror-like reflection, the worst-case approach.

The formula for street-level compliance assessment for any given antenna operation is as follows:

$$MPE\% = (100 * Chans * TxPower * 10^{(Gmax-Vdisc/10)} * 4) / (MPE * 4\pi * R^2)$$

where

MPE%	=	RF level, expressed as a percentage of the MPE limit applicable to continuous exposure of the general public
100	=	factor to convert the raw result to a percentage
Chans	=	maximum number of RF channels per sector
TxPower	=	maximum transmitter power per channel, in milliwatts
$10^{(Gmax-Vdisc/10)}$	=	numeric equivalent of the relative antenna gain in the downward direction of interest; data on the antenna vertical-plane pattern is taken from manufacturer specifications
4	=	factor to account for a 100-percent-efficient energy reflection from the intervening ground, and the squared relationship between RF field strength and power density ($2^2 = 4$)
MPE	=	FCC general population MPE limit
R	=	straight-line distance from the RF source to the point of interest, centimeters

The MPE% calculations are performed out to a distance of 500 feet from the facility to points 6.5 feet (approximately two meters, the FCC-recommended standing height) off the ground, as illustrated in Figure 2 on the next page.

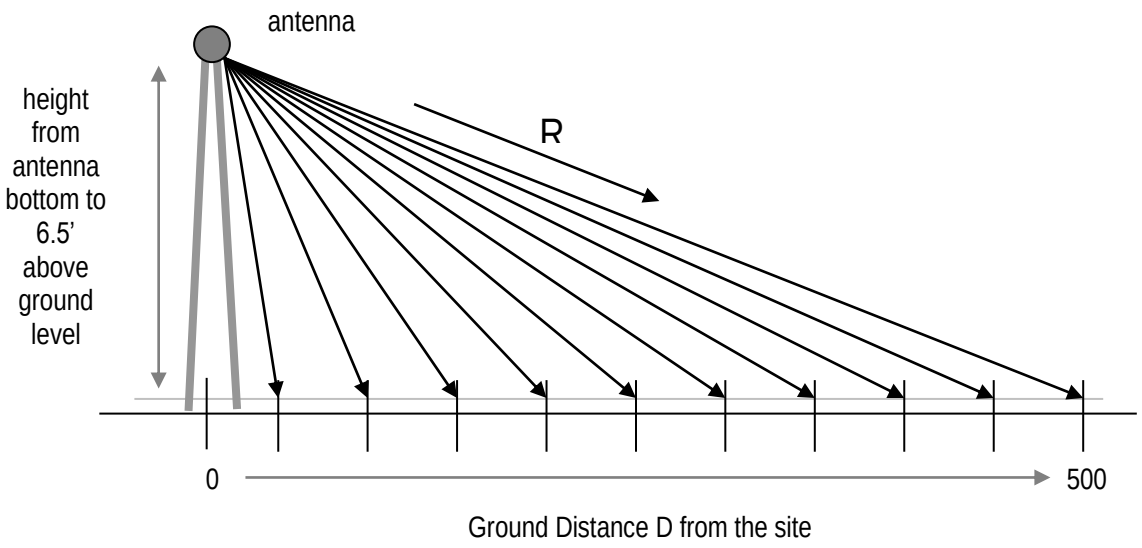


Figure 2. Street-level MPE% Calculation Geometry

It is popularly understood that the farther away one is from an antenna, the lower the RF level – which is generally but not universally correct. The results of MPE% calculations fairly close to the site will reflect the variations in the vertical-plane antenna pattern as well as the variation in straight-line distance to the antennas. Therefore, RF levels may actually increase slightly with increasing distance within the range of zero to 500 feet from the site. As the distance approaches 500 feet and beyond, though, the antenna pattern factor becomes less significant, the RF levels become primarily distance-controlled, and as a result the RF levels generally decrease with increasing distance, and are well understood to be in compliance.

Street-level FCC compliance for a collocated antenna site is assessed in the following manner. At each distance point along the ground, an MPE% calculation is made for each antenna operation, and the sum of the individual MPE% contributions at each point is compared to 100 percent, the normalized reference for compliance with the MPE limit. We refer to the sum of the individual MPE% contributions as "total MPE%", and any calculated total MPE% result exceeding 100 percent is, by definition, higher than the FCC limit and represents non-compliance and a need to mitigate the potential exposure.

If all results are consistently below 100 percent, on the other hand, that set of results serves as a clear and sufficient demonstration of compliance with the MPE limit.

Note that according to the FCC, when directional antennas and sectorized coverage arrangements are used, the compliance assessments are based on the RF effect of a single (facing) sector, as the RF effects of directional antennas facing generally away from the point of interest are insignificant.

The following conservative methodology and assumptions are incorporated into the MPE% calculations on a general basis:

1. The antennas are assumed to be operating continuously at maximum power and maximum channel capacity.
2. The power-attenuation effects of shadowing or other obstructions to the line-of-sight path from the antenna to the point of interest are ignored.
3. The calculations intentionally minimize the distance factor (R) by assuming a 6'6" human and performing the calculations from the bottom (rather than the centerline) of each operator's lowest-mounted antenna, as applicable.
4. The potential RF exposure at ground level is assumed to be 100-percent enhanced (increased) via a "perfect" field reflection from the intervening ground.

The net result of these assumptions is to significantly overstate the calculated RF exposure levels relative to the levels that will actually occur – and the purpose of this conservatism is to allow very "safe-side" conclusions about compliance.

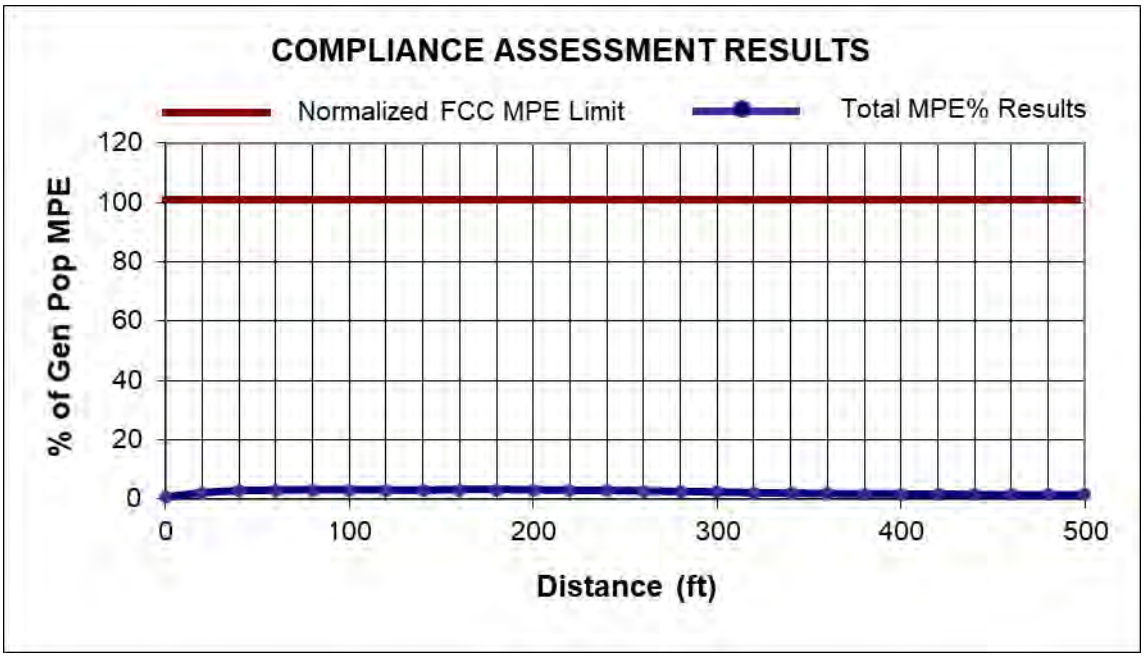
The table that follows provides the results of the MPE% calculations, with the maximum calculated "Total MPE%" result highlighted in bold in the last column.

Ground Distance (ft)	DESPP MPE%	Bloomfield Center FD MPE%	Town of Bloomfield MPE%	Eversource Energy Svcs MPE%	Town of Simsbury MPE%	Yankee Gas Svcs MPE%	Subtotal MPE%
0	0.0086	0.0010	0.0002	0.0085	0.0000	0.0048	0.0231
20	0.0340	0.0009	0.0051	0.4476	0.0004	0.3637	0.8517
40	0.1521	0.0008	0.0137	1.3435	0.0010	0.6220	2.1331
60	0.2013	0.0007	0.0225	2.1635	0.0018	0.2959	2.6857
80	0.0636	0.0006	0.0251	2.6354	0.0023	0.0287	2.7557
100	0.0021	0.0004	0.0235	2.7519	0.0018	0.0460	2.8257
120	0.0000	0.0004	0.0177	2.5761	0.0008	0.1828	2.7778
140	0.0050	0.0003	0.0083	2.3803	0.0001	0.3286	2.7226
160	0.0012	0.0010	0.0037	2.1103	0.0002	0.4444	2.5608
180	0.0342	0.0008	0.0007	1.9339	0.0007	0.5822	2.5525
200	0.0599	0.0007	0.0007	1.7749	0.0016	0.6282	2.4660
220	0.0286	0.0006	0.0019	1.6396	0.0025	0.6862	2.3594
240	0.0022	0.0010	0.0051	1.5337	0.0028	0.7404	2.2852
260	0.0262	0.0009	0.0075	1.4454	0.0029	0.7028	2.1857
280	0.0313	0.0008	0.0100	1.3456	0.0026	0.6729	2.0632
300	0.0066	0.0007	0.0137	1.2927	0.0022	0.6494	1.9653
320	0.0001	0.0024	0.0149	1.2430	0.0016	0.6168	1.8788
340	0.0198	0.0021	0.0188	1.1754	0.0012	0.5897	1.8070
360	0.0339	0.0019	0.0201	1.1117	0.0006	0.5802	1.7484
380	0.0395	0.0017	0.0212	1.1156	0.0004	0.5234	1.7018
400	0.0332	0.0015	0.0229	1.0731	0.0002	0.4968	1.6277
420	0.0193	0.0014	0.0242	1.0429	0.0002	0.4524	1.5404
440	0.0057	0.0013	0.0251	1.0098	0.0002	0.4431	1.4852
460	0.0000	0.0012	0.0266	0.9399	0.0003	0.4066	1.3746
480	0.0048	0.0017	0.0278	0.9201	0.0005	0.3920	1.3469
500	0.0164	0.0016	0.0290	0.9100	0.0005	0.3621	1.3196

Ground Distance (ft)	Subtotal MPE%	AT&T MPE%	T-Mobile MPE%	Verizon Wireless MPE%	Total MPE%
0	0.0231	0.0430	0.0036	0.0137	0.0834
20	0.8517	0.0387	0.0077	0.0168	0.9149
40	2.1331	0.0734	0.0108	0.0340	2.2513
60	2.6857	0.0921	0.0078	0.0825	2.8681
80	2.7557	0.1053	0.0343	0.1118	3.0071
100	2.8257	0.1451	0.0465	0.1107	3.1280
120	2.7778	0.1964	0.0373	0.0752	3.0867
140	2.7226	0.2176	0.0348	0.1260	3.1010
160	2.5608	0.3619	0.0231	0.2263	3.1721
180	2.5525	0.4416	0.0585	0.1920	**3.2446**
200	2.4660	0.4142	0.1009	0.1803	3.1614
220	2.3594	0.3549	0.0316	0.2583	3.0042
240	2.2852	0.3382	0.0399	0.2830	2.9463
260	2.1857	0.3494	0.0609	0.2574	2.8534
280	2.0632	0.3534	0.0199	0.1989	2.6354
300	1.9653	0.3172	0.0610	0.1533	2.4968
320	1.8788	0.2346	0.0690	0.0845	2.2669
340	1.8070	0.1766	0.0526	0.0498	2.0860
360	1.7484	0.1341	0.0383	0.0244	1.9452
380	1.7018	0.1141	0.0625	0.0125	1.8909
400	1.6277	0.1128	0.1092	0.0167	1.8664
420	1.5404	0.1035	0.1220	0.0350	1.8009
440	1.4852	0.1000	0.0798	0.0678	1.7328
460	1.3746	0.0925	0.0736	0.0626	1.6033
480	1.3469	0.0903	0.0325	0.1035	1.5732
500	1.3196	0.0838	0.0379	0.1569	1.5982

As indicated, even with the significant degree of conservatism built into the calculations, the maximum calculated RF level is 3.2446 percent of the FCC general population MPE limit – well below the 100-percent reference for compliance.

A graph of the overall calculation results, provided on the next page, provides perhaps a clearer *visual* illustration of the relative compliance of the calculated RF levels. The line representing the overall calculation shows an obviously clear, consistent margin to the FCC MPE limit.



Compliance Conclusion

According to the FCC, the MPE limit has been constructed in such a manner that continuous human exposure to RF fields up to and including 100 percent of the MPE limit is acceptable and safe.

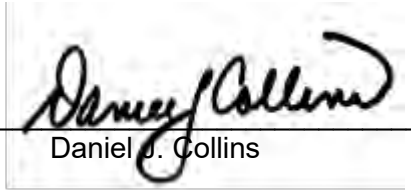
The conservative analysis in this case shows that the maximum calculated RF level from the combination of proposed and existing antenna operations at the site is 3.2446 percent of the FCC general population MPE limit. In other words, the worst-case calculated RF level is more than 30 times below the FCC MPE limit.

The results of the calculations provide a clear demonstration of FCC compliance. Moreover, because of the conservative calculation methodology and operational assumptions applied in the analysis, the RF levels actually caused by the antennas at the site will be even less significant than the calculations indicate.

Certification

It is the policy of Pinnacle Telecom Group that all FCC RF compliance assessments are reviewed, approved, and signed by the firm's Chief Technical Officer who certifies as follows:

1. I have read and fully understand the FCC regulations concerning RF safety and the control of human exposure to RF fields (47 CFR 1.1301 *et seq*).
2. To the best of my knowledge, the statements and information disclosed in this report are true, complete and accurate.
3. The analysis of site RF compliance provided herein is consistent with the applicable FCC regulations, additional guidelines issued by the FCC, and industry practice.
4. The results of the analysis indicate that the subject antenna operations will be in compliance with the FCC regulations concerning the control of potential human exposure to the RF emissions from antennas.



Daniel J. Collins — 4/2/20

Daniel J. Collins — Date

Appendix A. Background on the FCC MPE Limit

FCC Rules and Regulations

As directed by the Telecommunications Act of 1996, the FCC has established limits for maximum continuous human exposure to RF fields.

The FCC maximum permissible exposure (MPE) limits represent the consensus of federal agencies and independent experts responsible for RF safety matters. Those agencies include the National Council on Radiation Protection and Measurements (NCRP), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), the American National Standards Institute (ANSI), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). In formulating its guidelines, the FCC also considered input from the public and technical community – notably the Institute of Electrical and Electronics Engineers (IEEE).

The FCC's RF exposure guidelines are incorporated in Section 1.301 *et seq* of its Rules and Regulations (47 CFR 1.1301-1.1310). Those guidelines specify MPE limits for both occupational and general population exposure.

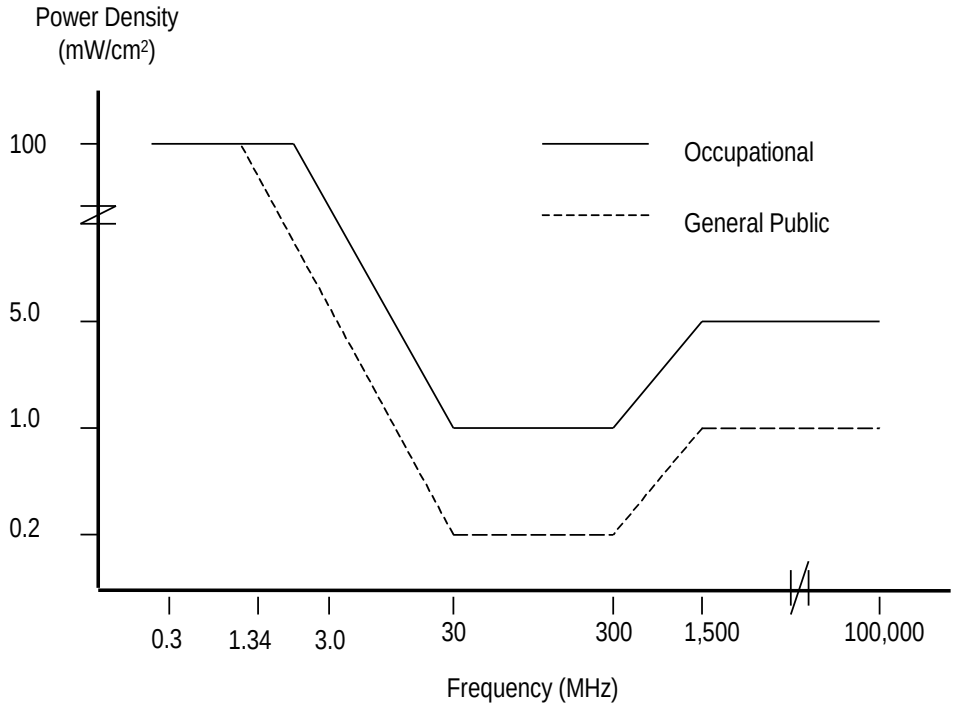
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in the form of heat). The occupational MPE guidelines incorporate a safety factor of 10 or greater with respect to RF levels known to represent a health hazard, and an additional safety factor of five is applied to the MPE limits for general population exposure. Thus, the general population MPE limit has a built-in safety factor of more than 50. The limits were constructed to appropriately protect humans of both sexes and all ages and sizes and under all conditions – and continuous exposure at levels equal to or below the applicable MPE limits is considered to result in no adverse health effects or even health risk.

The reason for *two* tiers of MPE limits is based on an understanding and assumption that members of the general public are unlikely to have had appropriate RF safety training and may not be aware of the exposures they receive; occupational exposure in controlled environments, on the other hand, is assumed to involve individuals who have had such training, are aware of the exposures, and know how to maintain a safe personal work environment.

The FCC's RF exposure limits are expressed in two equivalent forms, using alternative units of field strength (expressed in volts per meter, or V/m), and power density (expressed in milliwatts per square centimeter, or mW/cm^2). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm^2 reference, for the different radio frequency ranges.

Frequency Range (F) (MHz)	Occupational Exposure (mW/cm^2)	General Public Exposure (mW/cm^2)
0.3 - 1.34	100	100
1.34 - 3.0	100	$180 / F^2$
3.0 - 30	$900 / F^2$	$180 / F^2$
30 - 300	1.0	0.2
300 - 1,500	F / 300	F / 1500
1,500 - 100,000	5.0	1.0

The diagram below provides a graphical illustration of both the FCC's occupational and general population MPE limits.



Because the FCC's MPE limits are frequency-shaped, the exact MPE limits applicable to the instant situation depend on the frequency range used by the systems of interest.

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

For potential exposure from multiple systems, the respective percentages of the MPE limits are added, and the total percentage compared to 100 (percent of the limit). If the result is less than 100, the total exposure is in compliance; if it is more than 100, exposure mitigation measures are necessary to achieve compliance.

Note that the FCC "categorically excludes" certain types of antenna facilities from the routine requirement to specifically (i.e., mathematically) demonstrate compliance with the MPE limit. Among those types of facilities are cellular antennas mounted on any type of tower, when the bottoms of the antennas are more than 10 meters (c. 32.8 feet) above ground. The basis for the categorical exclusion, according to the FCC, is the understanding that because of the low power and the directionality of the antennas, such facilities – individually and collectively – are well understood to have no significant effect on the human environment. As a result, the FCC automatically deems such facilities to be in compliance.

FCC References on Compliance

47 CFR, FCC Rules and Regulations, Part 1 (Practice and Procedure), Section 1.1310 (Radiofrequency radiation exposure limits).

FCC Second Memorandum Opinion and Order and Notice of Proposed Rulemaking (FCC 97-303), *In the Matter of Procedures for Reviewing Requests for Relief From State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934 (WT Docket 97-192), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (ET Docket 93-62), and Petition for Rulemaking of the Cellular Telecommunications Industry Association Concerning Amendment of the Commission's Rules to Preempt State and Local Regulation of Commercial Mobile Radio Service Transmitting Facilities*, released August 25, 1997.

FCC First Memorandum Opinion and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released December 24, 1996.

FCC Report and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released August 1, 1996.

FCC Office of Engineering and Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 97-01, August 1997.

Appendix B. Summary of Expert Qualifications

Daniel J. Collins, Chief Technical Officer, Pinnacle Telecom Group, LLC

Synopsis:	• 40+ years of experience in all aspects of wireless system engineering, related regulation, and RF exposure • Has performed or led RF exposure compliance assessments on more than 20,000 antenna sites since the latest FCC regulations went into effect in 1997 • Has provided testimony as an RF compliance expert more than 1,500 times since 1997 • Have been accepted as an FCC compliance expert in Connecticut, New Jersey, New York, Pennsylvania and more than 40 other states, as well as by the FCC
Education:	• B.E.E., City College of New York (Sch. Of Eng.), 1971 • M.B.A., 1982, Fairleigh Dickinson University, 1982 • Bronx High School of Science, 1966
Current Responsibilities:	• Leads all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation
Prior Experience:	• Edwards & Kelcey, VP – RF Engineering and Chief Information Technology Officer, 1996-99 • Bellcore (a Bell Labs offshoot after AT&T's 1984 divestiture), Executive Director – Regulation and Public Policy, 1983-96 • AT&T (Corp. HQ), Division Manager – RF Engineering, and Director – Radio Spectrum Management, 1977-83 • AT&T Long Lines, Group Supervisor – Microwave Radio System Design, 1972-77
Specific RF Safety / Compliance Experience:	• Involved in RF exposure matters since 1972 • Have had lead corporate responsibility for RF safety and compliance at AT&T, Bellcore, Edwards & Kelcey, and PTG • While at AT&T, helped develop the mathematical models for calculating RF exposure levels • Have been relied on for compliance by all major wireless carriers, as well as by the federal government, several state and local governments, equipment manufacturers, system integrators, and other consulting / engineering firms
Other Background:	• Author, *Microwave System Engineering* (AT&T, 1974) • Co-author and executive editor, *A Guide to New Technologies and Services* (Bellcore, 1993) • National Spectrum Management Association (NSMA) – former three-term President and Chairman of the Board of Directors; was founding member, twice-elected Vice President, long-time member of the Board, and was named an NSMA Fellow in 1991 • Have published more than 35 articles in industry magazines