



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

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

December 11, 2020

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

RE: **Notice of Exempt Modification**  
**Eversource Site # 98100494**  
**316 Indian Mountain Road, Salisbury, CT 06039**  
**Latitude: 41-55-18.68 N / Longitude: 73-27-52.88 W**

Dear Ms. Bachman:

The Connecticut Light and Power Company doing business as Eversource Energy (“Eversource”) currently maintains multiple antennas mounted at 43 feet above ground level (AGL) on an existing 40-foot wood pole located at the Salisbury Substation, 316 Indian Mountain Road in Salisbury. See Attachment A, Parcel Map and Property Card.<sup>1</sup> The tower and property are owned by Eversource. Eversource plans to install one 18-foot 7-inch tall omni-directional antenna, to be mounted at approximately 38 feet AGL, two 7/8-inch diameter coaxial cables and an ice bridge. There will be no changes to the fenced compound, the tower or the antennas and equipment currently mounted on the tower. The tower and existing and proposed equipment on the tower are depicted on Attachment B, Construction Drawings, dated October 15, 2020 and Attachment C, Structural Analysis, dated October 15, 2020. The tower is a component of the Salisbury Substation most recently addressed by the Council in Petition No. 1371, approved by the Council on June 6, 2019.

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

Please accept this letter as notification, pursuant to Regulations of Connecticut State Agencies (“R.C.S.A.”) §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this notice is being delivered to Curtis Rand, First Selectman for the Town of Salisbury and Abby Conroy, Land Use Administrator for the Town

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<sup>1</sup> The Salisbury town offices were closed due to Covid-19 at the time this document was compiled and the Town does not offer on-line access to property records. Attachment A is the parcel information on file with Eversource.

of Salisbury via private carrier. Proof of delivery is attached. See Attachment D, Proof of Delivery of Notice.

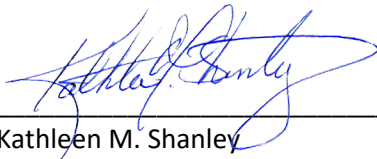
The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2):

1. There will be no change to the height of the existing tower.
2. The proposed modifications will not require extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the new antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard as shown in the attached Radio Frequency Emissions Report, dated October 27, 2020 (Attachment E – Power Density Report).
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

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

By:

  
Kathleen M. Shanley  
Manager – Transmission Siting

cc: Honorable Curtis Rand, First Selectman, Town of Salisbury  
Abby Conroy, Land Use Administrator, Town of Salisbury

#### Attachments

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

ATTACHMENT A – PARCEL MAP AND PROPERTY CARD

[122-002.pdf](#)

Map Block Lot	02 / 01 / 1
Town Parcel ID	480
State GIS ID	N/A
Tax Card ID	122-002
Parcel Source	Town Data
Site Address	316 INDIAN MOUNTAIN RD
Address Number	316
Address Location	INDIAN MOUNTAIN RD
City	SALISBURY
State	CT
Postal Zip 5	06068
County	LITCHFIELD COUNTY
Primary Owner	CL&P
Secondary Owner	N/A
Postal Address	107 SELDEN ST
Postal City	BERLIN
Postal State	CT
Postal Zip 5	06037
Book	127
Page	608
Grantor	CONN LIGHT + POWER CO
Legal Reference Date	07/01/1982
Deed Type	N/A
Prior Book and Page	N/A
Prior Grantor	N/A
Prior Legal Reference Date	N/A
Assessed Land Value	246500
Total Assessed Value	246500
Assessed Acres	7.78
GIS Acres	8.594505
Number of Buildings Present	0
Land Use Code	2-1
Land Use Description	COMM LAND MDL-00
Zoning Code	RR1
Zoning Description	RURAL RESIDENTIAL 1 ZONE
ROW Number	N/A
Line Number	18
Company ID	N/A
Project Number	000-51.018; 121-03.654
Substation Present	YES
Substation ID	121-3.654
Substation Name	SALISBURY 21J
Tax Card Year	2014
Number of Tax Cards	1
Tax Card Hyperlink	<a href="#">\\nhbdata\checkin\42114.05\GIS\Data\GeoDatabase\EversourceParcelMapping\TaxCards\SALISBURY\122-002.pdf</a>
Tax Card URL	N/A
Parcel ID 1	121-3.654
Parcel ID 2	1
Parcel ID 3	N/A



Legend

- Approximate Antenna Location
- Substation Compound

Salisbury 21J

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ATTACHMENT B – CONSTRUCTION DRAWINGS





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

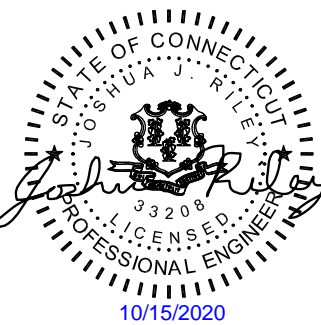


**BLACK & VEATCH**

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

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

0	10/13/20	ISSUED FOR FILING
REV	DATE	DESCRIPTION

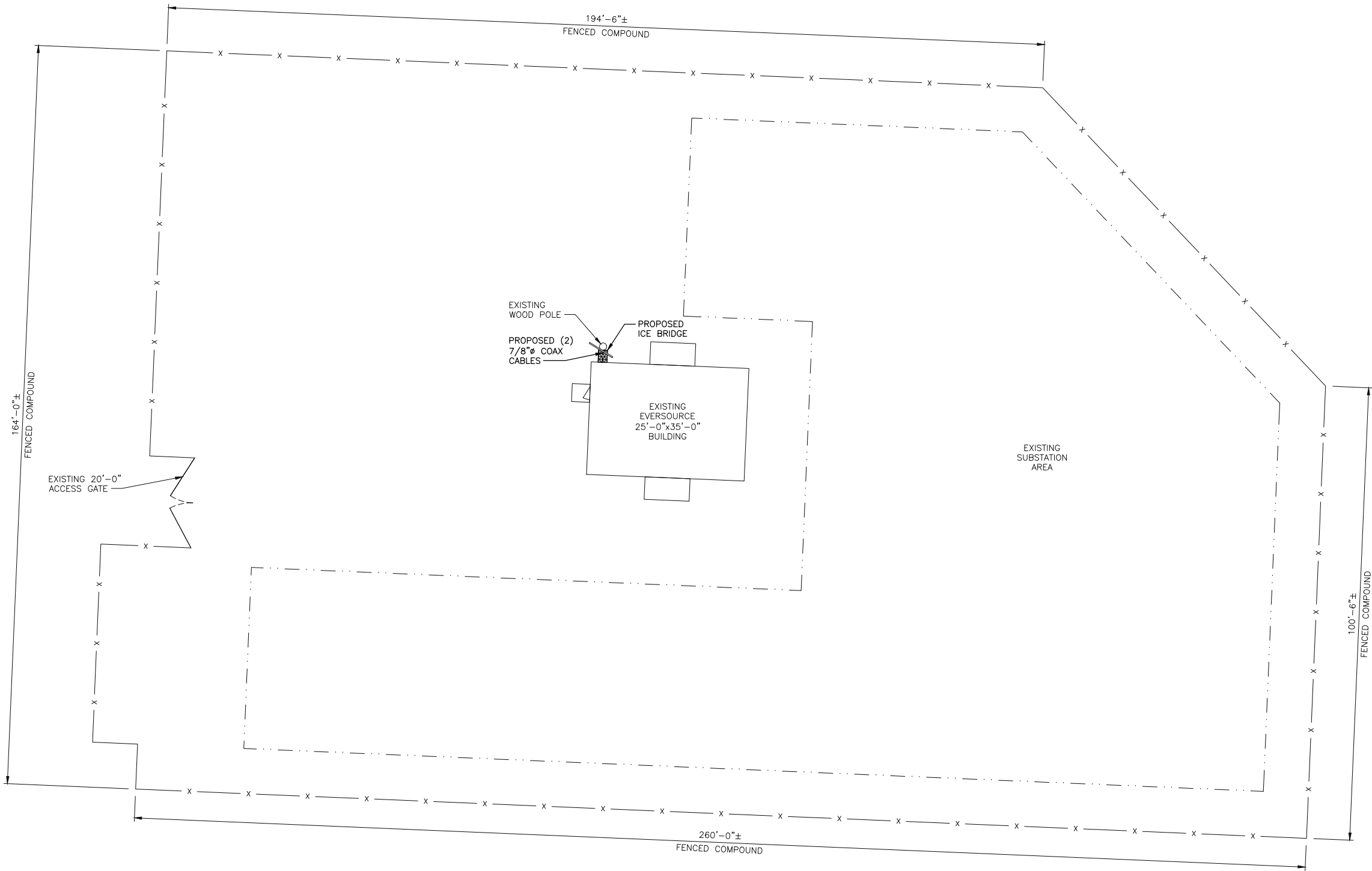


IT IS A VIOLATION OF LAW FOR ANY PERSON,  
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OF A LICENSED PROFESSIONAL ENGINEER,  
TO ALTER THIS DOCUMENT.

SALISBURY 21J  
316 INDIAN MOUNTAIN RD  
SALISBURY, CT 06039

SHEET TITLE  
SITE PLAN

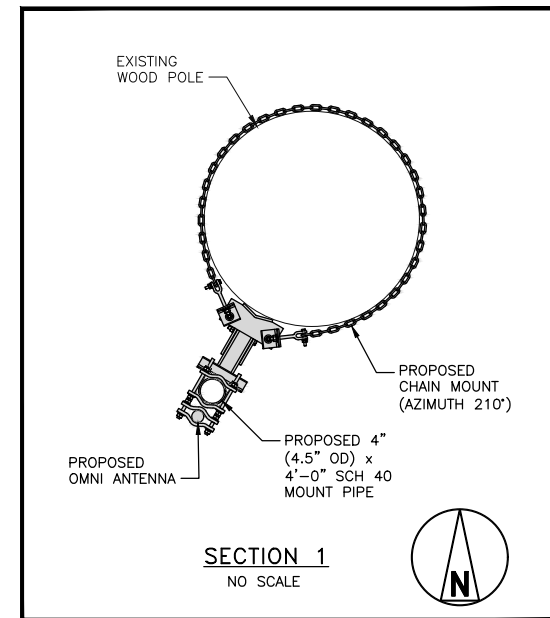
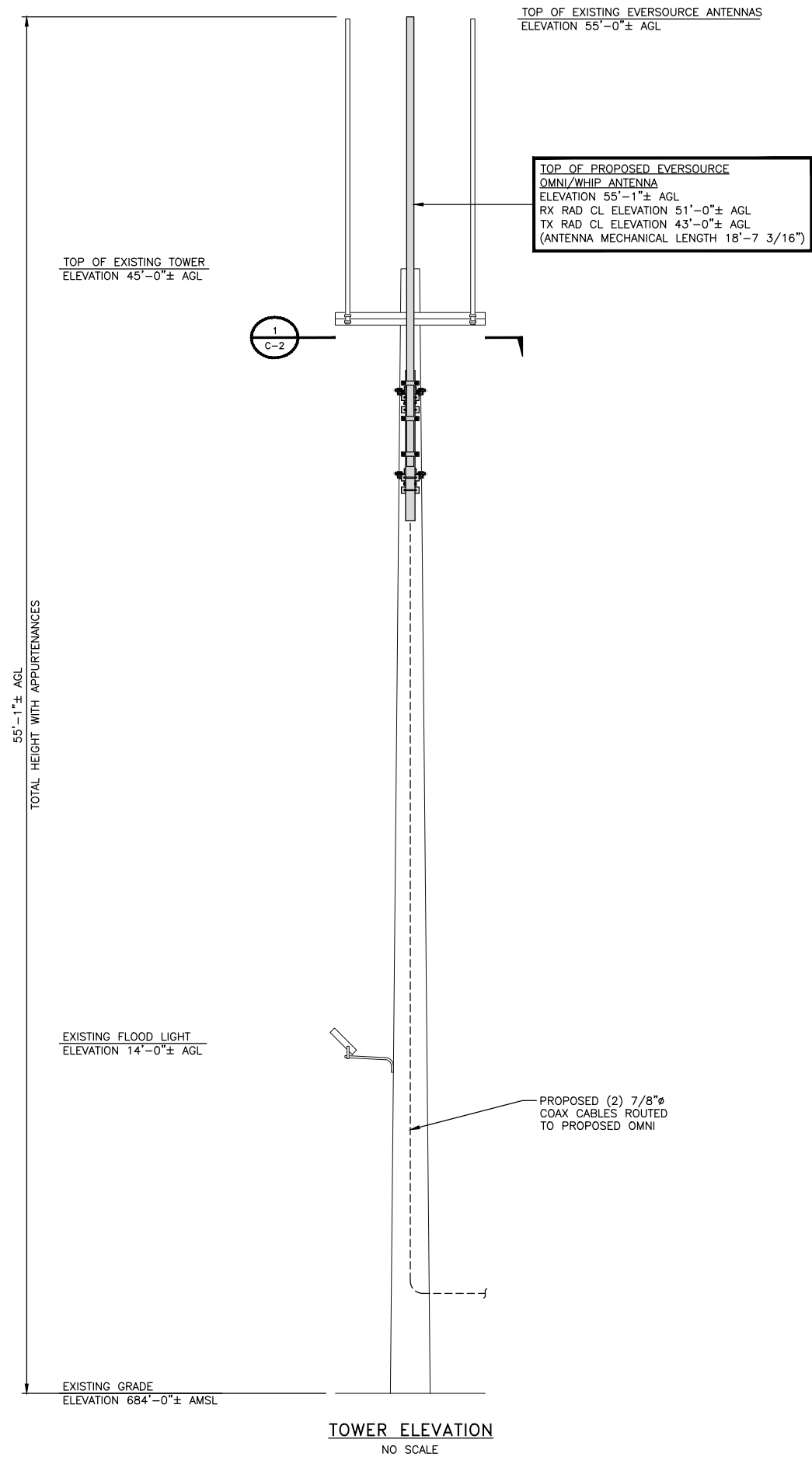
SHEET NUMBER  
**C-1**



**SITE PLAN**  
NO SCALE







**EVERSOURCE**  
ENERGY

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

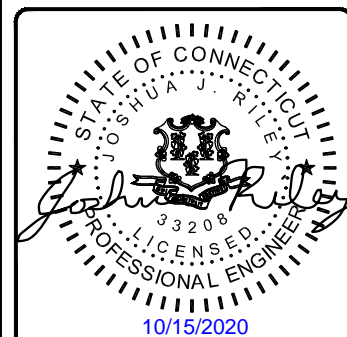


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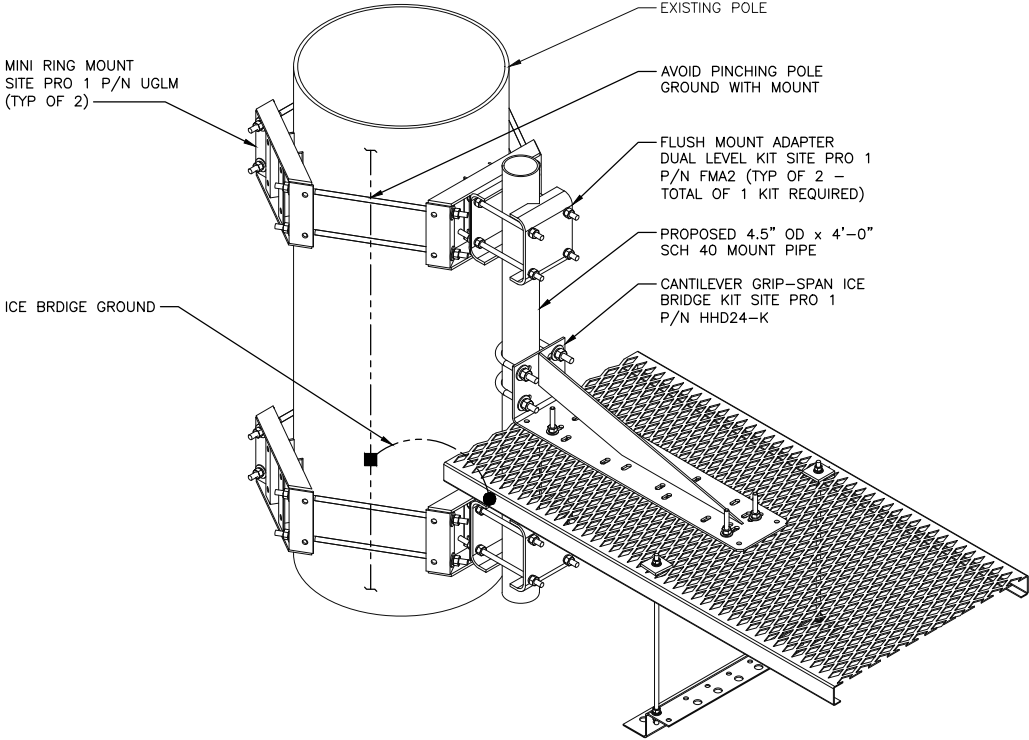
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316 INDIAN MOUNTAIN RD  
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SHEET TITLE  
TOWER ELEVATION &  
ANTENNA EQUIPMENT

SHEET NUMBER

**C-2**



ICE BRIDGE DETAIL  
SITE PRO 1 P/N IB24D-Z  
NO SCALE

**EVERSOURCE**  
ENERGY

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

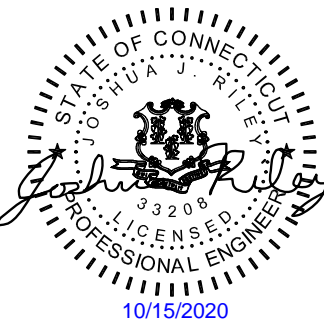


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SALISBURY, CT 06039

SHEET TITLE

ICE BRIDE  
DETAILS

SHEET NUMBER

C-3



● EXOTHERMIC.  
--- GROUND WIRE.

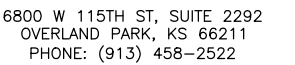
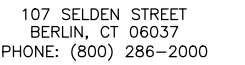


(A) POLE GROUNDING: VERIFY POLE GROUND CONNECTS TO EXISTING SUBSTATION GROUND GRID AND IF REQUIRED EXTEND #2 TINNED CU WIRE TO SUBSTATION GROUND AND EXOTHERMICALLY WELD.

(B) EXTERIOR GROUND BAR: EXTEND #2 TINNED CU WIRE FROM BURIED GROUND GRID UP TO THE EXTERIOR GROUND BAR AND MAKE AN EXOTHERMIC CONNECTION.

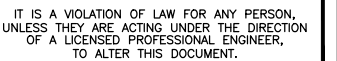
(C) ICE BRIDGE GROUNDING: EXTEND #2 TINNED CU WIRE FROM BURIED GROUND GRID TO ICE BRIDGE AND EXOTHERMICALLY WELD.

1. ALL GROUNDING GRID CONDUCTORS AND CONNECTIONS BELOW GRADE SHALL BE THERMAL WELDS AT GROUND RODS AND AT A MINIMUM OF 36" BELOW GRADE, OR 6" BELOW FROST LINE, WHICH EVER IS GREATER OF THE TWO DIMENSIONS.
2. ALL INSTALLATIONS SHALL BE FIELD VERIFIED.
3. ALL GROUND WIRE SHALL BE #2 AWG BARE COPPER TINNED UNLESS NOTED OTHERWISE.
4. ALL GROUND WIRES SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
5. ALL EXOTHERMIC CONNECTIONS SHALL BE INSTALLED UTILIZING THE PROPER CONNECTION/MOLD AND MATERIALS FOR THE PARTICULAR APPLICATION.
6. PLASTIC CLIPS SHALL BE USED TO FASTEN AND SUPPORT GROUNDING CONDUCTORS. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL NOT BE USED.
7. STANDARD BUS BARS MGB, GWB, IGB, TELCO GB, FIBER GB, AND POWER GB SHALL BE FURNISHED AND INSTALLED BY THE SUBCONTRACTOR. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD. ALL GROUNDING BUSES SHALL BE IDENTIFIED WITH MINIMUM 3/4" LETTERS BY WAY OF STENCILING OR DESIGNATION PLATE.
8. CONTRACTOR SHALL REPAIR/PLACE EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
9. ALL NEW GROUNDS SHALL CONNECT TO EXISTING GRID.

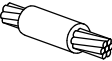




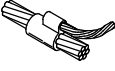

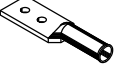




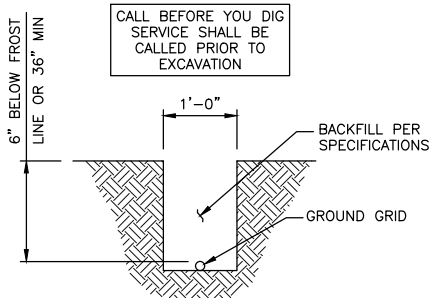
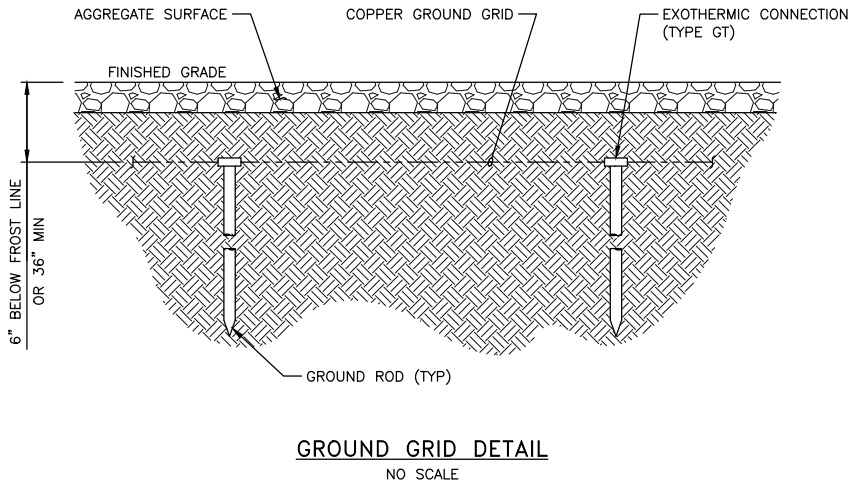
PROJECT NO:	405025
DRAWN BY:	TYW
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**G-1**

CADWELD CONNECTIONS OR APPROVED EQUAL			BURNDY CONNECTIONS OR APPROVED EQUAL
 HORIZONTAL SPLICE SPLICE OF HORIZONTAL CABLES TYPE SS	 PARALLEL HORIZONTAL CONDUCTORS PARALLEL THROUGH CONNECTION OF HORIZONTAL CABLES TYPE PT	 VERTICAL PIPE CABLE DOWN AT 45° TO RANGE OF VERTICAL PIPES TYPE VS	 BOND JUMPER FIELD FABRICATED GREEN STRANDED INSULATED TYPE 2-YA-2
 HORIZONTAL STEEL SURFACE TO FLAT STEEL SURFACE OR HORIZONTAL PIPE TYPE HS	 PARALLEL HORIZONTAL CONDUCTORS PARALLEL DEAD END TAP OR HORIZONTAL THRU CONDUCTOR TYPE PC	 VERTICAL STEEL SURFACE CABLE DOWN AT 45° TO VERTICAL STEEL SURFACE INCLUDING PIPE TYPE VS	 COPPER LUGS TWO HOLE - LONG BARREL LENGTH TYPE YA-2
 HORIZONTAL TEE TEE OF HORIZONTAL RUN AND TAP CABLES TYPE TA	 THROUGH CABLE TO GROUND ROD THROUGH CABLE TO TOP OF GROUND ROD TYPE GT		



- NOTES**
- ALL EXOTHERMIC WELD CONNECTIONS SHALL BE BELOW FROST LINE.

**GROUND GRID TRENCH**  
NO SCALE

- NOTES**
- REFER TO SHEET G-1 FOR WIRE SIZES.

**EVERSOURCE**  
ENERGY

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BERLIN, CT 06037  
PHONE: (800) 286-2000

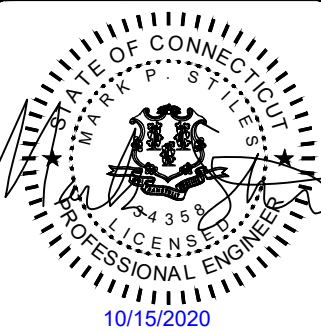


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PROJECT NO:	405025
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SALISBURY 21J  
316 INDIAN MOUNTAIN RD  
SALISBURY, CT 06039

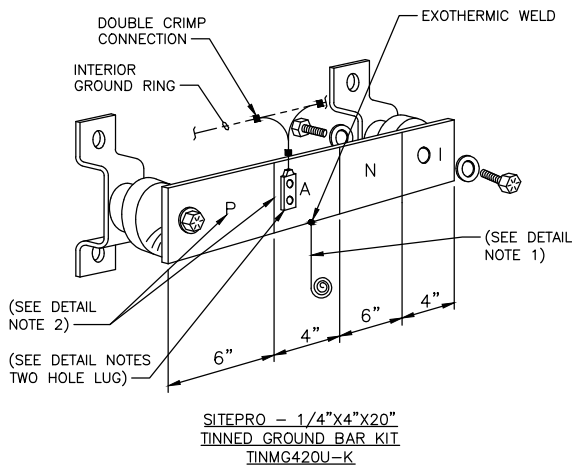
SHEET TITLE

GROUNDING  
DETAILS

SHEET NUMBER

**G-2**





**EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION**

**SECTION "P" – SURGE PROTECTORS**

CELL REFERENCE GROUND BAR (IF CO-LOCATED)  
GENERATOR FRAMEWORK (IF AVAILABLE) (#2)  
TELCO GROUND BAR (#2)  
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#3/0)  
FIBER GROUND BAR (#2)

**SECTION "A" – SURGE ABSORBERS**

INTERIOR GROUND RING (#2)  
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)

**SECTION "N" – NON-ISOLATED GROUND ZONE EQUIPMENT**

MISC NON-ISOLATED GROUND ZONE  
BATTERY RACK

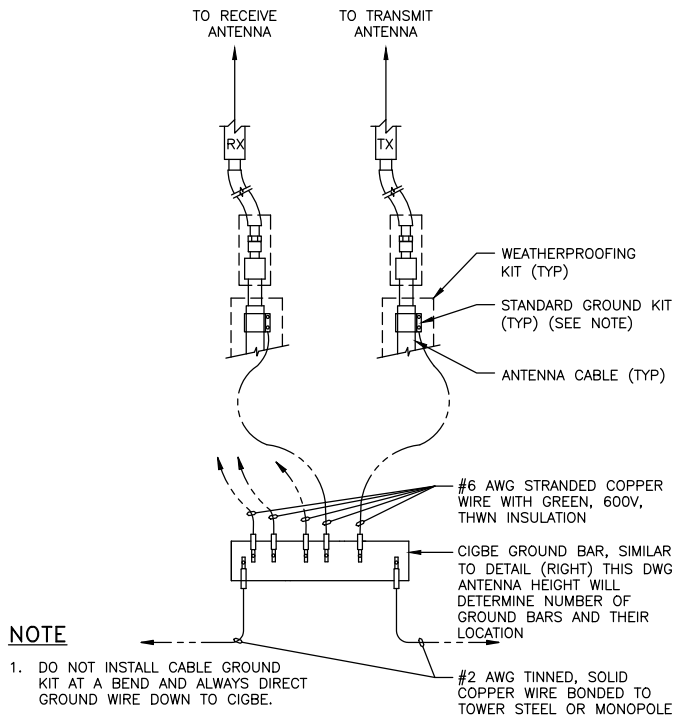
**SECTION "I" – ISOLATED GROUND ZONE**

ALL ISOLATED GROUND REFERENCE  
GROUND WINDOW BAR

**DETAIL NOTES**

- EXOTHERMIC ALLY WELD #2 AWG BARE TINNED SOLID COPPER CONDUCTOR TO GROUND BAR. ROUTE CONDUCTOR TO BURIED GROUND RING AND PROVIDE EXOTHERMIC WELD.
- EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH 1" HIGH LETTERS.

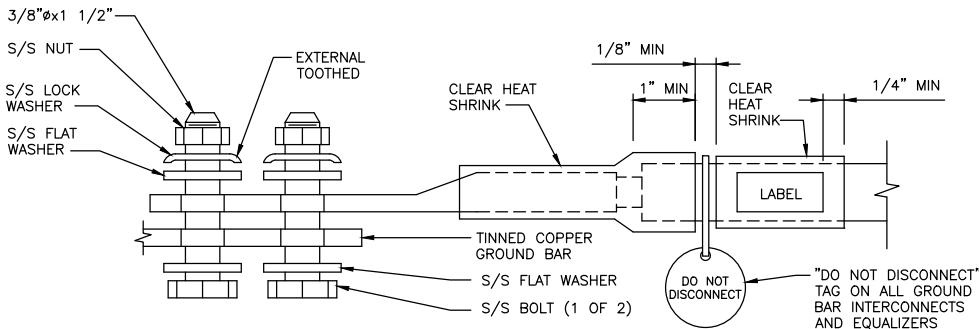
**(MGB) REFERENCE GROUND BAR**  
NO SCALE



**CONNECTION OF GROUND WIRE TO EXTERIOR GROUNDING BAR**  
NO SCALE

**NOTES**

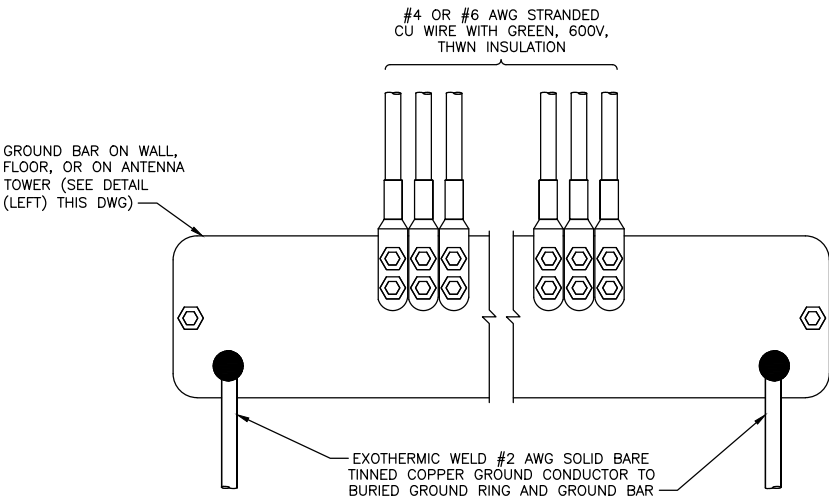
- ALL LUGS SHALL BE 2-HOLE, LONG BARREL, TINNED SOLID COPPER UNLESS OTHERWISE SPECIFIED, USING THE PROPER U.L. TOOL AND CIRCUMFERENTIAL HEXAGON DIE. LUGS SHALL BE THOMAS AND BETTS SERIES 548##BE, BURNDY, ERICO OR EQUIVALENT. BOLT HOLE DIAMETER AND SPACING ON ALL GROUND LUGS SHALL MATCH HOLE DIAMETER AND SPACING OF THE GROUND BAR. ANGLE LUGS MAY BE USED IF CONSTRUCTION CONDITIONS DICTATE. REFER TO DETAIL "G".
- AN ANTI-OXIDATION COMPOUND SHALL BE APPLIED BETWEEN THE LUG AND GROUND BAR ONLY. DO NOT COVER THE LUG. THE ANTI-OXIDATION COMPOUND SHALL BE THOMAS AND BETTS "KOPR-SHIELD" OR BURNDY PENETROX-E.
- GROUND BARS SHALL BE ATTACHED TO THE ANTENNA SUPPORT STRUCTURES WITH U.L. APPROVED MOUNTING DEVICES. GROUND CLAMPS MAY BE USED TO MOUNT THE GROUND BAR TO AVAILABLE FLANGES, COAX PORT RIMS, ETC. STEEL STRAPS MAY BE USED TO ATTACH GROUND BAR TO A MONOPOLE IF NO CONVENIENT CLAMPING SURFACES ARE PRESENT. ALL CONNECTING SURFACES SHALL BE CLEAN AND FREE OF DIRT, OIL AND CORROSION. GALVANIZED SURFACES SHALL BE POLISHED WITH A STEEL BRUSH. DO NOT DRILL HOLES OR USE EXOTHERMIC WELDS TO CONNECT GROUND LEADS TO A STEEL TOWER EXCEPT ON STEEL TABS OR FLANGES SPECIFICALLY DESIGNED FOR THAT PURPOSE.



**NOTES**

- ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
- ALL HARDWARE SHALL BE S/S 3/8 INCH DIAMETER OR LARGER.
- FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.

**TWO HOLE LUG**  
NO SCALE



**NOTE**

- NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.

**INSTALLATION OF GROUND WIRE TO EXTERIOR GROUNDING BAR**  
NO SCALE

**EVERSOURCE**  
ENERGY

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BERLIN, CT 06037  
PHONE: (800) 286-2000

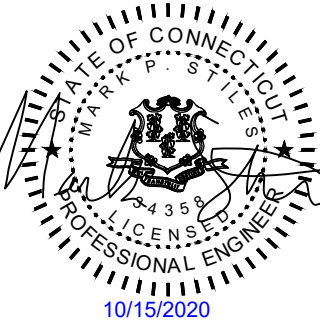


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PHONE: (913) 458-2522

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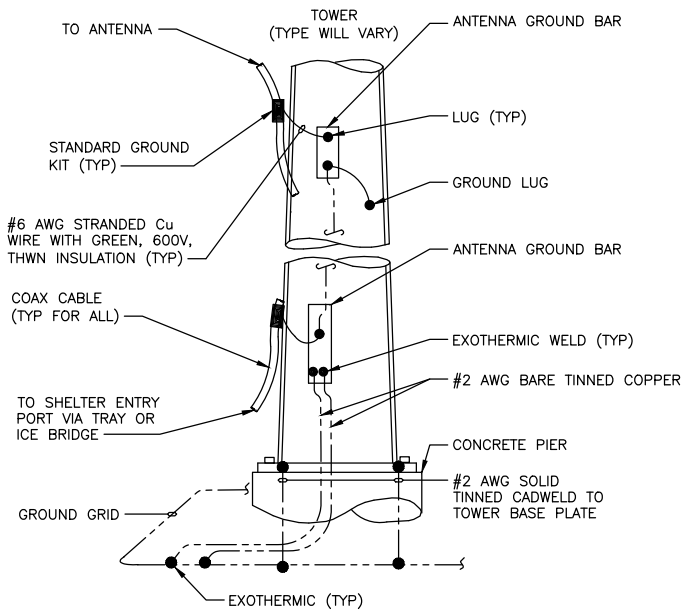


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SALISBURY 21J  
316 INDIAN MOUNTAIN RD  
SALISBURY, CT 06039

SHEET TITLE  
**GROUNDING  
DETAILS**

SHEET NUMBER  
**G-3**

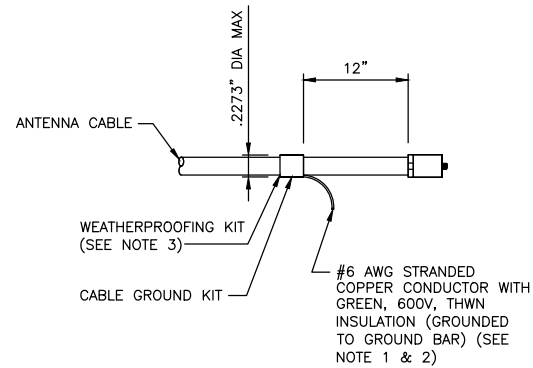


#### NOTE

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

#### ANTENNA CABLE GROUNDING

NO SCALE

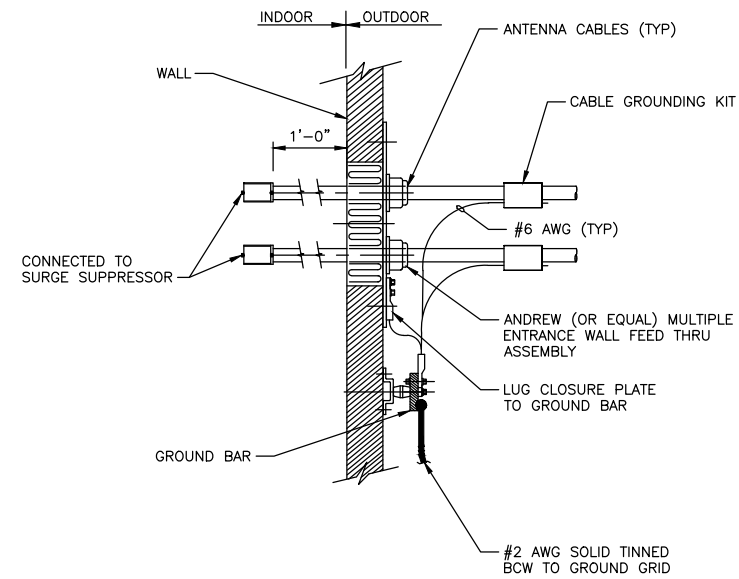


#### NOTES

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

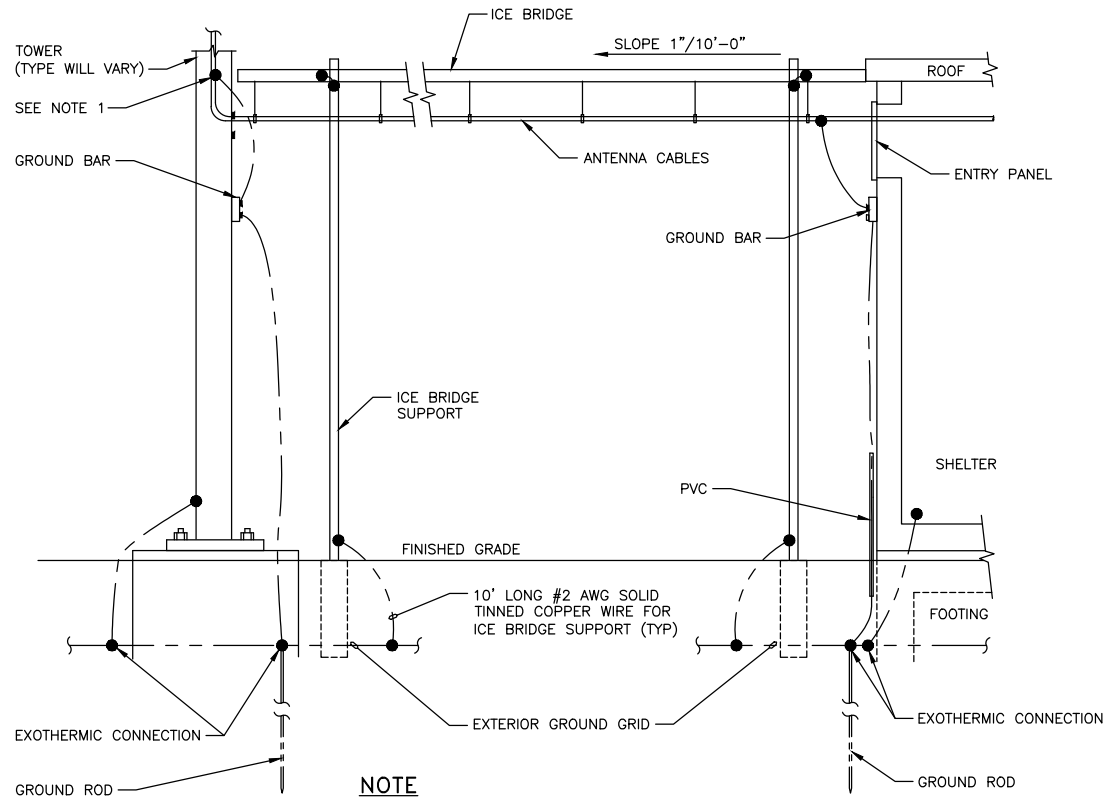
#### CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE

NO SCALE



#### CABLE INSTALLATION WITH WALL FEED THRU ASSEMBLY

NO SCALE



#### NOTE

1. PROVIDE GROUND KIT 6" BEFORE TURN

#### ICE BRIDGE AND ANTENNA CABLE DETAIL

NO SCALE

**EVERSOURCE**  
ENERGY

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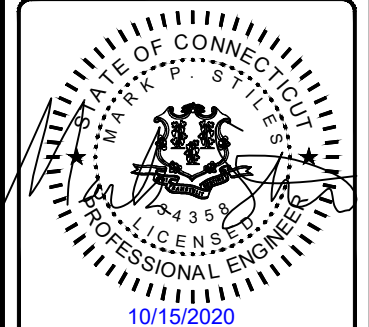


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PHONE: (913) 458-2522

PROJECT NO:	405025
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SALISBURY 21J  
316 INDIAN MOUNTAIN RD  
SALISBURY, CT 06039

SHEET TITLE

GROUNDING  
DETAILS

SHEET NUMBER

**G-4**



DESIGN BASIS

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

GENERAL CONDITIONS

1. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO COMPLY WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL BUILDING CODES, PERMIT CONDITIONS AND SAFETY CODES DURING CONSTRUCTION.
2. THE ENGINEER IS NOT: A GUARANTOR OF THE INSTALLING CONTRACTOR'S WORK; RESPONSIBLE FOR SAFETY IN, ON OR ABOUT THE WORK SITE; IN CONTROL OF THE SAFETY OR ADEQUACY OF ANY BUILDING COMPONENT, SCAFFOLDING OR SUPERINTENDING THE WORK.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL PERMITS, INSPECTIONS, TESTING AND CERTIFICATES NEEDED FOR LEGAL OCCUPANCY OF THE FINISHED PROJECT.
4. THE CONTRACTOR IS RESPONSIBLE TO REVIEW THIS COMPLETE PLAN SET AND VERIFY THE EXISTING CONDITIONS SHOWN IN THESE PLANS AS THEY RELATE TO THE WORK PRIOR TO SUBMITTING PRICE. SIGNIFICANT DEVIATIONS FROM WHAT IS SHOWN AFFECTING THE WORK SHALL BE REPORTED IMMEDIATELY TO THE CONSTRUCTION MANAGER.
5. DETAILS INCLUDED IN THIS PLAN SET ARE TYPICAL AND APPLY TO SIMILAR CONDITIONS.
6. EXISTING ELECTRICAL AND MECHANICAL FIXTURES, PIPING, WIRING, AND EQUIPMENT OBSTRUCTING THE WORK SHALL BE REMOVED AND/OR RELOCATED AS DIRECTED BY THE CONSTRUCTION MANAGER. TEMPORARY SERVICE INTERRUPTIONS MUST BE COORDINATED WITH OWNER.
7. THE CONTRACTOR SHALL DILIGENTLY PROTECT THE EXISTING BUILDING/SITE CONDITIONS AND THOSE OF ANY ADJOINING BUILDING/SITES AND RESTORE ANY DAMAGE CAUSED BY HIS ACTIVITIES TO THE PRE-CONSTRUCTION CONDITION.
8. THE CONTRACTOR SHALL SAFEGUARD AGAINST: CREATING A FIRE HAZARD, AFFECTING TENANT EGRESS OR COMPROMISING BUILDING SITE SECURITY MEASURES.
9. THE CONTRACTOR SHALL REMOVE ALL DEBRIS AND CONSTRUCTION WASTE FROM THE SITE EACH DAY. WORK AREAS SHALL BE SWEEPED AND MADE CLEAN AT THE END OF EACH WORK DAY.
10. THE CONTRACTOR'S HOURS OF WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND ORDINANCES AND BE APPROVED BY OWNER.
11. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CONSTRUCTION MANAGER IF ASBESTOS IS ENCOUNTERED DURING THE EXECUTION OF HIS WORK. THE CONTRACTOR SHALL CEASE ALL ACTIVITIES WHERE THE ASBESTOS MATERIAL IS FOUND UNTIL NOTIFIED BY THE CONSTRUCTION MANAGER TO RESUME OPERATIONS.

THERMAL & MOISTURE PROTECTION

1. FIRE-STOP ALL PENETRATIONS FOR ELECTRICAL CONDUITS OR WAVEGUIDE CABLING THROUGH BUILDING WALLS, FLOORS, AND CEILINGS SHALL BE FIRESTOPPED WITH ACCEPTED MATERIALS TO MAINTAIN THE FIRE RATING OF THE EXISTING ASSEMBLY. ALL FILL MATERIAL SHALL BE SHAPED, FITTED, AND PERMANENTLY SECURED IN PLACE. FIRESTOPPING SHALL BE INSTALLED IN ACCORDANCE WITH ASTM E814.
2. HILTI CP620 FIRE FOAM OR 3M FIRE BARRIER FILL, VOID OR CAVITY MATERIAL OR ACCEPTED EQUAL SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND ASSOCIATED UNDERWRITERS LABORATORIES (UL) SYSTEM NUMBER.
3. FIRESTOPPING SHALL BE APPLIED AS SOON AS PRACTICABLE AFTER PENETRATIONS ARE MADE AND EQUIPMENT INSTALLED.
4. FIRESTOPPED PENETRATIONS SHALL BE LEFT EXPOSED AND MADE AVAILABLE FOR INSPECTION BEFORE CONCEALING SUCH PENETRATIONS. FIRESTOPPING MATERIAL CERTIFICATES SHALL BE MADE AVAILABLE AT THE TIME OF INSPECTION.
5. ANY BUILDING ROOF PENETRATION AND/OR RESTORATION SHALL BE PERFORMED SO THAT THE ROOF WARRANTY IN PLACE IS NOT COMPROMISED. CONTRACTOR SHALL ARRANGE FOR OWNER'S ROOFING CONTRACTOR TO PERFORM ANY AND ALL ROOFING WORK IF SO REQUIRED BY EXISTING ROOF WARRANTY. OTHERWISE, ROOF SHALL BE MADE WATERTIGHT WITH LIKE CONSTRUCTION AS SOON AS PRACTICABLE AND AT COMPLETION OF CONSTRUCTION.
6. ALL PENETRATIONS INTO AND/OR THROUGH BUILDING EXTERIOR WALLS SHALL BE SEALED WITH SILICONE SEALER.
7. WHERE CONDUIT AND CABLES PENETRATES FIRE RATED WALLS AND FLOORS, FIRE GROUT ALL PENETRATIONS IN ORDER TO MAINTAIN THE FIRE RATING USING A LISTED FIRE SEALING DEVICE OR GROUT.
8. CONTRACTOR TO REMOVE AND RE-INSTALL ALL FIRE PROOFING AS REQUIRED DURING CONSTRUCTION.

SUBMITTALS

1. CONTRACTOR TO SUBMIT SHOP DRAWINGS TO ENGINEER FOR REVIEW PRIOR TO FABRICATION.
2. CONTRACTOR TO NOTIFY ENGINEER FOR INSPECTION PRIOR TO CLOSING PENETRATIONS.
3. CONTRACTORS SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. THE ENGINEER SHALL BE NOTIFIED OF ANY CONDITIONS WHICH PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
4. ALL STEEL MATERIAL EXPOSED TO WEATHER SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 " ZINC (HOT-DIPPED GALVANIZED) COATINGS" ON IRON AND STEEL PRODUCTS.
5. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS FOR REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

STEEL

1. MATERIAL:
- WIDE FLANGE: ASTM A572, GR 50  
TUBING: ASTM A500, GR C  
PIPE: ASTM A53, GR B AND ASTM 572, GR 50  
ANGLE: ASTM A570, GR 50 AND ASTM A36  
BOLTS: ASTM A325  
GRATING: TYPE GW-2 (1"x3/16" BARS)  
MISC. MATERIAL: ASTM A36
- ALL STEEL SHAPES SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH ASTM A123 WITH A COATING WEIGHT OF 2 OZ/SF.
2. DAMAGED GALVANIZED SURFACES SHALL BE CLEANED WITH A WIRE BRUSH AND PAINTED WITH TWO COATS OF COLD ZINC, "GALVANOX", "DRY GALV", "ZINC IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURER'S GUIDELINES. TOUCH UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT IN SHOP OR FIELD.
3. DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC "MANUAL OF STEEL CONSTRUCTION" 13TH EDITION.
4. THE STEEL STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER COMPLETION. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION.
5. ALL STEEL ELEMENTS SHALL BE INSTALLED PLUMB AND LEVEL.
6. TOWER MANUFACTURER'S DESIGNS SHALL PREVAIL FOR TOWER.

SITE GENERAL

1. CONTRACTOR SHALL FOLLOW CONDITIONS OF ALL APPLICABLE PERMITS AND WORK IN ACCORDANCE WITH OSHA REGULATIONS.
2. THESE PLANS DEPICT KNOWN UNDERGROUND STRUCTURES, CONDUITS, AND/OR PIPELINES. THE LOCATIONS FOR THESE ELEMENTS ARE BASED UPON THE VARIOUS RECORD DRAWINGS AVAILABLE. THE CONTRACTOR IS HEREBY ADVISED THAT THESE DRAWINGS MAY NOT ACCURATELY DEPICT AS-BUILT LOCATIONS AND OTHER UNKNOWN STRUCTURES. THE CONTRACTOR SHALL THEREFORE DETERMINE THE EXACT LOCATION OF EXISTING UNDERGROUND ELEMENTS AND EXCAVATE WITH CARE AFTER CALLING MARKOUT SERVICE AT 1-800-272-4480 48 HOURS BEFORE DIGGING, DRILLING OR BLASTING.
3. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, AND OTHER UTILITIES WHERE ENCOUNTERED, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION, SHALL BE RELOCATED AS DIRECTED BY ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES. CONTRACTOR SHALL HAND DIG UTILITIES AS NEEDED. CONTRACTOR SHALL PROVIDE, BUT IS NOT LIMITED TO, APPROPRIATE A) FALL PROTECTION, B) CONFINED SPACE ENTRY, C) ELECTRICAL SAFETY, AND D) TRENCHING AND EXCAVATION.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, FIBER OPTIC, OR OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT THE POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF THE CONSTRUCTION MANAGER.
6. CONTRACTOR IS RESPONSIBLE FOR REPAIRING OR REPLACING STRUCTURES OR UTILITIES DAMAGED DURING CONSTRUCTION.
7. CONTRACTOR SHALL PROTECT EXISTING PAVED AND GRAVEL SURFACES, CURBS, LANDSCAPE AND STRUCTURES AND RESTORE SITE OR PRE-CONSTRUCTION CONDITION WITH AS GOOD, OR BETTER, MATERIALS. NEW MATERIALS SHALL MATCH EXISTING THICKNESS AND TYPE.
8. THE CONTRACTOR SHALL SHORE ALL TRENCH EXCAVATIONS GREATER THAN 5 FEET IN DEPTH OR LESS WHERE SOIL CONDITIONS ARE DEEMED UNSTABLE. ALL SHEETING AND/OR SHORING METHODS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER.
9. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING GROUNDWATER LEVELS IN THE VICINITY OF EXCAVATIONS TO PROTECT ADJACENT PROPERTIES AND NEW WORK. GROUNDWATER SHALL BE DRAINED IN ACCORDANCE WITH LOCAL SEDIMENTATION AND EROSION CONTROL GUIDELINES.



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BLACK & VEATCH

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

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STATE OF CONNECTICUT

Joshua J. Riley

33208

PROFESSIONAL ENGINEER

10/15/2020

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SHEET TITLE  
NOTES  
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N-1

ELECTRICAL

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

GROUNDING

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

ANTENNA & CABLE NOTES

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



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BLACK & VEATCH

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PHONE: (913) 458–2522

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

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SHEET TITLE  
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N-2



SYMBOLS

	EXOTHERMIC CONNECTION
	COMPRESSION CONNECTION
	5/8"Øx10-0" COPPER CLAD STEEL GROUND ROD.
	TEST GROUND ROD WITH INSPECTION SLEEVE
	GROUNDING CONDUCTOR
	KEY NOTES
CHAINLINK FENCE	
WOOD FENCE	
LEASE AREA	
ICE BRIDGE	
CABLE TRAY	
GAS LINE	
UNDERGROUND ELECTRICAL/TELCO	
UNDERGROUND ELECTRICAL/CONTROL	
UNDERGROUND ELECTRICAL	
UNDERGROUND TELCO	
PROPERTY LINE (PL)	

ABBREVIATIONS

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

**EVERSOURCE**  
ENERGY

107 SELDEN STREET  
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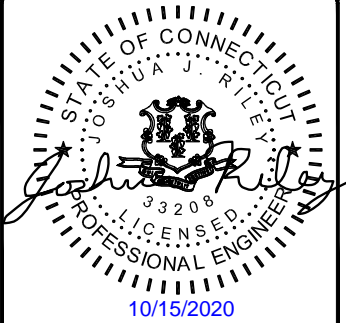


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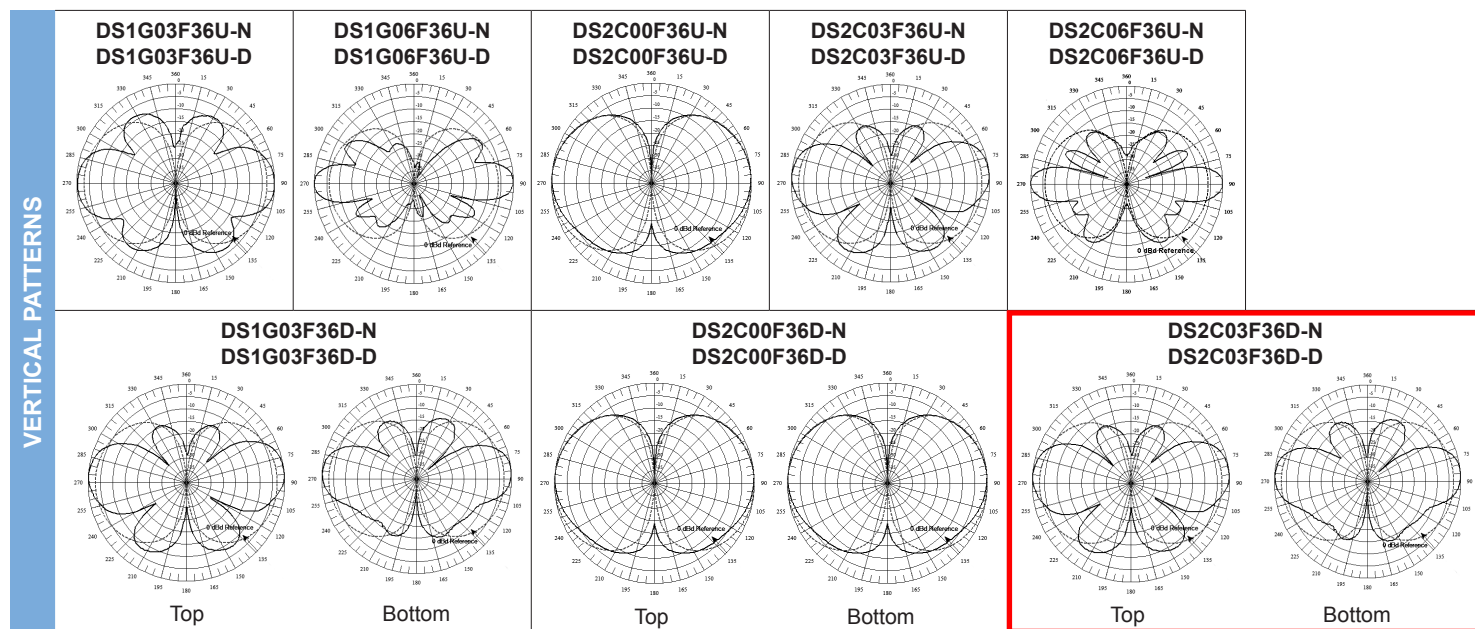
N-3

# REFERENCE CUTSHEETS

# VHF Omni Antennas (160-222 MHz)

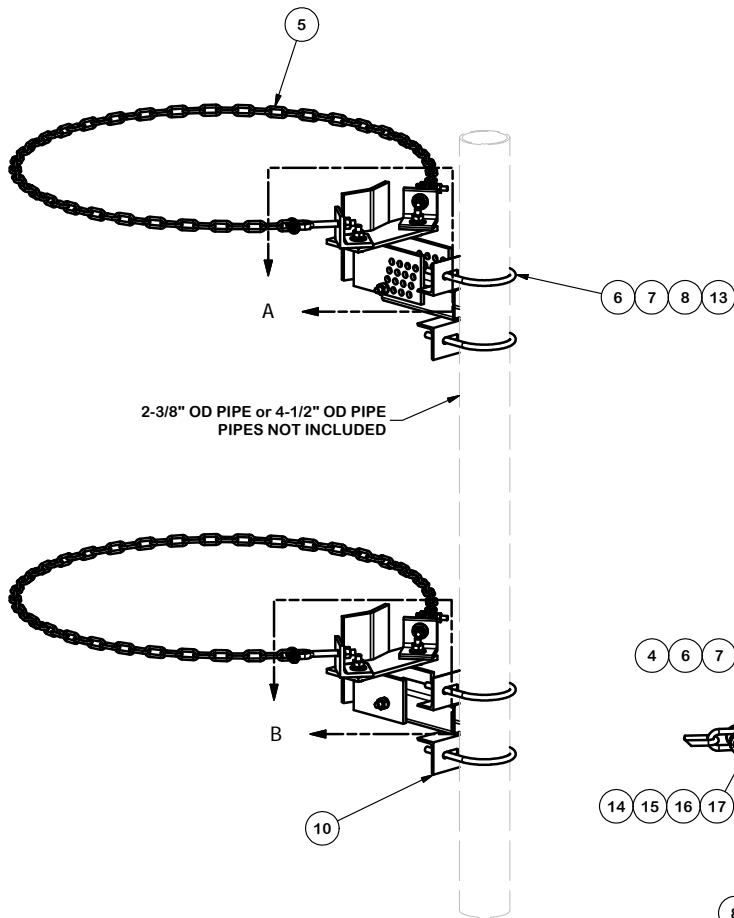
		160-174 MHz						217-222 MHz									
Model Number		DS1G03F36U-N	DS1G03F36U-D	DS1G06F36U-N	DS1G06F36U-D	DS1G03F36D-N	DS1G03F36D-D	DS2C00F36U-N	DS2C00F36U-D	DS2C03F36U-N	DS2C03F36U-D	DS2C06F36U-N	DS2C06F36U-D	DS2C00F36D-N	DS2C00F36D-D	DS2C03F36D-N	DS2C03F36D-D
Input Connector		N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN
Type		Single		Single		Dual		Single		Single		Single		Dual		Dual	
ELECTRICAL	Bandwidth, MHz	14		14		14		5		5		5		5		5	
	Power, Watts	500		500		350		500		500		500		350		350	
	Gain, dBd	3		6		3		0		3		6		0		3	
	Horizontal Beamwidth, degrees	360		360		360		360		360		360		360		360	
	Vertical Beamwidth, degrees	30		16		30		60		30		16		60		30	
	Beam Tilt, degrees	0		0		0		0		0		0		0		0	
	Isolation (minimum), dB	N/A		N/A		30		N/A		N/A		N/A		30		30	
MECHANICAL	Number of Connectors	1		1		2		1		1		1		2		2	
	Flat Plate Area, ft²	2.10		3.63		3.69		1.28		1.64		2.58		2.09		3.08	
	Lateral Windload Thrust, lbf	88		152		155		54		69		109		88		129	
	Wind Speed FUB without ice, mph	FJ0		150		150		250		225		175		190		160	
	Mounting Hardware included	DSH3V3R		DSH3V3N		DSH3V3N		DSH2V3R		DSH2V3R		DSH3V3N		DSH3V3R		DSH3V3N	
DIMENSIONS	Length, ft(m)	12.7 (3.9)		21.9 (6.7)		22.3 (6.8)		7.7 (2.3)		9.9 (3)		15.6 (4.8)		12.6 (3.8)		18.6 (5.7)	
	Radome O.D., in(cm)	3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)	
	Mast O.D., in(cm)	2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)	
	Net Weight w/o bracket, lb(kg)	37 (16.8)		60 (27.2)		63 (28.6)		19 (8.6)		26 (11.8)		47 (21.3)		40 (18.1)		70 (31.8)	
	Shipping Weight, lb(kg)	67 (30.4)		90 (40.8)		93 (42.2)		39 (17.7)		56 (25.4)		77 (34.9)		70 (31.8)		100 (45.4)	

DS2C03F36D-D

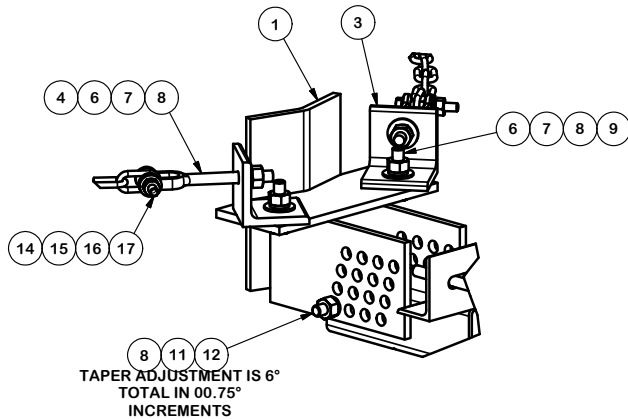




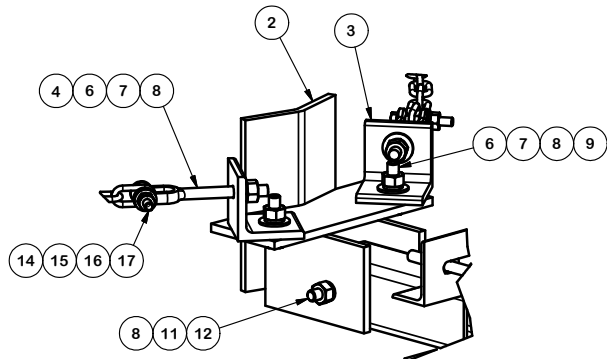
(1) 4" (4.5" OD) x 4'-0" LG SCH 40 MOUNT PIPE REQUIRED.



2-3/8" OD PIPE or 4-1/2" OD PIPE  
PIPES NOT INCLUDED



DETAIL A  
UPPER MOUNTING BRACKET



DETAIL B  
LOWER MOUNTING BRACKET

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	X-UCMMH	TOP CHAIN MOUNT BRACKET		16.17	16.17
2	1	X-UCMSH	LOWER CHAIN MOUNT BRACKET		14.14	14.14
3	4	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3.000 in	1.84	7.36
4	4	JB4	JAW BOLT GALV. 1/2" x 6"		0.51	2.04
5	2	GC4095	1/4" x GR40 GALV. CHAIN 9.5'		4.07	8.14
6	16	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	1.15
7	16	G12FW	1/2" HDG USS FLATWASHER		0.03	0.55
8	18	G12LW	1/2" HDG LOCKWASHER		0.01	0.25
9	4	G1202	1/2" x 2" HDG HEX BOLT GR5	2	0.18	0.70
10	2	X-UAPM	UNIVERSAL ANGLE TUBE 9"		9.31	18.62
11	2	A12NUT	1/2" HDG A325 HEX NUT		0.07	0.14
12	2	A1205	1/2" x 5" A325 HDG BOLT	5 in.	0.34	0.69
13	4	X-UB1458	1/2" X 4-5/8" X 7" X 3" GALV U-BOLT		0.97	3.89
13	4	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" GALV. U-BOLT		0.66	2.63
14	4	G38FW	3/8" HDG USS FLATWASHER		0.01	0.05
15	4	G38LW	3/8" HDG LOCKWASHER		0.01	0.03
16	4	G38NUT	3/8" HDG HEAVY 2H HEX NUT		0.03	0.14
17	4	G38212	3/8" x 2-1/2" HDG HEX BOLT GR5		0.10	0.41
TOTAL WT. #					80.15	

TOLERANCE NOTES

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

PROPRIETARY NOTE:  
THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION  
1'-0" STANDOFF, SINGLE SECTOR,  
TAPER ADJUSTMENT CHAIN MOUNT,  
SITE PRO 1

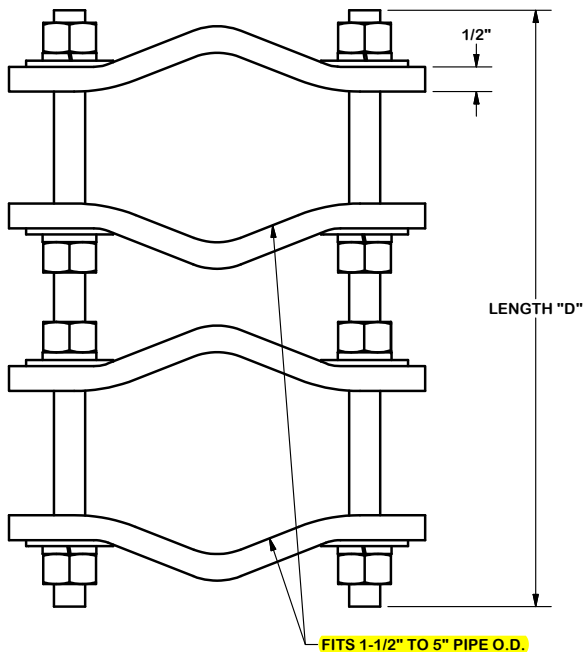
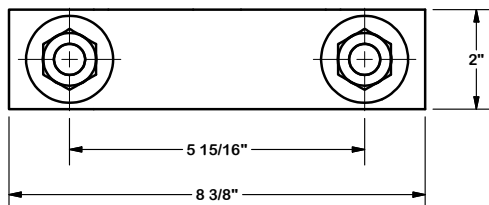
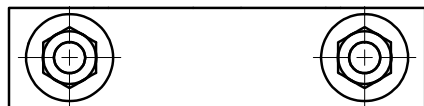
CPD NO.	DRAWN BY	ENG. APPROVAL
	RH18 3/12/2010	
CLASS	DRAWING USAGE	CHECKED BY
81	CUSTOMER	BMC 3/15/2010



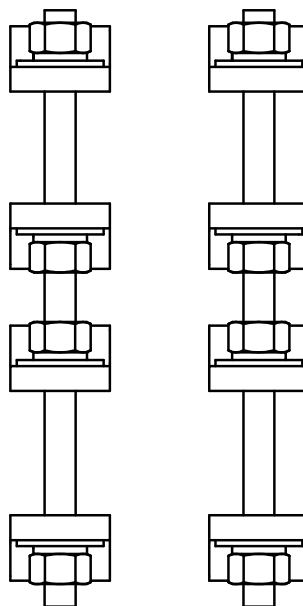
Locations:  
New York, NY  
Atlanta, GA  
Los Angeles, CA  
Plymouth, IN  
Salem, OR  
Dallas, TX  
Engineering  
Support Team:  
1-888-753-7446

PART NO.	TCHM1
DWG. NO.	TCHM1

A TOTAL OF (2) TWO CLAMP SETS REQUIRED. THESE CLAMP SETS WILL BE USED TO ATTACH THE PROPOSED ANTENNA TO THE PROPOSED 4.5" OD MOUNT PIPE. A MINIMUM OF (3) THREE CONNECTION POINTS (CLAMPS) ARE REQUIRED.

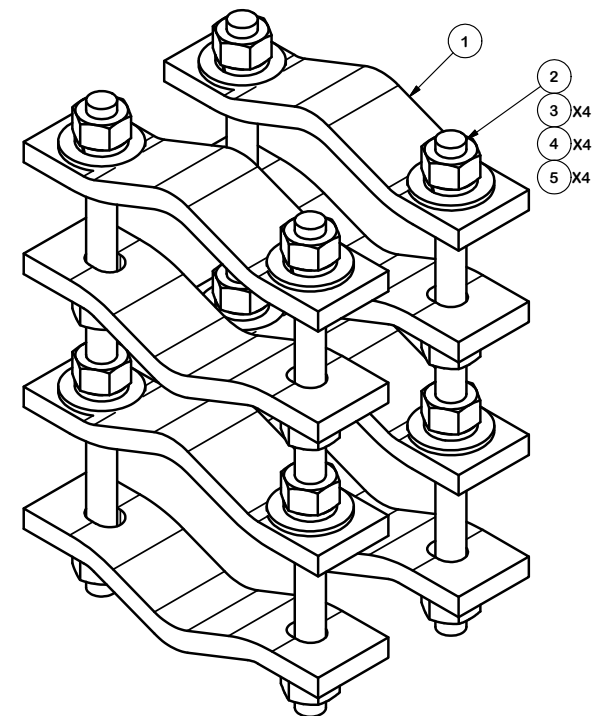


FITS 1-1/2" TO 5" PIPE O.D.



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	8	DCP	CLAMP HALF, 1/2" THICK, 8-3/8"		2.40	19.20
2	B	C	5/8" THREADED ROD	D	E	F
3	16	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	2.08
4	16	G58LW	5/8" HDG LOCKWASHER		0.03	0.42
5	16	G58FW	5/8" HDG USS FLATWASHER		0.07	1.13

VARIABLE PARTS TABLE						
ASSEMBLY "A"	QTY "B"	PART "C"	LENGTH "D"	UNIT WT. "E"	NET WT. "F"	TOTAL WEIGHT
DCP12K	4	G58R-12	12"	1.05	4.18	27.01
DCP18K	4	G58R-18	18"	1.57	6.27	29.10



#### TOLERANCE NOTES

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

PROPRIETARY NOTE:  
THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION  
PIPE TO PIPE CLAMP SET  
1-1/2" TO 5" PIPE  
1/2" THICK CLAMP

CPD NO. DRAWN BY  
KC8 8/21/2012

CLASS SUB DRAWING USAGE  
81 01 CUSTOMER

ENG. APPROVAL

CHECKED BY  
CEK 1/22/2013



Engineering  
Support Team:  
1-888-753-7446

Locations:  
New York, NY  
Atlanta, GA  
Los Angeles, CA  
Plymouth, IN  
Salem, OR  
Dallas, TX

PART NO. SEE ASSEMBLY "A"

DWG. NO. DCPxxK

## ATTACHMENT C – STRUCTURAL ANALYSIS REPORT



Date: **October 15, 2020**



Black & Veatch Corp.  
6800 W. 115th St., Suite 2292  
Overland Park, KS 66211  
(913) 458-2522

**Subject:** **Structural Analysis Report**

**Eversource Designation:** **Site Number:** ES-084  
**Site Name:** Salisbury21J

**Engineering Firm Designation:** **Black & Veatch Corp. Project Number:** 405025

**Site Data:** **316 Indian Mountain Road, Salisbury, Litchfield County, CT 06039**  
**Latitude: 41° 55' 18.68", Longitude: -73° 27' 52.88"**  
**45 Foot - Round Timber Wood Pole**

Black & Veatch Corp. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine the acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

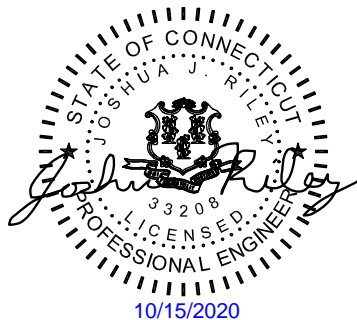
LC1: Proposed Equipment Configuration: **Sufficient Capacity – 76.0%**

This analysis utilizes an ultimate 3-second gust wind speed of 120 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural Analysis prepared by: Sanyukta R. Arvikar / Robert Hudson II

Respectfully Submitted by:

Joshua J. Riley, P.E.  
Professional Engineer



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### **2) ANALYSIS CRITERIA**

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Table 2 – Other Considered Equipment

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3.1) Analysis Method

3.2) Assumptions

### **4) ANALYSIS RESULTS**

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Table 5 – Tower Component Stresses vs. Capacity

4.1) Recommendations

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Wood Pole Tool Output

### **6) APPENDIX B**

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### **7) APPENDIX C**

Additional Calculations

## 1) INTRODUCTION

This tower is a 45 feet Round Timber Wood Pole.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	III
<b>Wind Speed:</b>	120 mph ultimate
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	1.275 in
<b>Wind Speed with Ice:</b>	40 mph
<b>Seismic S<sub>s</sub>:</b>	0.177
<b>Seismic S<sub>1</sub>:</b>	0.065

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
38.0	46.0	1	dbspectra	DS2C03F36D-D	2	7/8	-
	38.0	1	generic	Mount Pipe 4" Sch 40 (4.5 OD) x 6'-0"			
		1	site pro 1	TCHM1 Chain Mount			
10.0	10.0	2	site pro 1	UGLM Ring Mount	-	-	-
		1	site pro 1	Ice Bridge Assembly			
		1	Generic	Mount Pipe 4" Sch 40 (4.5 OD) x 4'-0"			

**Table 2 – Other Considered Equipment**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
43.0	49.0	2	rfs/celwave	PD1142	3	7/8	1
	43.0	2	generic	8' Crossarm	1	2 Conduit	

Note:

- Existing Equipment

## 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Remarks	Reference	Source
POLE GEOMETRY	Length, Diameter, and Wood Species Photos dated 10/02/2019	-	Eversource

### 3.1) Analysis Method

Wood Pole Tool (version 3.3.2) was used to calculate member stresses for various load cases. Selected output from the analysis is included in Appendix A. The tower and foundation have been analyzed based on the ice criteria outlined in section 2 of this report. Based on the analysis, ice loading is not governing the tower and foundation stress. Wind loading governs the tower and foundation stress.



### 3.2) Assumptions

- 1) The antenna mounting system has been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 3) Pole tip diameter assumed following ANSI-05.1 2008 minimum dimensions.
- 4) Soil parameters provided by Eversource. Black & Veatch does not assume any responsibility for its accuracy.

This analysis may be affected if any assumptions are not valid or have been made in error. Black & Veatch Corp. should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 4 – Section Capacity (Summary)**

Elevation (ft)	Size	Controlling Direction	$f_b$ (psi)	$f_c$ (psi)	$F'_b$ (psi)	$F'_c$ (psi)	% Capacity	Pass / Fail
45	9.23	--	0	0	2700	60.69	0.0%	Pass
43	9.64	--	5.12	0.77	2700	66.43	0.2%	Pass
38	10.67	--	245.69	4.09	2700	84.94	10.1%	Pass
33	11.69	--	641.57	3.87	2700	112.39	25.0%	Pass
28	12.72	--	941.06	3.69	2700	155.58	35.8%	Pass
23	13.74	--	1168.86	3.56	2659.63	229.15	44.6%	Pass
18	14.77	--	1342.27	3.43	2638.45	369.21	51.3%	Pass
14	15.59	--	1450.09	3.31	2622.64	594.4	55.5%	Pass
13	15.79	--	1473.42	3.47	2618.84	681	56.5%	Pass
11	16.2	--	1519.25	3.42	2611.39	913.32	58.3%	Pass
10	16.41	--	1540.28	5.45	2607.74	1066.49	59.2%	Pass
5	17.43	--	1630.55	5.15	2590.23	1900.7	63.0%	Pass
0	18.46	--	1678.96	4.85	2573.83	2077.81	65.2%	Pass
							Summary	
						Rating:	65.2%	Pass

**Table 5 – Tower Component Stresses vs. Capacity – LC1**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Foundation Structural	0	76.0%	Pass
	Base Foundation Soil Interaction		64.8%	Pass

<b>Structure Rating (max from all components) =</b>	<b>76.0%</b>
---	--------------

Note:

1. See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed. Ratings per TIA-222-H Section 15.5.

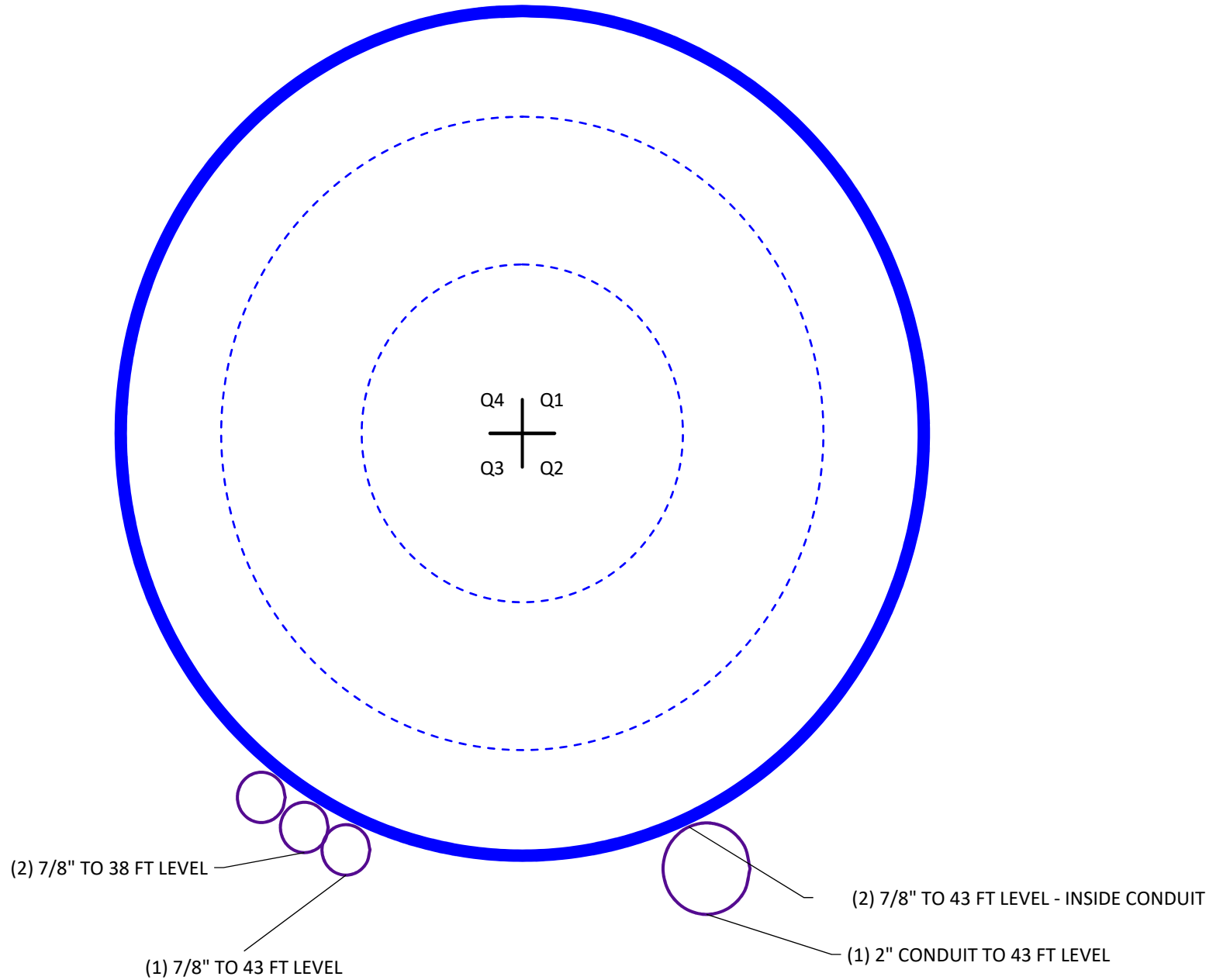
### 4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

**APPENDIX A**  
**WOOD POLE TOOL OUTPUT**



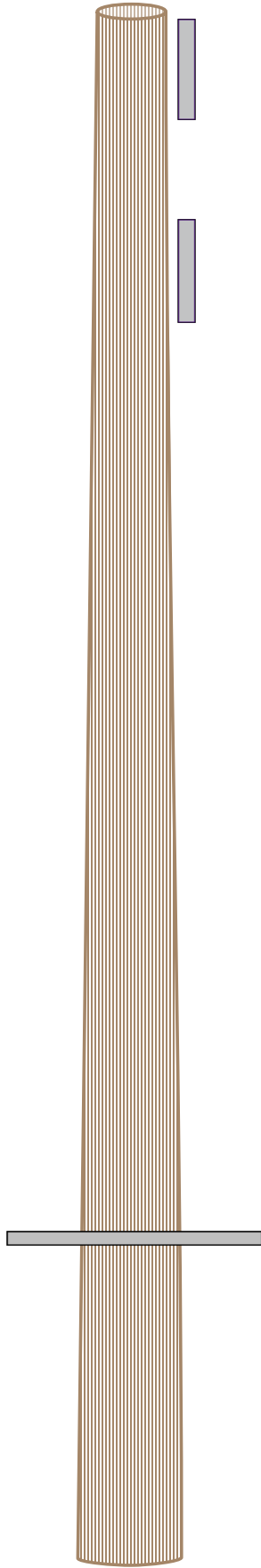
**\*Round Poles Only\***  
**BASE LEVEL DRAWING**



**APPENDIX B**  
**BASE LEVEL DRAWING**



					45 ft
Length (ft)	45				
Top Dim (in)	9.23				
Bot Dim (in)	18.46				
Material	Western Red Cedar				
Weight (k)	0.24				
					0.0 ft

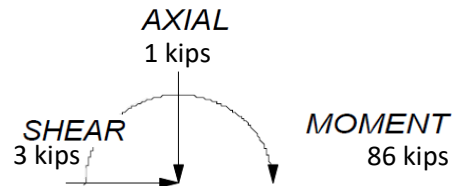


#### TOWER ANALYSIS NOTES

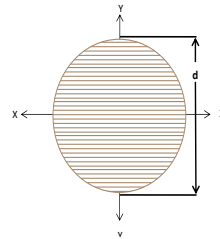
1. Tower is located in Litchfield, CT
2. Tower was analyzed for a 120 mph 3-second gust wind in accordance with ASCE 7-10
3. Exposure category C used in analysis
4. Topographic Kzt factor of 1 used in analysis.

TOWER RATING: 65.2%

#### FACTORED REACTIONS



120 mph Ultimate 3-sec Gust Wind Speed



Job:	<b>Salisbury21J</b>		
Project:			
Client:	Eversource	Drawn by:	SRA
Code:	2015 IBC	Date:	8/11/2020
Path:	C:\Users\G0084633\OneDrive - Black & Veatch\Documents\07 Eversource\Salisbury21J	Scale:	NTS
		Dwg No.	E-1

Geometry

Pole Data:

Lumber Type:	Round Timber	ft
Pole Length:	45	
Wood Species:	Western Red Cedar	
Wood Database:		
Design Interval:	5	ft

Pole Properties:

Eminy =		psi	Wood Density:	0.005	kcf
Fby =		psi	Cond. Treatment:	Air Dried	
Eminx =	360000	psi	Temperature:	90	°F
Fbx =	1250	psi			
Fc =	875	psi			

Pole Geometry:

Diameter Top (in)	Diameter Bottom (in)	X-Axis Top Width "b" (in)	X-Axis Bottom Width "b" (in)	Raceway X-Axis Width (in)	Y-Axis Top Width "d" (in)	Y-Axis Bottom Width "d" (in)	Raceway Y-Axis Width (in)
9.23	18.46						

Discrete Loading

Mount CL Elev (ft)	Vertical Offset (ft)	Database	Model	Qty	Offset Type	Face	Azimuth	C <sub>9</sub> A <sub>9</sub> Front (ft <sup>2</sup> )	C <sub>9</sub> A <sub>9</sub> Side (ft <sup>2</sup> )	Weight (lb)
43	6	RFS/CELWAVE	PD1142	1	From Face	C	0	2.09	2.09	10.00
43	6	RFS/CELWAVE	PD1142	1	From Face	C	0	2.09	2.09	10.00
13	1		Flood Light	1	From Face	C	0	0.82	1.32	20.00
38	9.3		DS2C03F36D-D	1	From Face	C	0	5.58	5.58	70.00
43	0	Tower Mounts	8' Crossarm	2	From Face	C	0	5.63	0.13	5.00
13	0	Tower Mounts	2' x 2-1/2" Mount Pipe	1	From Face	C	0	0.01	0.52	6.10
38	0	Tower Mounts	TCHM1	1	From Face	C	0	2.96	2.53	89.00
38	0	Tower Mounts	6' x 4-1/2" Mount Pipe	1	From Face	C	0	2.25	2.25	60.00
10		Tower Mounts	UGLM	2	None			0.66	0.66	89.00
10	0	Tower Mounts	4.5" x 4' Pipe (4STD)	1	From Leg	B	0	1.32	1.32	43.16
10	0	Tower Mounts	ICE BRIDGE ASSEMBLY	1	From Leg	B	0	0.33	1.68	130.00

Linear Loading

Start Height (ft)	End Height (ft)	Nominal Width (in)	Face	Total #	# Exposed	Diameter (in)	Weight (plf)
0	43	7/8	C	1	1	1.103	0.46
11	43	0.875	C	2	0	0	0.46
11	43	2	C	1	1	2	2.8
11	38	7/8	C	2	1	1.1	0.36

Results

Elevation (ft)	Diameter	Axial (k)	Shear (k)	Moment (k-ft)	f <sub>b</sub> (psi)	f <sub>c</sub> (psi)	F' <sub>b</sub> (psi)	F' <sub>c</sub> (psi)	% Capacity
49	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0%
47.3	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0%
45	9.23	0.000	0.019	0.000	0.00	0.00	2700.00	60.69	0.0%
43	9.64	0.057	0.480	0.038	5.12	0.77	2700.00	66.43	0.2%
38	10.67	0.366	1.190	2.439	245.69	4.09	2700.00	84.94	10.1%
33	11.69	0.415	1.489	8.388	641.57	3.87	2700.00	112.39	25.0%
28	12.72	0.469	1.797	15.834	941.06	3.69	2700.00	155.58	35.8%
23	13.74	0.527	2.110	24.818	1168.86	3.56	2659.63	229.15	44.6%
18	14.77	0.587	2.392	35.369	1342.27	3.43	2638.45	369.21	51.3%
14	15.59	0.632	2.549	44.939	1450.09	3.31	2622.64	594.40	55.5%
13	15.79	0.680	2.696	47.488	1473.42	3.47	2618.84	681.00	56.5%
11	16.20	0.706	2.794	52.881	1519.25	3.42	2611.39	913.32	58.3%
10	16.41	1.153	3.004	55.674	1540.28	5.45	2607.74	1066.49	59.2%
5	17.43	1.230	3.143	70.693	1630.55	5.15	2590.23	1900.70	63.0%
0	18.46	1.297	3.216	86.408	1678.96	4.85	2573.83	2077.81	65.2%

**APPENDIX C**  
**ADDITIONAL CALCULATIONS**



NDS Version	2015-LRFD
-------------	-----------

Base Reactions

Moment (k-ft):	86.41
Axial (k):	1.30
Shear (k):	3.22

Pole Properties

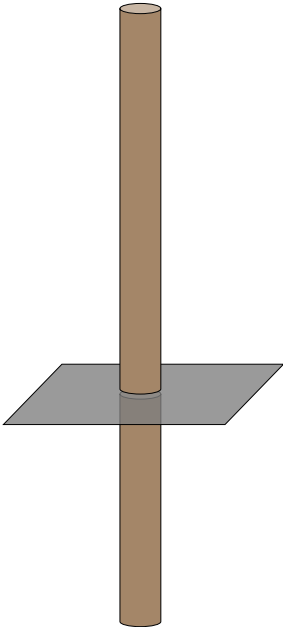
Encased:	No	Select
Depth to check pole (ft):	5	

Foundation Dimensions

Pole Diameter (ft):	1.65
Depth Below Existing Grade (ft):	15

Soil Properties

Ultimate Gross Bearing (ksf):	4.00	
Neglect Top Layer:	Yes	Select
Groundwater:	Yes	Select
Groundwater Depth Below Grade (ft):	0	



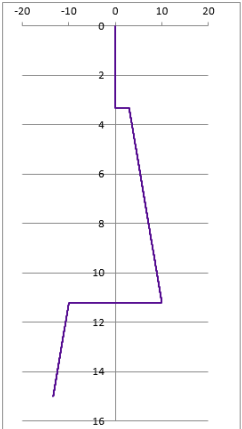
Layer Top Depth (ft)	Layer Bottom Depth (ft)	Layer Thickness (ft)	Effective Unit Weight of Soil (pcf)	Cohesion (ksf)	Internal Friction Angle (deg)	SPT Blow Count	Ultimate Skin Friction (ksf)
0	3.33	3.33	60	0	0	0	0.000
3.33	15	11.67	60	0	30	0	0.000

Soil Checks

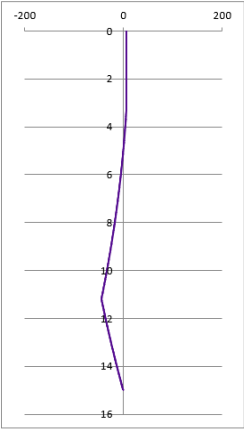
	Available Capacity	Demand	Check	% Capacity
Pier-Soil Interaction (FOS):	2.05	1.33	Pass	64.8%
Bearing (kips):	6.41	1.46	Pass	22.8%

Structural Checks

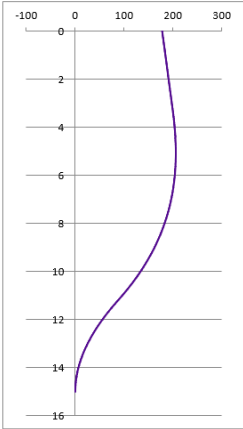
	F' <sub>b</sub> (psi)	F' <sub>c</sub> (psi)	Bending (psi)	Axial (psi)	Check	% Capacity
Embedded Wood Capacity:	2573.83	2077.81	1956.16	5.02	Pass	76.0%



Passive Pressure



Shear



Moment

ATTACHMENT D – PROOF OF DELIVERY OF NOTICE

Ref: CT587100-ES-084 Date: 10Dec20  
Dep: BL GRAPHICS Wgt: 0.60 LBS

DV:

SHIPPING: 15.88  
SPECIAL: 4.74  
HANDLING: 0.00  
0.00 TOTAL: 20.62

Svcs: PRIORITY OVERNIGHT  
TRCK: 9151 3346 9006

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES  
355 RESEARCH PARKWAY

MERIDEN, CT 06450  
UNITED STATES US

SHIP DATE: 10DEC20  
ACTWGT: 0.60 LB  
CAD: 0765627/CAFE3407

BILL SENDER

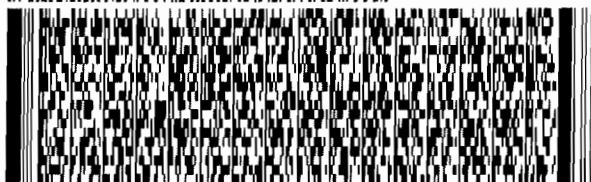
TO **HONORABLE CURTIS RAND**  
**TOWN OF SALISBURY**  
**27 MAIN STREET**

543274196/0542

**SALISBURY CT 06068**

REF: CT587100-ES-084 SALISBURY

DEPT: BL GRAPHICS



**FedEx**  
Express



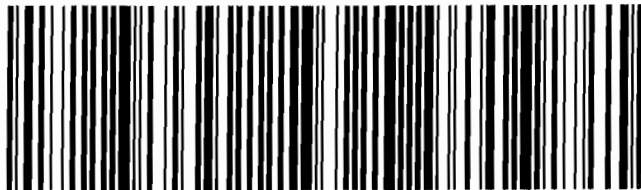
J201019110601uw

**FRI - 11 DEC 12:00P**  
**PRIORITY OVERNIGHT**

TRK# 9151 3346 9006  
0201

**00 HFDA**

**06068**  
**CT-US BDL**



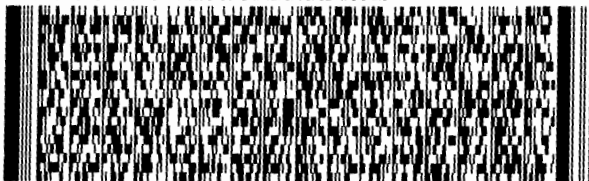
PAR #156143-434 FIT EXP 05/24 \*\*

Wgt: 0.60 LBS

	SHIPPING:	15.88
	SPECIAL:	4.74
	HANDLING:	0.00
0.00	TOTAL:	20.62

BILL SENDER

DEPT: BL GRAPHICS



**FedEx**  
Express



120707977060134

TRK# 9151 3346 9017  
0201

**FRI - 11 DEC 12:00P**  
**PRIORITY OVERNIGHT**

# 00 HFDA

06068  
CT-US BDL



Ref: CT587100-ES-084 Date: 10Dec20  
Dep: BL GRAPHICS Wgt: 0.60 LBS

DV:

SHIPPING: 15.88  
SPECIAL: 0.71  
HANDLING: 0.00  
TOTAL: 16.59

Svcs: PRIORITY OVERNIGHT  
TRCK: 9151 3346 9028

ORIGIN ID:RSPA (800) 301-3077

BL COMPANIES  
355 RESEARCH PARKWAY

MERIDEN, CT 06450  
UNITED STATES US

SHIP DATE: 10DEC20  
ACTWGT: 0.60 LB MAN  
CAD: 0765627/CAFE3407

BILL SENDER

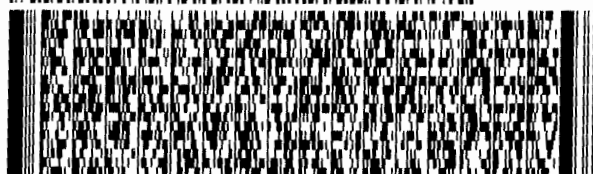
TO

**CONNECTICUT SITING COUNCIL  
10 FRANKLIN SQUARE**

**NEW BRITAIN CT 06051**

REF: CT587100-ES-084 SALISBURY

DEPT: BL GRAPHICS



**FedEx**  
Express



J201015110601u

TRK# 9151 3346 9028  
0201

**FRI - 11 DEC 10:30A  
PRIORITY OVERNIGHT**

**00 BDLA**

**06051  
CT-US BDL**





## ATTACHMENT E - POWER DENSITY REPORT



C Squared Systems, LLC  
65 Dartmouth Drive  
Auburn, NH 03032  
603-644-2800  
[support@csquaredsystems.com](mailto:support@csquaredsystems.com)

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## Calculated Radio Frequency Emissions Report



**ES-084**

316 Indian Mountain Road

Salisbury, CT 06039

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October 27, 2020

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## **1. Introduction**

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed Eversource installation on the to be located on the existing wood pole at 316 Indian Mountain Road in Salisbury, CT.

Eversource is proposing to install an omnidirectional antenna as part of its 220 MHz communications system.

This report considers the planned and existing antenna configuration as provided by Eversource to calculate the cumulative % MPE (Maximum Permissible Exposure) of the proposed facility at ground level. There are no other known operators at this site.

## **2. FCC Guidelines for Evaluating RF Radiation Exposure Limits**

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

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

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

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

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

### 3. Power Density Calculation Methods

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

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

Where:

EIRP = Effective Isotropic Radiated Power = 1.64 x ERP

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

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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



#### 4. Calculated % MPE Results

Table 1 below outlines the power density information for the site. The proposed Eversource omnidirectional antenna has a relatively narrow vertical beamwidth of 30°; therefore, the majority of the RF power is focused out towards the horizon. Please refer to Attachment C for the vertical pattern of the proposed Eversource antenna. Likewise, the other transmit antenna exhibits directionality of 75° vertical beamwidth. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the facility. The calculated results in Table 1 include a nominal of 10 dB off-beam pattern loss for the proposed omnidirectional and a 3 dB off-beam loss for the existing antenna. Any inactive or receive-only antennas are not listed in the table unless specified otherwise, as they are irrelevant in terms of the % MPE calculations. The green shaded entry in the calculations represents the existing Eversource transmit antenna, whereas the blue shaded entry represents the proposed installation. The associated technical details for each are based upon the parameters provided by Eversource through its agents as part of this project.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm <sup>2</sup> )	Limit	%MPE
Eversource	49	48.4	1	100	0.0097	0.2000	4.87%
Eversource	43	217	4	124	0.0130	0.2000	6.52%
						<b>Total</b>	<b>11.40%</b>

**Table 1: Proposed Facility % MPE <sup>1 2</sup>**

<sup>1</sup> Please note that % MPE values listed are rounded to two decimal points and the total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

<sup>2</sup> Antenna centerline heights listed are based on the Black & Veatch Structural Analysis Report dated October 15, 2020. The proposed Eversource antenna consists of two internally stacked antennas – the upper antenna is intended for receive-only, whereas the lower internal antenna is for transmit. The transmit antenna height listed in the table has been adjusted accordingly.

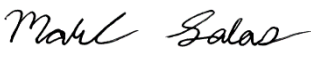
## 5. Conclusion

The above analysis concludes that RF exposure at ground level with the proposed antenna installation will be below the maximum power density limits as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods discussed herein, the highest expected percent of Maximum Permissible Exposure at ground level with the proposed installation is **11.4% of the FCC General Population/Uncontrolled limit**.

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


## 6. Statement of Certification

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

  
\_\_\_\_\_  
Report Prepared By: Marc Salas  
RF Engineer  
C Squared Systems, LLC

October 23, 2020

Date

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

October 27, 2020

Date

### **Attachment A: References**

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

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

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

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

### (A) Limits for Occupational/Controlled Exposure<sup>3</sup>

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

### (B) Limits for General Population/Uncontrolled Exposure<sup>4</sup>

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

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

**Table 2: FCC Limits for Maximum Permissible Exposure (MPE)**

<sup>3</sup> Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

<sup>4</sup> General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

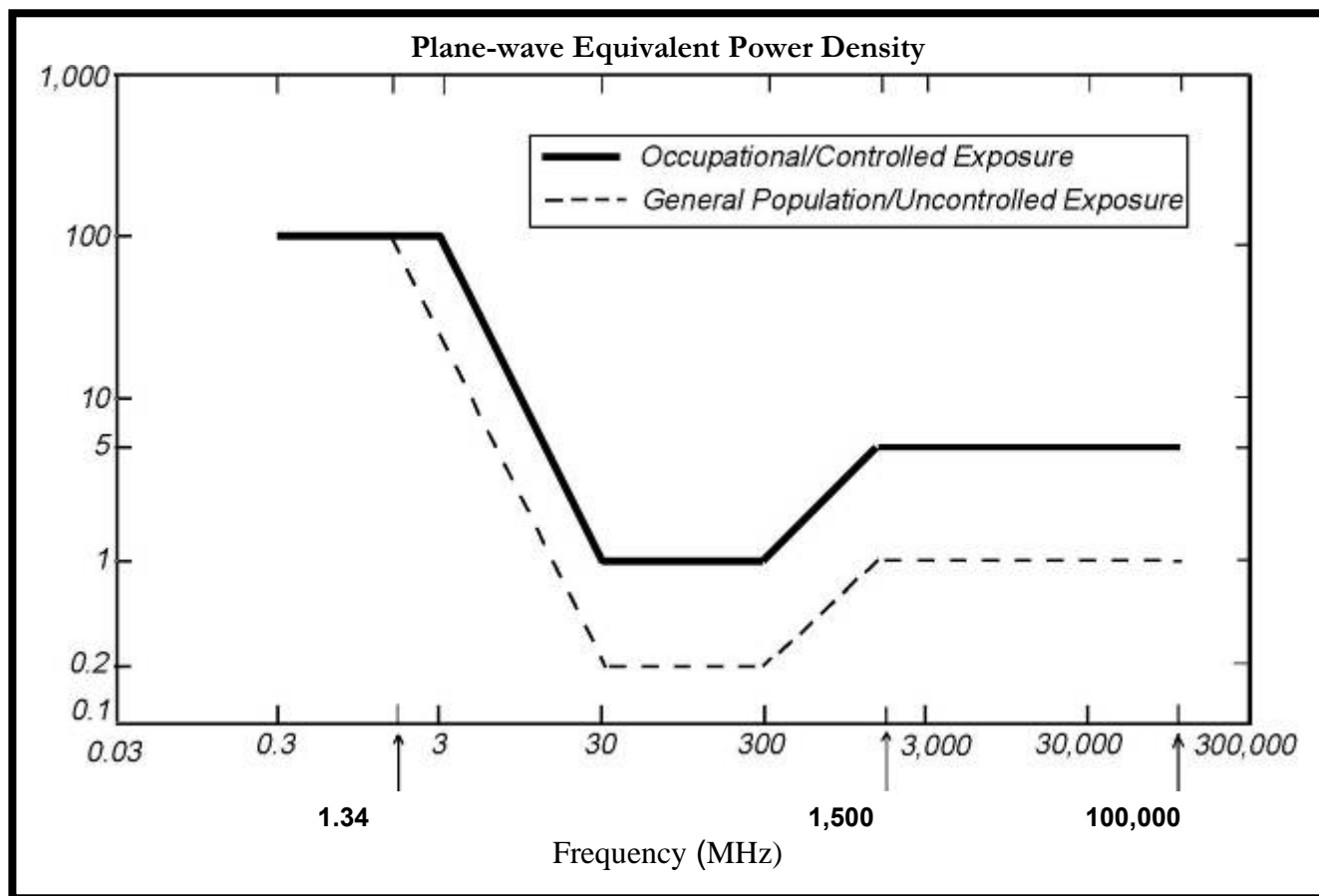


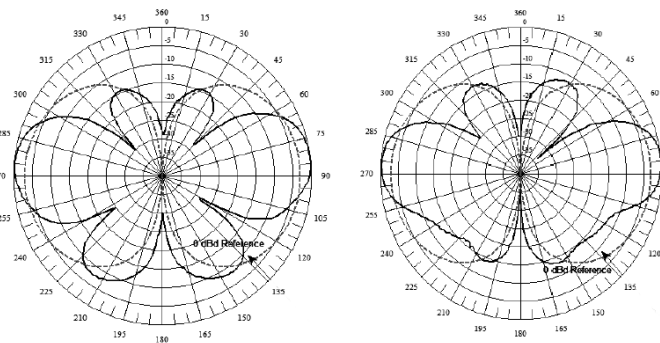
Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

**Attachment C: Eversource Antenna Data Sheets and Electrical Patterns**

**217 MHz**

Manufacturer: dbSpectra  
 Model #: DS2C03F36D  
 Frequency Band: 217-222 MHz  
 Gain: 3.0 dBd  
 Vertical Beamwidth: 30°  
 Horizontal Beamwidth: 360°  
 Polarization: Vertical-Polarization  
 Length: 18.6'

**DS2C03F36D-N  
DS2C03F36D-D**

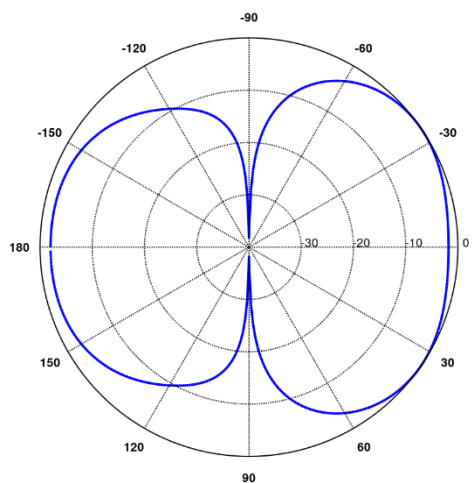


Top

Bottom

**48.4 MHz**

Manufacturer: Celwave (RFS)  
 Model #: PD1142<sup>5</sup>  
 Frequency Band: 42-54 MHz  
 Gain: 0.0 dBd  
 Vertical Beamwidth: 75°  
 Horizontal Beamwidth: 360°  
 Polarization: Vertical-Polarization  
 Length: 12.6'



<sup>5</sup> The digital antenna pattern for this specific antenna is unavailable. Therefore, the pattern shown is that of an antenna with similar vertical beamwidth characteristics.