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

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

July 22, 2020

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

RE: **Notice of Exempt Modification**
Eversource Site Meriden Cooper St.
56 Cooper Street, Meriden, CT 06451
Latitude: 41-31-57.1 N / Longitude: 72-48-21.4 W

Dear Ms. Bachman:

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") currently maintains multiple antennas at various mounting heights on an existing building located at 56 Cooper Street in Meriden, CT. See Attachment A, Parcel Map and Property Card. The building and property are owned by Eversource. Eversource plans to install one 24-foot 3-inch tall omni-directional antenna on the existing penthouse wall; the top of the antenna will extend to approximately 67 feet above ground level ("AGL"). Two 7/8-inch diameter coaxial cables will be routed from the antenna into the existing building where it will terminate in an existing communications room. There will be no ground disturbance and no changes to the building or the existing antennas and equipment. The existing and proposed antennas on the building are depicted on Attachment B, Construction Drawings, dated March 30, 2020.

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 Kevin Scarpati, Mayor of the City of Meriden and Renata Bertotti, Director of Planning, Development & Enforcement for the City of Meriden via the United States Postal Service or private carrier. Proof of delivery is attached. See Attachment C, 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 building; an existing omni-directional antenna extends to 60'-11" AGL; the proposed omni-directional antenna will extend to 67'-0" AGL.
2. The proposed modifications will not require the 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 antenna 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 March 6, 2020 (Attachment D – Power Density Report)[1].
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 as shown in the attached Structural Analysis, dated March 26, 2020 (Attachment E – Structural Analysis).

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). Two copies of this notice and a check in the amount of $625 are enclosed.

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

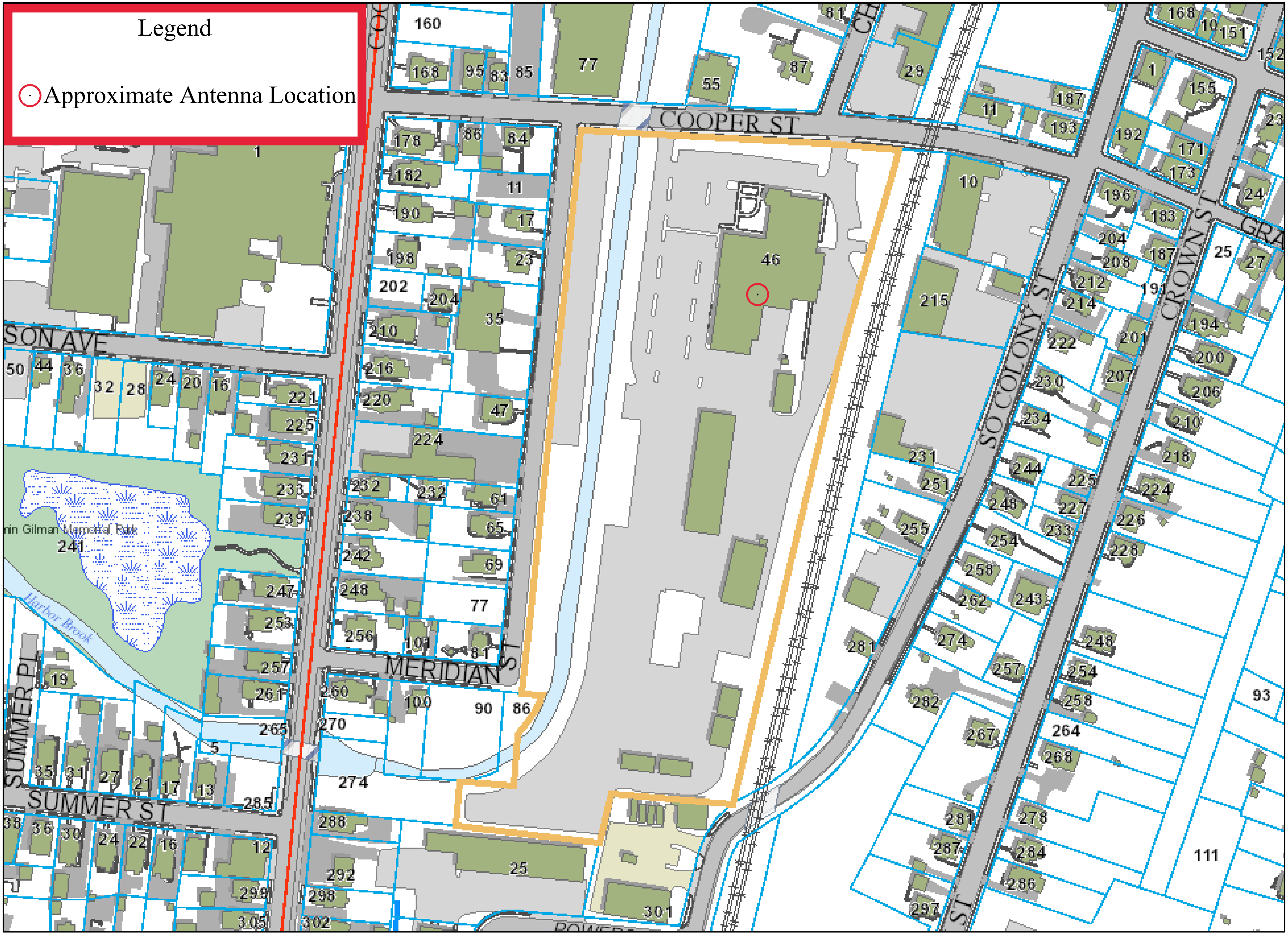
By: ________________________________
Kathleen M. Shanley
Manager – Transmission Siting

cc: Honorable Kevin Scarpati, Mayor, City of Meriden
Renata Bertotti, Director of Planning, Development & Enforcement, City of Meriden

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

[1] It should be noted that the number of transmitting antennas accounted for in the Power Density Report accounts for two channels on the 88' centerline antenna. Also, the "Antenna Height" column on Table 1 in the Power Density Report only accounts for the centerline of the Transmit or "TX" antenna centerline.

ATTACHMENT A – PARCEL MAP AND PROPERTY CARD



CITY OF MERIDEN, CT GIS

ES-281 Meriden - 46 Cooper Street

Date: 2/27/2020

1 inch = 200 feet

CITY OF MERIDEN
GIS Services

PROPERTY INFORMATION Location: **46 COOPER ST** Map/Lot: 0113-0059-0001-0010

OWNER INFORMATION

Owner(s):
YANKEE GAS SERVICES CO
C/O PROPERTY TAX DEPT

Owner Address:
P O BOX 270
HARTFORD, CT 06141

BUILDING INFORMATION

Card Number: 1

Total Units: 1

OVERVIEW	
Building ID	908
Finished Area	50,218
Comm/Rental Units	1
Living Units	0
Building Type	Ind Mfg (L)
Year Built	1969
Effective Yr Built	
Building Number	1
Condo Name	

INTERIOR DETAILS	
Rooms	
BedRooms	
Full Bath	0
Full Bath Rating	
Half Bath	0
Half Bath Rating	
Kitchens	0
Kitchen Rating	
Fireplaces	0

CONSTRUCTION DETAILS	
Exterior	Masonry
Roof Structure	Flat
Roof Cover	Rubber
Quality	C+
Heat Fuel	Oil
Heat Type	Forced Air
Prcnt. Heated	100.00
Prcnt. AC	50.00
Stories	2 story
Foundation	Conc Slab

Sub Area Summary

No Sub Area data found

Special Features

No Special Features found.

APPRAISAL INFORMATION **Tax District:** 2 **District Name:** INNER DISTRICT **District Mill Rate:** 43.21

Grand List Year: 2019

Land Appraised	Building Appraised	Yard Appraised	Total Appraised Value	Land Assessed	Building Assessed	Yard Assessed	Special Land Value	Total Assessed Value
$1,751,200	$2,059,300	$625,300	$4,435,800	$1,225,840	$1,441,510	$437,710	$0	$3,105,060

Previous Year: 2018

Land Value	Building Value	Yard Items	Appraised Value	Land Value	Building Value	Yard Items	Assessed Value
$1,749,800	$2,057,800	$625,300	$4,432,900	$1,224,860	$1,440,460	$437,710	**$3,103,030**

LAND INFORMATION

Land Use	Zoning	Land Area	Neighborhood Description
Comm Bldg	M-3	10.46919	INNER CITY AREA

*Confirm zoning with Planning Office.
Zoning map is the official document to determine zone.

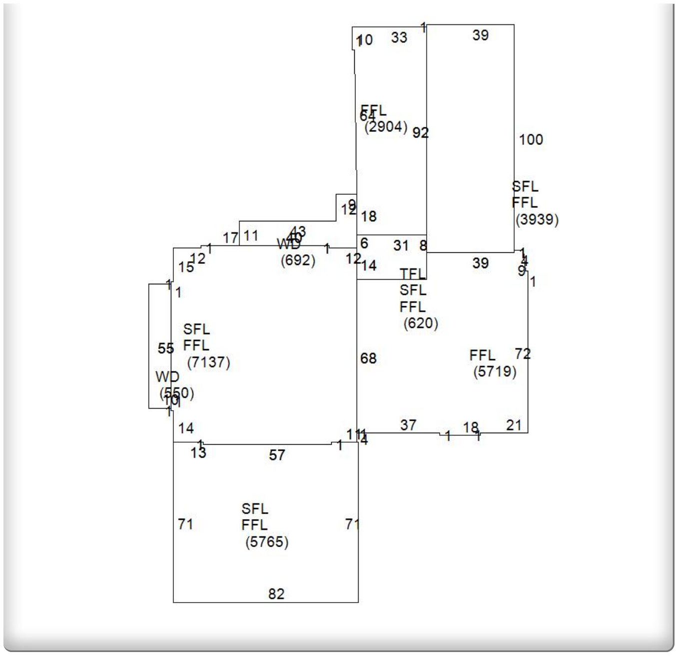
SALES INFORMATION

Sale Date	Sale Price	Book	Page	Grantor	Grantee	Deed Type
6/30/1989	$0	1646	11			

ASSESSOR'S PERMIT HISTORY

No data found.

PROPERTY IMAGES



909
0113-0059-0001-0010
1

ATTACHMENT B – CONSTRUCTION DRAWINGS

EVERSOURCE ENERGY

MERIDEN
56 COOPER STREET
MERIDEN, CT 06451

PROJECT SUMMARY

THE GENERAL SCOPE OF WORK CONSISTS OF THE FOLLOWING:

1. INSTALL (1) NEW ANTENNA MAST PIPE NEAR TOP OF EXISTING BUILDING WALL
2. INSTALL (1) NEW OMNI/WHIP ANTENNA AT ELEVATION 67'-0"± AGL
3. INSTALL (1) NEW RACK WITH DMR EQUIPMENT IN EXISTING TELECOM ROOM

GOVERNING CODES

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

GENERAL NOTES

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

SITE INFORMATION

SITE NAME:	MERIDEN
SITE ID NUMBER:	#908
SITE ADDRESS:	56 COOPER STREET MERIDEN, CT 06451
MAP/LOT	0113-0059-0001-0010
ZONE:	M-3
LATITUDE:	41° 31' 57.1" N
LONGITUDE:	72° 48' 21.4" W
ELEVATION:	110'± AMSL
FEMA/FIRM DESIGNATION:	AE
ACREAGE:	10.47± AC (BOOK: 1646, PAGE: 11)

CONTACT INFORMATION

APPLICANTS:
EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037

PROPERTY OWNER:
EVERSOURCE ENERGY
107 SELDEN STREET
BERLIN, CT 06037

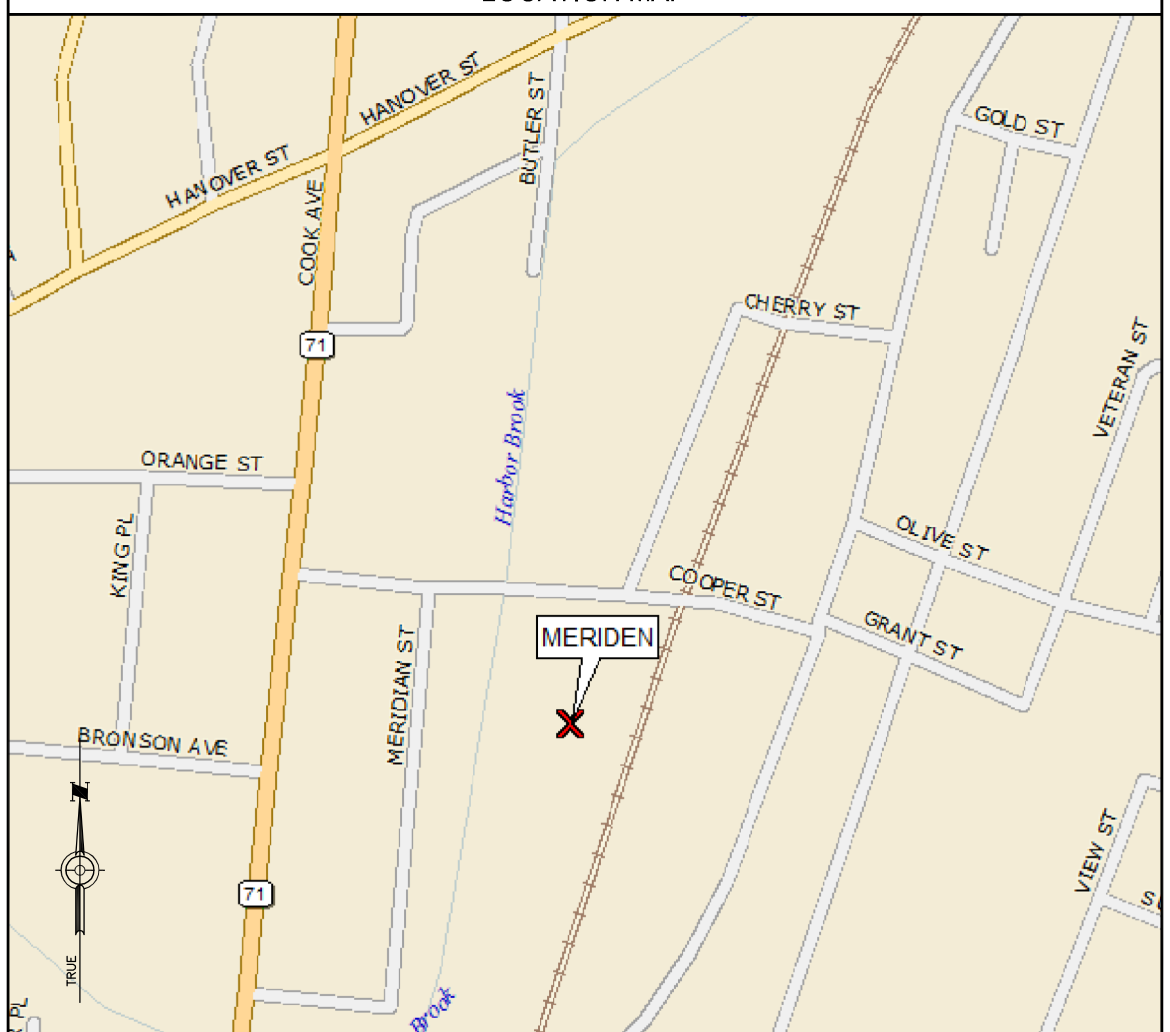
EVERSOURCE ENERGY PROJECT MANAGER:
NIKOLL PRECI
(860) 655-3079

POWER PROVIDER:
EVERSOURCE ENERGY
(800) 286-2000

TELCO PROVIDER:
FRONTIER
(800) 921-8102

CALL BEFORE YOU DIG:
(800) 922-4455

LOCATION MAP



NO SCALE

DESIGN TYPE

SITE UPGRADE
ROOFTOP

DRAWING INDEX

SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
C-1	ROOFTOP PLAN
C-2	BUILDING ELEVATION
S-1	STRUCTURAL DETAILS
S-2	STRUCTURAL DETAILS
G-1	GROUNDING DETAILS
N-1	NOTES & SPECIFICATIONS
N-2	NOTES & SPECIFICATIONS
N-3	NOTES & SPECIFICATIONS

DO NOT SCALE DRAWINGS

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

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

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

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-3595

PROJECT NO:	403093
DRAWN BY:	TCG
CHECKED BY:	JR

REV	DATE	DESCRIPTION
0	03/30/20	ISSUED FOR FILING

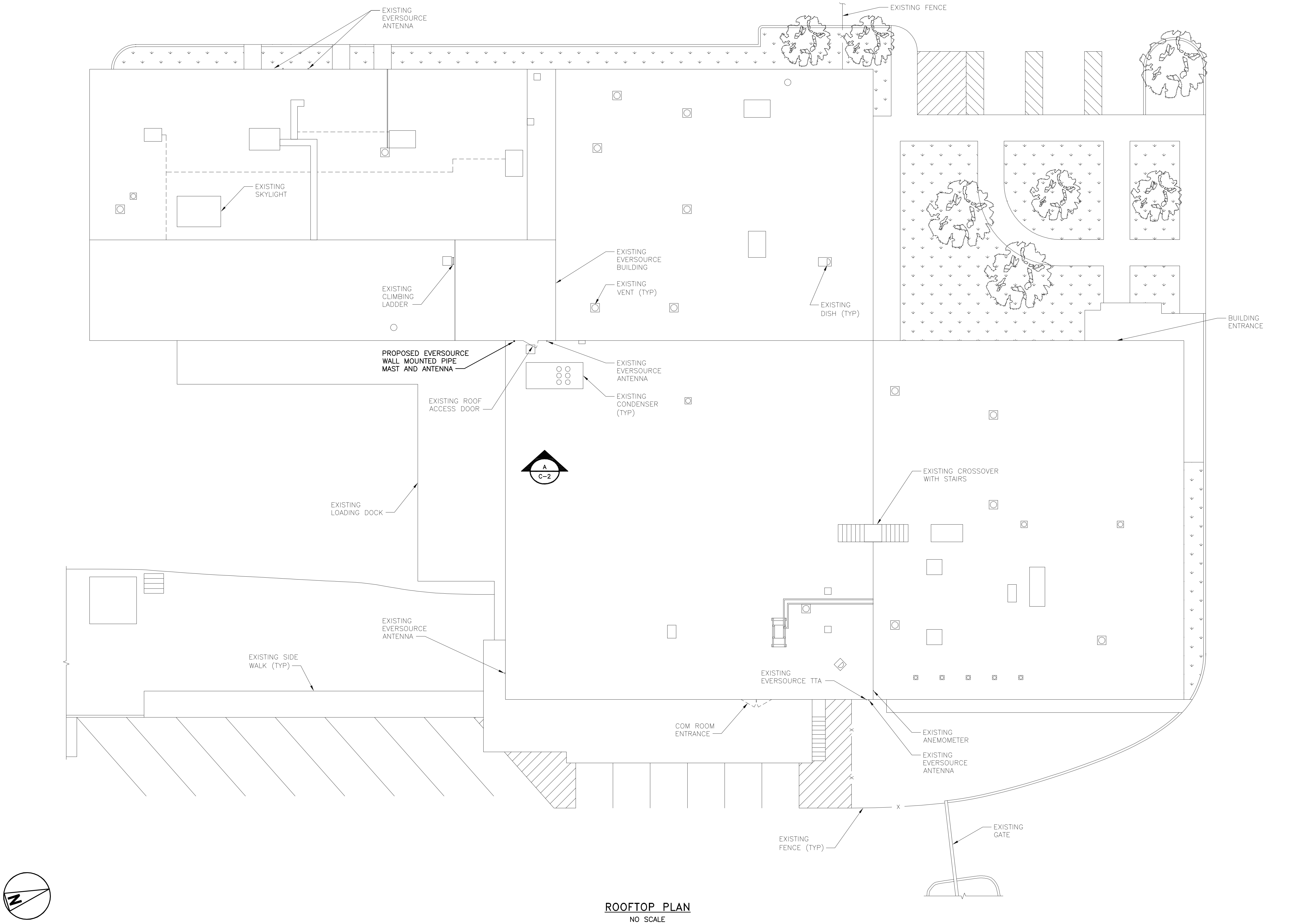
03/30/2020

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

MERIDEN
56 COOPER STREET
MERIDEN, CT 06451

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



ROOFTOP PLAN

NO SCALE

EVERSOURCE ENERGY

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

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-3595

PROJECT NO:	403093
DRAWN BY:	TCG
CHECKED BY:	JR

0	03/30/20	ISSUED FOR FILING
REV	DATE	DESCRIPTION

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED
PROFESSIONAL ENGINEER

03/30/2020

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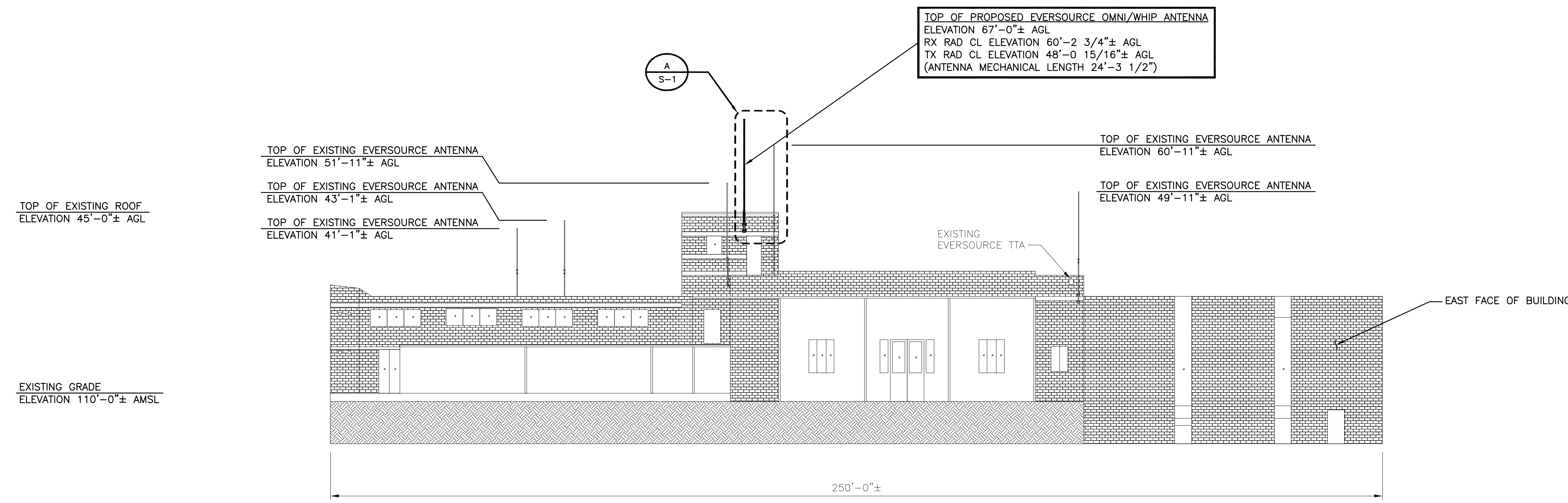
MERIDEN
56 COOPER STREET
MERIDEN, CT 06451

SHEET TITLE

ROOFTOP PLAN

SHEET NUMBER

C-1



DETAIL A
BUILDING ELEVATION
NO SCALE

EVERSOURCE ENERGY

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

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-3595

PROJECT NO:	403093
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REV	DATE	DESCRIPTION
0	03/30/20	ISSUED FOR FILING

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED
PROFESSIONAL ENGINEER

03/30/2020

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MERIDEN
56 COOPER STREET
MERIDEN, CT 06451

SHEET TITLE

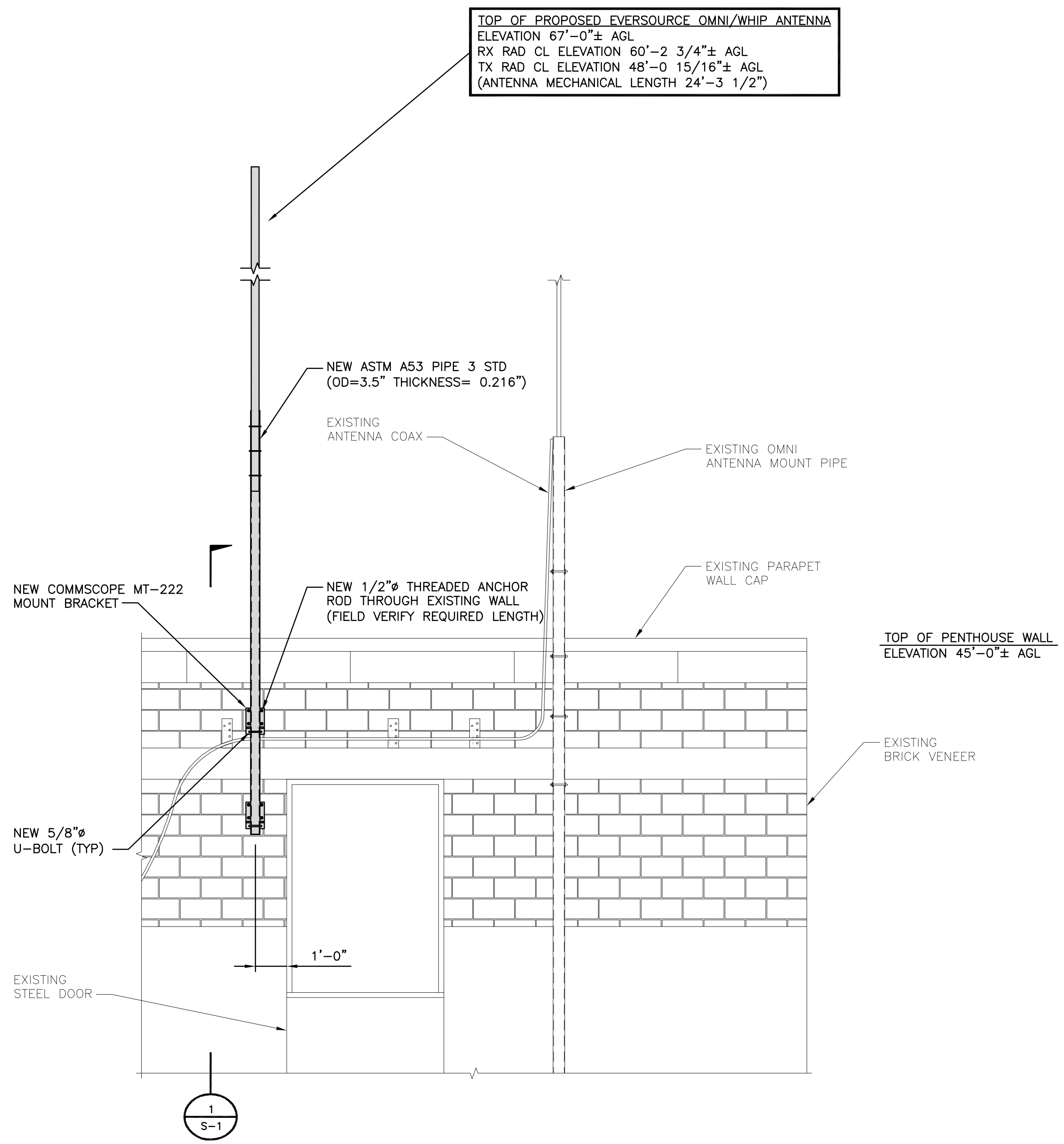
BUILDING ELEVATION

SHEET NUMBER

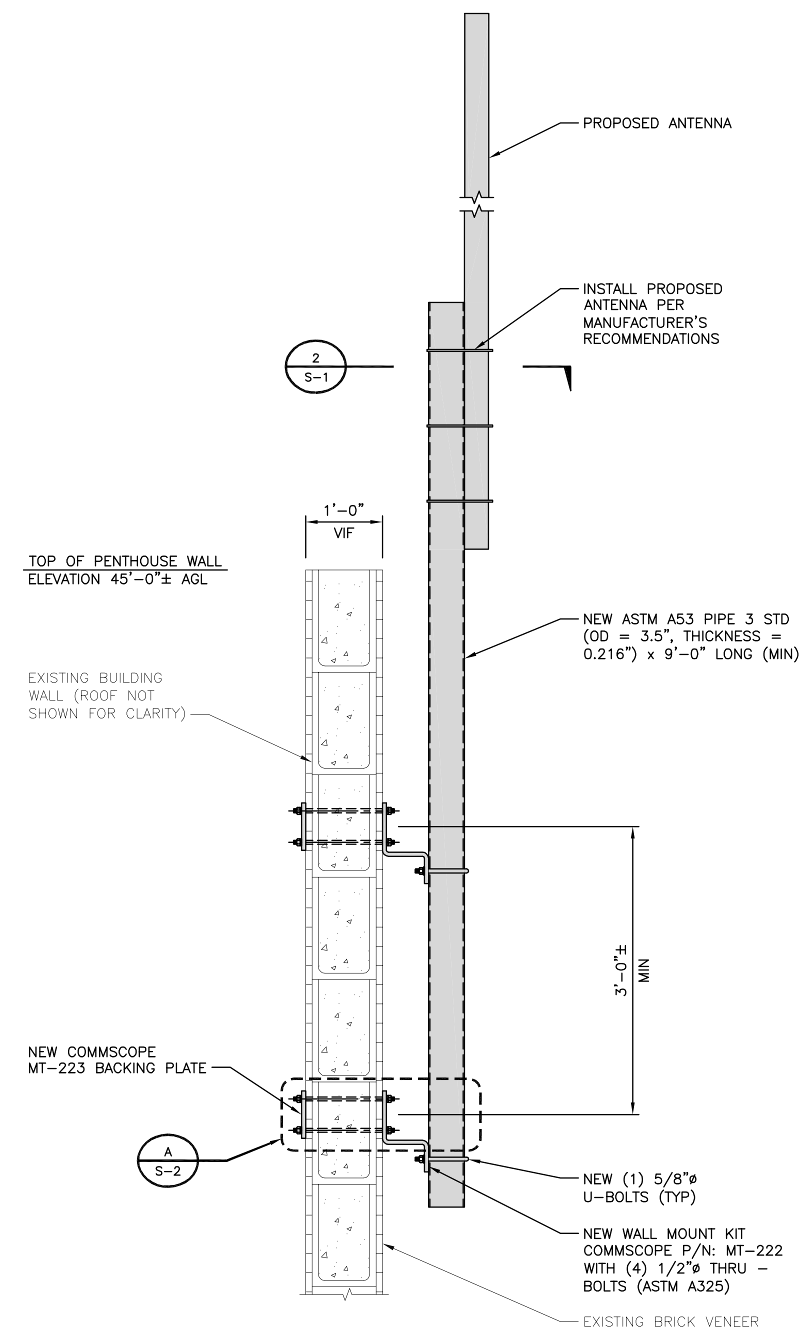
C-2

NOTES

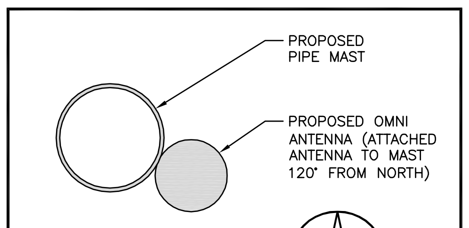
1. INSTALL COAX GROUND KITS AT BOTTOM OF ANTENNA AND BEFORE COAX ENTERS BUILDING. CONNECT TO #6 AWG GROUND WIRE RUNNING FROM EGB TO ANTENNA MOUNT (SEE DETAILS "A" AND "B" SH G-1).



DETAIL A
NO SCALE



SECTION 1
NO SCALE



SECTION 2
NO SCALE

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

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-3595

PROJECT NO:	403093
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REV	DATE	DESCRIPTION
0	03/30/20	ISSUED FOR FILING

03/30/2020

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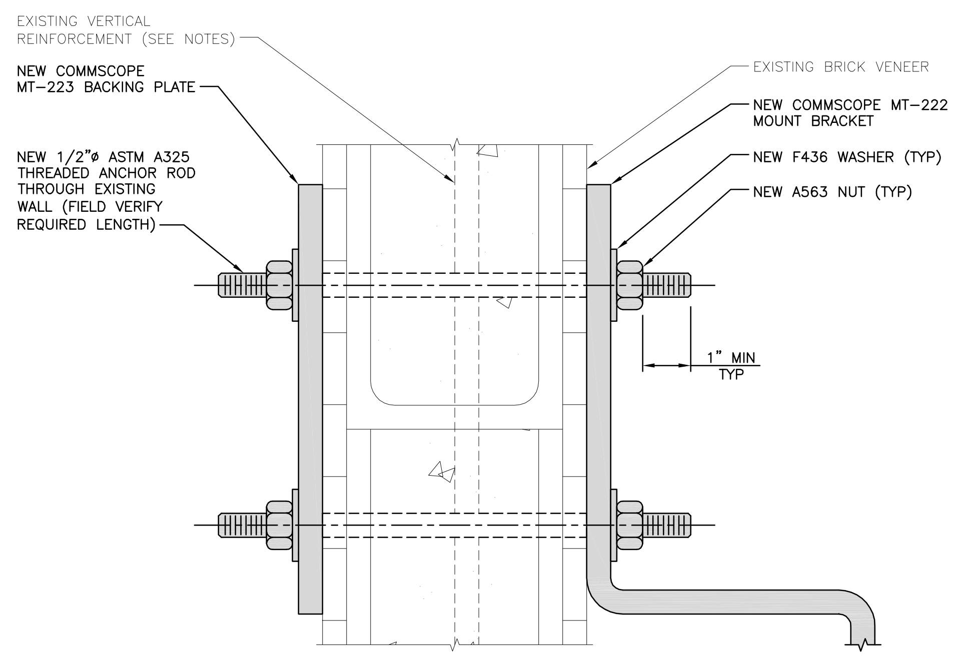
MERIDEN
56 COOPER STREET
MERIDEN, CT 06451

SHEET TITLE
STRUCTURAL DETAILS

SHEET NUMBER
S-1

NOTES

1. CONTRACTOR SHALL NOT INTERFERE WITH EXISTING WALL REINFORCEMENT. WALL MAY NEED TO BE X-RAYED TO DETERMINE REINFORCEMENT LOCATIONS.
2. EXISTING WALL REINFORCEMENT SHALL BE INTACT.
3. CONTRACTOR SHALL NOTIFY EOR IMMEDIATELY IF THE EXISTING WALL DOES NOT MATCH THE DETAIL SHOWN HERE.



DETAIL A
NO SCALE

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

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-3595

PROJECT NO:	403093
DRAWN BY:	TCG
CHECKED BY:	JR

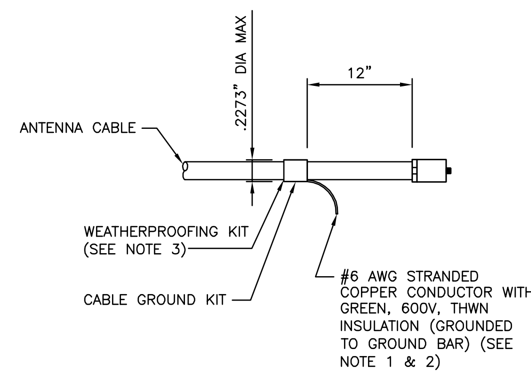
REV	DATE	DESCRIPTION
0	03/30/20	ISSUED FOR FILING

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED PROFESSIONAL ENGINEER
03/30/2020

MERIDEN
56 COOPER STREET
MERIDEN, CT 06451

SHEET TITLE
STRUCTURAL DETAILS

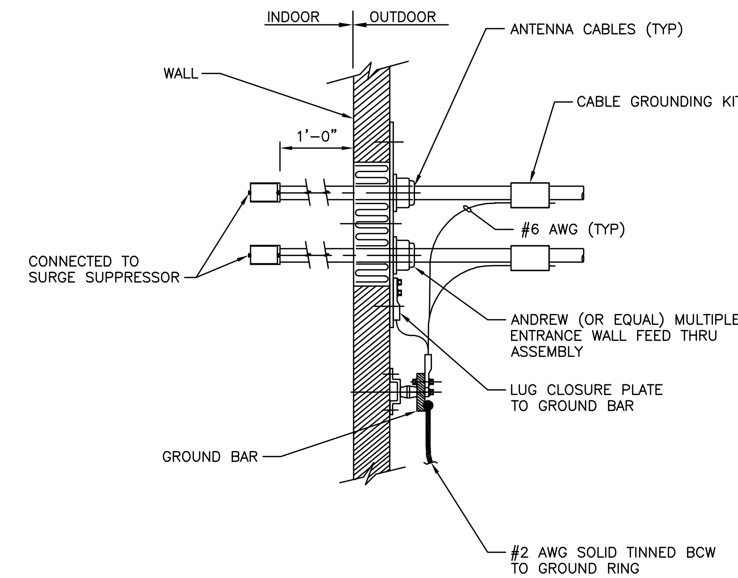
SHEET NUMBER
S-2



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.

DETAIL A
CONNECTION OF CABLE GROUND KIT TO ANTENNA CABLE
NO SCALE



CABLE INSTALLATION WITH WALL FEED THRU ASSEMBLY
NO SCALE

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

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211
PHONE: (913) 458-3595

PROJECT NO:	403093
DRAWN BY:	TCG
CHECKED BY:	JR

REV	DATE	DESCRIPTION
0	03/30/20	ISSUED FOR FILING

STATE OF CONNECTICUT
MARK P. STILES
24358
LICENSED
PROFESSIONAL ENGINEER
03/30/2020

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MERIDEN
56 COOPER STREET
MERIDEN, CT 06451

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-1

DESIGN BASIS

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

GENERAL CONDITIONS

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

THERMAL & MOISTURE PROTECTION

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

SUBMITTALS

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

STEEL

1. MATERIAL:

WIDE FLANGE:	ASTM A572, GR 50
TUBING:	ASTM A500, GR C
PIPE:	ASTM A53, GR B
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.

CONNECTIONS

1. CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR AND CONSTRUCTED IN ACCORDANCE WITH THE AISC "MANUAL OF STEEL CONSTRUCTION" 13TH EDITION. CONNECTIONS SHALL BE PROVIDED TO CONFORM TO THE REQUIREMENTS OF TYPE 2 CONSTRUCTION UNLESS OTHERWISE DETAILED. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
2. DESIGN CONNECTIONS AT BEAM ENDS FOR 10 KIPS (MIN).
3. ALL BUILDING CONNECTION POINTS ARE TO BE CENTERED OVER BEARING WALLS
4. CONNECTIONS SHALL BE MADE USING ASTM A325 BOLTS (SNUG TIGHT OR SLIP CRITICAL) OR WELDS. IF TENSION CONTROL BOLTS ARE USED, CONNECTIONS SHALL BE DESIGNED FOR SLIP CRITICAL BOLT ALLOWABLE LOAD VALUES.
5. NUT LOCKING DEVICES ARE REQUIRED FOR ALL BOLT ASSEMBLIES.
6. GRATING SHALL BE ATTACHED USING FOR GRATING CLAMPS OR 1/4 INCH FILLET WELDS. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY BE 5/8" DIAMETER GALVANIZED ASTM A307 BOLTS UNLESS OTHERWISE NOTED.
7. ALL BOLTS, ANCHORS, AND MISCELLANEOUS HARDWARE EXPOSED TO WEATHER SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE."
8. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". UPON COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED. SEE NOTE ABOVE.
9. USE THE LARGER OF 1/4 INCH FILLET WELDS OR MINIMUM SIZE PER AISC REQUIREMENTS WHERE NO WELD SIZE IS SHOWN ON THE DRAWINGS.
10. ALL ARC AND GAS WELDING SHALL BE DONE BY LICENSED AND CERTIFIED WELDER IN ACCORDANCE WITH AMERICAN WELDING SOCIETY.
11. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1. UPON THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATINGS SHALL REPAIRED.
12. USE PRECAUTIONS AND PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED METALS.

ANCHORS

1. EXPANSION ANCHORS SHALL BE USED WHERE ATTACHING TO CONCRETE. MASONRY MOUNTS SHALL HAVE INJECTION ADHESIVE ANCHORING.
2. EXPANSION BOLTS SHALL BE HILTI KWIK BOLT 3 OR APPROVED EQUAL. MINIMUM EMBEDMENT SHALL BE 4 INCHES.
3. INJECTION ADHESIVE ANCHORING IN MASONRY WITH VOIDS SHALL BE HILTI HY–70 OR EQUAL WITH THREADED ROD AND SCREEN TUBES TO THE FOLLOWING BASE MATERIALS.

   BRICK WITH HOLES:
   SPACE ANCHORS 2 COMPLETE BRICKS APART MINIMUM.
   MAINTAIN 2 COMPLETE BRICKS OR 16 INCHES FROM FREE EDGES (WHICHEVER IS LESS).
   EMBEDMENT: 3 1/2 INCHES MINIMUM.

   HOLLOW CONCRETE BLOCK:
   USE 50% MORE ANCHORS THAN SHOWN IN DETAIL.
   SPACING: ONE ANCHOR MAXIMUM PER BLOCK CELL.
   MAINTAIN 12 INCH SPACING FROM FREE EDGES.
   EMBEDMENT: THROUGH FACE.

4. INJECTION ADHESIVE ANCHORING IN SOLID MASONRY AND GROUT FILLED BLOCK SHALL BE HILTI HIT HY–200 OR EQUAL WITH THREADED ROD. MAINTAIN 12 INCH SPACING BETWEEN ANCHORS AND ALL FREE EDGES. MINIMUM SPACING BETWEEN ANCHORS IS 8 INCHES.
5. ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SHALL NOT BE INSTALLED IN MORTAR JOINTS.
6. GRATING SHALL BE ATTACHED USING FOR GRATING CLAMPS OR 1/4 INCH FILLET WELDS. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY BE 5/8" DIAMETER GALVANIZED ASTM A307 BOLTS UNLESS OTHERWISE NOTED.

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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PROJECT NO:	403093
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CHECKED BY:	JR

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STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED
PROFESSIONAL ENGINEER
03/30/2020

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MERIDEN
56 COOPER STREET
MERIDEN, CT 06451

SHEET TITLE
NOTES & SPECIFICATIONS

SHEET NUMBER
N-1

ELECTRICAL

1. CONTRACTOR SHALL VERIFY EXISTING ELECTRIC SERVICE TYPE AND CAPACITY AND ORDER NEW ELECTRIC SERVICE FROM LOCAL ELECTRIC UTILITY, WHERE APPLICABLE.
2. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES, AND SHALL BE ACCEPTABLE TO ALL AUTHORITIES HAVING JURISDICTION. WHERE A CONFLICT EXISTS BETWEEN CODES, PLAN AND SPECIFICATIONS, OR AUTHORITIES HAVING JURISDICTION, THE MORE STRINGENT AUTHORITIES SHALL APPLY.
3. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC, FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN AND/OR OTHERWISE REQUIRED.
4. ALL ELECTRICAL CONDUCTORS SHALL BE 100% COPPER AND SHALL HAVE TYPE THHN INSULATION UNLESS INDICATED OTHERWISE.
5. CONDUIT SHALL BE THREADED RIGID GALVANIZED STEEL OR EMT WITH ONLY COMPRESSION TYPE COUPLINGS AND CONNECTORS, ALL MADE UP WRENCH TIGHT.
6. ALL BURIED CONDUIT SHALL BE MINIMUM SCH 40 PVC UNLESS NOTED OTHERWISE, OR AS PER LOCAL CODE REQUIREMENTS.
7. PROVIDE FLEXIBLE STEEL CONDUIT OR LIQUID TIGHT FLEXIBLE STEEL CONDUIT TO ALL VIBRATING EQUIPMENT, INCLUDING HVAC UNITS, TRANSFORMERS, MOTORS, ETC, OR WHERE EQUIPMENT IS PLACED UPON A SLAB ON GRADE.
8. ALL BRANCH CIRCUITS AND FEEDERS SHALL HAVE A SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR BONDED TO ALL ENCLOSURES, PULLBOXES, ETC.
9. CONDUIT AND CABLE WITHIN CORRIDORS SHALL BE CONCEALED AND EXPOSED ELSEWHERE, UNLESS NOTED OTHERWISE.
10. ELECTRICAL MATERIALS INSTALLED ON ROOFTOP SHALL BE LISTED FOR NEMA 3R USE. –AND ALL WIRING WITHIN A VENTILATION DUCT SHALL BE LISTED FOR SUCH USE. IN GENERAL WIRING METHODS WITHIN A DUCT SHALL BE AN MC CABLE WITH SMOOTH OR CORRUGATED METAL JACKET AND HAVE NO OUTER COVERING OVER THE METAL JACKET. INTERLOCKED ARMOR TYPE OF MC CABLE IS NOT ACCEPTABLE FOR THIS APPLICATION. CONTRACTOR CAN ALSO USE TYPE MI CABLE IN THE VENTILATION DUCT PROVIDED IT DOES NOT HAVE ANY OUTER COVERINGS OVER THE METAL EXTERIOR.
11. WIRING DEVICES SHALL BE SPECIFICATION GRADE, AND WIRING DEVICE COVER PLATES SHALL BE PLASTIC WITH ENGRAVING AS SPECIFIED.
12. GROUNDING SYSTEM RESISTANCE SHALL BE MEASURED, RECORDED, AND DATED USING MEGGER DET14 OR SIMILAR INSTRUMENT. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION.
13. COORDINATE WITH BUILDING MANAGEMENT BEFORE PERFORMING ANY WORK INVOLVING EXISTING SYSTEMS OR EQUIPMENT IN ORDER TO DETERMINE THE EFFECT, IF ANY, ON OTHER TENANTS WITHIN THE BUILDING, AND TO DETERMINE THE APPROPRIATE TIME FOR PERFORMING THIS WORK.
14. THE CONTRACTOR SHALL BE REQUIRED TO VISIT THE SITE PRIOR TO SUBMITTING BID IN ORDER TO DETERMINE THE EXTENT OF THE EXISTING CONDITIONS.
15. ALL CONDUCTOR ENDS SHALL BE TAGGED AND ELECTRICAL EQUIPMENT LABELED WITH ENGRAVED IDENTIFICATION PLATES.
16. CONTRACTOR IS RESPONSIBLE FOR ALL CONTROL WIRING AND ALARM TIE–INS.

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).

CABLE TRAY

1. CABLE TRAY SHALL BE MADE OF EITHER CORROSION RESISTANT METAL OR WITH A CORROSION RESISTANT FINISH.
2. CABLE TRAY SHALL BE OF LADDER TRAY TYPE WITH FLAT COVER CLAMPED TO SIDE RAILS.
3. CABLE LADDER SHALL BE SIZED TO FIT ALL CABLES IN ACCORD WITH NEC AND NEMA 11–15–84.
4. CABLE LADDER TRAYS SHALL BE NEMA CLASS 12A BY PW INDUSTRIES, INC OR EQUAL.
5. CABLE LADDER TRAY SHALL BE SUPPORTED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
6. ALL WORKMANSHIP SHALL CONFORM TO THESE REQUIREMENTS AND ALL LOCAL CODES AND STANDARDS TO ENSURE SAFE AND ADEQUATE GROUNDING SYSTEM.

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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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
(A)	KEY NOTES

FENCE	—— X —— X —— X —— X —— X ——
LEASE AREA	— — — — — — — — — — — — — — —
ICE BRIDGE	
CABLE TRAY	
GAS LINE	—— G —— G —— G —— G —— G ——
UNDERGROUND ELECTRICAL/TELCO	—— E/T —— E/T —— E/T —— E/T ——
UNDERGROUND ELECTRICAL/CONTROL	—— E/C —— E/C —— E/C —— E/C ——
UNDERGROUND ELECTRICAL	—— E —— E —— E —— E —— E ——
UNDERGROUND TELCO	—— T —— T —— T —— T —— T ——
PROPERTY LINE (PL)	—— — — —— — — —— — — —— — — ——

ABBREVIATIONS

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

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SHEET NUMBER

N-3

REFERENCE CUTSHEETS

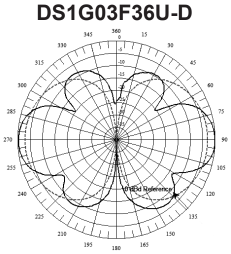
VHF Omni Antennas (160-222 MHz)

dbSpectra

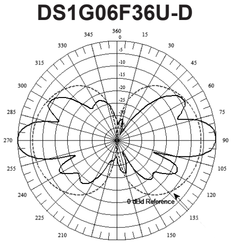
		160-174 MHz						217-222 MHz									
	Model Number	DS1G03F36U-N	DS1G03F36U-D	DS1G06F36U-N	DS1G06F36U-D	DS1G03F36D-N	DS1G03F36D-D	DS2C00F36U-N	DS2C00F36U-D	DS2C03F36U-N	DS2C03F36U-D	DS2C06F36U-N	DS2C06F36U-D	DS2C00F36D-N	DS2C00F36D-D	DS2C03F36D-N	DS2C03F36D-D
	Input Connector	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN	N(F)	7/16 DIN
	Type	Single		Single		Dual		Single		Single		Single		Dual		Dual	
ELECTRICAL	**Bandwidth**, MHz	14		14		14		5		5		5		5		5	
ELECTRICAL	**Power**, Watts	500		500		350		500		500		500		350		350	
ELECTRICAL	**Gain**, dBd	3		6		3		0		3		6		0		3	
ELECTRICAL	**Horizontal Beamwidth**, degrees	360		360		360		360		360		360		360		360	
ELECTRICAL	**Vertical Beamwidth**, degrees	30		16		30		60		30		16		60		30	
ELECTRICAL	**Beam Tilt**, degrees	0		0		0		0		0		0		0		0	
ELECTRICAL	**Isolation (minimum)**, dB	N/A		N/A		30		N/A		N/A		N/A		30		30	
MECHANICAL	**Number of Connectors**	1		1		2		1		1		1		2		2	
MECHANICAL	**Flat Plate Area**, ft²(m²)	2.53 (0.24)		4.38 (0.41)		4.5 (0.42)		1.9 (0.18)		1.9 (0.18)		2.58 (0.24)		2.4 (0.22)		4.1 (0.38)	
MECHANICAL	**Lateral Windload Thrust**, lbf(N)	95 (423)		164 (730)		169 (752)		53 (236)		69 (307)		108 (480)		90 (400)		169 (752)	
MECHANICAL	**Survival Wind Speed**																
MECHANICAL	**without ice**, mph(kph)	110 (177)		75 (121)		75 (121)		222 (357)		172 (277)		110 (177)		130 (209)		75 (121)	
MECHANICAL	**with 0.5" radial ice**, mph(kph)	93 (150)		60 (97)		65 (105)		193 (311)		150 (241)		96 (154)		115 (185)		65 (105)	
MECHANICAL	**Mounting Hardware** included	DSH3V3R		DSH3V3N		DSH3V3N		DSH2V3R		DSH2V3R		DSH3V3N		DSH3V3R		DSH3V3N	
DIMENSIONS	**Length**, ft(m)	12.7 (3.9)		21.9 (6.7)		22.3 (6.8)		7.7 (2.3)		9.9 (3)		18.1 (5.5)		13.6 (4.1)		24.3 (7.4)	
DIMENSIONS	**Radome O.D.**, in(cm)	3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)		3 (7.6)	
DIMENSIONS	**Mast O.D.**, in(cm)	2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)		2.5 (6.4)	
DIMENSIONS	**Net Weight** w/o bracket, lb(kg)	37 (16.8)		60 (27.2)		63 (28.6)		19 (8.6)		26 (11.8)		47 (21.3)		40 (18.1)		70 (31.8)	
DIMENSIONS	**Shipping Weight**, lb(kg)	67 (30.4)		90 (40.8)		93 (42.2)		39 (17.7)		56 (25.4)		77 (34.9)		70 (31.8)		100 (45.4)	

VERTICAL PATTERNS

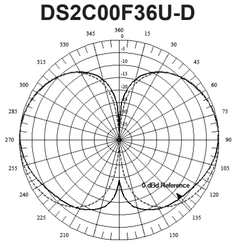
DS1G03F36U-N
DS1G03F36U-D



DS1G06F36U-N
DS1G06F36U-D



DS2C00F36U-N
DS2C00F36U-D



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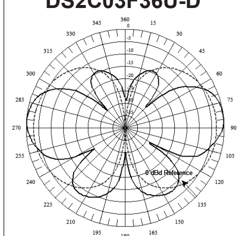

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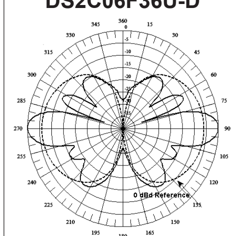

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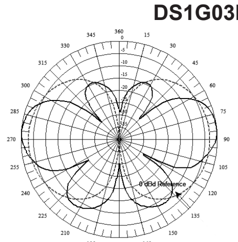
DS1G03F36D-D



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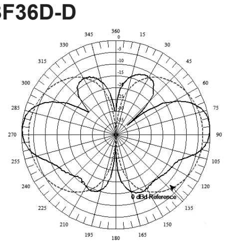

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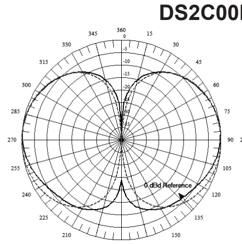
DS2C00F36D-D



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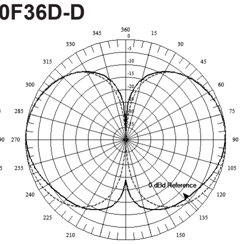

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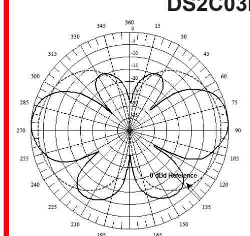
DS2C03F36D-N
DS2C03F36D-D



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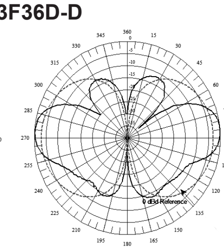

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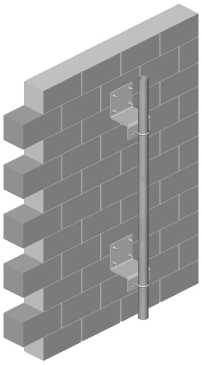
MT-222



Adjustable Wall Mount for solid walls, 6 in stand-off

Product Classification

Product Type	Wall mount kit

Dimensions

Height	203.2 mm | 8.0 in
Length	152.4 mm | 6.0 in
Pipe Outer Diameter	2 3/8 in | 2 7/8 in | 3 1/2 in | 4 1/2 in
Weight	20.6 kg | 45.5 lb
Width	203.2 mm | 8.0 in

Environmental Specifications

Wind Rating	For Specifications, please contact steelproducts@commscope.com or call 800-255-1479

General Specifications

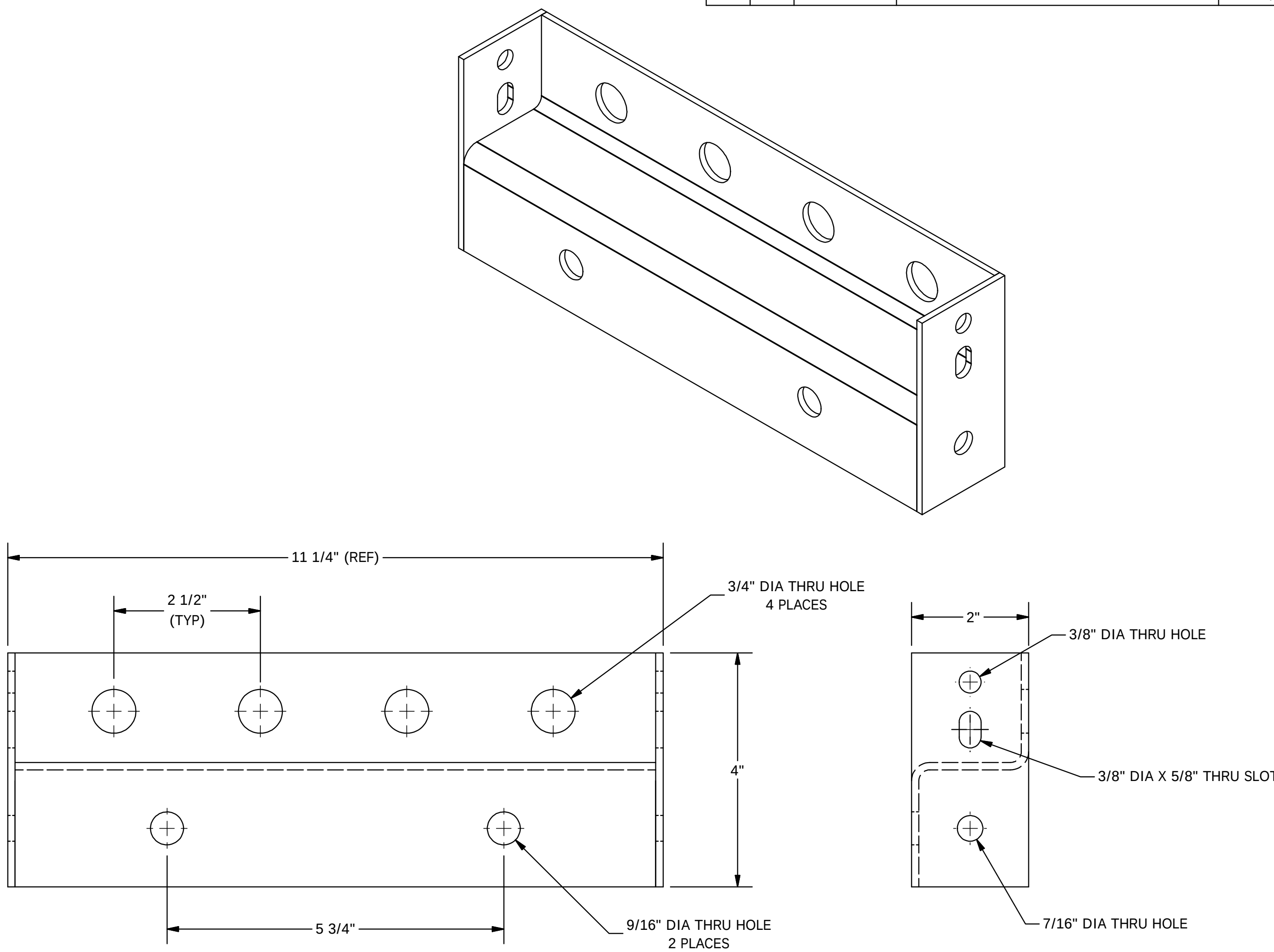
Mounting	Solid walls
Includes	Backing plates or anchors | Wall brackets (2)
Material Type	Hot dip galvanized steel
Package Quantity	2
Stand-off Distance	152.4 mm | 6.0 in

Outline Drawing

Regulatory Compliance/Certifications

Agency	**Classification**
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	1	SP1586	WALL MOUNT BRACKET FOR 4 RUNS OF COAX	11 1/4 in	2.81	2.81



REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	CHANGED SPACING ON 9/16" HOLES		CEK	4/30/2015

REVISION HISTORY

TOLERANCE NOTES

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

DESCRIPTION
WALL MOUNT BRACKET FOR 4 RUNS GALVANIZED

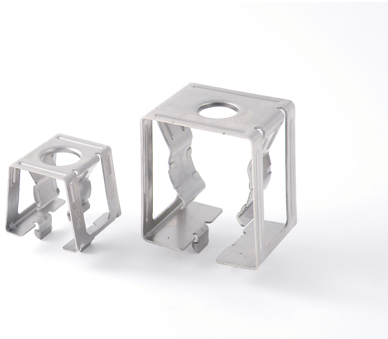
CPD NO.		DRAWN BY	ENG. APPROVAL
5080		KC8 5/16/2012	
CLASS	SUB	DRAWING USAGE	CHECKED BY
81	02	CUSTOMER	BMC 4/30/2015

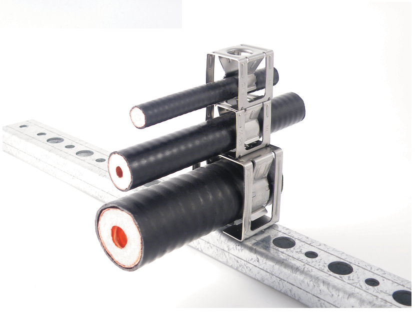
SITE PRO 1
A valmont COMPANY
Engineering Support Team:
1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

PART NO. **SP1586**

DWG. NO. **SP1586**

MonoBloc Stackable Snap-In Hangers (SIC1, SIC2, SIC3, SIC4)





Features:

- Allows cable attachment without the need for hardware
- One-hand mounting
- Stack up to four 1/2”, 7/8” or 1-1/4” cables or three 1-5/8” cables

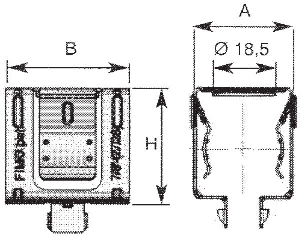
Construction:

- 301 stainless steel

Design Criteria:

- Can be used outdoors or indoors

Part #	AT&T	Cable Size	U of M	A	B	H
SIC1	CEQ.11469	1/2”	10 pack	1-1/4”	1-9/16”	1-1/2”
SIC2	ANT.13860	7/8”	10 pack	1-1/4”	1-9/16”	1-1/2”
SIC3	ANT.13859	1-1/4”	10 pack	2-1/4”	1-3/4”	2-5/8”
SIC4	ANT.12719	1-5/8”	10 pack	2-1/4”	1-3/4”	2-5/8”



ATTACHMENT C – STRUCTURAL ANALYSIS REPORT

STRUCTURAL ANALYSIS OF PROPOSED ANTENNA MOUNT AND PENTHOUSE WALL

MERIDEN COOPER ST.
46 COOPER ST.
MERIDEN, CT 06451

B&V PROJECT NO. 403093.2000.2200
PROJECT NAME: LMR EPC PHASE 1.5

PREPARED FOR

EVERSOURCE
ENERGY

107 SELDEN STREET
BERLIN, CT 06037

BLACK & VEATCH
Building a world of difference.

BLACK & VEATCH CORPORATION
6800 WEST 115TH ST, SUITE 2292
OVERLAND PARK, KANSAS 66211

March 26, 2020

STATE OF CONNECTICUT
JOSHUA J. RILEY
33208
LICENSED
PROFESSIONAL ENGINEER

03/26/2020
Joshua J. Riley, P.E.
Professional Engineer

TABLE OF CONTENTS

1. PURPOSE

The purpose of this calculation is to evaluate the proposed antenna mount and the existing penthouse wall under proposed loading.

2. REFERENCES

A. 2018 Connecticut State Building Code

B. International Building Code, IBC 2015

C. Structural Standard for Antenna Supporting Structures and Antennas, TIA-222-H

D. American Society of Civil Engineers, ASCE 7-10

E. American Institute of Steel Construction, 14th Edition

F. Site Survey Report Completed by Black & Veatch Corp., dated 1/10/2019

G. Site Photos

3. ASSUMPTIONS

- The existing penthouse walls are assumed to be Masonry wall.

4. CONCLUSION

Design Criteria based on: **2018 Connecticut State Building Code**

Wind

Wind Speed:	135	mph
Exposure Category:	C	
Topographic Factor K_{zt}:	1.00	
Risk Category:	III	

Ice

Ice Thickness:	0.75	inch
Ice Wind:	50	mph

Seismic

Seismic Importance Factor:	1.25
Seismic S_{DS}:	0.195g
Seismic Design Category:	B

4.1 Structural Analysis of Proposed Antenna Mount

Governing Load Combination:	1.2DL+ WL (0 DEG, +X) + 0.5RLL
Max Stress Ratio on Proposed Pipe Mast: Pipe 3.0 STD:	81.3% *
Governing Load Combination:	1.2DL+ WL (0 DEG, +X) + 0.5RLL
Max Stress Ratio on Proposed Wall Mount Anchorage:	54.8% *
The Proposed Antenna Mount Result:	**SUFFICIENT**

Use Pipe 3 STD (O.D. 3.5") pipe x 9'-0" long min., with Commscope MT-222 wall mount bracket. Anchor (4) 1/2" Dia. Thru - Bolts (ASTM A325) drill to the existing penthouse wall or engineer approve equal.

* Note: The % ratio rating per TIA-222-H Section 15.5.

4. CONCLUSION (CONTINUED)

4.2 Structural Analysis of Existing Penthouse Wall

By engineering judgment/inspection, the existing penthouse wall is **SUFFICIENT** to support the proposed loads.

4.3 Disclaimers

This calculation is based on the loading and equipment position provided by client. If the installed loading and/or equipment position are different from the calculation, the calculation is considered invalid.

This certification assumes that all structural members are in good condition. Contractor shall inspect the condition of all relevant members and connectors and report any perceived deficiencies to the engineer prior to installation of any new equipment.

The contractor shall be responsible for the means and methods of construction. It is contractor's responsibility to provide necessary intermediate or temporary support during construction.

Summary of Final Loading

Eversource's Loading

Final Antenna / Equipment							
Equipment Owner	Equipment Elevation (ft)	Mount Location	Position	Type	Quantity	Manufacturer	Model
Eversource	**55**	**Pipe Mount**	**-**	**Omni**	**1**	**dbSpectra**	**(P) dbSpectra DS2C03F36D**

Note:
(P) = Proposed Equipment

5. ANALYSIS & DESIGN

5.1 Structural Analysis of Proposed Antenna Mount

Equipment Dead Load — **EVERSOURCE'S LOADING**

(P) dbSpectra DS2C03F36D	**100.0 lbs**

Owner:	EVERSOURCE	Computed By:	Nattakit S.
Site Name:	MERIDEN COOPER ST.	Date:	2/21/2020
Project No.	403093.2000.2200	Verified By:	K. Hyun
Title:	STRUCTURAL ANALYSIS OF PROPOSED ANTENNA MOUNT AND PENTHOUSE WALL	Date:	2/21/2020

BLACK & VEATCH

Wind Pressure per ASCE 7-10 / IBC 2012 / IBC 2015 / TIA-222-H

ASCE 7-10 Section #

a. Ultimate Velocity Pressure, $q_{z \text{ or }} q_h$ — 29.3.2

Basic Wind Speed, Vult = **135** mph — Fig. 26.5-1A

qz = $0.00256\ Kz\ Kzt\ Kd\ Ke\ Ks\ V^2$ — TIA-222-H

= 0.00256 x 1.19 x 1.00 x 0.95 x 1.00 x 1.00 x 135.00^2 — Sec. 2.6.11.6

qz = 52.80 psf

b. Velocity pressure coefficient, Kz — 29.3.1

Kz = $2.01\ (z/z_g)^{2/\alpha}$ — Exposure Category = **C**

= 2.01 (75 / 900^(2/9.5)

Kz = 1.19 — Height above Ground Level, z = **75** ft — Table 29.3-1

α = 9.50 — z_g = 900.00 ft

c. Topographic Factor, Kzt — 26.8.2

H = **15** ft

μ = 0.00 — Fig. 26.8-1

γ = 0.00 — Hill Shape: **Flat Terrain**

K_1 = 0.00 — Crest Type: **Upwind**

K_2 = $(1 - x / \mu\ Lh)$ — Distance Upwind of crest, Lh = **15** ft

= [1 - 15 / (0.0 x 15)]

K_2 = 0.00 — Distance Upwind to Bldg Site, x = **15** ft

$K_3 = e^{(\gamma z / Lh)}$ — Kzt = $[\ 1 + K_1\ K_2\ \ K_3\ ]^2$ — Eq. 26.8-1

= e^-(0.0 x 75 / 15) — = [1 + 0.00 x 0.00 x 0.00]^2

K_3 = 0.00 — Kzt = 1.00

d. Wind Directionality Factor, Kd — Table 26.6-1

(7) Chimney, Tank & Similar Structures - Round Shape — Kd = 0.95

e. Ground Elevation Factor, Ke — Ke = **1.00** — TIA-222-H Table 2-6

f. Rooftop Wind Speed-up Factor, Ks — Ks = **1.00** — TIA-222-H Sec. 2.6.7

g. Structure Risk Category — **III** — Table 1.5-1

h. Gust Effect Factor, G — G = **0.85** — **26.9**

Wind Load

Wind Velocity Pressure @ z = 75 ft	Q_z =	52.80 psf		**(based on 135 mph wind)**
Gust factor:	G =	0.85		

Wind Load on Members:

Proposed Pipe Mast: Pipe 3.0 STD

Depth:	Dp=	3.5 in.		
Force Coefficient:	Ca=	0.93		
Wind Load:	Pp=	Qz*G*Ca*Dp	=	**12.2 plf**

Wind Load (Continued)

Wind Load on Equipment:

(P) dbSpectra DS2C03F36D

Dimensions:	B=	0.25	ft.		
	H=	24.30	ft.		
Force Coefficient:	Ca=	1.20			
Wind Load:	Pa=	Qz*G*Ca*B*H		=	**327.2 lbs.**
				=	**13.5 plf**

Note:

30° and 60° application of wind load will be considered directly in the load combinations by applying load factors of 0.866 (from cos 30 or sin 60) and 0.5 (from sin 30 or cos 60)
60mph service wind will also be considered directly in the load combinations by applying a reduction factor of **0.198** based on (60mph)^2 / (135mph)^2.

ASCE 7-10 Section #

Ice Dead Load

Design Ice Thickness @ z = 33 ft **T_i = 0.75 in.** (Per TIA Annex B) — Fig. 10.2

Note: The design ice thickness shall be escalated with height when calculating the ice weight and wind force on the ice.

Platform and antennas height elevation, Z: 75 ft

Factored Ice Thickness, Tiz at Z for Ice Weight Calculations: — 10.4.6

$T_{iz} = 2.0*T_i*I_i*f_z*(K_{zt})^{0.35}$ $\boxed{T_{iz} = \textbf{2.04 in}}$ — Eq. 10.4-5

where,

Importance Factor for Ice Thickness, I_i — 10.4.4

Structure Risk Category: III — Table 1.5-1

I_i = 1.25 (multiplier on ice thickness) — Table 1.5-2

Height Factor, f_z — 10.4.3

$f_z = (Z/33)^{0.10}$ = (75 / 33) ^0.10 = 1.09 — Eq. 10.4-4

Topographic Factor, K_{zt} — 10.4.5

$K_{zt} = [\,1 + K_1\,K_2\,K_3\,]^2$ = [1 + 0.00 x 0.00 x 0.00] ^2 = 1.000 — Eq. 26.8-1

K_1 = 0.00 μ = 0.00 γ = 0.00 — Fig. 26.8-1

Exposure Category =	C	
Hill Shape =	Flat Terrain	
Crest Type =	Upwind	
Hill Height, H =	15	ft
Distance Upwind of crest, Lh =	15	ft
Distance Upwind to Bldg Site, x =	15	ft

(Use same values from wind calcs)

$K_2 = (1 - x / \mu\, L_h)$ = [1 - 15 / (0.0 x 15)] = 0.00 — Fig. 26.8-1

$K_3 = e^{-(\gamma z / Lh)}$ = e^-(0.0 x 75 / 15) = 0.00 — Fig. 26.8-1

Ice Topographic Factor, $(K_{zt})^{0.35}$ = (1.000) ^0.35 = 1.000 — 10.4.5

The weight of ice shall be based on a unit weight of 56 pcf. (Per TIA-222-G 2.6.8) — 10.4.1

Therefore

W_{ice} = 56pcf * Tiz /12= **9.50 psf**

Ice Dead Load (Continued)

Design Ice Thickness @ z = 33 ft Ti = 0.75 in.

Factored ice thickness @ z = 75 ft Tiz = 2.04 in.

<u>Ice Dead Load on Members:</u>

Proposed Pipe Mast: Pipe 3.0 STD

Dimensions: Dia= 3.5 in. Dc= 3.50

Ice cross sectional area: Aiz= π Tiz (Dc + Tiz) = 35.40 in.^2

DLice= Aiz * 56pcf * ft2 / 144 in2 = **13.8** **plf**

Ice Dead Load (Continued)

Ice Dead Load on Equipment:

(P) dbSpectra DS2C03F36D

Dimensions w/out ice:	B=	3 in.	W=	3 in.
	H=	291.6 in.	Dc=	4.24 in.
Ice cross sectional area:	Aiz=	π Tiz (Dc + Tiz) =	40.15 in^2	
Ice Dead Load:	DLice=	[Aiz(H+2Tiz)+2Tiz B D]*56pcf /1728 in^3=		**385.9 lbs**
				15.9 plf

Ice Wind Pressure per ASCE 7-10 / IBC 2012 / IBC 2015 / TIA-222-H

ASCE 7-10 Section #

a. Ultimate Velocity Pressure, $q_{z\ or}\ q_h$ — 29.3.2

Basic Wind Speed, Vult = **50** mph — Fig. 10-2

qz = 0.00256 Kz Kzt Kd Ke Ks V^2 — TIA-222-H

= 0.00256 x 1.19 x 1.00 x 0.95 x 1.00 x 1.00 x 50.00^2 — Sec. 2.6.11.6

qz = 7.24 psf

b. Velocity pressure coefficient, Kz — 29.3.1

Kz = $2.01\ (z/z_g)^{2/\alpha}$ — Exposure Category = **C**

= 2.01 (75 / 900^(2/9.5)

Kz = 1.19 — Height above Ground Level, z = 75 ft — Table 29.3-1

α = 9.50 — z_g = 900.00 ft

c. Topographic Factor, Kzt — 26.8.2

H = 15 ft

μ = 0.00 — Fig. 26.8-1

γ = 0.00 — Hill Shape: Flat Terrain

K_1 = 0.00 — Crest Type: Upwind

K_2 = (1 - x / μ Lh) — Distance Upwind of crest, Lh = 15 ft

= [1 - 15 / (0.0 x 15)]

K_2 = 0.00 — Distance Upwind to Bldg Site, x = 15 ft

$K_3 = e^{(\gamma z / Lh)}$ — Kzt = $[\ 1 + K_1\ K_2\ \ K_3\ ]^2$ — Eq. 26.8-1

= e^-(0.0 x 75 / 15) — = [1 + 0.00 x 0.00 x 0.00]^2

K_3 = 0.00 — Kzt = 1.00

d. Wind Directionality Factor, Kd — Table 26.6-1

(7) Chimney, Tank & Similar Structures - Round Shape — Kd = 0.95

e. Ground Elevation Factor, Ke — Ke = 1.00 — TIA-222-H Table 2-6

f. Rooftop Wind Speed-up Factor, Ks — Ks = 1.00 — TIA-222-H Sec. 2.6.7

g. Structure Risk Category: III — Table 1.5-1

h. Gust Effect Factor, G — G = 0.85 — **26.9**

Ice Wind Load

Wind Velocity Pressure @ z = 75 ft	$Q_{z\ ice}$ =	7.24 psf	**(based on 50 mph wind)**
Gust factor:	G =	0.85	

Ice Wind Load on Members:

Proposed Pipe Mast: Pipe 3.0 STD

Member Depth:	Dp=	3.5 in. + 2 Tiz =	8 in.
Force Coefficient:	Ca=	0.93	
Ice wind load:	Pp=	Qz ice*G*Ca*Dp =	**3.6 plf**

Ice Wind Load (Continued)

Ice Wind Load on Equipment:

(P) dbSpectra DS2C03F36D

Dimensions:	B=	0.25	ft + (2 Tiz) / 12 =	0.59	ft.
	H=	24.30	ft + (2 Tiz) / 12 =	24.64	ft.
Force Coefficient:	Ca=	1.20			
Wind Load:	Pa=	Qz ice*G*Ca*B*H =		**107.3**	**lbs.**
			=	**4.4**	**plf**

Note:

30° and 60° application of wind load will be considered directly in the load combinations by applying load factors of 0.866 (from cos 30 or sin 60) and 0.5 (from sin 30 or cos 60)

Seismic Load

ASCE 7-10 Section #

The Equipment is considered a Non-Structural Component per section 13.3 of ASCE 7-10.

Location Information: Latitude: N 41.532722 Longitude: W 72.805667

$F_p = 0.4\ a_p\ S_{DS}\ W_p\ (1 + 2\ z/h) / (R_p/I_p)$ = 0.4 x 1.00 x 0.195 Wp (1 + 2 x 1.00) / (2.50 / 1.25) — eq. 13.3-1

Fp = 0.117 Wp

$F_p = 1.6\ S_{DS}\ I_p\ W_p$ = 1.6 x 0.195 x 1.25 Wp — eq. 13.3-2

Fp = 0.390 Wp (maximum)

$F_p = 0.30\ S_{DS}\ I_p\ W_p$ = 0.30 x 0.195 x 1.25 Wp — eq. 13.3-3

Fp = 0.073 Wp (minimum)

Use F_p = 0.117 W_p

IBC-2015

$S_{DS} = 2/3\ S_{MS}$ — eq. 16-37

= 2 / 3 (0.293)

S_{DS} = 0.195 g

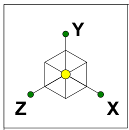
$S_{MS} = F_a\ S_S$ — eq. 16-39

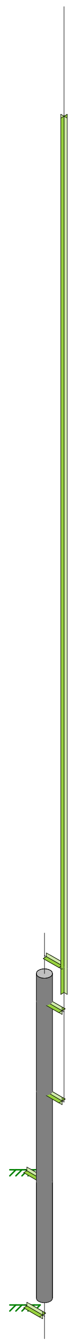
= 1.60 x 0.183

S_{MS} = 0.293

SDC =	B	Seismic Design Category	
S_S =	0.183g	maximum spectral response at short period per USGS Seismic Data	
Fa =	1.600	short period site coefficient (at 0.2-s period)	Tbl.1613.3.3(1)
			ASCE 7-10
Ip =	1.25	component importance factor	sec. 13.1.3
Rp =	2.50	component response modification factor	Table 13.6-1
ap =	1.00	component amplification factor	Table 13.6-1
z/h =	1.00	maximum value	sec. 13.1.3

Equipment	DL on each point (lb/pt)	Vertical Seismic Load $W_p\ S_{DS}$ (lb)	Horiz Seismic Load $W_p\ F_p$ (lb)
(P) dbSpectra DS2C03F36D	100.0	19.50	11.70





Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Members in 3D
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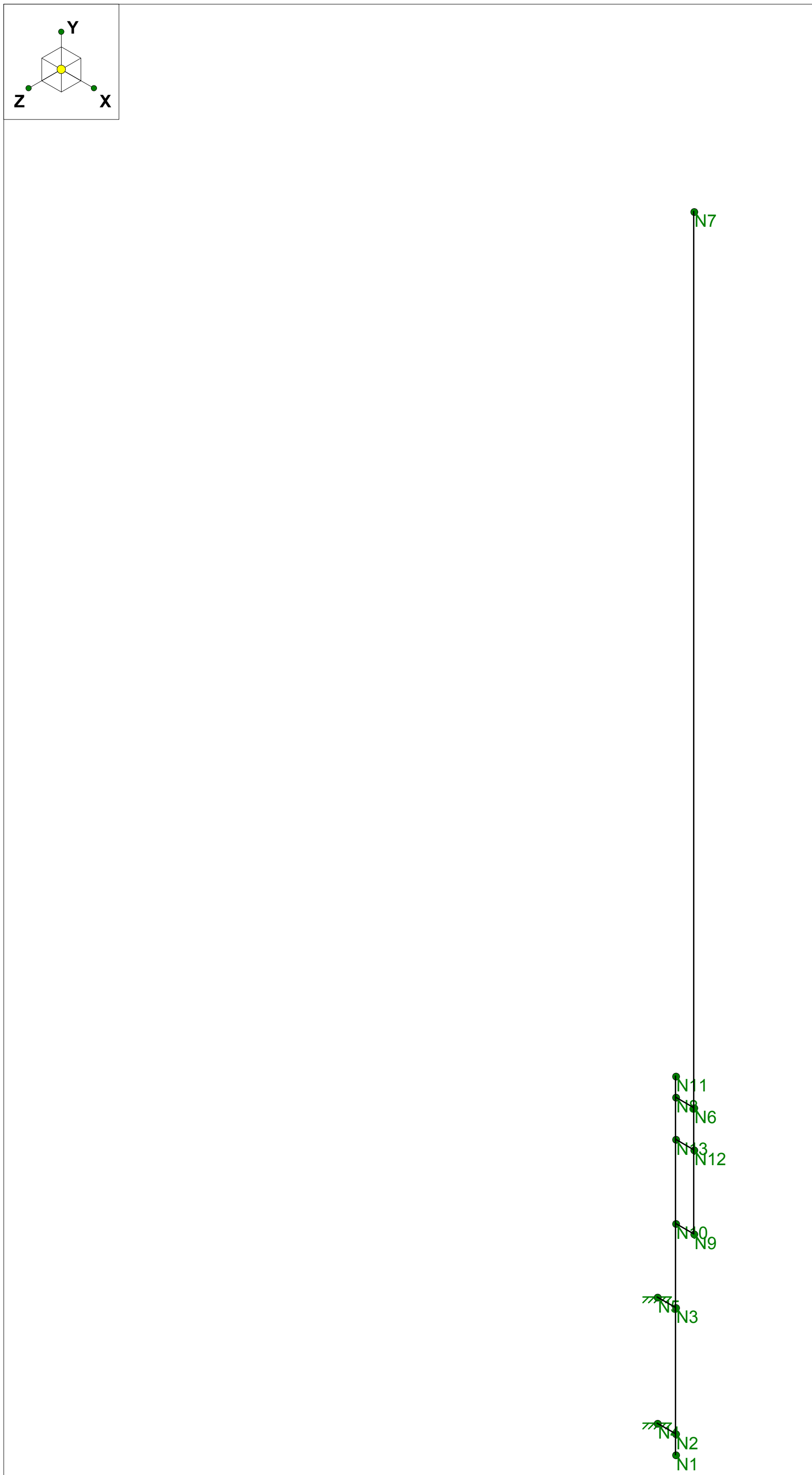

Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Joint Numbers
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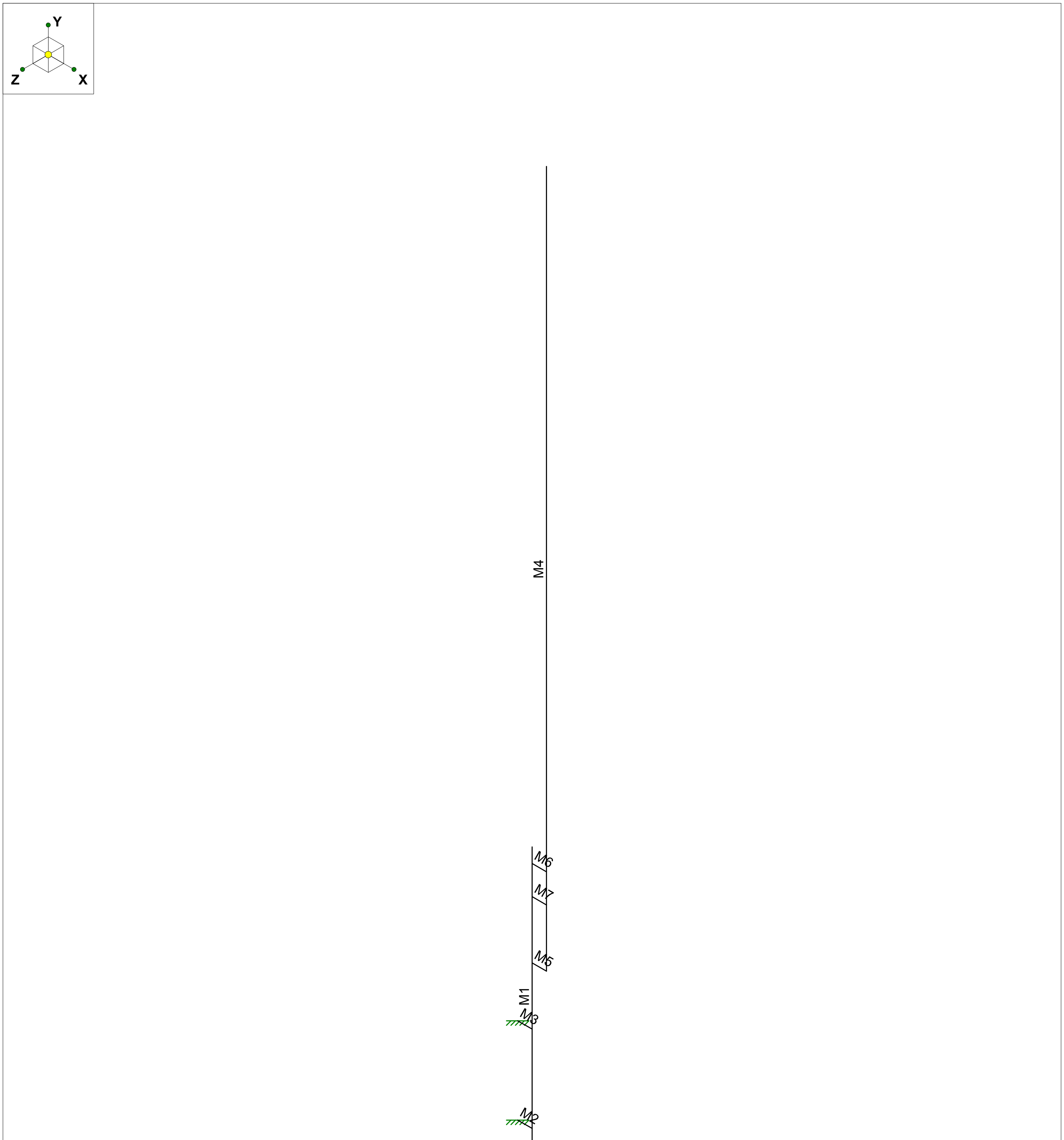

Envelope Only Solution

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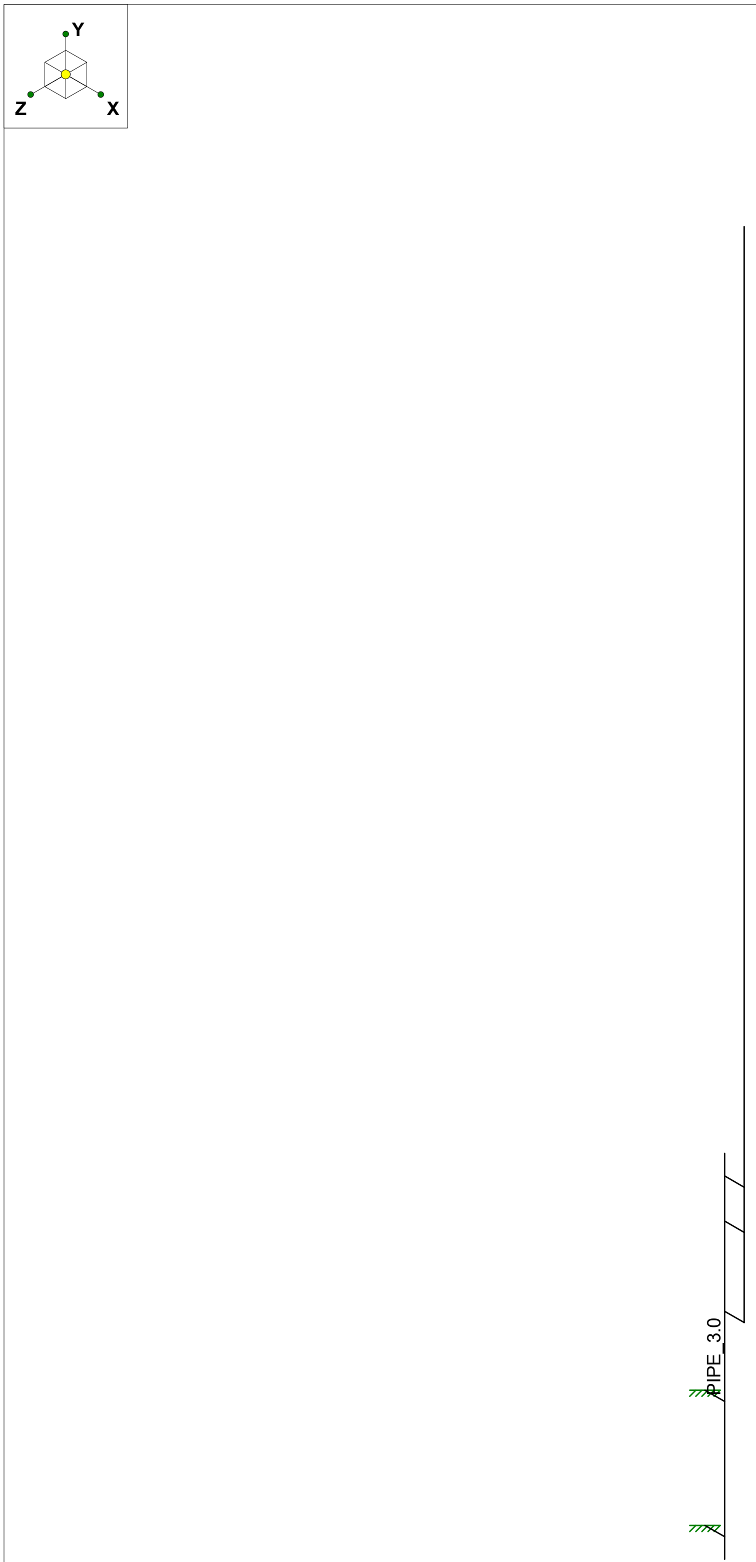
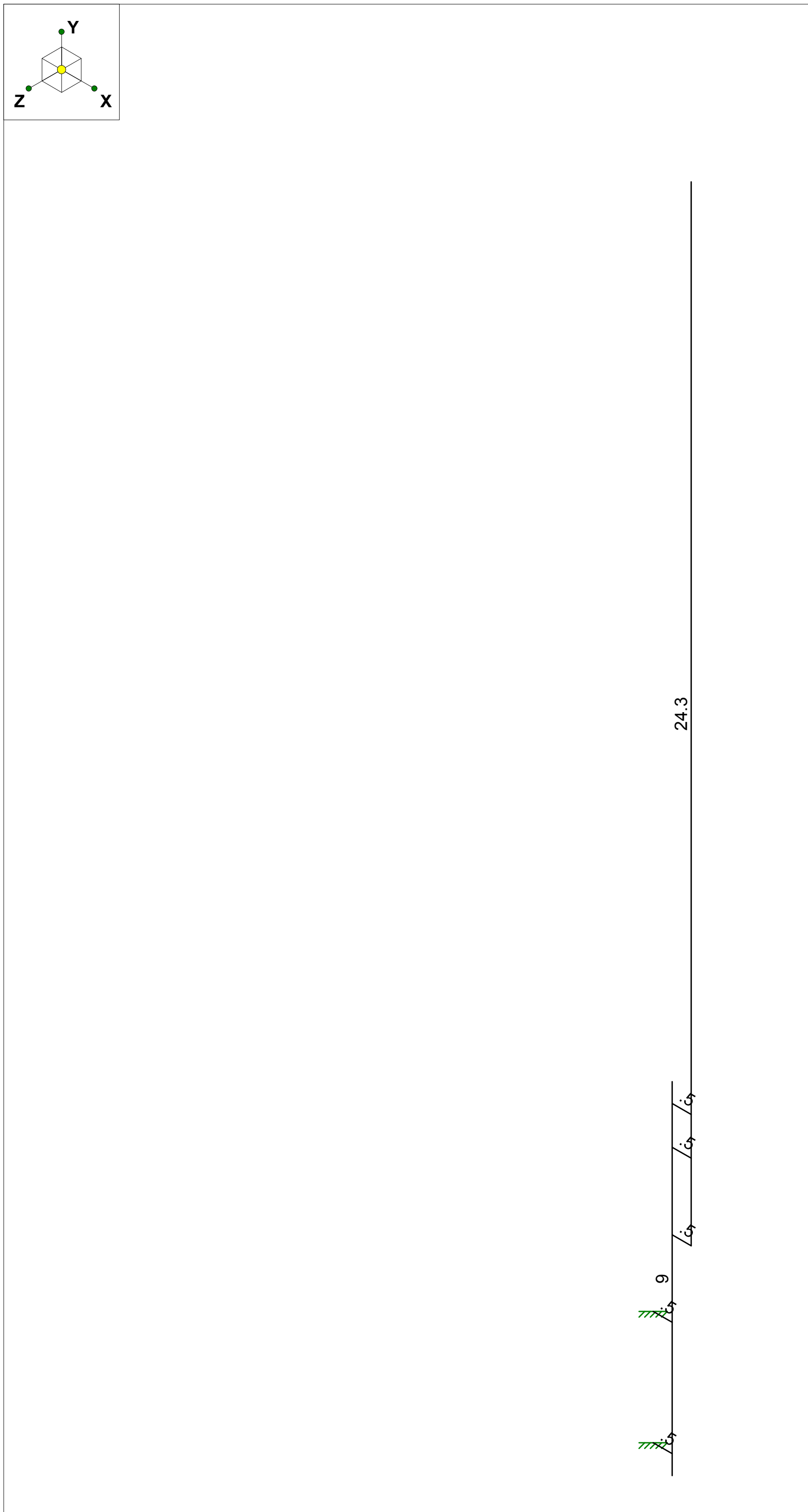


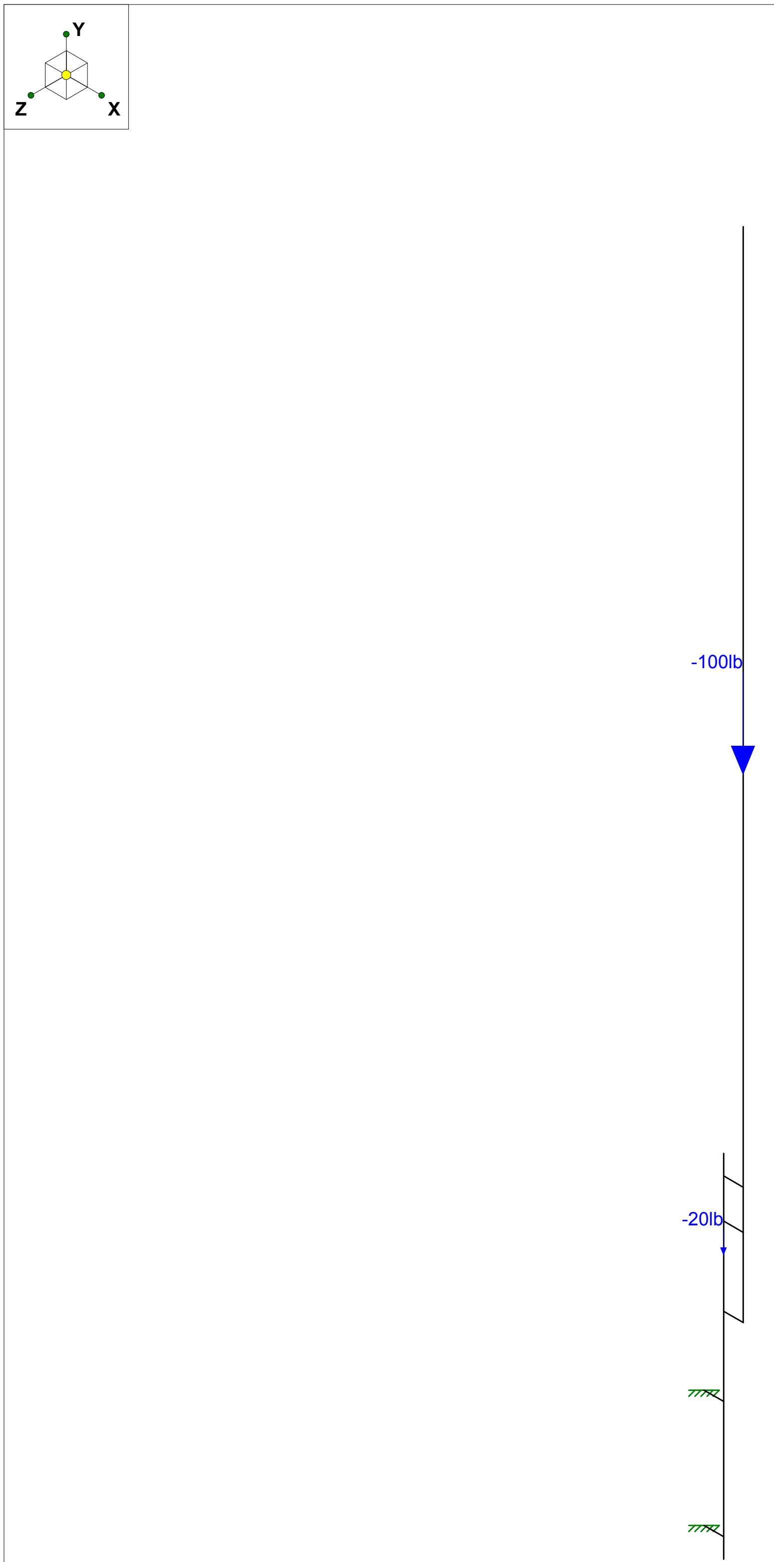
Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Member Shape
T. Eakkalak		Jan 9, 2020 at 1:14 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



Member Length (ft) Displayed
Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Member Length
T. Eakkalak		Jan 9, 2020 at 1:03 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



Loads: BLC 1, DL
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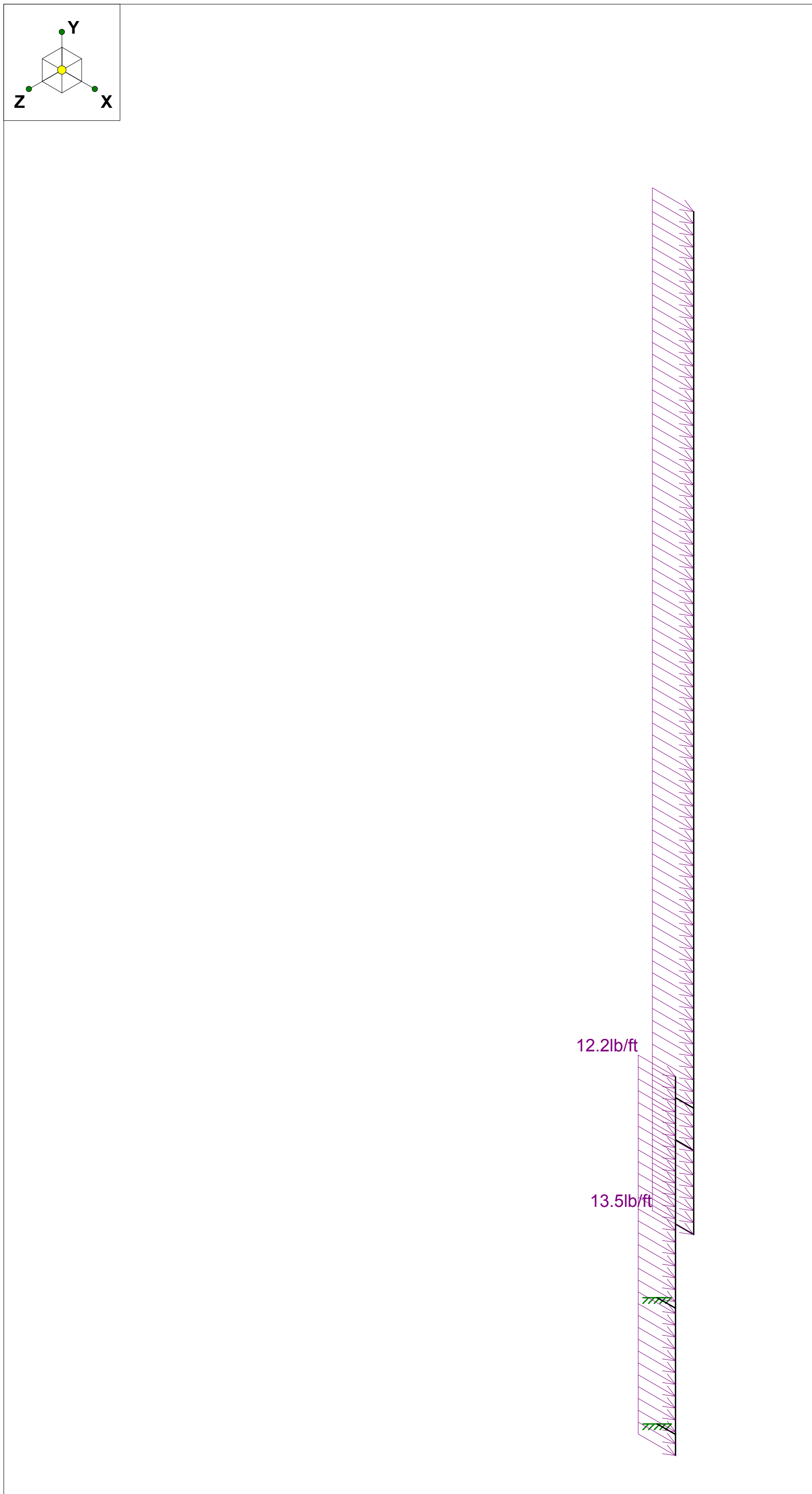
Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Appurtenance Loads
T. Eakkalak		Jan 9, 2020 at 1:05 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



Loads: BLC 3, Wind - 0 Deg (+X)
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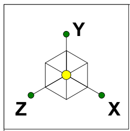
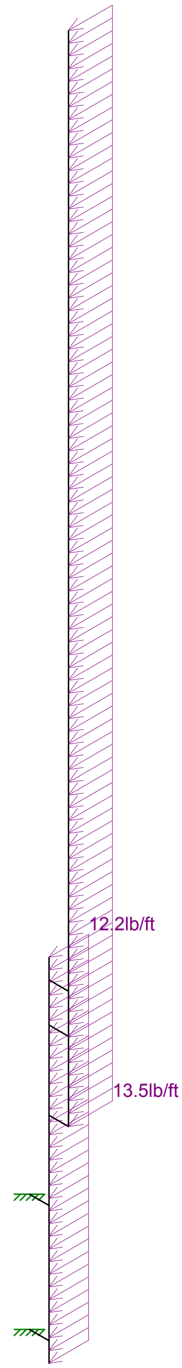
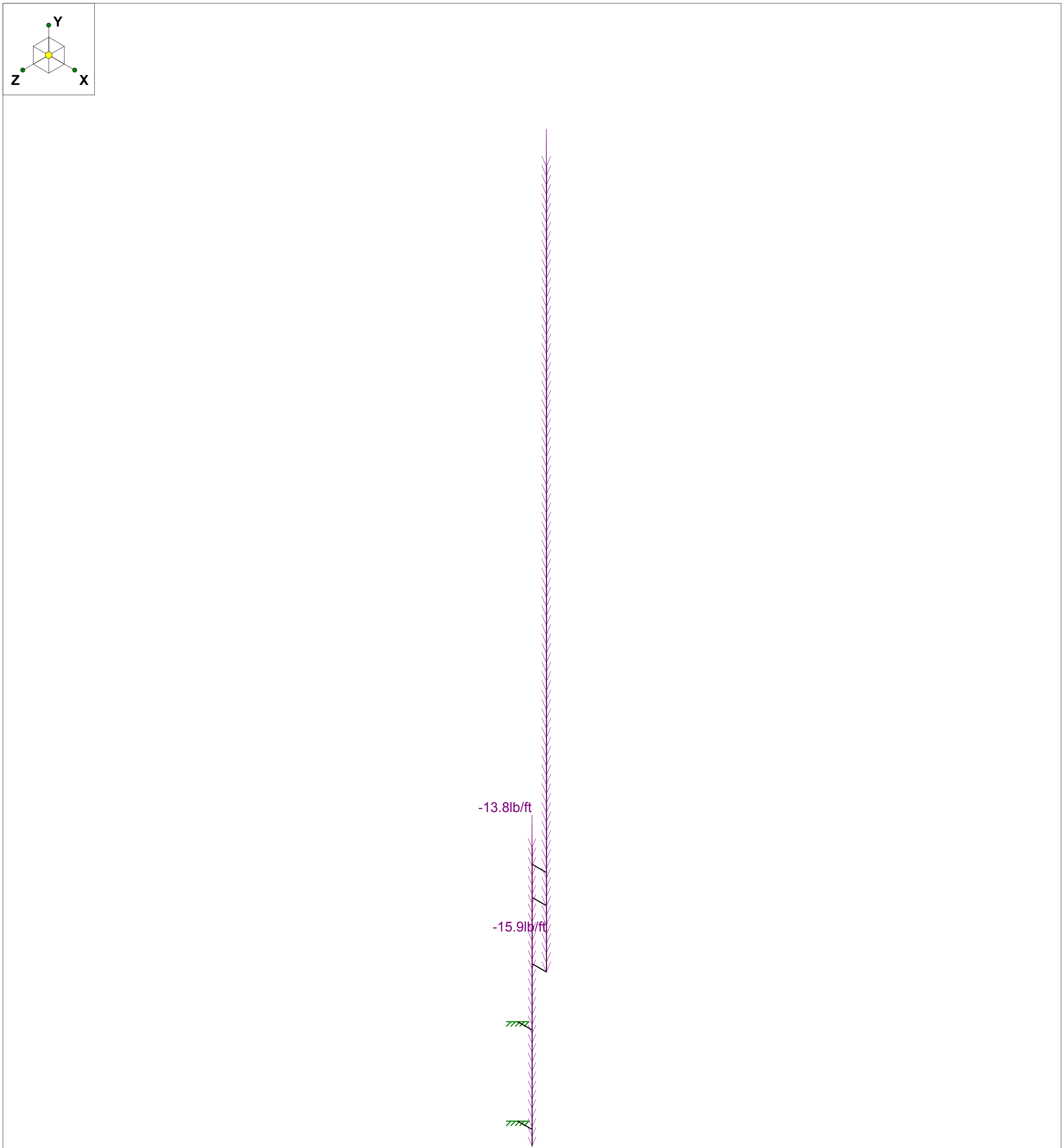
Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Wind Loads - X Direction
T. Eakkalak		Jan 9, 2020 at 1:06 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...





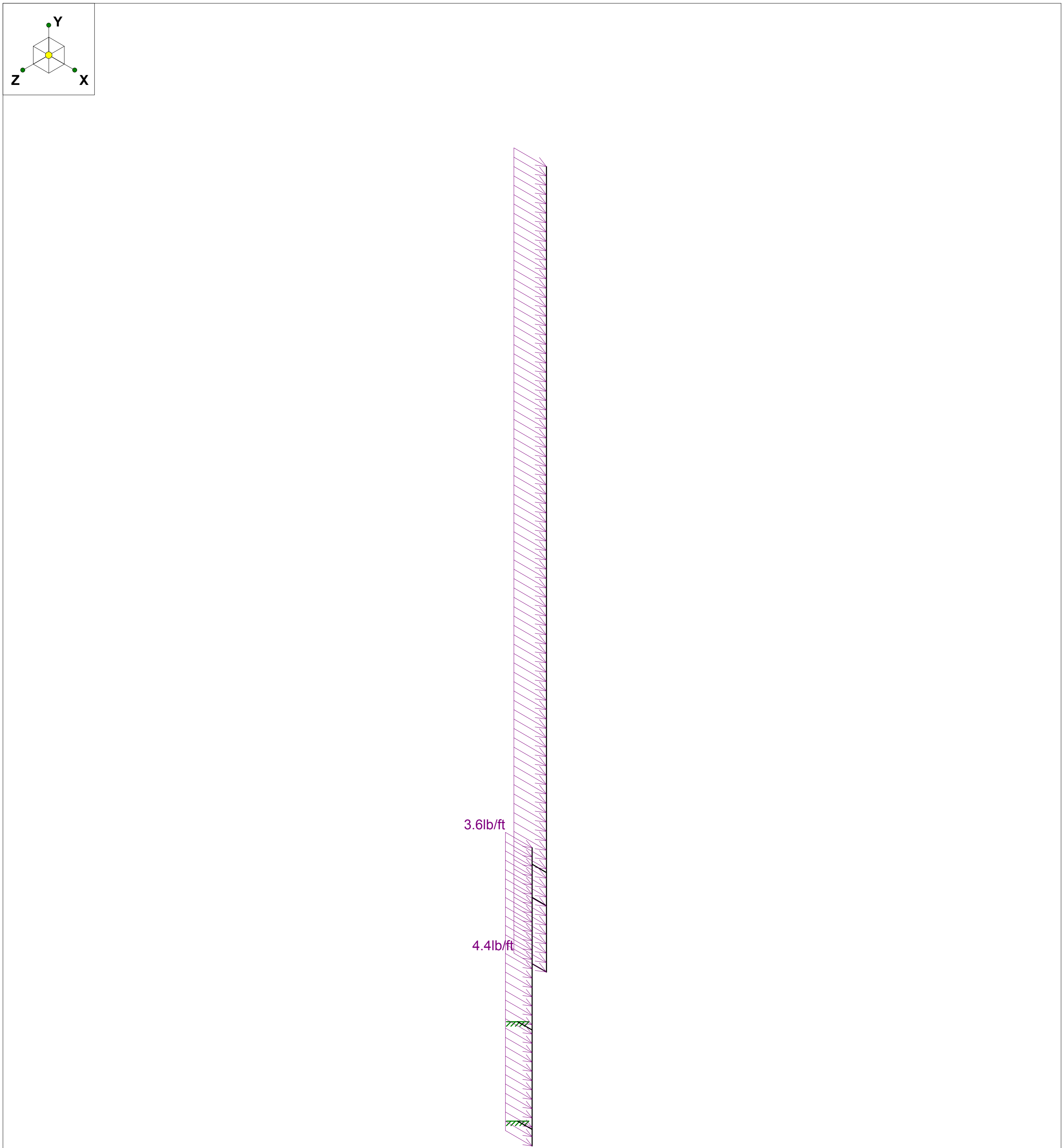
Loads: BLC 4, Wind - 90 Deg (+Z)
Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Wind Loads - Z Direction
T. Eakkalak		Jan 9, 2020 at 1:06 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



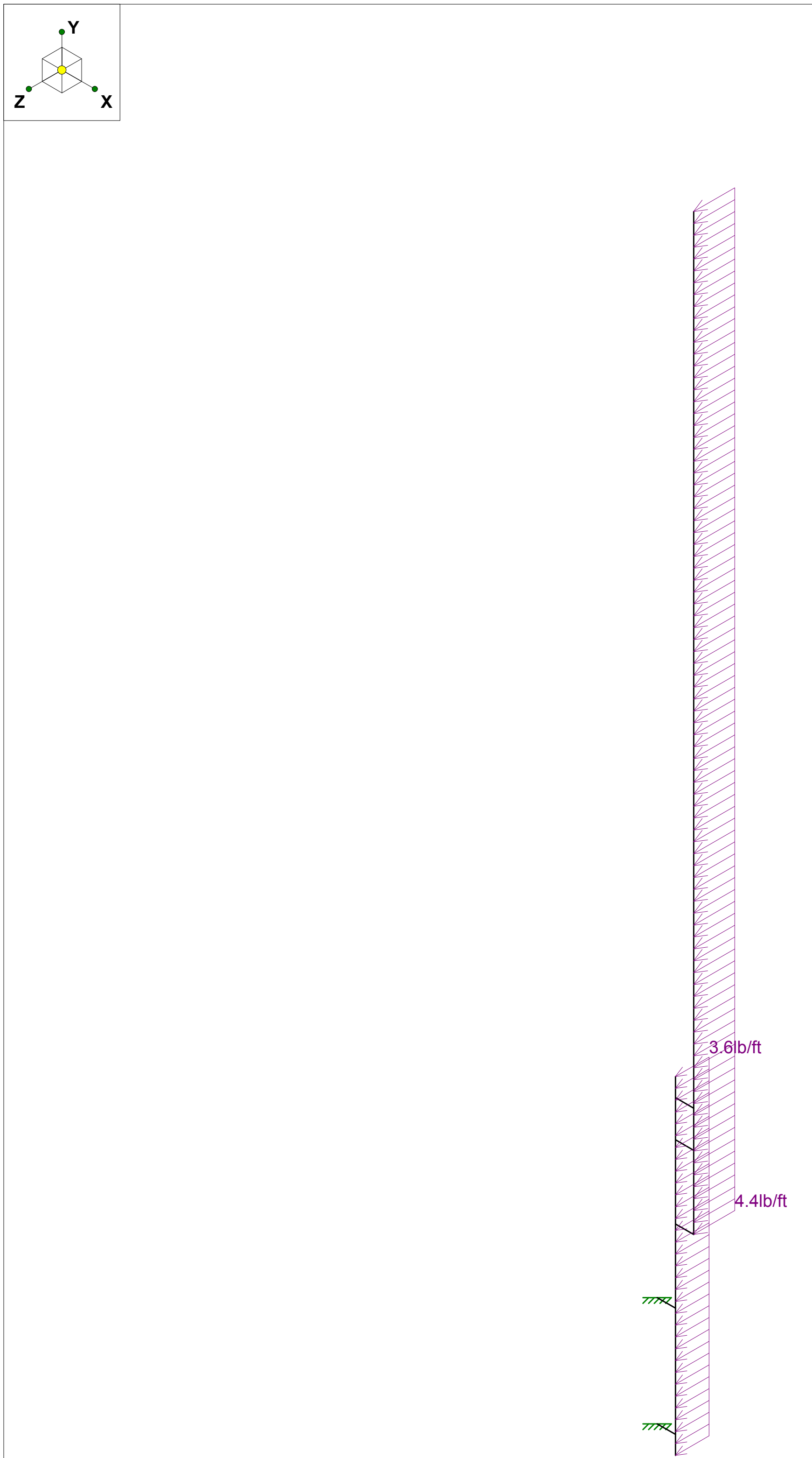
Loads: BLC 5, Ice DL
Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Ice Loads
T. Eakkalak		Jan 9, 2020 at 1:07 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



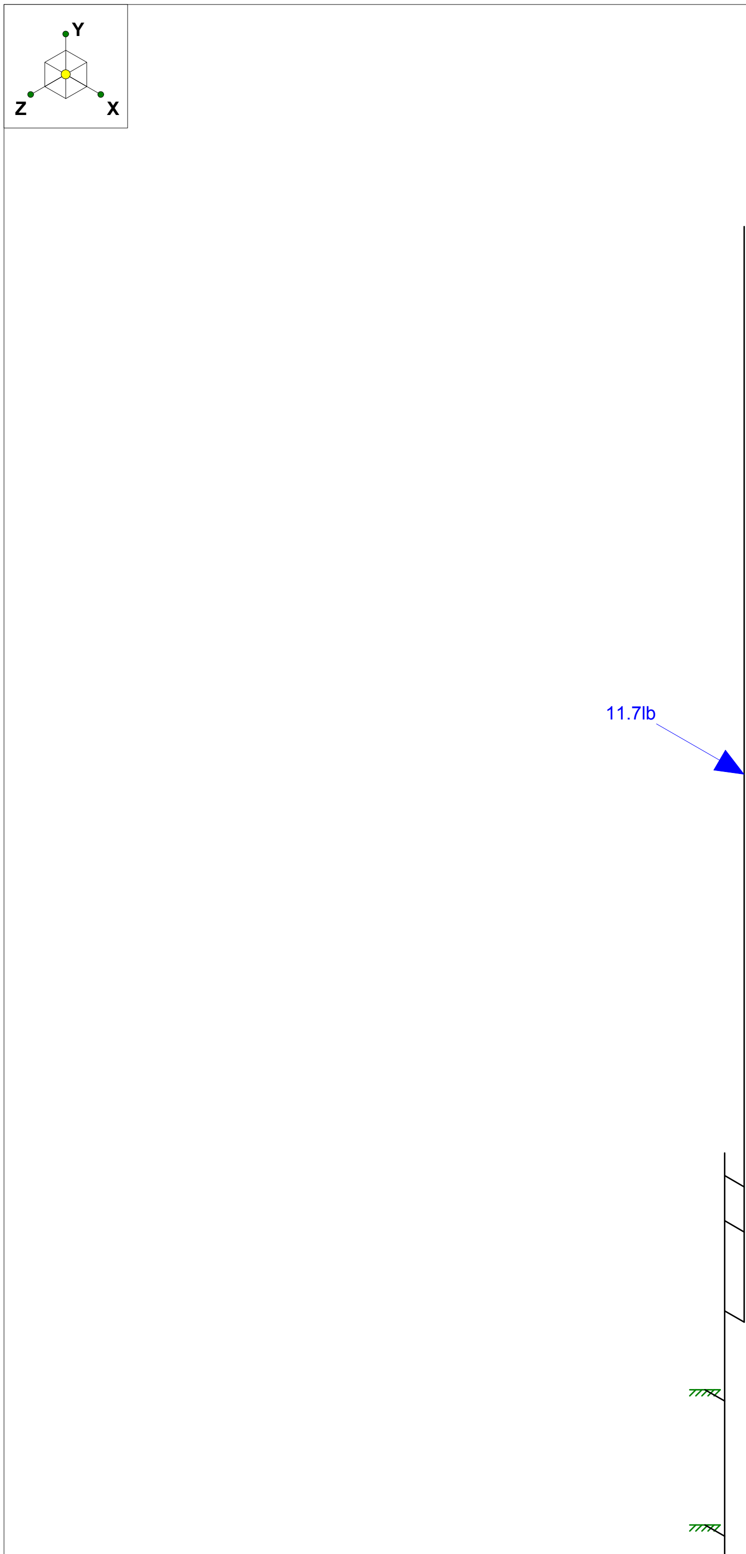
Loads: BLC 6, Ice Wind - 0 Deg (+X)
Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Ice Wind Loads - X Direction
T. Eakkalak		Jan 9, 2020 at 1:08 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



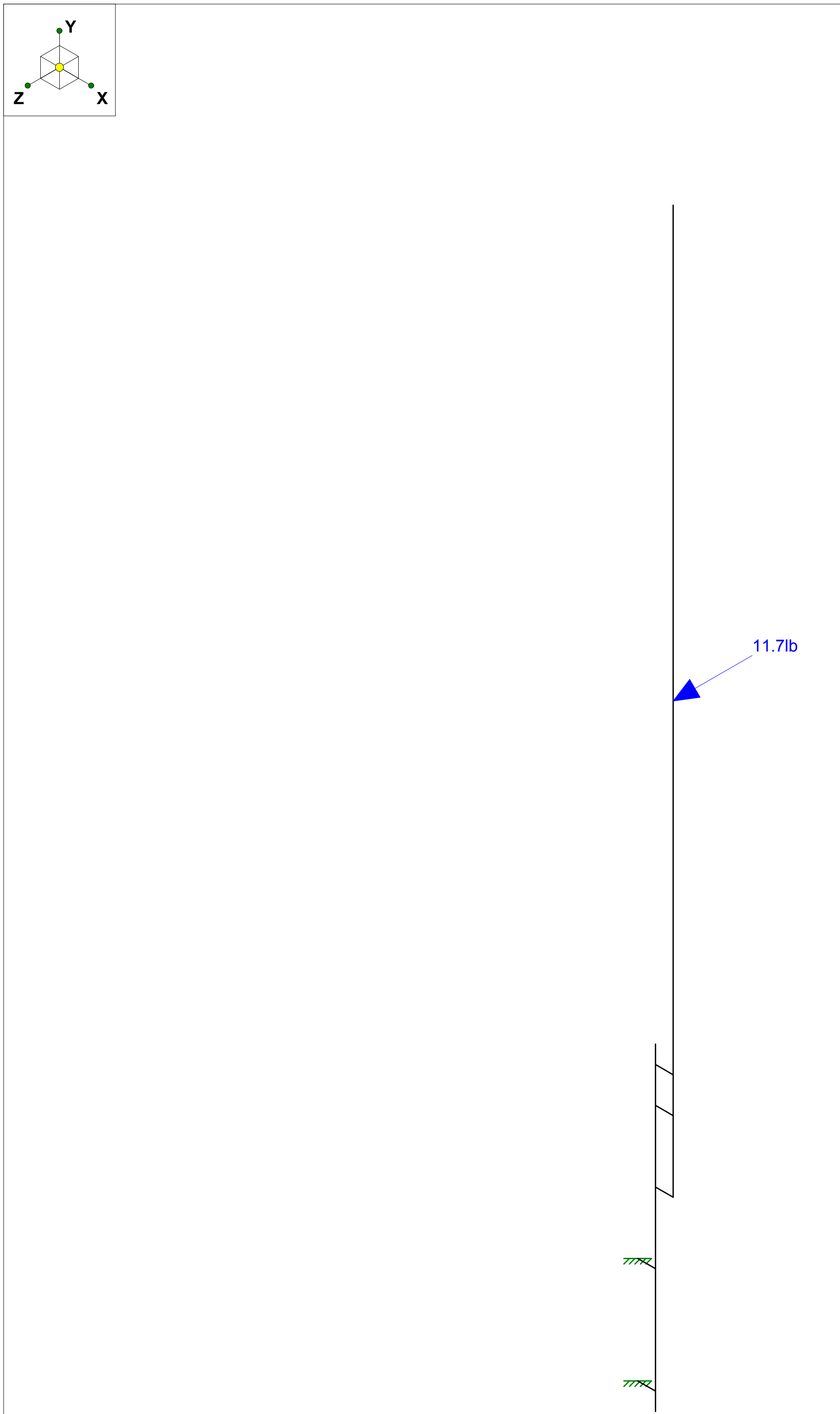
Loads: BLC 7, Ice Wind - 90 Deg (+Z)
Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Ice Wind Loads - Z Direction
T. Eakkalak		Jan 9, 2020 at 1:08 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



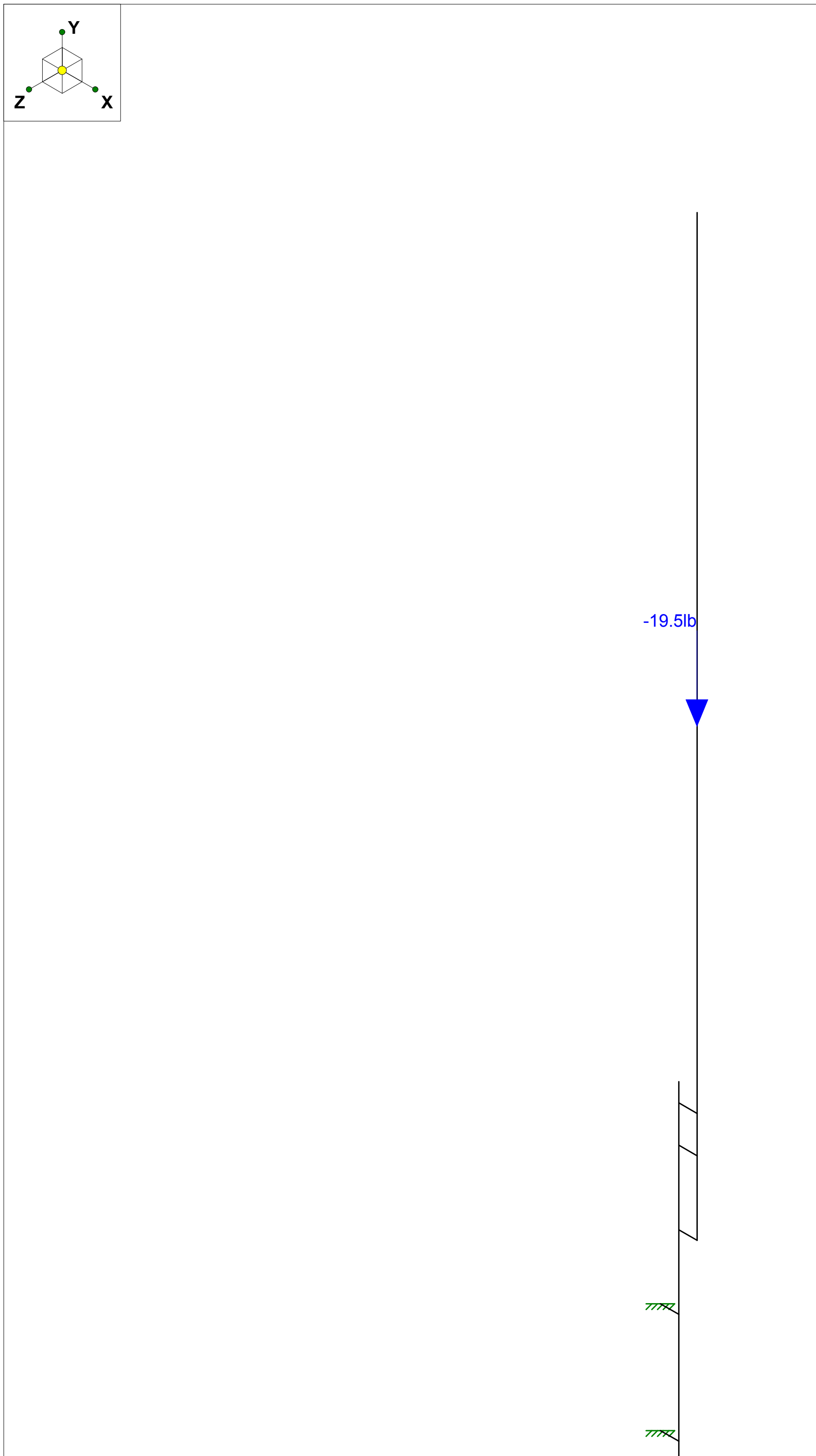
Loads: BLC 10, Lateral Seismic - Eh (X)

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Horizontal Seismic Load (X)
T. Eakkalak		Jan 9, 2020 at 1:59 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



Loads: BLC 11, Lateral Seismic - Eh (Z)

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Horizontal Seismic Load (Z)
T. Eakkalak		Jan 9, 2020 at 1:59 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...



Loads: BLC 12, Vertical Seismic - Ev (Y)
Envelope Only Solution

Black & Veatch Corp.	Meriden Cooper St. Proposed Antenna Mount Analysis	Vertical Seismic Load
T. Eakkalak		Jan 9, 2020 at 1:10 PM
403093.2000.2200		MeridenCooperSt_Phase 1.5 - Pro...

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	None

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	None
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/f...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

General Material Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E5 F)	Density[k/ft^3]
1	gen_Conc3NW	3155	1372	.15	.6	.145
2	gen_Conc4NW	3644	1584	.15	.6	.145
3	gen_Conc3LW	2085	906	.15	.6	.11
4	gen_Conc4LW	2408	1047	.15	.6	.11
5	gen_Alum	10600	4077	.3	1.29	.173
6	gen_Steel	29000	11154	.3	.65	.49
7	RIGID	1e+6		.3	0	0

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe 3.0 STD	PIPE_3.0	Column	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69

General Section Sets

	Label	Shape	Type	Material	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	GEN1A	RE4X4	Beam	gen_Conc3NW	16	21.333	21.333	31.573
2	RIGID		None	RIGID	1e+6	1e+6	1e+6	1e+6

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	-1	0	0	
2	N2	0	-.5	0	0	
3	N3	0	2.5	0	0	
4	N4	-.5	-.5	0	0	
5	N5	-.5	2.5	0	0	
6	N6	.5	7.5	0	0	
7	N7	.5	28.8	0	0	
8	N8	0	7.5	0	0	
9	N9	.5	4.5	0	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
10	N10	0	4.5	0	0	
11	N11	0	8	0	0	
12	N12	.5	6.5	0	0	
13	N13	0	6.5	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N4	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N5	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N11	N1			Pipe 3.0 STD	Column	Pipe	A53 Gr.B	Typical
2	M2	N4	N2			RIGID	None	None	RIGID	Typical
3	M3	N5	N3			RIGID	None	None	RIGID	Typical
4	M4	N9	N7			RIGID	None	None	RIGID	Typical
5	M5	N10	N9			RIGID	None	None	RIGID	Typical
6	M6	N8	N6			RIGID	None	None	RIGID	Typical
7	M7	N13	N12			RIGID	None	None	RIGID	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	L-tor...	Kyy	Kzz	Cb	Funct...
1	M1	Pipe 3.0 STD	9									Lateral

Member Point Loads (BLC 1 : DL)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[ft,%]
1	M4	Y	-100	%50
2	M1	Y	-20	%25

Member Point Loads (BLC 10 : Lateral Seismic - Eh (X))

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[ft,%]
1	M4	X	11.7	%50

Member Point Loads (BLC 11 : Lateral Seismic - Eh (Z))

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[ft,%]
1	M4	Z	11.7	%50

Member Point Loads (BLC 12 : Vertical Seismic - Ev (Y))

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[ft,%]
1	M4	Y	-19.5	%50

Member Distributed Loads (BLC 3 : Wind - 0 Deg (+X))

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	12.2	12.2	0	0
2	M4	PX	13.5	13.5	0	0

Member Distributed Loads (BLC 4 : Wind - 90 Deg (+Z))

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/...	Start Location[ft,%]	End Location[ft,%]

Member Distributed Loads (BLC 4 : Wind - 90 Deg (+Z)) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	12.2	12.2	0	0
2	M4	PZ	13.5	13.5	0	0

Member Distributed Loads (BLC 5 : Ice DL)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-13.8	-13.8	0	0
2	M4	Y	-15.9	-15.9	0	0

Member Distributed Loads (BLC 6 : Ice Wind - 0 Deg (+X))

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	3.6	3.6	0	0
2	M4	PX	4.4	4.4	0	0

Member Distributed Loads (BLC 7 : Ice Wind - 90 Deg (+Z))

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	3.6	3.6	0	0
2	M4	PZ	4.4	4.4	0	0

Basic Load Cases

	BLC Description	Category	X Grav...	Y Grav...	Z Grav...	Joint	Point	Distributed	Area(Mem...	Surfac...
1	DL	DL		-1			2			
3	Wind - 0 Deg (+X)	WL						2		
4	Wind - 90 Deg (+Z)	WL						2		
5	Ice DL	DL						2		
6	Ice Wind - 0 Deg (+X)	WL						2		
7	Ice Wind - 90 Deg (+Z)	WL						2		
10	Lateral Seismic - Eh (X)	ELX	.094				1			
11	Lateral Seismic - Eh (Z)	ELZ			.094		1			
12	Vertical Seismic - Ev (Y)	ELY		-.195			1			

Load Combinations

	Description	Solve	PDelta	SRSS	BLC	Factor	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...
1	LOAD COMBINATION USING ...																							
2	WIND LOAD COMBINATIONS (...																							
3	1.4DL	Yes	Y		1	1.4																		
4	1.2DL + 0.5RLL	Yes	Y		1	1.2	2	.5																
5	1.2DL + 1.6RLL + 0.5WL (0 DE...	Yes	Y		1	1.2	2	1.6	3	.5														
6	1.2DL + 1.6RLL - 0.5WL (0 DE...	Yes	Y		1	1.2	2	1.6	3	-.5														
7	1.2DL + 1.6RLL + 0.5WL (30 D...	Yes	Y		1	1.2	2	1.6	3	.4...	4	.25												
8	1.2DL + 1.6RLL - 0.5WL (30 DE...	Yes	Y		1	1.2	2	1.6	3	-....	4	-....												
9	1.2DL + 1.6RLL + 0.5WL (60 D...	Yes	Y		1	1.2	2	1.6	4	.4...	3	.25												
10	1.2DL + 1.6RLL - 0.5WL (60 DE...	Yes	Y		1	1.2	2	1.6	4	-....	3	-....												
11	1.2DL + 1.6RLL + 0.5WL (90 D...	Yes	Y		1	1.2	2	1.6	4	.5														
12	1.2DL + 1.6RLL - 0.5WL (90 DE...	Yes	Y		1	1.2	2	1.6	4	-.5														
13	1.2DL+ WL (0 DEG, +X) + 0.5R...	Yes	Y		1	1.2	2	.5	3	1														
14	1.2DL - WL (0 DEG, -X) + 0.5RLL	Yes	Y		1	1.2	2	.5	3	-1														
15	1.2DL + WL (30 DEG) + 0.5RLL	Yes	Y		1	1.2	2	.5	3	.8...	4	.5												
16	1.2DL - WL (30 DEG) + 0.5RLL	Yes	Y		1	1.2	2	.5	3	-....	4	-.5												
17	1.2DL + WL (60 DEG) + 0.5RLL	Yes	Y		1	1.2	2	.5	4	.8...	3	.5												
18	1.2DL - WL (60 DEG) + 0.5RLL	Yes	Y		1	1.2	2	.5	4	-....	3	-.5												
19	1.2DL + WL (90 DEG, +Z) + 0.5...	Yes	Y		1	1.2	2	.5	4	1														
20	1.2DL - WL (90 DEG, -Z) + 0.5R...	Yes	Y		1	1.2	2	.5	4	-1														

Load Combinations (Continued)

	Description	Solve	PDelta	SRSS	BLC	Factor	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...	...	F...
21	0.9DL + WL (0 DEG, +X)	Yes	Y		1	.9	3	1																
22	0.9DL - WL (0 DEG, -X)	Yes	Y		1	.9	3	-1																
23	0.9DL + WL (30 DEG)	Yes	Y		1	.9	3	.8...	4	.5														
24	0.9DL - WL (30 DEG)	Yes	Y		1	.9	3	-....	4	-.5														
25	0.9DL + WL (60 DEG)	Yes	Y		1	.9	4	.8...	3	.5														
26	0.9DL - WL (60 DEG)	Yes	Y		1	.9	4	-....	3	-.5														
27	0.9DL + WL (90 DEG, +Z)	Yes	Y		1	.9	4	1																
28	0.9DL - WL (90 DEG, -Z)	Yes	Y		1	.9	4	-1																
29																								
30	LOAD COMBINATIONS WITH I...																							
31	1.2DL + 0.2Ice DL + 0.5SL1	Yes	Y		1	1.2	5	.2	8	.5														
32	1.2DL + Ice DL + Ice WL (0 DE...	Yes	Y		1	1.2	5	1	6	1	8	.5												
33	1.2DL + Ice DL - Ice WL (0 DEG...	Yes	Y		1	1.2	5	1	6	-1	8	.5												
34	1.2DL + Ice DL + Ice WL (30 DE...	Yes	Y		1	1.2	5	1	6	.8...	7	.5	8	.5										
35	1.2DL + Ice DL - Ice WL (30 DE...	Yes	Y		1	1.2	5	1	6	-....	7	-.5	8	.5										
36	1.2DL + Ice DL + Ice WL (60 DE...	Yes	Y		1	1.2	5	1	7	.8...	6	.5	8	.5										
37	1.2DL + Ice DL - Ice WL (60 DE...	Yes	Y		1	1.2	5	1	7	-....	6	-.5	8	.5										
38	1.2DL + Ice DL + Ice WL (90 DE...	Yes	Y		1	1.2	5	1	7	1	8	.5												
39	1.2DL + Ice DL - Ice WL (90 DE...	Yes	Y		1	1.2	5	1	7	-1	8	.5												
40	0.9DL + Ice DL + Ice WL (0 DE...	Yes	Y		1	.9	5	1	6	1														
41	0.9DL + Ice DL - Ice WL (0 DEG...	Yes	Y		1	.9	5	1	6	-1														
42	0.9DL + Ice DL + Ice WL (30 DE...	Yes	Y		1	.9	5	1	6	.8...	7	.5												
43	0.9DL + Ice DL - Ice WL (30 DE...	Yes	Y		1	.9	5	1	6	-....	7	-.5												
44	0.9DL + Ice DL + Ice WL (60 DE...	Yes	Y		1	.9	5	1	7	.8...	6	.5												
45	0.9DL + Ice DL - Ice WL (60 DE...	Yes	Y		1	.9	5	1	7	-....	6	-.5												
46	0.9DL + Ice DL + Ice WL (90 DE...	Yes	Y		1	.9	5	1	7	1														
47	0.9DL + Ice DL - Ice WL (90 DE...	Yes	Y		1	.9	5	1	7	-1														
48																								
49	SEISMIC LOAD COMBINATIO...																							
50	1.2DL + 0.2Ev (Y) + Eh (X) + 0....	Yes	Y		1	1.2	8	.2	12	.2	10	1												
51	1.2DL - 0.2Ev (Y) + Eh (X) + 0.2...	Yes	Y		1	1.2	8	.2	12	-.2	10	1												
52	1.2DL + 0.2Ev (Y) - Eh (X) + 0.2...	Yes	Y		1	1.2	8	.2	12	.2	10	-1												
53	1.2DL - 0.2Ev (Y) - Eh (X) + 0.2...	Yes	Y		1	1.2	8	.2	12	-.2	10	-1												
54	1.2DL + 0.2Ev (Y) + Eh (Z) + 0....	Yes	Y		1	1.2	8	.2	12	.2	11	1												
55	1.2DL - 0.2Ev (Y) + Eh (Z) + 0.2...	Yes	Y		1	1.2	8	.2	12	-.2	11	1												
56	1.2DL + 0.2Ev (Y) - Eh (Z) + 0.2...	Yes	Y		1	1.2	8	.2	12	.2	11	-1												
57	1.2DL - 0.2Ev (Y) - Eh (Z) + 0.2...	Yes	Y		1	1.2	8	.2	12	-.2	11	-1												
58	0.9DL - 0.2Ev (Y) + Eh (X)	Yes	Y		1	.9	12	-.2	10	1														
59	0.9DL + 0.2Ev (Y) + Eh (X)	Yes	Y		1	.9	12	.2	10	1														
60	0.9DL - 0.2Ev (Y) - Eh (X)	Yes	Y		1	.9	12	-.2	10	-1														
61	0.9DL + 0.2Ev (Y) - Eh (X)	Yes	Y		1	.9	12	.2	10	-1														
62	0.9DL - 0.2Ev (Y) + Eh (Z)	Yes	Y		1	.9	12	-.2	11	1														
63	0.9DL + 0.2Ev (Y) + Eh (Z)	Yes	Y		1	.9	12	.2	11	1														
64	0.9DL - 0.2Ev (Y) - Eh (Z)	Yes	Y		1	.9	12	-.2	11	-1														
65	0.9DL + 0.2Ev (Y) - Eh (Z)	Yes	Y		1	.9	12	.2	11	-1														
66																								

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-...	LC	MZ [lb-...	LC
1	N4	max	24.4	14	44.506	32	24.4	28	7.625	28	12.2	27	24.503	32
2		min	-24.4	21	12.129	60	-24.4	27	-7.625	27	-12.2	28	-1.286	22
3	N5	max	413.399	14	686.138	33	413.438	28	4854.291	20	370.738	27	5012.9...	13
4		min	-413.398	21	146.553	58	-413.438	27	-4854.291	19	-370.7...	28	-4726....	22
5	Totals:	max	437.799	14	730.643	33	437.838	28						
6		min	-437.798	21	158.682	58	-437.838	27						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Memb...	Shape	Code Check	Loc[ft]	LC	Sh...	Lo...	...	...	phi*Pnc [lb]	phi*...	phi*M...	phi*Mn z-...	...	Eqn
1	M1	PIPE_3.0	.854	5.438	13	.052	5....		...	42263.948	652...	5748....	5748.75	...	H1-...

Joint Reactions (By Combination)

	LC	Joint Label	X [lb]	Y [lb]	Z [lb]	MX [lb-ft]	MY [lb-ft]	MZ [lb-ft]
1	13	N4	-24.4	16.906	0	0	0	16.078
2	13	N5	-413.398	203.164	0	0	0	5012.955
3	13	Totals:	-437.798	220.07	0			
4	13	COG (ft):	X: .273	Y: 10.916	Z: 0			

Maximum Joint Reactions (L.C. 13)

Owner:	EVERSOURCE		Prepared By:	T. Eakkalak
Plant:	MERIDEN COOPER ST.		Date:	1/9/2020
Project No.	403093.2000.2200		Verified By:	K. Hyun
Title:	STRUCTURAL ANALYSIS OF PROPOSED ANTENNA MOUNT AND PENTHOUSE WALL		Date:	1/9/2020

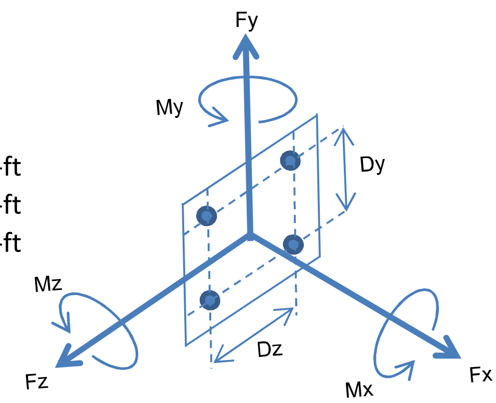
BLACK & VEATCH

Wall Anchor Check (LRFD) - Bolted Thru Wall

AISC 14th Ed.

Load Inputs: LC13 : 1.2DL+ WL (0 DEG, +X) + 0.5RLL

Vertical Force	Fy =	204	lbs
Horizontal Force (Tension)	Fx =	414	lbs
Horizontal Force	Fz =	0	lbs
Moment about Y-Axis	My =	0	lbs-ft
Moment about X-Axis	Mx =	0	lbs-ft
Moment about Z-Axis	Mz =	5,013	lbs-ft
Force Couple Y-Axis	Dy =	4	in
Force Couple Z-Axis	Dz =	5	in
Number of Anchors	N =	4	



Shear from Fy	Sy =	51	lbs	Sy = Fy / N
Tension from Fx	Tx =	104	lbs	Tx = Fx / N
Shear from Fz	Sz =	0	lbs	Sz = Fz / N
Tension from My	Tmy =	0	lbs	Tmy = My / Dz / (N/2)
Shear from Mx	Smx =	0	lbs	Smx = Mx / Dz / (N/2)
Tension from Mz	Tmz =	7520	lbs	Tmz = Mz / Dy / (N/2)
Total Shear	S =	51	lbs	S = SQRT(Sx^2 + Sz^2 + Smy^2)
Total Tension	T =	7623	lbs	T = Ty + Tmx + Tmz

Wall Anchor Check (LRFD) - Bolted Thru Wall (Continued)

AISC 14th Ed. Section #

Thru Bolt Steel Analysis

Loads					
Applied Shear Load	V_{ua} = 51	lbs	per bolt		
Applied Tensile Load	N_{ua} = 7,623	lbs	per bolt		
Parameters					
Bolt Diameter	d_b = 1/2	in			
Bolt Gross Area	A_b = 0.196	in^2	$\pi d_b^2 / 4$		
Specified Yield Strength of Bolt	f_y = 92	ksi			
Specified Tensile Strength of Bolt	f_{uta} = 120	ksi	A325		
Results					
Strength Resistance Factor	φ = 0.75				J3.2
Nominal Shear Strength	F_{nv} = 54.0	ksi	$0.45 \times f_{uta}$	(ductile)	C-J3-4
Nominal Tensile Strength	F_{nt} = 90.0	ksi	$0.75 \times F_{ut}$	(ductile)	C-J3-2
Design Shear Strength of Bolt	φR_{nv} = 7,952	lbs	$\varphi \times F_{nv} \times A_b$		Eq. J3-1
Design Tensile Strength of Bolt	φR_{nt} = 13,254	lbs	$\varphi \times F_{nt} \times A_b$		Eq. J3-1
Required Shear Stress for Bolt	f_v = 0.3	ksi	V_{ua} / A_b		
Required Tensile Stress for Bolt	f_t = 38.8	ksi	N_{ua} / A_b		

Combined Shear and Tension

$F'_{nt} = 1.3 F_{nt} - F_{nt} f_v / F_{nv} / \phi \leq F_{nt}$	F'_{nt} = **116.4**	ksi > Fnt	**Use Fnt for Eq. J3-2**		Eq. J3-3a
Available Tensile Strength of Bolt	φR_{nt} = **13,254**	lbs	φ x Fnt x Ab		Eq. J3-2
Stress Ratio (Less than 1.0)	SR = 0.575		$N_{ua} / \varphi R_{nt}$	**OK**	
Available Shear Strength of Bolt	φR_{nv} = **7,952**	lbs	$\varphi \times F_{nv} \times A_b$		J3.7
Stress Ratio (Less than 1.0)	SR = 0.006		$V_{ua} / \varphi R_{nv}$	**OK**	

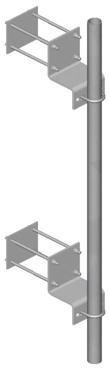
Use 1/2" dia A325 bolts thru existing penthouse wall

5.2 Structural Analysis of Existing Penthouse Wall

By inspection and engineering judgment, the final configuration of the equipment loading will not have significant adverse effect on the existing penthouse wall.

6. ATTACHMENTS

Product Specifications



MT-222

Adjustable Wall Mount for solid walls, 6 in stand-off

Dimensions

Height	203.2 mm | 8.0 in
Length	152.4 mm | 6.0 in
Pipe Outer Diameter	2 3/8 in | 2 7/8 in | 3 1/2 in | 4 1/2 in
Width	203.2 mm | 8.0 in
Weight	20.6 kg | 45.5 lb

Environmental Specifications

Wind Rating	For specifications—contact 828-324-2200 or 1-800-982-1708 (toll free), or your local CommScope representative

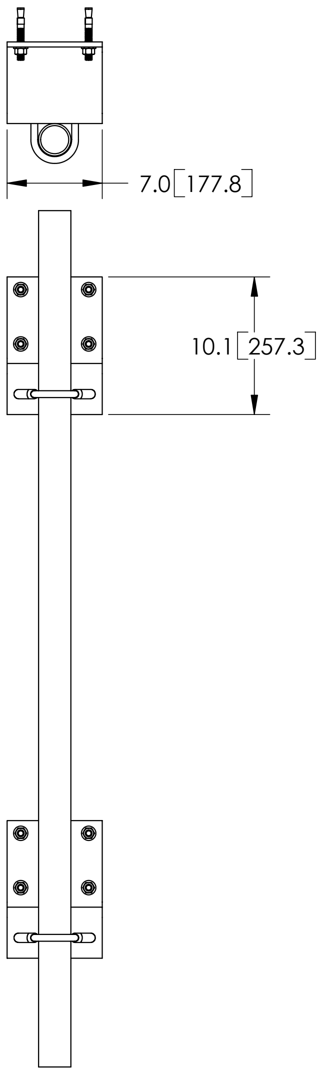
General Specifications

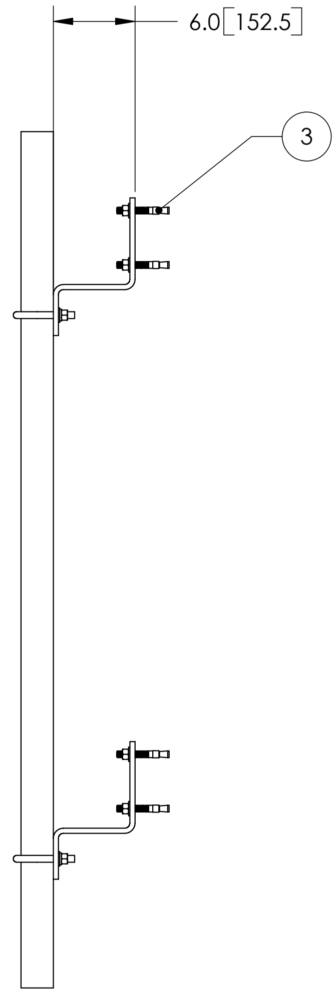
Product Type	Wall mount
Mounting	Solid walls
Stand-off Distance	152.4 mm | 6.0 in
Includes	Backing plates or anchors | Wall brackets (2)
Material Type	Hot dip galvanized steel
Package Quantity	2

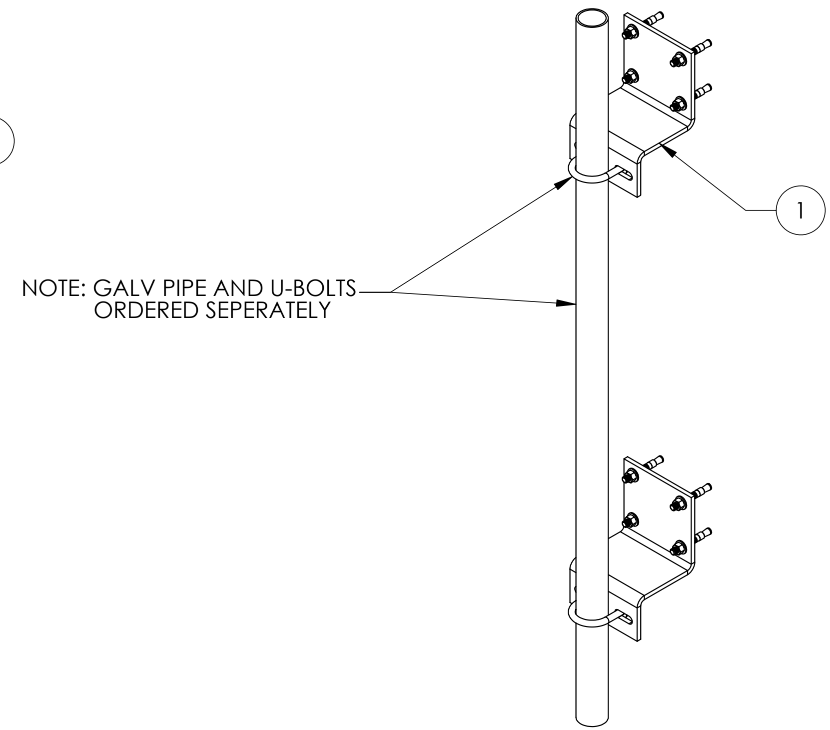
FOR REFERENCE ONLY

ITEM	PART NO.	DESCRIPTION	QTY.	WEIGHT
1	MT222.05	6" WALL MOUNT BRACKET	2	10.81 LBS
2	MT222H	HARDWARE KIT (ITEM 3)	2	
3	MT-271	1/2" X 3-3/4" WEDGE ANCHOR KIT	8	0.18 LBS

REVISIONS				
REV.	ZONE	DESCRIPTION	BY	DATE
B		REVISED & REDRAWN	JTS	04/12/01
C		UPDATE PART LIST	JTS	05/21/01
D		REDRAWN IN SOLIDWORKS	ACG	09/06/06
E		REDESIGN ITEM #1	MSM	02/27/08







These drawings and specifications are the proprietary property of ANDREW CORPORATION and may be used only for the specific purpose authorized in writing by Andrew Corporation.

ALL DIMENSIONS ARE IN INCHES U.O.S.
TOLERANCES UNLESS OTHERWISE SPECIFIED:

.X = ±	.06	ANGLES	±2'
.XX = ±	.03	FRACTIONS	±1/32
.XXX= ±	.010		

REMOVE BURRS AND BREAK EDGES .005

DO NOT SCALE THIS PRINT

DRAWN BY: ACG	SHEET: 1 of 1	PART NUMBER: MT-222
CHECKED BY: TP	SCALE: NTS	DESCRIPTION: 6" ADJUSTABLE SOLID WALL MOUNT
DATE: 09/06/06	MATERIAL: A36	DRAWING TYPE: ASSEMBLY DRAWING
REVISION: E	FINISH: GALV A123	
	WEIGHT: 44.10 LBS.	

VHF Dual Omni Antennas (140-222 MHz)

dbSpectra
Always a Better Value

		140-222 MHz				
	Model Number	**DS1E03F36D-D**	**DS1F03F36D-D**	**DS1G03F36D-D**	**DS2C00F36D-D**	**DS2C03F36D-D**
	Input Connector	7/16 DIN	7/16 DIN	7/16 DIN	7/16 DIN	7/16 DIN
	Type	Dual	Dual	Dual	Dual	Dual
	Frequency	140-150 MHz	150-164 MHz	160-174 MHz	217-222 MHz	217-222 MHz
ELECTRICAL	**Bandwidth**	11 MHz	15 MHz	15 MHz	6 MHz	6 MHz
	Power	500 Watts	500 Watts	500 Watts	500 Watts	500 Watts
	Gain	3 dBd	3 dBd	3 dBd	0 dBd	3 dBd
	Horizontal Beamwidth	360°	360°	360°	360°	360°
	Vertical Beamwidth	30°	30°	30°	60°	30°
	Beam Tilt	0°	0°	0°	0°	0°
	Isolation (minimum)	30	30	30 dB	30 dB	30 dB
MECHANICAL	**Number of Connectors**	2	2	2	2	2
	Flat Plate Area	4.1 ft^2 (0.38 m^2)	4.5 ft^2 (0.42 m^2)	4.5 ft^2 (0.42 m^2)	2.4 ft^2 (0.22 m^2)	4.1 ft^2 (0.38 m^2)
	Lateral Windload Thrust	169 lbf((752 N)	169 lbf (752 N)	169 lbf (752 N)	90 lbf (400 N)	169 lbf (752 N)
	Survival Wind Speed					
	without ice **with 0.5" radial ice**	75 mph (121 kph) 65 mph (105 kph)	75 mph (121 kph) 65 mph (105 kph)	75 mph (121 kph) 65 mph (105 kph)	130 mph (209 kph) 115 mph (185 kph)	75 mph (121 kph) 65 mph (105 kph)
	Mounting Hardware included	DSH3V3N	DSH3V3N	DSH3V3N	DSH3V3R	DSH3V3N
DIMENSIONS	**Length**	24.3 ft (7.4 m)	22.3 ft (6.8 m)	22.3 ft (6.8 m)	13.6 ft (4.1 m)	24.3 ft (7.4 m)
	Radome O.D.	3 in (7.6 cm)	3 in (7.6 cm)	3 in (7.6 cm)	3 in (7.6 cm)	3 in (7.6 cm)
	Mast O.D.	2.5 in (6.4 cm)	2.5 in (6.4 cm)	2.5 in (6.4 cm)	2.5 in (6.4 cm)	2.5 in (6.4 cm)
	Net Weight w/o bracket	70 lb (31.8 kg)	63 lb (28.6 kg)	63 lb (28.6 kg)	40 lb (18.1 kg)	70 lb (31.8 kg)
	Shipping Weight	100 lb (45.4 kg)	93 lb (42.2 kg)	93 lb (42.2 kg)	70 lb (31.8 kg)	100 lb (45.4 kg)

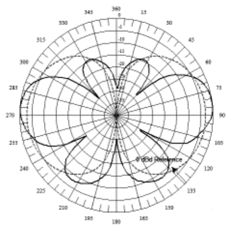
Antenna Patterns on the next page.

VHF Dual Omni Antennas (140-222 MHz)

dbSpectra
Always a Better Value

ANTENNA PATTERNS

DS1F03F36D-D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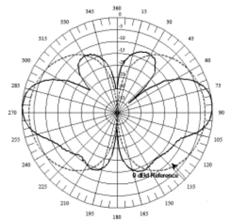
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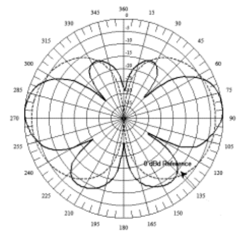
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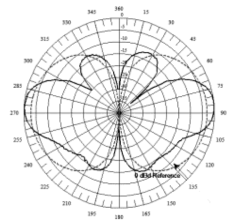
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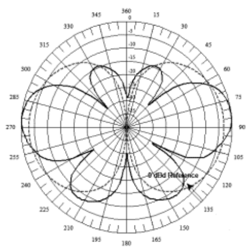
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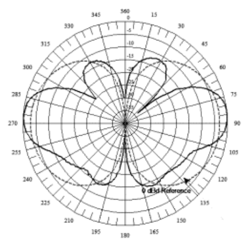
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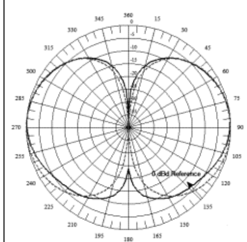
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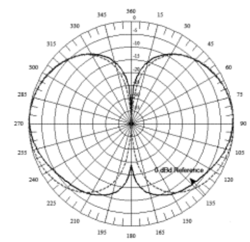
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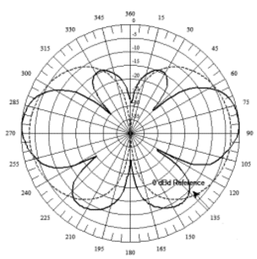
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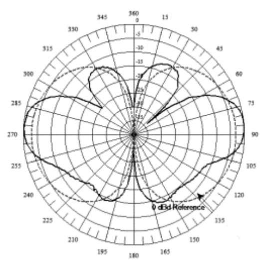
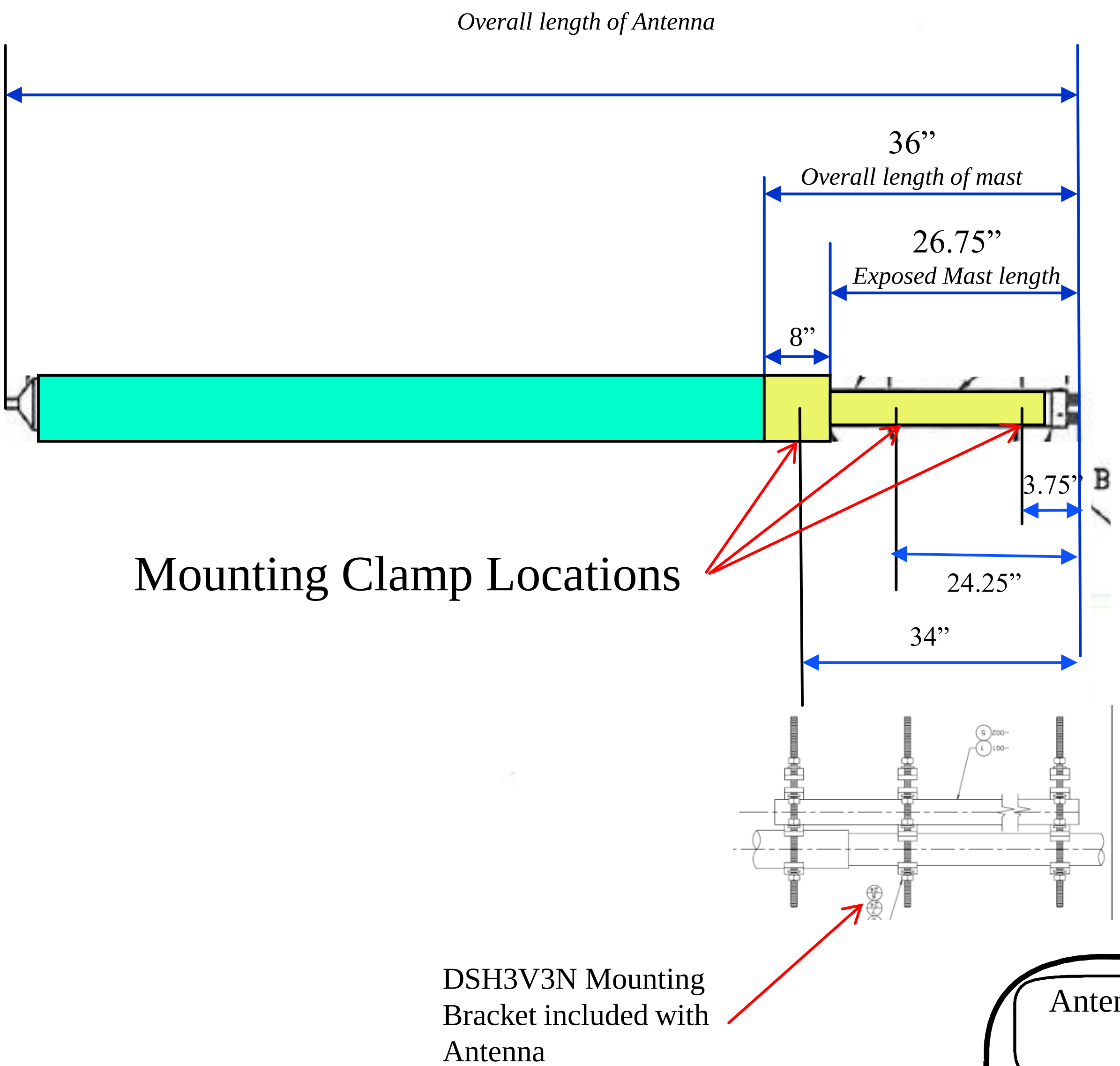

Bottom

Mounting Bracket locations and Antenna Mast Dimensions of Dual antenna



Antennas Mounting Bracket Info

dbSpectra

Engineer/Sales: Jim Bankston
Date: :Dec 2019
Ref:
dbSpectra System Layout

ASCE

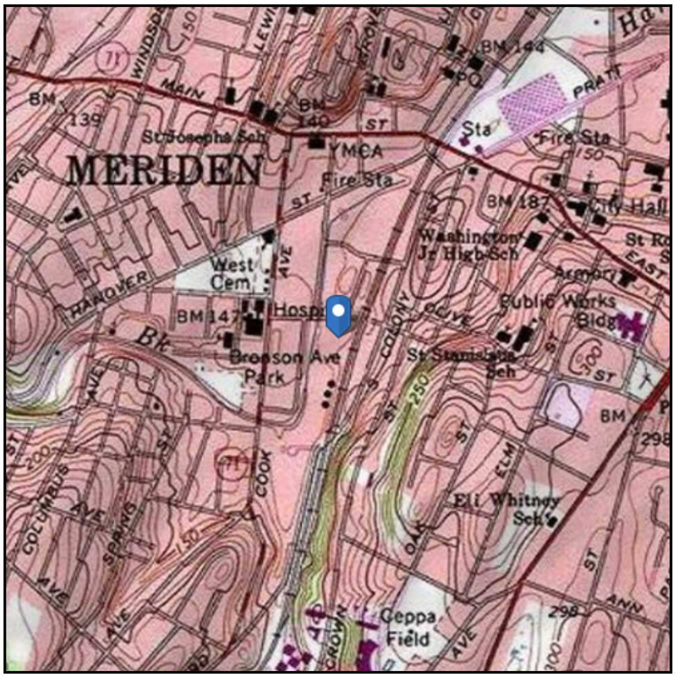
AMERICAN SOCIETY OF CIVIL ENGINEERS

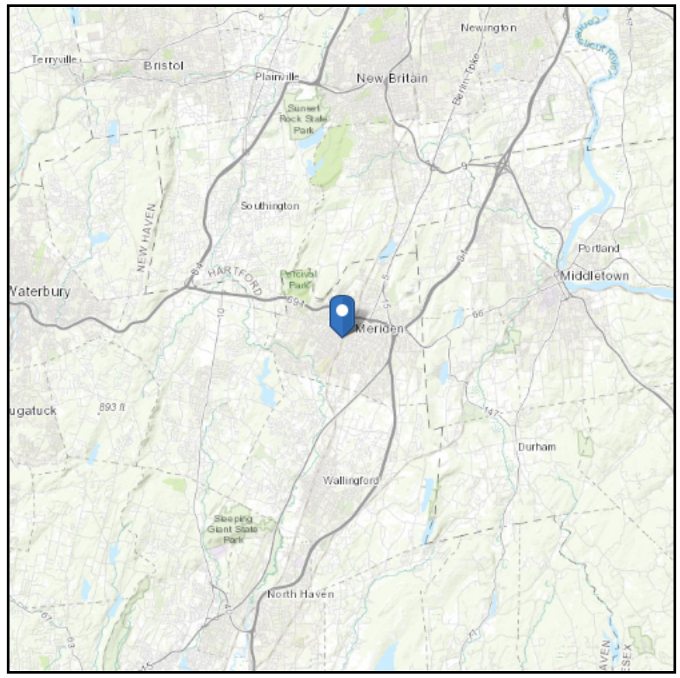
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: III
Soil Class: D - Stiff Soil

Elevation: 127.09 ft (NAVD 88)
Latitude: 41.532722
Longitude: -72.805667





Data Source: ASCE/SEI 7-10, Fig. 26.5-1B and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

Date Accessed: Wed Dec 04 2019

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

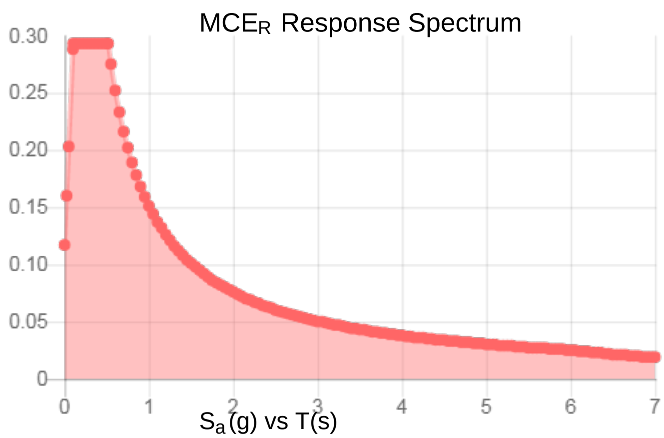
Seismic

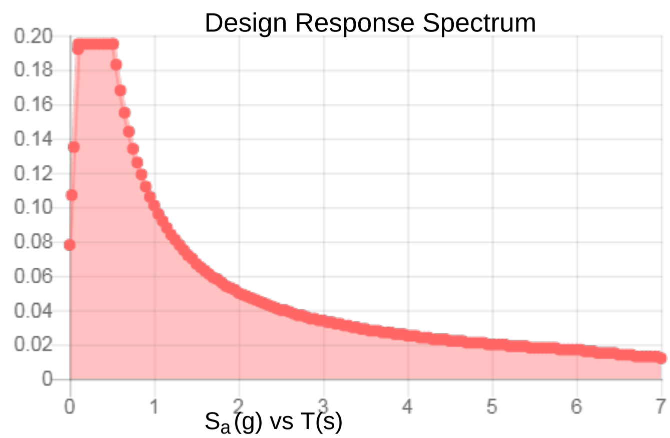
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.183	S_{DS} :	0.195
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.094
S_{MS} :	0.293	PGA_M :	0.15
S_{M1} :	0.151	F_{PGA} :	1.6
		I_e :	1.25

Seismic Design Category B





Data Accessed: Wed Dec 04 2019

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Dec 04 2019

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Snow

Results:

Ground Snow Load, p_g :	30 lb/ft^2
Elevation:	127.1 ft
Data Source:	ASCE/SEI 7-10, Fig. 7-1.
Date Accessed:	Wed Dec 04 2019

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

ATTACHMENT D – PROOF OF DELIVERY OF NOTICE

Ref: CT587100 ES MERI Date: 23Jul20
Dep: BL GRAPHICS Wgt: 0.95 LBS
DV: 0.00

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

Svcs: PRIORITY OVERNIGHT
TRCK: 1714 2090 7041

ORIGIN ID:RSPA (800) 301-3077
BL GRAPHICS
BL GRAPHICS
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 23JUL20
ACTWGT: 0.95 LB
CAD: 0765627/CAFE3311

BILL THIRD PARTY

565C3/C6A6/05A2

TO

CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051
REF: CT587100 ES MERIDEN
DEPT: BL GRAPHICS

FedEx
Express
E

J191219082001uv

FRI - 24 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **1714 2090 7041**

00 BDLA

06051
CT-US **BDL**

Ref: CT587100 ES MERI Date: 23Jul20
Dep: BL GRAPHICS Wgt: 0.95 LBS
DV: 0.00

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

Svcs: PRIORITY OVERNIGHT
TRCK: 1714 2090 7020

ORIGIN ID:RSPA (800) 301-3077
BL GRAPHICS
BL GRAPHICS
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 23JUL20
ACTWGT: 0.95 LB
CAD: 0765627/CAFE3311

BILL THIRD PARTY

TO **HONORABLE KEVIN SCARPATI, MAYOR**
CITY OF MERIDEN
142 EAST MAIN STREET

MERIDEN CT 06450
REF: CT587100 ES MERIDEN
DEPT: BL GRAPHICS

565C3/C6A6/05A2

FedEx
Express

E

J191219082001uv

FRI – 24 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **1714 2090 7020**

00 RSPA

06450
CT-US **BDL**

Ref: CT587100 ES MERI Date: 23Jul20
Dep: BL GRAPHICS Wgt: 0.95 LBS
DV: 0.00

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

Svcs: PRIORITY OVERNIGHT
TRCK: 1714 2090 7030

ORIGIN ID:RSPA (800) 301-3077
BL GRAPHICS
BL GRAPHICS
355 RESEARCH PARKWAY

MERIDEN, CT 06450
UNITED STATES US

SHIP DATE: 23JUL20
ACTWGT: 0.95 LB MAN
CAD: 0765627/CAFE3311

BILL THIRD PARTY

TO **RENATA BERTOTTI, DIRECTOR OF PLANNI**
CITY OF MERIDEN
142 EAST MAIN STREET

MERIDEN CT 06450
REF: CT587100 ES MERIDEN
DEPT: BL GRAPHICS

565C3/C6A6/05A2

FedEx Express

E

J191219082001uv

FRI - 24 JUL 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **1714 2090 7030**

00 RSPA

06450
CT-US **BDL**

ATTACHMENT E - POWER DENSITY REPORT

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

Calculated Radio Frequency Emissions Report

ES-281

46 Cooper Street

Meriden, CT 06451

March 6, 2020

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed Eversource installation to be located on the rooftop of 46 Cooper Street in Meriden, CT.

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

This report considers the planned antenna configuration as provided by Eversource along with power density information of the existing antennas to calculate the cumulative % MPE (Maximum Permissible Exposure) of the proposed facility at ground level.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

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

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

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

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:

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

Where:

EIRP = Effective Isotropic Radiated Power = 1.64 x ERP

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

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and full power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. Furthermore, all antennas on the rooftop are assumed to in the same location. 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. 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 vertical patterns of the other existing antennas also exhibit varying degrees of directionality. Please refer to Attachment C for the vertical pattern of the existing and proposed Eversource antenna. The calculated results in Table 1 for the Eversource antennas include a nominal of 10 dB off-beam pattern loss for the antennas to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Eversource	33	37.62	1	120	0.0059	0.2000	2.96%
Eversource	35	37.84	1	120	0.0051	0.2000	2.57%
Eversource	51.4	173.25	1	380	0.0066	0.2000	3.32%
Eversource	45.3	938	1	240	0.0056	0.6256	0.89%
Eversource	48	217	4	124	0.0101	0.2000	5.06%
						Total	14.80%

Table 1: Proposed Tower % MPE [1] [2] [3]

[1] The operating parameters for the existing Eversource antennas were taken from a survey report conducted by C Squared Systems on October 11, 2013 and recently confirmed through Eversource's agent. 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.

[2] The heights listed for the proposed (highlighted in blue) and existing Eversource antennas are in reference to Black & Veatch construction drawing dated 01/07/2020 (Rev. A).

[3] In cases where Eversource antennas were unable to be identified during the 2013 field survey (37.76 MHz and 37.84 MHz), an antenna model with like characteristics was considered in this analysis.

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 **14.80% 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.

Sokol Andoni

March 4, 2020

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RF Engineer
C Squared Systems, LLC

Date

Keith Vellante

March 6, 2020

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

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[4]

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

(B) Limits for General Population/Uncontrolled Exposure[5]

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

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

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

[4] 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

[5] 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

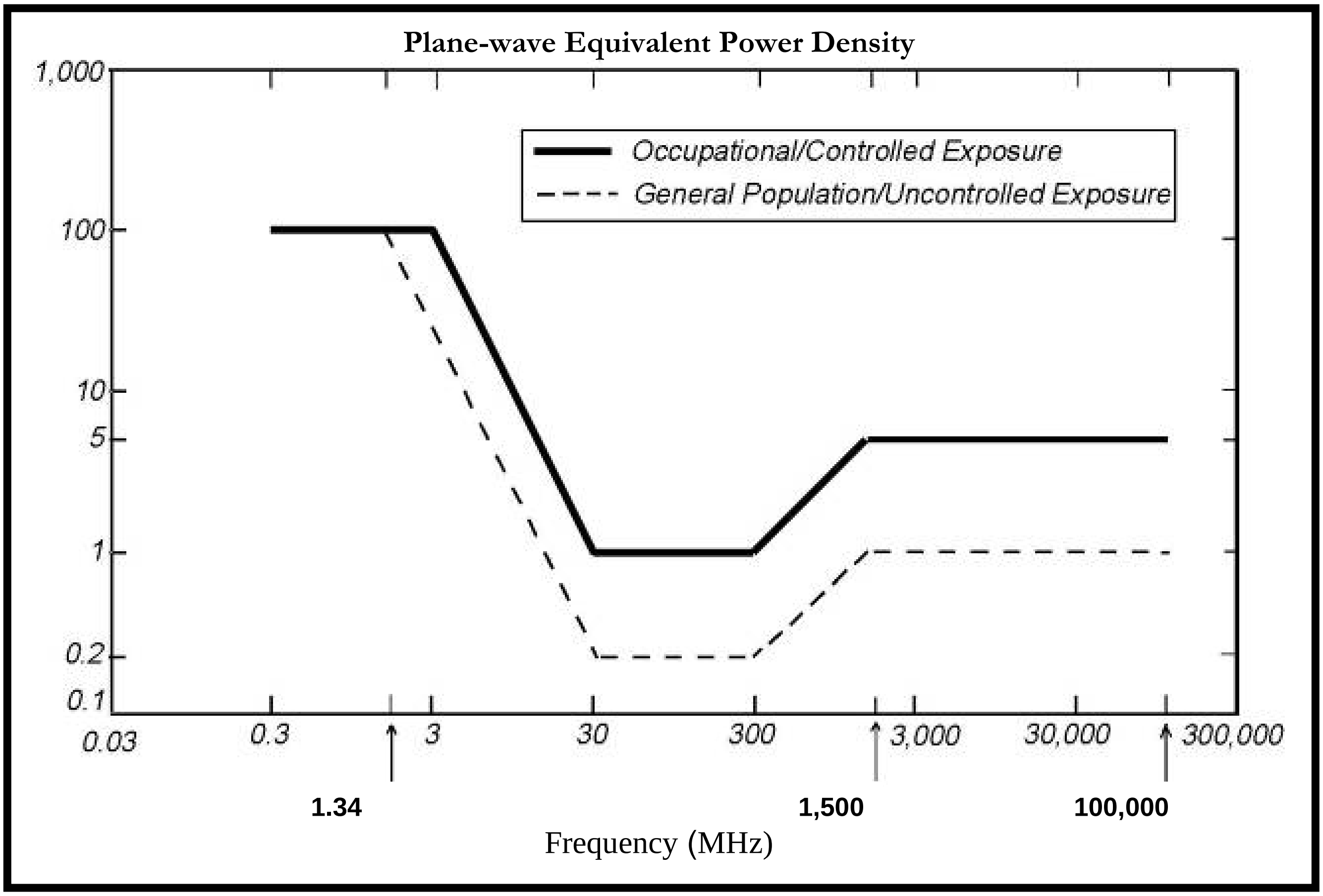
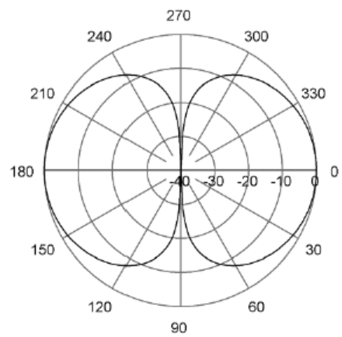


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

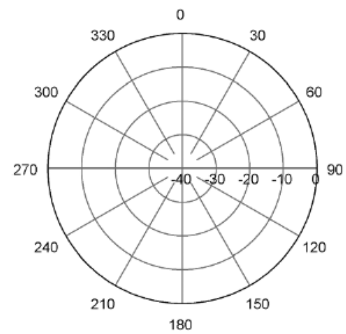
Attachment C: Eversource Antenna Data Sheets and Electrical Patterns

38 MHz

Manufacturer:	Amphenol
Model #:	MA431E40
Frequency Band:	34.3-40.8 MHz
Gain:	0.0 dBd
Vertical Beamwidth:	84°
Horizontal Beamwidth:	360°
Polarization:	Vertical-Polarization
Length:	16.2’



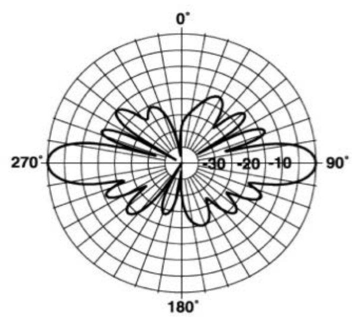
Vertical



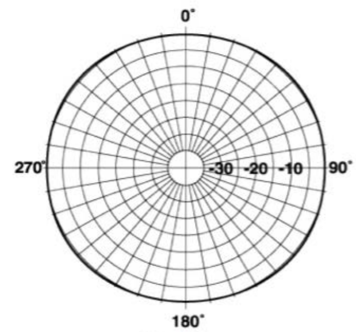
Horizontal

173 MHz

Manufacturer:	Commander
Model #:	220-7N
Frequency Band:	165-174 MHz
Gain:	5.25 dBd
Vertical Beamwidth:	18°
Horizontal Beamwidth:	360°
Polarization:	Vertical-Polarization
Length:	19’



Vertical Pattern

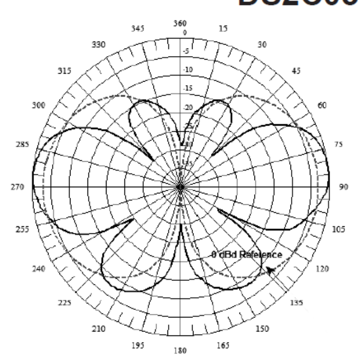


Horizontal Pattern

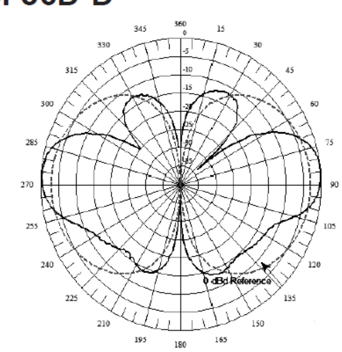
217 MHz

Manufacturer:	dbSpectra
Model #:	DS2C03F36D
Frequency Band:	217-222 MHz
Gain:	3.0 dBd
Vertical Beamwidth:	30°
Horizontal Beamwidth:	360°
Polarization:	Vertical-Polarization
Length:	24.3’

DS2C03F36D-N
DS2C03F36D-D



Top



Bottom

938 MHz

Manufacturer:	CommScope
Model #:	DB589-Y
Frequency Band:	890-960 MHz
Gain:	9.0 dBd
Vertical Beamwidth:	30°
Horizontal Beamwidth:	360°
Polarization:	Vertical-Polarization
Length:	9.2’