Robinson+Cole

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April 16, 2019

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

Re: **Notice of Exempt Modification – Facility Modification**
324 Montevideo Road, Avon, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains ten (10) wireless telecommunications antennas at a height of 55 feet above ground level ("AGL") on the existing 60-foot tower at 324 Montevideo Road in Avon, Connecticut (the "Property"). The tower and Property are owned by Talcott Mountain Science Center for Student Involvement. The Council approved Cellco's shared use of this tower in 1989. Cellco intends to remove two (2) of its antennas and replace four (4) of its existing remote radio heads ("RRHs") with four (4) newer model RRHs. Included in Attachment 1 are specifications for Cellco's replacement RRHs.

Please accept this letter as notification pursuant to 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 letter is being sent to the Avon Town Manager, Brandon Robertson; Hiram Peck III, Avon's Deputy Director of Planning and Community Development; Bloomfield Town Manager, Philip K. Schenk, Jr.; Jose Giner, Bloomfield's Director of Land Use; and Talcott Mountain Science Center for Student Involvement, the owner of the Property and the tower.[1]

[1] While maintaining an Avon mailing address, the tower is physically located in the Town of Bloomfield. Therefore, we are notifying public officials in both Towns.

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. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's proposed replacement RRHs will be located at the same 55-foot level on the tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

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

4. The installation of new RRHs will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Far Field Approximation tables for each of Cellco's operating frequencies for the modified Talcott Mountain facility are included in Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower, with certain structural modifications, can support Cellco's proposed modifications. (*See* Structural Modification Report included in Attachment 3).

A copy of the parcel map and Property owner information is included in Attachment 4. A Certificate of Mailing verifying that this filing was sent to municipal officials and the owner of the Property is included in Attachment 5.

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Brandon Robertson, Avon Town Manager
Hiram Peck III, AICP, Avon Director of Planning and Community Development
Philip K. Schenk, Jr., Bloomfield Town Manager
Jose Giner, Bloomfield Director of Land Use
Talcott Mountain Science Center for Student Involvement
Tim Parks

ATTACHMENT 1

SAMSUNG

Dual-Band Radio Unit
700/850MHz (B13/B5)
RFV01U-D2A

Samsung's RFV01U-D2A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D2A RU targets dual-band support across Band 13 (700MHz) and Band 5 (850MHz), making it an ideal product for broad coverage footprints across multiple common low-end, long-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B13: DL(746-756MHz)/UL(777-787MHz)
B5: DL(869-894MHz)/UL(824-849MHz)
Instantaneous Bandwidth: 10MHz(B13) + 25MHz(B5)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 207mm (29.9L)
Weight: 31.9kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

SAMSUNG

Dual-Band Radio Unit
AWS/PCS (B66/B2)
RFV01U-D1A

Samsung's RFV01U-D1A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D1A RU targets dual-band support across Band 66 (AWS) and Band 2 (PCS), making it an ideal product for broad coverage footprints across multiple common mid-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation
- Built-in Broadcast Auxiliary Services (BAS) filter ensures compliant AWS operation without impacting footprint

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)
B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)
Instantaneous Bandwidth:
70MHz(B66) + 60MHz(B2)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 255mm (36.8L)
Weight: 38.3kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

ATTACHMENT 2

Far Field Approximation
with downtilt variation

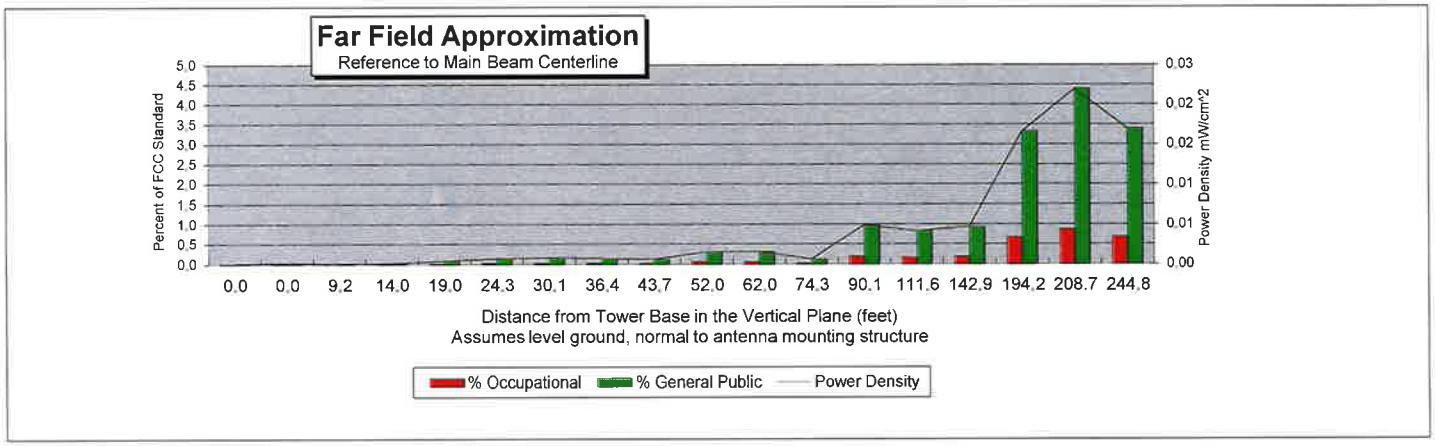
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Talcott Mtn, CT
Site #:	
Date:	04/08/19
Name:	Mark Brauer
File Name:	Talcott Mtn, CT - FF Power

Operating Freq. (MHz)	**746.0**
Antenna Height (ft):	**55.0**
Antenna Gain (dBi):	**14.8**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**10.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**160.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	90.0	80.0	75.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	14.0	12.0	
Solve for r, dx to antenna	52.0	52.0	52.8	53.8	55.3	57.4	60.1	63.5	67.9	73.6	80.9	90.7	104.0	123.1	152.1	201.0	215.1	250.2	
Distance from Antenna Structure Base in Horizontal plane	0.0	0.0	9.2	14.0	19.0	24.3	30.1	36.4	43.7	52.0	62.0	74.3	90.1	111.6	142.9	194.2	208.7	244.8	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.02	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.2	0.2	0.7	0.9	0.7	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.3	0.3	0.1	1.0	0.8	0.9	3.3	4.4	3.4	

Antenna Type SBNHH-1D65B
Max% 4.40%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

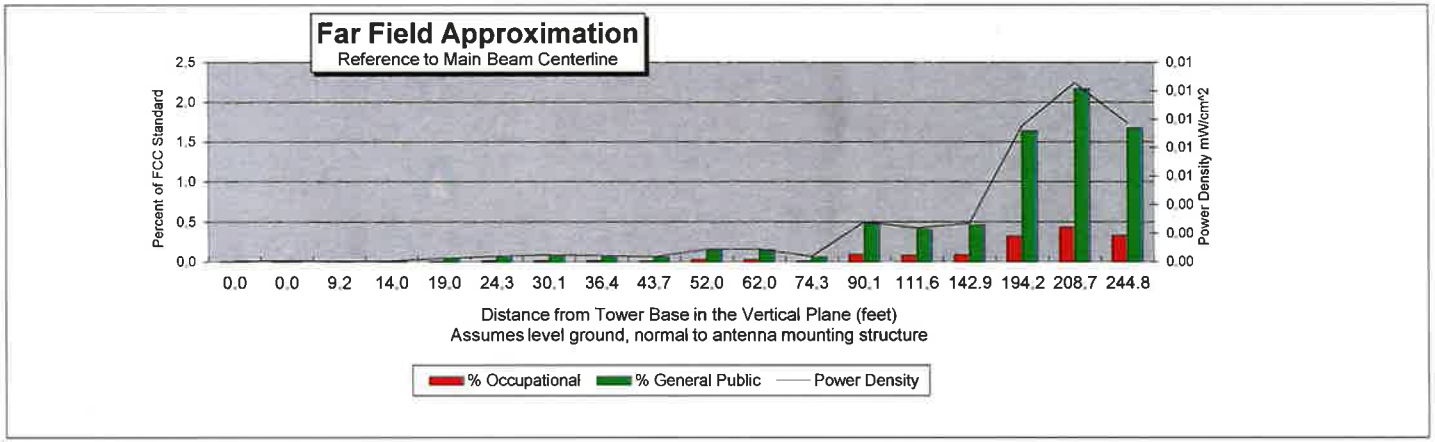
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Talcott Mtn, CT
Site #:	
Date:	04/08/19
Name:	Mark Brauer
File Name:	Talcott Mtn, CT - FF Power

Operating Freq. (MHz)	869.0
Antenna Height (ft):	55.0
Antenna Gain (dBi):	16.7
Antenna Size (in.):	72.0
Downtilt (degrees):	10.0
Feedline Loss (dB):	0.0
Power @ J4 (w):	60.0
Number of Channels	3



Distance in feet below:

Calc Angle	90.0	90.0	80.0	75.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	14.0	12.0	
Solve for r, dx to antenna	52.0	52.0	52.8	53.8	55.3	57.4	60.1	63.5	67.9	73.6	80.9	90.7	104.0	123.1	152.1	201.0	215.1	250.2	
Distance from Antenna Structure Base in Horizontal plane	0.0	0.0	9.2	14.0	19.0	24.3	30.1	36.4	43.7	52.0	62.0	74.3	90.1	111.6	142.9	194.2	208.7	244.8	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.3	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.5	0.4	0.5	1.6	2.2	1.7	

Antenna Type LPA-80063
Max% 2.17%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

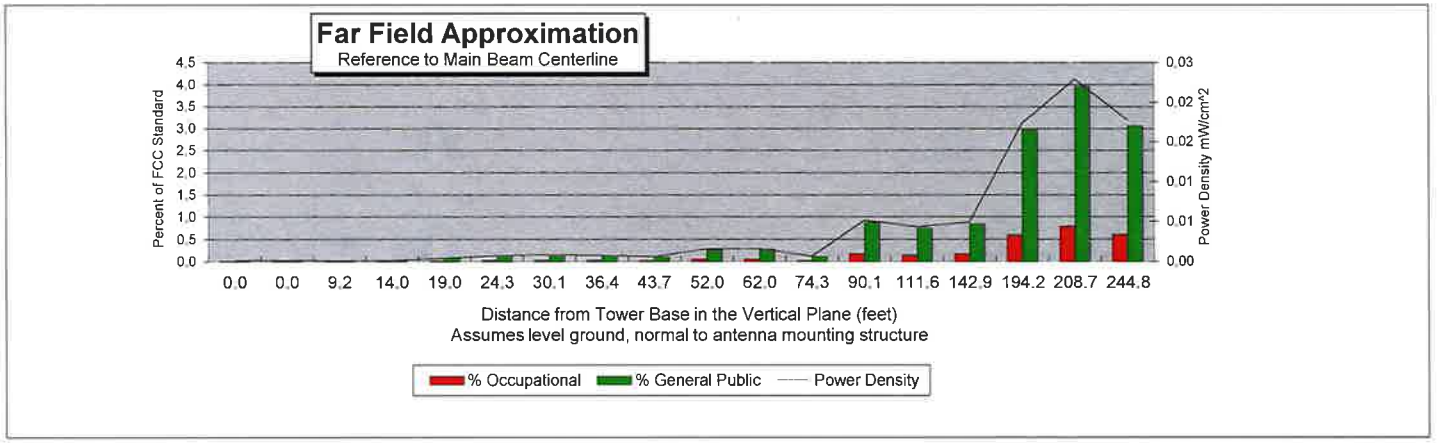
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Talcott Mtn, CT
Site #:	
Date:	04/08/19
Name:	Mark Brauer
File Name:	Talcott Mtn, CT - FF Power

Operating Freq. (MHz)	**869.0**
Antenna Height (ft):	**55.0**
Antenna Gain (dBi):	**15.0**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**10.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**160.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	90.0	80.0	75.0	70.0	65.0	60.0	55.0	50.0	45.0	40.0	35.0	30.0	25.0	20.0	15.0	14.0	12.0	
Solve for r, dx to antenna	52.0	52.0	52.8	53.8	55.3	57.4	60.1	63.5	67.9	73.6	80.9	90.7	104.0	123.1	152.1	201.0	215.1	250.2	
Distance from Antenna Structure Base in Horizontal plane	0.0	0.0	9.2	14.0	19.0	24.3	30.1	36.4	43.7	52.0	62.0	74.3	90.1	111.6	142.9	194.2	208.7	244.8	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.02	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.1	0.2	0.6	0.8	0.6	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1	0.9	0.7	0.8	3.0	4.0	3.1	

Antenna Type SBNHH-1D65B
Max% 3.96%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

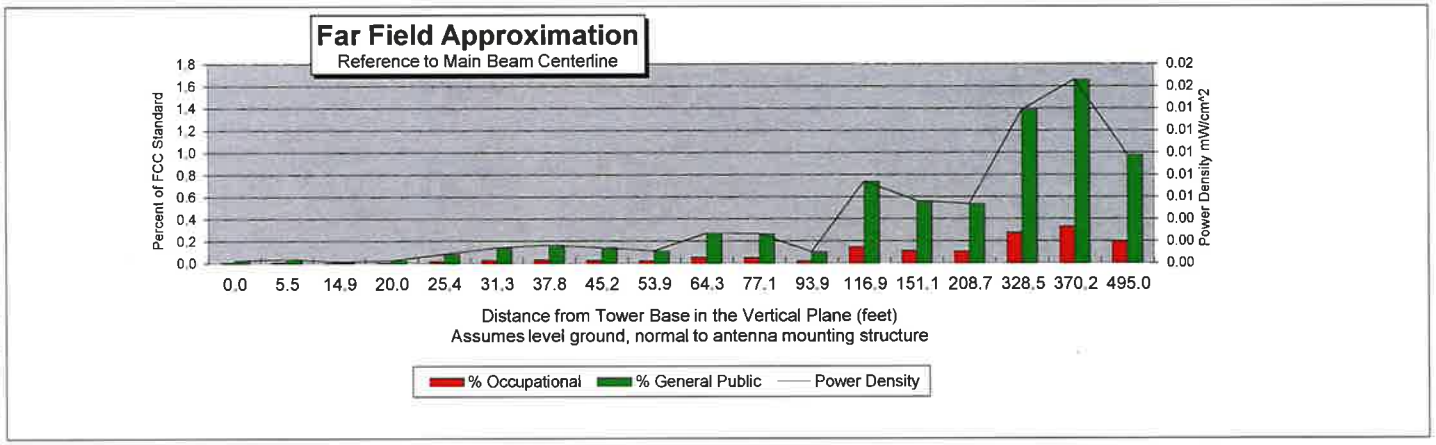
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Talcott Mtn, CT
Site #:	
Date:	04/08/19
Name:	Mark Brauer
File Name:	Talcott Mtn, CT - FF Power

Operating Freq. (MHz)	**1970.0**
Antenna Height (ft):	**55.0**
Antenna Gain (dBi):	**18.4**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**4.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**160.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	84.0	74.0	69.0	64.0	59.0	54.0	49.0	44.0	39.0	34.0	29.0	24.0	19.0	14.0	9.0	8.0	6.0	
Solve for r, dx to antenna	52.0	52.3	54.1	55.7	57.9	60.7	64.3	68.9	74.9	82.7	93.0	107.3	127.9	159.8	215.1	332.6	373.8	497.7	
Distance from Antenna Structure Base in Horizontal plane	0.0	5.5	14.9	20.0	25.4	31.3	37.8	45.2	53.9	64.3	77.1	93.9	116.9	151.1	208.7	328.5	370.2	495.0	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.3	0.2	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.3	0.3	0.1	0.7	0.6	0.5	1.4	1.7	1.0	

Antenna Type SBNHH-1D65B
Max% 1.66%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

Far Field Approximation
with downtilt variation

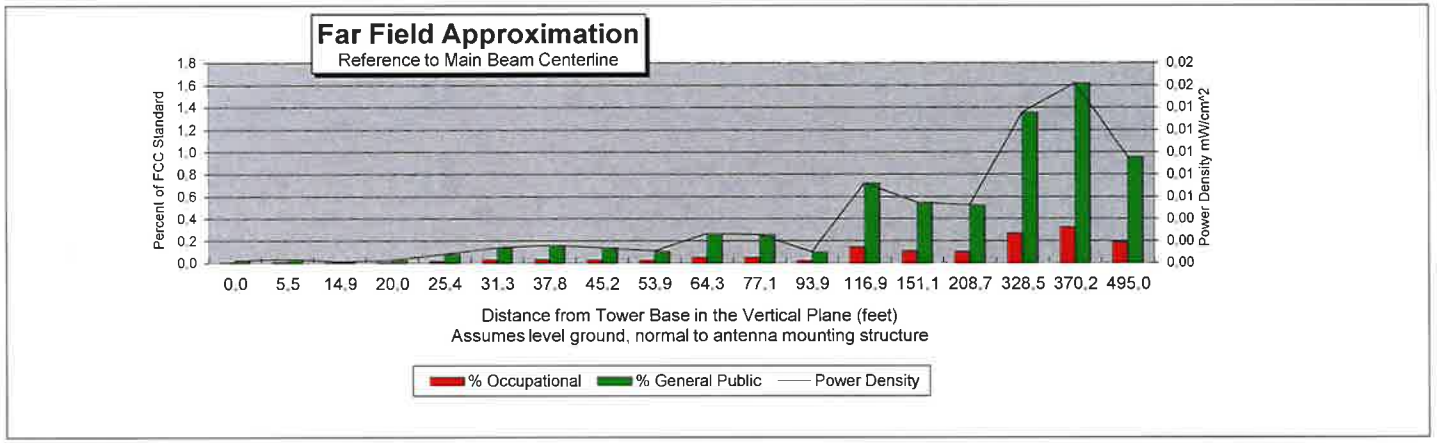
Estimated Radiated Emission

Single Emitter Far Field Model

Dipole / Wire/ Yagi Antenna Types

Location:	Talcott Mtn, CT
Site #:	
Date:	04/08/19
Name:	Mark Brauer
File Name:	Talcott Mtn, CT - FF Power

Operating Freq. (MHz)	**2110.0**
Antenna Height (ft):	**55.0**
Antenna Gain (dBi):	**18.3**
Antenna Size (in.):	**72.0**
Downtilt (degrees):	**4.0**
Feedline Loss (dB):	**0.0**
Power @ J4 (w):	**160.0**
Number of Channels	**1**



Distance in feet below:

Calc Angle	90.0	84.0	74.0	69.0	64.0	59.0	54.0	49.0	44.0	39.0	34.0	29.0	24.0	19.0	14.0	9.0	8.0	6.0	
Solve for r, dx to antenna	52.0	52.3	54.1	55.7	57.9	60.7	64.3	68.9	74.9	82.7	93.0	107.3	127.9	159.8	215.1	332.6	373.8	497.7	
Distance from Antenna Structure Base in Horizontal plane	0.0	5.5	14.9	20.0	25.4	31.3	37.8	45.2	53.9	64.3	77.1	93.9	116.9	151.1	208.7	328.5	370.2	495.0	
Angle from Main Beam (reference to horizontal plane)	90	80	70	65	60	55	50	45	40	35	30	25	20	15	10	5	4	2	
dB down from centerline (referenced to centerline)	36.76	34.35	38.52	35.34	29.54	26.8	25.59	25.63	25.99	21.21	20.29	23.24	13.03	12.3	9.92	2	0.2	0	
Reflection Coefficient (1 to 4, 2.56 typical)	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	2.56	
Power Density (mW/cm^2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.01	
Percent of Occupational Standard	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.3	0.3	0.2	
Percent of General Population Standard	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.3	0.3	0.1	0.7	0.5	0.5	1.4	1.6	1.0	

Antenna Type SBNHH-1D65B
Max% 1.62%

Instructions:

1) Fill in Site Location, Site number, Date, Name of Person Responsible for Date, and enter File Name to ba saved as.
2) References to J4 refer to a point where the transmission line exits the equipment shelter and proceeds to the antenna(s). There is typically a connector located here where power measurements are made.
3) Enter Antenna Height (in feet to bottom of antenna), Antenna Gain (expressed as dBi, add 2.17 to dBd to obtain dBi), Antenna Size (vertical size in inches), Downtilt (in Degrees, enter zero if none), Feedline loss from J4 to Antenna, and J4 Pov
4) From manufacturer's plots, or data sheet, input Angle from mainbeam and dB below mainbeam centerline.
5) Enter Reflection coefficient (2.56 would be typical, 1 for free space)
6) Spreadsheet calculates actual power density, then relates as Occupational or General Population percentage of FCC Standard.
7) An odd distance may be entered in the rightmost column of the lower table.

ATTACHMENT 3

PJF PAUL J. FORD & COMPANY

Report Date:	March 27, 2019
Client:	On Air Engineering, LLC 88 Foundry Pond Road Cold Spring, NY 10516 Attn: David Weinpahl 201-456-4624 dweinpahl@onaireng.com
Structure:	Modified 59.5-ft Self-Support Tower
Site Name:	Talcott Mtn CT
Site Address:	324 Montevideo Rd
City, County, State:	Avon, Hartford County, CT
Latitude, Longitude:	41.811767, -72.798708
PJF Project:	42918-0027.003.8800

Paul J. Ford and Company is pleased to submit this "**Structural Modification Report**" to determine the self-support tower stress level.

Analysis Criteria:

Reference Standard:	2018 Connecticut Building Code with the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1.
Ultimate Wind Speed:	120 mph 3-second gust wind speed without ice
Nominal Wind Speed:	93 mph 3-second gust wind speed without ice
Ice Wind Speed:	50 mph 3-second gust wind speed with 1.0" ice
Service Wind Speed:	60 mph (Serviceability) without ice
IBC Site Criteria:	Risk Category II, Topographic Category 1, Exposure Category B

Proposed Appurtenance Loads:

The structure was analyzed with the addition of the proposed appurtenance loads shown in Table 1 combined with the existing and reserved loads shown in Table 2 of this report.

Summary of Analysis Results:

Modified Structure:	Pass
Existing Foundation:	Pass

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and On Air Engineering, LLC. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully Submitted by:
Paul J. Ford and Company

Matthew Buske

Matthew Buske, P.E.
Project Engineer
mbuske@pauljford.com

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

MAR 28 2019

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 59.5 ft Self Support tower, the original tower manufacturer is unknown. The tower geometry was based on previous analysis performed by Walker Engineering in December of 2005. The tower has been reinforced multiple times to accommodate additional loading.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Nominal Wind Speed:	93 mph
Exposure Category:	B
Topographic Factor:	2.332
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
55.0	55.0	2	samsung telecommunications	RFV01U-D1A	-	-	-
		2	samsung telecommunications	RFV01U-D2A			
		2	commscope	BSAMNT-SBS-1-2 Dual Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
76.5	76.5	1		18-ft Doppler			1
70.0	70.0	3	cci antennas	TPA-65R-LCUUUU-H8	-	-	2
		3	andrew	SBNH-1D6565C			
		3	andrew	SBNH-1D6565C	4	2	1
		3	cci antennas	OPA-65R-LCUU-H8			
		3	cci antennas	TPA-65R-LCUUUU-H8			
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 32			
		3	ericsson	RRUS 32 B2			
		3	raycap	DC6-48-60-18-8F			
		1	-	Platform Mount			
55.0	55.0	4	alcatel lucent	RRH 2x60 - 1900	4	1 5/8	3
		1	antel	BXA-70080-4BF-EDIN-0			
		1	rfs	APX75-866514-CT0			
		2	amphenol	LPA-80063-6CF-EDIN-X	8	1 5/8	1
		4	andrew	SBNHH-1D65B			
		2	antel	LPA-80080-6CF-EDIN			
		2	tower mounts	14' Sector Frame			
51.0	51.0	1	raycap	RHSDC-3315-PF-48	-	-	1

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed, Not Considered In Analysis

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Structural Analysis	Walker Engineering, Inc., 3/1/2005	0502-0054	On Air Engineering, LLC
Tower Structural Analysis	Maser Consulting, 4/10/2017	16946029A	
Modification Drawings	Centek, 10/28/12	12001.C076	
Modification Drawings	Maser Consulting, 3/29/2018	17963018A	
RFDS	Verizon, 12/11/2018	TalCott Mtn CT	
Modification Drawings	PJF, 3/27/2019	42918-0027.003.8800	PJF

3.1) Analysis Method

tnxTower (version 8.0.5.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) Existing tower legs were assumed to be Grade ASTM A572-50, all other pipe was assumed to be ASTM Grade A53-B-35, and all angles were assumed to be Grade A36.
4) Tower and foundation modifications were assumed to be installed as indicated in the modification drawings referenced in table 3.
5) A geotechnical report or existing foundation drawings were not provided. Soil parameters and foundation dimensions were assumed to be taken from previous foundation analysis per direction from on Air Engineering, LLC.
6) Diagonal connection modifications from 19.5' to 39.5' could not be validated due to insufficient detail on the modification drawings, dated 3/29/2018, by Maser Consulting.
7) The wind area of the doppler at the top of the tower was assumed to be 127 ft^2, based on previous analysis performed by Maser Consulting in 2017.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	59.5 - 39.5	Leg	Pipe 3.5" x 0.216" (3 STD)	2	-59.17	82.56	71.7	Pass
T2	39.5 - 19.5	Leg	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (19.5' to 39.5')	29	-114.58	152.33	75.2	Pass
T3	19.5 - 13.1	Leg	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	56	-126.24	133.98	94.2	Pass
T4	13.1 - 6.8	Leg	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	65	-134.88	135.47	99.6	Pass
T5	6.8 - 0	Leg	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (0' to 6.8')	74	-137.43	169.50	81.1	Pass
T1	59.5 - 39.5	Diagonal	Pipe 2.875" x 0.203" (2.5 STD)	8	-12.80	28.69	44.6	Pass
T2	39.5 - 19.5	Diagonal	Pipe 2.875" x 0.203" (2.5 STD)	35	-15.31	28.85	53.1	Pass
T3	19.5 - 13.1	Diagonal	Pipe 2.875" x 0.203" (2.5 STD)	62	-7.64	24.48	31.2 42.8 (b)	Pass
T4	13.1 - 6.8	Diagonal	Pipe 2.875" x 0.203" (2.5 STD)	71	-6.71	22.44	29.9 37.9 (b)	Pass
T5	6.8 - 0	Diagonal	2L 3 x 3 x 3/16 (3/8)	84	-6.56	48.52	13.5	Pass
T1	59.5 - 39.5	Horizontal	L 2.5 x 2.5 x 1/4	24	-2.31	8.97	25.8 29.4 (b)	Pass
T2	39.5 - 19.5	Horizontal	L 3 x 3 x 3/8	37	-1.98	23.14	8.6 11.1 (b)	Pass
T3	19.5 - 13.1	Horizontal	L 3 x 3 x 1/4	60	-4.10	15.91	25.8 51.6 (b)	Pass
T4	13.1 - 6.8	Horizontal	L 3 x 3 x 1/4	67	-2.66	13.18	20.2 33.5 (b)	Pass
T5	6.8 - 0	Horizontal	2L 2 x 2 x 3/16 (3/8)	83	-6.35	26.80	23.7 47.3 (b)	Pass
T1	59.5 - 39.5	Top Girt	L 5 x 3 x 1/4 LLH	6	-3.32	24.93	13.3 33.9 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T5	6.8 - 0	Redund Horz 1 Bracing	L 2 x 2 x 3/16	81	-2.38	14.85	16.0	Pass
T5	6.8 - 0	Redund Diag 1 Bracing	L 2 x 2 x 3/16	82	-2.33	11.40	20.4	Pass
							Summary	
						Leg (T4)	99.6	Pass
						Diagonal (T2)	53.1	Pass
						Horizontal (T3)	51.6	Pass
						Top Girt (T1)	33.9	Pass
						Redund Horz 1 Bracing (T5)	16.0	Pass
						Redund Diag 1 Bracing (T5)	20.4	Pass
						Bolt Checks	75.9	Pass
						Rating =	99.6	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
2	Anchor Rods	-	-	-
1	Base Foundation Structural	-	73.1	Pass
1	Base Foundation Soil Interaction	-	68.0	Pass

Structure Rating (max from all components) =	99.6%

Notes:
1) See additional documentation in "Appendix B– Additional Calculations" for calculations supporting the % capacity consumed.
2) Existing anchor rods are encased in foundation.

4.1) Recommendations

The tower and its foundation will have sufficient capacity to carry the proposed loading configuration once the proposed modifications are installed.

- Install the proposed modifications per the attached drawings, dated 3/27/2019.

APPENDIX A

TNXTOWER OUTPUT

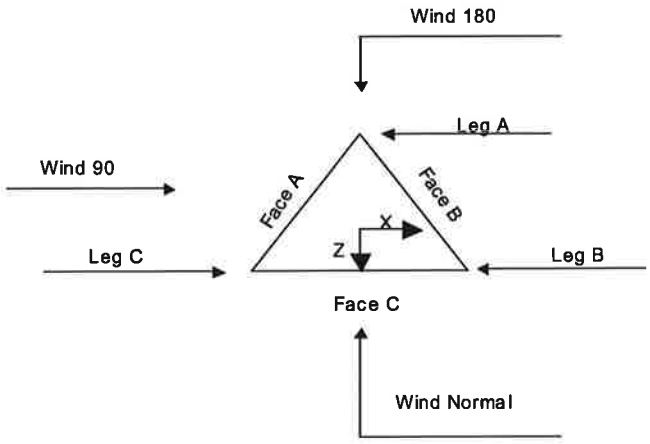
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 59.50 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 7.58 ft at the top and 9.71 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in Hartford County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 93 mph.
4) Structure Class II.
5) Exposure Category B.
6) Topographic Category 5.
7) Crest Height 730.00 ft.
8) SEAW RSM-03 procedures for wind speed-up calculations are used.
9) Topographic Feature: Continuous Ridge.
10) Slope Distance L: 3600.00 ft.
11) Distance from Crest x: 0.00 ft.
12) Nominal ice thickness of 1.000 in.
13) Ice thickness is considered to increase with height.
14) Ice density of 56 pcf.
15) A wind speed of 50 mph is used in combination with ice.
16) Temperature drop of 50 °F.
17) Deflections calculated using a wind speed of 60 mph.
18) A non-linear (P-delta) analysis was used.
19) Pressures are calculated at each section.
20) Stress ratio used in tower member design is 1.
21) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	59.50-39.50			7.58	1	20.00
T2	39.50-19.50			7.58	1	20.00
T3	19.50-13.10			7.58	1	6.40
T4	13.10-6.80			8.28	1	6.30
T5	6.80-0.00			9.02	1	6.80

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	59.50-39.50	5.00	K Brace Left	No	Yes	0.000	0.000
T2	39.50-19.50	5.00	K Brace Left	No	Yes	0.000	0.000
T3	19.50-13.10	6.40	Diag Down	No	Yes	0.000	0.000
T4	13.10-6.80	6.30	Diag Up	No	Yes	0.000	0.000
T5	6.80-0.00	6.80	K1 Down	No	Yes	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 59.50-39.50	Pipe	Pipe 3.5" x 0.216" (3 STD)	A572-50 (50 ksi)	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A53-B-35 (35 ksi)
T2 39.50-19.50	Arbitrary Shape	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half	A500-46 (46 ksi)	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A53-B-35 (35 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T3 19.50-13.10	Arbitrary Shape	sleeve (19.5' to 39.5') (42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	A500-46 (46 ksi)	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A53-B-35 (35 ksi)
T4 13.10-6.80	Arbitrary Shape	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	A500-46 (46 ksi)	Pipe	Pipe 2.875" x 0.203" (2.5 STD)	A53-B-35 (35 ksi)
T5 6.80-0.00	Arbitrary Shape	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (0' to 6.8')	A500-46 (46 ksi)	Double Angle	2L 3 x 3 x 3/16 (3/8)	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 59.50-39.50	Single Angle	L 5 x 3 x 1/4 LLH	A36 (36 ksi)	Channel		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 59.50-39.50	None	Single Angle		A36 (36 ksi)	Single Angle	L 2.5 x 2.5 x 1/4	A36 (36 ksi)
T2 39.50-19.50	None	Single Angle		A36 (36 ksi)	Single Angle	L 3 x 3 x 3/8	A36 (36 ksi)
T3 19.50-13.10	None	Single Angle		A36 (36 ksi)	Single Angle	L 3 x 3 x 1/4	A36 (36 ksi)
T4 13.10-6.80	None	Single Angle		A36 (36 ksi)	Single Angle	L 3 x 3 x 1/4	A36 (36 ksi)
T5 6.80-0.00	None	Single Angle		A36 (36 ksi)	Double Angle	2L 2 x 2 x 3/16 (3/8)	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T5 6.80-0.00	A36 (36 ksi)	Horizontal (1)	Single Angle	L 2 x 2 x 3/16	1
		Diagonal (1)	Single Angle	L 2 x 2 x 3/16	1

Tower Section Geometry *(cont'd)*

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

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 59.50-39.50	0.00	0.375	A36 (36 ksi)	1	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T2 39.50-19.50	0.00	0.375	A36 (36 ksi)	1	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T3 19.50-13.10	0.00	0.375	A36 (36 ksi)	1	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T4 13.10-6.80	0.00	0.375	A36 (36 ksi)	1	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt
T5 6.80-0.00	0.00	0.375	A36 (36 ksi)	1	1	1.1	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1 59.50-39.50	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 39.50-19.50	Yes	No	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 19.50-13.10	Yes	No	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1	1
T4 13.10-6.80	Yes	No	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1	1
T5 6.80-0.00	Yes	No	1	1	1	1	1	1	1	1	1	1	1	0.5	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 59.50-39.50	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 39.50-19.50	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 19.50-13.10	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 13.10-6.80	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 6.80-0.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 59.50-39.50	Flange	0.875 A325N	4	0.000 A325N	0	0.625 A325N	1	0.000 A325N	0	0.000 A325N	0	0.500 A325N	1	0.000 A325N	0
T2 39.50-19.50	Flange	0.875 A325N	4	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.750 A325N	1	0.000 A325N	0
T3 19.50-13.10	Flange	0.875 A325N	4	0.750 A325N	1	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.500 A325N	1	0.625 A325N	1
T4 13.10-6.80	Flange	0.875 A325N	4	0.750 A325N	1	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.500 A325N	1	0.625 A325N	1
T5 6.80-0.00	Flange	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.500 A325N	1	0.625 A325N	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A (1 5/8" foam)	C	No	No	Ar (CaAa)	55.00 - 0.00	0.000	-0.38	8	7	1.000 0.500	1.980		0.92
1.5" flat Cable Ladder Rail ***	C	No	No	Af (CaAa)	55.00 - 0.00	0.000	-0.38	2	2	24.000 1.500	1.500		1.80
2" (Nominal) Conduit	A	No	No	Ar (CaAa)	55.00 - 0.00	0.000	-0.4	4	4	2.375	2.375		0.72

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
18-ft Doppler ** **	C	None		0.000	76.50	No Ice 1/2" Ice 1" Ice	127.00 127.80 128.40	127.00 127.80 128.60	2.00 4.00 6.00
TPA-65R-LCUUUU-H8 w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.11 0.22 0.33
TPA-65R-LCUUUU-H8 w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.11 0.22 0.33
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.11 0.22 0.33
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.10 0.19 0.28
SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.10 0.19 0.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SBNH-1D6565C w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.10 0.19 0.28
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.10 0.19 0.28
SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.10 0.19 0.28
SBNH-1D6565C w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.10 0.19 0.28
OPA-65R-LCUU-H8 w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.12 0.21 0.32
OPA-65R-LCUU-H8 w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.12 0.21 0.32
OPA-65R-LCUU-H8 w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.12 0.21 0.32
TPA-65R-LCUUUU-H8 w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.11 0.22 0.33
TPA-65R-LCUUUU-H8 w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.11 0.22 0.33
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.11 0.22 0.33
RRUS 11	A	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.05 0.07 0.10
RRUS 11	B	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.05 0.07 0.10
RRUS 11	C	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.05 0.07 0.10
RRUS 32	C	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.06 0.08 0.10
RRUS 32	A	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.06 0.08 0.10
RRUS 32	B	From Leg	4.00 0 0	0.000	70.00	1" Ice No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.06 0.08 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRUS 32 B2	C	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.05 0.07 0.10
RRUS 32 B2	A	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.05 0.07 0.10
RRUS 32 B2	B	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.05 0.07 0.10
(3) DC6-48-60-18-8F	C	From Leg	4.00 0 0	0.000	70.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.03 0.05 0.08
Platform Mount	C	None		0.000	70.00	No Ice 1/2" Ice 1" Ice	37.47 44.23 50.99	37.47 44.23 50.99	1.60 2.04 2.48
**									
LPA-80063-6CF-EDIN-X w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	9.97 10.54 11.08	10.25 11.42 12.31	0.05 0.15 0.25
LPA-80063-6CF-EDIN-X w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	9.97 10.54 11.08	10.25 11.42 12.31	0.05 0.15 0.25
SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	8.42 8.96 9.48	7.42 8.45 9.35	0.08 0.15 0.23
SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	8.42 8.96 9.48	7.42 8.45 9.35	0.08 0.15 0.23
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	8.42 8.96 9.48	7.42 8.45 9.35	0.08 0.15 0.23
LPA-80080-6CF-EDIN w/ Mount Pipe	A	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	4.56 5.10 5.61	10.27 11.44 12.32	0.05 0.11 0.19
LPA-80080-6CF-EDIN w/ Mount Pipe	C	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	4.56 5.10 5.61	10.27 11.44 12.32	0.05 0.11 0.19
(2) RFV01U-D1A	A	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.25 1.39 1.54	0.08 0.10 0.12
(2) RFV01U-D2A	B	From Leg	4.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	1.88 2.05 2.22	1.01 1.14 1.28	0.07 0.09 0.11
Generic Sector Frame	A	From Leg	2.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	15.00 17.50 20.00	10.00 12.50 15.00	0.60 0.80 1.00
Generic Sector Frame	B	From Leg	2.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	15.00 17.50 20.00	10.00 12.50 15.00	0.60 0.80 1.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Generic Sector Frame	C	From Leg	2.00 0 0	0.000	55.00	No Ice 1/2" Ice 1" Ice	15.00 17.50 20.00	10.00 12.50 15.00	0.60 0.80 1.00
**									
**									
RHSDC-3315-PF-48	C	From Leg	0.00 0 0	0.000	51.00	No Ice 1/2" Ice 1" Ice	3.71 3.95 4.20	2.19 2.39 2.61	0.03 0.06 0.10
**									

Load Combinations

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

Comb. No.	Description
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	59.5 - 39.5	1.04	44	0.140	0.005
T2	39.5 - 19.5	0.49	44	0.100	0.006
T3	19.5 - 13.1	0.12	44	0.055	0.005
T4	13.1 - 6.8	0.05	44	0.037	0.006
T5	6.8 - 0	0.01	50	0.019	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
76.50	18-ft Doppler	44	1.04	0.140	0.005	101592
70.00	TPA-65R-LCUUUU-H8 w/ Mount Pipe	44	1.04	0.140	0.005	101592
55.00	LPA-80063-6CF-EDIN-X w/ Mount Pipe	44	0.91	0.131	0.006	101592
51.00	RHSDC-3315-PF-48	44	0.79	0.123	0.006	59760

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	59.5 - 39.5	3.98	12	0.537	0.017
T2	39.5 - 19.5	1.88	12	0.382	0.021
T3	19.5 - 13.1	0.44	12	0.211	0.016
T4	13.1 - 6.8	0.19	24	0.140	0.021
T5	6.8 - 0	0.02	3	0.072	0.004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
76.50	18-ft Doppler	12	3.98	0.537	0.017	26446
70.00	TPA-65R-LCUUUU-H8 w/ Mount Pipe	12	3.98	0.537	0.017	26446
55.00	LPA-80063-6CF-EDIN-X w/ Mount Pipe	12	3.48	0.502	0.019	26446
51.00	RHSDC-3315-PF-48	12	3.05	0.471	0.020	15556

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	59.5	Leg	A325N	0.875	4	12.98	40.59	0.320 ✔	1	Bolt Tension
		Horizontal	A325N	0.500	1	2.34	7.95	0.294 ✔	1	Bolt Shear
		Top Girt	A325N	0.625	1	3.54	10.44	0.339 ✔	1	Member Bearing
T2	39.5	Leg	A325N	0.875	4	26.12	40.59	0.644 ✔	1	Bolt Tension
		Horizontal	A325N	0.750	1	1.98	17.89	0.111 ✔	1	Bolt Shear
T3	19.5	Leg	A325N	0.875	4	28.86	40.59	0.711 ✔	1	Bolt Tension
		Diagonal	A325N	0.750	1	7.67	17.89	0.428 ✔	1	Bolt Shear
		Horizontal	A325N	0.500	1	4.10	7.95	0.516 ✔	1	Bolt Shear
T4	13.1	Leg	A325N	0.875	4	30.80	40.59	0.759 ✔	1	Bolt Tension
		Diagonal	A325N	0.750	1	6.79	17.89	0.379 ✔	1	Bolt Shear
		Horizontal	A325N	0.500	1	2.66	7.95	0.335 ✔	1	Bolt Shear
T5	6.8	Horizontal	A325N	0.500	1	5.86	12.40	0.473 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	59.5 - 39.5	Pipe 3.5" x 0.216" (3 STD)	20.00	5.00	51.6 K=1.00	2.228	-59.17	82.56	0.717 [1] ✔
T2	39.5 - 19.5	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (19.5' to 39.5')	20.00	5.00	59.2 K=1.00	4.658	-114.58	152.33	0.752 [1] ✔
T3	19.5 - 13.1	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	6.41	6.41	73.6 K=1.00	4.658	-126.24	133.98	0.942 [1] ✔
T4	13.1 - 6.8	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	6.31	6.31	72.5 K=1.00	4.658	-134.88	135.47	0.996 [1] ✔
T5	6.8 - 0	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (0' to 6.8')	6.81	3.41	43.8 K=1.00	4.658	-137.43	169.50	0.811 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	59.5 - 39.5	Pipe 2.875" x 0.203" (2.5 STD)	9.08	8.73	110.6 K=1.00	1.704	-12.80	28.69	0.446 [1] ✔
T2	39.5 - 19.5	Pipe 2.875" x 0.203" (2.5 STD)	9.08	8.70	110.2 K=1.00	1.704	-15.31	28.85	0.531 [1] ✔
T3	19.5 - 13.1	Pipe 2.875" x 0.203" (2.5 STD)	10.19	9.78	123.9 K=1.00	1.704	-7.64	24.48	0.312 [1] ✔
T4	13.1 - 6.8	Pipe 2.875" x 0.203" (2.5 STD)	10.70	10.31	130.5 K=1.00	1.704	-6.71	22.44	0.299 [1] ✔
T5	6.8 - 0	2L 3 x 3 x 3/16 (3/8)	8.36	8.08	81.9 K=1.00	2.180	-6.56	48.52	0.135 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	59.5 - 39.5	L 2.5 x 2.5 x 1/4	7.58	7.08	173.1 K=1.00	1.190	-2.31	8.97	0.258 [1] ✔
T2	39.5 - 19.5	L 3 x 3 x 3/8	7.58	7.02	143.5 K=1.00	2.110	-1.98	23.14	0.086 [1] ✔
T3	19.5 - 13.1	L 3 x 3 x 1/4	7.58	7.05	142.9 K=1.00	1.438	-4.10	15.91	0.258 [1] ✔
T4	13.1 - 6.8	L 3 x 3 x 1/4	8.28	7.75	157.0 K=1.00	1.438	-2.66	13.18	0.202 [1] ✔
T5	6.8 - 0	2L 2 x 2 x 3/16 (3/8)	9.02	6.42	102.0 K=1.00	1.430	-6.35	26.80	0.237 [1] ✔
		2L 'a' > 24.398 in - 83							

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	59.5 - 39.5	L 5 x 3 x 1/4 LLH	7.58	7.05	127.6 K=1.00	1.940	-3.32	24.93	0.133 [1] ✔

[1] $P_u / \phi P_n$ controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T5	6.8 - 0	L 2 x 2 x 3/16	2.26	2.09	91.9 K=1.44	0.715	-2.38	14.85	0.160 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	6.8 - 0	L 2 x 2 x 3/16	3.99	3.68	116.0 K=1.04	0.715	-2.33	11.40	0.204 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	59.5 - 39.5	Pipe 3.5" x 0.216" (3 STD)	20.00	5.00	51.6	2.228	51.93	100.28	0.518 [1] ✔
T2	39.5 - 19.5	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (19.5' to 39.5')	20.00	5.00	59.2	4.658	104.49	192.85	0.542 [1] ✔
T3	19.5 - 13.1	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	6.41	6.41	73.6	4.658	115.42	192.85	0.598 [1] ✔
T4	13.1 - 6.8	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	6.31	6.31	72.5	4.658	123.18	192.85	0.639 [1] ✔
T5	6.8 - 0	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (0' to 6.8')	6.81	3.41	43.8	4.658	124.81	192.85	0.647 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	59.5 - 39.5	Pipe 2.875" x 0.203" (2.5 STD)	9.08	8.73	110.6	1.704	12.73	53.68	0.237 [1] ✔
T2	39.5 - 19.5	Pipe 2.875" x 0.203" (2.5 STD)	9.08	8.70	110.2	1.704	15.29	53.68	0.285 [1] ✔
T3	19.5 - 13.1	Pipe 2.875" x 0.203" (2.5 STD)	10.19	9.78	123.9	1.704	7.67	53.68	0.143 [1] ✔
T4	13.1 - 6.8	Pipe 2.875" x 0.203" (2.5 STD)	10.70	10.31	130.5	1.704	6.79	53.68	0.126 [1] ✔
T5	6.8 - 0	2L 3 x 3 x 3/16 (3/8)	8.36	8.08	70.3	2.180	6.65	70.63	0.094 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	59.5 - 39.5	L 2.5 x 2.5 x 1/4	7.58	7.08	113.8	0.775	2.34	33.73	0.069 [1] ✔
T2	39.5 - 19.5	L 3 x 3 x 3/8	7.58	7.02	95.8	1.336	1.98	58.13	0.034 [1] ✔
T3	19.5 - 13.1	L 3 x 3 x 1/4	7.58	7.05	93.6	0.961	3.41	41.80	0.082 [1] ✔
T4	13.1 - 6.8	L 3 x 3 x 1/4	8.28	7.75	102.6	0.961	2.66	41.80	0.064 [1] ✔
T5	6.8 - 0	2L 2 x 2 x 3/16 (3/8)	9.02	6.42	84.6	0.897	5.86	39.01	0.150 [1] ✔
		2L 'a' > 24.398 in - 83							

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	59.5 - 39.5	L 5 x 3 x 1/4 LLH	7.58	7.05	101.6	1.314	3.54	57.18	0.062 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T5	6.8 - 0	L 2 x 2 x 3/16	2.26	2.09	40.7	0.715	2.38	23.17	0.103 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T5	6.8 - 0	L 2 x 2 x 3/16	3.99	3.68	71.6	0.715	2.33	23.17	0.100 [1] ✔

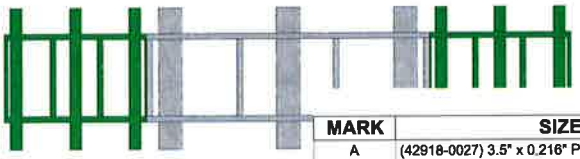
[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	59.5 - 39.5	Leg	Pipe 3.5" x 0.216" (3 STD)	2	-59.17	82.56	71.7	Pass
T2	39.5 - 19.5	Leg	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (19.5' to 39.5')	29	-114.58	152.33	75.2	Pass
T3	19.5 - 13.1	Leg	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	56	-126.24	133.98	94.2	Pass
T4	13.1 - 6.8	Leg	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')	65	-134.88	135.47	99.6	Pass
T5	6.8 - 0	Leg	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (0' to 6.8')	74	-137.43	169.50	81.1	Pass
T1	59.5 - 39.5	Diagonal	Pipe 2.875" x 0.203" (2.5 STD)	8	-12.80	28.69	44.6	Pass
T2	39.5 - 19.5	Diagonal	Pipe 2.875" x 0.203" (2.5 STD)	35	-15.31	28.85	53.1	Pass
T3	19.5 - 13.1	Diagonal	Pipe 2.875" x 0.203" (2.5 STD)	62	-7.64	24.48	31.2 42.8 (b)	Pass
T4	13.1 - 6.8	Diagonal	Pipe 2.875" x 0.203" (2.5 STD)	71	-6.71	22.44	29.9 37.9 (b)	Pass
T5	6.8 - 0	Diagonal	2L 3 x 3 x 3/16 (3/8)	84	-6.56	48.52	13.5	Pass
T1	59.5 - 39.5	Horizontal	L 2.5 x 2.5 x 1/4	24	-2.31	8.97	25.8 29.4 (b)	Pass
T2	39.5 - 19.5	Horizontal	L 3 x 3 x 3/8	37	-1.98	23.14	8.6 11.1 (b)	Pass
T3	19.5 - 13.1	Horizontal	L 3 x 3 x 1/4	60	-4.10	15.91	25.8 51.6 (b)	Pass
T4	13.1 - 6.8	Horizontal	L 3 x 3 x 1/4	67	-2.66	13.18	20.2 33.5 (b)	Pass
T5	6.8 - 0	Horizontal	2L 2 x 2 x 3/16 (3/8)	83	-6.35	26.80	23.7 47.3 (b)	Pass
T1	59.5 - 39.5	Top Girt	L 5 x 3 x 1/4 LLH	6	-3.32	24.93	13.3 33.9 (b)	Pass
T5	6.8 - 0	Redund Horz 1 Bracing	L 2 x 2 x 3/16	81	-2.38	14.85	16.0	Pass
T5	6.8 - 0	Redund Diag 1 Bracing	L 2 x 2 x 3/16	82	-2.33	11.40	20.4	Pass
							Summary	
						Leg (T4)	99.6	Pass
						Diagonal (T2)	53.1	Pass
						Horizontal (T3)	51.6	Pass
						Top Girt (T1)	33.9	Pass
						Redund Horz 1 Bracing (T5)	16.0	Pass
						Redund Diag 1 Bracing (T5)	20.4	Pass
						Bolt Checks	75.9	Pass
						RATING =	**99.6**	**Pass**

APPENDIX B

ADDITIONAL CALCULATIONS

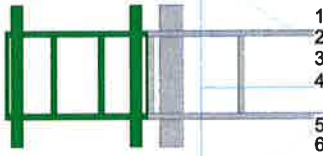


SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (19.5' to 39.5')	C	(42918-0027) 3.5" x 0.216" Pipe w/ 4.5" x 0.375" half sleeve (0' to 6.8')
B	(42918-0027) 3.5" x .216" Pipe w/ 4.5" x 0.375" half sleeve (6.8' to 19.5')		

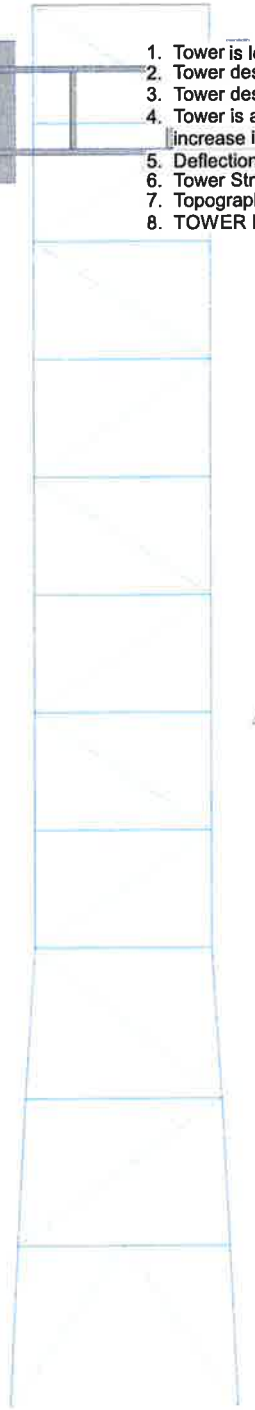
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A500-46	46 ksi	62 ksi
A53-B-35	35 ksi	60 ksi	A36	36 ksi	58 ksi



TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 5 with Crest Height of 730.00 ft
8. TOWER RATING: 99.6%

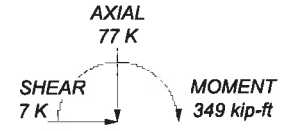


Legs	C	B	A							Pipe 3.5" x 0.216" (3 STD)
Leg Grade										A572-50
Diagonals	2L 3 x 3 x 3/16 (3/8)									
Diagonal Grade	A36			Pipe 2.875" x 0.203" (2.5 STD)						
Top Girts				A53-B-35						
Horizontals	2L 2 x 2 x 3/16 (3/8)			N.A.						L 5 x 3 x 1/4 LLH
Red. Horizontals	L 2 x 2 x 3/16			L 3 x 3 x 1/4						L 2.5 x 2.5 x 1/4
Red. Diagonals	L 2 x 2 x 3/16			L 3 x 3 x 3/8						
Face Width (ft)	9.70833	9.02179	8.28125	7.5833						
# Panels @ (ft)	1 @ 6.8		1 @ 6.3	1 @ 6.4			8 @ 5			
Weight (K)	6.5	1.0	0.7	0.7	0.7	2.5				1.7

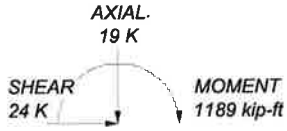
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 147 K
SHEAR: 14 K

UPLIFT: -134 K
SHEAR: 13 K



TORQUE 2 kip-ft
50 mph WIND - 1.000 in ICE



TORQUE 7 kip-ft
REACTIONS - 93 mph WIND

Paul J. Ford and Company
250 East Broad st., Suite 600
Columbus, OH 43215
Phone: (614) 221-6679
FAX:

Job: 62.1-ft Self-Support Tower Avon, CT			
Project: 42918-0027			
Client: On Air Engineering, LLC	Drawn by: mbuske	App'd:	
Code: TIA-222-G	Date: 03/27/19	Scale: N	
Path:		Dwg No.	

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

By MRB Date 3/28/2019
Project # Post-Installed Anchor Rods

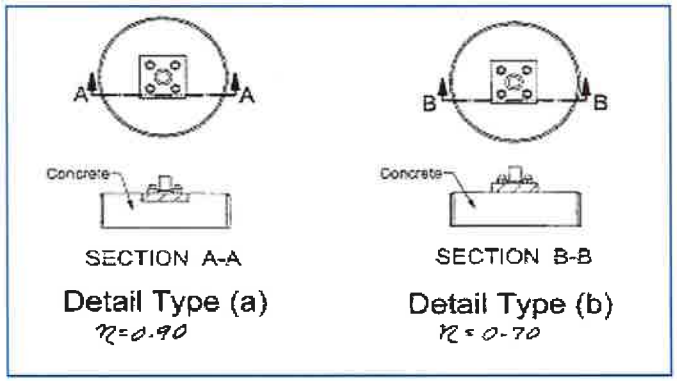
Self-Support Tower Anchor Rod Capacity - TIA-G

Loads

Compression :	71.5	kips	Tension :		kips	Code:	TIA-G
Comp. Shear :	0	kips	Ten.Shear :		kips	Maximum Ratio:	1.00

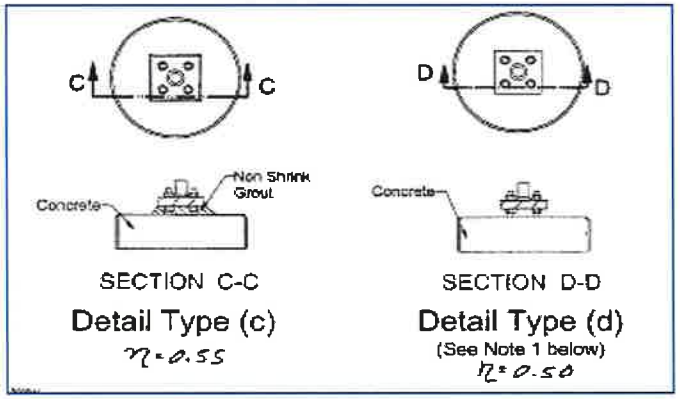
Existing Anchor Rods

Anchor Rod Condition (n) :	0.5			
Anchor Rod ø :	1	in	l_{ar} :	inches
Anchor Rod Quantity :	2		Comp. M_u :	0.00 k-in
Anchor Rod Grade :	A193 Gr B7			
F_y :	105	ksi		
F_u :	125	ksi		
Threads per Inch	8			
Net Tensile Area	0.61	in^2		
ϕ_t :	0.80			
$\phi_t R_{nt}$:	121.15	kip		
Anchor Rod Ratio :	0.590			



SECTION A-A
Detail Type (a)
η=0.90

SECTION B-B
Detail Type (b)
η = 0.70



SECTION C-C
Detail Type (c)
η=0.55

SECTION D-D
Detail Type (d)
(See Note 1 below)
η=0.50

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Page 1 of 1
By OFH Date 3/28/2019
Project # 42918-0027.003.8800

Ultimate Bearing Capacity =	18000	psf	
ϕ =	0.750		
ϕP_n =	13500	psf	
Max. Comp. LC Bearing =	2706	psf	(From RAM Concept)
Ratio =	0.200		
Max. Tens. LC Bearing =	6010	psf	(From RAM Concept)
Ratio =	0.445		

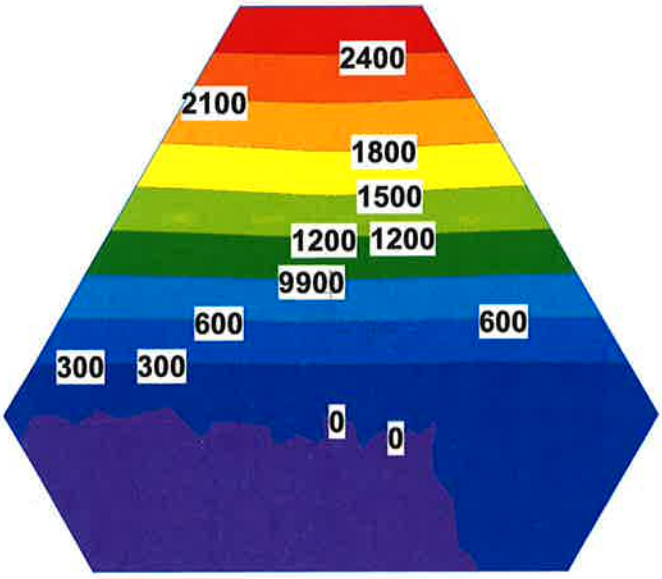
f'c =	4000	psi
fy =	60000	psi
As =	0.600	in^2
d =	19.6875	inch
b =	12	inch
a =	0.882	
ϕ =	0.9	
ϕM_n =	51.97	k-ft/ft

Max Mu =	38.340	k-ft/ft
Ratio =	0.738	

Factored LC: 1.2D+ 1.6W (Compression): Max Soil Bearin

Factored LC: 1.2D+ 1.6W (Compression): User Notes; User Lines; User Dimensions;
Drawing Import: User Lines; User Notes; User Dimensions;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Element
Scale = 1:80
Factored LC: 1.2D+ 1.6W (Compression) - Area Spring Vertical Reactions Plot (Maximum Values)

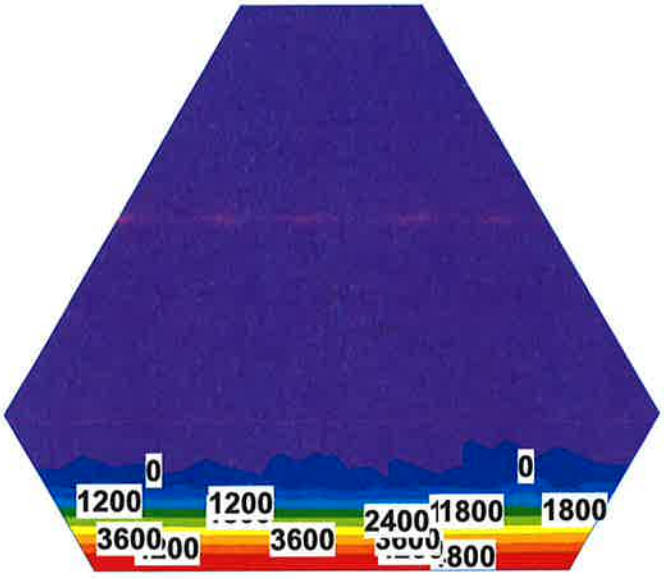
Min Value = -2.491e-11 psf @ (-7.159,-8.332) Max Value = 2706 psf @ (0,11.25)



Factored LC: 0.9D + 1.6W (Uplift): Max Soil Bearing Press

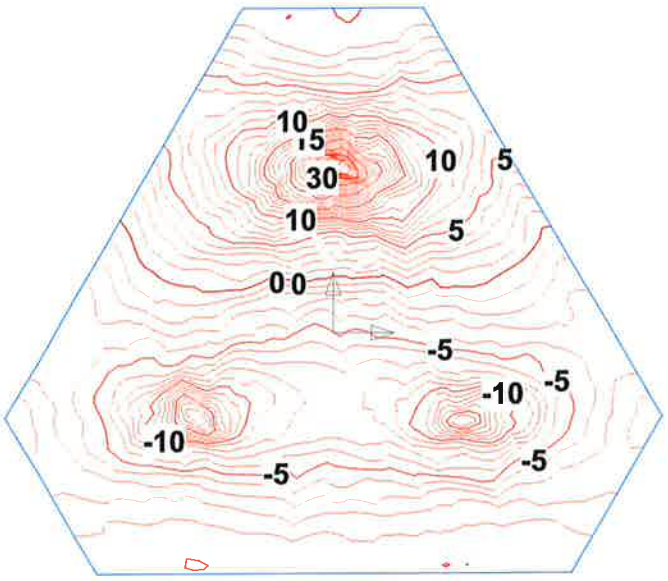
Factored LC: 0.9D + 1.6W (Uplift): User Notes; User Lines; User Dimensions;
Drawing Import: User Lines; User Notes; User Dimensions;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Element
Scale = 1:80
Factored LC: 0.9D + 1.6W (Uplift) - Area Spring Vertical Reactions Plot (Maximum Values)

Min Value = -0.002744 psf @ (-3.125,11.25) Max Value = 6010 psf @ (8.182,-8.332)



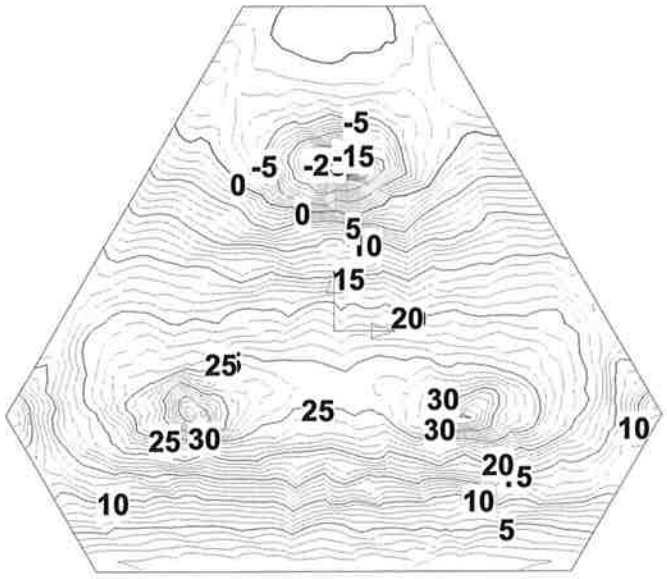
Factored LC: 1.2D+ 1.6W (Compression): Max Mx Plan

Factored LC: 1.2D+ 1.6W (Compression): User Notes; User Lines; User Dimensions;
Drawing Import: User Lines; User Notes; User Dimensions;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Element
Scale = 1:80
Factored LC: 1.2D+ 1.6W (Compression) - Bending Moment Plot (Maximum Values) (X-Axis Directic
One Contour = 1 Kips
Min Value = -18.74 Kips @ (-4.74,-2.816) Max Value = 38.34 Kips @ (0.3845,5.653)



Factored LC: 0.9D + 1.6W (Uplift): Max Mx Plan

Factored LC: 0.9D + 1.6W (Uplift): User Notes; User Lines; User Dimensions;
Drawing Import: User Lines; User Notes; User Dimensions;
Mesh Input: User Lines;
Element: Wall Elements Above; Wall Elements Below; Wall Element Outline Only; Column Element
Scale = 1:80
Factored LC: 0.9D + 1.6W (Uplift) - Bending Moment Plot (Maximum Values) (X-Axis Direction)
One Contour = 1 Kips
Min Value = -27.36 Kips @ (0.3845,5.653) Max Value = 37.5 Kips @ (-4.74,-2.816)



M_u = 1189 k·ft + 14k(3.5') = 1238 k·ft

Volume = (310 ft²)(3.5 ft) = 1085 ft³

weight = (.15)(1085 ft³) = 162.8k

additional weight from 2017 mod

Volume = (215.95 ft²)(2ft) = 431.9 ft³

weight = (.15)(431.9 ft³) = 64.8 k

total weight = 227.6 k

tower weight = 19 (1.2) = 15.83 k

total weight compression = 227.6k(1.2) + (15.83k)(1.2) = 292.1k
total weight uplift = .9(227.6k) + .9(15.83k) = 219.1 k

M_n = OTM resistance = (219.1 k)(8.33 ft) = 1825 k·ft

$\frac{M_u}{M_n}$ = 0.68 ≤ 1.0 ✓ okay

PAUL J. FORD & COMPANY

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1) Paul J. Ford and Company has not made a field inspection to verify the tower member sizes or the antenna/coax loading. If the existing conditions are not as represented on these drawings, we should be contacted immediately to evaluate the significance of the deviation.

2) No allowance was made for any damaged, missing, or rusted members. The analysis of this tower assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the tower members have the same load carrying capacity as the day the tower was erected.

3) It is not possible to have all the detailed information to perform a thorough analysis of every structural sub-component of an existing tower. The structural analysis by Paul J. Ford and Company verifies the adequacy of the main structural members of the tower. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc.

4) The structural integrity of the existing tower foundation can only be verified if exact foundation sizes and soil conditions are known. Paul J. Ford and Company will not accept any responsibility for the adequacy of the existing foundations unless the foundation sizes and a soils report are provided.

5) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard ANSI/TIA-222-G. If the owner or local or state agencies require a higher design wind load, Paul J. Ford and Company should be made aware of this requirement.

6) The enclosed sketches are a schematic representation of the tower that we have analyzed. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions and for the proper fit and clearance in the field.

7) Miscellaneous items such as antenna mounts etc. have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

APPENDIX C

MODIFICATION DRAWINGS

MODIFIED 59'-6" SELF SUPPORT TOWER

SITE #CTL01330; TALCOTT MOUNTAIN

324 MONTEVIDEO ROAD
AVON, CONNETICUTT 06001
HARTFORD COUNTY
LAT: 41° 48' 42.36"; LONG: -72° 47' 55.35"

PROJECT CONTACTS

CLIENT:
ON AIR ENGINEERING, LLC
CONTACT: DAVID WEINPAHL AT DWEINPAHL@ONAIRENG.COM
PH: (201) 456-4624

ENGINEER OF RECORD:
PJFTELECOM@PAULJFORD.COM

WIND DESIGN DATA	
REFERENCE STANDARD	TIA/EIA-222-G-2-2009
LOCAL CODE	2018 CBC
ULTIMATE WIND SPEED (3-SECOND GUST)	120 MPH
CONVERTED NOMINAL WIND SPEED (3-SECOND GUST)	93 MPH
ICE THICKNESS	1.0 IN
ICE WIND SPEED	50 MPH
SERVICE WIND SPEED	60 MPH
STRUCTURE CLASS	II
EXPOSURE CATEGORY	B
Kzt	1.0

SHEET INDEX	
SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
MI-1	MI CHECKLIST AND NOTES
N-1	NOTES
S-1	TOWER ELEVATION
S-2	WEEP HOLE INSTALLATION
S-3	ANCHOR ROD REINFORCEMENT
S-4	HALF SLEEVE LEG REINFORCING
S-5	HALF SLEEVE WELD DETAILS

QUALIFIED ENGINEERING SERVICES ARE AVAILABLE FROM PAUL J. FORD & COMPANY TO ASSIST CONTRACTORS IN CLASS IV RIGGING PLAN REVIEWS. FOR REQUESTED QUALIFIED ENGINEERING SERVICES, PLEASE CONTACT PJFMOD@PAULJFORD.COM.

STATE OF CONNECTICUT
JOSEPH PACHCARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

MAR 2 8 2019

REV	DATE	DESCRIPTION

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

ON AIR ENGINEERING, LLC
88 FOUNDRY POND ROAD COLD SPRING, NEW YORK 10516
PH: (201) 456-4624

SITE #CTL01330; TALCOTT MOUNTAIN
AVON, CONNETICUTT
MODIFIED 59'-6" SELF SUPPORT TOWER

PROJECT No:	42918-0027.003.8800
DRAWN BY:	JMC
DESIGNED BY:	MRB
CHECKED BY:	RMD
DATE:	03-27-2019

TITLE SHEET

T-1

42918-0027.003.DWG

POST-MODIFICATION CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT
NA	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE THE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. SEE SHOP DRAWING NOTES.
NA	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	FABRICATOR CERTIFIED WELD INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE TESTING AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL WITH A YIELD STRENGTH GREATER THAN 36 KSI AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR NDE INSPECTION	A VISUAL OBSERVATION OF A PORTION OF THE EXISTING STRUCTURE (AS NOTED ON THESE DRAWINGS) IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)	A VISUAL OBSERVATION OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	POST INSTALLED ANCHOR ROD VERIFICATION	ANCHOR ROD INSTALLATION SHALL INCLUDE VERIFICATION BY LETTER AND PHOTOGRAPHIC DOCUMENTATION.
NA	BASE PLATE GROUT VERIFICATION	A LETTER FROM THE GENERAL CONTRACTOR SHALL BE PROVIDED TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH INDUSTRY STANDARD FOR INCLUSION IN THE MI REPORT.
X	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT. PRE, DURING AND POST WELD INSPECTION IS REQUIRED.
NA	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED FOR FIELD PUNCHED/DRILLED HOLES.
NA	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
NA	MAGNI 565 COATING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY MAGNI 565 COATING WAS APPLIED IN ACCORDANCE PER ASTM F1136.
NA	MICROPILE / ROCK ANCHOR	THE GENERAL CONTRACTOR SHALL PROVIDE INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTATION TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
X	POST INSTALLED ANCHOR ROD PULL TESTING	POST INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH INDUSTRY STANDARD AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
NA	POST INSTALLED MICROPILE / ROCK ANCHOR TESTING	POST INSTALLED ANCHORS SHALL BE TESTED AND INSPECTED IN ACCORDANCE WITH SPECIFICATION STATED ON MICROPILE/ROCK ANCHOR NOTES.

NOTE: X DENOTES A DOCUMENT NEEDED FROM THE CONTRACTOR FOR THE MI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL
THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN, OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY.

MI INSPECTOR
THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO THE OWNER.

GENERAL CONTRACTOR
THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH INDUSTRY STANDARD.

RECOMMENDATIONS
THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI
IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE TOWER OWNER SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF THE TOWER OWNER CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S
IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH THE EOR TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH OWNER'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

PHOTOGRAPHS
BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE COORDINATE WITH THE MI.

SHOP DRAWINGS
EOR APPROVED SHOP DRAWINGS CAN BE PROVIDED AS AN ADDITIONAL SCOPE OF SERVICE. IF REQUIRED, PLEASE CONTACT PJF FOR ADDITIONAL INFORMATION.

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

MAR 28 2019

REV	DATE	DESCRIPTION

PJF PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

ON AIR ENGINEERING, LLC
88 FOUNDRY POND ROAD COLD SPRING, NEW YORK 10516
PH: (201) 456-4624

SITE #CTL01330; TALCOTT MOUNTAIN
AVON, CONNETICUTT
MODIFIED 59'-6" SELF SUPPORT TOWER

PROJECT No:	42918-0027.003.8800
DRAWN BY:	JMC
DESIGNED BY:	MRB
CHECKED BY:	RMD
DATE:	03-27-2019

MI CHECKLIST AND NOTES

MI-1

42918-0027.003.DWG

GENERAL NOTES:

1. THIS TOWER MODIFICATION DRAWING IS BASED UPON A STRUCTURAL ANALYSIS PERFORMED BY PAUL J. FORD AND COMPANY DATED 03-27-2019.
2. PAUL J. FORD AND COMPANY HAS NOT PERFORMED A FIELD VISIT TO VERIFY THE EXISTING TOWER MEMBER SIZES AND DIMENSIONS. THE MODIFICATIONS SHOWN ON THESE PAGES WERE DEVELOPED USING INFORMATION PROVIDED TO US BY ON AIR ENGINEERING, LLC.
3. THE CONTRACTOR IS EXPECTED TO PERFORM A SITE VISIT BEFORE FABRICATING ANY MATERIAL. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT AS REPRESENTED ON THESE DRAWINGS, PAUL J. FORD AND COMPANY SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE STRUCTURAL SIGNIFICANCE OF THE DEVIATION.
4. PAUL J. FORD AND COMPANY WAS NOT PROVIDED WITH THE EXACT LOCATION OF EVERY EXISTING APPURTENANCE THAT COULD POTENTIALLY INTERFERE WITH THE MODIFICATIONS AS INDICATED ON THESE DRAWINGS. IT IS IMPORTANT THAT THE MODIFICATION MATERIAL BE PLACED IN THE PROPER LOCATION TO BE EFFECTIVE. THIS MAY REQUIRE THE REPOSITIONING OF SOME EXISTING NON-STRUCTURAL ITEMS CURRENTLY ATTACHED TO THE TOWER.
5. THE LOADS IN THIS TOWER REQUIRE THAT ADDITIONAL STEEL, IN THE FORM OF PIPE SLEEVES, BE WELDED TO THE EXISTING TOWER LEGS. THE OWNER MUST BE AWARE THAT THE FIELD WELDING INDICATED ON THIS SHEET WILL DESTROY THE GALVANIZED COATING ON THE INSIDE OF THE EXISTING PIPE LEG CREATING A POTENTIAL CORROSION PROBLEM. THERE MAY ALSO BE SOME WARPING CAUSED BY THE HEAT OF WELDING.
6. THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED ON THESE DRAWINGS. BY ACCEPTANCE OF THIS PROJECT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED TO DO THIS WORK IN THE JURISDICTION IN WHICH THE WORK IS TO BE PERFORMED.
7. THIS DRAWING DOES NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.
8. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THE WORK.
9. INSPECTIONS SHALL BE COMPLETED IN ACCORDANCE WITH LOCAL BUILDING CODES.

CONSTRUCTION NOTES:

1. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION)
2. THESE DRAWINGS REQUIRE THE REMOVAL OF EXISTING ASTM A325 BOLTS. THE EXISTING ASTM A325 BOLTS THAT ARE REMOVED MUST BE REPLACED WITH NEW BOLTS.
3. BOLTS SHALL BE TORQUED TO THE SNUG-TIGHT CONDITION AS DEFINED BY AISC.
4. ANY GALVANIZED SURFACE THAT IS SCRATCHED OR DAMAGED DUE TO THE CONTRACTORS EFFORTS, SHALL BE REPAIRED WITH A COLD GALVANIZING COMPOUND CONFORMING TO ASTM A780.

FOUNDATION NOTES:

1. WATER SHALL BE REMOVED FROM FOUNDATION PRIOR TO PROCEEDING WITH GROUT INSTALLATION.
2. THE TOP OF THE GROUT SHALL BE SLOPED (APPROXIMATELY 1/4" PER FOOT) TO DRAIN.
3. WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND SAFETY REGULATIONS.
4. NEW GROUT SHALL BE NON-SHRINK, NON-METALLIC GROUT (EUCO NS GROUT BY EUCLID, OR APPROVED EQUAL) WITH A 7500 PSI MINIMUM COMPRESSIVE STRENGTH.
5. THE ADHESIVE SPOXY SHALL BE "HILTI HIT-RE 500 V3" BY HILTI OR APPROVED EQUAL.. THE CONTRACTOR SHALL FOLLOW ALL REBAR AND EPOXY MANUFACTURERS RECOMMENDATIONS REGARDING HANDLING OF REBAR, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION, PROPER PLACEMENT OF EPOXY INTO THE HOLE, ETC. THE HAMMER DRILLED HOLES IN THE CONCRETE SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF REBAR AND EPOXY.
6. IF DURING DRILLING EXISTING REBAR MATERIAL IS ENCOUNTERED, RELOCATE HOLE AND GROUT FILL IMPEDED HOLE WITH 5000 PSI NON-SHRINK GROUT. THE CONTRACTOR SHALL CONTACT PAUL J. FORD AND COMPANY TO DETERMINE THE SIGNIFICANCE IN DEVIATION.

MATERIAL NOTES:

1. THE MATERIAL LIST IS PROVIDED TO CLEARLY IDENTIFY MEMBER SIZES. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE PROPER FIT AND CLEARANCE OF THE REINFORCING MATERIAL IN THE FIELD. THE CONTRACTOR IS EXPECTED TO PERFORM A SITE VISIT BEFORE FABRICATING ANY MATERIAL.
2. ALL STEEL SHALL CONFORM TO THE FOLLOWING (U.N.O.):
   A. PIPE: ASTM A53 GR B (35 KSI YIELD POINT MATERIAL)
   B. PLATES: ASTM A572 GR 50 (50 KSI YIELD POINT MATERIAL)
3. ALL NEW STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH THE "SPECIFICATION FOR ZINC (HOT GALVANIZED) COATING ON PRODUCTS FABRICATED FROM ROLLED, PRESSED AND FORGED STEEL SHAPES, PLATES BAR, AND STRIP" ASTM A123.
4. ALL U-BOLTS SHALL CONFORM TO ASTM A36 (36 KSI YIELD POINT MATERIAL).
5. ALL U-BOLTS SHALL BE PROVIDED WITH LOCK-WASHERS, OR LOCK-NUTS, OR PAL-NUTS AND SHALL BE GALVANIZED ACCORDING TO ASTM A153.
6. ALL HOLES IN THE NEW STEEL MEMBERS SHALL BE SIZED 1/16" LARGER THAN THE BOLT DIAMETER. SLOTTED OR OVERSIZED HOLES ARE NOT PERMITTED.
7. DRILLED IN ANCHOR RODS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F1554 GRADE 105.
8. SHOP WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY AWS D1.1.
9. FIELD WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY AWS D1.1 USING E7018 ELECTRODES. PRIOR TO WELDING, CONTRACTOR SHALL WIRE BRUSH ALL STEEL SURFACES TO BARE METAL AND PREHEAT ALL JOINTS. AFTER WELDING ALL WELDED SURFACES SHALL BE WIRE BRUSHED AND COATED WITH COLD GALVANIZING COMPOUND.
10. ALL NEW STEEL SHALL BE PAINTED TO MATCH THE EXISTING TOWER COLOR SCHEME.

MAR 2 8 2019

REV	DATE	DESCRIPTION

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Phone 614.221.6679 www.pauljford.com

ON AIR ENGINEERING, LLC
88 FOUNDRY POND ROAD COLD SPRING, NEW YORK 10516
PH: (201) 456-4824

SITE #CTL01330; TALCOTT MOUNTAIN

AVON, CONNETICUTT

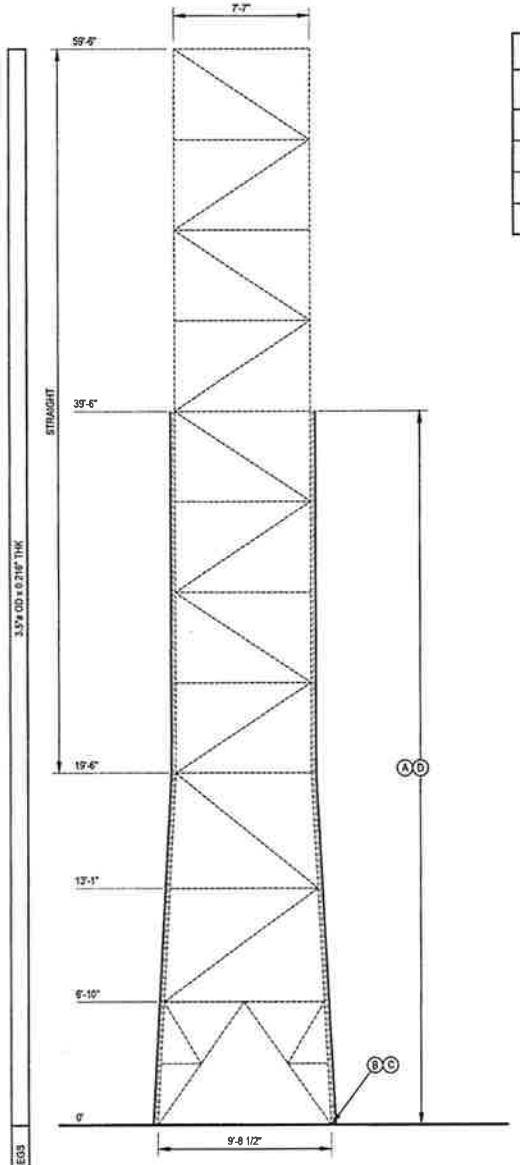
MODIFIED 59'-6" SELF SUPPORT TOWER

PROJECT No:	42918-0027.003.5800
DRAWN BY:	JMC
DESIGNED BY:	MRB
CHECKED BY:	RMD
DATE:	03-27-2019

NOTES

N-1

42918-0027.003.DWG



TOWER ELEVATION 1 / S-1

TOWER MODIFICATION SCHEDULE			
	ELEVATION	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEETS
Ⓐ	0'± TO 39'-6"±	REMOVE EXISTING HALF SLEEVE	S-1
Ⓑ	BASE	INSTALL DRAINAGE WEEP HOLES & SLOPE CONCRETE	S-2
Ⓒ	BASE	INSTALL ANCHOR RODS INTO FOUNDATION	S-3
Ⓓ	0'± TO 39'-6"±	INSTALL NEW HALF SLEEVE	S-4 & S-5

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TOWER ELEVATION

S-1

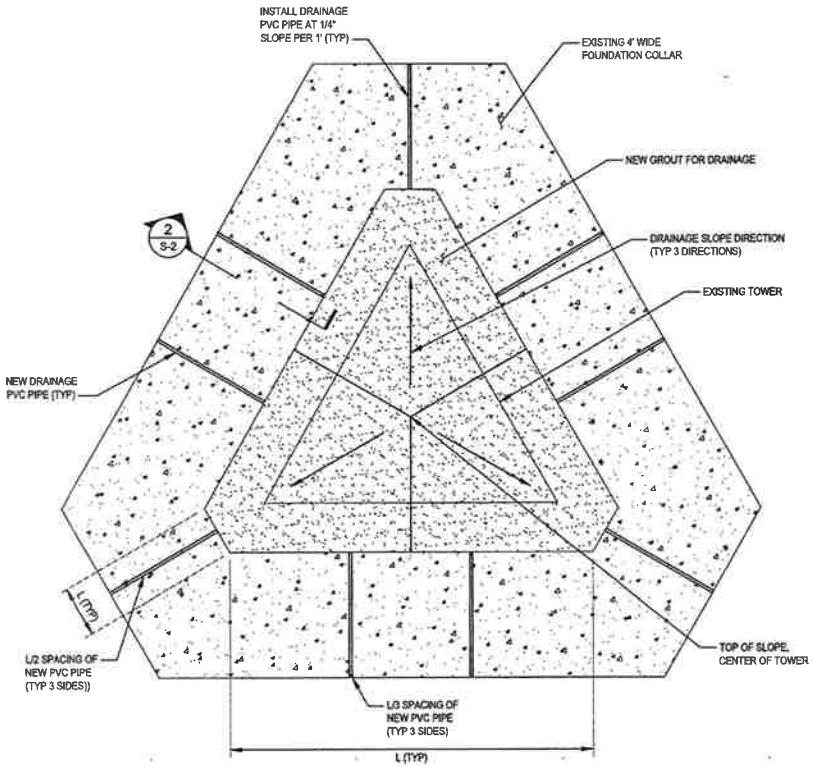
STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

MAR 28 2019

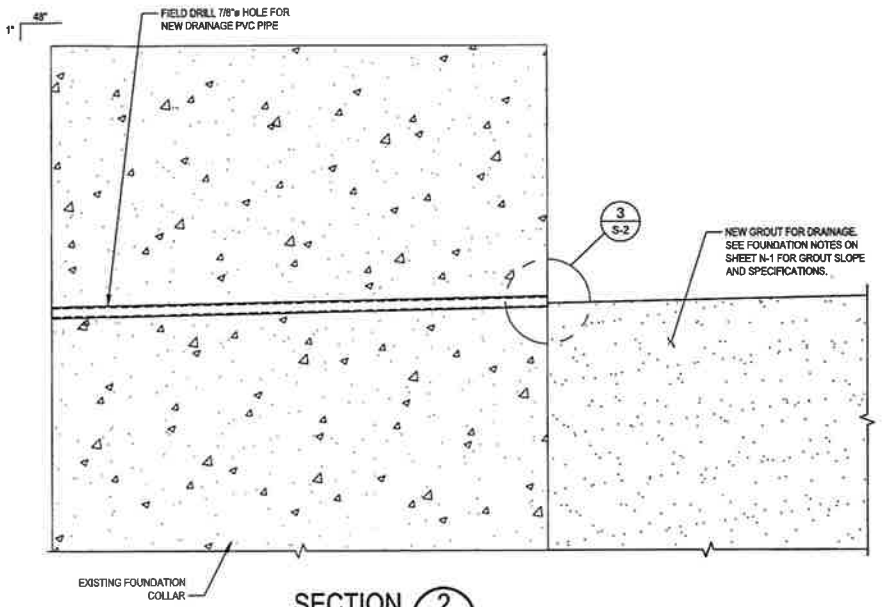
REV	DATE	DESCRIPTION

42918-0027.003.DWG

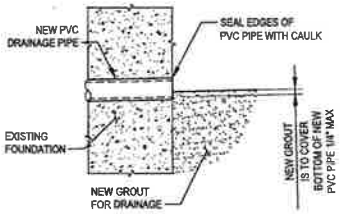
MATERIAL LIST			
ELEVATION	QTY	MATERIAL	LENGTH
BASE	9	PVC DRAINAGE PIPE 3/4"ø x 0.123" THK	4'-2"±



C WEEP HOLE LOCATION 1 S-2



SECTION 2 S-2



DETAIL 3 S-2

CONTRACTOR MUST SLOPE NEW GROUT FROM CENTER OF TOWER TO ALLOW DRAINAGE OF WATER IN 3 DIRECTIONS. NEW GROUT IS TO COVER ONLY 1/4" MAX OF BOTTOM OF THE NEW PVC DRAINAGE PIPES.

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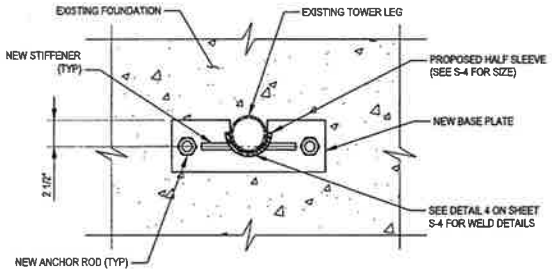
SITE #CTL01330; TALCOTT MOUNTAIN
AVON, CONNETICUTT
MODIFIED 59'-6" SELF SUPPORT TOWER

PROJECT No:	42918-0027.003.8806
DRAWN BY:	JMC
DESIGNED BY:	MRB
CHECKED BY:	RMD
DATE:	03-27-2019

WEEP HOLE INSTALLATION

S-2

42918-0027.003.DWG

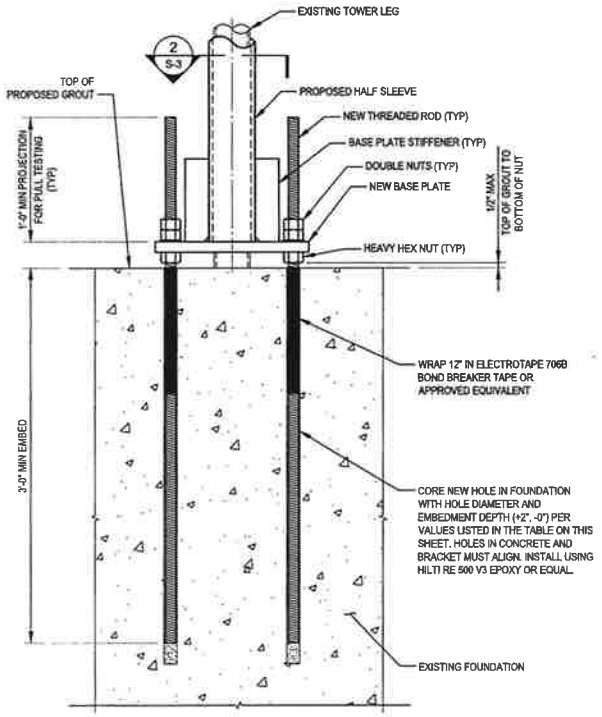


PLAN VIEW 2 / S-3

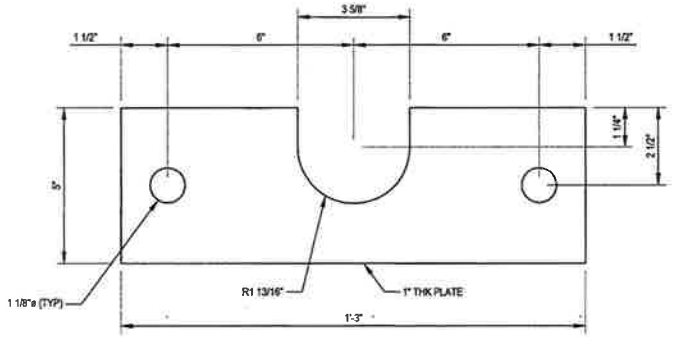
ANCHOR ROD NOTES:

1. RODS MUST BE GALVANIZED FROM THE TOP OF PROJECTION TO 15" BELOW THE SURFACE OF THE CONCRETE, AT A MINIMUM.
2. CORED HOLES MUST BE MECHANICALLY ROUGHENED USING A CARBIDE HOLE ROUGHENER OR EQUIVALENT. BRUSHING WITH A NYLON OR WIRE BRUSH SHALL BE USED IN THE PROCESS OF HOLE CLEANING, BUT DOES NOT SATISFY THE HOLE ROUGHENING REQUIREMENT.
3. FOLLOW EPOXY MANUFACTURERS RECOMMENDATIONS FOR HOLE CLEANING.
4. ALL HOLES MUST BE DRY PRIOR TO PLACING EPOXY.
5. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF THREADED ROD AND EPOXY, AS WELL AS ALL INSTALLATION INSTRUCTIONS AND REQUIREMENTS.
6. TAKE ALL MEASUREMENTS NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING CORING OPERATIONS. NOTIFY EOR IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENTS TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.
7. ONCE ALL RESIN AND GROUT HAVE CURED, NEW ANCHOR ROD REINFORCING SHALL BE TARGET TENSIONED TO THE VALUE LISTED IN THE TABLE ON THIS SHEET. SEE ENG-PRC-10119: PULL-OUT TESTING POST-INSTALLED ANCHOR RODS, FOR SPECIFICATIONS.
8. CONTRACTOR TO VERIFY THAT A PULL TEST IS ABLE TO BE PERFORMED USING THE ANCHOR ROD PROJECTION SHOWN.
9. WHEN COMPLETED WITH EPOXY INSTALLATION, THE TOP OF THE EPOXY SHALL BE EQUAL TO OR HIGHER THAN THE TOP OF THE FOUNDATION, SUCH THAT WATER IS NOT ABLE TO COLLECT IN THE ANNULAR AREA AROUND THE EXPOSED PORTION OF THE ANCHOR RODS.

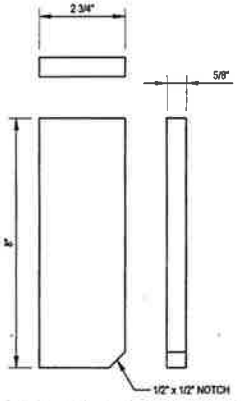
MATERIAL LIST			
ELEVATION	QTY	MATERIAL	LENGTH
BASE	3	BASE PLATE 1" x 5"	1'-3"±
	6	THREADED ROD 1"ø	4'-1"±
	6	STIFFENER 5/8" x 2 3/4"	0'-8"±



A ANCHOR ROD 1 / S-3



ANCHOR ROD BASE PLATE 3 / S-3



BASE PLATE STIFFENER 4 / S-3

ANCHOR ROD SPECIFICATIONS	
DIAMETER	1"ø
QUANTITY	6
INSTALLED LENGTH	49"
MATERIAL	A193 GR B7
EMBEDMENT DEPTH	36"
HOLE DIAMETER	1 1/8"
EPOXY	HILTI HIT-RE 500 V3
TARGET TENSION LOAD	36 KIPS

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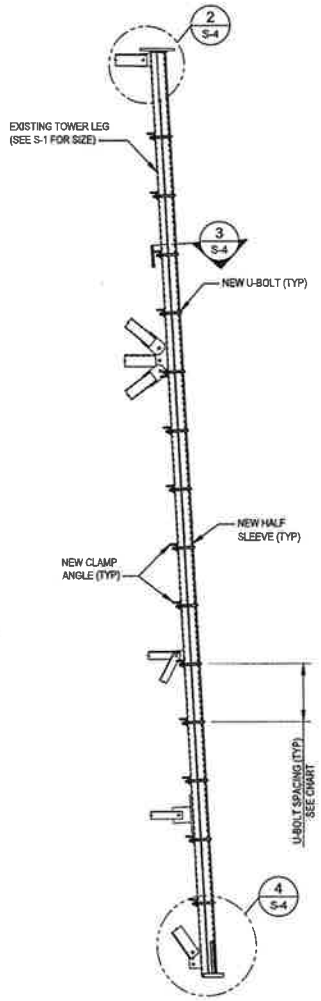
ANCHOR ROD REINFORCEMENT

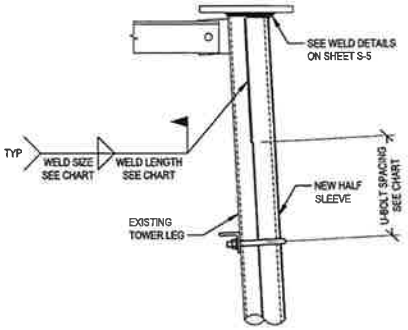
S-3

42918-0027.003.DWG

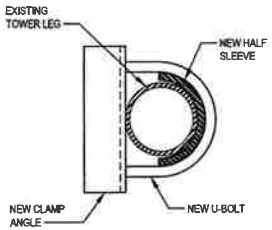
PIPE SLEEVE CHART			
ELEVATION	WELD SIZE	WELD LENGTH	MAX. U-BOLT SPACING
19'-6"± TO 39'-5"±	3/16"	12"	15"
0'± TO 19'-6"±	3/16"	12"	15"



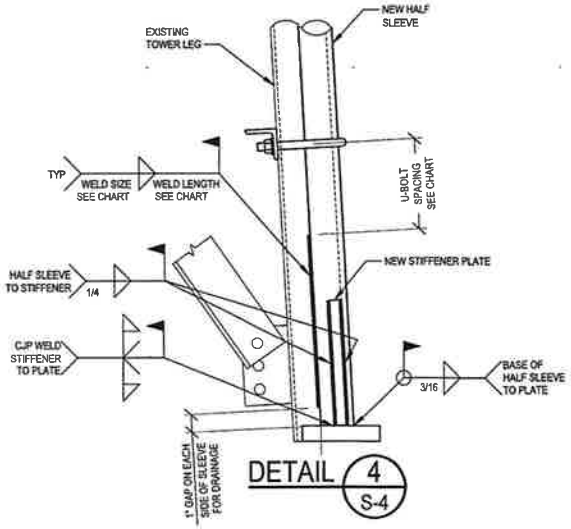
B HALF SLEEVE REINFORCING 1 S-4



DETAIL 2 S-4



SECTION 3 S-4



DETAIL 4 S-4

MATERIAL LIST			
ELEVATION	QTY	MATERIAL	LENGTH
19'-6"± TO 39'-6"±	3	HALF SLEEVE 4.5"ø OD x 0.375" THK	20'±
	45	CLAMP ANGLE L2 x 2 x 1/4	0'-7"±
	45	1/2"ø U-BOLTS	
0'± TO 19'-6"±	3	HALF SLEEVE 4.5"ø OD x 0.375" THK	19'-6"±
	42	CLAMP ANGLE L2 x 2 x 1/4	0'-7"±
	54	1/2"ø U-BOLTS	

CONTRACTOR SHALL VERIFY PIPE SLEEVE LENGTH. EXISTING TOWER LEG IS EMBEDDED INTO THE FOUNDATION AT THE BASE OF THE TOWER.

INSTALLATION OF THE PROPOSED HALF SLEEVE WILL REQUIRE THE EXISTING U-BOLTS FOR THE EXISTING GUSSET WELDMENTS ON THE TOWER TO BE REPLACED. CONTRACTOR SHALL FIELD VERIFY NEW U-BOLTS FOR FITUP WITH EXISTING GUSSET WELDMENTS.

MAR 2 8 2019

REV	DATE	DESCRIPTION

PJF PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 · Columbus, OH 43215
Phone 614.221.6679 www.paulford.com
ON AIR ENGINEERING, LLC
88 FOUNDRY POND ROAD COLD SPRING, NEW YORK 10516
PH: (201) 456-4824

SITE #CTL01330; TALCOTT MOUNTAIN
AVON, CONNETICUTT
MODIFIED 59'-6" SELF SUPPORT TOWER

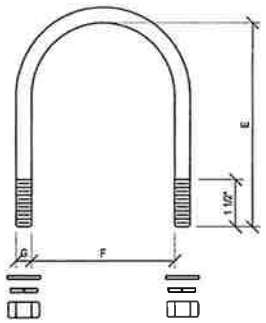
PROJECT No:	42918-0027.003.8808
DRAWN BY:	JMC
DESIGNED BY:	MRB
CHECKED BY:	RMD
DATE:	03-27-2019

HALF SLEEVE LEG REINFORCING

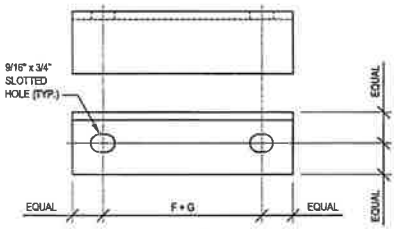
S-4

42918-0027.003.DWG

HALF SLEEVE OD	U-BOLT		
	E (in)	F (in)	G (in)
4.5	5 1/2	4 5/8	1/2

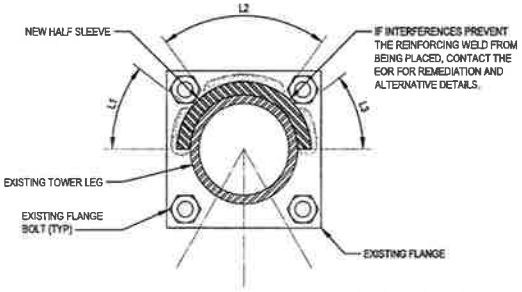


U-BOLT DETAIL



CLAMP ANGLE

NOTES:
1. ALL HOLES TO BE SHOP FABRICATED, UNLESS NOTED OTHERWISE.
2. TOLERANCES, UNLESS NOTED OTHERWISE: FRACTIONS ± 1/16"
   ANGLES ± 1/2 DEGREE
   DECIMALS ± .010"
3. STANDARD 1/2"ø U-BOLTS SHALL BE USED.
3. U-BOLT ASSEMBLY, COMPLETE WITH NUTS (ASTM A563), WASHERS (ASTM F436), AND LOCK WASHERS.
4. STANDARD 9/16"ø HOLES IN PLACE OF SLOTTED HORIZONTAL HOLES ON THE ANGLE ARE PERMITTED. WHEN STANDARD HOLES ARE USED, FLAT WASHERS ARE NOT REQUIRED.
5. U-BOLTS SHALL BE SNUG TIGHT.

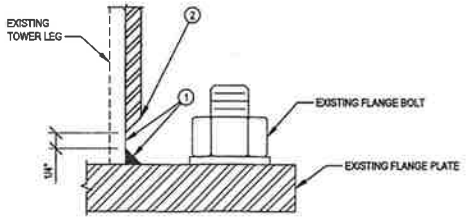


FLANGE CONNECTION INTERFERENCE

EL 19'-6" & 39'-6" ONLY

STEP 1 NOTES:

1. CLEAN GALVANIZING FROM EXISTING WELD AND ALL WELD CONTACT SURFACES.
2. INSTALL PROPOSED HALF SLEEVE.

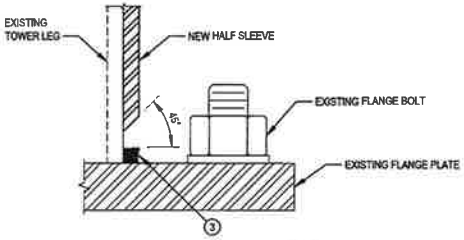


WELD DETAIL 1 / S-5

EL 19'-6" & 39'-6" ONLY

STEP 2 NOTES:

3. BUILD A PLATFORM WITH WELD (BUTTER) TO MATCH THE HEIGHT OF THE EXISTING FILLET WELD PER SECTION 5.22.4.3 OF AWS D1.1/D1.1M: 2010, ENGINEERING APPROVAL IS PROVIDED FOR CORRECTING ROOT OPENINGS GREATER THAN THOSE PERMITTED IN SECTION 5.22.4.3 IN ACCORDANCE WITH SECTION 5.22.4.4.

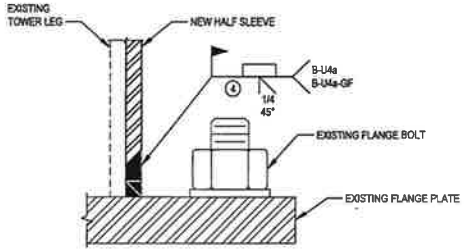


WELD DETAIL 2 / S-5

EL 19'-6" & 39'-6" ONLY

STEP 3 NOTES:

4. PERFORM A CJP WELD USING THE EXISTING TOWER LEG AS A BACKING BAR.

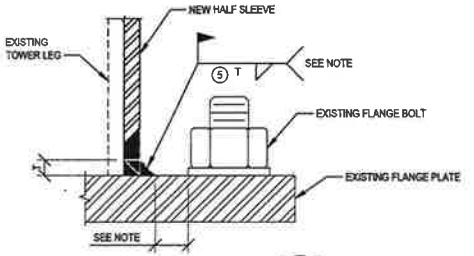


WELD DETAIL 3 / S-5

EL 19'-6" & 39'-6" ONLY

STEP 4 NOTES:

5. REINFORCING FILLET WELD SIZED TO MATCH EXISTING FILLET WELD. PRIOR TO CONSTRUCTION CONTRACTOR SHALL VERIFY THAT THERE IS ADEQUATE CLEARANCE BETWEEN THE PROPOSED WELD AND THE EXISTING FLANGE BOLTS. IF INTERFERENCE OCCURS AN ALTERNATIVE SLEEVE TERMINATION DETAIL MAY BE REQUIRED.



WELD DETAIL 4 / S-5

EL 19'-6" & 39'-6" ONLY

MAR 2 8 2019

REV	DATE	DESCRIPTION

PJF PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 - Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

ON AIR ENGINEERING, LLC
88 FOUNDRY POND ROAD COLD SPRING, NEW YORK 10516
PH: (201) 456-4624

SITE #CTL01330; TALCOTT MOUNTAIN
AVON, CONNETICUTT
MODIFIED 59'-6" SELF SUPPORT TOWER

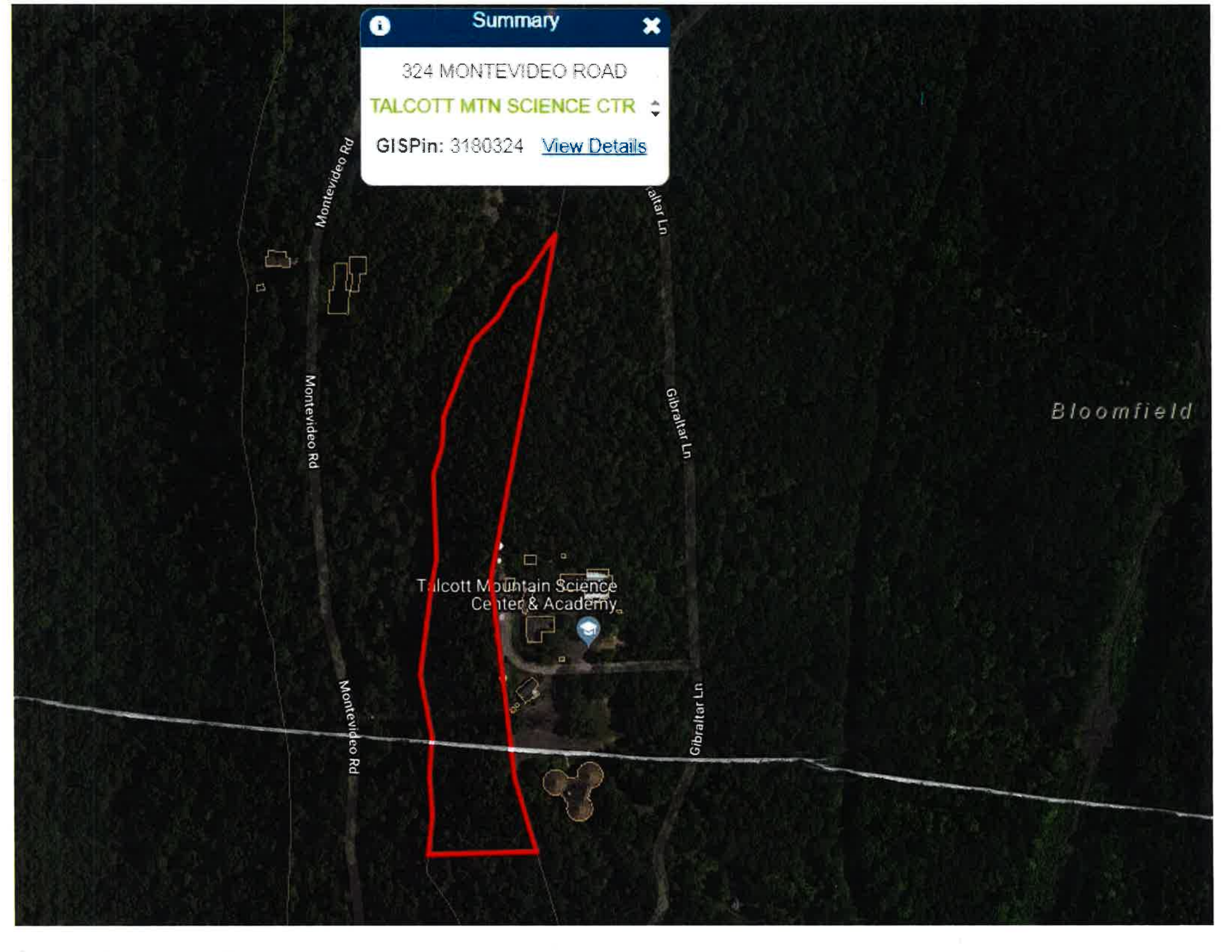
PROJECT No:	42918-0027.003.8800
DRAWN BY:	JMC
DESIGNED BY:	MRB
CHECKED BY:	RMD
DATE:	03-27-2019

HALF SLEEVE WELD DETAILS

S-5

42918-0027.003.DWG

ATTACHMENT 4


Summary
324 MONTEVIDEO ROAD
TALCOTT MTN SCIENCE CTR
GISPin: 3180324
View Details
Montevideo Rd
Montevideo Rd
Montevideo Rd
Gibraltar Ln
Gibraltar Ln
Gibraltar Ln
Talcott Mountain Science Center & Academy
Bloomfield

Property at 00324 MONTEVIDEO ROAD | Prop ID 3180324 | Printed 14-Feb-2019 8:16 PM | Design and Layout (C) Right/Angles

DBAX

Administrative Information

Owner name: TALCOTT MTN SCIENCE CTR FOR
Second name: STUDENT INVOLVEMENT
Address: MONTEVIDEO ROAD
City/state: AVON CT Zip: 06001

Location Information

Map: 009 Clerk map:
Lot: 3180324 Neigh.: Zone: RU2A Vol: 89 Page: 486

Assessments

Assmt category	Qty	Amount
Resident Land	2.00	280,000
Resident Excess	.05	260

Exemptions

Exempt	Cat	Amount

Last sale

Sale date: 30-Jun-1975
Sale price:
Sale valid:

Values

Mkt value :
Cost value: 400,371

Summary

Total assessments	280,260
Total exemptions	
Net assessment	280,260

Utilities

Water	None
Sewer	None
Gas	None

Sales ratios

Cost/sale :
Mkt/sale :
Assmt/sale:

Land Information

Type	Use	Acres/SqFt	Rate	Total	Infl Fact	Value	70% Value
PRIM	11	2.000	400,000	400,000		400,000	280,000
Primary Site		87,120					
RES	12	.050	7,500	375		375	263
Residual		2,178					
		2.050 acres		Total land value		400,375	280,263

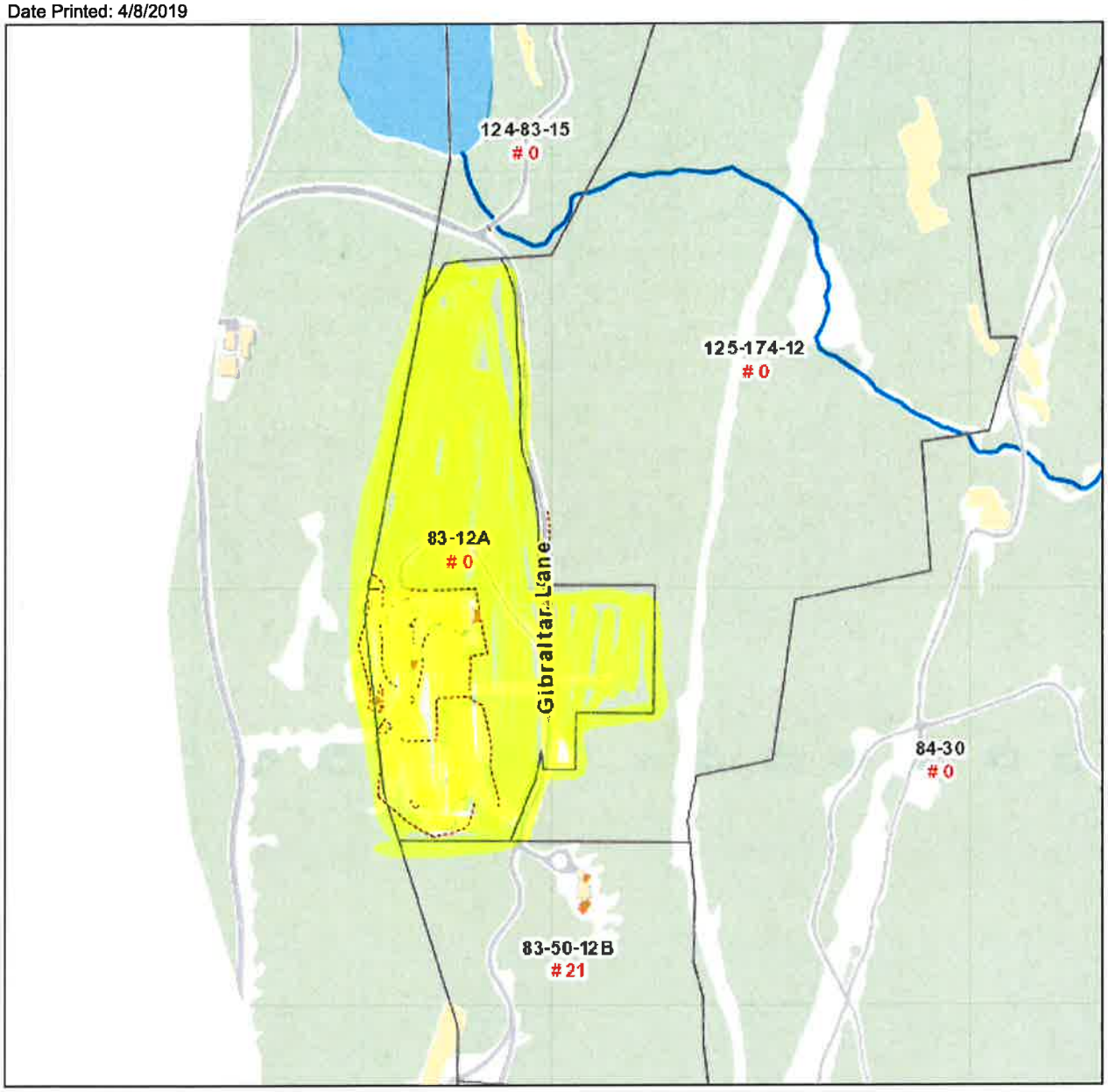
No sketch for this property

.35 AC VOL 89 PAGE 486
5.16AC VOL116 PAGE 825

Town of Bloomfield

Geographic Information System (GIS)

Date Printed: 4/8/2019



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Bloomfield and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 400 feet

0 400 Feet

N W E S

Town of Bloomfield, CT

Property Listing Report

Map Block Lot: 83-12A

Account: R90280

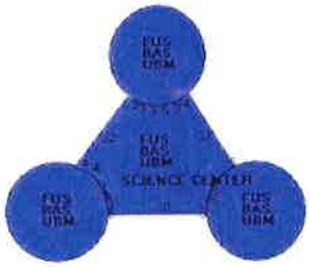
Property Information

Property Location	GIBRALTAR LN
Owner	TALCOTT MT SCIENCE CENTER
Co-Owner	
Mailing Address	NA NA NA NA
Land Use	981 Non-Profit Bldg
Land Class	E
Zoning Code	
Census Tract	4714
Sub Lot	

Neighborhood	
Acreage	14.67
Utilities	
Lot Setting/Desc	
Survey Map	
Foundation	

Photo

Sketch



Primary Construction Details

Year Built	1991
Stories	2
Building Style	Office Bldg
Building Use	Commercial
Building Condition	B
Floors	Concrete
Total Rooms	0

Bedrooms	0
Full Bathrooms	
Half Bathrooms	0
Bath Style	NA
Kitchen Style	NA
Roof Style	Mansard
Roof Cover	Arch Shingles

Exterior Walls	Concrete
Interior Walls	Drywall
Heating Type	Electr Basebrd
Heating Fuel	Heat Pump
AC Type	
Gross Bldg Area	13263
Total Living Area	8842

Report Created On 4/8/2019

Town of Bloomfield, CT

Property Listing Report | Map Block Lot 83-12A | Account R90280

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	1086300	760410
Extras	17600	12320
Outbuildings	6700	4690
Land	800200	560140
Total	1910800	1337560

Outbuilding and Extra Items

Type	Description
Elevator	1 UNITS
Shed	33.8 S.F.
Shed	494 S.F.
Shed	35 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	4421	4421
Finished Upper Story	4421	4421
Basement	4421	0
Total Area	13263	8842

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
TALCOTT MT SCIENCE CENTER	0180/0104		0

Report Created On 4/8/2019

Town of Bloomfield, CT

Property Listing Report | Map Block Lot **83-12A** | Account **R90280**

Photo

Sketch

Primary Construction Details

Year Built	1979	Kitchen Style	NA
Stories	1	Roof Style	Flat
Building Style	School-College	Roof Cover	Rolled Compos
Building Use	Commercial	Exterior Walls	Board & Batten
Building Condition	B	Interior Walls	Drywall
Floors	Concrete	Heating Type	Forced Air
Total Rooms	0	Heating Fuel	Gas
Bedrooms	0	AC Type	
Bathrooms		Gross Bldg Area	
Bath Style	NA	Total Living Area	
Half Bath	0		

Sub Areas

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

Photo

Sketch

Primary Construction Details

Year Built	1955	Kitchen Style	NA
Stories	1	Roof Style	Gable
Building Style	Office Bldg	Roof Cover	Asphalt Shingl
Building Use	Commercial	Exterior Walls	Vinyl Siding
Building Condition	D	Interior Walls	Drywall
Floors	Carpet	Heating Type	Electr Basebrd
Total Rooms	0	Heating Fuel	Electric
Bedrooms	0	AC Type	
Bathrooms		Gross Bldg Area	
Bath Style	NA	Total Living Area	
Half Bath	0		

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

Report Created On **4/8/2019**

Town of Bloomfield, CT

Property Listing Report | Map Block Lot **83-12A** | Account **R90280**

Photo

Sketch

No Photo Available

Primary Construction Details

Year Built	1955
Stories	1
Building Style	School-College
Building Use	Commercial
Building Condition	D
Floors	Carpet
Total Rooms	0
Bedrooms	0
Bathrooms	
Bath Style	NA
Half Bath	0

Kitchen Style	NA
Roof Style	Hip
Roof Cover	Arch Shingles
Exterior Walls	Concrete
Interior Walls	Drywall
Heating Type	Electr Basebrd
Heating Fuel	Electric
AC Type	
Gross Bldg Area	
Total Living Area	

Sub Areas

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

Photo

Sketch

No Photo Available

Primary Construction Details

Year Built	1955
Stories	1
Building Style	Office Bldg
Building Use	Commercial
Building Condition	D
Floors	Linoleum
Total Rooms	0
Bedrooms	0
Bathrooms	
Bath Style	NA
Half Bath	0

Kitchen Style	NA
Roof Style	Hip
Roof Cover	Arch Shingles
Exterior Walls	Stucco/Masonry
Interior Walls	Drywall
Heating Type	Electr Basebrd
Heating Fuel	Electric
AC Type	
Gross Bldg Area	
Total Living Area	

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

Report Created On **4/8/2019**

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103	5	5	neopost 04/16/2019 US POSTAGE $003.45⁰ ZIP 06103 041L12203937
	Postmaster, per *(name of receiving employee)* SMC		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Brandon Roberts, Town Manager Town of Avon 60 West Main Street Avon, CT 06001		USPS APR 16 2019 OLD STATE HOUSE STA 06103		
2.	Hiram Peck, III, AICP, Director of Planning and Community Development Town of Avon 60 West Main Street Avon, CT 06001				
3.	Philip K. Schenk, Jr., Town Manager Town of Bloomfield 800 Bloomfield Avenue Bloomfield, CT 06002				
4.	Jose Giner, Director of Land Use Town of Bloomfield 800 Bloomfield Avenue Bloomfield, CT 06002				
5.	Talcott Mountain Science Center 324 Montevideo Road Avon, CT 06001				
6.					

Talcott Mountain

See Reverse for Instructions