STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:	:	
	:	
A PETITION OF CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS FOR MODIFICATIONS TO AN EXISTING WIRELESS TELECOMMUNICATIONS FACILITY AT 221 WEST MAIN STREET IN EAST LYME, CONNECTICUT	:	SUB-PETITION NO. 1133 221 WEST MAIN STREET EAST LYME, CT DECEMBER 20, 2022

SUB-PETITION FOR DECLARATORY RULING: ELIGIBLE FACILITIES REQUEST FOR MODIFICATIONS THAT WILL NOT SUBSTANTIALLY CHANGE THE PHYSICAL DIMENSIONS OF AN EXISTING BASE STATION

I. Introduction

Pursuant to Section 6409(a) of the Middle Class Tax Relief and Job Creation Act of 2012, codified at 47 U.S.C. § 1455(a) ("Section 6409(a)") and the October 21, 2014 Report and Order (FCC-14-153) issued by the Federal Communications Commission ("FCC") (the "FCC Order"), Cellco Partnership d/b/a Verizon Wireless ("Cellco") hereby petitions the Connecticut Siting Council (the "Council") for a declaratory ruling ("Sub-Petition") that the installation of a new/replacement antenna and remote radio head ("RRH") at the existing wireless telecommunications base station at Samuel M. Peretz Park, 221 West Main Street in East Lyme, Connecticut (the "Property") constitutes an Eligible Facilities Request ("EFR") under the FCC Order. Cellco identifies this site as its "Niantic SC 6 Facility". The Property is a 24.65-acre parcel owned by the Town of East Lyme (the "Town").

II. Factual Background

The existing small cell wireless facility, approved by the Council in Petition No. 1285, consists of a single cannister antenna and related equipment attached to an 81'-4" tall light pole adjacent to the existing athletic fields in the southerly portion of the Property. The cannister antenna is attached to a mast that extends above the top of the light pole, to a height of 88.8' above ground level ("AGL"). A replacement Remote Radio Head ("RRH") and new diplexer will be attached to the pole at a height of approximately 20' AGL. The base of the light pole is surrounded by an 8' x 8" security fence enclosure. Included in Attachment 1 is a copy of the Council's Petition No. 1285 decision letter and staff report.

III. Cellco's Proposed Facility Modifications

Cellco is licensed to provide wireless telecommunications services in East Lyme and throughout the State of Connecticut. The Niantic SC 6 Facility will continue to operate in Cellco's 1900 and 2100 frequency ranges. Cellco intends to replace its existing cannister antenna and RRH with new equipment. The height of the top of the cannister antenna will increase from approximately 87.4' AGL, as approved in Petition No. 1285, to 88.8' AGL. The new pole-mounted RRH and Diplexer will remain in the same location, approximately 20' AGL.

Project Plans and Specifications for Cellco's new cannister antennas and RRH for the proposed Niantic SC 6 Facility modifications are included in Attachment 2. According to the attached Structural Analysis/Mount Analysis ("SA/MA"), the existing light pole tower, the pole's foundation and the existing pipe mount can support Cellco's facility modifications. A copy of the SA/MA is included in Attachment 3.

IV. Discussion

A. The Proposed Modification Will Not Cause a Substantial Change to the Physical Dimensions of the Existing Base Station

Section 6409(a) provides, in relevant part, that "a State or local government may not deny, and shall approve, any eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station." Pursuant to the FCC Order, the proposed modifications do not substantially change the physical dimensions of the base station if the following criteria are satisfied.

1. *The proposed modified facility will not increase the height of the tower by more than ten (10) percent (%) of the height.* Cellco's proposed antenna will be installed approximately 1.4' higher on the light pole than the existing antenna; an increase of approximately 1.6% of the existing structure height.

2. *The proposed facility modification will not protrude from the edge of the structure more than six (6) feet.* Cellco's new canister antenna will be attached to a mast and extend above the top of the existing light pole tower. The new antenna will not protrude more than six (6) feet from the face of the tower.

3. *The proposed facility does not involve installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets.* All equipment associated with this facility will be attached to the light pole. No equipment cabinets are proposed added as a part of these facility modifications.

4. *The proposed facility does not entail any excavation or deployment outside the current site of the base station.* Cellco's proposed facility modifications will remain within the limits of the Property and the existing fenced compound.

5. *The proposed facility does not defeat the existing concealment elements of the base station.* The existing facility does not have any existing concealment elements.

6. *The proposed facility complies with conditions associated with the prior*

approval of construction or modification of the base station. Cellco's proposed facility modifications are consistent with the Siting Council's approval in Petition No. 1285.

B. FCC Compliance

Included in Attachment 4 is a far field table for its proposed modified facility confirming that the Niantic SC 6 Facility will operate well within the FCC safety standards for radio frequency emissions.

C. Notice to the City, Property Owner and Abutting Landowners

On December 20, 2022, a copy of this Sub-Petition was sent to East Lyme First Selectman, Kevin A. Seery and Gary Goeschel, East Lyme's Director of Planning. The Town of East Lyme is the property owner. Copies of the letters sent to First Selectman Seery and Mr. Goeschel are included in Attachment 5. A copy of this Sub-Petition was also sent to the owners of land that abuts the Property. A sample abutter's letter and the list of those abutting landowners who were sent notice and a copy of this filing is included in Attachment 6.

V. Conclusion

Based on the information provided above, Cellco respectfully submits that the proposed modification of the existing base station at the Property constitutes an "eligible facilities request" under Section 6409(a) and the FCC Order.

Respectfully submitted,

CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS

By ______________________

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597
(860) 275-8200
Its Attorneys

ATTACHMENT 1

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

February 21, 2017

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **PETITION NO. 1285 -** Cellco Partnership d/b/a Verizon Wireless petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed installation of a small cell wireless telecommunications facility on a replacement light pole located at Samuel M. Peretz Park, 221 West Main Street, Niantic (East Lyme), Connecticut.

Dear Attorney Baldwin:

At a public meeting held on February 16, 2017, the Connecticut Siting Council (Council) considered and ruled that the above-referenced proposal would not have a substantial adverse environmental effect, and pursuant to Connecticut General Statutes § 16-50k, would not require a Certificate of Environmental Compatibility and Public Need with the following conditions:

1. Approval of any minor project changes be delegated to Council staff;
2. Prior to construction, Cellco shall file with the Council the final structural design for the replacement pole stamped by a Professional Engineer duly licensed in the State of Connecticut;
3. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as is practicable;
4. Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the Town of East Lyme;
5. Unless otherwise approved by the Council, the existing light pole shall be removed within 180 days of the installation of the new light pole;
6. The Council shall be notified in writing within 45 days of when the existing light pole is removed and the new light pole telecommunications facility is operational unless a written request for an extension is submitted to the Council within that timeframe;

7. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by the Petitioner shall be removed within 60 days of the date the antenna ceased to function;

8. The facility owner/operator shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v;

9. This Declaratory Ruling may be transferred, provided the facility owner/operator/transferor is current with payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v and the transferee provides written confirmation that the transferee agrees to comply with the terms, limitations and conditions contained in the Declaratory Ruling, including timely payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v; and

10. If the facility owner/operator is a wholly owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the facility within 30 days of the sale and/or transfer.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition dated December 28, 2016.

Enclosed for your information is a copy of the staff report on this project.

Very truly yours,

Robert Stein
Chairman

RS/MP/lm

Enclosure: Staff Report dated February 16, 2017

c: The Honorable Mark C. Nickerson, First Selectman, Town of East Lyme
Gary Goeschel II, Director of Planning, Town of East Lyme

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

Petition No. 1285
Cellco
221 West Main Street, Niantic
Small Cell Facility
Staff Report
February 16, 2017

On December 30, 2016, the Connecticut Siting Council (Council) received a petition from Cellco Partnership d/b/a Verizon Wireless (Cellco) for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed installation of a small cell telecommunications facility at Samuel M. Peretz Park, 221 West Main Street, Niantic (East Lyme), Connecticut. Currently, Cellco maintains four macro-cell facilities in the Town of East Lyme, which provide, to a significant extent, reliable wireless services in western portions of East Lyme, particularly portions of West Main Street (Route 156) and local roads as well as commercial, residential, recreational (e.g. Rocky Neck State Park and Peretz Park), and institutional land uses such as York Correction Facility. However, reliable service in and around Peretz Park can be problematic especially during times of active use of Peretz Park and Rock Neck State Park. To address this issue, Cellco proposes to install a small cell facility. Initially, the proposed facility would provide wireless service in the 2100 MHz range only.

Specifically, Cellco would replace an existing 80-foot light pole near the existing athletic fields with a new 80-foot galvanized steel pole that would support the athletic field lights and Cellco's small cell equipment. The proposed small cell replacement pole would be located on property owned by the Town of East Lyme. Specifically, Cellco would attach a single canister antenna and remote radio head at the top of the replacement pole. The top of the antenna would reach a height of approximately 87 feet 5-inches above ground level (agl). Cellco's radio equipment and battery backup cabinet would be located within a new 8-foot by 8-foot black vinyl fenced compound on the western portion of the property. Utility connections would be underground.

The subject property is located within East Lyme's Residential RU-40 Zone. While there are residences located farther west (on the west side of North Bridebrook Road), the visual impact is not expected to be significant due to the light pole design, limited height (i.e. less than eight feet taller than the existing pole with appurtenances), and existing trees to the west. The equipment compound would be screened with the vinyl fence.

The calculated power density would be 0.44 percent of the applicable limit using a -10 dB off-beam adjustment. Notice is not required to the Federal Aviation Administration.

Notice was provided to the Town of East Lyme (as both the host municipality and the subject property owner) and abutting property owners on or about December 28, 2016. To date, the Council has not received any comments.

Cellco contends that this proposed project would not have a substantial adverse environmental impact.

Staff recommends the following conditions:

1. Approval of any minor project changes be delegated to Council staff; and
2. Prior to construction, Cellco shall file with the Council the final structural design for the replacement pole stamped by a Professional Engineer duly licensed in the State of Connecticut.

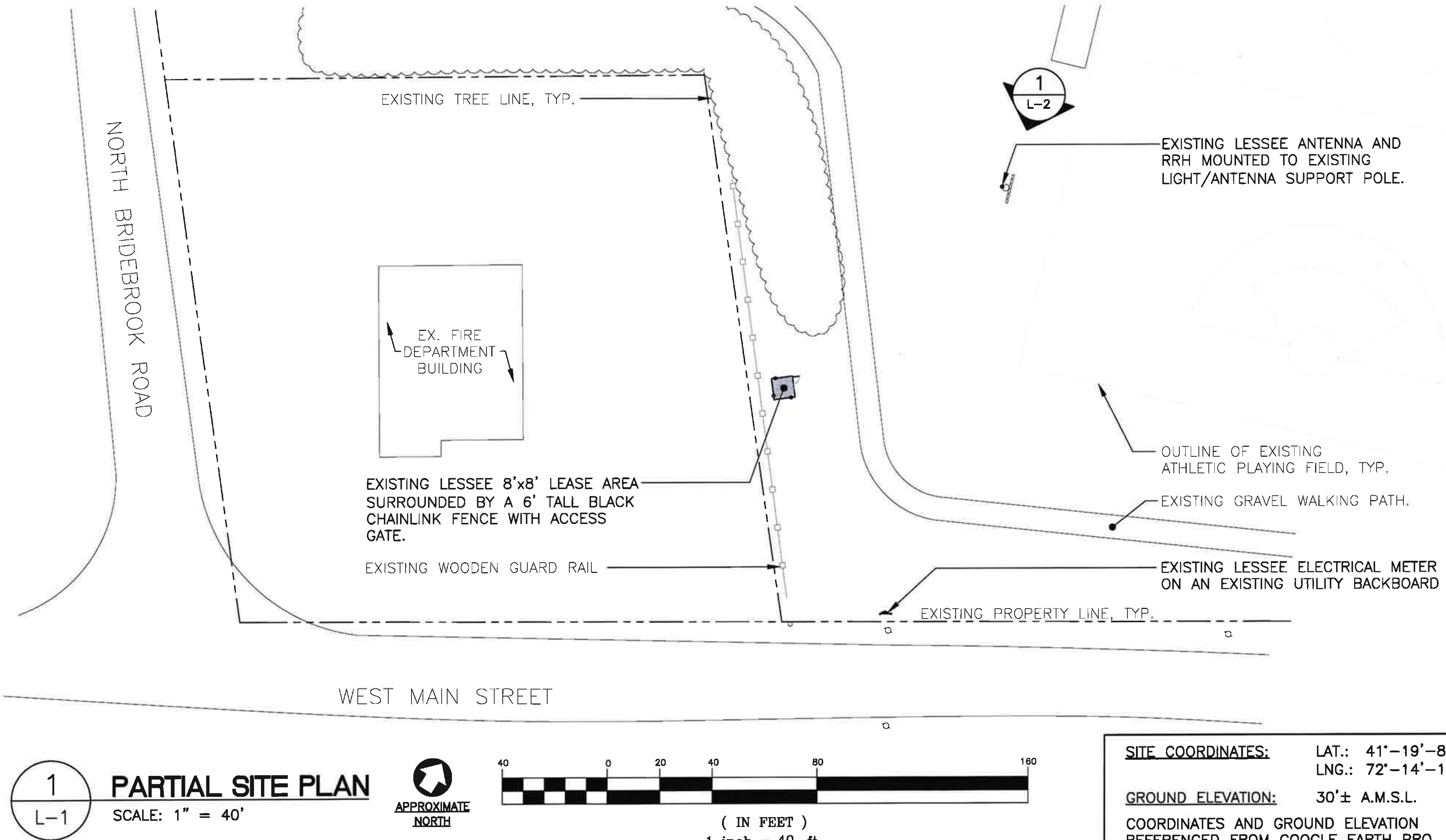
Site Location

Photo-simulation as viewed from West Main Street

ATTACHMENT 2

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.



1 / L-1 **PARTIAL SITE PLAN**
SCALE: 1" = 40'

SITE COORDINATES: LAT.: 41°-19'-8.2" N
LNG.: 72°-14'-15.9" W

GROUND ELEVATION: 30'± A.M.S.L.

COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH PRO.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
B	12/15/22	TJR	DMD	LEASE EXHIBIT – REVISED PER CLIENT COMMENTS
A	08/11/22	DMD	TJL	LEASE EXHIBIT – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

verizon

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

Cellco Partnership d/b/a Verizon Wireless

NIANTIC CT SC6

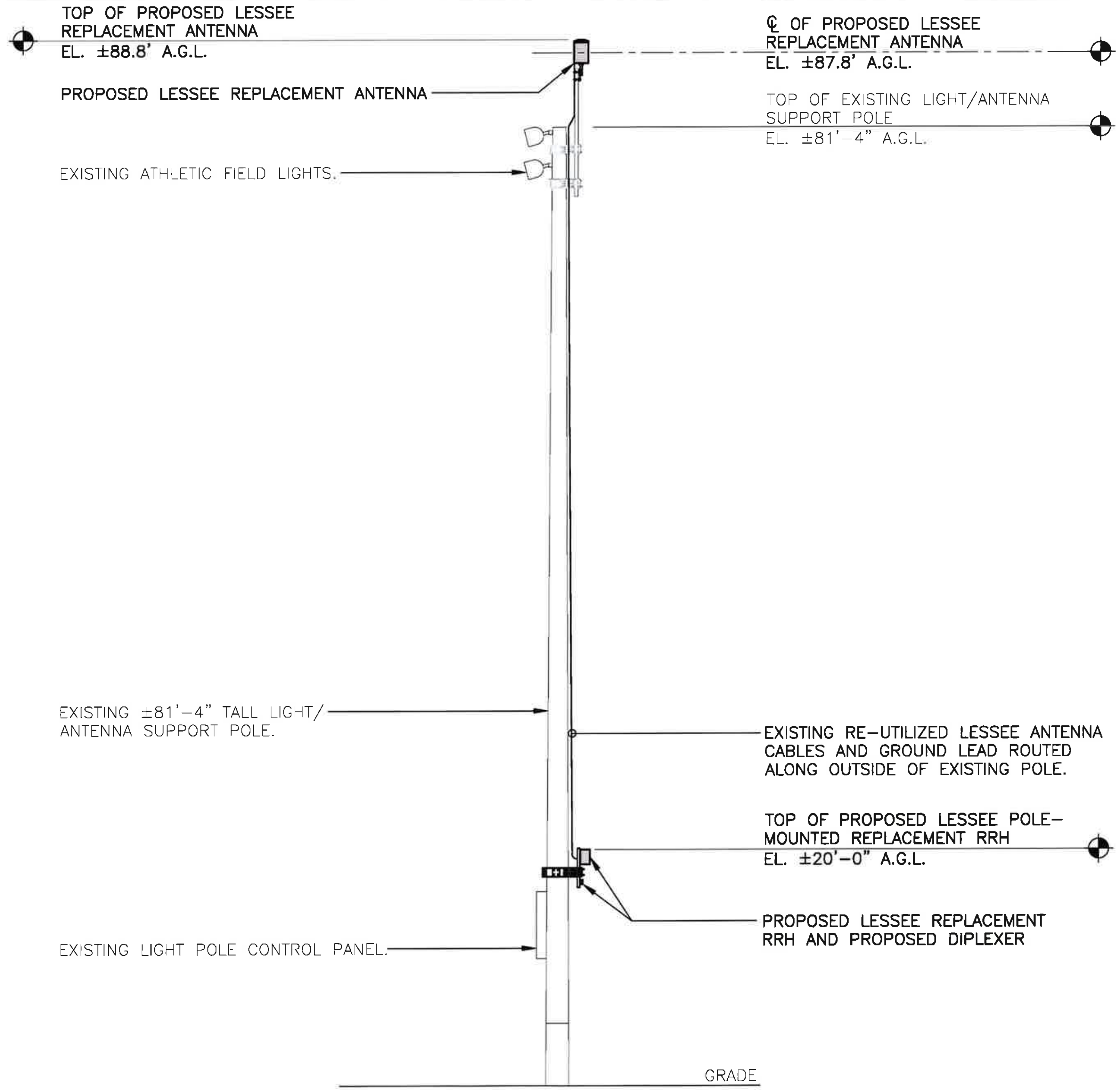
221 WEST MAIN STREET
EAST LYME, CT 06357

DATE: 08/11/2022
SCALE: AS SHOWN
JOB NO. 22105.02

SHEET NO. L-1

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.



1 / L-2 **LIGHT POLE ELEVATION - PROPOSED CONDITIONS**

SCALE: 1" = 10'

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
B	12/15/22	TJR	DMD	LEASE EXHIBIT - REVISED PER CLIENT COMMENTS
A	08/11/22	DMD	TJL	LEASE EXHIBIT - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

verizon

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

Cellco Partnership d/b/a Verizon Wireless

NIANTIC CT SC6
221 WEST MAIN STREET
EAST LYME, CT 06357

DATE: 08/11/2022
SCALE: AS SHOWN
JOB NO. 22105.02

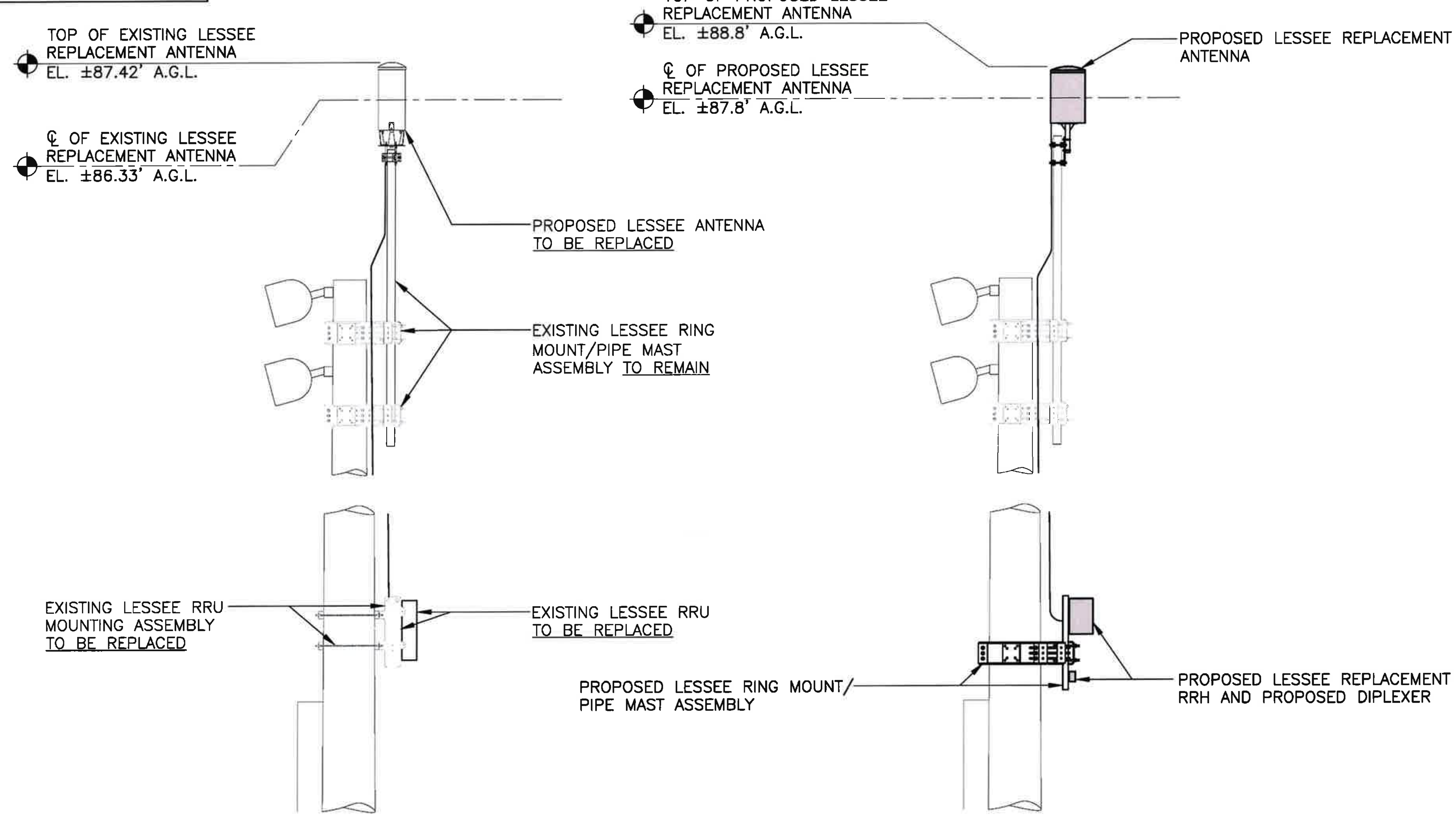
SHEET NO. L-2

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

NOTES:

1. THE PROPOSED LESSEE FACILITY UPGRADE TO CONSIST OF THE REPLACEMENT OF A TOTAL OF (1) ANTENNA, (1) REMOTE RADIO HEAD & ASSOCIATED MOUNT, AND INSTALLATION OF (1) DIPLEXER.



EXISTING CONDITION

PROPOSED CONDITION

1 / L-3 PARTIAL POLE ELEVATIONS

SCALE: 1/4" = 1'- 0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
B	12/15/22	TJR	DMD	LEASE EXHIBIT – REVISED PER CLIENT COMMENTS
A	08/11/22	DMD	TJL	LEASE EXHIBIT – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

verizon

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

Cellco Partnership d/b/a Verizon Wireless

NIANTIC CT SC6

221 WEST MAIN STREET
EAST LYME, CT 06357

DATE: 08/11/2022
SCALE: AS SHOWN
JOB NO. 22105.02

SHEET NO. L-3

CUUD120X06Fxyz0

TRI BAND | BROAD-BEAM 120°, HEART-SHAPE | CANISTER ANTENNA | X-POL | FIXED TILT | 610 MM (24.0 IN)

Features

- Broad-Beam 120°, Heart-Shape configuration with 6 connectors
- Ideal for Small Cell / DAS applications
- Available with 4.3-10 *or* 7/16-DIN connectors
- Four unique mounting options
- Available for order with a grey, brown or black radome

Connector Description

The antenna has 6 connectors located at the bottom.

Low Band	R1	696-960 MHz	(2x) 4.3-10 *or* 7/16-DIN Female
Mid Band #1	Y1	1695-2700 MHz	(2x) 4.3-10 *or* 7/16-DIN Female
Mid Band #2	Y2	1695-2700 MHz	(2x) 4.3-10 *or* 7/16-DIN Female

Electrical Characteristics

Electrical Characteristics	R1		Y1 Y2			
Frequency Bands (MHz)	696-960 MHz		(2x) 1695-2700 MHz			
	696-806	806-960	1695-1880	1850-1990	1920-2180	2200-2700
Polarization	±45°		±45°			
Horizontal Beamwidth	130°	120°	130°	125°	120°	115°
Vertical Beamwidth	45°	36°	19°	18°	16°	21°
Gain	6.5 dBi	7.1 dBi	10.9 dBi	11.1 dBi	11.3 dBi	11.6 dBi
Electrical Downtilt (°)	**(x)** 0, 5		**(y)** 0, 6			
Impedance	50Ω		50Ω			
VSWR	≤ 1.5:1		≤ 1.5:1			
Upper Sidelobe Suppression	N/A		> 15 dB			
Front-to-Back Ratio	> 11 dB		> 13 dB			
Isolation Between Ports	20 dB		28 dB			
IM3 (2x20W carrier)	< -153 dBc		< -153 dBc			
Input Power	(2x) 500 W		(4x) 300 W			
Diplexed	No					
Number of Sectors, Sector Spacing and/or Pattern Shape	1 Sector, Heart-Shape					
Lightning Protection	Direct Ground					

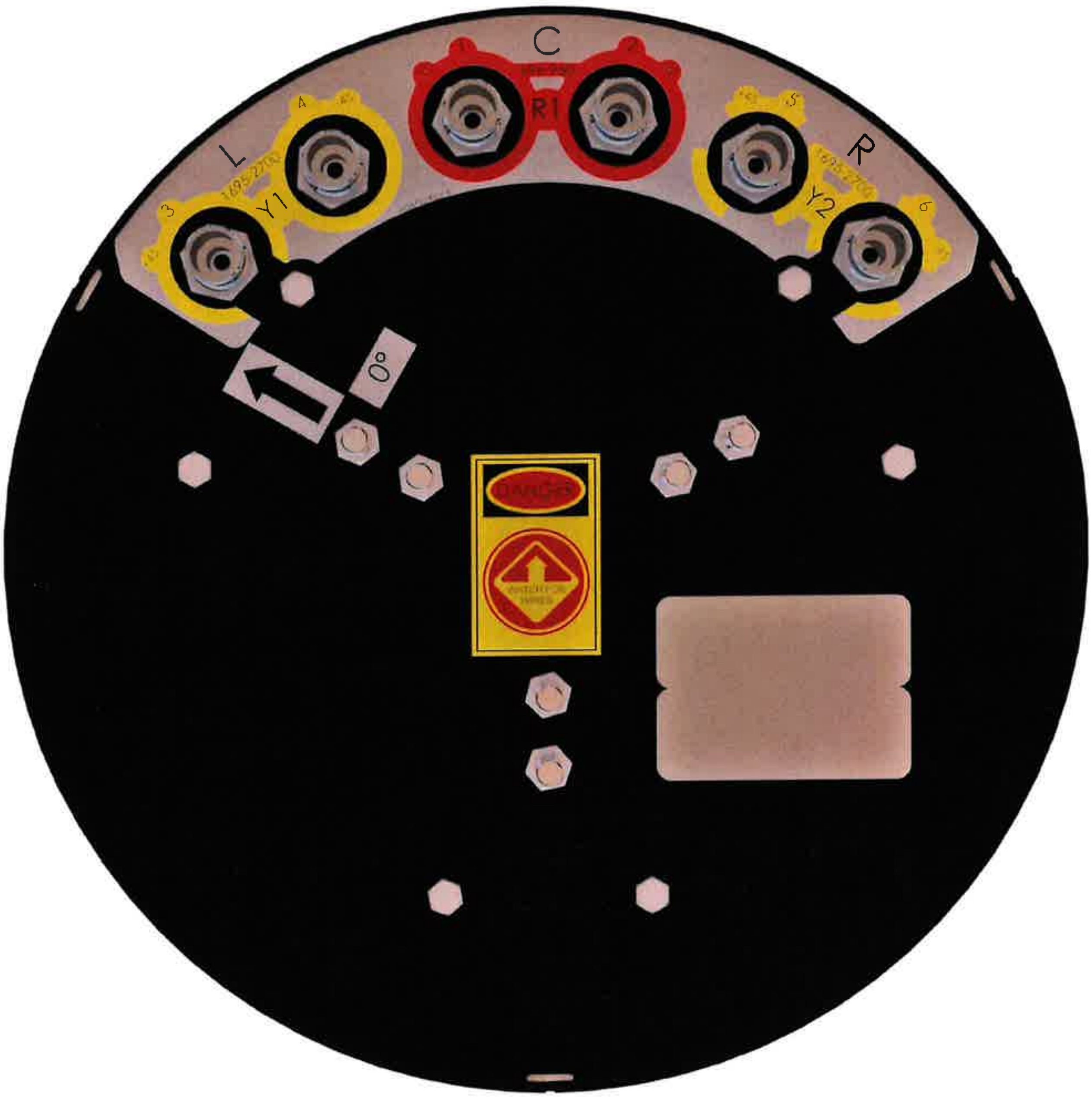
Mechanical Characteristics

Antenna Dimensions (Height x Diameter)	610 x 371	mm	24.0 x 14.6	in
Weight without Mounting Bracket Kit	13	kg	28	lbs
Antenna Volume	0.07	m³	2.3	ft³
Survival Wind Speed	241	km/hr	150	mph
Wind Area	0.22	m²	2.4	ft²
Wind Load (160 km/hr or 100 mph)	191	N	43	lbf

CUUD120X06Fxyz0

TRI BAND | BROAD-BEAM 120°, HEART-SHAPE | CANISTER ANTENNA | X-POL | FIXED TILT | 610 MM (24.0 IN)

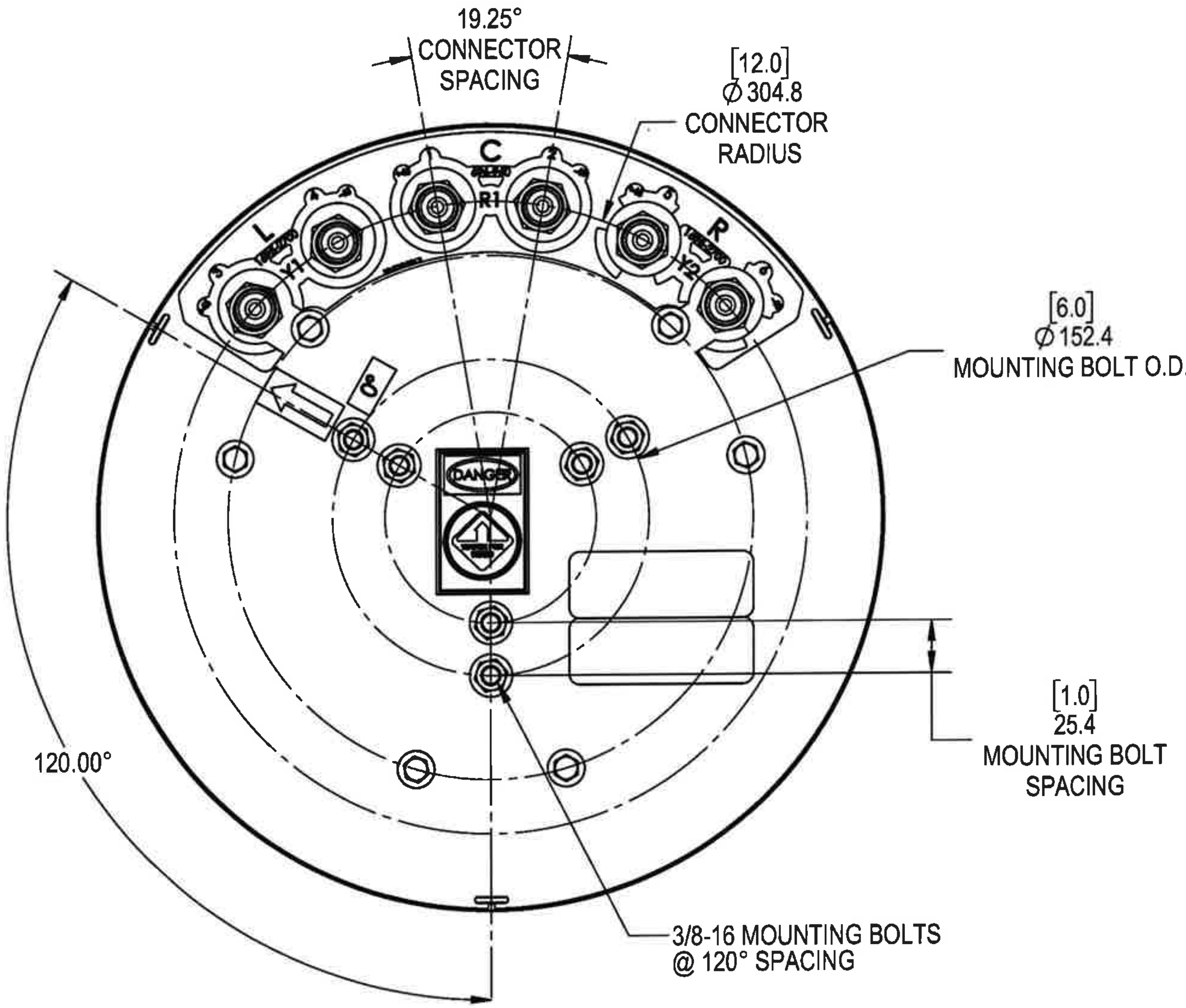
Bottom View - Connector Diagram



CUUD120X06Fxyz0

TRI BAND | BROAD-BEAM 120°, HEART-SHAPE | CANISTER ANTENNA | X-POL | FIXED TILT | 610 MM (24.0 IN)

Bottom View - Connector Diagram



CUUD120X06Fxyz0

TRI BAND | BROAD-BEAM 120°, HEART-SHAPE | CANISTER ANTENNA | X-POL | FIXED TILT | 610 MM (24.0 IN)

Ordering Options

When ordering, select the Radome Color, Degree of Electrical Downtilt for the Low (**x**) and Mid Bands (**y**) and the Connector Type (**z**).

Radome Color	Electrical Downtilt Degree		Connector Type (z)	
	Low Band R1 (x)	Mid Band Y1 Y2 (y)	4.3-10 Female	7/16-DIN Female
Grey Pantone 420 C	0°	0°	CUUD120X06F**00s**0	CUUD120X06F**00D**0
	0°	6°	CUUD120X06F**06s**0	CUUD120X06F**06D**0
	5°	0°	CUUD120X06F**50s**0	CUUD120X06F**50D**0
	5°	6°	CUUD120X06F**56s**0	CUUD120X06F**56D**0
Brown Pantone 476 C	0°	0°	CUUD120X06F**00s**0**BR**	CUUD120X06F**00D**0**BR**
	0°	6°	CUUD120X06F**06s**0**BR**	CUUD120X06F**06D**0**BR**
	5°	0°	CUUD120X06F**50s**0**BR**	CUUD120X06F**50D**0**BR**
	5°	6°	CUUD120X06F**56s**0**BR**	CUUD120X06F**56D**0**BR**
Black RAL 9011	0°	0°	CUUD120X06F**00s**0**BK**	CUUD120X06F**00D**0**BK**
	0°	6°	CUUD120X06F**06s**0**BK**	CUUD120X06F**06D**0**BK**
	5°	0°	CUUD120X06F**50s**0**BK**	CUUD120X06F**50D**0**BK**
	5°	6°	CUUD120X06F**56s**0**BK**	CUUD120X06F**56D**0**BK**

CUUD120X06Fxyz0

TRI BAND | BROAD-BEAM 120°, HEART-SHAPE | CANISTER ANTENNA | X-POL | FIXED TILT | 610 MM (24.0 IN)

Mounting Kits

This antenna can be mounted using any of the following mounting kits. Mounting kits must be ordered separately.

Side Mounting Bracket Kit	Top Mounting Bracket Kit	Utility Pole Mounting Bracket Kit	Wide Diameter Pole Top Mounting Bracket Kit
CWT-MKS-SIDE	CWT-MKS-TOP	WB3X-MKS-01	CWT-MKS-BASE-xx
			

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 3

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

81-ft Light Pole

Proposed Verizon
Antenna Upgrade

Site Ref: Niantic SC6

221 West Main Street
East Lyme, CT

Centek Project No. 22105.02

~~Date: August 16, 2022~~
Rev 2: December 16, 2022

Max Stress Ratio = 59%

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Prepared for:

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by Verizon on the light pole (tower) located in East Lyme, CT.

The host tower is a 79.33-ft tall, three-section, round, tapered monopole, originally designed and manufactured by Musco Sport-Lighting LLC; project no. 184978, dated March 3, 2017. The tower geometry, structure member sizes and foundation system information were obtained from the original design documents.

Antenna and appurtenance information were obtained from an RFDS provided by Verizon.

The tower is made up of three (3) tapered vertical sections consisting of A595-55 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 13.73-in at the top and 24.0-in at the base.

Antenna and Appurtenance Summary

- MISCELLANEOUS. (Existing):
  Antennas: One (1) 6+5 lighting array (LSS80DEXT) mounted to the tower with an elevation of 80-ft above the existing grade.
- MISCELLANEOUS. (Existing):
  Antennas: One (1) control box mounted to the tower with an elevation of 13-ft above the existing grade.
- VERIZON (Existing to Remain):
  Coax Cables: Two (2) 7/8" ∅ coax cables running on the exterior of the existing tower.
- VERIZON (Existing to Remove):
  Antennas: One (1) Andrew NH65PS-DG-F0M antenna pipe mounted with a RAD center elevation of 87.67-ft above grade.
  Appurtenance: One (1) Nokia B66A RRH 4x45 Remote Radio Head pipe mounted with an elevation of 20-ft above grade.
- **VERIZON (Proposed):**
  Antennas: One (1) Amphenol CUUD120X06Fxyz0 antenna pipe mounted with a RAD center elevation of 87.8-ft above grade.
  Appurtenance: One (1) Samsung B2/B66 Remote Radio Head and one (1) Commscope SDX1926Q-43 diplexer pipe mounted with an elevation of 20-ft above grade.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All existing coax cables to be installed as indicated in this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-H entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix P of the CSBC[1] and the wind speed data available in the TIA-222-H Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-H, gravity loads of the tower structure and its components, and the application of 1.00" radial ice on the tower structure and its components

Load Cases:	Load Case 1; 130 mph (Ultimate – Risk Category II) wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix P of the 2022 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 1.00" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-H]*

1 The 2021 International Building Code as amended by the 2022 Connecticut State Building Code (CSBC).

Mount Capacity

- Calculated stresses were found to be within allowable limits.

Component	Stress Ratio (percentage of capacity)	Result
Pipe Mast	21%	**PASS**
Connection	4%	**PASS**

Tower Capacity

- Calculated stresses were found to be within allowable limits. This tower was found to be at **58.8%** of its total capacity.

Tower Section	Elevation (AGL)	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L3)	2.00'-29.00'	58.8%	**PASS**

Foundation and Anchors

The foundation consists of an 4.0-ft diameter x 4.0-ft long reinforced concrete pier on a 14.0-ft x 2.0-ft thick reinforce concrete pad. The sub-grade conditions used in the analysis of the foundation were obtained from the aforementioned original design documents.

- The tower base reactions developed from the governing Load Case 1 were used in the verification of the foundation and its anchors:

Location	Vector	Proposed Reactions
Base	Shear	7 kips
	Compression	8 kips
	Moment	372 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS(1)	Proposed Loading (FS)(1)	Result
Reinforced Concrete Pad and Pier	OTM(2)	1.0	2.88	**PASS**

Note 1: FS denotes Factor of Safety.
Note 2: OTM denotes Overturning Moment.

Conclusion

This analysis shows that the subject tower and pipe mount are **adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by Verizon. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

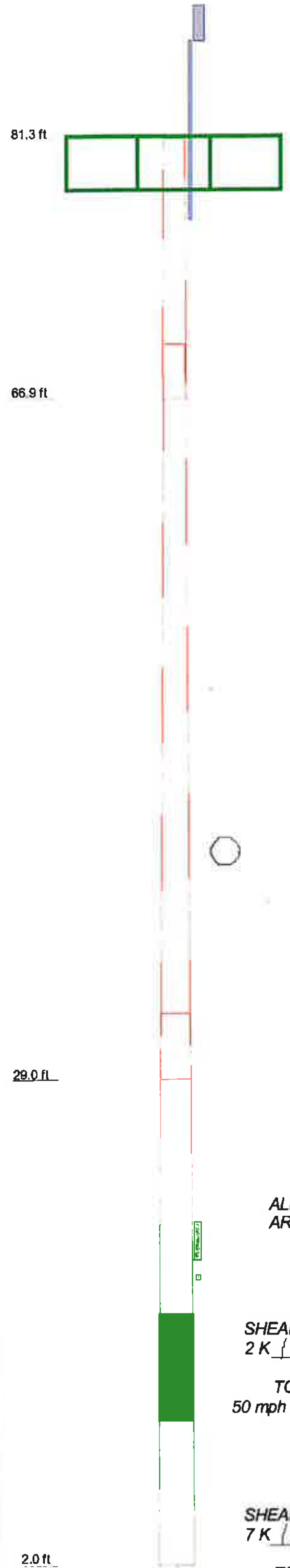
TnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, TnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

TnxTower Features:

- TnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-H standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- TnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	1	2	3
Length (ft)	14.417	40.917	30.669
Number of Sides	1	1	1
Thickness (in)	0.179	0.239	0.313
Socket Length (ft)	3.000	3.670	
Top Dia (in)	13.730	14.972	19.708
Bot Dia (in)	15.750	20.700	24.000
Grade	A595-55		
Weight (K)	0.4	1.8	2.2

Weight (K) total: 4.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
CUUD120X06Fxyz0 (Verizon Proposed)	87.8	Valmont Uni-Tri Bracket (Verizon)	77.3
		B2/B66A RRH (Verizon Proposed)	20
10'x3.0" Pipe Mount (Verizon)	81.8	Valmont Uni-Tri Bracket (Verizon)	20
Valmont Uni-Tri Bracket (Verizon)	80.8	SDX1926Q-43 (Verizon Proposed)	18
Musco LSS60DEXT Lights (6+5)	80	Musco Light Control Box	13

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A595-55	55 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. TOWER RATING: 58.8%

ALL REACTIONS ARE FACTORED

AXIAL 13 K
SHEAR 2 K
MOMENT 105 kip-ft
TORQUE 0 kip-ft
50 mph WIND - 1.000 in ICE

AXIAL 8 K
SHEAR 7 K
MOMENT 372 kip-ft
TORQUE 0 kip-ft
REACTIONS - 130 mph WIND

Centek Engineering Inc.	Job: 22105.02 - Niantic SC6		
63-2 North Branford Rd.	Project: 81-ft Light Pole - East Lyme, CT		
Branford, CT 06405	Client: Verizon	Drawn by: TJL	App'd:
Phone: (203) 488-0580	Code: TIA-222-H	Date: 12/16/22	Scale: NTS
FAX: (203) 488-8587	Path:		Dwg No. E-1

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

- Tower base elevation above sea level: 2.000 ft.
- Basic wind speed of 130 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.000 ft.
- Nominal ice thickness of 1.000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
√ Bypass Mast Stability Checks
Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
Add IBC .6D+W Combination
√ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs

Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-H Bracing Resist. Exemption
Use TIA-222-H Tension Splice Exemption

Poles

√ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No Appurtenances
Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	81.333-66.916	14.417	3.000	Round	13.730	15.750	0.179		A595-55 (55 ksi)
L2	66.916-28.999	40.917	3.670	Round	14.972	20.700	0.239		A595-55 (55 ksi)
L3	28.999-2.000	30.669		Round	19.708	24.000	0.313		A595-55 (55 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	13.730	7.620	174.945	4.791	6.865	25.484	349.891	3.808	0.000	0
	15.750	8.756	265.412	5.506	7.875	33.703	530.823	4.376	0.000	0
L2	15.392	11.062	300.204	5.209	7.486	40.103	600.407	5.528	0.000	0
	20.700	15.363	804.077	7.235	10.350	77.689	1608.154	7.677	0.000	0
L3	20.222	19.072	897.016	6.858	9.854	91.030	1794.033	9.530	0.000	0
	24.000	23.292	1633.843	8.375	12.000	136.154	3267.685	11.639	0.000	0

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
L1 81.333-66.916				1	1	1			
L2 66.916-28.999				1	1	1			
L3 28.999-2.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
7/8 (Verizon)	B	Yes	Surface Ar (CaAa)	81.333 - 5.000	2	2	0.000 0.000	1.110		0.001

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
1" dia. Elect. Conduit	C	No	Yes	Inside Pole	81.333 - 2.000	1	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	81.333-66.916	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	3.201	0.000	0.016
		C	0.000	0.000	0.000	0.000	0.037
L2	66.916-28.999	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	8.418	0.000	0.041
		C	0.000	0.000	0.000	0.000	0.099
L3	28.999-2.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	5.328	0.000	0.026
		C	0.000	0.000	0.000	0.000	0.070

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	81.333-66.916	A	1.084	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	7.908	0.000	0.072
		C		0.000	0.000	0.000	0.000	0.037
L2	66.916-28.999	A	1.037	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	20.798	0.000	0.191
		C		0.000	0.000	0.000	0.000	0.099
L3	28.999-2.000	A	0.925	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	12.881	0.000	0.115
		C		0.000	0.000	0.000	0.000	0.070

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	2	7/8	66.92 - 81.33	1.0000	1.0000
L2	2	7/8	29.00 - 66.92	1.0000	1.0000
L3	2	7/8	5.00 - 29.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
Musco LSS80DEXT Lights (6+5)	C	None		0.000	80.000	No Ice 1/2" Ice 1" Ice	41.400 56.000 70.600	15.000 20.000 25.000	0.500 1.200 1.900
CUUD120X06Fxyz0 (Verizon Proposed)	B	From Face	1.000 0.000 0.000	0.000	87.800	No Ice 1/2" Ice 1" Ice	1.217 1.896 2.098	1.217 1.896 2.098	0.035 0.060 0.087
10'x3.0" Pipe Mount (Verizon)	B	From Face	0.500 0.000 0.000	0.000	81.800	No Ice 1/2" Ice 1" Ice	3.277 4.537 5.300	3.277 4.537 5.300	0.076 0.101 0.133
Valmont Uni-Tri Bracket (Verizon)	B	From Face	0.000 0.000 0.000	0.000	80.800	No Ice 1/2" Ice 1" Ice	1.750 1.940 2.130	1.750 1.940 2.130	0.290 0.306 0.323
Valmont Uni-Tri Bracket (Verizon)	B	From Face	0.000 0.000 0.000	0.000	77.300	No Ice 1/2" Ice 1" Ice	1.750 1.940 2.130	1.750 1.940 2.130	0.290 0.306 0.323
B2/B66A RRH (Verizon Proposed)	B	From Face	0.500 0.000 0.000	0.000	20.000	No Ice 1/2" Ice 1" Ice	2.537 2.750 2.970	1.610 1.791 1.978	0.060 0.080 0.103
Valmont Uni-Tri Bracket (Verizon)	B	From Face	0.000 0.000 0.000	0.000	20.000	No Ice 1/2" Ice 1" Ice	1.750 1.940 2.130	1.750 1.940 2.130	0.290 0.306 0.323
SDX1926Q-43 (Verizon Proposed)	B	From Face	0.500 0.000 0.000	0.000	18.000	No Ice 1/2" Ice 1" Ice	0.241 0.306 0.379	0.101 0.144 0.195	0.030 0.032 0.036
Musco Light Control Box	C	From Face	0.500 0.000 0.000	0.000	13.000	No Ice 1/2" Ice 1" Ice	14.667 15.184 15.708	5.867 6.325 6.790	0.550 0.634 0.726

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 81.333-66.916	73.960	1.188	0.049	17.709	A	0.000	17.709	17.709	100.00	0.000	0.000
					B	0.000	17.709		100.00	3.201	0.000
					C	0.000	17.709		100.00	0.000	0.000
L2 66.916-28.999	47.427	1.082	0.044	57.020	A	0.000	57.020	57.020	100.00	0.000	0.000
					B	0.000	57.020		100.00	8.418	0.000
					C	0.000	57.020		100.00	0.000	0.000
L3 28.999-2.000	15.115	0.85	0.035	49.748	A	0.000	49.748	49.748	100.00	0.000	0.000
					B	0.000	49.748		100.00	5.328	0.000
					C	0.000	49.748		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 81.333-66.916	73.960	1.188	0.007	1.084	20.314	A	0.000	20.314	20.314	100.00	0.000	0.000
						B	0.000	20.314		100.00	7.908	0.000
						C	0.000	20.314		100.00	0.000	0.000
L2 66.916-28.999	47.427	1.082	0.007	1.037	63.871	A	0.000	63.871	63.871	100.00	0.000	0.000
						B	0.000	63.871		100.00	20.798	0.000
						C	0.000	63.871		100.00	0.000	0.000
L3 28.999-2.000	15.115	0.85	0.005	0.925	54.414	A	0.000	54.414	54.414	100.00	0.000	0.000
						B	0.000	54.414		100.00	12.881	0.000
						C	0.000	54.414		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 81.333-66.916	73.960	1.188	0.009	17.709	A	0.000	17.709	17.709	100.00	0.000	0.000
					B	0.000	17.709		100.00	3.201	0.000
					C	0.000	17.709		100.00	0.000	0.000
L2 66.916-28.999	47.427	1.082	0.008	57.020	A	0.000	57.020	57.020	100.00	0.000	0.000
					B	0.000	57.020		100.00	8.418	0.000
					C	0.000	57.020		100.00	0.000	0.000
L3 28.999-2.000	15.115	0.85	0.007	49.748	A	0.000	49.748	49.748	100.00	0.000	0.000
					B	0.000	49.748		100.00	5.328	0.000
					C	0.000	49.748		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.053	0.402	A	1	0.6	0.049	1	1	17.709	0.571	0.040	C
			B	1	0.6		1	1	17.709			
			C	1	0.6		1	1	17.709			
L2 66.916-28.999	0.140	1.840	A	1	0.6	0.044	1	1	57.020	1.665	0.044	C
			B	1	0.6		1	1	57.020			
			C	1	0.6		1	1	57.020			
L3 28.999-2.000	0.096	2.211	A	1	0.6	0.035	1	1	49.748	1.147	0.042	C
			B	1	0.6		1	1	49.748			
			C	1	0.6		1	1	49.748			
Sum Weight:	0.289	4.452						OTM	131.722 kip-ft	3.383		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.053	0.402	A	1	0.691	0.049	1	1	17.709	0.657	0.046	A
			B	1	0.6		1	1	17.709			
			C	1	0.6		1	1	17.709			
L2 66.916-28.999	0.140	1.840	A	1	0.641	0.044	1	1	57.020	1.779	0.047	A
			B	1	0.6		1	1	57.020			
			C	1	0.6		1	1	57.020			
L3 28.999-2.000	0.096	2.211	A	1	0.6	0.035	1	1	49.748	1.147	0.042	C
			B	1	0.6		1	1	49.748			
			C	1	0.6		1	1	49.748			
Sum Weight:	0.289	4.452						OTM	143.178 kip-ft	3.584		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.053	0.402	A	1	0.6	0.049	1	1	17.709	0.571	0.040	C
			B	1	0.6		1	1	17.709			
			C	1	0.6		1	1	17.709			
L2 66.916-28.999	0.140	1.840	A	1	0.6	0.044	1	1	57.020	1.665	0.044	C
			B	1	0.6		1	1	57.020			
			C	1	0.6		1	1	57.020			
L3 28.999-2.000	0.096	2.211	A	1	0.6	0.035	1	1	49.748	1.147	0.042	C
			B	1	0.6		1	1	49.748			
			C	1	0.6		1	1	49.748			
Sum Weight:	0.289	4.452						OTM	131.722 kip-ft	3.383		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.053	0.402	A	1	0.6	0.049	1	1	17.709	0.657	0.046	B
			B	1	0.691		1	1	17.709			
			C	1	0.6		1	1	17.709			
L2 66.916-28.999	0.140	1.840	A	1	0.6	0.044	1	1	57.020	1.779	0.047	B
			B	1	0.641		1	1	57.020			
			C	1	0.6		1	1	57.020			
L3 28.999-2.000	0.096	2.211	A	1	0.6	0.035	1	1	49.748	1.147	0.042	C
			B	1	0.6		1	1	49.748			
			C	1	0.6		1	1	49.748			
Sum Weight:	0.289	4.452						OTM	143.178	3.584		

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
									kip-ft			

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.110	0.704	A	1	1.2	0.007	1	1	20.314	0.194	0.013	C
			B	1	1.2		1	1	20.314			
			C	1	1.2		1	1	20.314			
L2 66.916-28.999	0.289	2.756	A	1	1.2	0.007	1	1	63.573	0.549	0.014	C
			B	1	1.2		1	1	63.573			
			C	1	1.2		1	1	63.573			
L3 28.999-2.000	0.185	2.913	A	1	1.2	0.005	1	1	53.910	0.368	0.014	C
			B	1	1.2		1	1	53.910			
			C	1	1.2		1	1	53.910			
Sum Weight:	0.584	6.373						OTM	43.701 kip-ft	1.111		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.110	0.704	A	1	1.2	0.007	1	1	20.314	0.194	0.013	C
			B	1	1.2		1	1	20.314			
			C	1	1.2		1	1	20.314			
L2 66.916-28.999	0.289	2.756	A	1	1.2	0.007	1	1	63.573	0.549	0.014	C
			B	1	1.2		1	1	63.573			
			C	1	1.2		1	1	63.573			
L3 28.999-2.000	0.185	2.913	A	1	1.2	0.005	1	1	53.910	0.368	0.014	C
			B	1	1.2		1	1	53.910			
			C	1	1.2		1	1	53.910			
Sum Weight:	0.584	6.373						OTM	43.701 kip-ft	1.111		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.110	0.704	A	1	1.2	0.007	1	1	20.314	0.194	0.013	C
			B	1	1.2		1	1	20.314			
			C	1	1.2		1	1	20.314			
L2 66.916-28.999	0.289	2.756	A	1	1.2	0.007	1	1	63.573	0.549	0.014	C
			B	1	1.2		1	1	63.573			
			C	1	1.2		1	1	63.573			
L3 28.999-2.000	0.185	2.913	A	1	1.2	0.005	1	1	53.910	0.368	0.014	C
			B	1	1.2		1	1	53.910			
			C	1	1.2		1	1	53.910			
Sum Weight:	0.584	6.373						OTM	43.701 kip-ft	1.111		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.110	0.704	A	1	1.2	0.007	1	1	20.314	0.194	0.013	C
			B	1	1.2		1	1	20.314			
			C	1	1.2		1	1	20.314			
L2 66.916-28.999	0.289	2.756	A	1	1.2	0.007	1	1	63.573	0.549	0.014	C
			B	1	1.2		1	1	63.573			
			C	1	1.2		1	1	63.573			
L3 28.999-2.000	0.185	2.913	A	1	1.2	0.005	1	1	53.910	0.368	0.014	C
			B	1	1.2		1	1	53.910			
			C	1	1.2		1	1	53.910			
Sum Weight:	0.584	6.373						OTM	43.701 kip-ft	1.111		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.053	0.402	A	1	0.6	0.009	1	1	17.709	0.109	0.008	C
			B	1	0.6		1	1	17.709			
			C	1	0.6		1	1	17.709			
L2 66.916-28.999	0.140	1.840	A	1	0.6	0.008	1	1	57.020	0.317	0.008	C
			B	1	0.6		1	1	57.020			
			C	1	0.6		1	1	57.020			
L3 28.999-2.000	0.096	2.211	A	1	0.6	0.007	1	1	49.748	0.219	0.008	C
			B	1	0.6		1	1	49.748			
			C	1	0.6		1	1	49.748			
Sum Weight:	0.289	4.452						OTM	25.105 kip-ft	0.645		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.053	0.402	A	1	0.691	0.009	1	1	17.709	0.125	0.009	A
			B	1	0.6		1	1	17.709			
			C	1	0.6		1	1	17.709			
L2 66.916-28.999	0.140	1.840	A	1	0.641	0.008	1	1	57.020	0.339	0.009	A
			B	1	0.6		1	1	57.020			
			C	1	0.6		1	1	57.020			
L3 28.999-2.000	0.096	2.211	A	1	0.6	0.007	1	1	49.748	0.219	0.008	C
			B	1	0.6		1	1	49.748			
			C	1	0.6		1	1	49.748			
Sum Weight:	0.289	4.452						OTM	27.289 kip-ft	0.683		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.053	0.402	A	1	0.6	0.009	1	1	17.709	0.109	0.008	C
			B	1	0.6		1	1	17.709			
			C	1	0.6		1	1	17.709			
L2 66.916-28.999	0.140	1.840	A	1	0.6	0.008	1	1	57.020	0.317	0.008	C
			B	1	0.6		1	1	57.020			
			C	1	0.6		1	1	57.020			
L3 28.999-2.000	0.096	2.211	A	1	0.6	0.007	1	1	49.748	0.219	0.008	C
			B	1	0.6		1	1	49.748			
			C	1	0.6		1	1	49.748			
Sum Weight:	0.289	4.452						OTM	25.105 kip-ft	0.645		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1 81.333-66.916	0.053	0.402	A	1	0.6	0.009	1	1	17.709	0.125	0.009	B
			B	1	0.691		1	1	17.709			
			C	1	0.6		1	1	17.709			
L2 66.916-28.999	0.140	1.840	A	1	0.6	0.008	1	1	57.020	0.339	0.009	B
			B	1	0.641		1	1	57.020			
			C	1	0.6		1	1	57.020			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L3 28.999-2.000	0.096	2.211	A	1	0.6	0.007	1	1	49.748	0.219	0.008	C
			B	`1	0.6		1	1	49.748			
			C	1	0.6		1	1	49.748			
Sum Weight:	0.289	4.452						OTM	27.289 kip-ft	0.683		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	4.452					
Bracing Weight	0.000					
Total Member Self-Weight	4.452			0.359	-0.746	
Total Weight	6.862			0.359	-0.746	
Wind 0 deg - No Ice		0.019	-6.796	-351.422	-1.079	0.495
Wind 30 deg - No Ice		3.256	-5.895	-304.459	-175.257	0.448
Wind 45 deg - No Ice		4.595	-4.819	-248.623	-247.370	0.377
Wind 60 deg - No Ice		5.621	-3.414	-175.820	-302.675	0.280
Wind 90 deg - No Ice		6.480	-0.019	0.026	-349.192	0.038
Wind 120 deg - No Ice		5.602	3.382	175.961	-302.342	-0.215
Wind 135 deg - No Ice		4.574	4.797	249.230	-247.258	-0.323
Wind 150 deg - No Ice		3.324	6.051	314.765	-180.408	-0.410
Wind 180 deg - No Ice		-0.019	6.796	352.140	-0.413	-0.495
Wind 210 deg - No Ice		-3.256	5.895	305.177	173.765	-0.448
Wind 225 deg - No Ice		-4.595	4.819	249.341	245.878	-0.377
Wind 240 deg - No Ice		-5.621	3.414	176.538	301.183	-0.280
Wind 270 deg - No Ice		-6.480	0.019	0.692	347.699	-0.038
Wind 300 deg - No Ice		-5.602	-3.382	-175.243	300.850	0.215
Wind 315 deg - No Ice		-4.574	-4.797	-248.512	245.766	0.323
Wind 330 deg - No Ice		-3.324	-6.051	-314.047	178.916	0.410
Member Ice	1.922					
Total Weight Ice	11.043			0.439	-1.004	
Wind 0 deg - Ice		0.003	-1.915	-98.621	-1.058	0.108
Wind 30 deg - Ice		0.937	-1.660	-85.376	-50.333	0.090
Wind 45 deg - Ice		1.323	-1.356	-69.645	-70.738	0.071
Wind 60 deg - Ice		1.619	-0.960	-49.138	-86.391	0.047
Wind 90 deg - Ice		1.868	-0.003	0.385	-99.569	-0.008
Wind 120 deg - Ice		1.616	0.955	49.922	-86.337	-0.061
Wind 135 deg - Ice		1.319	1.352	70.446	-70.662	-0.082
Wind 150 deg - Ice		0.931	1.657	86.200	-50.240	-0.097
Wind 180 deg - Ice		-0.003	1.915	99.498	-0.950	-0.108
Wind 210 deg - Ice		-0.937	1.660	86.253	48.325	-0.090
Wind 225 deg - Ice		-1.323	1.356	70.522	68.729	-0.071
Wind 240 deg - Ice		-1.619	0.960	50.015	84.382	-0.047
Wind 270 deg - Ice		-1.868	0.003	0.493	97.560	0.008
Wind 300 deg - Ice		-1.616	-0.955	-49.044	84.328	0.061
Wind 315 deg - Ice		-1.319	-1.352	-69.569	68.653	0.082
Wind 330 deg - Ice		-0.931	-1.657	-85.322	48.231	0.097
Total Weight	6.862			0.359	-0.746	
Wind 0 deg - Service		0.004	-1.298	-66.875	-0.810	0.097
Wind 30 deg - Service		0.622	-1.126	-57.899	-34.100	0.087
Wind 45 deg - Service		0.877	-0.920	-47.227	-47.883	0.072

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Load Case	*Vertical Forces* K	*Sum of Forces X* K	*Sum of Forces Z* K	*Sum of Overturning Moments, M_x* kip-ft	*Sum of Overturning Moments, M_z* kip-ft	*Sum of Torques* kip-ft
Wind 60 deg - Service		1.073	-0.652	-33.313	-58.453	0.053
Wind 90 deg - Service		1.237	-0.004	0.295	-67.344	0.006
Wind 120 deg - Service		1.070	0.646	33.921	-58.390	-0.043
Wind 135 deg - Service		0.873	0.916	47.924	-47.862	-0.064
Wind 150 deg - Service		0.635	1.155	60.444	-35.082	-0.081
Wind 180 deg - Service		-0.004	1.298	67.593	-0.683	-0.097
Wind 210 deg - Service		-0.622	1.126	58.617	32.608	-0.087
Wind 225 deg - Service		-0.877	0.920	47.945	46.391	-0.072
Wind 240 deg - Service		-1.073	0.652	34.031	56.961	-0.053
Wind 270 deg - Service		-1.237	0.004	0.422	65.852	-0.006
Wind 300 deg - Service		-1.070	-0.646	-33.203	56.898	0.043
Wind 315 deg - Service		-0.873	-0.916	-47.206	46.369	0.064
Wind 330 deg - Service		-0.635	-1.155	-59.726	33.590	0.081

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 45 deg - No Ice
7	0.9 Dead+1.0 Wind 45 deg - No Ice
8	1.2 Dead+1.0 Wind 60 deg - No Ice
9	0.9 Dead+1.0 Wind 60 deg - No Ice
10	1.2 Dead+1.0 Wind 90 deg - No Ice
11	0.9 Dead+1.0 Wind 90 deg - No Ice
12	1.2 Dead+1.0 Wind 120 deg - No Ice
13	0.9 Dead+1.0 Wind 120 deg - No Ice
14	1.2 Dead+1.0 Wind 135 deg - No Ice
15	0.9 Dead+1.0 Wind 135 deg - No Ice
16	1.2 Dead+1.0 Wind 150 deg - No Ice
17	0.9 Dead+1.0 Wind 150 deg - No Ice
18	1.2 Dead+1.0 Wind 180 deg - No Ice
19	0.9 Dead+1.0 Wind 180 deg - No Ice
20	1.2 Dead+1.0 Wind 210 deg - No Ice
21	0.9 Dead+1.0 Wind 210 deg - No Ice
22	1.2 Dead+1.0 Wind 225 deg - No Ice
23	0.9 Dead+1.0 Wind 225 deg - No Ice
24	1.2 Dead+1.0 Wind 240 deg - No Ice
25	0.9 Dead+1.0 Wind 240 deg - No Ice
26	1.2 Dead+1.0 Wind 270 deg - No Ice
27	0.9 Dead+1.0 Wind 270 deg - No Ice
28	1.2 Dead+1.0 Wind 300 deg - No Ice
29	0.9 Dead+1.0 Wind 300 deg - No Ice
30	1.2 Dead+1.0 Wind 315 deg - No Ice
31	0.9 Dead+1.0 Wind 315 deg - No Ice
32	1.2 Dead+1.0 Wind 330 deg - No Ice
33	0.9 Dead+1.0 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	81.333 - 66.916	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-3.867	-0.688	0.396
			Max. Mx	10	-1.642	-31.918	0.278
			Max. My	2	-1.643	-0.483	31.708
			Max. Vy	10	3.260	-31.918	0.278
			Max. Vx	2	-3.260	-0.483	31.708
			Max. Torque	16			0.420
L2	66.916 - 28.999	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-7.228	-0.735	0.413
			Max. Mx	10	-3.952	-183.592	0.292
			Max. My	2	-3.952	-0.518	183.377
			Max. Vy	10	4.889	-183.592	0.292
			Max. Vx	2	-4.889	-0.518	183.377
			Max. Torque	16			0.420
L3	28.999 - 2	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	34	-12.583	-1.222	-0.484
			Max. Mx	10	-8.229	-358.319	-0.088
			Max. My	18	-8.229	-0.588	-361.171
			Max. Vy	10	6.486	-358.319	-0.088
			Max. Vx	18	6.803	-0.588	-361.171
			Max. Torque	16			0.577

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	47	12.583	1.868	-0.003
	Max. H_x	26	8.234	6.480	-0.019
	Max. H_z	2	8.234	-0.019	6.796
	Max. M_x	2	360.323	-0.019	6.796
	Max. M_z	10	358.319	-6.480	0.019
	Max. Torsion	18	0.499	0.019	-6.796
	Min. Vert	31	6.175	4.574	4.797
	Min. H_x	10	8.234	-6.480	0.019
	Min. H_z	18	8.234	0.019	-6.796
	Min. M_x	18	-361.171	0.019	-6.796
	Min. M_z	26	-356.473	6.480	-0.019
	Min. Torsion	2	-0.499	-0.019	6.796

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	6.862	0.000	0.000	0.353	-0.760	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	8.234	0.019	-6.796	-360.323	-1.260	0.499
0.9 Dead+1.0 Wind 0 deg - No Ice	6.175	0.019	-6.796	-358.062	-1.022	0.497
1.2 Dead+1.0 Wind 30 deg - No Ice	8.234	3.256	-5.895	-312.160	-179.912	0.449
0.9 Dead+1.0 Wind 30 deg - No Ice	6.175	3.256	-5.895	-310.215	-178.494	0.449
1.2 Dead+1.0 Wind 45 deg - No Ice	8.234	4.595	-4.819	-254.900	-253.878	0.377
0.9 Dead+1.0 Wind 45 deg - No Ice	6.175	4.595	-4.819	-253.331	-251.971	0.377
1.2 Dead+1.0 Wind 60 deg - No Ice	8.234	5.621	-3.414	-180.241	-310.605	0.279
0.9 Dead+1.0 Wind 60 deg - No Ice	6.175	5.621	-3.414	-179.162	-308.323	0.280
1.2 Dead+1.0 Wind 90 deg - No Ice	8.234	6.480	-0.019	0.088	-358.319	0.034
0.9 Dead+1.0 Wind 90 deg - No Ice	6.175	6.480	-0.019	-0.016	-355.721	0.035
1.2 Dead+1.0 Wind 120 deg - No Ice	8.234	5.602	3.382	180.507	-310.270	-0.220
0.9 Dead+1.0 Wind 120 deg - No Ice	6.175	5.602	3.382	179.220	-307.988	-0.218
1.2 Dead+1.0 Wind 135 deg - No Ice	8.234	4.574	4.797	255.642	-253.772	-0.329
0.9 Dead+1.0 Wind 135 deg - No Ice	6.175	4.574	4.797	253.863	-251.863	-0.327
1.2 Dead+1.0 Wind 150 deg - No Ice	8.234	3.324	6.051	322.816	-185.187	-0.416
0.9 Dead+1.0 Wind 150 deg - No Ice	6.175	3.324	6.051	320.601	-183.734	-0.413

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 180 deg - No Ice	8.234	-0.019	6.796	361.171	-0.588	-0.499
0.9 Dead+1.0 Wind 180 deg - No Ice	6.175	-0.019	6.796	358.701	-0.352	-0.498
1.2 Dead+1.0 Wind 210 deg - No Ice	8.234	-3.256	5.895	313.008	178.065	-0.449
0.9 Dead+1.0 Wind 210 deg - No Ice	6.175	-3.256	5.895	310.855	177.121	-0.448
1.2 Dead+1.0 Wind 225 deg - No Ice	8.234	-4.595	4.819	255.749	252.031	-0.377
0.9 Dead+1.0 Wind 225 deg - No Ice	6.175	-4.595	4.819	253.971	250.598	-0.376
1.2 Dead+1.0 Wind 240 deg - No Ice	8.234	-5.621	3.414	181.089	308.759	-0.279
0.9 Dead+1.0 Wind 240 deg - No Ice	6.175	-5.621	3.414	179.801	306.950	-0.279
1.2 Dead+1.0 Wind 270 deg - No Ice	8.234	-6.480	0.019	0.760	356.473	-0.034
0.9 Dead+1.0 Wind 270 deg - No Ice	6.175	-6.480	0.019	0.655	354.348	-0.035
1.2 Dead+1.0 Wind 300 deg - No Ice	8.234	-5.602	-3.382	-179.659	308.423	0.220
0.9 Dead+1.0 Wind 300 deg - No Ice	6.175	-5.602	-3.382	-178.581	306.615	0.218
1.2 Dead+1.0 Wind 315 deg - No Ice	8.234	-4.574	-4.797	-254.795	251.925	0.329
0.9 Dead+1.0 Wind 315 deg - No Ice	6.175	-4.574	-4.797	-253.224	250.490	0.327
1.2 Dead+1.0 Wind 330 deg - No Ice	8.234	-3.324	-6.051	-321.969	183.340	0.415
0.9 Dead+1.0 Wind 330 deg - No Ice	6.175	-3.324	-6.051	-319.962	182.361	0.413
1.2 Dead+1.0 Ice+1.0 Temp	12.583	0.000	-0.000	0.484	-1.222	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	12.583	0.003	-1.915	-103.499	-1.288	0.112
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	12.583	0.937	-1.660	-89.595	-53.024	0.092
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	12.583	1.323	-1.356	-73.081	-74.448	0.072
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	12.583	1.619	-0.960	-51.554	-90.883	0.047
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	12.583	1.868	-0.003	0.431	-104.720	-0.011
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	12.583	1.616	0.955	52.431	-90.828	-0.065
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	12.583	1.319	1.352	73.976	-74.371	-0.087
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	12.583	0.931	1.657	90.512	-52.929	-0.103
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	12.583	-0.003	1.915	104.471	-1.179	-0.112
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	12.583	-0.937	1.660	90.567	50.557	-0.092
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	12.583	-1.323	1.356	74.053	71.981	-0.072
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	12.583	-1.619	0.960	52.526	88.415	-0.047
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	12.583	-1.868	0.003	0.541	102.251	0.011
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	12.583	-1.616	-0.955	-51.459	88.361	0.065

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	12.583	-1.319	-1.352	-73.004	71.903	0.087
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	12.583	-0.931	-1.657	-89.541	50.462	0.103
Dead+Wind 0 deg - Service	6.862	0.004	-1.298	-68.347	-0.831	0.098
Dead+Wind 30 deg - Service	6.862	0.622	-1.126	-59.175	-34.854	0.087
Dead+Wind 45 deg - Service	6.862	0.877	-0.920	-48.270	-48.940	0.073
Dead+Wind 60 deg - Service	6.862	1.073	-0.652	-34.052	-59.743	0.053
Dead+Wind 90 deg - Service	6.862	1.237	-0.004	0.289	-68.830	0.005
Dead+Wind 120 deg - Service	6.862	1.070	0.646	34.648	-59.679	-0.044
Dead+Wind 135 deg - Service	6.862	0.873	0.916	48.957	-48.920	-0.065
Dead+Wind 150 deg - Service	6.862	0.635	1.155	61.747	-35.857	-0.082
Dead+Wind 180 deg - Service	6.862	-0.004	1.298	69.054	-0.704	-0.098
Dead+Wind 210 deg - Service	6.862	-0.622	1.126	59.882	33.319	-0.087
Dead+Wind 225 deg - Service	6.862	-0.877	0.920	48.977	47.405	-0.073
Dead+Wind 240 deg - Service	6.862	-1.073	0.652	34.759	58.208	-0.053
Dead+Wind 270 deg - Service	6.862	-1.237	0.004	0.417	67.295	-0.005
Dead+Wind 300 deg - Service	6.862	-1.070	-0.646	-33.941	58.144	0.044
Dead+Wind 315 deg - Service	6.862	-0.873	-0.916	-48.250	47.385	0.065
Dead+Wind 330 deg - Service	6.862	-0.635	-1.155	-61.040	34.322	0.082

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-6.862	0.000	0.000	6.862	0.000	0.000%
2	0.019	-8.234	-6.796	-0.019	8.234	6.796	0.000%
3	0.019	-6.175	-6.796	-0.019	6.175	6.796	0.000%
4	3.256	-8.234	-5.895	-3.256	8.234	5.895	0.000%
5	3.256	-6.175	-5.895	-3.256	6.175	5.895	0.000%
6	4.595	-8.234	-4.819	-4.595	8.234	4.819	0.000%
7	4.595	-6.175	-4.819	-4.595	6.175	4.819	0.000%
8	5.621	-8.234	-3.414	-5.621	8.234	3.414	0.000%
9	5.621	-6.175	-3.414	-5.621	6.175	3.414	0.000%
10	6.480	-8.234	-0.019	-6.480	8.234	0.019	0.000%
11	6.480	-6.175	-0.019	-6.480	6.175	0.019	0.000%
12	5.602	-8.234	3.382	-5.602	8.234	-3.382	0.000%
13	5.602	-6.175	3.382	-5.602	6.175	-3.382	0.000%
14	4.574	-8.234	4.797	-4.574	8.234	-4.797	0.000%
15	4.574	-6.175	4.797	-4.574	6.175	-4.797	0.000%
16	3.324	-8.234	6.051	-3.324	8.234	-6.051	0.000%
17	3.324	-6.175	6.051	-3.324	6.175	-6.051	0.000%
18	-0.019	-8.234	6.796	0.019	8.234	-6.796	0.000%
19	-0.019	-6.175	6.796	0.019	6.175	-6.796	0.000%
20	-3.256	-8.234	5.895	3.256	8.234	-5.895	0.000%
21	-3.256	-6.175	5.895	3.256	6.175	-5.895	0.000%
22	-4.595	-8.234	4.819	4.595	8.234	-4.819	0.000%
23	-4.595	-6.175	4.819	4.595	6.175	-4.819	0.000%
24	-5.621	-8.234	3.414	5.621	8.234	-3.414	0.000%
25	-5.621	-6.175	3.414	5.621	6.175	-3.414	0.000%
26	-6.480	-8.234	0.019	6.480	8.234	-0.019	0.000%
27	-6.480	-6.175	0.019	6.480	6.175	-0.019	0.000%
28	-5.602	-8.234	-3.382	5.602	8.234	3.382	0.000%
29	-5.602	-6.175	-3.382	5.602	6.175	3.382	0.000%
30	-4.574	-8.234	-4.797	4.574	8.234	4.797	0.000%
31	-4.574	-6.175	-4.797	4.574	6.175	4.797	0.000%
32	-3.324	-8.234	-6.051	3.324	8.234	6.051	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	-3.324	-6.175	-6.051	3.324	6.175	6.051	0.000%
34	0.000	-12.583	0.000	-0.000	12.583	0.000	0.000%
35	0.003	-12.583	-1.915	-0.003	12.583	1.915	0.000%
36	0.937	-12.583	-1.660	-0.937	12.583	1.660	0.000%
37	1.323	-12.583	-1.356	-1.323	12.583	1.356	0.000%
38	1.619	-12.583	-0.960	-1.619	12.583	0.960	0.000%
39	1.868	-12.583	-0.003	-1.868	12.583	0.003	0.000%
40	1.616	-12.583	0.955	-1.616	12.583	-0.955	0.000%
41	1.319	-12.583	1.352	-1.319	12.583	-1.352	0.000%
42	0.931	-12.583	1.657	-0.931	12.583	-1.657	0.000%
43	-0.003	-12.583	1.915	0.003	12.583	-1.915	0.000%
44	-0.937	-12.583	1.660	0.937	12.583	-1.660	0.000%
45	-1.323	-12.583	1.356	1.323	12.583	-1.356	0.000%
46	-1.619	-12.583	0.960	1.619	12.583	-0.960	0.000%
47	-1.868	-12.583	0.003	1.868	12.583	-0.003	0.000%
48	-1.616	-12.583	-0.955	1.616	12.583	0.955	0.000%
49	-1.319	-12.583	-1.352	1.319	12.583	1.352	0.000%
50	-0.931	-12.583	-1.657	0.931	12.583	1.657	0.000%
51	0.004	-6.862	-1.298	-0.004	6.862	1.298	0.000%
52	0.622	-6.862	-1.126	-0.622	6.862	1.126	0.000%
53	0.877	-6.862	-0.920	-0.877	6.862	0.920	0.000%
54	1.073	-6.862	-0.652	-1.073	6.862	0.652	0.000%
55	1.237	-6.862	-0.004	-1.237	6.862	0.004	0.000%
56	1.070	-6.862	0.646	-1.070	6.862	-0.646	0.000%
57	0.873	-6.862	0.916	-0.873	6.862	-0.916	0.000%
58	0.635	-6.862	1.155	-0.635	6.862	-1.155	0.000%
59	-0.004	-6.862	1.298	0.004	6.862	-1.298	0.000%
60	-0.622	-6.862	1.126	0.622	6.862	-1.126	0.000%
61	-0.877	-6.862	0.920	0.877	6.862	-0.920	0.000%
62	-1.073	-6.862	0.652	1.073	6.862	-0.652	0.000%
63	-1.237	-6.862	0.004	1.237	6.862	-0.004	0.000%
64	-1.070	-6.862	-0.646	1.070	6.862	0.646	0.000%
65	-0.873	-6.862	-0.916	0.873	6.862	0.916	0.000%
66	-0.635	-6.862	-1.155	0.635	6.862	1.155	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00076618
3	Yes	4	0.00000001	0.00046521
4	Yes	5	0.00000001	0.00014797
5	Yes	5	0.00000001	0.00006354
6	Yes	5	0.00000001	0.00015612
7	Yes	5	0.00000001	0.00006570
8	Yes	5	0.00000001	0.00013987
9	Yes	5	0.00000001	0.00005979
10	Yes	4	0.00000001	0.00039558
11	Yes	4	0.00000001	0.00024074
12	Yes	5	0.00000001	0.00012950
13	Yes	5	0.00000001	0.00005516
14	Yes	5	0.00000001	0.00015752
15	Yes	5	0.00000001	0.00006659
16	Yes	5	0.00000001	0.00016179
17	Yes	5	0.00000001	0.00006924

18	Yes	4	0.00000001	0.00075832
19	Yes	4	0.00000001	0.00046080
20	Yes	5	0.00000001	0.00013019
21	Yes	5	0.00000001	0.00005577
22	Yes	5	0.00000001	0.00015304
23	Yes	5	0.00000001	0.00006484
24	Yes	5	0.00000001	0.00013830
25	Yes	5	0.00000001	0.00005957
26	Yes	4	0.00000001	0.00038700
27	Yes	4	0.00000001	0.00023599
28	Yes	5	0.00000001	0.00015108
29	Yes	5	0.00000001	0.00006546
30	Yes	5	0.00000001	0.00015624
31	Yes	5	0.00000001	0.00006622
32	Yes	5	0.00000001	0.00013331
33	Yes	5	0.00000001	0.00005624
34	Yes	4	0.00000001	0.00001996
35	Yes	5	0.00000001	0.00006536
36	Yes	5	0.00000001	0.00008739
37	Yes	5	0.00000001	0.00009207
38	Yes	5	0.00000001	0.00008607
39	Yes	5	0.00000001	0.00006524
40	Yes	5	0.00000001	0.00008354
41	Yes	5	0.00000001	0.00009090
42	Yes	5	0.00000001	0.00008717
43	Yes	5	0.00000001	0.00006447
44	Yes	5	0.00000001	0.00008045
45	Yes	5	0.00000001	0.00008660
46	Yes	5	0.00000001	0.00008126
47	Yes	4	0.00000001	0.00098316
48	Yes	5	0.00000001	0.00008457
49	Yes	5	0.00000001	0.00008865
50	Yes	5	0.00000001	0.00008147
51	Yes	4	0.00000001	0.00003648
52	Yes	4	0.00000001	0.00006081
53	Yes	4	0.00000001	0.00005617
54	Yes	4	0.00000001	0.00004691
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00004064
57	Yes	4	0.00000001	0.00006402
58	Yes	4	0.00000001	0.00007696
59	Yes	4	0.00000001	0.00003597
60	Yes	4	0.00000001	0.00003663
61	Yes	4	0.00000001	0.00005037
62	Yes	4	0.00000001	0.00004354
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00006554
65	Yes	4	0.00000001	0.00006179
66	Yes	4	0.00000001	0.00004336

Maximum Tower Deflections - Service Wind

Section No.	*Elevation* *ft*	*Horz. Deflection* *in*	*Gov. Load Comb.*	*Tilt* °	*Twist* °
L1	81.333 - 66.916	7.502	58	0.782	0.005
L2	69.916 - 28.999	5.663	58	0.742	0.003
L3	32.669 - 2	1.192	58	0.349	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
87.800	CUUD120X06Fxyz0	58	7.502	0.782	0.005	19749
81.800	10'x3.0" Pipe Mount	58	7.502	0.782	0.005	19749
80.800	Valmont Uni-Tri Bracket	58	7.415	0.781	0.004	19749
80.000	Musco LSS80DEXT Lights (6+5)	58	7.284	0.779	0.004	19749
77.300	Valmont Uni-Tri Bracket	58	6.844	0.771	0.004	19749
20.000	B2/B66A RRH	58	0.505	0.199	0.000	6330
18.000	SDX1926Q-43	58	0.429	0.176	0.000	7121
13.000	Musco Light Control Box	58	0.269	0.120	0.000	10358

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	81.333 - 66.916	39.273	16	4.099	0.023
L2	69.916 - 28.999	29.642	16	3.892	0.015
L3	32.669 - 2	6.228	16	1.826	0.004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
87.800	CUUD120X06Fxyz0	16	39.273	4.099	0.023	4047
81.800	10'x3.0" Pipe Mount	16	39.273	4.099	0.023	4047
80.800	Valmont Uni-Tri Bracket	16	38.816	4.092	0.023	4047
80.000	Musco LSS80DEXT Lights (6+5)	16	38.131	4.081	0.022	4047
77.300	Valmont Uni-Tri Bracket	16	35.825	4.043	0.020	4047
20.000	B2/B66A RRH	16	2.633	1.041	0.002	1207
18.000	SDX1926Q-43	16	2.240	0.923	0.002	1358
13.000	Musco Light Control Box	16	1.404	0.630	0.001	1975

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	81.333 -	TP15.75x13.73x0.179	14.417	0.000	0.0	8.520	-1.642	380.728	0.004

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in²	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	66.916 (1)								
L2	66.916 - 28.999 (2)	TP20.7x14.972x0.239	40.917	0.000	0.0	14.977	-3.940	671.758	0.006
L3	28.999 - 2 (3)	TP24x19.708x0.313	30.669	0.000	0.0	23.292	-8.228	1073.080	0.008

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	81.333 - 66.916 (1)	TP15.75x13.73x0.179	31.996	148.349	0.216	0.000	148.349	0.000
L2	66.916 - 28.999 (2)	TP20.7x14.972x0.239	188.553	343.832	0.548	0.000	343.832	0.000
L3	28.999 - 2 (3)	TP24x19.708x0.313	372.162	641.578	0.580	0.000	641.578	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	81.333 - 66.916 (1)	TP15.75x13.73x0.179	3.260	109.426	0.030	0.000	112.122	0.000
L2	66.916 - 28.999 (2)	TP20.7x14.972x0.239	5.083	196.404	0.026	0.419	264.952	0.002
L3	28.999 - 2 (3)	TP24x19.708x0.313	6.911	345.884	0.020	0.415	565.660	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	81.333 - 66.916 (1)	0.004	0.216	0.000	0.030	0.000	0.221 ✔	1.000	4.8.2 ✔
L2	66.916 - 28.999 (2)	0.006	0.548	0.000	0.026	0.002	0.555 ✔	1.000	4.8.2 ✔
L3	28.999 - 2 (3)	0.008	0.580	0.000	0.020	0.001	0.588 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\o P_{allow}$ K	% Capacity	Pass Fail
L1	81.333 - 66.916	Pole	TP15.75x13.73x0.179	1	-1.642	380.728	22.1	Pass
L2	66.916 - 28.999	Pole	TP20.7x14.972x0.239	2	-3.940	671.758	55.5	Pass
L3	28.999 - 2	Pole	TP24x19.708x0.313	3	-8.228	1073.080	58.8	Pass
							Summary	
						Pole (L3)	58.8	Pass
						RATING =	**58.8**	**Pass**

Standard Monopole Foundation:

Input Data:

Tower Data

Overturning Moment =	$OM := 372 \cdot ft \cdot kips$	(User Input)	
Shear Force =	$Shear := 7 \cdot kip$	(User Input)	
Axial Force =	$Axial := 8 \cdot kip$	(User Input)	
Tower Height =	$H_t := 81.33 \cdot ft$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 6 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.0 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 4.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 2 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 14 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 4500 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Anchor Bolt Yield Strength =	$f_{ya} := 75000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Ultimate Soil Bearing Capacity =	$q_u := 3000 \cdot psf$	(User Input)	
Allowable Soil Bearing Capacity =	$q_a := \frac{q_u}{2} = 1500 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 110 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 7$	(User Input)	
Bar Diameter =	$d_{bpier} := 0.875 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 16$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 0.375 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 7$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 0.875 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 14$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 7$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 0.875 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 14$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area = $A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0.601 \cdot in^2$

Pad Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.601 \cdot in^2$

Pad Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.601 \cdot in^2$

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := \text{if}(\text{Bouyancy} = 1, \gamma_{conc} - 62.4\text{pcf}, \gamma_{conc}) = 150\cdot\text{pcf}$

Adjusted Soil Unit Weight = $\gamma_s := \text{if}(\text{Bouyancy} = 1, \gamma_{soil} - 62.4\text{pcf}, \gamma_{soil}) = 110\cdot\text{pcf}$

Passive Pressure = $P_{pn} := K_p\cdot\gamma_s\cdot n + c\cdot 2\cdot\sqrt{K_p} = 0\cdot\text{ksf}$

$P_{pt} := K_p\cdot\gamma_s\cdot(D_f - T_f) + c\cdot 2\cdot\sqrt{K_p} = 1.32\cdot\text{ksf}$

$P_{top} := \text{if}\left[n < (D_f - T_f), P_{pt}, P_{pn}\right] = 1.32\cdot\text{ksf}$

$P_{bot} := K_p\cdot\gamma_s\cdot D_f + c\cdot 2\cdot\sqrt{K_p} = 1.98\cdot\text{ksf}$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.65\cdot\text{ksf}$

$T_p := \text{if}\left[n < (D_f - T_f), T_f, (D_f - n)\right] = 2$

$A_p := W_f\cdot T_p = 28$

Ultimate Shear = $S_u := P_{ave}\cdot A_p = 46.2\cdot\text{kip}$

Weight of Concrete Pad = $WT_c := \left[\left(W_f^{\,2}\cdot T_f\right) + \frac{1}{4}\cdot\pi\cdot d_p^{\,2}\cdot L_p\right]\cdot\gamma_c = 66.34\cdot\text{kip}$

Weight of Soil Above Footing = $WT_{s1} := \left[\left(W_f^{\,2} - \frac{1}{4}\cdot\pi\cdot d_p^{\,2}\right)\cdot\left(\left|L_p - L_{pag} - n\right|\right)\right]\cdot\gamma_s = 80.71\cdot\text{kip}$

Weight of Soil Wedge at Back Face = $WT_{s2} := \left(\frac{D_f^{\,2}\cdot\tan(\Phi_s)}{2}\cdot W_f\right)\cdot\gamma_s = 16.004\cdot\text{kip}$

Weight of Soil Wedge at back face Corners = $WT_{s3} := 2\cdot\left[(D_f)^3\cdot\frac{\tan(\Phi_s)}{3}\right]\cdot\gamma_s = 9.145\cdot\text{kips}$

Total Weight = $WT_{tot} := WT_c + WT_{s1} + \text{Axial} = 155.051\cdot\text{kip}$

Resisting Weight = $WT_R := 0.9\cdot WT_c + 0.75\cdot WT_{s1} + 0.75\cdot\text{Axial} = 126.239\cdot\text{kip}$

Resisting Moment = $M_r := (WT_R)\cdot\frac{W_f}{2} + 0.75\cdot S_u\cdot\frac{T_f}{3} + 0.75\cdot\left[(WT_{s2} + WT_{s3})\cdot\left(W_f + \frac{D_f\cdot\tan(\Phi_s)}{3}\right)\right] = 1193\cdot\text{kip}\cdot\text{ft}$

Overturning Moment = $M_{ot} := OM + \text{Shear}\cdot(L_p + T_f) = 414\cdot\text{kip}\cdot\text{ft}$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 2.88$

Factor of Safety Required = $FS_{req} := 1$

OverTurning_Moment_Check := if(FS ≥ FS_{req}, "Okay", "No Good")

OverTurning_Moment_Check = "Okay"

Shear Capacity in Pier:

Shear Resistance of Pier = $S_p := \dfrac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS_{req}} = 115.973 \cdot kips$

Shear_Check := if(S_p > Shear, "Okay", "No Good")

Shear_Check = "Okay"

Bearing Pressure Caused by Footing:

Area of the Mat = $A_{mat} := W_f^{\,2} = 196$

Section Modulus of Mat = $S := \dfrac{W_f^{\,3}}{6} = 457.33 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \dfrac{WT_{tot}}{A_{mat}} + \dfrac{M_{ot}}{S} = 1.696 \cdot ksf$

Max_Pressure_Check := if($P_{max} < .75 \cdot q_u$, "Okay", "No Good")

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \dfrac{WT_{tot}}{A_{mat}} - \dfrac{M_{ot}}{S} = -0.114 \cdot ksf$

Min_Pressure_Check := if[$(P_{min} \ge 0) \cdot (P_{min} < .75 \cdot q_u)$, "Okay", "No Good"]

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \dfrac{P_{max}}{\dfrac{P_{max} - P_{min}}{W_f}} \cdot \dfrac{1}{3} = 4.372$

Distance to Kern = $X_k := \dfrac{W_f}{6} = 2.333$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \dfrac{\dfrac{M_{ot}}{1.6}}{WT_{tot}} = 1.669$

Adjusted Soil Pressure = $P_a := \dfrac{2 \cdot WT_{tot}}{3 \cdot W_f \cdot \left(\dfrac{W_f}{2} - e\right)} = 1.385 \cdot ksf$

$q_{adj} := \text{if}(P_{min} < 0, P_a, P_{max}) = 1.385 \cdot ksf$

Pressure_Check := if($q_{adj} < q_a$, "Okay", "No Good")

Pressure_Check = "Okay"

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot d_p^2}{4} = 4.499 \times 10^3 \cdot kips$ (ACI-2008 10.14)

$Bearing\_Check := if(P_b > Axial, \text{"Okay"}, \text{"No Good"})$

$Bearing\_Check = \text{"Okay"}$

Shear Strength of Concrete:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - d_{bbot} = 1.677$

$d_1 := \frac{W_f}{2} - \frac{d_p}{2}$

$d_2 := d_1 - d$

$L := \left(\frac{W_f}{2} - e\right) \cdot 3$

$Slope := if\left(L > W_f, \frac{P_{max} - P_{min}}{W_f}, \frac{q_{adj}}{L}\right)$

$V_{req} := \left[\left(q_{adj} - Slope \cdot d_1\right) + \left(\frac{Slope \cdot d_1}{2}\right)\right] \cdot W_f \cdot d_1$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d$ (ACI-2008 11.2.1.1)

$Beam\_Shear\_Check := if(V_{req} < V_{Avail}, \text{"Okay"}, \text{"No Good"})$

$Beam\_Shear\_Check = \text{"Okay"}$

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.11.1.2)

Critical Perimeter of Punching Shear = $b_o := (d_p + d) \cdot \pi = 17.8$

Area Included Inside Perimeter = $A_{bo} := \frac{\pi \cdot (d_p + d)^2}{4} = 25.3$

Area Outside of Perimeter = $A_{out} := A_{mat} - A_{bo} = 170.7$

Guess Value = $v_u := 1ksf$ (From "Foundation Analysis and design", By Joseph Bowles, Eq. 8-9)

Given $d^2 + d_p \cdot d = \frac{WT_{tot}}{\pi \cdot v_u}$

$v_u := Find(v_u) = 5.2 \cdot ksf$

$V_u := v_u \cdot d \cdot W_f = 121.7 \cdot kips$

Required Shear Strength = $V_{req} := V_u = 121.7 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 982.4 \cdot kip$ (ACI-2008 11.11.2.1)

Punching_Shear_Check := if($V_{req} < V_{Avail}$, "Okay", "No Good")

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

$q_b := q_{adj} - d_1 \cdot Slope = 0.738 \cdot ksf$

Maximum Bending at Face of Pier = $M_n := \frac{1}{\phi_m} \cdot \left[\left(q_{adj} - q_b\right) \cdot \frac{d_1^2}{3} + q_b \cdot \frac{d_1^2}{2} \right] \cdot W_f = 227.4 \cdot kip \cdot ft$

$$\beta := \begin{cases} 0.85 & \text{if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 & \text{if } f_c > 8000 \cdot psi \\ \left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000 \right)}{1000} \right] \cdot 0.5 \right] & \text{otherwise} \end{cases} = 0.6$$

(ACI-2008 10.2.7.3)

$R_n := \frac{M_n}{W_f \cdot d^2} = 40.1 \cdot psi$

$\rho := \frac{0.85 \cdot f_c}{f_y} \left(1 - \sqrt{1 - \frac{2 \cdot R_n}{0.85 \cdot f_c}} \right) = 0.0007$

$\rho_{min} := \rho = 0.00067$

Required Reinforcement for Temperature and Shrinkage:

$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \ge 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases}$ (ACI-2008 7.12.2.1)

Check Bottom Bars:

$As := \begin{cases} \rho_{min} \cdot W_f \cdot d & \text{if } \rho_{min} > \frac{\rho_{sh}}{2} \\ \rho_{sh} \cdot W_f \cdot \frac{d}{2} & \text{otherwise} \end{cases} = 3.043 \cdot in^2$

$As_{prov.bot} := A_{bbot} \cdot NB_{bot} = 8.4 \cdot in^2$

Pad_Reinforcement_Bot := if$\left(As_{prov.bot} > As, \text{"Okay"}, \text{"No Good"}\right)$

Pad_Reinforcement_Bot = "Okay"

Check Temp Shrinkage Reinforcement:

$As := \rho_{sh} \cdot \left(W_f \cdot T_f\right) = 7.3 \cdot in^2$

$As_{prov.top} := A_{btop} \cdot NB_{top} = 8.4 \cdot in^2$

$As_{prov.tot} := As_{prov.bot} + As_{prov.top} = 16.8 \cdot in^2$

Pad_Reinforcement_Temp := if$\left(As_{prov.tot} > As, \text{"Okay"}, \text{"No Good"}\right)$

Pad_Reinforcement_Temp = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing = $B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 11.52 \cdot in$

Spacing or Cover Dimension = $c := \text{if}\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3 \cdot in$

Transverse Reinforcement Index = $k_{tr} := 0$ (ACI-2008 12.2.3)

$L_{dbt} := \frac{3 \cdot f_y \cdot \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 17.1 \cdot in$

Minimum Development Length = $L_{dbmin} := 12 \cdot in$ (ACI-2008 12.2.1)

$L_{dbtCheck} := \text{if}\left(L_{dbt} \ge L_{dbmin}, \text{"Use L.dbt"}, \text{"Use L.dbmin"}\right)$

Available Length in Pad = $L_{Pad} := \frac{W_f}{2} - \frac{d_p}{2} - Cvr_{pad} = 57 \cdot in$

Lpad_Check := if$\left(L_{Pad} > L_{dbt}, \text{"Okay"}, \text{"No Good"}\right)$

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

Area of Pier = $A_p := \frac{1}{4} \cdot \pi d_p^{\,2} = 1809.56 \cdot in^2$

$A_{smin} := 0.01 \cdot 0.5 \cdot A_p = 9.05 \cdot in^2$ (ACI-2008 10.8.4 & 10.9.1)

$A_{sprov} := NB_{pier} \cdot A_{bpier} = 9.62 \cdot in^2$

Steel_Area_Check := if($A_{sprov} > A_{smin}$, "Okay" , "No Good")

Steel_Area_Check = "Okay"

Bar Spacing In Pier = $B_{sPier} := \frac{d_p \cdot \pi}{NB_{pier}} - d_{bpier} = 8.55 \cdot in$

Diameter of Reinforcement Cage = $Diam_{cage} := d_p - 2 \cdot Cvr_{pier} = 42 \cdot in$

Maximum Moment in Pier = $M_p := \left[OM + Shear \cdot (L_p)\right] = 4800 \cdot in \cdot kips$

Pier Check evaluated from outside program and results are listed below;

$$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) := \left(d_p \cdot 12 \;\; NB_{pier} \;\; BS_{pier} \;\; \frac{Axial \cdot 1.333}{kips} \;\; \frac{M_p}{in \cdot kips}\right)$$

$$\left(D \;\; N \;\; n \;\; P_u \;\; M_{xu}\right) = (48 \;\; 16 \;\; 7 \;\; 10.7 \;\; 4800)$$

$$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := (0 \;\; 0 \;\; 0 \;\; 0)$$

$$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) := \phi P'_n\left(D, N, n, P_u, M_{xu}\right)^T$$

$$\left(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho\right) = (23.4 \;\; 10534.9 \;\; -60 \;\; 0)$$

Axial_Load_Check := if($\phi P_n \ge P_u$, "Okay" , "No Good")

Axial_Load_Check = "Okay"

Bending_Check := if($\phi M_{xn} \ge M_{xu}$, "Okay" , "No Good")

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

$L_{pier} := L_p - Cvr_{pier} = 45 \cdot in$

$L_{pad} := T_f - Cvr_{pad} = 21 \cdot in$

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension = $c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right) = 3 \cdot in$

Transverse Reinforcement = $k_{tr} := 0$ (ACI-2008 12.2.3)

$$L_{dbt} := \frac{3 \cdot f_y \cdot \alpha_{pier} \cdot \beta_{pier} \cdot \gamma_{pier} \cdot \lambda_{pier}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \left(\frac{c + k_{tr}}{d_{bpier}}\right)} \cdot d_{bpier} = 17.12 \cdot in$$

Minimum Development Length = $L_{dh} := \frac{1200 \cdot d_{bpier}}{\sqrt{\frac{f_c}{psi}}} \cdot .7 = 10.957 \cdot in$ (ACI 12.2.1)

Pier reinforcement bars are standard 90 degree hooks and therefore developement in the pad is computed as follows:

$L_{db} := max\left(L_{dbt}, L_{dbmin}\right)$

$L_{tension\_Check} := if\left(L_{pier} + L_{pad} > L_{dbt}, \text{"Okay"}, \text{"No Good"}\right)$

$L_{tension\_Check} = \text{"Okay"}$

Compression: (ACI-2008 12.3.2)

$$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot f_y}{\sqrt{f_c \cdot psi}} = 15.652 \cdot in$$

$$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot f_y\right) = 15.75 \cdot in$$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) = 15.75 \cdot in$

$L_{compression\_Check} := if\left(L_{pier} + L_{pad} > L_{dbc}, \text{"Okay"}, \text{"No Good"}\right)$

$L_{compression\_Check} = \text{"Okay"}$

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed	$V := 130$	mph	(User Input - 2022 CSBC Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-H)

Input

Structure Type =	Structure_Type := Pole		(User Input)
Structure Category =	SC := II		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 81.33$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 87.8$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topographic Factor =	$K_{zt} := 1.0$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 1.0$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H := 1.35$		(User Input - Section 2.6.9.4 of TIA-222-H)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if Structure\_Type = Pole} \\ 0.85 & \text{if Structure\_Type = Lattice} \end{cases} = 0.95$$

(Per Table 2-2 of TIA-222-H)

Importance Factors =

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \\ 1.25 & \text{if } SC = 4 \end{cases} = 1$$

(Per Table 2-3 of TIA-222-H)

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.103$$

$$t_{izant} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.103$$

Velocity Pressure Coefficient Antennas =

$$Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.231$$

Velocity Pressure w/o Ice Antennas =

$$qz_{ant} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V^2 = 50.389$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.ant} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_i^2 = 7.454$$

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Amphenol CUUD120X06Fxyz0		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 24$	in	(User Input)
Antenna Width =	$W_{ant} := 14.6$	in	(User Input)
Antenna Thickness =	$T_{ant} := 14.6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 30$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 30$	lbs

Gravity Loads (ice only)

cu in

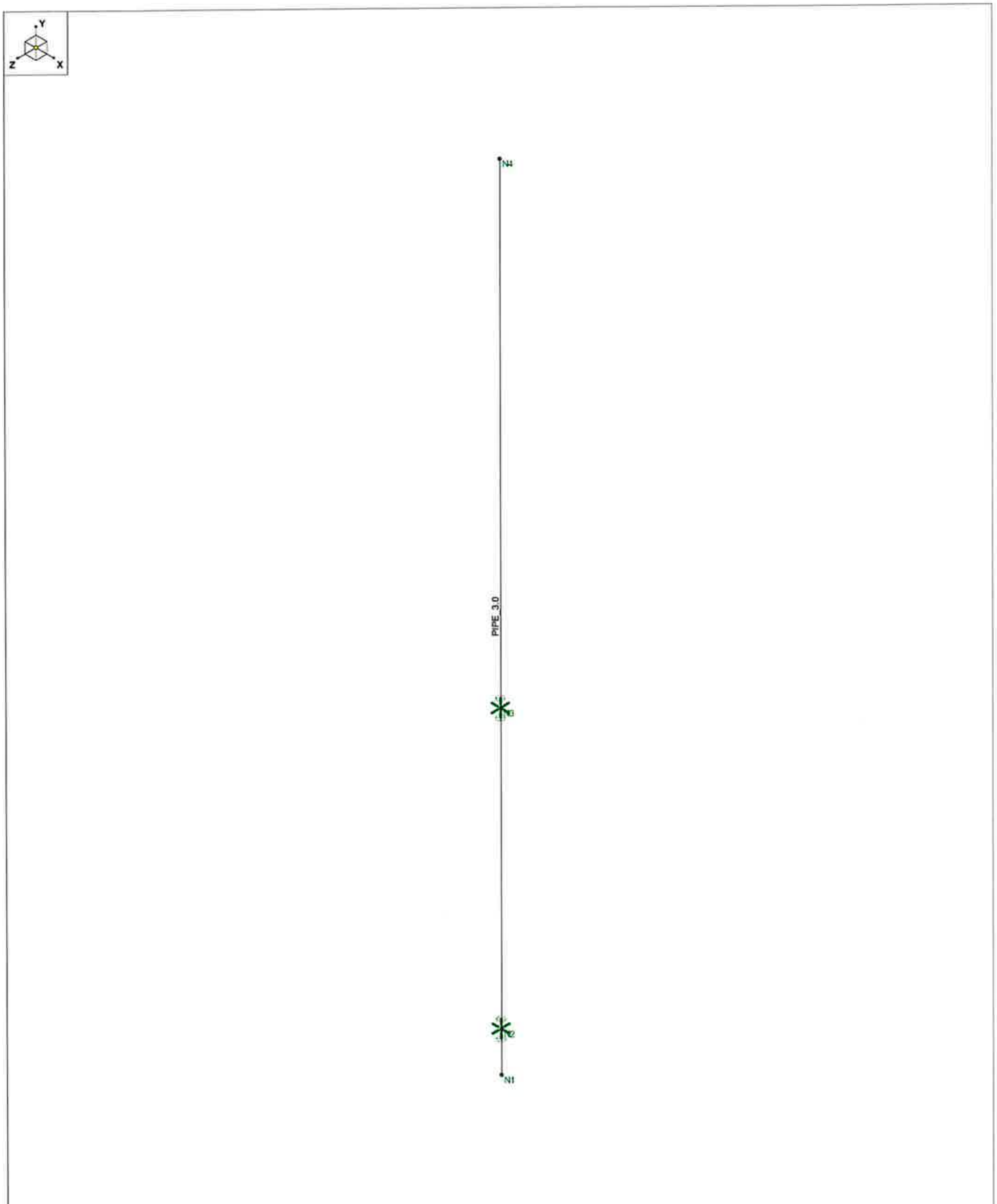
Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5116$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izant})(W_{ant} + 2 \cdot t_{izant}) \cdot (T_{ant} + 2 \cdot t_{izant}) - V_{ant} = 2285$	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 74$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 74$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izant}) \cdot (W_{ant} + 2 \cdot t_{izant})}{144} = 3.1$	sf
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 3.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 37$	lbs

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 2.4$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 2.4$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 199$	lbs



Envelope Only Solution

Centek	Niantic SC6	
TJL	Member Framing	Dec 7, 2022 at 9:48 AM
22105.02		Mount.r3d

(Global) Model Settings

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

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mast Pipe_3 S...	PIPE_3.0	Column	Wide Flange	A53 Grade B	Typical	2.07	2.85	2.85	5.69

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Antenna Mast Pipe...	10									Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N1	N4			Antenna Mast Pipe_3 STD	Column	Wide Flan...	A53 Grade B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	.5	0	0	
3	N3	0	4	0	0	
4	N4	0	10	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N2	Reaction	Reaction	Reaction		Reaction	
2	N3	Reaction	Reaction	Reaction		Reaction	

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.03	10

Member Point Loads (BLC 3 : Weight of Ice Only)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.074	10

Member Point Loads (BLC 4 : TIA Wind with Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.037	10

Member Point Loads (BLC 5 : TIA Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.199	10

Member Distributed Loads

Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft...	End Location[ft,...
No Data to Print ...					

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					1			
3	Weight of Ice Only	None					1			
4	TIA Wind with Ice	None					1			
5	TIA Wind	None					1			

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.2D + 1.0W	Yes	Y		1	1.2	2	1.2	5	1														
2	0.9D + 1.0W	Yes	Y		1	.9	2	.9	5	1														
3	1.2D +1.0Di + 1.0Wi	Yes	Y		1	1.2	2	1.2	3	1	4	1												

Envelope Joint Reactions

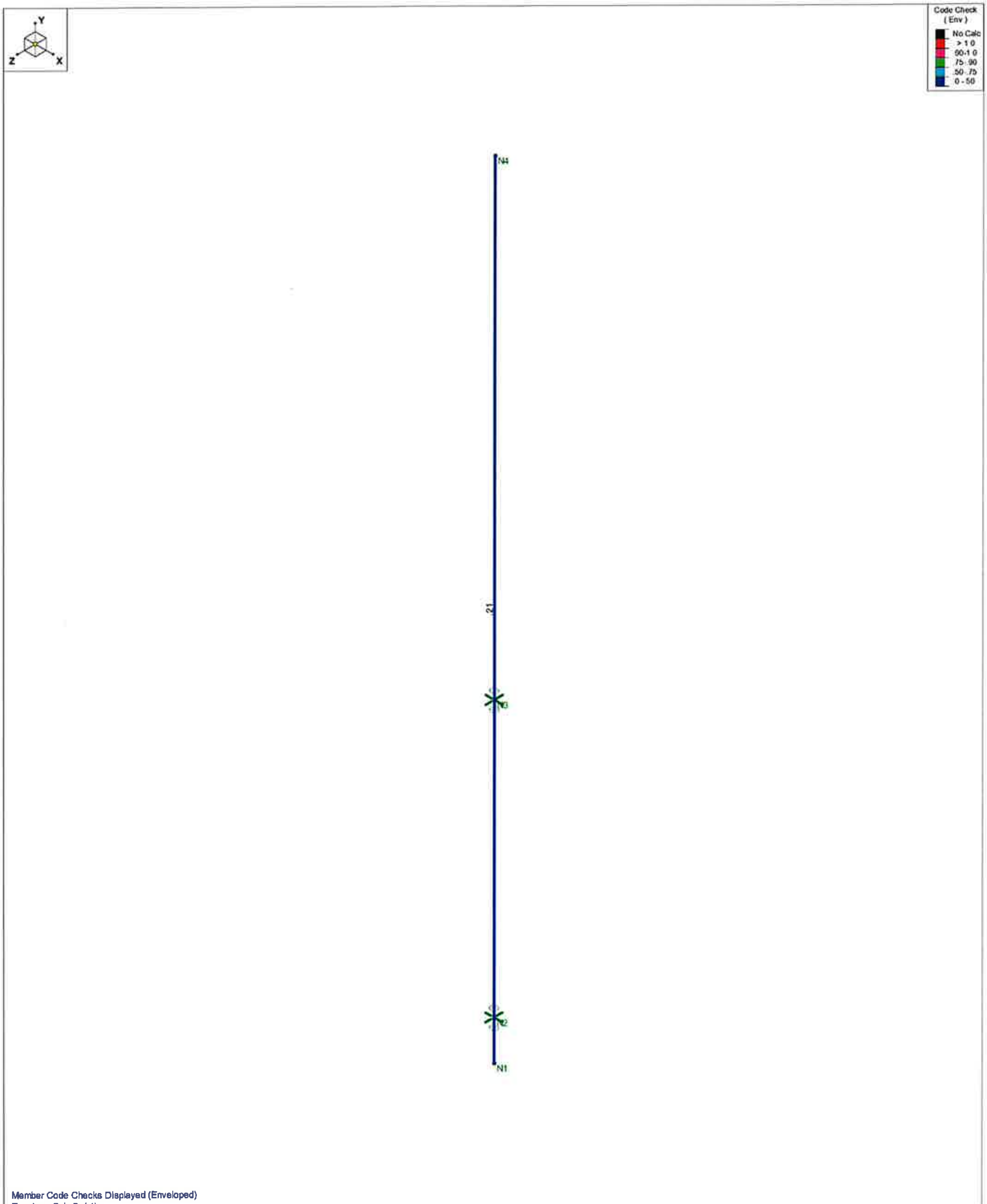
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N2	max	.342	1	.019	3	0	3	0	3	0	3	0	3
2		min	.064	3	.014	2	0	1	0	1	0	1	0	1
3	N3	max	-.101	3	.176	3	0	3	0	3	0	3	0	3
4		min	-.541	1	.076	2	0	1	0	1	0	1	0	1
5	Totals:	max	-.037	3	.195	3	0	3						
6		min	-.199	1	.09	2	0	1						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	.009	1	0	2	0	3	0	3	0	3	1.493e-03	1
2		min	.002	3	0	1	0	1	0	1	0	1	2.785e-04	3
3	N2	max	0	3	0	3	0	3	0	3	0	3	1.493e-03	1
4		min	0	1	0	1	0	1	0	1	0	1	2.785e-04	3
5	N3	max	0	3	0	3	0	3	0	3	0	3	-5.724e-04	3
6		min	0	1	0	1	0	1	0	1	0	1	-3.069e-03	1
7	N4	max	.598	1	0	2	0	3	0	3	0	3	-2.031e-03	3
8		min	.111	3	0	3	0	1	0	1	0	1	-1.089e-02	1

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

	Memb...	Shape	Code Check	L...	LC	Sh...	L...	Dir	...phi*P...	phi*Pn...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
1	M1	PIPE 3.0	.207	4...	1	.017	5..	1	38.177	65.205	5.749	5.749	1...	H1..



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek	Niantic SC6	
TJL	Unity Check	Dec 7, 2022 at 9:48 AM
22105.02		Mount.r3d

Antenna Mast Connection:

Anchor Data:

A307 Threaded Rod =

Number of Anchor Bolts =	$N := 4$	(User Input)
Diameter of Bolts =	$D := 0.625in$	(User Input)
Bolt Spacing Horz =	$Sp_H := 6in$	(User Input)
Bolt Spacing Vertical =	$Sp_V := 6in$	(User Input)
Design Tension =	$T_n := 10.4 \cdot kips$	(User Input)
Design Shear =	$V_n := 6.23 \cdot kips$	(User Input)

Design Reactions:

Shear X =	$Shear_x := 0.54 \cdot kips$	(User Input)
Shear Y =	$Shear_y := 0.176 \cdot kips$	(User Input)
Shear Z =	$Shear_z := 0.54 \cdot kips$	(User Input)
Moment X =	$Mx := 0 \cdot ft \cdot kips$	(User Input)
Moment Y =	$My := 0 \cdot ft \cdot kips$	(User Input)
Moment Z =	$Mz := 0 \cdot ft \cdot kips$	(User Input)

Anchor Check:

Max Tension Force =

$$T_{Max} := \frac{Shear_x}{N} + \frac{My}{Sp_H \cdot \frac{N}{2}} + \frac{Mz}{Sp_V \cdot \frac{N}{2}} = 135lb$$

Max Shear Force =

$$V_{Max} := \frac{Shear_y + Shear_z}{N} + \frac{Mx}{Sp_H \cdot \frac{N}{2}} = 179lb$$

Condition 1 =

$$Condition1 := if\left(\frac{T_{Max}}{T_n} + \frac{V_{Max}}{V_n} \le 1.0, \text{"OK"}, \text{"NG"}\right) = \text{"OK"}$$

% of Capacity =

$$max\left[\frac{T_{Max}}{T_n}, \frac{V_{Max}}{V_n}, \left(\frac{\frac{T_{Max}}{T_n} + \frac{V_{Max}}{V_n}}{1.0}\right)\right] = 4.2 \cdot \%$$

verizon fuze | RFDS

EAST > North East > New England > New England West > NIANTIC CT SC 6 - Light Pole

RF Submit by: , - - 2/23/2022, 10:18:50 AM

EE Submit by: Driscoll, Janet - janet.driscoll@verizonwireless.com - 7/19/2022, 10:20:25 AM

Project Details

FUZE Project ID: 16774016
Project Name: Radio Swap
Project Alt Name: NIANTIC CT SC 6 - NENG_SC_ESNAP
Project Type: Modification
Modification Type: RF
Designed Sector Carrier 4G: 3
Designed Sector Carrier 5G: N/A
Additional Sector Carrier 4G: N/A
Additional Sector Carrier 5G: N/A
FP Solution Type & Tech Type: MODIFICATION;4G_PCS,4G_Radio Swap
Carrier Aggregation: false
MPT Id:
eCIP-0: false
Suffix: Rev0_20220223

Location Information

Site ID: 3288318
E-NodeB ID: 0647839,064839
PSLC: 467865
Switch Name: Wallingford 1
Tower Owner:
Tower Type: Public Lighting Structure (free standing)
Site Type: SMALL-CELL
Site Sub Type: SPOKE
Street Address: 221 W Main St
City: East Lyme
State: CT
Zip Code: 06357
County: New London
Latitude: 41.318932 / 41° 19' 8.1552" N
Longitude: -72.237732 / 72° 14' 15.8352" W

RFDS Project Scope:
Add PCS
Swap antenna to CUUD120
Swap RRH to SS dual-band
Add diplexer for AWS/PCS

Rev0_20220223: initial design

Antenna Summary

Added

1900	AWS	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity	Item ID
LTE	LTE	AMPHENOL	CUUD120X06Fx0z0-T00-1900-(-45)-Y1	87.33	88.3	120(04)	false	true	PHYSICAL	1	

Removed

1900	AWS	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity	Item ID
	LTE	ANDREW	NH65PS-DG-F0M	87.33	88.5	120(04)	false	false	PHYSICAL	1	

Retained

1900	AWS	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity	Item ID

No data available

Added: 1	Removed: 1	Retained: 0

Equipment Summary

Added

Equipment Type	Location	1900	AWS	Make	Model	Cable Length	Cable Size	Install Type	Quantity	Item ID
Kit	Tower			COMMSCOPET-001	SDX1926Q-43			PHYSICAL	1	SDX1926Q-43
Diplexer	Tower			Commscope	SDX1926Q-43			PHYSICAL	1	
Kit	Tower			GEMINI	1600131299A			PHYSICAL	1	1600131299A
Kit	Tower			GEMINI	1600270671A			PHYSICAL	1	1600270671A
Kit	Tower			QUADELECTRIC	F113CGRS0101FLF025			PHYSICAL	2	F113CGRS0101FLF0
Kit	Tower			QUADELECTRIC	FLI002OT010046M010			PHYSICAL	2	FLI002OT010046M
Kit	Tower			QUADELECTRIC	SAM-CBRS-BRT-NID			PHYSICAL	1	SAM-CBRS-BRT-NID
Kit	Tower			QUADELECTRIC	TRAT303H1B1J00F006			PHYSICAL	8	TRAT303H1B1J00F
Kit	Tower			QUADELECTRIC	TRAT303H1B1J00F050			PHYSICAL	8	TRAT303H1B1J00F
Kit	Tower			QUADELECTRIC	UXP-4MT-12S			PHYSICAL	8	UXP-4MT-12S
Kit	Tower			QUADELECTRIC	WPS-4F			PHYSICAL	8	WPS-4F
Kit	Tower			QUADELECTRIC	WPS-N-4S			PHYSICAL	8	WPS-N-4S
Kit	Tower			QUADELELECTRIC	V3000			PHYSICAL	1	V3000
RRU	Tower	LTE	LTE	Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)			PHYSICAL	1	SLS-BR0497EAEX

Removed

Equipment Type	Location	1900	AWS	Make	Model	Cable Length	Cable Size	Install Type	Quantity	Item ID
RRU	Tower		LTE	Nokia	UHIE B66A RRH 4x45			PHYSICAL	1	

Retained

Equipment Type	Location	1900	AWS	Make	Model	Cable Length	Cable Size	Install Type	Quantity	Item ID

No data available.

Service Info

1900 MHz LTE

	0002
Sector	04
Azimuth	120
Cell / ENode B ID	064839
Antenna Model	CUUD120X06Fx0z0-T00 -1900-(-45)-Y1
Antenna Make	AMPHENOL
Antenna Centerline(Ft)	87.33
Mechanical Down-Tilt(Deg.)	0
Electrical Down-Tilt	0
Tip Height	88.3
Regulatory Power	36.26
DLEARFCN	1075
Channel Bandwidth(MHz)	15
Total ERP (W)	298.4
TMA Make	
TMA Model	
RRU Make	Samsung
RRU Model	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines	4,4
Position	
Transmitter Id	12435656
Source	ATOLL_API

2100 MHz LTE

	0000	0002
Sector	04	04
Azimuth	120	120
Cell / ENode B ID	064839	064839
Antenna Model	NH65PS-DG-F0M	CUUD120X06Fx0z0-T00 -2100-(-45)-Y1
Antenna Make	ANDREW	AMPHENOL
Antenna Centerline(Ft)	87.33	87.33
Mechanical Down-Tilt(Deg.)	0	0
Electrical Down-Tilt	0	0
Tip Height	88.5	88.3
Regulatory Power	55.43	28.48
DLEARFCN	2050	2050
Channel Bandwidth(MHz)	20	20
Total ERP (W)	608.14	312.46
TMA Make		
TMA Model		
RRU Make	Nokia	Samsung
RRU Model	UHIE B66A RRH 4x45	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines	2,2	4,4
Position		
Transmitter Id	1958721	12435655
Source	ATOLL_API	ATOLL_API

Service Comments

Callsigns Per Antenna

Sector	Antenna Make	Antenna Model	Ant CL Height AGL	Tip Height	Azimuth (TN)	Elec Tilt	Mech Tilt	Gain	Beam Width	Regulatory Power	Callsigns						
											700	850	1900	2100	28 GHz	31 GHz	39 GHz
04	AMPHENOL	CUUD120X06Fx0z0-T00-2100-(-45)-Y1	87.33	88.3	120	0	0	9.148	120	28.48				WQGA906 WQGD494			
04	AMPHENOL	CUUD120X06Fx0z0-T00-1900-(-45)-Y1	87.33	88.3	120	0	0	8.948	125	36.26			KNLH263 WQDU931 WQEM954				

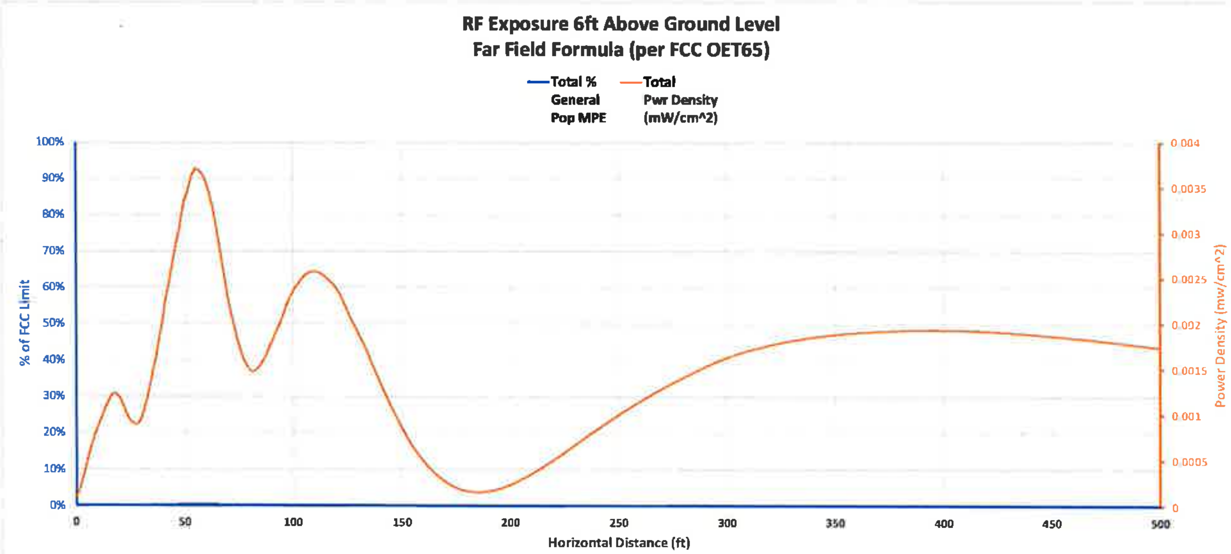
Callsigns

Callsign	Market	Radio Code	Market Number	Block	State	County	Licensee Name	Wholly Owned	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs /Sq MI	Status	Action	Approved for Insvc
WQEM954	*New London-Norwich, CT*	*CW*	*BTA319*	*C*	*CT*	*New London*	*Cellco Partnership*	*Yes*	*10.000*	*1895.000-1900.000*	*1975.000-1980.000*	*.000-.000*	*.000-.000*	*36.26*	*1640*	*412.19*	*Active*	*added*	*Yes*
WQDU931	*New London-Norwich, CT*	*CW*	*BTA319*	*C*	*CT*	*New London*	*Cellco Partnership*	*Yes*	*10.000*	*1900.000-1905.000*	*1980.000-1985.000*	*.000-.000*	*.000-.000*	*36.26*	*1640*	*412.19*	*Active*	*added*	*Yes*
KNLH263	*New London-Norwich, CT*	*CW*	*BTA319*	*F*	*CT*	*New London*	*Cellco Partnership*	*Yes*	*10.000*	*1890.000-1895.000*	*1970.000-1975.000*	*.000-.000*	*.000-.000*	*36.26*	*1640*	*412.19*	*Active*	*added*	*Yes*
WQGD494	*New London-Norwich, CT*	*AW*	*CMA154*	*A*	*CT*	*New London*	*Cellco Partnership*	*Yes*	*20.000*	*1710.000-1720.000*	*2110.000-2120.000*	*.000-.000*	*.000-.000*	*28.48*	*1640*	*412.19*	*Active*	*added*	*Yes*
WQGA906	*New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-*	*AW*	*BEA010*	*B*	*CT*	*New London*	*Cellco Partnership*	*Yes*	*20.000*	*1720.000-1730.000*	*2120.000-2130.000*	*.000-.000*	*.000-.000*	*28.48*	*1640*	*412.19*	*Active*	*added*	*Yes*
WQJQ689	Northeast	WU	REA001	C	CT	New London	Cellco Partnership	Yes	22.000	746.000-757.000	776.000-787.000	.000-.000	.000-.000		1000	412.19	Active		Yes
KNKA745	New London-Norwich, CT	CL	CMA154	A	CT	New London	Cellco Partnership	Yes	25.000	824.000-835.000	869.000-880.000	845.000-846.500	890.000-891.500		400	412.19	Active		Yes
WREE835	C09011 - New London, CT	UU	C09011	L1	CT	New London	Cellco Partnership	Yes	425.000	27500.000-27925.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WREE836	C09011 - New London, CT	UU	C09011	L2	CT	New London	Cellco Partnership	Yes	425.000	27925.000-28350.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD609	New York, NY	UU	PEA001	M1	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	37600.000-37700.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD610	New York, NY	UU	PEA001	M10	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	38500.000-38600.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD611	New York, NY	UU	PEA001	M2	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	37700.000-37800.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD612	New York, NY	UU	PEA001	M3	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	37800.000-37900.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD613	New York, NY	UU	PEA001	M4	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	37900.000-38000.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD614	New York, NY	UU	PEA001	M5	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	38000.000-38100.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD615	New York, NY	UU	PEA001	M6	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	38100.000-38200.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD616	New York, NY	UU	PEA001	M7	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	38200.000-38300.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD617	New York, NY	UU	PEA001	M8	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	38300.000-38400.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD618	New York, NY	UU	PEA001	M9	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	38400.000-38500.000	.000-.000	.000-.000	.000-.000			412.19	Active		Yes
WRHD619	New York, NY	UU	PEA001	N1	CT	New London	Straight Path Spectrum, LLC	Yes	100.000	38600.000-38700.000	.000-.000	.000-.000	.000-.000			412.19	Active	N/A	No
WRNE581	New York, NY	PM	PEA001	A1	CT	New London	Cellco Partnership	Yes	20.000	3700.000-3720.000	.000-.000	.000-.000	.000-.000		1640	412.19	Active		Yes

WRNE582	New York, NY	PM	PEA001	A2	CT	New London	Cellco Partnership	Yes	20.000	3720.000-3740.000	.000-.000	.000-.000	.000-.000		1640	412.19	Active	Yes
WRNE583	New York, NY	PM	PEA001	A3	CT	New London	Cellco Partnership	Yes	20.000	3740.000-3760.000	.000-.000	.000-.000	.000-.000		1640	412.19	Active	Yes
WRNE584	New York, NY	PM	PEA001	A4	CT	New London	Cellco Partnership	Yes	20.000	3760.000-3780.000	.000-.000	.000-.000	.000-.000		1640	412.19	Active	No
WRNE585	New York, NY	PM	PEA001	A5	CT	New London	Cellco Partnership	Yes	20.000	3780.000-3800.000	.000-.000	.000-.000	.000-.000		1640	412.19	Active	No
WRNE586	New York, NY	PM	PEA001	B1	CT	New London	Cellco Partnership	Yes	20.000	3800.000-3820.000	.000-.000	.000-.000	.000-.000		1640	412.19	Active	No
WRNE587	New York, NY	PM	PEA001	B2	CT	New London	Cellco Partnership	Yes	20.000	3820.000-3840.000	.000-.000	.000-.000	.000-.000		1640	412.19	Active	No
WRNE588	New York, NY	PM	PEA001	B3	CT	New London	Cellco Partnership	Yes	20.000	3840.000-3860.000	.000-.000	.000-.000	.000-.000		1640	412.19	Active	No

ATTACHMENT 4

Location	NIANTIC CT SC 6					
Date	11/21/2022					
Band	C-Band	AWS	PCS	850-LTE	850-CDMA	700
Operating Frequency (MHz)	3,700	2,145	1,970	880	869	746
General Population MPE (mW/cm^2)	1	1	1	0.586666667	0.579333333	0.497333333
ERP Per Transmitter (Watts)	0	312	298	0	0	0
Number of Transmitters	0	4	4	0	0	0
Antenna Centerline (feet)	87.8	87.8	87.8	87.8	87.8	87.8
Total ERP (Watts)	0	1,250	1,194	0	0	0
Total ERP (dBm)	#N/A	61	61	#N/A	#N/A	#N/A
Maximum % of General Population Limit	0.4%					



Angle Below Horizon	Power Density (mW/cm^2)						Percent of General Population MPE									Distance	Total Pwr Density (mW/cm^2)	Total % General Pop MPE
	C-Band	AWS	PCS	850-LTE	850-CDMA	700 MHz	39GHz	28GHz	C-Band	CBRS	AWS	PCS	Cellular	CDMA	700 MHz			
90	0	5.98676E-05	3.5253E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	0	9.51206E-05	0.01%
89	0	0.000104021	4.23767E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	1.029848831	0.000146398	0.01%
88	0	0.000164784	5.33237E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.02%	0.01%	0.00%	0.00%	0.00%	2.0603254	0.000218108	0.02%
87	0	0.000243541	6.55505E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.02%	0.01%	0.00%	0.00%	0.00%	3.092058978	0.000309091	0.03%
86	0	0.000328162	7.69295E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.03%	0.01%	0.00%	0.00%	0.00%	4.125681905	0.000405091	0.04%
85	0	0.00041254	8.61926E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.04%	0.01%	0.00%	0.00%	0.00%	5.161831148	0.000498732	0.05%
84	0	0.000495111	9.87887E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.05%	0.01%	0.00%	0.00%	0.00%	6.201149881	0.0005939	0.06%
83	0	0.000567282	0.000110612	0	0	0	0.00%	0.00%	0.00%	0.00%	0.06%	0.01%	0.00%	0.00%	0.00%	7.244289093	0.000677894	0.07%
82	0	0.000634968	0.000126694	0	0	0	0.00%	0.00%	0.00%	0.00%	0.06%	0.01%	0.00%	0.00%	0.00%	8.291909247	0.000761662	0.08%
81	0	0.000678517	0.000148445	0	0	0	0.00%	0.00%	0.00%	0.00%	0.07%	0.01%	0.00%	0.00%	0.00%	9.344681979	0.000826962	0.08%
80	0	0.00070831	0.000177921	0	0	0	0.00%	0.00%	0.00%	0.00%	0.07%	0.02%	0.00%	0.00%	0.00%	10.40329186	0.000886231	0.09%
79	0	0.000739159	0.000208325	0	0	0	0.00%	0.00%	0.00%	0.00%	0.07%	0.02%	0.00%	0.00%	0.00%	11.46843824	0.000947484	0.09%
78	0	0.000771085	0.000243841	0	0	0	0.00%	0.00%	0.00%	0.00%	0.08%	0.02%	0.00%	0.00%	0.00%	12.54083714	0.001014925	0.10%
77	0	0.000804106	0.000272469	0	0	0	0.00%	0.00%	0.00%	0.00%	0.08%	0.03%	0.00%	0.00%	0.00%	13.62122328	0.001076575	0.11%
76	0	0.000838241	0.000297422	0	0	0	0.00%	0.00%	0.00%	0.00%	0.08%	0.03%	0.00%	0.00%	0.00%	14.71035217	0.001135663	0.11%
75	0	0.000873506	0.000317154	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.03%	0.00%	0.00%	0.00%	15.80900235	0.00119066	0.12%
74	0	0.000909915	0.000315504	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.03%	0.00%	0.00%	0.00%	16.91797776	0.00122542	0.12%
73	0	0.000925914	0.000306602	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.03%	0.00%	0.00%	0.00%	18.03811021	0.001232516	0.12%
72	0	0.000920388	0.000291055	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.03%	0.00%	0.00%	0.00%	19.17026208	0.001211444	0.12%

71	0	0.000914531	0.000263756	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.03%	0.00%	0.00%	0.00%	20.31532918	0.001178287	0.12%
70	0	0.000867456	0.000244485	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.02%	0.00%	0.00%	0.00%	21.47424382	0.001111941	0.11%
69	0	0.000822459	0.000226526	0	0	0	0.00%	0.00%	0.00%	0.00%	0.08%	0.02%	0.00%	0.00%	0.00%	22.64797807	0.001048985	0.10%
68	0	0.000761717	0.000219684	0	0	0	0.00%	0.00%	0.00%	0.00%	0.08%	0.02%	0.00%	0.00%	0.00%	23.83754732	0.0009814	0.10%
67	0	0.000689096	0.000238937	0	0	0	0.00%	0.00%	0.00%	0.00%	0.07%	0.02%	0.00%	0.00%	0.00%	25.04401416	0.000928033	0.09%
66	0	0.000623113	0.000284821	0	0	0	0.00%	0.00%	0.00%	0.00%	0.06%	0.03%	0.00%	0.00%	0.00%	26.26849243	0.000907934	0.09%
65	0	0.000537835	0.000355348	0	0	0	0.00%	0.00%	0.00%	0.00%	0.05%	0.04%	0.00%	0.00%	0.00%	27.51215183	0.000893183	0.09%
64	0	0.00045344	0.000453445	0	0	0	0.00%	0.00%	0.00%	0.00%	0.05%	0.05%	0.00%	0.00%	0.00%	28.77622273	0.000906885	0.09%
63	0	0.000382096	0.000578332	0	0	0	0.00%	0.00%	0.00%	0.00%	0.04%	0.06%	0.00%	0.00%	0.00%	30.06200152	0.000960428	0.10%
62	0	0.000314484	0.00073723	0	0	0	0.00%	0.00%	0.00%	0.00%	0.03%	0.07%	0.00%	0.00%	0.00%	31.37085647	0.001051715	0.11%
61	0	0.000252808	0.000917901	0	0	0	0.00%	0.00%	0.00%	0.00%	0.03%	0.09%	0.00%	0.00%	0.00%	32.70423404	0.001170709	0.12%
60	0	0.000198491	0.00111621	0	0	0	0.00%	0.00%	0.00%	0.00%	0.02%	0.11%	0.00%	0.00%	0.00%	34.06366588	0.001314701	0.13%
59	0	0.000163095	0.001325699	0	0	0	0.00%	0.00%	0.00%	0.00%	0.02%	0.13%	0.00%	0.00%	0.00%	35.45077652	0.001488794	0.15%
58	0	0.00013705	0.001502738	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.15%	0.00%	0.00%	0.00%	36.86729176	0.001639788	0.16%
57	0	0.000129136	0.001702357	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.17%	0.00%	0.00%	0.00%	38.315048	0.001831493	0.18%
56	0	0.000142867	0.001883374	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.19%	0.00%	0.00%	0.00%	39.79600249	0.002026241	0.20%
55	0	0.000177225	0.002082235	0	0	0	0.00%	0.00%	0.00%	0.00%	0.02%	0.21%	0.00%	0.00%	0.00%	41.31224475	0.00225946	0.23%
54	0	0.000246498	0.002196939	0	0	0	0.00%	0.00%	0.00%	0.00%	0.02%	0.22%	0.00%	0.00%	0.00%	42.86600915	0.002443437	0.24%
53	0	0.000342597	0.002316267	0	0	0	0.00%	0.00%	0.00%	0.00%	0.03%	0.23%	0.00%	0.00%	0.00%	44.45968896	0.002658864	0.27%
52	0	0.000486882	0.002384667	0	0	0	0.00%	0.00%	0.00%	0.00%	0.05%	0.24%	0.00%	0.00%	0.00%	46.09585196	0.002871549	0.29%
51	0	0.000660263	0.002397293	0	0	0	0.00%	0.00%	0.00%	0.00%	0.07%	0.24%	0.00%	0.00%	0.00%	47.77725796	0.003057556	0.31%
50	0	0.000894641	0.002407982	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.24%	0.00%	0.00%	0.00%	49.50687824	0.003302624	0.33%
49	0	0.001130326	0.002307852	0	0	0	0.00%	0.00%	0.00%	0.00%	0.11%	0.23%	0.00%	0.00%	0.00%	51.28791753	0.003438178	0.34%
48	0	0.001394323	0.002209875	0	0	0	0.00%	0.00%	0.00%	0.00%	0.14%	0.22%	0.00%	0.00%	0.00%	53.12383861	0.003604198	0.36%
47	0	0.001641004	0.002065922	0	0	0	0.00%	0.00%	0.00%	0.00%	0.16%	0.21%	0.00%	0.00%	0.00%	55.01839008	0.003706926	0.37%
46	0	0.001842565	0.001842583	0	0	0	0.00%	0.00%	0.00%	0.00%	0.18%	0.18%	0.00%	0.00%	0.00%	56.97563771	0.003685148	0.37%
45	0	0.002019676	0.001604302	0	0	0	0.00%	0.00%	0.00%	0.00%	0.20%	0.16%	0.00%	0.00%	0.00%	59	0.003623978	0.36%
44	0	0.002111855	0.001363542	0	0	0	0.00%	0.00%	0.00%	0.00%	0.21%	0.14%	0.00%	0.00%	0.00%	61.09628851	0.003475396	0.35%
43	0	0.002155489	0.001105478	0	0	0	0.00%	0.00%	0.00%	0.00%	0.22%	0.11%	0.00%	0.00%	0.00%	63.26975389	0.003260967	0.33%
42	0	0.002098464	0.000854882	0	0	0	0.00%	0.00%	0.00%	0.00%	0.21%	0.09%	0.00%	0.00%	0.00%	65.52613837	0.002953346	0.30%
41	0	0.001993902	0.000616181	0	0	0	0.00%	0.00%	0.00%	0.00%	0.20%	0.06%	0.00%	0.00%	0.00%	67.87173603	0.002610083	0.26%
40	0	0.001848943	0.000413931	0	0	0	0.00%	0.00%	0.00%	0.00%	0.18%	0.04%	0.00%	0.00%	0.00%	70.31346196	0.002262874	0.23%
39	0	0.0017121	0.000265176	0	0	0	0.00%	0.00%	0.00%	0.00%	0.17%	0.03%	0.00%	0.00%	0.00%	72.85893224	0.001977276	0.20%
38	0	0.001546989	0.000181757	0	0	0	0.00%	0.00%	0.00%	0.00%	0.15%	0.02%	0.00%	0.00%	0.00%	75.5165563	0.001728746	0.17%
37	0	0.001395601	0.00016397	0	0	0	0.00%	0.00%	0.00%	0.00%	0.14%	0.02%	0.00%	0.00%	0.00%	78.29564448	0.001559571	0.16%
36	0	0.001256934	0.000218432	0	0	0	0.00%	0.00%	0.00%	0.00%	0.13%	0.02%	0.00%	0.00%	0.00%	81.20653331	0.001475366	0.15%
35	0	0.001183311	0.000341274	0	0	0	0.00%	0.00%	0.00%	0.00%	0.12%	0.03%	0.00%	0.00%	0.00%	84.2607324	0.001524585	0.15%
34	0	0.001137825	0.000508253	0	0	0	0.00%	0.00%	0.00%	0.00%	0.11%	0.05%	0.00%	0.00%	0.00%	87.47109714	0.001646078	0.16%
33	0	0.001117359	0.000721435	0	0	0	0.00%	0.00%	0.00%	0.00%	0.11%	0.07%	0.00%	0.00%	0.00%	90.85203287	0.001838794	0.18%
32	0	0.001094958	0.00093197	0	0	0	0.00%	0.00%	0.00%	0.00%	0.11%	0.09%	0.00%	0.00%	0.00%	94.41973721	0.002026928	0.20%
31	0	0.001121069	0.001147193	0	0	0	0.00%	0.00%	0.00%	0.00%	0.11%	0.11%	0.00%	0.00%	0.00%	98.19248946	0.002268262	0.23%
30	0	0.001119009	0.001314734	0	0	0	0.00%	0.00%	0.00%	0.00%	0.11%	0.13%	0.00%	0.00%	0.00%	102.1909976	0.002433742	0.24%
29	0	0.001114121	0.00143528	0	0	0	0.00%	0.00%	0.00%	0.00%	0.11%	0.14%	0.00%	0.00%	0.00%	106.4388176	0.002549401	0.25%
28	0	0.001081069	0.001492305	0	0	0	0.00%	0.00%	0.00%	0.00%	0.11%	0.15%	0.00%	0.00%	0.00%	110.9628615	0.002573374	0.26%
27	0	0.001022146	0.001477466	0	0	0	0.00%	0.00%	0.00%	0.00%	0.10%	0.15%	0.00%	0.00%	0.00%	115.7940198	0.002499612	0.25%
26	0	0.000963429	0.001392593	0	0	0	0.00%	0.00%	0.00%	0.00%	0.10%	0.14%	0.00%	0.00%	0.00%	120.9679267	0.002356022	0.24%
25	0	0.00084464	0.001220888	0	0	0	0.00%	0.00%	0.00%	0.00%	0.08%	0.12%	0.00%	0.00%	0.00%	126.5259083	0.002065528	0.21%
24	0	0.000737827	0.001042219	0	0	0	0.00%	0.00%	0.00%	0.00%	0.07%	0.10%	0.00%	0.00%	0.00%	132.5161697	0.001780047	0.18%
23	0	0.000599159	0.000808252	0	0	0	0.00%	0.00%	0.00%	0.00%	0.06%	0.08%	0.00%	0.00%	0.00%	138.9952896	0.001407411	0.14%
22	0	0.000462692	0.0005825	0	0	0	0.00%	0.00%	0.00%	0.00%	0.05%	0.06%	0.00%	0.00%	0.00%	146.0301244	0.001045192	0.10%
21	0	0.000331925	0.00037243	0	0	0	0.00%	0.00%	0.00%	0.00%	0.03%	0.04%	0.00%	0.00%	0.00%	153.7002548	0.000704356	0.07%
20	0	0.000221108	0.000211159	0	0	0	0.00%	0.00%	0.00%	0.00%	0.02%	0.02%	0.00%	0.00%	0.00%	162.1011677	0.000432267	0.04%
19	0	0.00013359	0.000108587	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	171.3484418	0.000242177	0.02%
18	0	8.0224E-05	7.31659E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	181.5833287	0.00015339	0.02%
17	0	6.91689E-05	0.000104692	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	192.9803045	0.000173861	0.02%
16	0	0.000100522	0.000196004	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%	0.00%	0.00%	0.00%	205.7574522	0.000296525	0.03%
15	0	0.000174162	0.000331862	0	0	0	0.00%	0.00%	0.00%	0.00%	0.02%	0.03%	0.00%	0.00%	0.00%	220.1909976	0.000506024	0.05%
14	0	0.00028544	0.000496043	0	0	0	0.00%	0.00%	0.00%	0.00%	0.03%	0.05%	0.00%	0.00%	0.00%	236.6360751	0.000781483	0.08%
13	0	0.000412441	0.000668908	0	0	0	0.00%	0.00%	0.00%	0.00%	0.04%	0.07%	0.00%	0.00%	0.00%	255.5570766	0.001081349	0.11%
12	0	0.000549256	0.000831342	0	0	0	0.00%	0.00%	0.00%	0.00%	0.05%	0.08%	0.00%	0.00%	0.00%	277.5731765	0.001380598	0.14%
11	0	0.000688414	0.00097242	0	0	0	0.00%	0.00%	0.00%	0.00%	0.07%	0.10%	0.00%	0.00%	0.00%	303.5286869	0.001660833	0.17%
10	0	0.000791448	0.001043343	0	0	0	0.00%	0.00%	0.00%	0.00%	0.08%	0.10%	0.00%	0.00%	0.00%	334.6056274	0.001834791	0.18%
9	0	0.000851073	0.001071448	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.11%	0.00%	0.00%	0.00%	372.5113394	0.001922521	0.19%
8	0	0.000871798	0.001048142	0	0	0	0.00%	0.00%	0.00%	0.00%	0.09%	0.10%	0.00%	0.00%	0.00%	419.8068136	0.00191994	0.19%
7	0	0.0008258	0.000970241	0	0	0	0.00%	0.00%	0.00%	0.00%	0.08%	0.10%	0.00%	0.00%	0.00%	480.5164393	0.001796041	0.18%
6	0	0.000733009	0.000822458	0	0	0	0.00%	0.00%	0.00%	0.00%	0.07%	0.08%	0.00%	0.00%	0.00%	561.3475028	0.001555466	0.16%
5	0	0.000600557	0.000658505	0	0	0	0.00%	0.00%	0.00%	0.00%	0.06%	0.07%	0.00%	0.00%	0.00%	674.3730859	0.001259062	0.13%
4	0	0.000442811	0.000463685	0	0	0	0.00%	0.00%	0.00%	0.00%	0.04%	0.05%	0.00%	0.00%	0.00%	843.7393091	0.000906496	0.09%
3	0	0.00028022	0.00028675	0	0	0	0.00%	0.00%	0.00%	0.00%	0.03%	0.03%	0.00%	0.00%	0.00%	1125.787065	0.00056697	0.06%
2	0	0.000133704	0.00013682	0	0	0	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.00%	0.00%	0.00%	1689.538944	0.000270524	0.03%
1	0	3.6693E-05	3.58581E-05	0	0	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3380.107736	7.25511E-05	0.01%

ATTACHMENT 5

Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

December 20, 2022

Via Certificate of Mailing

Kevin Seery, First Selectman
Town of East Lyme
108 Pennsylvania Avenue
Niantic, CT 06357

Re: **Proposed Modifications to an Existing Telecommunications Facility at 221 West Main Street in East Lyme, Connecticut**

Dear First Selectman Seery:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to modify its existing wireless telecommunications facility at 221 West Main Street in East Lyme, Connecticut (the "Property"). The existing facility consists of a single cannister antenna and related equipment attached to an 81.3' tall light pole adjacent to the existing athletic fields in the southerly portion of the Property. Cellco intends to remove the existing antenna and remote radio head and install a new antenna and remote radio head on the same light pole. The overall height of the antenna on the light pole will increase by approximately one foot from 87.4' to 88.8' above ground level.

As presented in the Sub-Petition, the proposed facility modifications constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-153). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment

Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

December 20, 2022

Via Certificate of Mailing

Gary Goeschel, Director of Planning
Town of East Lyme
108 Pennsylvania Avenue
Niantic, CT 06357

Re: **Proposed Modifications to an Existing Telecommunications Facility at 221 West Main Street in East Lyme, Connecticut**

Dear Mr. Goeschel:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to modify its existing wireless telecommunications facility at 221 West Main Street in East Lyme, Connecticut (the "Property"). The existing facility consists of a single cannister antenna and related equipment attached to an 81.3' tall light pole adjacent to the existing athletic fields in the southerly portion of the Property. Cellco intends to remove the existing antenna and remote radio head and install a new antenna and remote radio head on the same light pole. The overall height of the antenna on the light pole will increase by approximately one foot from 87.4' to 88.8' above ground level.

As presented in the Sub-Petition, the proposed facility modifications constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-153). A copy of the full Sub-Petition is attached for your review. Landowners whose property abuts the Property were also sent notice of this filing along with a copy of the Sub-Petition.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,

Kenneth C. Baldwin

Attachment

ATTACHMENT 6

Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

December 20, 2022

Via Certificate of Mailing

«Name_and_Address»

Re: **Proposed Modifications to an Existing Telecommunications Facility at 221 West Main Street, East Lyme, Connecticut**

Dear «Salutation»:

This firm represents Cellco Partnership d/b/a Verizon Wireless ("Cellco"). Today, Cellco filed a Sub-Petition for Declaratory Ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") seeking approval to modify its existing wireless telecommunications facility at 221 West Main Street in East Lyme, Connecticut (the "Property"). The existing facility consists of a single cannister antenna and related equipment attached to an 81.3' tall light pole adjacent to the existing athletic fields in the southerly portion of the Property. Cellco intends to remove the existing antenna and remote radio head and install a new antenna and remote radio head on the same light pole. The overall height of the antenna on the light pole will increase by approximately one foot from 87.4' to 88.8' above ground level.

As presented in the Sub-Petition, the proposed facility modifications constitute an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation act of 2012 (47 U.S.C. § 1455(a)) and the October 21, 2014 Order of the Federal Communications Commission (FCC-14-153). A copy of the full Sub-Petition is attached for your review.

Pursuant to its decision in Petition No. 1133, comments or concerns regarding this proposal should be submitted to the Council within thirty (30) days of the date of the attached Sub-Petition.

This notice is being sent to you because you are listed as an owner of land that abuts the Property. If you have any questions regarding the Sub-Petition, the Council's process for reviewing the Sub-Petition or the details of the filing itself, please feel free to contact me at the number listed above. You may also contact me or the Council directly at 860-827-2935.

Sincerely,

Kenneth C. Baldwin

Attachment

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS

ABUTTING PROPERTY OWNERS

221 WEST MAIN STREET
EAST LYME, CONNECTICUT

	Property Address	Owner's and Mailing Address
1.	199 West Main Street	State of Connecticut 199 West Main Street Niantic, CT 06357
2.	West Main Street	Town of East Lyme P.O. Box 519 Niantic, CT 06357-0519
3.	Giants Neck Road	State of Connecticut Department of Energy + Environmental Protection 79 Elm Street Hartford, CT 06106
4.	208 West Main Street	Joan B. Strickland 208 West Main Street Niantic, CT 06357
5.	210 West Main Street	Barbara Jane Kardys P.O. Box 557 Niantic, CT 06357
6.	212 West Main Street	Eric R. Berman 214 West Main Street Niantic, CT 06357
7.	214 West Main Street	Eric R. Berman 214 West Main Street Niantic, CT 06357
8.	218 West Main Street	Samantha Zweir 2 Oswegatchie Road Waterford, CT 06385

	Property Address	Owner's and Mailing Address
9.	220 West Main Street	James and Jennifer Lathrop 220 West Main Street Niantic, CT 06357
10.	West Main Street	East Lyme Historical Society P.O. Box 112 East Lyme, CT 06333
11.	227 West Main Street	Town of East Lyme P.O. Box 519 Niantic, CT 06357-0519
12.	229-2 West Main Street	Niantic Bay Inn Inc. 229 West Main Street Niantic, CT 06357
13.	6 North Bride Brook Road	Niantic Bay LLC 229 West Main Street Niantic, CT 06357
14.	8 North Bride Brook Road	Henry A. Paar 8 North Bride Brook Road Niantic, CT 06357
15.	10 North Bride Brook Road	John P. Rockwell 10 North Bride Brook Road Niantic, CT 06357
16.	12 North Bride Brook Road	Craig and Kimberly Thibeau 12 North Bride Brook Road Niantic, CT 06357
17.	14 North Bride Brook Road	Stephen Wilson and Ellen Arbour 14 North Bride Brook Road Niantic, CT 06357
18.	16 North Bride Brook Road	Steven J. Carpenter 25 Harvest Glen East Lyme, CT 06333
19.	18 North Bride Brook Road	Richard Wasik 18 North Bride Brook Road Niantic, CT 06357

	Property Address	Owner's and Mailing Address
20.	20 North Bride Brook Road	Daniel and Sandra Riquier 20 North Bride Brook Road Niantic, CT 06357
21.	24 North Bride Brook Road	Sharon Tuttle 24 North Bride Brook Road Niantic, CT 06357