brownrudnick

THOMAS J. REGAN

April 1, 2021

VIA E-MAIL (SITING.COUNCIL@CT.GOV) & (MELANIE.BACHMAN@CT.GOV)
& OVERNIGHT MAIL

Connecticut Siting Council
Attn: Melanie A. Bachman, Esq., Executive Director
Ten Franklin Square
New Britain, CT 06051

RE: Sub-Petition for Declaratory Ruling – Danbury, CT

Dear Executive Director Bachman:

Please find enclosed for filing one copy of New Cingular Wireless PCS LLC d/b/a AT&T's ("AT&T") Sub-Petition for a Declaratory Ruling for the approval of an eligible facilities request for collocation, modification and extension of an existing wireless telecommunications facility without substantial physical change to the existing tower at 15 Great Pasture Road, Danbury, Connecticut. Also enclosed is a check in the amount of $625.00 representing the required filing fee.

A complete copy of the filing will be provided in PDF format electronically via One Drive.

Sincerely,

BROWN RUDNICK LLP

Thomas Regan

THOMAS J. REGAN

cc: Mayor Joseph M. Cavo, City of Danbury, cover letter only (copy of petition provided with notice)

Sharon B. Calitro, AICP, Director of Planning & Zoning, City of Danbury, cover letter only (copy of petition provided with notice)

Janice R. Giegler, City Clerk, City of Danbury, cover letter only (copy of petition provided with notice)

Matt Knickerbocker, First Selectman, Town of Bethel, cover letter only (copy of petition provided with notice)

Beth Cavagna, Director/Town Planner, Town of Bethel, cover letter only (copy of petition provided with notice)

Lisa Bergh, Town Clerk, Town of Bethel, cover letter only (copy of petition provided with notice)

AT&T

Centerline Communications

Edward D. Pare, Jr., Esq.

63998024

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:
NEW CINGULAR WIRELESS PCS, LLC (AT&T) SUB-PETITION NO. _____
SUB-PETITION FOR A DECLARATORY RULING FOR
COLLOCATION, MODIFICATION AND EXTENSION April 1, 2021
OF THE EXISTING TELECOMMUNICATIONS
FACILITY ON PROPERTY LOCATED AT
15 GREAT PASTURE ROAD, DANBURY,
CONNECTICUT.

SUB-PETITION FOR A DECLARATORY RULING:
APPROVAL OF AN ELIGIBLE FACILITIES REQUEST FOR COLLOCATION, MODIFICATION AND EXTENSION OF AN EXISTING WIRELESS TELECOMMUNICATIONS FACILITY WITHOUT SUBSTANTIAL PHYSICAL CHANGE TO THE EXISTING TOWER AT 15 GREAT PASTURE ROAD, DANBURY, CONNECTICUT

I. INTRODUCTION

On behalf of New Cingular Wireless PCS LLC d/b/a AT&T ("AT&T"), we respectfully submit this sub-petition (the "Sub-Petition") to the Connecticut Siting Council (the "Council") for an administrative approval of a modification to an existing wireless telecommunications facility qualifying as an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation Act of 2012 (the "Spectrum Act", codified at 47 U.S.C. §1455) and the Council's ruling in Petition 1133 (the "Ruling") to collocate a wireless telecommunications facility consisting of six (6) panel antennas at 140' above tower baseplate ("ATB") antenna centerline height on a twenty foot (20') tall extension (the "Extension") of the existing monopole (the "Monopole"), located on property with an address of 15 Great Pasture Road, Danbury, Connecticut (the "Site"). **Attachment 1** contains Cellco Partnership's ("Verizon Wireless") authorization permitting AT&T to file this Sub-Petition. The modifications and collocation will allow AT&T to provide its enhanced, state-of-the-art services, including 5G services, to its customers.

II. HISTORY OF EXISTING TELECOMMUNICATIONS FACILITY

The 120' Monopole is owned by Verizon Wireless and was approved by the Council on December 10, 2015 in Docket No. 462. As noted in the Findings of Fact and Opinion in Docket 462, the Monopole was designed to be extended by twenty feet (20') to provide collocation opportunities for other wireless providers.

III. PROPOSED MODIFICATIONS

AT&T proposes to extend the existing 120' Monopole with the Extension to a height of 140' ATB and collocate six (6) panel antennas at the 140' ATB antenna centerline height, together

with related amplifiers, cables, fiber and other associated antenna equipment, including, without limitation, remote radio heads, surge arrestors, and global positioning system antenna with associated electronic equipment in a walk-in-cabinet, an emergency backup power propane-fueled generator, and other appurtenances on a proposed equipment pad and propane tank all located within an existing compound enclosed by a chain link fence (the "Facility"). The Site is located within the IL-40 (Light Industrial) zoning district. The surrounding area is a mix of industrial, commercial and residential uses.

Attachment 2 contains a copy of the structural report evidencing that the proposed modifications can be supported in accordance with applicable codes. Notice to the FAA is not required for the proposed modifications as provided in **Attachment 3**. **Attachment 4** contains a viewshed analysis characterizing the visibility of the proposed Extension to the Monopole and also includes photographs and photo simulations evidencing the minimal impact on visibility.

The backup power generator will be supported with a 500-gallon propane fuel tank. The generator typically exercises once a week and will otherwise operate during power outages to support continuity of telecommunications services. Based on estimated fuel consumption and assuming 500 gallons of propane, while operating at full loading the generator should be able to provide electrical power to the Facility for approximately 160 hours before refueling. **Attachment 5** contains the equipment specifications for the proposed generator.

Once AT&T receives all required approvals, the installation of the Facility will take approximately three (3) to four (4) weeks and will be constructed during normal business hours. Construction is scheduled to commence in June of this year.

While there is a state and federal listed species area within a quarter-mile to the southwest of the Site, given that AT&T's proposed Facility will be located on a Monopole on land which has previously been disturbed, AT&T respectfully asserts that the Proposed Facility will not impact any state listed species. Please refer to the DEEP Map submitted as **Attachment 6**.

IV. SECTION 6409 OF THE SPECTRUM ACT

Section 6409(a) of the Spectrum Act mandates that state and local governments "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."[1] An eligible facilities request is defined in the Spectrum Act as any request to modify a Tower or Base Station that involves "collocations of new Transmission Equipment," "removal," or "replacement" of Transmission Equipment.[2]

Under this eligible facilities request, AT&T is proposing to extend the existing 120' Monopole with a twenty-foot (20') tower extension to a total height of 140' ATB and collocate six (6) panel antennas at a 140' ATB antenna centerline height, together with related amplifiers, cables, fiber and other associated antenna equipment, including, without limitation, remote radio

[1] 47 U.S.C. §1455(a)(1).

[2] 47 U.S.C. §1455(a)(2).

heads, surge arrestors, and global positioning system antennas with associated electronic equipment in a walk-in-cabinet, an emergency backup power propane-fueled generator, and other appurtenances on a proposed equipment pad and propane tank, all located within an existing compound enclosed by a chain link fence and all as depicted on the plans submitted with this application as **Attachment 7** (the "Plans"). The modifications proposed by AT&T in this Sub-Petition do not substantially change the physical dimensions of the Monopole in accordance with the Spectrum Act and as interpreted and implemented by regulations (the "Regulations") [3] promulgated by the Federal Communications Commission ("FCC").

The equipment identified in this eligible facilities request to be collocated at the Site qualifies as transmission equipment pursuant to the FCC definition. The FCC has defined transmission equipment as "any equipment that facilitates transmission for any Commission-licensed or authorized wireless communication service, including, but not limited to, radio transceivers, antennas and other relevant equipment associated with and necessary to their operation, including coaxial or fiber-optic cable, and regular and back-up power supply. This definition includes equipment used in any technological configuration associated with any Commission-authorized wireless transmission, licensed or unlicensed, terrestrial or satellite, including commercial mobile, private mobile, broadcast and public safety services, as well as fixed wireless services such as microwave backhaul or fixed broadband." [4]

Pursuant to the Regulations, the FCC determined that any modification to an existing telecommunications tower that meets six (6) specified criteria does not substantially change the physical dimensions of the existing tower and, therefore, is an eligible facilities request, approval of which must be granted.[5] These six criteria and analysis of how this eligible facilities request satisfies each of the six (6) review criteria identified by the FCC are discussed below.

1. **For towers not in the public rights-of-way, in this case the Monopole, the modification increases the height of the Monopole by more than 10% or by the height of one additional antenna array with separation from the nearest existing antenna not to exceed twenty feet (20'), whichever is greater**;

   As depicted on the Plans, AT&T's proposed modifications do not increase the height of the Monopole by more than twenty feet (20') from the nearest existing antenna. Additionally, the FCC clarified in its recent Declaratory Ruling[6] that for purposes of the analysis, the height increase is measured from the top of the existing antenna to the bottom of the proposed antenna, which in this case is fourteen feet (14').

2. **For towers not in the public rights-of-way, in this case the Monopole, the modification involves adding an appurtenance to the body of the Monopole that would protrude from the edge of the monopole by twenty feet (20') or**

[3] 47 C.F.R. §1.6100(b)
[4] 47 C.F.R. §1.6100(b)(8)
[5] 47 C.F.R. §1.6100(b)(7)

[6] *Declaratory Ruling and Notice of Proposed Rulemaking* –WT Docket No. 19-250 and RM-11849

more than the width of the Monopole at the level of the appurtenance, whichever is greater;

As depicted on the Plans, AT&T's antennas and appurtenances will not protrude from the edge of the Monopole by more than twenty feet (20'). The outside face of the antenna is approximately six feet (6') from the edge of the Monopole and consistent with the existing antenna installation on the Monopole.

3. For any eligible support structure, in this case the Monopole, the modification involves installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets;

AT&T proposes one walk-in equipment cabinet.

4. The modification entails any excavation or deployment outside the current Site;

AT&T does not propose excavation or deployment outside the current Site.

5. The modification would defeat the concealment elements of the eligible support structure; or

The Monopole does not incorporate concealment elements. The new panel antennas will be mounted in a similar fashion to the existing panel antennas.

6. The modification does not comply with conditions associated with the siting approval of the construction or modification of the eligible support structure or base station equipment, provided however that this limitation does not apply to any modification that is non-compliant only in a manner that would not exceed the thresholds identified in § 1.40001(b)(7)(i) through (iv).

The modifications are consistent with all applicable terms and conditions of the Council's approval in Docket 462, including the anticipated design for a twenty-foot (20') extension of the Monopole.

IV. MAXIMUM PERMISSIBLE EXPOSURE COMPLIANCE

The power density levels for AT&T's proposed Facility will not exceed .06% of the federally permitted emission standards for the public. Please refer to the Radio Frequency Emissions analysis submitted as Attachment 8. The total radio frequency power density will comply with the standards adopted by the Connecticut Department of Environmental Protection and the Maximum Permissible Exposure limits of the FCC.

VI. NOTICE TO MUNICIPAL OFFICIALS AND ABUTTING PROPERTY OWNERS

Pursuant to the Ruling, AT&T sent notice of its filing of this Sub-Petition to the City of Danbury and to each abutting property owner as listed in the City of Danbury's Assessor records. The notice indicates that comments or concerns should be submitted to the Council within thirty (30) days of the date the notice was sent. A certification of such notice, a copy of the notice, the list of City officials and abutting property owners, and a map produced from the City of Danbury's GIS mapping data are submitted herewith as **Attachment 9**.

V. CONCLUSION

AT&T respectfully asserts that its proposed modifications do not substantially change the physical dimensions of the Monopole at the Site as enumerated in the Spectrum Act and the Regulations, and therefore qualifies as an eligible facilities request. For the foregoing reasons, AT&T respectfully requests that the Council issue an order approving AT&T's proposed wireless telecommunications facility.

Respectfully submitted,

/s/ Thomas J. Regan
Thomas J. Regan, Esq.

ATTACHMENT 1

verizon

Verizon Wireless
1515 E. Woodfield Rd.
Suite 1400
Schaumburg, IL 60173

LETTER OF AUTHORIZATION

Site Location:	**New England**
Coordinates:	**41° 22' 58.8" N, 73° 25' 19.8" W**
Site Address:	**15 Great Pasture Road, Danbury, CT 06810**
County:	**Fairfield**
Elevation	**387** Feet AMSL Tower Height: **120** Feet AGL

Tower Type:	**MonoPole**
Verizon Site Name:	**Bethel West 2 / LC: 467694**
Tenant Site Name:	**Bethel West 2 / S2873**
KGI Tower #:	**28493**

RE: Authorization of Agent – Jeff DelliColli, Attachment to Verizon Wireless Tower

Cellco Partnership ("Verizon Wireless"), FCC licensee and owner of the cellular tower located on the property referenced, hereby appoints and authorizes **Jeff DelliColli**, representing **AT&T** ("Tenant") to act, execute and deliver on behalf of and with full authority of Verizon Wireless, any documentation required by Federal, State or Local authorities to secure zoning or permitting approvals related to Tenant's application to attach to the above-referenced tower.

This authorization applies solely to the zoning and permitting process and shall not be used for any other purpose. The term of this Letter of Authorization shall be for six (6) months from the date of this letter.

Cellco Partnership
d/b/a Verizon Wireless

By: _____
Joseph McCarty (Nov 16, 2020 07:30 CST)

Name: Joseph McCarty

Title: Manager-Network Engineering & Operations

Date: 11 16 20

ATTACHMENT 2

Monopole Extension Package

Prepared for:

KGI

805 Las Cimas Parkway, Building Three, Suite 370

Austin, TX 78746

ATTN: Ms. Stephanie Oswald

Structure	:	**119 ft Monopole w/ Proposed 20 ft Extension**
Site ID	:	**28493**
Proposed Carrier	:	**AT&T Wireless**
Site Name	:	**Bethel West 2**
Site Location	:	**15 Great Pasture Road**
		Danbury, CT
		41.383, -73.4222
County	:	**Fairfield**
Date	:	**September 2, 2020**
Max Usage	:	**69%**
Result	:	**Pass**

Prepared By:
Thomas Taylor, P.E., S.E.
Engineering Manager

Thomas L. Taylor

EXP. 01/31/2021

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 119 ft Monopole w/ Proposed 20 ft Extension to reflect the change in loading by AT&T Wireless.

Supporting Documents

Tower Drawing	Sabre Job #16-7133-SCB, dated July 13, 2016
Foundation Drawing	Centek Engineering Job #14216.000, dated July 28, 2016
Geotechnical Report	DET Job #2015.13, dated February 19, 2016
Foundation Analysis	Centek Engineering Project #14216.00, dated March 12, 2020
Mount Analysis	Hudson Design Group Site #S2873 (NSB), dated October 10, 2019

Analysis

The tower was analyzed using TNX tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed	91 mph (3-Second Gust) Vasd / 117 mph (3-Second Gust) Vult
Basic Wind Speed w/Ice	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class	II
Exposure Category	B
Topographic Category	1
Crest Height	0 ft
Spectral Response	Ss = 0.22* , S1 = 0.07
Site Class	D - Stiff Soil

* Seismic analysis is not included in this analysis due to the value of Ss less than 1.

Conclusion

Based on the analysis results, the monopole with the proposed extension **meets** the requirements per the applicable codes listed above. The monopole and foundation can support the equipment as described in this report. If you have any questions or require additional information, please contact Semaan Engineering Solutions at 402-289-1888.

Attachments

1. Drawing T-1, Revision1, dated 09/02/2020.
2. Drawing N-1, Revision 1, dated 09/02/2020.
3. Drawing N-2, Revision 0, dated 05/15/2020.
4. Drawing S-1, Revision 0, dated 05/15/2020.
5. Drawing S-2, Revision 0, dated 05/15/2020.
6. Drawing S-3, Revision 0, dated 05/15/2020.

Existing and Reserved Equipment

This loading **is** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
120.0	120.0	12	BXA-70080/8CF	Platform w/Rail	(12) 1 5/8" (3) Hybrid	Verizon
		12	RRUS A2 Module			
		6	3JR52709AA			
		3	RRH 4x30-4R B13			
		3	RRH 4x30-4R B25			
		12	10"x7"x2" TMA			
		3	OVP Junction Box			

Equipment to be Removed

This loading **is not** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
No loading considered as to be removed						

Proposed Equipment

This loading **is** included in the analysis.

Centerline Elevation (ft)		Qty.	Antenna	Mount Type	Coax (in)	Carrier
Mount	Equip.					
140.0	140.0	9	TPA65R-BU6D	C10855721C Platform w/Rail	(6) 7/8" DC (2) 3/8" Fiber (2) 1/2"	AT&T
		3	4478 B14 RRU			
		3	8843 B2/B66A RRU			
		3	4415 B30 RRU			
		3	4449 B5/B12 RRU			
		3	DC6-48-60-18-8F			
		2	GPS			

Install proposed coax anywhere on tower.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Shaft	41%	Pass
Anchor Bolts	39%	Pass
Baseplate	40%	Pass
Flange	52%	Pass

Foundations

Reaction Component	Original Design Reactions	Analysis Reactions	% of Design
Moment (Kips-Ft)	4,952.3	2,024.9	41%
Axial (Kips)	57.2	39.1	68%
Shear (Kips)	48.9	19.9	41%

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings.

The attached foundation analysis by Centek Engineering also shows that the existing mat foundation is acceptable without considering the center (4) overloaded micropiles, therefore no modification or reinforcement of the foundation will be required.

Standard Conditions

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

--Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

--Information from drawings in the possession of Semaan Engineering Solutions, or generated by field inspections or measurements of the structure.

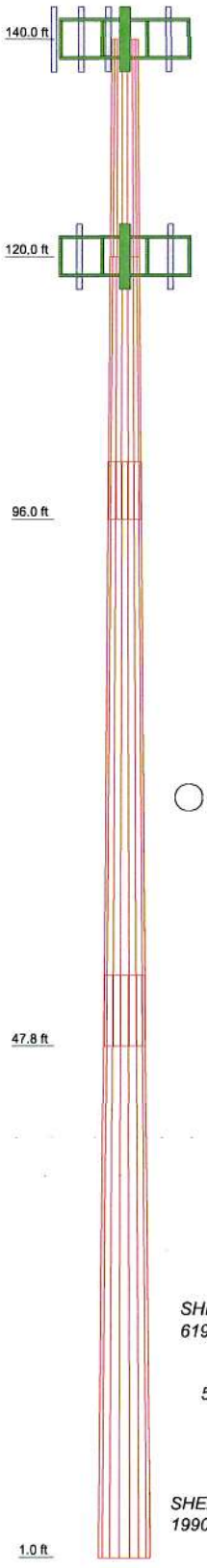
It is the responsibility of the client to ensure that the information provided to Semaan Engineering Solutions Holdings and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and Semaan Engineering Solutions, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. 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.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Semaan Engineering Solutions Holdings is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

Section	1	2	3	4
Length (ft)	20.000	24.000	53.500	53.250
Number of Sides	18	18	18	18
Thickness (in)	0.250	0.250	0.313	0.375
Socket Length (ft)		5.250	6.500	
Top Dia (in)	27.000	31.419	35.063	44.823
Bot Dia (in)	31.419	36.723	46.885	56.590
Grade	A572-65			
Weight (lb)	1563.9	2191.7	7342.2	10855.1

21952.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
C10855721C Platform w/Rail (ATI)	140	(4) BXA-70080/8CF (Verizon)	120
(3) TPA65R-BU6D (ATI)	140	(4) BXA-70080/8CF (Verizon)	120
(3) TPA65R-BU6D (ATI)	140	(4) BXA-70080/8CF (Verizon)	120
(3) TPA65R-BU6D (ATI)	140	(4) RRUS A2 Module (Verizon)	120
4478 B14 RRU (ATI)	140	(4) RRUS A2 Module (Verizon)	120
4478 B14 RRU (ATI)	140	(4) RRUS A2 Module (Verizon)	120
4478 B14 RRU (ATI)	140	(2) 3JR52709AA (Verizon)	120
8843 B2/B66A RRU (ATI)	140	(2) 3JR52709AA (Verizon)	120
8843 B2/B66A RRU (ATI)	140	(2) 3JR52709AA (Verizon)	120
8843 B2/B66A RRU (ATI)	140	RRH 4x30-4R B13 (Verizon)	120
4415 B30 RRU (ATI)	140	RRH 4x30-4R B13 (Verizon)	120
4415 B30 RRU (ATI)	140	RRH 4x30-4R B13 (Verizon)	120
4415 B30 RRU (ATI)	140	RRH 4x30-4R B25 (Verizon)	120
4449 B5/B12 RRU (ATI)	140	RRH 4x30-4R B25 (Verizon)	120
4449 B5/B12 RRU (ATI)	140	RRH 4x30-4R B25 (Verizon)	120
4449 B5/B12 RRU (ATI)	140	(4) 10"x7"x2" TMA (Verizon)	120
DC6-48-60-18-8F (ATI)	140	(4) 10"x7"x2" TMA (Verizon)	120
DC6-48-60-18-8F (ATI)	140	(4) 10"x7"x2" TMA (Verizon)	120
DC6-48-60-18-8F (ATI)	140	OVP Junction Box (Verizon)	120
(2) GPS (ATI)	140	OVP Junction Box (Verizon)	120
Platform w/Rail (Verizon)	120	OVP Junction Box (Verizon)	120

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 91 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. Weld together tower sections have flange connections.
9. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
10. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
11. Welds are fabricated with ER-70S-6 electrodes.
12. TOWER RATING: 41.1%

ALL REACTIONS ARE FACTORED

AXIAL 67024 lb

SHEAR 6192 lb *MOMENT 611759 lb-ft*

TORQUE 38 lb-ft
50 mph WIND - 0.750 in ICE

AXIAL 39098 lb

SHEAR 19908 lb *MOMENT 2024947 lb-ft*

TORQUE 93 lb-ft
REACTIONS - 91 mph WIND

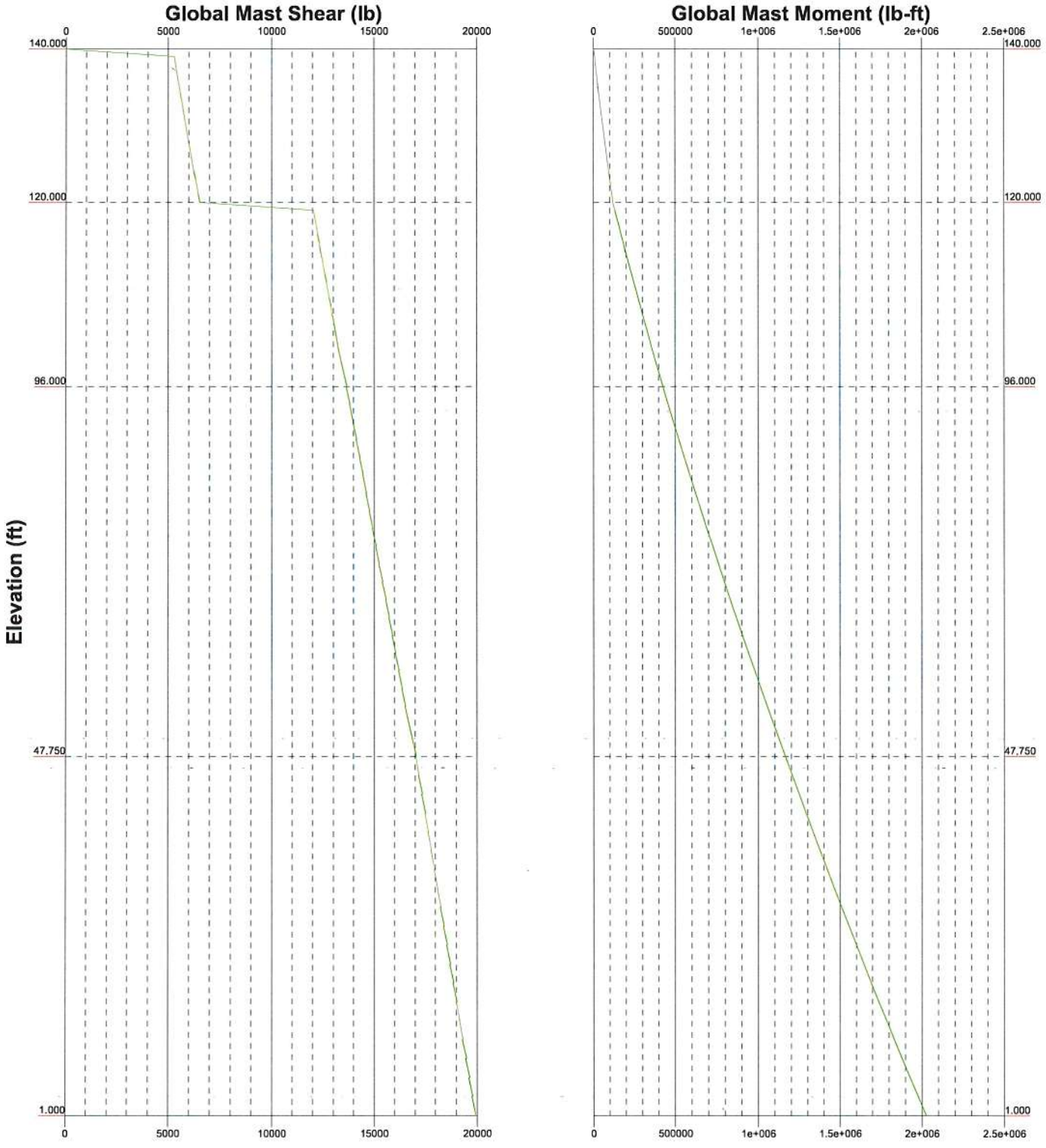
Semaan Engineering Solutions LLC
1047 N. 205th St.
Elkhorn, NE 68022
Phone: 402-289-1888
FAX:

Job: *28493_Bethel West 2*		
Project: *REV03*		
Client: KGI	Drawn by: TLT	App'd:
Code: TIA-222-G	Date: 09/02/20	Scale: NTS
Path: \\DMZSESSERVER01\Common\TNX files\28493\REV03\28493_REV03.eri		Dwg No. E-1

TIA-222-G - 91 mph/50 mph 0.750 in Ice Exposure B

Maximum Values

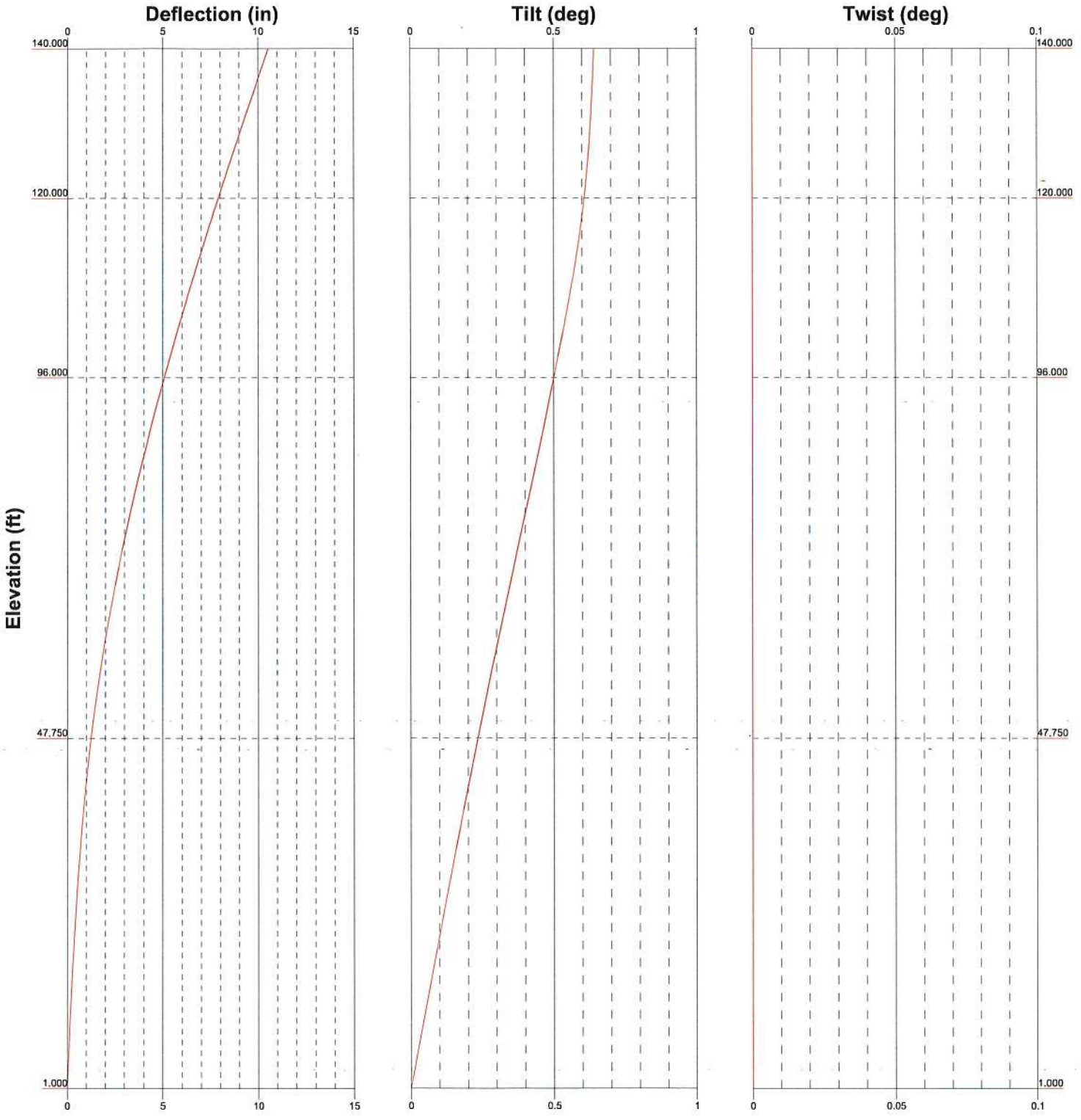
Vx Vz Mx Mz



Semaan Engineering Solutions LLC 1047 N. 205th St. Elkhorn, NE 68022 Phone: 402-289-1888 FAX:	Job: ***28493_Bethel West 2***		
	Project: ***REV03***		
	Client: KGI	Drawn by: TLT	App'd:
	Code: TIA-222-G	Date: 09/02/20	Scale: NTS
	Path: \\DMZSESSERVER01\Common\TNX files\28493\REV03\28493_REV03.eri		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values

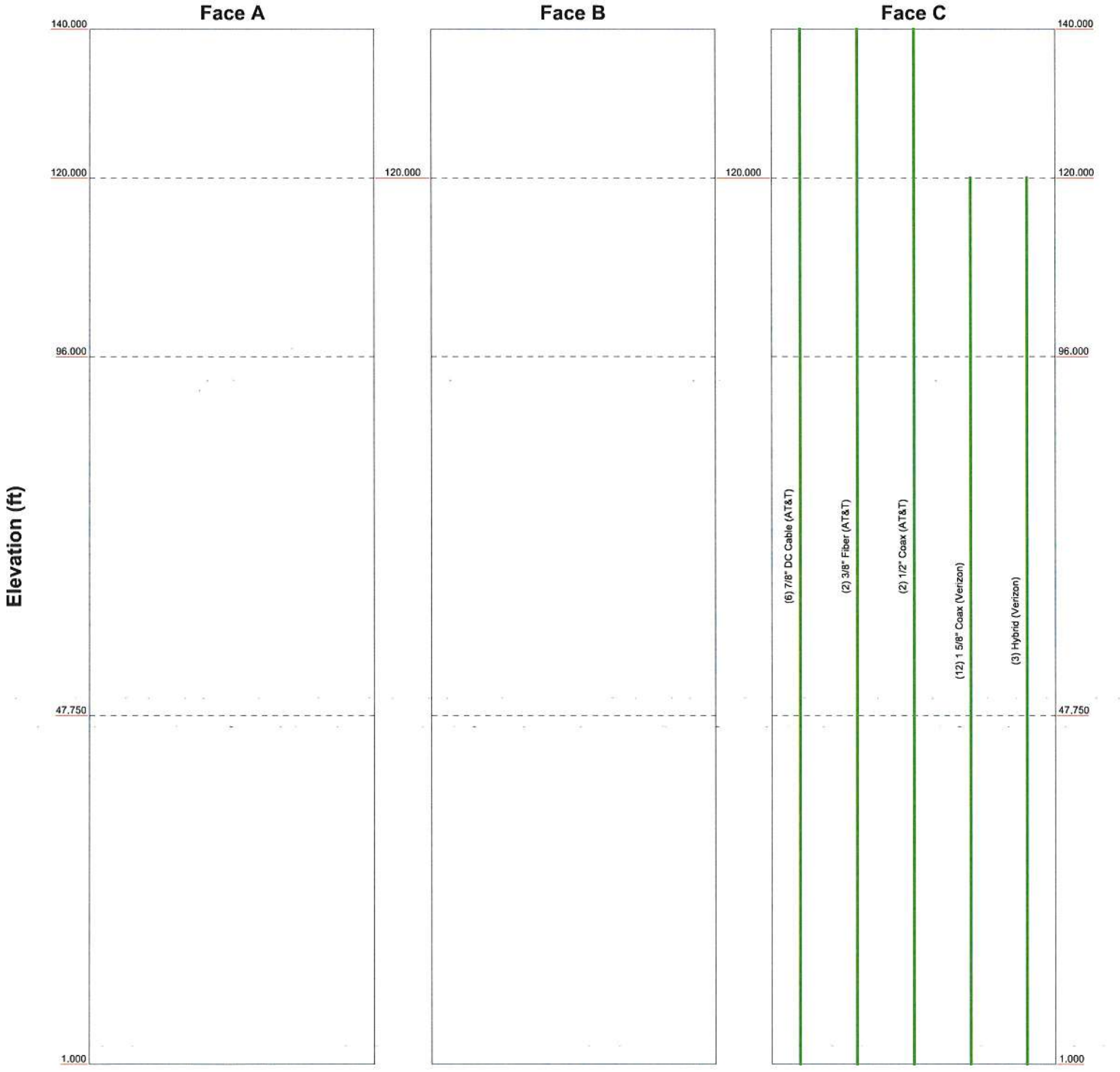


Semaan Engineering Solutions LLC
1047 N. 205th St.
Elkhorn, NE 68022
Phone: 402-289-1888
FAX:

Job: ***28493_Bethel West 2***		
Project: ***REV03***		
Client: KGI	Drawn by: TLT	App'd:
Code: TIA-222-G	Date: 09/02/20	Scale: NTS
Path: \\DMZSESSERVER01\Common\TNX files\28493\REV03\28493_REV03.eri		Dwg No. E-5

Feed Line Distribution Chart
1' - 140'

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



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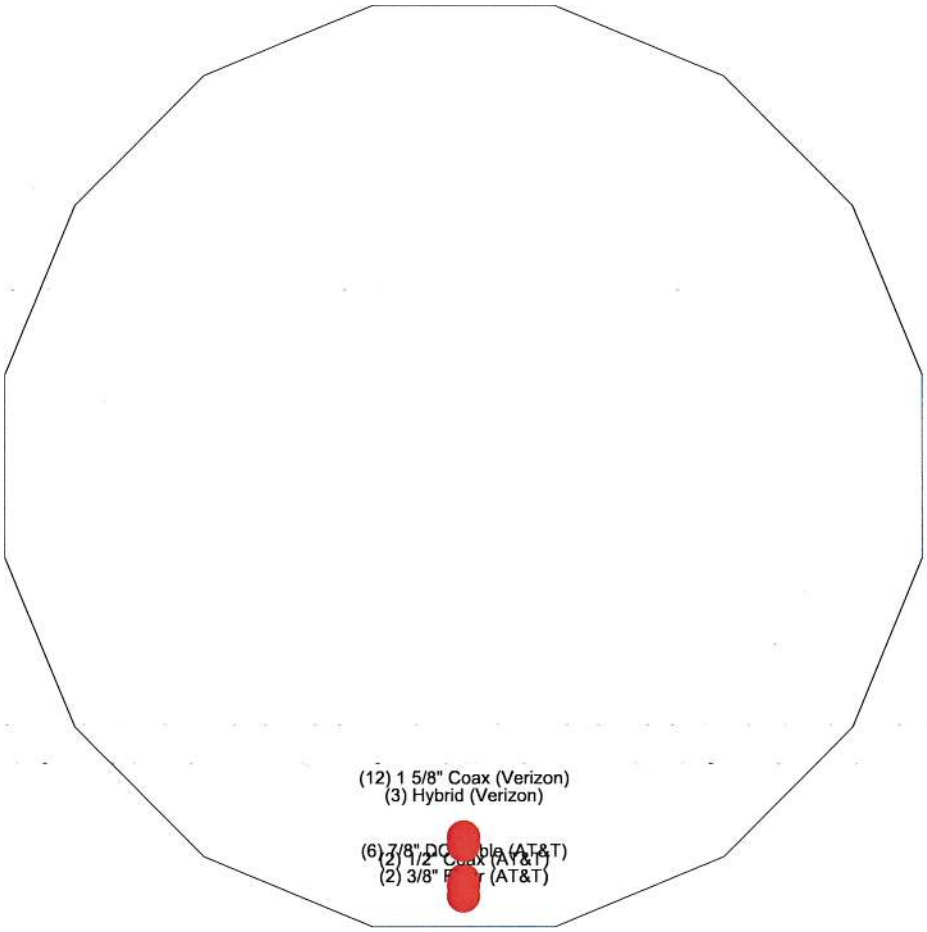
Path: \\DMZSESSERVER01\Common\TNX files\28493\REV03\28493_REV03.eri		Dwg No. E-7

Feed Line Plan

Round Flat App In Face App Out Face



Semaan Engineering Solutions LLC
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Client: KGI	Drawn by: TLT	App'd:
Code: TIA-222-G	Date: 09/02/20	Scale: NTS
Path: \\DMZSESSERVER01\Common\TNX files\28493\REV03\28493_REV03.eri		Dwg No. E-7

Tower Input Data

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

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 91 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 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.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
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	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	√ SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	√ Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	√ Ignore KL/ry For 60 Deg. Angle Legs	√ Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

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
L1	140.000-120.000	20.000	0.000	18	27.000	31.419	0.250	1.000	A572-65 (65 ksi)
L2	120.000-96.000	24.000	5.250	18	31.419	36.723	0.250	1.000	A572-65 (65 ksi)
L3	96.000-47.750	53.500	6.500	18	35.063	46.885	0.313	1.250	A572-65 (65 ksi)
L4	47.750-1.000	53.250		18	44.823	56.590	0.375	1.500	A572-65 (65 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	27.378	21.226	1918.915	9.496	13.716	139.903	3840.355	10.615	4.312	17.248
	31.866	24.733	3035.783	11.065	15.961	190.199	6075.561	12.369	5.090	20.359
L2	31.866	24.733	3035.783	11.065	15.961	190.199	6075.561	12.369	5.090	20.359
	37.251	28.941	4863.953	12.948	18.655	260.730	9734.306	14.473	6.023	24.093
L3	36.733	34.468	5258.525	12.336	17.812	295.227	10523.969	17.237	5.621	17.987
	47.560	46.194	12658.196	16.533	23.817	531.469	25333.047	23.101	7.702	24.645
L4	46.915	52.905	13205.069	15.779	22.770	579.927	26427.513	26.457	7.229	19.277
	57.405	66.910	26713.597	19.956	28.748	929.242	53462.345	33.461	9.300	24.8

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 140.000-120.000				1	1	1			
L2 120.000-96.000				1	1	1			
L3 96.000-47.750				1	1	1			
L4 47.750-1.000				1	1	1			

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
7/8" DC Cable (AT&T)	C	No	No	Inside Pole	140.000 - 1.000	6	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
3/8" Fiber (AT&T)	C	No	No	Inside Pole	140.000 - 1.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000

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" Ice	0.000	0.000
1/2" Coax (AT&T)	C	No	No	Inside Pole	140.000 - 1.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
1 5/8" Coax (Verizon)	C	No	No	Inside Pole	120.000 - 1.000	12	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
Hybrid (Verizon)	C	No	No	Inside Pole	120.000 - 1.000	3	No Ice	0.000	0.002
							1/2" Ice	0.000	0.002
							1" Ice	0.000	0.002

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	140.000-120.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	79.600
L2	120.000-96.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	523.200
L3	96.000-47.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	1051.850
L4	47.750-1.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	1019.150

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	140.000-120.000	A	1.720	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	79.600
L2	120.000-96.000	A	1.688	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	523.200
L3	96.000-47.750	A	1.620	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	1051.850
L4	47.750-1.000	A	1.452	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	1019.150

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	140.000-120.000	0.000	0.000	0.000	0.000
L2	120.000-96.000	0.000	0.000	0.000	0.000
L3	96.000-47.750	0.000	0.000	0.000	0.000
L4	47.750-1.000	0.000	0.000	0.000	0.000

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
C10855721C Platform w/Rail (AT&T)	A	None			0.000	140.000	No Ice	35.850	35.850	2500.000
							1/2" Ice	40.460	40.460	3500.000
							1" Ice	45.070	45.070	4500.000
(3) TPA65R-BU6D (AT&T)	A	From Face	3.500	0.000	0.000	140.000	No Ice	12.709	5.615	69.000
			0.000				1/2" Ice	13.206	6.067	142.956
			0.000				1" Ice	13.709	6.526	223.562
(3) TPA65R-BU6D (AT&T)	B	From Face	3.500	0.000	0.000	140.000	No Ice	12.709	5.615	69.000
			0.000				1/2" Ice	13.206	6.067	142.956
			0.000				1" Ice	13.709	6.526	223.562
(3) TPA65R-BU6D (AT&T)	C	From Face	3.500	0.000	0.000	140.000	No Ice	12.709	5.615	69.000
			0.000				1/2" Ice	13.206	6.067	142.956
			0.000				1" Ice	13.709	6.526	223.562
4478 B14 RRU (AT&T)	A	From Face	3.500	0.000	0.000	140.000	No Ice	2.021	1.246	59.400
			0.000				1/2" Ice	2.200	1.396	77.013
			0.000				1" Ice	2.386	1.554	97.398
4478 B14 RRU (AT&T)	B	From Face	3.500	0.000	0.000	140.000	No Ice	2.021	1.246	59.400
			0.000				1/2" Ice	2.200	1.396	77.013
			0.000				1" Ice	2.386	1.554	97.398
4478 B14 RRU (AT&T)	C	From Face	3.500	0.000	0.000	140.000	No Ice	2.021	1.246	59.400
			0.000				1/2" Ice	2.200	1.396	77.013
			0.000				1" Ice	2.386	1.554	97.398
8843 B2/B66A RRU (AT&T)	A	From Face	3.500	0.000	0.000	140.000	No Ice	1.639	1.353	72.000
			0.000				1/2" Ice	1.799	1.500	89.596
			0.000				1" Ice	1.966	1.655	109.915
8843 B2/B66A RRU (AT&T)	B	From Face	3.500	0.000	0.000	140.000	No Ice	1.639	1.353	72.000
			0.000				1/2" Ice	1.799	1.500	89.596
			0.000				1" Ice	1.966	1.655	109.915
8843 B2/B66A RRU (AT&T)	C	From Face	3.500	0.000	0.000	140.000	No Ice	1.639	1.353	72.000
			0.000				1/2" Ice	1.799	1.500	89.596
			0.000				1" Ice	1.966	1.655	109.915
4415 B30 RRU (AT&T)	A	From Face	3.500	0.000	0.000	140.000	No Ice	1.843	0.820	46.000
			0.000				1/2" Ice	2.012	0.943	60.075
			0.000				1" Ice	2.190	1.075	76.665
4415 B30 RRU (AT&T)	B	From Face	3.500	0.000	0.000	140.000	No Ice	1.843	0.820	46.000
			0.000				1/2" Ice	2.012	0.943	60.075
			0.000				1" Ice	2.190	1.075	76.665

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
4415 B30 RRU	C	From Face	3.500	0.000	140.000	140.000	No Ice	1.843	0.820	46.000
(AT&T)			0.000				1/2" Ice	2.012	0.943	60.075
			0.000				1" Ice	2.190	1.075	76.665
4449 B5/B12 RRU	A	From Face	3.500	0.000	140.000	140.000	No Ice	1.968	1.408	71.000
(AT&T)			0.000				1/2" Ice	2.144	1.564	89.509
			0.000				1" Ice	2.328	1.727	110.838
4449 B5/B12 RRU	B	From Face	3.500	0.000	140.000	140.000	No Ice	1.968	1.408	71.000
(AT&T)			0.000				1/2" Ice	2.144	1.564	89.509
			0.000				1" Ice	2.328	1.727	110.838
4449 B5/B12 RRU	C	From Face	3.500	0.000	140.000	140.000	No Ice	1.968	1.408	71.000
(AT&T)			0.000				1/2" Ice	2.144	1.564	89.509
			0.000				1" Ice	2.328	1.727	110.838
DC6-48-60-18-8F	A	From Face	3.500	0.000	140.000	140.000	No Ice	0.917	0.917	32.800
(AT&T)			0.000				1/2" Ice	1.458	1.458	50.515
			0.000				1" Ice	1.643	1.643	70.725
DC6-48-60-18-8F	B	From Face	3.500	0.000	140.000	140.000	No Ice	0.917	0.917	32.800
(AT&T)			0.000				1/2" Ice	1.458	1.458	50.515
			0.000				1" Ice	1.643	1.643	70.725
DC6-48-60-18-8F	C	From Face	3.500	0.000	140.000	140.000	No Ice	0.917	0.917	32.800
(AT&T)			0.000				1/2" Ice	1.458	1.458	50.515
			0.000				1" Ice	1.643	1.643	70.725
(2) GPS	A	From Face	3.500	0.000	140.000	140.000	No Ice	0.267	0.267	15.000
(AT&T)			0.000				1/2" Ice	0.337	0.337	19.829
			0.000				1" Ice	0.415	0.415	26.148
Platform w/Rail	A	None			0.000	120.000	No Ice	35.850	35.850	2500.000
(Verizon)							1/2" Ice	40.460	40.460	3500.000
							1" Ice	45.070	45.070	4500.000
(4) BXA-70080/8CF	A	From Face	3.500	0.000	120.000	120.000	No Ice	8.291	6.449	23.000
(Verizon)			0.000				1/2" Ice	8.879	7.024	70.397
			0.000				1" Ice	9.474	7.607	125.021
(4) BXA-70080/8CF	B	From Face	3.500	0.000	120.000	120.000	No Ice	8.291	6.449	23.000
(Verizon)			0.000				1/2" Ice	8.879	7.024	70.397
			0.000				1" Ice	9.474	7.607	125.021
(4) BXA-70080/8CF	C	From Face	3.500	0.000	120.000	120.000	No Ice	8.291	6.449	23.000
(Verizon)			0.000				1/2" Ice	8.879	7.024	70.397
			0.000				1" Ice	9.474	7.607	125.021
(4) RRUS A2 Module	A	From Face	3.500	0.000	120.000	120.000	No Ice	1.600	0.455	21.160
(Verizon)			0.000				1/2" Ice	1.758	0.558	31.489
			0.000				1" Ice	1.924	0.667	44.034
(4) RRUS A2 Module	B	From Face	3.500	0.000	120.000	120.000	No Ice	1.600	0.455	21.160
(Verizon)			0.000				1/2" Ice	1.758	0.558	31.489
			0.000				1" Ice	1.924	0.667	44.034
(4) RRUS A2 Module	C	From Face	3.500	0.000	120.000	120.000	No Ice	1.600	0.455	21.160
(Verizon)			0.000				1/2" Ice	1.758	0.558	31.489
			0.000				1" Ice	1.924	0.667	44.034
(2) 3JR52709AA	A	From Face	3.500	0.000	120.000	120.000	No Ice	3.355	2.005	55.000
(Verizon)			0.000				1/2" Ice	3.612	2.237	78.159
			0.000				1" Ice	3.876	2.476	104.946
(2) 3JR52709AA	B	From Face	3.500	0.000	120.000	120.000	No Ice	3.355	2.005	55.000
(Verizon)			0.000				1/2" Ice	3.612	2.237	78.159
			0.000				1" Ice	3.876	2.476	104.946
(2) 3JR52709AA	C	From Face	3.500	0.000	120.000	120.000	No Ice	3.355	2.005	55.000
(Verizon)			0.000				1/2" Ice	3.612	2.237	78.159
			0.000				1" Ice	3.876	2.476	104.946
RRH 4x30-4R B13	A	From Face	3.500	0.000	120.000	120.000	No Ice	2.160	1.620	57.200
(Verizon)			0.000				1/2" Ice	2.350	1.794	76.813
			0.000				1" Ice	2.548	1.975	99.381

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RRH 4x30-4R B13	B	From Face	3.500	0.000	120.000	No Ice	2.160	1.620	57.200
(Verizon)			0.000			1/2" Ice	2.350	1.794	76.813
			0.000			1" Ice	2.548	1.975	99.381
RRH 4x30-4R B13	C	From Face	3.500	0.000	120.000	No Ice	2.160	1.620	57.200
(Verizon)			0.000			1/2" Ice	2.350	1.794	76.813
			0.000			1" Ice	2.548	1.975	99.381
RRH 4x30-4R B25	A	From Face	3.500	0.000	120.000	No Ice	2.136	1.304	51.000
(Verizon)			0.000			1/2" Ice	2.325	1.460	68.438
			0.000			1" Ice	2.521	1.623	88.698
RRH 4x30-4R B25	B	From Face	3.500	0.000	120.000	No Ice	2.136	1.304	51.000
(Verizon)			0.000			1/2" Ice	2.325	1.460	68.438
			0.000			1" Ice	2.521	1.623	88.698
RRH 4x30-4R B25	C	From Face	3.500	0.000	120.000	No Ice	2.136	1.304	51.000
(Verizon)			0.000			1/2" Ice	2.325	1.460	68.438
			0.000			1" Ice	2.521	1.623	88.698
(4) 10"x7"x2" TMA	A	From Face	3.500	0.000	120.000	No Ice	0.583	0.182	15.000
(Verizon)			0.000			1/2" Ice	0.681	0.250	19.019
			0.000			1" Ice	0.787	0.325	24.463
(4) 10"x7"x2" TMA	B	From Face	3.500	0.000	120.000	No Ice	0.583	0.182	15.000
(Verizon)			0.000			1/2" Ice	0.681	0.250	19.019
			0.000			1" Ice	0.787	0.325	24.463
(4) 10"x7"x2" TMA	C	From Face	3.500	0.000	120.000	No Ice	0.583	0.182	15.000
(Verizon)			0.000			1/2" Ice	0.681	0.250	19.019
			0.000			1" Ice	0.787	0.325	24.463
OVP Junction Box	A	From Face	3.500	0.000	120.000	No Ice	3.791	2.511	32.000
(Verizon)			0.000			1/2" Ice	4.043	2.724	63.460
			0.000			1" Ice	4.302	2.944	98.675
OVP Junction Box	B	From Face	3.500	0.000	120.000	No Ice	3.791	2.511	32.000
(Verizon)			0.000			1/2" Ice	4.043	2.724	63.460
			0.000			1" Ice	4.302	2.944	98.675
OVP Junction Box	C	From Face	3.500	0.000	120.000	No Ice	3.791	2.511	32.000
(Verizon)			0.000			1/2" Ice	4.043	2.724	63.460
			0.000			1" Ice	4.302	2.944	98.675

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	129.748	1.065	0.021	49.370	A	0.000	49.370	49.370	100.00	0.000	0.000
140.000-120.0					B	0.000	49.370		100.00	0.000	0.000
00					C	0.000	49.370		100.00	0.000	0.000
L2	107.689	1.009	0.020	69.116	A	0.000	69.116	69.116	100.00	0.000	0.000
120.000-96.00					B	0.000	69.116		100.00	0.000	0.000
0					C	0.000	69.116		100.00	0.000	0.000
L3	71.426	0.898	0.018	169.464	A	0.000	169.464	169.464	100.00	0.000	0.000
96.000-47.750					B	0.000	169.464		100.00	0.000	0.000

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
L4 47.750-1.000	23.893	0.7	0.014	203.208	C	0.000	169.464		100.00	0.000	0.000
					A	0.000	203.208	203.208	100.00	0.000	0.000
					B	0.000	203.208		100.00	0.000	0.000
					C	0.000	203.208		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 140.000-120.000	129.748	1.065	0.006	1.720	55.103	A	0.000	55.103	55.103	100.00	0.000	0.000
						B	0.000	55.103		100.00	0.000	0.000
						C	0.000	55.103		100.00	0.000	0.000
L2 120.000-96.000	107.689	1.009	0.006	1.688	75.870	A	0.000	75.870	75.870	100.00	0.000	0.000
						B	0.000	75.870		100.00	0.000	0.000
						C	0.000	75.870		100.00	0.000	0.000
L3 96.000-47.750	71.426	0.898	0.005	1.620	183.041	A	0.000	183.041	183.041	100.00	0.000	0.000
						B	0.000	183.041		100.00	0.000	0.000
						C	0.000	183.041		100.00	0.000	0.000
L4 47.750-1.000	23.893	0.7	0.004	1.452	215.833	A	0.000	215.833	215.833	100.00	0.000	0.000
						B	0.000	215.833		100.00	0.000	0.000
						C	0.000	215.833		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 140.000-120.0 00	129.748	1.065	0.008	49.370	A	0.000	49.370	49.370	100.00	0.000	0.000
					B	0.000	49.370		100.00	0.000	0.000
					C	0.000	49.370		100.00	0.000	0.000
L2 120.000-96.00 0	107.689	1.009	0.008	69.116	A	0.000	69.116	69.116	100.00	0.000	0.000
					B	0.000	69.116		100.00	0.000	0.000
					C	0.000	69.116		100.00	0.000	0.000
L3 96.000-47.750	71.426	0.898	0.007	169.464	A	0.000	169.464	169.464	100.00	0.000	0.000
					B	0.000	169.464		100.00	0.000	0.000
					C	0.000	169.464		100.00	0.000	0.000
L4 47.750-1.000	23.893	0.7	0.006	203.208	A	0.000	203.208	203.208	100.00	0.000	0.000
					B	0.000	203.208		100.00	0.000	0.000
					C	0.000	203.208		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	1563.891	A	1	0.65	0.021	1	1	49.370	756.806	0.038	C
140.000-120.0			B	1	0.65		1	1	49.370			
00			C	1	0.65		1	1	49.370			
L2	523.200	2191.700	A	1	0.65	0.020	1	1	69.116	1004.575	0.042	C
120.000-96.00			B	1	0.65		1	1	69.116			
0			C	1	0.65		1	1	69.116			
L3	1051.850	7342.187	A	1	0.65	0.018	1	1	169.464	2178.906	0.045	C
96.000-47.750			B	1	0.65		1	1	169.464			
			C	1	0.65		1	1	169.464			
L4	1019.150	10855.112	A	1	0.65	0.014	1	1	203.208	2099.990	0.045	C
47.750-1.000			B	1	0.65		1	1	203.208			
			C	1	0.65		1	1	203.208			
Sum Weight:	2673.800	21952.890						OTM	406140.72 7 lb-ft	6040.277		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	1563.891	A	1	0.65	0.021	1	1	49.370	756.806	0.038	C
140.000-120.0			B	1	0.65		1	1	49.370			
00			C	1	0.65		1	1	49.370			
L2	523.200	2191.700	A	1	0.65	0.020	1	1	69.116	1004.575	0.042	C
120.000-96.00			B	1	0.65		1	1	69.116			
0			C	1	0.65		1	1	69.116			
L3	1051.850	7342.187	A	1	0.65	0.018	1	1	169.464	2178.906	0.045	C
96.000-47.750			B	1	0.65		1	1	169.464			
			C	1	0.65		1	1	169.464			
L4	1019.150	10855.112	A	1	0.65	0.014	1	1	203.208	2099.990	0.045	C
47.750-1.000			B	1	0.65		1	1	203.208			
			C	1	0.65		1	1	203.208			
Sum Weight:	2673.800	21952.890						OTM	406140.72 7 lb-ft	6040.277		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	1563.891	A	1	0.65	0.021	1	1	49.370	756.806	0.038	C
140.000-120.0			B	1	0.65		1	1	49.370			
00			C	1	0.65		1	1	49.370			
L2	523.200	2191.700	A	1	0.65	0.020	1	1	69.116	1004.575	0.042	C
120.000-96.00			B	1	0.65		1	1	69.116			
0			C	1	0.65		1	1	69.116			
L3	1051.850	7342.187	A	1	0.65	0.018	1	1	169.464	2178.906	0.045	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
96.000-47.750			B	1	0.65		1	1	169.464			
			C	1	0.65		1	1	169.464			
L4	1019.150	10855.112	A	1	0.65	0.014	1	1	203.208	2099.990	0.045	C
47.750-1.000			B	1	0.65		1	1	203.208			
			C	1	0.65		1	1	203.208			
Sum Weight:	2673.800	21952.890						OTM	406140.72 7 lb-ft	6040.277		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	2877.268	A	1	1.2	0.006	1	1	55.103	470.790	0.024	C
140.000-120.0			B	1	1.2		1	1	55.103			
00			C	1	1.2		1	1	55.103			
L2	523.200	3980.208	A	1	1.2	0.006	1	1	75.870	614.603	0.026	C
120.000-96.00			B	1	1.2		1	1	75.870			
0			C	1	1.2		1	1	75.870			
L3	1051.850	11508.751	A	1	1.2	0.005	1	1	182.495	1307.786	0.027	C
96.000-47.750			B	1	1.2		1	1	182.495			
			C	1	1.2		1	1	182.495			
L4	1019.150	15286.603	A	1	1.2	0.004	1	1	214.524	1235.599	0.026	C
47.750-1.000			B	1	1.2		1	1	214.524			
			C	1	1.2		1	1	214.524			
Sum Weight:	2673.800	33652.830						OTM	246573.14 9 lb-ft	3628.779		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	2877.268	A	1	1.2	0.006	1	1	55.103	470.790	0.024	C
140.000-120.0			B	1	1.2		1	1	55.103			
00			C	1	1.2		1	1	55.103			
L2	523.200	3980.208	A	1	1.2	0.006	1	1	75.870	614.603	0.026	C
120.000-96.00			B	1	1.2		1	1	75.870			
0			C	1	1.2		1	1	75.870			
L3	1051.850	11508.751	A	1	1.2	0.005	1	1	182.495	1307.786	0.027	C
96.000-47.750			B	1	1.2		1	1	182.495			
			C	1	1.2		1	1	182.495			
L4	1019.150	15286.603	A	1	1.2	0.004	1	1	214.524	1235.599	0.026	C
47.750-1.000			B	1	1.2		1	1	214.524			
			C	1	1.2		1	1	214.524			
Sum Weight:	2673.800	33652.830						OTM	246573.14 9 lb-ft	3628.779		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	2877.268	A	1	1.2	0.006	1	1	55.103	470.790	0.024	C
140.000-120.0			B	1	1.2		1	1	55.103			
00			C	1	1.2		1	1	55.103			
L2	523.200	3980.208	A	1	1.2	0.006	1	1	75.870	614.603	0.026	C
120.000-96.00			B	1	1.2		1	1	75.870			
0			C	1	1.2		1	1	75.870			
L3	1051.850	11508.751	A	1	1.2	0.005	1	1	182.495	1307.786	0.027	C
96.000-47.750			B	1	1.2		1	1	182.495			
			C	1	1.2		1	1	182.495			
L4	1019.150	15286.603	A	1	1.2	0.004	1	1	214.524	1235.599	0.026	C
47.750-1.000			B	1	1.2		1	1	214.524			
			C	1	1.2		1	1	214.524			
Sum Weight:	2673.800	33652.830						OTM	246573.14 9 lb-ft	3628.779		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	1563.891	A	1	0.65	0.008	1	1	49.370	294.374	0.015	C
140.000-120.0			B	1	0.65		1	1	49.370			
00			C	1	0.65		1	1	49.370			
L2	523.200	2191.700	A	1	0.65	0.008	1	1	69.116	390.749	0.016	C
120.000-96.00			B	1	0.65		1	1	69.116			
0			C	1	0.65		1	1	69.116			
L3	1051.850	7342.187	A	1	0.65	0.007	1	1	169.464	847.527	0.018	C
96.000-47.750			B	1	0.65		1	1	169.464			
			C	1	0.65		1	1	169.464			
L4	1019.150	10855.112	A	1	0.65	0.006	1	1	203.208	816.831	0.017	C
47.750-1.000			B	1	0.65		1	1	203.208			
			C	1	0.65		1	1	203.208			
Sum Weight:	2673.800	21952.890						OTM	157976.16 9 lb-ft	2349.481		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	1563.891	A	1	0.65	0.008	1	1	49.370	294.374	0.015	C
140.000-120.0			B	1	0.65		1	1	49.370			
00			C	1	0.65		1	1	49.370			
L2	523.200	2191.700	A	1	0.65	0.008	1	1	69.116	390.749	0.016	C
120.000-96.00			B	1	0.65		1	1	69.116			
0			C	1	0.65		1	1	69.116			
L3	1051.850	7342.187	A	1	0.65	0.007	1	1	169.464	847.527	0.018	C
96.000-47.750			B	1	0.65		1	1	169.464			
			C	1	0.65		1	1	169.464			
L4	1019.150	10855.112	A	1	0.65	0.006	1	1	203.208	816.831	0.017	C
47.750-1.000			B	1	0.65		1	1	203.208			
			C	1	0.65		1	1	203.208			
Sum Weight:	2673.800	21952.890						OTM	157976.16 9 lb-ft	2349.481		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F lb	w klf	Ctrl. Face
L1	79.600	1563.891	A	1	0.65	0.008	1	1	49.370	294.374	0.015	C
140.000-120.0			B	1	0.65		1	1	49.370			
00			C	1	0.65		1	1	49.370			
L2	523.200	2191.700	A	1	0.65	0.008	1	1	69.116	390.749	0.016	C
120.000-96.00			B	1	0.65		1	1	69.116			
0			C	1	0.65		1	1	69.116			
L3	1051.850	7342.187	A	1	0.65	0.007	1	1	169.464	847.527	0.018	C
96.000-47.750			B	1	0.65		1	1	169.464			
			C	1	0.65		1	1	169.464			
L4	1019.150	10855.112	A	1	0.65	0.006	1	1	203.208	816.831	0.017	C
47.750-1.000			B	1	0.65		1	1	203.208			
			C	1	0.65		1	1	203.208			
Sum Weight:	2673.800	21952.890						OTM	157976.16 9 lb-ft	2349.481		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	21952.890					
Bracing Weight	0.000					
Total Member Self-Weight	21952.890			-69.375	120.161	
Total Weight	32581.810			-69.375	120.161	
Wind 0 deg - No Ice		0.000	-12442.688	-1230579.307	120.161	-46.338
Wind 30 deg - No Ice		6221.344	-10775.684	-1065722.236	-615134.805	-53.506
Wind 60 deg - No Ice		10775.684	-6221.344	-615324.341	-1065532.700	-46.338

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 90 deg - No Ice		12442.688	0.000	-69.375	-1230389.771	-26.753
Wind 120 deg - No Ice		10775.684	6221.344	615185.591	-1065532.700	0.000
Wind 150 deg - No Ice		6221.344	10775.684	1065583.486	-615134.805	26.753
Wind 180 deg - No Ice		0.000	12442.688	1230440.557	120.161	46.338
Wind 210 deg - No Ice		-6221.344	10775.684	1065583.486	615375.127	53.506
Wind 240 deg - No Ice		-10775.684	6221.344	615185.591	1065773.022	46.338
Wind 270 deg - No Ice		-12442.688	0.000	-69.375	1230630.093	26.753
Wind 300 deg - No Ice		-10775.684	-6221.344	-615324.341	1065773.022	0.000
Wind 330 deg - No Ice		-6221.344	-10775.684	-1065722.236	615375.127	-26.753
Member Ice	11699.940					
Total Weight Ice	59438.393			-181.598	314.538	
Wind 0 deg - Ice		0.000	-6192.090	-576341.429	314.538	-28.599
Wind 30 deg - Ice		3096.045	-5362.508	-499150.648	-287765.378	-33.023
Wind 60 deg - Ice		5362.508	-3096.045	-288261.513	-498654.512	-28.599
Wind 90 deg - Ice		6192.090	0.000	-181.598	-575845.293	-16.512
Wind 120 deg - Ice		5362.508	3096.045	287898.317	-498654.512	0.000
Wind 150 deg - Ice		3096.045	5362.508	498787.451	-287765.378	16.512
Wind 180 deg - Ice		0.000	6192.090	575978.232	314.538	28.599
Wind 210 deg - Ice		-3096.045	5362.508	498787.451	288394.453	33.023
Wind 240 deg - Ice		-5362.508	3096.045	287898.317	499283.587	28.599
Wind 270 deg - Ice		-6192.090	0.000	-181.598	576474.368	16.512
Wind 300 deg - Ice		-5362.508	-3096.045	-288261.513	499283.587	0.000
Wind 330 deg - Ice		-3096.045	-5362.508	-499150.648	288394.453	-16.512
Total Weight	32581.810			-69.375	120.161	
Wind 0 deg - Service		0.000	-4839.821	-478699.644	120.161	-18.024
Wind 30 deg - Service		2419.910	-4191.408	-414575.347	-239194.973	-20.812
Wind 60 deg - Service		4191.408	-2419.910	-239384.509	-414385.811	-18.024
Wind 90 deg - Service		4839.821	0.000	-69.375	-478510.108	-10.406
Wind 120 deg - Service		4191.408	2419.910	239245.759	-414385.811	0.000
Wind 150 deg - Service		2419.910	4191.408	414436.597	-239194.973	10.406
Wind 180 deg - Service		0.000	4839.821	478560.894	120.161	18.024
Wind 210 deg - Service		-2419.910	4191.408	414436.597	239435.295	20.812
Wind 240 deg - Service		-4191.408	2419.910	239245.759	414626.133	18.024
Wind 270 deg - Service		-4839.821	0.000	-69.375	478750.430	10.406
Wind 300 deg - Service		-4191.408	-2419.910	-239384.509	414626.133	0.000
Wind 330 deg - Service		-2419.910	-4191.408	-414575.347	239435.295	-10.406

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice

Comb. No.	Description
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	140 - 120	Pole	Max Tension	26	0.000	0.000	0.000
			Max. Compression	26	-15269.640	338.570	195.473
			Max. Mx	20	-6485.401	117020.547	82.552
			Max. My	2	-6485.428	142.985	116959.024
			Max. Vy	20	-6501.820	117020.547	82.552
			Max. Vx	2	-6501.792	142.985	116959.024
			Max. Torque	16			-93.196
L2	120 - 96	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-31895.604	338.570	195.473
			Max. Mx	20	-13530.045	352821.008	84.233
			Max. My	2	-13530.080	145.897	352758.722
			Max. Vy	20	-13219.374	352821.008	84.233
			Max. Vx	2	-13219.338	145.897	352758.722
			Max. Torque	16			-93.189
L3	96 - 47.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-45789.011	338.570	195.473
			Max. Mx	20	-23143.998	1052606.56	86.889

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	2	-23144.012	150.496	1052542.905
			Max. Vy	20	-16525.124	1052606.564	86.889
			Max. Vx	2	-16525.103	150.496	1052542.905
			Max. Torque	16			-93.156
L4	47.75 - 1	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-67024.255	338.570	195.473
			Max. Mx	20	-39088.891	2024921.331	87.788
			Max. My	2	-39088.891	152.053	2024857.066
			Max. Vy	20	-19926.523	2024921.331	87.788
			Max. Vx	2	-19926.522	152.053	2024857.066
			Max. Torque	16			-93.071

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	36	67024.255	6192.104	0.000
	Max. H_x	20	39098.173	19908.304	0.000
	Max. H_z	2	39098.173	0.000	19908.304
	Max. M_x	2	2024857.066	0.000	19908.304
	Max. M_z	8	2024617.225	-19908.304	0.000
	Max. Torsion	4	93.036	-9954.151	17241.095
	Min. Vert	11	29323.629	-17241.095	-9954.151
	Min. H_x	8	39098.173	-19908.304	0.000
	Min. H_z	14	39098.173	0.000	-19908.304
	Min. M_x	14	-2024681.491	0.000	-19908.304
	Min. M_z	20	-2024921.331	19908.304	0.000
	Min. Torsion	16	-93.039	9954.151	-17241.095

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	32581.810	0.000	0.000	-69.375	120.161	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	39098.173	-0.000	-19908.304	-2024857.066	152.042	-80.573
0.9 Dead+1.6 Wind 0 deg - No Ice	29323.629	-0.000	-19908.302	-2010305.141	112.472	-78.868
1.2 Dead+1.6 Wind 30 deg - No Ice	39098.172	9954.151	-17241.095	-1753591.442	-1012233.771	-93.036
0.9 Dead+1.6 Wind 30 deg - No Ice	29323.629	9954.151	-17241.095	-1740984.641	-1005007.990	-91.068
1.2 Dead+1.6 Wind 60 deg - No Ice	39098.172	17241.095	-9954.151	-1012473.591	-1753351.613	-80.575

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.6 Wind 60 deg - No Ice	29323.629	17241.095	-9954.151	-1005185.395	-1740807.230	-78.869
1.2 Dead+1.6 Wind 90 deg - No Ice	39098.173	19908.304	-0.000	-87.781	-2024617.225	-46.519
0.9 Dead+1.6 Wind 90 deg - No Ice	29323.629	19908.302	-0.000	-64.936	-2010127.722	-45.535
1.2 Dead+1.6 Wind 120 deg - No Ice	39098.172	17241.095	9954.151	1012298.025	-1753351.607	0.002
0.9 Dead+1.6 Wind 120 deg - No Ice	29323.629	17241.095	9954.151	1005055.521	-1740807.226	0.001
1.2 Dead+1.6 Wind 150 deg - No Ice	39098.172	9954.151	17241.095	1753415.869	-1012233.766	46.517
0.9 Dead+1.6 Wind 150 deg - No Ice	29323.629	9954.151	17241.095	1740854.763	-1005007.986	45.534
1.2 Dead+1.6 Wind 180 deg - No Ice	39098.173	-0.000	19908.304	2024681.491	152.042	80.573
0.9 Dead+1.6 Wind 180 deg - No Ice	29323.629	-0.000	19908.302	2010175.261	112.472	78.868
1.2 Dead+1.6 Wind 210 deg - No Ice	39098.172	-9954.151	17241.095	1753415.880	1012537.855	93.039
0.9 Dead+1.6 Wind 210 deg - No Ice	29323.629	-9954.151	17241.095	1740854.770	1005232.933	91.069
1.2 Dead+1.6 Wind 240 deg - No Ice	39098.172	-17241.095	9954.151	1012298.035	1753655.708	80.571
0.9 Dead+1.6 Wind 240 deg - No Ice	29323.629	-17241.095	9954.151	1005055.528	1741032.181	78.867
1.2 Dead+1.6 Wind 270 deg - No Ice	39098.173	-19908.304	-0.000	-87.781	2024921.331	46.519
0.9 Dead+1.6 Wind 270 deg - No Ice	29323.629	-19908.302	-0.000	-64.936	2010352.681	45.534
1.2 Dead+1.6 Wind 300 deg - No Ice	39098.172	-17241.095	-9954.151	-1012473.601	1753655.714	0.002
0.9 Dead+1.6 Wind 300 deg - No Ice	29323.629	-17241.095	-9954.151	-1005185.402	1741032.185	0.001
1.2 Dead+1.6 Wind 330 deg - No Ice	39098.172	-9954.151	-17241.095	-1753591.452	1012537.860	-46.520
0.9 Dead+1.6 Wind 330 deg - No Ice	29323.629	-9954.151	-17241.095	-1740984.648	1005232.937	-45.535
1.2 Dead+1.0 Ice+1.0 Temp	67024.255	0.000	0.000	-195.473	338.570	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	67024.255	-0.000	-6192.104	-611539.026	381.823	-33.169
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	67024.255	3096.052	-5362.519	-529637.858	-305277.464	-38.300
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	67024.255	5362.519	-3096.052	-305879.727	-529035.579	-33.169
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	67024.255	6192.104	-0.000	-220.446	-610936.727	-19.150
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	67024.255	5362.519	3096.052	305438.830	-529035.570	0.000
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	67024.255	3096.052	5362.519	529196.950	-305277.454	19.150
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	67024.255	-0.000	6192.104	611098.112	381.823	33.169
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	67024.255	-3096.052	5362.519	529196.967	306041.110	38.300
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	67024.255	-5362.519	3096.052	305438.847	529799.245	33.168
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	67024.255	-6192.104	-0.000	-220.446	611700.412	19.150
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	67024.255	-5362.519	-3096.052	-305879.744	529799.255	0.000

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	67024.255	-3096.052	-5362.519	-529637.875	306041.120	-19.150
Dead+Wind 0 deg - Service	32581.810	-0.000	-4839.821	-490103.015	125.740	-19.360
Dead+Wind 30 deg - Service	32581.810	2419.910	-4191.408	-424451.388	-244889.471	-22.355
Dead+Wind 60 deg - Service	32581.810	4191.408	-2419.910	-245087.806	-424253.052	-19.360
Dead+Wind 90 deg - Service	32581.810	4839.821	-0.000	-72.596	-489904.679	-11.178
Dead+Wind 120 deg - Service	32581.810	4191.408	2419.910	244942.614	-424253.052	0.000
Dead+Wind 150 deg - Service	32581.810	2419.910	4191.408	424306.196	-244889.470	11.178
Dead+Wind 180 deg - Service	32581.810	-0.000	4839.821	489957.823	125.740	19.360
Dead+Wind 210 deg - Service	32581.810	-2419.910	4191.408	424306.196	245140.950	22.355
Dead+Wind 240 deg - Service	32581.810	-4191.408	2419.910	244942.615	424504.532	19.360
Dead+Wind 270 deg - Service	32581.810	-4839.821	-0.000	-72.596	490156.159	11.178
Dead+Wind 300 deg - Service	32581.810	-4191.408	-2419.910	-245087.806	424504.532	0.000
Dead+Wind 330 deg - Service	32581.810	-2419.910	-4191.408	-424451.388	245140.950	-11.178

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.000	-32581.810	0.000	0.000	32581.810	0.000	0.000%
2	0.000	-39098.172	-19908.301	0.000	39098.173	19908.304	0.000%
3	0.000	-29323.629	-19908.301	0.000	29323.629	19908.302	0.000%
4	9954.151	-39098.172	-17241.095	-9954.151	39098.172	17241.095	0.000%
5	9954.151	-29323.629	-17241.095	-9954.151	29323.629	17241.095	0.000%
6	17241.095	-39098.172	-9954.151	-17241.095	39098.172	9954.151	0.000%
7	17241.095	-29323.629	-9954.151	-17241.095	29323.629	9954.151	0.000%
8	19908.301	-39098.172	0.000	-19908.304	39098.173	0.000	0.000%
9	19908.301	-29323.629	0.000	-19908.302	29323.629	0.000	0.000%
10	17241.095	-39098.172	9954.151	-17241.095	39098.172	-9954.151	0.000%
11	17241.095	-29323.629	9954.151	-17241.095	29323.629	-9954.151	0.000%
12	9954.151	-39098.172	17241.095	-9954.151	39098.172	-17241.095	0.000%
13	9954.151	-29323.629	17241.095	-9954.151	29323.629	-17241.095	0.000%
14	0.000	-39098.172	19908.301	0.000	39098.173	-19908.304	0.000%
15	0.000	-29323.629	19908.301	0.000	29323.629	-19908.302	0.000%
16	-9954.151	-39098.172	17241.095	9954.151	39098.172	-17241.095	0.000%
17	-9954.151	-29323.629	17241.095	9954.151	29323.629	-17241.095	0.000%
18	-17241.095	-39098.172	9954.151	17241.095	39098.172	-9954.151	0.000%
19	-17241.095	-29323.629	9954.151	17241.095	29323.629	-9954.151	0.000%
20	-19908.301	-39098.172	0.000	19908.304	39098.173	0.000	0.000%
21	-19908.301	-29323.629	0.000	19908.302	29323.629	0.000	0.000%
22	-17241.095	-39098.172	-9954.151	17241.095	39098.172	9954.151	0.000%
23	-17241.095	-29323.629	-9954.151	17241.095	29323.629	9954.151	0.000%
24	-9954.151	-39098.172	-17241.095	9954.151	39098.172	17241.095	0.000%
25	-9954.151	-29323.629	-17241.095	9954.151	29323.629	17241.095	0.000%
26	0.000	-67024.255	0.000	0.000	67024.255	0.000	0.000%
27	0.000	-67024.255	-6192.090	0.000	67024.255	6192.104	0.000%
28	3096.045	-67024.255	-5362.508	-3096.052	67024.255	5362.519	0.000%
29	5362.508	-67024.255	-3096.045	-5362.519	67024.255	3096.052	0.000%
30	6192.090	-67024.255	0.000	-6192.104	67024.255	0.000	0.000%
31	5362.508	-67024.255	3096.045	-5362.519	67024.255	-3096.052	0.000%
32	3096.045	-67024.255	5362.508	-3096.052	67024.255	-5362.519	0.000%
33	0.000	-67024.255	6192.090	0.000	67024.255	-6192.104	0.000%
34	-3096.045	-67024.255	5362.508	3096.052	67024.255	-5362.519	0.000%
35	-5362.508	-67024.255	3096.045	5362.519	67024.255	-3096.052	0.000%
36	-6192.090	-67024.255	0.000	6192.104	67024.255	0.000	0.000%
37	-5362.508	-67024.255	-3096.045	5362.519	67024.255	3096.052	0.000%
38	-3096.045	-67024.255	-5362.508	3096.052	67024.255	5362.519	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
39	0.000	-32581.810	-4839.821	0.000	32581.810	4839.821	0.000%
40	2419.910	-32581.810	-4191.408	-2419.910	32581.810	4191.408	0.000%
41	4191.408	-32581.810	-2419.910	-4191.408	32581.810	2419.910	0.000%
42	4839.821	-32581.810	0.000	-4839.821	32581.810	0.000	0.000%
43	4191.408	-32581.810	2419.910	-4191.408	32581.810	-2419.910	0.000%
44	2419.910	-32581.810	4191.408	-2419.910	32581.810	-4191.408	0.000%
45	0.000	-32581.810	4839.821	0.000	32581.810	-4839.821	0.000%
46	-2419.910	-32581.810	4191.408	2419.910	32581.810	-4191.408	0.000%
47	-4191.408	-32581.810	2419.910	4191.408	32581.810	-2419.910	0.000%
48	-4839.821	-32581.810	0.000	4839.821	32581.810	0.000	0.000%
49	-4191.408	-32581.810	-2419.910	4191.408	32581.810	2419.910	0.000%
50	-2419.910	-32581.810	-4191.408	2419.910	32581.810	4191.408	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	0.00016283
3	Yes	4	0.00000001	0.00008784
4	Yes	5	0.00000001	0.00031213
5	Yes	5	0.00000001	0.00015056
6	Yes	5	0.00000001	0.00031517
7	Yes	5	0.00000001	0.00015207
8	Yes	4	0.00000001	0.00014838
9	Yes	4	0.00000001	0.00007615
10	Yes	5	0.00000001	0.00031359
11	Yes	5	0.00000001	0.00015130
12	Yes	5	0.00000001	0.00031278
13	Yes	5	0.00000001	0.00015090
14	Yes	4	0.00000001	0.00016280
15	Yes	4	0.00000001	0.00008782
16	Yes	5	0.00000001	0.00031551
17	Yes	5	0.00000001	0.00015222
18	Yes	5	0.00000001	0.00031246
19	Yes	5	0.00000001	0.00015070
20	Yes	4	0.00000001	0.00014843
21	Yes	4	0.00000001	0.00007617
22	Yes	5	0.00000001	0.00031402
23	Yes	5	0.00000001	0.00015146
24	Yes	5	0.00000001	0.00031484
25	Yes	5	0.00000001	0.00015186
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00027439
28	Yes	5	0.00000001	0.00031943
29	Yes	5	0.00000001	0.00031977
30	Yes	5	0.00000001	0.00027376
31	Yes	5	0.00000001	0.00031907
32	Yes	5	0.00000001	0.00031898
33	Yes	5	0.00000001	0.00027394
34	Yes	5	0.00000001	0.00032019
35	Yes	5	0.00000001	0.00031984
36	Yes	5	0.00000001	0.00027455
37	Yes	5	0.00000001	0.00032053
38	Yes	5	0.00000001	0.00032063
39	Yes	4	0.00000001	0.00003022

40	Yes	4	0.00000001	0.00015321
41	Yes	4	0.00000001	0.00015744
42	Yes	4	0.00000001	0.00002993
43	Yes	4	0.00000001	0.00015517
44	Yes	4	0.00000001	0.00015405
45	Yes	4	0.00000001	0.00003020
46	Yes	4	0.00000001	0.00015794
47	Yes	4	0.00000001	0.00015368
48	Yes	4	0.00000001	0.00002997
49	Yes	4	0.00000001	0.00015585
50	Yes	4	0.00000001	0.00015700

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 120	10.529	49	0.640	0.000
L2	120 - 96	7.894	49	0.610	0.000
L3	101.25 - 47.75	5.639	49	0.530	0.000
L4	54.25 - 1	1.582	49	0.272	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.000	C10855721C Platform w/Rail	49	10.529	0.640	0.000	72323
120.000	Platform w/Rail	49	7.894	0.610	0.000	18526

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	140 - 120	43.527	20	2.644	0.001
L2	120 - 96	32.637	20	2.521	0.000
L3	101.25 - 47.75	23.314	20	2.192	0.000
L4	54.25 - 1	6.541	20	1.123	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.000	C10855721C Platform w/Rail	20	43.527	2.644	0.001	17612
120.000	Platform w/Rail	20	32.637	2.521	0.000	4509

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
L1	140 - 120 (1)	TP31.419x27x0.25	20.000	0.000	0.0	24.733	-6485.380	1724110.000	0.004
L2	120 - 96 (2)	TP36.723x31.419x0.25	24.000	0.000	0.0	28.021	-13530.000	1866770.000	0.007
L3	96 - 47.75 (3)	TP46.885x35.063x0.313	53.500	0.000	0.0	44.769	-23144.000	2956030.000	0.008
L4	47.75 - 1 (4)	TP56.59x44.823x0.375	53.250	0.000	0.0	66.910	-39088.898	4349740.000	0.009

Pole Bending Design Data

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		lb-ft	lb-ft		lb-ft	lb-ft	
L1	140 - 120 (1)	TP31.419x27x0.25	117043.333	1104883.333	0.106	0.000	1104883.333	0.000
L2	120 - 96 (2)	TP36.723x31.419x0.25	352844.167	1356591.667	0.260	0.000	1356591.667	0.000
L3	96 - 47.75 (3)	TP46.885x35.063x0.313	1052633.333	2746158.333	0.383	0.000	2746158.333	0.000
L4	47.75 - 1 (4)	TP56.59x44.823x0.375	2024950.000	5034083.333	0.402	0.000	5034083.333	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		lb	lb		lb-ft	lb-ft	
L1	140 - 120 (1)	TP31.419x27x0.25	6502.070	862055.000	0.008	0.000	2215150.000	0.000
L2	120 - 96 (2)	TP36.723x31.419x0.25	13219.500	933386.000	0.014	0.001	2719416.667	0.000
L3	96 - 47.75 (3)	TP46.885x35.063x0.313	16525.100	1478010.000	0.011	0.001	5504775.000	0.000
L4	47.75 - 1 (4)	TP56.59x44.823x0.375	19926.500	2174870.000	0.009	0.002	10090666.667	0.000

Pole Interaction Design Data

Section No.	Elevation	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
	ft								
L1	140 - 120 (1)	0.004	0.106	0.000	0.008	0.000	0.110 ✓	1.000	4.8.2 ✓
L2	120 - 96 (2)	0.007	0.260	0.000	0.014	0.000	0.268 ✓	1.000	4.8.2 ✓

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	96 - 47.75 (3)	0.008	0.383	0.000	0.011	0.000	0.391 ✓	1.000	4.8.2 ✓
L4	47.75 - 1 (4)	0.009	0.402	0.000	0.009	0.000	0.411 ✓	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	140 - 120	Pole	TP31.419x27x0.25	1	-6485.380	1724110.000	11.0	Pass
L2	120 - 96	Pole	TP36.723x31.419x0.25	2	-13530.000	1866770.000	26.8	Pass
L3	96 - 47.75	Pole	TP46.885x35.063x0.313	3	-23144.000	2956030.000	39.1	Pass
L4	47.75 - 1	Pole	TP56.59x44.823x0.375	4	-39088.898	4349740.000	41.1	Pass
							Summary	
						Pole (L4)	41.1	Pass
						RATING =	**41.1**	**Pass**

Site Number:	**28493**
Site Name:	**Bethel West 2**
Job Number:	**REV03**
Engineer:	**CRB**
Date:	**9/2/2020**

Base Plate and Bolt Analysis

Moment:	2024.9	k-ft
Shear/Leg:	19.9	k
Compression/Leg:	39.1	k

TIA-222 Code Revision:	G		Anchor Bolts		
Anchor Bolt Arrangement:	Round		Anchor Bolt Yield Strength:	75	ksi
Monopole Shaft Diameter (Across Flats):	56.6	in	Anchor Bolt Ultimate Strength:	100	ksi
Lower Monopole Thickness:	0.375	in	Anchor Bolt Diameter:	2.25	in
# of Sides of Pole:	18		Anchor Bolt Circle:	63.25	in
Monopole Shaft Yield Strength:	65	ksi	# of Anchor Bolts:	16	
Baseplate Diameter / Length:	69.00		Minimum Anchor Bolt Separation:	6.00	in
Base Plate Thickness:	2.25	in	Additional Anchor Bolts Installed:	N	
Base Plate Yield Strength:	50	ksi			
Baseplate Detail Type:	D				
Include Plate Thickness Beyond Bolt Circle:	Y				
Stress Increase:	1.00				
Fillet Weld Size:	0.375	in			
Weld Type (CJP or F/F):	CJP				
Weld Strength:	70	ksi			

	Baseplate Flexural Capacity					Baseplate Shear Capacity			
Failure Mode:	Effective Width (in)	Moment (k-in)	S/Z (in^{-})	Capacity (k-in)	Usage	Shear (k)	Area (in^{-})	Capacity (k)	Usage
AA	32.75	496.0	41.5	1865.3	0.27	280.7	73.7	1989.6	0.14
AB	40.66	929.2	51.5	2315.6	0.40	280.7	91.5	2469.9	0.11
BA	30.93	373.4	39.1	1761.6	0.21	280.7	69.6	1879.0	0.15
BB	37.05	755.1	46.9	2110.0	0.36	280.7	83.4	2250.7	0.12

Anchor Bolt Capacity

Area of Bolt:	3.25	in^2	
Inertia of Bolt:	0.84	in^4	
Total Bolt Inertia:	25998.5	in^4	
Maximum Bolt Tension:	93.5	k	
Maximum Bolt Compression:	98.4	k	
Bolt Shear:	1.2	k	
Tensile Bolt Capacity:	259.8	k	
Compressive Bolt Capacity:	259.8	k	
Shear Bolt Capacity:	140.3	k	
Interaction Equation:	0.39	Result:	
		OK	

Base Weld Capacity

Force / Weld:	7.7	k/in	
Weld Capacity:	26.6	k/in	
Interaction Equation:	0.29	Result:	
		OK	
SES Base Plate Design Moment:	327.8	k-in	
Design Stress:	23.3	ksi	
SES Base Plate Allowable Stress / Moment Capacity:	632.8	ksi / k-in	
Usage:	0.52		
Moment Factor:	2.83		
Length Factor:	3.66		

Site Number:	**28493**
Site Name:	**Bethel West 2**
Job Number:	**REV03**
Engineer:	**CRB**
Date:	**9/2/2020**

Flange @ 120'

Moment:	117.0 k-ft
Shear/Leg:	6.5 k
Compression/Leg:	6.5 k

TIA-222 Code Revision:	G
Anchor Bolt Arrangement:	Round
Monopole Shaft Diameter (Across Flats):	31.4 in
Lower Monopole Thickness:	0.250 in
# of Sides of Pole:	18
Monopole Shaft Yield Strength:	65 ksi
Baseplate Diameter / Length:	37.50
Base Plate Thickness:	1.50 in
Base Plate Yield Strength:	50 ksi
Baseplate Detail Type:	D
Include Plate Thickness Beyond Bolt Circle:	Y
Stress Increase:	1.00
Fillet Weld Size:	0.375 in
Weld Type (CJP or F/F):	CJP
Weld Strength:	70 ksi

Anchor Bolts

Anchor Bolt Yield Strength:	92 ksi
Anchor Bolt Ultimate Strength:	120 ksi
Anchor Bolt Diameter:	1.00 in
Anchor Bolt Circle:	35.00 in
# of Anchor Bolts:	6
Minimum Anchor Bolt Separation:	2.67 in
Additional Anchor Bolts Installed:	N

	Baseplate Flexural Capacity					Baseplate Shear Capacity			
Failure Mode:	Effective Width (in)	Moment (k-in)	S/Z (in^3)	Capacity (k-in)	Usage	Shear (k)	Area (in^2)	Capacity (k)	Usage
AA	18.42	49.8	10.4	466.3	0.11	27.8	27.6	746.0	0.04
AB	13.61	49.8	7.7	344.4	0.14	27.8	20.4	551.1	0.05
BA	17.39	43.1	9.8	440.2	0.10	27.8	26.1	704.3	0.04
BB	10.55	43.1	5.9	267.1	0.16	27.8	15.8	427.3	0.07

Anchor Bolt Capacity

Area of Bolt:	0.61 in^2
Inertia of Bolt:	0.03 in^4
Total Bolt Inertia:	556.7 in^4
Maximum Bolt Tension:	25.7 k
Maximum Bolt Compression:	27.8 k
Bolt Shear:	1.1 k
Tensile Bolt Capacity:	58.2 k
Compressive Bolt Capacity:	58.2 k
Shear Bolt Capacity:	26.2 k
Interaction Equation:	0.52 Result: OK

Base Weld Capacity

Force / Weld:	1.4 k/in
Weld Capacity:	21.9 k/in
Interaction Equation:	0.07 Result: OK

SES Base Plate Design Moment:	49.8 k-in
Design Stress:	5.4 ksi
SES Base Plate Allowable Stress / Moment Capacity:	416.4 ksi / k-in
Usage:	0.12
Moment Factor:	0.86
Length Factor:	0.64

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Project

Tower Foundation
Structural Analysis Report

Bethel W 2

15 Great Pasture Road
Danbury, CT

Centek Project No. 14216.00

Prepared For

Verizon Wireless
99 East River Road
East Hartford, CT 06108

Attn: Joseph McCarty
CC: Scott Kisting, Shirley Rock

Prepared By

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March 12, 2020

TABLE OF CONTENTS

1.00 EXECUTIVE SUMMARY

1.01 INTRODUCTION

This report was prepared on behalf of our client, Verizon Wireless, for the purpose of verifying the structural adequacy of the existing (As-Built) micropile supported tower mat foundation.

The tower foundation was originally designed by Centek in 2017. Upon re-analysis of the foundation by Thomas Taylor of Semaan engineering, a design deficiency in the micropiles was discovered. The deficiency identified consists of an overload condition of the inner (4) piles. Due to the placement of the aforementioned piles they receive the full tower axial load, the weight of the thickened portion of the mat and the associated mat weight. This combined loading exceeds the micro-plie allowable capacity.

Our reanalysis assumes the subject (4) inner micropiles to be failed and re-evaluates the system with the reinforced concrete mat supported by the remaining (40) micropiles. The reinforced concrete mat was conservatively analyzed as a one-way slab for its ability to span to the middle row of piles (31'-4"). The max pile loading was recalculated and compared to the as-built micropile capacity.

1.02 REFERENCE MATERIALS

The following documents were referenced in the structural analysis of the tower foundation:

- Monopole Tower Design Report prepared by Sabre Industries project no. 16-7133-SCB dated 7/13/16.
- Foundation Design Drawings prepared by Centek Engineering, Inc. project no. 14216.00 dated 5/3/17 Rev.2.
- Geotechnical Report prepared by Design Earth Technology project no. 2015.13, dated 2/19/16.
- Drilled Micropile Design submittal prepared by Helical Drilling Inc. dated 3/21/17.
- Grout Compression Tests prepared by Materials Testing, Inc. S-1000A, S-1001A and S-1002A dated 5/3/17.
- 2015 International Building Code (Section 1810 Deep Foundations)
- ACI 318-14 "Building Code Requirements for Structural Concrete"

1.03 FOUNDATION ANALYSIS RESULTS

A structural check was made of the tower foundation. Calculations are provided in Section 2.00 of this report. Refer to the following tables for a summary of the analysis results:

i. **Table 1**

Component Capacity Check			
Component	**Type**	**Stress Ratio**	**Result**
Reinforced Concrete Mat	Bending	77.4%	**PASS**
	Shear	72.3%	**PASS**
Micropile	Compression	87.9%	**PASS**
	Rock Socket	99.2%	**PASS**

1.04 CONCLUSION

This analysis finds the micropile supported tower foundation in the as-built condition to be structurally adequate to accommodate the tower reactions from the Monopole Tower Design Report prepared by Sabre Industries project no. 16-7133-SCB dated 7/13/16 Sabre.

As discussed with Scott Kisting consultant to Verizon Wireless, the maintenance and condition assessment program that Verizon has in place would identify potential issues with the foundation should they present.

The analysis is based, in part, on the original foundation design documents, Helical micropile design documents and the tower installation field inspection documents, including material testing reports. The field inspection documents compiled during construction of the subject foundation alleviate any concerns with potential installation errors.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

STATE OF CONNECTICUT
CARLO F. CENTORE
No. 16694
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Timothy J. Lynn, PE
Structural Engineer

Section 2.0

Calculations

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Branford, CT 06405 F: (203) 488-8587

JOB BETHEL WEST 2
SHEET NO. _____ OF _____
CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

MICRO PILE CAPACITY

- **CHECK CASED PORTION**

AREA OF STEEL PIPE $= \frac{1}{4}\pi\left[(5.5)^2 - \left(5.5 - (2)(0.361)\right)^2\right] = 5.83\ in^2$

ALLOWABLE COMPRESSION STRESS = $0.4F_y \leq 32{,}000$ (IBC 1810.3.2.6)
$0.4(80) = 32$ ksi

$P_{ALL} = (5.83\ in^2)(32\ ksi) = 186.6^k$ * ADDITIONAL STRENGTH PROVIDED BY GROUT/REBAR

- **CHECK UNCASED PORTION**

AREA OF REBAR = $1.27\ in^2$ (#10 BAR)

ALLOWABLE COMP STRESS = $0.5F_y \leq 32{,}000$ (IBC 1810.3.2.6)
$0.5(75) = 37.5$ ksi

AREA OF GROUT = $\frac{1}{4}\pi(4)^2 - 1.27\ in^2 = 11.3\ in^2$

ALLOWABLE COMP STRESS = $0.33f'_c$ (IBC 1810.3.2.6)
$= (0.33)(7210\ psi)$
$= 2379\ psi$

$P_{ALL_{COMP}} = (1.27\ in^2)(32\ ksi) + (11.3\ in^2)(2.38\ ksi) = 67.5^k$

- **CHECK END BEARING / GROUT BOND (Rock Socket)**

ALLOWABLE BOND LOAD = $\pi(4")(5'\times 12)(75\ psi) = 56.5^k$

ALLOWABLE END BEARING = $\frac{1}{4}\pi(5.5")^2\left(10\ tons/ft^2\right)\left(\frac{2000}{144}\right) = 3.3^k$

$P_{ALL_{TS}} = 56.5^k + 3.3^k = 59.8^k$ ← CONTROLS

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UNFACTORED TOWER BASE REACTIONS

SHEAR = 36^k
AXIAL = 47.6^k
MOMENT = 3941 k-ft

FROM SABRE TOWER DESIGN CALCS, TIA-222-F LOADING

WEIGHT OF CONCRETE

PIER = $(8')^2(1')(0.15\text{-kcf}) = 9.6^k$

THICKED HAUNCH = $\frac{1}{2}(4.5')\left[(8')^2 + (17')^2 + \sqrt{(8')(17')}\right](0.15) = 110^k$

TRIB AREA MAT INNER (16) PILES = $(39.15')^2 = 1533\ ft^2$

WEIGHT MAT INNER (16) = $(1533\ ft^2)(2.25')(0.15) = 517.5^k$

TRIB AREA MAT OUTER (24) = $(50')^2 - 1533 = 967\ ft^2$

WEIGHT MAT OUTER (24) = $(967\ ft^2)(2.25')(0.15) = 326.5^k$

$P_{CONC.\ (INNER)} = (9.6^k + 110^k + 517.5^k)/16 = 39.8^k$ ←

$P_{CONC.\ (OUTER)} = 326.5^k/24 = 13.6^k$ ←

LOADS FROM TOWER

PILE POLAR MOMENT OF INERTIA

$I_P = (23.5')^2(14) + (15.67')^2(14) + (7.83')^2(8) = 11660\ ft^2$

$M_{OT} = (36^k)(3.5') + 3941^{k\text{-}ft} = 4067\ k\text{-}ft$

$P_{TOWER\ (INNER)} = \frac{4067\ k\text{-}ft\,(15.67')}{11660\ ft^2} + \frac{47.6^k}{16} = 8.5^k$ ←

$P_{TOWER\ (OUTER)} = \frac{4067\ k\text{-}ft\,(23.5')}{11660\ ft^2} = 8.2^k$ ←

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EQUIPMENT DEAD LOAD

17,000 # TOT. / 4 = 4,250 # (COMMSCOPE VZWA-9-4x16-6LSP-3)

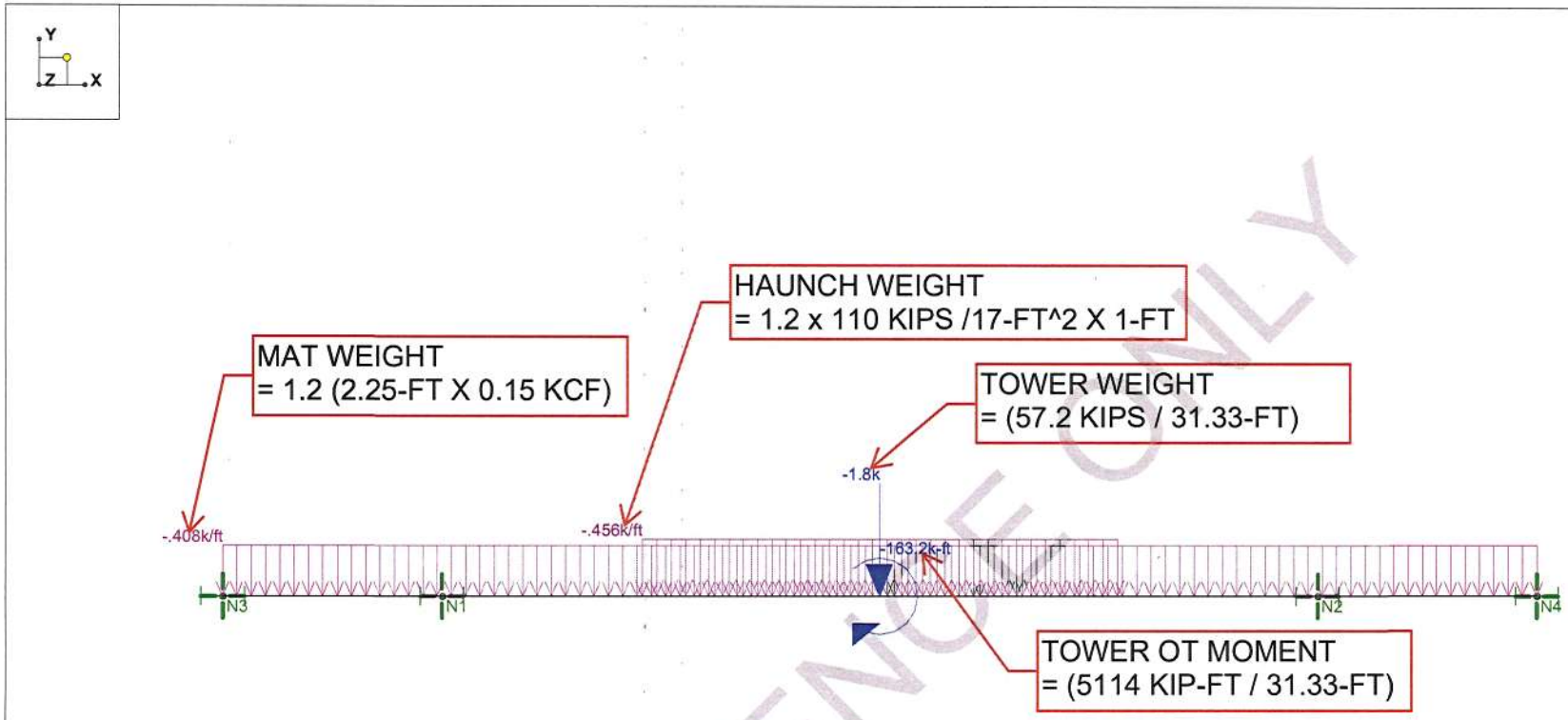
TOTAL LOADS ON PILES

$P_{TOT\ (INNER)} = 39.8^{K} + 8.5^{K} + 4.3^{K} + 6.7^{K} = 59.3^{K} < 59.8\ (OK)$

$P_{TOT\ (OUTTER)} = 13.6^{K} + 8.2^{K} + 4.3^{K} + 6.7^{K} = 32.8^{K} < 59.8\ (OK)$

$$\frac{P_{TOT}}{P_{ALL\ COMP}} = \frac{59.3^{K}}{59.8^{K}} = 99.2\%$$

$$\frac{P_{TOT}}{P_{ALL\ RS}} = \frac{59.3^{K}}{67.5^{K}} = 87.9\%$$



Loads: LC 4, IBC 16-4 (a)
Envelope Only Solution

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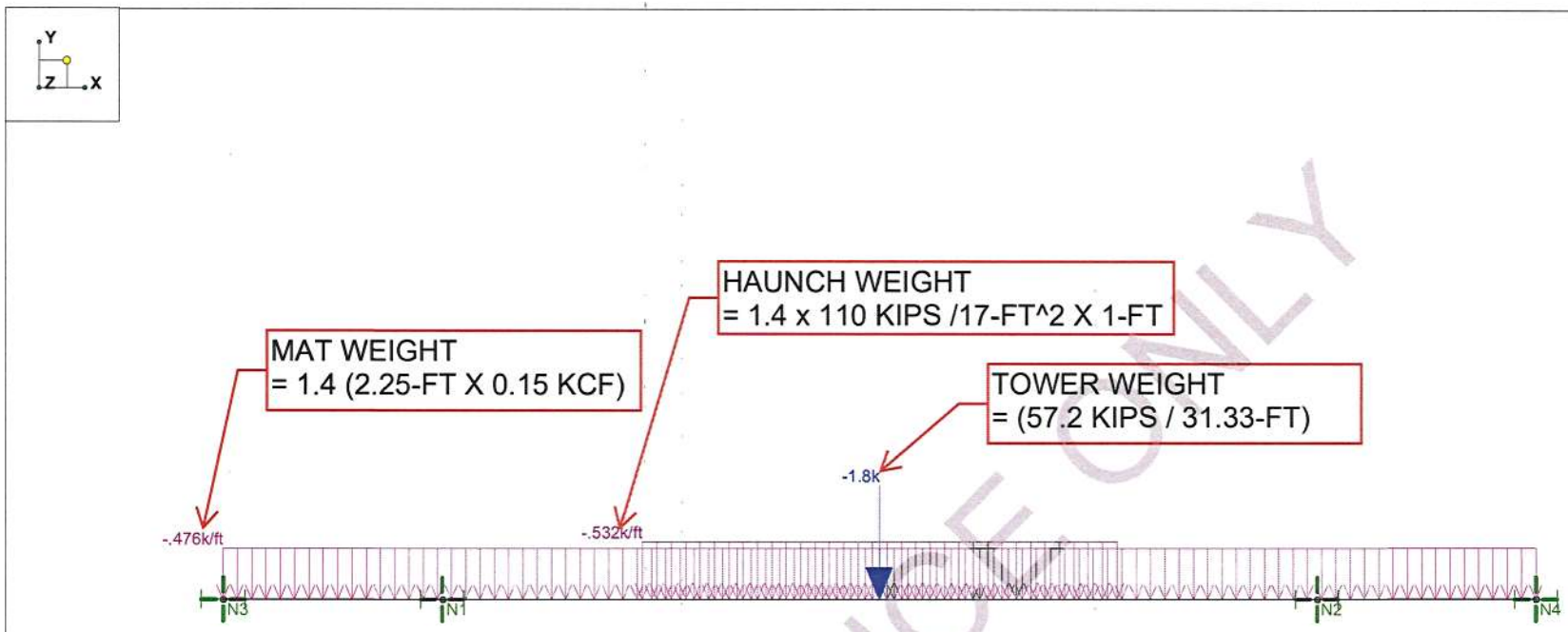

Loads: LC 1, IBC 16-1
Envelope Only Solution

		SK - 1
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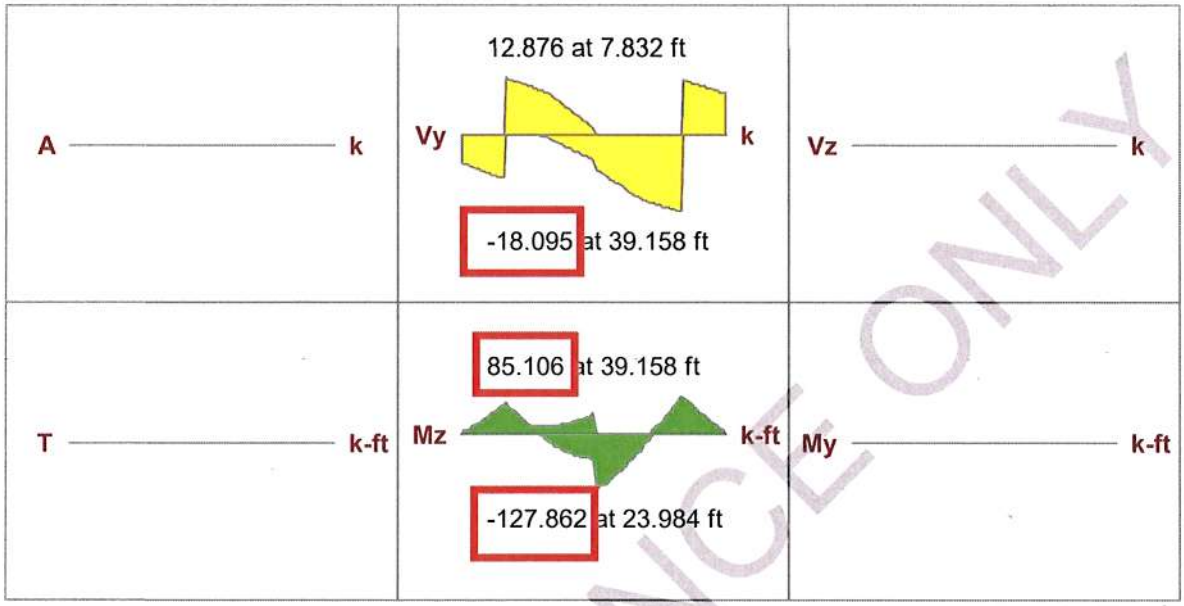
		12-in Strip.r3d

Beam: ***M1***

Shape: **CRECT24X12**
Material: **Conc4000NW**
Length: **46.99 ft**
I Joint: **N3**
J Joint: **N4**

Concrete Stress Block: **Rectangular**

Code Check: **No Calc**
Report Based On 97 Sections



No Calc

- Concrete code check not calculated -

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	Section				Sheet no./rev. 1	
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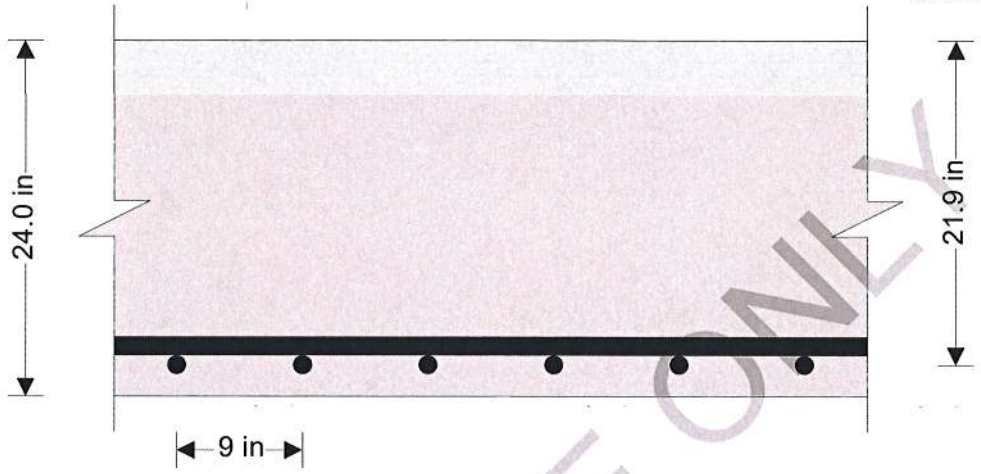
RC ONE-WAY SLAB DESIGN (ACI318-11)

Tedds calculation version 1.1.04



Slab definition

Slab type	**One-way continuous**
Overall thickness of slab	h = **24.000** in
Clear shorter span of slab	l_n = **31.33** ft
Clear cover to tension reinforcement	c_c = **1.50** in

Materials

Specified compressive strength of concrete	f'_c = **4000** psi
Specified yield strength of reinforcement	f_y = **60000** psi
Modulus of elasticity	E_{SACI} = **29000000** psi
Concrete modification factor	λ = **1.00**

Maximum design moment and shear in span(per 12 in width of slab)

Maximum ultimate positive moment	M_{us} = **128.000** kip_ft/ft
Maximum ultimate shear force	V_u = **18.000** kips/ft

Reinforcement calculation - positive moments

Tension steel provided	**No. 10 @ 8.5 in o.c.**
Depth to tension steel	d = (h – c_c – D / 2) = **21.87** in
Stress block depth factor	β_1 = 0.85
Reinforcement ratio at strain of 0.004	$\rho^b = 0.85 \times \beta_1 \times f'_c / f_y \times (0.003 / (0.003 + 0.004))$ = **0.021**
Maximum reinforcement ratio	$\rho^{max} = \rho^b$ = **0.021**
Maximum area of tension steel	$A_{s\_max} = \rho^{max} \times d$ = **5.416** in²/ft
Min ratio of transverse reinforcement (cl. 7.12.2.1)	ρ^t =**0.0018**
Min area tension steel req'd (cl. 10.5.4 & 7.12.2.1)	$A_{s\_min} = \rho^t \times h$ = **0.518** in²/ft
Area of tension steel provided	A_{s_prov} = **1.788** in²/ft

PASS - Area of steel provided - OK

Steel stress (cl. 10.6.4)	$f_s = 2/3 \times f_y$ = **40000** psi
Max allowable spacing (cl. 10.5.4 & 10.6.4)	s_{max} = min(3×h, 18in, 15in×(40000 psi/f_s) – 2.5×c_c, 12in×(40000 psi/f_s))

	s_{max} = **11.250** in
Actual tensile bar spacing provided	s = **8.500** in

PASS - Spacing of bars (+ve moment steel) less than maximum allowable

Check for section - positive moments

Depth of equivalent rectangular stress block	$a = (A_{s\_prov} \times f_y) / (0.85 \times f'_c)$ = **2.63** in
Depth of neutral axis	$c = a / \beta^1$ = **3.094** in
Net tensile strain in long. steel at nominal strength	$\varepsilon^t = 0.003 \times [(d - c) / c]$ = **0.0182**

Section is tension controlled, design OK

Strength reduction factor	ϕ = 0.9
Revised required nominal flexural strength	$M_{ns} = M_{us} / \phi$ = **142.222** kip_ft/ft
Actual nominal flexural strength	$M_{ns\_prov} = A_{s\_prov} \times f_y \times (d - a / 2)$ = **183.756** kip_ft/ft

PASS - Actual flexural strength exceeds required nominal flexural strength

Transverse reinforcement - (for shrinkage and temperature)

Transverse reinforcement provided	**No. 10 @ 8.5 in o.c.**
Area of reinforcement provided	A_{t_prov} = **1.788** in^2/ft
Min ratio of transverse reinforcement (cl. 7.12.2.1)	ρ^t =**0.0018**
Minimum area of transverse reinforcement required	$A_{t\_req} = \rho^t \times h$ = **0.518** in^2/ft

PASS - Area of transverse steel provided OK

Maximum allowable spacing of bars	s_{max_t} = min (5 × h, 18 in) = **18.000** in
Actual transverse bar spacing provided	s_t = **8.500** in

PASS - Spacing of transverse bars is less than allowable

Check for shear

Nominal shear strength required	$V_n = abs(V_u) / 0.75$ = **24.000** kips/ft
Shear strength provided by concrete	$V_c = 2 \times \lambda \times \sqrt{(f'_c \times 1\ psi)} \times d$ = **33.189** kips/ft
Shear strength provided by shear steel (assumed)	V_s = 0 kips/ft
Shear capacity of section	$V = V_c + V_s$ = **33.189** kips/ft

PASS - One-way shear capacity

Check of clear cover (ACI 7.7.1)

Permissible min nominal cover to all reinforcement	c_{min} = 0.75 in
Clear cover to tension reinforcement (+ve mnt)	$c_c = h - d - D/2$ = **1.500** in

PASS - Cover to steel resisting positive moment exceeds allowable minimum cover

Deflection

Support condition	**Both ends continuous**
Basic span-to-thickness ratio (Table 9.5(a))	$ratio_{basic}$ = **28**
Type of concrete	**Normal weight**
Concrete density factor (Table 9.5(a))	$f_{density}$ = **1.00**
Allowable span-to-thickness ratio	$ratio_{allow} = ratio_{basic} / (f_{density} \times (0.4 + f_y / 100000\ psi))$ = **28.000**
Actual span-to-thickness ratio	$ratio_{actual} = l_n / h$ = **15.665**

PASS - The slab thickness is adequate to control deflection

Design summary

Slab is 24.0 in thick in 4000 psi concrete

Tension steel provided - positive moment, No. 10 @ 8.5 in o.c. in 60000 psi steel

Transverse steel provided , No. 10 @ 8.5 in o.c. in 60000 psi steel

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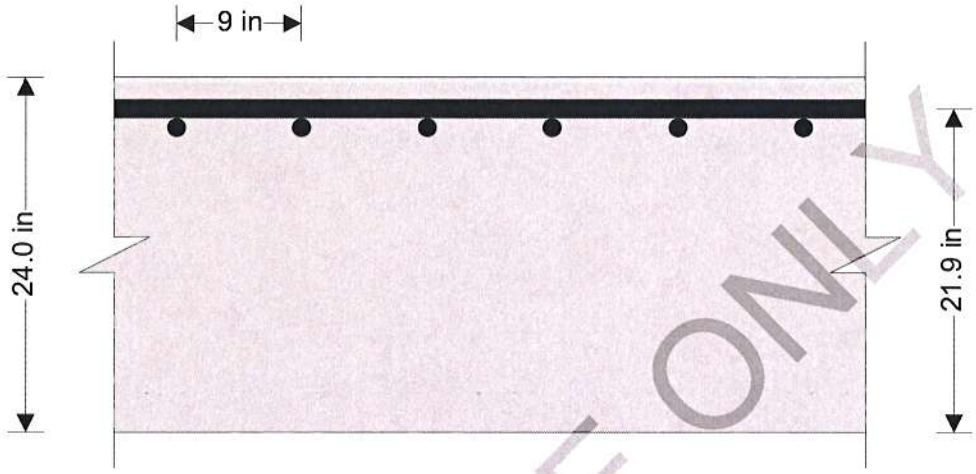
	Section				Sheet no./rev. 1	
	Calc. by T	Date 3/11/2020	Chk'd by	Date	App'd by	Date

RC ONE-WAY SLAB DESIGN (ACI318-11)

Tedds calculation version 1.1.04



Slab definition

Slab type	**One-way continuous**
Overall thickness of slab	h = **24.00** in
Clear shorter span of slab	l_n = **31.33** ft
Clear cover to tension reinforcement	c_{c_hog} = **1.50** in

Materials

Specified compressive strength of concrete	f'_c = **4000** psi
Specified yield strength of reinforcement	f_y = **60000** psi
Modulus of elasticity	E_{SACI} = **29000000** psi
Concrete modification factor	λ = **1.00**

Maximum design moment and shear in span(per 12 in width of slab)

Maximum ultimate negative moment	M_{uh} = **86.000** kip_ft/ft
Maximum ultimate shear force	V_u = **18.000** kips/ft

Reinforcement calculations - negative moment

Tension steel provided	**No. 10 @ 8.5 in o.c.**
Depth to tension steel	$d_{hog} = (h - c_{c\_hog} - D_{hog} / 2)$ = **21.87** in
Stress block depth factor	β^1 = 0.85
Reinforcement ratio at strain of 0.004	$\rho^b = 0.85 \times \beta^1 \times f'_c / f_y \times (0.003 / (0.003 + 0.004))$ = **0.021**
Maximum reinforcement ratio	$\rho^{max} = \rho^b$ = **0.021**
Maximum area of tension steel	$A_{s\_max\_hog} = \rho^{max} \times d_{hog}$ = **5.416** in²/ft
Min ratio of transverse reinforcement (cl. 7.12.2.1)	ρ^t =**0.0018**
Min area tension steel req'd (cl. 10.5.4 & 7.12.2.1)	$A_{s\_min\_hog} = \rho^t \times h$ = **0.518** in²/ft
Area of tension steel provided	$A_{s\_prov\_hog}$ = **1.788** in²/ft
	PASS - Area of steel provided - OK
Steel stress (cl. 10.6.4)	$f_s = 2/3 \times f_y$ = **40000** psi
Max allowable spacing (cl. 10.5.4 & 10.6.4)	$s_{max} = \min(3\times h, 18in, 15in \times (40000\ psi/f_s) - 2.5 \times c_{c\_hog}, 12in \times (40000psi/f_s))$

	s_{max} = **11.250** in
Actual tensile bar spacing provided	s_{hog} = **8.500** in
	PASS - Spacing of bars (-ve mnt) less than maximum allowable

Check for section - negative moment

Depth of equivalent rectangular stress block	$a_{hog} = (A_{s\_prov\_hog} \times f_y) / (0.85 \times f'_c)$ = **2.63** in
Depth of neutral axis	$c_{hog} = a_{hog} / \beta_1$ = **3.094** in
Net tensile strain in long. steel at nominal strength	$\varepsilon t_{\_hog} = 0.003 \times [(d_{hog} - c_{hog}) / c_{hog}]$ = **0.0182**
	Section is tension controlled, Design OK
Strength reduction factor	ϕ_{hog} = 0.9
Revised required nominal flexural strength	$M_{nh} = M_{uh} / \phi_{hog}$ = **95.556** kip_ft/ft
Actual nominal flexural strength	$M_{nh\_prov} = A_{s\_prov\_hog} \times f_y \times (d_{hog} - a_{hog} / 2)$ = **183.756** kip_ft/ft
	PASS - Actual flexural strength exceeds required nominal flexural strength

Transverse reinforcement - (for shrinkage and temperature)

Transverse reinforcement provided	**No. 10 @ 8.5 in o.c.**
Area of reinforcement provided	A_{t_prov} = **1.788** in^2/ft
Min ratio of transverse reinforcement (cl. 7.12.2.1)	ρ^t =**0.0018**
Minimum area of transverse reinforcement required	$A_{t\_req} = \rho^t \times h$ = **0.518** in^2/ft
	PASS - Area of transverse steel provided OK
Maximum allowable spacing of bars	s_{max_t} = min (5 × h, 18 in) = **18.000** in
Actual transverse bar spacing provided	s_t = **8.500** in
	PASS - Spacing of transverse bars is less than allowable

Check for shear

Nominal shear strength required	V_n = abs(V_u) / 0.75 = **24.000** kips/ft
Shear strength provided by concrete	$V_c = 2 \times \lambda \times \sqrt{(f'_c \times 1\ psi)} \times d_{hog}$ = **33.189** kips/ft
Shear strength provided by shear steel (assumed)	V_s = 0 kips/ft
Shear capacity of section	$V = V_c + V_s$ = **33.189** kips/ft
	PASS - One-way shear capacity

Check of clear cover (ACI 7.7.1)

Permissible min nominal cover to all reinforcement	c_{min} = 0.75 in
Clear cover to tension reinforcement (-ve mnt)	$c_{c\_hog} = h - d_{hog} - D_{hog}/2$ = **1.500** in
	PASS - Cover to steel resisting negative moment exceeds allowable minimum cover

Deflection

Support condition	**Both ends continuous**
Basic span-to-thickness ratio (Table 9.5(a))	$ratio_{basic}$ = **28**
Type of concrete	**Normal weight**
Concrete density factor (Table 9.5(a))	$f_{density}$ = **1.00**
Allowable span-to-thickness ratio	$ratio_{allow} = ratio_{basic} / (f_{density} \times (0.4 + f_y / 100000\ psi))$ = **28.000**
Actual span-to-thickness ratio	$ratio_{actual} = l_n / h$ = **15.665**
	PASS - The slab thickness is adequate to control deflection

Design summary

Slab is 24.0 in thick in 4000 psi concrete

Tension steel provided - negative moment, No. 10 @ 8.5 in o.c. in 60000 psi steel

Transverse steel provided , No. 10 @ 8.5 in o.c. in 60000 psi steel

CENTEK engineering

Section 3.0

Supporting Documentation

Sabre Industries™
Towers and Poles

Structural Design Report

120' Extendible to 140' Monopole
Site: Bethel W2, CT
Site Number: 5-0157

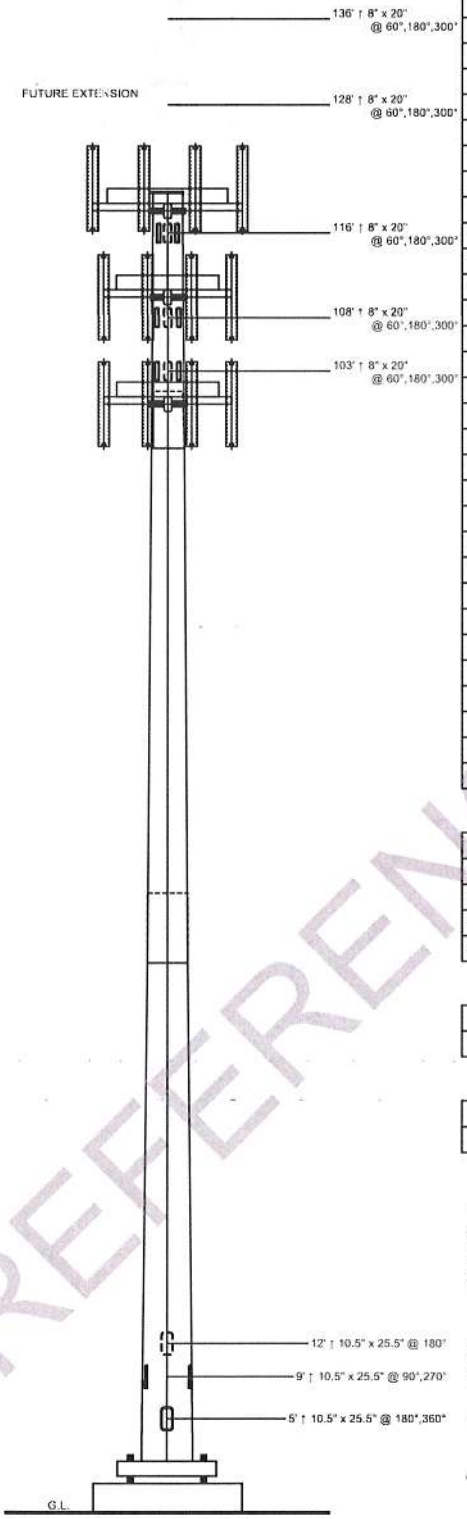
Prepared for: VERIZON WIRELESS
by: Sabre Towers & Poles ™

Job Number: 16-7133-SCB

July 13, 2016

7/13/16

Length (ft)	53' - 3"	53' - 6"	24' - 0"	20' - 0"
Number Of Sides		18		
Thickness (in)	3/8"	5/16"	1/4"	
Lap Splice (ft)		6' - 6"	5' - 3"	
Top Diameter (in)	44.83"	35.06"	31.42"	27"
Bottom Diameter (in)	56.59"	46.89"	36.72"	31.42"
Taper (in/ft)		0.221		
Grade		A572-65		
Weight (lbs)	13314	7793	3148	2331
Overall Steel Height (ft)		119		20 (Extension)



Designed Appurtenance Loading

Elev	Description	Tx-Line
140***	(3) 800 10510	(3) 1 5/8"
140***	(18) TMA	
140***	(2) DB-B1-6C-12AB-0Z	(2) DC/Fiber Trunks
140***	(12) RRH2x40-AWS	
140***	(9) 800 10766	(9) 1 5/8"
138***	L.P. Platform (Monopole Only) - 12' w/ Handrail	
130***	L.P. Platform (Monopole Only) - 12' w/ Handrail	
130***	(12) RRH2x40-AWS	
130***	(18) TMA	
130***	(3) 800 10510	(3) 1 5/8"
130***	(9) 800 10766	(9) 1 5/8"
130***	(2) DB-B1-6C-12AB-0Z	(2) DC/Fiber Trunks
120	(6) HBX-6517DS-VTM	(9) 1 5/8"
120	(3) RRH2x60-AWS	
120	(3) RRH2x60-1900A-4R	
120	(2) DB-B1-6C-12AB-0Z	(2) DC/Fiber Trunks
120	(6) 800 10766	(9) 1 5/8"
120	(3) RRH2x60-700	
118	L.P. Platform (Monopole Only) - 14' w/ Handrail	
110	L.P. Platform (Monopole Only) - 12' w/ Handrail	
110	(12) RRH2x40-AWS	
110	(18) TMA	
110	(3) 800 10510	(3) 1 5/8"
110	(9) 800 10766	(9) 1 5/8"
110	(2) DB-B1-6C-12AB-0Z	(2) DC/Fiber Trunks
100	L.P. Platform (Monopole Only) - 12' w/ Handrail	
100	(12) RRH2x40-AWS	
100	(18) TMA	
100	(3) 800 10510	(3) 1 5/8"
100	(9) 800 10766	(9) 1 5/8"
100	(2) DB-B1-6C-12AB-0Z	(2) DC/Fiber Trunks

Load Case Reactions

Description	Axial (kips)	Shear (kips)	Moment (ft-k)	Deflection (ft)	Sway (deg)
3s Gusted Wind	57.21	45.89	4952.27	9.02	6.45
3s Gusted Wind 0.9 Dead	42.95	45.76	4867.79	8.82	6.3
3s Gusted Wind&Ice	81.12	14.08	1566.09	2.91	2.07
Service Loads	47.65	9.22	988.59	1.81	1.29

Base Plate Dimensions

Shape	Diameter	Thickness	Bolt Circle	Bolt Qty	Bolt Diameter
Round	69"	2.25"	63.25"	16	2.25"

Anchor Bolt Dimensions

Length	Diameter	Hole Diameter	Weight	Type	Finish
84"	2.25"	2.625"	1937.6	A615-75	Galv-18"

Notes

1) Antenna Feed Lines Run Inside Pole
2) All dimensions are above ground level, unless otherwise specified.
3) Weights shown are estimates. Final weights may vary.
4) The Monopole was designed for a basic wind speed of 100 mph with 0" of radial ice, and 50 mph with 3/4" of radial ice, in accordance with ANSI/TIA-222-G, Structure Class II, Exposure Category C, Topographic Category 1.
5) Full Height Step Bolts
6) The Monopole was designed for a basic wind speed of 85 mph with 1/2" radial ice with reduction, in accordance with EIA/TIA-222-F.
7) ANSI/TIA-222-G load case reactions are shown in the table above. EIA/TIA -222-F load case reactions can be found in the calcuations toward the end of this design report.

*** These Appurtenances cannot be installed until the Monopole has been extended.

Sabre Industries
Towers and Poles

Sabre Communications Corporation
7101 Southbridge Drive
P.O. Box 658
Sioux City, IA 51102-0658
Phone: (712) 258-6690
Fax: (712) 279-0814

Job:	**16-7133-SCB**
Customer:	VERIZON WIRELESS
Site Name:	Bethel W2, CT 5-0157
Description:	120' ext. 140' Monopole
Date:	7/13/2016 By: REB

	0.02	0.54	0.55	180.0	0.04	0.00	0.04	90.0
95.00								
	0.02	0.55	0.57	180.0	0.04	0.00	0.04	90.0
	0.02	0.74	0.75	180.0	0.04	0.00	0.04	90.0
81.08								
	0.02	0.74	0.75	180.0	0.04	0.00	0.04	90.0
	0.02	0.87	0.89	180.0	0.03	0.00	0.03	90.0
67.17								
	0.02	0.87	0.89	180.0	0.03	0.00	0.03	90.0
	0.02	0.97	0.98	180.0	0.03	0.00	0.03	90.0
53.25								
	0.01	0.81	0.82	180.0	0.03	0.00	0.03	90.0
	0.01	0.84	0.85	180.0	0.03	0.00	0.03	90.0
46.75								
	0.01	0.86	0.87	180.0	0.03	0.00	0.03	90.0
	0.01	0.90	0.92	180.0	0.03	0.00	0.03	90.0
35.06								
	0.01	0.90	0.92	180.0	0.03	0.00	0.03	90.0
	0.01	0.94	0.95	180.0	0.03	0.00	0.03	90.0
23.37								
	0.01	0.94	0.95	180.0	0.03	0.00	0.03	90.0
	0.01	0.96	0.97	180.0	0.03	0.00	0.03	90.0
11.69								
	0.01	0.96	0.98	180.0	0.03	0.00	0.03	90.0
	0.01	0.98	0.99	180.0	0.02	0.00	0.02	90.0
0.00								

EXTREME FIBRE STRESSES IN LAP SPLICE

ELEV	CONTACT.PRESSURE MAX	CONTACT.PRESSURE AZI	HOOP.STRESSES MAX	HOOP.STRESSES AZI	BENDING.STRESSES MAX	BENDING.STRESSES AZI
ft	ksi	deg	ksi	deg	ksi	deg
100.25	0.30	0.0	21.55	90.0	29.57	180.0
95.00	0.29	180.0	21.56	90.0	28.76	180.0
53.25	0.54	0.0	39.05	90.0	50.24	180.0
46.75	0.52	180.0	39.06	90.0	44.78	180.0

LOADS ONTO FOUNDATION(w.r.t. NORTH-EAST-DOWN coordinates)

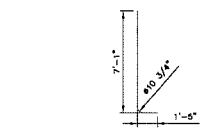
TOTAL AXIAL	SHEAR NORTH	SHEAR EAST	MOMENT NORTH	MOMENT EAST	TORSION
kip	kip	kip	ft-kip	ft-kip	ft-kip
47.56	-36.16	0.00	3940.84	0.00	0.00

LOADS ONTO FOUNDATION(w.r.t. wind direction)

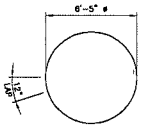
DOWN	SHEAR.w.r.t.WIND.DIR ALONG	SHEAR.w.r.t.WIND.DIR ACROSS	MOMENT.w.r.t.WIND.DIR ALONG	MOMENT.w.r.t.WIND.DIR ACROSS	TORSION
kip	kip	kip	ft-kip	ft-kip	ft-kip
47.56	36.16	0.00	-3940.84	0.00	0.00

LOADING CONDITION B ========== Iterations: Mast 5 ======

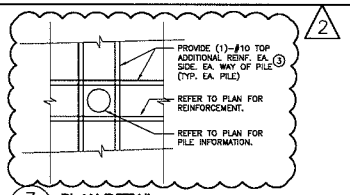
85 mph + 0.5" ice (Reduction Allowed)



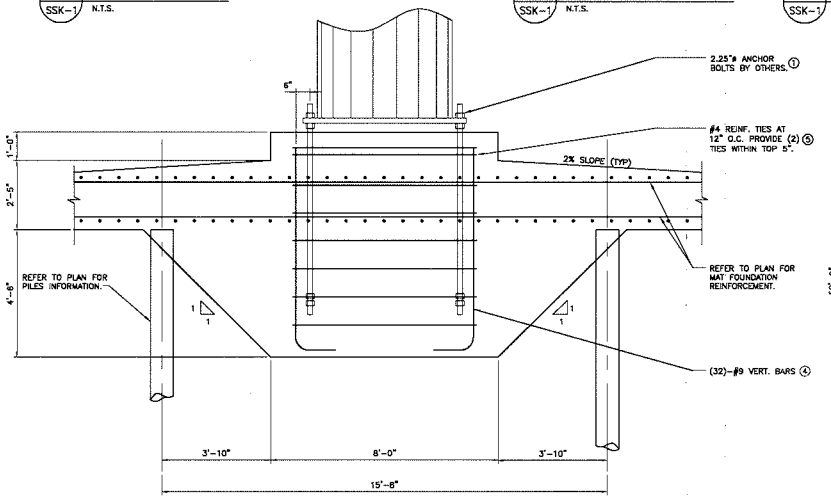
5 SSK-1 **L BARS (ITEMS #4)** N.T.S.



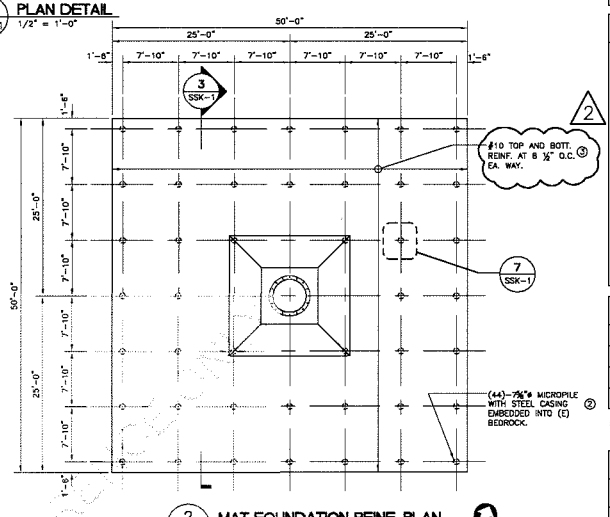
6 SSK-1 **HORZ. TIES (ITEMS #5)** N.T.S.



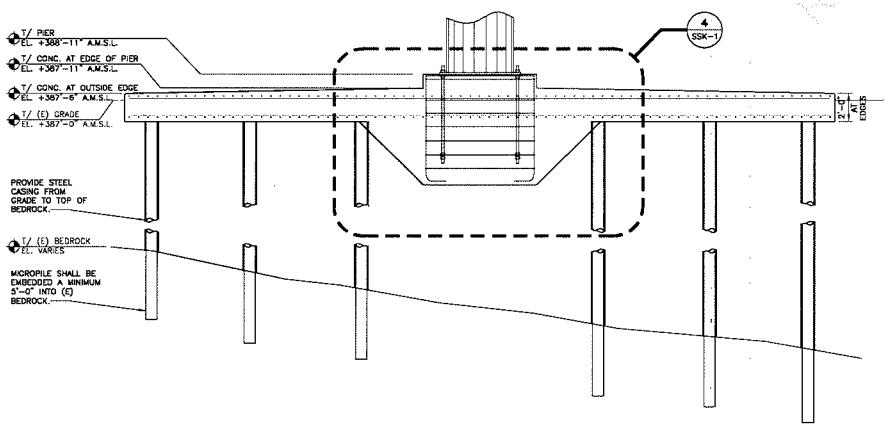
7 SSK-1 **PLAN DETAIL** 1/2" = 1'-0"



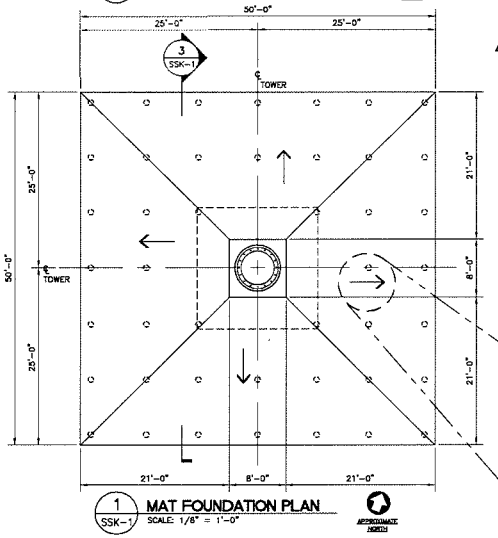
4 SSK-1 **MAT FOUNDATION REINF. PLAN** SCALE: 1/2" = 1'-0"



2 SSK-1 **MAT FOUNDATION REINF. PLAN** SCALE: 1/8" = 1'-0"



3 SSK-1 **MAT FOUNDATION REINF. PLAN** SCALE: 1/4" = 1'-0"



1 SSK-1 **MAT FOUNDATION PLAN** SCALE: 1/8" = 1'-0"

DESIGN BASIS

GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2009 CONNECTICUT SUPPLEMENT.

1. DESIGN CRITERIA:
   - WIND SPEED OF 85 MPH (FASTEST MILE) AND 74 MPH (FASTEST MILE) CONCURRENT WITH 0.5" OF RADIAL ICE PER EIA/TIA 222 F-96.
   - WIND SPEED OF 100 MPH (3 SECOND GUST) AND 50 MPH (3 SECOND GUST) CONCURRENT WITH 0.75" OF RADIAL ICE PER TIA-222-G.
   - SEISMIC LOAD: PER ASCE 7-95 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES (DOES NOT GOVERN).

GENERAL NOTES

1. FOUNDATION DESIGN IS BASED ON TOWER STRUCTURE DESIGN CALCULATIONS PREPARED BY ENGINEERED SABRE INDUSTRIES, JOB No. 16-7133-SCB, FOR VERIZON WIRELESS, DATED JULY 13, 2016.
2. PILE DESIGN IS BASED ON GEOTECHNICAL REPORT PREPARED BY DESIGN EARTH TECHNOLOGIES, DATED FEBRUARY 19, 2016 WITH A MAXIMUM ALLOWABLE ROCK BEARING PRESSURE OF 10 TONS/SF (20KSF).
3. THE TOWER FOUNDATION MUST BEAR ON COMPETENT (SOUND) ROCK. BEDROCK BEARING SURFACE SHALL BE LEVEL, CLEANED OF ANY SOIL, LOOSE ROCK FRAGMENTS AND ANY UNSUITABLE BEARING MATERIAL. THE FINISHED BEARING SURFACE IS TO BE INSPECTED BY THE DESIGN ENGINEER FOR APPROVAL.
4. DRILLED HOLES SHALL BE CLEAR OF DEBRIS BEFORE GROUTING.
5. ALL WORK SHALL BE SUBJECT TO SPECIAL INSPECTION RETAINED BY THE OWNER/CONTRACTOR AS PER THE 2005 CONNECTICUT STATE BUILDING CODE WITH 2009 SUPPLEMENT.
6. MICROPILES SHALL BE DESIGNED AND INSTALLED BY A RESPONSIBLE PROFESSIONAL EXPERIENCED IN MICROPILE WORK.
7. AN INDEPENDENT QUALIFIED INPESTION/TESTING AGENCY SHALL BE RETAINED BY THE OWNER FOR THE PURPOSE OF INSPECTING, TESTING AND DOCUMENTING ALL FIELD WORK PREFORMED BY THE PILE CONTRACTOR. ALL INSPECTION REPORTS AND DOCUMENTS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD (CENTEK ENGINEERING INC.) FOR REVIEW.

FOUNDATION DESIGN REACTIONS

BASE REACTION TYPE	TIA/EIA-222-F	TIA-222-G
SHEAR (kips)	38.00	45.89
AXIAL (kips)	47.56	57.21
BASE MOMENT (ft-kips)	3940.84	4952.27

NOTE:
1. REACTIONS SHOWN TAKEN FROM TOWER DESIGN AS PREPARED BY ENGINEERED SABRE INDUSTRIES. REFER TO GENERAL NOTE #1.

MATERIAL LIST

ITEM	QTY.	LENGTH	DESCRIPTION
①	16	7'-0"	2.625"ø A615-GR.75 ANCHOR BOLTS w/ (4) H.H.N. AND ANCHOR PLATES (x2) AS PROVIDED BY OTHERS.
②	44	VARIES	7⅝"ø MICROPILES (TO RESIST 55 KIP MINIMUM AXIAL LOAD) OR ENGINEER APPROVED EQUAL. REFER TO GEOTECHNICAL REPORT (GENERAL NOTE #2) FOR PILE LENGTHS.
③	624 304	20'-0" 25'-0"	#10 (ASTM A615-GR.60) EA. WAY TOP & BOTT. PROVIDE ADDITIONAL BAR EA. SIDE OF PILE.
④	32	8'-6"	#9 (ASTM A615-GR.60) L SHAPE BAR. REFER TO 5/SSK-1.
⑤	10	21'-2"	#4 TIE (ASTM A615-GR.60). PROVIDE (2) TIES WITHIN TOP 5". REFER TO 6/SSK-1.

CONCRETE	(cu.yd)	217	4000psi TYPE II CEMENT

PILE LOAD CALCULATION

LOAD TYPE (PER PILE)	AXIAL FORCE (kips)
DEAD/EQUIPMENT LOAD	33.6
TOWER LOAD	10.0
DOWN DRAG LOAD	6.7
TOTAL REQUIRED LOAD	50.3
MINIMUM PILE CAPACITY	55.0

AS-BUILT PILE CAPACITY = 59.0 KIPS

REV	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
3	09/07/17	MAH	LVP	REINFORCEMENT MODIFICATION
2	04/05/17	DMD	EFC	FOR CONSTRUCTION
1	08/02/16	LVP	EFC	FOR D&M APPROVAL
0	08/02/16	LVP	EFC	FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

Celco Partnership d/b/a Verizon Wireless

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

Celco Partnership d/b/a Verizon Wireless
WIRELESS COMMUNICATIONS FACILITY

BETHEL W2
15 GREAT PASTURE ROAD
DANBURY, CT 06810

DATE: 07/25/16
SCALE: AS NOTED
JOB NO. 14218.000

MAT FOUNDATION AND PILE DETAILS

SSK-1
Sheet No. 1 of 2

NOTES:

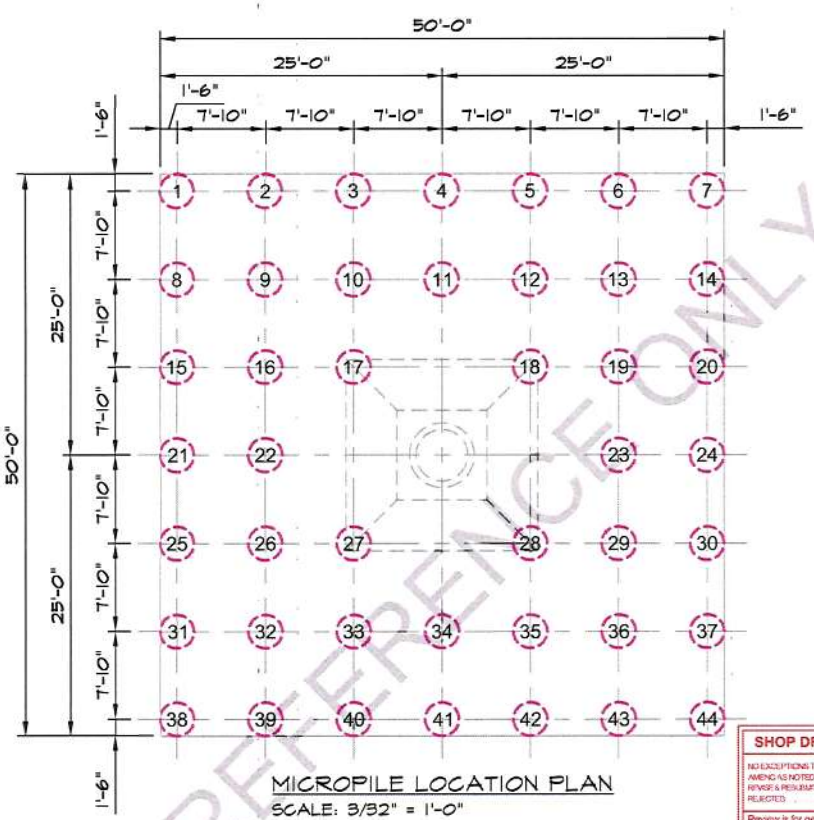
1. Micropiles shall be advanced through the fill soil and bonded into bedrock at an average maximum depth of 25.0' below working grade.

2. Micropiles shall consist of steel casing, with an outside diameter of 5.5" and a wall thickness of 0.361" as manufactured by PennDrill Manufacturing (Punxsutawney, PA) with N80 flush joint casing. The lead section of casing shall be fitted with carbide "J" teeth. Beyond that a 4.0" rock socket will be a drilled for the bond zone. The borehole will be filled with a minimum 4.0 ksi neat cement grout and a #10 (GR-75) thread bar. The thread bar will be centered using PVC centralizers. A minimum bond length of 5'-0" is required.

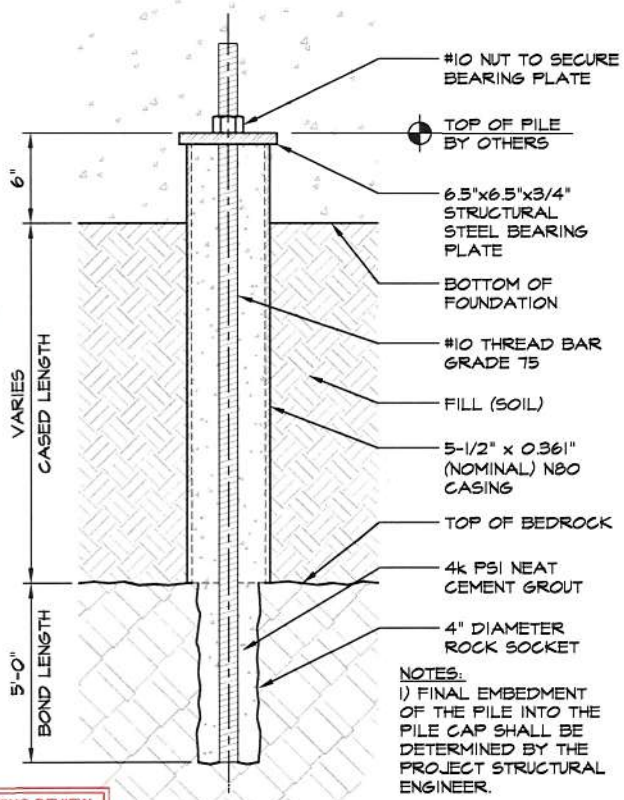
3. All Micropiles will be designed for 55 kips (allowable) axial compression.

4. Pile cap plates will be a minimum of 6.5" x 6.5" x .75" structural steel plates. Structural Engineer of Record to verify depth/height of bearing plates in pile cap.

5. Concrete pile caps and grade beams, including pile embedment into concrete, shall be sized and designed by the Structural Engineer of Record. We have schematically shown the pile caps. Pile layout will be the responsibility of others along with any as-built information. Minimum pile spacing shall be 3 times the pile diameter.



MICROPILE LOCATION PLAN
SCALE: 3/32" = 1'-0"



NOTES:
1) FINAL EMBEDMENT OF THE PILE INTO THE PILE CAP SHALL BE DETERMINED BY THE PROJECT STRUCTURAL ENGINEER.

2) STEEL BEARING PLATE IS Fy=36 ksi STRUCTURAL STEEL

MICROPILE DETAIL
SCALE: N.T.S.

SHOP DRAWING REVIEW
NO EXCEPTIONS TAKEN ☒
AMEND AS NOTED ☐
REVISE & RESUBMIT ☐
REJECTED ☐
Review is for general compliance with the Contract Documents. The contractor is responsible for construction methods, coordination of work, quantities and dimensions.
Centek Engineering, Inc.
Date 03/23/17 Checked By LVP
Centek Project # 17000.01

(#) Indicates Micropile location and designation as indicated on Sheet SSK-1, dated 8/3/16. Micropile layouts, survey locations, and any as-builts are the responsibility of others.

SCALE	DATE	SHEET	PLAN #
AS NOTED	3/21/17	1 of 1	
DRAWN BY	CHKD BY	APPD BY	DISK REF #
MJP	PJY	RMV	

HELICAL
Geotechnical Design/Build
639 GRANITE ST.
BRAINTREE, MA
02184
(781) 848-2110

MICROPILE LOCATION PLAN AND DETAILS

Bethel W2 Verizon
15 Great Pasture Road
Danbury, CT

SHEET NO.
MP-1.0

accomplished by rotary percussive methods, which can address obstructions (i.e. cobbles, boulders, wood/stumps, debris). It is estimated that these mini-piles would be about 30 to 40 feet deep. Static load tests would be required to verify load capacity. These rock-socketed mini-piles would achieve capacity through side friction in the rock socket and end bearing.

There are a few considerations when the mini-piles are designed by the structural engineer. The design load shall be distributed into the bedrock using the bond strength between the bedrock and the grout. This bond strength value can be estimated from the bedrock core samples at Ultim A minimum of 5' shall used as the uncased bond length into bedrock. Due to the relatively small cross sectional area of the mini-pile, load carrying capacity resul).0 tons/ consi d un-bonded zones. It is recommended in the un-bonded zone to have steel installation casing left in-place (from top of bedrock to within the upper horizontal foundation component). This produces a superior mini-pile that has a higher quality of installation. Mini-piles are very slender elements that can not resist lateral load effectively. The use of battered mini-piles is recommended for the lateral loads. The mini-piles shall not be designed to carry tensile or uplift loads. Because the fill material will continue to settle, the mini-pile design must address "negative" skin friction. Negative skin friction develops along the contact surface between pile and soil when the soil settles relative to the pile. The negative skin friction must be added into the dead load of the pile. A preliminary estimate of this negative skin friction load could be as much as 20 tons per pile.

At least one verification load test should be performed to confirm the ultimate bond stress. A minimum of one proof test should also be performed on one of the production pile.

Equipment Shelter

If the shelter is allowed to settle because of the deep fill material, a spread footing is considered appropriate, if minimal settlement is allowed for the shelter, a deep foundation with a mini-pile foundation system is to be used.

EARTHQUAKE DESIGN (SEISMIC)

Seismic design requirements for the State of Connecticut are based on the Connecticut State Building Code, which incorporates the Seismic design Category approach from the International Building Code. The seismic design Category determination is based on a few category factors. One such category is the "Site Classification (soil type)". From our test borings, we consider that the site subsurface conditions match the General Description of "Very Dense Soil and Soft Rock". The site classification is therefore "C".

The proposed deep foundation is to bear on bedrock. This bedrock will not liquefy during a seismic event and needs not be addressed in the foundation design.

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

COMPRESSION TESTS (MASONRY)

CLIENT: Centek Engineering
63-2 North Branford Road
Branford, CT 06405
Attn: Erik Armas

S-1001A

PROJECT: 17000.01 Bethel West 2

LOCATION: Pile #36

MATERIAL: Type II Portland Cement

DATE CAST: 04-18-17 **DATE RECEIVED:** 05-03-17

TEMPERATURE-AMBIENT: **MIX:**

SAMPLES CAST BY: Contractor **SAMPLING TIME:**

REQUIRED STRENGTH: 5000 PSI

SAMPLE TYPE:
- ☐ 3½" x 3½" x 7" GROUT - ASTM C1019
- ☐ 6" x 12" CYLINDERS - COARSE GROUT - ASTM C31
- ☐ 2" x 2" CUBES - MORTAR - ASTM C109 MODIFIED
- ☒ 2" x 2" CUBES - GROUT USED FOR SUPPORT - ASTM C1107
- ☐ OTHER:_____

SLUMP: _____

FLOW RATE: _____

SAMPLE NUMBER	AGE DAYS	DATE TESTED	LOAD LBS.	COMPRESSIVE STRENGTH- PSI
S-50746	21	05-09-17	31,660	7920
S-50747	28	05-16-17	32,510	8130
S-50748	28	05-16-17	28,840	7210

Materials Testing, Inc.

William J. Soucy

1cc: Client

sw

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED PROFESSIONAL ENGINEER

5/22/17

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

COMPRESSION TESTS (MASONRY)

CLIENT: Centek Engineering
63-2 North Branford Road
Branford, CT 06405
Attn: Erik Armas

S-1000A

PROJECT: 17000.01 Bethel West 2

LOCATION: Pile #3

MATERIAL: Type II Portland Cement

DATE CAST: 04-18-17 **DATE RECEIVED:** 05-03-17

TEMPERATURE-AMBIENT: **MIX:**

SAMPLES CAST BY: Contractor **SAMPLING TIME:**

REQUIRED STRENGTH: 5000 PSI

SAMPLE TYPE:
- ☐ 3½" x 3½" x 7" GROUT - ASTM C1019
- ☐ 6" x 12" CYLINDERS - COARSE GROUT - ASTM C31
- ☐ 2" x 2" CUBES - MORTAR - ASTM C109 MODIFIED
- ☒ 2" x 2" CUBES - GROUT USED FOR SUPPORT - ASTM C1107
- ☐ OTHER:_____

SLUMP: _____

FLOW RATE: _____

SAMPLE NUMBER	AGE DAYS	DATE TESTED	LOAD LBS.	COMPRESSIVE STRENGTH- PSI
S-50743	21	05-09-17	42,980	10,720
S-50744	28	05-16-17	39,580	9900
S-50745	28	05-16-17	45,380	11350

Materials Testing, Inc.

William J. Soucy

1cc: Client

sw

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED PROFESSIONAL ENGINEER

5/24/17

MATERIALS TESTING, INC.

55 LAURA STREET • NEW HAVEN, CONNECTICUT 06512 • (203)468-5216
42 BOSTON POST ROAD • WILLIMANTIC, CONNECTICUT 06226 • (860)423-1972
materialstestinginc.com

COMPRESSION TESTS (MASONRY)

CLIENT: Centek Engineering
63-2 North Branford Road
Branford, CT 06405
Attn: Erik Armas

S-1002A

PROJECT: 17000.01 Bethel West 2

LOCATION: Pile #25

MATERIAL: Type II Portland Cement

DATE CAST: 04-18-17 **DATE RECEIVED:** 05-03-17

TEMPERATURE-AMBIENT: **MIX:**

SAMPLES CAST BY: Contractor **SAMPLING TIME:**

REQUIRED STRENGTH: 5000 PSI

SAMPLE TYPE:
- ☐ 3½" x 3½" x 7" GROUT - ASTM C1019
- ☐ 6" x 12" CYLINDERS - COARSE GROUT - ASTM C31
- ☐ 2" x 2" CUBES - MORTAR - ASTM C109 MODIFIED
- ☒ 2" x 2" CUBES - GROUT USED FOR SUPPORT - ASTM C1107
- ☐ OTHER: _____

SLUMP: _____

FLOW RATE: _____

SAMPLE NUMBER	AGE DAYS	DATE TESTED	LOAD LBS.	COMPRESSIVE STRENGTH- PSI
S-50749	21	05-09-17	28,840	7210
S-50750	28	05-16-17	30,750	7690
S-50751	28	05-16-17	30,690	7670

Materials Testing, Inc.

William J. Soucy

1cc: Client

sw

STATE OF CONNECTICUT
M. S. RAVI SHARMA
No. 28322
LICENSED PROFESSIONAL ENGINEER

5/22/17

1810.3.2.6 Allowable stresses. The allowable stresses for materials used in deep foundation elements shall not exceed those specified in Table 1810.3.2.6.

❖ This section refers the code user to the table of allowable stresses in order to identify the correct values that apply to various types of deep foundations. Note that Section 1810.1.4 allows "special types of piles" using the allowable stresses for materials that are specified herein.

TABLE 1810.3.2.6. See below.

❖ This table provides a complete list of the relevant allowable stresses for deep foundation element materials including concrete, reinforcing steel and structural steel.

1810.3.2.7 Increased allowable compressive stress for cased cast-in-place elements. The allowable compressive stress in the concrete shall be permitted to be increased as specified in Table 1810.3.2.6 for those portions of permanently cased cast-in-place elements that satisfy all of the following conditions:

1. The design shall not use the casing to resist any portion of the axial load imposed.
2. The casing shall have a sealed tip and be mandrel driven.
3. The thickness of the casing shall not be less than manufacturer's standard gage No.14 (0.068 inch) (1.75 mm).
4. The casing shall be seamless or provided with seams of strength equal to the basic material and be of a configuration that will provide confinement to the cast-in-place concrete.
5. The ratio of steel yield strength (F_y) to specified compressive strength (f'_c) shall not be less than six.
6. The nominal diameter of the element shall not be greater than 16 inches (406 mm).

❖ For cased cast-in-place concrete elements formed by driving permanent steel casings, the allowable design compressive stress in Table 1810.3.2.6 is generally not to exceed $0.33f'_c$. When the permanent casing complies with the requirements of this section, the allowable concrete compressive stress may be increased to $0.40f'_c$. The basis for this increase in allowable concrete stress is the added strength given to the concrete by the confining action of the steel casing. The general formula for increased allowable stress caused by confinement is:

$$f_c 0.33f'_c\left(\frac{1 + 7.5tf_y}{Df'_c}\right)$$

where:

f_c = Allowable concrete stress.

f'_c = Specified concrete strength.

TABLE 1810.3.2.6
ALLOWABLE STRESSES FOR MATERIALS USED IN DEEP FOUNDATION ELEMENTS

MATERIAL TYPE AND CONDITION	MAXIMUM ALLOWABLE STRESS[a]
1. Concrete or grout in compression[b]	
Cast-in-place with a permanent casing in accordance with Section 1810.3.2.7	$0.4f'_c$
Cast-in-plac	$0.3f'_c$
Cast-in-place without a permanent casing	$0.33f'_c$
Precast nonprestressed	$0.33f'_c$
Precast prestressed	$0.33f'_c - 0.27f_{pc}$
2. Nonprestressed reinforcement in compression	$0.4f_y \le 30{,}000$ psi
3. Steel in compression	
Cores within	$0.5F_y \le 32{,}000$ psi
Pipes, tubes or H-piles, where justified in accordance with Section 1810.3.2.8	
Pipes or tub	$0.35F_y \le 16{,}000$ psi
Other pipes, tubes or H-piles	$0.6F_y \le 0.5F_u$
Helical piles	
4. Nonprestressed reinforcement in tension	
Within micropiles	$0.6f_y$
Other conditions	$0.5f_y \le 24{,}000$ psi
5. Steel in tension	
Pipes, tubes or H-piles, where justified in accordance with Section 1810.3.2.8	$0.5F_y \le 32{,}000$ psi
Other pipes, tubes or H-piles	$0.35F_y \le 16{,}000$ psi
Helical piles	$0.6F_y \le 0.5F_u$
6. Timber	In accordance with the AWC NDS

a. f'_c is the specified compressive strength of the concrete or grout; f_{pc} is the compressive stress on the gross concrete section due to effective prestress forces only; f_y is the specified yield strength of reinforcement; F_y is the specified minimum yield stress of steel; F_u is the specified minimum tensile stress of structural steel.

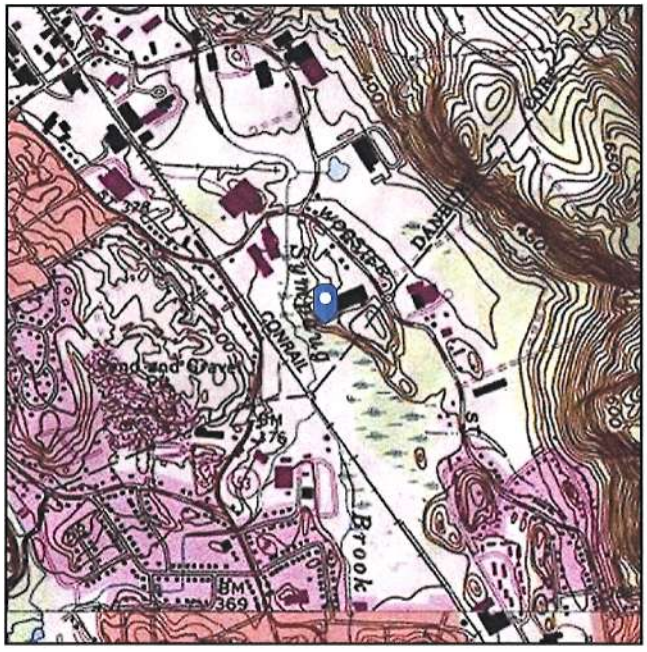
b. The stresses specified apply to the gross cross-sectional area within the concrete surface. Where a temporary or permanent casing is used, the inside face of the casing shall be considered the concrete surface.

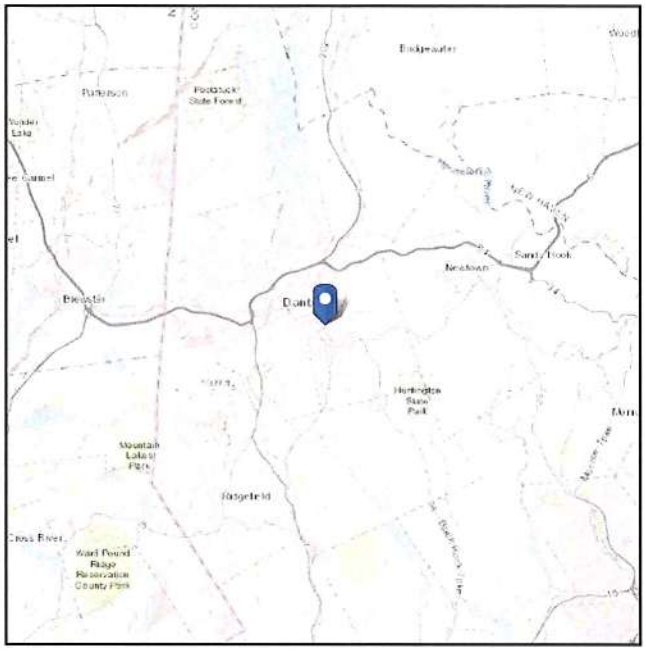
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 386.01 ft (NAVD 88)
Latitude: 41.383
Longitude: -73.4222





Wind

Results:

Wind Speed:	117 Vmph
10-year MRI	76 Vmph
25-year MRI	85 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Mon Feb 10 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

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

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

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

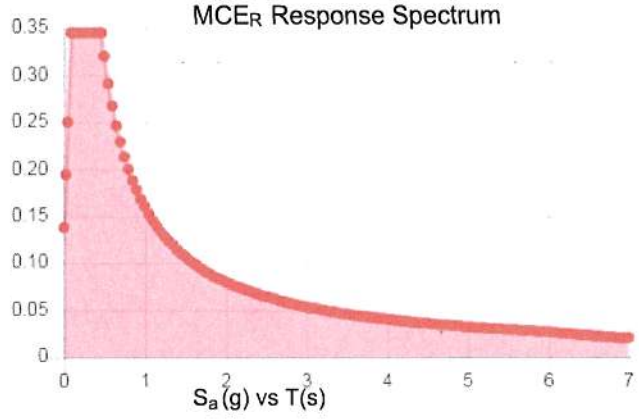
Seismic

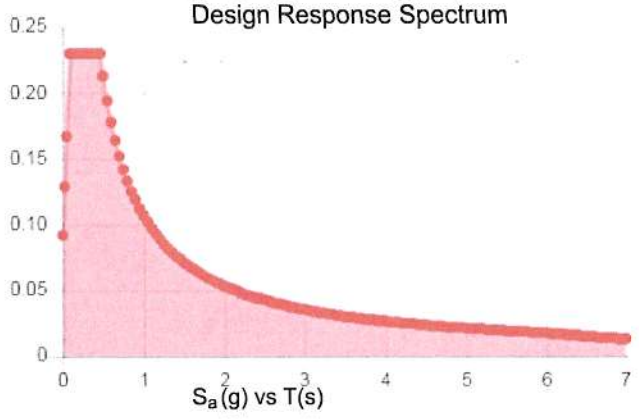
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.216	S_{DS} :	0.23
S_1 :	0.067	S_{D1} :	0.107
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.118
S_{MS} :	0.345	PGA_M :	0.184
S_{M1} :	0.16	F_{PGA} :	1.565
		I_e :	1

Seismic Design Category B





Data Accessed: Mon Feb 10 2020

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

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Feb 10 2020

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

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

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ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

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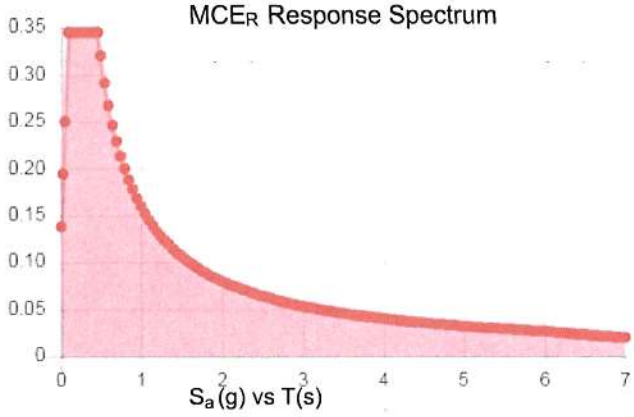
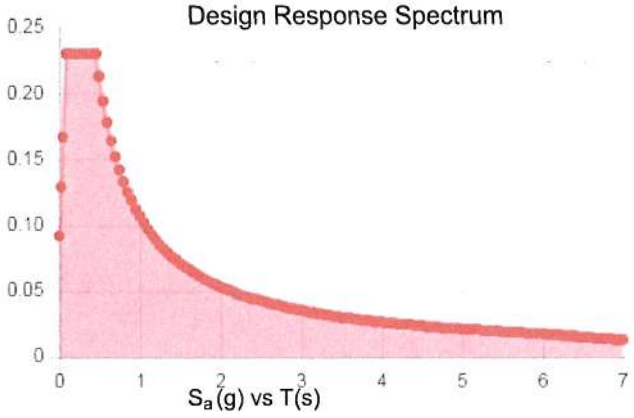
		I_e :	1

Seismic Design Category B





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PREPARED FOR

KGI WIRELESS

MODIFICATION PACKAGE FOR A 119 FT 18-SIDED SABRE MONOPOLE WITH A PROPOSED 20 FT EXTENSION

PREPARED BY

SEMAAN ENGINEERING SOLUTIONS

SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC

CLIENT SITE NAME/NUMBER

28493

PROPOSED CARRIER / SITE NAME

AT&T / BETHEL WEST 2

SITE ADDRESS

15 GREAT PASTURE ROAD
DANBURY, CT 06810
FAIRFIELD COUNTY
N41°22'58.8", W73°25'19.92"

DATE:

09/02/2020

CONTACT INFORMATION

ENGINEER OF RECORD

NAME: SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC
ADDRESS: 1047 N 205TH STREET
ELKHORN, NE 68022
CONTACT: THOMAS TAYLOR ----
(402) 289-1888 x1
EMAIL: TOMT@SEMAANENG.COM

SHEET INDEX

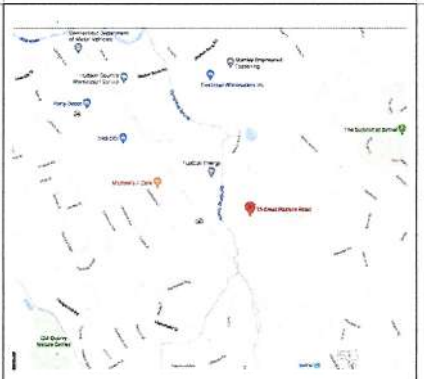
SHEET #	SHEET TITLE	REV #
T-1	TITLE SHEET	1
N-1	GENERAL NOTES	1
N-2	SITE SPECIFIC NOTES	0
S-1	MONOPOLE ELEVATION VIEW	0
S-2	MONOPOLE EXTENSION DETAILS	0
S-3	MONOPOLE EXTENSION SECTIONS	0

STAMP

STATE OF CONNECTICUT
THOMAS L TAYLOR
No. 28130
LICENSED PROFESSIONAL ENGINEER
9-02-20
EXP. 01/31/2021

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT

VICINITY MAP



MODIFICATION OUTLINE

THE MODIFICATIONS PROVIDED IN THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL MODIFICATIONS ANALYSIS REPORT COMPLETED BY SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC (SES) DATED 09/02/2020. THIS REPORT IS BASED ON A SPECIFIC ANTENNA LOADING AND COAX CONFIGURATION AS DEFINED IN THE REPORT. ANY OTHER ANTENNA OR COAX CONFIGURATION REQUIRES REVIEW BY SES

CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, QUANTITIES, PART NUMBERS AND COAX/ANTENNA PLACEMENTS PRIOR TO BIDDING, ORDERING MATERIALS, AND CONSTRUCTION.

GENERAL NOTES:

1. REFERENCE THE SEMAAN ENGINEERING SOLUTIONS ANALYSIS DATED 09/02/2020 FOR THE PROPOSED AND EXISTING LOADS CONSIDERED. THIS DRAWING IS NOT VALID IF LOADS OTHER THAN THOSE CONSIDERED IN THE ANALYSIS ARE ADDED TO OR REMOVED FROM THE STRUCTURE UNLESS APPROVED IN WRITING BY SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC.
2. THE PROPOSED LOADS SHALL NOT BE ADDED TO THE STRUCTURE UNTIL ALL MODIFICATIONS HAVE BEEN COMPLETED, INSPECTED BY A 3RD PARTY, AND APPROVED BY THE ENGINEER OF RECORD.
3. ALL METHODS, MATERIALS AND WORKMANSHIP SHALL FOLLOW THE DICTATES OF GOOD CONSTRUCTION PRACTICE.
4. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN TOWER AND FOUNDATION CONSTRUCTION.
5. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS AND CONDITIONS PRIOR TO FABRICATION. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR THE PROPER FIT AND CLEARANCE IN THE FIELD. CONTACT SEMAAN ENGINEERING IF ANY DISCREPANCIES EXIST.
6. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF RECORD IMMEDIATELY OF ANY INSTALLATION INTERFERENCES. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. DETAILS NOT SPECIFICALLY SHOWN ON THE DRAWINGS SHALL FOLLOW SIMILAR DETAILS FOR THIS JOB.
7. THIS DRAWING DOES NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND INSPECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.
8. ALL WORK SHALL BE DONE IN ACCORDANCE WITH LOCAL CODES AND OSHA SAFETY REGULATIONS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE ON-SITE SAFETY ASSOCIATED WITH THE WORK TO BE PERFORMED AS WELL AS THE PUBLIC AFFECTED BY THE WORK IN THE VICINITY OF THE JOB SITE.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY, PER TIA-322-A, TO PROVIDE A COMPLETE AND STABLE STRUCTURE AS SHOWN ON THESE DRAWINGS.
10. THE CONTRACTOR'S PROPOSED INSTALLATION SHALL NOT INTERFERE, NOR DENY ACCESS TO, ANY EXISTING OPERATIONAL AND SAFETY EQUIPMENT.
11. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THE PROTECTION OF THE PROPERTY IN THE VICINITY OF THE JOB SITE. THE CONTRACTOR SHALL USE THE PRECAUTIONARY MEANS NECESSARY FOR ADEQUATE PROTECTION.
12. ALL WORK SHALL BE PERFORMED IN CALM WIND CONDITIONS, WHERE SPEED DOES NOT EXCEED 10 MPH.
13. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
14. ALL TOWER MODIFICATION WORK SHALL BE IN ACCORDANCE WITH TIA-322-A STANDARDS FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

APPLICABLE CODES AND STANDARDS:

1. ANSI/TIA-222 STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES, REV G.
2. 2015 INTERNATIONAL BUILDING CODE. WITH CONNECTICUT STATE AMENDMENTS.
3. ACI 318: AMERICAN CONCRETE INSTITUTE, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, 318-14 (LATEST EDITION).
4. CRSI: CONCRETE REINFORCEMENT STEEL INSTITUTE, MANUAL OF STANDARD PRACTICE, 318-14.
5. AISC: AMERICAN INSTITUTE OF STEEL CONSTRUCTION, MANUAL OF STEEL CONSTRUCTION, 15TH EDITION - 2017 (LATEST EDITION).
6. AWS: AMERICAN WELDING SOCIETY D1.1, STRUCTURAL WELDING CODE - 2015, (LATEST EDITION).

STEEL CONSTRUCTION:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION, 14TH EDITION, FOR THE DESIGN, FABRICATION, AND ERECTION OF STEEL COMPONENTS.
2. UNLESS NOTED OTHERWISE, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
   - ANGLE: ASTM A36
   - PIPE/TUBE: ASTM A500 (46 ksi YIELD)
   - PLATE: ASTM A36
   A. ALL BOLTS, ASTMA325 GALVANIZED HIGH STRENGTH BOLTS.
   B. ALL U-BOLTS, ASTM A36
   C. ALL NUTS, A563 CARBON AND STEEL ALLOY NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS
3. SHOP DRAWINGS SHALL BE SUBMITTED TO SES FOR APPROVAL PRIOR TO FABRICATION. SHOP DRAWINGS SHALL INCLUDE ALL FABRICATED STEEL ASSEMBLIES INCLUDING MONOPOLE/TOWER EXTENSIONS

STEEL CONSTRUCTION (CONT.):

4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123 FOR COMPONENTS AND ASTM A153 FOR HARDWARE, AND AS FOLLOWS, UNLESS OTHERWISE NOTED.
   A. GALVANIZING SHALL BE PERFORMED AFTER SHOP FABRICATION AND WELDING TO THE GREATEST EXTENT POSSIBLE
   B. ALL DINGS, SCRAPES, MARS AND WELDS IN THE GALVANIZED AREA SHALL BE COATED WITH (3) BRUSH COATS OF ZRC COLD GALVANIZING COMPOUND OR APPROVED EQUAL. THE COATING SHALL BE APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
   C. IF THE STRUCTURE WAS ORIGINALLY PAINTED, AFTER ZINC-RICH COATING IS DRY, OVERCOAT WITH AN APPROPRIATE PAINT WITH THE SAME COLOR AS THE EXISTING.
5. NO TORCH CUTTING SHALL BE PERMITTED UNLESS APPROVED BY THE ENGINEER.
6. DO NOT PLACE HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON DRAWINGS.

WELDING NOTES:

1. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
2. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON ALL FIELD WELDS. A REPORT SHALL BE SUBMITTED TO SEMAAN ENGINEERING FOR FINAL APPROVAL.
3. ALL ELECTRODES SHALL BE LOW HYDROGEN E70XX ELECTRODES, PER AWS D1.1, UNLESS NOTED OTHERWISE.
4. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
5. PRIOR TO FIELD WELDING GALVANIZED MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING AND ANY OTHER CONTAMINANTS 2" BEYOND ALL FIELD WELD SURFACES. AFTER WELDING, REPAIR ALL GROUND AND WELDED SURFACES WITH (3) BRUSH COATS OF ZRC COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS REQUIREMENTS.
6. ALL FULL PENETRATION WELDS ARE REQUIRED TO BE 100% NDE INSPECTED BY ULTRASONIC TESTING (UT) IN ACCORDANCE WITH AWS D1.1.
7. ALL PARTIAL PENETRATION AND FILLET WELDS ARE REQUIRED TO BE 100% VISUALLY INSPECTED IN ACCORDANCE WITH AWS D1.1.

BOLTING NOTES:

1. STRUCTURAL CONNECTIONS TO BE ASSEMBLED AND INSPECTED IN ACCORDANCE WITH RCSC-2009 (SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR ASTM A490 BOLTS.)
2. ALL CONNECTION BOLTS SHALL BE ASTM A325N (GALVANIZED). UNLESS NOTED OTHERWISE.
3. SPLICE/FLANGE BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC "SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS", LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:

   FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8.2.1 THROUGH 8.2.4.

   8.2.1 TURN-OF-NUT PRETENSIONING
   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED IN THE TABLE PROVIDED. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

TURN-OF-NUT ROTATION FROM SNUG TIGHT CONDITION

BOLT LENGTH (UNDER SIDE OF HEAD TO END OF BOLT)	BOTH FACES NORMAL TO BOLT AXIS		
	NUT ROTATION	INITIAL MARKING POSITION	FINAL MARKING POSITION
UP TO AND INCLUDING 4 DIAMETERS	1/3 TURN		
OVER 4 DIAMETERS BUT NOT EXCEEDING 8 DIA.	1/2 TURN		
OVER 8 DIAMETERS BUT NOT EXCEEDING 12 DIA.	2/3 TURN		

USE A WATERPROOF BLACK MARKER TO MARK THE BOLT AND NUT AS SHOWN ON THE TABLE.

BOLTING NOTES (CONT.):

4. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE SPECIFICATION.
5. ALL BOLT HOLES SHALL BE ALIGNED TO PERMIT INSERTION OF THE BOLTS WITHOUT UNDUE DAMAGE TO THE THREADS. BOLTS SHALL BE PLACED IN ALL HOLES WITH WASHERS POSITIONED AS REQUIRED AND NUTS THREADED TO COMPLETE THE ASSEMBLY. COMPACTING THE JOINT TO THE SNUG-TIGHT CONDITION SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT. THE SNUG-TIGHTENED CONDITION IS THE TIGHTNESS THAT IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE CONNECTED PLIES INTO FIRM CONTACT.
6. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS.
7. ALL NEW BOLTS SHALL BE LONG ENOUGH TO FULLY ENGAGE THE FULL DEPTH OF THE NUT AND LOCKING DEVICE.
8. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.

CONCRETE CONSTRUCTION:

1. ALL CONCRETE SHALL CONFORM TO THE SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, ACI 301
2. ALL CONCRETE SHALL BE MADE WITH STONE AGGREGATE & SHALL DEVELOP 4000 PSI MIN. COMPRESSIVE STRENGTH IN 28 DAYS. CONCRETE MIX DESIGN: 6 1/2 SACKS OF CEMENT MINIMUM PER CUBIC YARD, 3/4" MAXIMUM AGGREGATE. AIR ENTRAINMENT = 6% ± 1% AND SLUMP = 4" ± 1" (WITHOUT PLASTICIZER)
3. ALL REINFORCING SHALL BE HIGH STRENGTH DEFORMED BARS, GRADE 60, ASTM A615, WITH 60,000 PSI MINIMUM YIELD POINT.
4. REINFORCING PROTECTION: CONCRETE POURED AGAINST EARTH.....3"
5. ALL BAR LENGTHS ARE NOT DRAWN TO SCALE. NO SPLICES OF REINFORCEMENT SHALL BE MADE EXCEPT AS DETAILED OR AS AUTHORIZED BY THE STRUCTURAL ENGINEER. LAP SPLICES, WHERE PERMITTED, SHALL BE A MINIMUM OF 40 BAR DIAMETERS UNLESS NOTED.
6. DETAIL BARS IN ACCORDANCE WITH ACI DETAILING MANUAL & ACI BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
7. PROVIDE ALL ACCESSORIES NECESSARY TO SUPPORT REINFORCING AT THE POSITIONS SHOWN ON THE PLANS.
8. BACKFILL AND COMPACT SOIL TO A MINIMUM 95% OF STANDARD PROCTOR DENSITY PER ASTM D 698. THE COMPACTED SOIL SHALL PROVIDE A MINIMUM UNIT WEIGHT OF 120 POUNDS PER CUBIC FOOT FOR THE FILL MATERIAL.
9. AS APPLICABLE, ORIENT NEW ANCHORS IN LINE WITH EXISTING ANCHORS.
10. AS APPLICABLE, ANCHOR RODS TO PASS THROUGH CENTROID OF BLOCK.

EPOXY-GROUTED FASTENER INSTALLATION:

1. CONTRACTOR SHALL VERIFY THAT DRILLING CLEARANCE IS ADEQUATE PRIOR TO CONSTRUCTION. NOTIFY THE ENGINEER IF A CLEARANCE PROBLEM EXISTS.
2. ALL HOLES SHALL BE WIRE-BRUSHED TO PROFILE THE CONCRETE SURFACE. ALL CORED HOLES WITH SMOOTH WALLS SHALL BE ROUGHENED.
3. USE COMPRESSED AIR TO BLOW ANY REMAINING DEBRIS OUT OF THE NEWLY DRILLED HOLES.
4. EPOXY GROUT THE NEW ANCHOR BOLTS OR REBAR IN PLACE PER THE MANUFACTURER'S INSTRUCTIONS.

CONTINUOUS INSPECTION AND MAINTENANCE:

CONTINUOUS INSPECTION OF THE STRUCTURE AND THE ADDED REINFORCING CONSISTENT WITH THE CURRENT REQUIREMENTS OF THE LATEST TIA 222 STANDARD SHALL BE IMPLEMENTED BY THE OWNER. ANY FUTURE CORROSION OR OTHER DETERIORATION OF THE STRUCTURE OR ITS REINFORCING WILL REDUCE ITS CAPACITY TO WITHSTAND THE REQUIRED LOADS. ANY DEFECTS SHALL BE REPAIRED TO ENSURE THE STRUCTURAL INTEGRITY FOR THE LIFE OF THE STRUCTURE.

CLIENT

KGI WIRELESS

SITE NAME/NUMBER

28493

SITE ADDRESS

15 GREAT PASTURE ROAD
DANBURY, CT 06810
N41°22'58.8", W73°25'19.92"

DRAWINGS PREPARED BY:

SEMAAN ENGINEERING SOLUTIONS
SEMAAN ENGINEERING SOLUTIONS HOLDINGS LLC
1047 NORTH 205TH STREET
OMAHA, NEBRASKA 68022
PHONE: (402) 289-1888
FAX: (402) 289-1861

STAMP

EXP. 01/31/2021

DRAWN BY: KRC
APPROVED BY: TLT

REV	DESCRIPTION	DATE
1	ANALYSIS REVISION	09/02/20

DRAWING DESCRIPTION

GENERAL NOTES

SHEET NUMBER	REVISION
N-1	0

SPECIAL INSPECTION:

1. A QUALIFIED INDEPENDENT INSPECTION FIRM, EMPLOYED BY THE OWNER, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE IBC 2015, SECTION 1704 AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK TO BE INCLUDED IN THE POST-MODIFICATION INSPECTION (PMI) REPORT.

SPECIAL INSPECTION REQUIREMENTS (TO BE INCLUDED IN PMI REPORT)

REQUIRED (Y,N,NA)	REPORT ITEM
	PRE-CONSTRUCTION
N	PRE-APPROVED INSPECTION AGENCY APPROVED BY LOCAL JURISDICTION
N	PRE-APPROVED FABRICATOR APPROVED BY LOCAL JURISDICTION
Y	GC SITE VISIT TO FIELD VERIFY MODIFICATION INSTALLATION(S)
Y	EOR APPROVED SHOP DRAWINGS
Y	FABRICATOR CERTIFIED WELD INSPECTION/QA PROGRAM
Y	MATERIAL CERTIFICATIONS
	CONSTRUCTION
Y	CONSTRUCTION INSPECTIONS
NA	CONTINUOUS FOUNDATION INSPECTIONS
NA	CONCRETE COMPRESSIVE STRENGTH, AIR, AND SLUMP TESTS (SEE CONCRETE NOTES FOR TESTS)
Y	CONTINUOUS VISUAL WELD INSPECTION (FIELD WELDS)
Y	WELD NON-DESTRUCTIVE EVALUATION (NDE) REQUIRED
Y	HIGH STRENGTH BOLT INSPECTION (VERIFY TURN-OF-NUT INSTALLATION)
NA	EARTHWORK, LIFT, AND DENSITY
Y	ON-SITE COLD GALVANIZING VERIFICATIONS
NA	GUY CABLE TENSION VERIFICATIONS
Y	GC AS-BUILT DOCUMENTS
	POST-CONSTRUCTION
Y	SPECIAL INSPECTION NOTED DEVIATIONS
NA	POST-INSTALLED ANCHOR ROD PULL-OUT TESTS
Y	PHOTOGRAPHS (CLOSE-UP ON STRUCTURES)

2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER IN ACCORDANCE WITH IBC 2015, 1704. THE INSPECTION FIRM SHALL ALSO PROVIDE A REDLINE SET OF THE AS-BUILT DRAWINGS AND COMPLETE PHOTO DOCUMENTATION OF THE MODIFICATIONS COMPLETED AT THE SITE.

CLIENT

KGI WIRELESS

SITE NAME/NUMBER

28493

SITE ADDRESS

15 GREAT PASTURE ROAD
DANBURY, CT 06810
N41°22'58.8", W73°25'19.92"

DRAWINGS PREPARED BY:

SEMAAN ENGINEERING SOLUTIONS

SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC

1047 NORTH 205TH STREET
OMAHA, NEBRASKA 68022
PHONE: (402) 289-1888
FAX: (402) 289-1861

STAMP

STATE OF CONNECTICUT
THOMAS L TAYLOR
No. 28130
LICENSED PROFESSIONAL ENGINEER
04-02-20
EXP. 01/31/2021

DRAWN BY: KRC
APPROVED BY: TLT

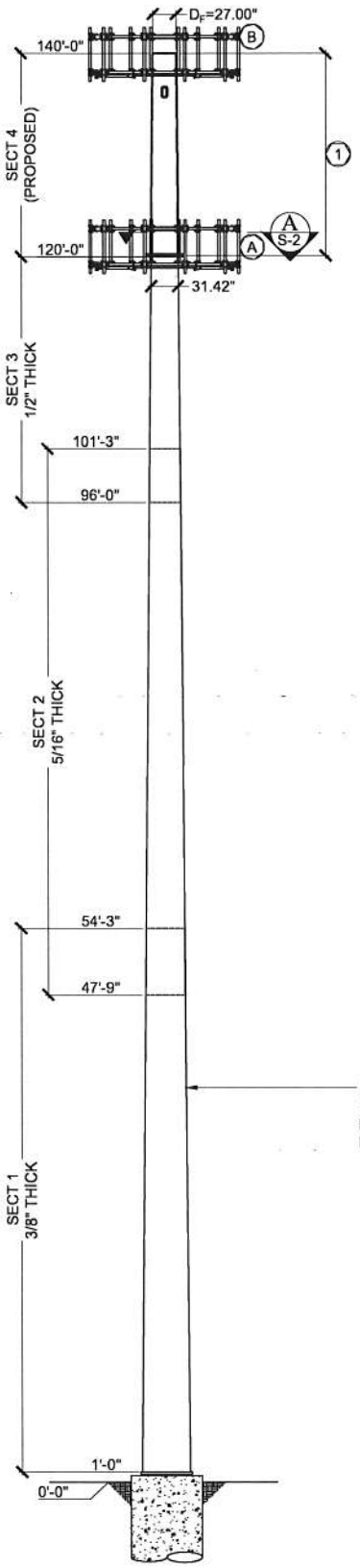
REV	DESCRIPTION	DATE

DRAWING DESCRIPTION

SITE SPECIFIC NOTES

SHEET NUMBER: N-2

REVISION: 0



EXISTING 18-SIDED SABRE MONOPOLE.
REFERENCE SABRE DRAWING # 16-7133-SBC
DATED JULY 13, 2016 FOR ADDITIONAL
INFORMATION.

MODIFICATION SCHEDULE

NO.	MODIFICATION DESCRIPTION	ELEVATIONS (FT)	SHEETS	DETAILS
(1)	INSTALL NEW MONOPOLE EXTENSION	120'-0" - 140'-0"	S-2	-

CARRIER SCHEDULE

NO.	CARRIER	ELEVATION (FT)	DESCRIPTION
(A)	VERIZON	120	EXISTING
(B)	AT&T	140	PROPOSED

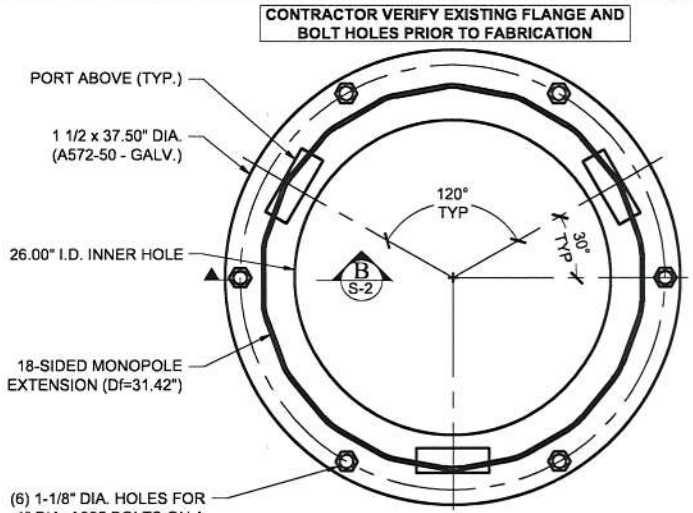
BILL OF MATERIALS

NO.	ITEM DESCRIPTION	QUANTITY
1	NEW 18 SIDED x 20'-0" GALVANIZED MONOPOLE EXTENSION (F_Y=65 ksi t=1/4")	1
2	37.5" DIA x 1.5" FLANGE PLATE (A572-50)	1
3	6 x 12"PORTS (SABRE PART #C30-138-001 OR APPROVED EQUAL)	3
4	NEW 1" DIA. A325 BOLTS	6
5	NEW 1" DIA. A325 HEAVY HEX NUTS	12
6	NEW 1" DIA. A325 FLAT WASHERS	12

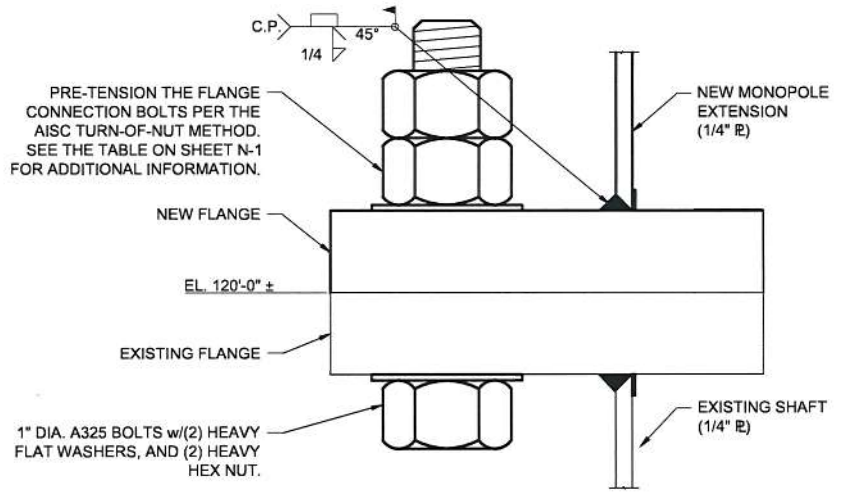
SABRE CONTACT INFORMATION:
PHONE: (800) 369-6690
(721) 258-6690

TOWER ELEVATION
NOT TO SCALE

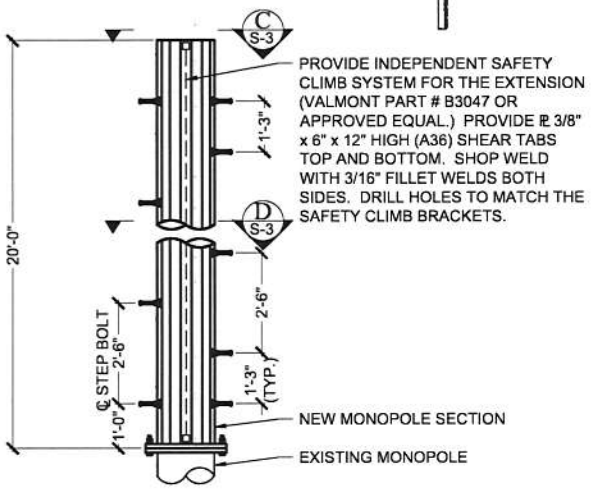
SHEET NUMBER S-1
REVISION 0
MONOPOLE ELEVATION VIEW
REV 0 DESCRIPTION FIRST ISSUE DATE 08/31/2020
DRAWING DESCRIPTION
DRAWN BY: KRC
APPROVED BY: TLT
STAMP
STATE OF CONNECTICUT THOMAS L. TOMLINSON LICENSED PROFESSIONAL ENGINEER No. 28130
EXP. 01/31/2021
1047 NORTH 205TH STREET
OMAHA, NEBRASKA 68022
PHONE: (402) 289-1888
FAX: (402) 289-1861
DRAWINGS PREPARED BY:
SEMAAN ENGINEERING SOLUTIONS
SEMAAN ENGINEERING SOLUTIONS HOLDINGS, LLC
SITE ADDRESS
15 GREAT PASTURE ROAD
DANBURY, CT 06810
N41°22'58.8", W73°25'19.92"
SITE NAME/NUMBER
28493
CLIENT
KGI WIRELESS



A FLANGE DETAIL
NOT TO SCALE



B SECTION
NOT TO SCALE



2 S-2 BASEPLATE CUTTING DETAIL
NOT TO SCALE

CLIENT
KGI WIRELESS

SITE NAME/NUMBER
28493

SITE ADDRESS
15 GREAT PASTURE ROAD
DANBURY, CT 06810
N41°22'58.8", W73°25'19.92"

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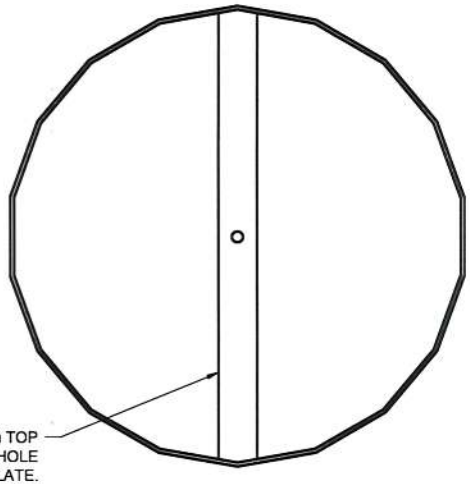
STATE OF CONNECTICUT
THOMAS L TAYLOR
No. 28130
LICENSED PROFESSIONAL ENGINEER
EXP. 01/31/2021

DRAWN BY: KRC
APPROVED BY: TLT

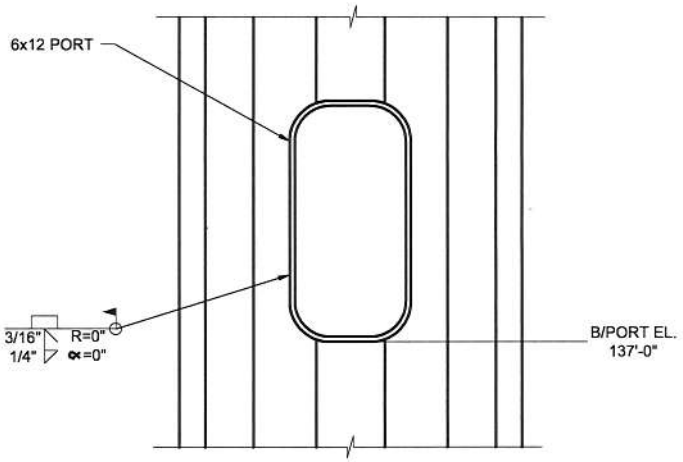
REV	DESCRIPTION	DATE
0	FIRST ISSUE	08/31/2020

DRAWING DESCRIPTION
MONOPOLE EXTENSION DETAILS

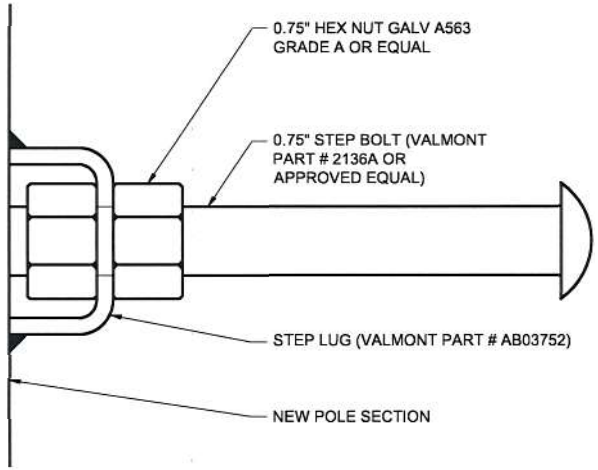
SHEET NUMBER: S-2
REVISION: 0



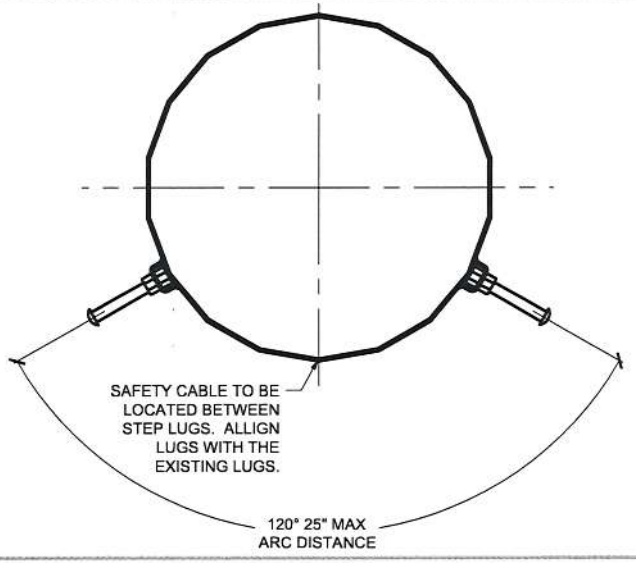
C TOP STRAP DETAIL
NOT TO SCALE



HANDHOLE DETAIL
NOT TO SCALE



STEP BOLT DETAIL
NOT TO SCALE



D ORIENTATION DETAIL
NOT TO SCALE

CLIENT

KGI WIRELESS

SITE NAME/NUMBER

28493

SITE ADDRESS

15 GREAT PASTURE ROAD
DANBURY, CT 06810
N41°22'58.8", W73°25'19.92"

DRAWINGS PREPARED BY:

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STATE OF CONNECTICUT
THOMAS L. TAYLOR
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LICENSED PROFESSIONAL ENGINEER
EXP. 01/31/2021

DRAWN BY: KRC
APPROVED BY: TLT

REV	DESCRIPTION	DATE
0	FIRST ISSUE	08/31/2020

DRAWING DESCRIPTION

MONOPOLE EXTENSION SECTIONS

SHEET NUMBER	REVISION
S-3	0

October 10, 2019
August 10, 2020 (Rev. 1)

CENTERLINE COMMUNICATIONS at&t

Centerline Communications
750 West Center Street, Suite #301
West Bridgewater, MA 02379

RE:		
	Site Number:	S2873 (NSB)
	FA Number:	12684101
	PACE Number:	MRCTB036632
	PT Number:	2051A0LAWW
	Site Name:	DANBURY GREAT PASTURE ROAD
	Site Address:	15 Great Pasture Road Danbury, CT 06810

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by Centerline Communications to perform a mount analysis on the proposed AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- **(9) TPA65R-BU6DA-K Antennas (71.2"x20.7"x7.7" – Wt. = 69 lbs. /each)**
- **(3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)**
- **(3) 4415 B30 RRH's (16.5"x13.4"x5.9" – Wt. = 46 lbs. /each)**
- **(3) 4449 B5/B12 RRH's (17.9"x13.2"x9.5" – Wt. = 71 lbs. /each)**
- **(3) B2/B66A 8843 RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each)**
- **(3) Squid Surge Arrestors (24.0"x9.7" Ø – Wt. = 33 lbs.)**

**Proposed equipment shown in bold*

Mount fabrication drawings prepared by Sabre Industries Towers and Poles, P/N C10855721C, dated October 18, 2017 were available for the proposed mounts.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R13.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 120 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.16 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- The mount has been analyzed with load combinations consisting of 250 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.

Based on our evaluation, we have determined that the New Sabre Industries C10855721C mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Proposed (NSB) Mount Rating	69	LC10	47%	**PASS**

Reference Documents:

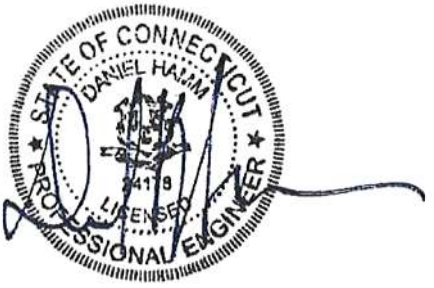
- Fabrication drawings prepared by Sabre Industries Towers and Poles, P/N C10855721C, dated October 18, 2017.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The proposed mount will be adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\,(z/z_g)^{2/\alpha}$

K_z= **1.088**

z= 140 (ft)
z_g= 1200 (ft)
α= 7.0

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c K_t/K_h)]^2$ $K_h = e^{(f*z/H)}$

K_{zt}= **#DIV/0!**

K_h= #DIV/0!
K_c= 0.9 (from Table 2-4)
K_t= (from Table 2-5)
f= (from Table 2-5)
z= 140
z_s= 390 (Mean elevation of base of structure above sea level)
H= (Ht. of the crest above surrounding terrain)
K_{zt}= 1.00 (from 2.6.6.2.1)
K_e= 0.99 (from 2.6.8)

(If Category 1 then K_{zt}=1.0)

Category= **1**

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i = 1.00 in
Importance Factor = I= 1.00 (from Table 2-3)
K_{iz} = 1.16 (from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$ t_{iz} = 1.16 in

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	140	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

$F = q_z * G_h * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

		K_z=	1.088 (from 2.6.5.2)
		K_{zt}=	1.0 (from 2.6.6.2.1)
		K_s=	1.0 (from 2.6.7)
q_z=	**37.57**	K_e=	0.99 (from 2.6.8)
$q_{z\,(ice)}$=	**6.52**	K_d=	0.95 (from Table 2-2)
$q_{z\,(30)}$=	**2.35**	V_{max}=	120 mph (Ultimate Wind Speed)
		$V_{max\,(ice)}$=	50 mph
		V_{30}=	30 mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **1.16 in** **Angle = 0 (deg)** **Equivalent Angle = 180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.44	1.24	**477**	**95**	**30**
B14 4478 RRH	18.1	13.4	8.3	1.68	1.35	1.20	**76**	**17**	**5**
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	2.18	1.20	**47**	**12**	**3**
4415 B30 RRH	16.5	13.4	5.9	1.54	1.23	1.20	**69**	**16**	**4**
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	2.80	1.21	**31**	**8**	**2**
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.36	1.20	**74**	**17**	**5**
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.88	1.20	**53**	**13**	**3**
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.20	**62**	**15**	**4**
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.20	**51**	**12**	**3**
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	**43**	**10**	**3**
HSS 6x3	3.0	12.0	-	0.25	0.25	1.25	**12**		
HSS 3x3	3.0	12.0	-	0.25	0.25	1.25	**12**		
L 2x2 Angles	2.0	12.0	-	0.17	0.17	2.00	**13**		
PL 2x1/8	0.1	12.0	-	0.01	0.01	2.00	**1**		
2-1/2" Pipe	2.9	12.0	-	0.24	0.24	1.20	**11**		
2" Pipe	2.4	12.0	-	0.20	0.20	1.20	**9**		

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.16	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	477	211	411
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	76	47	69
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	47	76	54
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	69	31	60
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	31	69	40
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	74	53	69
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	53	74	58
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	62	51	59
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	51	62	54

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.5	23.0	10.0	11.75	5.11	3.19	7.34	1.23	1.41	94	47	82
B14 4478 RRH	20.4	15.7	10.6	2.23	1.50	1.30	1.92	1.20	1.20	17	12	16
B14 4478 RRH (Side)	20.4	10.6	15.7	1.50	2.23	1.92	1.30	1.20	1.20	12	17	13
4415 B30 RRH	18.8	15.7	8.2	2.05	1.07	1.20	2.29	1.20	1.20	16	8	14
4415 B30 RRH (Side)	18.8	8.2	15.7	1.07	2.05	2.29	1.20	1.20	1.20	8	16	10
4449 B5/B12 RRH	20.2	15.5	11.8	2.18	1.66	1.30	1.71	1.20	1.20	17	13	16
4449 B5/B12 RRH (Side)	20.2	11.8	15.5	1.66	2.18	1.71	1.30	1.20	1.20	13	17	14
B2/B66A 8843 RRH	17.2	15.5	13.2	1.85	1.58	1.11	1.30	1.20	1.20	15	12	14
B2/B66A 8843 RRH (Side)	17.2	13.2	15.5	1.58	1.85	1.30	1.11	1.20	1.20	12	15	13

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	30	13	26
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	3
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	4
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	4	3
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	5	3	4
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	5	4
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	4	3	4
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	3

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.16	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	477	211	278
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	76	47	54
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	47	76	69
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	69	31	40
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	31	69	60
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	74	53	58
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	53	74	69
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	62	51	54
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	51	62	59

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.5	23.0	10.0	11.75	5.11	3.19	7.34	1.23	1.41	94	47	59
B14 4478 RRH	20.4	15.7	10.6	2.23	1.50	1.30	1.92	1.20	1.20	17	12	13
B14 4478 RRH (Side)	20.4	10.6	15.7	1.50	2.23	1.92	1.30	1.20	1.20	12	17	16
4415 B30 RRH	18.8	15.7	8.2	2.05	1.07	1.20	2.29	1.20	1.20	16	8	10
4415 B30 RRH (Side)	18.8	8.2	15.7	1.07	2.05	2.29	1.20	1.20	1.20	8	16	14
4449 B5/B12 RRH	20.2	15.5	11.8	2.18	1.66	1.30	1.71	1.20	1.20	17	13	14
4449 B5/B12 RRH (Side)	20.2	11.8	15.5	1.66	2.18	1.71	1.30	1.20	1.20	13	17	16
B2/B66A 8843 RRH	17.2	15.5	13.2	1.85	1.58	1.11	1.30	1.20	1.20	15	12	13
B2/B66A 8843 RRH (Side)	17.2	13.2	15.5	1.58	1.85	1.30	1.11	1.20	1.20	12	15	14

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	30	13	17
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	4
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	3
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	4	4
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	5	3	4
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	5	4
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	4	3	3
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	4

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.16	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	477	211	211
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	76	47	47
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	47	76	76
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	69	31	31
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	31	69	69
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	74	53	53
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	53	74	74
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	62	51	51
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	51	62	62

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.5	23.0	10.0	11.75	5.11	3.19	7.34	1.23	1.41	94	47	47
B14 4478 RRH	20.4	15.7	10.6	2.23	1.50	1.30	1.92	1.20	1.20	17	12	12
B14 4478 RRH (Side)	20.4	10.6	15.7	1.50	2.23	1.92	1.30	1.20	1.20	12	17	17
4415 B30 RRH	18.8	15.7	8.2	2.05	1.07	1.20	2.29	1.20	1.20	16	8	8
4415 B30 RRH (Side)	18.8	8.2	15.7	1.07	2.05	2.29	1.20	1.20	1.20	8	16	16
4449 B5/B12 RRH	20.2	15.5	11.8	2.18	1.66	1.30	1.71	1.20	1.20	17	13	13
4449 B5/B12 RRH (Side)	20.2	11.8	15.5	1.66	2.18	1.71	1.30	1.20	1.20	13	17	17
B2/B66A 8843 RRH	17.2	15.5	13.2	1.85	1.58	1.11	1.30	1.20	1.20	15	12	12
B2/B66A 8843 RRH (Side)	17.2	13.2	15.5	1.58	1.85	1.30	1.11	1.20	1.20	12	15	15

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	30	13	13
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	5
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	2
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	4	4
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	5	3	3
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	5	5
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	4	3	3
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	4

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.16	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	477	211	278
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	76	47	54
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	47	76	69
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	69	31	40
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	31	69	60
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	74	53	58
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	53	74	69
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	62	51	54
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	51	62	59

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.5	23.0	10.0	11.75	5.11	3.19	7.34	1.23	1.41	94	47	59
B14 4478 RRH	20.4	15.7	10.6	2.23	1.50	1.30	1.92	1.20	1.20	17	12	13
B14 4478 RRH (Side)	20.4	10.6	15.7	1.50	2.23	1.92	1.30	1.20	1.20	12	17	16
4415 B30 RRH	18.8	15.7	8.2	2.05	1.07	1.20	2.29	1.20	1.20	16	8	10
4415 B30 RRH (Side)	18.8	8.2	15.7	1.07	2.05	2.29	1.20	1.20	1.20	8	16	14
4449 B5/B12 RRH	20.2	15.5	11.8	2.18	1.66	1.30	1.71	1.20	1.20	17	13	14
4449 B5/B12 RRH (Side)	20.2	11.8	15.5	1.66	2.18	1.71	1.30	1.20	1.20	13	17	16
B2/B66A 8843 RRH	17.2	15.5	13.2	1.85	1.58	1.11	1.30	1.20	1.20	15	12	13
B2/B66A 8843 RRH (Side)	17.2	13.2	15.5	1.58	1.85	1.30	1.11	1.20	1.20	12	15	14

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	30	13	17
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	4
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	3
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	4	4
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	5	3	4
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	5	4
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	4	3	3
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	4

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.16	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	477	211	411
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	76	47	69
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	47	76	54
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	69	31	60
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	31	69	40
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	74	53	69
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	53	74	58
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	62	51	59
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	51	62	54

WIND LOADS WITH ICE:

TPA65R-BU6DA-K Antenna	73.5	23.0	10.0	11.75	5.11	3.19	7.34	1.23	1.41	94	47	82
B14 4478 RRH	20.4	15.7	10.6	2.23	1.50	1.30	1.92	1.20	1.20	17	12	16
B14 4478 RRH (Side)	20.4	10.6	15.7	1.50	2.23	1.92	1.30	1.20	1.20	12	17	13
4415 B30 RRH	18.8	15.7	8.2	2.05	1.07	1.20	2.29	1.20	1.20	16	8	14
4415 B30 RRH (Side)	18.8	8.2	15.7	1.07	2.05	2.29	1.20	1.20	1.20	8	16	10
4449 B5/B12 RRH	20.2	15.5	11.8	2.18	1.66	1.30	1.71	1.20	1.20	17	13	16
4449 B5/B12 RRH (Side)	20.2	11.8	15.5	1.66	2.18	1.71	1.30	1.20	1.20	13	17	14
B2/B66A 8843 RRH	17.2	15.5	13.2	1.85	1.58	1.11	1.30	1.20	1.20	15	12	14
B2/B66A 8843 RRH (Side)	17.2	13.2	15.5	1.58	1.85	1.30	1.11	1.20	1.20	12	15	13

WIND LOADS AT 30 MPH:

TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	30	13	26
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	3
4415 B30 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	4
4415 B30 RRH (Side)	16.5	5.9	13.4	0.68	1.54	2.80	1.23	1.21	1.20	2	4	3
4449 B5/B12 RRH	17.9	13.2	9.5	1.64	1.18	1.36	1.88	1.20	1.20	5	3	4
4449 B5/B12 RRH (Side)	17.9	9.5	13.2	1.18	1.64	1.88	1.36	1.20	1.20	3	5	4
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	4	3	4
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	3

Date: 8/10/2020
Project Name: DANBURY GREAT PASTURE ROAD
Project No.: S2873
Designed By: RL **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.16 in.
Density of ice: 56 pcf

TPA65R-BU6DA-K Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		195 lbs
Weight of object:	69.0 lbs	
Combined weight of ice and object:		264 lbs

B14 4478 RRH

Weight of ice based on total radial SF area:

Height (in):	18.1	
Width (in):	13.4	
Depth (in):	8.3	
Total weight of ice on object:		36 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		96 lbs

4415 B30 RRH

Weight of ice based on total radial SF area:

Height (in):	16.5	
Width (in):	13.4	
Depth (in):	5.9	
Total weight of ice on object:		31 lbs
Weight of object:	46.0 lbs	
Combined weight of ice and object:		77 lbs

4449 B5/B12 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.5	
Total weight of ice on object:		37 lbs
Weight of object:	71.0 lbs	
Combined weight of ice and object:		108 lbs

B2/B66A 8843 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	10.9	
Total weight of ice on object:		32 lbs
Weight of object:	72.0 lbs	
Combined weight of ice and object:		104 lbs

Squid Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	24.0	
Diameter(in):	9.7	
Total weight of ice on object:		31 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		64 lbs

HSS 6x3

Weight of ice based on total radial SF area:

Height (in):	6	
Width (in):	3	
Per foot weight of ice on object:		11 plf

HSS 3x3

Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:		8 plf

L 2x2 Angles

Weight of ice based on total radial SF area:

Height (in):	2	
Width (in):	2	
Per foot weight of ice on object:		6 plf

PL 2x1/8

Weight of ice based on total radial SF area:

Height (in):	2	
Width (in):	0.13	
Per foot weight of ice on object:		4 plf

2-1/2" Pipe

Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:		6 plf

2" Pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		5 plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)

Bentley

Current Date: 8/10/2020 1:14 PM
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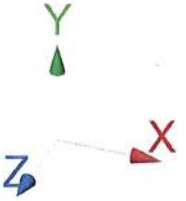

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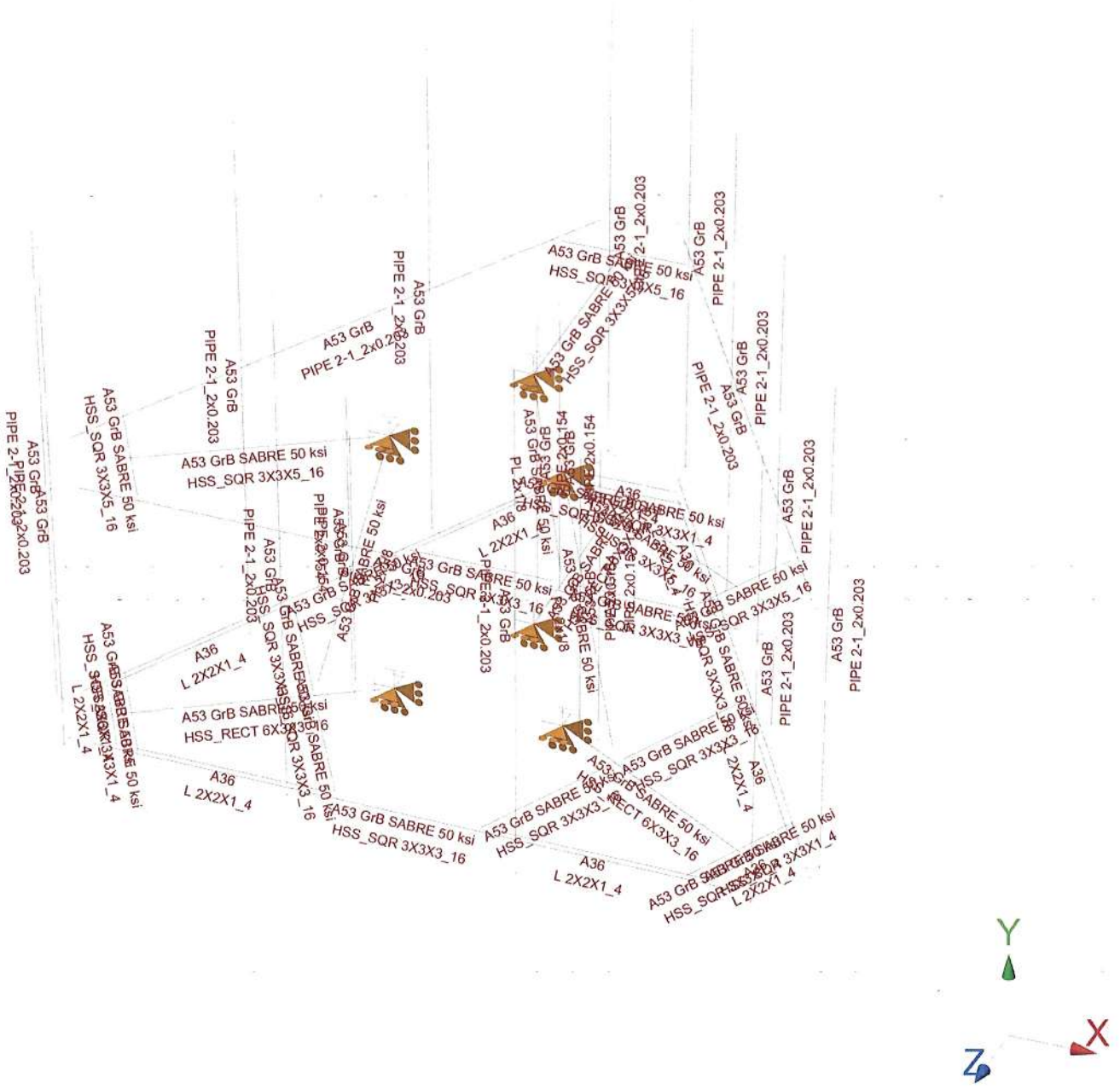

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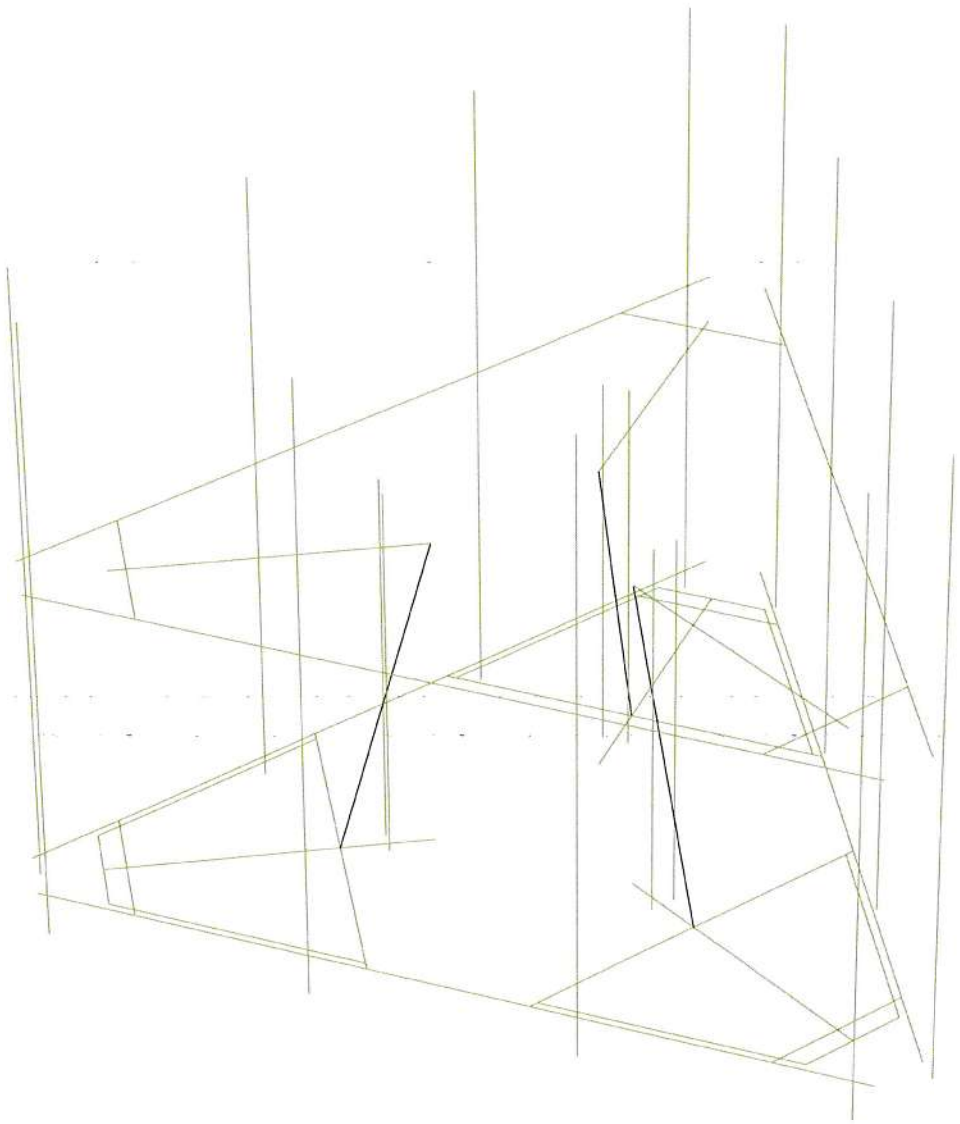

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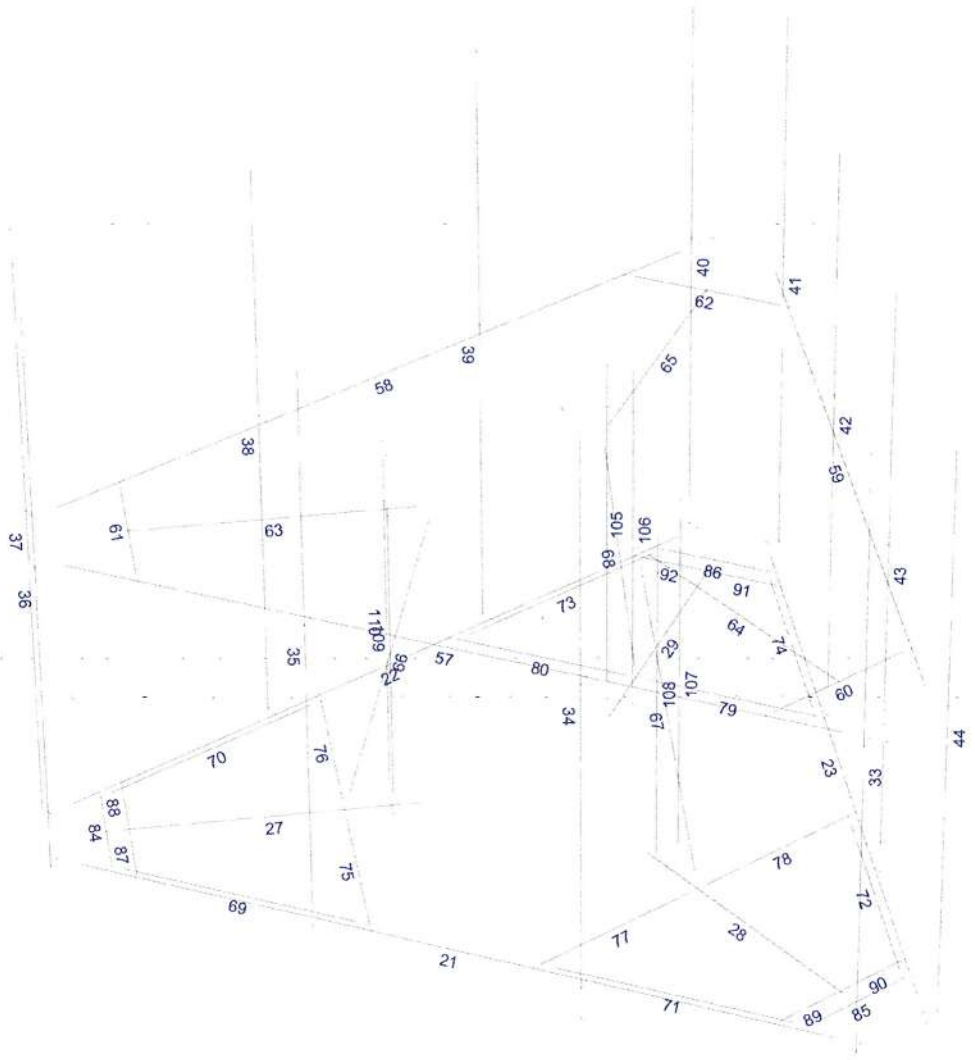

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Load data

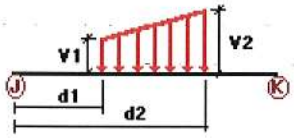
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL
LLa4	250 lb Live Load Antenna 4	No	LL

Distributed force on members



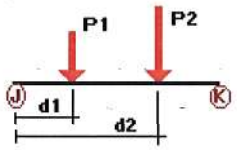
Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	71	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	69	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	74	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	72	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	70	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	73	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	84	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	75	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	76	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	86	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	80	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	79	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	77	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	78	Y	-0.01	-0.01	0.00	Yes	100.00	Yes
	85	Y	-0.01	-0.01	0.00	Yes	100.00	Yes

W0	35	z	-0.011	-0.011	0.00	No	100.00	Yes
	37	z	-0.011	-0.011	0.00	No	100.00	Yes
	38	z	-0.011	-0.011	0.00	No	100.00	Yes
	39	z	-0.011	-0.011	0.00	No	100.00	Yes
	40	z	-0.011	-0.011	0.00	No	100.00	Yes
	41	z	-0.011	-0.011	0.00	No	100.00	Yes
	42	z	-0.011	-0.011	0.00	No	100.00	Yes
	43	z	-0.011	-0.011	0.00	No	100.00	Yes
	44	z	-0.011	-0.011	0.00	No	100.00	Yes
	66	z	-0.001	-0.001	0.00	No	100.00	Yes
	67	z	-0.001	-0.001	0.00	No	100.00	Yes
	68	z	-0.001	-0.001	0.00	No	100.00	Yes
	105	z	-0.009	-0.009	0.00	No	100.00	Yes
	106	z	-0.009	-0.009	0.00	No	100.00	Yes
	107	z	-0.009	-0.009	0.00	No	100.00	Yes
	108	z	-0.009	-0.009	0.00	No	100.00	Yes
	109	z	-0.009	-0.009	0.00	No	100.00	Yes
	110	z	-0.009	-0.009	0.00	No	100.00	Yes
	71	z	-0.013	-0.013	0.00	No	100.00	Yes
	69	z	-0.013	-0.013	0.00	No	100.00	Yes
	21	z	-0.012	-0.012	0.00	No	100.00	Yes
	57	z	-0.011	-0.011	0.00	No	100.00	Yes
	74	z	-0.013	-0.013	0.00	No	100.00	Yes
	72	z	-0.013	-0.013	0.00	No	100.00	Yes
	23	z	-0.012	-0.012	0.00	No	100.00	Yes
	59	z	-0.011	-0.011	0.00	No	100.00	Yes
	70	z	-0.013	-0.013	0.00	No	100.00	Yes
	73	z	-0.013	-0.013	0.00	No	100.00	Yes
	22	z	-0.012	-0.012	0.00	No	100.00	Yes
	58	z	-0.011	-0.011	0.00	No	100.00	Yes
	84	z	-0.013	-0.013	0.00	No	100.00	Yes
	88	z	-0.012	-0.012	0.00	No	100.00	Yes
	61	z	-0.012	-0.012	0.00	No	100.00	Yes
	87	z	-0.012	-0.012	0.00	No	100.00	Yes
	27	z	-0.012	-0.012	0.00	No	100.00	Yes
	63	z	-0.012	-0.012	0.00	No	100.00	Yes
	75	z	-0.012	-0.012	0.00	No	100.00	Yes
	76	z	-0.012	-0.012	0.00	No	100.00	Yes
	62	z	-0.012	-0.012	0.00	No	100.00	Yes
	91	z	-0.012	-0.012	0.00	No	100.00	Yes
	86	z	-0.013	-0.013	0.00	No	100.00	Yes
	92	z	-0.012	-0.012	0.00	No	100.00	Yes
	80	z	-0.012	-0.012	0.00	No	100.00	Yes
	79	z	-0.012	-0.012	0.00	No	100.00	Yes
	28	z	-0.012	-0.012	0.00	No	100.00	Yes
	64	z	-0.012	-0.012	0.00	No	100.00	Yes
	77	z	-0.012	-0.012	0.00	No	100.00	Yes
	78	z	-0.012	-0.012	0.00	No	100.00	Yes
	60	z	-0.012	-0.012	0.00	No	100.00	Yes
	85	z	-0.013	-0.013	0.00	No	100.00	Yes
	89	z	-0.012	-0.012	0.00	No	100.00	Yes
	90	z	-0.012	-0.012	0.00	No	100.00	Yes
W30	33	x	-0.011	-0.011	0.00	No	100.00	Yes
	34	x	-0.011	-0.011	0.00	No	100.00	Yes
	35	x	-0.011	-0.011	0.00	No	100.00	Yes
	36	x	-0.011	-0.011	0.00	No	100.00	Yes
	37	x	-0.011	-0.011	0.00	No	100.00	Yes
	38	x	-0.011	-0.011	0.00	No	100.00	Yes
	39	x	-0.011	-0.011	0.00	No	100.00	Yes
	40	x	-0.011	-0.011	0.00	No	100.00	Yes

	43	x	-0.011	-0.011	0.00	No	100.00	Yes
	66	x	-0.001	-0.001	0.00	No	100.00	Yes
	67	x	-0.001	-0.001	0.00	No	100.00	Yes
	68	x	-0.001	-0.001	0.00	No	100.00	Yes
	105	x	-0.009	-0.009	0.00	No	100.00	Yes
	106	x	-0.009	-0.009	0.00	No	100.00	Yes
	107	x	-0.009	-0.009	0.00	No	100.00	Yes
	108	x	-0.009	-0.009	0.00	No	100.00	Yes
	109	x	-0.009	-0.009	0.00	No	100.00	Yes
	110	x	-0.009	-0.009	0.00	No	100.00	Yes
	57	x	-0.011	-0.011	0.00	No	100.00	Yes
	74	x	-0.013	-0.013	0.00	No	100.00	Yes
	72	x	-0.013	-0.013	0.00	No	100.00	Yes
	23	x	-0.012	-0.012	0.00	No	100.00	Yes
	59	x	-0.011	-0.011	0.00	No	100.00	Yes
	70	x	-0.013	-0.013	0.00	No	100.00	Yes
	73	x	-0.013	-0.013	0.00	No	100.00	Yes
	22	x	-0.012	-0.012	0.00	No	100.00	Yes
	58	x	-0.011	-0.011	0.00	No	100.00	Yes
	84	x	-0.013	-0.013	0.00	No	100.00	Yes
	88	x	-0.012	-0.012	0.00	No	100.00	Yes
	61	x	-0.012	-0.012	0.00	No	100.00	Yes
	87	x	-0.012	-0.012	0.00	No	100.00	Yes
	27	x	-0.012	-0.012	0.00	No	100.00	Yes
	63	x	-0.012	-0.012	0.00	No	100.00	Yes
	75	x	-0.012	-0.012	0.00	No	100.00	Yes
	76	x	-0.012	-0.012	0.00	No	100.00	Yes
	29	x	-0.012	-0.012	0.00	No	100.00	Yes
	65	x	-0.012	-0.012	0.00	No	100.00	Yes
	28	x	-0.012	-0.012	0.00	No	100.00	Yes
	64	x	-0.012	-0.012	0.00	No	100.00	Yes
	77	x	-0.012	-0.012	0.00	No	100.00	Yes
	78	x	-0.012	-0.012	0.00	No	100.00	Yes
	60	x	-0.012	-0.012	0.00	No	100.00	Yes
	85	x	-0.013	-0.013	0.00	No	100.00	Yes
	89	x	-0.012	-0.012	0.00	No	100.00	Yes
	90	x	-0.012	-0.012	0.00	No	100.00	Yes
Di	33	y	-0.006	-0.006	0.00	No	100.00	Yes
	34	y	-0.006	-0.006	0.00	No	100.00	Yes
	35	y	-0.006	-0.006	0.00	No	100.00	Yes
	36	y	-0.006	-0.006	0.00	No	100.00	Yes
	37	y	-0.006	-0.006	0.00	No	100.00	Yes
	38	y	-0.006	-0.006	0.00	No	100.00	Yes
	39	y	-0.006	-0.006	0.00	No	100.00	Yes
	40	y	-0.006	-0.006	0.00	No	100.00	Yes
	41	y	-0.006	-0.006	0.00	No	100.00	Yes
	42	y	-0.006	-0.006	0.00	No	100.00	Yes
	43	y	-0.006	-0.006	0.00	No	100.00	Yes
	44	y	-0.006	-0.006	0.00	No	100.00	Yes
	66	y	-0.004	-0.004	0.00	No	100.00	Yes
	67	y	-0.004	-0.004	0.00	No	100.00	Yes
	68	y	-0.004	-0.004	0.00	No	100.00	Yes
	105	y	-0.005	-0.005	0.00	No	100.00	Yes
	106	y	-0.005	-0.005	0.00	No	100.00	Yes
	107	y	-0.005	-0.005	0.00	No	100.00	Yes
	108	y	-0.005	-0.005	0.00	No	100.00	Yes
	109	y	-0.005	-0.005	0.00	No	100.00	Yes
	110	y	-0.005	-0.005	0.00	No	100.00	Yes
	71	y	-0.006	-0.006	0.00	No	100.00	Yes
	69	y	-0.006	-0.006	0.00	No	100.00	Yes

21	y	-0.008	-0.008	0.00	No	100.00	Yes
57	y	-0.006	-0.006	0.00	No	100.00	Yes
74	y	-0.006	-0.006	0.00	No	100.00	Yes
72	y	-0.006	-0.006	0.00	No	100.00	Yes
23	y	-0.008	-0.008	0.00	No	100.00	Yes
59	y	-0.006	-0.006	0.00	No	100.00	Yes
70	y	-0.006	-0.006	0.00	No	100.00	Yes
73	y	-0.006	-0.006	0.00	No	100.00	Yes
22	y	-0.008	-0.008	0.00	No	100.00	Yes
58	y	-0.006	-0.006	0.00	No	100.00	Yes
84	y	-0.006	-0.006	0.00	No	100.00	Yes
88	y	-0.008	-0.008	0.00	No	100.00	Yes
61	y	-0.008	-0.008	0.00	No	100.00	Yes
87	y	-0.008	-0.008	0.00	No	100.00	Yes
27	y	-0.011	-0.011	0.00	No	100.00	Yes
63	y	-0.008	-0.008	0.00	No	100.00	Yes
75	y	-0.008	-0.008	0.00	No	100.00	Yes
76	y	-0.008	-0.008	0.00	No	100.00	Yes
62	y	-0.008	-0.008	0.00	No	100.00	Yes
91	y	-0.008	-0.008	0.00	No	100.00	Yes
86	y	-0.006	-0.006	0.00	No	100.00	Yes
92	y	-0.008	-0.008	0.00	No	100.00	Yes
80	y	-0.008	-0.008	0.00	No	100.00	Yes
79	y	-0.008	-0.008	0.00	No	100.00	Yes
29	y	-0.011	-0.011	0.00	No	100.00	Yes
65	y	-0.008	-0.008	0.00	No	100.00	Yes
28	y	-0.011	-0.011	0.00	No	100.00	Yes
64	y	-0.008	-0.008	0.00	No	100.00	Yes
77	y	-0.008	-0.008	0.00	No	100.00	Yes
78	y	-0.008	-0.008	0.00	No	100.00	Yes
60	y	-0.008	-0.008	0.00	No	100.00	Yes
85	y	-0.006	-0.006	0.00	No	100.00	Yes
89	y	-0.008	-0.008	0.00	No	100.00	Yes
90	y	-0.008	-0.008	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	33	y	-0.035	1.50	No
		y	-0.035	6.50	No
	34	y	-0.035	1.50	No
		y	-0.035	6.50	No
	35	y	-0.033	6.00	No
	36	y	-0.035	1.50	No
		y	-0.035	6.50	No
	37	y	-0.035	1.50	No
		y	-0.035	6.50	No
	38	y	-0.035	1.50	No
		y	-0.035	6.50	No

	39	y	-0.033	6.00	No
	40	y	-0.035	1.50	No
		y	-0.035	6.50	No
	41	y	-0.035	1.50	No
		y	-0.035	6.50	No
	42	y	-0.035	1.50	No
		y	-0.035	6.50	No
	43	y	-0.033	6.00	No
	44	y	-0.035	1.50	No
		y	-0.035	6.50	No
	105	y	-0.06	2.00	No
		y	-0.071	4.00	No
	106	y	-0.046	2.00	No
		y	-0.072	4.00	No
	107	y	-0.06	2.00	No
		y	-0.071	4.00	No
	108	y	-0.046	2.00	No
		y	-0.072	4.00	No
	109	y	-0.06	2.00	No
		y	-0.071	4.00	No
	110	y	-0.046	2.00	No
		y	-0.072	4.00	No
W0	33	z	-0.239	1.50	No
		z	-0.239	6.50	No
	34	z	-0.239	1.50	No
		z	-0.239	6.50	No
	35	z	-0.043	6.00	No
	36	z	-0.239	1.50	No
		z	-0.239	6.50	No
	37	z	-0.139	1.50	No
		z	-0.139	6.50	No
	38	z	-0.139	1.50	No
		z	-0.139	6.50	No
	39	z	-0.043	6.00	No
	40	z	-0.139	1.50	No
		z	-0.139	6.50	No
	41	z	-0.139	1.50	No
		z	-0.139	6.50	No
	42	z	-0.139	1.50	No
		z	-0.139	6.50	No
	43	z	-0.043	6.00	No
	44	z	-0.139	1.50	No
		z	-0.139	6.50	No
	105	z	-0.047	2.00	No
		z	-0.053	4.00	No
	106	z	-0.031	2.00	No
		z	-0.051	4.00	No
	107	z	-0.069	2.00	No
		z	-0.069	4.00	No
	108	z	-0.06	2.00	No
		z	-0.059	4.00	No
	109	z	-0.069	2.00	No
		z	-0.069	4.00	No
	110	z	-0.06	2.00	No
		z	-0.059	4.00	No
W30	33	x	-0.106	1.50	No
		x	-0.106	6.50	No
	34	x	-0.106	1.50	No
		x	-0.106	6.50	No
	35	x	-0.043	6.00	No

	36	x	-0.106	1.50	No
		x	-0.106	6.50	No
	37	x	-0.206	1.50	No
		x	-0.206	6.50	No
	38	x	-0.206	1.50	No
		x	-0.206	6.50	No
	39	x	-0.043	6.00	No
	40	x	-0.206	1.50	No
		x	-0.206	6.50	No
	41	x	-0.206	1.50	No
		x	-0.206	6.50	No
	42	x	-0.206	1.50	No
		x	-0.206	6.50	No
	43	x	-0.043	6.00	No
	44	x	-0.206	1.50	No
		x	-0.206	6.50	No
	105	x	-0.076	2.00	No
		x	-0.074	4.00	No
	106	x	-0.069	2.00	No
		x	-0.062	4.00	No
	107	x	-0.054	2.00	No
		x	-0.058	4.00	No
	108	x	-0.04	2.00	No
		x	-0.054	4.00	No
	109	x	-0.054	2.00	No
		x	-0.058	4.00	No
	110	x	-0.04	2.00	No
		x	-0.054	4.00	No
Di	33	y	-0.098	1.50	No
		y	-0.098	6.50	No
	34	y	-0.098	1.50	No
		y	-0.098	6.50	No
	35	y	-0.031	6.00	No
	36	y	-0.098	1.50	No
		y	-0.098	6.50	No
	37	y	-0.098	1.50	No
		y	-0.098	6.50	No
	38	y	-0.098	1.50	No
		y	-0.098	6.50	No
	39	y	-0.031	6.00	No
	40	y	-0.098	1.50	No
		y	-0.098	6.50	No
	41	y	-0.098	1.50	No
		y	-0.098	6.50	No
	42	y	-0.098	1.50	No
		y	-0.098	6.50	No
	43	y	-0.031	6.00	No
	44	y	-0.098	1.50	No
		y	-0.098	6.50	No
	105	y	-0.036	2.00	No
		y	-0.037	4.00	No
	106	y	-0.031	2.00	No
		y	-0.032	4.00	No
	107	y	-0.036	2.00	No
		y	-0.037	4.00	No
	108	y	-0.031	2.00	No
		y	-0.032	4.00	No
	109	y	-0.036	2.00	No
		y	-0.037	4.00	No
	110	y	-0.031	2.00	No

		y	-0.032	4.00	No
Wi0	33	z	-0.048	1.50	No
		z	-0.048	6.50	No
	34	z	-0.048	1.50	No
		z	-0.048	6.50	No
	35	z	-0.01	6.00	No
	36	z	-0.048	1.50	No
		z	-0.048	6.50	No
	37	z	-0.03	1.50	No
		z	-0.03	6.50	No
	38	z	-0.03	1.50	No
		z	-0.03	6.50	No
	39	z	-0.01	6.00	No
	40	z	-0.03	1.50	No
		z	-0.03	6.50	No
	41	z	-0.03	1.50	No
		z	-0.03	6.50	No
	42	z	-0.03	1.50	No
		z	-0.03	6.50	No
	43	z	-0.01	6.00	No
	44	z	-0.03	1.50	No
		z	-0.03	6.50	No
	105	z	-0.012	2.00	No
		z	-0.013	4.00	No
	106	z	-0.008	2.00	No
		z	-0.012	4.00	No
	107	z	-0.016	2.00	No
		z	-0.016	4.00	No
	108	z	-0.014	2.00	No
		z	-0.014	4.00	No
	109	z	-0.016	2.00	No
		z	-0.016	4.00	No
	110	z	-0.014	2.00	No
		z	-0.014	4.00	No
Wi30	33	x	-0.024	1.50	No
		x	-0.024	6.50	No
	34	x	-0.024	1.50	No
		x	-0.024	6.50	No
	35	x	-0.01	6.00	No
	36	x	-0.024	1.50	No
		x	-0.024	6.50	No
	37	x	-0.042	1.50	No
		x	-0.042	6.50	No
	38	x	-0.042	1.50	No
		x	-0.042	6.50	No
	39	x	-0.01	6.00	No
	40	x	-0.042	1.50	No
		x	-0.042	6.50	No
	41	x	-0.042	1.50	No
		x	-0.042	6.50	No
	42	x	-0.042	1.50	No
		x	-0.042	6.50	No
	43	x	-0.01	6.00	No
	44	x	-0.042	1.50	No
		x	-0.042	6.50	No
	105	x	-0.017	2.00	No
		x	-0.017	4.00	No
	106	x	-0.016	2.00	No
		x	-0.015	4.00	No
	107	x	-0.013	2.00	No

		x	-0.014	4.00	No
	108	x	-0.01	2.00	No
		x	-0.013	4.00	No
	109	x	-0.013	2.00	No
		x	-0.014	4.00	No
	110	x	-0.01	2.00	No
		x	-0.013	4.00	No
WL0	33	z	-0.015	1.50	No
		z	-0.015	6.50	No
	34	z	-0.015	1.50	No
		z	-0.015	6.50	No
	35	z	-0.003	6.00	No
	36	z	-0.015	1.50	No
		z	-0.015	6.50	No
	37	z	-0.009	1.50	No
		z	-0.009	6.50	No
	38	z	-0.009	1.50	No
		z	-0.009	6.50	No
	39	z	-0.003	6.00	No
	40	z	-0.009	1.50	No
		z	-0.009	6.50	No
	41	z	-0.009	1.50	No
		z	-0.009	6.50	No
	42	z	-0.009	1.50	No
		z	-0.009	6.50	No
	43	z	-0.003	6.00	No
	44	z	-0.009	1.50	No
		z	-0.009	6.50	No
	105	z	-0.003	2.00	No
		z	-0.003	4.00	No
	106	z	-0.002	2.00	No
		z	-0.003	4.00	No
	107	z	-0.004	2.00	No
		z	-0.004	4.00	No
	108	z	-0.004	2.00	No
		z	-0.004	4.00	No
	109	z	-0.004	2.00	No
		z	-0.004	4.00	No
	110	z	-0.004	2.00	No
		z	-0.004	4.00	No
WL30	33	x	-0.007	1.50	No
		x	-0.007	6.50	No
	34	x	-0.007	1.50	No
		x	-0.007	6.50	No
	35	x	-0.003	6.00	No
	36	x	-0.007	1.50	No
		x	-0.007	6.50	No
	37	x	-0.013	1.50	No
		x	-0.013	6.50	No
	38	x	-0.013	1.50	No
		x	-0.013	6.50	No
	39	x	-0.003	6.00	No
	40	x	-0.013	1.50	No
		x	-0.013	6.50	No
	41	x	-0.013	1.50	No
		x	-0.013	6.50	No
	42	x	-0.013	1.50	No
		x	-0.013	6.50	No
	43	x	-0.003	6.00	No
	44	x	-0.013	1.50	No

		x	-0.013	6.50	No
	105	x	-0.005	2.00	No
		x	-0.005	4.00	No
	106	x	-0.004	2.00	No
		x	-0.004	4.00	No
	107	x	-0.003	2.00	No
		x	-0.004	4.00	No
	108	x	-0.003	2.00	No
		x	-0.003	4.00	No
	109	x	-0.003	2.00	No
		x	-0.004	4.00	No
	110	x	-0.003	2.00	No
		x	-0.003	4.00	No
LL1	57	y	-0.25	50.00	Yes
LL2	57	y	-0.25	100.00	Yes
LLa1	33	y	-0.25	50.00	Yes
LLa2	34	y	-0.25	50.00	Yes
LLa3	35	y	-0.25	50.00	Yes
LLa4	36	y	-0.25	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00

LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.2DL
LC15=1.2DL+1.5LL1
LC16=1.2DL+1.5LL2
LC17=1.2DL+WL0+1.5LLa1
LC18=1.2DL+WL30+1.5LLa1
LC19=1.2DL-WL0+1.5LLa1
LC20=1.2DL-WL30+1.5LLa1
LC21=1.2DL+WL0+1.5LLa2
LC22=1.2DL+WL30+1.5LLa2
LC23=1.2DL-WL0+1.5LLa2
LC24=1.2DL-WL30+1.5LLa2
LC25=1.2DL+WL0+1.5LLa3
LC26=1.2DL+WL30+1.5LLa3
LC27=1.2DL-WL0+1.5LLa3
LC28=1.2DL-WL30+1.5LLa3
LC29=1.2DL+WL0+1.5LLa4
LC30=1.2DL+WL30+1.5LLa4
LC31=1.2DL-WL0+1.5LLa4
LC32=1.2DL-WL30+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_RECT 6X3X3_16	**27**	LC10 at 0.00%	**0.20**	**OK**	Eq. H1-1b
		28	LC12 at 0.00%	0.20	OK	Eq. H1-1b
		29	LC10 at 0.00%	0.20	OK	Eq. H1-1b
	HSS_SQR 3X3X1_4	**87**	LC11 at 100.00%	0.11	OK	Eq. H1-1b
		88	LC10 at 0.00%	**0.12**	**OK**	Eq. H1-1b
		89	LC11 at 100.00%	0.12	OK	Eq. H1-1b
		90	LC12 at 0.00%	0.11	OK	Eq. H1-1b
		91	LC9 at 100.00%	0.12	OK	Eq. H1-1b
		92	LC9 at 0.00%	0.11	OK	Eq. H1-1b
	HSS_SQR 3X3X3_16	**21**	LC10 at 40.28%	0.10	OK	Eq. H1-1b
		22	LC9 at 59.72%	0.10	OK	Eq. H1-1b
		23	LC12 at 59.72%	0.10	OK	Eq. H1-1b
		75	LC10 at 100.00%	0.22	OK	Eq. H1-1b
		76	LC10 at 0.00%	0.22	OK	Eq. H1-1b
		77	LC11 at 100.00%	0.22	OK	Eq. H1-1b
		78	LC12 at 0.00%	0.22	OK	Eq. H1-1b

	79	LC9 at 100.00%	**0.22**	**OK**	Eq. H1-1b
	80	LC9 at 100.00%	0.22	OK	Eq. H1-1b
HSS_SQR 3X3X5_16	**60**	LC2 at 50.00%	0.26	OK	Eq. H1-1b
	61	LC4 at 50.00%	0.30	OK	Eq. H1-1b
	62	LC3 at 50.00%	0.25	OK	Eq. H1-1b
	63	LC3 at 0.00%	0.27	OK	Eq. H1-1b
	64	LC1 at 93.75%	0.29	OK	Eq. H1-1b
	65	LC2 at 0.00%	**0.34**	**OK**	Eq. H1-1b
L 2X2X1_4	**69**	LC10 at 90.63%	**0.47**	**OK**	Eq. H3-8
	70	LC11 at 90.63%	0.25	OK	Eq. H2-1
	71	LC12 at 90.63%	0.25	OK	Eq. H2-1
	72	LC12 at 9.38%	0.25	OK	Eq. H2-1
	73	LC9 at 90.63%	0.46	OK	Eq. H3-8
	74	LC9 at 9.38%	0.46	OK	Eq. H3-8
	84	LC10 at 50.00%	0.26	OK	Eq. H2-1
	85	LC11 at 50.00%	0.26	OK	Eq. H2-1
	86	LC9 at 50.00%	0.26	OK	Eq. H2-1
PIPE 2-1_2x0.203	**33**	LC1 at 43.75%	0.29	OK	Eq. H1-1b
	34	LC1 at 43.75%	0.29	OK	Eq. H1-1b
	35	LC10 at 93.75%	0.13	OK	Eq. H1-1b
	36	LC3 at 43.75%	0.29	OK	Eq. H1-1b
	37	LC2 at 43.75%	0.29	OK	Eq. H1-1b
	38	LC4 at 43.75%	0.29	OK	Eq. H1-1b
	39	LC12 at 93.75%	0.15	OK	Eq. H1-1b
	40	LC2 at 43.75%	0.29	OK	Eq. H1-1b
	41	LC4 at 43.75%	0.25	OK	Eq. H1-1b
	42	LC4 at 43.75%	0.25	OK	Eq. H1-1b
	43	LC11 at 93.75%	0.12	OK	Eq. H1-1b
	44	LC2 at 43.75%	0.25	OK	Eq. H1-1b
	57	LC1 at 86.61%	**0.42**	**OK**	Eq. H1-1b
	58	LC4 at 13.39%	0.39	OK	Eq. H1-1b
	59	LC2 at 13.39%	0.33	OK	Eq. H1-1b
PIPE 2x0.154	**105**	LC2 at 18.75%	0.11	OK	Eq. H1-1b
	106	LC4 at 18.75%	0.11	OK	Eq. H1-1b
	107	LC3 at 18.75%	0.11	OK	Eq. H1-1b
	108	LC3 at 18.75%	0.12	OK	Eq. H1-1b
	109	LC3 at 18.75%	**0.12**	**OK**	Eq. H1-1b
	110	LC3 at 18.75%	0.11	OK	Eq. H1-1b
PL 2x1/8	**66**	LC10 at 100.00%	0.29	With warnings	Eq. H1-1a
	67	LC12 at 100.00%	0.28	With warnings	Eq. H1-1a
	68	LC9 at 100.00%	**0.29**	**With warnings**	Eq. H1-1a

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
9	0.00	0.00	-1.75	0
216	0.00	5.00	-1.75	0
172	1.5155	0.00	0.875	0
214	1.5155	5.00	0.875	0
174	-1.5155	0.00	0.875	0
215	-1.5155	5.00	0.875	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
9	1	1	1	1	1	1
216	1	1	1	1	1	1
172	1	1	1	1	1	1
214	1	1	1	1	1	1
174	1	1	1	1	1	1
215	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
33	239	227		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
34	240	228		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
35	242	230		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
36	241	229		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
37	243	231		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
38	244	232		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
39	245	233		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
40	246	234		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
41	247	235		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
42	248	236		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
43	249	237		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
44	250	238		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
66	215	211		PL 2x1/8	A53 GrB SABRE 50...	0.00	0.00	0.00
67	214	212		PL 2x1/8	A53 GrB SABRE 50...	0.00	0.00	0.00
68	216	213		PL 2x1/8	A53 GrB SABRE 50...	0.00	0.00	0.00
105	380	377		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
106	379	375		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
107	384	371		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
108	383	369		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
109	382	365		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
110	381	363		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
71	288	286		L 2X2X1_4	A36	0.00	0.00	0.00
69	289	287		L 2X2X1_4	A36	0.00	0.00	0.00
21	29	28		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
57	314	315		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
74	273	272		L 2X2X1_4	A36	0.00	0.00	0.00
72	271	270		L 2X2X1_4	A36	0.00	0.00	0.00
23	4	5		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
59	318	319		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
70	284	282		L 2X2X1_4	A36	0.00	0.00	0.00
73	285	283		L 2X2X1_4	A36	0.00	0.00	0.00
22	25	26		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
58	316	317		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
84	287	282		L 2X2X1_4	A36	0.00	0.00	0.00
88	359	354		HSS_SQR 3X3X1_4	A53 GrB SABRE 50...	0.00	0.00	0.00
61	334	331		HSS_SQR 3X3X5_16	A53 GrB SABRE 50...	0.00	0.00	0.00
87	357	359		HSS_SQR 3X3X1_4	A53 GrB SABRE 50...	0.00	0.00	0.00
27	174	208		HSS_RECT 6X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
63	215	217		HSS_SQR 3X3X5_16	A53 GrB SABRE 50...	0.00	0.00	0.00
75	206	211		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
76	211	201		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
62	326	332		HSS_SQR 3X3X5_16	A53 GrB SABRE 50...	0.00	0.00	0.00
91	349	358		HSS_SQR 3X3X1_4	A53 GrB SABRE 50...	0.00	0.00	0.00
86	273	283		L 2X2X1_4	A36	0.00	0.00	0.00
92	358	355		HSS_SQR 3X3X1_4	A53 GrB SABRE 50...	0.00	0.00	0.00
80	202	213		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
79	189	213		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
29	9	210		HSS_RECT 6X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
65	216	225		HSS_SQR 3X3X5_16	A53 GrB SABRE 50...	0.00	0.00	0.00
28	172	209		HSS_RECT 6X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
64	214	223		HSS_SQR 3X3X5_16	A53 GrB SABRE 50...	0.00	0.00	0.00
77	205	212		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
78	212	180		HSS_SQR 3X3X3_16	A53 GrB SABRE 50...	0.00	0.00	0.00
60	333	321		HSS_SQR 3X3X5_16	A53 GrB SABRE 50...	0.00	0.00	0.00
85	286	271		L 2X2X1_4	A36	0.00	0.00	0.00
89	356	360		HSS_SQR 3X3X1_4	A53 GrB SABRE 50...	0.00	0.00	0.00
90	360	348		HSS_SQR 3X3X1_4	A53 GrB SABRE 50...	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
71	270.00	0	0.00	0.00	0.00
72	270.00	0	0.00	0.00	0.00
70	270.00	0	0.00	0.00	0.00
27	90.00	0	0.00	0.00	0.00
86	270.00	0	0.00	0.00	0.00
29	90.00	0	0.00	0.00	0.00
28	90.00	0	0.00	0.00	0.00
85	270.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
66	0.00	-1.00	0.00	0.00	-3.00	0.00
67	0.00	-1.00	0.00	0.00	-3.00	0.00
68	0.00	-1.00	0.00	0.00	-3.00	0.00
71	0.00	-1.00	0.00	0.00	-1.00	0.00
69	0.00	-1.00	0.00	0.00	-1.00	0.00
57	0.00	3.50	0.00	0.00	3.50	0.00
74	0.00	-1.00	0.00	0.00	-1.00	0.00
72	0.00	-1.00	0.00	0.00	-1.00	0.00
59	0.00	3.50	0.00	0.00	3.50	0.00
70	0.00	-1.00	0.00	0.00	-1.00	0.00
73	0.00	-1.00	0.00	0.00	-1.00	0.00
58	0.00	3.50	0.00	0.00	3.50	0.00
84	0.00	-1.00	0.00	0.00	-1.00	0.00
88	0.00	-3.00	0.00	0.00	-3.00	0.00
61	0.00	0.75	0.00	0.00	0.75	0.00
87	0.00	-3.00	0.00	0.00	-3.00	0.00
27	0.00	-3.00	0.00	0.00	-3.00	0.00
63	0.00	-2.00	0.00	0.00	-2.00	0.00
75	0.00	-3.00	0.00	0.00	-3.00	0.00
76	0.00	-3.00	0.00	0.00	-3.00	0.00
62	0.00	0.75	0.00	0.00	0.75	0.00
91	0.00	-3.00	0.00	0.00	-3.00	0.00
86	0.00	-1.00	0.00	0.00	-1.00	0.00
92	0.00	-3.00	0.00	0.00	-3.00	0.00
80	0.00	-3.00	0.00	0.00	-3.00	0.00
79	0.00	-3.00	0.00	0.00	-3.00	0.00
29	0.00	-3.00	0.00	0.00	-3.00	0.00
65	0.00	-2.00	0.00	0.00	-2.00	0.00
28	0.00	-3.00	0.00	0.00	-3.00	0.00
64	0.00	-2.00	0.00	0.00	-2.00	0.00
77	0.00	-3.00	0.00	0.00	-3.00	0.00
78	0.00	-3.00	0.00	0.00	-3.00	0.00
60	0.00	0.75	0.00	0.00	0.75	0.00
85	0.00	-1.00	0.00	0.00	-1.00	0.00
89	0.00	-3.00	0.00	0.00	-3.00	0.00
90	0.00	-3.00	0.00	0.00	-3.00	0.00

Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
66	0	0	0	0	0	0	0	0	0	0	Tension only
67	0	0	0	0	0	0	0	0	0	0	Tension only
68	0	0	0	0	0	0	0	0	0	0	Tension only

ATTACHMENT 3

```
*****************************************************
                     *            Federal Airways & Airspace
*
                     *         Summary Report: New Construction
*
                     *                 Antenna Structure
*

*****************************************************

                     Airspace User: Not Identified

                     File: BETHELWEST2

                     Location:  Torrington, CT

                     Latitude:  42°-22'-58.81"         Longitude:
73°-25'-19.81"

                     SITE ELEVATION AMSL......387 ft.
                     STRUCTURE HEIGHT.........143 ft.
                     OVERALL HEIGHT AMSL......530 ft.

     NOTICE CRITERIA
       FAR 77.9(a): NNR (DNE 200 ft AGL)
       FAR 77.9(b): NNR (DNE Notice Slope)
       FAR 77.9(c): NNR (Not a Traverse Way)
       FAR 77.9:    NNR FAR 77.9 IFR Straight-In Notice Criteria
for PSF
       FAR 77.9:    NNR FAR 77.9 IFR Straight-In Notice Criteria
for NY1
       FAR 77.9(d): NNR (Off Airport Construction)

       NR  = Notice Required
       NNR = Notice Not Required
       PNR = Possible Notice Required (depends upon actual IFR
procedure)
             For new construction review Air Navigation
Facilities at bottom
             of this report.

       Notice to the FAA is not required at the analyzed location
and height for
       slope, height or Straight-In procedures. Please review the
'Air Navigation'
       section for notice requirements for offset IFR procedures
and EMI.


     OBSTRUCTION STANDARDS
       FAR 77.17(a)(1): DNE 499 ft AGL
```

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      FAR 77.17(a)(2): DNE - Airport Surface
      FAR 77.19(a):    DNE - Horizontal Surface
      FAR 77.19(b):    DNE - Conical Surface
      FAR 77.19(c):    DNE - Primary Surface
      FAR 77.19(d):    DNE - Approach Surface
      FAR 77.19(e):    DNE - Approach Transitional Surface
      FAR 77.19(e):    DNE - Abeam Transitional Surface

    VFR TRAFFIC PATTERN AIRSPACE FOR: PSF: PITTSFIELD MUNI
    Type: A   RD: 36250.88   RE: 1188.4
      FAR 77.17(a)(1):          DNE
      FAR 77.17(a)(2):          DNE - Greater Than 5.99 NM.
      VFR Horizontal Surface:   DNE
      VFR Conical Surface:      DNE
      VFR Primary Surface:      DNE
      VFR Approach Surface:     DNE
      VFR Transitional Surface: DNE

    VFR TRAFFIC PATTERN AIRSPACE FOR: NY1: KLINE KILL
    Type: A   RD: 58797.53   RE: 356
      FAR 77.17(a)(1):          DNE
      FAR 77.17(a)(2):          DNE - Greater Than 5.99 NM.
      VFR Horizontal Surface:   DNE
      VFR Conical Surface:      DNE
      VFR Primary Surface:      DNE
      VFR Approach Surface:     DNE
      VFR Transitional Surface: DNE

    TERPS DEPARTURE PROCEDURE (FAA Order 8260.3, Volume 4)
      FAR 77.17(a)(3) Departure Surface Criteria (40:1)
      DNE Departure Surface

    MINIMUM OBSTACLE CLEARANCE ALTITUDE (MOCA)
      FAR 77.17(a)(4) MOCA Altitude Enroute Criteria
      The Maximum Height Permitted is 2400 ft AMSL

    PRIVATE LANDING FACILITIES
      No Private Landing Facilites Are Within 6 NM

    AIR NAVIGATION ELECTRONIC FACILITIES
      FAC              ST                DIST  DELTA
GRND  APCH
       IDNT    TYPE     AT  FREQ  VECTOR  (ft)  ELEVA ST LOCATION
ANGLE BEAR
       ---- ----------  -- ------ ------ ------ ----- -- --------
--------- ------- ----
       GBR  NDB         R      39 176.15  73061  -196 MA GREAT
BARRINGTON     -.15
       QHA  RADAR ARSR  Y   1320.  74.6  127111 -1623 MA West
Cummington      -.73
       CTR  VOR/DME     R   115.1 104.81 132129 -1070 MA
CHESTER             -.46
```

```
       ALB  VORTAC      R   115.3 322.42 167810  +258 NY
ALBANY                .09
       ALB  RADAR       ON        320.75 169056   +95 NY ALBANY
INT'L          .03
       KENX RADAR WXL   Y         293.41 188358 -1406 NY
ALBANY               -.43
       BAF  VORTAC      R   113.0 113.1  207368  +263 MA
BARNES                .07

     CFR Title 47, §1.30000-§1.30004
       AM STUDY NOT REQUIRED: Structure is not near a FCC
licensed AM station.
       Movement Method Proof as specified in §73.151(c) is not
required.
       Please review 'AM Station Report' for details.

       Nearest AM Station: WUPE @ 12478 meters.


Airspace® Summary Version 19.11.545

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ATTACHMENT 4

Photographic Simulation Package

Proposed Upgrade to Existing Wireless Telecommunications Facility:

CT2873 Bethel
15 Great Pasture Road
Danbury, CT 06810

- Proposed 20ft extension to existing 119ft tower

Package prepared by:

Virtual Site Simulations, LLC
24 Salt Pond Road
Suite C3
South Kingstown, Rhode Island 02879

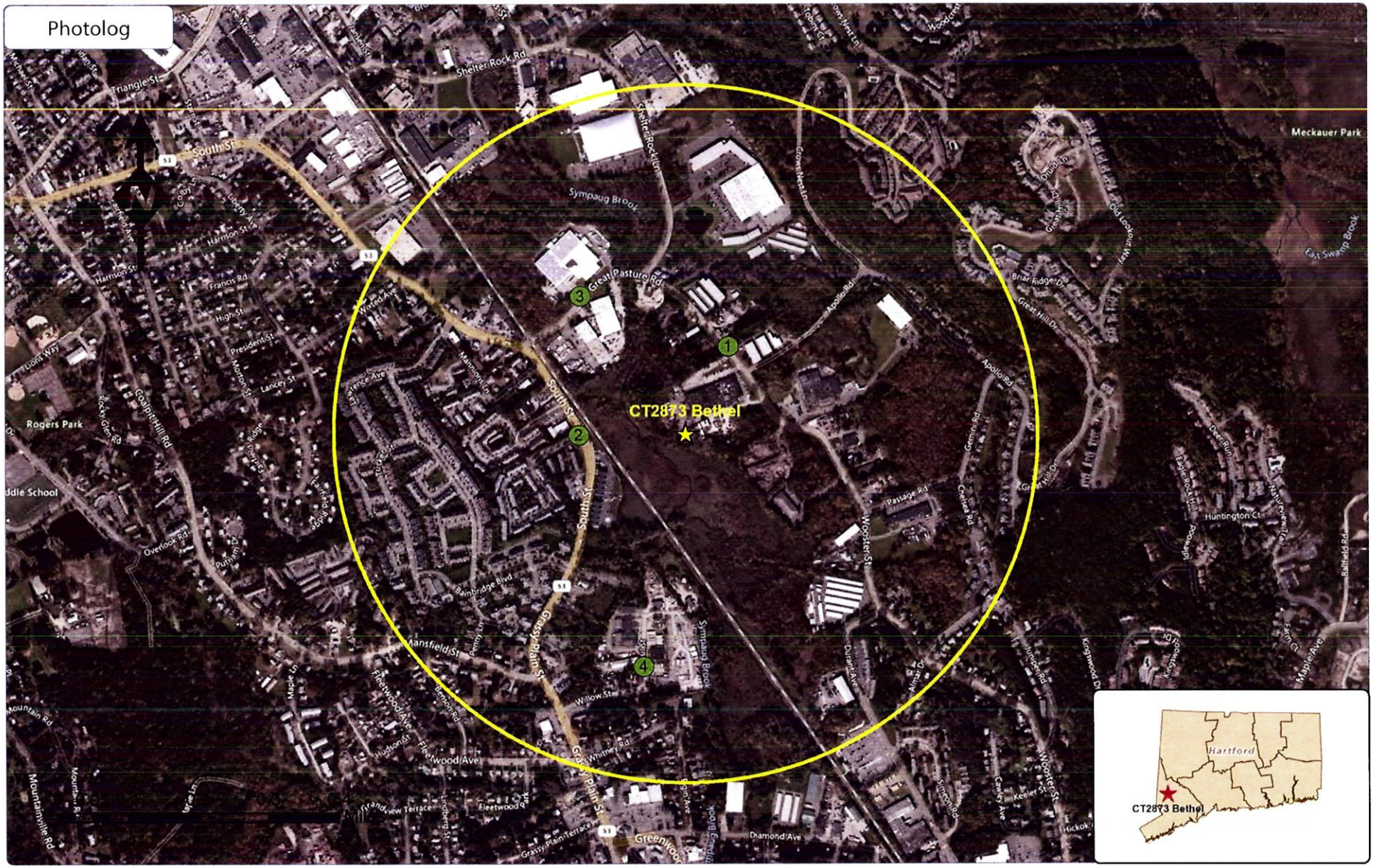
www.VirtualSiteSimulations.com
www.ThinkVSSFirst.com

VSS

CENTERLINE

at&t

Photolog



Wireless Telecommunications Facility:

CT2873 Bethel

15 Great Pasture Road

Danbury, CT 06810

Legend:

- Facility Location
- 2640 Ft Radius
- Photo location - Year Round Visibility
- Photo location- Obscured Visibility
- Photo location - NOT visible

Photo Simulations are for demonstration purposes only. It should not be used in any other fashion or with any other intent. The accuracy of the resulting data is not guaranteed and is not for redistribution

VSS

CENTERLINE COMMUNICATIONS

at&t

Existing

Photo #	Approximate Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
1	Great Pasture Rd	41.38483	-73.42102	0.14 Miles	North-East	205	Year Round

Site: CT2873 Bethel

Photo Simulations are for demonstration purposes only. It should not be used in any other fashion or with any other intent. The accuracy of the resulting data is not guaranteed and is not for redistribution

VSS

CENTERLINE COMMUNICATIONS

at&t

Simulation

Photo #	Approximate Location	Gps Coordinates	Distance to site	Orientation	Bearing to site	Visibility
1	Great Pasture Rd	41.38483 , -73.42102	0.14 Miles	North-East	205	Year Round

Site: CT2873 Bethel

Photo Simulations are for demonstration purposes only. It should not be used in any other fashion or with any other intent. The accuracy of the resulting data is not guaranteed and is not for redistribution

VSS

CENTERLINE COMMUNICATIONS

at&t

Existing

Photo #	Approximate Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
2	South St	41.38297	-73.42508	0.15 Miles	West	89	Year Round

Site: CT2873 Bethel

Photo Simulations are for demonstration purposes only. It should not be used in any other fashion or with any other intent. The accuracy of the resulting data is not guaranteed and is not for redistribution

VSS

CENTERLINE COMMUNICATIONS

at&t

Simulation

Photo #	Approximate Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
2	South St	41.38297	-73.42508	0.15 Miles	West	89	Year Round

Site: CT2873 Bethel

Photo Simulations are for demonstration purposes only. It should not be used in any other fashion or with any other intent. The accuracy of the resulting data is not guaranteed and is not for redistribution

VSS

CENTERLINE COMMUNICATIONS

at&t

Existing

Photo #	Approximate Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
3	Great Pasture Rd	41.38585	-73.42505	0.25 Miles	North-West	143	Year Round

Site: CT2873 Bethel

Photo Simulations are for demonstration purposes only. It should not be used in any other fashion or with any other intent. The accuracy of the resulting data is not guaranteed and is not for redistribution

VSS

CENTERLINE COMMUNICATIONS

at&t

Simulation

Photo #	Approximate Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
3	Great Pasture Rd	41.38585	-73.42505	0.25 Miles	North-West	143	Year Round

Site: CT2873 Bethel

VSS

CENTERLINE

at&t

Existing

Photo #	Approximate Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
4	Paul St	41.37817	-73.42328	0.34 Miles	South	10	Year Round

Site: CT2873 Bethel

VSS CENTERLINE at&t

Simulation

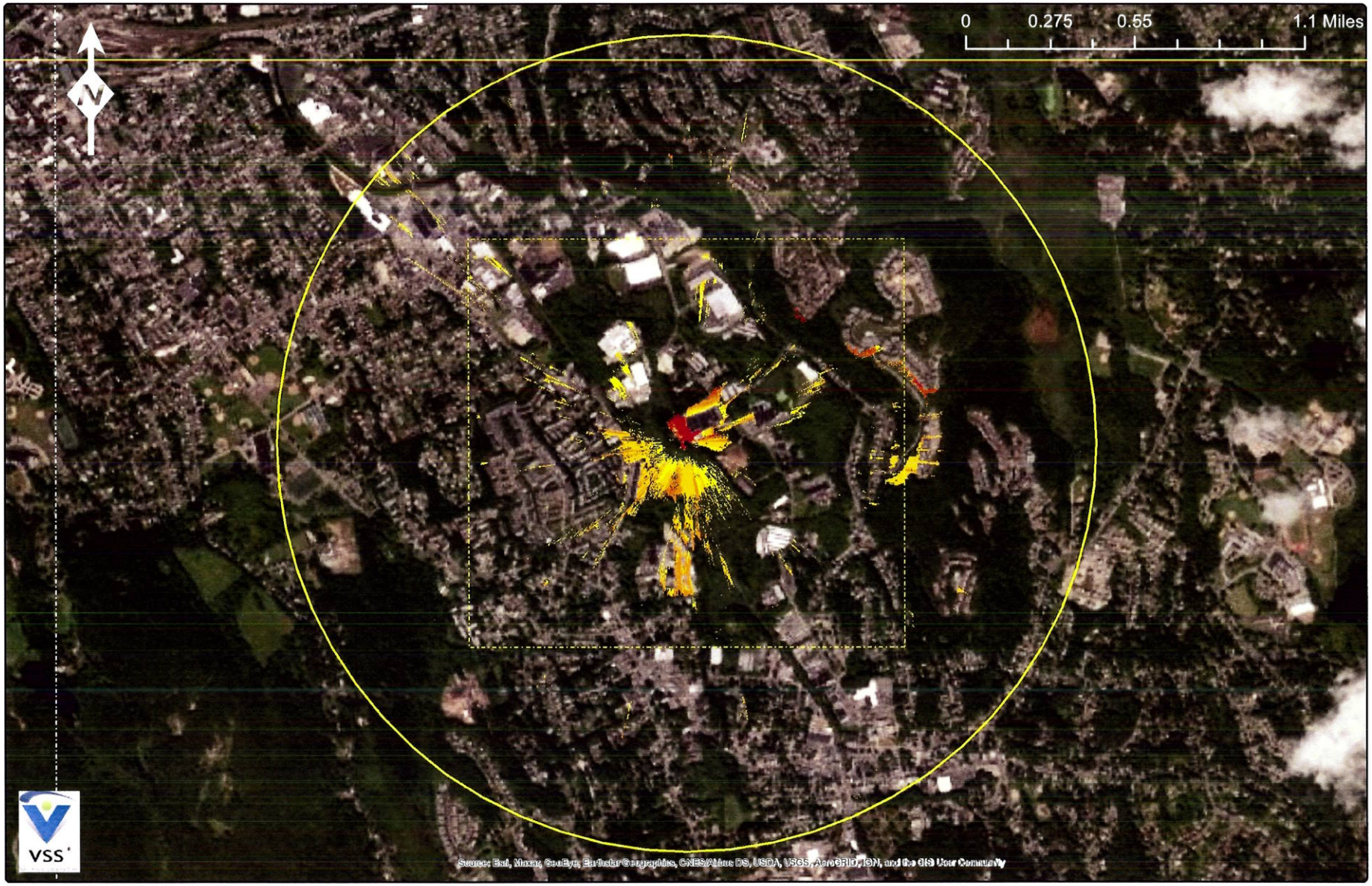
Photo #	Approximate Location	Gps Coordinates		Distance to site	Orientation	Bearing to site	Visibility
4	Paul St	41.37817	-73.42328	0.34 Miles	South	10	Year Round

Site: CT2873 Bethel

VSS CENTERLINE COMMUNICATIONS at&t

CT2873 120

Date: 2/3/2021



Tower Visibility

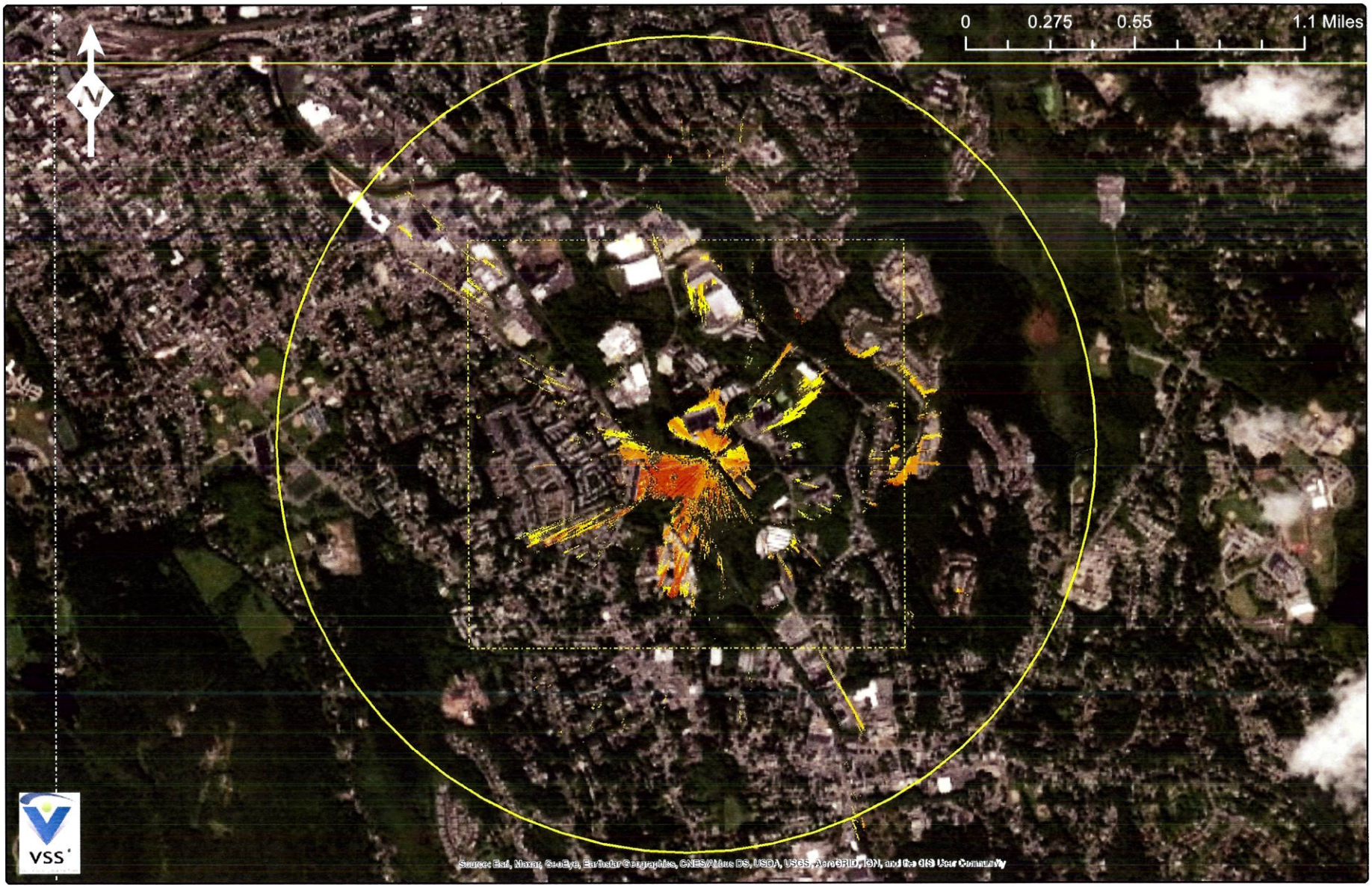
Tower Height:	120 ft	
Lat, Lon:	41.383003	-73.422169
Ring Range:	1 mi	
Color Bands:	4 equal – base	

Color	Location	% Vis	Acres
	Top 25%	0.56%	11.2
	Top 50%	0.78%	15.7
	Top 75%	0.38%	7.7
	Top 100%	0.08%	1.7
	Base	0.09%	1.9
	TOTAL	1.90%	38.2 Acres

Created by: VSS, LLC using VSS- IVS Interactive Viewshed Analysis Tool

Important Note:

Visibility percentages and acreages based on range perameter.



Tower Visibility

Tower Height:	140 ft	
Lat, Lon:	41.383003	-73.422169
Ring Range:	1 mi	
Color Bands:	4 equal – base	

Color	Location	% Vis	Acres
	Top 25%	0.61%	12.2
	Top 50%	0.56%	11.3
	Top 75%	0.66%	13.2
	Top 100%	0.47%	9.4
	Base	0.01%	0.3
	TOTAL	2.30%	46.3 Acres

Created by: VSS, LLC using VSS- IVS Interactive Viewshed Analysis Tool

Important Note:

Visibility percentages and acreages based on range perameter.

ATTACHMENT 5

RE027, EH&S Notification Template Form for EH310, Generator and Engine Manufacturer Documents Version 2.0

Instructions:

For RE027, EH&S Notification related to Generator and Fuel Storage Tank projects, the vendor is to attach the manufacturer specification sheet, manufacturer emissions data sheet, and manufacturer certificate of conformity for the associated Generator and Engine to each respective section below. When attached, the completed Template Form is to be uploaded into CCN/FileNet under Document ID EH310, Generator and Engine Manufacturer Documents.

Please contact Ron Houser, Sr. Project Manager, at rh037s@att.com or 330-509-6543 with questions.

Document Attachments:

1. Generator Manufacturer Specification Sheet

2. Generator Manufacturer Emissions Data Sheet

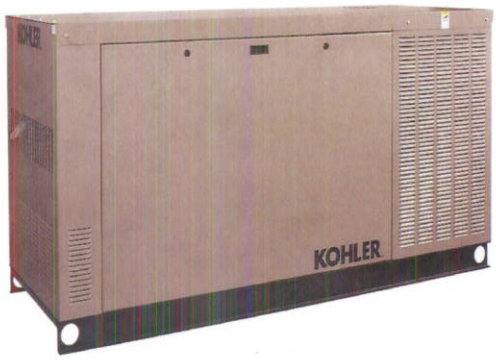
3. Generator Manufacturer Certificate of Conformity

KOHLER.

Model: 24RCL

Multi-Fuel
Natural Gas/LPG

ISO 9001 KOHLER. NATIONALLY REGISTERED



The Kohler® Advantage

- **High Quality Power**
  Kohler home generators provide advanced voltage and frequency regulation along with ultra-low levels of harmonic distortion for excellent generator power quality to protect your valuable electronics.
- **Extraordinary Reliability**
  Kohler is known for extraordinary reliability and performance and backs that up with a premium five-year or 2000 hour limited warranty.
- **All-Aluminum Sound Enclosure**
- **Quiet Operation**
  Kohler home generators provide quiet, neighborhood-friendly performance.

Standard Features

- Kohler Co. provides one-source responsibility for the generating system and accessories.
- The generator set and its components are prototype-tested, factory-built, and production-tested.
- The generator set accepts rated load in one step.
- A standard five-year or 2000 hour limited warranty covers all systems and components.
- Quick-ship (QS) models with selected features are available. See your Kohler distributor for details.
- Meets 291 kph (181 mph) wind load rating.
- RDC2 Controller
  - One digital controller manages both the generator set and transfer switch functions (with optional Model RXT transfer switch).
  - Designed for today's most sophisticated electronics.
  - Electronic speed control responds quickly to varying household demand.
  - Digital voltage regulation protects your valuable electronics from harmonic distortion and unstable power quality.
  - Two-line, backlit LCD screen is easy to read in all lighting conditions, including direct sunlight and low light.
- Engine Features
  - Powerful and reliable 2.2 L liquid-cooled engine
  - Electronic engine management system.
  - Simple field conversion between natural gas and LPG fuels while maintaining emission certification.
- Innovative Cooling System
  - Electronically controlled fan speeds minimize generator set sound signature.
- Certifications
  - The 60 Hz generator set engine is certified by the Environmental Protection Agency (EPA) to conform to the New Source Performance Standard (NSPS) for stationary spark-ignited emissions.
  - UL 2200/cUL listing is available (60 Hz only).
  - CSA certification is available (60 Hz only).
  - Accepted by the Massachusetts Board of Registration of Plumbers and Gas Fitters.
- Approved for stationary standby applications in locations served by a reliable utility source.

Generator Set Ratings

				Standby Ratings			
				Natural Gas		LPG	
Alternator	Voltage	Ph	Hz	kW/kVA	Amps	kW/kVA	Amps
4E5.0	120/240	1	60	21/21	87	24/24	100
4D5.0	120/208	3	60	21/26	73	23/28	80
	127/220	3	60	21/26	69	23/28	75
	120/240	3	60	21/26	63	23/28	69
	277/480	3	60	21/26	32	23/28	35
	220/380*	3	50	16/20	30	17/22	33
	230/400	3	50	16/21	30	18/23	33
	240/416*	3	50	16/21	29	18/23	32

* 50 Hz models are factory-connected as 230/400 volts. Field-adjustable to 220/380 or 240/416 volts by an authorized service technician.

RATINGS: All three-phase units are rated at 0.8 power factor. All single-phase units are rated at 1.0 power factor. Due to manufacturing variations, the ratings tolerance is ±5%. *Standby Ratings:* Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads with an average load factor of 80% for the duration of a power outage. No overload capacity is specified for this rating. Ratings are in accordance with ISO-3046/1, BS 5514, AS 2789, and DIN 6271. GENERAL GUIDELINES FOR DERATING: *Altitude:* Derate 1.3% per 100 m (328 ft.) elevation above 200 m (656 ft.). *Temperature:* Derate 3.0% per 10°C (18°F) temperature above 25°C (77°F). Availability is subject to change without notice. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. Contact your local Kohler generator distributor for availability.

Alternator Specifications

Specifications	Alternator
Manufacturer	Kohler
Type	4-Pole, Rotating Field
Exciter type	Brushless, Wound-Field
Leads: quantity, type	
4E5.0	4, 120/240
4D5.0	12, Reconnectable
Voltage regulator	Solid State, Volts/Hz
Insulation:	NEMA MG1
Material	Class H
Temperature rise	130°C, Standby
Bearing: quantity, type	1, Sealed
Coupling	Flexible Disc
Voltage regulation, no-load to full-load	±1.0% Maximum
Unbalanced load capability	100% of Rated Standby Current
One-step load acceptance	100% of Rating
Peak motor starting kVA:	(35% dip for voltages below)
240 V 4E5.0 (4 lead)	37 (60 Hz)
480 V, 400 V 4D5.0 (12 lead)	59 (60 Hz) 44 (50 Hz)

- NEMA MG1, IEEE, and ANSI standards compliance for temperature rise and motor starting.
- Sustained short-circuit current of up to 300% of the rated current for up to 10 seconds.
- Sustained short-circuit current enabling downstream circuit breakers to trip without collapsing the alternator field.
- Self-ventilated and drip-proof construction.
- Windings are vacuum-impregnated with epoxy varnish for dependability and long life.
- Superior voltage waveform from a two-thirds pitch stator and skewed rotor.
- Total harmonic distortion (THD) from no load to full load with a linear load is less than 5%.

Application Data

Engine

Engine Specifications	60 Hz	50 Hz
Manufacturer	Kohler	
Engine: model, type	Residential Powertrain KG2204, 2.2 L, 4-Cycle Natural Aspiration	
Cylinder arrangement	In-line 4	
Displacement, L (cu. in.)	2.2 (134.25)	
Bore and stroke, mm (in.)	91 x 86 (3.5 x 3.4)	
Compression ratio	10.5:1	
Piston speed, m/min. (ft./min.)	310 (1016)	258 (847)
Main bearings: quantity, type	5, plain alloy steel	
Rated rpm	1800	1500
Max. power at rated rpm, kW (HP)		
LPG	30 (40)	NA
Natural Gas	27 (36)	NA
Cylinder head material	Cast Iron	
Piston type and material	High Silicon Aluminum	
Crankshaft material	Nodular Iron	
Valve (exhaust) material	Forged Steel	
Governor type	Electronic	
Frequency regulation, no-load to full-load	Isochronous	
Frequency regulation, steady state	±1.0%	
Frequency	Fixed	
Air cleaner type	Dry	

Engine Electrical

Engine Electrical System	
Ignition system	Electronic
Battery charging alternator:	
Ground (negative/positive)	Negative
Volts (DC)	14
Ampere rating	90
Starter motor rated voltage (DC)	12
Battery, recommended rating for -18°C (0°F):	
Qty., cold cranking amps (CCA)	One, 630
Battery voltage (DC)	12
Battery group size	24

Exhaust

Exhaust System	60 Hz	50 Hz
Exhaust manifold type	Dry	
Exhaust temperature at rated kW, dry exhaust, °C (°F)	633 (1171)	
Maximum allowable back pressure, kPa (in. Hg)	7.5 (2.2)	

Fuel

Fuel System	
Fuel type	Natural Gas or LPG
Fuel supply line inlet	1 in. NPT
Natural gas fuel supply pressure, kPa (in. H_2O)	1.24–2.74 (5-11)
LPG vapor withdrawal fuel supply pressure, kPa (in. H_2O)	1.24–2.74 (5-11)

Fuel Composition Limits *	Nat. Gas	LP Gas
Methane, % by volume	90 min.	—
Ethane, % by volume	4.0 max.	—
Propane, % by volume	1.0 max.	85 min.
Propene, % by volume	0.1 max.	5.0 max.
C_4 and higher, % by volume	0.3 max.	2.5 max.
Sulfur, ppm mass	25 max.	
Lower heating value, MJ/m^3 (Btu/ft^3), min.	33.2 (890)	84.2 (2260)

* Fuels with other compositions may be acceptable. If your fuel is outside the listed specifications, contact your local distributor for further analysis and advice.

Lubrication

Lubricating System	
Type	Full Pressure
Oil pan capacity, L (qt.)	4.2 (4.4)
Oil added during oil change (on average), L (qt.)	3.3 (3.5)
Oil filter: quantity, type	1, Cartridge

Application Data

Cooling

Radiator System	60 Hz	50 Hz
Ambient temperature, °C (°F)	45 (113)	
Engine jacket water capacity, L (gal.)	2.65 (0.7)	
Radiator system capacity, including engine, L (gal.)	13.2 (3.5)	
Water pump type	Centrifugal	
Fan diameter, mm (in.)	qty. 3 @ 406 (16)	
Fan power requirements (powered by engine battery charging alternator)	12VDC, 18 amps each	

Operation Requirements

Air Requirements	60 Hz	50 Hz
Radiator-cooled cooling air, m^3/min. (scfm)†	51 (1800)	51 (1800)
Combustion air, m^3/min. (cfm)	1.4 (49)	1.2 (42)
Air over engine, m^3/min. (cfm)	25 (900)	25 (900)

† Air density = 1.20 kg/m^3 (0.075 lbm/ft^3)

Fuel Consumption‡		
Natural Gas, m^3/hr. (cfh) at % load	**60 Hz**	**50 Hz**
100%	8.5 (301)	7.8 (275)
75%	6.3 (223)	6.4 (225)
50%	5.6 (199)	5.4 (192)
25%	4.0 (140)	3.3 (116)
Exercise	2.8 (97)	2.9 (103)
LP Gas, m^3/hr. (cfh) at % load	**60 Hz**	**50 Hz**
100%	3.2 (113)	2.7 (96)
75%	2.8 (97)	2.3 (81)
50%	2.4 (84)	2.0 (72)
25%	1.8 (63)	1.7 (60)
Exercise	1.4 (51)	1.4 (48)

‡ Nominal Fuel Rating: Natural gas, 37 MJ/m^3 (1000 Btu/ft^3)
LP Vapor, 93 MJ/m^3 (2500 Btu/ft^3)

LP vapor conversion factors:
8.58 $ft.^3$ = 1 lb.
0.535 m^3 = 1 kg.
36.39 $ft.^3$ = 1 gal.

Sound Enclosure Features

- Sound-attenuating enclosure uses acoustic insulation that meets UL 94 HF1 flammability classification and repels moisture absorption.
- Internally mounted critical silencer.
- Skid-mounted, aluminum construction with two removable access panels.
- Fade-, scratch-, and corrosion-resistant Kohler® cashmere powder-baked finish.

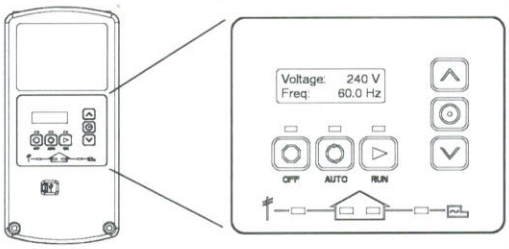
Sound Data

Model 24RCL 8 point logarithmic average sound levels are 54 dB(A) during weekly engine exercise and 61 dB(A) during full-speed generator diagnostics and normal operation. For comparison to competitor ratings, the lowest point sound levels are 52 dB(A) and 60 dB(A) respectively.*

All sound levels are measured at 7 meters with no load.

* Lowest of 8 points measured around the generator. Sound levels at other points around generator may vary depending on installation parameters.

RDC2 Controller



The RDC2 controller provides integrated control for the generator set, Kohler® Model RXT transfer switch, programmable interface module (PIM), and load management.

The RDC2 controller's 2-line LCD screen displays status messages and system settings that are clear and easy to read, even in direct sunlight or low light.

RDC2 Controller Features

- Membrane keypad
  - OFF, AUTO, and RUN push buttons
  - Select and arrow buttons for access to system configuration and adjustment menus
- LED indicators for OFF, AUTO, and RUN modes
- LED indicators for utility power and generator set source availability and ATS position (Model RXT transfer switch required)
- LCD screen
  - Two lines x 16 characters per line
  - Backlit display with adjustable contrast for excellent visibility in all lighting conditions
- Scrolling system status display
  - Generator set status
  - Voltage and frequency
  - Engine temperature
  - Oil pressure
  - Battery voltage
  - Engine runtime hours
- Date and time displays
- Smart engine cooldown senses engine temperature
- Digital isochronous governor to maintain steady-state speed at all loads
- Digital voltage regulation: ±1.0% RMS no-load to full-load
- Automatic start with programmed cranking cycle
- Programmable exerciser can be set to start automatically on any future day and time, and to run every week or every two weeks
- Exercise modes
  - Unloaded exercise with complete system diagnostics
  - Unloaded full-speed exercise
  - Loaded full-speed exercise (Model RXT ATS required)
- Front-access mini USB connector for SiteTech™ connection
- Integral Ethernet connector for Kohler® OnCue® Plus
- Built-in 2.5 amp battery charger
- Remote two-wire start/stop capability for optional connection of a Model RDT transfer switch

See additional controller features on the next page.

KOHLER.

KOHLER CO., Kohler, Wisconsin 53044 USA
Phone 920-457-4441, Fax 920-459-1646
For the nearest sales and service outlet in the US and Canada, phone 1-800-544-2444
KOHLERPower.com

Additional RDC2 Controller Features

- Diagnostic messages
  - Displays diagnostic messages for the engine, generator, Model RXT transfer switch, programmable interface module (PIM), and load management device
  - Over 70 diagnostic messages can be displayed
- Maintenance reminders
- System settings
  - System voltage, frequency, and phase
  - Voltage adjustment
  - Measurement system, English or metric
- ATS status (Model RXT ATS required)
  - Source availability
  - ATS position (normal/utility or emergency/generator)
  - Source voltage and frequency
- ATS control (Model RXT ATS required)
  - Source voltage and frequency settings
  - Engine start time delay
  - Transfer time delays
  - Fixed pickup and dropout settings
  - Voltage calibration
- Programmable interface module (PIM) status displays
  - Input status (active/inactive)
  - Output status (active/inactive)
- Load control menus
  - Load status
  - Test function

Generator Set Standard Features

- Aluminum sound enclosure with enclosed silencer
- Battery rack and cables
- Electronic, isochronous governor
- Flexible fuel line
- Gas fuel system (includes fuel mixer, electronic secondary gas regulator, two gas solenoid valves, and flexible fuel line between the engine and the skid-mounted fuel system components)
- Integral vibration isolation
- Line circuit breaker
- Oil drain extension
- OnCue® Plus Generator Management System
- Operation and installation literature
- RDC2 controller with built-in battery charger
- Standard five-year or 2000 hour limited warranty

Available Options

Approvals and Listings

- ❑ UL 2200/cUL Listing (60 Hz only)
- ❑ CSA Approval (60 Hz only)

Controller Accessories

- ❑ Lockable Emergency Stop (lockout/tagout)
- ❑ Programmable Interface Module (PIM) (provides 2 digital inputs and 6 relay outputs)

Electrical System

- ❑ Battery
- ❑ Battery Heater

Available Options, Continued

Starting Aids

- ❑ Oil Pan Heater, 120 V, 1 Ph
- ❑ Oil Pan Heater, 240 V, 1 Ph

Recommended for ambient temperatures below 0°C (32°F).

Automatic Transfer Switches and Accessories

- ❑ Model RDT Automatic Transfer Switch
- ❑ Model RXT Automatic Transfer Switch
- ❑ Model RXT Automatic Transfer Switch with Combined Interface/Load Management Board
- ❑ Load Shed Kit for RDT or RXT
- ❑ Power Relay Modules (use up to 4 relay modules for each load management device)

Miscellaneous

- ❑ Rated Power Factor Testing

Literature

- ❑ General Maintenance Literature Kit
- ❑ Overhaul Literature Kit
- ❑ Production Literature Kit

Warranty

- ❑ Extended 5-Year/2000 Hour Comprehensive Limited Warranty

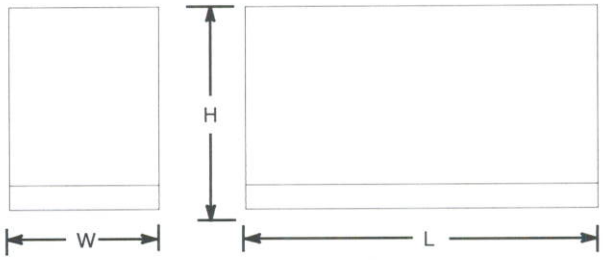
Other Options

- ❑ _____
- ❑ _____

Dimensions and Weights

Overall Size, L x W x H, mm (in.):	1880 x 836 x 1169 (74 x 32.9 x 46.0)
Shipping Weight, wet, kg (lb.):	572 (1260)

Weight includes generator set with engine fluids, sound enclosure, silencer, and packaging.



NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

KOHLER®

2019 Stationary 60 Hz Emergency Standby Certified Power Generation Rating Data												
Generator Model	Engine	Speed	Freq	Fuel	Duty Cycle	Flywheel power		Engine Family	CO_2	CH_4	N_20	Catalyst
		RPM	Hz			HP	kW		(g/kW-hr)	(g/kW-hr)	(g/kW-hr)	
24RCL	KG2204	1800	60	LPG	Emergency	40	30	KKHXB2.237NA	728.6	0.305	-	No
	KG2204	1800	60	NG	Emergency	36	27	KKHXB2.237DA	678.2	1.421	-	No

[1] Standby and overload ratings based on ISO3046. Continuous ratings based on ISO 8528.

[2] All ratings are gross flywheel horsepower corrected to 77°F at an altitude of 328 feet with no cooling fan or alternator losses using heating value for NG of 1015 BTU/SCF.

[3] Production tolerances in engines and installed components can account for power variations of +/- 5%. Altitude, temperature and excessive exhaust and intake restrictions should be applied to power calculations.

[4] Electrical ratings are an estimated based on assumed fan and generator losses and may vary depending on actual equipment losses.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2019 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Kohler Co.**
(U.S. Manufacturer or Importer)
Certificate Number: **KKHXB2.237NA-004**

Effective Date: 12/14/2018
Expiration Date: 12/31/2019

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 12/14/2018
Revision Date: N/A

Manufacturer: Kohler Co.
Engine Family: KKHXB2.237NA
Mobile/Stationary Certification Type: Stationary
Fuel : LPG/Propane
Emission Standards :
Part 90 Phase 1
CO (g/kW-hr) : 519.0
HC + NOx (g/kW-hr) : 13.4
Emergency Use Only : Y

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

ATTACHMENT 6

Natural Diversity Data Base Areas

DANBURY, CT

December 2020

State and Federal Listed Species

Critical Habitat

Town Boundary

NOTE: This map shows general locations of State and Federal Listed Species and Critical Habitats. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDB) from a variety of data sources . Exact locations of species have been buffered to produce the generalized locations.

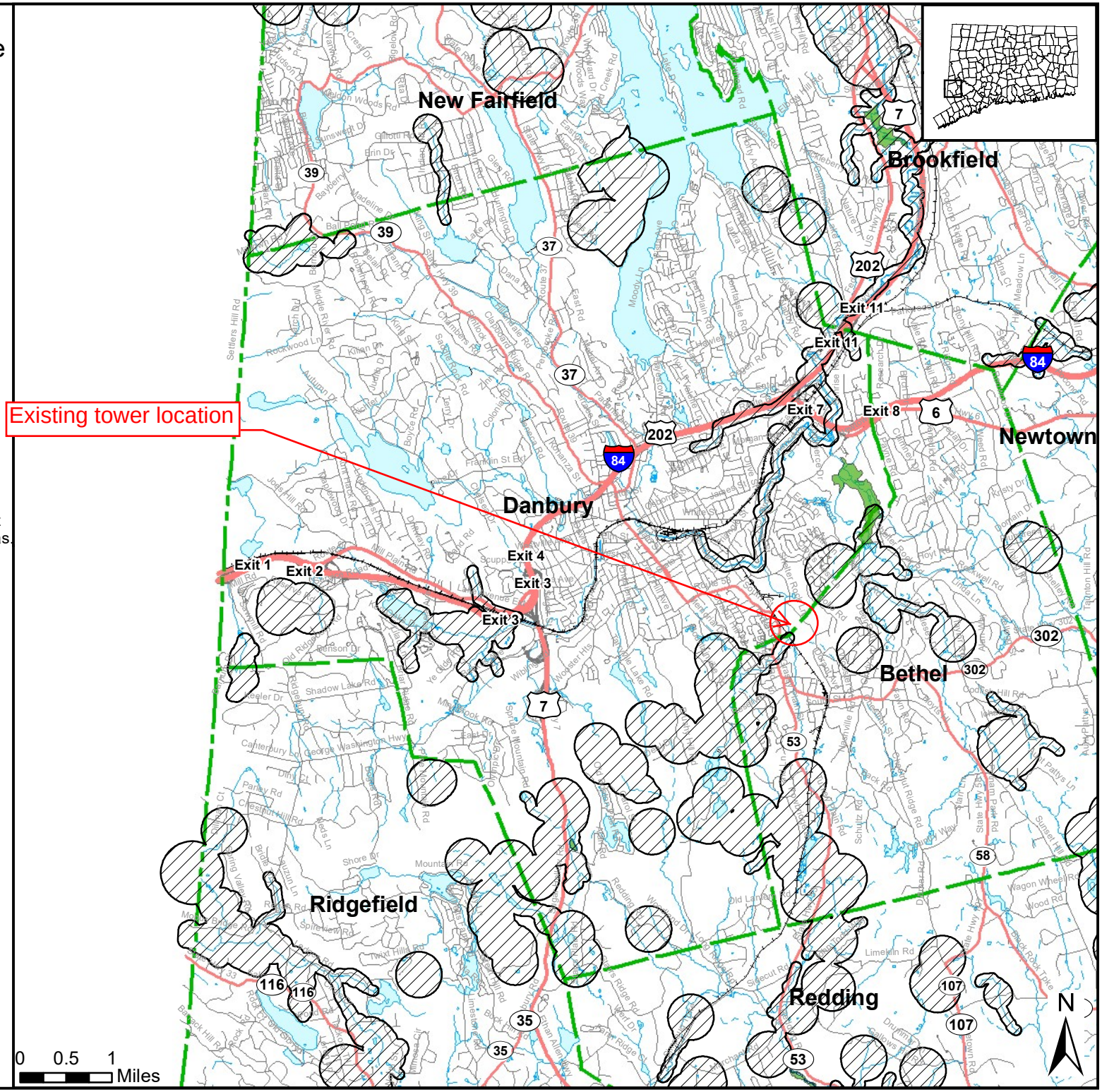
This map is intended for use as a preliminary screening tool for conducting a Natural Diversity Data Base Review Request. To use the map, locate the project boundaries and any additional affected areas. If the project is within a hatched area there may be a potential conflict with a listed species. For more information, complete a Request for Natural Diversity Data Base State Listed Species Review form (DEP-APP-007), and submit it to the NDDB along with the required maps and information. More detailed instructions are provided with the request form on our website.

www.ct.gov/deep/nddbrequest

Use the CTECO Interactive Map Viewers at http://cteco.uconn.edu to more precisely search for and locate a site and to view aerial imagery with NDDB Areas.

QUESTIONS: Department of Energy and Environmental Protection (DEEP)
79 Elm St, Hartford, CT 06106
email: deep.nddbrequest@ct.gov
Phone: (860) 424-3011

Connecticut Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division



ATTACHMENT 7

WIRELESS COMMUNICATIONS FACILITY
CT2873 BETHEL
15 GREAT PASTURE ROAD
DANBURY, CT 06810

PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF THE PROPOSED COLLOCATION OF AT&T AT AN EXISTING UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY, GENERALLY INCLUDING THE FOLLOWING:

   A. INSTALLATION OF A PROPOSED 20' MONOPOLE TOWER EXTENSION TO THE TOP OF THE EXISTING MONOPOLE TOWER. THE DESIGN OF THE PROPOSED EXTENSION IS BY OTHERS.

   B. INSTALLATION OF A PROPOSED ANTENNA MOUNTING PLATFORM. THE PROPOSED PLATFORM TO ACCOMMODATE THE INSTALLATION OF A TOTAL OF (6) PANEL ANTENNAS, (12) RRU UNITS AND (3) SURGE ARRESTOR UNITS ALONG WITH ASSOCIATED CABLING.

   C. THE PROPOSED AT&T GROUND MOUNTED EQUIPMENT TO CONSIST OF A "WALK-IN EQUIPMENT CABINET (WIC) AND A 24 KW PROPANE FUELED GENERATOR, AND A 500 GALLON PROPANE TANK LOCATED WITHIN THE EXISTING FENCED FACILITY COMPOUND. AN ANTENNA CABLE ICE BRIDGE IS PROPOSED TO FACILITATE AT&T ANTENNA CABLES FROM THE WIC TO THE EXISTING MONOPOLE.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT2873
AT&T SITE NAME:	BETHEL
SITE ADDRESS:	15 GREAT PASTURE ROAD DANBURY, CT 06810
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
AT&T PACE JOB:	PACE JOB 1 – MRCTB026223 PACE JOB 2 – MRCTB047907 PACE JOB 3 – MRCTB026243 PACE JOB 4 – MRCTB026229 PACE JOB 5 – MRCTB006512 PACE JOB 6 – MRCTB026247
AT&T FA LOCATION CODE:	12684101
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-22'-58.813" LONGITUDE: 73°-25'-19.811" GROUND ELEVATION: 387.1'± A.M.S.L. SITE COORDINATES AND GROUND ELEVATION AND REFERENCED FROM FAA-1A SURVEY CERTIFICATION AS PREPARED BY MARTINEZ COUCH AND ASSOCIATES LLC, DATED FEBRUARY 17, 2015.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA-222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2018 CONNECTICUT FIRE SAFETY CODE AND, 2017 NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT

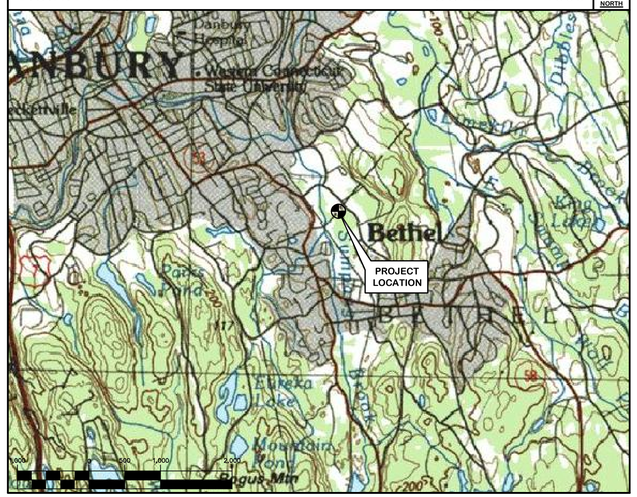
TO: 15 GREAT PASTURE ROAD, DANBURY, CONNECTICUT

1.	HEAD NORTHEAST ON ENTERPRISE DRIVE TOWARD CAPITAL BLVD.	0.36 MI
2.	TURN LEFT ONTO CAPITAL BLVD.	0.27 MI
3.	TURN LEFT ONTO WEST STREET.	0.30 MI
4.	MERGE ONTO I-91 S VIA RAMP ON THE LEFT TOWARD NEW HAVEN.	9.60 MI
5.	MERGE ONTO I-691 W VIA EXIT 18 TOWARD MERIDEN/WATERBURY.	7.98 MI
6.	MERGE ONTO I-84 W VIA EXIT 1 ON THE LEFT TOWARD WATERBURY/DANBURY.	32.11 MI
7.	MERGE ONTO NEWTOWN ROAD VIA EXIT 8 TOWARD BETHEL.	1.68 MI
8.	TURN LEFT ONTO OLD SHELTER ROCK ROAD.	0.59 MI
9.	OLD SHELTER ROCK ROAD BECOMES CROSS STREET.	0.17 MI
10.	TURN LEFT ONTO SHELTER ROCK ROAD.	0.04 MI
11.	TURN SLIGHT RIGHT ONTO SHELTER ROCK LANE.	0.41 MI
12.	TURN LEFT ONTO GREAT PASTURE ROAD.	0.18 MI
13.	15 GREAT PASTURE ROAD IS ON THE RIGHT.	

VICINITY MAP

SCALE: 1" = 1000'

NORTH



SHEET INDEX

SHEET ADDED

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	4
N-1	NOTES, SPECIFICATIONS AND ANTENNA SCHEDULE	0
C-0	ABUTTERS AND NATURAL DIVERSITY MAPS	3
C-1	SITE LOCATION PLAN	0
C-2	COMPOUND PLANS AND ELEVATION	2
C-3	ANTENNA CONFIGURATION AND EQUIPMENT DETAILS	1
C-4	SITE AND EQUIPMENT DETAILS	2
C-5	RF PLUMBING DIAGRAM	0
E-1	SITE UTILITY PLAN	0
E-2	COMPOUND PLANS	0
E-3	ELECTRICAL RISER DIAGRAM AND NOTES	0
E-4	SCHEMATIC RISER DIAGRAM AND NOTES	0
E-5	ELECTRICAL GROUNDING PLAN AND NOTES	0
E-6	ELECTRICAL DETAILS	2
E-7	ELECTRICAL DETAILS	0
E-8	ELECTRICAL DETAILS	0
E-9	ELECTRICAL SPECIFICATIONS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
4	03/17/21	DMD	TJR	CONSTRUCTION DRAWINGS - SHEET INDEX UPDATE
3	12/16/20	DMD	TJR	CONSTRUCTION DRAWINGS - SHEET INDEX UPDATE
2	11/02/20	DMD	TJR	CONSTRUCTION DRAWINGS - SHEET INDEX UPDATE
0	09/28/20	DMD	TJR	CONSTRUCTION DRAWINGS - FINAL PER DESCOPED RFDS

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CT2873 BETHEL
15 GREAT PASTURE ROAD
DANBURY, CT 06810

DATE:	08/20/19
SCALE:	AS NOTED
JOB NO.	19101.00

TITLE SHEET

T-1

Sheet No. 1 of 17

STRUCTURAL SPECIFICATIONS

DESIGN BASIS:

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

1. DESIGN CRITERIA:

WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 93 MPH (Vasd)

- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 118 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

SPECIAL INSPECTIONS

1. SPECIAL INSPECTIONS ARE TO BE PROVIDED BY AN APPROVED AGENCY HIRED BY AT&T.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

ANTENNA AND APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	DOWNTILT	(E/P) TMA/DIPLEXER /TRIPLEXER (QTY)	(E/P) RRU (QTY)	FEEDER	(E/P) RAYCAP (QTY)
A1	PROPOSED	LTE 700 B14/LTE AWS/LTE WCS	CCI TPA65R-BU6DA-K	71.2 x 21 x 7.8	140'	15°	0°		(P) 4478 B14 (1 AT ANTENNA LOCATION), (P) 4415 B30 (1 AT ANTENNA LOCATION)	FIBER AND DC POWER	(P) RAYCAP DC6-48-60-0-18-8F (1)
A2	PROPOSED	LTE 700/ 850 5G/LTE 1900	CCI TPA65R-BU6DA-K	71.2 x 21 x 7.8	140'	15°	0°		(P) 4449 B5/B12 (1 AT ANTENNA LOCATION), (P) 8843 B2/B66A (1 AT ANTENNA LOCATION)	FIBER AND DC POWER	
A3											
A4											
B1	PROPOSED	LTE 700 B14/LTE AWS/LTE WCS	CCI TPA65R-BU6DA-K	71.2 x 21 x 7.8	140'	140°	0°		(P) 4478 B14 (1 AT ANTENNA LOCATION), (P) 4415 B30 (1 AT ANTENNA LOCATION)	FIBER AND DC POWER	(P) RAYCAP DC6-48-60-0-18-8F (1)
B2	PROPOSED	LTE 700/ 850 5G/LTE 1900	CCI TPA65R-BU6DA-K	71.2 x 21 x 7.8	140'	140°	0°		(P) 4449 B5/B12 (1 AT ANTENNA LOCATION), (P) 8843 B2/B66A (1 AT ANTENNA LOCATION)	FIBER AND DC POWER	
B3											
B4											
C1	PROPOSED	LTE 700 B14/LTE AWS/LTE WCS	CCI TPA65R-BU6DA-K	71.2 x 21 x 7.8	140'	260°	0°		(P) 4478 B14 (1 AT ANTENNA LOCATION), (P) 4415 B30 (1 AT ANTENNA LOCATION)	FIBER AND DC POWER	(P) RAYCAP DC6-48-60-0-18-8F (1)
C2	PROPOSED	LTE 700/ 850 5G/LTE 1900	CCI TPA65R-BU6DA-K	71.2 x 21 x 7.8	140'	260°	0°		(P) 4449 B5/B12 (1 AT ANTENNA LOCATION), (P) 8843 B2/B66A (1 AT ANTENNA LOCATION)	FIBER AND DC POWER	
C3											
C4											

RRU	SIZE (INCHES) (L x W x D)
B14 4478	14.9 x 13.1 x 7.3
4415 B30	14.9 x 13.2 x 5.4
B5/B12 4449	17.9 x 13.2 x 9.4
B2/B66A 8843	14.9 x 13.2 x 10.9

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	09/28/20	DMD	TJR	CONSTRUCTION DRAWINGS - FINAL PER DESCOPED RFDS

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DANBURY, CT 06810

DATE: 08/20/19
SCALE: AS NOTED
JOB NO. 19101.00

NOTES, SPECIFICATIONS AND ANTENNA SCHEDULE

N-1

Natural Diversity Data Base Areas

BETHEL, CT

December 2020

- State and Federal Listed Species
- Critical Habitat
- Town Boundary

NOTE: This map shows general locations of State and Federal Listed Species and Critical Habitats. Information on listed species is collected and compiled by the Natural Diversity Data Base (NDDB) from a variety of data sources. Exact locations of species have been buffered to produce the generalized locations.

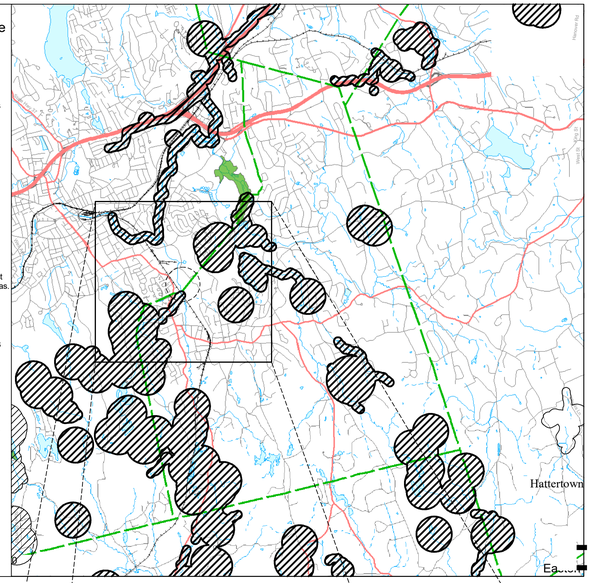
This map is intended for use as a preliminary screening tool for conducting a Natural Diversity Data Base Review Request. To use the map, locate the project boundaries and any additional affected areas. If the project is within a hatched area there may be a potential conflict with a listed species. For more information, complete a Request for Natural Diversity Data Base State Listed Species Review form (DEP-APP-007), and submit it to the NDDB along with the required maps and information. More detailed instructions are provided with the request form on our website.

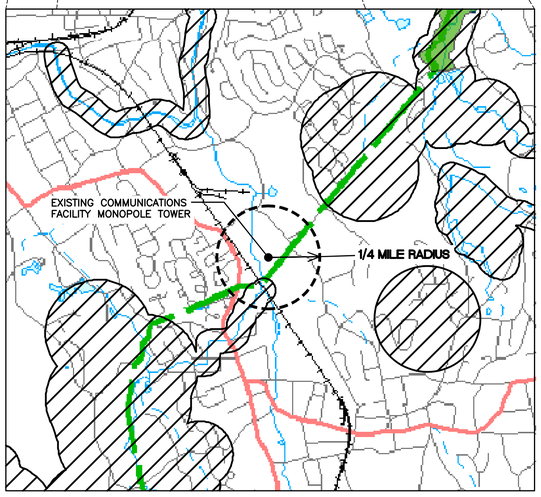
www.ct.gov/deep/nddbrequest

Use the CTECO Interactive Map Viewers at http://cteco.uconn.edu to more precisely search for and locate a site and to view aerial imagery with NDDB Areas.

QUESTIONS: Department of Energy and Environmental Protection (DEEP)
79 Elm St, Hartford, CT 06106
email: deep.nddbrequest@ct.gov
Phone: (860) 424-3011

Connecticut Department of Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division





NATURAL DIVERSITY INSERT MAP
NOT TO SCALE

N/F
L16/4
GLORIA B PUTNAM
13 GREAT PASTURE ROAD
DANBURY, CT 06810
M.A.: 28 GRIFFITH LANE
RIDGEFIELD, CT 06877

N/F
L16/8
TDRAP LLC
16 GREAT PASTURE ROAD
DANBURY, CT 06810
M.A.: PO BOX 1026
REDDING, CT 06801

N/F
L16/6
SANDVIK WIRE AND HEATING TECHNOLOGY CORP.
GREAT PASTURE ROAD
DANBURY, CT 06810
M.A.: 982 GRIFFIN POND RD
CLARKS SUMMIT, PA 18411

N/F
L16/1
DOWN HOME ASSOCIATES LLC
7 GREAT PASTURE ROAD
DANBURY, CT 06810
M.A.: 28 GRIFFITH LANE
RIDGEFIELD, CT 06877

N/F
L15/8-9
REAL TIME CAPITAL PROPERTIES LLC
10 GREAT PASTURE ROAD
DANBURY, CT 06810
M.A.: 3 CRICKLEWOOD ROAD
REDDING, CT 06896

EXISTING RESIDENTIAL STRUCTURE.

GREAT PASTURE ROAD

DANBURY
BETHEL

N/F
K16/156
FUEL CELL ENERGY INC.
3 GREAT PASTURE ROAD
DANBURY, CT 06810

±617'
DISTANCE TO NEAREST OFF SITE RESIDENCE

N/F
20/72/1
THE KANTHAL CORPORATION
119 WOOSTER STREET
BETHEL, CT 06801
M.A.: 982 GRIFFIN POND RD
CLARKS SUMMIT, PA 184

SUBJECT PROPERTY:
N/F
L16/5
EPPOLITI INDUSTRIAL REALTY INC.
15 GREAT PASTURE ROAD
DANBURY, CT 06810
M.A.: 37 DANBURY RD #203
RIDGEFIELD, CT 06877

N/F
21/40/1
EPPOLITI INDUSTRIAL REALTY INC.
WOOSTER STREET
BETHEL, CT 06801
M.A.: 37 DANBURY RD #203
RIDGEFIELD, CT 06877

WOOSTER STREET

EXISTING MONOPOLE TOWER WITHIN EXISTING 50'x50' COMMUNICATIONS FACILITY COMPOUND

N/F
K16/160
CITY OF DANBURY
GREAT PASTURE ROAD
DANBURY, CT 06810
M.A.: 155 DEER HILL AVENUE
DANBURY, CT 06810

N/F
21/40/03-02
STAMFORD COVE PARTNERS LLC.
104 WOOSTER STREET
BETHEL, CT 06801
M.A.: PO BOX 372
BETHEL, CT 06801

N/F
20/40/02
TOWN OF BETHEL
WOOSTER STREET
BETHEL, CT 06801
M.A.: 1 SCHOOL STREET
BETHEL, CT 06801

DANBURY
BETHEL

N/F
20/40/03-11
BETHEL LAND TRUST INC.
WOOSTER STREET
BETHEL, CT 06801
M.A.: 54 TAYLOR AVENUE
BETHEL, CT 06801

3°41'
0°12'16"
TRUE NORTH
NAD 83
MAG. FEBRUARY 2014
CONN. GRID

1 / C-1 **ABUTTERS MAP**
SCALE: 1"=100'

GRAPHIC SCALE
100 0 50 100 200 400
(IN FEET)
1 inch = 100 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	09/28/20	DMD	TJR	CONSTRUCTION DRAWINGS - FINAL PER DESCOPED RFDS
1	03/17/21	DMD	TJR	CONSTRUCTION DRAWINGS - REVISED PER ZONING COMMENTS

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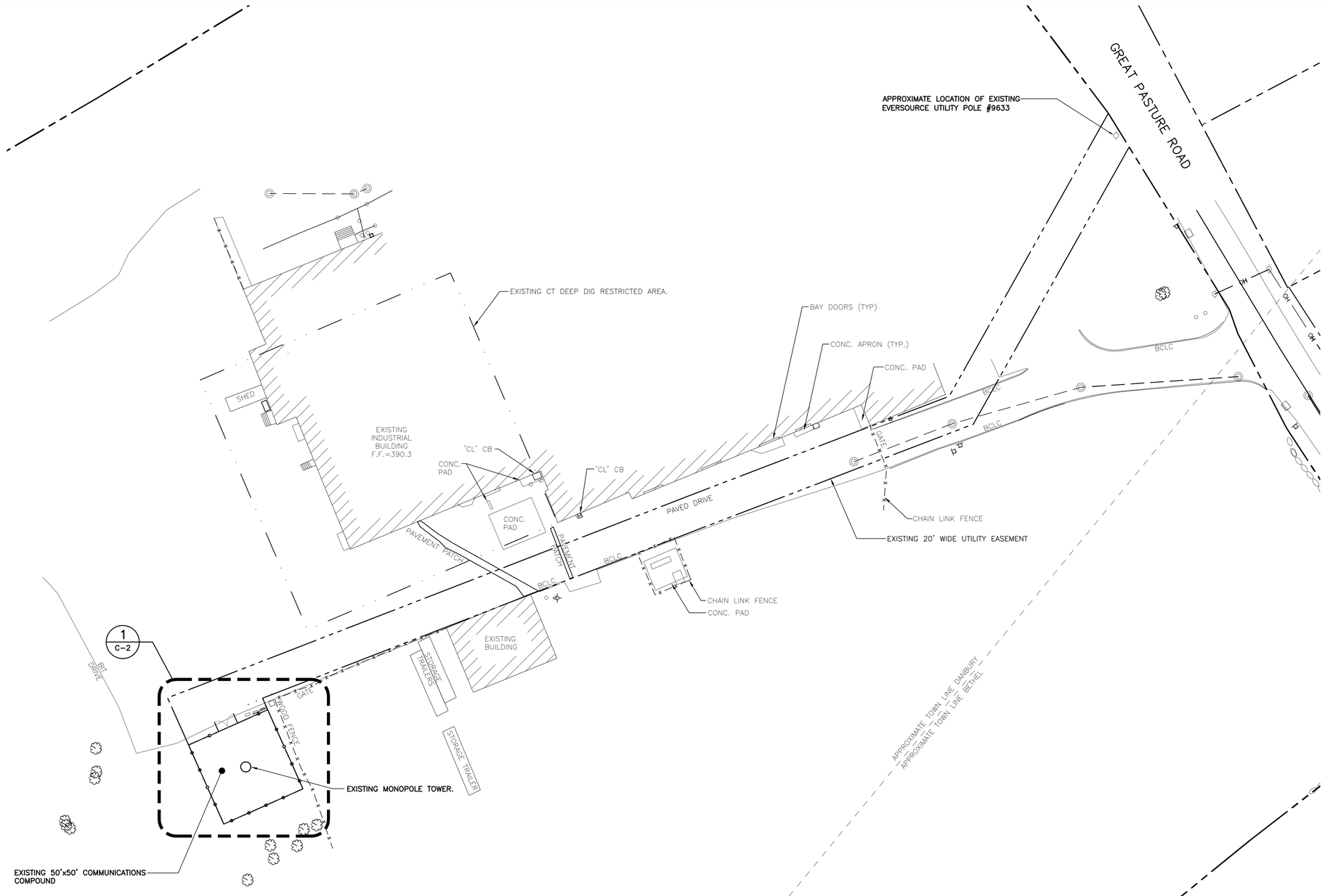
JOB NO. 19101.00

ABUTTERS AND NATURAL DIVERSITY MAPS

C-0

Sheet No. 3 of 17



SYMBOLS LEGEND

- PROPERTY LINE
- EASEMENT LINE
- EXISTING ROAD
- UTILITY POLE
- EXISTING DECIDUOUS TREE
- FENCE LINE

1 / C-1 **SITE LOCATION PLAN**
SCALE: 1"=30'

APPROXIMATE NORTH

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch = 30 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	09/28/20	DMD	TJR	CONSTRUCTION DRAWINGS – FINAL PER DESCOPED RFDS

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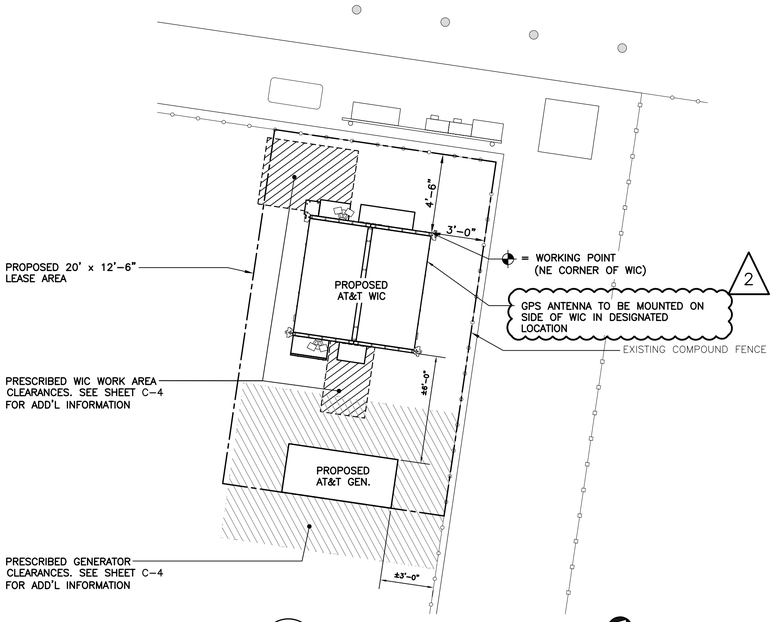
SITE LOCATION PLAN

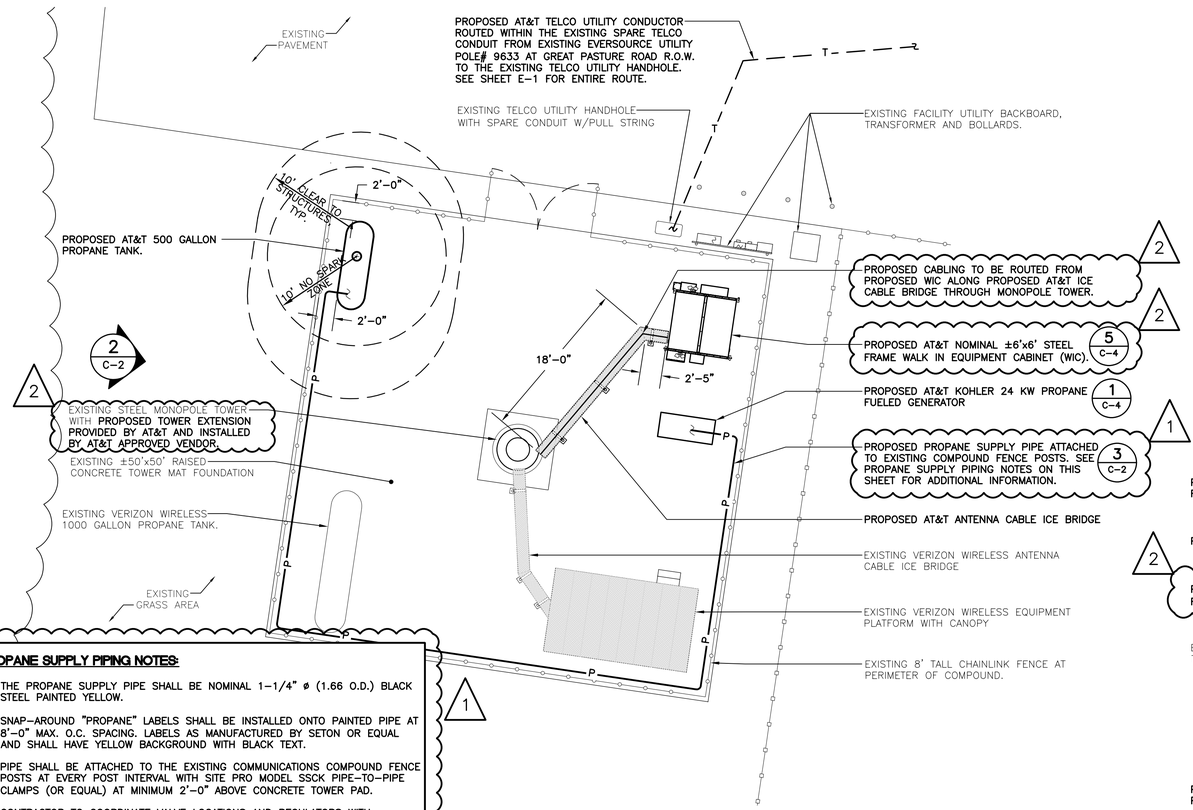
C-1

Sheet No. 4 of 17



1A / C-2 **PARTIAL COMPOUND PLAN**
SCALE: 1/4" = 1'- 0"

APPROXIMATE NORTH



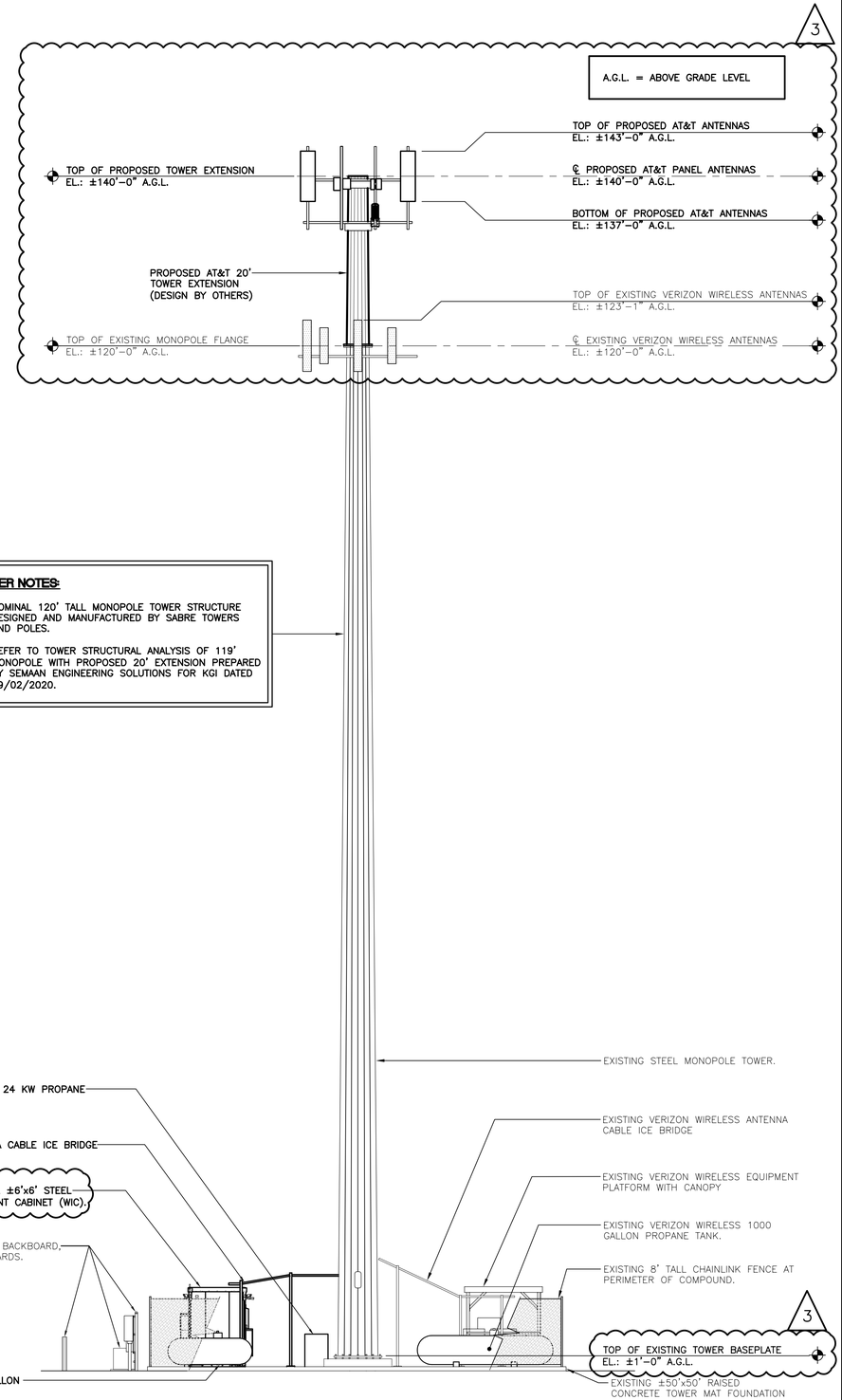
PROPANE SUPPLY PIPING NOTES:

1. THE PROPANE SUPPLY PIPE SHALL BE NOMINAL 1-1/4" ø (1.66 O.D.) BLACK STEEL PAINTED YELLOW.
2. SNAP-AROUND "PROPANE" LABELS SHALL BE INSTALLED ONTO PAINTED PIPE AT 8'-0" MAX. O.C. SPACING. LABELS AS MANUFACTURED BY SETON OR EQUAL AND SHALL HAVE YELLOW BACKGROUND WITH BLACK TEXT.
3. PIPE SHALL BE ATTACHED TO THE EXISTING COMMUNICATIONS COMPOUND FENCE POSTS AT EVERY POST INTERVAL WITH SITE PRO MODEL SSCK PIPE-TO-PIPE CLAMPS (OR EQUAL) AT MINIMUM 2'-0" ABOVE CONCRETE TOWER PAD.
4. CONTRACTOR TO COORDINATE VALVE LOCATIONS AND REGULATORS WITH PROPANE TANK SUPPLIER/INSTALLER.

1 / C-2 **COMPOUND PLAN**
SCALE: 1/8" = 1'- 0"

APPROXIMATE NORTH

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.



TOWER NOTES:

1. NOMINAL 120' TALL MONOPOLE TOWER STRUCTURE DESIGNED AND MANUFACTURED BY SABRE TOWERS AND POLES.
2. REFER TO TOWER STRUCTURAL ANALYSIS OF 119' MONOPOLE WITH PROPOSED 20' EXTENSION PREPARED BY SEMAAN ENGINEERING SOLUTIONS FOR KGI DATED 09/02/2020.

2 / C-2 **WEST ELEVATION**
SCALE: 1/8" = 1'- 0"

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	03/17/21	DMD	TJR	CONSTRUCTION DRAWINGS - REVISED PER ZONING COMMENTS
4	12/16/20	DMD	TJR	CONSTRUCTION DRAWINGS - WIC MODEL CHANGE
3	11/02/20	DMD	TJR	CONSTRUCTION DRAWINGS - PROPANE SUPPLY PIPE ROUTING
0	09/28/20	DMD	TJR	CONSTRUCTION DRAWINGS - FINAL PER DESCOPED RFDS

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at&t

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WIRELESS COMMUNICATIONS FACILITY
CT2873 BETHEL
15 GREAT PASTURE ROAD
DANBURY, CT 06810

DATE:	08/20/19
SCALE:	AS NOTED
JOB NO.	19101.00

COMPOUND PLANS AND ELEVATION

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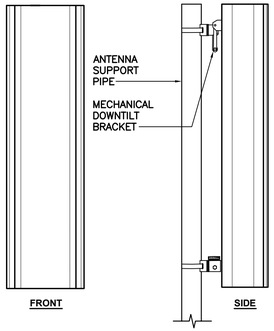
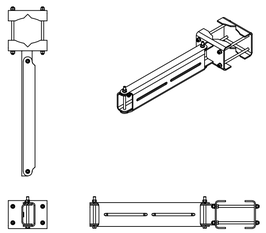


ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: TPA65R-BU6DA-K	71.2"L x 21.0"W x 7.8"D	87 LBS.

1 C-3 PROPOSED ANTENNA DETAIL

NOT TO SCALE



RRU DUAL SWIVEL MOUNT		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SITE PRO 1 PART NO.: RRUDSM	27.75"L x 6.5"W x 4.7"D	39.4 LBS.
NOTE: SWIVEL MOUNT KIT INCLUDES (2) SWIVEL MOUNTS.		

2 C-3 RRH DUAL SWIVEL MOUNT DETAIL

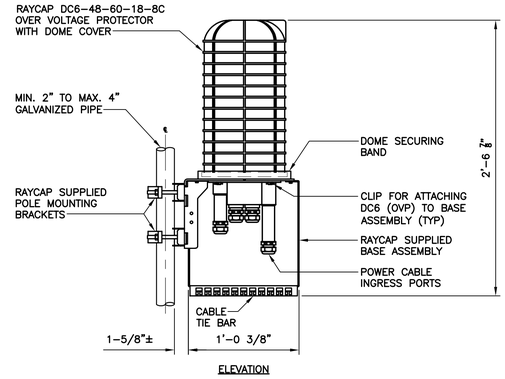
NOT TO SCALE

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT (W/O MOUNTING HDWR)	CLEARANCES
MAKE: ERICSSON MODEL: B14 4478	14.9"L x 13.1"W x 7.3"D	60 LBS.	BELOW: 20" MIN.
MAKE: ERICSSON MODEL: 4415 B30	14.9"L x 13.2"W x 5.4"D	44 LBS.	BELOW: 20" MIN.
MAKE: ERICSSON MODEL: B5/B12 4449	17.9"L x 13.2"W x 9.4"D	71 LBS.	BELOW: 20" MIN.
MAKE: ERICSSON MODEL: B2/B66A 8843	14.9"L x 13.2"W x 10.9"D	72 LBS.	BELOW: 20" MIN. TO EDGE OF ANTENNA: 8"

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. RRUs TO BE MOUNTED A MINIMUM OF 8" AWAY FROM THE BACK PLANE OF ANTENNAS.

3 C-3 PROPOSED RRU SPECIFICATIONS

NOT TO SCALE



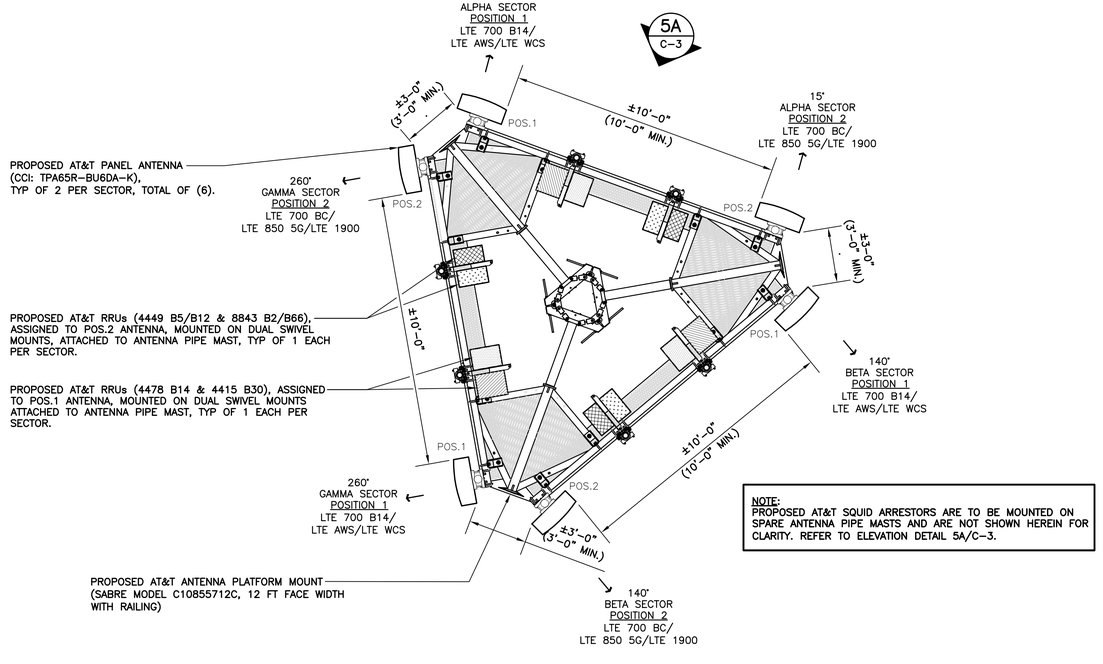
ELEVATION

SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
MONOPOLE	MAKE: RAYCAP (FIBER DC SQUID) MODEL: DC6-48-60-18-8F	(3)	TOWER, ADJACENT TO AT&T ANTENNAS AND RRUs.	20 LBS. (WITHOUT MOUNT)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.
3. RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

4 C-3 PROPOSED SURGE ARRESTOR DETAIL

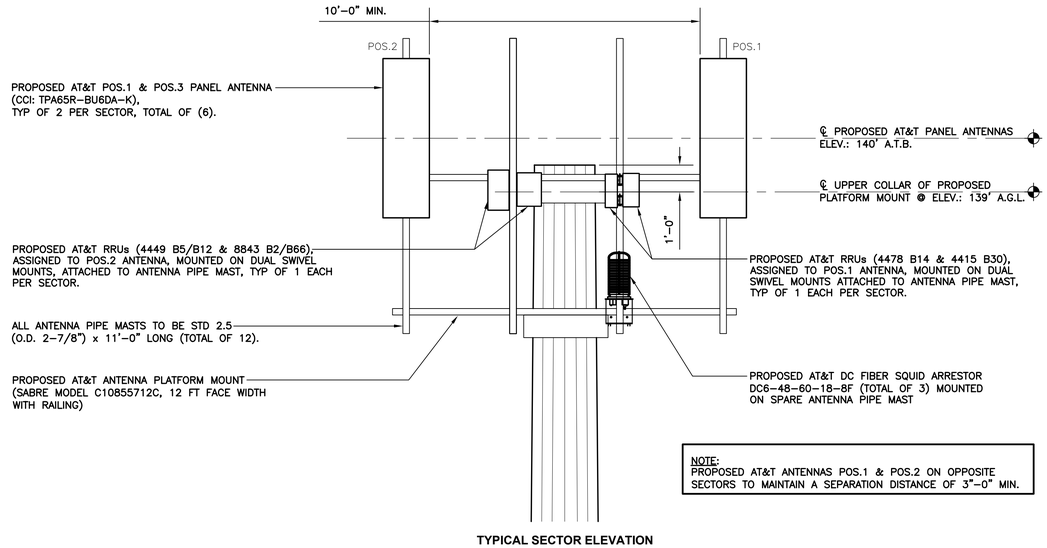
NOT TO SCALE



NOTE:
PROPOSED AT&T SQUID ARRESTORS ARE TO BE MOUNTED ON SPARE ANTENNA PIPE MASTS AND ARE NOT SHOWN HEREIN FOR CLARITY. REFER TO ELEVATION DETAIL 5A/C-3.

5 C-3 ANTENNA MOUNTING CONFIG. PLAN

SCALE: 3/8" = 1'- 0"



NOTE:
PROPOSED AT&T ANTENNAS POS.1 & POS.2 ON OPPOSITE SECTORS TO MAINTAIN A SEPARATION DISTANCE OF 3"-0" MIN.

TYPICAL SECTOR ELEVATION

5A C-3 ANTENNA MOUNTING CONFIG. ELEVATION

SCALE: 3/8" = 1'- 0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	09/28/20	DMD	TJR	CONSTRUCTION DRAWINGS - FINAL PER DESCOPED RFDS
A	12/16/20	LGL	DMD	CONSTRUCTION DRAWINGS - ANTENNA SEPERATIONS ADDED

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ANTENNA CONFIGURATION AND EQUIPMENT DETAILS

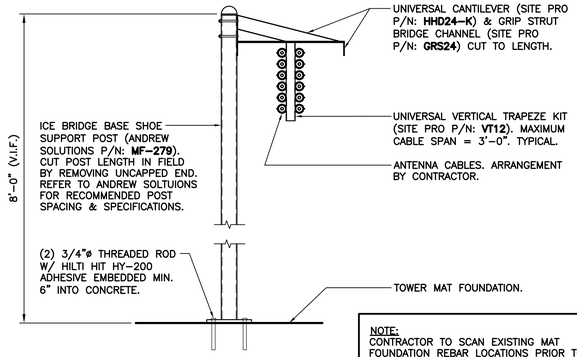
C-3

Sheet No. 6 of 17

PROPANE FUELED GENERATOR		
EQUIPMENT	POWER GENERATION (AC/DC)	DIMENSIONS
MAKE: KOHLER MODEL: 24RCL	AC	74.0"L x 32.9"W x 46.0"H

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. THE RECOMMENDED DISTANCE FROM A STRUCTURE IS DEPENDENT ON STATE AND LOCAL CODES. NFPA 37 (STANDARDS FOR THE INSTALLATION AND USE OF STATIONARY COMBUSTION ENGINES AND GAS TURBINES) STATES THIS DISTANCE SHOULD BE AT LEAST 5 FEET FROM A COMBUSTIBLE MATERIAL. FOR INSTALLATIONS NEAR NON-COMBUSTIBLE MATERIAL BE SURE TO LEAVE A MINIMUM DISTANCE OF 3 FEET TO ENSURE PROPER GENERATOR COOLING.

1 / C-4 **BACK UP GENERATOR DETAIL**
NOT TO SCALE



NOTE:
CONTRACTOR TO SCAN EXISTING MAT FOUNDATION REBAR LOCATIONS PRIOR TO ICE BRIDGE BASE PLATE ANCHOR INSTALLATION SO AS TO AVOID REBAR.

2 / C-4 **ICE BRIDGE DETAIL**
NOT TO SCALE

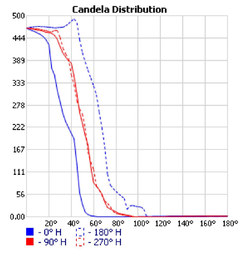
GPS ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: PCTEL MODEL: GPS-TMG-HR-26N	5.0"H x 3.2"D	0.6 LBS.

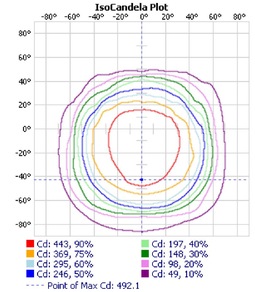
NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

3 / C-4 **GPS UNIT DETAIL**
NOT TO SCALE

EXTERIOR LIGHT		
EQUIPMENT	WATTAGE	VOLTAGE
MAKE: LITHONIA LIGHTING MODEL: OFLR 6 MO	21.89 W	120 V

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

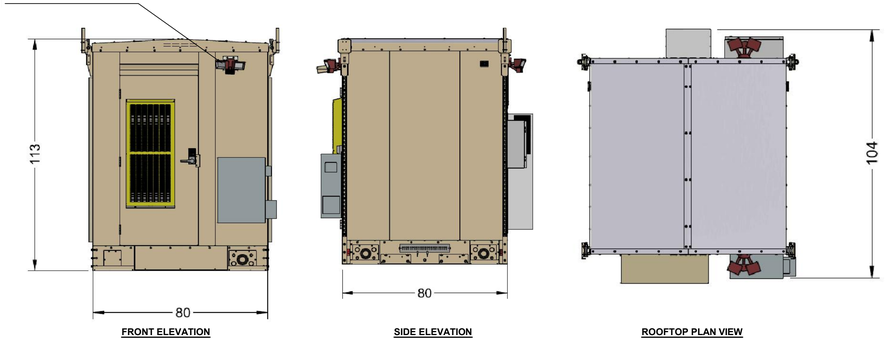




6 / C-4 **EXTERIOR LIGHT DETAIL**
NOT TO SCALE

2

(2) ±22W MOTION CONTROLLED OUTSIDE LIGHTS, (1) IN THE FRONT AND (1) IN THE REAR OF THE WIC. THE LIGHTS WILL CONTAIN A TIMER FOR AN AUTOMATIC SHUT-OFF. THESE LIGHTS WILL BE FACING DOWN AND WILL HAVE NO SPILLOVER TO ADJACENT PROPERTIES.



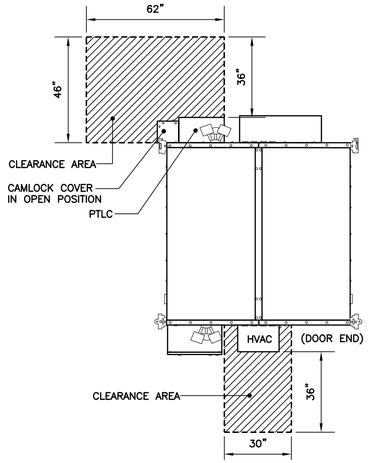
FRONT ELEVATION — SIDE ELEVATION — ROOFTOP PLAN VIEW

WALK-IN CABINET				
EQUIPMENT	CONSTRUCTION	DIMENSIONS	WEIGHTS	WIC BASE OPTION
MAKE: VERTIV MODEL: 6'X6' WIC P/N: F2018001-WIC	14 GA. INTERLOCKING STEEL PANEL CONSTRUCTION	80"L x 80"W x 113.0"H	EMPTY: ±5500 LBS. FULLY INTEGRATED: ±7500 LBS	CONCRETE FOUNDATION KIT P/N.: D1007-0000-0012 (SEE NOTES BELOW)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION AND ALL OPTIONAL EQUIPMENT INCLUSIONS WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO SCAN EXISTING MAT FOUNDATION REBAR LOCATIONS PRIOR TO WIC BASE HOLD-DOWN ANCHOR INSTALLATION SO AS TO AVOID REBAR.
3. WIC HOLD-DOWN ANCHORS BY WIC MANUFACTURER. INSTALL PER MANUFACTURER'S WRITTEN RECOMMENDATIONS.

5 / C-4 **WALK-IN CABINET DETAIL**
NOT TO SCALE

TYP. FOUNDATION WIC BASE ATTACHMENT KIT



4 / C-4 **EQUIPMENT SHELTER CLEARANCES PLAN**
SCALE: 3/8" = 1'- 0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	11/25/20	DMD	TJR	CONSTRUCTION DRAWINGS - WIC MODEL CHANGE
0	09/28/20	DMD	TJR	CONSTRUCTION DRAWINGS - FINAL PER DESCOPED RFDS

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SITE AND EQUIPMENT DETAILS

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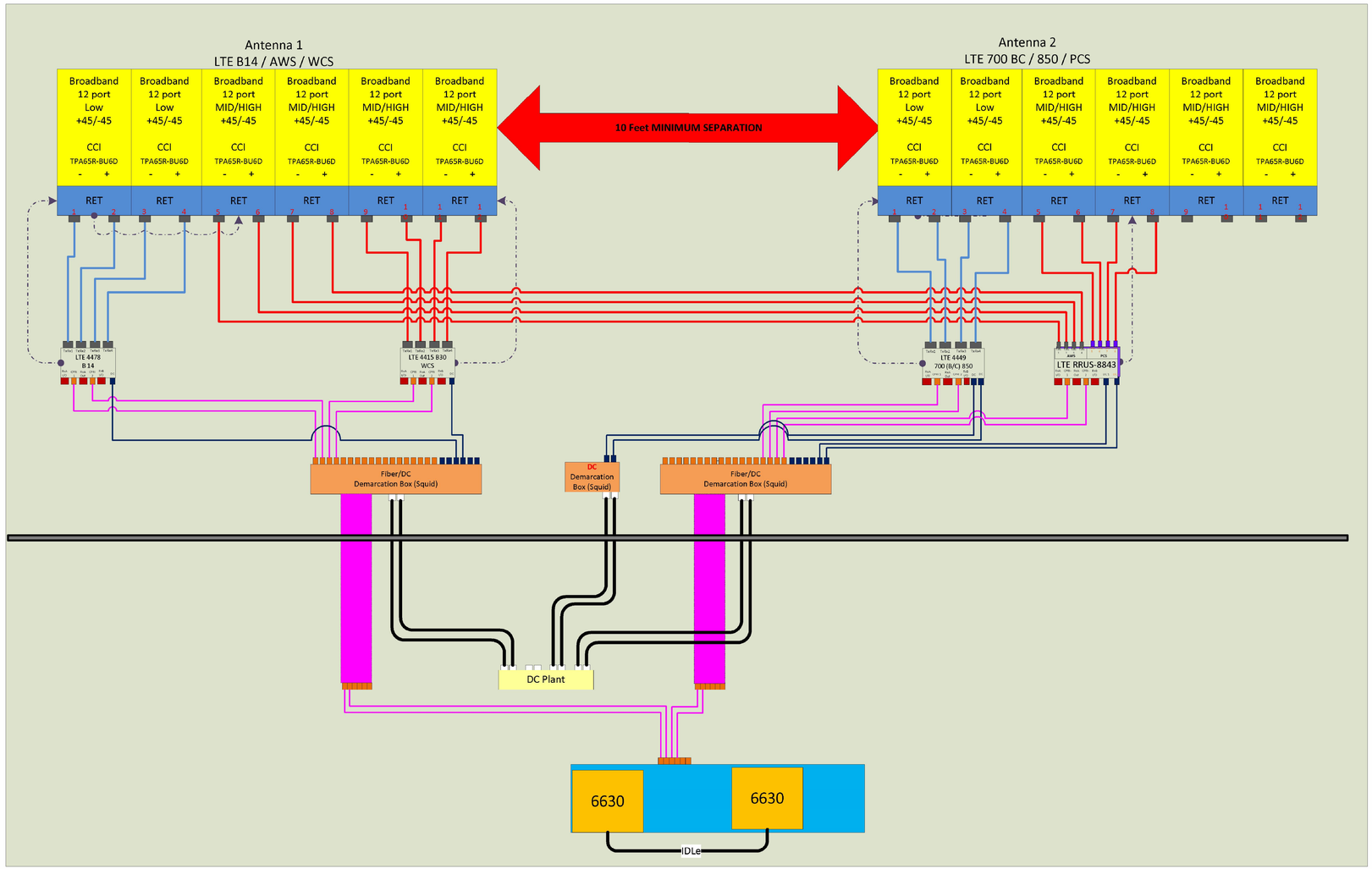
Sheet No. 7 of 17



ALL SECTORS

1 / C-5 **RF PLUMBING DIAGRAM**

NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	09/28/20	DMD	TJR	CONSTRUCTION DRAWINGS – FINAL PER DESCOPED RFDS

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RF PLUMBING DIAGRAM

C-5

Sheet No. 8 of 17

ATTACHMENT 8

Radio Frequency Safety Survey Report Prediction (RFSSRP)

AT&T Wireless Monopole Facility

Site ID: CT2873 **Site Name:** DANBURY GREAT PASTURE ROAD **Address:** 15 GREAT PASTURE ROAD, DANBURY, CT 06810 **Latitude:** 41.383003 **Longitude:** -73.422159 **USID:** 253157 **FA**: 12684101	**Prepared for:** AT&T Mobility 550 Cochituate Road, Suite 13 Framingham, MA 01701 Report Writer: Dane Folie Date: March 26, 2021 Report Reviewer: Brandon Green

Statement of Compliance

AT&T will be compliant with FCC Regulations upon installation of recommended mitigation measures.

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1.0 GENERAL SUMMARY

Centerline Communications, LLC ("Centerline") has been contracted to provide a Radio Frequency (RF) Analysis for the following AT&T Mobility wireless monopole facility to determine whether the facility is in compliance with federal standards and regulations regarding RF emissions. This analysis includes theoretical emissions calculations, for all equipment for AT&T Mobility and any other wireless carriers on site.

1.1 SITE SUMMARY

Analysis Site Data	
Site USID:	253157
Site FA#:	12684101
Site Name:	DANBURY GREAT PASTURE ROAD
Site Address:	15 GREAT PASTURE ROAD, DANBURY CT 06810
Site Latitude:	41.383003
Site Longitude:	-73.422159
Facility Type:	Monopole
Compliance Summary	
Compliance Status:	Compliant Upon Mitigation Installation
Maximum Modeled AT&T MPE% on Walking Surface (General Public Limit):	0.09%
Maximum Modeled AT&T MPE% at Ground Level (General Public Limit):	0.09%
Site Survey Data	
Is Access Locked or Controlled? :	Unknown
Lock or Control Measures if Present:	Unknown
Parapet Height:	N/A
Site Data Information	
CD:	2020-0928 CT2873 Bethel - CD Rev0_19101.00 (S&S).pdf
RFDS:	NEW-ENGLAND_CONNECTICUT_CT2873_2020-New-Site_New_ra9161_2051A0DQ2P_12684101_253157_03-18-2019_Preliminary-In-Progress_v3.00.pdf

Signage and barriers are the primary means of mitigating access to accessible areas of exposure. Below is a summary of existing and recommended signage at this AT&T facility.

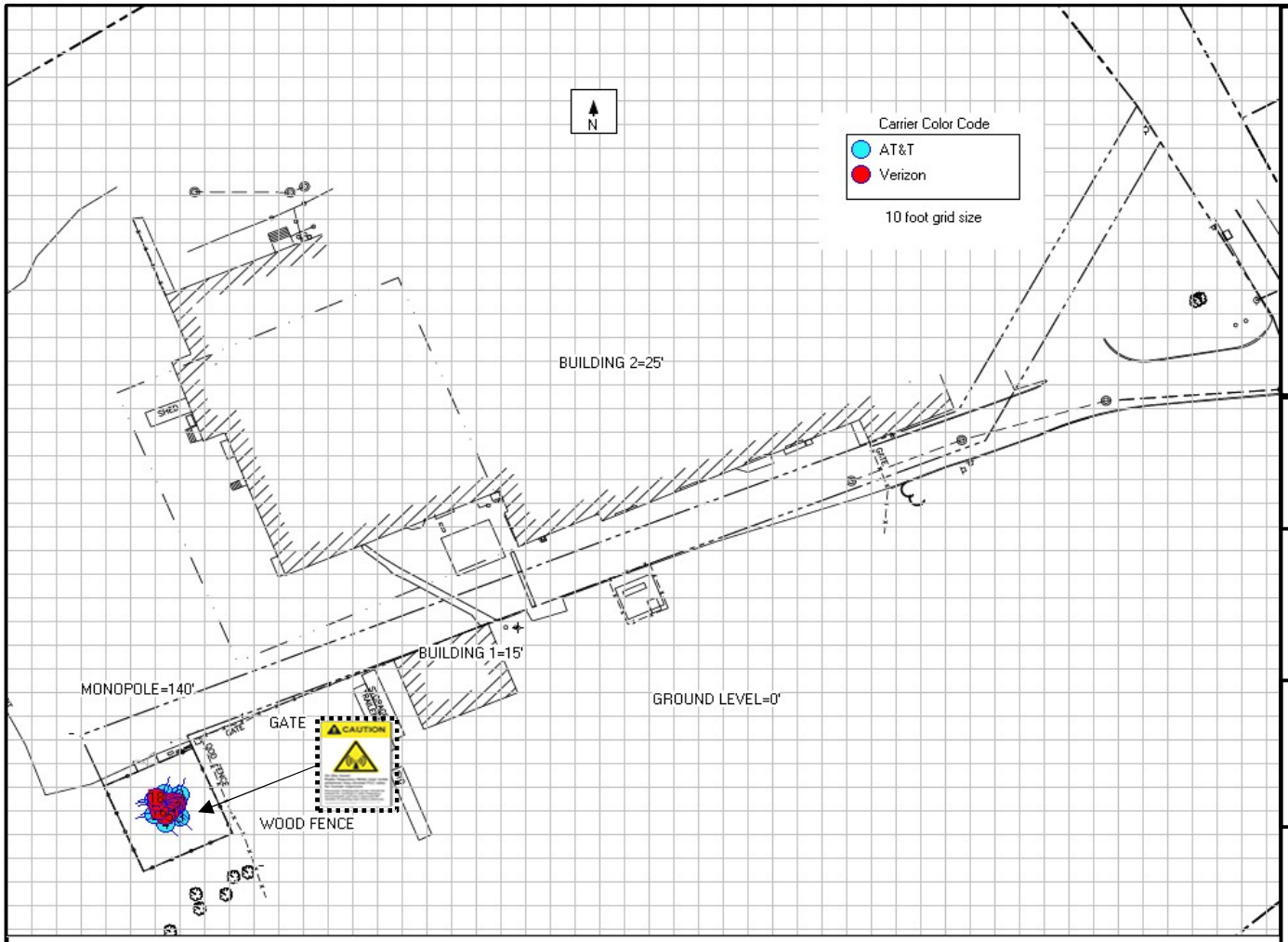
Existing Signage and Barriers (AT&T Sectors)										
Location	Information	Notice	Notice 2	Caution	Caution 2	Caution 2B	Caution 2C	Warning	Warning 2	Barriers
Gate	0	0	0	0	0	0	0	0	0	0
Monopole Base	0	0	0	0	0	0	0	0	0	0

Recommended Signage and Barriers (AT&T Sectors)						
Location	Notice 2	Caution 2	Caution 2B	Caution 2C	Warning 2	Barriers
Gate	0	0	0	0	0	0
Monopole Base	0	0	1	0	0	0

Monopole Base:

- Install (1) Caution 2B sign at the base of the monopole.

2.0 SITE SCALE MAP



Operator Antenna Identifiers

- AT&T Mobility
- Verizon
- Clearwire
- Cricket
- T-Mobile
- Sprint
- US Cellular
- Metro PCS
- Unknown


INFO 1 Sign


Caution 1 Sign


INFO 2 Sign


Tower Caution Sign


Notice 1 Sign


Caution 2 Sign


Notice 2 Sign


Warning 2 Sign

Items to be Removed

Existing Sign

Proposed Sign

Existing Barrier

Proposed Barrier

Signage/ Mitigation Plan

DANBURY GREAT PASTURE ROAD / 12684101

3.0 ANTENNA INVENTORY

ANT ID	Operator	Antenna Make	Antenna Model	Type	Freq (MHz)	TPO (Watts)	# of TX	Azimuth (°)	BW (°)	Gain (dBd)	Total ERP (Watts)	Length (ft.)	Antenna Z Value (ft.) AGL*
1	AT&T	CCI	TPA65R-BU6D	Panel	700	40	4	15	68	11.75	2393.98	5.9	137.3
1	AT&T	CCI	TPA65R-BU6D	Panel	2100	40	4	15	60	15.85	6153.47	5.9	137.3
1	AT&T	CCI	TPA65R-BU6D	Panel	2300	25	4	15	52	14.75	2985.38	5.9	137.3
2	AT&T	CCI	TPA65R-BU6D	Panel	700	40	2	15	68	11.75	1196.99	5.9	137.3
2	AT&T	CCI	TPA65R-BU6D	Panel	850	40	2	15	65	12.45	1406.34	5.9	137.3
2	AT&T	CCI	TPA65R-BU6D	Panel	1900	40	4	15	63	14.85	4887.87	5.9	137.3
3	AT&T	CCI	TPA65R-BU6D	Panel	700	40	4	140	68	11.75	2393.98	5.9	137.3
3	AT&T	CCI	TPA65R-BU6D	Panel	2100	40	4	140	60	15.85	6153.47	5.9	137.3
3	AT&T	CCI	TPA65R-BU6D	Panel	2300	25	4	140	52	14.75	2985.38	5.9	137.3
4	AT&T	CCI	TPA65R-BU6D	Panel	700	40	2	140	68	11.75	1196.99	5.9	137.3
4	AT&T	CCI	TPA65R-BU6D	Panel	850	40	2	140	65	12.45	1406.34	5.9	137.3
4	AT&T	CCI	TPA65R-BU6D	Panel	1900	40	4	140	63	14.85	4887.87	5.9	137.3
5	AT&T	CCI	TPA65R-BU6D	Panel	700	40	4	260	68	11.75	2393.98	5.9	137.3
5	AT&T	CCI	TPA65R-BU6D	Panel	2100	40	4	260	60	15.85	6153.47	5.9	137.3
5	AT&T	CCI	TPA65R-BU6D	Panel	2300	25	4	260	52	14.75	2985.38	5.9	137.3
6	AT&T	CCI	TPA65R-BU6D	Panel	700	40	2	260	68	11.75	1196.99	5.9	137.3
6	AT&T	CCI	TPA65R-BU6D	Panel	850	40	2	260	65	12.45	1406.34	5.9	137.3
6	AT&T	CCI	TPA65R-BU6D	Panel	1900	40	4	260	63	14.85	4887.87	5.9	137.3
7	Verizon	GENERIC	PANEL 6FT	Panel	850	30	4	15	66	12.62	2193.72	6.0	117.0
8	Verizon	GENERIC	PANEL 6FT	Panel	1900	30	4	15	66	15.84	4604.49	6.0	117.0
9	Verizon	GENERIC	PANEL 6FT	Panel	2100	40	2	15	63	16.39	3484.09	6.0	117.0
10	Verizon	GENERIC	PANEL 6FT	Panel	700	60	1	15	68	12.33	1026.01	6.0	117.0
11	Verizon	GENERIC	PANEL 6FT	Panel	850	30	4	140	66	12.62	2193.72	6.0	117.0
12	Verizon	GENERIC	PANEL 6FT	Panel	1900	30	4	140	66	15.84	4604.49	6.0	117.0
13	Verizon	GENERIC	PANEL 6FT	Panel	2100	40	2	140	63	16.39	3484.09	6.0	117.0

14	Verizon	GENERIC	PANEL 6FT	Panel	700	60	1	140	68	12.33	1026.01	6.0	117.0
15	Verizon	GENERIC	PANEL 6FT	Panel	850	30	4	260	66	12.62	2193.72	6.0	117.0
16	Verizon	GENERIC	PANEL 6FT	Panel	1900	30	4	260	66	15.84	4604.49	6.0	117.0
17	Verizon	GENERIC	PANEL 6FT	Panel	2100	40	2	260	63	16.39	3484.09	6.0	117.0
18	Verizon	GENERIC	PANEL 6FT	Panel	700	60	1	260	68	12.33	1026.01	6.0	117.0

*Table 1: Total Site Data Table (*AGL = Above Ground Level)*

Note: Z Value represents the bottom tip height of the antenna

4.0 PREDICTED EMISSION LEVELS AND DISCUSSION

All calculations performed based upon the data listed for this facility have produced results that are within allowable limits for General Population limits for exposure to RF emissions as specified by federal standards.

AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document states that microwave dishes are compliant if they are mounted 20 feet or greater above any accessible walking or working surface.

Maximum Predicted MPE Level on Site:	% of MPE Limit:	Location:
Accessible **General Population** MPE Limits:	**0.09%**	**Sector A**
Accessible **Occupational** MPE Limits:	**0.02%**	

Ground Level Assessment:	% of MPE Limit:
Ground Level **General Population** MPE Limits:	**0.09%**
Ground Level **Occupational** MPE Limits:	**0.02%**

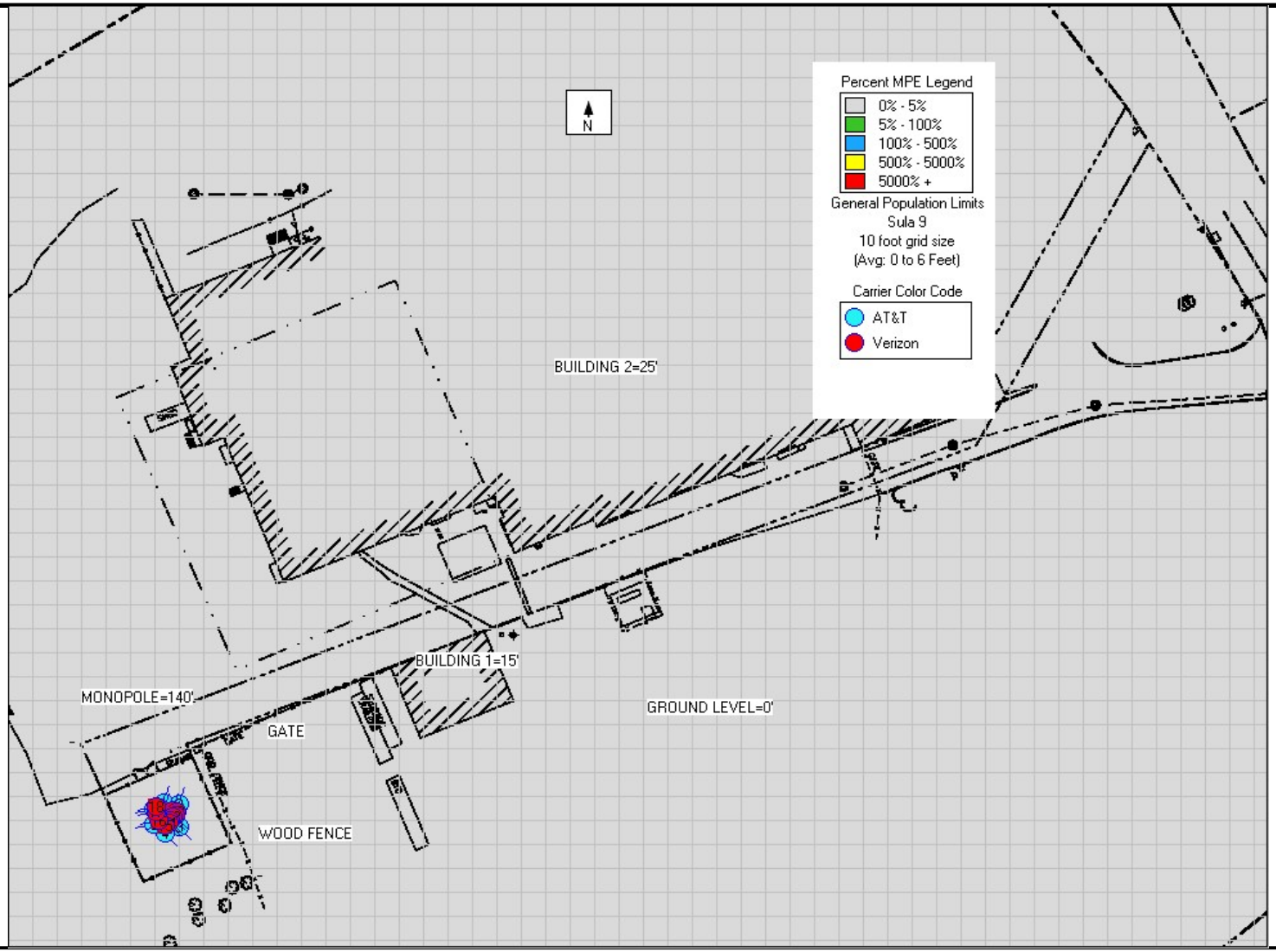
Sector A: Transmitting over Ground Level	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**0.09%**	**0**
Accessible **Occupational** MPE Limits:	**0.02%**	**0**

Sector B: Transmitting over Ground Level	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**0.08%**	**0**
Accessible **Occupational** MPE Limits:	**0.02%**	**0**

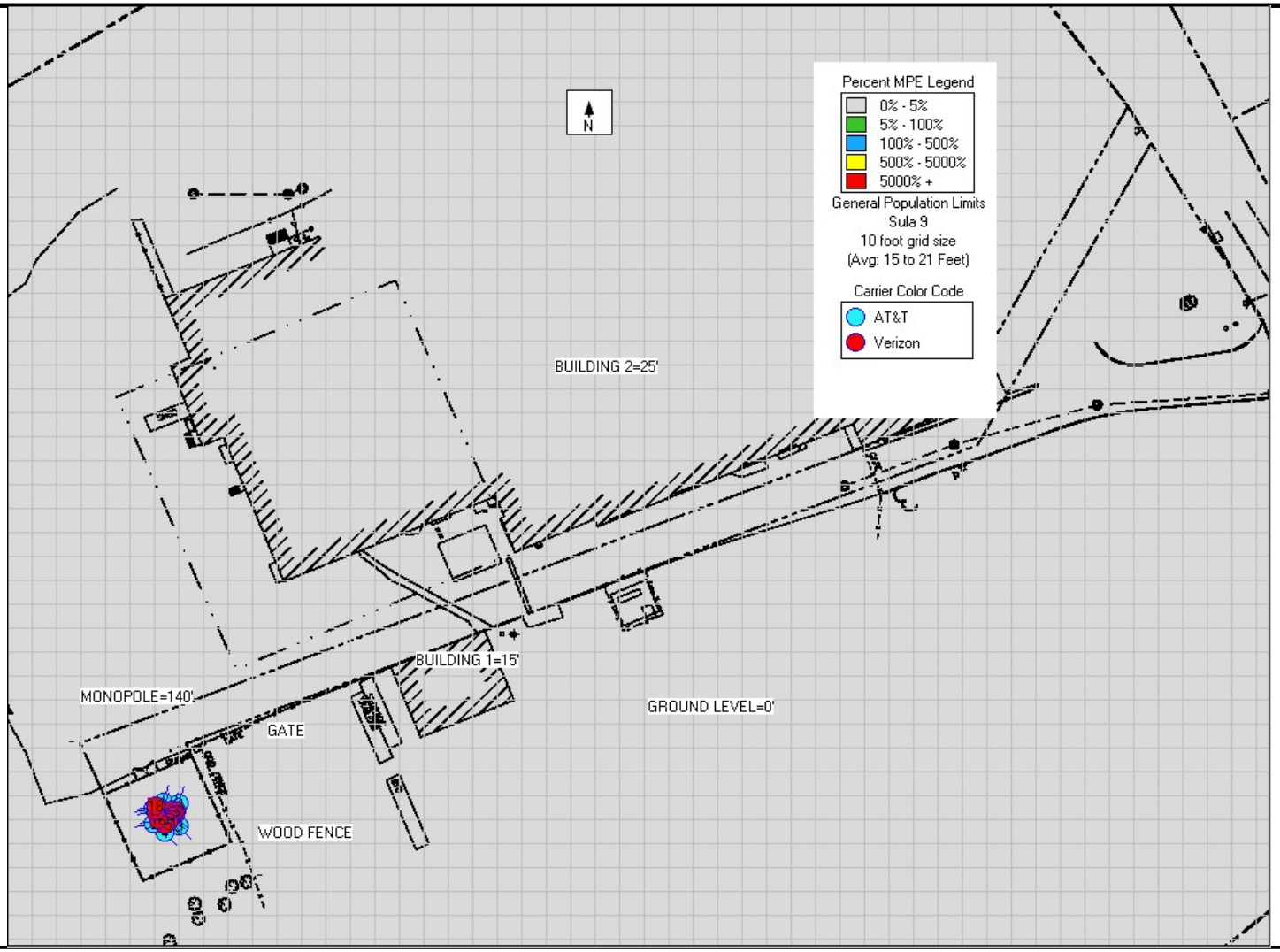
Sector C: Transmitting over Ground Level	% of MPE Limit:	*Distance from Antenna:
Accessible **General Population** MPE Limits:	**0.08%**	**0**
Accessible **Occupational** MPE Limits:	**0.02%**	**0**

**Distance from Antenna is the distance that the MPE limits are exceeded from the front face of the antenna, outward across an accessible area.*

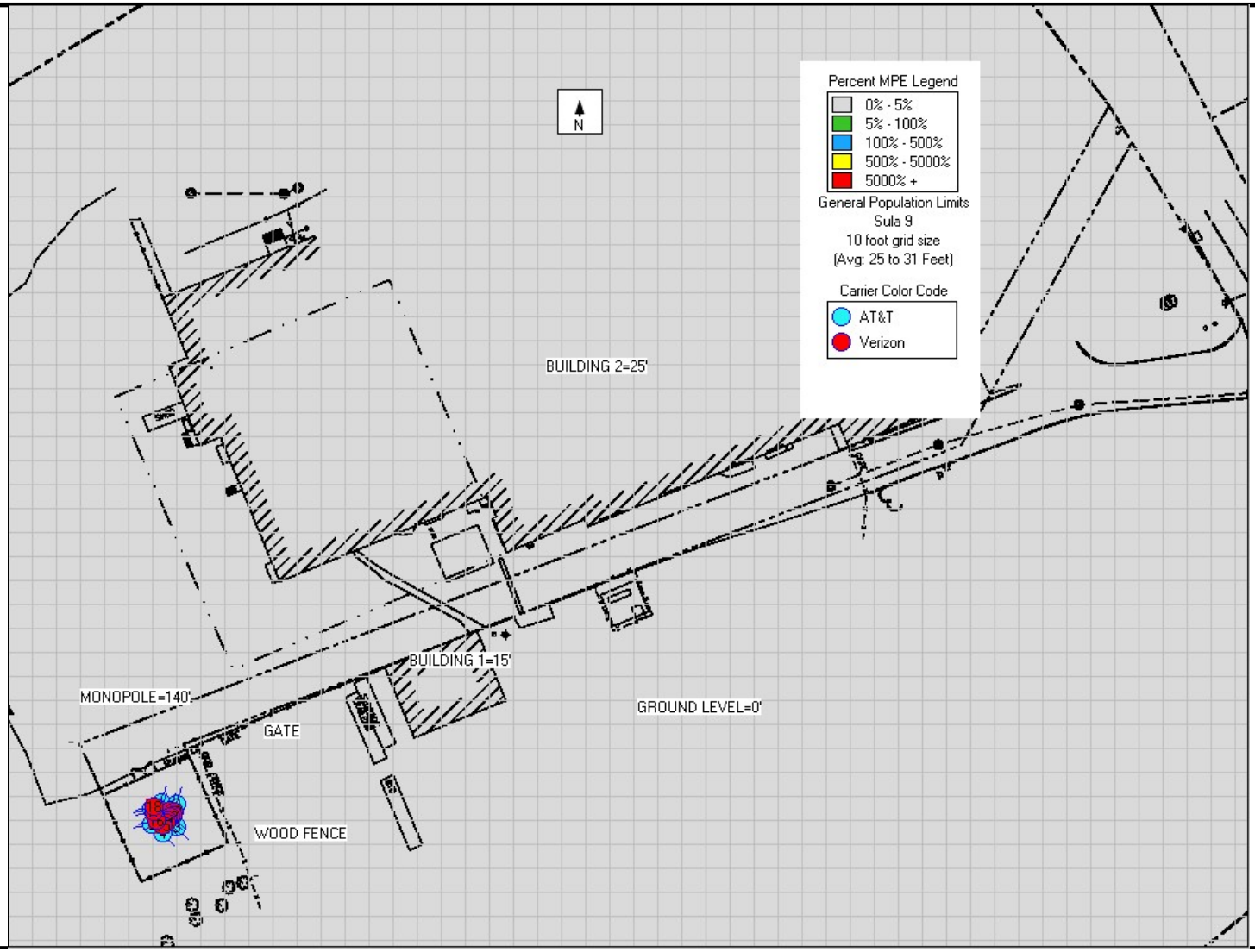
5.0 EMISSIONS DIAGRAMS



Emissions Thresholds for AT&T (Ground Level 0.00ft.) DANBURY GREAT PASTURE ROAD / 12684101



Emissions Thresholds for AT&T (Building 1 Level 15.00ft.) DANBURY GREAT PASTURE ROAD / 12684101



Emissions Thresholds for AT&T (Building 2 Level 25.00ft.) DANBURY GREAT PASTURE ROAD / 12684101

6.0 STATEMENT OF COMPLIANCE

Centerline conducted worst case modeling to determine whether the monopole facility located at 15 GREAT PASTURE ROAD in DANBURY, Connecticut is in compliance with FCC Regulations.

6.1 STATEMENT OF AT&T MOBILITY COMPLIANCE

Based on the information analyzed, AT&T will be compliant with FCC Regulations once the mitigation measures recommended in this report are implemented.

6.2 RECOMMENDATIONS

Recommended Signage and Barriers (AT&T Sectors)						
Location	Notice 2	Caution 2	Caution 2B	Caution 2C	Warning 2	Barriers
Gate	0	0	0	0	0	0
Monopole Base	0	0	1	0	0	0

Monopole Base:

- Install (1) Caution 2B sign at the base of the monopole.

7.0 FALL ARREST AND PARAPET INFORMATION

As per AT&T barrier policy, rooftop edges that are protected with a 39-inch parapet wall or guardrail are safe for work activity within six (6) feet of the edge. OSHA has stated that an existing 39-inch guardrail or parapet provides sufficient protection for employees. The height of the top rail or equivalent component of guardrail systems in new construction shall be at least 42 inches above the walking or working surface. It should also be noted that the height of the parapet or guardrail may be reduced to no less than 30 inches at any point provided the sum of the depth (horizontal distance) of the top edge, and the height of the top edge (vertical distance from the work surface to the top edge of the top member, is at least 48 inches. If there is no reason for working atop the roof, then edge protection is not required. In addition, workers may use personnel lifts or temporary fall protection measures to perform work within 6 feet of the roof edge in place of permanent edge protection. Reference: 29 CFR 1910.28, 29 CFR 1910.23 (NPRM-1990); OSHA Letters of Interpretation 2/9/83 and 3/8/9

APPENDIX A: RF SIGNAGE

AT&T RF Signage

Sign	Description	Sign	Description
	**Information 1 Sign** Gives guidelines on how to proceed and who to contact regarding areas that may exceed either the FCC's General Population or Occupational emissions limits.		**Information 2 Sign** Gives specific information on how to proceed and who to contact regarding antennas that are façade mounted, concealed or on stand-alone structures.
	**Blue Notice 1 Sign** Used to alert individuals that they are entering an area that may exceed the FCC's General Population emissions limit. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.		**Blue Notice 2 Sign** Used to alert individuals that they are entering an area that may exceed the FCC's General Population emissions limits. To be used on barriers or antenna sectors as a hybrid of the Information 1 and Blue Notice 1 signs.
	**Yellow Caution 1 Sign-Rooftop** Used to inform individuals that they are entering an area that may exceed the FCC's Occupational emissions limit. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.		**Yellow Caution 2 Sign-Rooftop** Used to alert individuals that they are entering an area that may exceed the FCC's Occupational emissions limit. To be used on barriers or antenna sectors as a hybrid of the Information 1 and Yellow Caution 1 signs.
	**Yellow Caution 1 Sign-Tower** Used to inform individuals that they are entering an area that may exceed the FCC's Occupational emissions limits. Must be placed at the base of the tower to warn tower climbers of potential for exposure.		**Warning 2 Sign** Used to inform individuals that they are entering an area that may exceed the FCC's Occupational emissions limit by a factor of 10 or greater. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.

APPENDIX B: FCC GUIDELINES AND EMISSIONS THRESHOLD LIMITS

All power density values used in this report were analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General Population/Uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the 700 and 800 MHz Bands is approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively, and the general population exposure limit for the 1900 MHz PCS and 2100 MHz AWS bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/Controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure, have been properly trained in RF safety and can exercise control over their exposure. Occupational/Controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure, have been trained in RF safety and can exercise control over his or her exposure by leaving the area or by some other appropriate means. The Occupational/Controlled exposure limits all utilized frequency bands is five (5) times the FCC's General Public / Uncontrolled exposure limit.

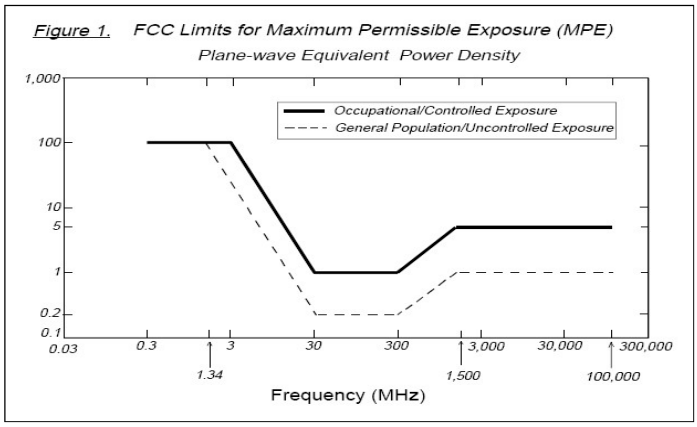
The FCC Mandates that if a site is found to be out of compliance with regard to emissions that any system operator contributing 5% or more to areas exceeding the FCC's allowable limits will be responsible for bringing the site into compliance.

Additional details can be found in FCC OET 65.

Table 1: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-I,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-I,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)

* Plane-wave equivalent power density



APPENDIX C: CALCULATION METHODOLOGY

Centerline Communications, LLC has performed theoretical modeling using Waterford Consultants' RoofMaster™ 2020 Version 21.9.04.20 which uses a cylindrical model for conservative power density predictions within the near field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations the power decreases inversely with the square of the distance. This modeling technique is accurate with low antenna centerlines, such as rooftops, where persons can get close to the antennas and pass through fields in close proximity.

The modeling is based on worst-case assumptions for the number of antennas and transmitter power. No losses were included in the power calculations unless they were specifically provided for the project.

APPENDIX D: CERTIFICATIONS

I, Dane Folie, preparer of this report certify that I am fully trained and aware of the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document.

Dane Folie

3/26/2021

I, Brandon Green, reviewer and approver of this report certify that I am fully trained and aware of the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document.

Brandon Green

3/26/2021

APPENDIX E: PROPRIETARY STATEMENT

This report was prepared for the use of AT&T Mobility, LLC to meet requirements specified in AT&T's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by Centerline Communications, LLC are based solely on the information provided by AT&T Mobility and all observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to Centerline Communications, LLC so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

ATTACHMENT 9

CERTIFICATE OF SERVICE

I hereby certify that on the 31st day of March, 2021, a copy of the following letter and Sub-Petition for a declaratory ruling filed with the Connecticut Siting Council was sent by certified mail, return receipt requested, to the attached list of Town officials:

Dated: March 31, 2021

Brown Rudnick LLP
Joseph A. Giammarco

City of Danbury

JOSEPH M. CAVO, MAYOR DANBURY CITY HALL 155 DEER HILL AVENUE DANBURY, CT 06810	SHARON B. CALITRO, AICP DIRECTOR OF PLANNING & ZONING DANBURY CITY HALL 155 DEER HILL ROAD DANBURY, CT 06810
CONSERVATION COMMISSION DANBURY CITY HALL 155 DEER HILL AVENUE DANBURY, CT 06810	JANICE R. GIEGLER, TOWN CLERK DANBURY CITY HALL 155 DEER HILL AVENUE DANBURY, CT 06810
DANBURY HISTORIC PROPERTIES COMMISSION DANBURY CITY HALL 155 DEER HILL AVENUE DANBURY, CT 06810	

Town of Bethel

MATT KNICKERBOCKER, FIRST SELECTMAN TOWN OF BETHEL 1 SCHOOL STREET BETHEL, CT 06801	BETH CAVAGNA, DIRECTOR/TOWN PLANNER TOWN OF BETHEL 1 SCHOOL STREET BETHEL, CT 06801
TOWN OF BETHEL INLAND WETLANDS COMMISSION 1 SCHOOL STREET BETHEL, CT 06801	LISA BERGH, CCTV, TOWN CLERK TOWN OF BETHEL 1 SCHOOL STREET BETHEL, CT 06801

CERTIFICATE OF SERVICE

I hereby certify that on the 31st day of March, 2021, a copy of the following letter and Sub-Petition for a declaratory ruling filed with the Connecticut Siting Council was sent by certified mail, return receipt requested, to the attached list of abutting property owners:

Dated: March 31, 2021

Brown Rudnick LLP
Joseph A. Giammarco

EPPOLITI INDUSTRIAL REALTY INC. 37 DANBURY ROAD RIDGEFIELD, CT 06877 *Parcel ID L160050000* *Map L16, Lot 5* ***Subject Property:*** *15 Great Pasture Road, Danbury, CT* *Identified as parcel **A** on Abutters Map* *Parcel ID: 20-40-01* *Map 20, Block 40, Lot 1* *Abutting Property: Wooster Street, Bethel, CT* *Identified as parcel **K** on Abutters Map*	FUELCELL ENERGY INC. 3 GREAT PASTURE ROAD DANBURY, CT 06810 *Parcel ID: K161560000* *Map K16, Lot 156* *Property Address: 3 Great Pasture Road, Danbury, CT* *Identified as parcel **B** on Abutters Map*
CITY OF DANBURY 155 DEER HILL AVENUE DANBURY, CT 06810-7769 *Parcel ID: K161600000* *Map K16, Lot 160* *Property Address: Great Pasture Road, Danbury, CT* *Identified as parcel **C** on Abutters Map*	DOWN HOME ASSOCIATES LLC 28 GRIFFITH LANE RIDGEFIELD, CT 06877 *Parcel ID: L160010000* *Map L16, Lot 1* *Property Address: 7 Great Pasture Road, Danbury, CT* *Identified as parcel **D** on Abutters Map*
KEATING PROPERTIES LC 28 GRIFFITH LANE RIDGEFIELD, CT 06877 Parcel ID: L160030000 Map L16, Lot 3 *Property Address: 11 Great Pasture Road, Danbury, CT* *Identified as parcel **E** on Abutters Map*	GLORIA B. PUTNAM 28 GRIFFITH LANE RIDGEFIELD, CT 06877 Parcel ID: L160040000 Map L16, Lot 4 *Property Address: 13 Great Pasture Road, Danbury, CT* *Identified as parcel **F** on Abutters Map*

SANDVIK WIRE AND HEATING TECHNOLOGY CORPORATION ATTENTION: ROGER F. ASSAD 17-02 NEVINS ROAD FAIR LAWN, NJ 07410 Parcel ID: L160060000 Map L16, Lot 6 *Property Address: Great Pasture Road, Danbury, CT* *Identified as parcel **G** on Abutters Map*	TDRAP LLC P.O. BOX 1026 BETHEL, CT 06801 Parcel ID: L160080000 Map L16, Lot 8 *Property Address: 16 Great Pasture Road, Danbury, CT* *Identified as parcel **H** on Abutters Map*
DRAPER TIMOTHY P.O. BOX 1026 BETHEL, CT 06801 Parcel ID: L160090000 Map L16, Lot 9 *Property Address: 14 Great Pasture Road, Danbury, CT* *Identified as parcel **I** on Abutters Map*	REAL TIME CAPITAL PROPERTIES LLC 3 CRICKLEWOOD ROAD, REDDING, CT 06896 Parcel ID: L150080009 Map L15, Lot 8, Unit 009 *Property Address: 10 Great Pasture Road, Danbury, CT* *Identified as parcel **J** on Abutters Map*
STAMFORD COVE PARTNERS LLC C/O ROBERT RYBNICK, JR. P.O.BOX 372 BETHEL, CT 06801 Parcel ID: 21-40-03-02 *Map 20, Block 40, Lot 1* *Property Address: 104 Wooster Street, Bethel, CT* *Identified as Parcel **L** on Abutters Map*	SANDVIK WIRE AND HEATING TECHNOLOGY CORPORATION 982 GRIFFIN POND ROAD, CLARKS SUMMIT, PA 18411 Parcel ID: 20-72-01 Map 20, Block 72, Lot 1 *Property Address: 119 Wooster Street, Bethel, CT* *Identified as parcel **M** on Abutters Map*
TOWN OF BETHEL 1 SCHOOL STREET BETHEL, CT 06801 Parcel ID: 20-40-02 Map 20, Block 40, Lot 2 *Property Address: Wooster Street, Bethel, CT* *Identified as parcel **N** on Abutters Map*	BETHEL LAND TRUST INC. C/O JOHN O'NEILL 54 TAYLOR AVENUE BETHEL, CT 06801 Parcel ID: 21-40-03-11 Map 21, Block 40, Lot 3-11 *Property Address: Wooster Street, Bethel, CT* *Identified as parcel **O** on Abutters Map.*

March 31, 2021
VIA CERTIFIED MAIL/
RETURN RECEIPT REQUESTED

[Insert Abutter/official
Name and Address]

Re: New Cingular Wireless PCS, LLC ("AT&T") – Connecticut Siting Council Sub-Petition for a Declaratory Ruling – Modification and Extension of an Existing Monopole and Collocation of a Wireless Telecommunications Facility at 15 Great Pasture Road, Danbury, Connecticut

To Whom it May Concern:

On behalf of our client New Cingular Wireless PCS, LLC ("AT&T"), we are providing this notice to you with respect to the above-referenced matter pursuant to the Connecticut Siting Council's (the "Siting Council") ruling in Petition No. 1133. AT&T is filing a sub-petition (the "Sub-Petition") for a declaratory ruling with the Siting Council for approval to collocate a new wireless telecommunications facility (the "Facility") on the existing monopole tower located at 15 Great Pasture Road, Danbury, Connecticut. The Facility consists of six (6) panel antennas at the 140' antenna centerline height on a twenty-foot (20') extension to the existing monopole tower (the "Monopole") together with related amplifiers, cables, fiber and other associated antenna equipment, including, without limitation, remote radio heads, surge arrestors, and global positioning system antennas with associated electronic equipment in a walk-in-cabinet, an emergency backup power propane-fueled generator, and other appurtenances on a proposed equipment pad and propane tank located within an existing compound enclosed by a chain link fence, all as depicted on the plans submitted with the Sub-Petition. The Monopole is owned by Cellco Partnership ("Verizon Wireless"). The Monopole is currently 120' tall and, after modification, will be 140' tall.

The Sub-Petition is an eligible facilities request submitted pursuant to the Federal Middle Class Tax Relief and Job Creation Act of 2012, also known as the Spectrum Act and codified at 47 U.S.C. § 1455(a). AT&T's proposed modifications qualify as an eligible facilities request under the Spectrum Act and associated regulations promulgated by the Federal Communications Commission.

Any comments or concerns regarding this Sub-Petition should be submitted to the Siting Council within thirty (30) days of the date of this notice.

If you have any questions, please do not hesitate to contact us or the Council at 860.827.2935.

Sincerely,

_____

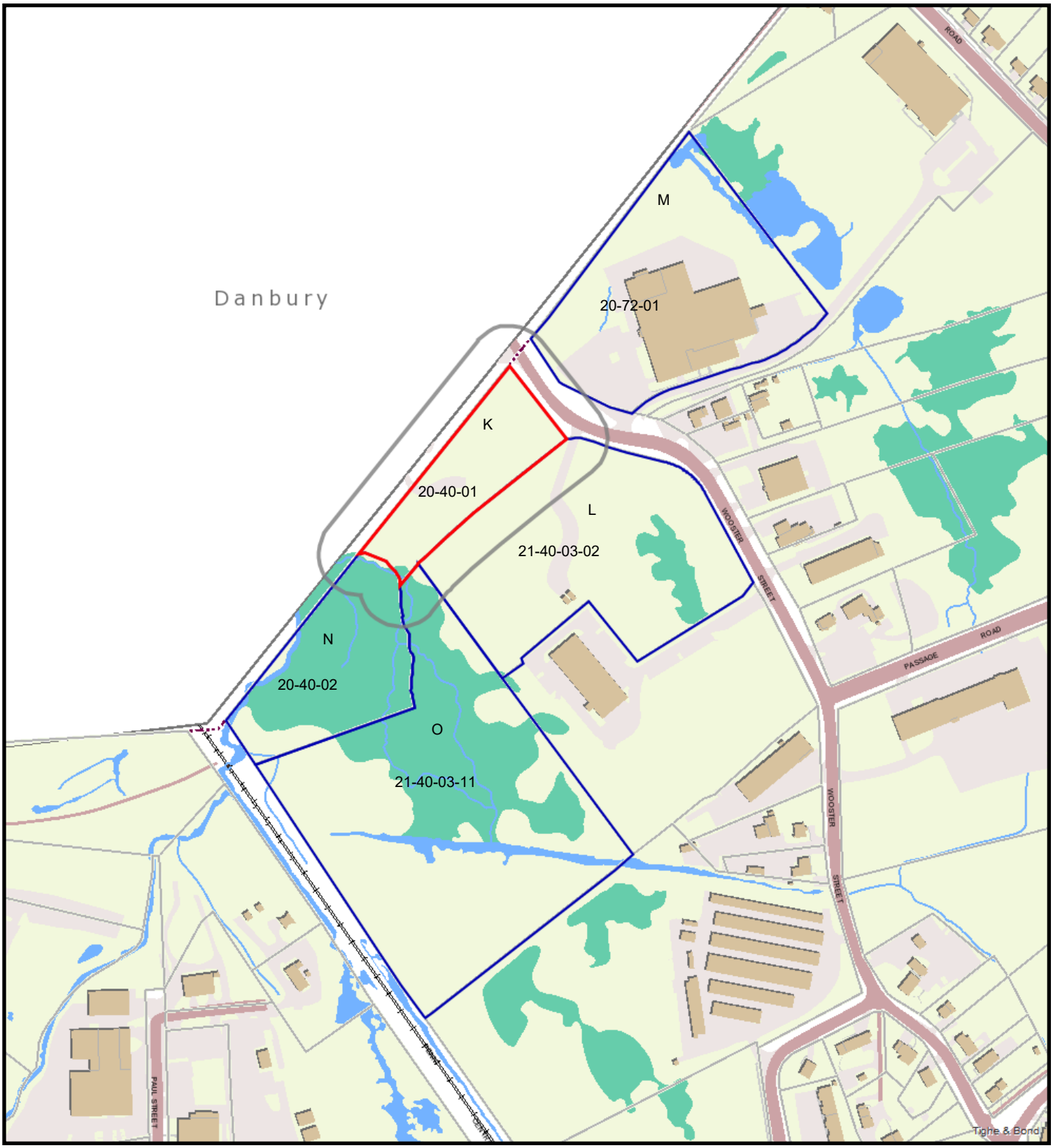
Thomas J. Regan, Esq.

Enclosure.

Abutters List

Parcel ID	Physical Address	Owner Name	Mailing Address	City	State	Zip Code
L150050000	15 Great Pasture Road Danbury, CT 06810	Eppolito Industrial Realty, Inc.	37 Danbury Road	Ridgefield	CT	06877
K161560000	3 Great Pasture Road Danbury, CT 06810	Fuelcell Energy, Inc.	3 Great Pasture Road	Danbury	CT	06810
K161600000	Great Pasture Road Danbury, CT 06810	City of Danbury	155 Deer Hill Avenue	Danbury	CT	06810-77
L160010000	7 Great Pasture Road Danbury, CT 06810	Down Home Associates, LLC	28 Griffith Lane	Ridgefield	CT	06877
L160030000	11 Great Pasture Road Danbury, CT 06810	Keating Properties, LC	28 Griffith Lane	Ridgefield	CT	06877
L160040000	13 Great Pasture Road Danbury, CT 06810	Putnam, Gloria B.	28 Griffith Lane	Ridgefield	CT	06877
L160060000	Great Pasture Road	Sandvik Wire and Heating Technology Corporation Att: Roger F. Assad	17-02 Nevins Road	Fair Lawn	NJ	07410
L160080000	16 Great Pasture Road Danbury, CT 06810	TDRAP LLC	P.O. Box 1026	Bethel	CT	06801
L160090000	14 Great Pasture Road Danbury, CT 06810	Draper, Timothy	P.O. Box 1026	Bethel	CT	06801

L150080009	10 Great Pasture Road Danbury, CT 06810	Real Time Capital Properties LLC	3 Cricklewood Road	Redding	CT	06896
21-40-03-11	Wooster Street, Bethel, CT 06801	Bethel Land Trust, Inc.	54 Taylor Avenue	Bethel	CT	06801
20-40-02	Wooster Street Bethel, CT 06801	Bethel, Town of	1 School Street	Bethel	CT	06801
20-40-01	Wooster Street Bethel, CT 06801	Eppolito Industrial Realty, Inc.	37 Danbury Road, Ste. 203	Ridgefield	CT	06877
21-40-03	104 Wooster Street Bethel, CT 06801	Stamford Cove Partners, LLC C/o Robert Rybnick, Jr.	P.O. Box 372	Bethel	CT	06801
20-72-01	119 Wooster Street Bethel, CT 06801	Sandvik Wire and Heating Technology Corporation	982 Griffin Pond Road	Clarks Summi	PA	18411



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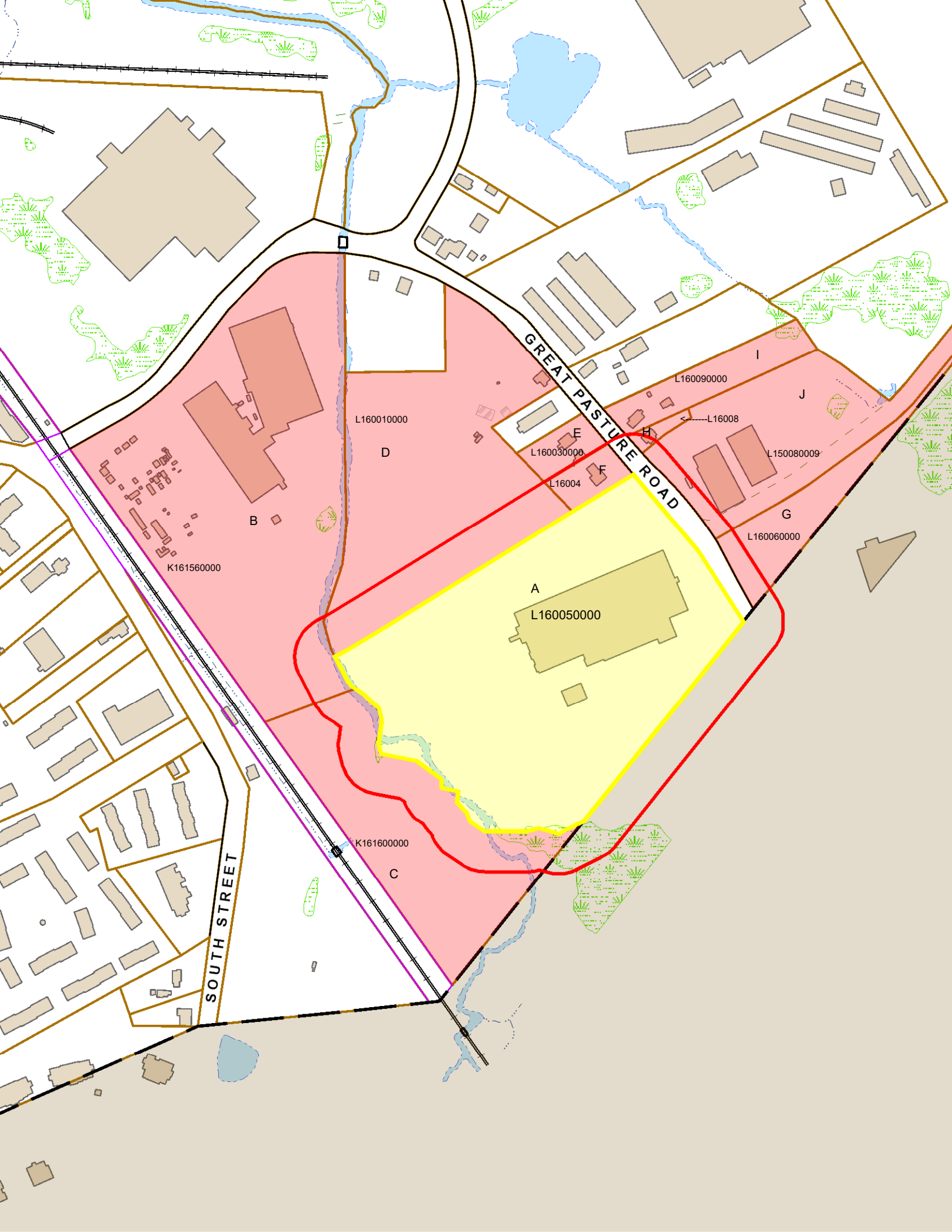
Scale: 1"=333'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.


GREAT PASTURE ROAD
SOUTH STREET
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L160050000
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C
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