



STATE OF CONNECTICUT  
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)

Web Site: [portal.ct.gov/csc](http://portal.ct.gov/csc)

VIA ELECTRONIC MAIL

June 27, 2023

Kenneth C. Baldwin, Esq.  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103-3597  
[kbaldwin@rc.com](mailto:kbaldwin@rc.com)

RE: **TS-VER-045-220106** – Cellco Partnership d/b/a Verizon Wireless request for an order to approve tower sharing at an existing telecommunications facility located at 2 Arbor Crossing, East Lyme, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of the correspondence dated June 26, 2023 regarding a project change for the above-referenced tower share request approved by the Council on January 28, 2022.

Pursuant to Condition No. 1 of the Council's January 28, 2022 tower share approval, the request to change the model of the remote radio head (RRH) to RF4439d-25A and RF4440-13A due to the unavailability of the approved RRH model is hereby approved.

This approval applies only to the project change in the correspondence dated June 26, 2023.

Please be advised that deviations from the standards established by the Council in the tower share approval are enforceable under the provisions of Connecticut General Statutes §16-50u.

Thank you for your attention and cooperation.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Melanie A. Bachman'.

Melanie A. Bachman  
Executive Director

MAB/ANM/dll

c: Kevin Seery, First Selectperson, Town of East Lyme ([kseery@eltownhall.com](mailto:kseery@eltownhall.com))

KENNETH C. BALDWIN

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Hartford, CT 06103-3597  
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Also admitted in Massachusetts  
and New York

June 26, 2023

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

Re: **TS-VER-045-220106 – Cellco Partnership d/b/a Verizon Wireless – 2 Arbor  
Crossing, East Lyme, Connecticut**

Dear Attorney Bachman:

On January 28, 2022, the Siting Council approved the above referenced Tower Share filing permitting the Cellco to install its antennas and related equipment on an existing telecommunications facility located at 2 Arbor Crossing in East Lyme. Cellco recently learned that the remote radio head (“RRH”) models it intended to install at this site are no longer available. The new RRH model numbers RF4439d-25A and RF4440d-13A will be installed in their place.

Enclosed is a revised Structural Analysis, Mounts Analysis and updated set of project plans showing the new RRHs that Cellco intends to install.

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

Sincerely,



Kenneth C. Baldwin

Attachments



June 15, 2023

**Stephen Rambeau**  
Director of Engineering  
TowerCo  
5000 Valleystone Drive  
Cary, NC 27519

**PASS**  
(Tower, 60% capacity)  
(Foundation, 76% capacity)



**Subject** **Comprehensive Structural Analysis**

**Carrier Designation** **Verizon Wireless, Reconfiguration**  
**Site Number: 2558230**  
**Site Name: EAST LYME NORTH CT**

**TowerCo Designation** **Site Number: CT0025**  
**Site Name: East Lyme Relo**  
**JIRA Ticket: [ENG-37436](#)**

**Engineering Firm Designation** **Delta Oaks Group Project: STR23-19376-10**  
**Delta Oaks Group Site Number: 07-00084**

**Site Data** **2 Arbor Crossing, East Lyme, New London County, CT 06333**  
**Latitude: 41.3663°±; Longitude: -72.2423°±**  
**Elevation: 334-ft±, Topography Category: 1;**  
**Exposure Category: "C"; Risk Category: "II";**  
**105-ft Self-Supporting Silo Structure**

Dear Stephen Rambeau,

To your request, we present our comprehensive structural analysis. Our work indicates that with the proposed appurtenance configuration, the tower and foundation will satisfy the structural strength requirements of ANSI/TIA-222-H / 2022 Connecticut State Building Code (2021 IBC) / ASCE 7-16 for:

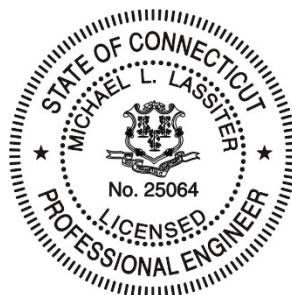
- V = 126-mph three-second gust basic design wind speed [per ASCE 7-16]
- 50-mph three-second gust basic wind speed with 1-in radial ice
- Earthquake design parameters and loading, per USGS Ground Motion Parameter Calculator (ASCE 7-16) and industry standard, respectively, including:
  - $S_s = 0.200$  g,  $S_1 = 0.053$  g

Delta Oaks Group appreciates the opportunity to be of service to TowerCo. Please do not hesitate to contact us if you have any questions or require any additional information.

Sincerely,

Connor Lutes  
Structural Engineer II

Reviewed By: LK



Michael L. Lassiter, SE, PE  
VP | Chief Structural Engineer  
CT PE License PE No. 25064

**Table 1: Existing, Proposed and Reserved Appurtenance Configuration**

Elevation (AGL, ft)	Carrier	Mount	Equipment	Feedlines	Location
95 <sup>1</sup>	AT&T [Existing]	(1) Platform Mount	(9) CCI HPA65R-BU6AA-K (3) KMW EPBQ654L8H6-L2 (3) Ericsson RRUS B14 4478 (3) Ericsson RRUS32 (6) Ericsson RRUS-12 (6) Ericsson RRUS-11 (3) Ericsson RRUS-E2 (3) Raycap DC12-48-60-0-25E (3) Fiber Management Boxes	(6) DC Cables (1) Fiber Trunk	Inside
86 <sup>3</sup>	Verizon [To Remove]	--	(3) Samsung B2/B66A RRH-BR049 (3) Samsung B5/B13 RRH-BR04 (1) Commscope FE-16148-OVP-B12	--	Inside
	Verizon [Existing]	(1) Platform Mount	(6) Commscope NHH-65B-R2B (3) Samsung MT6407-77A	(1) 12x24 Hybrid	
	<i>Verizon [Proposed]</i>	--	<i>(3) Samsung B2/B66A RRH ORAN (RF4439d-25A)</i> <i>(3) Samsung B5/B13 RRH ORAN (RF4440d-13A)</i> <i>(1) Raycap RVZDC-6627-PF-48</i>	--	
66 <sup>2</sup>	Dish Wireless [Existing]	(1) Platform Mount	(3) JMA MX08FRO665-20_V0F (3) Fujitsu TA08025-B605 (3) Fujitsu A08025-B604 (1) Raycap RDIDC-9181-PF-48	(1) 1.6" Hybrid	Inside

- Existing AT&T loading per previous construction drawings dated 03/07/2017 stamped "As-Built by JDH Contracting.
- Existing Dish Wireless loading per colocation tenant application dated 10/11/2021 via JIRA Ticket# ENG-34607.
- Existing and proposed Verizon loading per reconfiguration tenant application dated 04/26/2023 via JIRA Ticket# ENG-37436.

**Table 2: Serviceability Requirements: Limit State Deformations<sup>1</sup>**

Elevation (AGL, ft)	Equipment	Twist (deg) <sup>2</sup>	Sway (deg) <sup>2</sup>	Deflection (in)	Deflection Limit (in) <sup>3</sup>	Result
91.25	Structure	0.0047	0.0322	0.526	37.8	O. K.

- See program output for supporting details.
- Per TIA-222-H Section 2.8.2.1 rotation about the vertical axis (twist) or any horizontal axis (sway) of the structure shall not exceed 4 degrees.
- Per TIA-222-H Section 2.8.2.2 horizontal displacement shall not exceed 3% of the height of the structure.

**Table 3: Tower Structure Results, Percent Capacity Utilized<sup>1</sup>**

Structural Component	Capacity	Result
Legs	50	O. K.
Diagonals	60	O. K.
Girts	6	O. K.
Bolts	60	O. K.

- Detailed results and capacities available in the TNX Tower output attached. Percent utilized less than 105% is considered acceptable.
- The drag coefficient (C<sub>d</sub>) for FRP sections is assumed to be 0.63 in accordance with ASCE 7-16, Section 29.4.2.1.

**Table 4: Foundation Results, Percent Capacity Utilized**

<b>Component</b>	<b>Percent Utilized</b>	<b>Result</b>
<b>Max Utilization – Soil</b>	<b>76</b>	<b>O. K.</b>
Max Utilization –Structure	26	O. K.

## ASSUMPTIONS

This comprehensive structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. Delta Oaks Group (“DOG”) has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed based on industry standards.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer’s specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/available and to have been properly installed.
10. Loading interpreted from photos is accurate to  $\pm 5'$  AGL, antenna size accurate to  $\pm 3.3$  SF, and coax equal to the number of existing antennas without reserve.
11. Unless otherwise noted, documents reviewed and used in this structural analysis were provided by CLIENT.
12. The proposed coax shall be installed per the attached coax layout plan, Sheet QP-P.
13. Leg A is determined per best industry practice.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and DOG should be allowed to review any new information to determine its effect on the structural integrity of the tower.

## DISCLAIMER OF WARRANTIES

Delta Oaks Group (“DOG”) has not necessarily performed a detailed site visit to the tower to verify the member sizes or antenna/coax loading. Even if a site visit was performed, it is possible that the tower configuration, components, and/or loading has been modified since said site visit. Therefore, if the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation, nor does this report replace a full tower inspection. The tower and foundations are assumed to be in good condition, twist free, and plumb and are also assumed to have been properly fabricated, erected, and maintained.

The engineering services rendered by DOG in connection with this Comprehensive Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This report does not include an analysis of the fabrication of the structure (including welding). As it is not feasible to attain all the detailed information necessary to perform a thorough analysis of every structural sub-component and connection of an existing tower, DOG provides a limited scope of service that does not verify the adequacy of every weld, plate connection detail, etc. Therefore, the purpose of this report is to assess the capacity of the major tower components regarding the addition of appurtenances, usually accompanied by transmission lines, to the structure.

It is the owner’s responsibility to determine the amount of ice accumulation in excess of the specified code recommended amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from DOG, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work.

DOG makes no warranties, expressed and/or implied, in connection with this report and disclaim any liability arising from material, fabrication, and erection of this tower.

**Attachments:**

- Document Research Report
- Program Input and Output – Wind
- Silo Wind Pressure Calculation
- Foundation Calculations
- Tenant Application



## Document Research Report



**Project #: STR23-19376-10**

**Site ID: CT0025**

**Site Name: East Lyme Relo**

Doc ID	Document Name	Issued By	Issued To	Issue Date	Description
19-05533.JF	19-05533 East Lyme Relo CT0025	Delta Oaks Group	Delta Oaks Group		Job Folder
0702012.SD	0702012 Site Documents	TowerCo	Delta Oaks Group		Site Documents Folder
3007631	3007631_CT0025 East Lyme Relo - Stealth Tower (Silo)				Photo of Silo
3007630	3007630_CT0025 East Lyme Relo - Tape Drop				Tape Drop Photo
2117371	2117371_CT0025 East Lyme Relo - Geotechnical Report_04-17-17	Atlantic Consulting & Engineering, LLC	Centek Engineering Inc.	4/17/2017	Geotechnical Report
2113399	2113399_CT0025 Stealth Silo Tower and Foundation Design Drawings 04-25-2017	Vector Engineers	Stealth Go Unnoticed	4/25/2017	Silo Tower and Foundation Design Drawings
2113400	2113400_CT0025 Stealth Silo Tower and Foundation Design Calculations 04-25-2017	Vector Engineering	SAI Communications & Stealth Concealment Solutions	4/25/2017	Silo Tower Foundation Calculations
2117372	2117372_CT0025 1A Survey 06-20-17	Centek Engineering Inc.	AT&T Mobility	6/20/2017	1A Survey
2117473	2117473_CT0025 East Lyme Relo - Opinion Letter 1A Cords (FAAFCC, State Filing & Lighting are Not required. No AM Issues) 02-13-18	Federal Communication Commission	TowerCo	2/13/2018	1A Cords Letter
2118297	2118297_CT0025 East Lyme Relo - ATT BTS Collo Application 4-3-18	TowerCo	New Cingular Wireless	4/3/2018	Colocation Application
3000761	3000761_CT0025 East Lyme Relo - ATT Site Sublease 4-23-19	New Cingular Wireless PCS, LLC	TowerCo 2013 LLC	4/23/2018	Site Sublease
2124966	2124966_CT0025 East Lyme Relo - NSB - CD REV 7_18.05.17 (SS)	Centek Engineering	AT&T	5/17/2018	Construction Drawings REV7
3001046	3001046_CT0025 Notice of Rent Commencement ATT	TowerCo	AT&T Mobility Tower Asset Group	4/30/2019	Initial Rent Commencement Notice
3005438	3005438_CT0025 East Lyme Relo - ATT Emergency Power Generator Agreement 9-4-19	TowerCo 2013 LLC	New Cingular Wireless PCS LLC	9/4/2019	ATT Emergency Power Generator Agreement

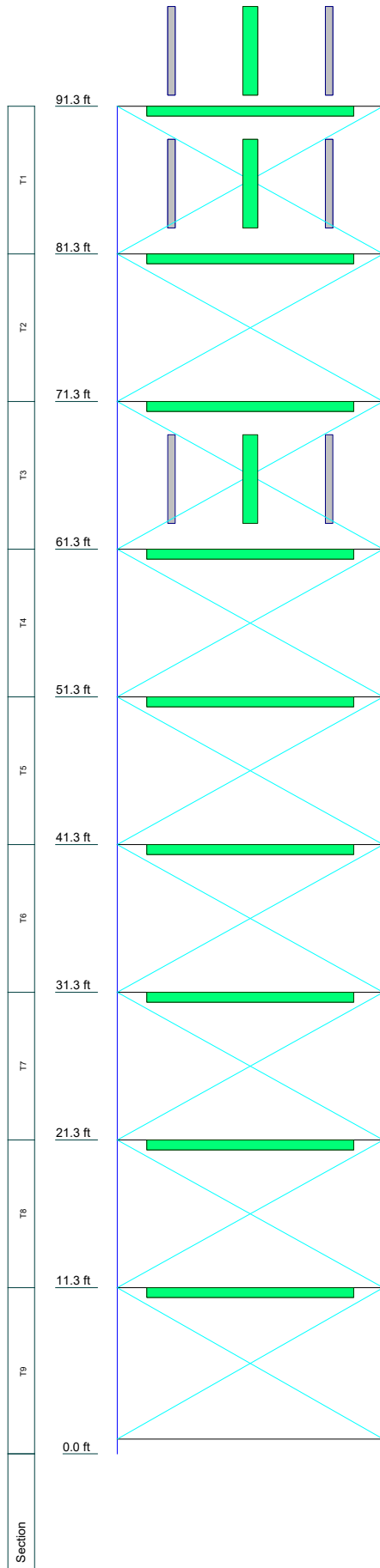
## Document Research Report

Page 2 of 2



Doc ID	Document Name	Issued By	Issued To	Issue Date	Description
3007629	3007629_CT0025 East Lyme Relo - TowerCo Height Verification Form 11-15-19	TowerCo		11/15/2019	Hieght Verification Form
19-05533	ENG-30364	TowerCo	Delta Oaks Group	12/2/2019	CT0025 - Create Tower Profile + SSR For New Tower 'East Lyme Relo'
19-05533	ENG-30365	TowerCo	Delta Oaks Group	12/2/2019	CT0025 - Create Site Plan For New Tower 'East Lyme Relo'
STR19-05533-20	CT0025_20191204_SP.pdf	Delta Oaks Group	TowerCo	12/4/2019	Site Plan
STR19-05533-04	CT0025_20191217_TP.pdf	Delta Oaks Group	TowerCo	12/17/2019	Tower Profile
ENG-33868	CT0025 Dish Colo SA + SSR + TP + SP	TowerCo	Delta Oaks Group	5/3/2021	CT0025 Dish Colo SA + SSR + TP + SP
ENG-34079	CT0025 Verizon Colo SA + SSR + TP	TowerCo	Delta Oaks Group	6/23/2021	CT0025 Verizon Colo SA + SSR + TP
ENG-37912	CT0025 East Lyme Verizon (1st Amend) Relo App Dated 04 11 2023.doc	Verizon	TowerCo	4/11/2023	Tenant Application
ENG-37436	CT0025 East Lyme Verizon (1st Amend) Relo App Updated 04 26 2023.pdf	Verizon	TowerCo	4/26/2023	Tenant Application
CT0025	CT0025 TECGLS Passing Verizon Relo 1st Amend Mount Analysis R0 2023-05-16 signed.pdf	Tectonic	TowerCo	5/16/2023	Mount Analysis Report

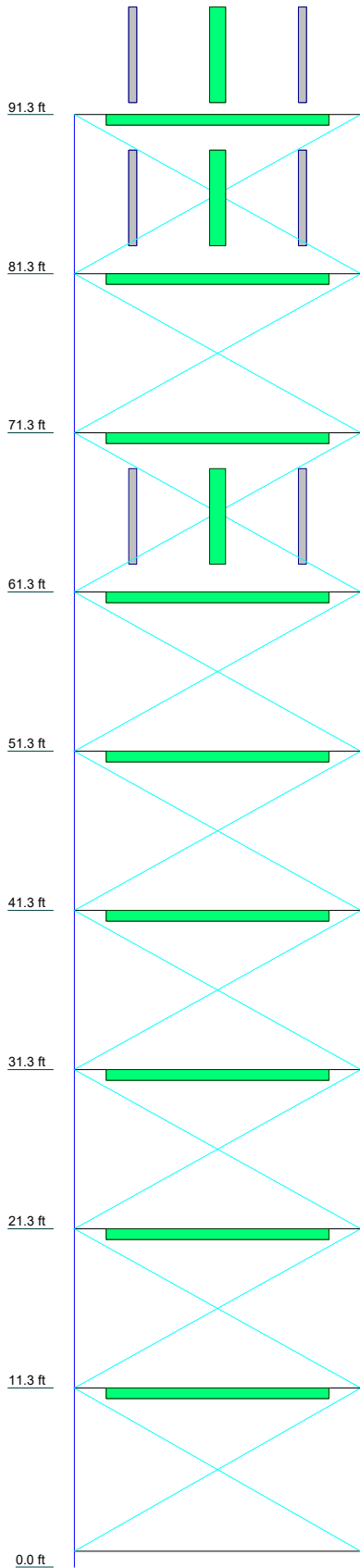
**DESIGNED APPURTENANCE LOADING**



TYPE	ELEVATION	TYPE	ELEVATION
Cannister Section (Tower)	99	Samsung RF4439d-25A B2/B66 (Verizon)	86
(3) CCI HPA65R-BU6AA-K (ATI)	95	Samsung RF4440d-13A B5/B13 (Verizon)	86
(3) CCI HPA65R-BU6AA-K (ATI)	95	Samsung RF4440d-13A B5/B13 (Verizon)	86
KMW EPBQ654L8H6-L2 (ATI)	95	Samsung RF4440d-13A B5/B13 (Verizon)	86
KMW EPBQ654L8H6-L2 (ATI)	95	Samsung RF4440d-13A B5/B13 (Verizon)	86
KMW EPBQ654L8H6-L2 (ATI)	95	Samsung RF4440d-13A B5/B13 (Verizon)	86
Ericsson RRUS-B14 4478 (ATI)	95	Platform (Tower)	81.25
Ericsson RRUS-B14 4478 (ATI)	95	Cannister Section (Tower)	76
Ericsson RRUS32 (ATT) (ATI)	95	Platform (Tower)	71.25
Ericsson RRUS32 (ATT) (ATI)	95	JMA MX08FRO665-20_V0F (Dish Wireless)	66
Ericsson RRUS32 (ATT) (ATI)	95	JMA MX08FRO665-20_V0F (Dish Wireless)	66
(2) Ericsson RRUS-12 (ATI)	95	JMA MX08FRO665-20_V0F (Dish Wireless)	66
(2) Ericsson RRUS-12 (ATI)	95	JMA MX08FRO665-20_V0F (Dish Wireless)	66
(2) Ericsson RRUS-12 (ATI)	95	JMA MX08FRO665-20_V0F (Dish Wireless)	66
(2) Ericsson RRUS-11 (ATI)	95	Cannister Section (Tower)	66
(2) Ericsson RRUS-11 (ATI)	95	Fujitsu TA08025-B605 (Dish Wireless)	66
(2) Ericsson RRUS-11 (ATI)	95	Fujitsu TA08025-B605 (Dish Wireless)	66
Ericsson RRUS-E2 (ATI)	95	Fujitsu TA08025-B605 (Dish Wireless)	66
Ericsson RRUS-E2 (ATI)	95	Fujitsu A08025-B604 (Dish Wireless)	66
Ericsson RRUS-E2 (ATI)	95	Fujitsu A08025-B604 (Dish Wireless)	66
Raycap DC6-48-60-18-8F (ATI)	95	Fujitsu A08025-B604 (Dish Wireless)	66
Raycap DC6-48-60-18-8F (ATI)	95	Raycap RDIDC-9181-PF-48 (Dish Wireless)	66
Raycap DC6-48-60-18-8F (ATI)	95	Platform (Tower)	61.25
(3) CCI HPA65R-BU6AA-K (ATI)	95	Cannister Section (Tower)	56
Platform (Tower)	91.25	Platform (Tower)	51.25
Cannister Section (Tower)	87	Cannister Section (Tower)	46
(2) Commscope NHH-65B-R2B w/ MP (Verizon)	86	Platform (Tower)	41.25
(2) Commscope NHH-65B-R2B w/ MP (Verizon)	86	Cannister Section (Tower)	36
(2) Commscope NHH-65B-R2B w/ MP (Verizon)	86	Platform (Tower)	31.25
(2) Commscope NHH-65B-R2B w/ MP (Verizon)	86	Cannister Section (Tower)	26
Samsung MT6407-77A (Verizon)	86	Platform (Tower)	21.25
Samsung MT6407-77A (Verizon)	86	Cannister Section (Tower)	16
△ Samsung MT6407-77A (Verizon)	86	Platform (Tower)	11.25
Raycap RVZDC-6627-PF-48 (Verizon)	86	Cannister Section (Tower)	5.5
Samsung RF4439d-25A B2/B66 (Verizon)	86		
Samsung RF4439d-25A B2/B66 (Verizon)	86		

 <p><b>DELTA OAKS GROUP</b> CLIENT FOCUSED -- EMPLOYEE DRIVEN</p>	<p><b>Delta Oaks Group</b> 4904 Professional Court, Second Floor Raleigh, NC 27609 Phone: (919) 342-8247 FAX:</p>	<p>Job: <b>CT0025 - East Lyme Relo</b></p>		
		<p>Project: <b>ENG-37436</b></p>		
		Client: Towerco	Drawn by: CLutes	App'd:
		Code: TIA-222-H	Date: 06/13/23	Scale: NTS
		Path: P:\2023 Projects\23-19376 East Lyme Relo CT0025\STRIModels\SA-ri\CT0025.er		Dwg No. E-1

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	
Legs	HSS8x8x1/4									
Leg Grade	A500-46									
Diagonals	L4x4x1/4									
Diagonal Grade	A36									
Top Girts	HSS8x4x3/8									
Bottom Girts	N.A.									
Face Width (ft)	18									
# Panels @ (ft)	8 @ 10									
Weight (lb) 27954.5	2833.2	2833.2	2833.2	2833.2	2788.8	3125.6	3125.6	3125.6	4056.0	



### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-46	46 ksi	62 ksi	A36	36 ksi	58 ksi

### TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 126 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 59.9%

ALL REACTIONS  
ARE FACTORED

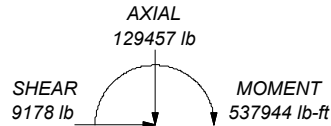
MAX. CORNER REACTIONS AT BASE:

DOWN: 213698 lb

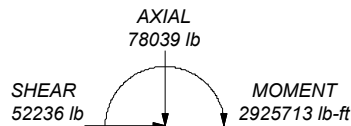
SHEAR: 22117 lb

UPLIFT: -167907 lb

SHEAR: 21496 lb



TORQUE 14508 lb-ft  
50 mph WIND - 1.0000 in ICE



TORQUE 32299 lb-ft  
REACTIONS - 126 mph WIND

 <b>DELTA OAKS GROUP</b> CLIENT FOCUSED -- EMPLOYEE DRIVEN	<b>Delta Oaks Group</b> 4904 Professional Court, Second Floor Raleigh, NC 27609 Phone: (919) 342-8247 FAX:		Job: <b>CT0025 - East Lyme Relo</b>		
	Project: <b>ENG-37436</b>		Client: Towerco	Drawn by: CLutes	App'd:
		Code: TIA-222-H	Date: 06/13/23	Scale: NTS	Dwg No. E-1
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<b>tnxTower</b>  <b>Delta Oaks Group</b> 4904 Professional Court, Second Floor Raleigh, NC 27609 Phone: (919) 342-8247 FAX:	Job	CT0025 - East Lyme Relo	Page	1 of 23
	Project	ENG-37436	Date	09:46:12 06/13/23
	Client	Towerco	Designed by	CLutes

<b>tnxTower</b>  <b>Delta Oaks Group</b> 4904 Professional Court, Second Floor Raleigh, NC 27609 Phone: (919) 342-8247 FAX:	Job	CT0025 - East Lyme Relo	Page	2 of 23
	Project	ENG-37436	Date	09:46:12 06/13/23
	Client	Towerco	Designed by	CLutes

### Tower Input Data

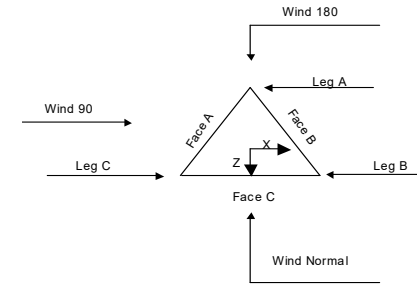
The main tower is a 3x free standing tower with an overall height of 91.25 ft above the ground line.  
The base of the tower is set at an elevation of 0.00 ft above the ground line.  
The face width of the tower is 18.00 ft at the top and 18.00 ft at the base.  
This tower is designed using the TIA-222-H standard.

The following design criteria apply:

- Tower base elevation above sea level: 334.00 ft.
- Basic wind speed of 126 mph.
- Risk Category II.
- Exposure Category C.
- Simplified Topographic Factor Procedure for wind speed-up calculations is used.
- Topographic Category: 1.
- Crest Height: 0.00 ft.
- Nominal ice thickness of 1.0000 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.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- Maximum demand-capacity ratio is: 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

### Options

- |  |   |  |
|--|---|--|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>√ Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>√ Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>√ SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>√ Use Clear Spans For Wind Area</li> <li>√ Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>√ Sort Capacity Reports By Component</li> <li>√ Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>√ Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>√ SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>√ Include Angle Block Shear Check</li> <li>Use TIA-222-H Bracing Resist. Exemption</li> <li>Use TIA-222-H Tension Splice Exemption</li> <li>Poles</li> <li>Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Arc</li> <li>Known</li> </ul> |
|--|---|--|



**Triangular Tower**

### Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	91.25-81.25			18.00	1	10.00
T2	81.25-71.25			18.00	1	10.00
T3	71.25-61.25			18.00	1	10.00
T4	61.25-51.25			18.00	1	10.00
T5	51.25-41.25			18.00	1	10.00
T6	41.25-31.25			18.00	1	10.00
T7	31.25-21.25			18.00	1	10.00
T8	21.25-11.25			18.00	1	10.00
T9	11.25-0.00			18.00	1	11.25

### Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	91.25-81.25	10.00	X Brace	No	No	0.0000	0.0000
T2	81.25-71.25	10.00	X Brace	No	No	0.0000	0.0000
T3	71.25-61.25	10.00	X Brace	No	No	0.0000	0.0000
T4	61.25-51.25	10.00	X Brace	No	No	0.0000	0.0000
T5	51.25-41.25	10.00	X Brace	No	No	0.0000	0.0000
T6	41.25-31.25	10.00	X Brace	No	No	0.0000	0.0000

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Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T7	31.25-21.25	10.00	X Brace	No	No	0.0000	0.0000
T8	21.25-11.25	10.00	X Brace	No	No	0.0000	0.0000
T9	11.25-0.00	10.25	X Brace	No	No	0.0000	12.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 91.25-81.25	Tube	HSS8x8x1/4	A500-46 (46 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T2 81.25-71.25	Tube	HSS8x8x1/4	A500-46 (46 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T3 71.25-61.25	Tube	HSS8x8x1/4	A500-46 (46 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T4 61.25-51.25	Tube	HSS8x8x1/4	A500-46 (46 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)
T5 51.25-41.25	Tube	HSS8x8x1/4	A500-46 (46 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T6 41.25-31.25	Tube	HSS8x8x3/8	A500-46 (46 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T7 31.25-21.25	Tube	HSS8x8x3/8	A500-46 (46 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T8 21.25-11.25	Tube	HSS8x8x3/8	A500-46 (46 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)
T9 11.25-0.00	Tube	HSS8x8x3/8	A500-46 (46 ksi)	Equal Angle	L5x5x5/16	A36 (36 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T1 91.25-81.25	Tube	HSS8x4x3/8	A500-46 (46 ksi)	Solid Round		A36 (36 ksi)
T2 81.25-71.25	Tube	HSS8x4x3/8	A500-46 (46 ksi)	Solid Round		A36 (36 ksi)
T3 71.25-61.25	Tube	HSS8x4x3/8	A500-46 (46 ksi)	Solid Round		A36 (36 ksi)
T4 61.25-51.25	Tube	HSS8x4x3/8	A500-46 (46 ksi)	Solid Round		A36 (36 ksi)
T5 51.25-41.25	Tube	HSS6x4x1/4	A500-46 (46 ksi)	Solid Round		A36 (36 ksi)
T6 41.25-31.25	Tube	HSS6x4x1/4	A500-46 (46 ksi)	Solid Round		A36 (36 ksi)
T7 31.25-21.25	Tube	HSS6x4x1/4	A500-46 (46 ksi)	Solid Round		A36 (36 ksi)
T8 21.25-11.25	Tube	HSS6x4x1/4	A500-46 (46 ksi)	Solid Round		A36 (36 ksi)
T9 11.25-0.00	Tube	HSS6x4x1/4	A500-46 (46 ksi)	Tube	HSS6x4x1/4	A500-46 (46 ksi)

### Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
T1 91.25-81.25	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000
T2 81.25-71.25	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000
T3 71.25-61.25	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000
T4 61.25-51.25	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000
T5 51.25-41.25	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000
T6 41.25-31.25	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000
T7 31.25-21.25	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000
T8 21.25-11.25	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000
T9 11.25-0.00	0.00	0.0000	A36 (36 ksi)	0	0	1	36.0000	36.0000	36.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors <sup>1</sup>						
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
ft				X <sub>X</sub> Y	X <sub>Y</sub> Y	X <sub>Y</sub> Y	X <sub>Y</sub> Y	X <sub>Y</sub> Y	X <sub>Y</sub> Y	X <sub>Y</sub> Y
T1	Yes	No	1	1	1	1	1	1	1	1
91.25-81.25				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
81.25-71.25				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
71.25-61.25				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
61.25-51.25				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
51.25-41.25				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
41.25-31.25				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
31.25-21.25				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
21.25-11.25				1	1	1	1	1	1	1
T9 11.25-0.00	Yes	No	1	1	1	1	1	1	1	1

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

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**Tower Section Geometry (cont'd)**

Tower Elevation ft	Leg	Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal		
		Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	
T1 91.25-81.25	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 81.25-71.25	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 71.25-61.25	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 61.25-51.25	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 51.25-41.25	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 41.25-31.25	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 31.25-21.25	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 21.25-11.25	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 11.25-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 91.25-81.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 81.25-71.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 71.25-61.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 61.25-51.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 51.25-41.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 41.25-31.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 31.25-21.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 21.25-11.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 11.25-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

**Tower Section Geometry (cont'd)**

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 91.25-81.25	Flange	0.7500	8	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T2 81.25-71.25	Flange	0.7500	0	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T3 71.25-61.25	Flange	0.7500	0	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T4 61.25-51.25	Flange	0.7500	0	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T5 51.25-41.25	Flange	0.7500	8	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T6 41.25-31.25	Flange	0.7500	0	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T7 31.25-21.25	Flange	0.7500	0	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T8 21.25-11.25	Flange	0.7500	0	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T9 11.25-0.00	Flange	1.2500	8	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0

**Feed Line/Linear Appurtenances - Entered As Area**

Description	Face or Shield Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	C <sub>1</sub> A <sub>1</sub> ft <sup>2</sup> /ft	Weight plf
5/8 (AT&T)	C	No	No	CaAa (Out Of Face)	91.25 - 0.00	-0.5000	0	8	No Ice 0.09 1/2" Ice 0.29	0.27 2.55
5/8" FIBER (AT&T)	C	No	No	CaAa (Out Of Face)	91.25 - 0.00	-0.5000	0	2	No Ice 0.06 1/2" Ice 0.26	0.08 2.07
3/8 RET (AT&T)	C	No	No	CaAa (Out Of Face)	91.25 - 0.00	-0.5000	0	1	No Ice 0.04 1/2" Ice 0.24	0.08 1.84
***										
1-5/8 Hybrid (DISH Wireless)	C	No	No	CaAa (Out Of Face)	66.00 - 0.00	-0.2500	0	1	No Ice 0.20 1/2" Ice 0.40	0.82 4.46
***										
12x24 Hybriflex (Verizon)	C	No	No	CaAa (Out Of Face)	86.00 - 0.00	0.2500	0	1	No Ice 0.19 1/2" Ice 0.39	3.20 6.74

**Feed Line/Linear Appurtenances Section Areas**

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>1</sub> A <sub>1</sub> In Face ft <sup>2</sup>	C <sub>1</sub> A <sub>1</sub> Out Face ft <sup>2</sup>	Weight lb
T1	91.25-81.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.552	39.20
T2	81.25-71.25	A	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face	$A_R$	$A_F$	$C_{dA}_A$ In Face	$C_{dA}_A$ Out Face	Weight lb
			ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	
T3	71.25-61.25	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	10.550	56.00
		A	0.000	0.000	0.000	0.000	0.00
T4	61.25-51.25	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	11.490	59.90
		A	0.000	0.000	0.000	0.000	0.00
T5	51.25-41.25	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.530	64.20
		A	0.000	0.000	0.000	0.000	0.00
T6	41.25-31.25	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.530	64.20
		A	0.000	0.000	0.000	0.000	0.00
T7	31.25-21.25	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.530	64.20
		A	0.000	0.000	0.000	0.000	0.00
T8	21.25-11.25	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	12.530	64.20
		A	0.000	0.000	0.000	0.000	0.00
T9	11.25-0.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	14.096	72.22
		A	0.000	0.000	0.000	0.000	0.00

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$	$A_F$	$C_{dA}_A$ In Face	$C_{dA}_A$ Out Face	Weight lb
				ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	
T1	91.25-81.25	A	0.936	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	31.027	275.08
T2	81.25-71.25	A	0.924	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	32.732	305.08
T3	71.25-61.25	A	0.911	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	34.229	319.98
T4	61.25-51.25	A	0.897	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	35.841	335.63
T5	51.25-41.25	A	0.879	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	35.389	328.83
T6	41.25-31.25	A	0.858	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	34.839	320.55
T7	31.25-21.25	A	0.831	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	34.130	309.88
T8	21.25-11.25	A	0.792	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	33.119	294.66
T9	11.25-0.00	A	0.712	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	34.927	296.41

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$	$CP_z$	$CP_x$ Ice	$CP_z$ Ice
		in	in	in	in
T1	91.25-81.25	-108.0000	62.3538	-108.0000	62.3538
T2	81.25-71.25	-108.0000	62.3538	-108.0000	62.3538
T3	71.25-61.25	-108.0000	62.3538	-108.0000	62.3538
T4	61.25-51.25	-108.0000	62.3538	-108.0000	62.3538
T5	51.25-41.25	-108.0000	62.3538	-108.0000	62.3538
T6	41.25-31.25	-108.0000	62.3538	-108.0000	62.3538
T7	31.25-21.25	-108.0000	62.3538	-108.0000	62.3538
T8	21.25-11.25	-108.0000	62.3538	-108.0000	62.3538
T9	11.25-0.00	-108.0000	62.3538	-108.0000	62.3538

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	$C_{dA}_A$ Front	$C_{dA}_A$ Side	Weight lb
			Horz Lateral ft	Vert ft			ft <sup>2</sup>	ft <sup>2</sup>	
(3) CCI HPA65R-BU6AA-K (AT&T)	A	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	41.60
			0.00			1/2" Ice	0.00	0.00	41.60
			0.00			1" Ice	0.00	0.00	41.60
(3) CCI HPA65R-BU6AA-K (AT&T)	B	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	41.60
			0.00			1/2" Ice	0.00	0.00	41.60
			0.00			1" Ice	0.00	0.00	41.60
(3) CCI HPA65R-BU6AA-K (AT&T)	C	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	41.60
			0.00			1/2" Ice	0.00	0.00	41.60
			0.00			1" Ice	0.00	0.00	41.60
KMW EPBQ654L8H6-L2 (AT&T)	A	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	73.00
			0.00			1/2" Ice	0.00	0.00	73.00
			0.00			1" Ice	0.00	0.00	73.00
KMW EPBQ654L8H6-L2 (AT&T)	B	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	73.00
			0.00			1/2" Ice	0.00	0.00	73.00
			0.00			1" Ice	0.00	0.00	73.00
KMW EPBQ654L8H6-L2 (AT&T)	C	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	73.00
			0.00			1/2" Ice	0.00	0.00	73.00
			0.00			1" Ice	0.00	0.00	73.00
Ericsson RRUS-B14 4478 (AT&T)	A	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	59.00
			0.00			1/2" Ice	0.00	0.00	59.00
			0.00			1" Ice	0.00	0.00	59.00
Ericsson RRUS-B14 4478 (AT&T)	B	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	59.00
			0.00			1/2" Ice	0.00	0.00	59.00
			0.00			1" Ice	0.00	0.00	59.00
Ericsson RRUS-B14 4478 (AT&T)	C	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	59.00
			0.00			1/2" Ice	0.00	0.00	59.00
			0.00			1" Ice	0.00	0.00	59.00
Ericsson RRUS32 (AT&T)	A	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	60.00
			0.00			1/2" Ice	0.00	0.00	60.00
			0.00			1" Ice	0.00	0.00	60.00
Ericsson RRUS32 (AT&T)	B	From Face	1.00	0.0000	95.00	No Ice	0.00	0.00	60.00
			0.00			1/2" Ice	0.00	0.00	60.00
			0.00			1" Ice	0.00	0.00	60.00



<b>tnxTower</b>  <b>Delta Oaks Group</b> 4904 Professional Court, Second Floor Raleigh, NC 27609 Phone: (919) 342-8247 FAX:	<b>Job</b>	CT0025 - East Lyme Relo	<b>Page</b>	9 of 23
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	<b>Client</b>	Towerco	<b>Designed by</b>	CLutes

<b>tnxTower</b>  <b>Delta Oaks Group</b> 4904 Professional Court, Second Floor Raleigh, NC 27609 Phone: (919) 342-8247 FAX:	<b>Job</b>	CT0025 - East Lyme Relo	<b>Page</b>	10 of 23
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	<b>Client</b>	Towerco	<b>Designed by</b>	CLutes

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement	C <sub>A</sub> A Front	C <sub>A</sub> A Side	Weight	
			Vert ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
Ericsson RRUS32 (AT&T)	C	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	60.00
			1.00			No Ice	0.00	0.00	60.00
			0.00			1/2" Ice	0.00	0.00	60.00
(2) Ericsson RRUS-12 (AT&T)	A	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	60.00
			1.00			No Ice	0.00	0.00	80.00
			0.00			1/2" Ice	0.00	0.00	80.00
(2) Ericsson RRUS-12 (AT&T)	B	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	80.00
			1.00			No Ice	0.00	0.00	80.00
			0.00			1/2" Ice	0.00	0.00	80.00
(2) Ericsson RRUS-12 (AT&T)	C	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	80.00
			1.00			No Ice	0.00	0.00	80.00
			0.00			1/2" Ice	0.00	0.00	80.00
(2) Ericsson RRUS-11 (AT&T)	A	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	55.00
			1.00			No Ice	0.00	0.00	55.00
			0.00			1/2" Ice	0.00	0.00	55.00
(2) Ericsson RRUS-11 (AT&T)	B	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	55.00
			1.00			No Ice	0.00	0.00	55.00
			0.00			1/2" Ice	0.00	0.00	55.00
(2) Ericsson RRUS-11 (AT&T)	C	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	55.00
			1.00			No Ice	0.00	0.00	55.00
			0.00			1/2" Ice	0.00	0.00	55.00
Ericsson RRUS-E2 (AT&T)	A	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	60.00
			1.00			No Ice	0.00	0.00	60.00
			0.00			1/2" Ice	0.00	0.00	60.00
Ericsson RRUS-E2 (AT&T)	B	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	60.00
			1.00			No Ice	0.00	0.00	60.00
			0.00			1/2" Ice	0.00	0.00	60.00
Ericsson RRUS-E2 (AT&T)	C	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	60.00
			1.00			No Ice	0.00	0.00	60.00
			0.00			1/2" Ice	0.00	0.00	60.00
Raycap DC6-48-60-18-8F (AT&T)	A	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	18.90
			1.00			No Ice	0.00	0.00	18.90
			0.00			1/2" Ice	0.00	0.00	18.90
Raycap DC6-48-60-18-8F (AT&T)	B	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	18.90
			1.00			No Ice	0.00	0.00	18.90
			0.00			1/2" Ice	0.00	0.00	18.90
Raycap DC6-48-60-18-8F (AT&T)	C	From Face	0.00	0.0000	95.00	1" Ice	0.00	0.00	18.90
			1.00			No Ice	0.00	0.00	18.90
			0.00			1/2" Ice	0.00	0.00	18.90
***									
JMA MX08FRO665-20_V0F (Dish Wireless)	A	From Face	0.00	0.0000	66.00	1" Ice	0.00	0.00	54.00
			1.00			No Ice	0.00	0.00	54.00
			0.00			1/2" Ice	0.00	0.00	54.00
JMA MX08FRO665-20_V0F (Dish Wireless)	B	From Face	0.00	0.0000	66.00	1" Ice	0.00	0.00	54.00
			1.00			No Ice	0.00	0.00	54.00
			0.00			1/2" Ice	0.00	0.00	54.00
JMA MX08FRO665-20_V0F (Dish Wireless)	C	From Face	0.00	0.0000	66.00	1" Ice	0.00	0.00	54.00
			1.00			No Ice	0.00	0.00	54.00
			0.00			1/2" Ice	0.00	0.00	54.00
Fujitsu TA08025-B605 (Dish Wireless)	A	From Face	0.00	0.0000	66.00	1" Ice	0.00	0.00	74.95
			1.00			No Ice	0.00	0.00	74.95
			0.00			1/2" Ice	0.00	0.00	74.95
Fujitsu TA08025-B605 (Dish Wireless)	B	From Face	0.00	0.0000	66.00	1" Ice	0.00	0.00	74.95
			1.00			No Ice	0.00	0.00	74.95
			0.00			1/2" Ice	0.00	0.00	74.95
Fujitsu TA08025-B605 (Dish Wireless)	C	From Face	0.00	0.0000	66.00	1" Ice	0.00	0.00	74.95
			1.00			No Ice	0.00	0.00	74.95
			0.00			1/2" Ice	0.00	0.00	74.95

Description	Face or Leg	Offset Type	Offsets: Horz Lateral	Azimuth Adjustment	Placement	C <sub>A</sub> A Front	C <sub>A</sub> A Side	Weight	
			Vert ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	lb	
(Dish Wireless)			0.00	0.0000	66.00	1/2" Ice	0.00	0.00	74.95
			0.00			1" Ice	0.00	0.00	74.95
			1.00			No Ice	0.00	0.00	63.93
Fujitsu A08025-B604 (Dish Wireless)	A	From Leg	0.00	0.0000	66.00	1/2" Ice	0.00	0.00	63.93
			0.00			1" Ice	0.00	0.00	63.93
			1.00			No Ice	0.00	0.00	63.93
Fujitsu A08025-B604 (Dish Wireless)	B	From Leg	0.00	0.0000	66.00	1/2" Ice	0.00	0.00	63.93
			0.00			1" Ice	0.00	0.00	63.93
			1.00			No Ice	0.00	0.00	63.93
Fujitsu A08025-B604 (Dish Wireless)	C	From Leg	0.00	0.0000	66.00	1/2" Ice	0.00	0.00	63.93
			0.00			1" Ice	0.00	0.00	63.93
			1.00			No Ice	0.00	0.00	63.93
Raycap RDIDC-9181-PF-48 (Dish Wireless)	A	From Face	0.00	0.0000	66.00	1" Ice	0.00	0.00	21.85
			0.00			1/2" Ice	0.00	0.00	21.85
			0.00			1" Ice	0.00	0.00	21.85
***									
Platform (Tower)	C	None		0.0000	11.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
Platform (Tower)	C	None		0.0000	21.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
Platform (Tower)	C	None		0.0000	31.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
Platform (Tower)	C	None		0.0000	41.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
Platform (Tower)	C	None		0.0000	51.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
Platform (Tower)	C	None		0.0000	61.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
Platform (Tower)	C	None		0.0000	71.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
Platform (Tower)	C	None		0.0000	81.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
Platform (Tower)	C	None		0.0000	91.25	No Ice	0.00	0.00	1800.00
						1/2" Ice	0.00	0.00	1800.00
						1" Ice	0.00	0.00	1800.00
***									
Cannister Section (Tower)	C	None		0.0000	99.00	No Ice	189.15	189.15	1884.96
						1/2" Ice	189.78	189.78	4089.12
						1" Ice	190.41	190.41	6293.28
Cannister Section (Tower)	C	None		0.0000	87.00	No Ice	189.15	189.15	1884.96
						1/2" Ice	189.78	189.78	4089.12
						1" Ice	190.41	190.41	6293.28
Cannister Section (Tower)	C	None		0.0000	76.00	No Ice	157.63	157.63	1570.80
						1/2" Ice	158.15	158.15	3407.60
						1" Ice	158.68	158.68	5244.40
Cannister Section (Tower)	C	None		0.0000	66.00	No Ice	157.63	157.63	1570.80
						1/2" Ice	158.15	158.15	3407.60
						1" Ice	158.68	158.68	5244.40
Cannister Section (Tower)	C	None		0.0000	56.00	No Ice	157.63	157.63	1570.80
						1/2" Ice	158.15	158.15	3407.60

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	<b>Client</b>	Towerco	<b>Designed by</b>	CLutes

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A Front ft <sup>2</sup>	C <sub>A</sub> A Side ft <sup>2</sup>	Weight lb
Cannister Section (Tower)	C	None	0.0000	46.00	1" Ice	158.68	158.68	5244.40
					No Ice	157.63	157.63	1570.80
					1/2" Ice	158.15	158.15	3407.60
Cannister Section (Tower)	C	None	0.0000	36.00	1" Ice	158.68	158.68	5244.40
					No Ice	157.63	157.63	1570.80
					1/2" Ice	158.15	158.15	3407.60
Cannister Section (Tower)	C	None	0.0000	26.00	1" Ice	158.68	158.68	5244.40
					No Ice	157.63	157.63	1570.80
					1/2" Ice	158.15	158.15	3407.60
Cannister Section (Tower)	C	None	0.0000	16.00	1" Ice	158.68	158.68	5244.40
					No Ice	157.63	157.63	1570.80
					1/2" Ice	158.15	158.15	3407.60
Cannister Section (Tower)	C	None	0.0000	5.50	1" Ice	158.68	158.68	5244.40
					No Ice	173.39	173.39	1727.88
					1/2" Ice	173.97	173.97	3748.36
***								
*								
(2) Commscope NHH-65B-R2B w/ MP (Verizon)	A	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 72.90 72.90
(2) Commscope NHH-65B-R2B w/ MP (Verizon)	B	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 72.90 72.90
(2) Commscope NHH-65B-R2B w/ MP (Verizon)	C	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 72.90 72.90
Samsung MT6407-77A (Verizon)	A	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	101.70 101.70 101.70
Samsung MT6407-77A (Verizon)	B	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	101.70 101.70 101.70
Samsung MT6407-77A (Verizon)	C	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	101.70 101.70 101.70
Raycap RVZDC-6627-PF-48 (Verizon)	A	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	32.00 68.49 108.97
*								
Samsung RF4439d-25A B2/B66 (Verizon)	A	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	84.40 102.74 123.87
Samsung RF4439d-25A B2/B66 (Verizon)	B	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	84.40 102.74 123.87
Samsung RF4439d-25A B2/B66 (Verizon)	C	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	84.40 102.74 123.87
Samsung RF4440d-13A B5/B13 (Verizon)	A	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	70.30 87.64 107.70
Samsung RF4440d-13A B5/B13 (Verizon)	B	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	70.30 87.64 107.70
Samsung RF4440d-13A B5/B13 (Verizon)	C	From Face	1.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice	0.00 0.00	70.30 87.64

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A Front ft <sup>2</sup>	C <sub>A</sub> A Side ft <sup>2</sup>	Weight lb
(Verizon) ****			0.00		1" Ice	0.00	0.00	107.70

### Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 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

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Comb. No.	Description
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

Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>y</sub>	Overtuning Moment, M <sub>x</sub>	Overtuning Moment, M <sub>y</sub>	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 120 deg - No Ice	78038.92	45238.08	26118.22	1462556.35	-2521378.19	27972.16
0.9 Dead+1.0 Wind 120 deg - No Ice	58529.19	45238.08	26118.22	1461751.65	-2522945.34	27972.16
1.2 Dead+1.0 Wind 150 deg - No Ice	78038.92	26118.22	45238.08	2530865.58	-1453068.95	32299.46
0.9 Dead+1.0 Wind 150 deg - No Ice	58529.19	26118.22	45238.08	2530060.88	-1454636.10	32299.46
1.2 Dead+1.0 Wind 180 deg - No Ice	78038.92	-0.00	52236.44	2921893.90	6268.61	27972.16
0.9 Dead+1.0 Wind 180 deg - No Ice	58529.19	-0.00	52236.44	2921089.20	4701.46	27972.16
1.2 Dead+1.0 Wind 210 deg - No Ice	78038.92	-26118.22	45238.08	2530865.58	1465606.17	16149.73
0.9 Dead+1.0 Wind 210 deg - No Ice	58529.19	-26118.22	45238.08	2530060.88	1464039.02	16149.73
1.2 Dead+1.0 Wind 240 deg - No Ice	78038.92	-45238.08	26118.22	1462556.35	2533915.41	-0.00
0.9 Dead+1.0 Wind 240 deg - No Ice	58529.19	-45238.08	26118.22	1461751.65	2532348.25	-0.00
1.2 Dead+1.0 Wind 270 deg - No Ice	78038.92	-52236.44	0.00	3218.79	2924943.73	-16149.73
0.9 Dead+1.0 Wind 270 deg - No Ice	58529.19	-52236.44	0.00	2414.09	2923376.57	-16149.73
1.2 Dead+1.0 Wind 300 deg - No Ice	78038.92	-45238.08	-26118.22	-1456118.77	2533915.41	-27972.16
0.9 Dead+1.0 Wind 300 deg - No Ice	58529.19	-45238.08	-26118.22	-1456923.46	2532348.25	-27972.16
1.2 Dead+1.0 Wind 330 deg - No Ice	78038.92	-26118.22	-45238.08	-2524428.00	1465606.17	-32299.46
0.9 Dead+1.0 Wind 330 deg - No Ice	58529.19	-26118.22	-45238.08	-2525232.70	1464039.02	-32299.46
1.2 Dead+1.0 Ice+1.0 Temp	129456.56	-0.00	0.00	14624.34	26793.57	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	129456.56	-0.00	-9177.65	-492803.01	26793.57	-12564.29
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	129456.56	4588.82	-7948.08	-424820.64	-226920.11	-7253.99
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	129456.56	7948.08	-4588.82	-239089.33	-412651.41	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	129456.56	9177.65	0.00	14624.34	-480633.79	7253.99
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	129456.56	7948.08	4588.82	268338.02	-412651.41	12564.29
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	129456.56	4588.82	7948.08	454069.33	-226920.11	14507.99
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	129456.56	-0.00	9177.65	522051.70	26793.57	12564.29
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	129456.56	-4588.82	7948.08	454069.33	280507.25	7253.99
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	129456.56	-7948.08	4588.82	268338.02	466238.55	-0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	129456.56	-9177.65	0.00	14624.34	534220.93	-7253.99
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	129456.56	-7948.08	-4588.82	-239089.33	466238.55	-12564.29
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	129456.56	-4588.82	-7948.08	-424820.64	280507.25	-14507.99
Dead+Wind 0 deg - Service	65032.43	-0.00	-12468.42	-693981.98	5223.84	-6676.73
Dead+Wind 30 deg - Service	65032.43	6234.21	-10797.97	-600646.66	-343108.31	-3854.81
Dead+Wind 60 deg - Service	65032.43	10797.97	-6234.21	-345649.83	-598105.15	0.00
Dead+Wind 90 deg - Service	65032.43	12468.42	0.00	2682.32	-691440.47	3854.81

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	213697.57	19153.68	-11058.52
	Max. H <sub>x</sub>	20	188613.09	20157.82	-3491.50
	Max. H <sub>y</sub>	3	-73768.19	-3069.39	15882.62
	Min. Vert	7	-167384.74	-18597.36	10737.09
	Min. H <sub>x</sub>	9	-142300.26	-19601.49	3170.06
Leg B	Min. H <sub>y</sub>	14	120081.02	3625.72	-16204.06
	Max. Vert	10	213001.06	-19600.24	-10277.97
	Max. H <sub>x</sub>	21	-142822.65	19603.03	3172.72
	Max. H <sub>y</sub>	3	-74290.58	3968.14	14331.27
	Min. Vert	23	-167907.13	19047.50	9962.74
Leg A	Min. H <sub>x</sub>	8	187916.58	-20155.77	-3487.95
	Min. H <sub>y</sub>	14	119384.51	-4520.88	-14646.50
	Max. Vert	2	213039.58	-899.26	22113.49
	Max. H <sub>x</sub>	21	19354.87	12555.06	272.85
	Max. H <sub>y</sub>	2	213039.58	-899.26	22113.49
Leg A	Min. Vert	15	-167878.23	895.67	-21476.83
	Min. H <sub>x</sub>	8	25806.49	-12558.65	363.81
	Min. H <sub>y</sub>	15	-167878.23	895.67	-21476.83

### Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>y</sub> lb	Overtuning Moment, M <sub>x</sub> lb-ft	Overtuning Moment, M <sub>y</sub> lb-ft	Torque lb-ft
Dead Only	65032.43	-0.00	0.00	2682.32	5223.84	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	78038.92	-0.00	-52236.44	-2915456.32	6268.61	-27972.16
0.9 Dead+1.0 Wind 0 deg - No Ice	58529.19	-0.00	-52236.44	-2916261.02	4701.46	-27972.16
1.2 Dead+1.0 Wind 30 deg - No Ice	78038.92	26118.22	-45238.08	-2524428.00	-1453068.95	-16149.73
0.9 Dead+1.0 Wind 30 deg - No Ice	58529.19	26118.22	-45238.08	-2525232.70	-1454636.10	-16149.73
1.2 Dead+1.0 Wind 60 deg - No Ice	78038.92	45238.08	-26118.22	-1456118.77	-2521378.19	0.00
0.9 Dead+1.0 Wind 60 deg - No Ice	58529.19	45238.08	-26118.22	-1456923.46	-2522945.34	0.00
1.2 Dead+1.0 Wind 90 deg - No Ice	78038.92	52236.44	0.00	3218.79	-2912406.51	16149.73
0.9 Dead+1.0 Wind 90 deg - No Ice	58529.19	52236.44	0.00	2414.09	-2913973.66	16149.73

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Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>y</sub>	Overturing Moment, M <sub>x</sub>	Overturing Moment, M <sub>y</sub>	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Dead+Wind 120 deg - Service	65032.43	10797.97	6234.21	351014.48	-598105.15	6676.73
Dead+Wind 150 deg - Service	65032.43	6234.21	10797.97	606011.31	-343108.31	7709.62
Dead+Wind 180 deg - Service	65032.43	-0.00	12468.42	699346.63	5223.84	6676.73
Dead+Wind 210 deg - Service	65032.43	-6234.21	10797.97	606011.31	353555.99	3854.81
Dead+Wind 240 deg - Service	65032.43	-10797.97	6234.21	351014.48	608552.83	-0.00
Dead+Wind 270 deg - Service	65032.43	-12468.42	0.00	2682.32	701888.15	-3854.81
Dead+Wind 300 deg - Service	65032.43	-10797.97	-6234.21	-345649.83	608552.83	-6676.73
Dead+Wind 330 deg - Service	65032.43	-6234.21	-10797.97	-600646.66	353555.99	-7709.62

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
45	0.00	-65032.43	12468.42	0.00	65032.43	-12468.42	0.000%
46	-6234.21	-65032.43	10797.97	6234.21	65032.43	-10797.97	0.000%
47	-10797.97	-65032.43	6234.21	10797.97	65032.43	-6234.21	0.000%
48	-12468.42	-65032.43	0.00	12468.42	65032.43	-0.00	0.000%
49	-10797.97	-65032.43	-6234.21	10797.97	65032.43	6234.21	0.000%
50	-6234.21	-65032.43	-10797.97	6234.21	65032.43	10797.97	0.000%

### Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-65032.43	0.00	0.00	65032.43	-0.00	0.000%
2	0.00	-78038.92	-52236.43	0.00	78038.92	52236.44	0.000%
3	0.00	-58529.19	-52236.43	0.00	58529.19	52236.44	0.000%
4	26118.21	-78038.92	-45238.07	-26118.22	78038.92	45238.08	0.000%
5	26118.21	-58529.19	-45238.07	-26118.22	58529.19	45238.08	0.000%
6	45238.07	-78038.92	-26118.21	-45238.08	78038.92	26118.22	0.000%
7	45238.07	-58529.19	-26118.21	-45238.08	58529.19	26118.22	0.000%
8	52236.43	-78038.92	0.00	-52236.44	78038.92	-0.00	0.000%
9	52236.43	-58529.19	0.00	-52236.44	58529.19	-0.00	0.000%
10	45238.07	-78038.92	26118.21	-45238.08	78038.92	-26118.22	0.000%
11	45238.07	-58529.19	26118.21	-45238.08	58529.19	-26118.22	0.000%
12	26118.21	-78038.92	45238.07	-26118.22	78038.92	-45238.08	0.000%
13	26118.21	-58529.19	45238.07	-26118.22	58529.19	-45238.08	0.000%
14	0.00	-78038.92	52236.43	0.00	78038.92	-52236.44	0.000%
15	0.00	-58529.19	52236.43	0.00	58529.19	-52236.44	0.000%
16	-26118.21	-78038.92	45238.07	26118.22	78038.92	-45238.08	0.000%
17	-26118.21	-58529.19	45238.07	26118.22	58529.19	-45238.08	0.000%
18	-45238.07	-78038.92	26118.21	45238.08	78038.92	-26118.22	0.000%
19	-45238.07	-58529.19	26118.21	45238.08	58529.19	-26118.22	0.000%
20	-52236.43	-78038.92	0.00	52236.44	78038.92	-0.00	0.000%
21	-52236.43	-58529.19	0.00	52236.44	58529.19	-0.00	0.000%
22	-45238.07	-78038.92	-26118.21	45238.08	78038.92	26118.22	0.000%
23	-45238.07	-58529.19	-26118.21	45238.08	58529.19	26118.22	0.000%
24	-26118.21	-78038.92	-45238.07	26118.22	78038.92	45238.08	0.000%
25	-26118.21	-58529.19	-45238.07	26118.22	58529.19	45238.08	0.000%
26	0.00	-129456.56	0.00	0.00	129456.56	-0.00	0.000%
27	0.00	-129456.56	-9177.65	0.00	129456.56	9177.65	0.000%
28	4588.82	-129456.56	-7948.08	-4588.82	129456.56	7948.08	0.000%
29	7948.08	-129456.56	-4588.82	-7948.08	129456.56	4588.82	0.000%
30	9177.65	-129456.56	0.00	-9177.65	129456.56	-0.00	0.000%
31	7948.08	-129456.56	4588.82	-7948.08	129456.56	-4588.82	0.000%
32	4588.82	-129456.56	7948.08	-4588.82	129456.56	-7948.08	0.000%
33	0.00	-129456.56	9177.65	0.00	129456.56	-9177.65	0.000%
34	-4588.82	-129456.56	7948.08	4588.82	129456.56	-7948.08	0.000%
35	-7948.08	-129456.56	4588.82	7948.08	129456.56	-4588.82	0.000%
36	-9177.65	-129456.56	0.00	9177.65	129456.56	-0.00	0.000%
37	-7948.08	-129456.56	-4588.82	7948.08	129456.56	4588.82	0.000%
38	-4588.82	-129456.56	-7948.08	4588.82	129456.56	7948.08	0.000%
39	-0.00	-65032.43	-12468.42	0.00	65032.43	12468.42	0.000%
40	6234.21	-65032.43	-10797.97	-6234.21	65032.43	10797.97	0.000%
41	10797.97	-65032.43	-6234.21	-10797.97	65032.43	6234.21	0.000%
42	12468.42	-65032.43	0.00	-12468.42	65032.43	-0.00	0.000%
43	10797.97	-65032.43	6234.21	-10797.97	65032.43	-6234.21	0.000%
44	6234.21	-65032.43	10797.97	-6234.21	65032.43	-10797.97	0.000%

### Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	91.25 - 81.25	0.526	47	0.0322	0.0047
T2	81.25 - 71.25	0.454	47	0.0318	0.0046
T3	71.25 - 61.25	0.381	47	0.0309	0.0044
T4	61.25 - 51.25	0.308	47	0.0292	0.0040
T5	51.25 - 41.25	0.238	47	0.0265	0.0035
T6	41.25 - 31.25	0.177	47	0.0226	0.0031
T7	31.25 - 21.25	0.123	47	0.0190	0.0026
T8	21.25 - 11.25	0.075	47	0.0143	0.0019
T9	11.25 - 0	0.039	47	0.0084	0.0012

### Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
99.00	Cannister Section	47	0.526	0.0322	0.0047	843193
95.00	(3) CCI HPA65R-BU6AA-K	47	0.526	0.0322	0.0047	843193
91.25	Platform	47	0.526	0.0322	0.0047	843193
87.00	Cannister Section	47	0.496	0.0321	0.0046	843193
86.00	(2) Commscope NHH-65B-R2B w/ MP	47	0.488	0.0320	0.0046	803069
81.25	Platform	47	0.454	0.0318	0.0046	531361
76.00	Cannister Section	47	0.416	0.0314	0.0045	Inf
71.25	Platform	47	0.381	0.0309	0.0044	Inf
66.00	JMA MX08FRO665-20_V0F	47	0.343	0.0301	0.0042	Inf
61.25	Platform	47	0.308	0.0292	0.0040	Inf
56.00	Cannister Section	47	0.271	0.0279	0.0038	176790
51.25	Platform	47	0.238	0.0265	0.0035	103650
46.00	Cannister Section	47	0.205	0.0245	0.0033	132283
41.25	Platform	47	0.177	0.0226	0.0031	205188
36.00	Cannister Section	47	0.148	0.0207	0.0028	224967
31.25	Platform	47	0.123	0.0190	0.0026	190898
26.00	Cannister Section	47	0.097	0.0167	0.0022	114005
21.25	Platform	47	0.075	0.0143	0.0019	92827
16.00	Cannister Section	47	0.055	0.0113	0.0016	179713
11.25	Platform	47	0.039	0.0084	0.0012	Inf
5.50	Cannister Section	47	0.019	0.0042	0.0007	Inf

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**Maximum Tower Deflections - Design Wind**

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	91.25 - 81.25	2.190	18	0.1339	0.0195
T2	81.25 - 71.25	1.893	18	0.1323	0.0193
T3	71.25 - 61.25	1.589	18	0.1284	0.0184
T4	61.25 - 51.25	1.286	18	0.1214	0.0169
T5	51.25 - 41.25	0.992	18	0.1102	0.0147
T6	41.25 - 31.25	0.738	18	0.0941	0.0129
T7	31.25 - 21.25	0.512	18	0.0790	0.0107
T8	21.25 - 11.25	0.315	18	0.0594	0.0081
T9	11.25 - 0	0.163	18	0.0348	0.0052

**Critical Deflections and Radius of Curvature - Design Wind**

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
99.00	Cannister Section	18	2.190	0.1339	0.0195	202160
95.00	(3) CCI HPA65R-BU6AA-K	18	2.190	0.1339	0.0195	202160
91.25	Platform	18	2.190	0.1339	0.0195	202160
87.00	Cannister Section	18	2.065	0.1334	0.0194	202160
86.00	(2) Commscope NHH-65B-R2B w/ MP	18	2.035	0.1332	0.0194	192542
81.25	Platform	18	1.893	0.1323	0.0193	127561
76.00	Cannister Section	18	1.734	0.1306	0.0189	465339
71.25	Platform	18	1.589	0.1284	0.0184	320600
66.00	JMA MX08FRO665-20_V0F	18	1.430	0.1251	0.0177	804677
61.25	Platform	18	1.286	0.1214	0.0169	392332
56.00	Cannister Section	18	1.128	0.1162	0.0158	42546
51.25	Platform	18	0.992	0.1102	0.0147	24881
46.00	Cannister Section	18	0.854	0.1019	0.0138	31809
41.25	Platform	18	0.738	0.0941	0.0129	49531
36.00	Cannister Section	18	0.617	0.0863	0.0118	54354
31.25	Platform	18	0.512	0.0790	0.0107	46037
26.00	Cannister Section	18	0.403	0.0694	0.0093	27387
21.25	Platform	18	0.315	0.0594	0.0081	22284
16.00	Cannister Section	18	0.231	0.0472	0.0067	43512
11.25	Platform	18	0.163	0.0348	0.0052	727967
5.50	Cannister Section	18	0.080	0.0176	0.0028	528853

**Bolt Design Data**

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T1	91.25	Leg	A325N	0.7500	8	439.25	30101.40	0.015	✓	1 Bolt Tension
		Diagonal	A325N	0.7500	2	1807.84	13371.10	0.135	✓	1 Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T2	81.25	Diagonal	A325N	0.7500	2	3069.88	13371.10	0.230	✓	1 Member Block Shear
T3	71.25	Diagonal	A325N	0.7500	2	4043.67	13371.10	0.302	✓	1 Member Block Shear
T4	61.25	Diagonal	A325N	0.7500	2	5049.75	13371.10	0.378	✓	1 Member Block Shear
T5	51.25	Leg	A325N	0.7500	8	6332.70	30101.40	0.210	✓	1 Bolt Tension
		Diagonal	A325N	0.7500	2	6756.01	19880.40	0.340	✓	1 Bolt Shear
T6	41.25	Diagonal	A325N	0.7500	2	7542.78	19880.40	0.379	✓	1 Bolt Shear
T7	31.25	Diagonal	A325N	0.7500	2	8658.48	19880.40	0.436	✓	1 Bolt Shear
T8	21.25	Diagonal	A325N	0.7500	2	9043.62	19880.40	0.455	✓	1 Bolt Shear
T9	11.25	Leg	A325N	1.2500	8	20992.10	87219.80	0.241	✓	1 Bolt Tension
		Diagonal	A325N	0.7500	2	11899.60	19880.40	0.599	✓	1 Bolt Shear

**Compression Checks**

**Leg Design Data (Compression)**

Section No.	Elevation ft	Size	L ft	L <sub>n</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>n</sub> lb	φP <sub>n</sub> lb	Ratio P <sub>n</sub> / φP <sub>n</sub>
T1	91.25 - 81.25	HSS8x8x1/4	10.00	10.00	38.1 K=1.00	7.1000	-10542.10	266601.00	0.040 <sup>1</sup>
T2	81.25 - 71.25	HSS8x8x1/4	10.00	10.00	38.1 K=1.00	7.1000	-21222.30	266601.00	0.080 <sup>1</sup>
T3	71.25 - 61.25	HSS8x8x1/4	10.00	10.00	38.1 K=1.00	7.1000	-35862.00	266601.00	0.135 <sup>1</sup>
T4	61.25 - 51.25	HSS8x8x1/4	10.00	10.00	38.1 K=1.00	7.1000	-53687.10	266601.00	0.201 <sup>1</sup>
T5	51.25 - 41.25	HSS8x8x1/4	10.00	10.00	38.1 K=1.00	7.1000	-74177.90	266601.00	0.278 <sup>1</sup>
T6	41.25 - 31.25	HSS8x8x3/8	10.00	10.00	38.7 K=1.00	10.4000	-99336.30	389277.00	0.255 <sup>1</sup>
T7	31.25 - 21.25	HSS8x8x3/8	10.00	10.00	38.7 K=1.00	10.4000	-126847.00	389277.00	0.326 <sup>1</sup>
T8	21.25 - 11.25	HSS8x8x3/8	10.00	10.00	38.7 K=1.00	10.4000	-156647.00	389277.00	0.402 <sup>1</sup>
T9	11.25 - 0	HSS8x8x3/8	11.25	1.00	3.9 K=1.00	10.4000	-213698.00	430126.00	0.497 <sup>1</sup>

<sup>1</sup> P<sub>n</sub> / φP<sub>n</sub> controls

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### Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>n</sub> lb	φP <sub>n</sub> lb	Ratio P <sub>n</sub> / φP <sub>n</sub>
T1	91.25 - 81.25	L4x4x1/4	20.59	9.65	139.6 K=0.96	1.9400	-3971.02	28476.90	0.139 ✓ <sup>1</sup>
T2	81.25 - 71.25	L4x4x1/4	20.59	9.65	139.6 K=0.96	1.9400	-6701.16	28476.90	0.235 ✓ <sup>1</sup>
T3	71.25 - 61.25	L4x4x1/4	20.59	9.65	139.6 K=0.96	1.9400	-8872.72	28476.90	0.312 ✓ <sup>1</sup>
T4	61.25 - 51.25	L4x4x1/4	20.59	9.65	139.6 K=0.96	1.9400	-10975.70	28476.90	0.385 ✓ <sup>1</sup>
T5	51.25 - 41.25	L5x5x5/16	20.59	9.65	117.4 K=1.01	3.0300	-13512.00	61252.40	0.221 ✓ <sup>1</sup>
T6	41.25 - 31.25	L5x5x5/16	20.59	9.65	117.4 K=1.01	3.0300	-15085.60	61252.40	0.246 ✓ <sup>1</sup>
T7	31.25 - 21.25	L5x5x5/16	20.59	9.65	117.4 K=1.01	3.0300	-17317.00	61252.40	0.283 ✓ <sup>1</sup>
T8	21.25 - 11.25	L5x5x5/16	20.59	9.65	117.4 K=1.01	3.0300	-18087.20	61252.40	0.295 ✓ <sup>1</sup>
T9	11.25 - 0	L5x5x5/16	20.71	9.71	117.9 K=1.01	3.0300	-23799.20	60849.80	0.391 ✓ <sup>1</sup>

<sup>1</sup> P<sub>n</sub> / φP<sub>n</sub> controls

### Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>n</sub> lb	φP <sub>n</sub> lb	Ratio P <sub>n</sub> / φP <sub>n</sub>
T1	91.25 - 81.25	HSS8x4x3/8	18.00	17.33	129.2 K=1.00	7.5800	-1440.38	102597.00	0.014 ✓ <sup>1</sup>
T2	81.25 - 71.25	HSS8x4x3/8	18.00	17.33	129.2 K=1.00	7.5800	-367.58	102597.00	0.004 ✓ <sup>1</sup>
T3	71.25 - 61.25	HSS8x4x3/8	18.00	17.33	129.2 K=1.00	7.5800	-621.15	102597.00	0.006 ✓ <sup>1</sup>
T4	61.25 - 51.25	HSS8x4x3/8	18.00	17.33	129.2 K=1.00	7.5800	-929.89	102597.00	0.009 ✓ <sup>1</sup>
T5	51.25 - 41.25	HSS6x4x1/4	18.00	17.33	129.2 K=1.00	4.3000	-1284.80	58201.40	0.022 ✓ <sup>1</sup>
T6	41.25 - 31.25	HSS6x4x1/4	18.00	17.33	129.2 K=1.00	4.3000	-1720.56	58201.40	0.030 ✓ <sup>1</sup>
T7	31.25 - 21.25	HSS6x4x1/4	18.00	17.33	129.2 K=1.00	4.3000	-2197.05	58201.40	0.038 ✓ <sup>1</sup>
T8	21.25 - 11.25	HSS6x4x1/4	18.00	17.33	129.2 K=1.00	4.3000	-2713.20	58201.40	0.047 ✓ <sup>1</sup>
T9	11.25 - 0	HSS6x4x1/4	18.00	17.33	129.2 K=1.00	4.3000	-3701.35	58201.40	0.064 ✓ <sup>1</sup>

<sup>1</sup> P<sub>n</sub> / φP<sub>n</sub> controls

### Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>n</sub> lb	φP <sub>n</sub> lb	Ratio P <sub>n</sub> / φP <sub>n</sub>
T9	11.25 - 0	HSS6x4x1/4	18.00	17.33	129.2 K=1.00	4.3000	-7314.93	58201.40	0.126 ✓ <sup>1</sup>

<sup>1</sup> P<sub>n</sub> / φP<sub>n</sub> controls

### Tension Checks

### Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>n</sub> lb	φP <sub>n</sub> lb	Ratio P <sub>n</sub> / φP <sub>n</sub>
T1	91.25 - 81.25	HSS8x8x1/4	10.00	10.00	38.1	7.1000	2896.80	293940.00	0.010 ✓ <sup>1</sup>
T2	81.25 - 71.25	HSS8x8x1/4	10.00	10.00	38.1	7.1000	10514.30	293940.00	0.036 ✓ <sup>1</sup>
T3	71.25 - 61.25	HSS8x8x1/4	10.00	10.00	38.1	7.1000	20640.70	293940.00	0.070 ✓ <sup>1</sup>
T4	61.25 - 51.25	HSS8x8x1/4	10.00	10.00	38.1	7.1000	33891.50	293940.00	0.115 ✓ <sup>1</sup>
T5	51.25 - 41.25	HSS8x8x1/4	10.00	10.00	38.1	7.1000	50661.60	293940.00	0.172 ✓ <sup>1</sup>
T6	41.25 - 31.25	HSS8x8x3/8	10.00	10.00	38.7	10.4000	70877.60	430560.00	0.165 ✓ <sup>1</sup>
T7	31.25 - 21.25	HSS8x8x3/8	10.00	10.00	38.7	10.4000	94019.30	430560.00	0.218 ✓ <sup>1</sup>
T8	21.25 - 11.25	HSS8x8x3/8	10.00	10.00	38.7	10.4000	119262.00	430560.00	0.277 ✓ <sup>1</sup>
T9	11.25 - 0	HSS8x8x3/8	11.25	1.00	3.9	10.4000	167937.00	430560.00	0.390 ✓ <sup>1</sup>

<sup>1</sup> P<sub>n</sub> / φP<sub>n</sub> controls

### Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>n</sub> lb	φP <sub>n</sub> lb	Ratio P <sub>n</sub> / φP <sub>n</sub>
T1	91.25 - 81.25	L4x4x1/4	20.59	9.65	95.2	1.2909	3615.67	56155.80	0.064 ✓ <sup>1</sup>

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Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	A	P <sub>u</sub>	φP <sub>n</sub>	Ratio P <sub>u</sub> / φP <sub>n</sub>
	ft		ft	ft		in <sup>2</sup>	lb	lb	
T2	81.25 - 71.25	L4x4x1/4	20.59	9.65	95.2	1.2909	6139.75	56155.80	0.109 <sup>1</sup>
T3	71.25 - 61.25	L4x4x1/4	20.59	9.65	95.2	1.2909	8087.33	56155.80	0.144 <sup>1</sup>
T4	61.25 - 51.25	L4x4x1/4	20.59	9.65	95.2	1.2909	10099.50	56155.80	0.180 <sup>1</sup>
T5	51.25 - 41.25	L5x5x5/16	20.59	9.65	75.8	2.0674	12092.90	89932.90	0.134 <sup>1</sup>
T6	41.25 - 31.25	L5x5x5/16	20.59	9.65	75.8	2.0674	14098.50	89932.90	0.157 <sup>1</sup>
T7	31.25 - 21.25	L5x5x5/16	20.59	9.65	75.8	2.0674	16064.40	89932.90	0.179 <sup>1</sup>
T8	21.25 - 11.25	L5x5x5/16	20.59	9.65	75.8	2.0674	16763.90	89932.90	0.186 <sup>1</sup>
T9	11.25 - 0	L5x5x5/16	20.71	9.71	76.2	2.0674	21884.90	89932.90	0.243 <sup>1</sup>

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	A	P <sub>u</sub>	φP <sub>n</sub>	Ratio P <sub>u</sub> / φP <sub>n</sub>
	ft		ft	ft		in <sup>2</sup>	lb	lb	
T1	91.25 - 81.25	HSS8x4x3/8	18.00	17.33	129.2	7.5800	1563.95	313812.00	0.005 <sup>1</sup>
T2	81.25 - 71.25	HSS8x4x3/8	18.00	17.33	129.2	7.5800	930.13	313812.00	0.003 <sup>1</sup>
T3	71.25 - 61.25	HSS8x4x3/8	18.00	17.33	129.2	7.5800	1093.37	313812.00	0.003 <sup>1</sup>
T4	61.25 - 51.25	HSS8x4x3/8	18.00	17.33	129.2	7.5800	1441.13	313812.00	0.005 <sup>1</sup>
T5	51.25 - 41.25	HSS6x4x1/4	18.00	17.33	129.2	4.3000	2620.67	178020.00	0.015 <sup>1</sup>
T6	41.25 - 31.25	HSS6x4x1/4	18.00	17.33	129.2	4.3000	3375.99	178020.00	0.019 <sup>1</sup>
T7	31.25 - 21.25	HSS6x4x1/4	18.00	17.33	129.2	4.3000	3362.53	178020.00	0.019 <sup>1</sup>
T8	21.25 - 11.25	HSS6x4x1/4	18.00	17.33	129.2	4.3000	4842.71	178020.00	0.027 <sup>1</sup>
T9	11.25 - 0	HSS6x4x1/4	18.00	17.33	129.2	4.3000	4850.32	178020.00	0.027 <sup>1</sup>

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Bottom Girt Design Data (Tension)

Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	A	P <sub>u</sub>	φP <sub>n</sub>	Ratio P <sub>u</sub> / φP <sub>n</sub>
	ft		ft	ft		in <sup>2</sup>	lb	lb	
T9	11.25 - 0	HSS6x4x1/4	18.00	17.33	129.2	4.3000	11395.80	178020.00	0.064 <sup>1</sup>

<sup>1</sup> P<sub>u</sub> / φP<sub>n</sub> controls

### Section Capacity Table

Section No.	Elevation	Component Type	Size	Critical Element	P lb	σP <sub>allow</sub> lb	% Capacity	Pass Fail	
T1	91.25 - 81.25	Leg	HSS8x8x1/4	1	-10542.10	266601.00	4.0	Pass	
T2	81.25 - 71.25	Leg	HSS8x8x1/4	13	-21222.30	266601.00	8.0	Pass	
T3	71.25 - 61.25	Leg	HSS8x8x1/4	25	-35862.00	266601.00	13.5	Pass	
T4	61.25 - 51.25	Leg	HSS8x8x1/4	37	-53687.10	266601.00	20.1	Pass	
T5	51.25 - 41.25	Leg	HSS8x8x1/4	49	-74177.90	266601.00	27.8	Pass	
T6	41.25 - 31.25	Leg	HSS8x8x3/8	61	-99336.30	389277.00	25.5	Pass	
T7	31.25 - 21.25	Leg	HSS8x8x3/8	73	-126847.00	389277.00	32.6	Pass	
T8	21.25 - 11.25	Leg	HSS8x8x3/8	85	-156647.00	389277.00	40.2	Pass	
T9	11.25 - 0	Leg	HSS8x8x3/8	97	-213698.00	430126.00	49.7	Pass	
T1	91.25 - 81.25	Diagonal	L4x4x1/4	11	-3971.02	28476.90	13.9	Pass	
T2	81.25 - 71.25	Diagonal	L4x4x1/4	23	-6701.16	28476.90	23.5	Pass	
T3	71.25 - 61.25	Diagonal	L4x4x1/4	35	-8872.72	28476.90	31.2	Pass	
T4	61.25 - 51.25	Diagonal	L4x4x1/4	47	-10975.70	28476.90	38.5	Pass	
T5	51.25 - 41.25	Diagonal	L5x5x5/16	59	-13512.00	61252.40	22.1	Pass	
T6	41.25 - 31.25	Diagonal	L5x5x5/16	71	-15085.60	61252.40	24.6	Pass	
T7	31.25 - 21.25	Diagonal	L5x5x5/16	84	-17317.00	61252.40	28.3	Pass	
T8	21.25 - 11.25	Diagonal	L5x5x5/16	95	-18087.20	61252.40	29.5	Pass	
T9	11.25 - 0	Diagonal	L5x5x5/16	111	-23799.20	60849.80	39.1	Pass	
T1	91.25 - 81.25	Top Girt	HSS8x4x3/8	5	-1440.38	102597.00	1.4	Pass	
T2	81.25 - 71.25	Top Girt	HSS8x4x3/8	16	-365.23	102597.00	0.5	Pass	
T3	71.25 - 61.25	Top Girt	HSS8x4x3/8	30	-621.15	102597.00	0.6	Pass	
T4	61.25 - 51.25	Top Girt	HSS8x4x3/8	42	-929.89	102597.00	0.9	Pass	
T5	51.25 - 41.25	Top Girt	HSS6x4x1/4	54	-1284.80	58201.40	2.2	Pass	
T6	41.25 - 31.25	Top Girt	HSS6x4x1/4	66	-1720.56	58201.40	3.0	Pass	
T7	31.25 - 21.25	Top Girt	HSS6x4x1/4	78	-2197.05	58201.40	3.8	Pass	
T8	21.25 - 11.25	Top Girt	HSS6x4x1/4	90	-2713.20	58201.40	4.7	Pass	
T9	11.25 - 0	Top Girt	HSS6x4x1/4	102	-3701.35	58201.40	6.4	Pass	
T9	11.25 - 0	Bottom Girt	HSS6x4x1/4	104	-7314.93	58201.40	12.6	Pass	
							Summary		
							Leg (T9)	49.7	Pass
							Diagonal (T9)	59.9	Pass
							Top Girt (T9)	6.4	Pass
							Bottom Girt (T9)	12.6	Pass
							Bolt Checks	59.9	Pass
							<b>RATING =</b>	<b>59.9</b>	<b>Pass</b>

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# SST Unit Base Foundation

Site # : CT0025  
 Site Name: East Lyme Relo  
 Project #: STR23-19376-10

TIA-222 Revision: H

Top & Bot. Pad Rein. Different?:	<input checked="" type="checkbox"/>
Tower Centroid Offset?:	<input type="checkbox"/>
Block Foundation?:	<input checked="" type="checkbox"/>
Rectangular Pad?:	<input type="checkbox"/>

Superstructure Analysis Reactions		
Global Moment, <b>M</b> :	2925.713	ft-kips
Global Axial, <b>P</b> :	78.039	kips
Global Shear, <b>V</b> :	52.236	kips
Leg Compression, <b>P<sub>comp</sub></b> :	213.698	kips
Leg Comp. Shear, <b>V<sub>u,comp</sub></b> :	22.12	kips
Leg Uplift, <b>P<sub>uplift</sub></b> :	167.91	kips
Leg Uplift. Shear, <b>V<sub>u,uplift</sub></b> :	21.5	kips
Tower Height, <b>H</b> :	91.25	ft
Base Face Width, <b>BW</b> :	18	ft
BP Dist. Above Fdn, <b>bp<sub>dist</sub></b> :	2	in
Anchor Bolt Circle, <b>BC</b> :	15.25	in

Foundation Analysis Checks				
	Capacity	Demand	Rating	Check
<i>Lateral (Sliding) (kips)</i>	82.14	52.24	63.6%	Pass
<i>Bearing Pressure (ksf)</i>	9.21	2.00	21.7%	Pass
<i>Overturing (kip*ft)</i>	4096.11	3091.13	75.5%	Pass
<i>Pad Flexure (kip*ft)</i>	3715.59	963.06	25.9%	Pass
<i>Pad Shear - 1-way (kips)</i>	932.37	168.45	18.1%	Pass
<i>Pad Shear - Comp 2-way (ksi)</i>	0.190	0.043	22.9%	Pass
<i>Flexural 2-way (Comp) (kip*ft)</i>	1135.30	0.00	0.0%	Pass
<i>Pad Shear - Tension 2-way (ksi)</i>	0.190	0.034	18.0%	Pass
<i>Flexural 2-way (Tension) (kip*ft)</i>	1135.30	0.00	0.0%	Pass

Soil Rating:	75.5%
Structural Rating:	25.9%

Pad Properties		
Depth, <b>D</b> :	2.75	ft
Pad Width, <b>W<sub>1</sub></b> :	26.00	ft
Pad Thickness, <b>T</b> :	3.00	ft
Pad Rebar Size (Top dir.2), <b>Sp<sub>top2</sub></b> :	8	
Pad Rebar Quantity (Top dir. 2), <b>mp<sub>top2</sub></b> :	26	
Pad Rebar Size (Bottom dir. 2), <b>Sp<sub>2</sub></b> :	8	
Pad Rebar Quantity (Bottom dir. 2), <b>mp<sub>2</sub></b> :	34	
Pad Clear Cover, <b>cc<sub>pad</sub></b> :	3	in

Material Properties		
Rebar Grade, <b>Fy</b> :	60	ksi
Concrete Compressive Strength, <b>F'c</b> :	4	ksi
Dry Concrete Density, <b>δc</b> :	150	pcf

Soil Properties		
Total Soil Unit Weight, <b>γ</b> :	100	pcf
Ultimate Net Bearing, <b>Qnet</b> :	12.000	ksf
Cohesion, <b>Cu</b> :		ksf
Friction Angle, <b>φ</b> :		degrees
SPT Blow Count, <b>N<sub>blows</sub></b> :		
Base Friction, <b>μ</b> :	0.3	
Neglected Depth, <b>N</b> :	0.0	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, <b>gw</b> :	N/A	ft

<-- Toggle between Gross and Net



RELOCATION / RECONFIGURATION APPLICATION

Application Fee: <i>(Please contact TowerCo)</i> Date Received: _____04/26/2023_____	<b>CARRIER INFORMATION</b>		<b>LESSOR TOWER INFORMATION</b>	
<b>TowerCo Site Name:</b> <u>East Lyme Relo</u>	Carrier:	Contact Name:	Latitude:	41°21'58.6"N
<b>TowerCo Site Number:</b> <u>CT0025</u>	Contact Number:	Corey Vaccaro	Longitude:	72°14'32.5"W
Carrier Site Name: <u>EAST LYME NORTH CT</u>	Contact Fax:	781-227-1314	Structure Type:	Silo
Carrier Site Number: <u>2558230</u>	Contact Address:	49 Brattle St	Structure Height:	105'
Carrier Legal Entity Name: <u>Verizon Wireless</u>	Contact Email:	Arlington, MA 02474	Site Address:	2 Arbor Crossing,
Notice Address for Lease: <u>900 Chelmsford St</u>	RF Contact:	cvaccaro@structureconsulting.net		East Lyme, CT 06333
<u>Tower 2 Floor 5</u>	Construction Contact:	mhumphreys@structureconsulting.net		
<u>Lowell, MA 01851</u>	Emergency Contact:			
			<b>Proposed Change-Out Date:</b>	

**ANTENNA CONFIGURATION**

Type of Request:    Additional Ground Space                       Relocation of RAD                       Increase/Decrease of Antennas at Same RAD  
 Add Microwave Dish     Second RAD     Amplifier     Other: Change of RRU model

*Is FirstNet being added to this site?*    YES    NO

EXISTING ANTENNA CONFIGURATION				PROPOSED (Final) ANTENNA CONFIGURATION		
Sector:	V1	V2	V3	V1	V2	V3
Desired RAD Center (AGL)	86'	86'	86'	86'	86'	86'
Antenna Quantity	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1	2 / 1
Antenna Manufacturer	COMMSCOPE / Samsung	COMMSCOPE / Samsung	COMMSCOPE / Samsung	COMMSCOPE / Samsung	COMMSCOPE / Samsung	COMMSCOPE / Samsung
Antenna Model	NHH-65B-R2B / MT6407-77A	NHH-65B-R2B / MT6407-77A	NHH-65B-R2B / MT6407-77A	NHH-65B-R2B / MT6407-77A	NHH-65B-R2B / MT6407-77A	NHH-65B-R2B / MT6407-77A
Weight (per antenna)	43.651 lb / 87.1 lbs	43.651 lb / 87.1 lbs	43.651 lb / 87.1 lbs	43.651 lb / 87.1 lbs	43.651 lb / 87.1 lbs	43.651 lb / 87.1 lbs
Antenna Dimensions	71.9 x 11.8 x 7.1 in / 16.06 x 35.12 x 5.51	71.9 x 11.8 x 7.1 in / 16.06 x 35.12 x 5.51	71.9 x 11.8 x 7.1 in / 16.06 x 35.12 x 5.51	71.9 x 11.8 x 7.1 in / 16.06 x 35.12 x 5.51	71.9 x 11.8 x 7.1 in / 16.06 x 35.12 x 5.51	71.9 x 11.8 x 7.1 in / 16.06 x 35.12 x 5.51
ERP (watts)	71.26	71.26	71.26	71.26	71.26	71.26
Orientation /Azimuth (Degrees)	10	150	270	10	150	270
Mechanical Tilt						
TMA/BTS Quantity						
TMA/BTS Mfg. and Model #						



RELOCATION / RECONFIGURATION APPLICATION

TMA /BTS Weight						
TMA/BTS Dimensions						
<b>RRU</b> Quantity	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
RRU Mfg. and Model #	Samsung B2/B66A RRH-BR049 / Samsung B5/B13 RRH-BR04	Samsung B2/B66A RRH-BR049 / Samsung B5/B13 RRH-BR04	Samsung B2/B66A RRH-BR049 / Samsung B5/B13 RRH-BR04	Samsung B2/B66A RRH ORAN (RF4439d-25A) / Samsung B5/B13 RRH ORAN (RF4440d-13A)	Samsung B2/B66A RRH ORAN (RF4439d-25A) / Samsung B5/B13 RRH ORAN (RF4440d-13A)	Samsung B2/B66A RRH ORAN (RF4439d-25A) / Samsung B5/B13 RRH ORAN (RF4440d-13A)
RRU Weight	70.3 lb / 84.4 lbs	70.3 lb / 84.4 lbs	70.3 lb / 84.4 lbs	74.7 lb / 70.33 lbs	74.7 lb / 70.33 lbs	74.7 lb / 70.33 lbs
RRU Dimensions	15 x 15 x 8.1 / 15 x 15 x 10	15 x 15 x 8.1 / 15 x 15 x 10	15 x 15 x 8.1 / 15 x 15 x 10	14.96 x 14.96 x 10.04 / 14.96 x 14.96 x 9.05	14.96 x 14.96 x 10.04 / 14.96 x 14.96 x 9.05	14.96 x 14.96 x 10.04 / 14.96 x 14.96 x 9.05
<b>Surge Suppressor</b> Quantity						
Surge Suppressor Mfg. & Model #						
Surge Suppressor Weight						
Surge Suppressor Dimensions						
<b>RET</b> (or other equip) Quantity	1			1		
Manufacturer and Model	Commscope FE-16148-OVP-B12			Raycap RVZDC-6627-PF-48		
Weight	15.21 lb			32 lb		
Dimensions	16 x 14 x 8			29.5 x 16.5 x 12.6		
<b>MOUNT</b> Type / Mfg / Model	Site Pro RMQP-496-HK			Site Pro RMQP-496-HK		
<b>Mount Mounting Height</b> on Tower	86'			86'		
<b>**NOTE: PLEASE SPECIFY IF CHANGING THE MOUNT</b>						
<b>Coax Cables</b> Quantity (Please note: "Per ANTENNA" or "Per SECTOR")						
Diameter of Coax Cables						
<b>Fiber or Power Cables</b> Quantity	1			1		
Diameter of Fiber/Power Cable	12 x 24			12 x 24		
<b>RET Cables</b> (or other) Quantity						
Diameter of RET (or other) Cables						
<b>Transmit Frequency</b>	700, 850, 1900, 2100			700, 850, 1900, 2100		
<b>Receive Frequency</b>	700, 850, 1900,			700, 850, 1900, 2100		



RELOCATION / RECONFIGURATION APPLICATION

	2100				
<b>Type of Service</b> (i.e CDMA, iDEN, GSM, TDMA, PAGING):					
<b>MICROWAVE</b>	<b>EXISTING MICROWAVE CONFIGURATION</b>			<b>PROPOSED MICROWAVE CONFIGURATION</b>	
MW RAD Center					
MW Quantity					
MW Mfg. and Model #					
MW Weight					
MW Dimensions					
ODU Quantity					
ODU Mfg. and Model #					
ODU Weight					
ODU Dimensions					
MW -Mount Type / Mfg / Model					
MW -Mount Height on Tower					
MW -Coax Cables Quantity					
Diameter of Coax Cables for MW					
MW- Fiber Cables Quantity					
Diameter of Fiber Cables for MW					
MW -Transmit Frequency					
MW -Receive Frequency					
<b>Additional Information /Comments/ Brief description of scope of work:</b>					
<p><b>Change of RRU model and OVP</b></p>					
	<b>EXISTING GROUND SPACE REQUIREMENTS</b>			<b>PROPOSED GROUND SPACE REQUIREMENTS</b>	
Cabinet Manufacturer, Model					
Equipment Pad Dimensions					
Shelter Manufacturer & Dimensions					
<b>Total Lease Area Dimensions</b> (including generator)	<b>10' x 35'</b>			<b>10' x 35'</b>	
Power Requirements					



TowerCo

**RELOCATION / RECONFIGURATION APPLICATION**

AC Power		
Required Voltage and Total Amps		
Power /Type Generator		

Date: **May 16, 2023**

### Structural Mount Analysis

**Client:** On Air Engineering, LLC  
**Carrier:** Verizon  
**Scope of Work:** "New Macro Build"  
**Site Name:** East Lyme North CT  
**Site Data:** 2 Arbor Crossing, East Lyme, CT 06333  
Silo Interior Antenna Mounts

**Tectonic Project Number:** 11372.EastLyme

Tectonic Engineering Consultants, Geologists, & Land Surveyors, D.P.C., Inc. (Tectonic) is pleased to submit this "**Structural Mount Analysis**" to determine the structural integrity of the above-mentioned antenna mounts.

The following information was provided for this assessment:

- Antenna Enclosure Report by Stealth, dated 04/25/17
- ZD's/CSC Dwgs by On Air Engineering, dated 05/15/23

Based on our review of the above information, Verizon Wireless is proposing six (6) Commscope NHH-65B-R2B antennas, three (3) Samsung MT6407 antennas, three (3) Samsung RF4439D-25A RRH's, three (3) Samsung RF4440D-13A RRH's, and one (1) Raycap RCMDC-6627-PF-48 OVP. The proposed equipment will be enclosed within the existing silo structure; thus, no additional wind load will be provided to the structure.

The proposed antenna mounts will be sufficient to support the proposed loading as detailed in the above referenced documents.

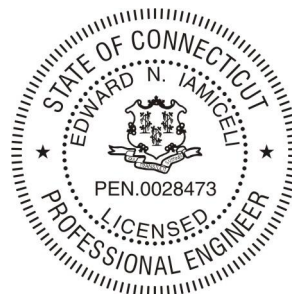
Gamma Sector (Worst Case Loading): **54%**

We at Tectonic appreciate the opportunity of providing our continuing professional services to you and Verizon. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully submitted by:  
Tectonic Engineering Consultants, Geologists, & Land Surveyors, D.P.C., Inc.



Edward N. Iamiceli, P.E.  
Managing Director – Structural



#### Project Contact Info

1279 Route 300 | Newburgh, NY 12550  
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com  
Equal Opportunity Employer



Job No.: 11372.EastLyme  
 Sheet No.: 1 of 4  
 Calculated By: AMP Date : 05/16/23  
 Checked By: JR Date : 05/16/23

**D** **D** **D** **R**

W.O.	11372.EastLyme
Project Name	EastLyme
Location	2 Arbor Crossing, East Lyme, Connecticut 06333
County	New London

Tower Type	SST	Self-Supporting (lattice)
Structure Height	105.00	ft
Supporting Str Height	0.00	ft Or ground mounted
Risk Category	II	Moderate risk
Exposure Category	C	Open terrain
Topo Category	1	Flat or rolling terrain
Height of crest	0	ft
Mean elevation (zs)	0	ft

Basic Wind Speed (3-sec gust):		
Without ice	126	mph
With ice	50	mph
Maintenance Wind	30	mph
Ice thickness	1.00	in

Importance Factor	
Ice thickness	1.00
Earthquake	1.00
Supporting Data:	
Ks	1.00
Ke	1.00
Kc	1.00
Kt	N/A
f	N/A
Zg	900
$\alpha$	9.5
Kz,min	0.85
Kd	0.95
Gh	1.00

Height	z (ft)	86
	Kh	N/A
	Kzt	1.00
	Kz	1.23
	Kiz	1.10
Wind Pressure, qz (psf)	No Ice	47.34
	With Ice	7.45
(tiz)	Service	2.68
	Ice Thk	1.10
Appurtenances (qzGh)	No Ice	47.34
	With Ice	7.45
	Service	2.68

Note : As proposed mounts are within an enclosure, wind does not govern, and seismic is used for the analysis.

**Dead Load**

Equipment (Gamma)	Weight (lb)
(2) NHH-65B-R2B on 'SBS' Bracket	112.8
MT6407-77A	79.4
Samsung B5/13 RRH ORAN (RF4440d-13A)	70.3
Samsung B2/B66a RRH ORAN (RF4439d-25A)	74.7
RCMDC-6627-PF-48	32.0
<b>Total</b>	<b>369.2</b>

**Mounting System**

Tower Information

Tower Type:	SST
Structure Height	105 ft
Supporting Structure Height	0 ft
Mount Height	86 ft

Geographic Information

City:	East Lyme
State:	Connecticut
County:	New London
Latitude:	41.366369
Longitude:	-72.24233

Seismic Information

Risk Category	II
Importance Factor	1.00
Site Soil Classification	D
$S_s$	0.2
$S_1$	0.053
$F_a$	1.6
$F_v$	2.4
$S_{Ds}$	0.213
$S_{D1}$	0.086
R	2.00
As	3.00
Cs	0.11

Table 2-10  
<https://asce7hazardtool.online/>

(Table 2-11, interpolation allowed)  
(Table 2-12, interpolation allowed)  
Section 2.7.5

Section 16.7  
Section 16.7 & 2.7.8  
 0.03

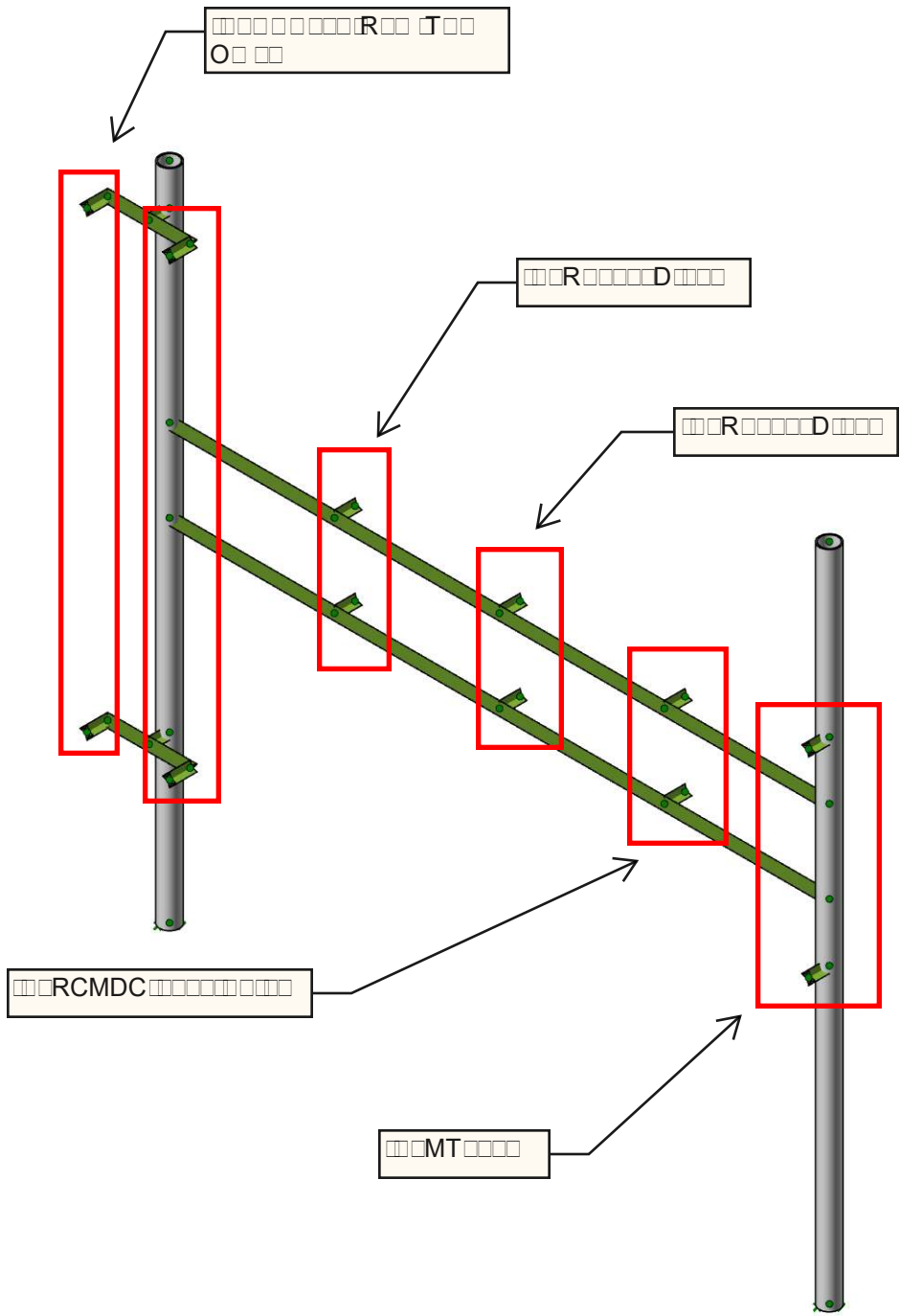
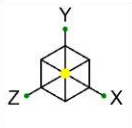
**Equipment (Discrete Appurtenances)**

Antenna Configuration	(E) or (P)	Qty per Sector	z (ft)	Antenna Weight (lb)	Seismic Shear $V_s = C_s * W$ (lbs)	Vert. Seismic load (Ev, lbs)	Horz. Seismic load (Eh, lbs)
NHH-65B-R2B	P	2	86	113	12	14	37
MT6407-77A	P	1	86	79	9	10	26
Samsung B5/13 RRH ORAN (RF4440d-13A)	P	1	86	70	8	9	23
Samsung B2/B66a RRH ORAN (RF4439d-25A)	P	1	86	75	8	10	25
RCMDC-6627-PF-48	P	1	86	32	4	4	11

**Mounting System (Discrete Appurtenances)**

$E_v = 0.2 S_{Ds} * D$	0.0426 x D	"D" is the dead weight of the mount members.
$E_h = \rho * Q_E$	0.11 x W	"W" total weight of structure above ground



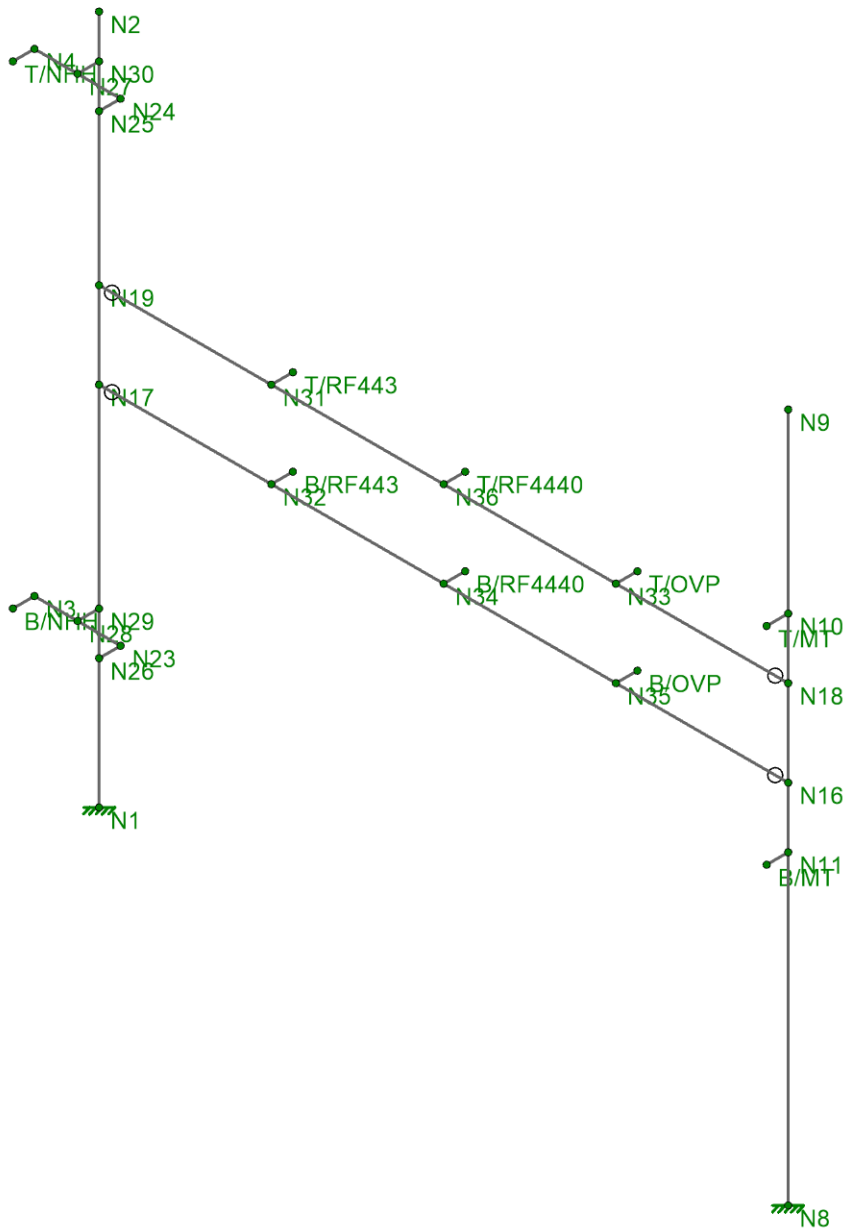


Envelope Only Solution

Tectonic Engineering  
 Armand Pineiro  
 11372.EastLyme

Gamma Sector  
 or Core Sector

SK-8  
 May 12, 2023  
 All Sectors.r3d



Envelope Only Solution

Tectonic Engineering

Armand Pineiro

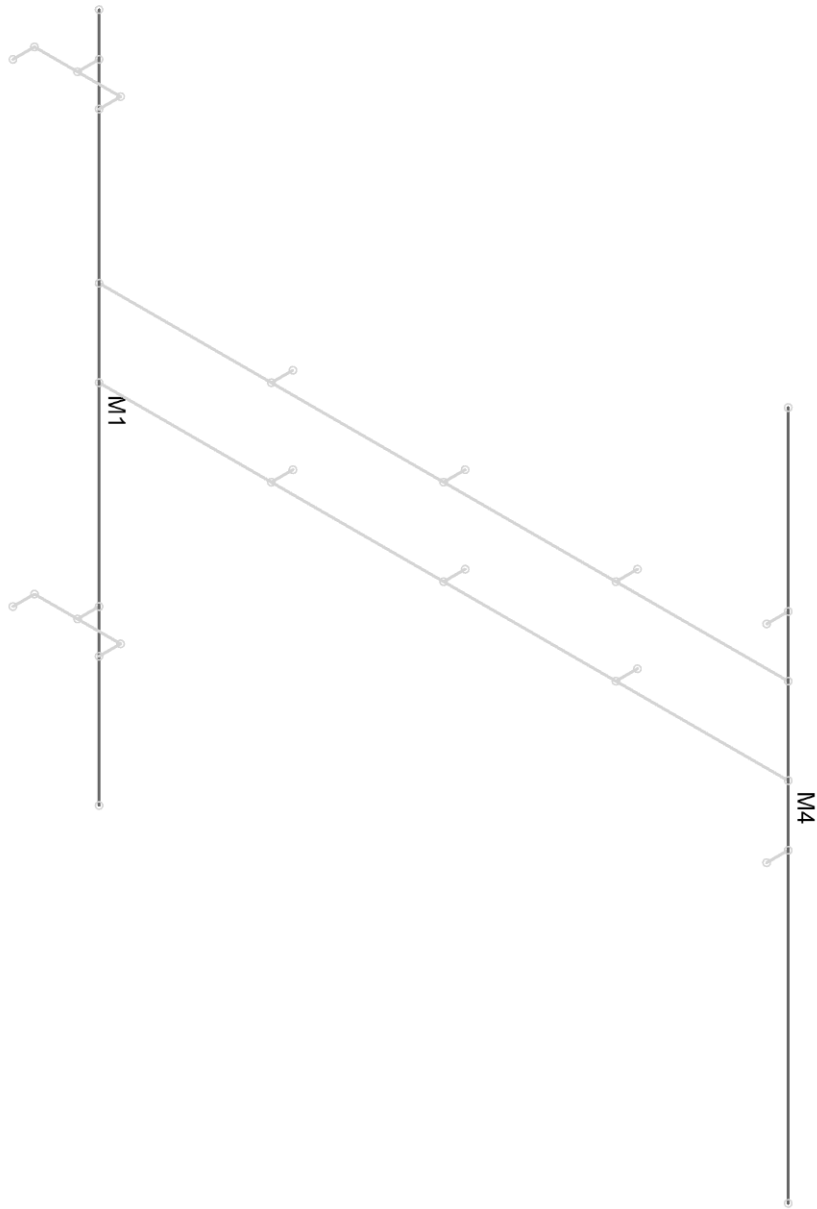
11372.EastLyme

Gamma Sector

SK-9

May 12, 2023

All Sectors.r3d



Envelope Only Solution

Tectonic Engineering

Armand Pineiro

11372.EastLyme

Gamma Sector

SK-10

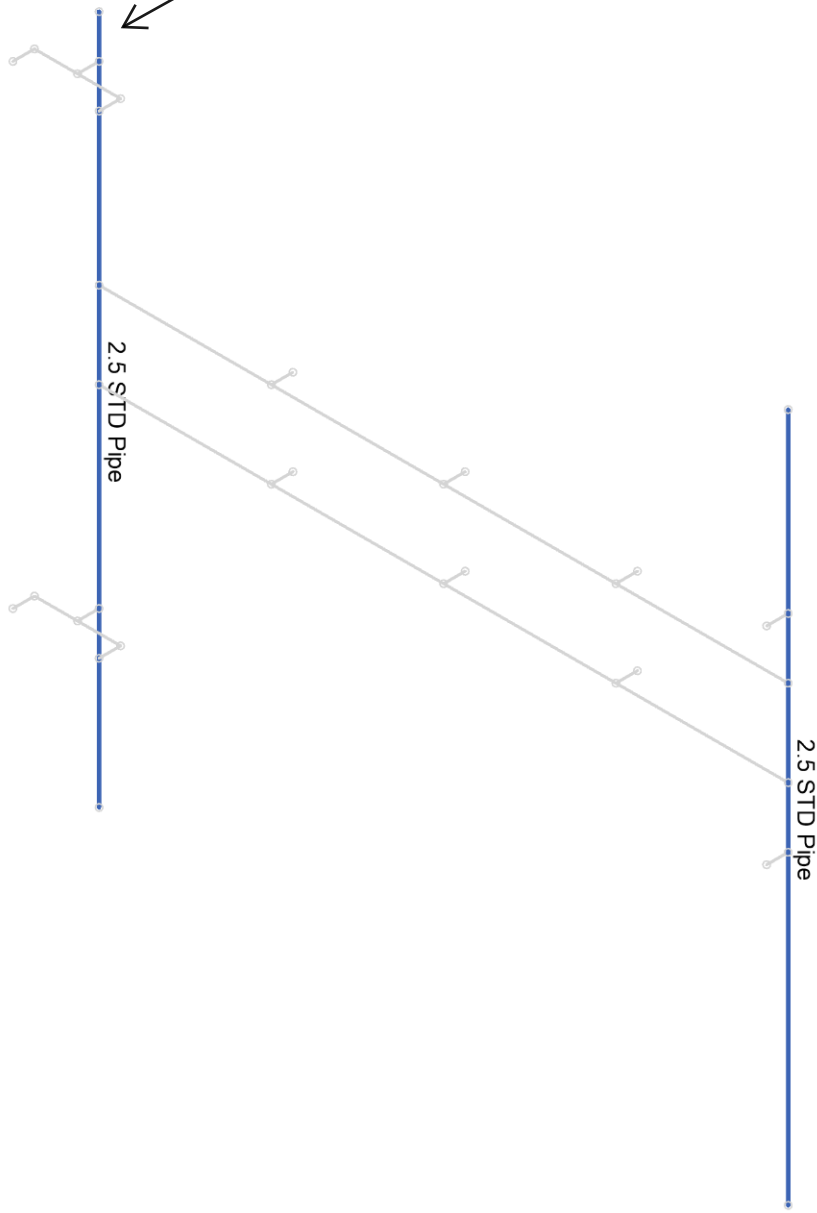
May 12, 2023

All Sectors.r3d



Section Sets	
<span style="color: blue;">█</span>	2.5 STD Pipe
<span style="color: green;">█</span>	RIGID

<span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	STD	<span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>
<span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	G	<span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>
<span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	T	<span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>
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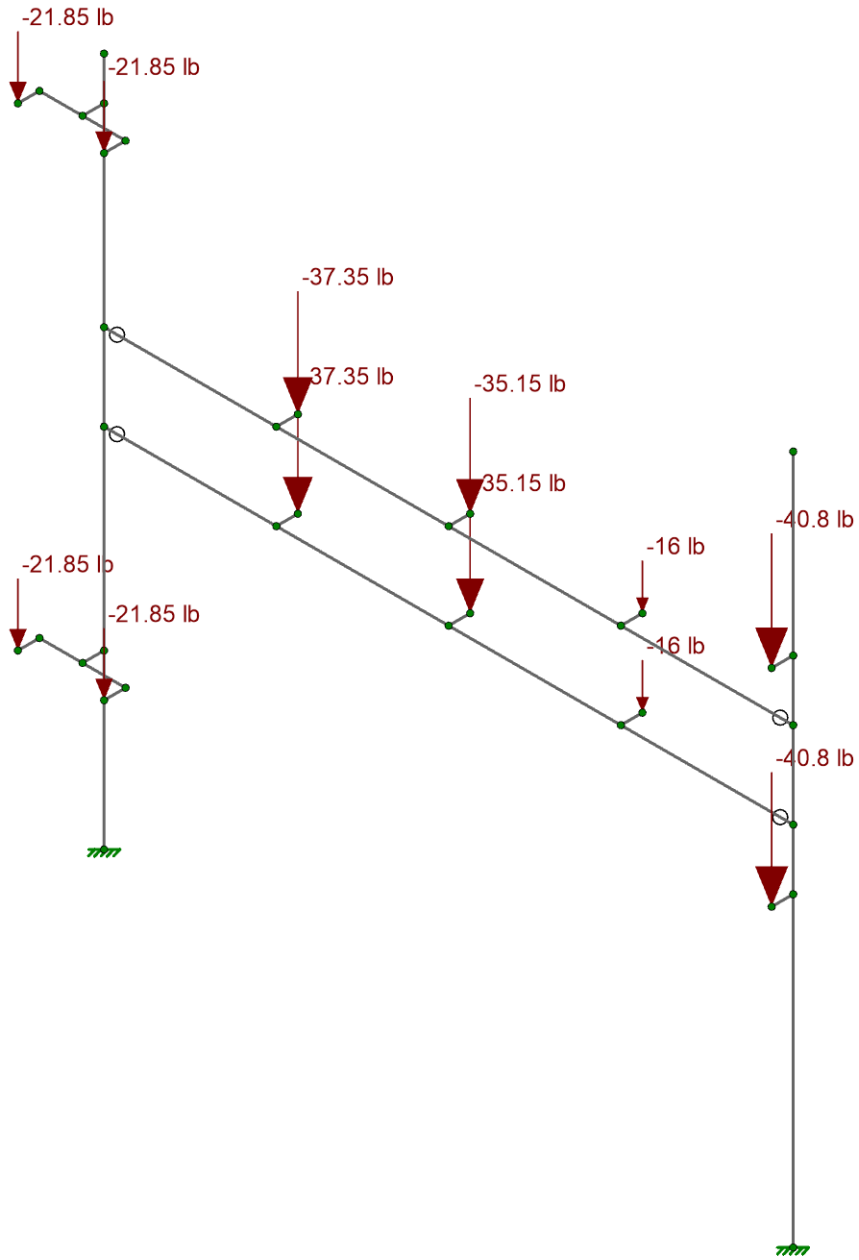


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Tectonic Engineering  
 Armand Pineiro  
 11372.EastLyme

Gamma Sector

SK-11  
 May 12, 2023  
 All Sectors.r3d

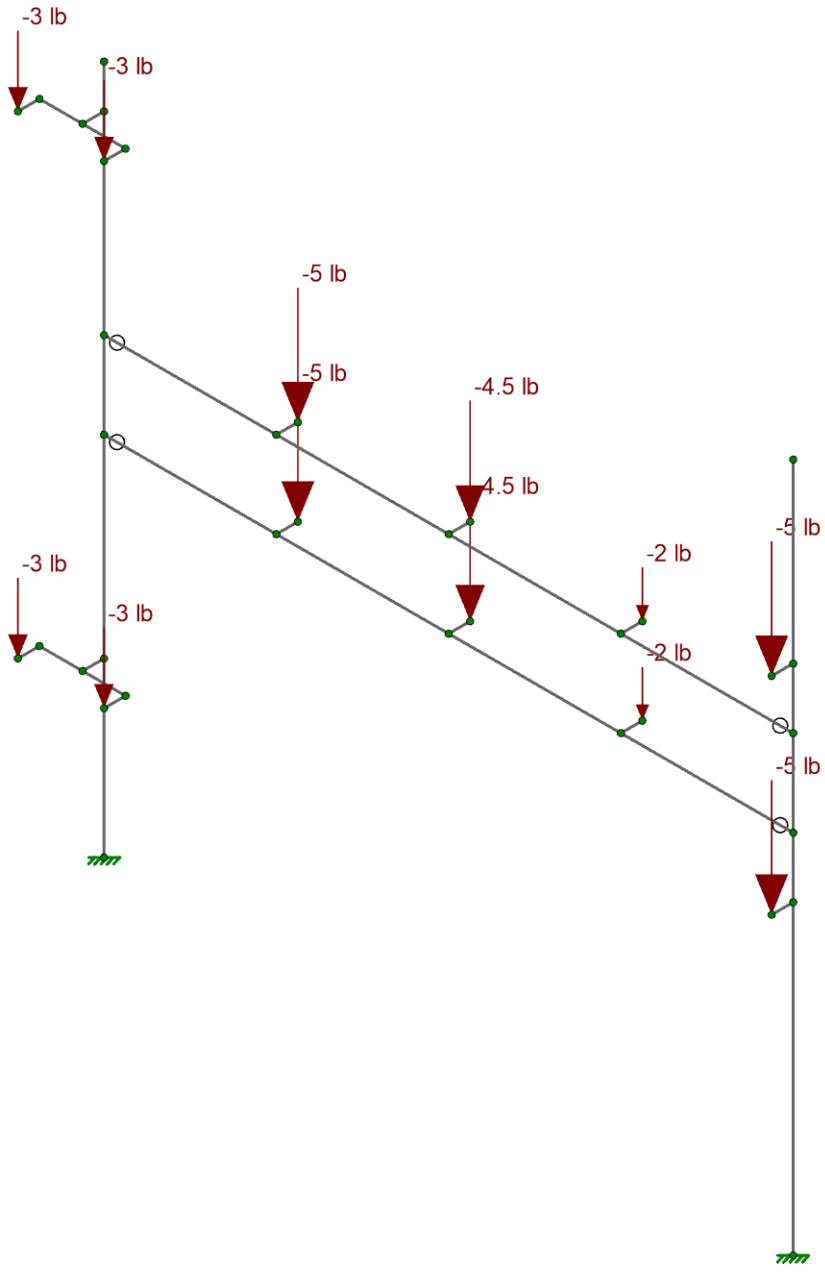
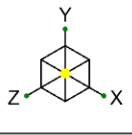


Loads: BLC 1, DL  
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11372.EastLyme

Gamma Sector

SK-12  
May 12, 2023  
All Sectors.r3d

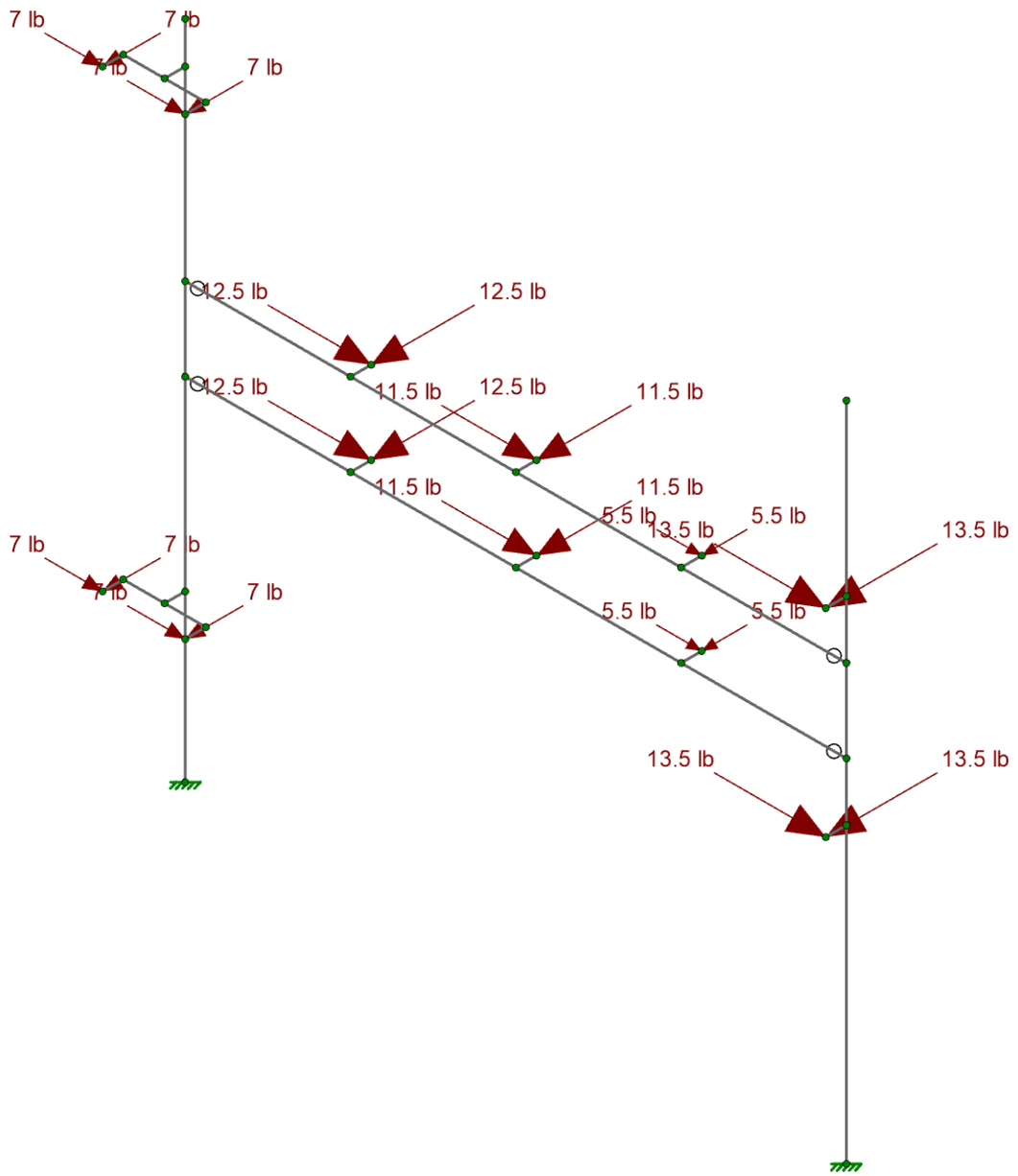


Loads: BLC 2, ELv  
Envelope Only Solution

Tectonic Engineering  
Armand Pineiro  
11372.EastLyme

Gamma Sector

SK-13  
May 12, 2023  
All Sectors.r3d



Loads: BLC 3, ELh  
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Tectonic Engineering  
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11372.EastLyme

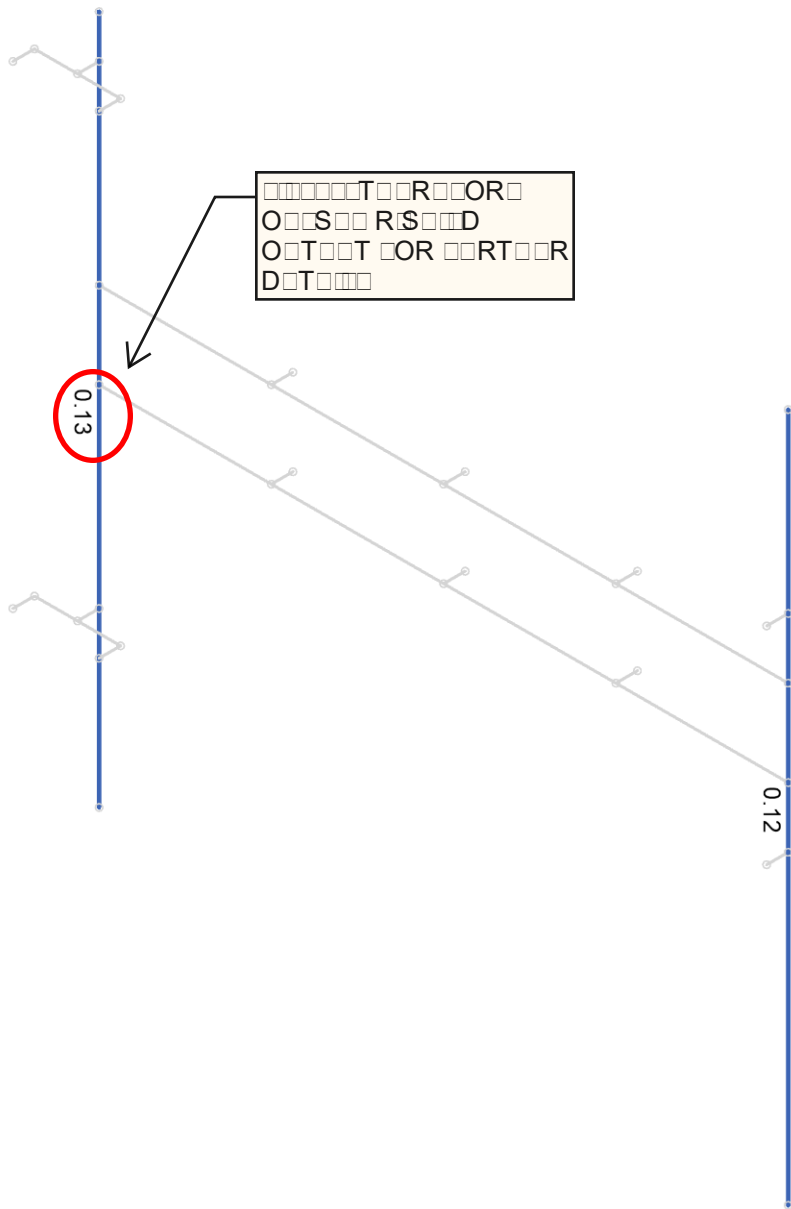
Gamma Sector

SK-14  
May 12, 2023  
All Sectors.r3d



Code Check (Env)

Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

Tectonic Engineering  
Armand Pineiro  
11372.EastLyme

Gamma Sector

SK-15

May 12, 2023

All Sectors.r3d



**Hot Rolled Steel Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e <sup>5</sup> F <sup>-1</sup> ]	Density [k/ft <sup>3</sup> ]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B RECT	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A500 Gr.C RND	29000	11154	0.3	0.65	0.527	46	1.4	62	1.3
7	A500 Gr.C RECT	29000	11154	0.3	0.65	0.527	50	1.4	62	1.3
8	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
9	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
10	A913 Gr.65	29000	11154	0.3	0.65	0.49	65	1.1	80	1.1

**Hot Rolled Steel Section Sets**

	Label	Shape	Type	Design List	Material	Design Rule	Area [in <sup>2</sup> ]	Iyy [in <sup>4</sup> ]	Izz [in <sup>4</sup> ]	J [in <sup>4</sup> ]
1	2.5 STD Pipe	PIPE_2.5	Beam	HSS Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89

**Basic Load Cases**

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal
1	DL	DL		-1.05		12
2	ELv	ELY		-0.05		12
3	ELh	EL	0.11		0.11	24

**Load Combinations**

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor
1	*LRFD								
2	1.4D	Yes	Y	1	1.4				
3	**Seismic Load**								
4	1.2D+ELv+ELh	Yes	Y	1	1.2	2	1	3	1

**Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks**

Member	Shape	Code Check	Loc[ft]	LC	Shear	Check	Loc[ft]	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	M1	PIPE 2.5	0.125	8	4	0.01	8	4	30038.461	50715	3596.25	3596.25	1	H1-1b
2	M4	PIPE 2.5	0.12	8	4	0.008	8	4	30038.461	50715	3596.25	3596.25	1	H1-1b

Max stresses do not exceed 13% of the ultimate stress capacity. Therefore, proposed mount is sufficient to support proposed loading.

**Envelope Node Reactions**

Node	Label	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
1	N1	max	0	2	325.632	2	0.001	2	-20.966	2	0	2	296.467	4
2		min	-65.51	4	306.304	4	-63.959	4	-313.496	4	-13.994	4	0	2
3	N8	max	0	2	287.622	2	0	2	-7.095	2	0	2	288.962	4
4		min	-58.111	4	268.724	4	-59.664	4	-298.741	4	-6.749	4	0	2
5	Totals:	max	0	2	613.254	2	0.001	2						
6		min	-123.621	4	575.029	4	-123.623	4						

Job No.	11372.EastLyme		
Sheet No.	1	of	2
Calculated By:	AMP	Date :	5/12/23
Checked By:		Date :	

### Connection Checks - Post Connection

Connection Details		
Bolt Details		
Bolt Quantity =	4	
Bolt Diameter =	0.500	in
Vertical Spacing =	9.5	in
Horizontal Spacing =	9.5	in
Bolt Grade =	A325	
Bolt $F_u$ , if "Other" =	N/A	ksi

Loading Details		
Envelope Loading		
Shear, X =	0.066	k
Shear, Z =	0.064	k
Tension, Y =	0	k
Mx =	0.313	k-ft
Mz =	0.296	k-ft
Torsion, My =	0	k-ft

#### 1 - Tensile Capacity

$$R_{nt} = F_{nt} A_b \quad \text{AISC [Eqn. J3-1]}$$

$\Omega =$	2	
$F_{nt} =$	90	ksi
$A_b =$	0.19635	in <sup>2</sup>
$R_{nt}/\Omega =$	8.84	k
$T_{max} =$	0.38	k

$\Phi R_{nt} > T_{max}$

4.4% OK

#### 2 - Shear Capacity

$$R_{nv} = F_{nv} A_b \quad \text{AISC [Eqn. J3-1]}$$

$\Omega =$	2	
$F_{nv} =$	54	ksi
$A_b =$	0.19635	in <sup>2</sup>
$R_{nv}/\Omega =$	5.30	k
$V_{max} =$	0.02	k

AISC [Eqn. J3-1]

AISC [Table J3.2]

$\Phi R_{nv} > V_{max}$

0.4% OK

#### 3 - Combined Tension and Shear Capacity

$$R'_{nt} = F'_{nt} A_b \quad \text{AISC [Eqn. J3-2]}$$

$$F'_{nt} = 1.3F_{nt} - \frac{\Omega F_{nt}}{F_{nv}} f_{rv} \leq F_{nt} \quad \text{AISC [Eqn. J3-3a]}$$

$\Omega =$	2	
$F'_{nt} =$	90	ksi
$A_b =$	0.19635	in <sup>2</sup>
$R'_{nt}/\Omega =$	8.84	k
$T_{max} =$	0.38	k

$\Phi R'_{nt} > T_{max}$

4.4% OK

Job No.	11372.EastLyme		
Sheet No.	2	of	2
Calculated By:	AMP	Date :	5/12/23
Checked By:		Date :	

**Connection Checks - Post Connection**

Connection Details		
Weld Details		
Weld Type	Fillet	
Electrodes	70	XX
Size of Weld =	0.1875	in
Pipe Diameter =	2.88	in
Pipe Thickness =	0.19	in
Plate Details		
Height/Width =	12.50	in
Thickness =	0.375	in
F <sub>y</sub> =	36	ksi

Loading Details		
Envelope Loading		
Shear, X =	0.066	k
Shear, Z =	0.064	k
Tension, Y =	0	k
M <sub>x</sub> =	0.313	k-ft
M <sub>z</sub> =	0.296	k-ft
Torsion, M <sub>y</sub> =	0	k-ft

**4 - Weld Capacity**

$$F_{nw} = 0.6F_{EXX}$$

$\Omega =$	2	
$F_{nw}/\Omega =$	21.00	ksi
$f_{v,max} =$	0.073	ksi
$f_{b,max} =$	5.92	ksi

AISC [Table J2.5]

$$\text{Min}(\Phi F_{nw}, \Phi F_{nbm}) > \sqrt{(f_{v,max} + f_{m,max})}$$

**28.2%** OK

**5 - Plate Capacity**

$\Omega =$	2	
$F_{byy}/\Omega =$	18.00	ksi
$f_b =$	9.80	ksi

$$\Phi F_{byy} > F_b$$

**54.4%** OK

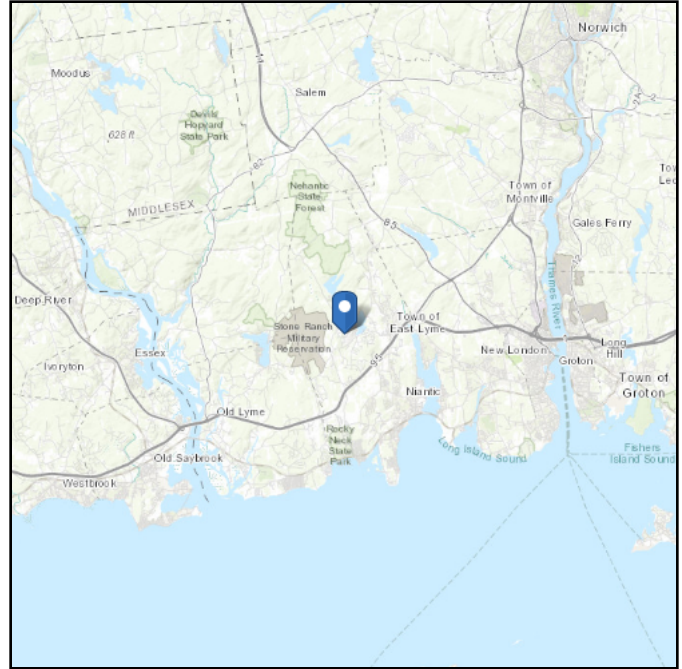
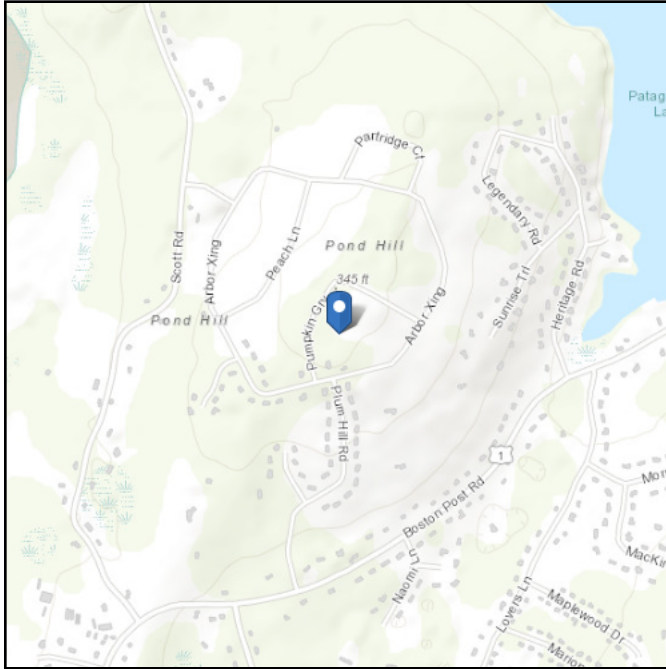


# ASCE 7 Hazards Report

**Address:**  
2 Arbor Xing  
East Lyme, Connecticut  
06333

**Standard:** ASCE/SEI 7-16  
**Risk Category:** II  
**Soil Class:** D - Default (see Section 11.4.3)

**Latitude:** 41.366369  
**Longitude:** -72.24233  
**Elevation:** 337.5362644428924 ft (NAVD 88)

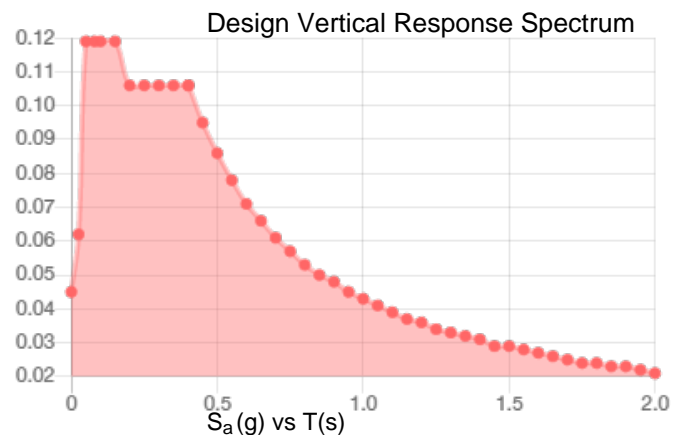
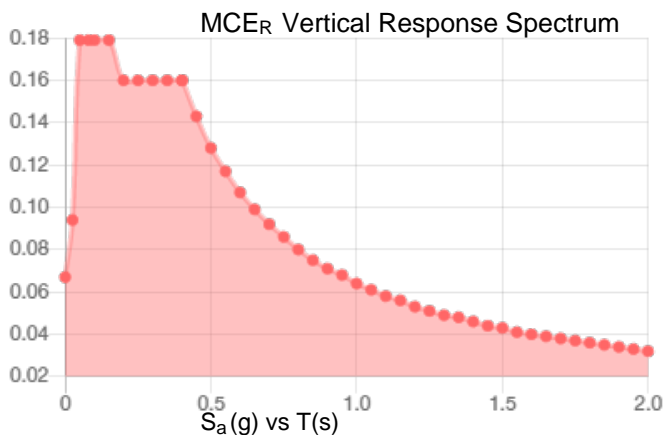
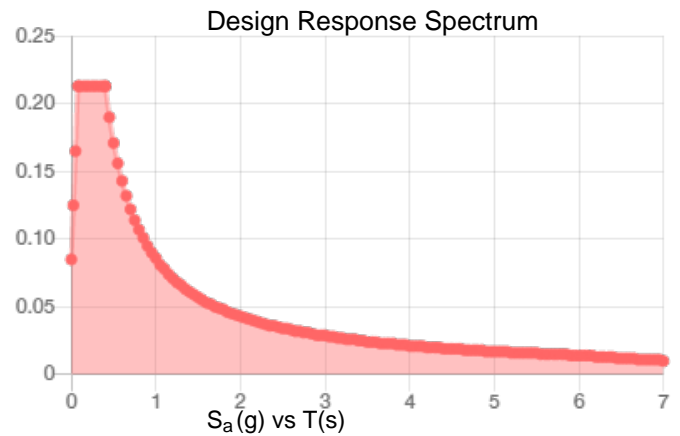
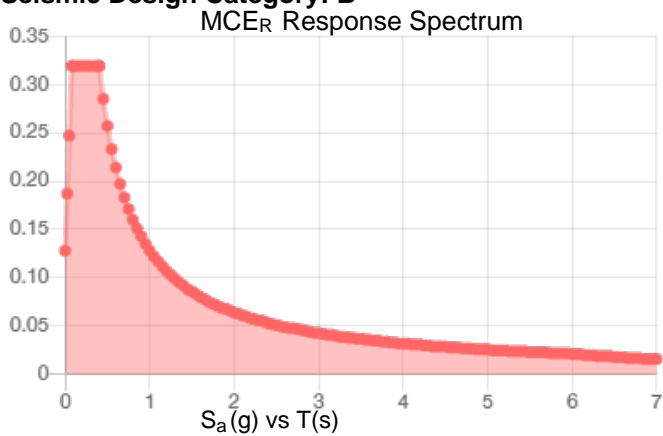


**Site Soil Class:**

**Results:**

$S_s$ :	0.2	$S_{D1}$ :	0.086
$S_1$ :	0.053	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.111
$F_v$ :	2.4	PGA <sub>M</sub> :	0.175
$S_{MS}$ :	0.319	$F_{PGA}$ :	1.578
$S_{M1}$ :	0.128	$I_e$ :	1
$S_{DS}$ :	0.213	$C_v$ :	0.7

**Seismic Design Category: B**



**Data Accessed:**

**Thu May 11 2023**

**Date Source:**

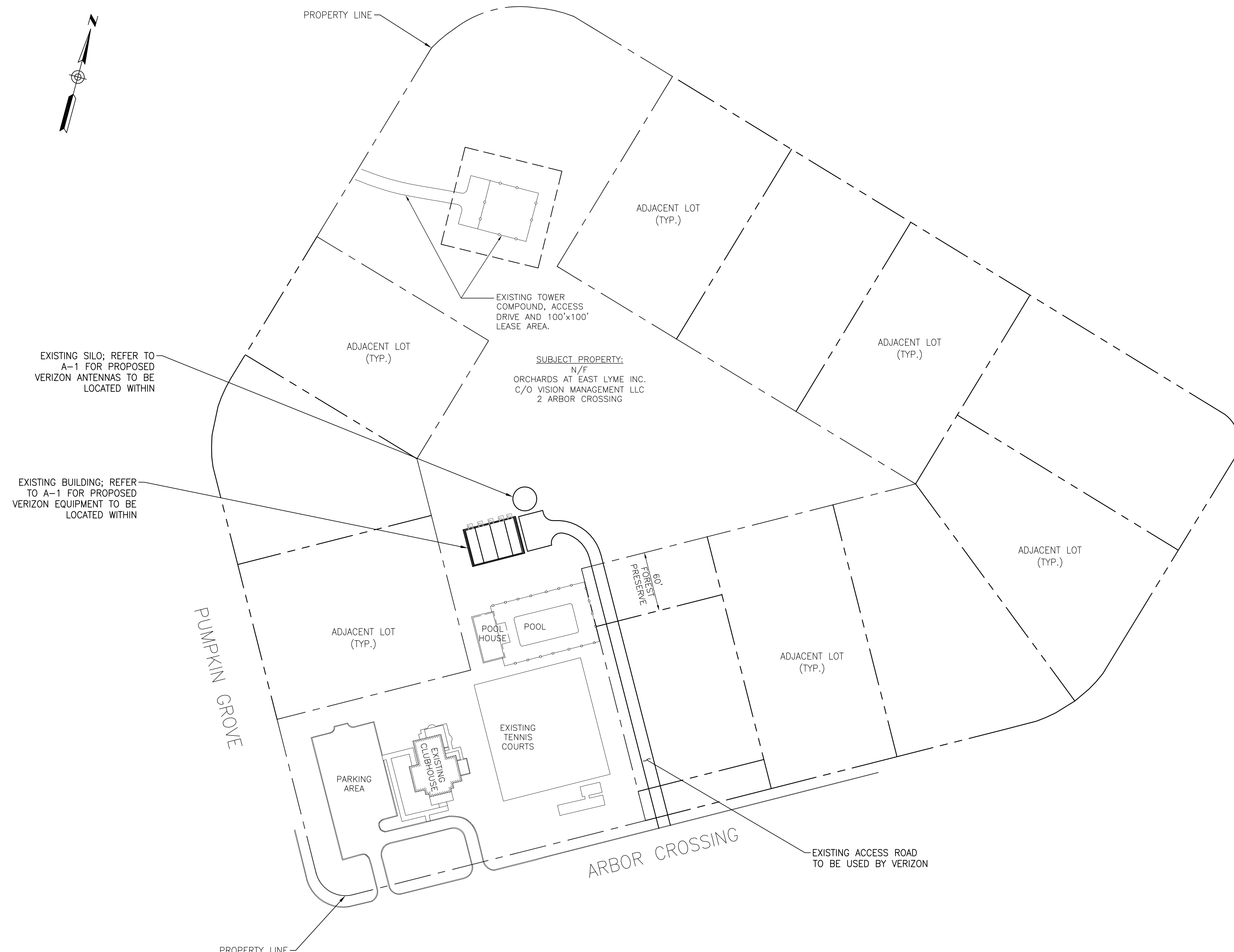
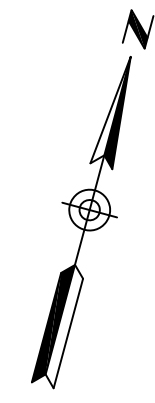
**USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.**

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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**1**  
**C-1** AREA MAP  
Scale: 1" = 60'



WIRELESS COMMUNICATIONS FACILITY

20 ALEXANDER DRIVE  
WALLINGFORD, CT 06492



88 Foundry Pond Rd.  
Cold Spring, NY 10516  
onair@optonline.net  
201-456-4624

LICENSURE



DAVID WEINPAHL, P.E.  
CT LIC. NO. 22144

NO. DATE SUBMISSIONS

NO.	DATE	SUBMISSIONS
0	10.26.21	REVIEW
1	12.05.21	CSC FILING
2	05.15.23	REVISED PER MOUNT ANALYSIS

DRAWN BY:	CHECKED BY:
MF	DW

NEW BUILD MACRO

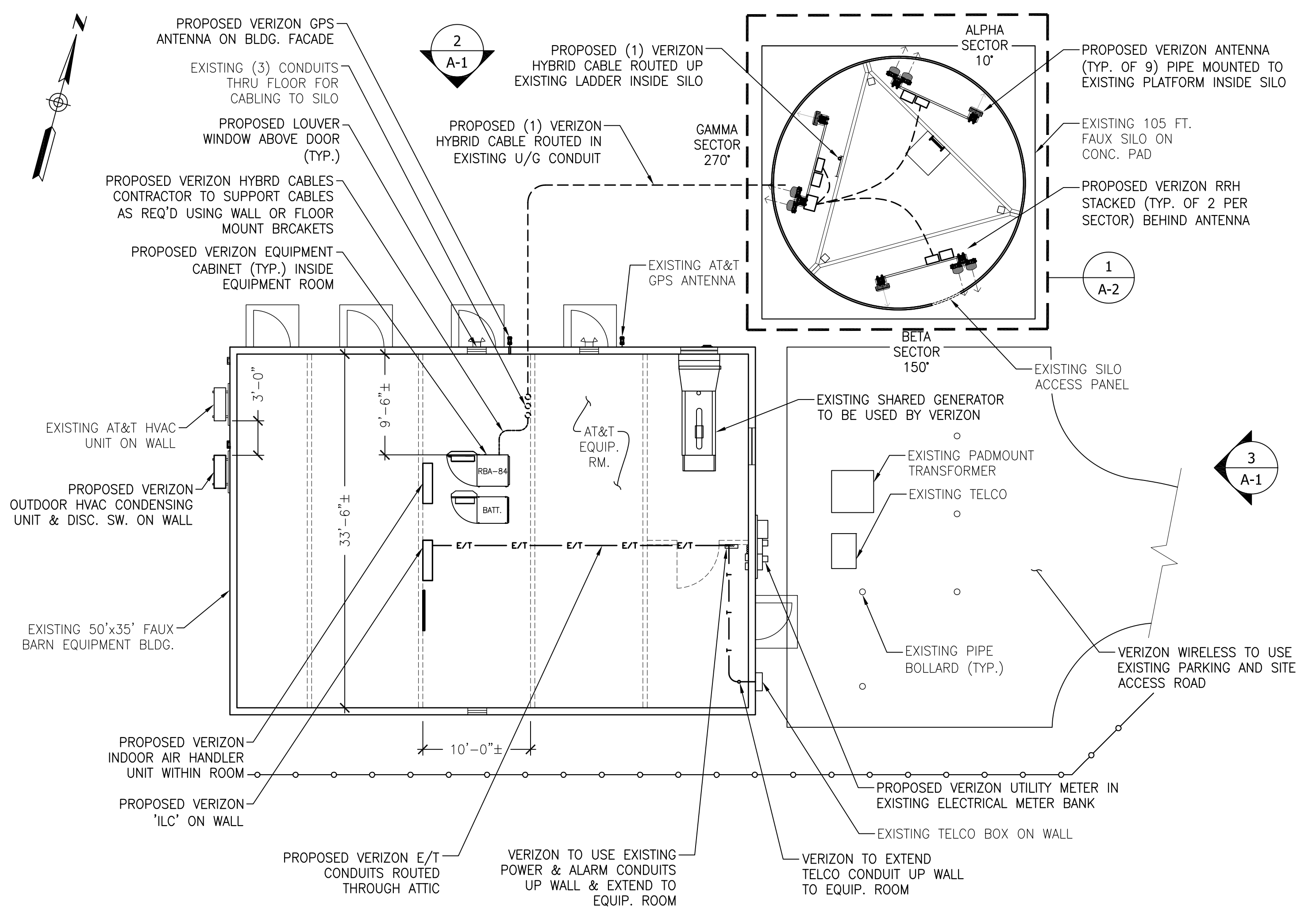
SITE NAME:  
**EAST LYME NORTH CT**

PROJECT INFORMATION:  
**TOWERCO SITE # CT0025  
2 ARBOR CROSSING  
EAST LYME, CT 06333**

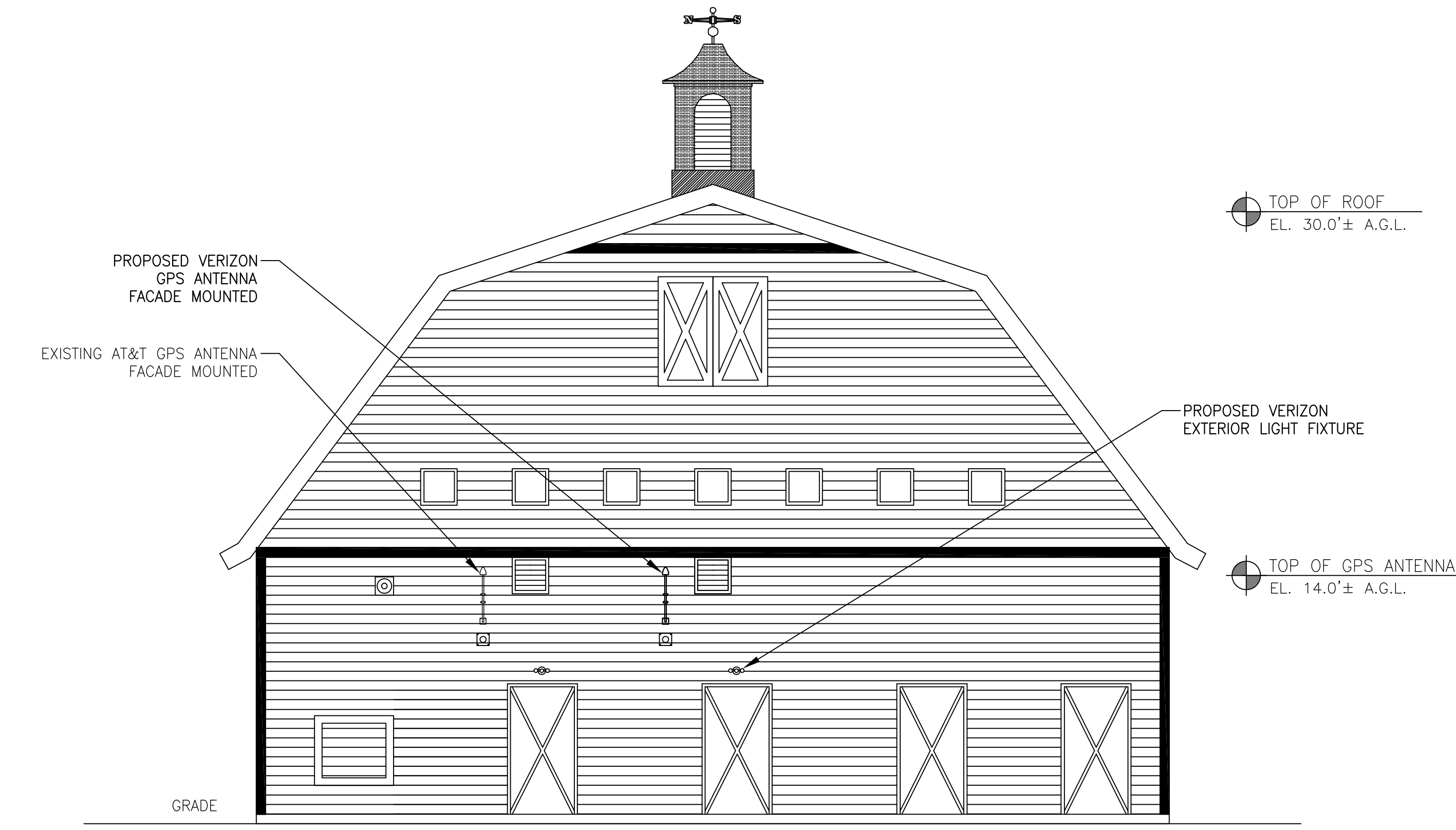
DRAWING TITLE:  
**AREA MAP**

SHEET NUMBER:  
**C-1**

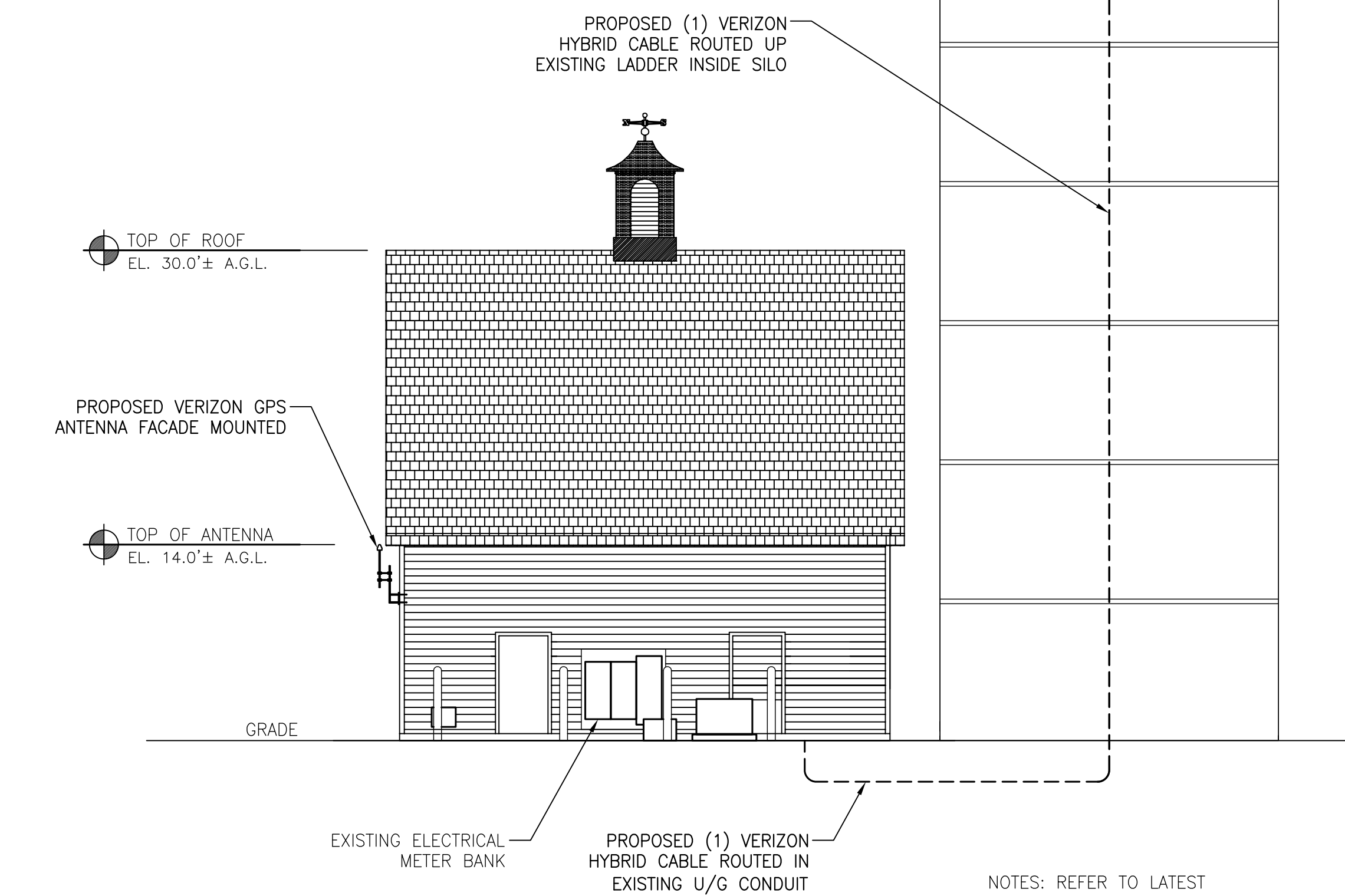
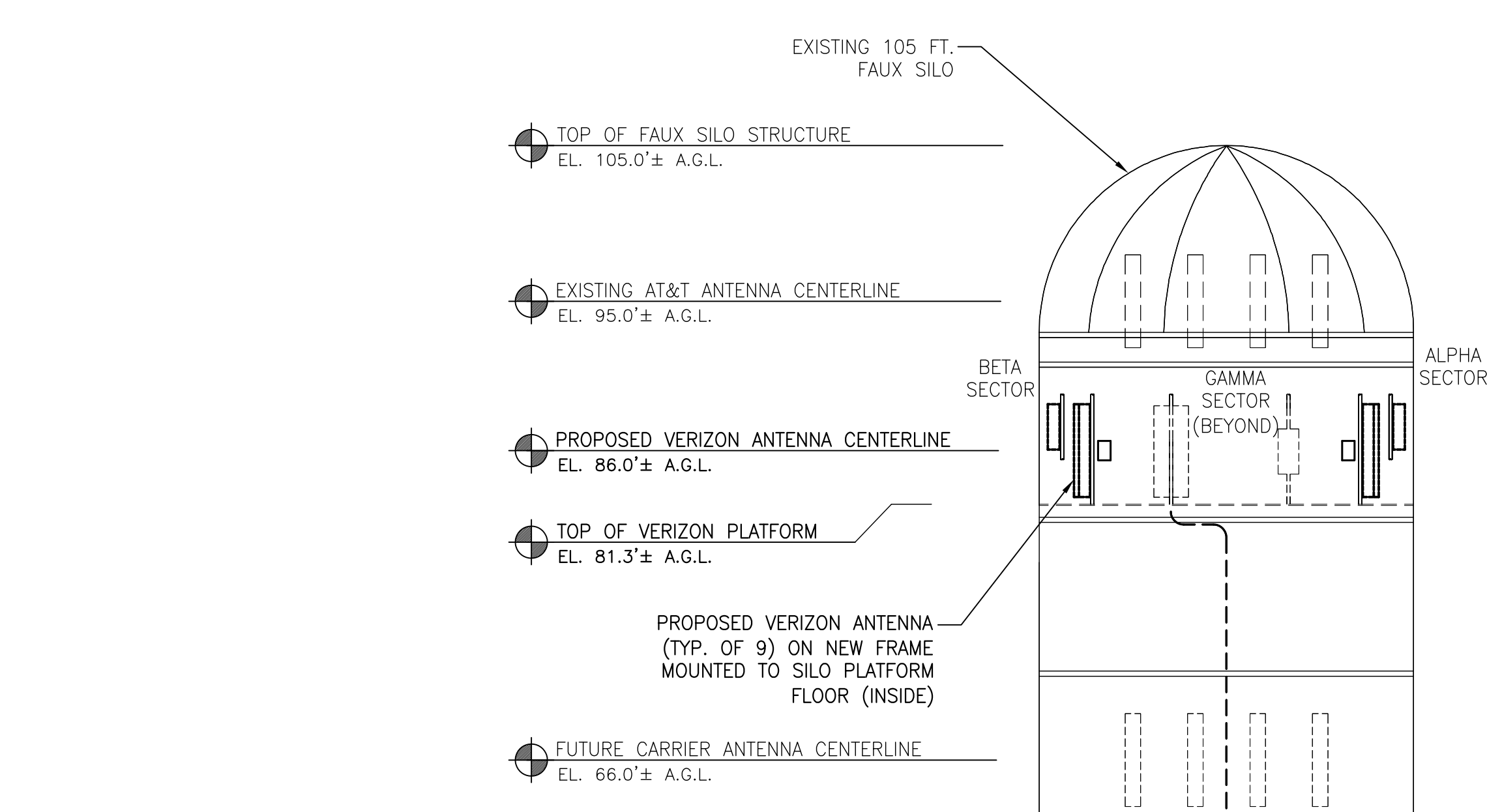




**1 SITE LAYOUT**  
Scale: 1/8" = 1'-0"



**2 NORTH ELEVATION**  
Scale: 3/16" = 1'-0"



**3 EAST ELEVATION**  
Scale: 1/8" = 1'-0"

NOTES: REFER TO LATEST VERSIONS OF STRUCTURAL AND MOUNT ANALYSIS REPORTS, UNDER SEPARATE COVER, BY OTHERS (BOTH REPORTS PASSING)

**verizon**  
WIRELESS COMMUNICATIONS FACILITY  
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**On Air Engineering, LLC**  
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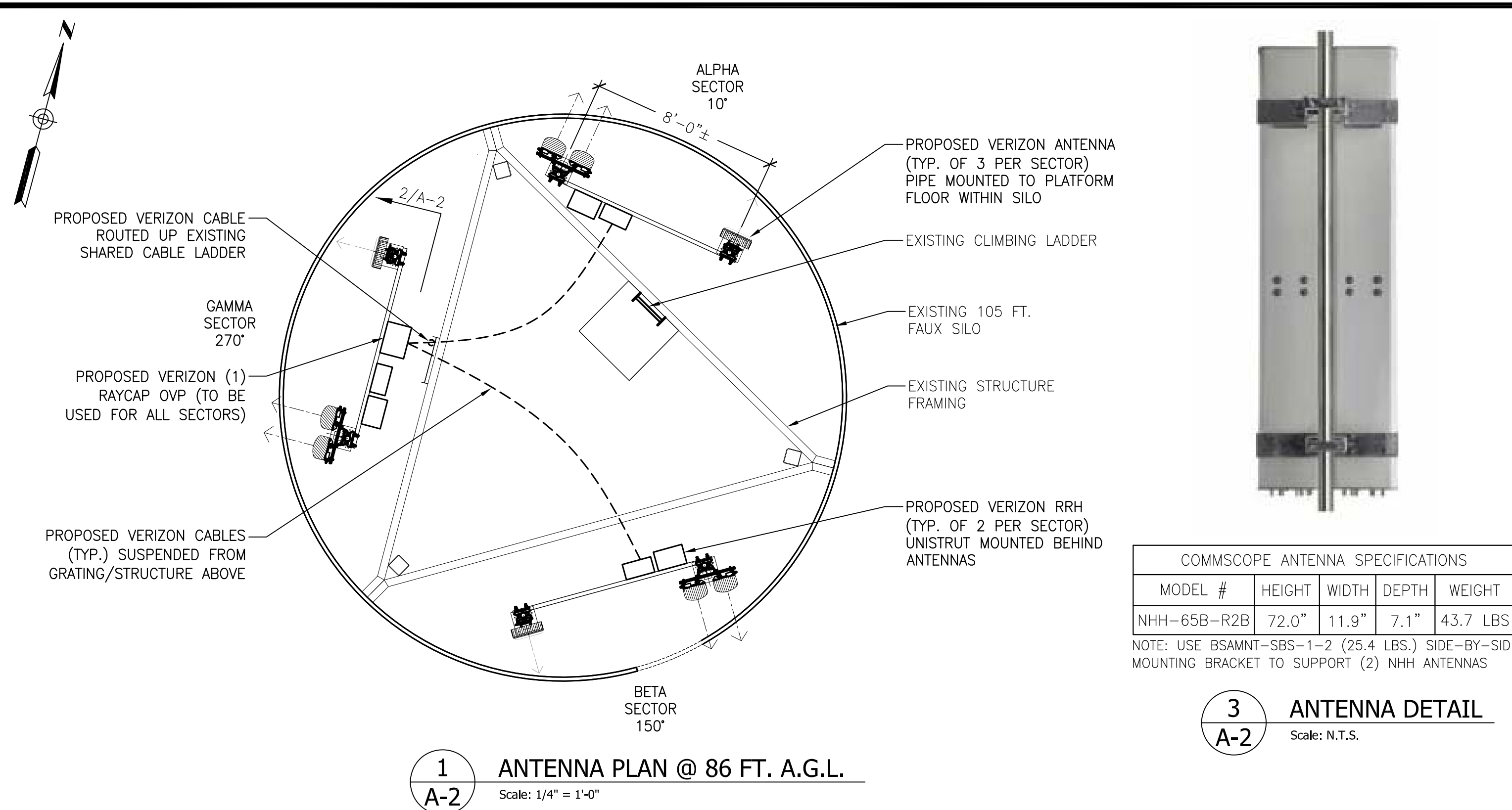
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**2 ARBOR CROSSING**  
**EAST LYME, CT 06333**

DRAWING TITLE:  
**SITE LAYOUT,**  
**NORTH & EAST**  
**ELEVATIONS**

SHEET NUMBER:  
**A-1**



COMMSCOPE ANTENNA SPECIFICATIONS

MODEL #	HEIGHT	WIDTH	DEPTH	WEIGHT
NHH-65B-R2B	72.0"	11.9"	7.1"	43.7 LBS

NOTE: USE BSAMNT-SBS-1-2 (25.4 LBS.) SIDE-BY-SIDE MOUNTING BRACKET TO SUPPORT (2) NHH ANTENNAS



SAMSUNG ANTENNA SPECIFICATIONS

MODEL #	HEIGHT	WIDTH	DEPTH	WEIGHT
MT6407	35.1"	16.1"	5.5"	79.4 LBS

\*INCLUDES INTEGRATED RRH

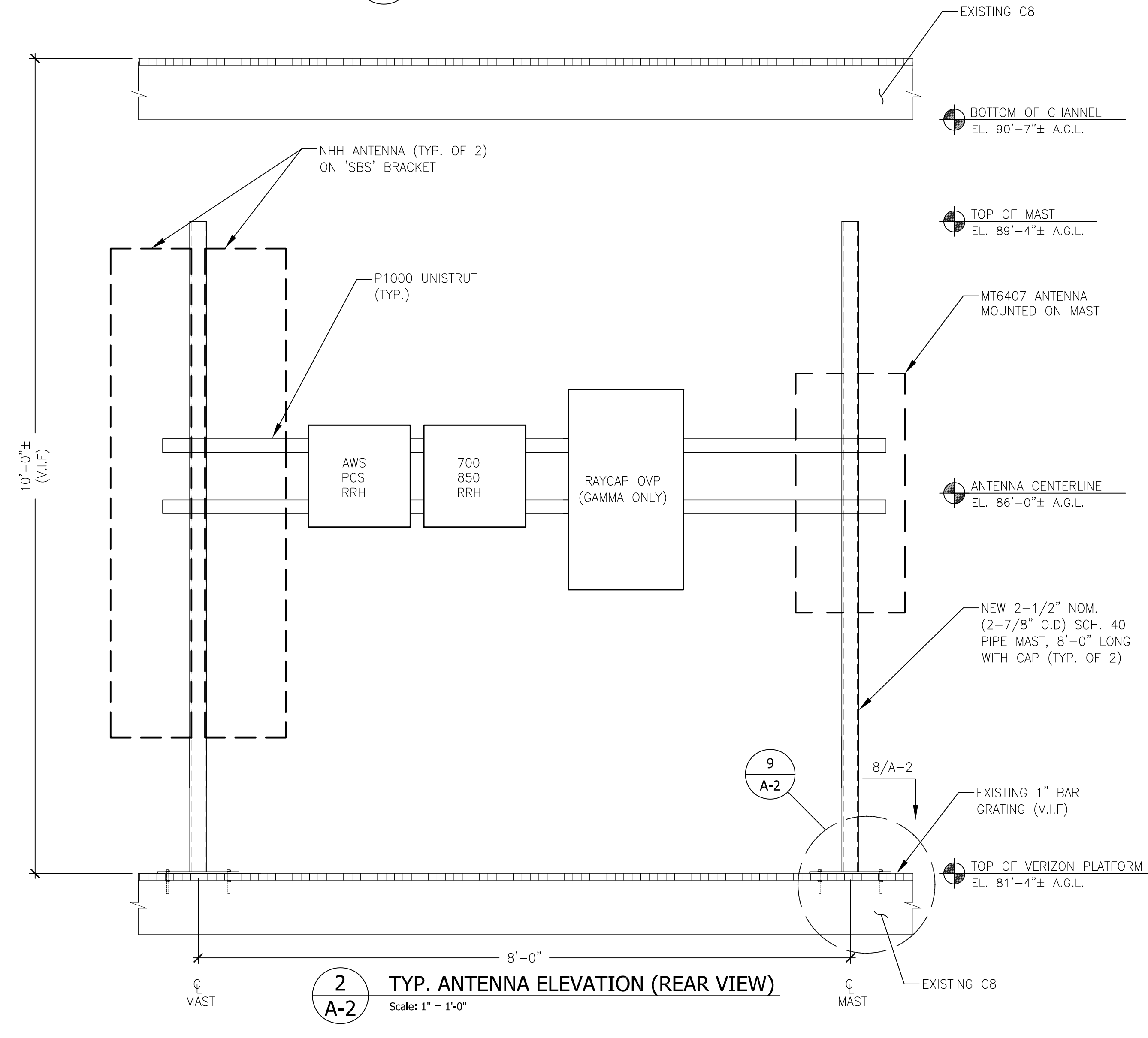


SAMSUNG RRH AWS/PCS ORAN SPECIFICATIONS

MODEL #	HEIGHT	WIDTH	DEPTH	WEIGHT
RF4439D-25A	15"	15"	10"	74.7 LBS

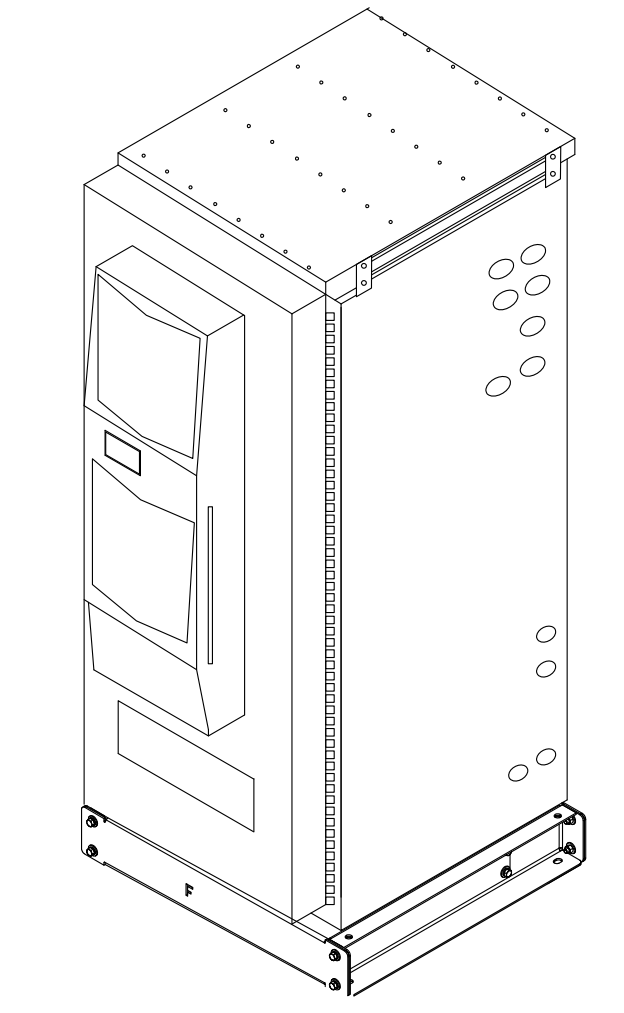
SAMSUNG RRH 700/850 ORAN SPECIFICATIONS

MODEL #	HEIGHT	WIDTH	DEPTH	WEIGHT
RF4440D-13A	15"	15"	9.1"	70.3 LBS



RAYCAP OVP EQUIPMENT SPECIFICATIONS

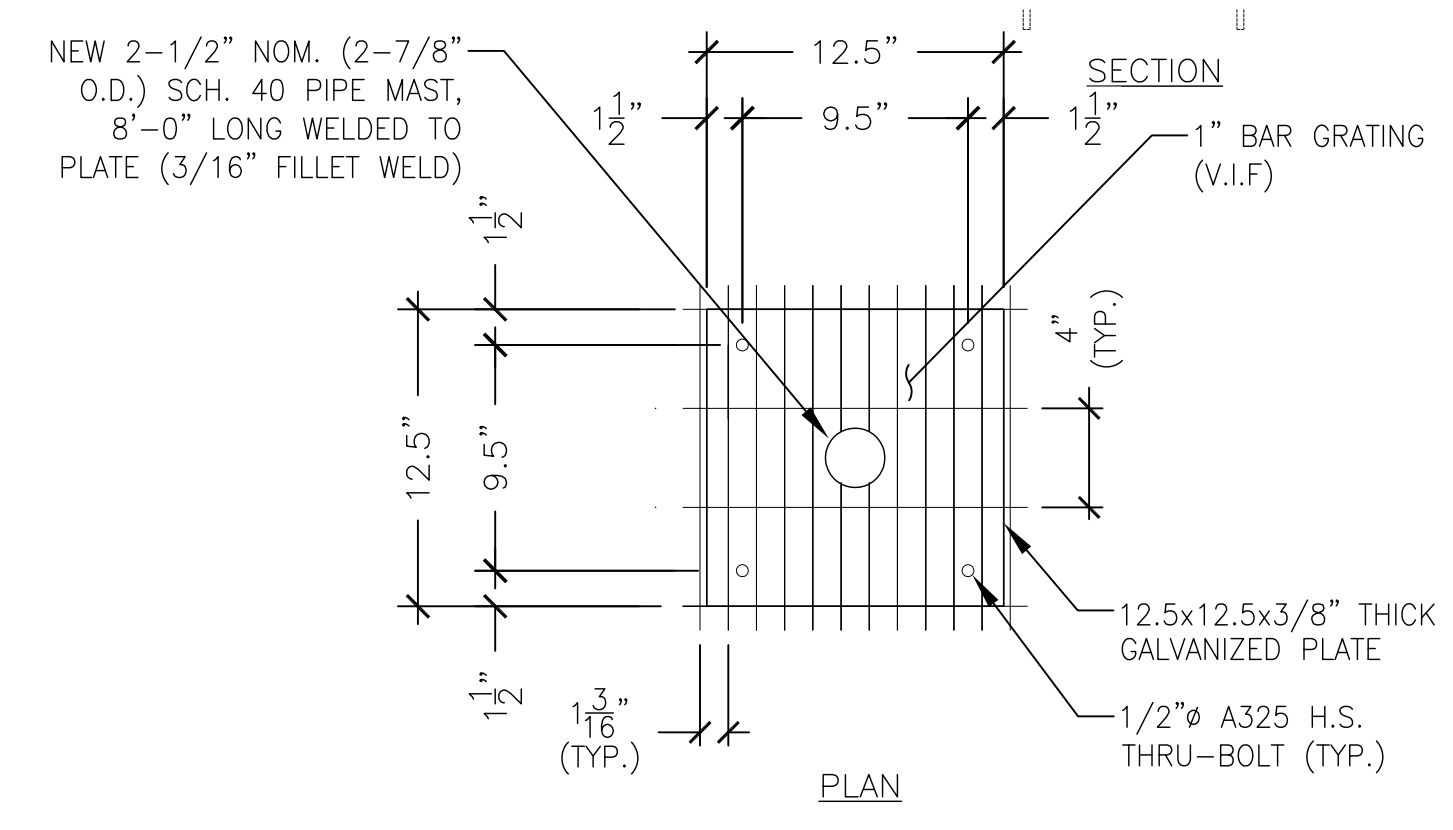
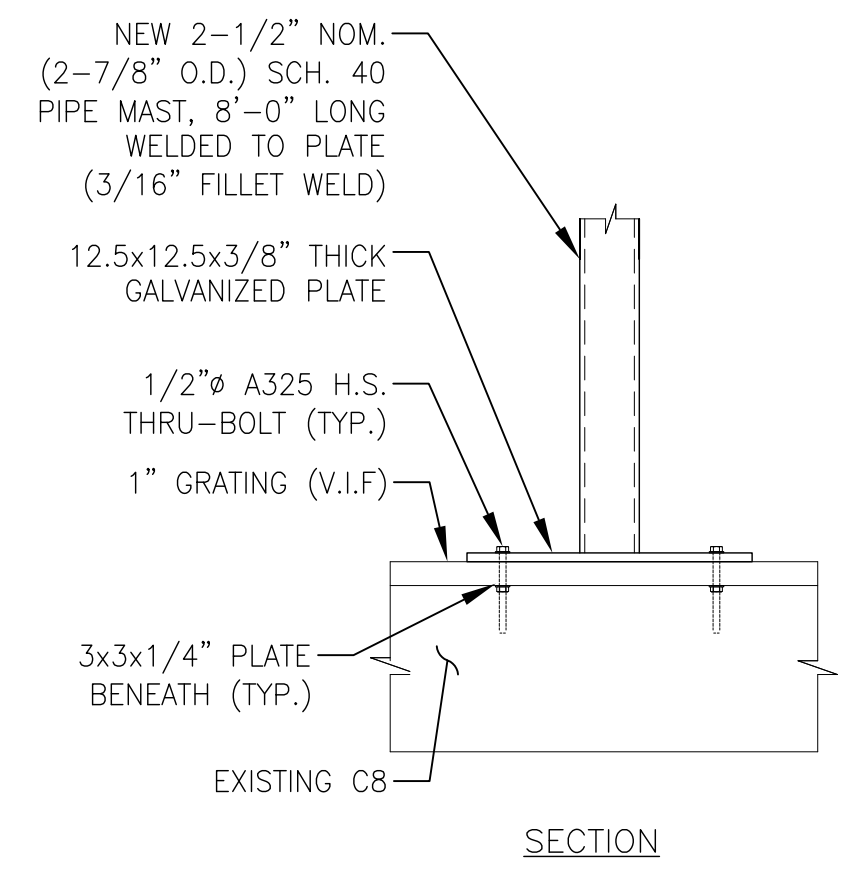
MODEL #	HEIGHT	WIDTH	DEPTH	WEIGHT
RCMDC-6627-PF-48	29.5"	16.5"	12.6"	32 LBS



COMMSCOPE EQUIPMENT SPECIFICATIONS

MODEL #	HEIGHT	WIDTH	DEPTH	WEIGHT
RBA84	85.2"	32.0"	35.4"	1,955 LBS (1)
760238731	6"	32.0"	36.6"	50 LBS (2)

(1) WEIGHT OF CABINET WITH 2-STRINGS OF BATTERIES  
(2) APPROX. WEIGHT OF SUB-BASE



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2 ARBOR CROSSING  
EAST LYME, CT 06333

DRAWING TITLE:  
ANTENNA PLAN & DETAILS

SHEET NUMBER:  
A-2