

May 1, 2023

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

Re: **EM-VER-093-220727 – Cellco Partnership d/b/a Verizon Wireless – 115 Peat Meadow Road, New Haven, Connecticut**

Dear Attorney Bachman:

On September 6, 2022, the Siting Council approved the above referenced Exempt Modification filing permitting the modification of an existing telecommunications facility located at 115 Peat Meadow Road in New Haven. Cellco recently learned that the remote radio heads (“RRH”) it intended to install at this site was no longer available. The new RRH, model numbers RF-4439d-25A and model RF4440d-13A will be installed in its place.

Enclosed is a revised Structural Analysis, Mount Analysis and updated set of project plans and RRH specification sheets 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

Copy: Karla Hanna

(REVISED)
STRUCTURAL ANALYSIS REPORT

For

VERIZON SITE NAME: EAST HAVEN 5 CT
TEP PROJECT NUMBER: 0324908. 836288

115 Peat Meadow Road
New Haven, CT 06513

Antennas Mounted on the Monopole Extension



Prepared for:

verizon✓

20 Alexander Drive, 2nd Floor
Wallingford, CT 06492

Dated: April 27, 2023 (Rev. 7)

March 22, 2023 (Rev. 6)

November 20, 2020

Prepared by:



(TEP OPCO, LLC)
45 Beechwood Drive
North Andover, MA 01845
(P) 978.557.5553
www.tepgroup.net





SCOPE OF WORK:

TEP Northeast (TEP NE) has been authorized by Verizon to conduct a structural evaluation of the 24' monopole with a proposed 42' extension supporting the proposed Verizon antennas located at elevation 67' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of Verizon's existing and proposed antennas listed below.

The following documents were used for our reference:

- Construction Drawings prepared by Effective Engineering Solution, LTD dated October 15, 2012.
- Structural Analysis report prepared by Hudson Design Group dated January 31, 2018.
- Mount Structural Analysis report prepared by Hudson Design Group dated June 30, 2022.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing tower is in conformance with the ANSI/TIA-222-H Standard for the loading considered under the criteria listed in this report. The tower structure is rated at 84.9 % - (Monopole Tower Section L2 from EL.0' to EL.10' Controlling).

CONNECTION SUMMARY:

Based on our evaluation, we have determined that the proposed and existing connection are in conformance with the ANSI/TIA-222-H Standard for the loading considered under the criteria listed in this report. The connection is rated at 87.5 %.



APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
Verizon	(6) JAHH-45B-R3B Antennas	67'	BSAMNT-SBS-2-3 on Pipe Mast on Horizontal Pipe
Verizon	(3) MT6407-77A Antennas	67'	Pipe Mast on Horizontal Pipe
Verizon	(3) B2/B66A RRH ORAN RRH's (RF4439d-25A RRH)	60'	Pipe Mast on UGLM-DCP
Verizon	(3) B5/B13 RRH ORAN RRH's (RF4440d-13A RRH)	60'	Pipe Mast on UGLM-DCP
Verizon	(3) CBC78T-DS-43-2X Diplexers	60'	Pipe Mast on UGLM-DCP
Verizon	(1) OVP Box	60'	Pipe Mast on UGLM-DCP

*Proposed Verizon Appurtenances shown in Bold.

VERIZON EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
Verizon	(1) Hybrid Cable	67'	Inside Monopole

*Proposed Verizon Coax Cables shown in Bold.

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Extension	20.6 %	27 – 69	PASS	
Tower Section L1	73.4 %	10 – 24	PASS	
Tower Section L2	84.9 %	0 – 10	PASS	Controlling

CONNECTION RESULTS SUMMARY:

	Stress Ratio	Pass/Fail	Comments
Anchors	65.9 %	PASS	
Plate	66.6 %	PASS	
Stiffener	87.5 %	PASS	Controlling

TOWER FOUNDATION COMPARISON SUMMARY:

	Proposed Reactions	*Previous Reactions	Stress Ratio	Pass/Fail
Shear	43634 lbs	49755 lbs	87.7 %	PASS
Axial	92501 lbs	150000 lbs**	61.7 %	PASS
Moment	1717291 lb-ft	1865196 lb-ft	92.1 %	PASS

* Reactions taken from previous HDG Tower Structural Analysis dated January 31, 2018.

** Reaction taken from previous HDG Foundation Evaluation dated January 31, 2018.



DESIGN CRITERIA:

1. EIA/TIA-222-H Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

County: New Haven

Wind Load: 125 mph (2022 Connecticut State Building Code)

Structural Class: II

Exposure Category: B

Topographic Category: 1

Nominal Ice Thickness: 1.0 inch

2. Approximate height above grade to proposed antennas: 67'

*Calculations and referenced documents are attached.

ASSUMPTIONS:

1. The appurtenances configuration is as stated in this report. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
2. The tower and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.

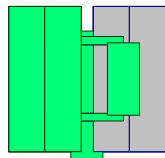
SUPPORT RECOMMENDATIONS:

TEP NE recommends that the proposed antennas, RRH's and OVP be mounted on the proposed mount supported by the proposed monopole extension.

FIELD PHOTOS:



CALCULATIONS



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
3'-6" Face Horizontal	67	MT6407-77A Antenna w/ Mounting Pipe	67
3'-6" Face Horizontal	67	MT6407-77A Antenna w/ Mounting Pipe	67
3'-6" Face Horizontal	67	7'x2" Antenna Mount Pipe	60
3'-6" Face Horizontal	67	7'x2" Antenna Mount Pipe	60
3'-6" Face Horizontal	67	7'x2" Antenna Mount Pipe	60
3'-6" Face Horizontal	67	B2/B66A RRH ORAN RRH	60
3'-6" Face Horizontal	67	B2/B66A RRH ORAN RRH	60
3'-6" Face Horizontal	67	B2/B66A RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	B5/B13 RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	B5/B13 RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	CBC78T-DS-43-2X Diplexer	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	CBC78T-DS-43-2X Diplexer	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	CBC78T-DS-43-2X Diplexer	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	OVP Box	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	24"x42" Pipe	48
JAHH-45B-R3B Antenna w/Mounting Pipe	67	(2) W30x108 Beams	25.5
MT6407-77A Antenna w/ Mounting Pipe	67	24" Torsion Pipe	25.5
		(2) 14"x48" Billborad	25.5

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

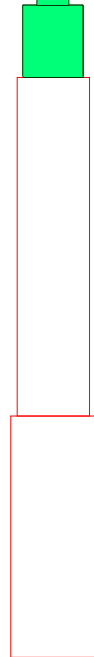
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125.0 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 84.9%

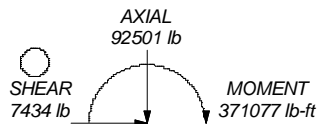
24.0 ft

10.0 ft

0.0 ft



ALL REACTIONS ARE FACTORED



TORQUE 202 lb-ft
50.0 mph WIND - 1.0000 in ICE



TORQUE 1001 lb-ft
REACTIONS - 125.0 mph WIND

Section	Size	Length (ft)	Grade	Weight (lb)
1	P36x1/2	14.00	A53-B-42	2656.5
2	P42x7/16	10.00		1943.9
				4600.4

TEP Northeast		Job: EAST HAVEN 5 CT	
45 Beechwood Drive		Project: 24 ft Monopole	
North Andover, MA 01845		Client: VERIZON	Drawn by: RL
TEP Northeast	Phone: (978) 557-5553	Code: TIA-222-H	Date: 04/26/23
	FAX:	Path:	App'd: _____
			Scale: NTS
			Dwg No. E-1

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job EAST HAVEN 5 CT	Page 1 of 9
	Project 24 ft Monopole	Date 09:38:26 04/26/23
	Client VERIZON	Designed by RL

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Tower base elevation above sea level: 15.00 ft.

Basic wind speed of 125.0 mph.

Risk Category II.

Exposure Category B.

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 56.0 pcf.

A wind speed of 50.0 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 60.0 mph.

A non-linear (P-delta) analysis was used.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	24.00-10.00	14.00	P36x1/2	A53-B-42 (42 ksi)	
L2	10.00-0.00	10.00	P42x7/16	A53-B-42 (42 ksi)	

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 24.00-10.00				1	1	1			
L2 10.00-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf	
12X24 Hybrid Cable	D	No	Yes	Inside Pole	24.00 - 0.00	1	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	3.20 3.20 3.20
***** 1 5/8	D	No	Yes	Inside Pole	24.00 - 0.00	10	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.04 1.04 1.04

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	2 of 9
	Project	24 ft Monopole	Date	09:38:26 04/26/23
	Client	VERIZON	Designed by	RL

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	24.00-10.00	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	0.000	0.00
		D	0.000	0.000	0.000	0.000	190.40
L2	10.00-0.00	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	0.000	0.00
		D	0.000	0.000	0.000	0.000	136.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	24.00-10.00	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	0.000	0.00
		D		0.000	0.000	0.000	0.000	190.40
L2	10.00-0.00	A	0.828	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	0.000	0.00
		D		0.000	0.000	0.000	0.000	136.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	
24"x42' Pipe	C	From Centroid-Le g	0.00	0.0000	48.00	No Ice	93.33	93.33	5778.00
			0.00			1/2" Ice	95.86	95.86	6422.49
			0.00			1" Ice	98.39	98.39	7095.23
(2) W30x108 Beams	C	From Centroid-Le g	0.00	0.0000	25.50	No Ice	12.60	12.60	756.00
			0.00			1/2" Ice	13.04	13.04	915.09
			0.00			1" Ice	13.48	13.48	1082.15

3'-6" Face Horizontal	A	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	A	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			-1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	B	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	B	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			-1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	C	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			1.59			1" Ice	1.50	0.19	43.26

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	3 of 9
	Project	24 ft Monopole	Date	09:38:26 04/26/23
	Client	VERIZON	Designed by	RL

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight lb
3'-6" Face Horizontal	C	From Face	1.50 0.00 -1.59	0.0000	67.00	No Ice 1.05 1/2" Ice 1.27 1" Ice 1.50	0.10 0.14 0.19	20.30 30.29 43.26
3'-6" Face Horizontal	D	From Face	1.50 0.00 1.59	0.0000	67.00	No Ice 1.05 1/2" Ice 1.27 1" Ice 1.50	0.10 0.14 0.19	20.30 30.29 43.26
3'-6" Face Horizontal	D	From Face	1.50 0.00 -1.59	0.0000	67.00	No Ice 1.05 1/2" Ice 1.27 1" Ice 1.50	0.10 0.14 0.19	20.30 30.29 43.26
JAHH-45B-R3B Antenna w/Mounting Pipe	D	From Face	3.00 2.50 0.00	0.0000	67.00	No Ice 11.40 1/2" Ice 11.89 1" Ice 12.38	6.71 7.66 8.49	113.90 195.38 285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	D	From Face	3.00 1.00 0.00	0.0000	67.00	No Ice 11.40 1/2" Ice 11.89 1" Ice 12.38	6.71 7.66 8.49	113.90 195.38 285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	A	From Face	3.00 2.50 0.00	0.0000	67.00	No Ice 11.40 1/2" Ice 11.89 1" Ice 12.38	6.71 7.66 8.49	113.90 195.38 285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	A	From Face	3.00 1.00 0.00	0.0000	67.00	No Ice 11.40 1/2" Ice 11.89 1" Ice 12.38	6.71 7.66 8.49	113.90 195.38 285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	B	From Face	3.00 2.50 0.00	0.0000	67.00	No Ice 11.40 1/2" Ice 11.89 1" Ice 12.38	6.71 7.66 8.49	113.90 195.38 285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	B	From Face	3.00 1.00 0.00	0.0000	67.00	No Ice 11.40 1/2" Ice 11.89 1" Ice 12.38	6.71 7.66 8.49	113.90 195.38 285.02
MT6407-77A Antenna w/Mounting Pipe	D	From Face	3.00 -1.50 0.00	0.0000	67.00	No Ice 4.94 1/2" Ice 5.30 1" Ice 5.66	2.71 3.17 3.66	101.70 141.68 186.81
MT6407-77A Antenna w/Mounting Pipe	A	From Face	3.00 -1.50 0.00	0.0000	67.00	No Ice 4.94 1/2" Ice 5.30 1" Ice 5.66	2.71 3.17 3.66	101.70 141.68 186.81
MT6407-77A Antenna w/Mounting Pipe	B	From Face	3.00 -1.50 0.00	0.0000	67.00	No Ice 4.94 1/2" Ice 5.30 1" Ice 5.66	2.71 3.17 3.66	101.70 141.68 186.81
7'x2" Antenna Mount Pipe	D	From Face	2.00 0.00 0.00	0.0000	60.00	No Ice 1.66 1/2" Ice 2.39 1" Ice 2.83	1.66 2.39 2.83	26.00 38.58 55.84
7'x2" Antenna Mount Pipe	A	From Face	2.00 0.00 0.00	0.0000	60.00	No Ice 1.66 1/2" Ice 2.39 1" Ice 2.83	1.66 2.39 2.83	26.00 38.58 55.84
7'x2" Antenna Mount Pipe	B	From Face	2.00 0.00 0.00	0.0000	60.00	No Ice 1.66 1/2" Ice 2.39 1" Ice 2.83	1.66 2.39 2.83	26.00 38.58 55.84
B2/B66A RRH ORAN RRH	D	From Face	2.00 0.00 2.00	0.0000	60.00	No Ice 1.87 1/2" Ice 2.03 1" Ice 2.21	1.25 1.39 1.54	74.70 93.02 114.12
B2/B66A RRH ORAN RRH	A	From Face	2.00 0.00 2.00	0.0000	60.00	No Ice 1.87 1/2" Ice 2.03 1" Ice 2.21	1.25 1.39 1.54	74.70 93.02 114.12
B2/B66A RRH ORAN RRH	B	From Face	2.00 0.00 2.00	0.0000	60.00	No Ice 1.87 1/2" Ice 2.03 1" Ice 2.21	1.25 1.39 1.54	74.70 93.02 114.12
B5/B13 RRH ORAN RRH	D	From Face	2.00 0.00 0.00	0.0000	60.00	No Ice 1.87 1/2" Ice 2.03 1" Ice 2.21	1.13 1.27 1.41	70.33 87.65 107.70

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	Project	24 ft Monopole	Date	09:38:26 04/26/23
	Client	VERIZON	Designed by	RL

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			ft ft ft	°	ft	ft ²	ft ²	lb
B5/B13 RRH ORAN RRH	A	From Face	2.00 0.00 0.00	0.0000	60.00	No Ice 1.87 1/2" Ice 2.03 1" Ice 2.21	1.13 1.27 1.41	70.33 87.65 107.70
B5/B13 RRH ORAN RRH	B	From Face	2.00 0.00 0.00	0.0000	60.00	No Ice 1.87 1/2" Ice 2.03 1" Ice 2.21	1.13 1.27 1.41	70.33 87.65 107.70
CBC78T-DS-43-2X Diplexer	D	From Face	2.00 0.00 -2.00	0.0000	60.00	No Ice 0.56 1/2" Ice 0.65 1" Ice 0.76	0.52 0.61 0.71	21.00 27.39 35.46
CBC78T-DS-43-2X Diplexer	A	From Face	2.00 0.00 -2.00	0.0000	60.00	No Ice 0.56 1/2" Ice 0.65 1" Ice 0.76	0.52 0.61 0.71	21.00 27.39 35.46
CBC78T-DS-43-2X Diplexer	B	From Face	2.00 0.00 -2.00	0.0000	60.00	No Ice 0.56 1/2" Ice 0.65 1" Ice 0.76	0.52 0.61 0.71	21.00 27.39 35.46
OVP Box	D	From Face	2.00 0.00 -2.00	0.0000	60.00	No Ice 3.78 1/2" Ice 4.03 1" Ice 4.29	2.51 2.72 2.94	32.00 63.40 98.56

24" Torsion Pipe	C	From Centroid-Le g	0.00 0.00 0.00	0.0000	25.50	No Ice 100.80 1/2" Ice 103.74 1" Ice 106.68	4.80 5.07 5.35	3977.70 4798.29 5654.85
(2) 14'x48' Billborad	C	From Face	0.00 0.00 10.00	0.0000	25.50	No Ice 1238.00 1/2" Ice 1243.04 1" Ice 1247.68	78.12 79.76 81.40	45000.00 50654.87 56365.93

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 45 deg - No Ice
5	0.9 Dead+1.0 Wind 45 deg - No Ice
6	1.2 Dead+1.0 Wind 90 deg - No Ice
7	0.9 Dead+1.0 Wind 90 deg - No Ice
8	1.2 Dead+1.0 Wind 135 deg - No Ice
9	0.9 Dead+1.0 Wind 135 deg - No Ice
10	1.2 Dead+1.0 Wind 180 deg - No Ice
11	0.9 Dead+1.0 Wind 180 deg - No Ice
12	1.2 Dead+1.0 Wind 225 deg - No Ice
13	0.9 Dead+1.0 Wind 225 deg - No Ice
14	1.2 Dead+1.0 Wind 270 deg - No Ice
15	0.9 Dead+1.0 Wind 270 deg - No Ice
16	1.2 Dead+1.0 Wind 315 deg - No Ice
17	0.9 Dead+1.0 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp

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	Project	24 ft Monopole	Date	09:38:26 04/26/23
	Client	VERIZON	Designed by	RL

Comb. No.	Description
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	24	92501.12	5086.56	-1491.18
	Max. H _x	15	55977.72	43611.85	1403.72
	Max. H _z	2	74636.95	1403.72	12075.58
	Max. M _x	2	526414.90	1403.72	12075.58
	Max. M _z	6	1716916.66	-43611.85	-1403.72
	Max. Torsion	6	1000.68	-43611.85	-1403.72
	Min. Vert	3	55977.72	1403.72	12075.58
	Min. H _x	6	74636.95	-43611.85	-1403.72
	Min. H _z	10	74636.95	-1403.72	-12075.58
	Min. M _x	10	-526090.00	-1403.72	-12075.58
	Min. M _z	15	-1575609.30	43611.85	1403.72
	Min. Torsion	16	-955.30	31830.81	9531.30

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	62197.46	0.00	0.00	-135.12	-65842.11	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	74636.95	-1403.72	-12075.58	-526414.90	-43134.44	156.49
0.9 Dead+1.0 Wind 0 deg - No Ice	55977.72	-1403.72	-12075.58	-525383.82	-23263.78	127.24
1.2 Dead+1.0 Wind 45 deg - No Ice	74636.95	29845.66	-7546.15	-346809.84	-1211771.15	-851.23
0.9 Dead+1.0 Wind 45 deg - No Ice	55977.72	29845.66	-7546.15	-346108.13	-1189804.68	-868.53
1.2 Dead+1.0 Wind 90 deg - No Ice	74636.95	43611.85	1403.72	35851.80	-1716916.66	-1000.68
0.9 Dead+1.0 Wind 90 deg - No Ice	55977.72	43611.85	1403.72	35837.27	-1694050.08	-996.59
1.2 Dead+1.0 Wind 135 deg - No Ice	74636.95	31830.81	9531.30	397417.13	-1262702.22	-479.51
0.9 Dead+1.0 Wind 135 deg - No Ice	55977.72	31830.81	9531.30	396718.84	-1240657.45	-456.59
1.2 Dead+1.0 Wind 180 deg - No Ice	74636.95	1403.72	12075.58	526090.00	-115164.73	-69.71
0.9 Dead+1.0 Wind 180 deg - No Ice	55977.72	1403.72	12075.58	525140.72	-95183.23	-40.63
1.2 Dead+1.0 Wind 225 deg - No Ice	74636.95	-29845.66	7546.15	346486.04	1053475.91	263.70
0.9 Dead+1.0 Wind 225 deg - No Ice	55977.72	-29845.66	7546.15	345865.85	1071360.59	282.12
1.2 Dead+1.0 Wind 270 deg - No Ice	74636.95	-43611.85	-1403.72	-36176.66	1558625.86	802.18
0.9 Dead+1.0 Wind 270 deg - No Ice	55977.72	-43611.85	-1403.72	-36080.34	1575609.30	798.47
1.2 Dead+1.0 Wind 315 deg - No Ice	74636.95	-31830.81	-9531.30	-397743.08	1104407.49	955.30
0.9 Dead+1.0 Wind 315 deg - No Ice	55977.72	-31830.81	-9531.30	-396962.73	1122213.74	931.46
1.2 Dead+1.0 Ice+1.0 Temp	92501.12	0.00	-0.00	-428.63	-94101.07	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	92501.12	-236.75	-2345.60	-97464.67	-88026.68	-121.29
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	92501.12	5086.56	-1491.18	-64745.58	-285624.43	-201.85
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	92501.12	7430.24	236.75	5654.74	-371033.54	-153.76
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	92501.12	5421.39	1826.00	72491.47	-294227.69	-13.07
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	92501.12	236.75	2345.60	96607.34	-100192.88	123.95
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	92501.12	-5086.56	1491.18	63884.75	97389.33	184.88

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	6 of 9
	Project	24 ft Monopole	Date	09:38:26 04/26/23
	Client	VERIZON	Designed by	RL

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	92501.12	-7430.24	-236.75	-6512.12	182803.79	148.02
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	92501.12	-5421.39	-1826.00	-73344.89	105992.14	26.97
Dead+Wind 0 deg - Service	62197.46	-289.37	-2489.35	-108479.40	-58435.44	21.00
Dead+Wind 45 deg - Service	62197.46	6152.60	-1555.62	-71504.45	-299060.42	-129.86
Dead+Wind 90 deg - Service	62197.46	8990.47	289.37	7281.59	-403074.08	-189.51
Dead+Wind 135 deg - Service	62197.46	6561.84	1964.85	81723.01	-309549.24	-134.57
Dead+Wind 180 deg - Service	62197.46	289.37	2489.35	108209.12	-73268.38	-17.34
Dead+Wind 225 deg - Service	62197.46	-6152.60	1555.62	71234.20	167351.80	104.95
Dead+Wind 270 deg - Service	62197.46	-8990.47	-289.37	-7551.88	271365.62	181.10
Dead+Wind 315 deg - Service	62197.46	-6561.84	-1964.85	-81993.34	177840.65	154.74

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	-62197.46	0.00	-0.00	62197.46	0.00	0.000%
2	-1403.72	-74636.95	-12075.58	1403.72	74636.95	12075.58	0.000%
3	-1403.72	-55977.72	-12075.58	1403.72	55977.72	12075.58	0.000%
4	29845.66	-74636.95	-7546.15	-29845.66	74636.95	7546.15	0.000%
5	29845.66	-55977.72	-7546.15	-29845.66	55977.72	7546.15	0.000%
6	43611.85	-74636.95	1403.72	-43611.85	74636.95	-1403.72	0.000%
7	43611.85	-55977.72	1403.72	-43611.85	55977.72	-1403.72	0.000%
8	31830.81	-74636.95	9531.30	-31830.81	74636.95	-9531.30	0.000%
9	31830.81	-55977.72	9531.30	-31830.81	55977.72	-9531.30	0.000%
10	1403.72	-74636.95	12075.58	-1403.72	74636.95	-12075.58	0.000%
11	1403.72	-55977.72	12075.58	-1403.72	55977.72	-12075.58	0.000%
12	-29845.66	-74636.95	7546.15	29845.66	74636.95	-7546.15	0.000%
13	-29845.66	-55977.72	7546.15	29845.66	55977.72	-7546.15	0.000%
14	-43611.85	-74636.95	-1403.72	43611.85	74636.95	1403.72	0.000%
15	-43611.85	-55977.72	-1403.72	43611.85	55977.72	1403.72	0.000%
16	-31830.81	-74636.95	-9531.30	31830.81	74636.95	9531.30	0.000%
17	-31830.81	-55977.72	-9531.30	31830.81	55977.72	9531.30	0.000%
18	0.00	-92501.12	0.00	-0.00	92501.12	0.00	0.000%
19	-236.75	-92501.12	-2345.60	236.75	92501.12	2345.60	0.000%
20	5086.56	-92501.12	-1491.18	-5086.56	92501.12	1491.18	0.000%
21	7430.24	-92501.12	236.75	-7430.24	92501.12	-236.75	0.000%
22	5421.38	-92501.12	1826.00	-5421.39	92501.12	-1826.00	0.000%
23	236.75	-92501.12	2345.60	-236.75	92501.12	-2345.60	0.000%
24	-5086.56	-92501.12	1491.18	5086.56	92501.12	-1491.18	0.000%
25	-7430.24	-92501.12	-236.75	7430.24	92501.12	236.75	0.000%
26	-5421.38	-92501.12	-1826.00	5421.39	92501.12	1826.00	0.000%
27	-289.37	-62197.46	-2489.35	289.37	62197.46	2489.35	0.000%
28	6152.60	-62197.46	-1555.62	-6152.60	62197.46	1555.62	0.000%
29	8990.47	-62197.46	289.37	-8990.47	62197.46	-289.37	0.000%
30	6561.84	-62197.46	1964.85	-6561.84	62197.46	-1964.85	0.000%
31	289.37	-62197.46	2489.35	-289.37	62197.46	-2489.35	0.000%
32	-6152.60	-62197.46	1555.62	6152.60	62197.46	-1555.62	0.000%
33	-8990.47	-62197.46	-289.37	8990.47	62197.46	289.37	0.000%
34	-6561.84	-62197.46	-1964.85	6561.84	62197.46	1964.85	0.000%

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	7 of 9
	Project	24 ft Monopole	Date	09:38:26 04/26/23
	Client	VERIZON	Designed by	RL

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000517
5	Yes	4	0.00000001	0.00000301
6	Yes	4	0.00000001	0.00000482
7	Yes	4	0.00000001	0.00000247
8	Yes	4	0.00000001	0.00000510
9	Yes	4	0.00000001	0.00000287
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000394
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000428
15	Yes	4	0.00000001	0.00000229
16	Yes	4	0.00000001	0.00000459
17	Yes	4	0.00000001	0.00000278
18	Yes	4	0.00000001	0.00000429
19	Yes	4	0.00000001	0.00000540
20	Yes	4	0.00000001	0.00001111
21	Yes	4	0.00000001	0.00001372
22	Yes	4	0.00000001	0.00001139
23	Yes	4	0.00000001	0.00000565
24	Yes	4	0.00000001	0.00000322
25	Yes	4	0.00000001	0.00000513
26	Yes	4	0.00000001	0.00000359
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	24 - 10	0.5129	29	0.1963	0.0002
L2	10 - 0	0.0901	29	0.0826	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
67.00	3'-6" Face Horizontal	29	0.5129	0.1963	0.0002	12689
60.00	7'x2" Antenna Mount Pipe	29	0.5129	0.1963	0.0002	12689
48.00	24"x42' Pipe	29	0.5129	0.1963	0.0002	12689
25.50	(2) W30x108 Beams	29	0.5129	0.1963	0.0002	12689

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job EAST HAVEN 5 CT	Page 8 of 9
	Project 24 ft Monopole	Date 09:38:26 04/26/23
	Client VERIZON	Designed by RL

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	24 - 10	2.1106	6	0.7891	0.0008
L2	10 - 0	0.3796	6	0.3458	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
67.00	3'-6" Face Horizontal	6	2.1106	0.7891	0.0009	3138
60.00	7'x2" Antenna Mount Pipe	6	2.1106	0.7891	0.0009	3138
48.00	24"x42' Pipe	6	2.1106	0.7891	0.0009	3138
25.50	(2) W30x108 Beams	6	2.1106	0.7891	0.0009	3138

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	24 - 10 (1)	P36x1/2	14.00	0.00	0.0	55.7633	-71864.60	2107850.00	0.034
L2	10 - 0 (2)	P42x7/16	10.00	0.00	0.0	57.1254	-74622.00	2028190.00	0.037

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} lb-ft	φM _{ux} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} lb-ft	φM _{uy} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	24 - 10 (1)	P36x1/2	1281750.00	1842816.67	0.696	0.00	1842816.67	0.000
L2	10 - 0 (2)	P42x7/16	1717291.67	2125975.00	0.808	0.00	2125975.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u lb	φV _n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u lb-ft	φT _n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	24 - 10 (1)	P36x1/2	43480.90	632356.00	0.069	1000.65	1973650.00	0.001
L2	10 - 0 (2)	P42x7/16	43660.00	647803.00	0.067	1000.63	2367141.67	0.000

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job EAST HAVEN 5 CT	Page 9 of 9
	Project 24 ft Monopole	Date 09:38:26 04/26/23
	Client VERIZON	Designed by RL

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	24 - 10 (1)	0.034	0.696	0.000	0.069	0.001	0.734	1.000	4.8.2 ✓
L2	10 - 0 (2)	0.037	0.808	0.000	0.067	0.000	0.849	1.000	4.8.2 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail	
L1	24 - 10	Pole	P36x1/2	1	-71864.60	2107850.00	73.4	Pass	
L2	10 - 0	Pole	P42x7/16	2	-74622.00	2028190.00	84.9	Pass	
							Summary		
							Pole (L2)	84.9	Pass
							RATING =	84.9	Pass

Monopole Base Plate Connection @ 24'

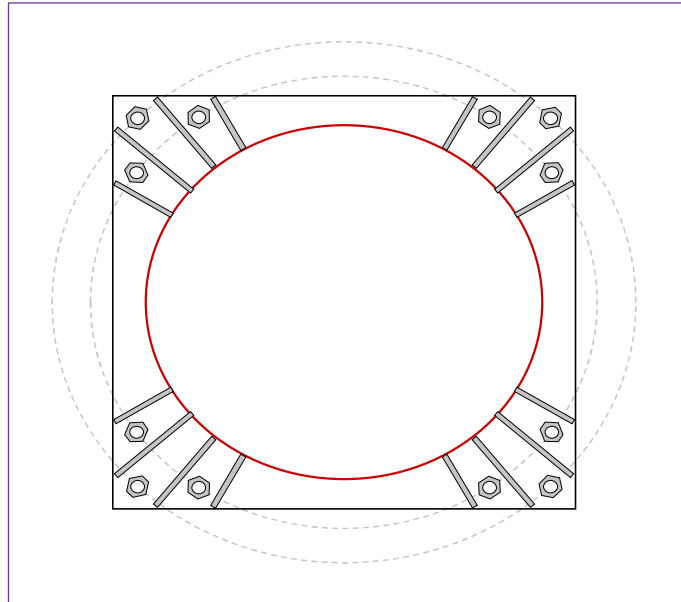


Site Info	
BU #	324908
Site Name	East Haven 5 CT
Rev.	7

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
I_{ar} (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	614.99
Axial Force (kips)	68.50
Shear Force (kips)	40.60

*TIA-222-H Section 15.5 Applied



Connection Properties Analysis Results

Anchor Rod Data	
GROUP 1:	(4) 1-1/4" ϕ bolts (A325 N; $F_y=81$ ksi, $F_u=105$ ksi) on 53" BC
GROUP 2:	(8) 1-1/4" ϕ bolts (A325 N; $F_y=81$ ksi, $F_u=105$ ksi) on 46" BC

Base Plate Data	
42" W x 1" Plate (A36; $F_y=36$ ksi, $F_u=58$ ksi); Clip: 0 in	

Stiffener Data	
Group 1:	(8) 10"H x 6"W x 0.5"T, Notch: 0.25"
plate: $F_y=36$ ksi ; weld: $F_y=70$ ksi	
horiz. weld: 0.25" fillet	
vert. weld: 0.25" fillet	

Group 2:	(8) 10"H x 9"W x 0.5"T, Notch: 0.25"
plate: $F_y=36$ ksi ; weld: $F_y=70$ ksi	
horiz. weld: 0.25" fillet	
vert. weld: 0.25" fillet	

Pole Data	
36" x 0.5" round pole (A36; $F_y=36$ ksi, $F_u=58$ ksi)	

Anchor Rod Summary (units of kips, kip-in)		
GROUP 1:		
$P_u_c = 61.24$	$\phi P_n_c = 89.46$	Stress Rating
$V_u = 3.38$	$\phi V_n = 40.26$	65.9%
$M_u = n/a$	$\phi M_n = n/a$	Pass
GROUP 2:		
$P_u_c = 53.91$	$\phi P_n_c = 89.46$	Stress Rating
$V_u = 3.38$	$\phi V_n = 40.26$	58.1%
$M_u = n/a$	$\phi M_n = n/a$	Pass

Base Plate Summary		
Max Stress (ksi):	22.65	(Roark's Flexural)
Allowable Stress (ksi):	32.4	
Stress Rating:	66.6%	Pass

Stiffener Summary		
Horizontal Weld:	40.9%	Pass
Vertical Weld:	50.7%	Pass
Plate Flexure+Shear:	38.2%	Pass
Plate Tension+Shear:	29.1%	Pass
Plate Compression:	87.5%	Pass
Pole Summary		
Punching Shear:	21.0%	Pass

CCIplate

Elevation (ft) 0 (Base)

note: Bending interaction not considered when Grout Considered = "Yes"
Grout Considered = "Yes" when Eta > 0.5

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	
2	Yes	Yes	Yes	No	No	

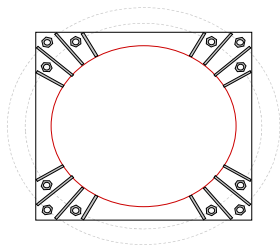
Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, n:	I_p (in):	Thread Type	Area Override, in ²	Tension Only
1	1	45	1.25	A325	53	0.5	0	N-Included		No
2	1	135	1.25	A325	53	0.5	0	N-Included		No
3	1	225	1.25	A325	53	0.5	0	N-Included		No
4	1	315	1.25	A325	53	0.5	0	N-Included		No
5	2	35	1.25	A325	46	0.5	0	N-Included		No
6	2	125	1.25	A325	46	0.5	0	N-Included		No
7	2	215	1.25	A325	46	0.5	0	N-Included		No
8	2	305	1.25	A325	46	0.5	0	N-Included		No
9	2	55	1.25	A325	46	0.5	0	N-Included		No
10	2	145	1.25	A325	46	0.5	0	N-Included		No
11	2	235	1.25	A325	46	0.5	0	N-Included		No
12	2	325	1.25	A325	46	0.5	0	N-Included		No

Custom Stiffener Connection

Stiffener	Stiffener Group ID	Location (deg.)	Width (in)	Height (in)	Thickness (in)	H. Notch (in)	V. Notch (in)	Grade (ksi)	Weld Type	Groove Depth (in)	Groove Angle (deg.)	H. Fillet Weld Size (in)	V. Fillet Weld Size (in)	Weld Strength (ksi)
1	1	30	6	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
2	1	60	6	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
3	1	120	6	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
4	1	150	6	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
5	1	210	6	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
6	1	240	6	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
7	1	300	6	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
8	1	330	6	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
9	2	40	9	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
10	2	50	9	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
11	2	130	9	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
12	2	140	9	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
13	2	220	9	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
14	2	230	9	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
15	2	310	9	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
16	2	320	9	10	0.5	0.25	0.25	36	Fillet			0.25	0.25	70

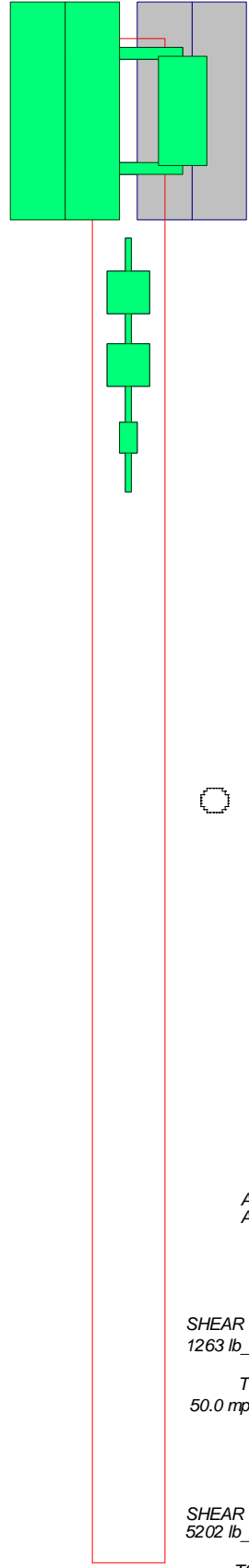
Plot Graphic





PROPOSED EXTENSION

Section	1
Size	P24x1/2
Length (ft)	42.00
Grade	A53-B-42
Weight (lb)	5275.6
	69.0 ft
	27.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
3'-6" Face Horizontal	67	MT6407-77A Antenna w/ Mounting Pipe	67
3'-6" Face Horizontal	67	MT6407-77A Antenna w/ Mounting Pipe	67
3'-6" Face Horizontal	67	MT6407-77A Antenna w/ Mounting Pipe	67
3'-6" Face Horizontal	67	MT6407-77A Antenna w/ Mounting Pipe	67
3'-6" Face Horizontal	67	7x2" Antenna Mount Pipe	60
3'-6" Face Horizontal	67	7x2" Antenna Mount Pipe	60
3'-6" Face Horizontal	67	7x2" Antenna Mount Pipe	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	B2/B66A RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	B2/B66A RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	B2/B66A RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	B5/B13 RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	B5/B13 RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	B5/B13 RRH ORAN RRH	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	CBC78T-DS-43-2X Diplexer	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	CBC78T-DS-43-2X Diplexer	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	CBC78T-DS-43-2X Diplexer	60
JAHH-45B-R3B Antenna w/Mounting Pipe	67	OVP Box	60

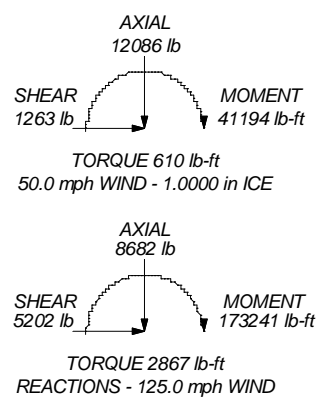
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125.0 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 20.6%

ALL REACTIONS ARE FACTORED



TEP Northeast		Job: EAST HAVEN 5 CT	
45 Beechwood Drive		Project: 42 ft Monopole Extension	
North Andover, MA 01845		Client: VERIZON	Drawn by: RL
TEP Northeast	Phone: (978) 557-5553	Code: TIA-222-H	Date: 04/26/23
	FAX:	Path:	Scale: NTS
			Dwg No. E-1

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	1 of 8
	Project	42 ft Monopole Extension	Date	10:01:19 04/26/23
	Client	VERIZON	Designed by	RL

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Tower base elevation above sea level: 69.00 ft.

Basic wind speed of 125.0 mph.

Risk Category II.

Exposure Category B.

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 56.0 pcf.

A wind speed of 50.0 mph is used in combination with ice.

Temperature drop of 50.0 °F.

Deflections calculated using a wind speed of 60.0 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Pole Size	Pole Grade	Socket Length <i>ft</i>
L1	69.00-27.00	42.00	P24x1/2	A53-B-42 (42 ksi)	

Tower Elevation <i>ft</i>	Gusset Area (per face) <i>ft²</i>	Gusset Thickness <i>in</i>	Gusset Grade	Adjust. Factor <i>A_f</i>	Adjust. Factor <i>A_r</i>	Weight Mult.	Double Angle Stitch Bolt Spacing <i>Diagonals</i> <i>in</i>	Double Angle Stitch Bolt Spacing <i>Horizontals</i> <i>in</i>	Double Angle Stitch Bolt Spacing <i>Redundants</i> <i>in</i>
L1 69.00-27.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement <i>ft</i>	Total Number	<i>C_AA_A</i> <i>ft²/ft</i>	Weight <i>plf</i>
12X24 Hybrid Cable	D	No	Yes	Inside Pole	67.00 - 27.00	1	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00	3.20 3.20 3.20

1 5/8	D	No	Yes	Inside Pole	34.00 - 27.00	10	No Ice 0.00 1/2" Ice 0.00 1" Ice 0.00	1.04 1.04 1.04

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	2 of 8
	Project	42 ft Monopole Extension	Date	10:01:19 04/26/23
	Client	VERIZON	Designed by	RL

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	69.00-27.00	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	0.000	0.00
		D	0.000	0.000	0.000	0.000	200.80

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	69.00-27.00	A	1.040	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	0.000	0.00
		D		0.000	0.000	0.000	0.000	200.80

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb	
3'-6" Face Horizontal	A	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	A	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			-1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	B	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	B	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			-1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	C	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	C	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			-1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	D	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			1.59			1" Ice	1.50	0.19	43.26
3'-6" Face Horizontal	D	From Face	1.50	0.0000	67.00	No Ice	1.05	0.10	20.30
			0.00			1/2" Ice	1.27	0.14	30.29
			-1.59			1" Ice	1.50	0.19	43.26
JAHH-45B-R3B Antenna w/Mounting Pipe	D	From Face	3.00	0.0000	67.00	No Ice	11.40	6.71	113.90
			2.50			1/2" Ice	11.89	7.66	195.38
			0.00			1" Ice	12.38	8.49	285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	D	From Face	3.00	0.0000	67.00	No Ice	11.40	6.71	113.90
			1.00			1/2" Ice	11.89	7.66	195.38
			0.00			1" Ice	12.38	8.49	285.02

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	3 of 8
	Project	42 ft Monopole Extension	Date	10:01:19 04/26/23
	Client	VERIZON	Designed by	RL

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA		Weight
			Horz	Vert			Front	Side	
			ft	ft	°	ft	ft ²	ft ²	lb
JAHH-45B-R3B Antenna w/Mounting Pipe	A	From Face	3.00	0.0000	67.00	No Ice	11.40	6.71	113.90
			2.50			1/2" Ice	11.89	7.66	195.38
			0.00			1" Ice	12.38	8.49	285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	A	From Face	3.00	0.0000	67.00	No Ice	11.40	6.71	113.90
			1.00			1/2" Ice	11.89	7.66	195.38
			0.00			1" Ice	12.38	8.49	285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	B	From Face	3.00	0.0000	67.00	No Ice	11.40	6.71	113.90
			2.50			1/2" Ice	11.89	7.66	195.38
			0.00			1" Ice	12.38	8.49	285.02
JAHH-45B-R3B Antenna w/Mounting Pipe	B	From Face	3.00	0.0000	67.00	No Ice	11.40	6.71	113.90
			1.00			1/2" Ice	11.89	7.66	195.38
			0.00			1" Ice	12.38	8.49	285.02
MT6407-77A Antenna w/Mounting Pipe	D	From Face	3.00	0.0000	67.00	No Ice	4.94	2.71	101.70
			-1.50			1/2" Ice	5.30	3.17	141.68
			0.00			1" Ice	5.66	3.66	186.81
MT6407-77A Antenna w/Mounting Pipe	A	From Face	3.00	0.0000	67.00	No Ice	4.94	2.71	101.70
			-1.50			1/2" Ice	5.30	3.17	141.68
			0.00			1" Ice	5.66	3.66	186.81
MT6407-77A Antenna w/Mounting Pipe	B	From Face	3.00	0.0000	67.00	No Ice	4.94	2.71	101.70
			-1.50			1/2" Ice	5.30	3.17	141.68
			0.00			1" Ice	5.66	3.66	186.81
7'x2" Antenna Mount Pipe	D	From Face	2.00	0.0000	60.00	No Ice	1.66	1.66	26.00
			0.00			1/2" Ice	2.39	2.39	38.58
			0.00			1" Ice	2.83	2.83	55.84
7'x2" Antenna Mount Pipe	A	From Face	2.00	0.0000	60.00	No Ice	1.66	1.66	26.00
			0.00			1/2" Ice	2.39	2.39	38.58
			0.00			1" Ice	2.83	2.83	55.84
7'x2" Antenna Mount Pipe	B	From Face	2.00	0.0000	60.00	No Ice	1.66	1.66	26.00
			0.00			1/2" Ice	2.39	2.39	38.58
			0.00			1" Ice	2.83	2.83	55.84
B2/B66A RRH ORAN RRH	D	From Face	2.00	0.0000	60.00	No Ice	1.87	1.25	74.70
			0.00			1/2" Ice	2.03	1.39	93.02
			2.00			1" Ice	2.21	1.54	114.12
B2/B66A RRH ORAN RRH	A	From Face	2.00	0.0000	60.00	No Ice	1.87	1.25	74.70
			0.00			1/2" Ice	2.03	1.39	93.02
			2.00			1" Ice	2.21	1.54	114.12
B2/B66A RRH ORAN RRH	B	From Face	2.00	0.0000	60.00	No Ice	1.87	1.25	74.70
			0.00			1/2" Ice	2.03	1.39	93.02
			2.00			1" Ice	2.21	1.54	114.12
B5/B13 RRH ORAN RRH	D	From Face	2.00	0.0000	60.00	No Ice	1.87	1.13	70.33
			0.00			1/2" Ice	2.03	1.27	87.65
			0.00			1" Ice	2.21	1.41	107.70
B5/B13 RRH ORAN RRH	A	From Face	2.00	0.0000	60.00	No Ice	1.87	1.13	70.33
			0.00			1/2" Ice	2.03	1.27	87.65
			0.00			1" Ice	2.21	1.41	107.70
B5/B13 RRH ORAN RRH	B	From Face	2.00	0.0000	60.00	No Ice	1.87	1.13	70.33
			0.00			1/2" Ice	2.03	1.27	87.65
			0.00			1" Ice	2.21	1.41	107.70
CBC78T-DS-43-2X Diplexer	D	From Face	2.00	0.0000	60.00	No Ice	0.56	0.52	21.00
			0.00			1/2" Ice	0.65	0.61	27.39
			-2.00			1" Ice	0.76	0.71	35.46
CBC78T-DS-43-2X Diplexer	A	From Face	2.00	0.0000	60.00	No Ice	0.56	0.52	21.00
			0.00			1/2" Ice	0.65	0.61	27.39
			-2.00			1" Ice	0.76	0.71	35.46
CBC78T-DS-43-2X Diplexer	B	From Face	2.00	0.0000	60.00	No Ice	0.56	0.52	21.00
			0.00			1/2" Ice	0.65	0.61	27.39
			-2.00			1" Ice	0.76	0.71	35.46

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	4 of 8
	Project	42 ft Monopole Extension	Date	10:01:19 04/26/23
	Client	VERIZON	Designed by	RL

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz Lateral	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
OVP Box	D	From Face	2.00	0.0000	60.00	No Ice	3.78	2.51	32.00
			0.00			1/2" Ice	4.03	2.72	63.40
			-2.00			1" Ice	4.29	2.94	98.56

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 45 deg - No Ice
5	0.9 Dead+1.0 Wind 45 deg - No Ice
6	1.2 Dead+1.0 Wind 90 deg - No Ice
7	0.9 Dead+1.0 Wind 90 deg - No Ice
8	1.2 Dead+1.0 Wind 135 deg - No Ice
9	0.9 Dead+1.0 Wind 135 deg - No Ice
10	1.2 Dead+1.0 Wind 180 deg - No Ice
11	0.9 Dead+1.0 Wind 180 deg - No Ice
12	1.2 Dead+1.0 Wind 225 deg - No Ice
13	0.9 Dead+1.0 Wind 225 deg - No Ice
14	1.2 Dead+1.0 Wind 270 deg - No Ice
15	0.9 Dead+1.0 Wind 270 deg - No Ice
16	1.2 Dead+1.0 Wind 315 deg - No Ice
17	0.9 Dead+1.0 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	18	12086.46	0.00	0.00
	Max. H _x	15	6511.86	4679.93	0.00
	Max. H _z	2	8682.48	0.00	5202.04
	Max. M _x	2	173225.54	0.00	5202.04
	Max. M _z	7	150890.42	-4679.93	0.00

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	5 of 8
	Project	42 ft Monopole Extension	Date	10:01:19 04/26/23
	Client	VERIZON	Designed by	RL

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. Torsion	2	2866.61	0.00	5202.04
	Min. Vert	7	6511.86	-4679.93	0.00
	Min. H _x	6	8682.48	-4679.93	0.00
	Min. H _z	10	8682.48	0.00	-5202.04
	Min. M _x	10	-172862.86	0.00	-5202.04
	Min. M _z	14	-155064.35	4679.93	0.00
	Min. Torsion	10	-2866.66	0.00	-5202.04

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
Dead Only	7235.40	0.00	0.00	-150.42	1897.92	0.02
1.2 Dead+1.0 Wind 0 deg - No Ice	8682.48	-0.00	-5202.04	-173225.54	2287.95	-2866.61
0.9 Dead+1.0 Wind 0 deg - No Ice	6511.86	-0.00	-5202.04	-172983.32	1713.09	-2865.08
1.2 Dead+1.0 Wind 45 deg - No Ice	8682.48	3309.21	-3678.39	-122542.14	-105741.05	-2685.13
0.9 Dead+1.0 Wind 45 deg - No Ice	6511.86	3309.21	-3678.39	-122357.54	-106193.80	-2683.81
1.2 Dead+1.0 Wind 90 deg - No Ice	8682.48	4679.93	-0.00	-181.30	-150488.23	-930.63
0.9 Dead+1.0 Wind 90 deg - No Ice	6511.86	4679.93	-0.00	-135.74	-150890.42	-930.31
1.2 Dead+1.0 Wind 135 deg - No Ice	8682.48	3309.21	3678.39	122179.50	-105741.00	1369.05
0.9 Dead+1.0 Wind 135 deg - No Ice	6511.86	3309.21	3678.39	122086.02	-106193.76	1368.17
1.2 Dead+1.0 Wind 180 deg - No Ice	8682.48	-0.00	5202.04	172862.86	2287.95	2866.66
0.9 Dead+1.0 Wind 180 deg - No Ice	6511.86	-0.00	5202.04	172711.78	1713.09	2865.10
1.2 Dead+1.0 Wind 225 deg - No Ice	8682.48	-3309.21	3678.39	122179.59	110317.01	2685.06
0.9 Dead+1.0 Wind 225 deg - No Ice	6511.86	-3309.21	3678.39	122086.08	109620.04	2683.73
1.2 Dead+1.0 Wind 270 deg - No Ice	8682.48	-4679.93	-0.00	-181.30	155064.35	930.67
0.9 Dead+1.0 Wind 270 deg - No Ice	6511.86	-4679.93	-0.00	-135.74	154316.78	930.34
1.2 Dead+1.0 Wind 315 deg - No Ice	8682.48	-3309.21	-3678.39	-122542.22	110317.06	-1368.89
0.9 Dead+1.0 Wind 315 deg - No Ice	6511.86	-3309.21	-3678.39	-122357.60	109620.07	-1368.03
1.2 Dead+1.0 Ice+1.0 Temp	12086.46	-0.00	-0.00	-483.16	4573.11	0.12
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	12086.46	-0.00	-1262.96	-39485.57	4578.18	-609.42
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	12086.46	841.26	-893.05	-28062.19	-21001.03	-541.64
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	12086.46	1189.72	-0.00	-483.70	-31596.28	-156.49
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	12086.46	841.26	893.05	27094.79	-21001.03	320.39
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	12086.46	-0.00	1262.96	38518.18	4578.18	609.67
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	12086.46	-841.26	893.05	27094.80	30157.38	541.88
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	12086.46	-1189.72	-0.00	-483.70	40752.64	156.74
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	12086.46	-841.26	-893.05	-28062.19	30157.39	-320.15
Dead+Wind 0 deg - Service	7235.40	0.00	-1072.39	-35795.78	1904.59	-590.74
Dead+Wind 45 deg - Service	7235.40	682.18	-758.29	-25355.65	-20348.04	-553.35
Dead+Wind 90 deg - Service	7235.40	964.76	0.00	-150.94	-29565.38	-191.80
Dead+Wind 135 deg - Service	7235.40	682.18	758.29	25053.76	-20348.04	282.11
Dead+Wind 180 deg - Service	7235.40	0.00	1072.39	35493.89	1904.59	590.78
Dead+Wind 225 deg - Service	7235.40	-682.18	758.29	25053.76	24157.22	553.38
Dead+Wind 270 deg - Service	7235.40	-964.76	0.00	-150.94	33374.56	191.83
Dead+Wind 315 deg - Service	7235.40	-682.18	-758.29	-25355.65	24157.22	-282.08

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	-7235.40	0.00	0.00	7235.40	0.00	0.000%
2	0.00	-8682.48	-5202.04	0.00	8682.48	5202.04	0.000%
3	0.00	-6511.86	-5202.04	0.00	6511.86	5202.04	0.000%

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	6 of 8
	Project	42 ft Monopole Extension	Date	10:01:19 04/26/23
	Client	VERIZON	Designed by	RL

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
4	3309.21	-8682.48	-3678.39	-3309.21	8682.48	3678.39	0.000%
5	3309.21	-6511.86	-3678.39	-3309.21	6511.86	3678.39	0.000%
6	4679.93	-8682.48	0.00	-4679.93	8682.48	0.00	0.000%
7	4679.93	-6511.86	0.00	-4679.93	6511.86	0.00	0.000%
8	3309.21	-8682.48	3678.39	-3309.21	8682.48	-3678.39	0.000%
9	3309.21	-6511.86	3678.39	-3309.21	6511.86	-3678.39	0.000%
10	0.00	-8682.48	5202.04	0.00	8682.48	-5202.04	0.000%
11	0.00	-6511.86	5202.04	0.00	6511.86	-5202.04	0.000%
12	-3309.21	-8682.48	3678.39	3309.21	8682.48	-3678.39	0.000%
13	-3309.21	-6511.86	3678.39	3309.21	6511.86	-3678.39	0.000%
14	-4679.93	-8682.48	0.00	4679.93	8682.48	0.00	0.000%
15	-4679.93	-6511.86	0.00	4679.93	6511.86	0.00	0.000%
16	-3309.21	-8682.48	-3678.39	3309.21	8682.48	3678.39	0.000%
17	-3309.21	-6511.86	-3678.39	3309.21	6511.86	3678.39	0.000%
18	0.00	-12086.46	0.00	0.00	12086.46	0.00	0.000%
19	0.00	-12086.46	-1262.96	0.00	12086.46	1262.96	0.000%
20	841.26	-12086.46	-893.05	-841.26	12086.46	893.05	0.000%
21	1189.72	-12086.46	0.00	-1189.72	12086.46	0.00	0.000%
22	841.26	-12086.46	893.05	-841.26	12086.46	-893.05	0.000%
23	0.00	-12086.46	1262.96	0.00	12086.46	-1262.96	0.000%
24	-841.26	-12086.46	893.05	841.26	12086.46	-893.05	0.000%
25	-1189.72	-12086.46	0.00	1189.72	12086.46	0.00	0.000%
26	-841.26	-12086.46	-893.05	841.26	12086.46	893.05	0.000%
27	0.00	-7235.40	-1072.39	0.00	7235.40	1072.39	0.000%
28	682.18	-7235.40	-758.29	-682.18	7235.40	758.29	0.000%
29	964.76	-7235.40	0.00	-964.76	7235.40	0.00	0.000%
30	682.18	-7235.40	758.29	-682.18	7235.40	-758.29	0.000%
31	0.00	-7235.40	1072.39	0.00	7235.40	-1072.39	0.000%
32	-682.18	-7235.40	758.29	682.18	7235.40	-758.29	0.000%
33	-964.76	-7235.40	0.00	964.76	7235.40	0.00	0.000%
34	-682.18	-7235.40	-758.29	682.18	7235.40	758.29	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.0000001	0.0000001
2	Yes	4	0.0000001	0.0000001
3	Yes	4	0.0000001	0.0000001
4	Yes	4	0.0000001	0.0000001
5	Yes	4	0.0000001	0.0000001
6	Yes	4	0.0000001	0.0000001
7	Yes	4	0.0000001	0.0000001
8	Yes	4	0.0000001	0.0000001
9	Yes	4	0.0000001	0.0000001
10	Yes	4	0.0000001	0.0000001
11	Yes	4	0.0000001	0.0000001
12	Yes	4	0.0000001	0.0000001
13	Yes	4	0.0000001	0.0000001
14	Yes	4	0.0000001	0.0000001
15	Yes	4	0.0000001	0.0000001
16	Yes	4	0.0000001	0.0000001
17	Yes	4	0.0000001	0.0000001
18	Yes	4	0.0000001	0.0000001
19	Yes	4	0.0000001	0.0000001
20	Yes	4	0.0000001	0.0000001
21	Yes	4	0.0000001	0.0000001
22	Yes	4	0.0000001	0.0000001
23	Yes	4	0.0000001	0.0000001

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	7 of 8
	Project	42 ft Monopole Extension	Date	10:01:19 04/26/23
	Client	VERIZON	Designed by	RL

24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	69 - 27	0.4533	27	0.0745	0.0033

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
67.00	3'-6" Face Horizontal	27	0.4317	0.0710	0.0032	Inf
60.00	7'x2" Antenna Mount Pipe	27	0.3562	0.0585	0.0026	Inf

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	69 - 27	2.1817	2	0.3546	0.0161

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
67.00	3'-6" Face Horizontal	2	2.0778	0.3377	0.0153	Inf
60.00	7'x2" Antenna Mount Pipe	2	1.7142	0.2786	0.0126	Inf

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	KL/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	69 - 27 (1)	P24x1/2	42.00	0.00	0.0	36.9137	-8680.67	1395340.00	0.006

tnxTower TEP Northeast 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX:	Job	EAST HAVEN 5 CT	Page	8 of 8
	Project	42 ft Monopole Extension	Date	10:01:19 04/26/23
	Client	VERIZON	Designed by	RL

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	69 - 27 (1)	P24x1/2	173240.83	869925.00	0.199	0.00	869925.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	69 - 27 (1)	P24x1/2	5205.05	418602.00	0.012	2866.60	864866.67	0.003

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	69 - 27 (1)	0.006	0.199	0.000	0.012	0.003	0.206	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail	
L1	69 - 27	Pole	P24x1/2	1	-8680.67	1395340.00	20.6	Pass	
							Summary		
							Pole (L1)	20.6	Pass
							RATING =	20.6	Pass

Monopole Base Plate Connection @ 27'

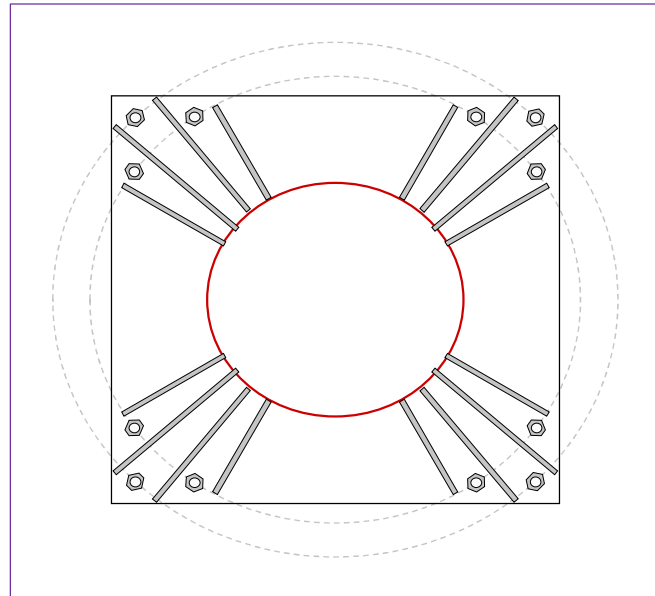


Site Info	
BU #	324908
Site Name	East Haven 5 CT
Rev.	7

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	See Custom Sheet
I_{ar} (in)	See Custom Sheet

Applied Loads	
Moment (kip-ft)	173.24
Axial Force (kips)	8.68
Shear Force (kips)	5.20

*TIA-222-H Section 15.5 Applied



Connection Properties Analysis Results

Anchor Rod Data

GROUP 1: (8) 1" ϕ bolts (A325 N; $F_y=92$ ksi, $F_u=120$ ksi) on 46" BC
Anchor Spacing: 4.009 in

GROUP 2: (4) 1" ϕ bolts (A325 N; $F_y=92$ ksi, $F_u=120$ ksi) on 53" BC

Base Plate Data

42" W x 2" Plate (A36; $F_y=36$ ksi, $F_u=58$ ksi); Clip: 0 in

Stiffener Data

Group 1: (8) 16"H x 11"W x 0.5"T, Notch: 0.25"
plate: $F_y=36$ ksi ; weld: $F_y=70$ ksi
horiz. weld: 0.25" fillet
vert. weld: 0.25" fillet

Group 2: (8) 16"H x 15"W x 0.5"T, Notch: 0.25"
plate: $F_y=36$ ksi ; weld: $F_y=70$ ksi
horiz. weld: 0.25" fillet
vert. weld: 0.25" fillet

Pole Data

24" x 0.5" round pole (A53-B-42; $F_y=42$ ksi, $F_u=63$ ksi)

Anchor Rod Summary			(units of kips, kip-in)
GROUP 1:			
$P_{u,t} = 12.86$	$\phi P_{n,t} = 54.54$	Stress Rating	
$V_u = 0.43$	$\phi V_n = 35.34$	22.4%	
$M_u = n/a$	$\phi M_n = n/a$	Pass	

GROUP 2:			
$P_{u,t} = 14.92$	$\phi P_{n,t} = 54.54$	Stress Rating	
$V_u = 0.43$	$\phi V_n = 35.34$	26.1%	
$M_u = n/a$	$\phi M_n = n/a$	Pass	

Base Plate Summary		
Max Stress (ksi):	0.33	(Shear)
Allowable Stress (ksi):	21.6	
Stress Rating:	1.5%	Pass

Stiffener Summary		
Horizontal Weld:	10.4%	Pass
Vertical Weld:	13.7%	Pass
Plate Flexure+Shear:	8.3%	Pass
Plate Tension+Shear:	6.2%	Pass
Plate Compression:	24.0%	Pass
Pole Summary		
Punching Shear:	4.9%	Pass

CCIplate

Elevation (ft) 0 (Base)

note: Bending interaction not considered when Grout Considered = "Yes"
Grout Considered = "Yes" when Eta > 0.5

Bolt Group	Resist Axial	Resist Shear	Induce Plate Bending	Grout Considered	Apply at BARB Elevation	BARB CL Elevation (ft)
1	Yes	Yes	Yes	No	No	
2	Yes	Yes	Yes	No	No	

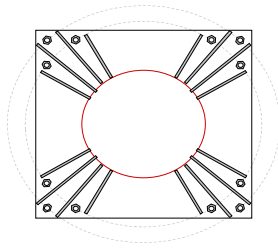
Custom Bolt Connection

Bolt	Bolt Group ID	Location (deg.)	Diameter (in)	Material	Bolt Circle (in)	Eta Factor, n _i	I _p (in ⁴)	Thread Type	Area Override, in ²	Tension Only
1	1	35	1	A325	46	0.5	0	N-Included		No
2	2	45	1	A325	53	0.5	0	N-Included		No
3	1	55	1	A325	46	0.5	0	N-Included		No
4	1	125	1	A325	46	0.5	0	N-Included		No
5	2	135	1	A325	53	0.5	0	N-Included		No
6	1	145	1	A325	46	0.5	0	N-Included		No
7	1	215	1	A325	46	0.5	0	N-Included		No
8	2	225	1	A325	53	0.5	0	N-Included		No
9	1	235	1	A325	46	0.5	0	N-Included		No
10	1	305	1	A325	46	0.5	0	N-Included		No
11	2	315	1	A325	53	0.5	0	N-Included		No
12	1	325	1	A325	46	0.5	0	N-Included		No

Custom Stiffener Connection

Stiffener	Stiffener Group ID	Location (deg.)	Width (in)	Height (in)	Thickness (in)	H. Notch (in)	V. Notch (in)	Grade (ksi)	Weld Type	Groove Depth (in)	Groove Angle (deg.)	H. Fillet Weld Size (in)	V. Fillet Weld Size (in)	Weld Strength (ksi)
1	1	30	11	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
2	2	40	15	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
3	2	50	15	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
4	1	60	11	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
5	1	120	11	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
6	2	130	15	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
7	2	140	15	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
8	1	150	11	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
9	1	210	11	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
10	2	220	15	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
11	2	230	15	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
12	1	240	11	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
13	1	300	11	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
14	2	310	15	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
15	2	320	15	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70
16	1	330	11	16	0.5	0.25	0.25	36	Fillet			0.25	0.25	70

Plot Graphic



April 18, 2023 (Rev.1)
June 30, 2022



Verizon Wireless
20 Alexander Drive, 2nd Floor
Wallingford, CT 06492

RE: TEP Project Number: 368254
Site Name: EAST HAVEN 5 CT
Site Address: 115 Peat Meadow Road
New Haven, CT 06513

To Whom It May Concern:

TEP Northeast (TEP NE) has been authorized by Verizon Wireless to perform a mount analysis on the proposed Verizon Wireless antenna/RRH mounts to determine their capability of supporting the following additional loading:

- **(6) JAHH-45B-R3B Antennas (72.0"x18.0"x7.0" – Wt. = 92 lbs. /each)**
- **(3) MT6407-77A Antennas w/ RRH's (Not to Exceed: 35.12"x16.06"x5.51" – Wt. = 87.1 lbs. /each)**
- **(3) B2/B66A RRH ORAN RRH's (RF4439d-25A RRH's) (15.0"x15.0"x10.0" – Wt. = 75 lbs. /each) (separate mount)**
- **(3) B5/B13 RRH ORAN RRH's (RF4440d-25A RRH's) (15.0"x15.0"x9.1" – Wt. = 71 lbs. /each) (separate mount)**
- **(3) CBC78T-DS-43-2X Diplexers (9.6"x6.9"x6.4" – Wt. = 21 lbs. /each) (separate mount)**
- **(1) OVP Box (28.9"x15.7"x10.3" – Wt. = 32 lbs.) (separate mount)**

**Proposed equipment shown in bold*

Mount fabrication drawings prepared by SitePro1, P/N WMM01 dated May 10, 2010; P/N UGLM-DCP dated February 27, 2013; P/N UGLM4 dated June 12, 2017; and mount fabrication drawings prepared by CommScope, P/N BSAMNT-SBS-2-3 dated March 2, 2017, were used to perform this analysis.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2021 with 2022 Connecticut State Building Code, and AT&T Mount Technical Directive – R22.
- TEP NE considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix P of the Connecticut State Building Code, the max basic wind speed for this site is equal to 125 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.07 in was used for this analysis.
- TEP NE considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- TEP NE considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- TEP NE considers this site to have a spectral response acceleration parameter at short periods, S_s , of 0.201 and a spectral response acceleration parameter at a period of 1 second, S_1 , of 0.054.
- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 2.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The proposed mounts are to be secured to the existing monopole with ring mounts and threaded rods. TEP NE considers the threaded rods to be the governing connection member.

Based on our evaluation, we have determined that the Proposed SitePro1 P/N UGLM-DC4 collar mounts, Proposed CommScope P/N BSAMNT-SBS-2-3 dual mounts, and Proposed SitePro1 P/N UGLM-DCP collar mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Proposed Antenna Mount	1	LC7	25%	PASS
Proposed RRH Mount	11	LC10	3%	PASS

Reference Documents:

- Fabrication drawings prepared by SitePro1, P/N WMM01 dated May 10, 2010.
- Fabrication drawings prepared by SitePro1, P/N UGLM-DCP dated February 27, 2013.
- Fabrication drawings prepared by SitePro1, P/N UGLM4 dated June 12, 2017.
- Fabrication drawings prepared by CommScope, P/N BSAMNT-SBS-2-3 dated March 2, 2017.

This determination was based on the following limitations and assumptions:

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

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

Respectfully Submitted,
TEP Northeast



Michael Cabral
Director



Daniel P. Hamm, PE
Vice President

**Wind & Ice
Calculations**

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

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

$K_z =$ **0.881**

$z =$ 67 (ft)
 $z_g =$ 1200 (ft)
 $\alpha =$ 7.0

$K_{zmin} \leq K_z \leq 2.01$

Table 2-4

Exposure	Z _g	α	K _{zmin}	K _c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

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

$$K_{zt} = [1 + (K_c K_t / K_h)]^2$$

$$K_h = e^{(fz/H)}$$

$K_{zt} =$ **1**

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

Category = **1**

$K_h =$ 1
 $K_c =$ 0.9 (from Table 2-4)
 $K_t =$ 0 (from Table 2-5)
 $f =$ 0 (from Table 2-5)
 $z =$ 67
 $z_g =$ 15 (Mean elevation of base of structure above sea level)
 $H =$ 0 (Ht. of the crest above surrounding terrain)
 $K_{zt} =$ 1.00 (from 2.6.6.2.1)
 $K_e =$ 1.00 (from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness =
 Importance Factor =

$t_i =$ 1.00 in
 $I =$ 1.00 (from Table 2-3)
 $K_{iz} =$ 1.07 (from Sec. 2.6.10)

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

$t_{iz} =$ 1.07 in

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

$G_h = 1.0$ Latticed Structures > 600 ft

$G_h = 0.85$ Latticed Structures 450 ft or less

$G_h = 0.85 + 0.15 [h/150 - 3.0]$

$h =$ ht. of structure

$h = 69$

$G_h = 0.85$

2.6.9.2 Guyed Masts

$G_h = 0.85$

2.6.9.3 Pole Structures

$G_h = 1.1$

2.6.9 Appurtenances

$G_h = 1.0$

2.6.9.4 Structures Supported on Other Structures

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

$G_h = 1.35$

$G_h = 1.00$

2.6.11.2 Design Wind Force on Appurtenances

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

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

$q_z =$	33.47
$q_z (ice) =$	5.36
$q_z (30) =$	1.93

$K_z =$	0.881 (from 2.6.5.2)
$K_{zt} =$	1.0 (from 2.6.6.2.1)
$K_s =$	1.0 (from 2.6.7)
$K_e =$	1.00 (from 2.6.8)
$K_d =$	0.95 (from Table 2-2)
$V_{max} =$	125 mph (Ultimate Wind Speed)
$V_{max (ice)} =$	50 mph
$V_{30} =$	30 mph

Table 2-2

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

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



Determine Ca:

Table 2-9

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

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

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

Ice Thickness = **1.07 in** Angle = **0 (deg)** Equivalent Angle = **180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	4.00	1.27	382	70	22
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	2.19	1.20	157	30	9
B5/B13 RRH ORAN (RF4440D-13A) RRH	15.0	15.0	9.1	1.56	1.00	1.20	63	13	4
B2/B66A RRH ORAN (RF4439D-25A) RRH	15.0	15.0	10.0	1.56	1.00	1.20	63	13	4
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	1.41	1.20	19	5	1
OVP Box	28.9	15.7	10.3	3.15	1.84	1.20	127	25	7
2-1/2" Pipe	2.9	12.0		0.24	0.24	1.20	10		
HSS 4x4	4.0	12.0		0.33	0.33	2.00	22		

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



WIND LOADS

Angle = 30 (deg) Ice Thickness = 1.07 in. Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	382	177	330
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	157	62	133
B5/B13 RRH ORAN (RF4440D-13A) F	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	63	38	57
B2/B66A RRH ORAN (RF4439D-25A)	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	63	42	58
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	19	17	18
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	127	84	116

WIND LOADS WITH ICE:

JAHH-45B-R3B Antenna	74.1	20.1	9.1	10.37	4.71	3.68	8.11	1.25	1.44	70	36	61
MT6407-77A Antenna w/ RRH	37.3	18.2	7.7	4.71	1.98	2.05	4.87	1.20	1.31	30	14	26
B5/B13 RRH ORAN (RF4440D-13A) F	17.1	17.1	11.2	2.04	1.34	1.00	1.52	1.20	1.20	13	9	12
B2/B66A RRH ORAN (RF4439D-25A)	17.1	17.1	12.1	2.04	1.45	1.00	1.41	1.20	1.20	13	9	12
CBC78T-DS-43-2X Diplexer	11.8	9.0	8.5	0.74	0.70	1.31	1.39	1.20	1.20	5	5	5
OVP Box	31.0	17.8	12.4	3.85	2.68	1.74	2.49	1.20	1.20	25	17	23

WIND LOADS AT 30 MPH:

JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	22	10	19
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	9	4	8
B5/B13 RRH ORAN (RF4440D-13A) F	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	4	2	3
B2/B66A RRH ORAN (RF4439D-25A)	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	4	2	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	7	5	7

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



WIND LOADS

Angle = 60 (deg) Ice Thickness = 1.07 in. Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	382	177	228
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	157	62	86
B5/B13 RRH ORAN (RF4440D-13A) F	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	63	38	44
B2/B66A RRH ORAN (RF4439D-25A)	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	63	42	47
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	19	17	18
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	127	84	95

WIND LOADS WITH ICE:

JAHH-45B-R3B Antenna	74.1	20.1	9.1	10.37	4.71	3.68	8.11	1.25	1.44	70	36	45
MT6407-77A Antenna w/ RRH	37.3	18.2	7.7	4.71	1.98	2.05	4.87	1.20	1.31	30	14	18
B5/B13 RRH ORAN (RF4440D-13A) F	17.1	17.1	11.2	2.04	1.34	1.00	1.52	1.20	1.20	13	9	10
B2/B66A RRH ORAN (RF4439D-25A)	17.1	17.1	12.1	2.04	1.45	1.00	1.41	1.20	1.20	13	9	10
CBC78T-DS-43-2X Diplexer	11.8	9.0	8.5	0.74	0.70	1.31	1.39	1.20	1.20	5	5	5
OVP Box	31.0	17.8	12.4	3.85	2.68	1.74	2.49	1.20	1.20	25	17	19

WIND LOADS AT 30 MPH:

JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	22	10	13
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	9	4	5
B5/B13 RRH ORAN (RF4440D-13A) F	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	4	2	3
B2/B66A RRH ORAN (RF4439D-25A)	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	4	2	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	7	5	5

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



WIND LOADS

Angle = 90 (deg) Ice Thickness = 1.07 in. Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	382	177	177
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	157	62	62
B5/B13 RRH ORAN (RF4440D-13A) R	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	63	38	38
B2/B66A RRH ORAN (RF4439D-25A)	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	63	42	42
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	19	17	17
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	127	84	84

WIND LOADS WITH ICE:

JAHH-45B-R3B Antenna	74.1	20.1	9.1	10.37	4.71	3.68	8.11	1.25	1.44	70	36	36
MT6407-77A Antenna w/ RRH	37.3	18.2	7.7	4.71	1.98	2.05	4.87	1.20	1.31	30	14	14
B5/B13 RRH ORAN (RF4440D-13A) R	17.1	17.1	11.2	2.04	1.34	1.00	1.52	1.20	1.20	13	9	9
B2/B66A RRH ORAN (RF4439D-25A)	17.1	17.1	12.1	2.04	1.45	1.00	1.41	1.20	1.20	13	9	9
CBC78T-DS-43-2X Diplexer	11.8	9.0	8.5	0.74	0.70	1.31	1.39	1.20	1.20	5	5	5
OVP Box	31.0	17.8	12.4	3.85	2.68	1.74	2.49	1.20	1.20	25	17	17

WIND LOADS AT 30 MPH:

JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	22	10	10
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	9	4	4
B5/B13 RRH ORAN (RF4440D-13A) R	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	4	2	2
B2/B66A RRH ORAN (RF4439D-25A)	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	4	2	2
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	7	5	5

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



WIND LOADS

Angle = **120** (deg) Ice Thickness = **1.07** in. Equivalent Angle = **300** (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	382	177	228
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	157	62	86
B5/B13 RRH ORAN (RF4440D-13A) R	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	63	38	44
B2/B66A RRH ORAN (RF4439D-25A)	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	63	42	47
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	19	17	18
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	127	84	95

WIND LOADS WITH ICE:

JAHH-45B-R3B Antenna	74.1	20.1	9.1	10.37	4.71	3.68	8.11	1.25	1.44	70	36	45
MT6407-77A Antenna w/ RRH	37.3	18.2	7.7	4.71	1.98	2.05	4.87	1.20	1.31	30	14	18
B5/B13 RRH ORAN (RF4440D-13A) R	17.1	17.1	11.2	2.04	1.34	1.00	1.52	1.20	1.20	13	9	10
B2/B66A RRH ORAN (RF4439D-25A)	17.1	17.1	12.1	2.04	1.45	1.00	1.41	1.20	1.20	13	9	10
CBC78T-DS-43-2X Diplexer	11.8	9.0	8.5	0.74	0.70	1.31	1.39	1.20	1.20	5	5	5
OVP Box	31.0	17.8	12.4	3.85	2.68	1.74	2.49	1.20	1.20	25	17	19

WIND LOADS AT 30 MPH:

JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	22	10	13
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	9	4	5
B5/B13 RRH ORAN (RF4440D-13A) R	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	4	2	3
B2/B66A RRH ORAN (RF4439D-25A)	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	4	2	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	7	5	5

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



WIND LOADS

Angle = 150 (deg) Ice Thickness = 1.07 in. Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	382	177	330
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	157	62	133
B5/B13 RRH ORAN (RF4440D-13A) RI	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	63	38	57
B2/B66A RRH ORAN (RF4439D-25A) I	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	63	42	58
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	19	17	18
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	127	84	116

WIND LOADS WITH ICE:

JAHH-45B-R3B Antenna	74.1	20.1	9.1	10.37	4.71	3.68	8.11	1.25	1.44	70	36	61
MT6407-77A Antenna w/ RRH	37.3	18.2	7.7	4.71	1.98	2.05	4.87	1.20	1.31	30	14	26
B5/B13 RRH ORAN (RF4440D-13A) RI	17.1	17.1	11.2	2.04	1.34	1.00	1.52	1.20	1.20	13	9	12
B2/B66A RRH ORAN (RF4439D-25A) I	17.1	17.1	12.1	2.04	1.45	1.00	1.41	1.20	1.20	13	9	12
CBC78T-DS-43-2X Diplexer	11.8	9.0	8.5	0.74	0.70	1.31	1.39	1.20	1.20	5	5	5
OVP Box	31.0	17.8	12.4	3.85	2.68	1.74	2.49	1.20	1.20	25	17	23

WIND LOADS AT 30 MPH:

JAHH-45B-R3B Antenna	72.0	18.0	7.0	9.00	3.50	4.00	10.29	1.27	1.51	22	10	19
MT6407-77A Antenna w/ RRH	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	9	4	8
B5/B13 RRH ORAN (RF4440D-13A) RI	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	4	2	3
B2/B66A RRH ORAN (RF4439D-25A) I	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	4	2	3
CBC78T-DS-43-2X Diplexer	9.7	6.9	6.4	0.46	0.43	1.41	1.52	1.20	1.20	1	1	1
OVP Box	28.9	15.7	10.3	3.15	2.07	1.84	2.81	1.20	1.21	7	5	7

Date: 4/18/2023

Project Name: EAST HAVEN 5 CT

Designed By: CL Checked By: MSC



ICE WEIGHT CALCULATIONS

Thickness of ice: 1.07 in.

Density of ice: 56 pcf

JAHH-45B-R3B Antenna

Weight of ice based on total radial SF area:

Height (in): 72.0

Width (in): 18.0

Depth (in): 7.0

Total weight of ice on object: 160 lbs

Weight of object: 92.0 lbs

Combined weight of ice and object: 252 lbs

MT6407-77A Antenna w/ RRH

Weight of ice based on total radial SF area:

Height (in): 35.1

Width (in): 16.1

Depth (in): 5.5

Total weight of ice on object: 69 lbs

Weight of object: 87.1 lbs

Combined weight of ice and object: 156 lbs

B5/B13 RRH ORAN (RF4440D-13A) RRH

Weight of ice based on total radial SF area:

Height (in): 15.0

Width (in): 15.0

Depth (in): 9.1

Total weight of ice on object: 30 lbs

Weight of object: 71.0 lbs

Combined weight of ice and object: 101 lbs

B2/B66A RRH ORAN (RF4439D-25A) RRH

Weight of ice based on total radial SF area:

Height (in): 15.0

Width (in): 15.0

Depth (in): 10.0

Total weight of ice on object: 31 lbs

Weight of object: 75.0 lbs

Combined weight of ice and object: 106 lbs

CBC78T-DS-43-2X Diplexer

Weight of ice based on total radial SF area:

Height (in): 9.7

Width (in): 6.9

Depth (in): 6.4

Total weight of ice on object: 11 lbs

Weight of object: 21.0 lbs

Combined weight of ice and object: 32 lbs

OVP Box

Weight of ice based on total radial SF area:

Height (in): 28.9

Width (in): 15.7

Depth (in): 10.3

Total weight of ice on object: 62 lbs

Weight of object: 32.0 lbs

Combined weight of ice and object: 94 lbs

2-1/2" Pipe

Per foot weight of ice:

diameter (in): 2.88

Per foot weight of ice on object: 5 plf

HSS 4x4

Weight of ice based on total radial SF area:

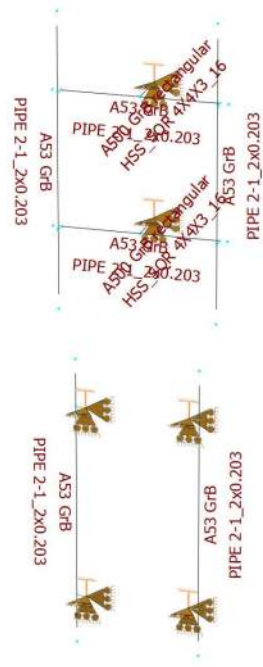
Height (in): 4

Width (in): 4

Per foot weight of ice on object: 9 plf

**Mount Calculations
(Proposed Conditions)**

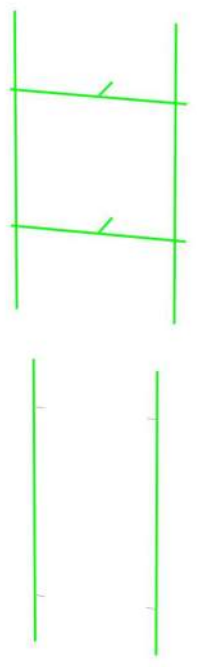


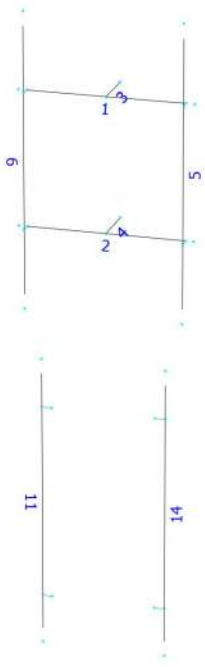




Design status

- Not designed
- Error on design
- Design O.K.
- With warnings





Load data

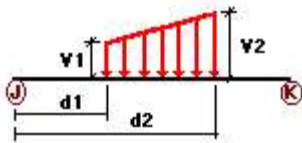
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load Right End of Mount	No	LL
LL3	250 lb Live Load Left End of Mount	No	LL
LLa1	500 lb Live Load Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL

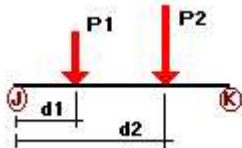
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	1	z	-0.01	-0.01	0.00	No	100.00	Yes
	2	z	-0.01	-0.01	0.00	No	100.00	Yes
	11	z	-0.01	-0.01	0.00	No	100.00	Yes
	14	z	-0.01	-0.01	0.00	No	100.00	Yes
W30	1	z	-0.01	-0.01	0.00	No	100.00	Yes

	2	z	-0.01	-0.01	0.00	No	100.00	Yes
	11	z	-0.01	-0.01	0.00	No	100.00	Yes
	14	z	-0.01	-0.01	0.00	No	100.00	Yes
W60	3	x	-0.022	-0.022	0.00	No	100.00	Yes
	4	x	-0.022	-0.022	0.00	No	100.00	Yes
	5	x	-0.01	-0.01	0.00	No	100.00	Yes
	6	x	-0.01	-0.01	0.00	No	100.00	Yes
	11	x	-0.01	-0.01	0.00	No	100.00	Yes
	14	x	-0.01	-0.01	0.00	No	100.00	Yes
W90	3	x	-0.022	-0.022	0.00	No	100.00	Yes
	4	x	-0.022	-0.022	0.00	No	100.00	Yes
	5	x	-0.01	-0.01	0.00	No	100.00	Yes
	6	x	-0.01	-0.01	0.00	No	100.00	Yes
	11	x	-0.01	-0.01	0.00	No	100.00	Yes
	14	x	-0.01	-0.01	0.00	No	100.00	Yes
W120	3	x	-0.022	-0.022	0.00	No	100.00	Yes
	4	x	-0.022	-0.022	0.00	No	100.00	Yes
	5	x	-0.01	-0.01	0.00	No	100.00	Yes
	6	x	-0.01	-0.01	0.00	No	100.00	Yes
	11	x	-0.01	-0.01	0.00	No	100.00	Yes
	14	x	-0.01	-0.01	0.00	No	100.00	Yes
W150	1	z	0.01	0.01	0.00	No	100.00	Yes
	2	z	0.01	0.01	0.00	No	100.00	Yes
	5	z	0.01	0.01	0.00	No	100.00	Yes
	6	z	0.01	0.01	0.00	No	100.00	Yes
	11	z	0.01	0.01	0.00	No	100.00	Yes
	14	z	0.01	0.01	0.00	No	100.00	Yes
Di	1	y	-0.005	-0.005	0.00	No	100.00	Yes
	2	y	-0.005	-0.005	0.00	No	100.00	Yes
	3	y	-0.009	-0.009	0.00	No	100.00	Yes
	4	y	-0.009	-0.009	0.00	No	100.00	Yes
	5	y	-0.005	-0.005	0.00	No	100.00	Yes
	6	y	-0.005	-0.005	0.00	No	100.00	Yes
	11	y	-0.005	-0.005	0.00	No	100.00	Yes
	14	y	-0.005	-0.005	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	5	y	-0.044	1.00	No
		y	-0.044	4.00	No
	6	y	-0.036	0.50	No
		y	-0.036	3.00	No
		y	-0.036	5.50	No
		y	-0.092	0.50	No
		y	-0.092	5.50	No
	11	y	-0.075	0.50	No
		y	-0.071	2.50	No
		y	-0.021	3.75	No

		y	-0.032	5.50	No
	14	y	-0.075	0.50	No
		y	-0.071	2.50	No
		y	-0.021	3.75	No
		y	-0.021	5.50	No
Wo	5	z	-0.079	1.00	No
		z	-0.079	4.00	No
	6	z	-0.382	0.50	No
		z	-0.382	5.50	No
	11	z	-0.063	0.50	No
		z	-0.063	2.50	No
		z	-0.019	3.75	No
		z	-0.127	5.50	No
	14	z	-0.063	0.50	No
		z	-0.063	2.50	No
		z	-0.019	3.75	No
		z	-0.019	5.50	No
W30	5	3	-0.067	1.00	No
		3	-0.067	4.00	No
	6	3	-0.33	0.50	No
		3	-0.33	5.50	No
	11	3	-0.058	0.50	No
		3	-0.057	2.50	No
		3	-0.018	3.75	No
		3	-0.116	5.50	No
	14	3	-0.058	0.50	No
		3	-0.057	2.50	No
		3	-0.018	3.75	No
		3	-0.018	5.50	No
W60	5	3	-0.043	1.00	No
		3	-0.043	4.00	No
	6	3	-0.228	0.50	No
		3	-0.228	5.50	No
	11	3	-0.047	0.50	No
		3	-0.044	2.50	No
		3	-0.018	3.75	No
		3	-0.095	5.50	No
	14	3	-0.047	0.50	No
		3	-0.044	2.50	No
		3	-0.018	3.75	No
		3	-0.018	5.50	No
W90	5	x	-0.031	1.00	No
		x	-0.031	4.00	No
	6	x	-0.177	0.50	No
		x	-0.177	5.50	No
	11	x	-0.042	0.50	No
		x	-0.038	2.50	No
		x	-0.017	3.75	No
		x	-0.084	5.50	No
	14	x	-0.042	0.50	No
		x	-0.038	2.50	No
		x	-0.017	3.75	No
		x	-0.017	5.50	No
W120	5	2	-0.043	1.00	No
		2	-0.043	4.00	No
	6	2	-0.228	0.50	No
		2	-0.228	5.50	No
	11	2	-0.047	0.50	No
		2	-0.044	2.50	No
		2	-0.018	3.75	No

		2	-0.095	5.50	No
	14	2	-0.047	0.50	No
		2	-0.044	2.50	No
		2	-0.018	3.75	No
		2	-0.018	5.50	No
W150	5	2	-0.067	1.00	No
		2	-0.067	4.00	No
	6	2	-0.33	0.50	No
		2	-0.33	5.50	No
	11	2	-0.058	0.50	No
		2	-0.057	2.50	No
		2	-0.018	3.75	No
		2	-0.116	5.50	No
	14	2	-0.058	0.50	No
		2	-0.057	2.50	No
		2	-0.018	3.75	No
		2	-0.018	5.50	No
Di	5	y	-0.035	1.00	No
		y	-0.035	4.00	No
	6	y	-0.16	0.50	No
		y	-0.16	5.50	No
	11	y	-0.031	0.50	No
		y	-0.03	2.50	No
		y	-0.011	3.75	No
		y	-0.062	5.50	No
	14	y	-0.031	0.50	No
		y	-0.03	2.50	No
		y	-0.011	3.75	No
		y	-0.011	5.50	No
W10	5	z	-0.015	1.00	No
		z	-0.015	4.00	No
	6	z	-0.07	0.50	No
		z	-0.07	5.50	No
	11	z	-0.013	0.50	No
		z	-0.013	2.50	No
		z	-0.005	3.75	No
		z	-0.025	5.50	No
	14	z	-0.013	0.50	No
		z	-0.013	2.50	No
		z	-0.005	3.75	No
		z	-0.005	5.50	No
W130	5	3	-0.013	1.00	No
		3	-0.013	4.00	No
	6	3	-0.061	0.50	No
		3	-0.061	5.50	No
	11	3	-0.012	0.50	No
		3	-0.012	2.50	No
		3	-0.005	3.75	No
		3	-0.023	5.50	No
	14	3	-0.012	0.50	No
		3	-0.012	2.50	No
		3	-0.005	3.75	No
		3	-0.005	5.50	No
W160	5	3	-0.009	1.00	No
		3	-0.009	4.00	No
	6	3	-0.045	0.50	No
		3	-0.045	5.50	No
	11	3	-0.01	0.50	No
		3	-0.01	2.50	No
		3	-0.005	3.75	No

		3	-0.019	5.50	No
	14	3	-0.01	0.50	No
		3	-0.01	2.50	No
		3	-0.005	3.75	No
		3	-0.005	5.50	No
WI90	5	x	-0.007	1.00	No
		x	-0.007	4.00	No
	6	x	-0.036	0.50	No
		x	-0.036	5.50	No
	11	x	-0.009	0.50	No
		x	-0.009	2.50	No
		x	-0.005	3.75	No
		x	-0.017	5.50	No
	14	x	-0.009	0.50	No
		x	-0.009	2.50	No
		x	-0.005	3.75	No
		x	-0.005	5.50	No
WI120	5	2	-0.009	1.00	No
		2	-0.009	4.00	No
	6	2	-0.045	0.50	No
		2	-0.045	5.50	No
	11	2	-0.01	0.50	No
		2	-0.01	2.50	No
		2	-0.005	3.75	No
		2	-0.019	5.50	No
	14	2	-0.01	0.50	No
		2	-0.01	2.50	No
		2	-0.005	3.75	No
		2	-0.005	5.50	No
WI150	5	2	-0.013	1.00	No
		2	-0.013	4.00	No
	6	2	-0.061	0.50	No
		2	-0.061	5.50	No
	11	2	-0.012	0.50	No
		2	-0.012	2.50	No
		2	-0.005	3.75	No
		2	-0.023	5.50	No
	14	2	-0.012	0.50	No
		2	-0.012	2.50	No
		2	-0.005	3.75	No
		2	-0.005	5.50	No
WLO	5	z	-0.005	1.00	No
		z	-0.005	4.00	No
	6	z	-0.022	0.50	No
		z	-0.022	5.50	No
	11	z	-0.004	0.50	No
		z	-0.004	2.50	No
		z	-0.001	3.75	No
		z	-0.007	5.50	No
	14	z	-0.004	0.50	No
		z	-0.004	2.50	No
		z	-0.001	3.75	No
		z	-0.001	5.50	No
WL30	5	3	-0.004	1.00	No
		3	-0.004	4.00	No
	6	3	-0.019	0.50	No
		3	-0.019	5.50	No
	11	3	-0.003	0.50	No
		3	-0.003	2.50	No
		3	-0.001	3.75	No

		3	-0.007	5.50	No
	14	3	-0.003	0.50	No
		3	-0.003	2.50	No
		3	-0.001	3.75	No
		3	-0.001	5.50	No
WL60	5	3	-0.003	1.00	No
		3	-0.003	4.00	No
	6	3	-0.013	0.50	No
		3	-0.013	5.50	No
	11	3	-0.003	0.50	No
		3	-0.003	2.50	No
		3	-0.001	3.75	No
		3	-0.005	5.50	No
	14	3	-0.003	0.50	No
		3	-0.003	2.50	No
		3	-0.001	3.75	No
		3	-0.001	5.50	No
WL90	5	x	-0.002	1.00	No
		x	-0.002	4.00	No
	6	x	-0.01	0.50	No
		x	-0.01	5.50	No
	11	x	-0.002	0.50	No
		x	-0.002	2.50	No
		x	-0.001	3.75	No
		x	-0.005	5.50	No
	14	x	-0.002	0.50	No
		x	-0.002	2.50	No
		x	-0.001	3.75	No
		x	-0.001	5.50	No
WL120	5	2	-0.003	1.00	No
		2	-0.003	4.00	No
	6	2	-0.013	0.50	No
		2	-0.013	5.50	No
	11	2	-0.003	0.50	No
		2	-0.003	2.50	No
		2	-0.001	3.75	No
		2	-0.005	5.50	No
	14	2	-0.003	0.50	No
		2	-0.003	2.50	No
		2	-0.001	3.75	No
		2	-0.001	5.50	No
WL150	5	2	-0.004	1.00	No
		2	-0.004	4.00	No
	6	2	-0.019	0.50	No
		2	-0.019	5.50	No
	11	2	-0.003	0.50	No
		2	-0.003	2.50	No
		2	-0.001	3.75	No
		2	-0.007	5.50	No
	14	2	-0.003	0.50	No
		2	-0.003	2.50	No
		2	-0.001	3.75	No
		2	-0.001	5.50	No
LL1	1	y	-0.25	50.00	Yes
LL2	1	y	-0.25	0.00	Yes
LL3	1	y	-0.25	100.00	Yes
LLa1	5	y	-0.50	50.00	Yes
LLa2	6	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load Right End of Mount	No	0.00	0.00	0.00
LL3	250 lb Live Load Left End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+W10
LC26=1.2D+Di+W130
LC27=1.2D+Di+W160
LC28=1.2D+Di+W190
LC29=1.2D+Di+W120
LC30=1.2D+Di+W1150
LC31=1.2D+Di-W10
LC32=1.2D+Di-W130
LC33=1.2D+Di-W160
LC34=1.2D+Di-W190
LC35=1.2D+Di-W120
LC36=1.2D+Di-W1150
LC37=1.2D+1.6LL1
LC38=1.2D+1.6LL2
LC39=1.2D+1.6LL3
LC40=1.2D+W10+1.6LLa1
LC41=1.2D+W130+1.6LLa1
LC42=1.2D+W160+1.6LLa1
LC43=1.2D+W190+1.6LLa1
LC44=1.2D+W120+1.6LLa1
LC45=1.2D+W150+1.6LLa1
LC46=1.2D-W10+1.6LLa1
LC47=1.2D-W130+1.6LLa1
LC48=1.2D-W160+1.6LLa1
LC49=1.2D-W190+1.6LLa1
LC50=1.2D-W120+1.6LLa1
LC51=1.2D-W150+1.6LLa1
LC52=1.2D+W10+1.6LLa2
LC53=1.2D+W130+1.6LLa2
LC54=1.2D+W160+1.6LLa2

LC55=1.2D+WL90+1.6LLa2
 LC56=1.2D+WL120+1.6LLa2
 LC57=1.2D+WL150+1.6LLa2
 LC58=1.2D-WL0+1.6LLa2
 LC59=1.2D-WL30+1.6LLa2
 LC60=1.2D-WL60+1.6LLa2
 LC61=1.2D-WL90+1.6LLa2
 LC62=1.2D-WL120+1.6LLa2
 LC63=1.2D-WL150+1.6LLa2

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	<i>HSS_SQR 4X4X3_16</i>	3	LC1 at 100.00%	0.07	OK	
		4	LC7 at 100.00%	0.07	OK	
	<i>PIPE 2-1_2x0.203</i>	1	LC7 at 50.00%	0.25	OK	
		2	LC1 at 50.00%	0.25	OK	
		5	LC46 at 27.08%	0.18	OK	
		6	LC53 at 27.08%	0.22	OK	
		11	LC10 at 81.25%	0.03	OK	
		14	LC10 at 16.67%	0.03	OK	

Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	1.375	0.00	0
2	0.00	1.375	1.00	0
3	-1.75	1.375	1.00	0
4	1.75	1.375	1.00	0
5	-1.585	1.375	1.00	0
6	1.585	1.375	1.00	0
7	0.00	-1.375	0.00	0
8	0.00	-1.375	1.00	0
9	-1.75	-1.375	1.00	0
10	1.75	-1.375	1.00	0
11	-1.585	-1.375	1.00	0
12	1.585	-1.375	1.00	0
13	-1.585	1.375	1.20	0
14	-1.585	-1.375	1.20	0
15	1.585	1.375	1.20	0
16	1.585	-1.375	1.20	0
17	-1.585	3.00	1.20	0
18	-1.585	-3.00	1.20	0
19	1.585	3.00	1.20	0
20	1.585	-3.00	1.20	0
26	-1.25	-4.00	1.20	0
27	-1.25	-10.00	1.20	0
34	1.25	-4.00	1.20	0

35	1.25	-10.00	1.20	0
36	-1.25	-5.00	1.20	0
37	1.25	-5.00	1.20	0
38	-1.25	-9.00	1.20	0
39	1.25	-9.00	1.20	0
40	-1.05	-5.00	1.20	0
41	-1.05	-9.00	1.20	0
42	1.05	-5.00	1.20	0
43	1.05	-9.00	1.20	0

Restraints

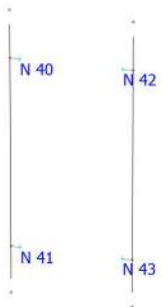
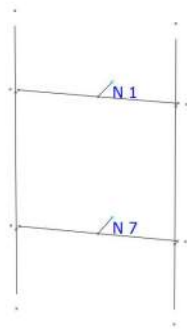
Node	TX	TY	TZ	RX	RY	RZ
1	1	1	1	0	1	0
7	1	1	1	0	1	0
40	1	1	1	0	1	0
41	1	1	1	0	1	0
42	1	1	1	0	1	0
43	1	1	1	0	1	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	4	3		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
2	10	9		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
3	1	2		HSS_SQR 4X4X3_16	A500 GrB rectangular	0.00	0.00	0.00
4	7	8		HSS_SQR 4X4X3_16	A500 GrB rectangular	0.00	0.00	0.00
5	19	20		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
6	17	18		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
11	26	27		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
14	34	35		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00

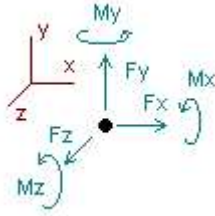
Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
5	315.00	0	0.00	0.00	0.00
6	315.00	0	0.00	0.00	0.00
11	315.00	0	0.00	0.00	0.00
14	315.00	0	0.00	0.00	0.00



Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition LC1=1.2D+Wo						
1	0.14108	0.41205	0.26877	0.00000	0.58327	0.00000
7	-0.14108	0.19325	0.72323	0.00000	0.37784	0.00000
40	0.01395	0.14379	0.13031	0.00000	0.02717	0.00000
41	-0.01395	0.13661	0.20169	0.00000	0.03923	0.00000
42	-0.01329	0.13794	0.14381	0.00000	-0.02778	0.00000
43	0.01329	0.12926	0.08019	0.00000	-0.01702	0.00000
SUM	0.00000	1.15290	1.54800	0.00000	0.98271	0.00000
Condition LC2=1.2D+W30						
1	0.43890	0.35462	0.07720	0.00000	0.76065	0.00000
7	0.12254	0.25068	0.55425	0.00000	0.50215	0.00000
40	0.07900	0.12088	0.09505	0.00000	0.01972	0.00000
41	0.09707	0.15952	0.14102	0.00000	0.02749	0.00000
42	0.06043	0.09880	0.10371	0.00000	-0.02011	0.00000
43	0.04635	0.16840	0.06306	0.00000	-0.01324	0.00000
SUM	0.84429	1.15290	1.03429	0.00000	1.27665	0.00000
Condition LC3=1.2D+W60						
1	0.42566	0.33859	-0.05289	0.00000	0.64859	0.00000
7	0.12159	0.26671	0.43614	0.00000	0.39176	0.00000
40	0.09636	0.15555	0.05242	0.00000	0.01109	0.00000
41	0.10789	0.12485	0.09183	0.00000	0.01776	0.00000
42	0.07593	0.07742	0.05922	0.00000	-0.01140	0.00000
43	0.07387	0.18978	0.03058	0.00000	-0.00656	0.00000
SUM	0.90130	1.15290	0.61730	0.00000	1.05124	0.00000
Condition LC4=1.2D+W90						
1	0.44225	0.29169	-0.25533	0.00000	0.47052	0.00000
7	0.13775	0.31361	0.25533	0.00000	0.19463	0.00000
40	0.10976	0.15078	0.00000	0.00000	0.00000	0.00000
41	0.13124	0.12962	0.00000	0.00000	0.00000	0.00000
42	0.09090	0.07096	0.00000	0.00000	0.00000	0.00000
43	0.08310	0.19624	0.00000	0.00000	0.00000	0.00000
SUM	0.99500	1.15290	0.00000	0.00000	0.66516	0.00000

Condition **LC5=1.2D+W120**

1	0.42568	0.24688	-0.45777	0.00000	0.25287	0.00000
7	0.12157	0.35842	0.07451	0.00000	-0.04128	0.00000
40	0.09636	0.15555	-0.05242	0.00000	-0.01109	0.00000
41	0.10789	0.12485	-0.09183	0.00000	-0.01776	0.00000
42	0.07593	0.07742	-0.05922	0.00000	0.01140	0.00000
43	0.07387	0.18978	-0.03058	0.00000	0.00656	0.00000
SUM	0.90130	1.15290	-0.61730	0.00000	0.20070	0.00000

Condition **LC6=1.2D+W150**

1	0.43892	0.21821	-0.64775	0.00000	0.20083	0.00000
7	0.12252	0.38709	-0.10370	0.00000	-0.11585	0.00000
40	0.07900	0.12088	-0.09505	0.00000	-0.01972	0.00000
41	0.09707	0.15952	-0.14102	0.00000	-0.02749	0.00000
42	0.06043	0.09880	-0.10371	0.00000	0.02011	0.00000
43	0.04635	0.16840	-0.06306	0.00000	0.01324	0.00000
SUM	0.84429	1.15290	-1.15429	0.00000	0.07113	0.00000

Condition **LC7=1.2D-W0**

1	0.14111	0.19434	-0.77937	0.00000	-0.32874	0.00000
7	-0.14111	0.41096	-0.21263	0.00000	-0.63118	0.00000
40	0.01395	0.14379	-0.13031	0.00000	-0.02717	0.00000
41	-0.01395	0.13661	-0.20169	0.00000	-0.03923	0.00000
42	-0.01329	0.13794	-0.14381	0.00000	0.02778	0.00000
43	0.01329	0.12926	-0.08019	0.00000	0.01702	0.00000
SUM	0.00000	1.15290	-1.54800	0.00000	-0.98153	0.00000

Condition **LC8=1.2D-W30**

1	-0.15671	0.25180	-0.58782	0.00000	-0.50720	0.00000
7	-0.40473	0.35351	-0.04363	0.00000	-0.75655	0.00000
40	-0.05110	0.16670	-0.09505	0.00000	-0.01972	0.00000
41	-0.12496	0.11370	-0.14102	0.00000	-0.02749	0.00000
42	-0.08700	0.17707	-0.10371	0.00000	0.02011	0.00000
43	-0.01977	0.09013	-0.06306	0.00000	0.01324	0.00000
SUM	-0.84429	1.15290	-1.03429	0.00000	-1.27761	0.00000

Condition **LC9=1.2D-W60**

1	-0.14347	0.26776	-0.45774	0.00000	-0.39491	0.00000
7	-0.40378	0.33755	0.07449	0.00000	-0.64594	0.00000
40	-0.06846	0.13203	-0.05242	0.00000	-0.01109	0.00000
41	-0.13579	0.14837	-0.09183	0.00000	-0.01776	0.00000
42	-0.10251	0.19845	-0.05922	0.00000	0.01140	0.00000
43	-0.04730	0.06875	-0.03058	0.00000	0.00656	0.00000
SUM	-0.90130	1.15290	-0.61730	0.00000	-1.05174	0.00000

Condition **LC10=1.2D-W90**

1	-0.16006	0.31460	-0.25530	0.00000	-0.21666	0.00000
7	-0.41994	0.29070	0.25530	0.00000	-0.44860	0.00000
40	-0.08186	0.13680	0.00000	0.00000	0.00000	0.00000
41	-0.15914	0.14360	0.00000	0.00000	0.00000	0.00000
42	-0.11747	0.20491	0.00000	0.00000	0.00000	0.00000
43	-0.05653	0.06229	0.00000	0.00000	0.00000	0.00000
SUM	-0.99500	1.15290	0.00000	0.00000	-0.66526	0.00000

Condition **LC11=1.2D-W120**

1	-0.14349	0.35939	-0.05286	0.00000	0.00141	0.00000
7	-0.40376	0.24592	0.43612	0.00000	-0.21227	0.00000
40	-0.06846	0.13203	0.05242	0.00000	0.01109	0.00000
41	-0.13579	0.14837	0.09183	0.00000	0.01776	0.00000
42	-0.10251	0.19845	0.05922	0.00000	-0.01140	0.00000
43	-0.04730	0.06875	0.03058	0.00000	-0.00656	0.00000

SUM	-0.90130	1.15290	0.61730	0.00000	-0.19996	0.00000
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Condition **LC12=1.2D-W150**

1	-0.15674	0.38803	0.13713	0.00000	0.05385	0.00000
7	-0.40471	0.21727	0.61431	0.00000	-0.13729	0.00000
40	-0.05110	0.16670	0.09505	0.00000	0.01972	0.00000
41	-0.12496	0.11370	0.14102	0.00000	0.02749	0.00000
42	-0.08700	0.17707	0.10371	0.00000	-0.02011	0.00000
43	-0.01977	0.09013	0.06306	0.00000	-0.01324	0.00000

SUM	-0.84429	1.15290	1.15429	0.00000	-0.06958	0.00000
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Condition **LC13=0.9D+W0**

1	0.10581	0.33619	0.33277	0.00000	0.55151	0.00000
7	-0.10581	0.11779	0.65923	0.00000	0.40956	0.00000
40	0.01046	0.10784	0.13031	0.00000	0.02717	0.00000
41	-0.01046	0.10246	0.20169	0.00000	0.03923	0.00000
42	-0.00997	0.10346	0.14381	0.00000	-0.02778	0.00000
43	0.00997	0.09694	0.08019	0.00000	-0.01702	0.00000

SUM	0.00000	0.86468	1.54800	0.00000	0.98267	0.00000
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Condition **LC14=0.9D+W30**

1	0.40366	0.27876	0.14114	0.00000	0.72893	0.00000
7	0.15778	0.17522	0.49030	0.00000	0.53383	0.00000
40	0.07551	0.08494	0.09505	0.00000	0.01972	0.00000
41	0.10055	0.12536	0.14102	0.00000	0.02749	0.00000
42	0.06375	0.06432	0.10371	0.00000	-0.02011	0.00000
43	0.04302	0.13608	0.06306	0.00000	-0.01324	0.00000

SUM	0.84429	0.86468	1.03429	0.00000	1.27661	0.00000
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Condition **LC15=0.9D+W60**

1	0.39042	0.26272	0.01100	0.00000	0.61685	0.00000
7	0.15683	0.19126	0.37225	0.00000	0.42345	0.00000
40	0.09287	0.11961	0.05241	0.00000	0.01109	0.00000
41	0.11137	0.09069	0.09183	0.00000	0.01776	0.00000
42	0.07925	0.04294	0.05922	0.00000	-0.01140	0.00000
43	0.07055	0.15746	0.03058	0.00000	-0.00656	0.00000

SUM	0.90130	0.86468	0.61730	0.00000	1.05120	0.00000
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Condition **LC16=0.9D+W90**

1	0.40700	0.21581	-0.19150	0.00000	0.43879	0.00000
7	0.17300	0.23816	0.19150	0.00000	0.22633	0.00000
40	0.10627	0.11483	0.00000	0.00000	0.00000	0.00000
41	0.13473	0.09547	0.00000	0.00000	0.00000	0.00000
42	0.09422	0.03648	0.00000	0.00000	0.00000	0.00000
43	0.07978	0.16393	0.00000	0.00000	0.00000	0.00000

SUM	0.99500	0.86468	0.00000	0.00000	0.66512	0.00000
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Condition **LC17=0.9D+W120**

1	0.39043	0.17100	-0.39399	0.00000	0.22114	0.00000
7	0.15682	0.28298	0.01074	0.00000	-0.00958	0.00000
40	0.09287	0.11961	-0.05241	0.00000	-0.01109	0.00000
41	0.11137	0.09069	-0.09183	0.00000	-0.01776	0.00000
42	0.07925	0.04294	-0.05922	0.00000	0.01140	0.00000
43	0.07055	0.15746	-0.03058	0.00000	0.00656	0.00000

SUM 0.90130 0.86468 -0.61730 0.00000 0.20066 0.00000

Condition **LC18=0.9D+W150**

1	0.40368	0.14232	-0.58404	0.00000	0.16910	0.00000
7	0.15777	0.31165	-0.16740	0.00000	-0.08415	0.00000
40	0.07551	0.08494	-0.09505	0.00000	-0.01972	0.00000
41	0.10055	0.12536	-0.14102	0.00000	-0.02749	0.00000
42	0.06375	0.06432	-0.10371	0.00000	0.02011	0.00000
43	0.04302	0.13608	-0.06306	0.00000	0.01324	0.00000

SUM 0.84429 0.86468 -1.15429 0.00000 0.07109 0.00000

Condition **LC19=0.9D-Wo**

1	0.10584	0.11845	-0.71570	0.00000	-0.36051	0.00000
7	-0.10584	0.33553	-0.27630	0.00000	-0.59945	0.00000
40	0.01046	0.10784	-0.13031	0.00000	-0.02717	0.00000
41	-0.01046	0.10246	-0.20169	0.00000	-0.03923	0.00000
42	-0.00997	0.10346	-0.14381	0.00000	0.02778	0.00000
43	0.00997	0.09694	-0.08019	0.00000	0.01702	0.00000

SUM 0.00000 0.86468 -1.54800 0.00000 -0.98156 0.00000

Condition **LC20=0.9D-W30**

1	-0.19202	0.17591	-0.52409	0.00000	-0.53900	0.00000
7	-0.36942	0.27807	-0.10735	0.00000	-0.72479	0.00000
40	-0.05459	0.13075	-0.09505	0.00000	-0.01972	0.00000
41	-0.12148	0.07955	-0.14102	0.00000	-0.02749	0.00000
42	-0.08368	0.14259	-0.10371	0.00000	0.02011	0.00000
43	-0.02309	0.05781	-0.06306	0.00000	0.01324	0.00000

SUM -0.84429 0.86468 -1.03429 0.00000 -1.27764 0.00000

Condition **LC21=0.9D-W60**

1	-0.17878	0.19187	-0.39397	0.00000	-0.42670	0.00000
7	-0.36847	0.26210	0.01072	0.00000	-0.61418	0.00000
40	-0.07195	0.09608	-0.05241	0.00000	-0.01109	0.00000
41	-0.13230	0.11422	-0.09183	0.00000	-0.01776	0.00000
42	-0.09919	0.16396	-0.05922	0.00000	0.01140	0.00000
43	-0.05062	0.03644	-0.03058	0.00000	0.00656	0.00000

SUM -0.90130 0.86468 -0.61730 0.00000 -1.05177 0.00000

Condition **LC22=0.9D-W90**

1	-0.19537	0.23873	-0.19147	0.00000	-0.24845	0.00000
7	-0.38463	0.21525	0.19147	0.00000	-0.41685	0.00000
40	-0.08535	0.10086	0.00000	0.00000	0.00000	0.00000
41	-0.15565	0.10944	0.00000	0.00000	0.00000	0.00000
42	-0.11415	0.17042	0.00000	0.00000	0.00000	0.00000
43	-0.05985	0.02998	0.00000	0.00000	0.00000	0.00000

SUM -0.99500 0.86468 0.00000 0.00000 -0.66529 0.00000

Condition **LC23=0.9D-W120**

1	-0.17879	0.28352	0.01103	0.00000	-0.03037	0.00000
7	-0.36846	0.17046	0.37223	0.00000	-0.18052	0.00000
40	-0.07195	0.09608	0.05241	0.00000	0.01109	0.00000
41	-0.13230	0.11422	0.09183	0.00000	0.01776	0.00000
42	-0.09919	0.16396	0.05922	0.00000	-0.01140	0.00000
43	-0.05062	0.03644	0.03058	0.00000	-0.00656	0.00000
SUM	-0.90130	0.86468	0.61730	0.00000	-0.20000	0.00000

Condition **LC24=0.9D-W150**

1	-0.19204	0.31217	0.20109	0.00000	0.02206	0.00000
7	-0.36940	0.14181	0.55035	0.00000	-0.10554	0.00000
40	-0.05459	0.13075	0.09505	0.00000	0.01972	0.00000
41	-0.12148	0.07955	0.14102	0.00000	0.02749	0.00000
42	-0.08368	0.14259	0.10371	0.00000	-0.02011	0.00000
43	-0.02309	0.05781	0.06306	0.00000	-0.01324	0.00000
SUM	-0.84429	0.86468	1.15429	0.00000	-0.06962	0.00000

Condition **LC25=1.2D+Di+W10**

1	0.28519	0.54558	-0.35124	0.00000	0.33937	0.00000
7	-0.28519	0.50272	0.52124	0.00000	-0.16469	0.00000
40	0.02065	0.20921	0.02119	0.00000	0.00445	0.00000
41	-0.02065	0.20519	0.03481	0.00000	0.00675	0.00000
42	-0.01744	0.18076	0.02369	0.00000	-0.00456	0.00000
43	0.01744	0.16944	0.01231	0.00000	-0.00264	0.00000
SUM	0.00000	1.81290	0.26200	0.00000	0.17868	0.00000

Condition **LC26=1.2D+Di+W130**

1	0.34081	0.53514	-0.38597	0.00000	0.37379	0.00000
7	-0.23616	0.51316	0.49062	0.00000	-0.14032	0.00000
40	0.03457	0.20674	0.01392	0.00000	0.00292	0.00000
41	0.00220	0.20766	0.02285	0.00000	0.00443	0.00000
42	-0.00193	0.17184	0.01551	0.00000	-0.00299	0.00000
43	0.02597	0.17836	0.00853	0.00000	-0.00181	0.00000
SUM	0.16546	1.81290	0.16546	0.00000	0.23602	0.00000

Condition **LC27=1.2D+Di+W160**

1	0.32565	0.53263	-0.40111	0.00000	0.34324	0.00000
7	-0.24929	0.51568	0.47747	0.00000	-0.17060	0.00000
40	0.03245	0.20817	0.01180	0.00000	0.00248	0.00000
41	-0.00134	0.20623	0.01931	0.00000	0.00375	0.00000
42	-0.00440	0.17294	0.01304	0.00000	-0.00253	0.00000
43	0.02561	0.17726	0.00818	0.00000	-0.00171	0.00000
SUM	0.12869	1.81290	0.12869	0.00000	0.17462	0.00000

Condition **LC28=1.2D+Di+W190**

1	0.33070	0.52330	-0.44152	0.00000	0.31085	0.00000
7	-0.24470	0.52500	0.44152	0.00000	-0.20734	0.00000
40	0.03584	0.20874	0.00000	0.00000	0.00000	0.00000
41	0.00416	0.20566	0.00000	0.00000	0.00000	0.00000
42	-0.00075	0.17049	0.00000	0.00000	0.00000	0.00000
43	0.02875	0.17971	0.00000	0.00000	0.00000	0.00000
SUM	0.15400	1.81290	0.00000	0.00000	0.10351	0.00000

Condition **LC29=1.2D+Di+W1120**

1	0.32566	0.51451	-0.48194	0.00000	0.26646	0.00000
7	-0.24929	0.53379	0.40558	0.00000	-0.25519	0.00000
40	0.03245	0.20817	-0.01180	0.00000	-0.00248	0.00000
41	-0.00134	0.20623	-0.01931	0.00000	-0.00375	0.00000
42	-0.00440	0.17294	-0.01304	0.00000	0.00253	0.00000
43	0.02561	0.17726	-0.00818	0.00000	0.00171	0.00000

SUM 0.12869 1.81290 -0.12869 0.00000 0.00929 0.00000

Condition **LC30=1.2D+Di+W1150**

1	0.34082	0.51055	-0.49709	0.00000	0.27185	0.00000
7	-0.23617	0.53775	0.39243	0.00000	-0.25353	0.00000
40	0.03457	0.20674	-0.01392	0.00000	-0.00292	0.00000
41	0.00220	0.20766	-0.02285	0.00000	-0.00443	0.00000
42	-0.00193	0.17184	-0.01551	0.00000	0.00299	0.00000
43	0.02597	0.17836	-0.00853	0.00000	0.00181	0.00000

SUM 0.16546 1.81290 -0.16546 0.00000 0.01578 0.00000

Condition **LC31=1.2D+Di-W10**

1	0.28520	0.50567	-0.53180	0.00000	0.17422	0.00000
7	-0.28520	0.54264	0.36180	0.00000	-0.34824	0.00000
40	0.02065	0.20921	-0.02119	0.00000	-0.00445	0.00000
41	-0.02065	0.20519	-0.03481	0.00000	-0.00675	0.00000
42	-0.01744	0.18076	-0.02369	0.00000	0.00456	0.00000
43	0.01744	0.16944	-0.01231	0.00000	0.00264	0.00000

SUM 0.00000 1.81290 -0.26200 0.00000 -0.17803 0.00000

Condition **LC32=1.2D+Di-W130**

1	0.22957	0.51611	-0.49707	0.00000	0.13976	0.00000
7	-0.33422	0.53220	0.39242	0.00000	-0.37265	0.00000
40	0.00673	0.21169	-0.01392	0.00000	-0.00292	0.00000
41	-0.04350	0.20271	-0.02285	0.00000	-0.00443	0.00000
42	-0.03295	0.18968	-0.01551	0.00000	0.00299	0.00000
43	0.00891	0.16052	-0.00853	0.00000	0.00181	0.00000

SUM -0.16546 1.81290 -0.16546 0.00000 -0.23544 0.00000

Condition **LC33=1.2D+Di-W160**

1	0.24473	0.51862	-0.48193	0.00000	0.17032	0.00000
7	-0.32110	0.52968	0.40557	0.00000	-0.34236	0.00000
40	0.00885	0.21026	-0.01180	0.00000	-0.00248	0.00000
41	-0.03996	0.20414	-0.01931	0.00000	-0.00375	0.00000
42	-0.03048	0.18857	-0.01304	0.00000	0.00253	0.00000
43	0.00926	0.16163	-0.00818	0.00000	0.00171	0.00000

SUM -0.12869 1.81290 -0.12869 0.00000 -0.17402 0.00000

Condition **LC34=1.2D+Di-W190**

1	0.23969	0.52795	-0.44151	0.00000	0.20271	0.00000
7	-0.32569	0.52036	0.44151	0.00000	-0.30561	0.00000
40	0.00546	0.20969	0.00000	0.00000	0.00000	0.00000
41	-0.04546	0.20471	0.00000	0.00000	0.00000	0.00000
42	-0.03413	0.19103	0.00000	0.00000	0.00000	0.00000
43	0.00613	0.15917	0.00000	0.00000	0.00000	0.00000

SUM -0.15400 1.81290 0.00000 0.00000 -0.10290 0.00000

Condition **LC35=1.2D+Di-WI120**

1	0.24473	0.53673	-0.40110	0.00000	0.24712	0.00000
7	-0.32109	0.51157	0.47746	0.00000	-0.25774	0.00000
40	0.00885	0.21026	0.01180	0.00000	0.00248	0.00000
41	-0.03996	0.20414	0.01931	0.00000	0.00375	0.00000
42	-0.03048	0.18857	0.01304	0.00000	-0.00253	0.00000
43	0.00926	0.16163	0.00818	0.00000	-0.00171	0.00000
SUM	-0.12869	1.81290	0.12869	0.00000	-0.00865	0.00000

Condition **LC36=1.2D+Di-WI150**

1	0.22956	0.54069	-0.38595	0.00000	0.24173	0.00000
7	-0.33422	0.50761	0.49061	0.00000	-0.25939	0.00000
40	0.00673	0.21169	0.01392	0.00000	0.00292	0.00000
41	-0.04350	0.20271	0.02285	0.00000	0.00443	0.00000
42	-0.03295	0.18968	0.01551	0.00000	-0.00299	0.00000
43	0.00891	0.16052	0.00853	0.00000	-0.00181	0.00000
SUM	-0.16546	1.81290	0.16546	0.00000	-0.01512	0.00000

Condition **LC37=1.2D+1.6LL1**

1	0.14112	0.54856	-0.40078	0.00000	0.12706	0.00000
7	-0.14112	0.45674	0.40078	0.00000	-0.12692	0.00000
40	0.01395	0.14379	0.00000	0.00000	0.00000	0.00000
41	-0.01395	0.13661	0.00000	0.00000	0.00000	0.00000
42	-0.01329	0.13794	0.00000	0.00000	0.00000	0.00000
43	0.01329	0.12926	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	1.55290	0.00000	0.00000	0.00015	0.00000

Condition **LC38=1.2D+1.6LL2**

1	-0.11344	0.51413	-0.40087	0.00000	-0.12375	0.00000
7	0.11344	0.49117	0.40087	0.00000	0.12367	0.00000
40	0.01395	0.14379	0.00000	0.00000	0.00000	0.00000
41	-0.01395	0.13661	0.00000	0.00000	0.00000	0.00000
42	-0.01329	0.13794	0.00000	0.00000	0.00000	0.00000
43	0.01329	0.12926	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	1.55290	0.00000	0.00000	-0.00008	0.00000

Condition **LC39=1.2D+1.6LL3**

1	0.39564	0.51426	-0.40084	0.00000	0.37785	0.00000
7	-0.39564	0.49104	0.40084	0.00000	-0.37750	0.00000
40	0.01395	0.14379	0.00000	0.00000	0.00000	0.00000
41	-0.01395	0.13661	0.00000	0.00000	0.00000	0.00000
42	-0.01329	0.13794	0.00000	0.00000	0.00000	0.00000
43	0.01329	0.12926	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	1.55290	0.00000	0.00000	0.00035	0.00000

Condition **LC40=1.2D+WL0+1.6LLa1**

1	-0.32000	0.71174	-0.57571	0.00000	-0.26272	0.00000
7	0.32000	0.69356	0.62971	0.00000	0.31615	0.00000
40	0.01395	0.14379	0.00644	0.00000	0.00134	0.00000
41	-0.01395	0.13661	0.00956	0.00000	0.00186	0.00000
42	-0.01329	0.13794	0.00719	0.00000	-0.00137	0.00000
43	0.01329	0.12926	0.00281	0.00000	-0.00063	0.00000
SUM	0.00000	1.95290	0.08000	0.00000	0.05462	0.00000

Condition **LC41=1.2D+WL30+1.6LLa1**

1	-0.30269	0.70842	-0.58720	0.00000	-0.25164	0.00000
7	0.33521	0.69688	0.61972	0.00000	0.32383	0.00000
40	0.01726	0.14211	0.00331	0.00000	0.00071	0.00000
41	-0.00736	0.13829	0.00658	0.00000	0.00127	0.00000
42	-0.00944	0.13582	0.00384	0.00000	-0.00074	0.00000
43	0.01510	0.13138	0.00181	0.00000	-0.00039	0.00000

SUM	0.04808	1.95290	0.04808	0.00000	0.07303	0.00000
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Condition **LC42=1.2D+WL60+1.6LLa1**

1	-0.30790	0.70750	-0.59238	0.00000	-0.26323	0.00000
7	0.33053	0.69781	0.61501	0.00000	0.31233	0.00000
40	0.01744	0.14337	0.00349	0.00000	0.00072	0.00000
41	-0.00895	0.13703	0.00499	0.00000	0.00098	0.00000
42	-0.00944	0.13582	0.00384	0.00000	-0.00074	0.00000
43	0.01510	0.13138	0.00181	0.00000	-0.00039	0.00000

SUM	0.03677	1.95290	0.03677	0.00000	0.04966	0.00000
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Condition **LC43=1.2D+WL90+1.6LLa1**

1	-0.30726	0.70482	-0.60442	0.00000	-0.27301	0.00000
7	0.33126	0.70049	0.60442	0.00000	0.30133	0.00000
40	0.01714	0.14242	0.00000	0.00000	0.00000	0.00000
41	-0.00714	0.13798	0.00000	0.00000	0.00000	0.00000
42	-0.00960	0.13573	0.00000	0.00000	0.00000	0.00000
43	0.01560	0.13147	0.00000	0.00000	0.00000	0.00000

SUM	0.04000	1.95290	0.00000	0.00000	0.02833	0.00000
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Condition **LC44=1.2D+WL120+1.6LLa1**

1	-0.30790	0.70224	-0.61647	0.00000	-0.28435	0.00000
7	0.33053	0.70306	0.59384	0.00000	0.28861	0.00000
40	0.01744	0.14337	-0.00349	0.00000	-0.00072	0.00000
41	-0.00895	0.13703	-0.00499	0.00000	-0.00098	0.00000
42	-0.00944	0.13582	-0.00384	0.00000	0.00074	0.00000
43	0.01510	0.13138	-0.00181	0.00000	0.00039	0.00000

SUM	0.03677	1.95290	-0.03677	0.00000	0.00370	0.00000
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Condition **LC45=1.2D+WL150+1.6LLa1**

1	-0.30269	0.70077	-0.62166	0.00000	-0.28354	0.00000
7	0.33522	0.70453	0.58913	0.00000	0.28847	0.00000
40	0.01726	0.14211	-0.00331	0.00000	-0.00071	0.00000
41	-0.00736	0.13829	-0.00658	0.00000	-0.00127	0.00000
42	-0.00944	0.13582	-0.00384	0.00000	0.00074	0.00000
43	0.01510	0.13138	-0.00181	0.00000	0.00039	0.00000

SUM	0.04808	1.95290	-0.04808	0.00000	0.00409	0.00000
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Condition **LC46=1.2D-WL0+1.6LLa1**

1	-0.32001	0.69918	-0.63314	0.00000	-0.31356	0.00000
7	0.32001	0.70612	0.57914	0.00000	0.25919	0.00000
40	0.01395	0.14379	-0.00644	0.00000	-0.00134	0.00000
41	-0.01395	0.13661	-0.00956	0.00000	-0.00186	0.00000
42	-0.01329	0.13794	-0.00719	0.00000	0.00137	0.00000
43	0.01329	0.12926	-0.00281	0.00000	0.00063	0.00000

SUM	0.00000	1.95290	-0.08000	0.00000	-0.05557	0.00000
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Condition **LC47=1.2D-WL30+1.6LLa1**

1	-0.33732	0.70250	-0.62165	0.00000	-0.32464	0.00000
7	0.30479	0.70280	0.58912	0.00000	0.25151	0.00000
40	0.01063	0.14547	-0.00331	0.00000	-0.00071	0.00000
41	-0.02053	0.13493	-0.00658	0.00000	-0.00127	0.00000
42	-0.01713	0.14006	-0.00384	0.00000	0.00074	0.00000
43	0.01148	0.12714	-0.00181	0.00000	0.00039	0.00000

SUM	-0.04808	1.95290	-0.04808	0.00000	-0.07398	0.00000
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Condition **LC48=1.2D-WL60+1.6LLa1**

1	-0.33210	0.70343	-0.61646	0.00000	-0.31305	0.00000
7	0.30948	0.70188	0.59383	0.00000	0.26301	0.00000
40	0.01046	0.14421	-0.00349	0.00000	-0.00072	0.00000
41	-0.01894	0.13619	-0.00499	0.00000	-0.00098	0.00000
42	-0.01713	0.14006	-0.00384	0.00000	0.00074	0.00000
43	0.01148	0.12714	-0.00181	0.00000	0.00039	0.00000

SUM	-0.03677	1.95290	-0.03677	0.00000	-0.05061	0.00000
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Condition **LC49=1.2D-WL90+1.6LLa1**

1	-0.33275	0.70611	-0.60442	0.00000	-0.30328	0.00000
7	0.30875	0.69920	0.60442	0.00000	0.27400	0.00000
40	0.01076	0.14516	0.00000	0.00000	0.00000	0.00000
41	-0.02076	0.13524	0.00000	0.00000	0.00000	0.00000
42	-0.01698	0.14015	0.00000	0.00000	0.00000	0.00000
43	0.01098	0.12705	0.00000	0.00000	0.00000	0.00000

SUM	-0.04000	1.95290	0.00000	0.00000	-0.02927	0.00000
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Condition **LC50=1.2D-WL120+1.6LLa1**

1	-0.33210	0.70868	-0.59238	0.00000	-0.29193	0.00000
7	0.30947	0.69663	0.61500	0.00000	0.28672	0.00000
40	0.01046	0.14421	0.00349	0.00000	0.00072	0.00000
41	-0.01894	0.13619	0.00499	0.00000	0.00098	0.00000
42	-0.01713	0.14006	0.00384	0.00000	-0.00074	0.00000
43	0.01148	0.12714	0.00181	0.00000	-0.00039	0.00000

SUM	-0.03677	1.95290	0.03677	0.00000	-0.00464	0.00000
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Condition **LC51=1.2D-WL150+1.6LLa1**

1	-0.33732	0.71015	-0.58719	0.00000	-0.29275	0.00000
7	0.30479	0.69515	0.61971	0.00000	0.28687	0.00000
40	0.01063	0.14547	0.00331	0.00000	0.00071	0.00000
41	-0.02053	0.13493	0.00658	0.00000	0.00127	0.00000
42	-0.01713	0.14006	0.00384	0.00000	-0.00074	0.00000
43	0.01148	0.12714	0.00181	0.00000	-0.00039	0.00000

SUM	-0.04808	1.95290	0.04808	0.00000	-0.00503	0.00000
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Condition **LC52=1.2D+WL0+1.6LLa2**

1	0.60219	0.71197	-0.57571	0.00000	0.56767	0.00000
7	-0.60219	0.69333	0.62971	0.00000	-0.51289	0.00000
40	0.01395	0.14379	0.00644	0.00000	0.00134	0.00000
41	-0.01395	0.13661	0.00956	0.00000	0.00186	0.00000
42	-0.01329	0.13794	0.00719	0.00000	-0.00137	0.00000
43	0.01329	0.12926	0.00281	0.00000	-0.00063	0.00000

SUM	0.00000	1.95290	0.08000	0.00000	0.05598	0.00000
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Condition **LC53=1.2D+WL30+1.6LLa2**

1	0.61943	0.70865	-0.58720	0.00000	0.57869	0.00000
7	-0.58690	0.69665	0.61973	0.00000	-0.50514	0.00000
40	0.01726	0.14211	0.00331	0.00000	0.00071	0.00000
41	-0.00736	0.13829	0.00658	0.00000	0.00127	0.00000
42	-0.00944	0.13582	0.00384	0.00000	-0.00074	0.00000
43	0.01510	0.13138	0.00181	0.00000	-0.00039	0.00000

SUM	0.04808	1.95290	0.04808	0.00000	0.07440	0.00000
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Condition **LC54=1.2D+WL60+1.6LLa2**

1	0.61424	0.70772	-0.59239	0.00000	0.56714	0.00000
7	-0.59162	0.69758	0.61501	0.00000	-0.51668	0.00000
40	0.01744	0.14337	0.00349	0.00000	0.00072	0.00000
41	-0.00895	0.13703	0.00499	0.00000	0.00098	0.00000
42	-0.00944	0.13582	0.00384	0.00000	-0.00074	0.00000
43	0.01510	0.13138	0.00181	0.00000	-0.00039	0.00000

SUM	0.03677	1.95290	0.03677	0.00000	0.05103	0.00000
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Condition **LC55=1.2D+WL90+1.6LLa2**

1	0.61488	0.70504	-0.60443	0.00000	0.55737	0.00000
7	-0.59088	0.70026	0.60443	0.00000	-0.52768	0.00000
40	0.01714	0.14242	0.00000	0.00000	0.00000	0.00000
41	-0.00714	0.13798	0.00000	0.00000	0.00000	0.00000
42	-0.00960	0.13573	0.00000	0.00000	0.00000	0.00000
43	0.01560	0.13147	0.00000	0.00000	0.00000	0.00000

SUM	0.04000	1.95290	0.00000	0.00000	0.02969	0.00000
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Condition **LC56=1.2D+WL120+1.6LLa2**

1	0.61425	0.70247	-0.61647	0.00000	0.54605	0.00000
7	-0.59162	0.70283	0.59384	0.00000	-0.54042	0.00000
40	0.01744	0.14337	-0.00349	0.00000	-0.00072	0.00000
41	-0.00895	0.13703	-0.00499	0.00000	-0.00098	0.00000
42	-0.00944	0.13582	-0.00384	0.00000	0.00074	0.00000
43	0.01510	0.13138	-0.00181	0.00000	0.00039	0.00000

SUM	0.03677	1.95290	-0.03677	0.00000	0.00507	0.00000
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Condition **LC57=1.2D+WL150+1.6LLa2**

1	0.61944	0.70100	-0.62166	0.00000	0.54685	0.00000
7	-0.58691	0.70431	0.58913	0.00000	-0.54054	0.00000
40	0.01726	0.14211	-0.00331	0.00000	-0.00071	0.00000
41	-0.00736	0.13829	-0.00658	0.00000	-0.00127	0.00000
42	-0.00944	0.13582	-0.00384	0.00000	0.00074	0.00000
43	0.01510	0.13138	-0.00181	0.00000	0.00039	0.00000

SUM	0.04808	1.95290	-0.04808	0.00000	0.00546	0.00000
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Condition **LC58=1.2D-WL0+1.6LLa2**

1	0.60220	0.69941	-0.63314	0.00000	0.51691	0.00000
7	-0.60220	0.70589	0.57914	0.00000	-0.56991	0.00000
40	0.01395	0.14379	-0.00644	0.00000	-0.00134	0.00000
41	-0.01395	0.13661	-0.00956	0.00000	-0.00186	0.00000
42	-0.01329	0.13794	-0.00719	0.00000	0.00137	0.00000
43	0.01329	0.12926	-0.00281	0.00000	0.00063	0.00000

SUM	0.00000	1.95290	-0.08000	0.00000	-0.05420	0.00000
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Condition **LC59=1.2D-WL30+1.6LLa2**

1	0.58496	0.70273	-0.62165	0.00000	0.50589	0.00000
7	-0.61749	0.70258	0.58912	0.00000	-0.57766	0.00000
40	0.01063	0.14547	-0.00331	0.00000	-0.00071	0.00000
41	-0.02053	0.13493	-0.00658	0.00000	-0.00127	0.00000
42	-0.01713	0.14006	-0.00384	0.00000	0.00074	0.00000
43	0.01148	0.12714	-0.00181	0.00000	0.00039	0.00000
SUM	-0.04808	1.95290	-0.04808	0.00000	-0.07262	0.00000

Condition **LC60=1.2D-WL60+1.6LLa2**

1	0.59015	0.70365	-0.61646	0.00000	0.51745	0.00000
7	-0.61277	0.70165	0.59384	0.00000	-0.56613	0.00000
40	0.01046	0.14421	-0.00349	0.00000	-0.00072	0.00000
41	-0.01894	0.13619	-0.00499	0.00000	-0.00098	0.00000
42	-0.01713	0.14006	-0.00384	0.00000	0.00074	0.00000
43	0.01148	0.12714	-0.00181	0.00000	0.00039	0.00000
SUM	-0.03677	1.95290	-0.03677	0.00000	-0.04924	0.00000

Condition **LC61=1.2D-WL90+1.6LLa2**

1	0.58951	0.70633	-0.60442	0.00000	0.52722	0.00000
7	-0.61351	0.69897	0.60442	0.00000	-0.55513	0.00000
40	0.01076	0.14516	0.00000	0.00000	0.00000	0.00000
41	-0.02076	0.13524	0.00000	0.00000	0.00000	0.00000
42	-0.01698	0.14015	0.00000	0.00000	0.00000	0.00000
43	0.01098	0.12705	0.00000	0.00000	0.00000	0.00000
SUM	-0.04000	1.95290	0.00000	0.00000	-0.02791	0.00000

Condition **LC62=1.2D-WL120+1.6LLa2**

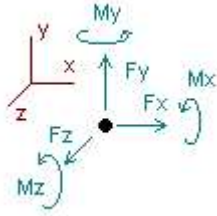
1	0.59014	0.70890	-0.59238	0.00000	0.53854	0.00000
7	-0.61277	0.69640	0.61501	0.00000	-0.54238	0.00000
40	0.01046	0.14421	0.00349	0.00000	0.00072	0.00000
41	-0.01894	0.13619	0.00499	0.00000	0.00098	0.00000
42	-0.01713	0.14006	0.00384	0.00000	-0.00074	0.00000
43	0.01148	0.12714	0.00181	0.00000	-0.00039	0.00000
SUM	-0.03677	1.95290	0.03677	0.00000	-0.00328	0.00000

Condition **LC63=1.2D-WL150+1.6LLa2**

1	0.58495	0.71038	-0.58719	0.00000	0.53774	0.00000
7	-0.61748	0.69492	0.61972	0.00000	-0.54226	0.00000
40	0.01063	0.14547	0.00331	0.00000	0.00071	0.00000
41	-0.02053	0.13493	0.00658	0.00000	0.00127	0.00000
42	-0.01713	0.14006	0.00384	0.00000	-0.00074	0.00000
43	0.01148	0.12714	0.00181	0.00000	-0.00039	0.00000
SUM	-0.04808	1.95290	0.04808	0.00000	-0.00367	0.00000

Envelope for nodal reactions

Note.- I_c is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

- LC1=1.2D+W_o
- LC2=1.2D+W₃₀
- LC3=1.2D+W₆₀
- LC4=1.2D+W₉₀
- LC5=1.2D+W₁₂₀
- LC6=1.2D+W₁₅₀
- LC7=1.2D-W_o
- LC8=1.2D-W₃₀
- LC9=1.2D-W₆₀
- LC10=1.2D-W₉₀
- LC11=1.2D-W₁₂₀
- LC12=1.2D-W₁₅₀
- LC13=0.9D+W_o
- LC14=0.9D+W₃₀
- LC15=0.9D+W₆₀
- LC16=0.9D+W₉₀
- LC17=0.9D+W₁₂₀
- LC18=0.9D+W₁₅₀
- LC19=0.9D-W_o
- LC20=0.9D-W₃₀
- LC21=0.9D-W₆₀
- LC22=0.9D-W₉₀
- LC23=0.9D-W₁₂₀
- LC24=0.9D-W₁₅₀
- LC25=1.2D+D_i+W_{I0}
- LC26=1.2D+D_i+W_{I30}
- LC27=1.2D+D_i+W_{I60}
- LC28=1.2D+D_i+W_{I90}
- LC29=1.2D+D_i+W_{I120}
- LC30=1.2D+D_i+W_{I150}
- LC31=1.2D+D_i-W_{I0}
- LC32=1.2D+D_i-W_{I30}
- LC33=1.2D+D_i-W_{I60}
- LC34=1.2D+D_i-W_{I90}
- LC35=1.2D+D_i-W_{I120}
- LC36=1.2D+D_i-W_{I150}
- LC37=1.2D+1.6LL1
- LC38=1.2D+1.6LL2
- LC39=1.2D+1.6LL3
- LC40=1.2D+W_{L0}+1.6LLa1
- LC41=1.2D+W_{L30}+1.6LLa1
- LC42=1.2D+W_{L60}+1.6LLa1
- LC43=1.2D+W_{L90}+1.6LLa1
- LC44=1.2D+W_{L120}+1.6LLa1
- LC45=1.2D+W_{L150}+1.6LLa1
- LC46=1.2D-W_{L0}+1.6LLa1
- LC47=1.2D-W_{L30}+1.6LLa1
- LC48=1.2D-W_{L60}+1.6LLa1
- LC49=1.2D-W_{L90}+1.6LLa1
- LC50=1.2D-W_{L120}+1.6LLa1
- LC51=1.2D-W_{L150}+1.6LLa1

LC52=1.2D+WL0+1.6LLa2
 LC53=1.2D+WL30+1.6LLa2
 LC54=1.2D+WL60+1.6LLa2
 LC55=1.2D+WL90+1.6LLa2
 LC56=1.2D+WL120+1.6LLa2
 LC57=1.2D+WL150+1.6LLa2
 LC58=1.2D-WL0+1.6LLa2
 LC59=1.2D-WL30+1.6LLa2
 LC60=1.2D-WL60+1.6LLa2
 LC61=1.2D-WL90+1.6LLa2
 LC62=1.2D-WL120+1.6LLa2
 LC63=1.2D-WL150+1.6LLa2

Node		Forces						Moments					
		Fx [Kip]	lc	Fy [Kip]	lc	Fz [Kip]	lc	Mx [Kip*ft]	lc	My [Kip*ft]	lc	Mz [Kip*ft]	lc
1	Max	0.619	LC57	0.712	LC52	0.333	LC13	0.00000	LC1	0.76065	LC2	0.00000	LC1
	Min	-0.337	LC47	0.118	LC19	-0.779	LC7	0.00000	LC1	-0.53900	LC20	0.00000	LC1
7	Max	0.335	LC45	0.706	LC46	0.723	LC1	0.00000	LC1	0.53383	LC14	0.00000	LC1
	Min	-0.617	LC59	0.118	LC13	-0.276	LC19	0.00000	LC1	-0.75655	LC8	0.00000	LC1
40	Max	0.110	LC4	0.212	LC32	0.130	LC1	0.00000	LC1	0.02717	LC13	0.00000	LC1
	Min	-0.085	LC22	0.085	LC18	-0.130	LC7	0.00000	LC1	-0.02717	LC19	0.00000	LC1
41	Max	0.135	LC16	0.208	LC26	0.202	LC13	0.00000	LC1	0.03923	LC1	0.00000	LC1
	Min	-0.159	LC10	0.080	LC20	-0.202	LC19	0.00000	LC1	-0.03923	LC7	0.00000	LC1
42	Max	0.094	LC16	0.205	LC10	0.144	LC13	0.00000	LC1	0.02778	LC19	0.00000	LC1
	Min	-0.117	LC10	0.036	LC16	-0.144	LC19	0.00000	LC1	-0.02778	LC13	0.00000	LC1
43	Max	0.083	LC4	0.196	LC4	0.080	LC1	0.00000	LC1	0.01702	LC7	0.00000	LC1
	Min	-0.060	LC22	0.030	LC22	-0.080	LC7	0.00000	LC1	-0.01702	LC1	0.00000	LC1

Connection Check

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



CHECK THRU BOLT CONNECTION CAPACITY → PROPOSED ANCHORS AT ANTENNA MOUNT

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Bolt Type = A325 5/8" Threaded Rod

Allowable Tensile Load =

$F_{Tall} = 13806$ lbs.

Allowable Shear Load =

$F_{vall} = 8283$ lbs.

CONNECTION PLATE CONFIGURATION (4-BOLTS)

$N_{BOLT\ ROWS} = 2$ rows $d_y = 6$ in (Min.)
 $N_{BOLTS} = 2$ bolts/row $d_x = 6$ in (Min.)

TENSILE FORCES

Moment in X axis: 0 lb-ft. (See Bentley Output)
 Couple Reaction from M_x : 0 lbs.
 Moment in Y axis: 761 lb-ft. (See Bentley Output)
 Couple Reaction from M_y : 3044 lbs.
 Reaction in Z direction: 779 lbs. (See Bentley Output)
 Resultant per bolt: 1717 lbs.

SHEAR FORCES

Moment in Z axis: 0 lb-ft. (See Bentley Output)
 Couple Reaction from M_z : 0 lbs.
 Reaction in X direction: 619 lbs. (See Bentley Output)
 Reaction in Y direction: 712 lbs. (See Bentley Output)
 Resultant per bolt: 236 lbs.

Tension Design Load /Bolts =

$f_t = 1716.75$ lbs. < 13806 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

$f_v = 235.86$ lbs. < 8283.5 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

$f_t / F_T + f_v / F_v \leq 1.0$
 0.124 + 0.028 = 0.153 < 1.0 **Therefore, OK !**

Date: 4/18/2023
 Project Name: EAST HAVEN 5 CT
 Designed By: CL Checked By: MSC



CHECK THRU BOLT CONNECTION CAPACITY → PROPOSED ANCHORS AT RRH MOUNT

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Bolt Type = A36 5/8" Threaded Rod

Allowable Tensile Load =

$F_{Tall} =$ 6673 lbs.

Allowable Shear Load =

$F_{vall} =$ 4004 lbs.

CONNECTION PLATE CONFIGURATION (2-BOLTS)

$N_{BOLT\ ROWS} =$ 2 rows
 $N_{BOLTS} =$ 1 bolts/row
 $d_y =$ 6 in

TENSILE FORCES

Moment in Y axis: 39 lb-ft. (See Bentley Output)
Couple Reaction from M_y : 156 lbs.
Reaction in Z direction: 202 lbs. (See Bentley Output)
Resultant per bolt: 257 lbs.

SHEAR FORCES

Reaction in X direction: 159 lbs. (See Bentley Output)
Reaction in Y direction: 208 lbs. (See Bentley Output)
Resultant per bolt: 131 lbs.

Tension Design Load /Bolts =

$f_t =$ 257.00 lbs. < 6673 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

$f_v =$ 130.91 lbs. < 4004 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

$f_t / F_T + f_v / F_v \leq 1.0$
 0.039 + 0.033 = 0.071 < 1.0 **Therefore, OK !**

CELLCO PARTNERSHIP

d.b.a. **verizon** ✓

WIRELESS COMMUNICATIONS FACILITY

EAST HAVEN 5 CT

**115 MEADOW ROAD
NEW HAVEN, CT 06513**

SPECIAL INSPECTIONS/CONSTRUCTION CONTROL NOTES:

WHERE PERMIT APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPE OF WORK LISTED ON THE STRUCTURAL NOTES & SPECIAL INSPECTIONS PAGE.

SEE SHEET SN-1 FOR FURTHER INFORMATION.

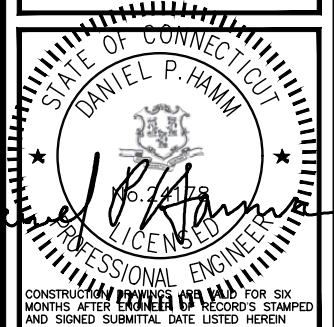
FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

verizon ✓



TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

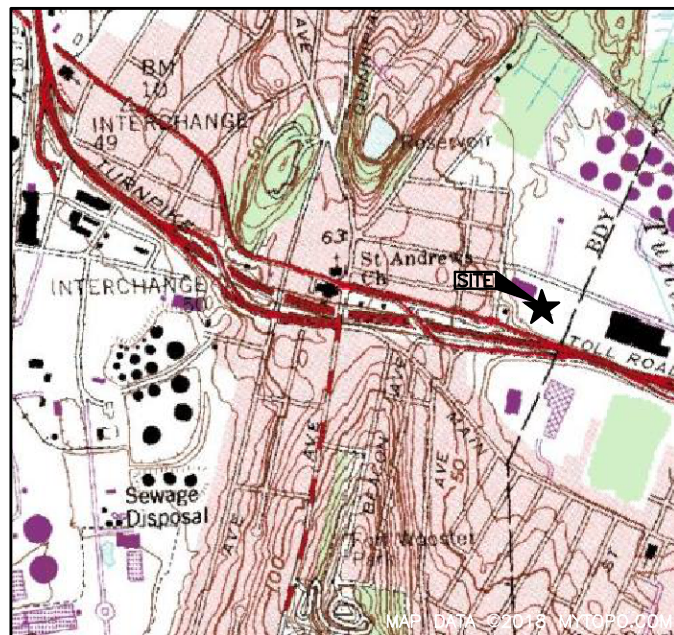
SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1



VICINITY MAP SCALE: 1"=800'

DIRECTIONS TO SITE: FROM VERIZON WALLINGFORD CT OFFICE

20 ALEXANDER DRIVE, WALLINGFORD, CT 06492

HEAD NORTH ON ALEXANDER DR TOWARD BARNES INDUSTRIAL RD S
TURN RIGHT ONTO BARNES INDUSTRIAL RD S
TURN LEFT AT THE 1ST CROSS STREET ONTO CT-68 W
TURN RIGHT TOWARD US-5 N/N COLONY RD
TURN RIGHT ONTO US-5 N/N COLONY RD
TURN LEFT TO MERGE ONTO CT-15 S TOWARD NEW HAVEN
TAKE EXIT 38 FOR CT-123/NEW CANAAN AVENUE
TURN RIGHT ONTO CT-123 S/NEW CANAAN AVE
ARRIVE AT 284 NEW CANAAN AVENUE, NORWALK, CT ON LEFT

CONSULTANT TEAM	
PROJECT ENGINEER	
HUDSON DESIGN GROUP, LLC 45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845 TEL: 1-(978)-557-5553 FAX: 1-(978)-336-5586	
SURVEYOR	
NORTHEAST SURVEY CONSULTANTS 116 PLEASANT ST. SUITE 302 EASTHAMPTON, MA 01027 TEL: 1-(413)-203-5144	

PROJECT SUMMARY	
SITE NAME:	EAST HAVEN 5 CT
SITE ADDRESS:	115 MEADOW ROAD NEW HAVEN, CT 06513
APPLICANT:	CELLCO PARTNERSHIP d/b/a VERIZON WIRELESS 20 ALEXANDER DRIVE WALLINGFORD, CT 06492
LATITUDE:	N 41°17'18.81"
LONGITUDE:	W 72°53'08.98"
PARCEL ID:	72/982/300
PROPERTY OWNER:	115 PEAT MEADOWS LLC 515 WEST MAIN STREET BRANFORD, CT 06405

SHEET INDEX	
SHEET NO.	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
C-1	SITE PLAN
C-2	COMPOUND GRADING PLAN
A-1	COMPOUND PLAN
A-2	ELEVATION
A-3	EQUIPMENT PLAN AND DETAILS
A-4	ANTENNA PLAN AND DETAILS
A-5	CABLE SUPPORT DETAILS
A-6	FENCE DETAILS
A-7	SITE SURFACE COVER AND EROSION CONTROL DETAILS
A-8	FENCE AND BOLLARD DETAILS
A-9	EROSION CONTROL DETAILS
SN-1	STRUCTURAL NOTES & SPECIAL INSPECTIONS
S-1	ICE CANOPY DETAILS
S-2	ICE CANOPY DETAILS
S-3	TOWER CONNECTION DETAILS
S-4	TOWER CONNECTION DETAILS
E-1	ELECTRICAL NOTES & WIRING DIAGRAM
E-2	GROUNDING RISER DIAGRAM
E-3	GROUNDING PLAN
E-4	GROUNDING DETAILS
RF-1	RF PLUMBING DIAGRAM & BILL OF MATERIAL

UNDERGROUND SERVICE ALERT
72 HOURS

CALL BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455
OR CALL 811

NOTE TO GENERAL CONTRACTOR:

'RF' DESIGN AND EQUIPMENT IS BASED UPON
RFDS ISSUED BY VZW DATED: 3/20/2023 REV 4
THE CONTRACTOR OF RECORD SHALL CONTACT VZW PRIOR TO ANY AND ALL ORDERING/PURCHASING/INSTALLATION OF EQUIPMENT TO VERIFY THAT THE 'RF' LISTED IN THE DRAWING SET IS CURRENT AND UP TO DATE.

DIVISION 01000 – GENERAL REQUIREMENTS

PART 1 GENERAL

REFER TO VERIZON STANDARD CONSTRUCTION SPECIFICATIONS. IN CASE OF A CONFLICT, VERIZON STANDARD CONSTRUCTION SPECIFICATIONS (LATEST EDITION) SHALL BE FOLLOWED.

PART 2 GENERAL NOTES

- 1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) VERIZON'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE THEMSELVES WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS / CONTRACT DOCUMENTS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE CONTRACTOR SHALL MAINTAIN A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUM'S OR CLARIFICATIONS AVAILABLE FOR THE USE OF ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, PROCEDURES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING UTILITIES DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE ALL UNNECESSARY MATERIAL.
13. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE STATE BASIC BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ARCHITECT/ENGINEER.
14. THE CONTRACTOR SHALL NOTIFY VERIZON'S REPRESENTATIVE WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL THE CONFLICT IS RESOLVED BY VERIZON'S REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.
16. THE CONTRACTOR SHALL NOTIFY THE RF ENGINEER FOR ANTENNA AZIMUTH VERIFICATION (DURING ANTENNA INSTALLATION) PRIOR TO CONDUCTING SITE SWEEPING.
17. THE GENERAL CONTRACTOR SHALL IN ALL INSTANCES CONFORM TO THE SPECIFICATIONS ISSUED BY VERIZON.
18. WHERE APPLICABLE PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS OR RISERS THROUGH THE BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT STRUCTURAL ENGINEER'S APPROVAL. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE PACKED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE STRUCTURE. FILL FOR FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE FIRE AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.

CONCRETE

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 DESCRIPTION

WORK INCLUDES CONSTRUCTION OF CAST-IN-PLACED CONCRETE FOUNDATIONS, INCLUDING FURNISHING AND INSTALLING READY-MIX CONCRETE, REINFORCING, FORMWORK, AND ACCESSORY MATERIALS AS SHOWN ON THE DRAWINGS. CAST-IN-PLACE CONCRETE INCLUDES ALL SITE CONCRETE, INCLUDING FOUNDATIONS, SLABS ON GRADE, EQUIPMENT PADS, PIERS AND GUARD POST FOUNDATIONS.

1.02 RELATED WORK

- A. COORDINATE UNDER SLAB CONDUITS
B. COORDINATE WITH GROUNDING

1.03 APPLICABLE STANDARDS

- A. ACI-301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE BUILDINGS.
B. ACI 347 – GUIDE TO FORMWORK FOR CONCRETE.
C. ASTM C33 – CONCRETE AGGREGATES
D. ASTM C94 – READY-MIXED CONCRETE
E. ASTM C150 – PORTLAND CEMENT
F. ASTM C260 – AIR-ENTRAINING ADMIXTURES FOR CONCRETE.
G. ASTM C309 – LIQUID MEMBRANE FORMING COMPOUNDS FOR CURING CONCRETE.
H. ASTM C494 – CHEMICAL ADMIXTURES FOR CONCRETE.
I. ASTM A615 – DEFORMED STEEL BARS FOR CONCRETE REINFORCEMENT.
J. ASTM A185 – STEEL WELDED WIRE FABRIC FOR CONCRETE REINFORCEMENT

1.04 QUALITY ASSURANCE

CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER AS DIRECTED BY VERIZON.

1.05 TESTS

CONCRETE TESTS SHALL BE AS DETAILED BELOW OR AS DIRECTED BY VERIZON. CONCRETE MATERIALS AND OPERATIONS SHALL BE TESTED AND INSPECTED BY THE ENGINEER AS THE WORK PROGRESSES. FAILURE TO DETECT ANY DEFECTIVE WORK OR MATERIAL SHALL NOT IN ANY WAY PREVENT LATER REJECTION WHEN SUCH DEFECT IS DISCOVERED NOR SHALL IT OBLIGATE THE ENGINEER FOR FINAL ACCEPTANCE.

A. THREE CONCRETE TEST CYLINDERS SHALL BE TAKEN OF THE TOWER PIER FOUNDATION. ONE SHALL BE TESTED @ THREE DAYS, ONE @ TWENTY-EIGHT DAYS. THE THIRD CYLINDER SHALL BE KEPT SEPARATELY. (IF REQUIRED TO BE USED IN THE FUTURE.)

B. ONE SLUMP TEST SHALL BE TAKEN FOR EACH SET OF TEST CYLINDERS TAKEN. SLUMP SHALL NOT EXCEED 4" UNLESS OTHERWISE NOTED.

PART 2 – PRODUCT

2.01 CONCRETE MATERIALS

CONCRETE SHALL BE COMPOSED OF PORTLAND CEMENT, WATER, FINE AND COARSE AGGREGATES, AND ADMIXTURES AS SPECIFIED BELOW, ALL WELL MIXED AND BROUGHT TO PROPER CONSISTENCY, CLASS I, II, III, OR V.

A. CEMENT: CEMENT SHALL BE TYPE II, GRAY COLOR, LOW-ALKALI PORTLAND CEMENT CONFORMING TO ASTM C150.

B. FINE AND COARSE AGGREGATES: AGGREGATES FOR USE IN CONCRETE SHALL COMPLY WITH ASTM C33.

C. WATER: WATER FOR MIXING AND CURING CONCRETE SHALL BE FREE FROM SEWAGE, OIL, ACID, ALKALI, AND SALTS AND SHALL BE FREE FROM OBJECTIONABLE QUANTITIES OF SILT, ORGANIC MATTER, AND OTHER DELETERIOUS SUBSTANCES.

2.02 ADMIXTURES

A. CHEMICAL ADMIXTURE: ASTM C494, TYPE A – WATER REDUCING OR TYPE D – WATER REDUCING AND RETARDING.

2.03 CURING COMPOUND: ASTM C309, TYPE1. CLASS B; TRANSLUCENT.

2.04 ACCESSORIES

A. NONSHRINK GROUT: PREMIXED COMPOUND CONSISTING OF NONMETALLIC AGGREGATE, CEMENT, WATER REDUCING AND PLASTICIZING AGENTS; CAPABLE OF DEVELOPING MINIMUM COMPRESSIVE STRENGTH OF 7,000 PSI IN 28 DAYS.

B. JOINT FILLER: BITUMINOUS TYPE, ASTM D1751 OR NON-BITUMINOUS TYPE ASTM D1752.

C. ANCHOR BOLTS: ASTM A307. UNPRIMED.

2.05 CONCRETE MIX

A. CONCRETE SHALL BE PROPORTIONED PER REQUIREMENTS OF ACI 301 & VERIZON CONSTRUCTION SPECIFICATIONS FOR DESIGN STRENGTH & WORKABILITY. CONCRETE SHALL BE DELIVERED WITHIN 45 MINUTES OF ADDITION OF WATER TO MIX.

B. THE FOLLOWING STRENGTHS SHALL BE USED:
1. FENCE POST FOUNDATIONS – DESIGN COMPRESSIVE STRENGTH AT 28 DAYS OF 3,000 PSI.
2. EQUIPMENT PLATFORM PIERS FOUNDATION – DESIGN COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS UNLESS OTHERWISE NOTED. (CONTRACTOR FURNISH 4,000 PSI CONCRETE).

3. CONCRETE STRENGTH FOR MONOPOLE OR TOWER FOUNDATION SHALL BE 1,000 PSI MORE THAN THE MANUFACTURER'S RECOMMENDATIONS, 4,000 PSI MINIMUM.

C. USE ACCELERATING ADMIXTURES IN COLD WEATHER AND RETARDING ADMIXTURES IN HOT WEATHER ONLY WHEN APPROVED BY THE ENGINEER.

D. TOTAL AIR CONTENT SHALL BE 5 PERCENT PLUS OR MINUS 1 PERCENT.

PART 3 – EXECUTION

3.01 INSPECTION

THE CONTRACTOR SHALL VERIFY ANCHORS, SEATS, PENETRATIONS, PLATES, REINFORCEMENT, AND OTHER ITEMS TO CAST INTO CONCRETE ARE ACCURATELY PLACED, HELD SECURELY, AND SHALL NOT CAUSE HARDSHIP IN PLACING CONCRETE.

3.02 PREPARATION

A. THE CONTRACTOR SHALL PREPARE PREVIOUSLY PLACED CONCRETE BY CLEANING WITH STEEL BRUSH AND APPLYING BONDING AGENT. APPLY BONDING AGENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

3.03 PLACING CONCRETE

A. THE ENGINEER SHALL BE NOTIFIED NOT LESS THAN 24 HOURS IN ADVANCE OF CONCRETE PLACEMENT. UNLESS INSPECTION IS WAIVED IN EACH CASE, PLACING OF CONCRETE SHALL BE PERFORMED ONLY IN THE PRESENCE OF THE ENGINEER.

CONCRETE SHALL NOT BE PLACED UNTIL ALL FORM WORK, EMBEDDED PARTS, STEEL REINFORCEMENT, FOUNDATION SURFACES, AND JOINTS INVOLVED IN THE PLACING HAVE BEEN APPROVED, AND UNTIL FACILITIES ACCEPTABLE TO THE VERIZON REPRESENTATIVE HAVE BEEN PROVIDED AND MADE READY FOR ACCOMPLISHMENT OF THE WORK AS SPECIFIED. CONCRETE MAY NOT BE ORDERED FOR PLACEMENT UNTIL ALL ITEMS HAVE BEEN APPROVED AND VERIZON HAS PERFORMED A FINAL INSPECTION AND GIVEN APPROVAL TO START PLACEMENT IN WRITING.

B. UNLESS SPECIFIED TO BE BEVELED, EXPOSED EDGES OF FLOATED OR TROWELED SURFACES SHALL BE EDGED WITH A TOOL HAVING A 1/4" CORNER RADIUS.

C. PLACEMENT OF CONCRETE SHALL BE IN ACCORDANCE WITH ACI 301.

D. THE CONTRACTOR SHALL ENSURE THAT REINFORCEMENT, INSERTS, EMBEDDED PARTS, FORMED JOINTS AND VAPOR BARRIERS ARE NOT DISTURBED DURING CONCRETE PLACEMENT.

E. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST EARTH.....3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 AND LARGER.....2 IN.
#5 AND SMALLER & WWF.....1 1/2 IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
SLAB AND WALL.....3/4 IN.
BEAMS AND COLUMNS.....1 1/2 IN.

3.04 SURFACE FINISHES

A. SURFACES AGAINST WHICH BACK FILL OR CONCRETE SHALL BE PLACED REQUIRE NO TREATMENT EXCEPT REPAIR OF DEFECTIVE AREAS.

B. SURFACES THAT WILL BE PERMANENTLY EXPOSED SHALL PRESENT A UNIFORM FINISH PROVIDED BY THE REMOVAL OF FINIS AND THE FILLING OF HOLES AND OTHER IRREGULARITIES WITH DRY PACK GROUT, OR BY SACKING WITH UTILITY OR ORDINARY GROUT.

C. SURFACES THAT WOULD NORMALLY BE LEVEL AND WHICH WILL BE PERMANENTLY EXPOSED TO THE WEATHER SHALL BE SLOPED FOR DRAINAGE. UNLESS ENGINEER'S DESIGN DRAWING SPECIFIES A HORIZONTAL SURFACE OR SHOWS THE SLOPE REQUIRED. THE TOPS OF NARROW SURFACES, SUCH AS STAIR TREADS, WALLS, CURBS, AND PARAPETS SHALL BE SLOPED APPROXIMATELY 3/8" /FT OF WIDTH. BROADER SURFACES SUCH AS WALKS, ROADS, PARKING AREAS AND PLATFORMS SHALL BE SLOPED APPROXIMATELY 1/4" /FT.

D. SURFACES THAT WILL BE COVERED BY BACKFILL OR CONCRETE SHALL BE SMOOTH SCREEEDED.

E. EXPOSED SLAB AND PIER SURFACES SHALL BE CONSOLIDATED, SCREEEDED, FLOATED, AND "STEEL TROWELED." HAND OR POWER-DRIVEN EQUIPMENT MAY BE USED FOR FLOATINGS WHICH SHALL BE STARTED AS SOON AS THE SCREENED SURFACE HAS ATTAINED A STIFFNESS TO PERMIT FINISHING OPERATIONS. ALL EDGES MUST HAVE A 3/4" CHAMFER. CONCRETE EXPANSION ANCHORS AND EPOXY ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS, SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. MANUFACTURER'S MINIMUM CONCRETE EDGE DISTANCE SHALL BE MAINTAINED DURING INSTALLATION.

3.05 PATCHING

THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY UPON REMOVAL OF THE FORMS TO OBSERVE CONCRETE SURFACE CONDITIONS. IMPERFECTIONS SHALL BE PATCHED ACCORDING TO THE ENGINEERS DIRECTION.

3.06 DEFECTIVE CONCRETE

THE CONTRACTOR SHALL MODIFY OR REPLACE CONCRETE NOT CONFORMING TO REQUIRED LEVELS AND LINES, DETAILS, AND ELEVATIONS AS SPECIFIED IN ACI 301.

3.07 PROTECTION

A. IMMEDIATELY AFTER PLACEMENT, THE CONTRACTOR SHALL PROTECT THE CONCRETE FROM PREMATURE DRYING. EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY. FINISHED WORK SHALL BE PROTECTED.

B. CONCRETE SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.

C. ALL CONCRETE SHALL BE WATER CURED PER ACCEPTABLE PRACTICES SPECIFIED BY ACI CODE.

METALS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. THE WORK CONSISTS OF THE FABRICATION AND INSTALLATION OF ALL MATERIALS TO BE FURNISHED, AND WITHOUT LIMITING THE GENERALITY THEREOF, INCLUDES ALL EQUIPMENT, LABOR AND SERVICES REQUIRED FOR ALL STRUCTURAL STEEL WORK, INCLUDING ALL ITEMS INCIDENTAL THERETO AS SPECIFIED HEREIN AND AS SHOWN ON THE DRAWINGS. INCLUDING:

- 1. STEEL FRAMING INCLUDING BEAMS, ANGLES, CHANNELS AND PLATES.
2. WELDING AND BOLTING OF ATTACHMENTS.

1.02 REFERENCE STANDARDS

A. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

1. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS, AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS IN BUILDING CODES"

2. AWS: AMERICAN WELDING SOCIETY INC., AS PUBLISHED IN "STANDARD D1.1-2015, STRUCTURAL WELDING CODE".

3. AISC: AMERICAN INSTITUTE FOR STEEL CONSTRUCTION, AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".

4. EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA SUPPORTING STRUCTURES.

PART 2 – STRUCTURAL NOTES

ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS AND VERIZON SPECIFICATIONS UNLESS OTHERWISE NOTED. STRUCTURAL STEEL SHALL BE ASTM-A992-50 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION". MISC. STEEL TO BE A36.

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, ANSI/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA SUPPORTING STRUCTURES.

2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.

3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".

4. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE A, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.

5. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". UNLESS OTHERWISE NOTED, ALL BOLTS SHALL BE 5/8" DIA TYPE X.

6. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.

7. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.

8. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.

9. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D.I.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION.

10. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.

11. UNISTRUTS SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP, WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA. UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION FOR EXTERNAL USE APPLICATIONS.

12. UNLESS OTHERWISE NOTED, EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF 1/2" DIAMETER STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED ON DWG.) OR ENGINEERS APPROVED EQUAL WITH 4-1/4" MIN. EMBEDMENT DEPTH.

13. UNLESS OTHERWISE NOTED, EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT II OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE THREE AND ONE HALF (3 1/2) INCHES.

WOOD

- 1. PLYWOOD SHALL MEET THE RECOMMENDATIONS OF THE A.P.A.
2. ALL LUMBER SHALL BE SPRUCE-PINE-FIR (SPF) #1 GRADE.
3. ALL LUMBER SHALL BE PRESSURE TREATED WITH PRESERVATIVES. ALLOWABLE BENDING STRESS: fb min = 1,000 PSI
MODULUS OF ELASTICITY: 1.6x10+6 PSI
4. ALL JOIST HANGERS, CLIP ANGLES AND PLATES TO BE HEAVY GALVANIZED AS MANUFACTURED BY SIMPSON CO., OR APPROVED EQUAL.
5. ALL LVL'S TO BE MANUFACTURED BY BOSIE CASCADE OR APPROVED EQUAL.

SPECIAL CONSTRUCTION ANTENNA INSTALLATION

PART 1 – GENERAL

1.01 WORK INCLUDED

A. ANTENNAS AND HYBRIFLEX CABLES SHALL BE AS SPECIFIED ON THESE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND PROPERTY. STRICT ADHERENCE TO OSHA STANDARDS IS MANDATED.

B. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND VERIZON SPECIFICATIONS.

C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

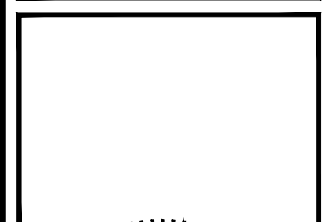
D. INSTALL HYBRIFLEX CABLES AND TERMINATION'S BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.

E. ANTENNA MOUNTS AND HARDWARE SHALL BE PAINTED TO MATCH EXISTING CONDITIONS.

F. ANTENNA AND HYBRIFLEX CABLE GROUNDING:
1. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED.
2. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS).

FOR CONSTRUCTION

PREPARED FOR: CELCO PARTNERSHIP D.B.A.



CHECKED BY: JX
APPROVED BY: DPH
SUBMITTALS table with columns REV., DATE, DESCRIPTION, BY

CHECKED BY: JX

APPROVED BY: DPH

Table with 4 columns: REV., DATE, DESCRIPTION, BY. Contains 6 rows of submittal data.

SITE NAME: EAST HAVEN 5 CT
SITE ADDRESS: 115 MEADOW ROAD NEW HAVEN, CT 06513

SHEET TITLE: GENERAL NOTES

SHEET NUMBER: GN-1

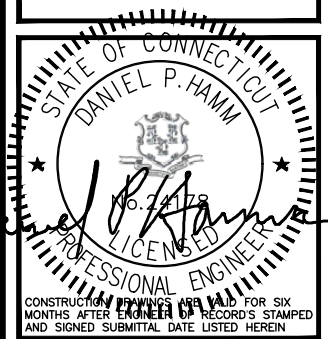
IF ASSUMED EXISTING CONDITION DIFFERS, ENGINEER MUST BE INFORMED OF ACTUAL FIELD CONDITION. SUBCONTRACTOR TO VERIFY EXISTING DIMENSIONS PRIOR TO STEEL FABRICATION.

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

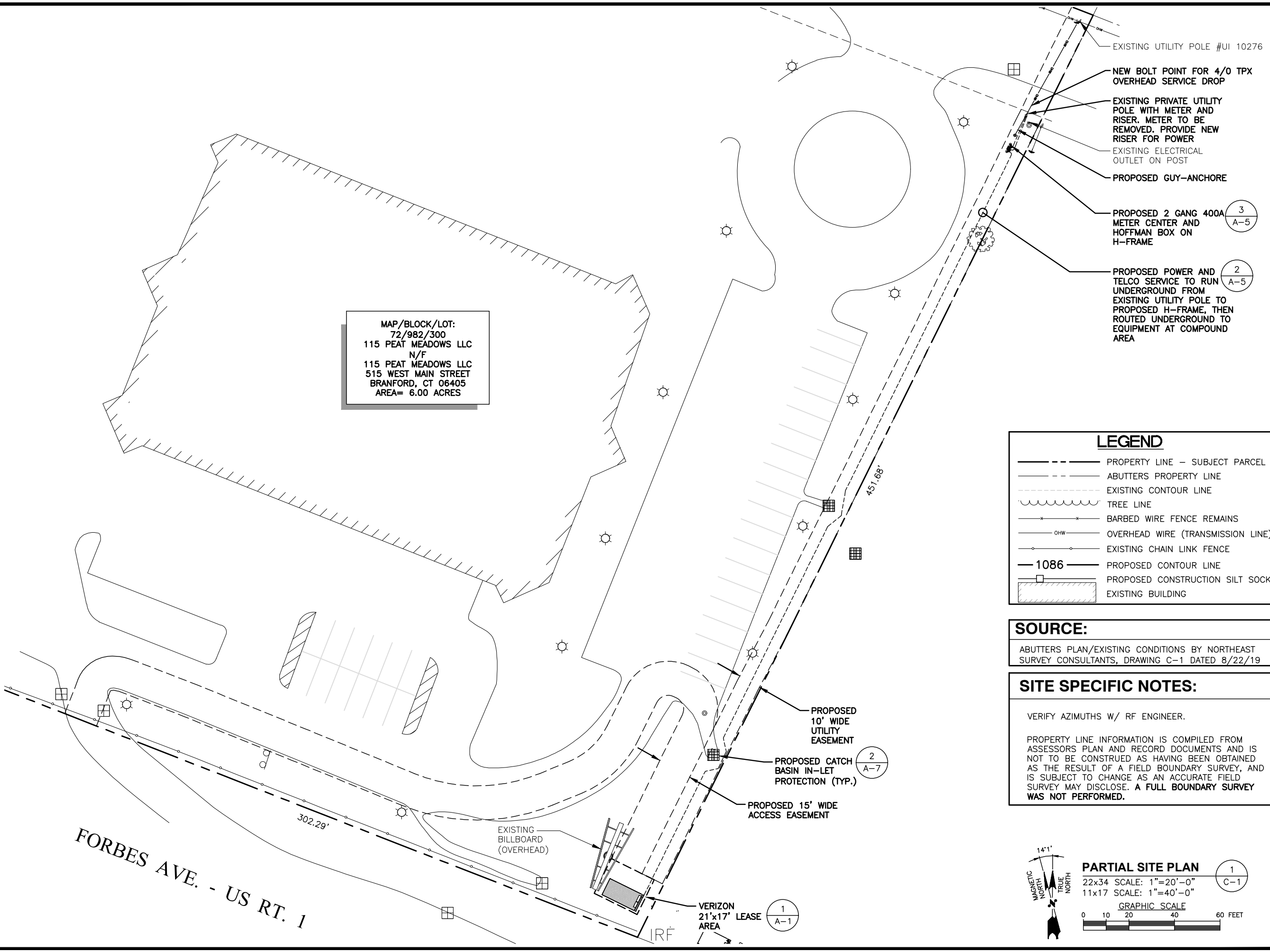
SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
SITE PLAN

SHEET NUMBER
C-1



MAP/BLOCK/LOT:
72/982/300
115 PEAT MEADOWS LLC
N/F
115 PEAT MEADOWS LLC
515 WEST MAIN STREET
BRANFORD, CT 06405
AREA= 6.00 ACRES

- EXISTING UTILITY POLE #UI 10276
- NEW BOLT POINT FOR 4/0 TPX OVERHEAD SERVICE DROP
- EXISTING PRIVATE UTILITY POLE WITH METER AND RISER. METER TO BE REMOVED. PROVIDE NEW RISER FOR POWER
- EXISTING ELECTRICAL OUTLET ON POST
- PROPOSED GUY-ANCHORE
- PROPOSED 2 GANG 400A METER CENTER AND HOFFMAN BOX ON H-FRAME (3 A-5)
- PROPOSED POWER AND TELCO SERVICE TO RUN UNDERGROUND FROM EXISTING UTILITY POLE TO PROPOSED H-FRAME, THEN ROUTED UNDERGROUND TO EQUIPMENT AT COMPOUND AREA (2 A-5)

LEGEND

- PROPERTY LINE - SUBJECT PARCEL
- ABUTTERS PROPERTY LINE
- - - EXISTING CONTOUR LINE
- ~ ~ ~ TREE LINE
- * - BARBED WIRE FENCE REMAINS
- OHW - OVERHEAD WIRE (TRANSMISSION LINE)
- - - EXISTING CHAIN LINK FENCE
- 1086 - PROPOSED CONTOUR LINE
- [] PROPOSED CONSTRUCTION SILT SOCK
- [] EXISTING BUILDING

SOURCE:
ABUTTERS PLAN/EXISTING CONDITIONS BY NORTHEAST SURVEY CONSULTANTS, DRAWING C-1 DATED 8/22/19

SITE SPECIFIC NOTES:

VERIFY AZIMUTHS W/ RF ENGINEER.

PROPERTY LINE INFORMATION IS COMPILED FROM ASSESSORS PLAN AND RECORD DOCUMENTS AND IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED AS THE RESULT OF A FIELD BOUNDARY SURVEY, AND IS SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. A FULL BOUNDARY SURVEY WAS NOT PERFORMED.

PARTIAL SITE PLAN (1 C-1)

22x34 SCALE: 1"=20'-0"
11x17 SCALE: 1"=40'-0"

GRAPHIC SCALE
0 10 20 40 60 FEET

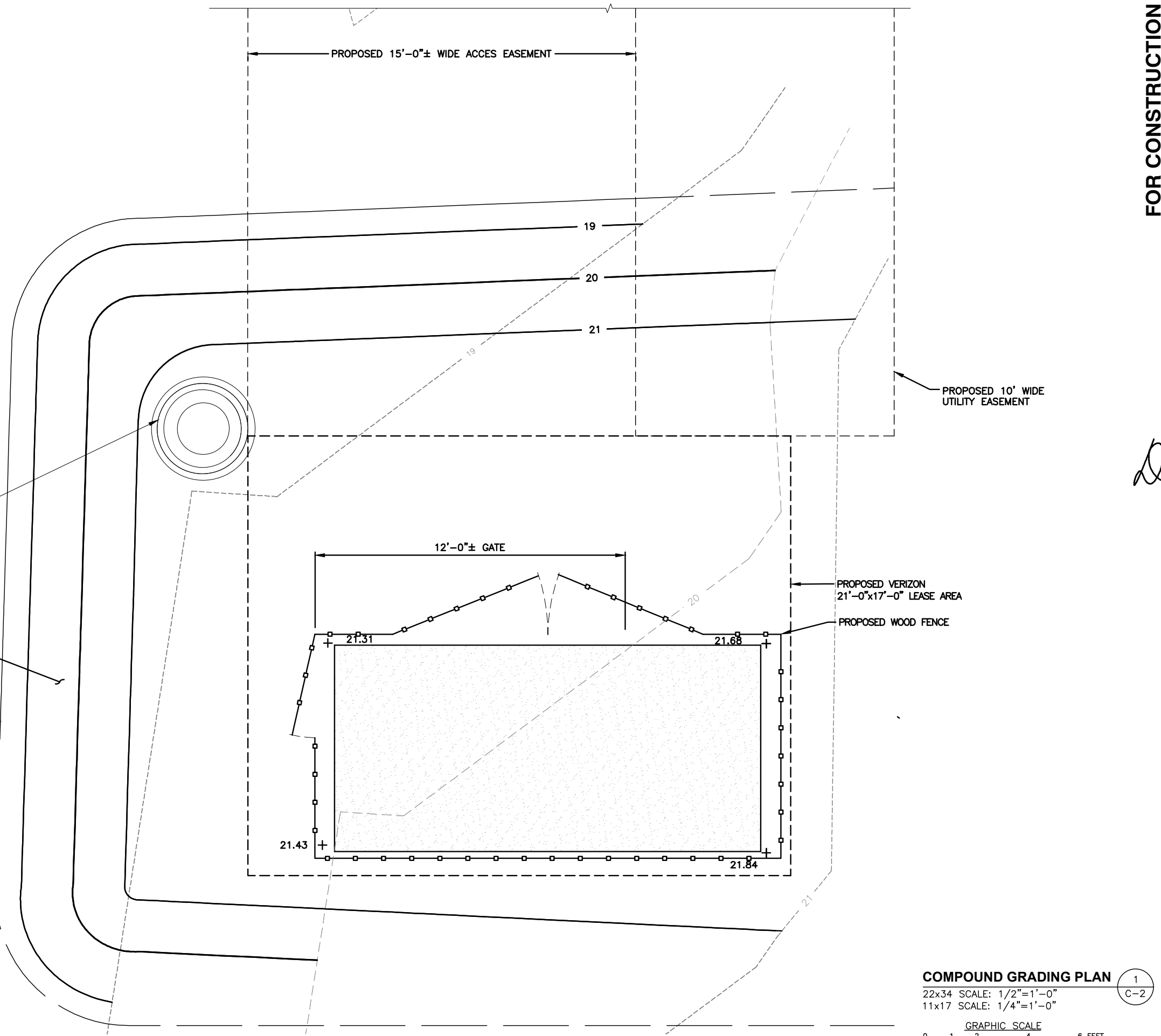
FORBES AVE. - US RT. 1

VERIZON 21'x17' LEASE AREA (1 A-1)

- PROPOSED 10' WIDE UTILITY EASEMENT (2 A-7)
- PROPOSED CATCH BASIN IN-LET PROTECTION (TYP.)
- PROPOSED 15' WIDE ACCESS EASEMENT

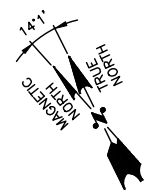
LEGEND

- PROPERTY LINE - SUBJECT PARCEL
- ABUTTERS PROPERTY LINE
- EXISTING CONTOUR LINE
- ~~~ TREE LINE
- x-x- BARBED WIRE FENCE REMAINS
- OHW- OVERHEAD WIRE (TRANSMISSION LINE)
- o-o- EXISTING CHAIN LINK FENCE
- s- EXISTING UNDERGROUND SEWER LINE
- - - DELINEATED WETLAND LINE
- ▭ EXISTING BUILDING
- ▭ PROPOSED EQUIPMENT CONCRETE PAD
- CB CATCH BASIN
- CONIFEROUS TREE
- DECIDUOUS TREE
- ⊙ EXISTING GROUND WELL
- ⊙ EXISTING SEWER MANHOLE
- STONEWALL
- WELL
- UTILITY POLE
- 1086- PROPOSED CONTOUR LINE
- PROPOSED CONSTRUCTION SILT SOCK
- PROPOSED TOWER



SHAPE, COMPACT, LOAM & SEED WITH N.E. WILDLIFE MIX, AND COVER WITH SHREDDED MULCH

2
A-7
PROPOSED CONSTRUCTION SILT SOCK PER 2002 CONNECTICUT GUIDELINES FOR SOIL AND SEDIMENT CONTROL



COMPOUND GRADING PLAN 1
C-2

22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

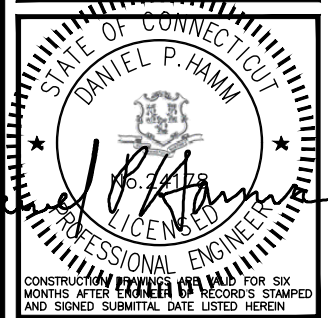
GRAPHIC SCALE
0 1 2 4 6 FEET

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SJY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SJY
2	06/24/22	REV. ANTENNA MOUNT	SJY
1	05/13/22	ADDED N77 ANTENNAS	SJY
0	07/19/21	ISSUED FOR CONSTRUCTION	SJY

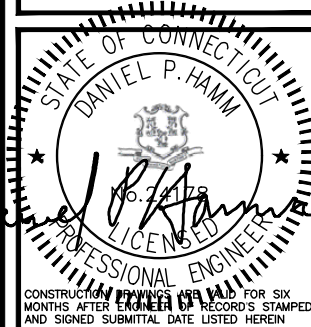
SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
COMPOUND GRADING PLAN

SHEET NUMBER
C-2

FOR CONSTRUCTION



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

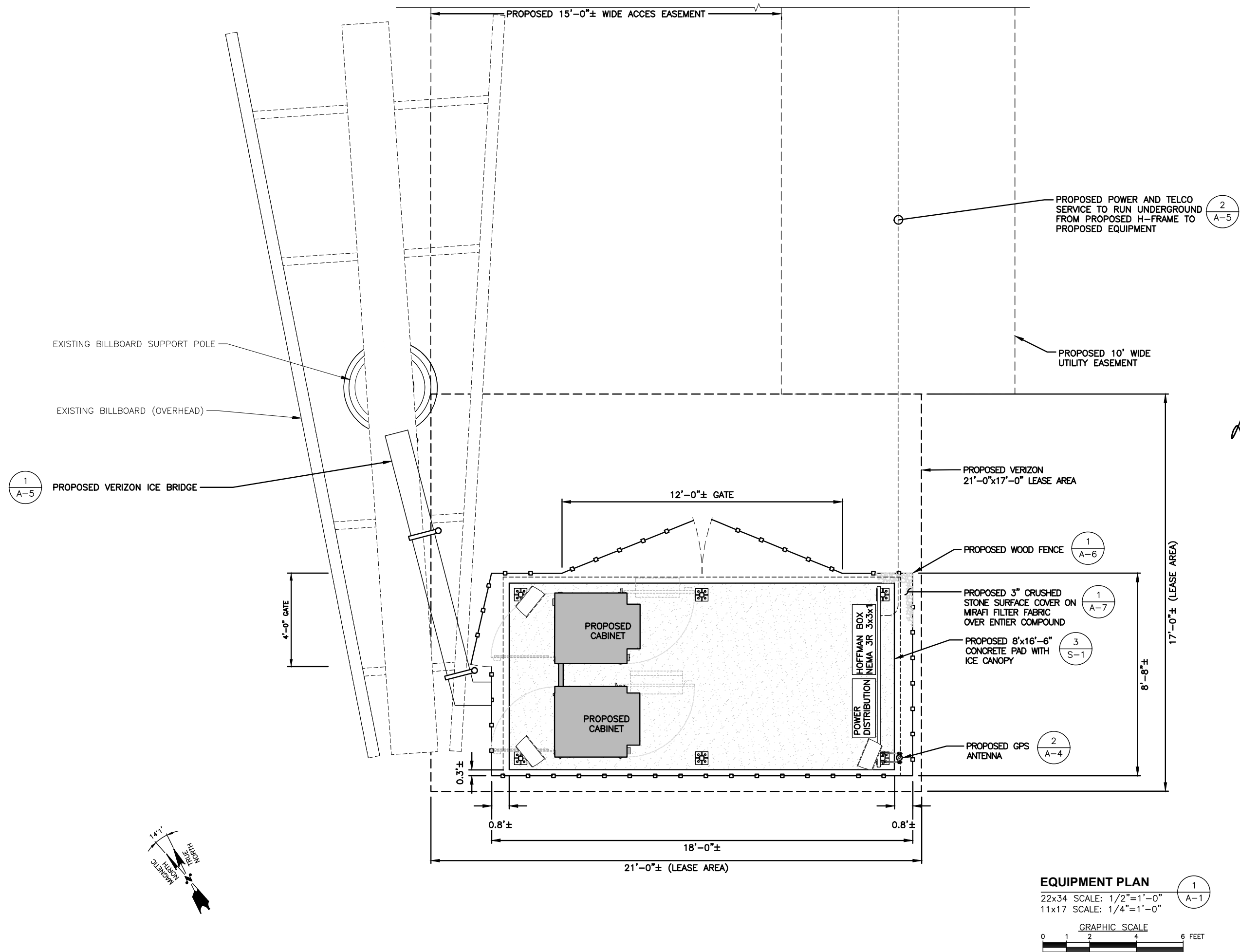
SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER

A-1



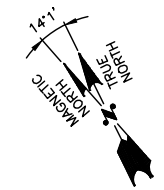
EQUIPMENT PLAN

22x34 SCALE: 1/2"=1'-0"

11x17 SCALE: 1/4"=1'-0"

GRAPHIC SCALE

0 1 2 4 6 FEET



TOP OF PROPOSED ANTENNAS
 ELEV. = 70'-0"± A.G.L
 ELEV. = 92'-0"± A.M.S.L

TOP OF PROPOSED POLE EXTENSION
 ELEV. = 69'-0"± A.G.L
 ELEV. = 91'-0"± A.M.S.L

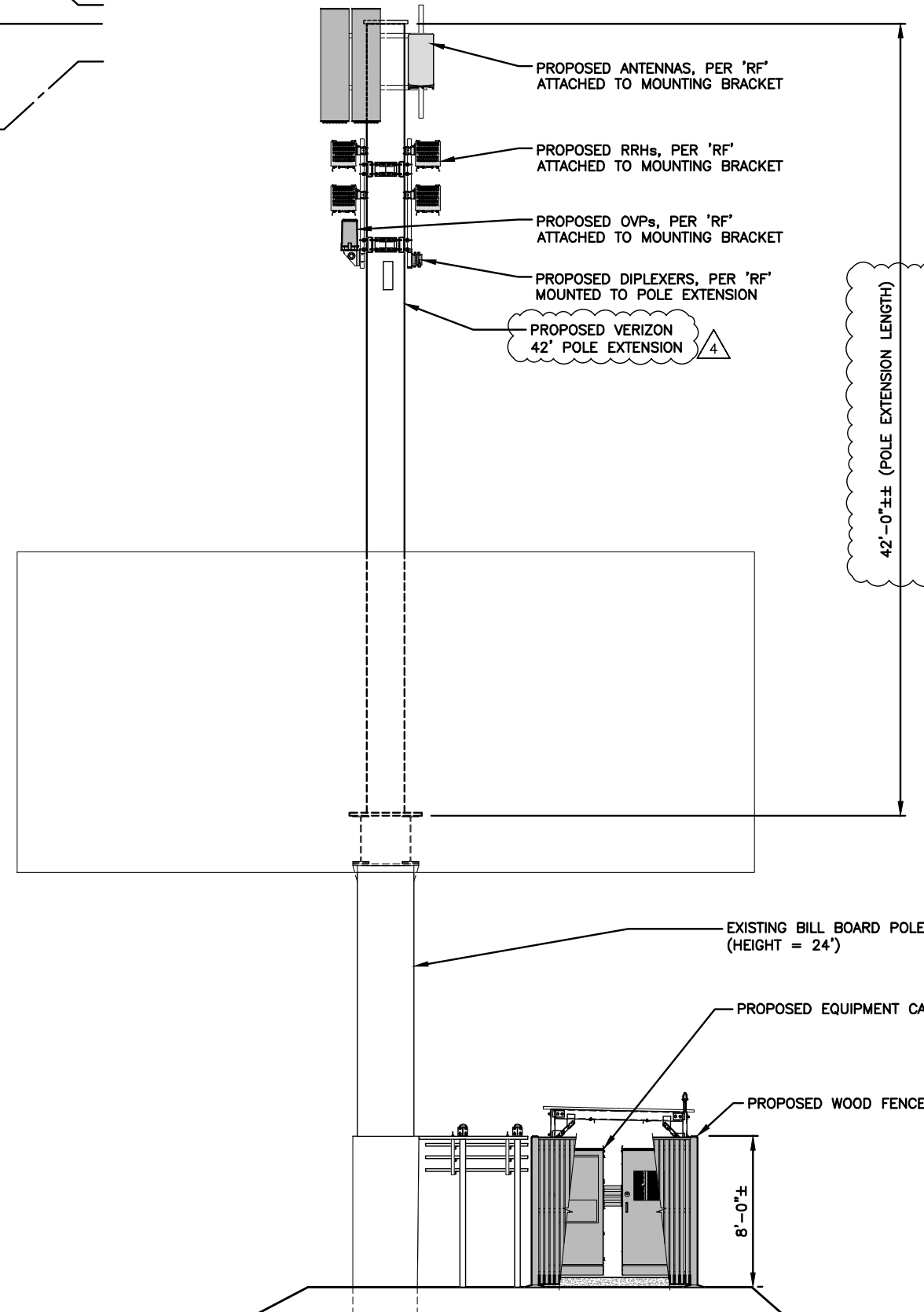
☉ OF PROPOSED VERIZON ANTENNAS
 ELEV. = 67'-0"± A.G.L
 ELEV. = 89'-0"± A.M.S.L

TOP OF EXISTING BILL BOARD
 ELEV. = 41'-0"± A.G.L
 ELEV. = 63'-0"± A.M.S.L

TOP OF EXISTING BILL BOARD POLE
 ELEV. = 24'-0"± A.G.L
 ELEV. = 46'-0"± A.M.S.L

PROPOSED GRADE
 ELEV. = 0.0'± A.G.L
 ELEV. = 22'-0"± A.M.S.L

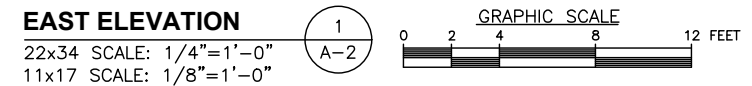
EXISTING GRADE
 ELEV. = -3.0'± A.G.L
 ELEV. = 19'-0"± A.M.S.L



NOTE:
 AN ANALYSIS OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY TEP NORTHEAST (TEP OPCO, LLC) DATED: MARCH 22, 2023 (REV.6)

NOTE:
 AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: TEP NORTHEAST (TEP OPCO, LLC) DATED: JUNE 30, 2022

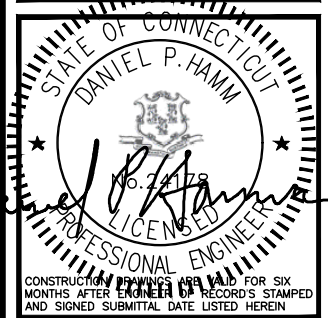
42'-0"± (POLE EXTENSION LENGTH)



NOTE TO GENERAL CONTRACTOR:
 'RF' DESIGN AND EQUIPMENT IS BASED UPON
RFDS ISSUED BY VZW DATED: 3/20/2023 REV 4
 THE CONTRACTOR OF RECORD SHALL CONTACT VZW PRIOR TO ANY AND ALL ORDERING/PURCHASING/INSTALLATION OF EQUIPMENT TO VERIFY THAT THE 'RF' LISTED IN THE DRAWING SET IS CURRENT AND UP TO DATE.

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS				
REV.	DATE	DESCRIPTION	BY	
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY	
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY	
2	06/24/22	REV. ANTENNA MOUNT	SLY	
1	05/13/22	ADDED N77 ANTENNAS	SLY	
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY	

SITE NAME:
EAST HAVEN 5 CT

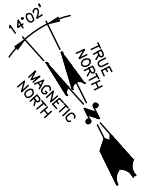
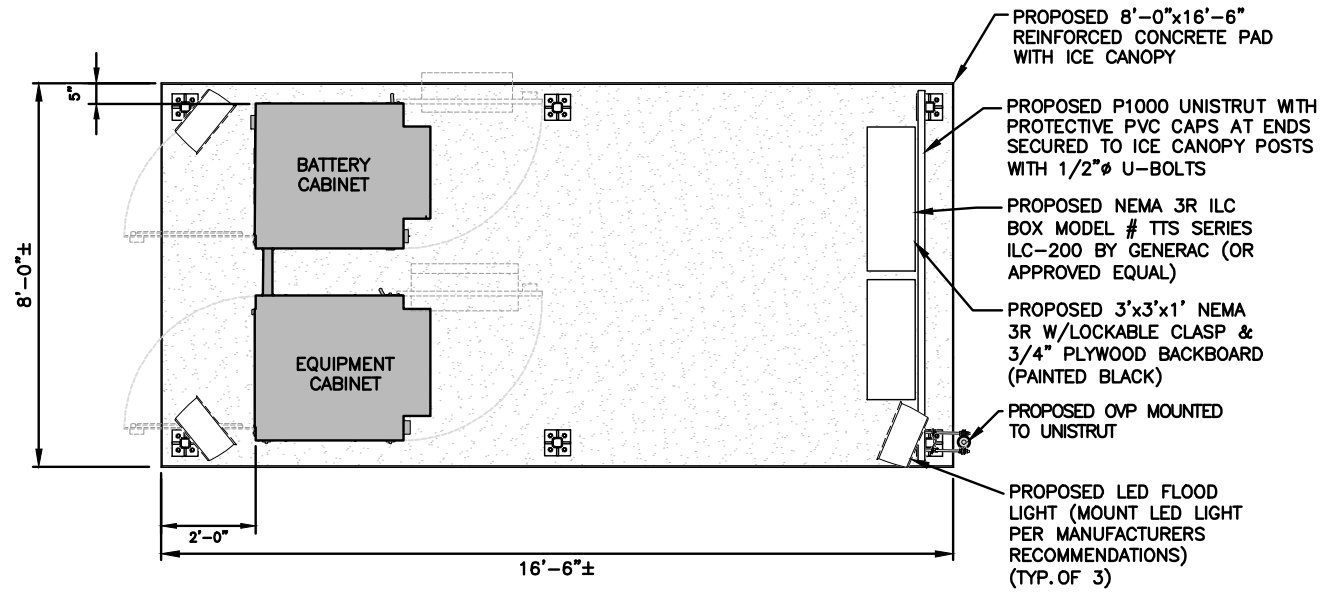
SITE ADDRESS:
 115 MEADOW ROAD
 NEW HAVEN, CT 06513

SHEET TITLE
ELEVATION

SHEET NUMBER
A-2

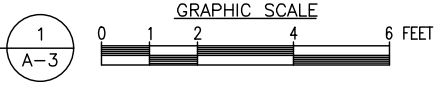
NOTE:

CONTRACTOR SHALL NOT INSTALL ANY HARDWARE/EQUIPMENT IN AND AROUND ANY WORKING AREAS THAT CREATE A TRIP HAZARD. E.O.R. SHALL BE NOTIFIED IF ANY EXISTING HARDWARE/EQUIPMENT CREATES A TRIP HAZARD PRIOR TO INSTALLATION.



EQUIPMENT PLAN

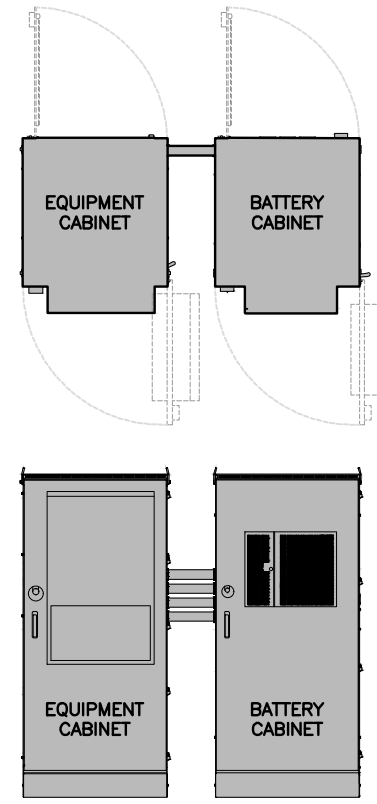
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"



COOPER LIGHTING NFFLD NIGHT FALCON
NFFLD-A25-E-UNV-66-S-BK
SLIPFITTER MOUNT AND VANDAL SHIELD
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

LED FLOOD LIGHT DETAIL

SCALE: N.T.S



SPECIFICATIONS:
MANUFACTURER: COMMSCOPE
PART NO.: CMC74-36B
BATTERY CABINET
SIZE: 80.75"x36.2"x43.7"
WEIGHT: TBD LBS

SPECIFICATIONS:
MANUFACTURER: COMMSCOPE
PART NO.: CMC74-36E
EQUIPMENT CABINET
SIZE: 80.75"x36.2"x43.7"
WEIGHT: TBD LBS

NOTE:
ANCHOR CABINET TO STEEL PLATFORM PER MANUFACTURERS RECOMMENDATIONS

DUAL CABINET DETAIL (EQUIPMENT & BATTERY)

SCALE: N.T.S



INTERMATIC_WP1220C

TYPE: DOUBLE GANG
HINGE: VERTICAL
INSERT: WP217
DEPTH: 2-1/4"
COLOR: CLEAR

OR APPROVED EQUIVALENT



INTERMATIC_FF6H

TIME CYCLE: 6 HOURS
SWITCH: SPST
HOLD: NO

OR APPROVED EQUIVALENT

SWITCH DETAIL

SCALE: N.T.S

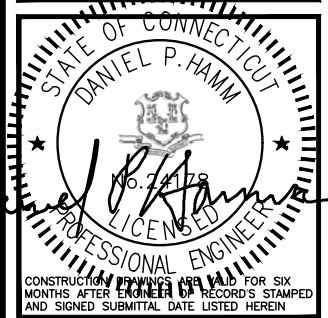


FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

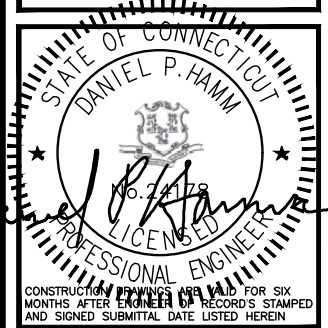
SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
EQUIPMENT PLAN AND DETAILS

SHEET NUMBER
A-3

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



CHECKED BY: JX

APPROVED BY: DPH

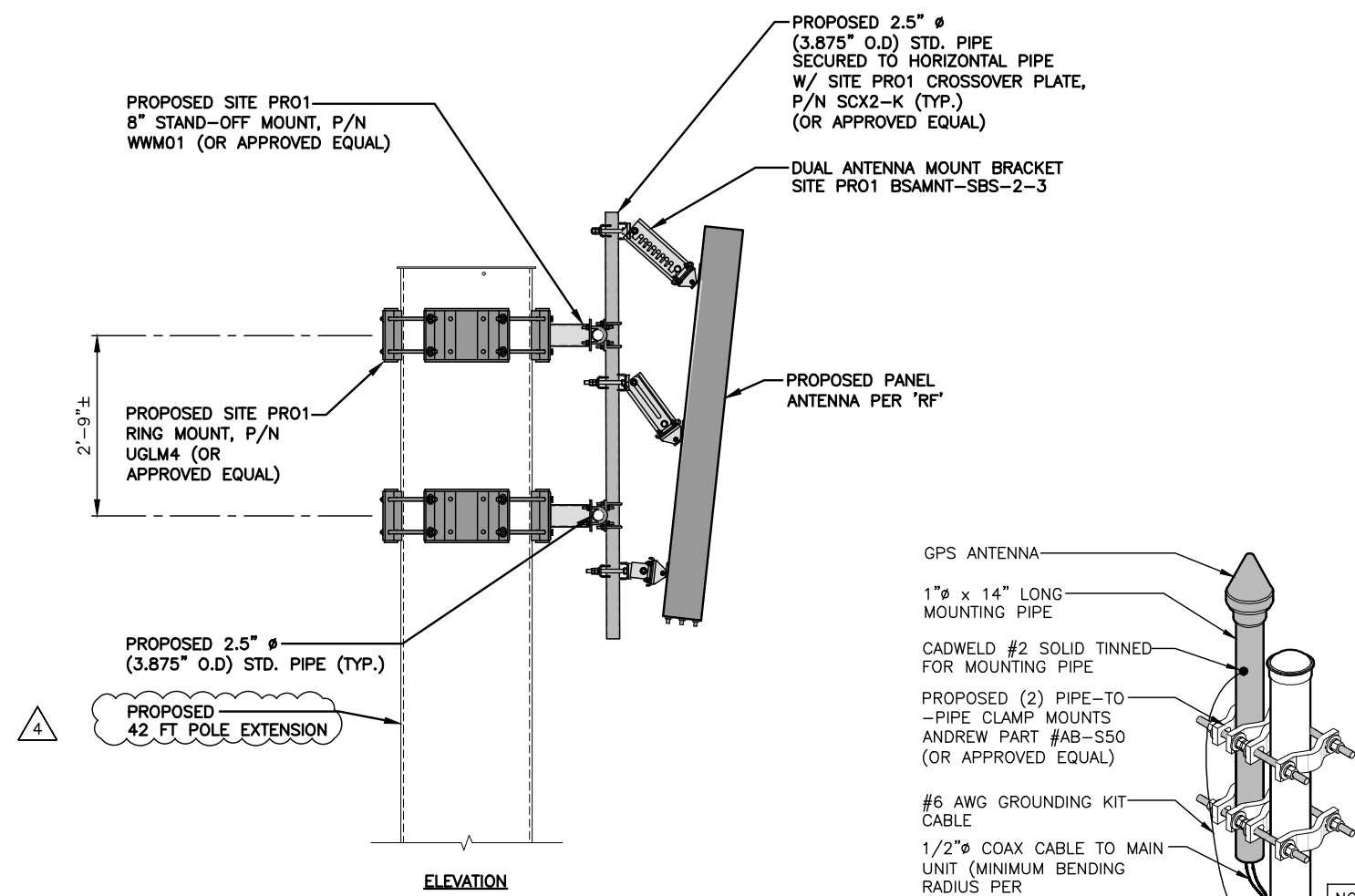
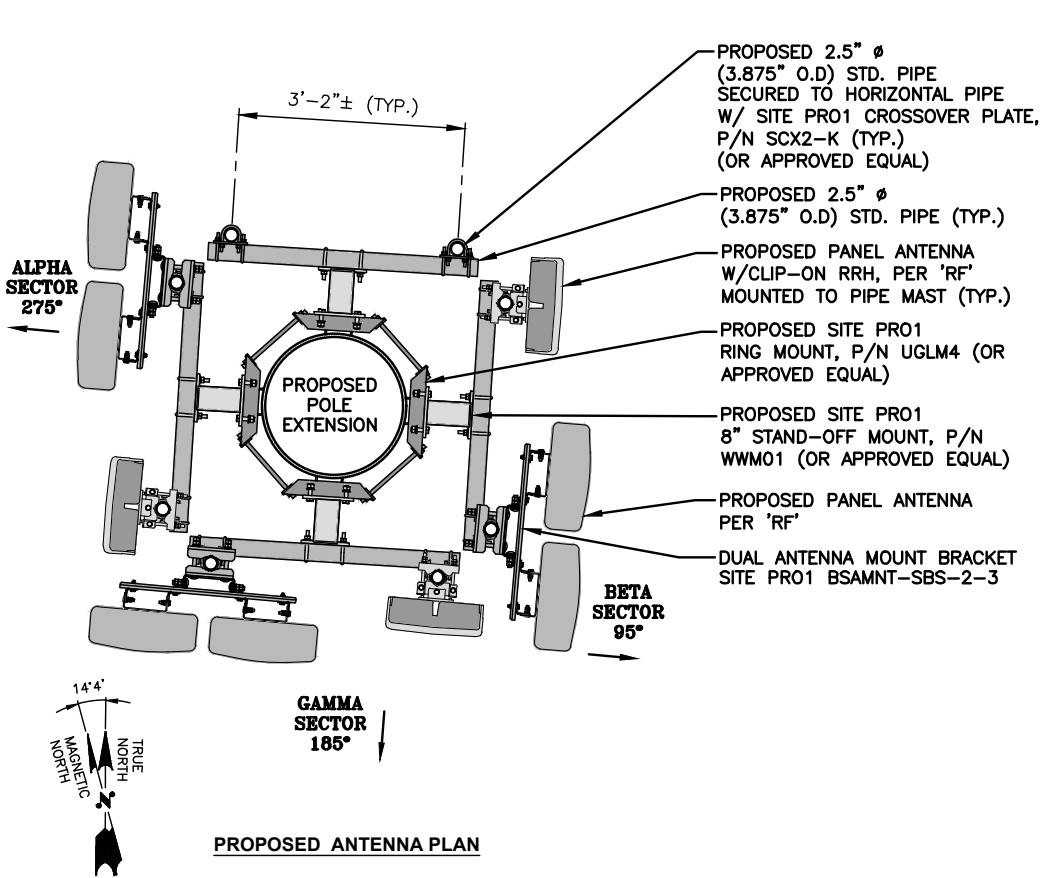
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REV.	DATE	DESCRIPTION	BY
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3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
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1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

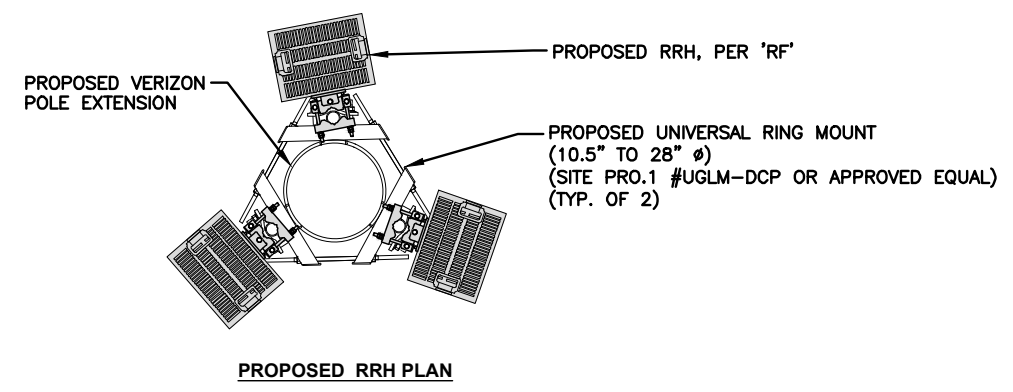
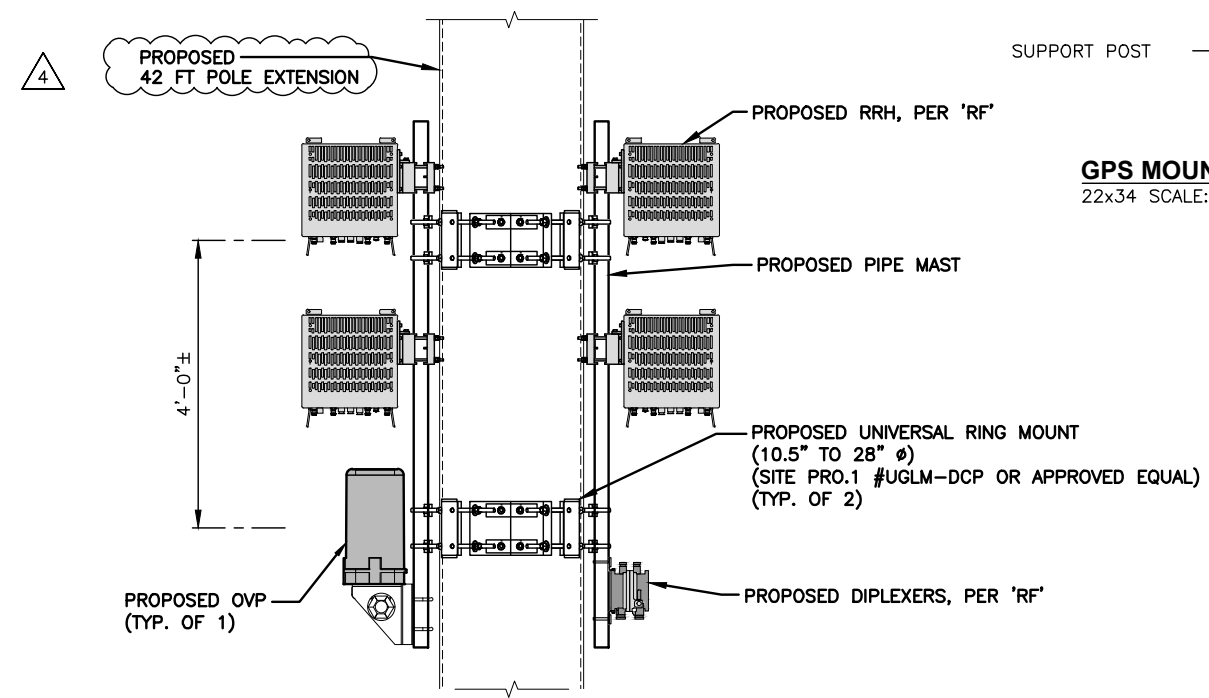
SHEET TITLE
ANTENNA PLAN AND DETAILS

SHEET NUMBER
A-4

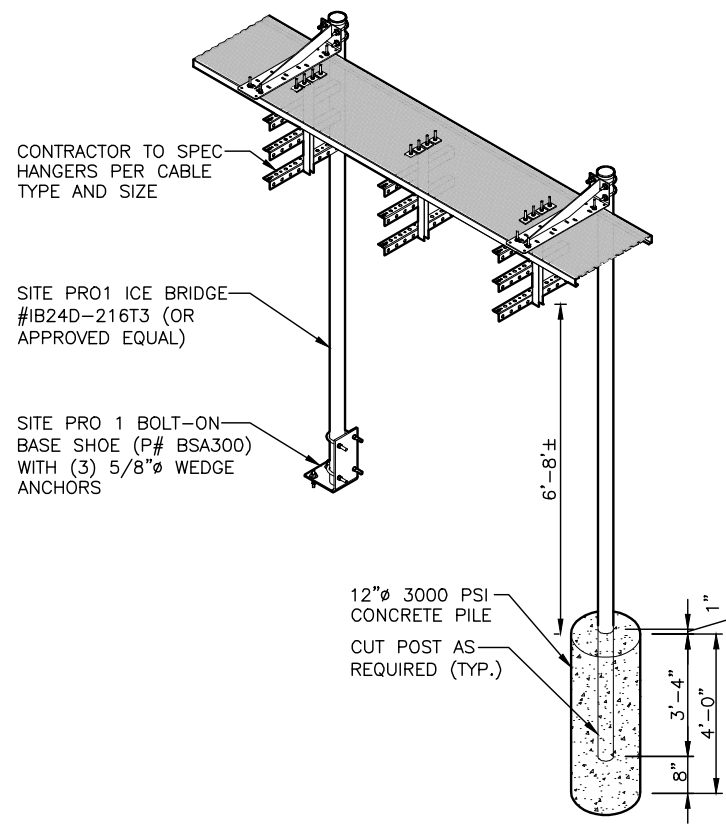


NOTE:
GPS TO BE MOUNTED WITH SOUTHWESTERN EXPOSURE. (MIN. OF 10' AWAY FROM EXISTING GPS ANTENNA)

GPS MOUNTING DETAIL 2
22x34 SCALE: N.T.S. A-4

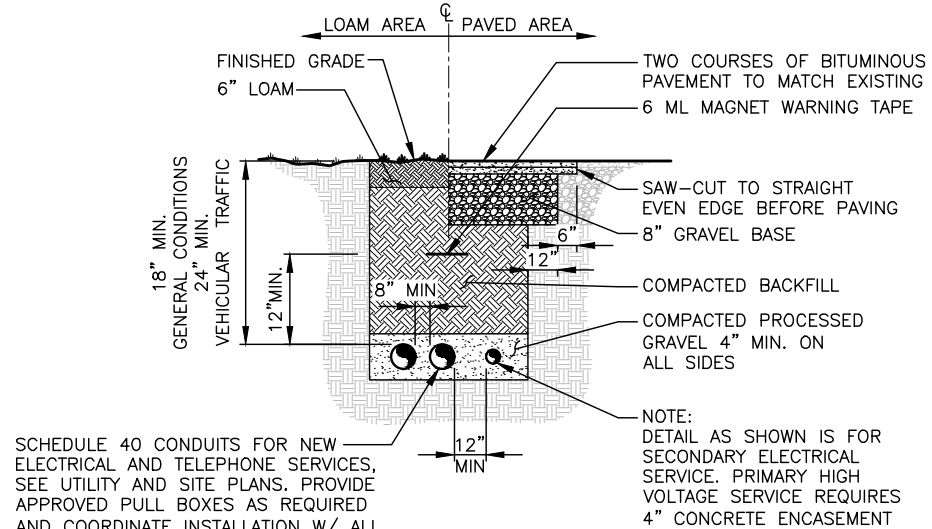


ANTENNA, RRH & OVP MOUNTING DETAILS 1
SCALE: N.T.S. A-4



ICE BRIDGE DETAIL
SCALE: N.T.S

1
A-5

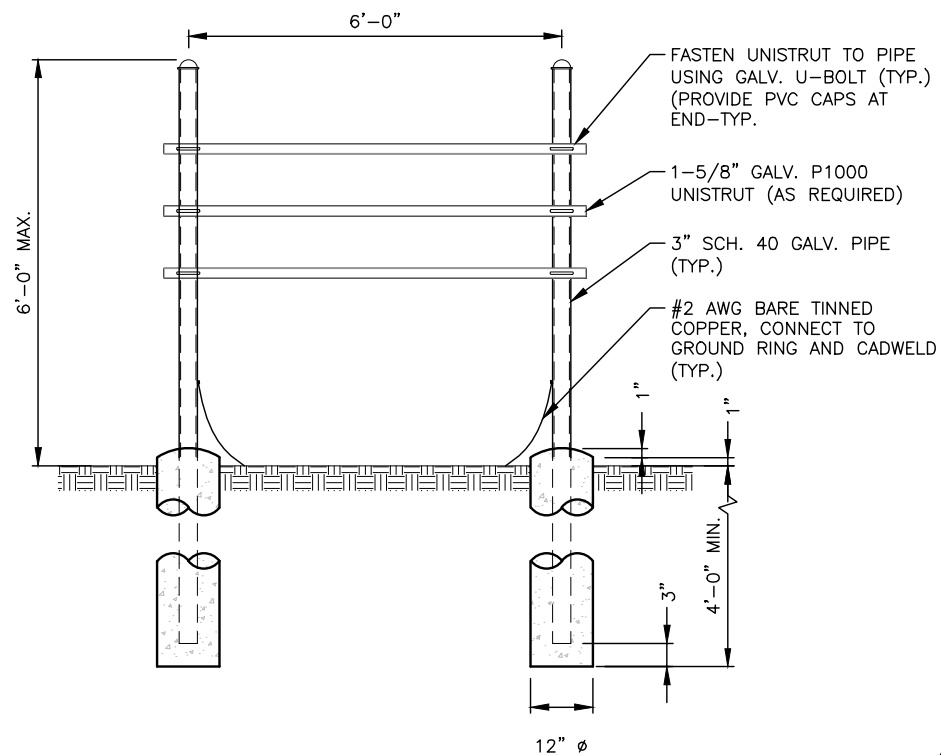


SCHEDULE 40 CONDUITS FOR NEW ELECTRICAL AND TELEPHONE SERVICES, SEE UTILITY AND SITE PLANS. PROVIDE APPROVED PULL BOXES AS REQUIRED AND COORDINATE INSTALLATION W/ ALL UTILITY COMPANIES FOR INTERFACING AT TERMINATION POINTS. PROVIDE FULL LENGTH PULL ROPES (TYP.)

INSTALL (2) PULL STRINGS AND CAP THE TELCO CONDUITS INSIDE THE VAULT AND MESA CABINET TO AVOID WATER/ICE FILL UP.

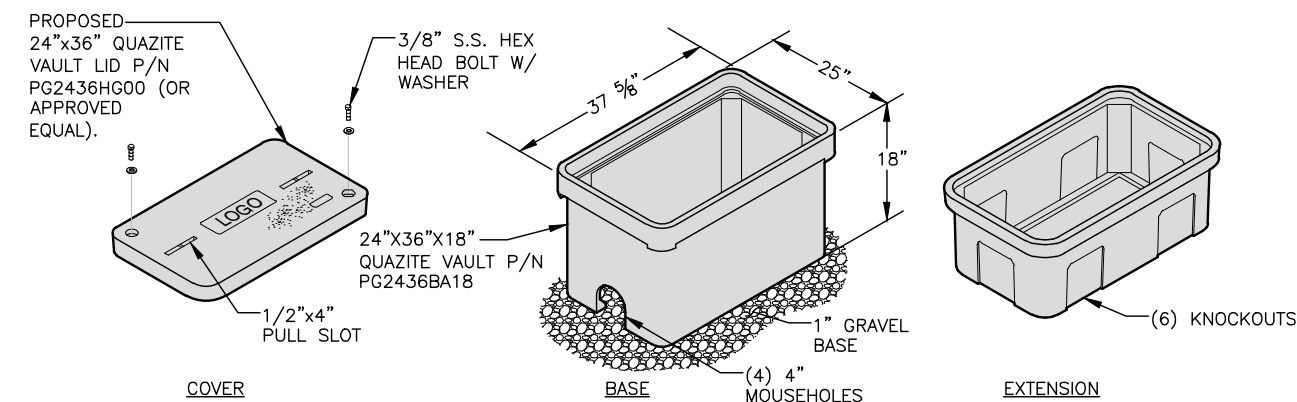
BURIED CONDUIT DETAIL
SCALE: N.T.S

2
A-5



H-FRAME DETAIL
SCALE: N.T.S

3
A-5

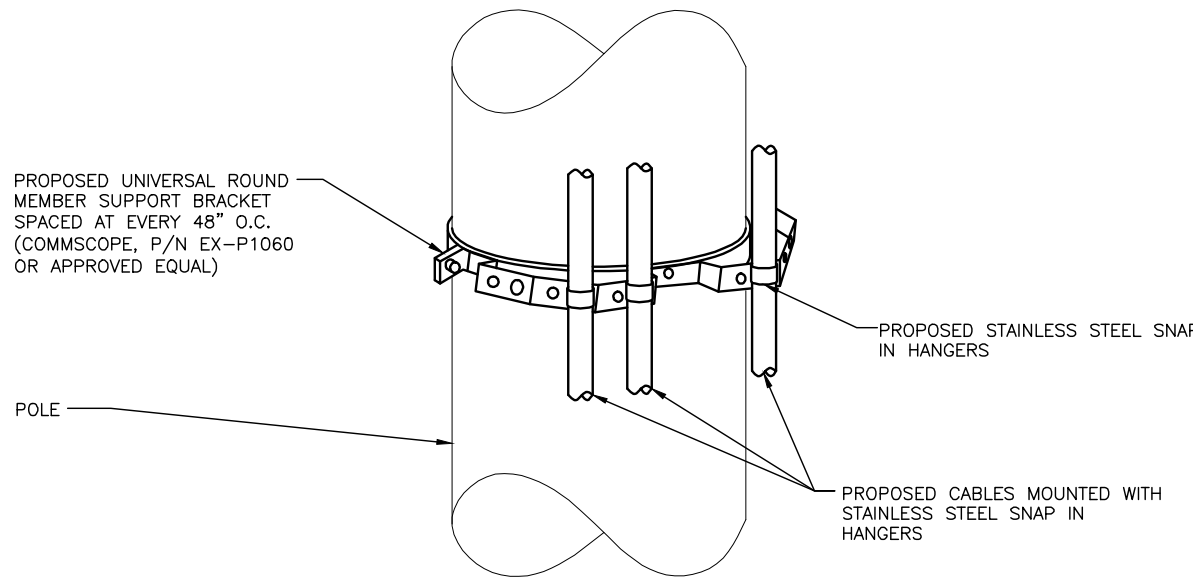


NOTE:

1. THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. SEE SPECIFICATION PROVIDED BY ELECTRICAL DESIGNER FOR FURTHER DETAIL AND INSTALLATION.
2. PROVIDE STANDARD HANDHOLE. COVER COLOR SHALL BE AS SPECIFIED BY THE NIH.
3. PROVIDE 25mm (1") X 10mm (3/8") BELL PULL SLOT FOR EACH HANDHOLE.
4. COVER, RING AND BOX SHALL BE MADE OF SAME MATERIAL.
5. PROVIDE IMPRINTED LOGO TO MATCH.

FOR TELCO AND POWER
HANDHOLE DETAIL
SCALE: N.T.S

4
A-5



NOTES:

1. UTILIZE COMMSCOPE KIT# EX-P1060 OR APPROVED EQUAL TO ATTACH BRACKET TO POLE.
2. MOUNTS BRACKETS TO POLE EVERY 4 FT.

CABLE SUPPORT DETAIL AT TOWER LEG
SCALE: N.T.S

5
A-5

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

CONSTRUCTION PERMITS ARE VALID FOR SIX MONTHS AFTER EXPIRES OF RECORDS STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: JX

APPROVED BY: DPH

REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
CABLE SUPPORT DETAILS

SHEET NUMBER
A-5

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

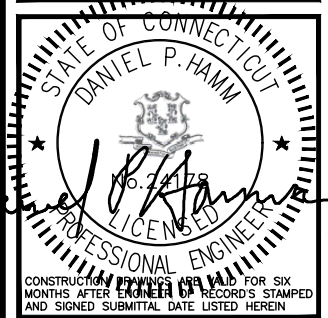
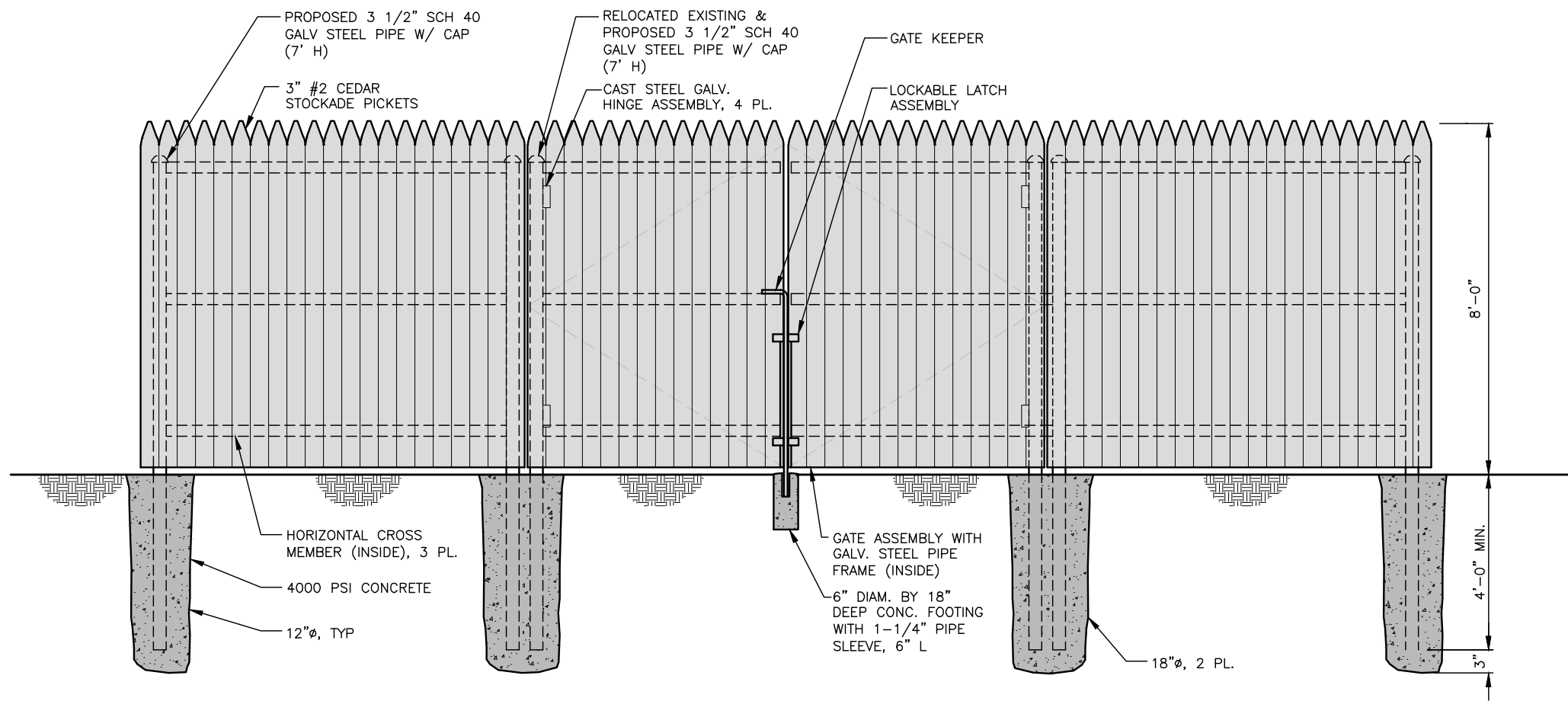


TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

FENCE NOTES

1. ALTERNATE FOOTINGS FOR ALL FENCE POSTS IN LEDGE: IF LEDGE IS ENCOUNTERED AT GRADE, OR AT A DEPTH SHALLOWER THAN 3'-6", CORE DRILL AN 8" DIA HOLE 18" INTO THE LEDGE. CENTER POST IN THE HOLE AND FILL WITH CONCRETE OR GROUT. IF LEDGE IS BELOW FINISH GRADE, COAT BACKFILLED SECTION OF POST WITH COAL TAR, AND BACKFILL WITH WELL-DRAINING GRAVEL.

2. ATTACH EACH GATE WITH 1-1/2" PAIR OF NON-LIFT-OFF TYPE, MALLEABLE IRON OR FORGING, PIN-TYPE HINGES. ASSEMBLIES SHALL ALLOW FOR 180° OF GATE TRAVEL.



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SJY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SJY
2	06/24/22	REV. ANTENNA MOUNT	SJY
1	05/13/22	ADDED N77 ANTENNAS	SJY
0	07/19/21	ISSUED FOR CONSTRUCTION	SJY

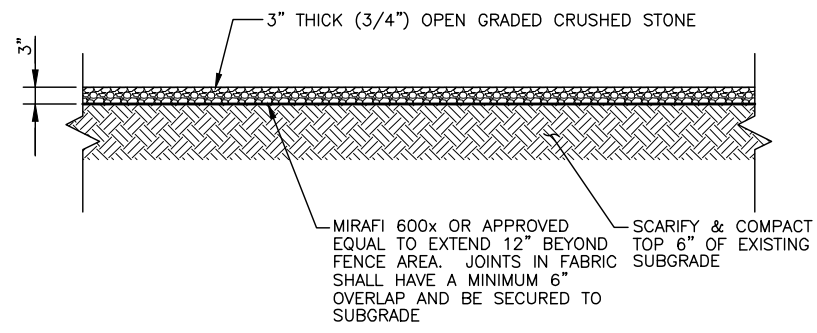
SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

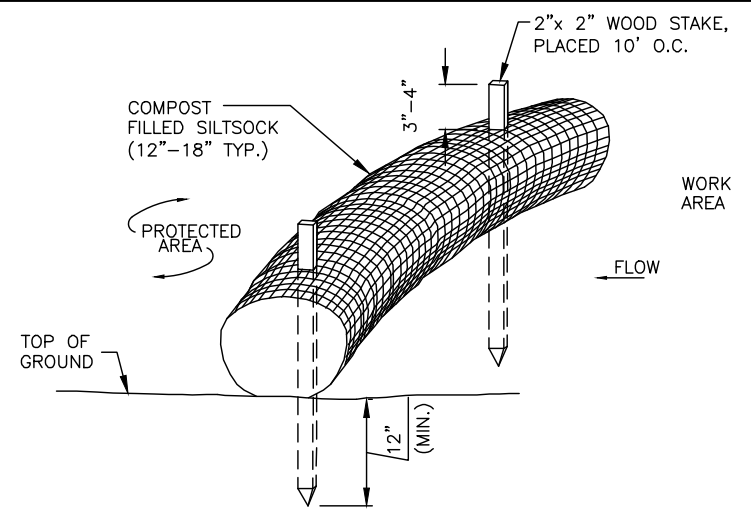
SHEET TITLE
FENCE DETAILS

SHEET NUMBER
A-6

STOCKADE FENCE DETAIL 1
SCALE: N.T.S. A-6



COMPOUND SURFACE DETAIL 1
 22x34 SCALE: 1"=1'-0"
 11x17 SCALE: 1/2"=1'-0"
 A-7



- NOTES:
- SILT SOCK SHALL BE FILTREXX SILT SOCK, OR APPROVED EQUAL.
 - COMPOST MATERIAL SHALL BE DISPERSED ON SITE, AS DETERMINED BY THE ENGINEER.
 - SILT SOCK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS, AND REPAIR OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED.
 - SEE SPECIFICATIONS FOR SOCK SIZE, AND COMPOST FILL, REQUIREMENTS.

SILT SOCK DETAIL 2
 SCALE: N.T.S.
 A-7

GENERAL CONSTRUCTION SEQUENCE:

- THIS IS A GENERAL CONSTRUCTION SEQUENCE OUTLINE SOME ITEMS OF WHICH MAY NOT APPLY TO PARTICULAR SITES.
- CLEAR AND GRUB AREAS OF PROPOSED CONSTRUCTION.
 - INSTALL TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES AS REQUIRED.
 - REMOVE AND STOCKPILE TOPSOIL. STOCKPILE SHALL BE SEEDED TO PREVENT EROSION.
 - CONSTRUCT CLOSED DRAINAGE SYSTEM. PROTECT CULVERT INLETS AND CATCH BASINS WITH SEDIMENTATION BARRIERS.
 - CONSTRUCT ROADWAYS AND PERFORM SITE GRADING, PLACING HAY BALES AND SILTATION FENCES AS REQUIRED TO CONTROL SOIL EROSION.
 - INSTALL UNDERGROUND UTILITIES.
 - BEGIN TEMPORARY AND PERMANENT SEEDING AND MULCHING. ALL CUT AND FILL SLOPES SHALL BE SEEDED OR MULCHED IMMEDIATELY AFTER THEIR CONSTRUCTION. NO AREA SHALL BE LEFT UNSTABILIZED FOR A TIME PERIOD OF MORE THAN 30 DAYS.
 - DAILY, OR AS REQUIRED, CONSTRUCT, INSPECT, AND IF NECESSARY, RECONSTRUCT TEMPORARY BERMS, DRAINS, DITCHES, SILT FENCES AND SEDIMENT TRAPS INCLUDING MULCHING AND SEEDING.
 - BEGIN EXCAVATION FOR AND CONSTRUCTION OF TOWERS AND PLATFORMS.
 - FINISH PAVING ALL ROADWAYS, DRIVES, AND PARKING AREAS.
 - COMPLETE PERMANENT SEEDING AND LANDSCAPING.
 - NO STORM WATER FLOW SHALL BE DIVERTED TO ANY WETLANDS UNTIL A HEALTHY STAND OF GRASS HAS BEEN ESTABLISHED IN REGRADED AREAS.
 - AFTER GRASS HAS BEEN FULLY GERMINATED IN ALL SEEDED AREAS, REMOVE ALL TEMPORARY EROSION CONTROL MEASURES.

EROSION CONTROL MEASURES:

- DISTURBED AREAS SHALL BE KEPT TO THE MINIMUM AREA NECESSARY TO CONSTRUCT THE ROADWAYS AND ASSOCIATED DRAINAGE FACILITIES.
- HAY BALE BARRIERS AND SEDIMENT TRAPS SHALL BE INSTALLED AS REQUIRED. BARRIERS AND TRAPS ARE TO BE MAINTAINED AND CLEANED UNTIL ALL SLOPES HAVE A HEALTHY STAND OF GRASS.
- BALED HAY AND MULCH SHALL BE MOWINGS OF ACCEPTABLE HERBACEOUS GROWTH, FREE FROM NOXIOUS WEEDS OR WOODY STEMS, AND SHALL BE DRY. NO SALT HAY SHALL BE USED.
- FILL MATERIAL SHALL BE FREE FROM STUMPS, WOOD, ROOTS, ETC.
- STOCKPILED MATERIALS SHALL BE PLACED IN AREAS SHOWN ON THE PLANS. STOCKPILES SHALL BE PROTECTED BY SILTATION FENCE AND SEEDED TO PREVENT EROSION. THESE MEASURES SHALL REMAIN UNTIL ALL MATERIAL HAS BEEN PLACED OR DISPOSED OFF SITE.
- ALL DISTURBED AREAS SHALL BE LOAMED AND SEEDED. A MINIMUM OF 4 INCHES OF LOAM SHALL BE INSTALLED WITH NOT LESS THAN ONE POUND OF SEED PER 50 SQUARE YARDS OF AREA.
- APPLICATION OF GRASS SEED, FERTILIZERS AND MULCH SHALL BE ACCOMPLISHED BY BROADCAST SEEDING OR HYDROSEEDING AT THE RATES OUTLINED BELOW:

LIMESTONE: 75-100 LBS./1,000 SQUARE FEET.
 FERTILIZER: RATE RECOMMENDED BY MANUFACTURER.
 MULCH: HAY MULCH APPROXIMATELY 3 TONS/ACRE UNLESS EROSION CONTROL MATTING IS USED.

SEED MIX (SLOPES LESS THAN 4:1)	LBS./ACRE
CREeping RED FESCUE	20
TALL FESCUE	20
REDTOP	2
	42

SLOPE MIX (SLOPES GREATER THAN 4:1)	LBS./ACRE
CREeping RED FESCUE	20
TALL FESCUE	20
BIRDSFOOT TREEFOIL	8
	48

TREATMENT SWALE PLANTING SPECIFICATIONS

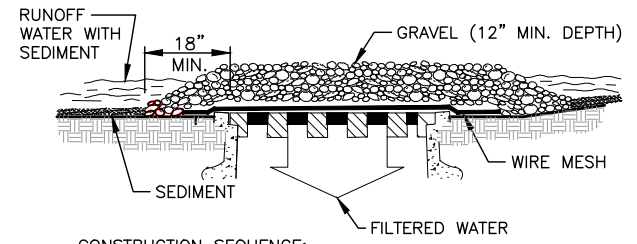
TALL FESCUE	20 LBS/ACRE	OR	0.45 LBS/10,000 SF
CREeping RED FESCUE	20 LBS/ACRE	OR	0.45 LBS/10,000 SF
BIRDSFOOT TREFOIL	8 LBS/ACRE	OR	0.20 LBS/10,000 SF

LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT TIME OF SEEDING AND INCORPORATED INTO THE SOIL. THE FOLLOWING RATES ARE RECOMMENDED:

AGRICULTURAL LIMESTONE	2 TONS/ACRE	OR	100 LBS/1,000 SF
NITROGEN (N)	50 LBS/ACRE	OR	1.1 LBS/10,000 SF
PHOSPHATE (P205)	100 LBS/ACRE	OR	2.2 LBS/10,000 SF
POTASH (K20)	100 LBS/ACRE	OR	2.2 LBS/10,000 SF

(THIS IS EQUIVALENT TO 500 LBS/ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS/ACRE OF 5-10-10).

- AFTER ALL DISTURBED AREAS HAVE BEEN STABILIZED THE TEMPORARY EROSION CONTROL MEASURES ARE TO BE REMOVED.
- PAVED ROADWAYS MUST BE KEPT CLEAN AT ALL TIMES.
- ALL CATCH BASIN INLETS WILL BE PROTECTED WITH LOW POINT SEDIMENTATION BARRIER.
- ALL STORM DRAINAGE OUTLETS WILL BE STABILIZE AND CLEANED AS REQUIRED, BEFORE THE DISCHARGE POINTS BECOME OPERATIONAL.
- ALL DEWATERING OPERATIONS MUST DISCHARGE DIRECTLY INTO A SEDIMENT FILTER AREA.
- NO DISCHARGE SHALL BE DIRECTED TOWARDS ANY PROPOSED DITCHES, SWALES, OR PONDS UNTIL THEY HAVE BEEN PROPERLY STABILIZED.

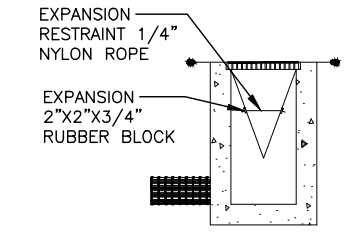
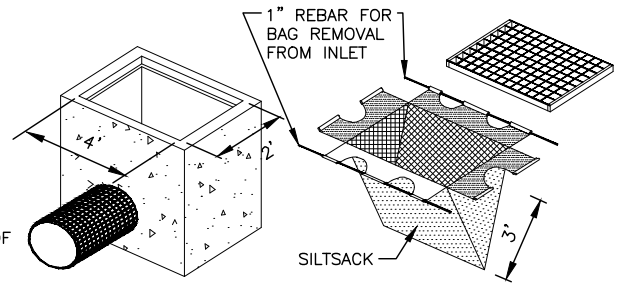


CONSTRUCTION SEQUENCE:

- A WIRE MESH SHOULD BE PLACED OVER THE DROP INLET OR CURB OPENING SO THAT THE ENTIRE OPENING AND A MINIMUM OF 12 INCHES AROUND THE OPENING ARE COVERED BY THE MESH. THE MESH MAY BE ORDINARY HARDWARE CLOTH OR WIRE MESH WITH OPENINGS UP TO 1/2 INCH.
- THE WIRE MESH SHOULD BE COVERED WITH CLEAN COARSE AGGREGATE SUCH AS SEWER STONE FOR A MINIMUM DEPTH OF 12 INCHES.
- THE COARSE AGGREGATE SHOULD EXTEND AT LEAST 18 INCHES ON ALL SIDES OF THE DRAIN OPENING.

MAINTENANCE:

ALL STRUCTURES SHOULD BE INSPECTED AFTER EVERY RAIN STORM AND REPAIRS MADE AS NECESSARY. SEDIMENT SHOULD BE REMOVED FROM THE TRAPPING DEVICES AFTER THE SEDIMENT HAS REACHED A MAXIMUM OF ONE HALF THE DEPTH OF THE TRAP. THE SEDIMENT SHOULD BE DISPOSED OF IN A SUITABLE AREA AND PROTECTED FROM EROSION BY EITHER STRUCTURAL OR VEGETATIVE MEANS. THE TEMPORARY TRAPS SHOULD BE REMOVED AND THE AREA REPAIRED AS SOON AS THE CONTRIBUTING DRAINAGE AREA TO THE INLET HAS BEEN COMPLETELY STABILIZED.



NOTE: REGULAR FLOW = 40 GAL./MIN./SF.
 HIGH = 200 GAL./MIN./SF.

SILKSACK DETAIL - ON OR OFF SITE

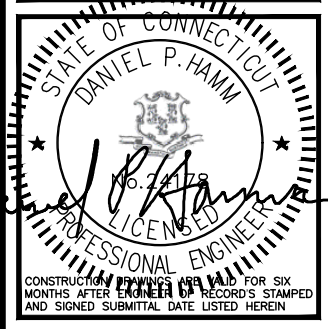
STONE INLET PROTECTION DETAIL-ON SITE 3
 SCALE: N.T.S.
 A-7

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
 TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

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4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
 115 MEADOW ROAD
 NEW HAVEN, CT 06513

SHEET TITLE
SITE SURFACE COVER AND EROSION CONTROL DETAILS

SHEET NUMBER
A-7

STRUCTURAL NOTES:

- DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
- DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
- STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
- STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
- STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
- FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
- CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
- INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
- UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
- EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-70 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
- EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
- WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
- ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
- NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
- SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	ENGINEER OF RECORD APPROVED SHOP DRAWINGS ¹
REQUIRED	MATERIAL SPECIFICATIONS REPORT ²
N/A	FABRICATOR NDE INSPECTION
REQUIRED	PACKING SLIPS ³
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS ⁴
REQUIRED	FOUNDATION INSPECTIONS
REQUIRED	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION ⁵
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
REQUIRED	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS ⁶
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

- REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
- PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
- PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
- HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
- ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
- AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

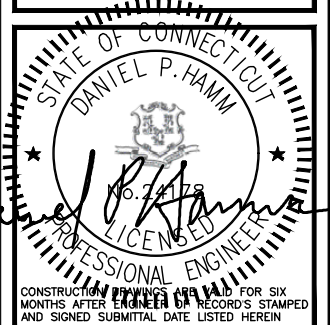
- ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4" A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
- SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
- SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
- VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
- CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
- EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE, NORTH AVONDER, MA 01845
TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

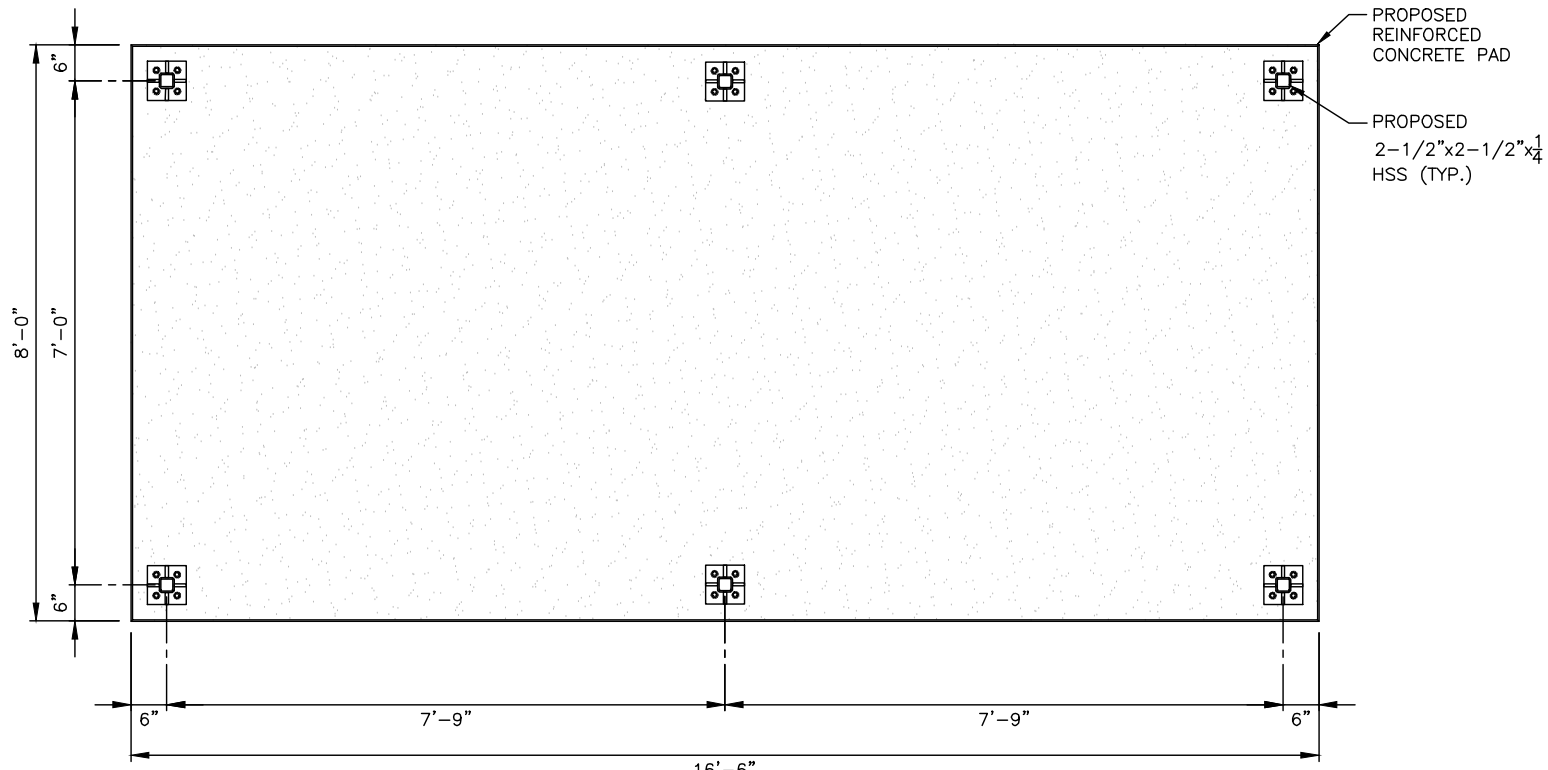
SUBMITTALS			
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3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
**STRUCTURAL NOTES
AND SPECIAL
INSPECTIONS**

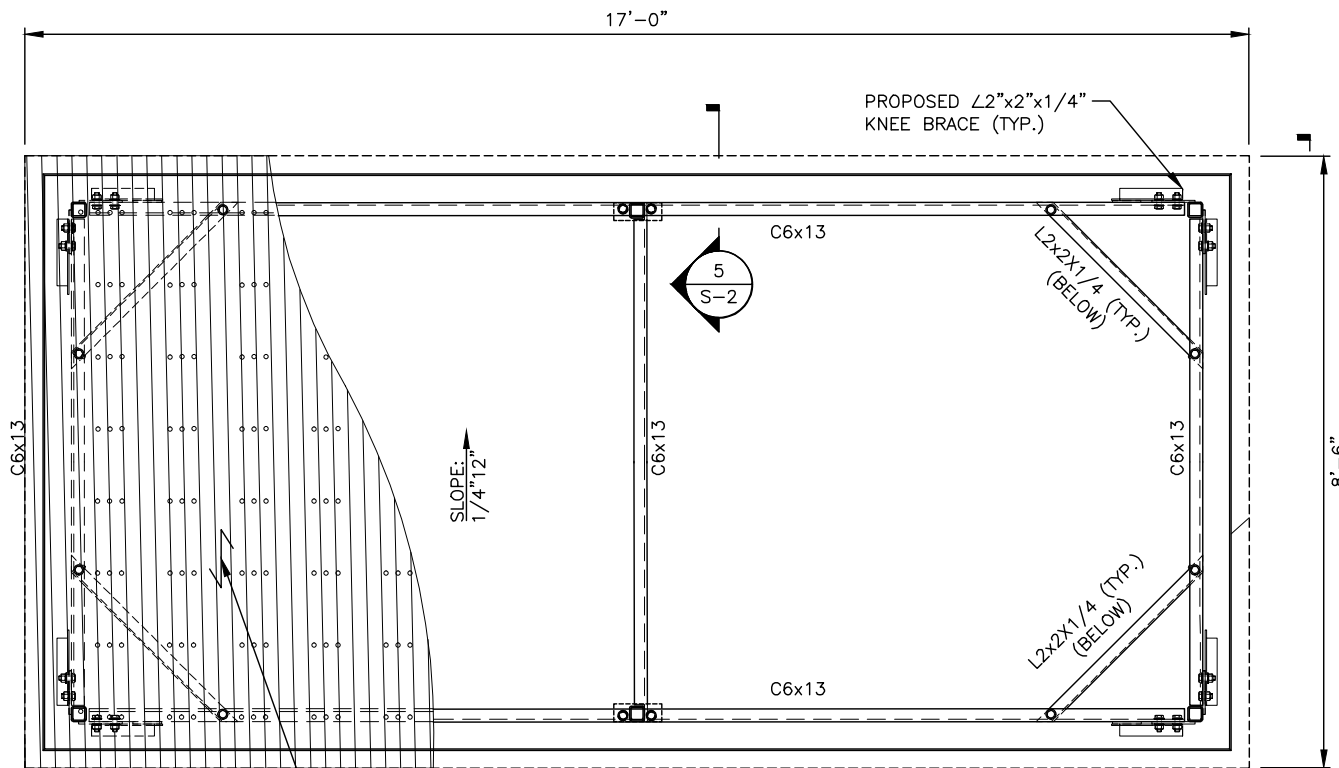
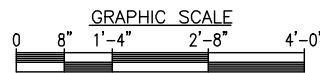
SHEET NUMBER
SN-1



HSS COLUMN PLAN

22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

1
S-1

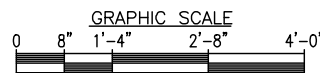


PROPOSED 16 GAUGE 1-1/2" CORRUGATED GALVANIZED SHEET METAL. OVERLAP MIN. 6" W/ SILICONE SEALANT. FASTEN W/ NO. 12 (USE #5 DRILL PT.) S.S. SELF-TAPPING SCREW @ MAX. 12" O.C.

ICE CANOPY FRAME PLAN

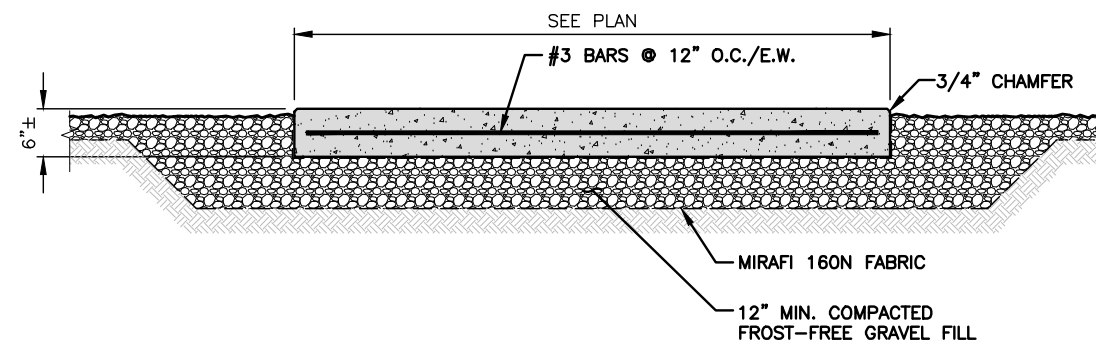
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

2
S-1



FOUNDATION NOTES & CONCRETE SPECIFICATIONS:

- FOUNDATION AREA SHALL BE EXCAVATED TO THE DEPTH AND DIMENSIONS SHOWN ON THE PLANS. EXISTING LEDGE AND ALL OTHER EXISTING UNSUITABLE MATERIAL SHALL BE REMOVED AND LEGALLY DISPOSED OF OFF-SITE. THE SUBGRADE SHALL BE ROLLED WITH A 1-TON, VIBRATORY, WALK-BEHIND ROLLER AT A SPEED OF LESS THAN 2 FPS, 6 PASSES MINIMUM, TO PROVIDE UNYIELDING SURFACE.
- UNDERCUT SOFT OR "WEAVING" AREAS A MINIMUM OF 12 INCHES DEEP. BACKFILL UNDERCUT AREA WITH FILL MEETING THE SPECIFICATIONS OF STRUCTURAL FILL.
- CONCRETE TO HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH (f'c)=4000 psi. CONCRETE TO BE AIR ENTRAINED, DESIRED AIR CONTENT TO BE 6% (PLUS OR MINUS 2%)
- REINFORCING BAR TO BE ASTM A615 GRADE 60.
- WELDED WIRE FABRIC TO CONFORM TO THE REQUIREMENTS OF ASTM A185. WIRES FOR FABRIC TO CONFORM TO THE REQUIREMENTS OF ASTM A82.
- ALL REINFORCING TO HAVE MINIMUM CONCRETE COVER PER ACI SPECIFICATIONS.
- ALL CONCRETE MATERIALS AND WORKMANSHIP SHALL CONFORM TO LATEST EDITION OF ACI 318 AND APPLICABLE STATE BUILDING CODE.



CONCRETE PAD DETAIL

SCALE: N.T.S.

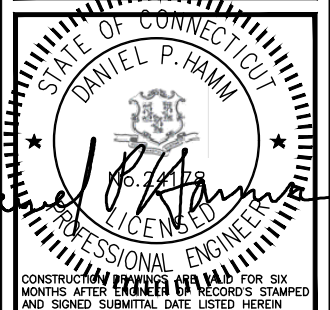
3
S-1

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

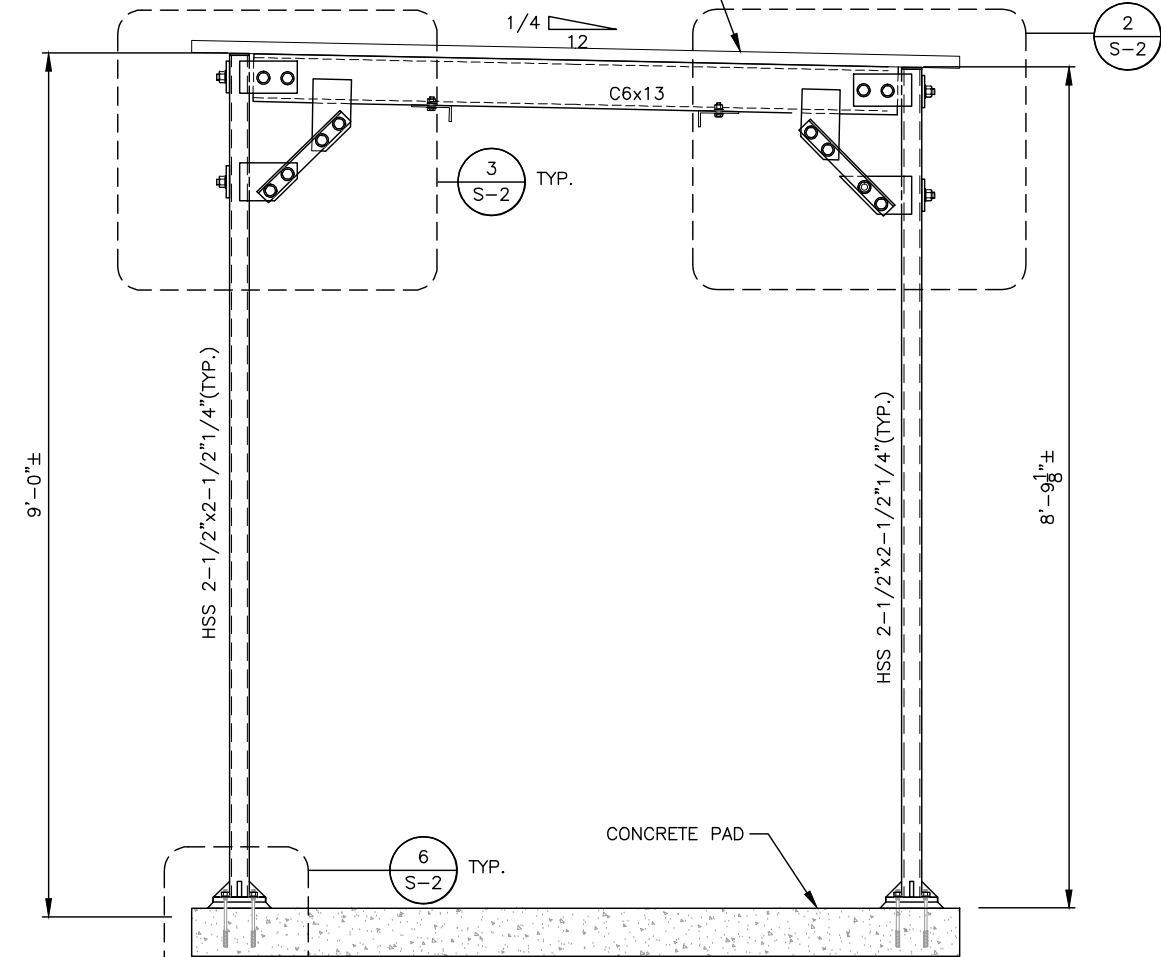
SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
ICE CANOPY DETAILS

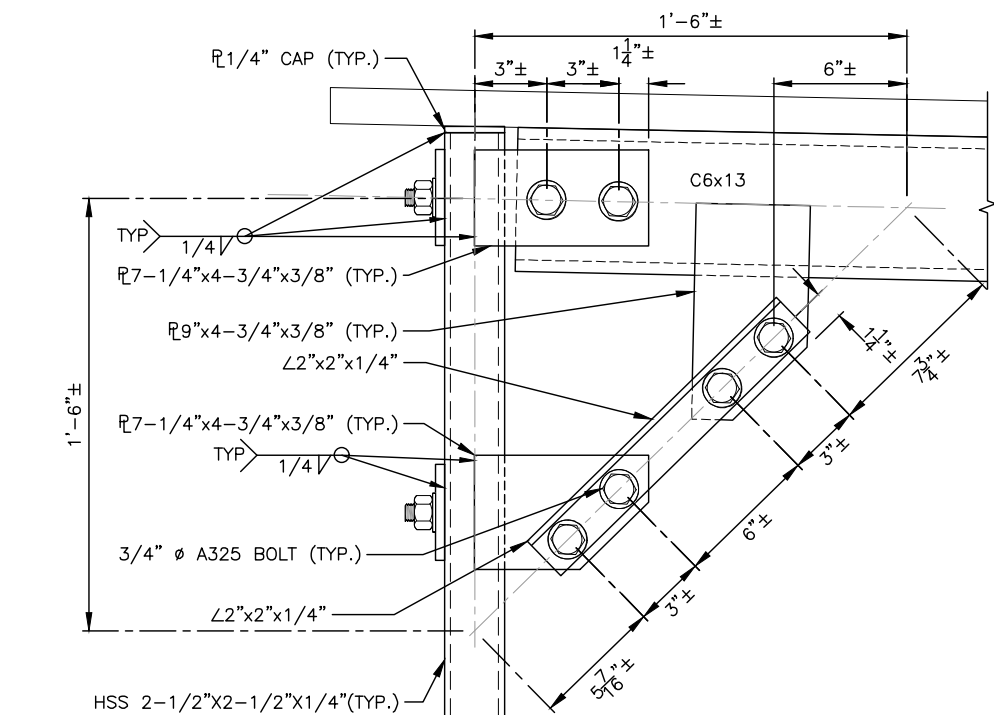
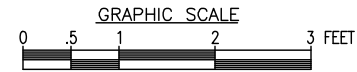
SHEET NUMBER
S-1

PROPOSED 16 GAUGE 1-1/2" CORRUGATED GALVANIZED SHEET METAL. OVERLAP MIN. 6" W/ SILICONE SEALANT. FASTEN W/ NO. 12 (USE #5 DRILL PT.) S.S. SELF-TAPPING SCREW @ MAX. 12" O.C.



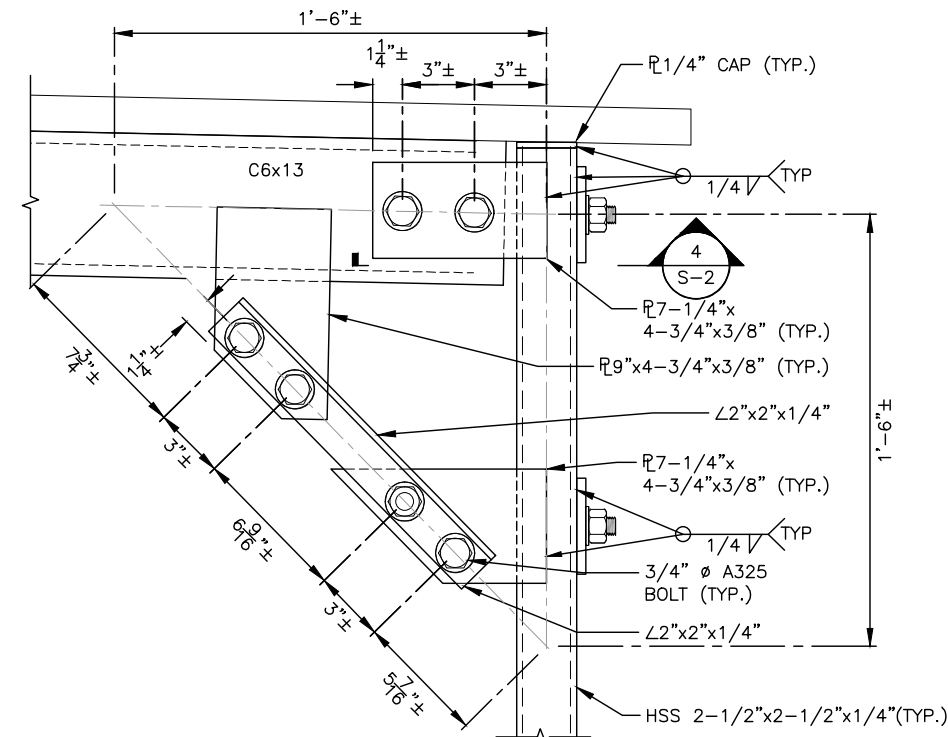
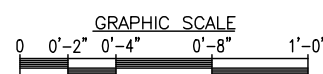
ICE CANOPY SECTION

22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"



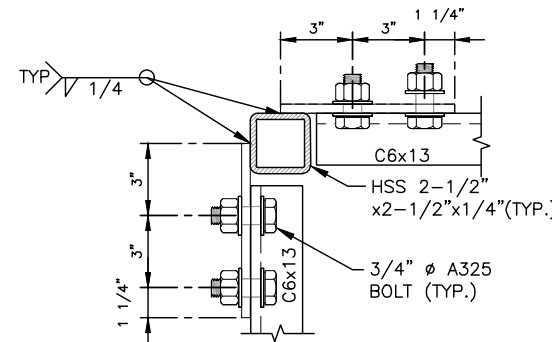
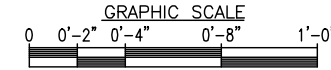
ICE CANOPY DETAIL

22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"



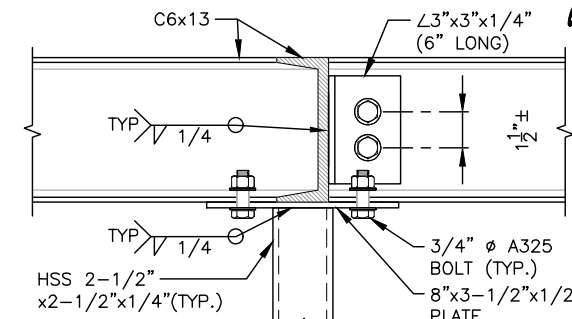
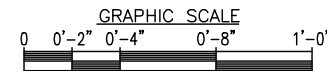
ICE CANOPY DETAIL

22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"



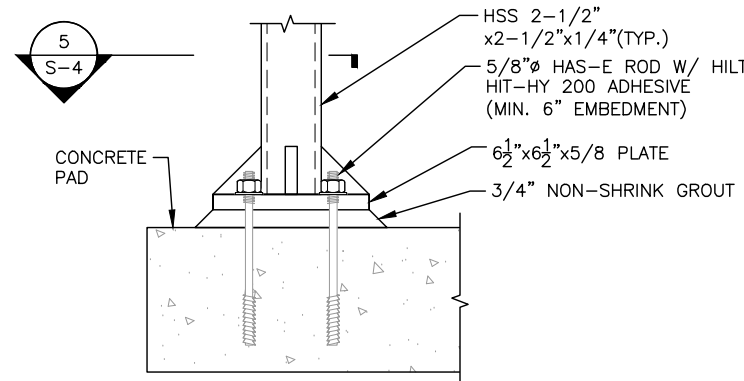
TYPICAL CHANNEL TO HSS CONNECTION DETAIL

22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"



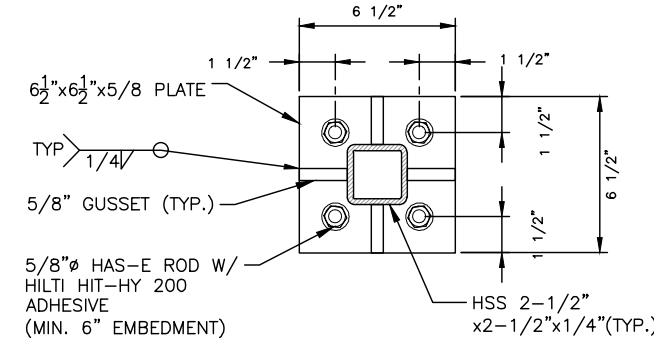
MID CHANNEL TO CHANNEL CONNECTION

22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"



TYPICAL HSS BASE PLATE CONNECTION SECTION

22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"



TYPICAL HSS BASE PLATE CONNECTION DETAIL

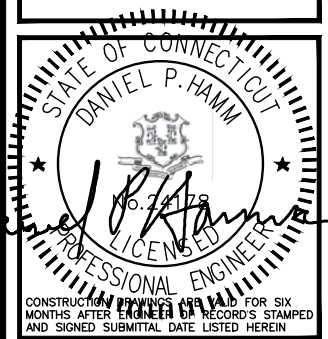
22x34 SCALE: 3"=1'-0"
11x17 SCALE: 1-1/2"=1'-0"

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

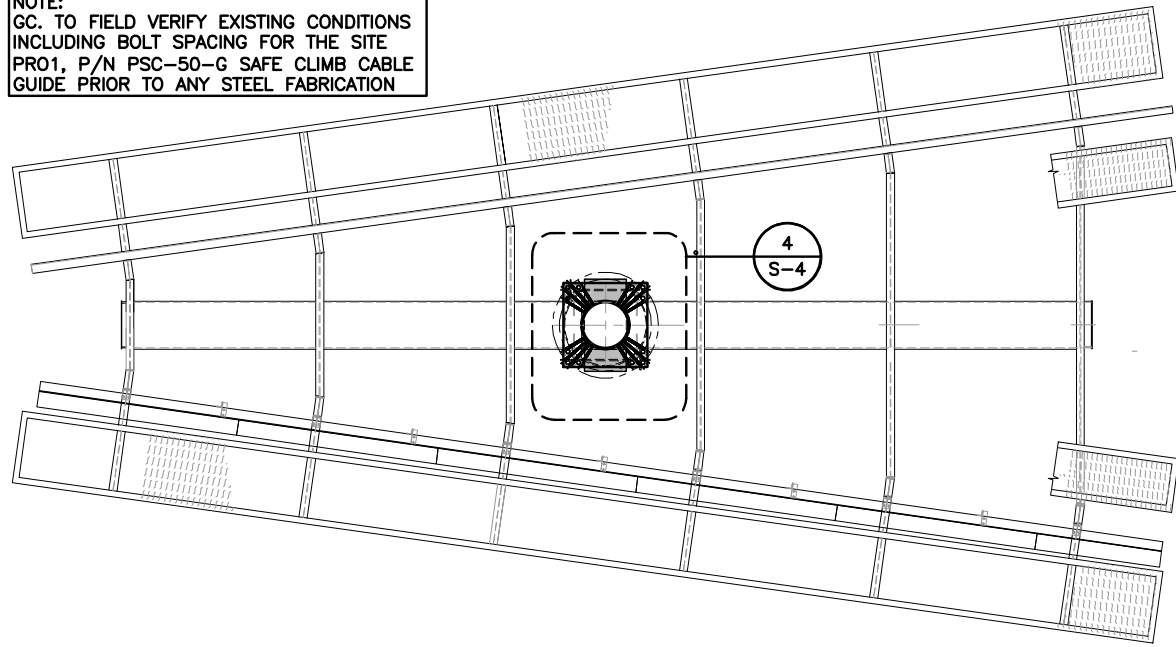
SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
ICE CANOPY DETAILS

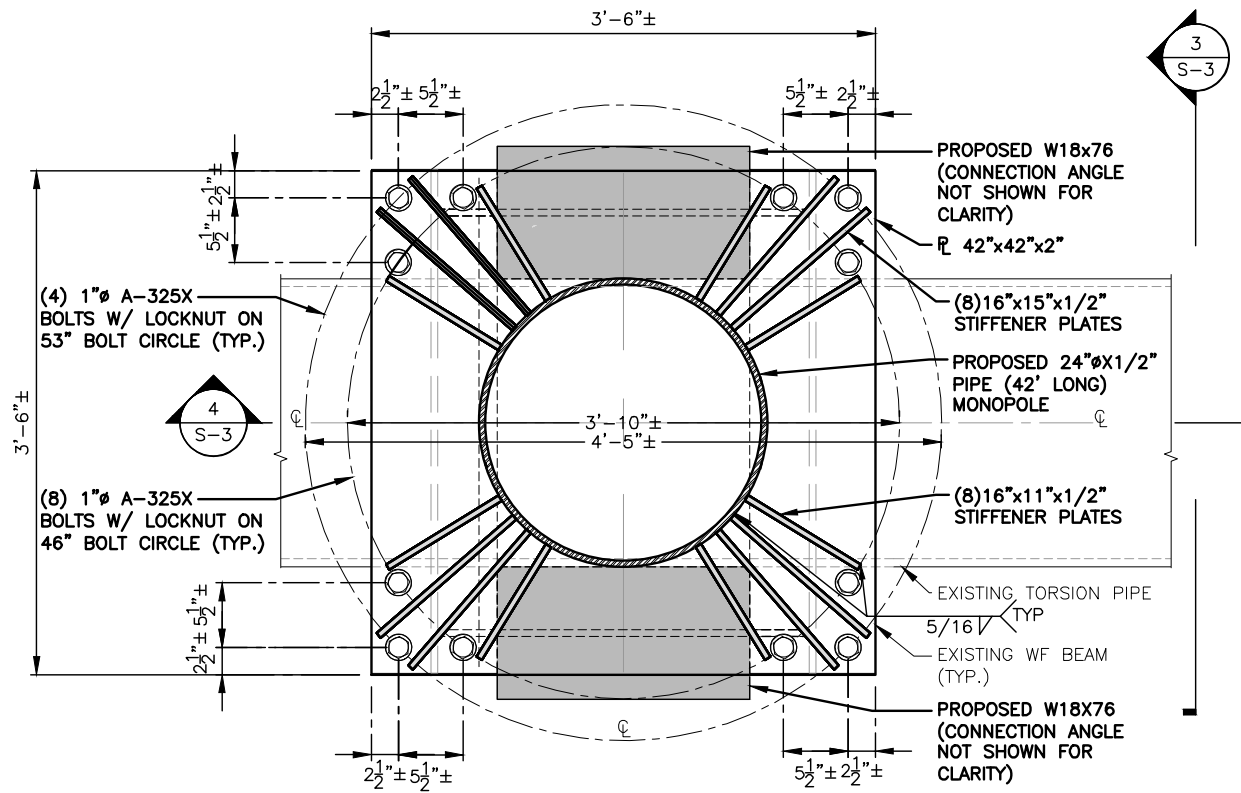
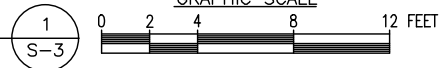
SHEET NUMBER
S-2

NOTE:
GC. TO FIELD VERIFY EXISTING CONDITIONS INCLUDING BOLT SPACING FOR THE SITE
PRO1, P/N PSC-50-G SAFE CLIMB CABLE GUIDE PRIOR TO ANY STEEL FABRICATION



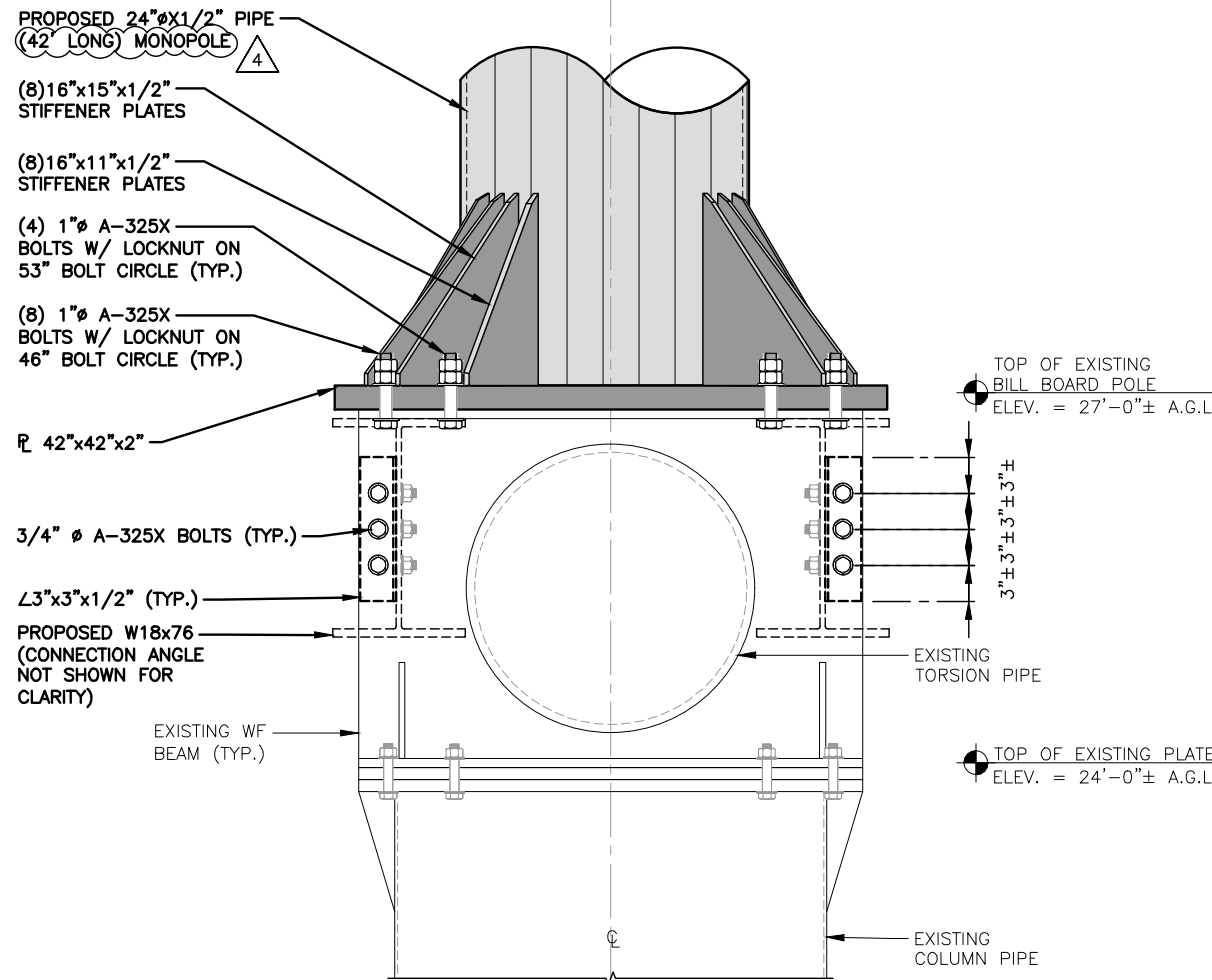
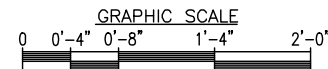
TOWER EXISTING PLAN

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



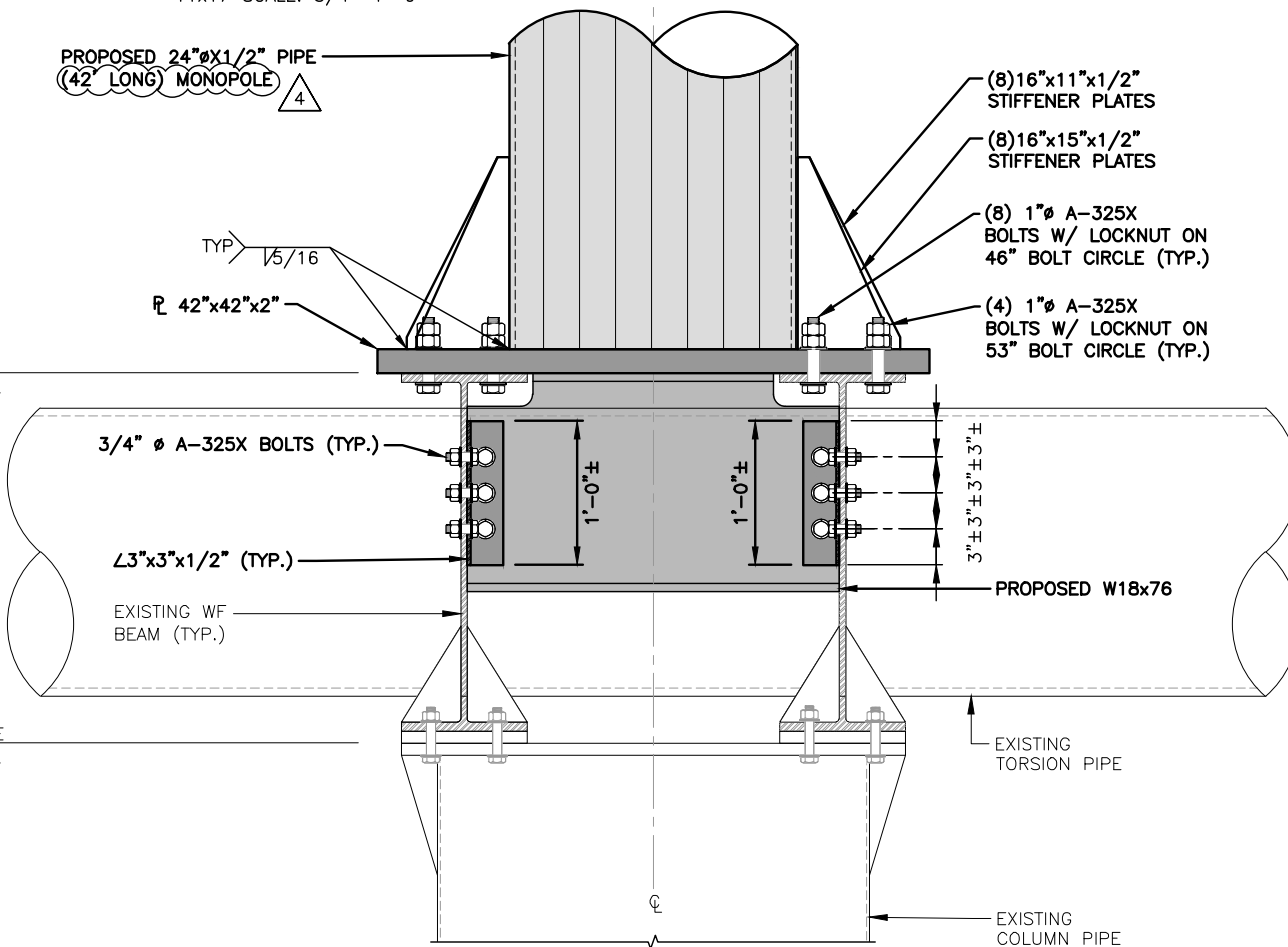
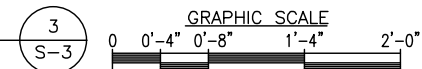
CONNECTION PLAN DETAIL

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



CONNECTION SECTION DETAIL

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



CONNECTION SECTION DETAIL

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"

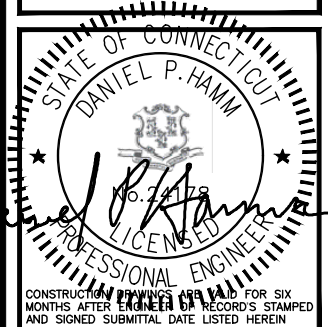


FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
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SUBMITTALS			
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3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
TOWER CONNECTION DETAILS

SHEET NUMBER
S-3

NOTE:
GC. TO FIELD VERIFY EXISTING CONDITIONS INCLUDING BOLT SPACING FOR THE SITE PRO1, P/N PSC-50-G SAFE CLIMB CABLE GUIDE PRIOR TO ANY STEEL FABRICATION

☉ OF PLATE
ELEV. = 68'-0"± A.G.L.

3/8 DIAMETER WIRE ROPE SAFETY CABLE

SAFETY CLIMB NOTE:

BOTTOM SAFETY CLIMB BRACKET MUST HAVE DOUBLE HOLES AWAY FROM THE POLE FOR USE WITH SAFETY CLIMB KIT PROVIDED.

☉ OF PROPOSED CABLE PORT
ELEV. = 56'± A.G.L.

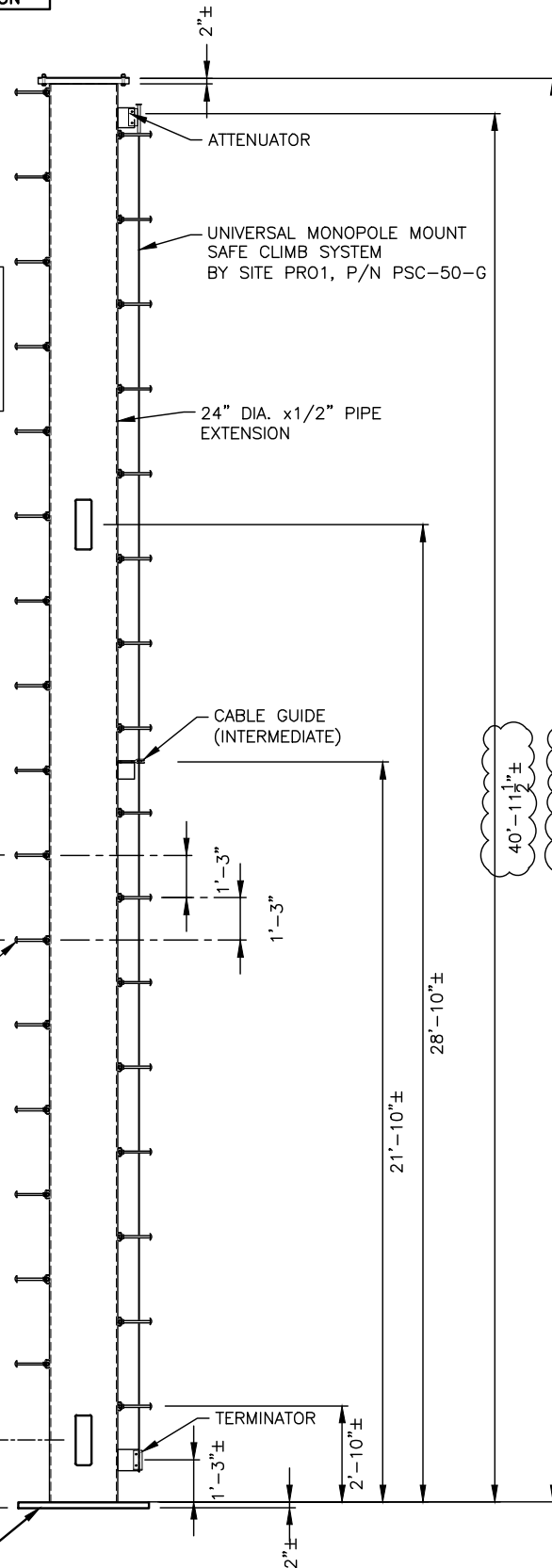
☉ TOP OF CABLE GUIDE PLATE
ELEV. = 49'± A.G.L.

☉ OF PROPOSED CABLE PORT
ELEV. = 29'± A.G.L.
☉ TOP OF POLE
ELEV. = 27'-2"± A.G.L.
☉ BOTTOM OF POLE
ELEV. = 27'± A.G.L.

REFER TO SHEET S-3 FOR BASE PLATE CONNECTION REQUIREMENTS

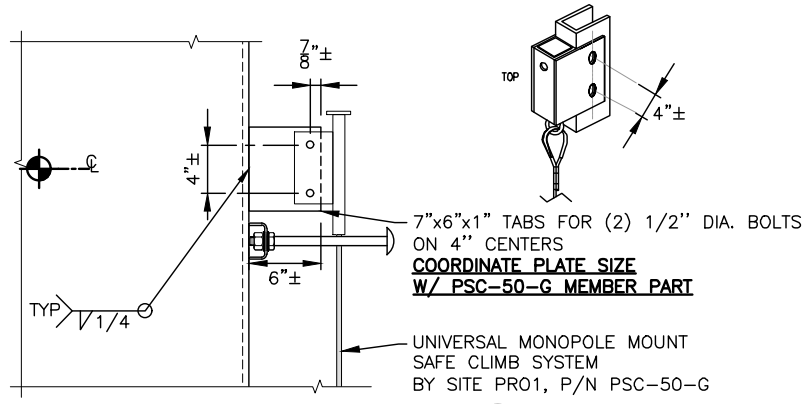
TOWER EXTENSION ELEVATION

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



CABLE STOP DETAIL (ATTENUATOR)

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



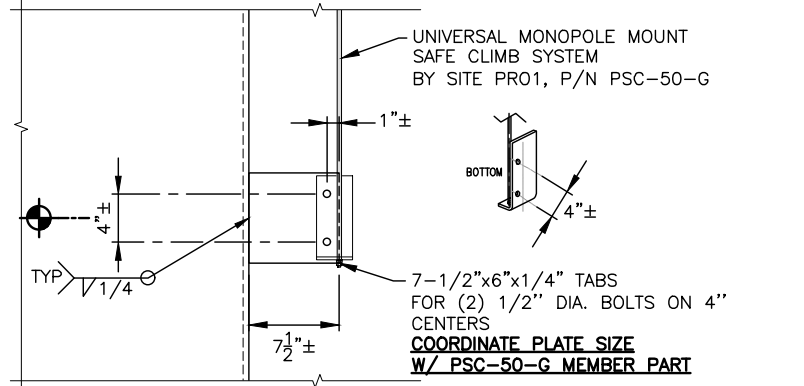
CABLE STOP DETAIL (TERMINATOR)

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



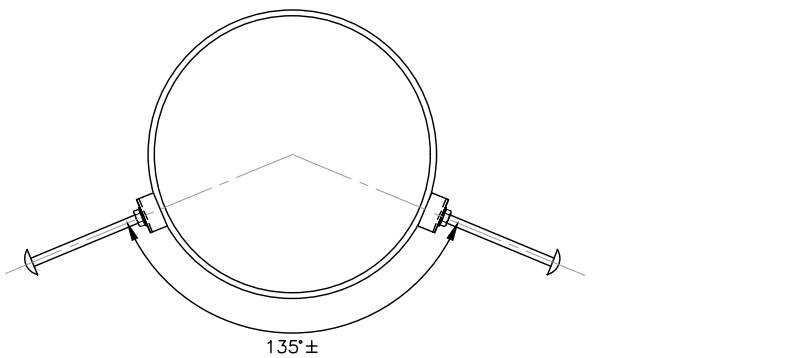
CABLE GUIDE DETAIL

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



CABLE STOP DETAIL (TERMINATOR)

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"

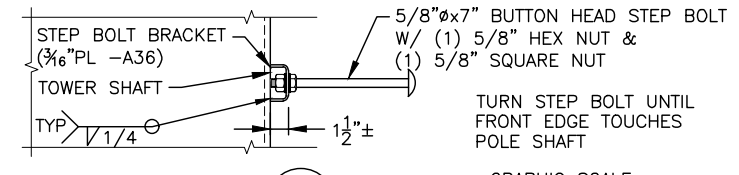


CLIMBING PEG PLAN

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"

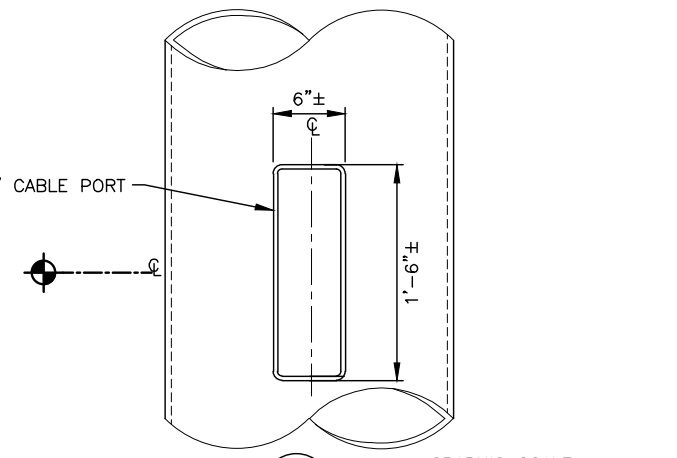
STEP BOLT SECTION

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



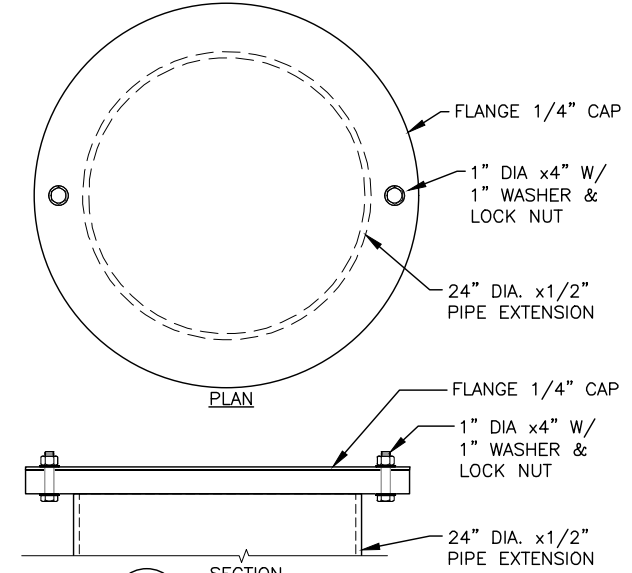
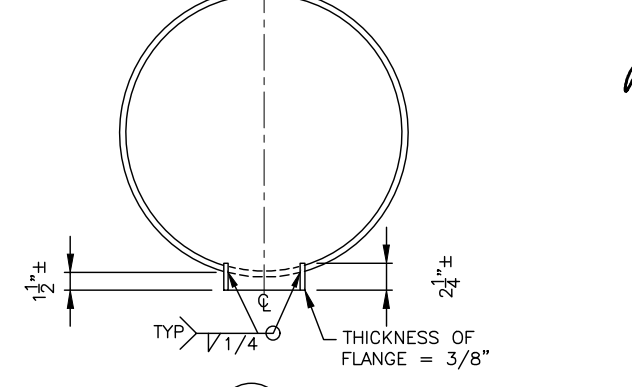
CABLE PORT ELEVATION

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



CABLE PORT PLAN

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"



TOP CAP COVER

22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"

FOR CONSTRUCTION

PREPARED FOR: CELCO PARTNERSHIP D.B.A.

verizon

TEP
NORTHEAST
TEP OPCO, LLC.

45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24798
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION PERMITS ARE VALID FOR SIX MONTHS AFTER ENGINEER'S RECORDS STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
TOWER CONNECTION DETAILS

SHEET NUMBER
S-4

GENERAL NOTES

ELECTRICAL

- ALL CONDUCTORS SHALL BE COPPER.
- ALL WIRING DEVICES AND EQUIPMENT SHALL BE SPECIFICATION GRADE AND UL LISTED.
- ALL UNDERGROUND LINES ON SITE SHALL BE LOCATED PRIOR TO CONSTRUCTION (IF APPLICABLE).
- THE INSTALLATION OF ALL MATERIALS SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE.
- ALL MATERIALS SHALL BE NEW.
- OUTLETS AND JUNCTION BOXES SHALL BE ZINC-COATED OR CADMIUM PLATED SHEET STEEL BOXES NOT LESS THAN FOUR INCHES SQUARE AND SUITABLE FOR THE TYPE OF SERVICE OUTLET. ALL OUTLET AND JUNCTION BOXES SHALL BE SECURELY SURFACE MOUNTED.
- THE ENTIRE SYSTEM SHALL BE SOLIDLY GROUNDED USING COMPRESSION-TYPE CONDUIT FITTINGS ON CONDUITS AND PROPERLY BONDED GROUND CONDUCTORS. CRIMP-TYPE AND SET SCREW-TYPE CONDUIT FITTINGS ARE NOT ALLOWED. ALL RECEPTACLES AND EQUIPMENT CIRCUITS SHALL BE GROUNDED USING A FULL-SIZE EQUIPMENT GROUNDING CONDUCTOR RUN WITH THE CURRENT CONDUCTORS.
- ALL WALL PENETRATIONS FOR TELCO, POWER, AND GROUNDING SHALL REQUIRE RIGID STEEL SLEEVES.
- ALL SWITCHES SHALL BE 48 INCHES A.F.F.
- ALL RECEPTACLES SHALL BE 18 INCHES A.F.F.
- ALL T-STATS SHALL BE 60 INCHES A.F.F.

CABLE TRAY

- BOTTOM OF CABLE TRAY SHALL BE 7'-6" A.F.F.
- CABLE TRAY ANCHORS SHALL BE MOUNTED TO STRUCTURAL CEILING.
- AFTER FINAL LEVELING OF CABLE TRAY, CUT THREADED RODS 1/2" BELOW NUT AND CAP OFF.

ALARM AND SIGNAL

- ALL ALARM WIRES SHALL BE RUN FROM EACH OF THE COMPONENTS TERMINAL STRIP. LEAVE ADDITIONAL ALARM WIRE COILED WITH SUFFICIENT LENGTH TO REACH THE FLOOR.
- ALL ALARM WIRES SHALL BE TAGGED AND LABELED WITH THE APPROPRIATE ALARM ITEM. ALL CONTRACTORS WILL BE NORMALLY CLOSED, DRY, AND ISOLATED FROM GROUND, U.O.N.
- ALL ALARM WIRING SHALL BE 1/2"C., (2)#22 AWG, UNLESS OTHERWISE NOTED.
- ELECTRICAL CONTRACTOR TO CARRY POWER FEED OF LESSEE'S MOD CELL EQUIPMENT.
- ALL ENCLOSURES TO BE NEMA.
- INTEGRATED LOAD CENTER ASSEMBLY SUPPLIED BY LESSEE.

ABBREVIATIONS

A	AMPERES
AC	ALTERNATING CURRENT
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISH FLOOR
AGB	COPPER ANTENNA GROUND BAR
AIC	AMPERE INTERRUPTING CAPACITY
AWG	AMERICAN WIRE GAUGE
BCW	BARE COPPER WIRE
BTS	BASE TRANSMISSION SYSTEM
C	CONDUIT
C/B	CIRCUIT BREAKER
CIGBE	COAX INSULATED GROUND BAR EXTERNAL
DC	DIRECT CURRENT
DWG	DRAWING
EMT	ELECTRICAL METALLIC TUBING
FACP	FIRE ALARM CONTROL PANEL
G	GROUND
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GR	GROWTH
HVAC	HEATING VENTILATION AND AIR-CONDITIONING
IEEE	INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
IGR	INTERNAL GROUND RING (HALO)
kcmil	ONE THOUSAND CIRCULAR MILS
LAGB	LOWER ANTENNA COPPER GROUND BAR
MIGB	MASTER ISOLATED GROUND BAR
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRIC MANUFACTURER'S ASSOCIATION
PCS	PERSONAL COMMUNICATION SYSTEM
PH	PHASE
PPC	POWER PROTECTION CABINET
PRC	PRIMARY RADIO CABINET
RGS	RIGID GALVANIZED STEEL
RWY	RACEWAY
TYP	TYPICAL
UAGB	UPPER ANTENNA COPPER GROUND
UL	UNDERWRITERS LABORATORIES
UON	UNLESS OTHERWISE NOTED
V	VOLTS
VA	VOLT-AMPS
W	WATTS

ELECTRICAL NOTES

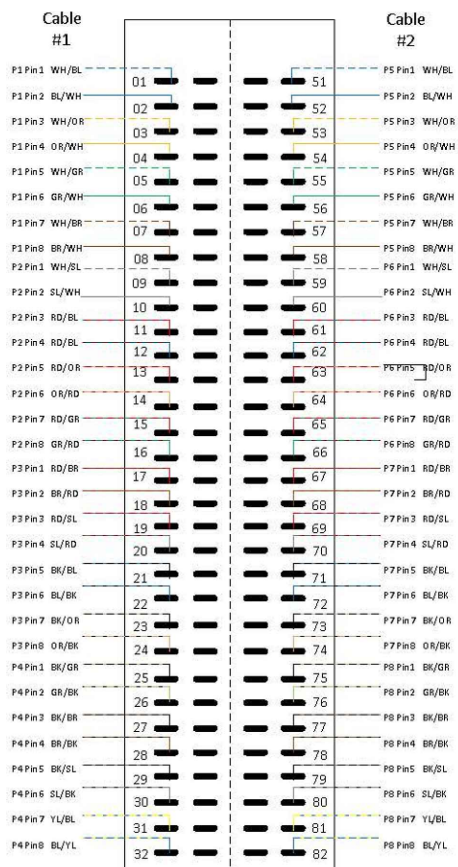
- UTILITY SERVICES SHOWN ARE PROPOSED, THE ELECTRIC CONTRACTOR SHALL COORDINATE EXACT TELEPHONE AND ELECTRIC SERVICE CONNECTION POINTS, PULL BOXES, ROUTING AND ASSOCIATED REQUIREMENTS WITH OWNER AND LOCAL UTILITY CO. VISIT SITE AND EXAMINE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED. REPORT ADVERSE CONDITIONS IN WRITING TO LICENSEE. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING CONDITIONS INCLUDING PREPARATORY WORK DONE BY OTHERS.
- GIVE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES AND BACK CHARGES, AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES THAT HAVE JURISDICTION.
- PERFORM WORK AS REQUIRED BY BOCA AND PER LOCAL LAWS.
- THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT ROUTING WITH OWNER AND FIELD CONSTRUCTION MANAGER.
- ALL EXTERIOR WALL PENETRATIONS SHALL BE SILICONE SEALED.
- MATERIAL AND EQUIPMENT SHALL BE UL, NEMA, ANSI, IEEE, ADA & CBM APPROVED FOR INTENDED SERVICE. INSTALLATION SHALL MEET REQUIREMENTS OF NATIONAL AND STATE ELECTRICAL CODE.
- ALL ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C..
- ALL NEW WIRING SHALL BE TYPE THWN RATED 75°C., 600 VOLT. WET OR DRY LOCATIONS. MINIMUM BRANCH CIRCUIT WIRING SHALL BE #12 AWG SOLID COPPER.
- ALL METALLIC CONDUITS SHALL BE PROVIDED WITH BONDING BUSHINGS.
- ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO THE LICENSEE PROJECT MANAGER AT JOB COMPLETION.
- PROVIDE THE OWNER WITH ONE SET OF COMPLETE ELECTRICAL "AS BUILT" DRAWINGS AT THE COMPLETION OF THE JOB.
- GUARANTEE WORK IN WRITING FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIALS OR INSTALLATION AT NO COST TO OWNER. CORRECT DAMAGE CAUSED IN MAKING NECESSARY REPAIRS AND REPLACEMENTS UNDER GUARANTEE AT NO COST TO OWNER.
- CONTRACTOR SHALL CONTACT "DIG SAFE" (1-888-DIG-SAFE) PRIOR TO COMMENCEMENT OF WORK.

PANEL NAME: PROPOSED AC PANEL

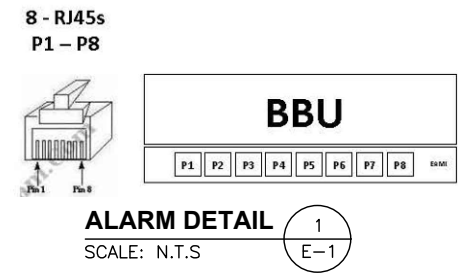
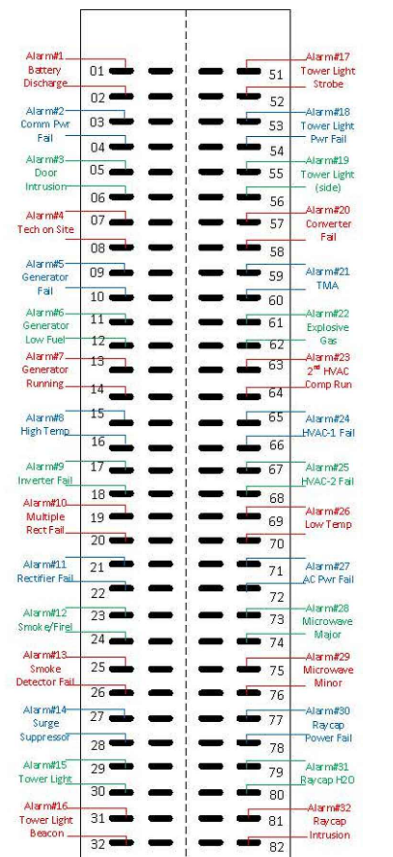
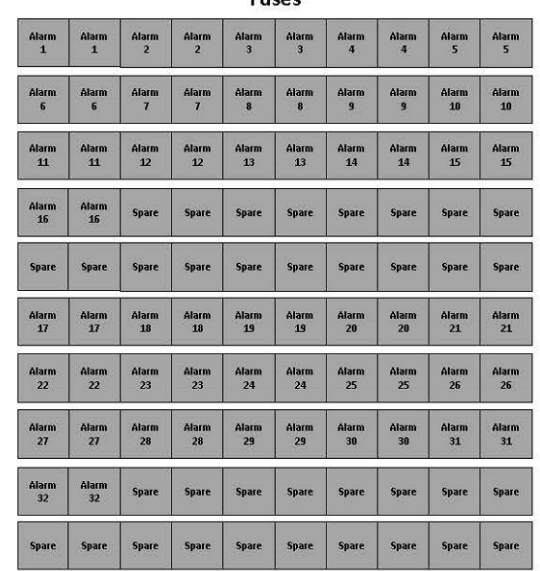
1Ø, 3W 120/240V, 200A

MOUNTING: SURFACE
MANUFACTURER: I.B.D.

CKT No.	BREAKER AMPS	POLES	LOAD DESCRIPTION	LOAD kVA	BRANCH CKT	CKT No.	BREAKER AMPS	POLES	LOAD DESCRIPTION	LOAD kVA	BRANCH CKT
1						2					
3	40	2	SURGE	9.6	3#8, 1#8G, 1"C	4	40	2	RECTIFIER #5	9.6	3#8, 1#8G, 1"C
5						6	40	2	RECTIFIER #6	9.6	3#8, 1#8G, 1"C
7	40	2	RECTIFIER #1	9.6	3#8, 1#8G, 1"C	8					
9						10	40	2	RECTIFIER #7	9.6	3#8, 1#8G, 1"C
11	40	2	RECTIFIER #2	9.6	3#8, 1#8G, 1"C	12					
13						14	40	2	RECTIFIER #8	9.6	3#8, 1#8G, 1"C
15	40	2	RECTIFIER #3	9.6	3#8, 1#8G, 1"C	16					
17						18	20	1	EQUIPMENT CABINET	2.4	2#12, 1#8G, 3/4"C
19	40	2	RECTIFIER #4	9.6	3#8, 1#8G, 1"C	20	20	1	TELCO/TWISTLOCK	2.4	2#12, 1#8G, 3/4"C
21		1	SPARE			22	20	1	LIGHTING	2.4	2#12, 1#8G, 3/4"C
23		1	SPARE			24		1	SPARE		



Wiring Diagram for Porta Systems Block Model 899A



FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

CONSTRUCTION PERMITS ARE VALID FOR SIX MONTHS AFTER ENGINEER'S RECORDS STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN

CHECKED BY: JX

APPROVED BY: DPH

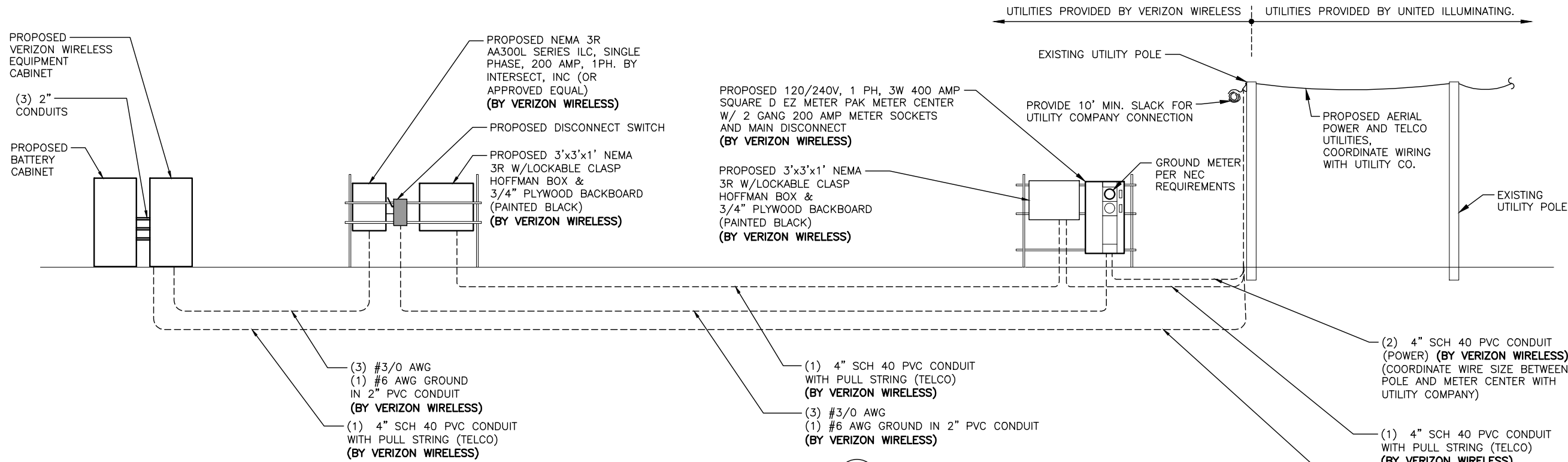
REV.	DATE	DESCRIPTION	BY
4	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
2	06/24/22	REV. ANTENNA MOUNT	SLY
1	05/13/22	ADDED N77 ANTENNAS	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
**115 MEADOW ROAD
NEW HAVEN, CT 06513**

SHEET TITLE
ELECTRICAL NOTES & WIRING DIAGRAM

SHEET NUMBER
E-1



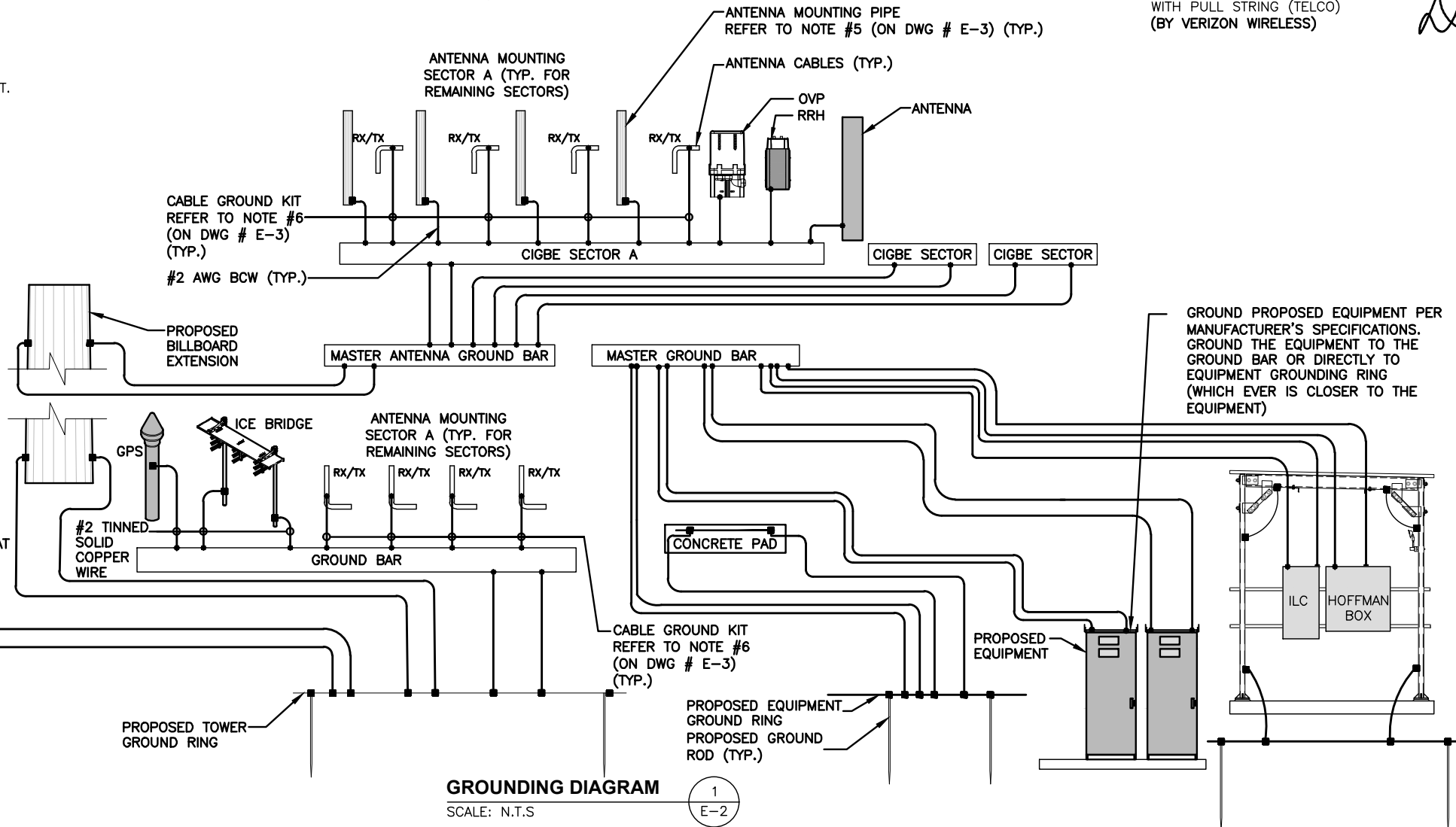
NOTES:

1. EXACT LOCATIONS OF ALL EQUIPMENT SHALL BE DETERMINED IN FIELD. ALL NEC CLEARANCE REQUIREMENTS SHALL BE MET.
2. REFER TO "A" DWGS FOR EXACT ROUTING OF ALL CONDUITS.
3. VERIZON CONSTRUCTION MANAGER SHALL COORDINATE ALL ELECTRICAL WORK WITH UTILITY COMPANY.
4. REFER TO DETAILS ON DWG E-3 FOR ADDITIONAL INFORMATION. TYPICAL BURIED CONDUIT 2/A-5 DETAIL SHALL APPLY TO ALL UNDERGROUND CONDUIT.
5. PROVIDE SERVICE GROUNDING IN ACCORDANCE WITH NEC ARTICLE 250.

ELECTRICAL/TELCO ONE-LINE DIAGRAM

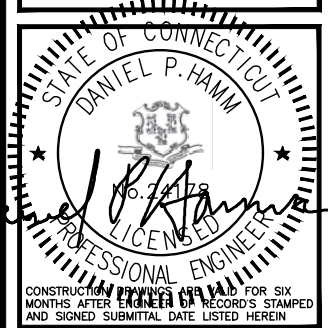
SCALE: N.T.S.

1
E-2



FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



CHECKED BY: JX

APPROVED BY: DPH

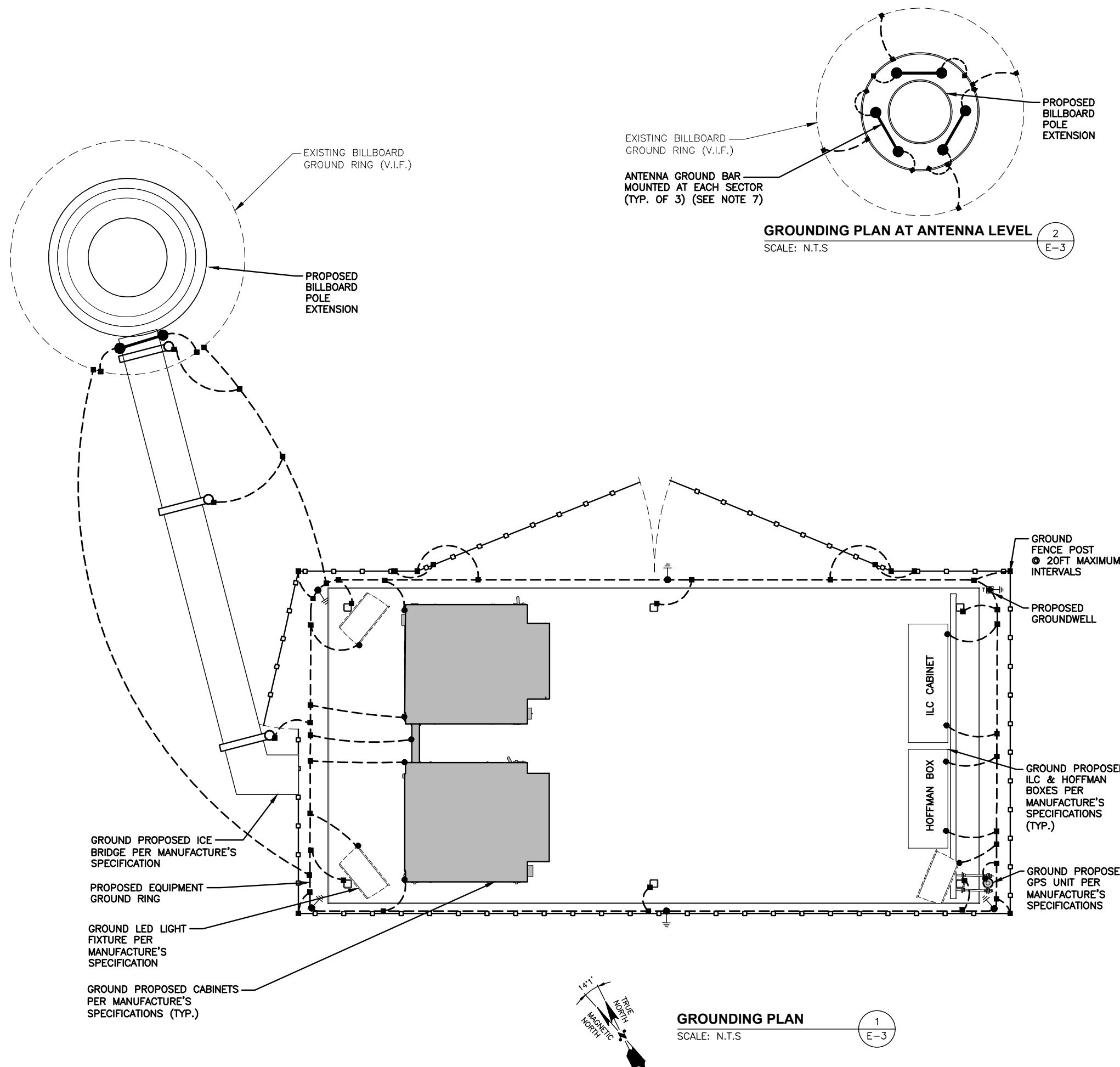
SUBMITTALS				
REV.	DATE	DESCRIPTION	BY	
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3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY	
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0	07/19/21	ISSUED FOR CONSTRUCTION	SLY	

SITE NAME:
EAST HAVEN 5 CT

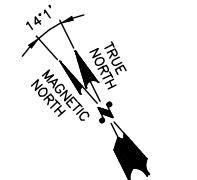
SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
GROUNDING RISER DIAGRAM

SHEET NUMBER
E-2



GROUNDING PLAN AT ANTENNA LEVEL 2
SCALE: N.T.S. E-3



GROUNDING PLAN 1
SCALE: N.T.S. E-3

GROUNDING NOTES

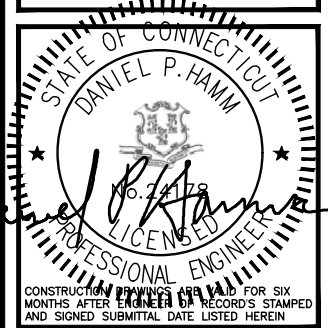
- ALL GROUND WIRE SHALL BE BARE COPPER #2 AWG UNLESS OTHERWISE NOTED.
- ALL GROUND WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
- ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION OF GROUND RODS AND GROUND RING WITH FOUNDATION AND UNDERGROUND CONDUIT.
- EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MIGB) WITH #2 AWG INSULATED STRANDED COPPER WIRE. EQUIPMENT CABINETS SHALL EACH HAVE (2) CONNECTIONS.
- PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE (TYPICAL FOR FOUR MOUNTING PIPES PER SECTOR).
- ANTENNA GROUND KITS SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
- COORDINATE NEW LICENSEE GROUND SYSTEM WITH EXISTING SITE GROUND SYSTEM.
- EACH SECTION OF CABLE TRAY, ICE BRIDGE AND ICE SHIELD SHALL BE CONNECTED IN A FASHION TO PROVIDE A CONTINUOUS GROUND.
- AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANELS AND FRAMES OF EQUIPMENT, AND WHERE EXPOSED FOR GROUNDING, CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE WITH STAINLESS STEEL SELF-TAPPING SCREWS.
- ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
- ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH LICENSEE PROJECT MANAGER.
- ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
- INSTALL GROUND BUSHINGS ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANELBOARD.
- GROUND ANTENNA BASES, FRAMES, CABLE RACKS AND OTHER METALLIC COMPONENTS WITH #2 AWG GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
- GROUND COAXIAL SHIELD AT BOTH ENDS USING MANUFACTURER'S GUIDELINES.
- REINFORCEMENT IN EQUIPMENT SLAB TO BE WELDED AND REINFORCEMENT TO BE BONDED TO GROUNDING RING.
- CONCRETE-ENCASED ELECTRODES GREATER THAN 20 S.F. OF SURFACE AREA & 1/2" OR GREATER REINFORCING STEEL MUST BE BONDED TO THE GROUNDING RING PER NEC 250.50.
- ALL GROUND BARS SHALL BE GALVANIZED WITH ANTI-THEFT HARDWARE.

GROUNDING LEGEND

- COMPRESSION TYPE CONNECTION
- EXOTHERMIC
- ⊗ CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
- ⊥● 5/8" X 10'-0" COPPER CLAD GROUND ROD
- ⊥● T TEST 5/8" X 10'-0" COPPER CLAD GROUND ROD WITH INSPECTION SLEEVE
- ⊗ EXOTHERMIC WITH INSPECTION SLEEVE
- #2 SOLID TINNED COPPER WIRE UNLESS OTHERWISE NOTED GROUNDING CONDUCTOR
- GROUNDING BAR
- PIGTAIL GROUND CONDUCTOR

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



CHECKED BY: JX

APPROVED BY: DPH

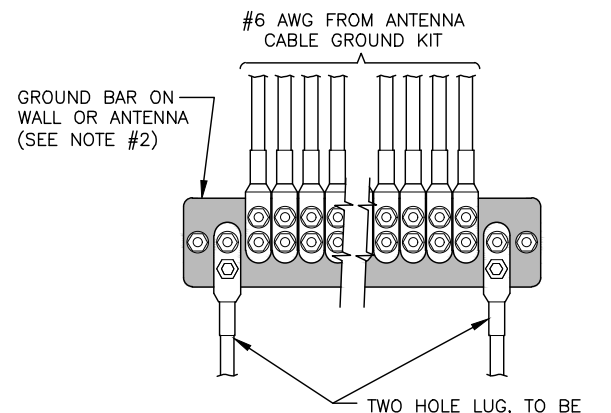
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SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
GROUNDING PLAN

SHEET NUMBER
E-3



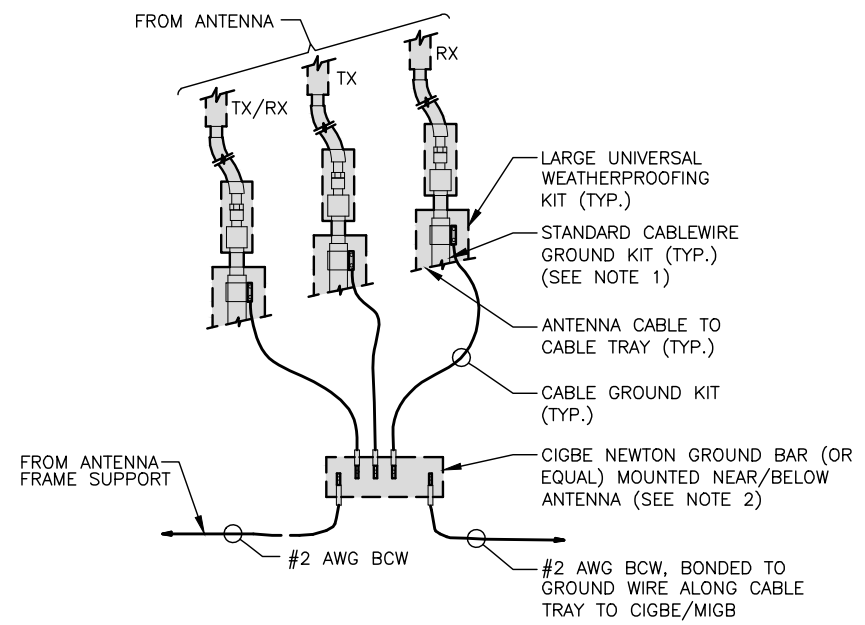
NOTES:

1. CONTRACTOR TO UTILIZE KOPR-SHIELD (THOMAS & BETTS) ON ALL LUG CONNECTIONS.
2. ALL GROUND BARS SHALL BE GALVANIZED WITH ANTI-THEFT HARDWARE.

**GROUNDING - STANDARD
DETAIL INSTALLATION OF
GROUNDWIRE TO GROUND BAR**

SCALE: N.T.S

1
E-4



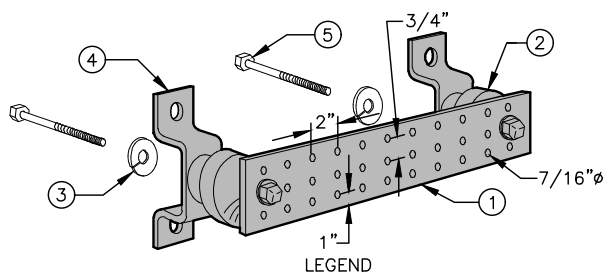
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.
2. ALL GROUND BARS SHALL BE GALVANIZED WITH ANTI-THEFT HARDWARE.

**GROUNDING - STANDARD
CONNECTION OF GROUND WIRES
TO GROUND BAR (CIGBE)**

SCALE: N.T.S

3
E-4



LEGEND

- 1 GALVANIZED STEEL GROUND BAR, 1/4"x4"x20", OR OTHER LENGTH AS REQUIRED, HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
- 2 INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL.
- 3 5/8" LOCKWASHERS OR EQUAL.
- 4 WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-8056 OR EQUAL.
- 5 5/8-11 x 1" H.H.C.S. BOLTS

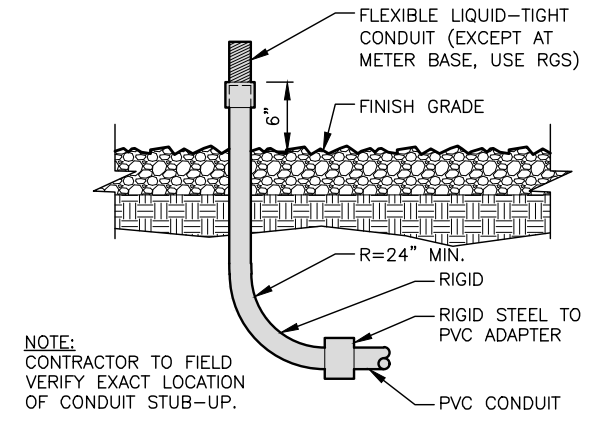
NOTES:

1. ALL BOLTS, NUTS, WASHERS, AND LOCK WASHERS SHALL BE 18-8 STAINLESS STEEL.
2. ALL GROUND BARS SHALL BE GALVANIZED WITH ANTI-THEFT HARDWARE.

**GROUNDING - STANDARD
DETAIL GROUND BAR**

SCALE: N.T.S

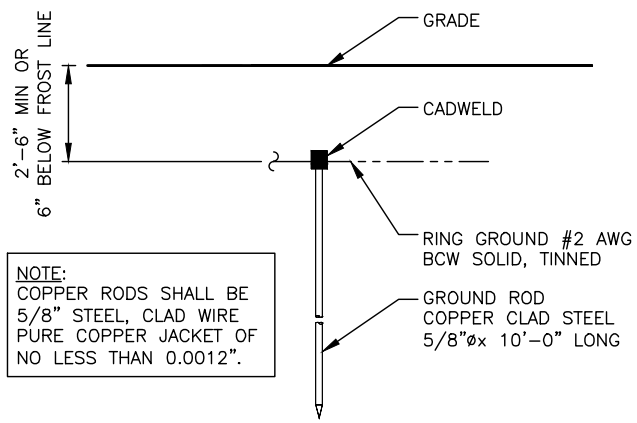
2
E-4



CONDUIT STUB-UP

SCALE: N.T.S

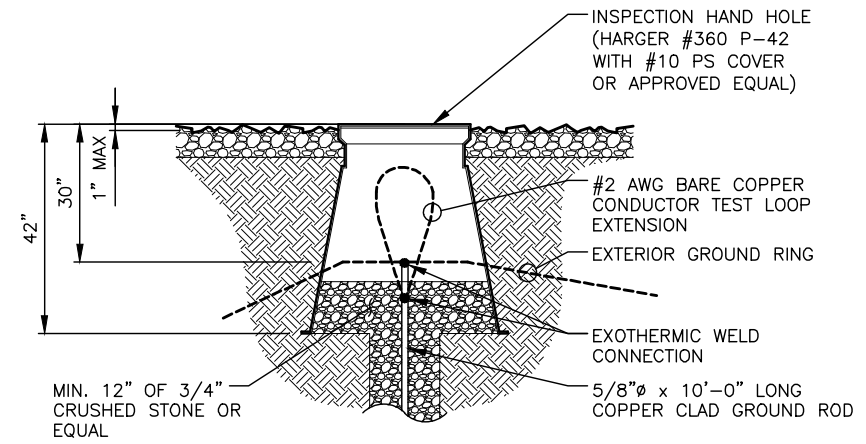
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E-4



TYPICAL GROUND ROD DETAIL

SCALE: N.T.S

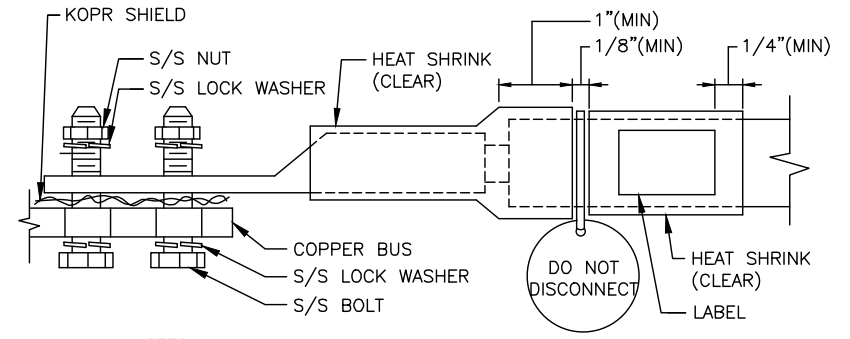
6
E-4



GROUNDING WELL DETAIL

SCALE: N.T.S

4
E-4



NOTES:

1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.
4. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

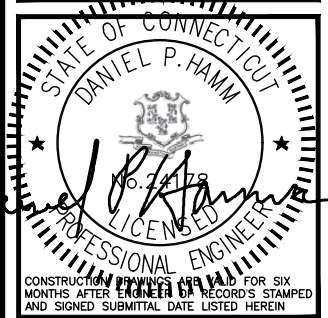
7
E-4

FOR CONSTRUCTION

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
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3	11/14/22	ADD. TOWER CONNECT DETAILS	SLY
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SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
**GROUNDING
DETAILS**

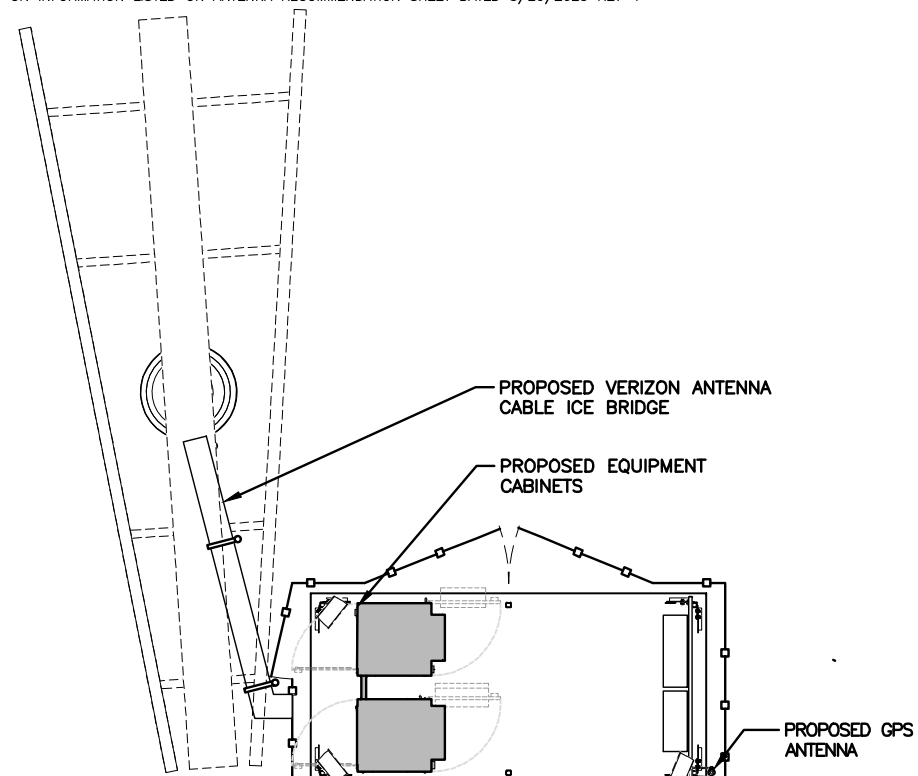
SHEET NUMBER
E-4

BILL OF MATERIALS

SITE NAME: EAST HAVEN 5 CT

ITEM	DESCRIPTION	QTY	LENGTH	COMMENTS
①	PROPOSED MT6407-77A ANTENNA W/CLIP-ON RRH	3		MOUNTED TO SECTOR FRAME
②	PROPOSED JAHH-45B-R3B ANTENNA	3		MOUNTED TO SECTOR FRAME
③	PROPOSED JAHH-45B-R3B ANTENNA	3		MOUNTED TO SECTOR FRAME
④				
⑤	PROPOSED 1/2" TOP COAX JUMPERS	20	6 FT.	ROUTE FROM RRH OR DIPLEXER TO ANTENNA
⑤	PROPOSED 1/2" TOP COAX JUMPERS	20	6 FT.	ROUTE FROM RRH OR DIPLEXER TO ANTENNA
⑤	PROPOSED 1/2" TOP COAX JUMPERS	20	6 FT.	ROUTE FROM RRH OR DIPLEXER TO ANTENNA
⑥	PROPOSED DIPLEXER CBC78T-DS-43-2X	3		MOUNTED PIPE MAST
⑦	PROPOSED LTE 700/850 RRH	3		SAMSUNG RRH B5/B13 RRH ORAN (RF4440D-13A) PIPE MOUNTED
⑦	PROPOSED PCS/AWS 1900/2100 RRH	3		SAMSUNG RRH B2/B66A RRH ORAN (RF4439D-25A) PIPE MOUNTED
⑦				
⑧	PROPOSED SAMSUNG FIBER JUMPER CABLES	9	15 FT.	ROUTE FROM OVP TO RRH
⑧	PROPOSED SAMSUNG POWER JUMPER CABLES	9	15 FT.	ROUTE FROM OVP TO RRH
⑨	PROPOSED UPPER OVP	1		MOUNTED TO PIPE MAST
⑩	PROPOSED 12X24 HYBRID CABLE	1	110 FT.	ROUTE FROM EQUIPMENT TO ANTENNA SECTOR
⑪	PROPOSED LOWER OVP	1		RACK MOUNTED INSIDE CABINET

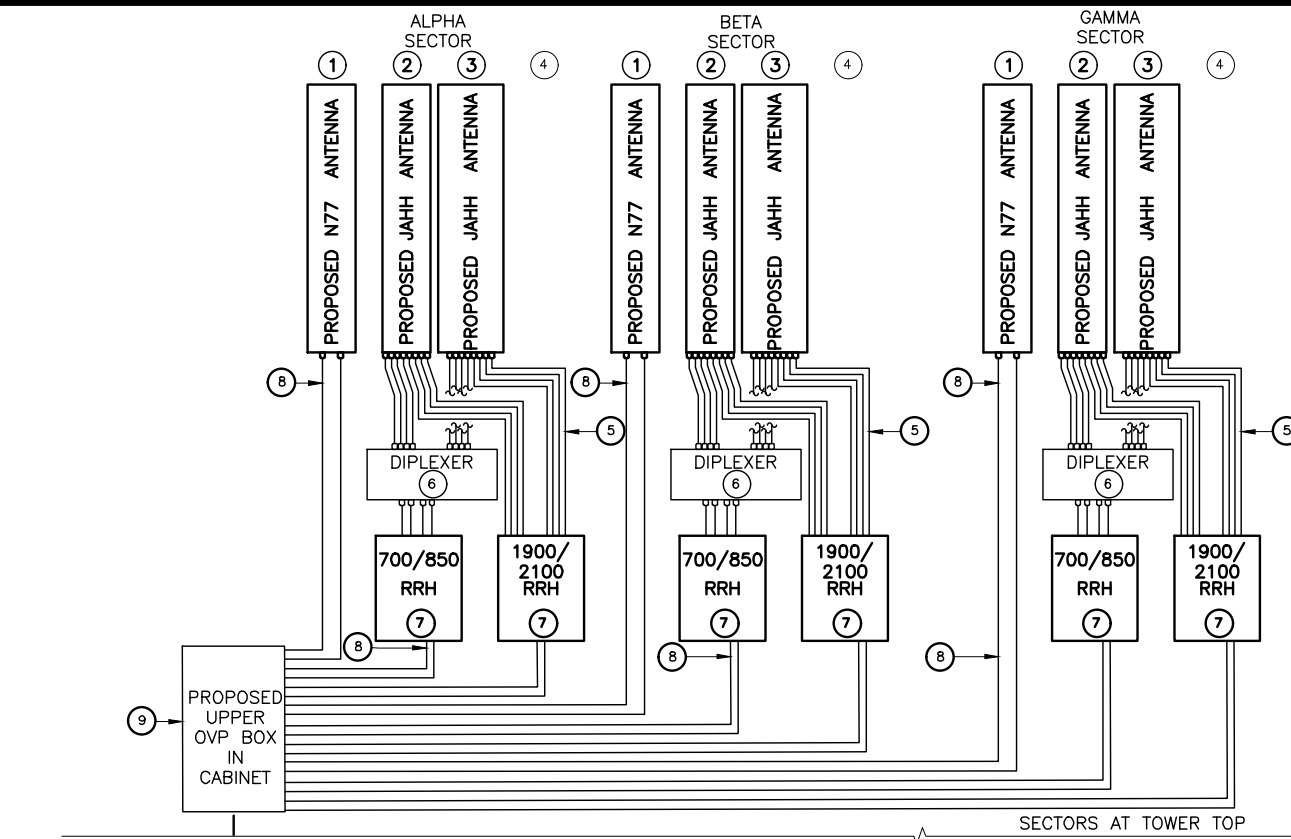
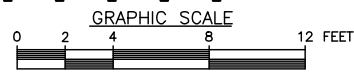
THE ABOVE RF-BOM SHEET IS BASED ON INFORMATION LISTED ON ANTENNA RECOMMENDATION SHEET DATED 3/20/2023 REV 4



COMPOUND PLAN

22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

①
RF-1



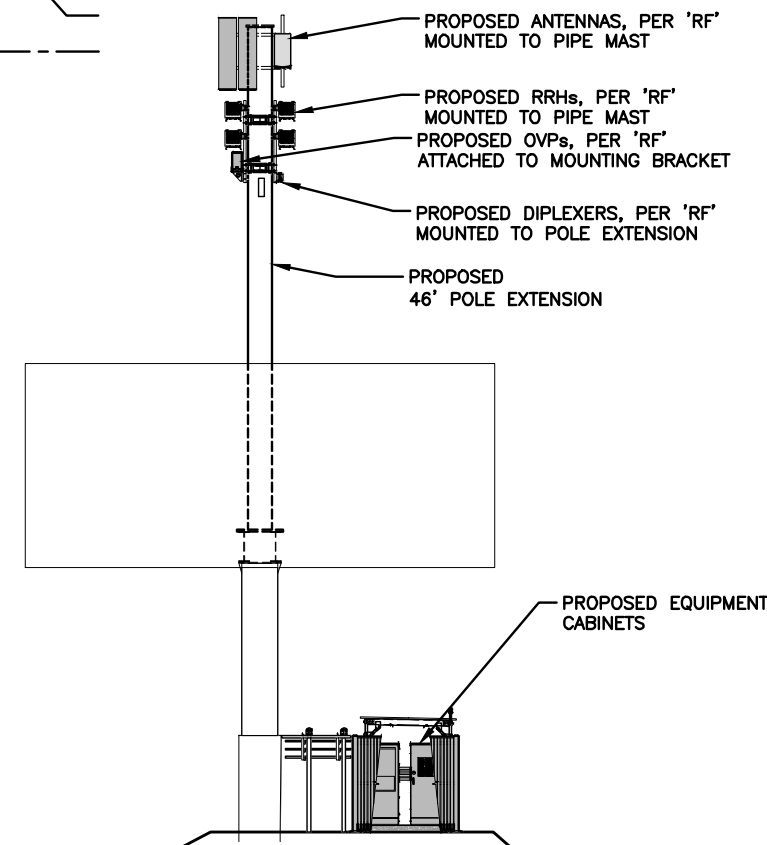
(ANTENNA CONFIGURATION WHEN VIEWED FROM BEHIND)

RF CABLE PLUMBING DIAGRAM

SCALE: N.T.S.

③
RF-1

- TOP OF PROPOSED ANTENNAS AND POLE EXTENSION
ELEV. = 70'-0"± A.G.L.
ELEV. = 92'-0"± A.M.S.L.
- C. OF PROPOSED VERIZON ANTENNAS
ELEV. = 67'-0"± A.G.L.
ELEV. = 89'-0"± A.M.S.L.



EAST ELEVATION

22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"

②
RF-1



PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	04/07/23	REV. POLE HEIGHT & RRH TYPE	SLY
0	07/19/21	ISSUED FOR CONSTRUCTION	SLY

SITE NAME:
EAST HAVEN 5 CT

SITE ADDRESS:
115 MEADOW ROAD
NEW HAVEN, CT 06513

SHEET TITLE
**RF PLUMBING
DIAGRAM AND BILL
OF MATERIALS**

SHEET NUMBER
RF-1

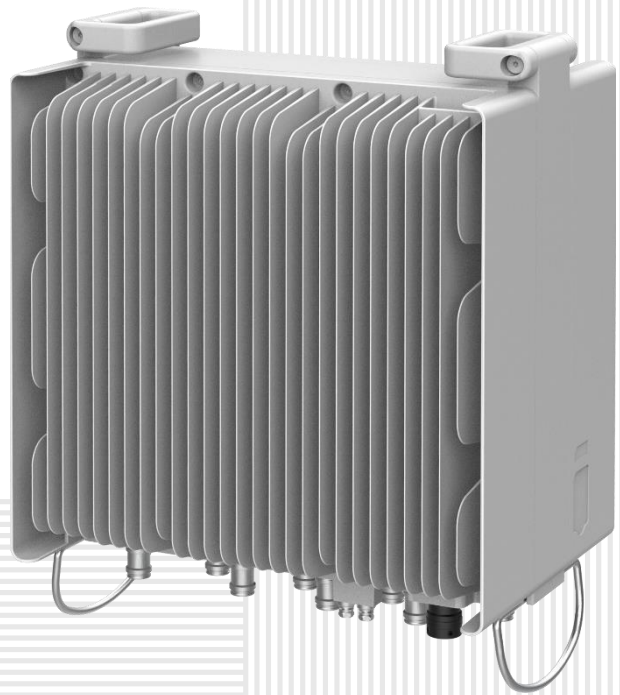
SAMSUNG

AWS/PCS MACRO RADIO

DUAL-BAND AND HIGH POWER
FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This AWS/PCS 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code RF4439d-25A



Homepage
samsungnetworks.com

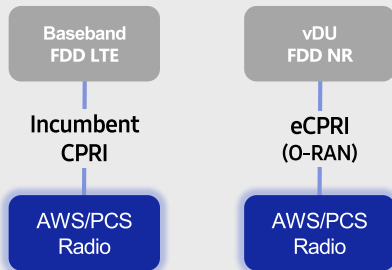


Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

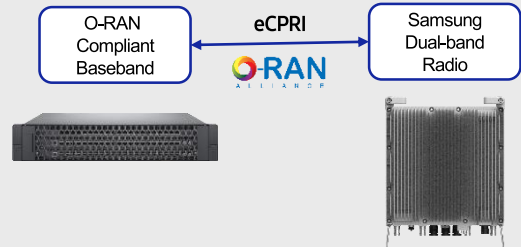
Samsung's AWS/PCS macro radio can support each incumbent CPRI interface as well as advanced eCPRI interfaces. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help in implementing cost-effective networks, which are capable of sending more data without compromising additional investments.

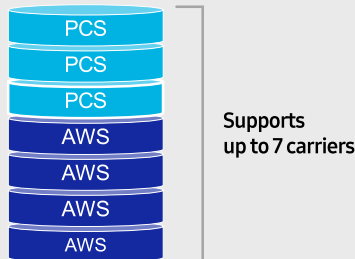
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

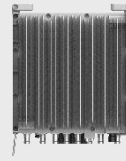
The number of required carriers varies according to site (region). Supporting many carriers is essential for using all frequencies that the operator has available.

The new AWS/PCS dual-band radio can support up to 3 carriers in the PCS (1.9GHz) band and 4 carriers in the AWS (2.1GHz) band, respectively.



Brand New Features in a Compact Size

Samsung's AWS/PCS macro radio offers several features, such as dual connectivity for baseband for both CDU and vDU, O-RAN capability, more carriers and an enlarged PCS spectrum, combined into an incumbent radio volume of 36.8L.



- 2 FH connectivity
- O-RAN capability
- More carriers and spectrum

Same as an incumbent radio volume

Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B25(PCS), B66(AWS)
Frequency Band	DL: 1930 – 1995MHz, UL: 1850 – 1915MHz DL: 2110 – 2200MHz, UL: 1710 – 1780MHz
RF Power	(B25) 4 × 40W or 2 × 60W (B66) 4 × 60W or 2 × 80W
IBW/OBW	(B25) 65MHz / 30MHz (B66) DL 90MHz, UL 70MHz / 60MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 10.04inch (36.8L) / 74.7lb

SAMSUNG

700/850MHZ MACRO RADIO

DUAL-BAND AND HIGH POWER
FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This 700/850MHz 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code RF4440d-13A



Homepage
samsungnetworks.com

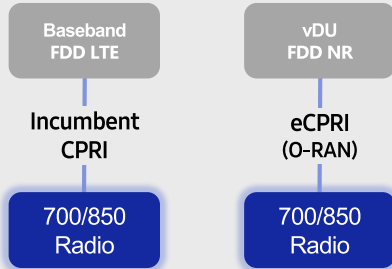


Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

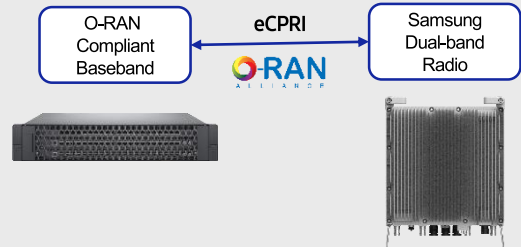
Samsung's 700/850MHz macro radio can support each incumbent CPRI interface as well as an advanced eCPRI interface. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help when implementing cost-effective networks because it is capable of sending more data without compromising additional investments.

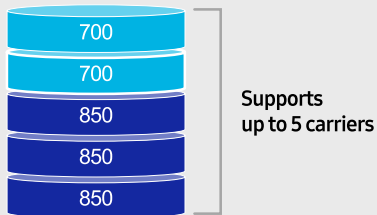
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

The number of required carriers varies according to site (region). The ability to support many carriers is essential for using all frequencies that the operator has available.

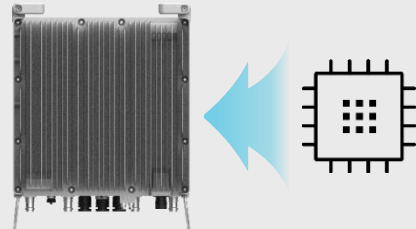
The new 700/850MHz dual-band radio can support up to 2 carriers in the B13 (700MHz) band and 3 carriers in the B5 (850MHz) band, respectively.



Secured Integrity

Access to sensitive data is allowed only to authorized software.

The Samsung radio's CPU can protect root of trust, which is credential information to verify SW integrity, and secure storage provides access control to sensitive data by using dedicated hardware (TPM).



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B13(700MHz), B5(850MHz)
Frequency Band	DL: 746 – 756MHz, UL: 777 – 787MHz DL: 869 – 894MHz, UL: 824 – 849MHz
RF Power	(B13) 4 × 40W or 2 × 60W (B5) 4 × 40W or 2 × 60W
IBW/OBW	(B13) 10MHz / 10MHz (B5) 25MHz / 25MHz
Installation	Pole, Wall
Size/Weight	14.96 x 14.96 x 9.05inch (33.2L) / 70.33 lb