Date: **July 06, 2022**

B+T GRP

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Verizon Wireless* Co-Locate**	
	Site Number:	712924
	Site Name:	CC Lake City Airport
Crown Castle Designation:	**BU Number:**	825272
	Site Name:	Lake City Airport
	JDE Job Number:	706810
	Work Order Number:	2133059
	Order Number:	605523 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	121641.005.01
Site Data:	**336 SE Newell DR, Lake City, Columbia County, FL** **Latitude *30° 10' 13.5"*, Longitude *-82° 35' 9.7"*** **132 Foot - Monopole Tower**	

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 118 mph as required by the 2020 Florida Building Code 7th Edition. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Massood Sattari

Respectfully submitted by: B+T Engineering, Inc.

COLUMBIA COUNTY BUILDING DEPARTMENT
Received for FILE COPY
Code Compliance
PLANS EXAMINER

CHAD E. TUTTLE
LICENSE
No. 57199
STATE OF FLORIDA
PROFESSIONAL ENGINEER

CHAD TUTTLE, P.E.
B&T ENGINEERING, INC
THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY CHAD TUTTLE, P.E. USING A DIGITAL SIGNATURE.
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Chad E. Tuttle, P.E.

tnxTower Report - version 8.1.1.0

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 132 ft. Monopole tower designed by Sabre Communications.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	118 mph
Exposure Category:	C
Topographic Factor:	1
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
123.0	123.0	2	Commscope	RCMDC-6627-PF-48	2	2
		6	JMA Wireless	MX06FIT865-02		
		3	Ericsson	4449		
		3	Ericsson	8843		
		3	Ericsson	AIR 6449 B77		
		1	Site Pro 1	HRK12		
		1	Site Pro 1	RMQP-NP Low Profile Platform		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
133.0	133.0	1	--	Platform Mount [LP 701-1_HR-1]	3	1-5/8
	129.0	4	Commscope	FFVV-65C-R3-V1_TMO		
		4	Ericsson	AIR6449 B41_T-MOBILE		
		4	Ericsson	RADIO 4460 B2/B25 B66_TMO		
		4	Ericsson	RADIO 4480 B71_TMO		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Tower Manufacturer Drawing	3553565	CCI Sites
Foundation Drawing	3877066	CCI Sites
Geotech Report	3553564	CCI Sites
Crown CAD Package	Date: 06/30/2022	CCI Sites

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

1) The tower and structures were maintained in accordance with the - TIA-222 standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	132 - 99.75	Pole	TP21.66x13.5x0.188	1	-10.303	759.503	76.9	Pass
L2	99.75 - 49	Pole	TP34.12x20.589x0.313	2	-17.127	1994.265	58.5	Pass
L3	49 - 0	Pole	TP45.9x32.42x0.313	3	-27.698	2777.460	65.0	Pass
							Summary	
						Pole (L1)	76.9	Pass
						Rating =	76.9	Pass

Table 5 - Tower Component Stresses vs. Capacity –LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	Base	54.5	Pass
1,2	Base Plate	Base	47.4	Pass
1,2	Base Foundation (Structure)	Base	57.0	Pass
1,2	Base Foundation (Soil Interaction)	Base	50.7	Pass

Structure Rating (max from all components) =	76.9%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Rating per TIA-222-H Section 15.5.

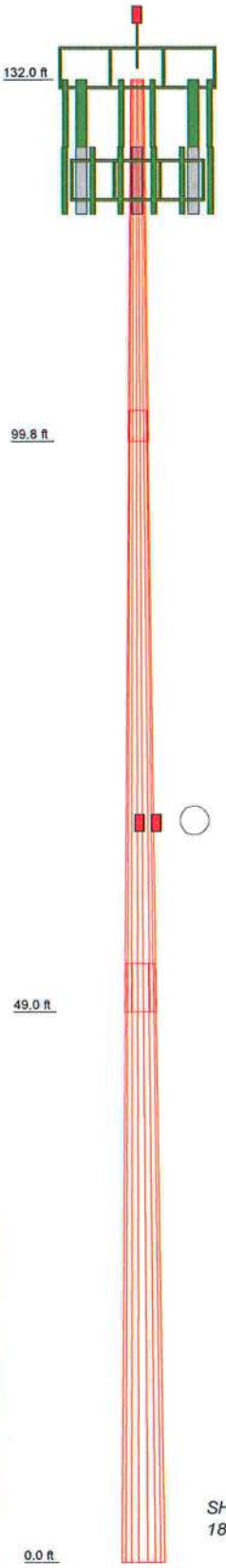
4.1) Recommendations

The tower and its foundations have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	32.250	53.500	53.250
Number of Sides	18	18	18
Thickness (in)	0.188	0.313	0.313
Socket Length (ft)	2.750	4.250	
Top Dia (in)	13.500	20.589	32.420
Bot Dia (in)	21.660	34.120	45.900
Grade	A572-65		
Weight (K) 13.0	1.1	4.9	7.0



ALL REACTIONS ARE FACTORED

AXIAL 28 K

SHEAR 18 K

MOMENT 1846 kip-ft

TORQUE 3 kip-ft

REACTIONS - 118 mph WIND

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Columbia County, Florida.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. TIA-222-H Annex S
8. TOWER RATING: 76.9%

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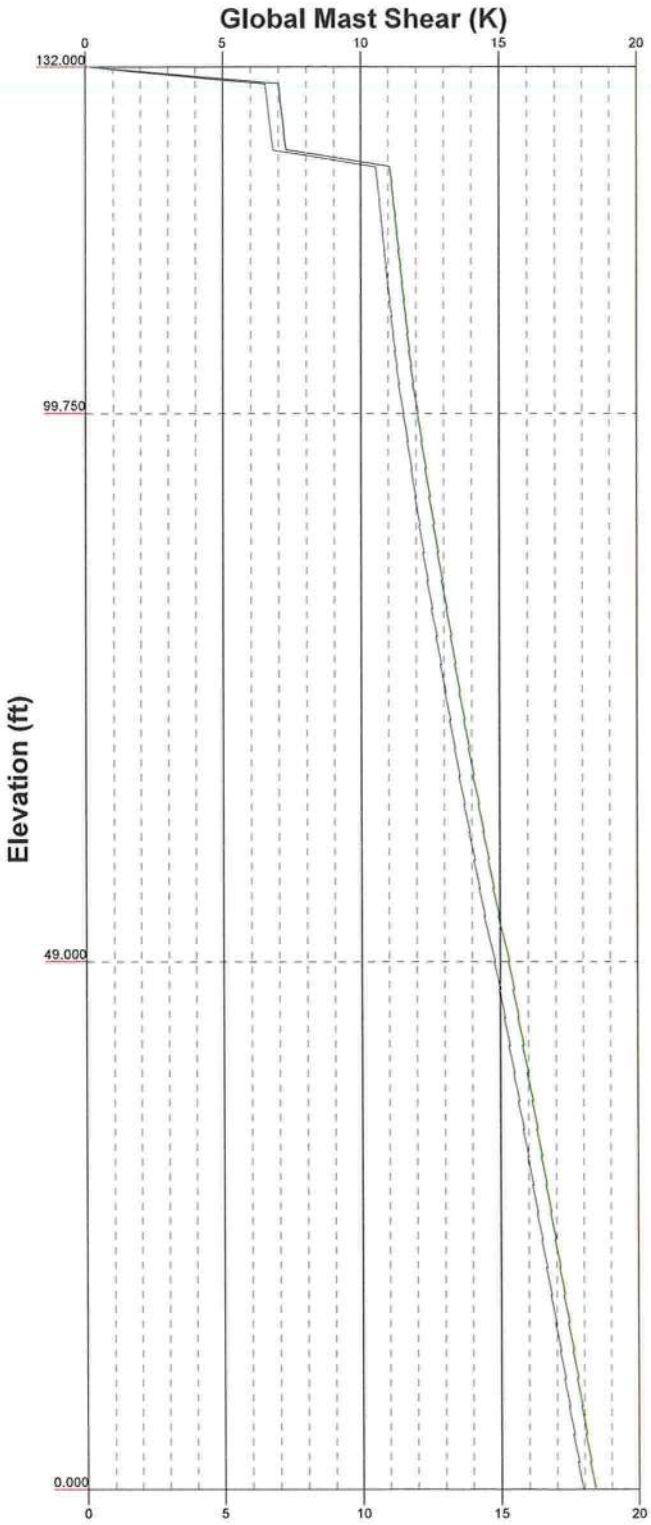
Job: 121641.005.01 - Lake City Airport, FL (BU# 82527			
Project:			
Client: Crown Castle	Drawn by: R AITHAL	App'd:	
Code: TIA-222-H	Date: 07/06/22	Scale: NTS	
Path:		Dwg No. E-1	

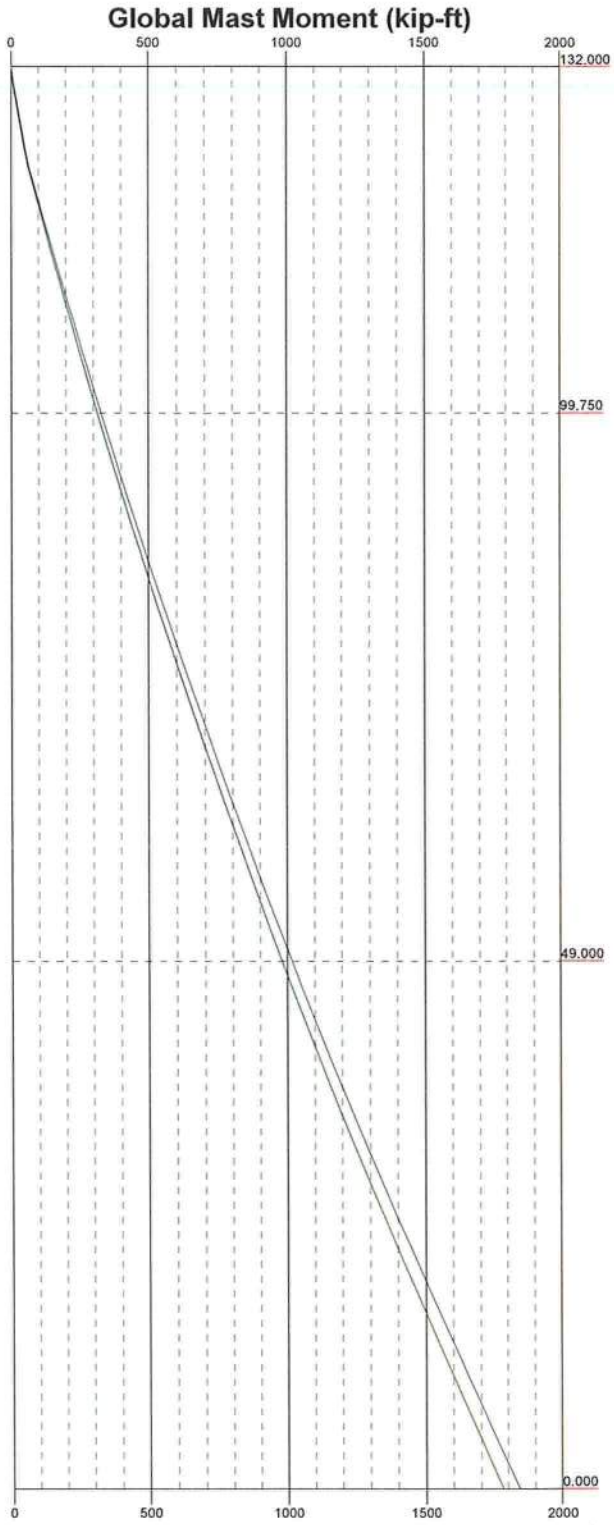
TIA-222-H - 118 mph Exposure C

Vx Vz

Maximum Values

Mx Mz





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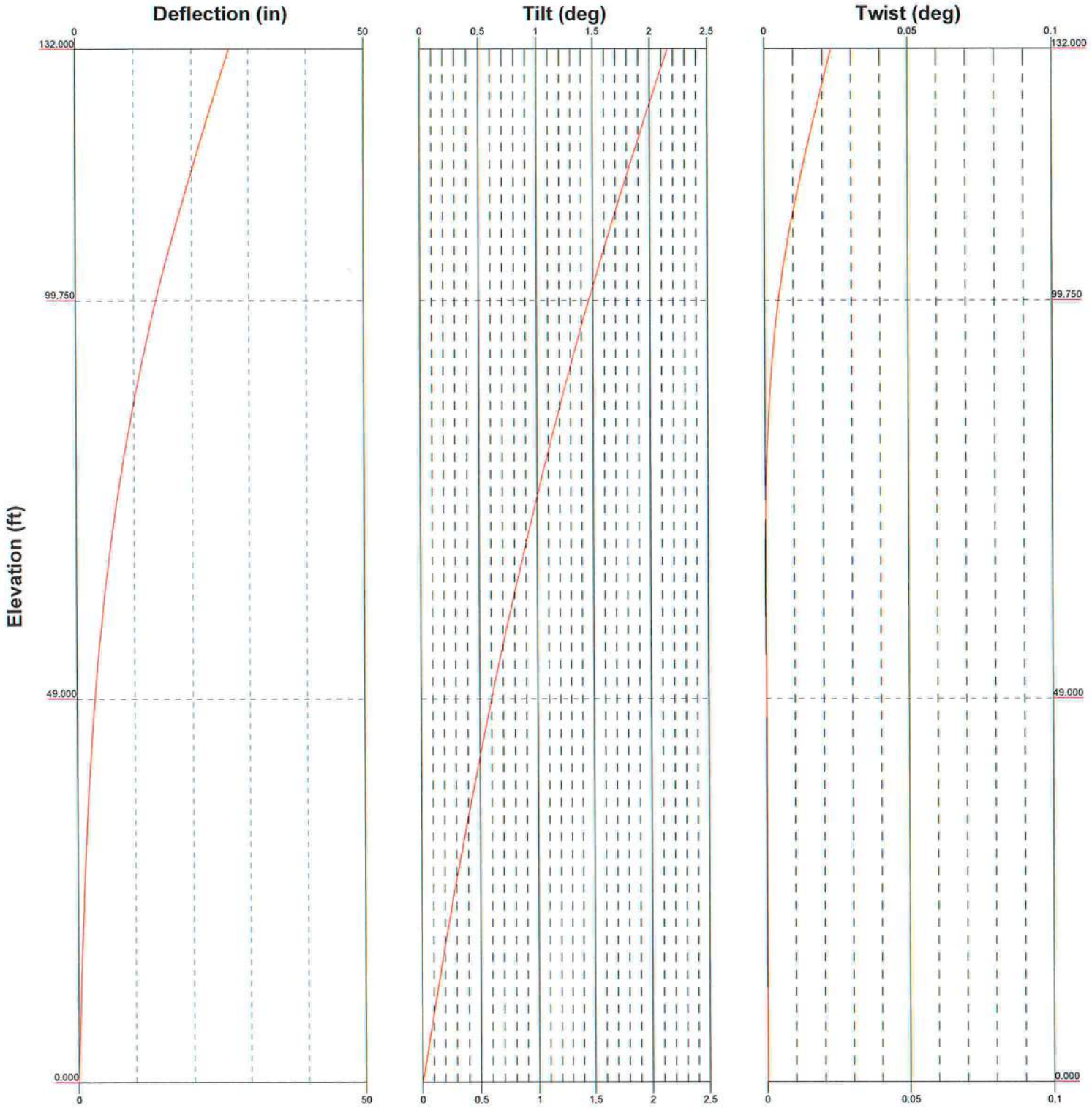
Project:			
Client: Crown Castle	Drawn by: R AITHAL	App'd:	
Code: TIA-222-H	Date: 07/06/22	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-H - Service - 60 mph

Maximum Values



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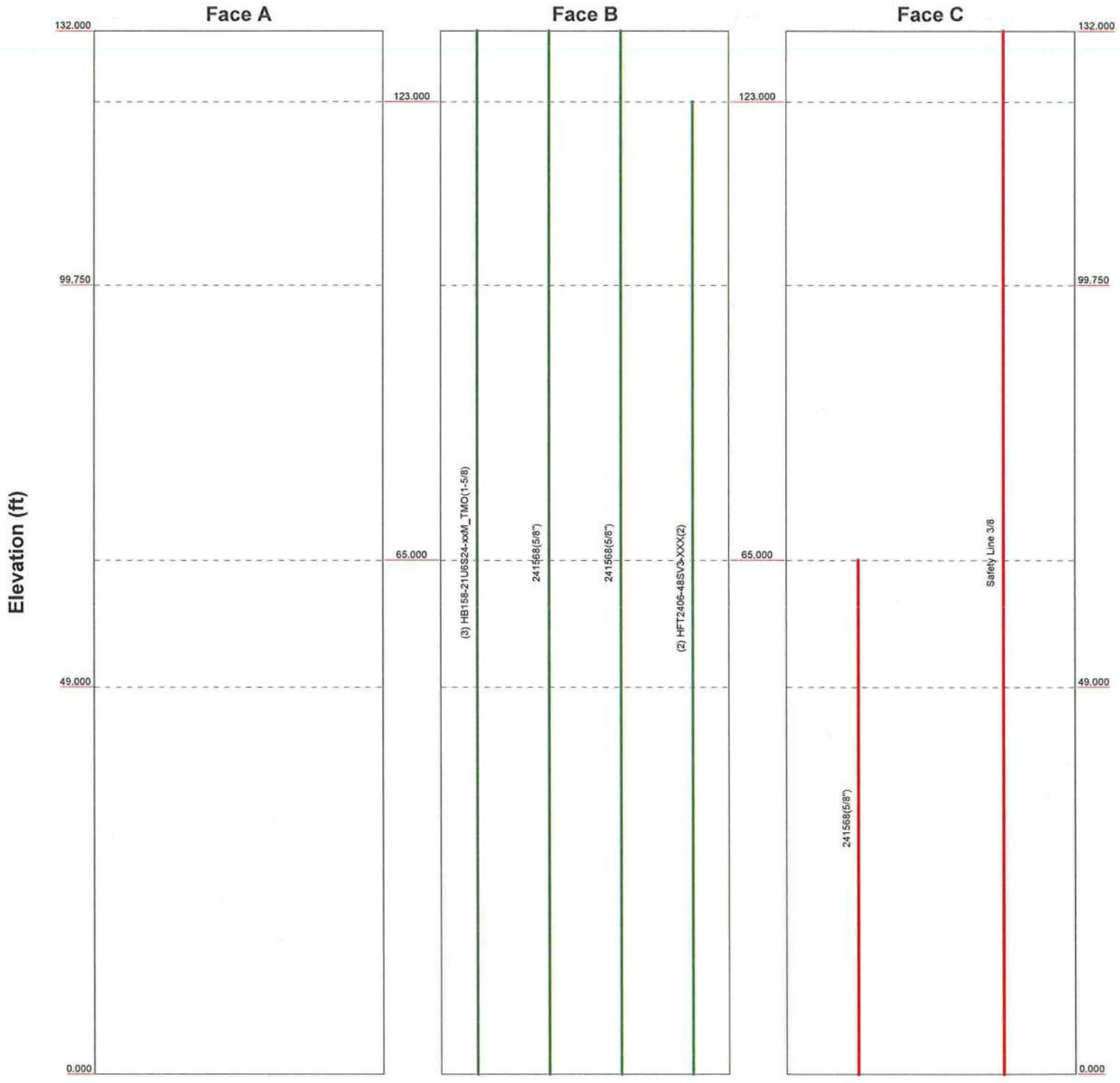
Project:			
Client: Crown Castle	Drawn by: R AITHAL	App'd:	
Code: TIA-222-H	Date: 07/06/22	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 132'

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



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Client: Crown Castle	Drawn by: R AITHAL	App'd:	
Code: TIA-222-H	Date: 07/06/22	Scale: NTS	
Path:		Dwg No. E-7	

tnxTower	Job	Page
B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	121641.005.01 - Lake City Airport, FL (BU# 825272)	1 of 13
	Project	Date 18:58:19 07/06/22
	Client Crown Castle	Designed by R AITHAL

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 Columbia County, Florida.
Tower base elevation above sea level: 167.000 ft.
Basic wind speed of 118 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$.
Maximum demand-capacity ratio is: 1.05.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Tapered Pole Section Geometry

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

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	132.000-99.750	32.250	2.750	18	13.500	21.660	0.188	0.750	A572-65 (65 ksi)
L2	99.750-49.000	53.500	4.250	18	20.589	34.120	0.313	1.250	A572-65 (65 ksi)
L3	49.000-0.000	53.250		18	32.420	45.900	0.313	1.250	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	13.679	7.923	177.388	4.726	6.858	25.866	355.010	3.962	2.046	10.912
	21.965	12.779	744.378	7.623	11.003	67.651	1489.735	6.391	3.482	18.572
L2	21.565	20.112	1044.685	7.198	10.459	99.881	2090.744	10.058	3.074	9.836
	34.598	33.533	4842.098	12.002	17.333	279.358	9690.567	16.770	5.455	17.456
L3	33.965	31.847	4147.810	11.398	16.469	251.849	8301.077	15.926	5.156	16.499
	46.560	45.217	11872.214	16.184	23.317	509.161	23760.050	22.613	7.528	24.091

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 132.000-99.750				1	1	1			
L2 99.750-49.000				1	1	1			
L3 49.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
* 241568(5/8")	C	No	Surface Ar (CaAa)	65.000 - 0.000	1	1	0.200 0.210	0.630		0.000
* Safety Line 3/8	C	No	Surface Ar (CaAa)	132.000 - 0.000	1	1	0.150 0.160	0.375		0.000
*										
*										

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
HB158-21U6S24-xx M_TMO(1-5/8) *	B	No	No	Inside Pole	132.000 - 0.000	3	No Ice	0.000	0.003
241568(5/8")	B	No	No	Inside Pole	132.000 - 0.000	1	No Ice	0.000	0.000
241568(5/8") *	B	No	No	Inside Pole	132.000 - 0.000	1	No Ice	0.000	0.000
HFT2406-48SV3-XXX(2) * *	B	No	No	Inside Pole	123.000 - 0.000	2	No Ice	0.000	0.003

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	132.000-99.750	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.398
		C	0.000	0.000	1.209	0.000	0.007
L2	99.750-49.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.715
		C	0.000	0.000	2.911	0.000	0.014
L3	49.000-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.690
		C	0.000	0.000	4.925	0.000	0.020

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	132.000-99.750	-0.096	0.284	-0.059	0.175
L2	99.750-49.000	-0.172	0.450	-0.106	0.277
L3	49.000-0.000	-0.301	0.732	-0.186	0.452

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	10	Safety Line 3/8	99.75 - 132.00	1.0000	1.0000
L2	8	241568(5/8")	49.00 - 65.00	1.0000	1.0000
L2	10	Safety Line 3/8	49.00 - 99.75	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L3	8	241568(5/8")	0.00 - 49.00	1.0000	1.0000
L3	10	Safety Line 3/8	0.00 - 49.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod 3/4" x 4'	A	From Leg	4.000 0.000 0.000	0.000	136.000	No Ice	0.300	0.300	0.030
Strobe	C	None		0.000	137.000	No Ice	4.500	3.000	0.020
4' x 3" Pipe Mount	C	None		0.000	135.000	No Ice	1.000	1.000	0.029
Side Lighting	A	From Leg	0.500 0.000 0.000	0.000	65.000	No Ice	0.112	0.112	0.005
Side Lighting	B	From Leg	0.500 0.000 0.000	0.000	65.000	No Ice	0.112	0.112	0.005
*									
AIR6449 B41_T-MOBILE w/ Mount Pipe	A	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	5.187	2.705	0.128
AIR6449 B41_T-MOBILE w/ Mount Pipe	B	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	5.187	2.705	0.128
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	5.187	2.705	0.128
AIR6449 B41_T-MOBILE w/ Mount Pipe	C	From Face	4.000 0.000 -4.000	0.000	133.000	No Ice	5.187	2.705	0.128
FFVV-65C-R3-V1_TMO w/ Mount Pipe	A	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	12.969	6.196	0.157
FFVV-65C-R3-V1_TMO w/ Mount Pipe	B	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	12.969	6.196	0.157
FFVV-65C-R3-V1_TMO w/ Mount Pipe	C	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	12.969	6.196	0.157
FFVV-65C-R3-V1_TMO w/ Mount Pipe	C	From Face	4.000 0.000 -4.000	0.000	133.000	No Ice	12.969	6.196	0.157
RADIO 4460 B2/B25 B66_TMO	A	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	2.139	1.686	0.109
RADIO 4460 B2/B25 B66_TMO	B	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	2.139	1.686	0.109
RADIO 4460 B2/B25	C	From Leg	4.000	0.000	133.000	No Ice	2.139	1.686	0.109

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
B66_TMO			0.000 -4.000						
RADIO 4460 B2/B25 B66_TMO	C	From Face	4.000 0.000 -4.000	0.000	133.000	No Ice	2.139	1.686	0.109
RADIO 4480 B71_TMO	A	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	2.852	1.383	0.093
RADIO 4480 B71_TMO	B	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	2.852	1.383	0.093
RADIO 4480 B71_TMO	C	From Leg	4.000 0.000 -4.000	0.000	133.000	No Ice	2.852	1.383	0.093
RADIO 4480 B71_TMO	C	From Face	4.000 0.000 -4.000	0.000	133.000	No Ice	2.852	1.383	0.093
8' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	133.000	No Ice	1.900	1.900	0.029
8' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	133.000	No Ice	1.900	1.900	0.029
8' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	133.000	No Ice	1.900	1.900	0.029
8' x 2" Mount Pipe	C	From Face	4.000 0.000 0.000	0.000	133.000	No Ice	1.900	1.900	0.029
Platform Mount [LP 701-1_HR-1] *	C	None		0.000	133.000	No Ice	55.580	55.580	3.082
AIR 6449 B77 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	3.650	2.715	0.108
AIR 6449 B77 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	3.650	2.715	0.108
AIR 6449 B77 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	3.650	2.715	0.108
(2) MX06FIT865-02 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	4.540	4.710	0.104
(2) MX06FIT865-02 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	4.540	4.710	0.104
(2) MX06FIT865-02 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	4.540	4.710	0.104
RCMDC-6627-PF-48	A	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	4.056	3.098	0.032
RCMDC-6627-PF-48	B	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	4.056	3.098	0.032
4449	A	From Leg	4.000	0.000	123.000	No Ice	1.969	1.402	0.071

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000 0.000						
(2) 4449	B	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	1.969	1.402	0.071
8843	A	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	1.650	1.363	0.072
8843	B	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	1.650	1.363	0.072
8843	C	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	1.650	1.363	0.072
8' x 2" Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	1.900	1.900	0.029
8' x 2" Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	1.900	1.900	0.029
8' x 2" Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	123.000	No Ice	1.900	1.900	0.029
RMQP-NP+HRK12 * *	C	None		0.000	123.000	No Ice	21.170	19.650	1.485

Load Combinations

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

Comb. No.	Description
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	Dead+Wind 0 deg - Service
27	Dead+Wind 30 deg - Service
28	Dead+Wind 60 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 120 deg - Service
31	Dead+Wind 150 deg - Service
32	Dead+Wind 180 deg - Service
33	Dead+Wind 210 deg - Service
34	Dead+Wind 240 deg - Service
35	Dead+Wind 270 deg - Service
36	Dead+Wind 300 deg - Service
37	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	132 - 99.75	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	20	-10.407	281.101	-1.874
			Max. Mx	8	-10.403	-282.893	-3.440
			Max. My	14	-10.303	-1.627	-297.447
			Max. Vy	8	11.424	-282.893	-3.440
			Max. Vx	14	11.906	-1.627	-297.447
			Max. Torque	8			-2.682
L2	99.75 - 49	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	20	-17.175	915.494	-0.341
			Max. Mx	8	-17.174	-917.400	-5.502
			Max. My	14	-17.127	-3.518	-955.400
			Max. Vy	8	14.501	-917.400	-5.502
			Max. Vx	14	14.969	-3.518	-955.400
			Max. Torque	6			-2.586
L3	49 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	20	-27.699	1782.113	1.419
			Max. Mx	8	-27.699	-1784.052	-7.461
			Max. My	14	-27.697	-5.396	-1846.313
			Max. Vy	8	17.976	-1784.052	-7.461
			Max. Vx	14	18.415	-5.396	-1846.313
			Max. Torque	6			-2.567

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	27.716	-0.034	-18.387
	Max. H_x	20	27.716	17.949	0.034
	Max. H_z	2	27.716	0.034	18.387
	Max. M_x	2	1840.231	0.034	18.387
	Max. M_z	8	1784.052	-17.949	-0.034

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. Torsion	18	2.419	15.528	-9.164
	Min. Vert	11	20.787	-15.561	-9.223
	Min. H_x	8	27.716	-17.949	-0.034
	Min. H_z	14	27.716	-0.034	-18.387
	Min. M_x	14	-1846.313	-0.034	-18.387
	Min. M_z	20	-1782.113	17.949	0.034
	Min. Torsion	6	-2.562	-15.528	9.164

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	23.097	0.000	0.000	2.467	-0.793	0.001
1.2 Dead+1.0 Wind 0 deg - No Ice	27.716	-0.034	-18.387	-1840.231	3.482	0.871
0.9 Dead+1.0 Wind 0 deg - No Ice	20.787	-0.034	-18.387	-1809.817	3.667	0.871
1.2 Dead+1.0 Wind 30 deg - No Ice	27.716	8.945	-15.907	-1591.181	-888.516	2.009
0.9 Dead+1.0 Wind 30 deg - No Ice	20.787	8.945	-15.907	-1564.980	-873.268	1.957
1.2 Dead+1.0 Wind 60 deg - No Ice	27.716	15.528	-9.164	-914.935	-1542.871	2.562
0.9 Dead+1.0 Wind 60 deg - No Ice	20.787	15.528	-9.164	-900.200	-1516.557	2.472
1.2 Dead+1.0 Wind 90 deg - No Ice	27.716	17.949	0.034	7.460	-1784.052	2.375
0.9 Dead+1.0 Wind 90 deg - No Ice	20.787	17.949	0.034	6.536	-1753.654	2.274
1.2 Dead+1.0 Wind 120 deg - No Ice	27.716	15.561	9.223	928.652	-1547.295	1.549
0.9 Dead+1.0 Wind 120 deg - No Ice	20.787	15.561	9.223	912.090	-1520.896	1.463
1.2 Dead+1.0 Wind 150 deg - No Ice	27.716	9.004	15.940	1601.652	-896.205	0.359
0.9 Dead+1.0 Wind 150 deg - No Ice	20.787	9.004	15.940	1573.678	-880.812	0.310
1.2 Dead+1.0 Wind 180 deg - No Ice	27.716	0.034	18.387	1846.313	-5.396	-0.873
0.9 Dead+1.0 Wind 180 deg - No Ice	20.787	0.034	18.387	1814.201	-5.048	-0.874
1.2 Dead+1.0 Wind 210 deg - No Ice	27.716	-8.945	15.907	1597.244	886.618	-1.870
0.9 Dead+1.0 Wind 210 deg - No Ice	20.787	-8.945	15.907	1569.350	871.898	-1.823
1.2 Dead+1.0 Wind 240 deg - No Ice	27.716	-15.528	9.164	920.977	1540.961	-2.419
0.9 Dead+1.0 Wind 240 deg - No Ice	20.787	-15.528	9.164	904.555	1515.177	-2.334
1.2 Dead+1.0 Wind 270 deg - No Ice	27.716	-17.949	-0.034	-1.420	1782.113	-2.371
0.9 Dead+1.0 Wind 270 deg - No Ice	20.787	-17.949	-0.034	-2.181	1752.254	-2.270
1.2 Dead+1.0 Wind 300 deg - No Ice	27.716	-15.561	-9.223	-922.593	1545.339	-1.686
0.9 Dead+1.0 Wind 300 deg -	20.787	-15.561	-9.223	-907.721	1519.485	-1.596

Load Combination	Vertical K	Shear$_x$ K	Shear$_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice 1.2 Dead+1.0 Wind 330 deg - No Ice	27.716	-9.004	-15.940	-1595.572	894.262	-0.499
0.9 Dead+1.0 Wind 330 deg - No Ice	20.787	-9.004	-15.940	-1569.295	879.411	-0.447
Dead+Wind 0 deg - Service	23.097	-0.008	-4.477	-442.353	0.266	0.218
Dead+Wind 30 deg - Service	23.097	2.178	-3.873	-382.229	-215.010	0.481
Dead+Wind 60 deg - Service	23.097	3.781	-2.232	-219.005	-372.892	0.611
Dead+Wind 90 deg - Service	23.097	4.371	0.008	3.575	-431.064	0.575
Dead+Wind 120 deg - Service	23.097	3.789	2.246	225.868	-373.963	0.385
Dead+Wind 150 deg - Service	23.097	2.193	3.882	388.309	-216.865	0.095
Dead+Wind 180 deg - Service	23.097	0.008	4.477	447.363	-1.875	-0.217
Dead+Wind 210 deg - Service	23.097	-2.178	3.873	387.239	213.401	-0.471
Dead+Wind 240 deg - Service	23.097	-3.781	2.232	224.014	371.283	-0.602
Dead+Wind 270 deg - Service	23.097	-4.371	-0.008	1.433	429.453	-0.574
Dead+Wind 300 deg - Service	23.097	-3.789	-2.246	-220.859	372.352	-0.392
Dead+Wind 330 deg - Service	23.097	-2.193	-3.882	-383.299	215.254	-0.102

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-23.097	0.000	-0.000	23.097	-0.000	0.000%
2	-0.034	-27.716	-18.387	0.034	27.716	18.387	0.000%
3	-0.034	-20.787	-18.387	0.034	20.787	18.387	0.000%
4	8.945	-27.716	-15.907	-8.945	27.716	15.907	0.000%
5	8.945	-20.787	-15.907	-8.945	20.787	15.907	0.000%
6	15.528	-27.716	-9.164	-15.528	27.716	9.164	0.000%
7	15.528	-20.787	-9.164	-15.528	20.787	9.164	0.000%
8	17.949	-27.716	0.034	-17.949	27.716	-0.034	0.000%
9	17.949	-20.787	0.034	-17.949	20.787	-0.034	0.000%
10	15.561	-27.716	9.223	-15.561	27.716	-9.223	0.000%
11	15.561	-20.787	9.223	-15.561	20.787	-9.223	0.000%
12	9.004	-27.716	15.940	-9.004	27.716	-15.940	0.000%
13	9.004	-20.787	15.940	-9.004	20.787	-15.940	0.000%
14	0.034	-27.716	18.387	-0.034	27.716	-18.387	0.000%
15	0.034	-20.787	18.387	-0.034	20.787	-18.387	0.000%
16	-8.945	-27.716	15.907	8.945	27.716	-15.907	0.000%
17	-8.945	-20.787	15.907	8.945	20.787	-15.907	0.000%
18	-15.528	-27.716	9.164	15.528	27.716	-9.164	0.000%
19	-15.528	-20.787	9.164	15.528	20.787	-9.164	0.000%
20	-17.949	-27.716	-0.034	17.949	27.716	0.034	0.000%
21	-17.949	-20.787	-0.034	17.949	20.787	0.034	0.000%
22	-15.561	-27.716	-9.223	15.561	27.716	9.223	0.000%
23	-15.561	-20.787	-9.223	15.561	20.787	9.223	0.000%
24	-9.004	-27.716	-15.940	9.004	27.716	15.940	0.000%
25	-9.004	-20.787	-15.940	9.004	20.787	15.940	0.000%
26	-0.008	-23.097	-4.477	0.008	23.097	4.477	0.000%
27	2.178	-23.097	-3.873	-2.178	23.097	3.873	0.000%
28	3.781	-23.097	-2.232	-3.781	23.097	2.232	0.000%
29	4.371	-23.097	0.008	-4.371	23.097	-0.008	0.000%
30	3.789	-23.097	2.246	-3.789	23.097	-2.246	0.000%
31	2.193	-23.097	3.882	-2.193	23.097	-3.882	0.000%
32	0.008	-23.097	4.477	-0.008	23.097	-4.477	0.000%
33	-2.178	-23.097	3.873	2.178	23.097	-3.873	0.000%
34	-3.781	-23.097	2.232	3.781	23.097	-2.232	0.000%
35	-4.371	-23.097	-0.008	4.371	23.097	0.008	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
36	-3.789	-23.097	-2.246	3.789	23.097	2.246	0.000%
37	-2.193	-23.097	-3.882	2.193	23.097	3.882	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00026565
3	Yes	5	0.00000001	0.00012369
4	Yes	6	0.00000001	0.00057022
5	Yes	6	0.00000001	0.00017866
6	Yes	6	0.00000001	0.00048687
7	Yes	6	0.00000001	0.00014948
8	Yes	5	0.00000001	0.00095393
9	Yes	5	0.00000001	0.00042823
10	Yes	6	0.00000001	0.00056849
11	Yes	6	0.00000001	0.00017637
12	Yes	6	0.00000001	0.00053698
13	Yes	6	0.00000001	0.00016480
14	Yes	5	0.00000001	0.00035844
15	Yes	5	0.00000001	0.00016486
16	Yes	6	0.00000001	0.00050417
17	Yes	6	0.00000001	0.00015391
18	Yes	6	0.00000001	0.00057829
19	Yes	6	0.00000001	0.00018125
20	Yes	5	0.00000001	0.00086710
21	Yes	5	0.00000001	0.00038954
22	Yes	6	0.00000001	0.00050105
23	Yes	6	0.00000001	0.00015437
24	Yes	6	0.00000001	0.00054283
25	Yes	6	0.00000001	0.00016827
26	Yes	4	0.00000001	0.00037729
27	Yes	5	0.00000001	0.00013151
28	Yes	5	0.00000001	0.00008894
29	Yes	4	0.00000001	0.00075256
30	Yes	5	0.00000001	0.00013335
31	Yes	5	0.00000001	0.00011055
32	Yes	4	0.00000001	0.00040958
33	Yes	5	0.00000001	0.00009417
34	Yes	5	0.00000001	0.00014103
35	Yes	4	0.00000001	0.00072719
36	Yes	5	0.00000001	0.00008995
37	Yes	5	0.00000001	0.00010935

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	132 - 99.75	26.494	32	2.155	0.024
L2	102.5 - 49	14.720	32	1.518	0.007

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L3	53.25 - 0	3.607	32	0.661	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.000	Strobe	32	26.494	2.155	0.024	12706
136.000	Lightning Rod 3/4" x 4'	32	26.494	2.155	0.024	12706
135.000	4' x 3" Pipe Mount	32	26.494	2.155	0.024	12706
133.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	32	26.494	2.155	0.024	12706
123.000	AIR 6449 B77 w/ Mount Pipe	32	22.677	1.956	0.018	7059
65.000	Side Lighting	32	5.326	0.839	0.001	3134

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	132 - 99.75	108.763	14	8.744	0.102
L2	102.5 - 49	60.689	14	6.254	0.028
L3	53.25 - 0	14.890	14	2.728	0.007

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.000	Strobe	14	108.763	8.744	0.102	3261
136.000	Lightning Rod 3/4" x 4'	14	108.763	8.744	0.102	3261
135.000	4' x 3" Pipe Mount	14	108.763	8.744	0.102	3261
133.000	AIR6449 B41_T-MOBILE w/ Mount Pipe	14	108.763	8.744	0.102	3261
123.000	AIR 6449 B77 w/ Mount Pipe	14	93.198	7.971	0.076	1811
65.000	Side Lighting	14	22.014	3.472	0.006	766

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	132 - 99.75 (1)	TP21.66x13.5x0.188	32.250	0.000	0.0	12.365	-10.303	723.336	0.014
L2	99.75 - 49 (2)	TP34.12x20.589x0.313	53.500	0.000	0.0	32.467	-17.127	1899.300	0.009
L3	49 - 0 (3)	TP45.9x32.42x0.313	53.250	0.000	0.0	45.217	-27.698	2645.200	0.010

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	132 - 99.75 (1)	TP21.66x13.5x0.188	297.451	376.543	0.790	0.000	376.543	0.000
L2	99.75 - 49 (2)	TP34.12x20.589x0.313	955.408	1581.500	0.604	0.000	1581.500	0.000
L3	49 - 0 (3)	TP45.9x32.42x0.313	1846.325	2750.642	0.671	0.000	2750.642	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	132 - 99.75 (1)	TP21.66x13.5x0.188	11.906	217.001	0.055	0.876	394.837	0.002
L2	99.75 - 49 (2)	TP34.12x20.589x0.313	14.969	569.790	0.026	0.875	1633.333	0.001
L3	49 - 0 (3)	TP45.9x32.42x0.313	18.415	793.560	0.023	0.873	3168.150	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	132 - 99.75 (1)	0.014	0.790	0.000	0.055	0.002	0.807 ✔	1.050	4.8.2 ✔
L2	99.75 - 49 (2)	0.009	0.604	0.000	0.026	0.001	0.614 ✔	1.050	4.8.2 ✔
L3	49 - 0 (3)	0.010	0.671	0.000	0.023	0.000	0.682 ✔	1.050	4.8.2 ✔

Section Capacity Table

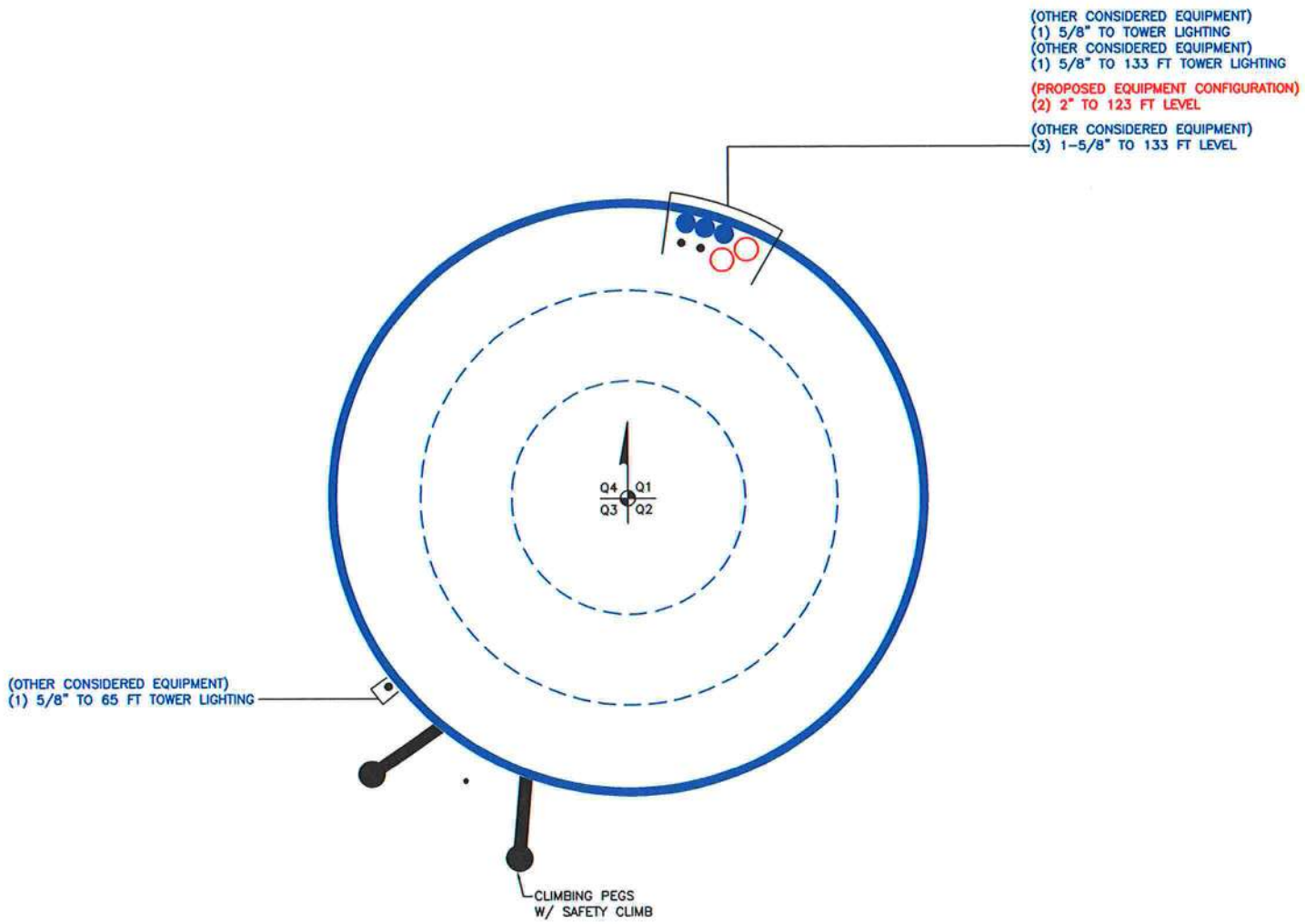
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	132 - 99.75	Pole	TP21.66x13.5x0.188	1	-10.303	759.503	76.9	Pass
L2	99.75 - 49	Pole	TP34.12x20.589x0.313	2	-17.127	1994.265	58.5	Pass
L3	49 - 0	Pole	TP45.9x32.42x0.313	3	-27.698	2777.460	65.0	Pass
							Summary	
						Pole (L1)	76.9	Pass
						RATING =	**76.9**	**Pass**

Program Version 8.1.1.0

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 825272

APPENDIX C

ADDITIONAL CALCULATIONS

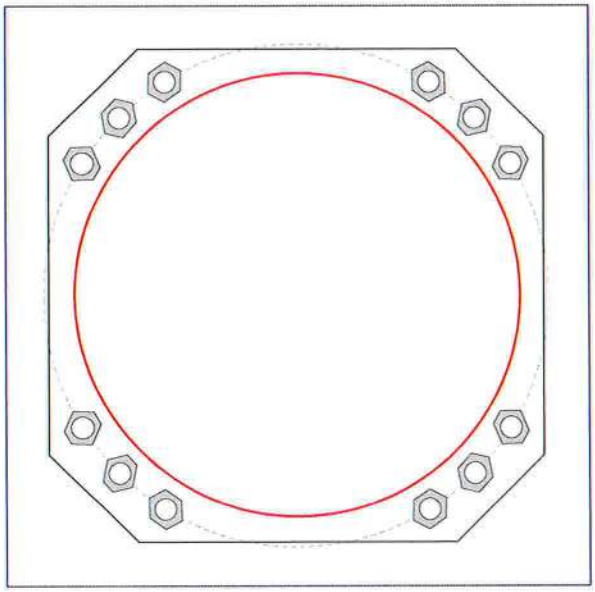
Monopole Base Plate Connection

Site Info	
BU #	825272
Site Name	Lake City Airport, FL
Order #	605523, Rev# 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{af} (in)	0.625

Applied Loads	
Moment (kip-ft)	1846.32
Axial Force (kips)	27.70
Shear Force (kips)	18.41

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(12) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 52" BC

Anchor Spacing: 6 in

Base Plate Data

51" W x 2.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi); Clip: 9 in

Stiffener Data

N/A

Pole Data

45.9" x 0.3125" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_t = 139.61	ϕPn_t = 243.75	**Stress Rating**
Vu = 1.53	ϕVn = 149.1	**54.5%**
Mu = n/a	ϕMn = n/a	Pass

Base Plate Summary

Max Stress (ksi):	26.9	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**47.4%**	Pass

Drilled Pier Foundation

BU # :	825272
Site Name:	Lake City Airport, FL
Order Number:	605523, Rev# 1
TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	1846.32	
Axial Force (kips)	27.72	
Shear Force (kips)	18.39	

Material Properties			Rebar 2, Fy Override (ksi)
Concrete Strength, f'c:	3	ksi	
Rebar Strength, Fy:	60	ksi	
Tie Yield Strength, Fyt:	40	ksi	

Pier Design Data		
Depth	25	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 25' below grade		
Pier Diameter	6	ft
Rebar Quantity	32	
Rebar Size	9	
Rebar Cage Diameter	64	in
Tie Size	4	
Tie Spacing	12	in

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	*Compression*	*Uplift*
$D_{v=0}$ (ft from TOC)	6.67	-
Soil Safety Factor	2.50	-
Max Moment (kip-ft)	1960.67	-
Rating*	*50.7%*	-
Soil Vertical Check	*Compression*	*Uplift*
Skin Friction (kips)	248.81	-
End Bearing (kips)	95.43	-
Weight of Concrete (kips)	100.11	-
Total Capacity (kips)	344.24	-
Axial (kips)	127.83	-
Rating*	*35.4%*	-
Reinforced Concrete Flexure	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.73	-
Critical Moment (kip-ft)	1960.64	-
Critical Moment Capacity	4232.08	-
Rating*	*44.1%*	-
Reinforced Concrete Shear	*Compression*	*Uplift*
Critical Depth (ft from TOC)	15.47	-
Critical Shear (kip)	244.38	-
Critical Shear Capacity	408.28	-
Rating*	*57.0%*	-

Structural Foundation Rating*	**57.0%**
Soil Interaction Rating*	**50.7%**

*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	☑
N/A	☐
Additional Longitudinal Rebar	
Input Effective Depths (else Actual):	☐
Shear Design Options	
Check Shear along Depth of Pier:	☑
Utilize Shear-Friction Methodology:	☐
Override Critical Depth:	☐

Go to Soil Calculations

Soil Profile

Groundwater Depth	11	# of Layers	7

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	115	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	5	6	1	115	150	0	33	0.000	0.000	0.60	0.45			Cohesionless
3	6	10	4	115	150	0	35	0.000	0.000	1.00	0.75			Cohesionless
4	10	11	1	110	150	0	32	0.000	0.000	1.30	0.98			Cohesionless
5	11	16	5	47.6	87.6	0	32	0.000	0.000	1.30	0.98			Cohesionless
6	16	21	5	47.6	87.6	0	30	0.000	0.000	0.80	0.60			Cohesionless
7	21	25	4	37.6	87.6	0.5	0	0.28	0.28	0.30	0.23	4.5		Cohesive

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 167.28 ft (NAVD 88)
Latitude: 30.170417
Longitude: -82.586028

Wind

Results:

Wind Speed	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Fri May 20 2022

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

ASCE
AMERICAN SOCIETY OF CIVIL ENGINEERS

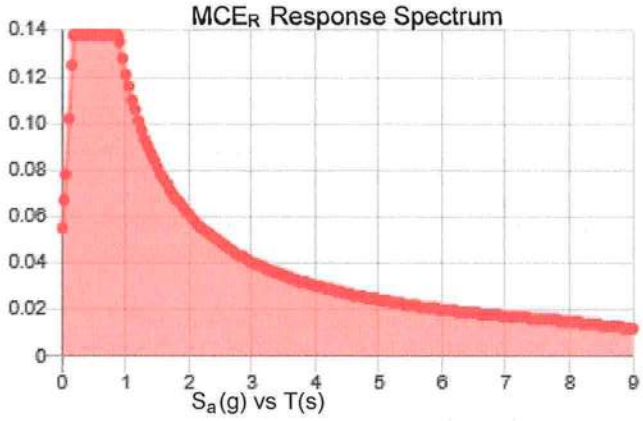
Seismic

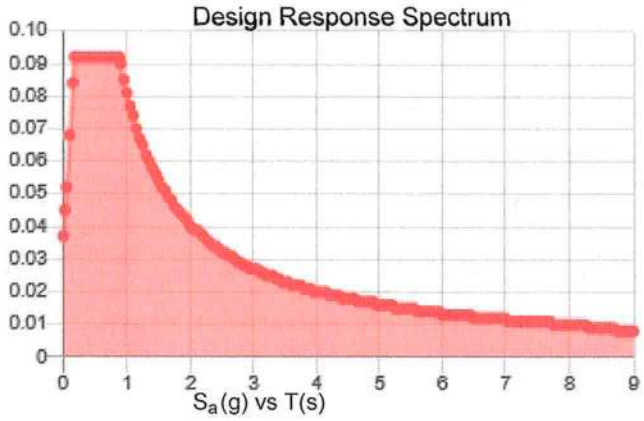
Site Soil Class: D - Default (see Section 11.4.3)

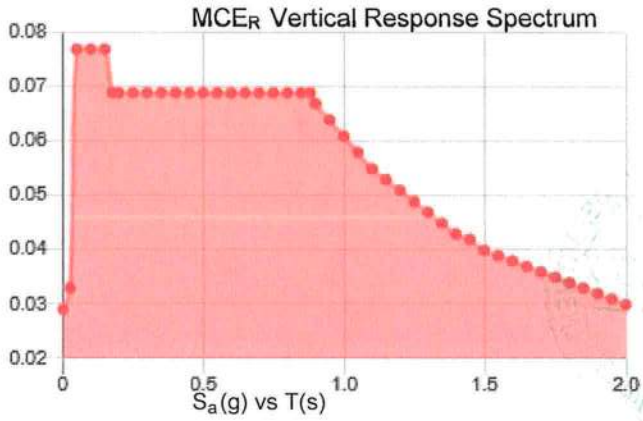
Results:

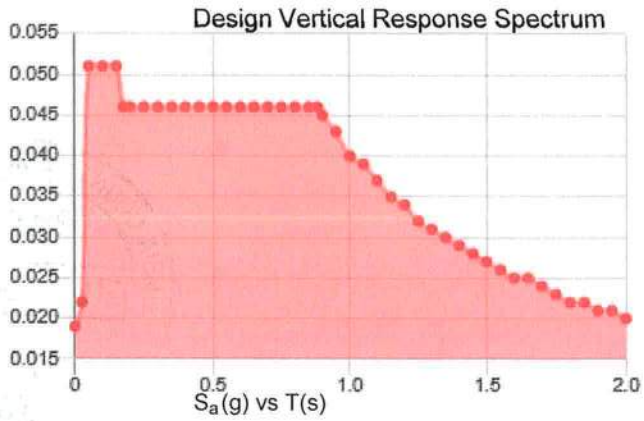
S_S :	0.086	S_{D1} :	0.081
S_1 :	0.051	T_L :	8
F_a :	1.6	PGA :	0.041
F_v :	2.4	PGA_M :	0.066
S_{MS} :	0.138	F_{PGA} :	1.6
S_{M1} :	0.121	I_e :	1
S_{DS} :	0.092	C_v :	0.7

Seismic Design Category B









Data Accessed: **Fri May 20 2022**

Date Source:

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

Ice

Results:

Ice Thickness:	0.25 in.
Concurrent Temperature:	25 F
Gust Speed	30 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Fri May 20 2022

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

verizon

VERIZON WIRELESS SITE NUMBER: 712924
VERIZON WIRELESS SITE NAME: CC LAKE CITY AIRPORT
SITE TYPE: MONOPOLE
TOWER HEIGHT: 133'-0"

BUSINESS UNIT #: 825272
SITE ADDRESS: 336 SE NEWELL DR LAKE CITY, FL 32025
COUNTY: COLUMBIA
JURISDICTION: COLUMBIA COUNTY

VERIZON: NEW SITE BUILD

SITE INFORMATION

CROWN CASTLE USA INC. SITE NAME:	LAKE CITY AIRPORT
SITE ADDRESS:	336 SE NEWELL DR LAKE CITY, FL 32025
COUNTY:	COLUMBIA
MAP/PARCEL #:	02-4S-17-07479-104
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	30° 10' 13.50"
LONGITUDE:	-82° 35' 09.70"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	168 FT.
CURRENT ZONING:	
JURISDICTION:	COLUMBIA COUNTY
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	IIB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	L JOY USA LLC 336 PENNINGTON CT ROYAL PALM BEACH, FL 33411
TOWER OWNER:	CROWN CASTLE 6420 CONGRESS AVENUE, STE 2000 BOCA RATON, FL 33487
CARRIER/APPLICANT:	VERIZON WIRELESS 7701 TELECOM PARKWAY TEMPLE TERRACE, FL 33637
ELECTRIC PROVIDER:	FP&L ----
TELCO PROVIDER:	AT&T ----

PROJECT TEAM

A&E FIRM:	TOWERSOURCE, INC. 1355 WINDWARD CONCOURSE SUITE 410 ALPHARETTA, GA 30005
CROWN CASTLE USA INC. DISTRICT CONTACTS:	6420 CONGRESS AVE SUITE 2000 BOCA RATON, FL 33487
	PETER VERDECCHIA - PROJECT MANAGER PETER.VERDECCHIA@CROWNCASTLE.COM
	---- - CONSTRUCTION MANAGER ----

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER.

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	SITE PLAN
C-1.2	PROPOSED EQUIPMENT PLAN
C-2	ANTENNA LAYOUT & TOWER ELEVATION
C-3	FINAL ANTENNA & CABLE CONFIGURATION
C-4	EQUIPMENT SPECS
C-5	SITE DETAILS
C-6	SITE DETAILS
C-7	SITE DETAILS
C-8	SITE DETAILS
C-9	GENERATOR SPECS
C-10	PROPANE TANK DETAILS
G-1	PROPOSED UTILITY ROUTING
G-2	PROPOSED GROUNDING PLAN
G-3	PANEL SCHEDULE & ONE-LINE DIAGRAM
G-4	ELECTRICAL & GROUNDING DETAILS
G-5	ELECTRICAL & GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL FLORIDA ONE CALL
(800) 432-4770
CALL 3 WORKING DAYS BEFORE YOU DIG!

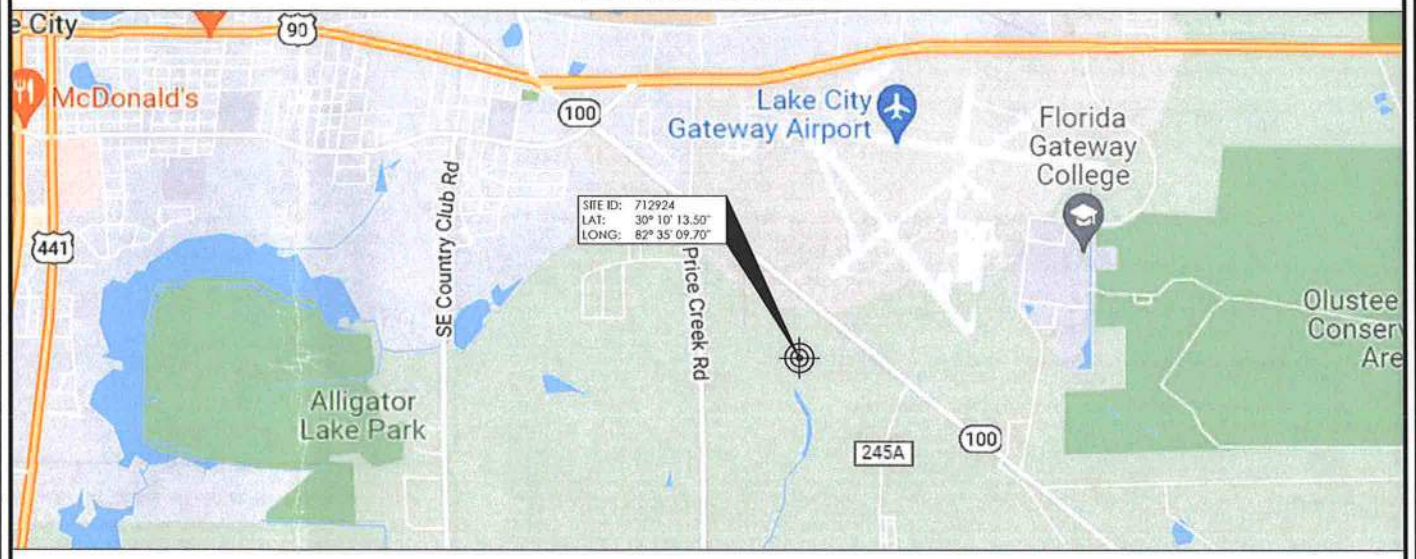
PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

TOWER SCOPE OF WORK:
- INSTALL (9) ANTENNAS
- INSTALL (2) OVPs
- INSTALL (6) RRHs
- INSTALL (2) 2" HYBRID CABLES
- INSTALL (1) PLATFORM ANTENNA MOUNT

GROUND SCOPE OF WORK:
- INSTALL (1) 4' x 10' CONCRETE EQUIPMENT PAD
- INSTALL (1) 4' x 10' CONCRETE PAD FOR LP TANK
- INSTALL (1) 4' x 10' CONCRETE GENERATOR PAD
- INSTALL (1) EQUIPMENT H-FRAME

LOCATION MAP



NO SCALE

APPLICABLE CODES/REFERENCE DOCUMENTS

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2020 FLORIDA BUILDING CODE 7TH EDITION/2015 IBC
MECHANICAL	2020 FLORIDA BUILDING CODE 7TH EDITION/2015 IMC
ELECTRICAL	2020 FLORIDA BUILDING CODE 7TH EDITION/2017 NEC

REFERENCE DOCUMENTS:
STRUCTURAL ANALYSIS: PROVIDED WITH APP
DATED:
MOUNT ANALYSIS:
DATED:
ORDER ID: 605523 RFDS REVISION: ----
REVISION: 0 DATED: 04/29/2022

ANALYSIS CRITERIA:
APPLICABLE CODES: TIA-222-H / ASCE 7-16
WIND SPEED: V = 118 MPH (ULTIMATE 3 SECOND GUST)
EXPOSURE CATEGORY: C
RISK CATEGORY: II
TOPOGRAPHIC CATEGORY: 1
CREST HEIGHT: 0
K_{zt}= 1.0
SEISMIC RESPONSE: NA

COLUMBIA COUNTY BUILDING DEPARTMENT
Received for FILE COPY
Code Compliance
PLANS EXAMINER

verizon
7701 E. TELECOM PARKWAY
TEMPLE TERRACE, FL 33637

CROWN CASTLE
8000 AVALON BLVD, SUITE 700
ALPHARETTA, GA 30009

towersource
A NextEdge Company
1355 WINDWARD CONCOURSE
SUITE 410
ALPHARETTA, GA 30005
TEL: 678-990-2338

VERIZON WIRELESS
SITE NUMBER: **712924**

BU #: **825272**
LAKE CITY AIRPORT

336 SE NEWELL DR
LAKE CITY, FL 32025

EXISTING 133'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/05/22	FS	ISSUED FOR FINALS	MAT

JAVAD K. PARSA
LICENSE
No 87002
STATE OF FLORIDA
PROFESSIONAL ENGINEER

javad k parsa
Digitally signed by javad k parsa
Date: 2022.08.05 11:58:14 -04'00'

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY JAVAD K. PARSA, P.E. ON THE DATE ADJACENT TO THE SEAL. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SHEET NUMBER: T-1
REVISION: 0

CROWN CASTLE USA INC. SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED- NO WORK SHALL COMMENCE PRIOR TO CROWN CASTLE USA INC. WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN CASTLE USA INC. NOC AT 800-788-7011 & THE CROWN CASTLE USA INC. CONSTRUCTION MANAGER.
2. "LOOK UP" – CROWN CASTLE USA INC. SAFETY CLIMB REQUIREMENT:
THE INTEGRITY OF THE SAFETY CLIMB AND ALL COMPONENTS OF THE CLIMBING FACILITY SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER MODIFICATION, MOUNT REINFORCEMENTS, AND/OR EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF THE SAFETY CLIMB OR ANY COMPONENTS OF THE CLIMBING FACILITY ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, IMPACT TO THE ANCHORAGE POINTS IN ANY WAY, OR TO IMPEDE/BLOCK ITS INTENDED USE. ANY COMPROMISED SAFETY CLIMB, INCLUDING EXISTING CONDITIONS MUST BE TAGGED OUT AND REPORTED TO YOUR CROWN CASTLE USA INC. POC OR CALL THE NOC TO GENERATE A SAFETY CLIMB MAINTENANCE AND CONTRACTOR NOTICE TICKET.
3. PRIOR TO THE START OF CONSTRUCTION, ALL REQUIRED JURISDICTIONAL PERMITS SHALL BE OBTAINED. THIS INCLUDES, BUT IS NOT LIMITED TO, BUILDING, ELECTRICAL, MECHANICAL, FIRE, FLOOD ZONE, ENVIRONMENTAL, AND ZONING. AFTER ONSITE ACTIVITIES AND CONSTRUCTION ARE COMPLETED, ALL REQUIRED PERMITS SHALL BE SATISFIED AND CLOSED OUT ACCORDING TO LOCAL JURISDICTIONAL REQUIREMENTS.
4. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN, AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN CASTLE USA INC. STANDARD CED-STD-10253, INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION, TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).
5. ALL SITE WORK TO COMPLY WITH QAS-STD-10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE USA INC. TOWER SITE," CED-STD-10294 "STANDARD FOR INSTALLATION OF MOUNTS AND APPURTENANCES," AND LATEST VERSION OF ANSI/TIA-1019-A-2012 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
6. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY CROWN CASTLE USA INC. PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
10. 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 CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION B) CONFINED SPACE C) ELECTRICAL SAFETY D) TRENCHING AND EXCAVATION E) CONSTRUCTION SAFETY PROCEDURES.
11. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS, LATEST APPROVED REVISION.
12. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH AT THE COMPLETION OF THE WORK. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
13. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, TOWER OWNER, CROWN CASTLE USA INC., AND/OR LOCAL UTILITIES.
14. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE REQUIRED BY LOCAL JURISDICTION AND SIGNAGE REQUIRED ON INDIVIDUAL PIECES OF EQUIPMENT, ROOMS, AND SHELTERS.
15. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE CARRIER'S EQUIPMENT AND TOWER AREAS.
16. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
17. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION AS SPECIFIED ON THE CONSTRUCTION DRAWINGS AND/OR PROJECT SPECIFICATIONS.
18. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
19. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
20. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
21. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.
22. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
CONTRACTOR: GENERAL CONTRACTOR RESPONSIBLE FOR CONSTRUCTION
CARRIER: VERIZON WIRELESS
TOWER OWNER: CROWN CASTLE USA INC.
2. THESE DRAWINGS HAVE BEEN PREPARED USING STANDARDS OF PROFESSIONAL CARE AND COMPLETENESS NORMALLY EXERCISED UNDER SIMILAR CIRCUMSTANCES BY REPUTABLE ENGINEERS IN THIS OR SIMILAR LOCALITIES. IT IS ASSUMED THAT THE WORK DEPICTED WILL BE PERFORMED BY AN EXPERIENCED CONTRACTOR AND/OR WORKPEOPLE WHO HAVE A WORKING KNOWLEDGE OF THE APPLICABLE CODE STANDARDS AND REQUIREMENTS AND OF INDUSTRY ACCEPTED STANDARD GOOD PRACTICE. AS NOT EVERY CONDITION OR ELEMENT IS (OR CAN BE) EXPLICITLY SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL USE INDUSTRY ACCEPTED STANDARD GOOD PRACTICE FOR MISCELLANEOUS WORK NOT EXPLICITLY SHOWN.
3. THESE DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY FOR PROTECTION OF LIFE AND PROPERTY DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, FORMWORK, SHORING, ETC. SITE VISITS BY THE ENGINEER OR HIS REPRESENTATIVE WILL NOT INCLUDE INSPECTION OF THESE ITEMS AND IS FOR STRUCTURAL OBSERVATION OF THE FINISHED STRUCTURE ONLY.
4. NOTES AND DETAILS IN THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL NOTES, AND SPECIFICATIONS, THE GREATER, MORE STRICT REQUIREMENTS, SHALL GOVERN. IF FURTHER CLARIFICATION IS REQUIRED CONTACT THE ENGINEER OF RECORD.
5. SUBSTANTIAL EFFORT HAS BEEN MADE TO PROVIDE ACCURATE DIMENSIONS AND MEASUREMENTS ON THE DRAWINGS TO ASSIST IN THE FABRICATON AND/OR PLACEMENT OF CONSTRUCTION ELEMENTS BUT IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE DIMENSIONS, MEASUREMENTS, AND/OR CLEARANCES SHOWN IN THE CONSTRUCTION DRAWINGS PRIOR TO FABRICATION OR CUTTING OF ANY NEW OR EXISTING CONSTRUCTION ELEMENTS. IF IT IS DETERMINED THAT THERE ARE DISCREPANCIES AND/OR CONFLICTS WITH THE CONSTRUCTION DRAWINGS THE ENGINEER OF RECORD IS TO BE NOTIFIED AS SOON AS POSSIBLE.
6. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CROWN CASTLE.
7. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
8. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
9. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
10. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CARRIER AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION AND IS TO DETERMINE THE BEST ROUTING OF ALL CONDUITS FOR POWER, AND TELCO AND FOR GROUNDING CABLES AS SHOWN IN THE POWER, TELCO, AND GROUNDING PLAN DRAWINGS.
12. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF CROWN CASTLE USA INC.
13. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
14. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

CONCRETE, FOUNDATIONS, AND REINFORCING STEEL:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. UNLESS NOTED OTHERWISE, SOIL BEARING PRESSURE USED FOR DESIGN OF SLABS AND FOUNDATIONS IS ASSUMED TO BE 1000 psf.
3. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH (f'c) OF 3000 psi AT 28 DAYS, UNLESS NOTED OTHERWISE. NO MORE THAN 90 MINUTES SHALL ELAPSE FROM BATCH TIME TO TIME OF PLACEMENT UNLESS APPROVED BY THE ENGINEER OF RECORD. TEMPERATURE OF CONCRETE SHALL NOT EXCEED 90°F AT TIME OF PLACEMENT.
4. CONCRETE EXPOSED TO FREEZE-THAW CYCLES SHALL CONTAIN AIR ENTRAINING ADMIXTURES. AMOUNT OF AIR ENTRAINMENT TO BE BASED ON SIZE OF AGGREGATE AND F3 CLASS EXPOSURE (VERY SEVERE). CEMENT USED TO BE TYPE II PORTLAND CEMENT WITH A MAXIMUM WATER-TO-CEMENT RATIO (W/C) OF 0.45.
5. ALL STEEL REINFORCING SHALL CONFORM TO ASTM A615. ALL WELDED WIRE FABRIC (WWF) SHALL CONFORM TO ASTM A185. ALL SPLICES SHALL BE CLASS "B" TENSION SPLICES, UNLESS NOTED OTHERWISE. ALL HOOKS SHALL BE STANDARD 90 DEGREE HOOKS, UNLESS NOTED OTHERWISE. YIELD STRENGTH (Fy) OF STANDARD DEFORMED BARS ARE AS FOLLOWS:
#4 BARS AND SMALLER........40 ksi
#5 BARS AND LARGER........60 ksi
6. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH........3"
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 BARS AND LARGER........2"
#5 BARS AND SMALLER........1-1/2"
CONCRETE NOT EXPOSED TO EARTH OR WEATHER:
SLAB AND WALLS........3/4"
BEAMS AND COLUMNS........1-1/2"
7. A TOOLED EDGE OR A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

GREENFIELD GROUNDING NOTES:

1. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
2. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 BARE SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (i.e. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 ft OF MAIN GROUND RING WITH (1) #2 BARE SOLID TINNED COPPER GROUND CONDUCTOR.
19. GROUND CONDUCTORS USED FOR THE FACILITY GROUNDING AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (i.e., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 BARE SOLID TINNED COPPER IN 3/4" NON-METALLIC, FLEXIBLE CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD-WELD TERMINATION POINT. THE EXPOSED END OF THE CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).
21. BUILDINGS WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
   - 4.1. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.
   - 4.2. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 22,000 AIC MINIMUM. VERYIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PRE THE GOVERNING JURISDICTION.
5. EACH END OF EVERY POWER PHASE CONDUCTOR, GROUNDING CONDUCTOR, AND TELCO CONDUCTOR OR CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
6. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH LAMICOID TAGS SHOWING THEIR RATED VOLTAGE, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (i.e. PANEL BOARD AND CIRCUIT ID'S).
7. PANEL BOARDS (ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
8. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
9. ALL POWER AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE COPPER CONDUCTOR (#14 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
10. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE COPPER CONDUCTOR (#6 OR LARGER) WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
11. POWER AND CONTROL WIRING IN FLEXIBLE CORD SHALL BE MULTI-CONDUCTOR, TYPE SOOW CORD (#14 OR LARGER) UNLESS OTHERWISE SPECIFIED.
12. POWER AND CONTROL WIRING FOR USE IN CABLE TRAY SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (#14 OR LARGER), WITH TYPE THHW, THWN, THWN-2, XHHW, XHHW-2, THW, THW-2, RHW, OR RHW-2 INSULATION UNLESS OTHERWISE SPECIFIED.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION NOT LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. ELECTRICAL METALLIC TUBING (EMT), INTERMEDIATE METAL CONDUIT (IMC), OR RIGID METAL CONDUIT (RMC) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
16. ELECTRICAL METALLIC TUBING (EMT) OR METAL-CLAD CABLE (MC) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND THE NEC.
21. WIREWAYS SHALL BE METAL WITH AN ENAMEL FINISH AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS (WIREMOLD SPECMATE WIREWAY).
22. SLOTTED WIRING DUCT SHALL BE PVC AND INCLUDE COVER (PANDUIT TYPE E OR EQUAL).
23. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES (i.e. POWDER-ACTUATED) FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
24. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL. SHALL MEET OR EXCEED UL 50 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND NEMA 3R (OR BETTER) FOR EXTERIOR LOCATIONS.
25. METAL RECEPTACLE, SWITCH AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1 AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
26. NONMETALLIC RECEPTACLE, SWITCH AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2 (NEWEST REVISION) AND BE RATED NEMA 1 (OR BETTER) FOR INTERIOR LOCATIONS AND WEATHER PROTECTED (WP OR BETTER) FOR EXTERIOR LOCATIONS.
27. THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CARRIER AND/OR CROWN CASTLE USA INC. BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
28. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
29. INSTALL LAMICOID LABEL ON THE METER CENTER TO SHOW "VERIZON WIRELESS".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

CONDUCTOR COLOR CODE		
SYSTEM	CONDUCTOR	COLOR
120/240V, 1Ø	A PHASE	BLACK
	B PHASE	RED
	NEUTRAL	WHITE
	GROUND	GREEN
120/208V, 3Ø	A PHASE	BLACK
	B PHASE	RED
	C PHASE	BLUE
	NEUTRAL	WHITE
	GROUND	GREEN
277/480V, 3Ø	A PHASE	BROWN
	B PHASE	ORANGE OR PURPLE
	C PHASE	YELLOW
	NEUTRAL	GREY
	GROUND	GREEN
DC VOLTAGE	POS (+)	RED**
	NEG (-)	BLACK**

* SEE NEC 210.5(C)(1) AND (2)
** POLARITY MARKED AT TERMINATION

APWA UNIFORM COLOR CODE:

WHITE	PROPOSED EXCAVATION
PINK	TEMPORARY SURVEY MARKINGS
RED	ELECTRIC POWER LINES, CABLES, CONDUIT, AND LIGHTING CABLES
YELLOW	GAS, OIL, STEAM, PETROLEUM, OR GASEOUS MATERIALS
ORANGE	COMMUNICATION, ALARM OR SIGNAL LINES, CABLES, OR CONDUIT AND TRAFFIC LOOPS
BLUE	POTABLE WATER
PURPLE	RECLAIMED WATER, IRRIGATION, AND SLURRY LINES
GREEN	SEWERS AND DRAIN LINES

ABBREVIATIONS:

ANT	ANTENNA
(E)	EXISTING
FIF	FACILITY INTERFACE FRAME
GEN	GENERATOR
GPS	GLOBAL POSITIONING SYSTEM
GSM	GLOBAL SYSTEM FOR MOBILE
LTE	LONG TERM EVOLUTION
MGB	MASTER GROUND BAR
MW	MICROWAVE
(N)	NEW
NEC	NATIONAL ELECTRIC CODE
(P)	PROPOSED
PP	POWER PLANT
QTY	QUANTITY
RECT	RECTIFIER
RBS	RADIO BASE STATION
RET	REMOTE ELECTRIC TILT
RFDS	RADIO FREQUENCY DATA SHEET
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
SIAD	SMART INTEGRATED DEVICE
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
W.P.	WORK POINT

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VERIZON WIRELESS
SITE NUMBER: **712924**

BU #: **825272**
LAKE CITY AIRPORT

336 SE NEWELL DR
LAKE CITY, FL 32025

EXISTING 133'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES/QA
0	08/05/22	FS	ISSUED FOR FINALS	MAT

JAVAD K. PARSA LICENSE No 87002 STATE OF FLORIDA PROFESSIONAL ENGINEER
8/8/2022

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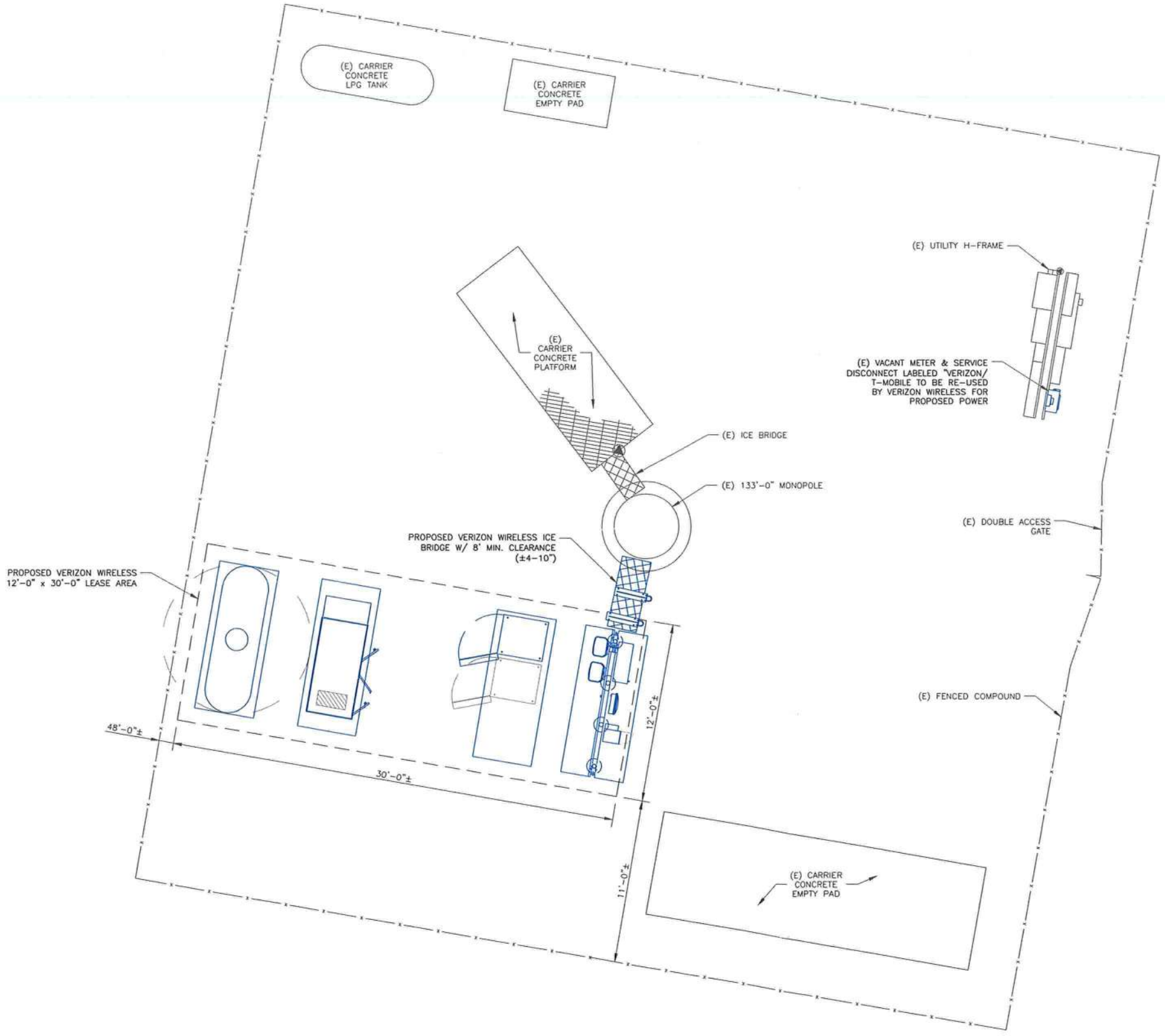
SHEET NUMBER: T-2
REVISION: 0

FLOOD NOTE:

THE SUBJECT PROPERTY APPEARS TO BE WITHIN FLOOD ZONE "X" PER FIRM MAP NUMBER 12023C0315C WITH AN EFFECTIVE DATE OF 02/04/2009.



1 SITE PLAN
SCALE: 4' 3' 2' 1' 0 4' 1/4"=1'-0" (FULL SIZE) 1/8"=1'-0" (11x17)

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VERIZON WIRELESS
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336 SE NEWELL DR
LAKE CITY, FL 32025

EXISTING 133'-0" MONOPOLE

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No 87002
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PROFESSIONAL ENGINEER
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SHEET NUMBER:	REVISION:
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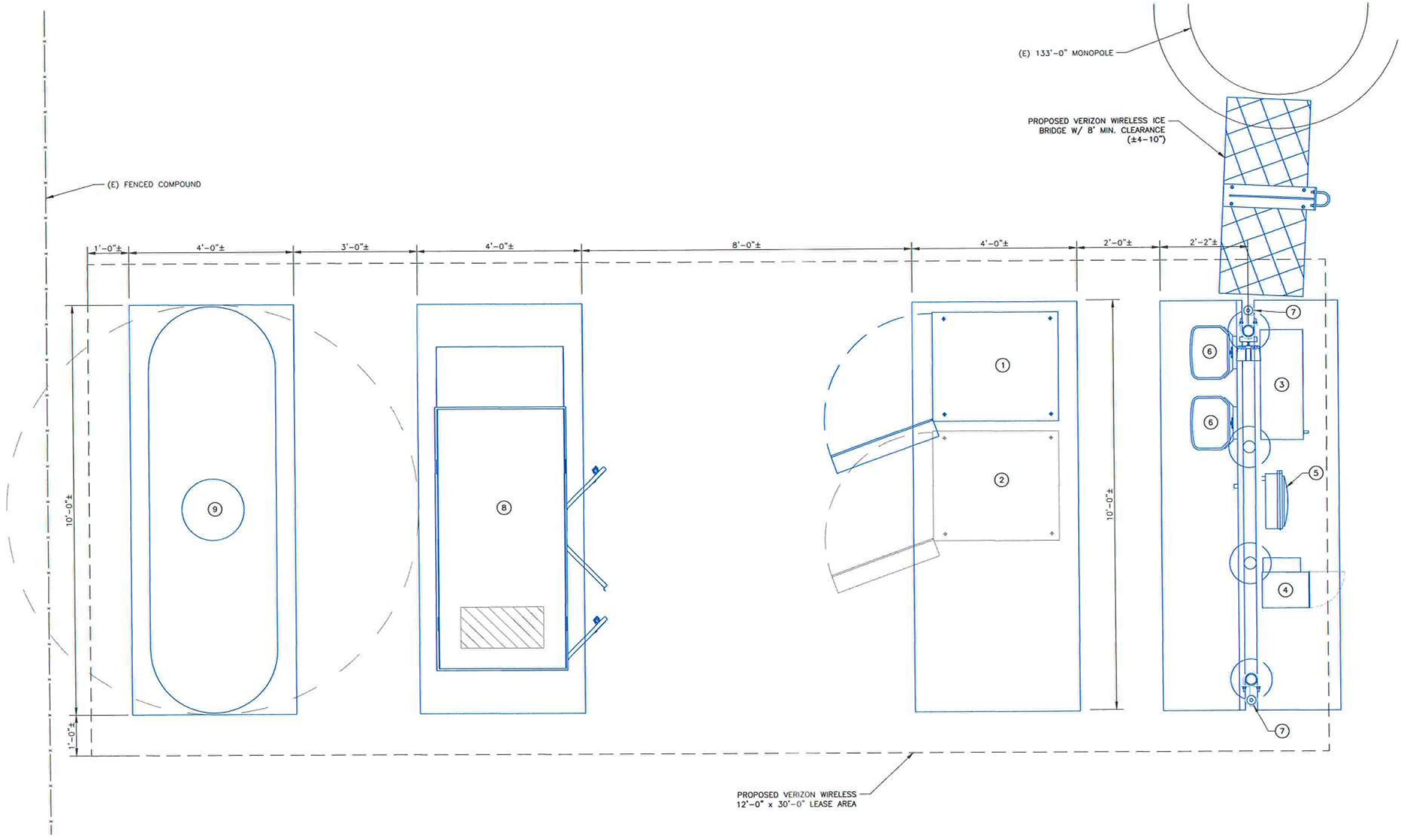

PROPOSED VERIZON WIRELESS EQUIPMENT	
1	PROPOSED VERIZON WIRELESS EQUIPMENT CABINET ON PROPOSED 4'-0" x 10'-0" SLAB
2	FUTURE VERIZON WIRELESS EQUIPMENT CABINET
3	PROPOSED VERIZON WIRELESS 200A., 120/240V 1ø ILC
4	PROPOSED VERIZON WIRELESS FIBER CABINET
5	PROPOSED VERIZON WIRELESS CIENNA BOX
6	PROPOSED VERIZON WIRELESS OVP
7	PROPOSED VERIZON WIRELESS GPS ANTENNA, TYP. OF 2
8	PROPOSED VERIZON WIRELESS 50KW LP GENERATOR ON PROPOSED 4'-0" X 10'-0" SLAB
9	PROPOSED VERIZON WIRELESS 500 GALLON LP TANK W/ INTEGRATED SHUT-OFF VALVE ON PROPOSED 4'-0" X 10'-0" SLAB

2 PROPOSED EQUIPMENT PLAN
SCALE: 1" 6" 0 1" 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)

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VERIZON WIRELESS
SITE NUMBER: **712924**

BU #: **825272**
LAKE CITY AIRPORT

336 SE NEWELL DR
LAKE CITY, FL 32025

EXISTING 133'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/05/22	FS	ISSUED FOR FINALS	MAT

JAVAD K. PARSA
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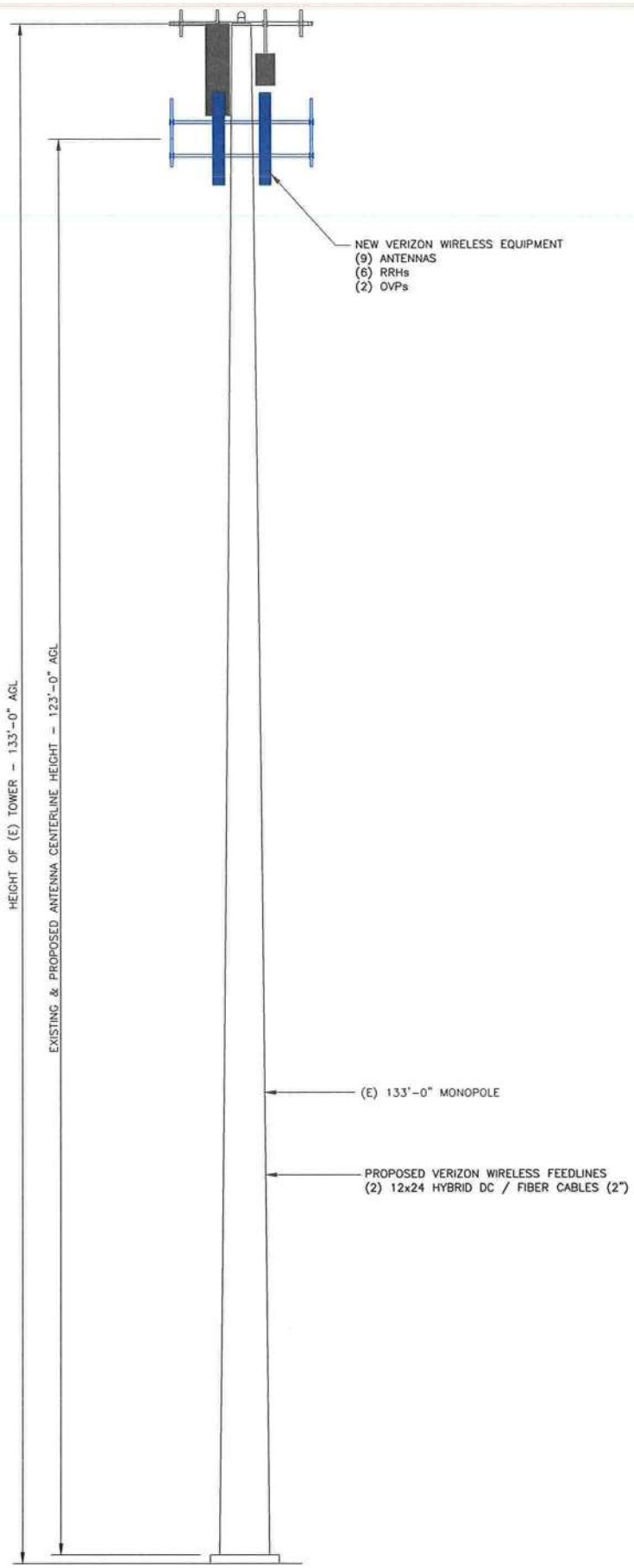
PROFESSIONAL ENGINEER
8/8/2022

SHEET NUMBER: C-1.2

REVISION: 0



1 TOWER ELEVATION
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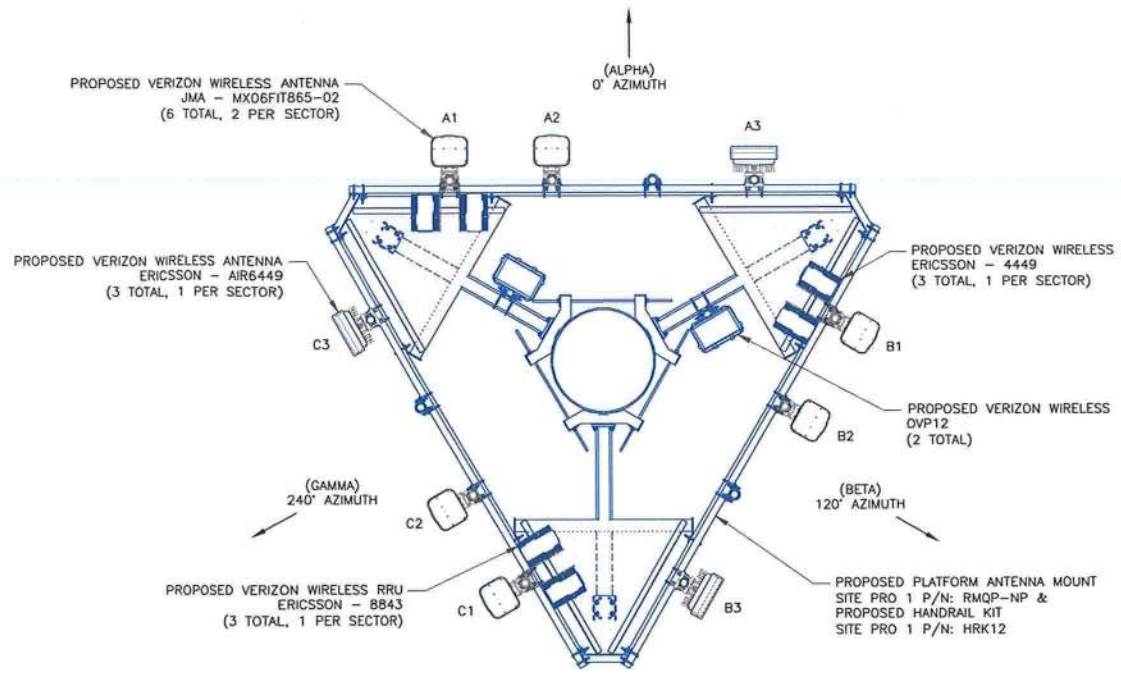

2 FINAL ANTENNA PLAN
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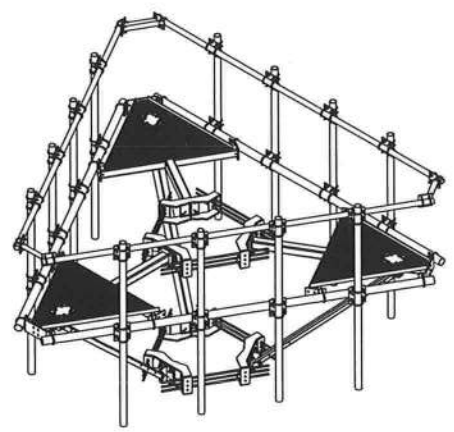

3 SITE PRO 1 - RMQP-NP & HRK12
SCALE: NOT TO SCALE

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TEL: 678-990-2338

VERIZON WIRELESS
SITE NUMBER: **712924**

BU #: **825272**
LAKE CITY AIRPORT

336 SE NEWELL DR
LAKE CITY, FL 32025

EXISTING 133'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/05/22	FS	ISSUED FOR FINALS	MAT

JAVAD K. PARSA
LICENSE
No 87002
STATE OF FLORIDA
PROFESSIONAL ENGINEER
8/8/2022

SHEET NUMBER: C-2

REVISION: 0

FINAL EQUIPMENT SCHEDULE

SECTOR	STATUS	ANTENNA MANUFACTURER	ANTENNA MODEL	ANTENNA CENTERLINE	AZIMUTH	TOWER EQUIPMENT MANUFACTURER	TOWER EQUIPMENT QTY/MODEL
A1	NEW	JMA	MX06FIT865-02	123'-0"	0°	ERICSSON	4449 & 8843
A2	NEW	JMA	MX06FIT865-02	123'-0"	0°	RAYCAP	OVP12
A3	NEW	ERICSSON	AIR6449	123'-0"	0°	-	-
B1	NEW	JMA	MX06FIT865-02	123'-0"	120°	ERICSSON	4449 & 8843
B2	NEW	JMA	MX06FIT865-02	123'-0"	120°	RAYCAP	OVP12
B3	NEW	ERICSSON	AIR6449	123'-0"	120°	-	-
C1	NEW	JMA	MX06FIT865-02	123'-0"	240°	ERICSSON	4449 & 8843
C2	NEW	JMA	MX06FIT865-02	123'-0"	240°	-	-
C3	NEW	ERICSSON	AIR6449	123'-0"	240°	-	-

1 FINAL EQUIPMENT SCHEDULE
SCALE: NOT TO SCALE

FINAL CABLE SCHEDULE

STATUS	CABLE TYPE	SIZE	LENGTH	QTY
NEW	HYBRID	2"	175'-0"±	2
TOTAL CABLE QTY:				2

NOTE:
REFER TO RFDS FOR ELECTRICAL & MECHANICAL DOWNTILTS

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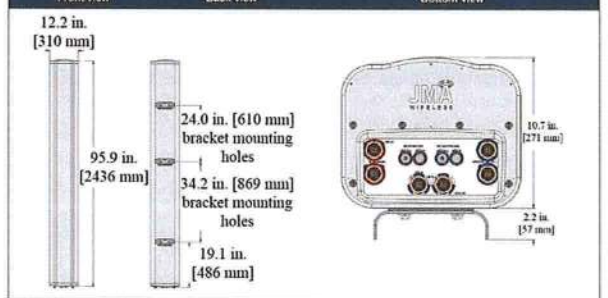
SHEET NUMBER: C-3
REVISION: 0

MX06FIT865-02
NWAV™ X-Pol Hex-Port Antenna

Mechanical specifications	
Dimensions height/width/depth, inches (mm)	95.9/ 12.2/ 10.7 (2436/ 310/ 273)
Shipping dimensions length/width/height, inches (mm)	106/ 20/ 15 (2692/ 508/ 381)
No. of RF input ports, connector type, and location	6 x 4.3-10 female, bottom
RF connector torque	96 lbf in (10.85 N·m or 8 lbf ft)
Net antenna weight, lb (kg)	71 (32.27)
Shipping weight, lb (kg)	120 (54.55)
Antenna mounting and downtilt kit included with antenna	91900318, 91900319 (middle bracket)
Net weight of the mounting and downtilt kit, lb (kg)	26 (11.82)
Range of mechanical up/down tilt	-2° to 12°
Rated wind survival speed, mph (km/h)	150 (241)
Frontal, lateral, and rear wind loading @ 150 km/h, lbf (N)	116 (517), 91 (405), 147 (654)
Equivalent flat plate @ 100 mph and Cd=2, sq ft	2.17

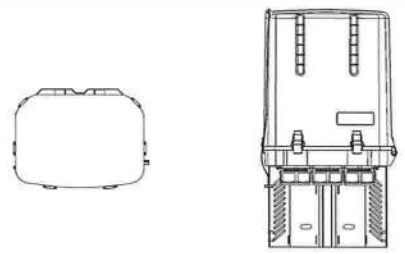
Front view Back view Bottom view



Ordering information	
Antenna model	**Description**
MX06FIT865-02	8F X-Pol HEX FIT 65°, 2-12° / 0-0° RET, 4.3-10 & SBT
Optional accessories	
AISG cables	M/F cables for AISG connections
PCU-1000 RET controller	Stand-alone controller for RET control and configurations

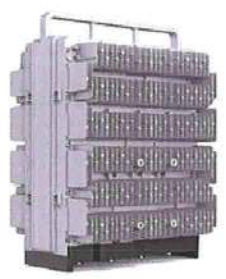
02/22/19
Page 2

1 JMA – MX06FIT865-02
SCALE: NOT TO SCALE



RAYCAP OVP12/6627
WEIGHT: 32.0 LBS
SIZE (HxWxD): 28.93x15.73x10.31 IN.

2 RAYCAP – OVP12/6627
SCALE: NOT TO SCALE



ERICSSON – 4449 B12 B71

WEIGHT: 62.7 LBS
DIMENSIONS (HxWxD): 17.9x13.2x9.3 IN.

3 ERICSSON 4449 B12 B71
SCALE: NOT TO SCALE

ERICSSON – RADIO 8843
WEIGHT: 71.9 LBS
SIZE (HxWxD): 18.0x13.2x11.1 IN.

4 ERICSSON – RADIO 8843
SCALE: NOT TO SCALE

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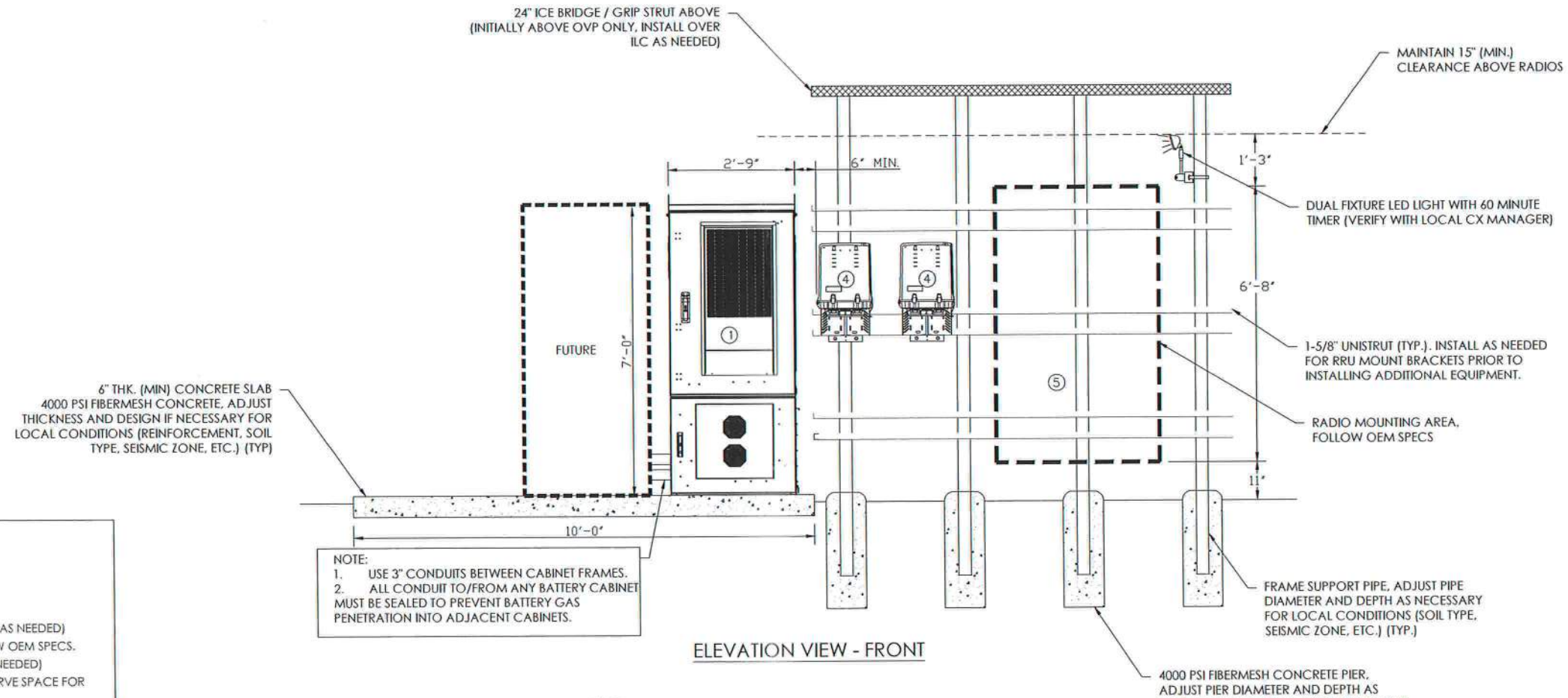
SHEET NUMBER:	REVISION:
C-4	0



LEGEND

1. PRIMARY CABINET
2. (NOT USED)
3. (NOT USED)
4. OVP-12 (PROPOSED AND FUTURE AS NEEDED)
5. RADIO MOUNTING AREA. FOLLOW OEM SPECS.
6. ILC CABINET (WITH CAMLOCK IF NEEDED)
7. DARK FIBER JUNCTION BOX (RESERVE SPACE FOR TELCO CABINET IF NECESSARY)
8. METER & DISCONNECT (UNLESS METER IS LOCATED AT A CENTRAL METER BANK/RACK)
9. RESERVED SPACE FOR CHARLES TELCO CABINET

NOTE:
EACH CABINET SIZE ON THE DRAWINGS HAVING RANGES OF 30"- 36"W X 72"- 84"H X 39"- 46"D (WITH COOLING SYSTEM)

NOTE:
1. WHEN H-FRAME IS INSTALLED ADJACENT TO CABINET PAD, INTERCONNECTING CONDUITS SHALL BE INSTALLED AT OR ABOVE GRADE.

1 EQUIPMENT ELEVATIONS
SCALE: NOT TO SCALE

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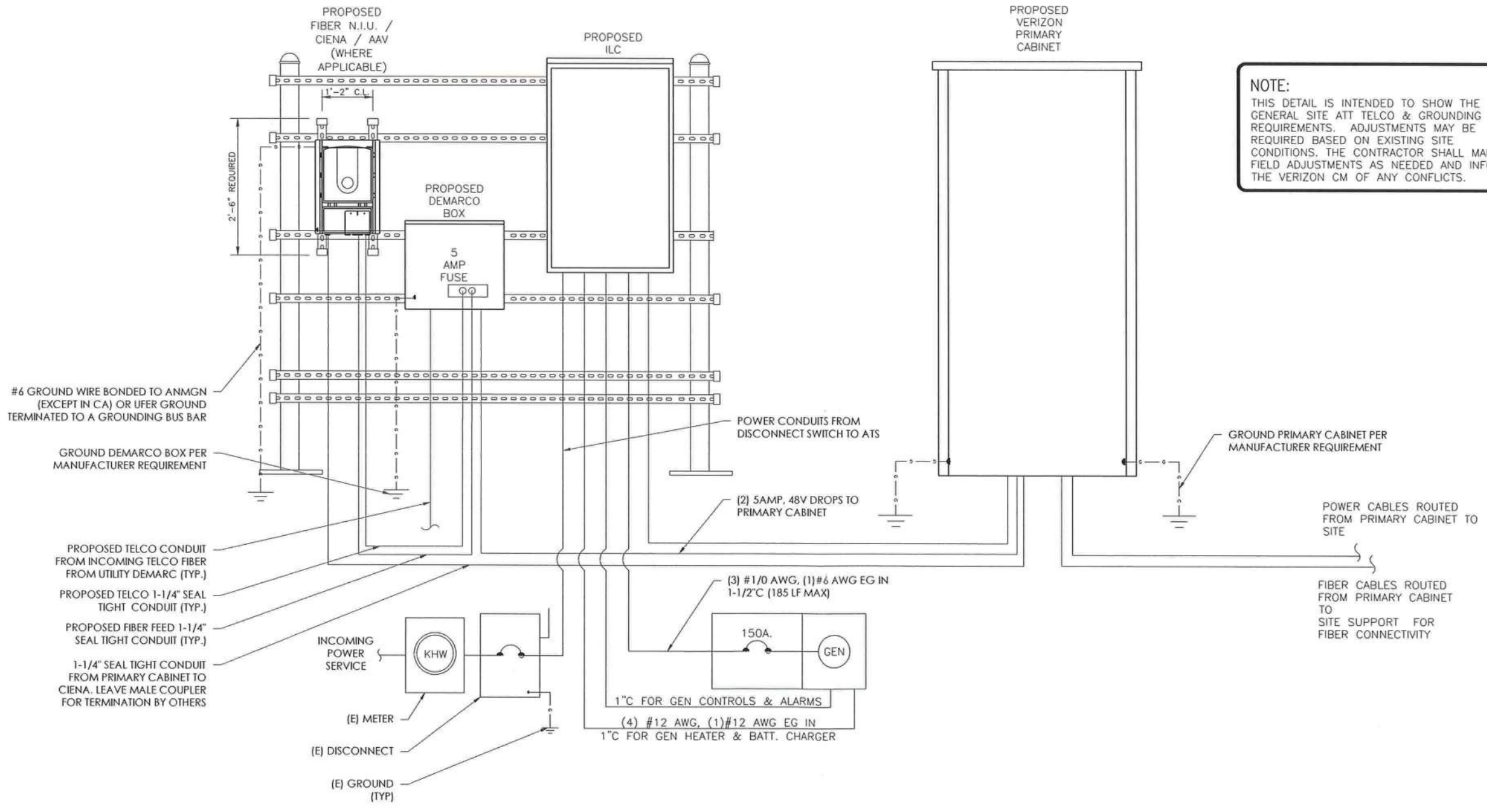
REVISION: 0



1 EQUIPMENT POWER, TELCO, & GROUNDING DIAGRAM
SCALE: NOT TO SCALE

NOTE:
THIS DETAIL IS INTENDED TO SHOW THE GENERAL SITE ATT TELCO & GROUNDING REQUIREMENTS. ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE VERIZON CM OF ANY CONFLICTS.

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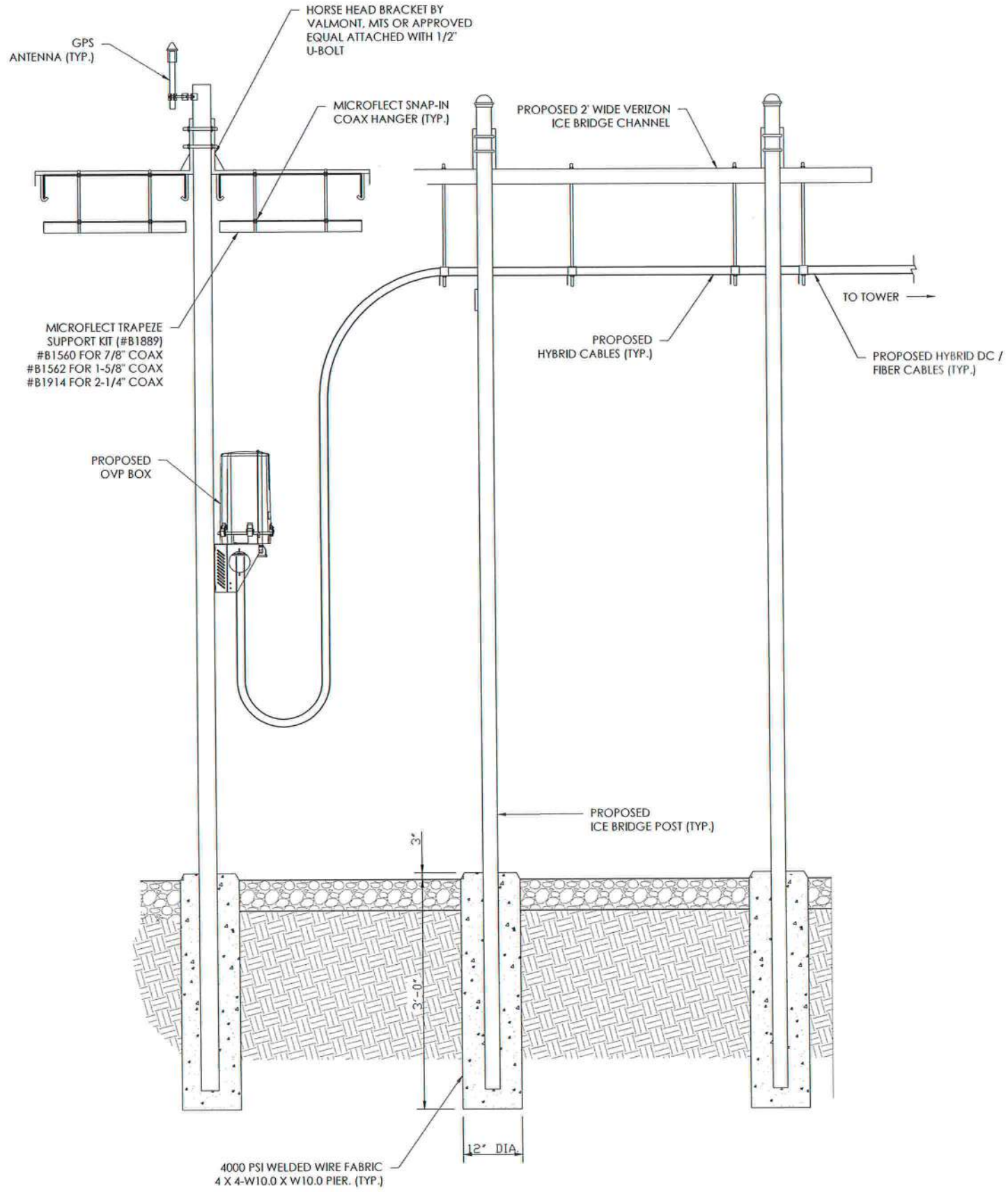
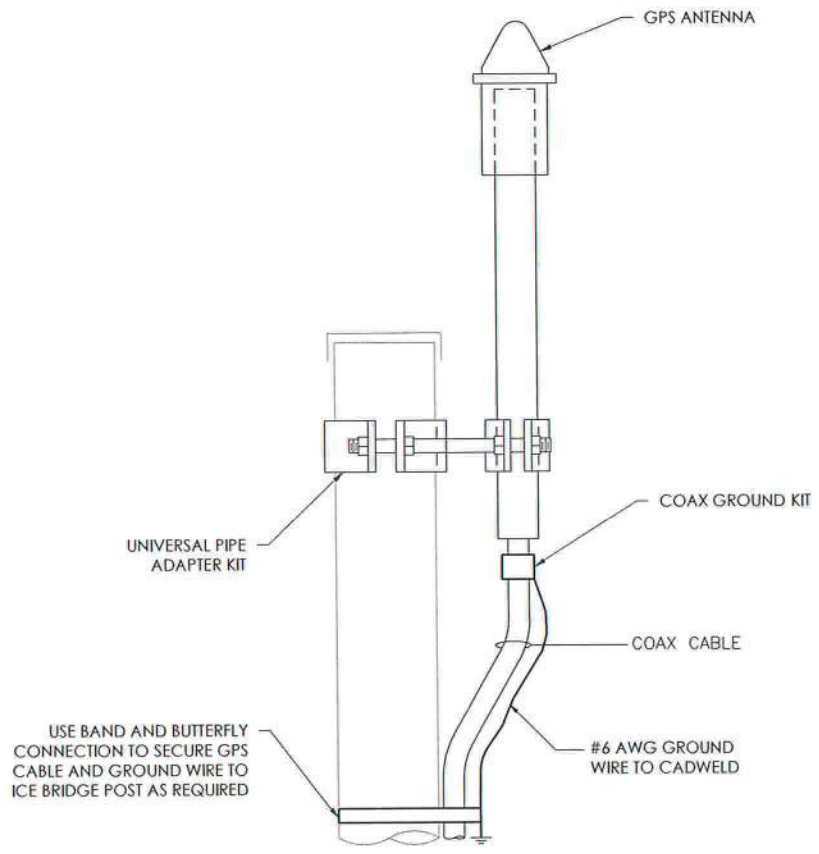
SHEET NUMBER: C-6
REVISION: 0



1 ICE BRIDGE DETAILS
SCALE: NOT TO SCALE



2 GPS ANTENNA MOUNTING DETAILS
SCALE: NOT TO SCALE

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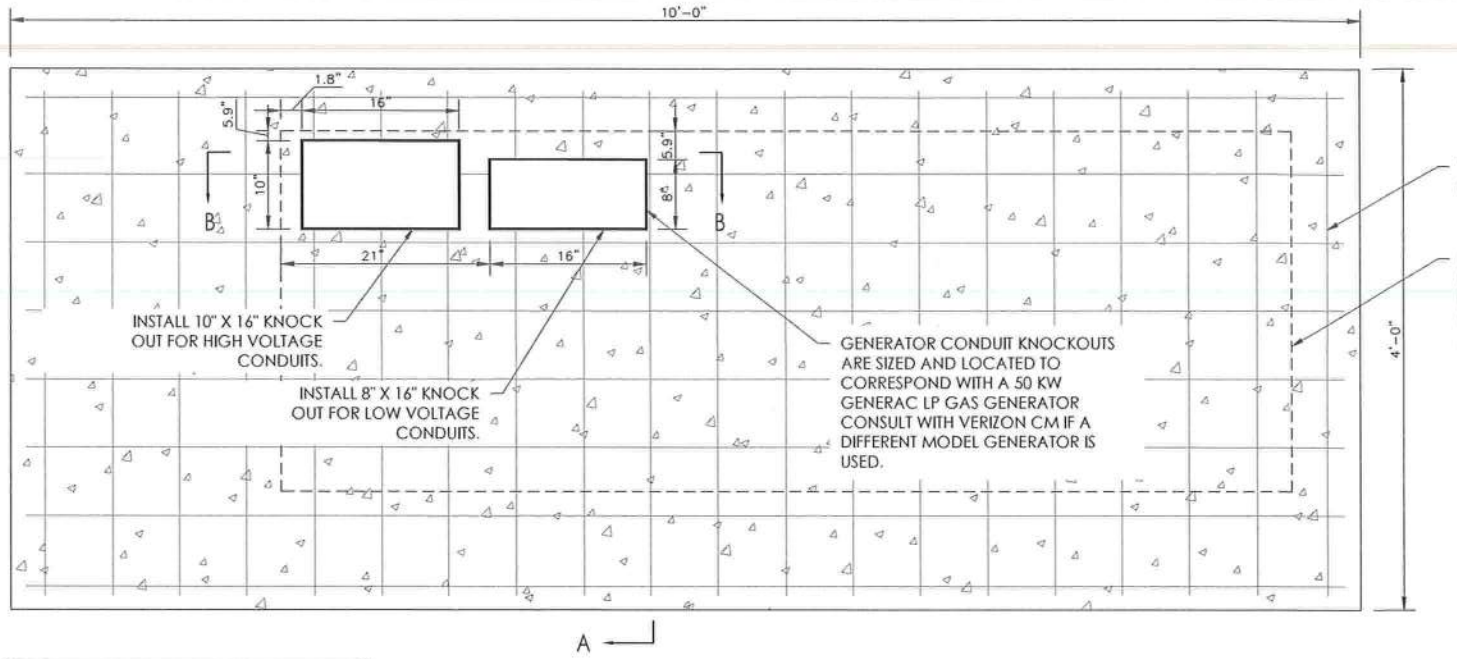
SHEET NUMBER: C-7

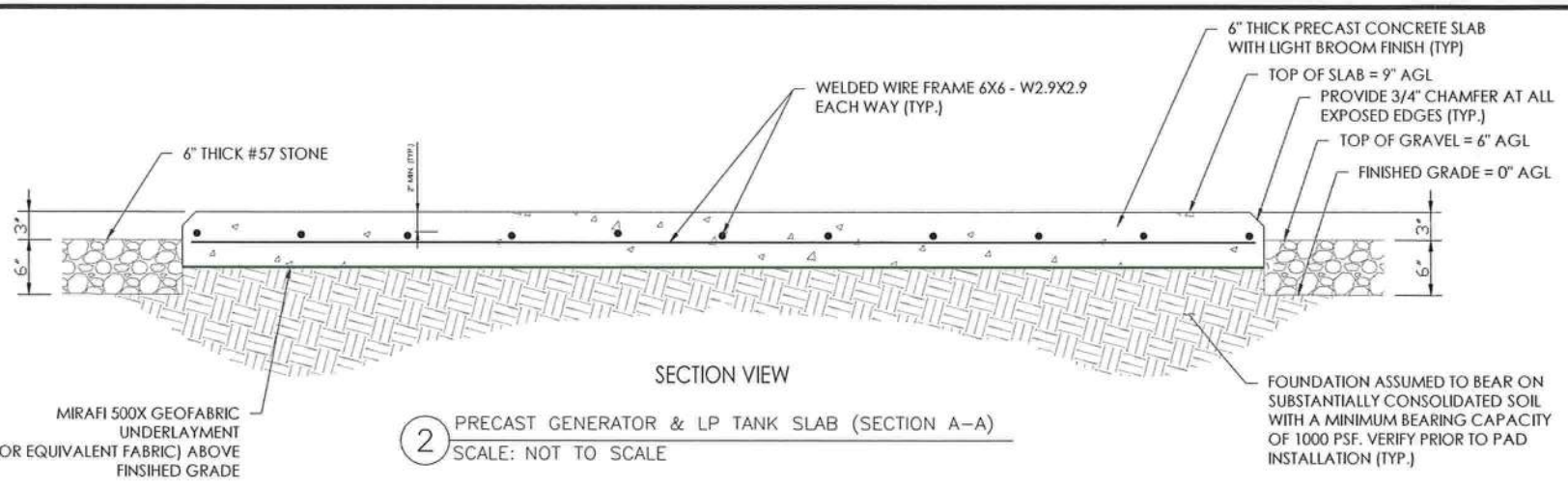
REVISION: 0



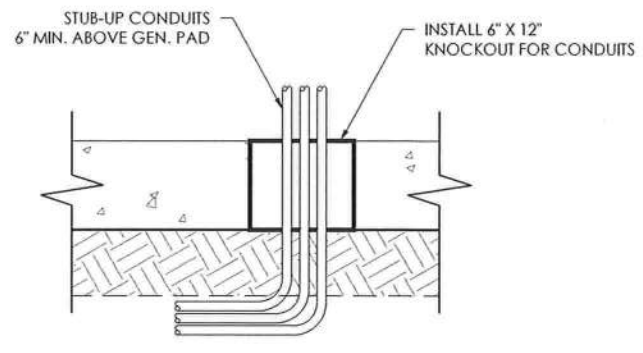
4" MIN. DISTANCE NEEDED FROM CONCRETE EDGES BEFORE DRILLING ANCHORS TO SUPPORT CABINETS OR ICE PROTECTION

1 CONCRETE SLAB DETAILS
SCALE: NOT TO SCALE

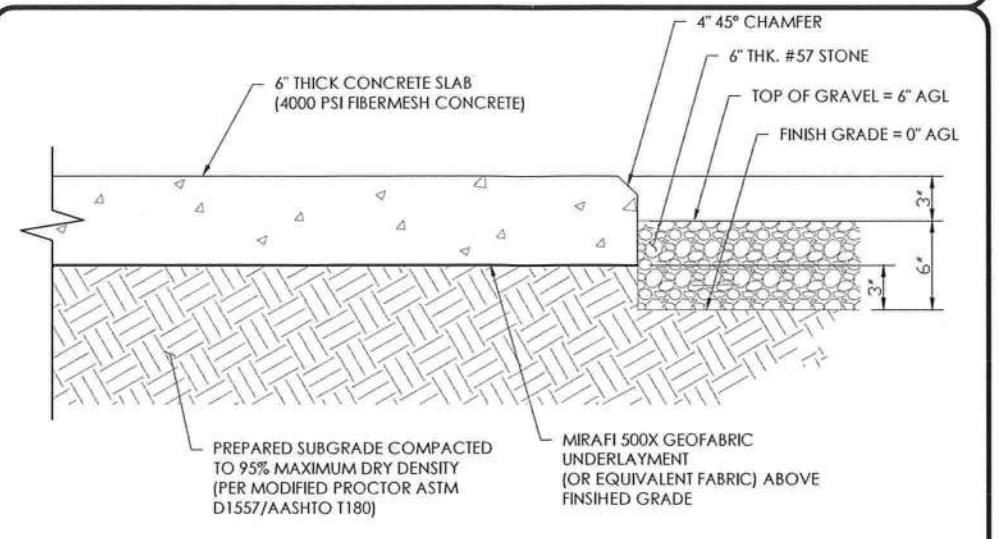
LIFTING NOTE:
THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF EMBEDDED HOISTING HOOKS OR REBAR AS REQUIRED PRIOR TO FABRICATION.



2 PRECAST GENERATOR & LP TANK SLAB (SECTION A–A)
SCALE: NOT TO SCALE



3 CONDUIT STUB–UP FOR GENERATOR SLAB (SECTION B–B)
SCALE: NOT TO SCALE



4 EQUIPMENT CONCRETE SLAB SECTION
SCALE: NOT TO SCALE

REINFORCED CONCRETE NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185, IBC 2006.
2. PRECAST CONCRETE FOR SLABS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS. CONCRETE TESTING IS NOT REQUIRED UNLESS NOTED OTHERWISE OR REQUIRED BY THE JURISDICTION HAVING AUTHORITY.

   SLUMP - 4" MIN. / 6" MAX.
   AIR ENTRAINMENT - 2% TO 3% BY VOLUME

   CLASSES OF CONCRETE

CLASS	28 DAY STRENGTH (PSI)	MAX WATER/CEMENT RATIO	PLACEMENT LOCATION	NOTES
TYPE I	3000	0.55	PRECAST SLABS	NORMAL WEIGHT
TYPE III *	5000	0.45	SITE CAST SLABS & POST FOOTINGS	HIGH EARLY STRENGTH

   * IF REQUIRED BY THE CONSTRUCTION SCHEDULE THE CONTRACTOR MAY SUBSTITUTE TYPE III HIGH EARLY STRENGTH CONCRETE WITH THE APPROVAL OF THE CONSTRUCTION MANAGER.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES FOR REBAR SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO. LAPS FOR WELDED WIRE FABRIC SHALL BE AT LEAST 8 INCHES, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH ..... 3"
   CONCRETE EXPOSED TO EARTH OR WEATHER
   #6 AND LARGER ..... 2"
   #5 AND SMALLER & W.W.F. .....1-1/2"
5. MAXIMUM COARSE AGGREGATE SIZE SHALL BE 3/4".
6. MAINTAIN THE TEMPERATURE OF CAST IN PLACE CONCRETE AT BETWEEN 50 AND 90 DEGREES FAHRENHEIT. IF COLDER OR HOTTER CONDITIONS EXIST, THE CONCRETE MIX DESIGN SHALL BE ADJUSTED ACCORDINGLY.
7. DO NOT USE RETEMPERED CONCRETE.
8. INSTALLATION OF CONCRETE ANCHORS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN SPECIFICATIONS. THE ANCHOR BOLT, DOWEL, OR ROD SHALL CONFORM TO THE ANCHOR MANUFACTURER'S SPECIFICATIONS FOR MATERIAL STRENGTH, EMBEDMENT DEPTH, SPACING, AND EDGE DISTANCE OR AS DETAILED ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR ENGINEERING APPROVAL WHEN DRILLING HOLES IN CONCRETE. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD, HILTI, OR APPROVED EQUAL. IF THE MANUFACTURER'S SPECIFICATIONS AND DETAILS ARE FOUND TO CONFLICT WITH THAT SHOWN HEREIN, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.
9. THE CONTRACTOR SHALL VERIFY FROST LINE AND FOOTING DEPTH REQUIREMENTS WITH THE JURISDICTION HAVING AUTHORITY PRIOR TO CONSTRUCTION.

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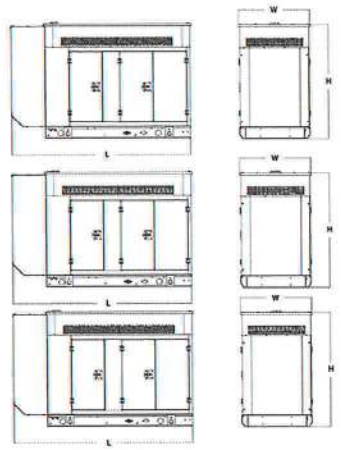

WEATHER PROTECTED ENCLOSURE

L x W x H - in (mm)	94.8 (2,407) x 37.4 (950) x 69.1 (1,755)
Weight - lbs (kg)	Steel: 2,697 (1,223) Aluminum: 1,754 (795)

LEVEL 1 SOUND ATTENUATED ENCLOSURE

L x W x H - in (mm)	94.8 (2,407) x 37.4 (950) x 69.1 (1,755)
Weight - lbs (kg)	Steel: 2,776 (1,259) Aluminum: 2,508 (1,138)

LEVEL 2 SOUND ATTENUATED ENCLOSURE

L x W x H - in (mm)	94.8 (2,407) x 37.4 (950) x 69.1 (1,755)
Weight - lbs (kg)	Steel: 2,928 (1,328) Aluminum: 2,574 (1,168)

SG050NA | 4.5L | 50 kW
INDUSTRIAL SPARK-IGNITED GENERATOR SET
EPA Certified Stationary

GENERAC | INDUSTRIAL POWER

CONFIGURABLE OPTIONS

ENGINE SYSTEM
- Heater with Shutoff Valves
- Fluid Containment Pan
- Engine Coolant Heater
- Oil Heater
- Level 1 Fan and Belt Guards (Enclosed Units Only)
- Radiator Duct Adapter (Open Set Only)

ELECTRICAL SYSTEM
- 10A UL Listed Battery Charger
- Battery Warmer

ALTERNATOR SYSTEM
- Alternator Upsizing
- Anti-Condensation Heater
- Tropical Cooling

CIRCUIT BREAKER OPTIONS
- Main Line Circuit Breaker
- 2nd Main Line Circuit Breaker
- 3rd Main Line Circuit Breaker
- Shunt Trip and Auxiliary Contact
- Electronic Trip Breakers

GENERATOR SET
- Demand Response Rating
- Extended Factory Testing (3-Phase Only)
- 8 Position Load Center

ENCLOSURE
- Weather Protected Enclosure
- Level 1 Sound Attenuated
- Level 2 Sound Attenuated
- Level 2 Sound Attenuated with Motorized Dampers
- Steel Enclosure
- Aluminum Enclosure
- Up to 200 MPH Wind Load Rating (Contact Factory for Availability)
- AC/DC Enclosure Lighting Kit
- Enclosure Heaters

CONTROL SYSTEM
- NFPA 110 Compliant 21-Light Remote Annunciator
- Remote Relay Assembly (8 or 16)
- Remote E-Stop (Break Glass-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Surface Mount)
- Remote E-Stop (Red Mushroom-Type, Flush Mount)
- 10A Run Relay
- Ground Fault Indication and Protection Functions
- 120V GFCI and 240V Outlets
- 100 dB Alarm Horn

WARRANTY (Standby Gensets Only)
- 2 Year Extended Limited Warranty
- 5 Year Limited Warranty
- 5 Year Extended Limited Warranty
- 7 Year Extended Limited Warranty
- 10 Year Extended Limited Warranty

ENGINEERED OPTIONS

CONTROL SYSTEM
- Spare Inputs (x4) / Outputs (x4)
- Battery Disconnect Switch

GENERATOR SET
- Special Testing
- Battery Box

SPEC SHEET
1 of 7

SG050NA | 4.5L | 50 kW
INDUSTRIAL SPARK-IGNITED GENERATOR SET
EPA Certified Stationary

GENERAC | INDUSTRIAL POWER

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Generac
Cylinder #	4
Type	In-Line
Displacement - in³ (L)	275.9 (4.5)
Bore - in (mm)	4.5 (114.3)
Stroke - in (mm)	4.25 (107.95)
Compression Ratio	9.94:1
Intake Air Method	Naturally Aspirated
Number of Main Bearings	5
Connecting Rods	Forged Steel, Fractured Split, Bolt/Capless
Cylinder Head	Cast Iron
Cylinder Liners	Cast Iron
Ignition	Coil Near Plug Solid State Inductive
Piston Type	Cast Aluminum Flat Top
Crankshaft Type	Forged Steel
Lifter Type	Hydraulic
Intake Valve Material	Stainless Steel
Exhaust Valve Material	Stellnite® Steel
Hardened Valve Seats	High Steel Iron Alloy

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	±0.25%

Lubrication System

Oil Pump Type	Gear Driving
Oil Filter Type	Full-Flow Spin-On Cartridge
Crankcase Capacity - qt (L)	21 (20)

Cooling System

Cooling System Type	Pressurized Closed
Fan Type	Pusher
Fan Speed - RPM	2,550
Fan Diameter - in (mm)	23 (584)

Fuel System

Fuel Type	Natural Gas, Propane
Fuel Injection	Electronic
Fuel Shut Off	Dual
NG Operating Fuel Pressure - in H_2O (kPa)	5 - 14 (1.2 - 3.5)
LP Operating Fuel Pressure - in H_2O (kPa)	7 - 14 (1.7 - 3.5)

Engine Electrical System

System Voltage	12 VDC
Battery Charge Alternator	35 A
Battery Size	See Battery Index 0161970SBY
Battery Voltage	12 VDC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	KJ060124Y21
Poles	4
Rotor Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	<5% (3-Phase)
Telephone Interference Factor (TIF)	<50
Standard Excitation	Synchronous Brushless
Bearings	Sealed Ball
Coupling	Direct via Flexible Disc
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	±0.25%

SPEC SHEET
2 of 7

SG050NA | 4.5L | 50 kW
INDUSTRIAL SPARK-IGNITED GENERATOR SET
EPA Certified Stationary

GENERAC | INDUSTRIAL POWER

OPERATING DATA

POWER RATINGS

		Natural Gas				LP Vapor			
		Standby/Demand Response		Prime		Standby/Demand Response		Prime	
Alternator	Voltage	Power	Amps	Power	Amps	Power	Amps	Power	Amps
A055004N21	Single-Phase 120/240 VAC (pf 1.0pf)	48 kW/48 kVA	200	45 kW/45 kVA	188	50 kW/50 kVA	208	45 kW/45 kVA	188
A060004N21	Single-Phase 120/240 VAC (pf 1.0pf)	50 kW/50 kVA	208	45 kW/45 kVA	188	50 kW/50 kVA	208	45 kW/45 kVA	188
K060124Y21	Three-Phase 120/208 VAC (pf0.8pf)	48 kW/58 kVA	167	45 kW/56 kVA	156	50 kW/63 kVA	174	45 kW/58 kVA	156
K060124Y21	Three-Phase 120/208 VAC (pf0.8pf)	50 kW/63 kVA	174	45 kW/56 kVA	156	50 kW/63 kVA	174	45 kW/58 kVA	156
K060124Y21	Three-Phase 120/240 VAC (pf0.8pf)	48 kW/60 kVA	144	45 kW/56 kVA	135	50 kW/63 kVA	150	45 kW/58 kVA	135
K060124Y21	Three-Phase 120/240 VAC (pf0.8pf)	50 kW/63 kVA	150	45 kW/56 kVA	135	50 kW/63 kVA	150	45 kW/58 kVA	135
K060124Y21	Three-Phase 277/480 VAC (pf0.8pf)	50 kW/63 kVA	75	45 kW/56 kVA	68	50 kW/63 kVA	75	45 kW/58 kVA	68
K060124Y21	Three-Phase 277/480 VAC (pf0.8pf)	50 kW/63 kVA	75	45 kW/56 kVA	68	50 kW/63 kVA	75	45 kW/58 kVA	68

MOTOR STARTING CAPABILITIES (skVA)

skVA vs. Voltage Dip				
277/480 VAC	30%	208/240 VAC	30%	
K055712Y21	98	K055012Y21	75	
K055312Y21	124	K056012Y21	99	

SPEC SHEET
3 of 7

SG050NA | 4.5L | 50 kW
INDUSTRIAL SPARK-IGNITED GENERATOR SET
EPA Certified Stationary

GENERAC | INDUSTRIAL POWER

OPERATING DATA

FUEL CONSUMPTION RATES*

Natural Gas – scfh (m³/hr)		Propane Vapor – scfh (m³/hr)	
Percent Load	Standby	Percent Load	Standby
25%	204 (5.8)	25%	102.6 (2.9)
50%	343 (9.7)	50%	175.9 (5.0)
75%	486 (12.9)	75%	297.5 (8.5)
100%	621 (17.6)	100%	392.2 (8.3)

* Fuel supply installation must accommodate fuel consumption rates at 100% load.

COOLING

		Standby
Air Flow (Fan Air Flow Across Radiator)	scfm (m³/min)	2,470 (69.9)
Coolant Flow	gpm (Lpm)	38 (142.7)
Coolant System Capacity	gal (L)	3 (11.4)
Max. Operating Ambient Temperature	°F (°C)	122 (50)
Maximum Operating Ambient Temperature (Before Derate)		See Bulletin No. 0170270SD
Maximum Radiator Backpressure	in H_2O (kPa)	0.5 (0.12)

COMBUSTION AIR REQUIREMENTS

	Standby
Flow at Rated Power scfm (m³/min)	115 (3.3)

ENGINE

		Standby
Rated Engine Speed	RPM	1,800
Horsepower at Rated kW**	hp	76
Piston Speed	ft/min (m/min)	1,275 (389)
BMEP	psi (kPa)	124 (855)

EXHAUST

		Standby
Exhaust Flow (Rated Output)	scfm (m³/min)	332 (9.4)
Maximum Exhaust Backpressure	in Hg (kPa)	0.73 (2.54)
Exhaust Temp (Rated Output - Post Silencer)	°F (°C)	1,100 (593)

** Refer to "Emissions Data Sheet" for maximum bHP for EPA and SCAQMD permitting purposes.

Duration – Operational characteristics consider maximum ambient conditions. Derate factors may apply under atypical site conditions.
Please contact a Generac Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5514, ISO8528, and DIN6271 standards.
Standby - See Bulletin 0187500SB
Prime - See Bulletin 0187510SB

SPEC SHEET
4 of 7

1 GENERATOR SPECIFICATIONS
SCALE: NOT TO SCALE

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VERIZON WIRELESS
SITE NUMBER: **712924**

BU #: **825272**
LAKE CITY AIRPORT

336 SE NEWELL DR
LAKE CITY, FL 32025

EXISTING 133'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
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JAVAD K. PARSA
LICENSE
No 87002
STATE OF
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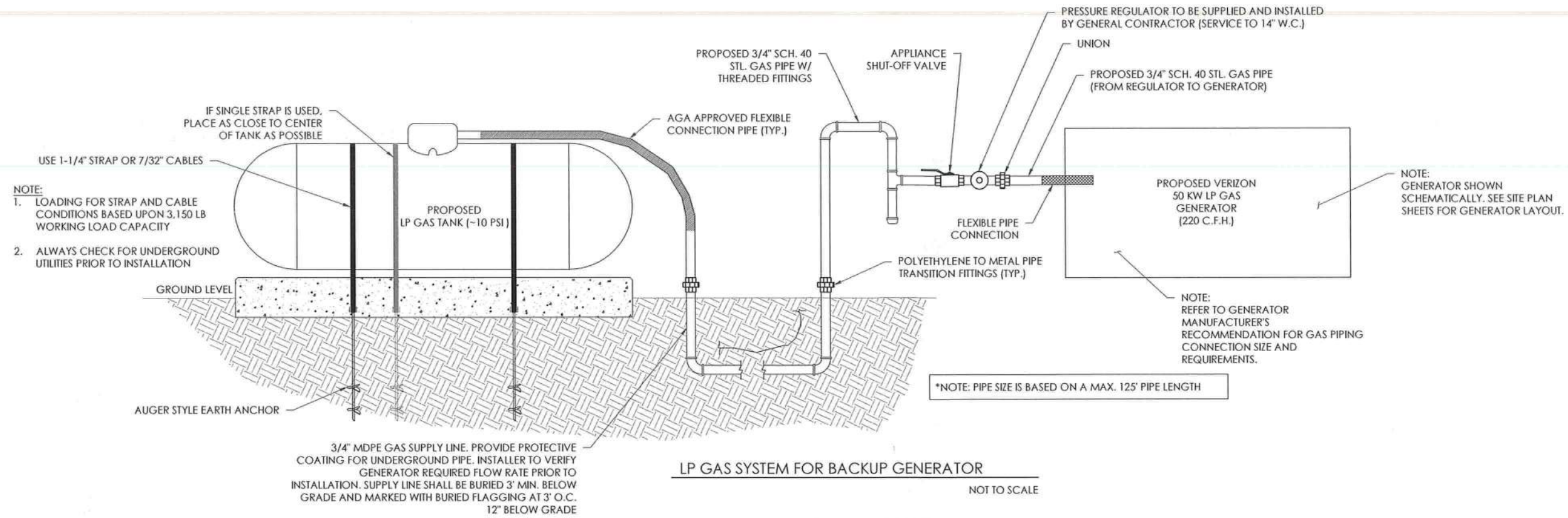
PROFESSIONAL ENGINEER
8/8/2022

SHEET NUMBER: C-9

REVISION: 0



LP GAS SYSTEM FOR BACKUP GENERATOR

NOT TO SCALE

GENERAL NOTES:

1. MAINTAIN MINIMUM 1'-0" VERTICAL AND 1'-0" HORIZONTAL SEPARATION OF GAS LINE FROM OTHER UTILITIES.
2. CONNECTION POINT MAY VARY WITH GENERATOR MANUFACTURER.
3. MAINTAIN 3' SERVICE CLEARANCE ON ALL SIDES OF GENERATOR.
4. GENERAL CONTRACTOR SHALL ANCHOR GENERATOR BASE4 TO SLAB OR PLATFORM WITH HOLES PROVIDED.
5. CONTRACTOR SHALL VERIFY LOCATION OF ALL EQUIPMENT PRIOR TO INSTALLATION.
6. CONTRACTOR SHALL COORDINATE INSTALLATION WITH GAS COMPANY & OTHER DISCIPLINES.
7. CONTRACTOR SHALL ADHERE TO APPLICABLE STATE & LOCAL CODES.
8. COORDINATE LOCATION OF GAS PIPE WITH OTHER UTILITIES.
9. FLEXIBLE CONNECTION TO BE SAME SIZE AS PIPING TIE-IN THAT IS PROVIDED BY THE GENERATOR SUPPLIER.
10. CONTRACTOR TO VERIFY GAS PRESSURE PER NOTE ON "GAS PIPE SIZING SCHEDULE".
11. GENERATOR TO BE LOCATED A SUITABLE DISTANCE FROM ANY ROOF PENETRATIONS IN ACCORDANCE WITH NFPA.
12. CONTRACTOR TO PROVIDE LOW POINT DRAINS AND HIGH POINT VENTS PER NFPA AND AGA CODES.

SPECIFICATIONS:

1. PIPE (LOW-PRESSURE): STEEL PIPE; ASTM A53, TYPE OR S, ELECTRIC-RESISTANCE WELDED OR SEAMLESS, GRADE A OR B, SCHEDULE 40 GALVANIZED STEEL, PAINTED YELLOW.
2. PIPE FITTINGS (ABOVE GROUND):
   A. GRAY-IRON THREAD FITTINGS: ASME B16.4, CLASS 125, GALVANIZED STANDARD PATTERN.
   B. UNIONS: ASME B16.39, CLASS 150, BLACK MALLEABLE IRON, FEMALE PATTERN, BRASS TO IRON SEAT, GROUND JOINT.
   C. TRANSITION FITTINGS: TYPE, MATERIAL, AND END CONNECTIONS TO MATCH PIPING BEING JOINED.
   D. PROVIDE DI-ELECTRIC UNIONS WHERE REQUIRED BETWEEN DIFFERENT METALLIC PIPE MATERIALS.
3. PIPE (UNDERGROUND): POLYETHYLENE PIPE; ASTM D 2513, SDR 11 OR IN ACCORDANCE WITH LOCAL CODES AND REGULATIONS.
4. POLYETHYLENE FITTINGS (UNDERGROUND): ASTM D 2683, SOCKET TYPE OR ASTM D 3261, BUTT TYPE WITH DIMENSIONS MATCHING ASTM D 2513, SDR 11, POLYETHYLENE PIPE.
5. TRANSITION FITTINGS: MANUFACTURED PIPE FITTING FOR CONNECTION TO POLYETHYLENE PIPE AND WITH ONE ASTM A 533 / A 53M, SCHEDULE 40, GALVANIZED STEEL PIPE END FOR THREADED CONNECTION TO GALVANIZED STEEL PIPE.
6. SERVICE-LINE RISER: MANUFACTURED PIPE FITTING WITH POLYETHYLENE PIPE INLET FOR CONNECTION TO UNDERGROUND POLYETHYLENE PIPE RISER SECTION WITH PROTECTIVE-COATED, ANODES, STEEL CASING AND THREADED OUTLET FOR THREADED CONNECTION TO ABOVE GROUND STEEL PIPING.

GENERATOR INSTALLATION RESPONSIBILITIES:

BTS ENGINEER:
1. DELIVERY AND SET UP OF GENERATOR.

GENERAL CONTRACTOR:
1. RUNS STUB-UPS FOR LP GAS TO GENERATOR.
2. COORDINATE DELIVERY OF LP GAS LINE TO THE SITE.
3. PULLS ALARM WIRES, START CIRCUIT WIRES, CONTROL CIRCUIT WIRES, AND LINE VOLTAGE WIRES FROM THE PPC TO THE ATS AND TO THE GENERATOR. HOME RUNS WIRES BACK TO THE ATS.
4. GROUNDS FOR GENERATOR.

GENERATOR MANUFACTURER CERTIFIED ELECTRICIAN:
1. COMPLETES FUEL CONNECTIONS.
2. TERMINATES ALARMS AND CONTROL CIRCUITS TO THE GENERATOR.
3. INSTALL FUEL REGULATORS.
4. FINAL INSPECTION AND START UP.
5. NOTIFY OPERATIONS (CELL TECHS) TWO DAYS PRIOR TO START-UP SCHEDULE. PLAN ON CELL TECH ARRIVAL EARLY AFTERNOON. IF START-UP PROBLEMS OCCUR, NOTIFY CELL TECH OF DELAY BEFORE NOON.
6. RUN LOAD TEST (ADDITIONAL COST TO VERIZON) AS REQUIRED, MOSTLY IN CORE.
7. EMAIL COPY OF START-UP CHECK OFF LIST TO VERIZON.

CELL TECH:
1. CELL TECH TO PUNCH DOWN ALL ALARMS IN CROSS CONNECT AND BTS.
2. CELL TECH TO VERIFY START-UP AND SIGN OFF ACCEPTING GENERATOR.
3. CELL TECH TO NOTIFY VIA TEXT MESSAGING OF ACCEPTANCE.

GENERATOR MANUFACTURER / VERIZON WIRELESS START-UP PROCEDURES:

NOTE: BEFORE RUNNING GENERATOR OR INTERRUPTING POWER, NOTIFY THE NETWORK OPERATIONS CENTER (NOC) AND APPROPRIATE CELL TECH.

1. INSPECT ALL CONNECTING CIRCUITS (GROUND LEADS - START LEADS - BLOCK HEATER - BATTERY CHARGER - POWER OUTLET LEADS) AND ANCHORING OF THE GENERATOR.
2. VERIFY ALL CIRCUITS ARE TERMINATED CORRECTLY AND CORRECT WIRE SIZES ARE USED. THE BATTERY IS CONNECTED, THE CHARGER ACTIVATED AND THE BATTERY IS CHARGING.
3. CHECK ALL LIQUID LEVELS.
4. PLACE ATS IN THE MANUAL MODE AND PROGRAMMED TO SET THE EXERCISER CLOCK TO OPERATE EVERY TWO WEEKS FOR ONE HOUR UNDER LOAD.
5. FUEL SYSTEM IS INSPECTED AND CHECKED FOR LEAKS. VERIFY CORRECT PRESSURE (4 TO 6 OUNCES) AND VERIFY PIPE SIZE.
6. DOCUMENT THE MODEL AND SERIAL NUMBER (SEND INFORMATION TO OPS AND BTS ENGINEER).
7. PREPARE FOR A NO LOAD (MANUAL) START-UP - IF REQUIRED.
8. VERIFY ATS IS IN MANUAL CONTROL POSITION.
9. START UP GENERATOR MANUALLY AND VERIFY VOLTAGE AND FREQUANCY. SET VOLTAGE FOR 230 VOLTS AND FREQUANCY FOR 60 HERTZ.
10. VERIFY ENGINE RUN ALARM IS ACTIVATED AND THERE IS CONTINUITY TO TELCO BOX.
11. INDUCE LOW OIL PRESSURE, HIGH WATER TEMP, OVER/UNDER VOLTAGE/FREQUANCY FAULTS SEPARATELY AND VERIFY THE ALARM IS ACTIVATED AND HAS CONTINUITY TO TELCO BOX.
12. PLACE ATS CONTROLS IN AUTOMATIC.
13. MANUALLY DISCONNECT COMMERCIAL POWER AND VERIFY GENERATOR TRANSFER.
14. ALLOW GENERATOR TO RUN UNDER LOAD FOR ONE HOUR - IF REQUIRED AND RECORD LOAD, COOLANT TEMPERATURE AND VOLTAGE (SEND INFORMATION TO OPS).
15. RESTORE COMMERCIAL POWER AND CHECK FOR TRANSFER, GENERATOR WILL REMAIN RUNNING FOR APPROXIMATELY 5 MINUTES FOR COOL DOWN.
16. COMPLETE ALL REQUIRED START-UP DOCUMENTATION LOCATED IN THE MANUAL, SCAN INTO JOB FILE AND EMAIL COPY TO KATOLIGHT AND OPS.
17. CONTACT OPS TWO DAYS PRIOR TO TESTING.

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TEL: 678-990-2338

VERIZON WIRELESS
SITE NUMBER: **712924**

BU #: **825272**
LAKE CITY AIRPORT

336 SE NEWELL DR
LAKE CITY, FL 32025

EXISTING 133'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/05/22	FS	ISSUED FOR FINALS	MAT

SHEET NUMBER: C-10

REVISION: 0

1 PROPOSED UTILITY ROUTING
SCALE: 40' 20' 0 40' 1"=40'-0" (FULL SIZE) 1"=80'-0" (11x17)

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JAVAD K. PARSA
LICENSE
No 87002
STATE OF FLORIDA
PROFESSIONAL ENGINEER
8/31/2022

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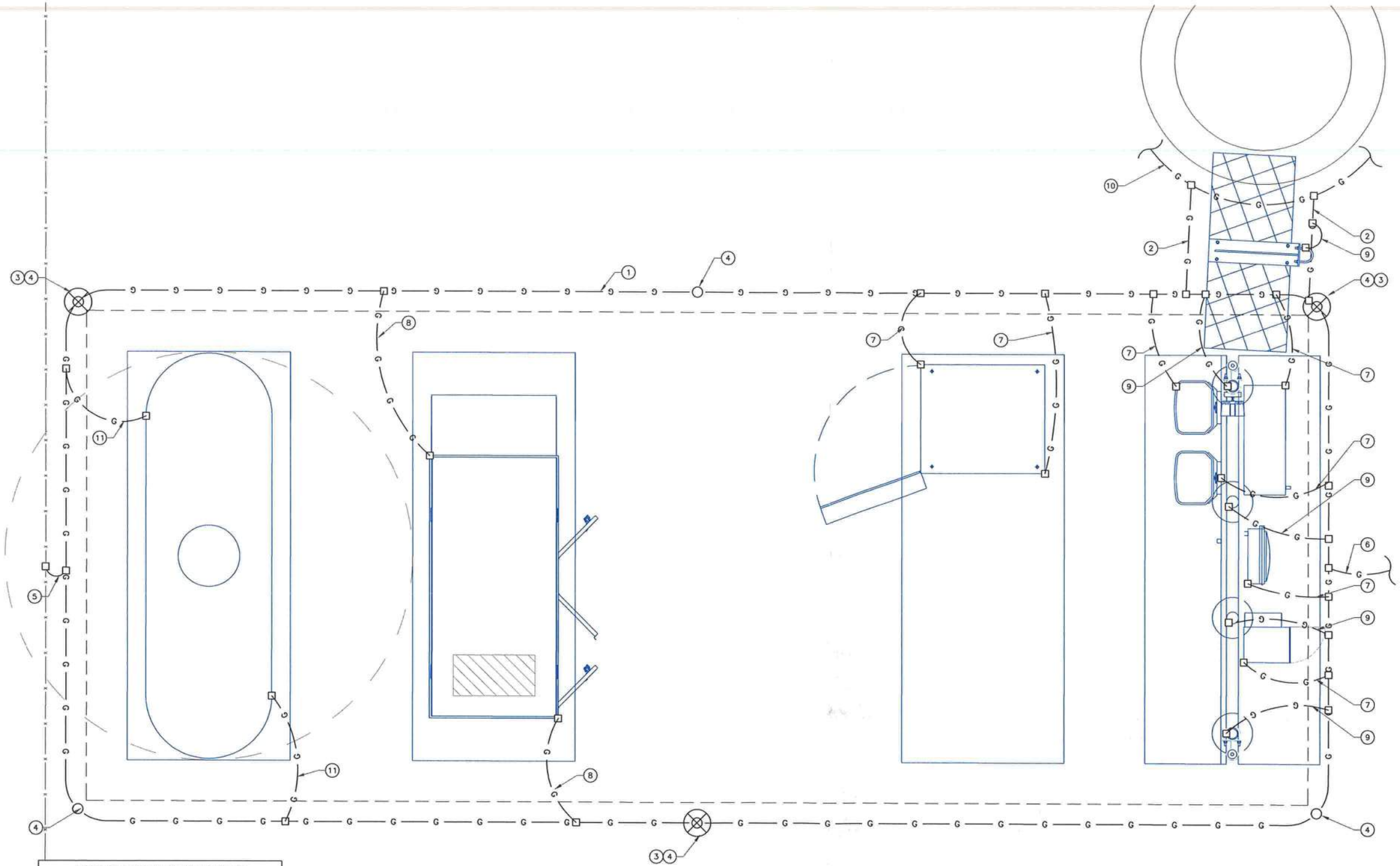

PROPOSED VERIZON WIRELESS EQUIPMENT	
(1)	#2 AWG BARE TINNED SOLID COPPER GROUND RING BURIED 30" BELOW GRADE (TYP.)
(2)	#2 AWG BARE TINNED SOLID COPPER GROUND RING CONNECTION TO EXISTING TOWER GROUND RING
(3)	PROPOSED GROUND ROD INSPECTION SLEEVE
(4)	PROPOSED 10' LONG, COPPER CLAD GROUND ROD
(5)	#2 AWG BARE TINNED SOLID COPPER GROUND CONNECTION TO EXISTING COMPOUND GROUND RING
(6)	#2 AWG BARE TINNED SOLID COPPER GROUND CONNECTION TO ANY METAL WITHIN 6'
(7)	#2 AWG BARE TINNED SOLID COPPER EQUIPMENT CASE BOND TO PROPOSED GROUND RING
(8)	#2 AWG BARE TINNED SOLID COPPER GENERATOR CASE BOND TO PROPOSED GROUND RING
(9)	#2 AWG BARE TINNED SOLID COPPER POST BOND TO PROPOSED GROUND RING
(10)	EXISTING TOWER GROUND RING CONTRACTOR TO HAND EXCAVATE TO EXPOSE
(11)	#2 AWG BARE TINNED SOLID COPPER LP TANK BOND TO PROPOSED GROUND RING

1 PROPOSED GROUNDING PLAN
SCALE: 1' 6" 0 1' — 3/4"=1'-0" (FULL SIZE) 3/8"=1'-0" (11x17)

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VERIZON WIRELESS
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BU #: **825272**
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EXISTING 133'-0" MONOPOLE

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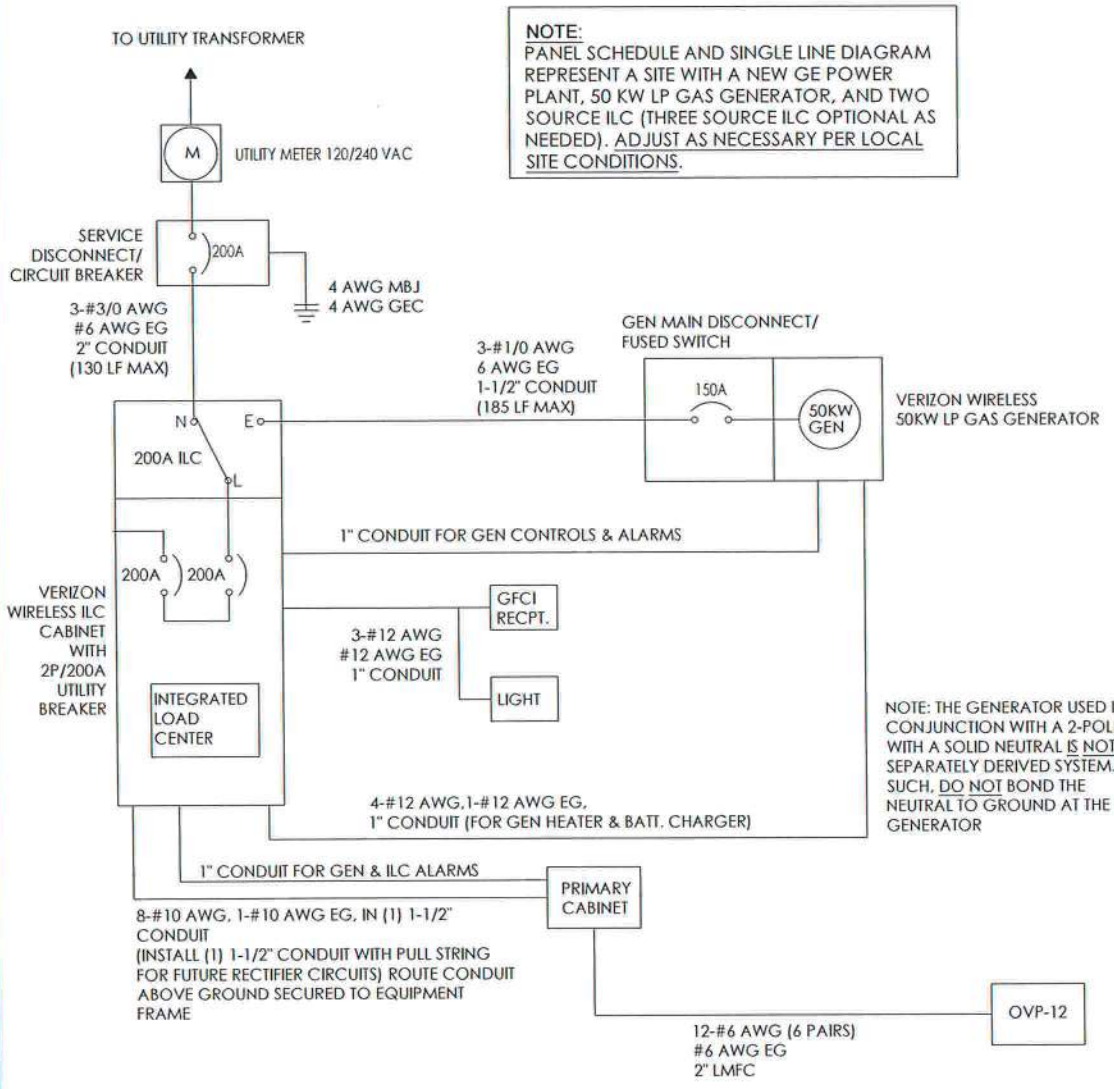
COMMON VzW DC PLANT RECTIFIER REQUIREMENTS			
RECTIFIER	INPUT FLA CURRENT AT 240 VAC (EACH RECTIFIER)	2 RECT / BRANCH CIRCUIT (PREFERRED APPROACH)	1 RECT / BRANCH CIRCUIT (ALT APPROACH)
GE 75A (NE075AC48xxxx or sim)	22 AMPS (MAX)	60A/2P #3 THHN	30A/2P #10 THHN

LOAD CALCULATION	
LOAD	AMPS
PROPOSED LOAD:	123.0
TOTAL DEMAND:	129.0
VOLTAGE: 120/240V SINGLE PHASE 3W 200A	



NOTE:
PANEL SCHEDULE AND SINGLE LINE DIAGRAM REPRESENT A SITE WITH A NEW GE POWER PLANT, 50 KW LP GAS GENERATOR, AND TWO SOURCE ILC (THREE SOURCE ILC OPTIONAL AS NEEDED). ADJUST AS NECESSARY PER LOCAL SITE CONDITIONS.

NOTE: THE GENERATOR USED IN CONJUNCTION WITH A 2-POLE ILC WITH A SOLID NEUTRAL IS NOT A SEPARATELY DERIVED SYSTEM. AS SUCH, DO NOT BOND THE NEUTRAL TO GROUND AT THE GENERATOR

ELECTRICAL SINGLE LINE DIAGRAM

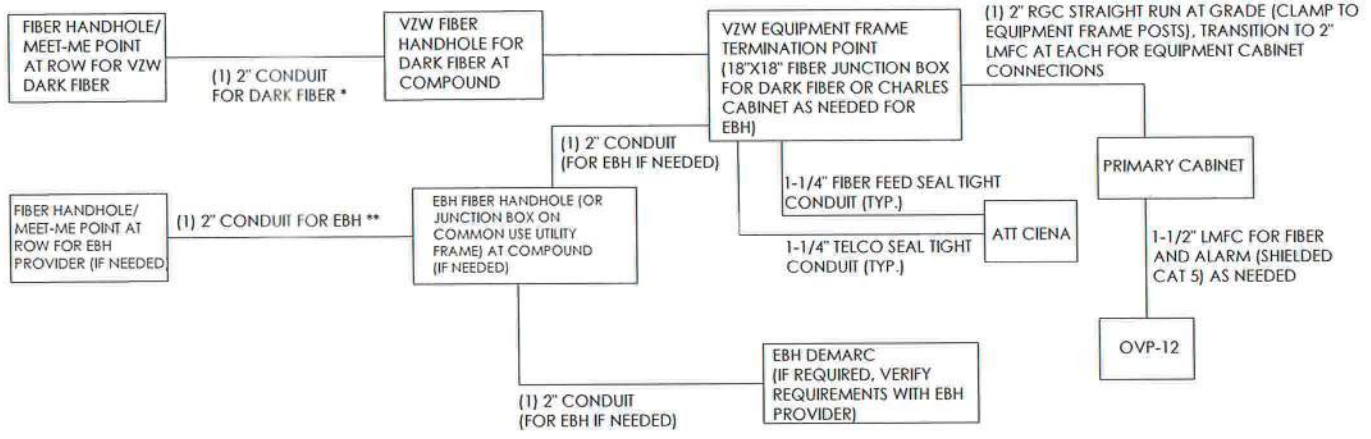
NOTES:
1. ALL EQUIPMENT SHALL BE NEMA 3R RATED.
2. ALL EQUIPMENT SHALL BE LIGHTNING PROTECTED IN ACCORDANCE WITH TIA-222-G AND VERIZON WIRELESS STANDARDS.
3. CONDUCTOR SIZES AND DISTANCES HAVE BEEN SIZED FOR 3% MAX VOLTAGE DROP (TOTAL SYSTEM VOLTAGE DROP ON BOTH FEEDERS AND BRANCH CIRCUITS TO THE FARTHEST DEMAND SHALL NOT EXCEED 5%).
4. WIRE SIZING AND MAXIMUM DISTANCE FROM GENERATOR TO ILC ASSUMES POWER FACTOR OF 0.9.
5. BELOW GRADE CONDUIT SHALL BE SCHEDULE 80 PVC. ABOVE GRADE CONDUIT SHALL BE GALVANIZED RIGID CONDUIT. BELOW GRADE PVC CONDUIT SHALL TRANSITION TO GRC PRIOR TO RISING ABOVE GRADE. ALL BENDS SHALL HAVE A MINIMUM 24" RADIUS. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT. VERIFY CONDUIT TYPE WITH LOCAL CONSTRUCTION MANAGER AND ADJUST IF NECESSARY. ALL CONDUIT SHALL MEET NEC, STATE, AND LOCAL CODE REQUIREMENTS AS REQUIRED.

PROPOSED VERIZON WIRELESS PANEL SCHEDULE															
PANEL NAME	VZW ILC				MODEL NUMBER	INTERSECT AA300G-1PH-3R									
RATED VOLTAGE	120	240	VOLTS		PHASE / WIRE	1	3								
MAIN BREAKER	200	AMPS			BUS RATING	200		KEY DOOR LATCH	YES						
MOUNT	SURFACE				NEUTRAL BAR	YES		HINGED DOOR	YES						
ENCLOSURE TYPE	NEMA 3R				AIC	65K									
POS	USAGE FACTOR	BUS AMPS L1	BUS AMPS L2	LOAD	POLES	AMPS	L1	L2	AMPS	POLE	LOAD	BUS AMPS L1	BUS AMPS L2	USAGE FACTOR	POS
1	1	18		RECTIFIER	2	30A.			30A.	2	RECTIFIER	18		1	2
3	1		18										18	1	4
5	1	18		RECTIFIER	2	30A.			30A.	2	RECTIFIER	18		1	6
7	1		18										18	1	8
9	1	18		RECTIFIER	2	30A.			30A.	2	RECTIFIER	18		1	10
11	1		18										18	1	12
13	1	18		RECTIFIER	2	30A.			30A.	2	RECTIFIER	18		1	14
15	1		18										18	1	16
17	1.25	12		GFI RECPT. / LIGHT	1	20A.									18
19	1.25		12	BLOCK HEATER	1	20A.									20
21	1.25	5		BATT. CHARGER	1	20A.									22
23															24
25															26
27															28
29															30
		93.25	87	SUB TOTAL AMPS							SUB TOTAL AMPS:	72	72		
											FACTORED TOTAL	165.5	155		

NOTES
1. ALL CONDUCTORS ARE TYPE THWN (75°C) COPPER
2. MAXIMUM LENGTH OF RUN FOR RECTIFIER CIRCUITS IS 50FT.
3. INTERSECT/GENERAC INTEGRATED LOAD CENTER INCLUDES 200A. MAIN DISCONNECT AND TRANSFER SWITH FOR PORTABLE OR PERMANENT GENERATOR.
4. RECTIFIER LOADS ARE CONSIDERED TO BE NON-CONTINUOUS.
5. IF ADDITIONAL FUTURE LOADS ARE ADDED WHICH CAUSE TOTAL DEMAND TO EXCEED GENERATOR BREAKER SIZE, BACKUP POWER SYSTEM SHALL BE EVALUATED AND UPGRADED AS NECESSARY

PANEL SCHEDULE

PANEL SCHEDULE



FIBER SINGLE LINE DIAGRAM

NOTES:
* ADD (1) ADDITIONAL 2" CONDUIT FOR DARK FIBER (2 TOTAL) IF REQUIRED BY LOCAL MARKET FACILITIES, VERIFY PRIOR TO CONSTRUCTION. (ADD 2 PULL STRINGS TO EACH CONDUIT)
** VERIFY EBH REQUIREMENTS WITH TELCO PROVIDER PRIOR TO CONSTRUCTION. (ADD 2 PULL STRINGS TO EACH CONDUIT)

1 PANEL SCHEDULE & ONE-LINE DIAGRAM
SCALE: NOTE TO SCALE

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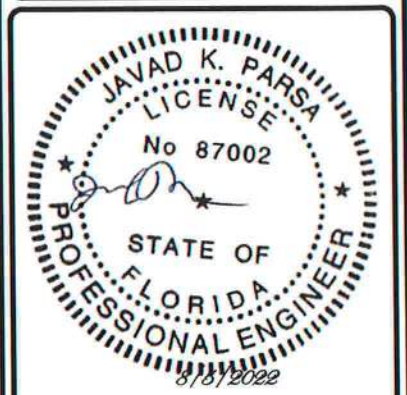

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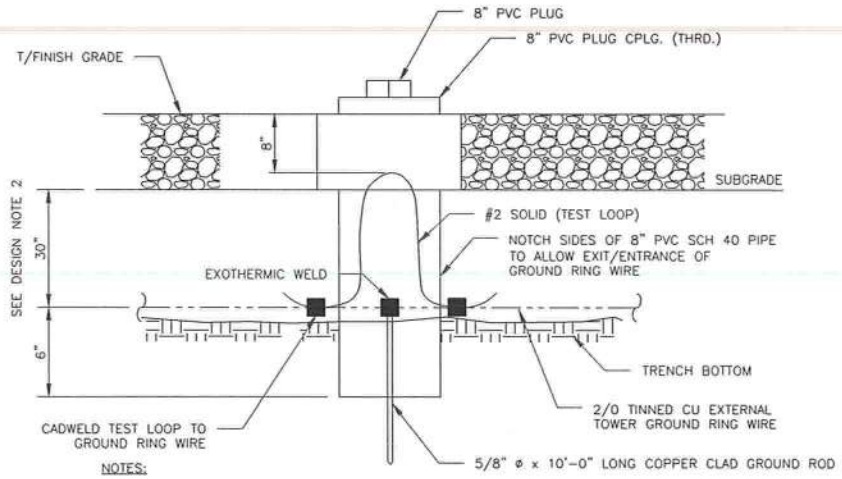
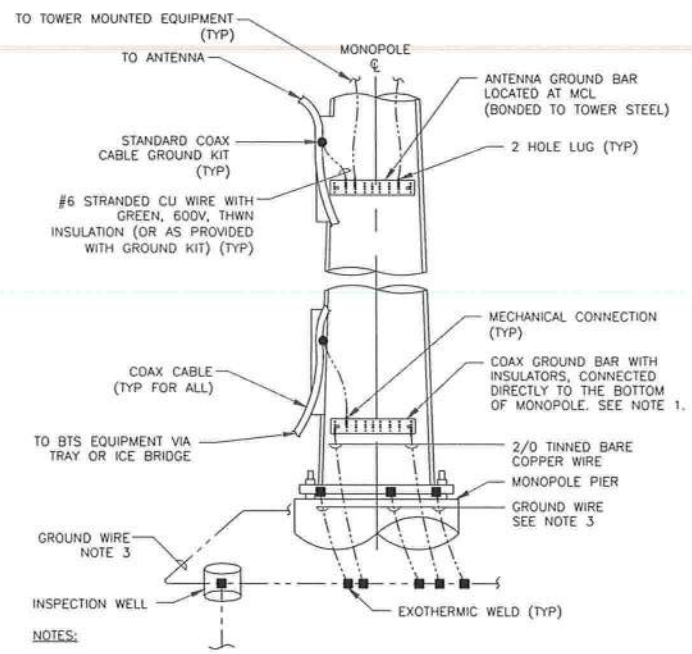


NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

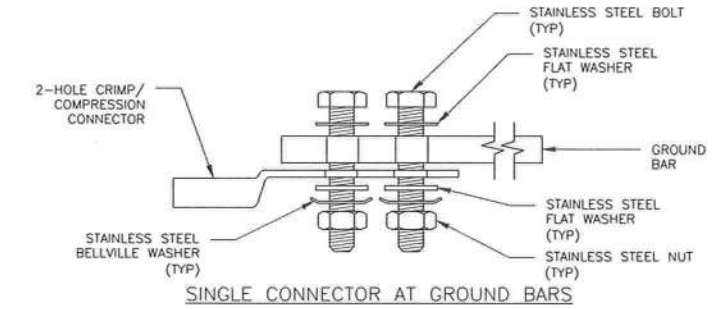
1 INSPECTION WELL DETAIL
SCALE: NOT TO SCALE



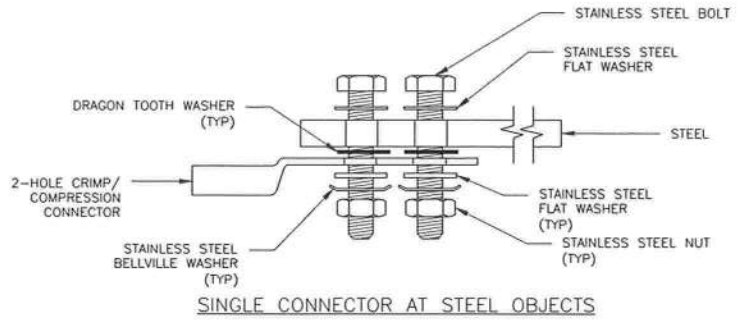
NOTES:

1. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATIONS AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET ON THE TOWER SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE USA INC. TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE RECOGNIZED EDITION OF ANSI/TIA 222 AND NFPA 780.

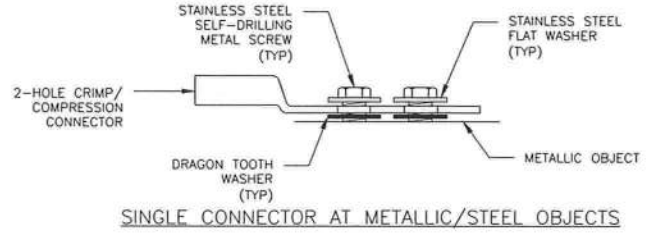
2 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

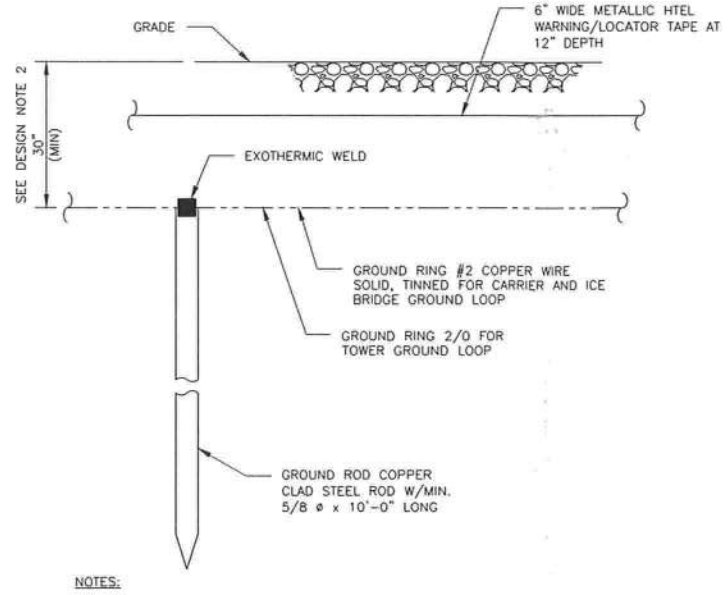


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

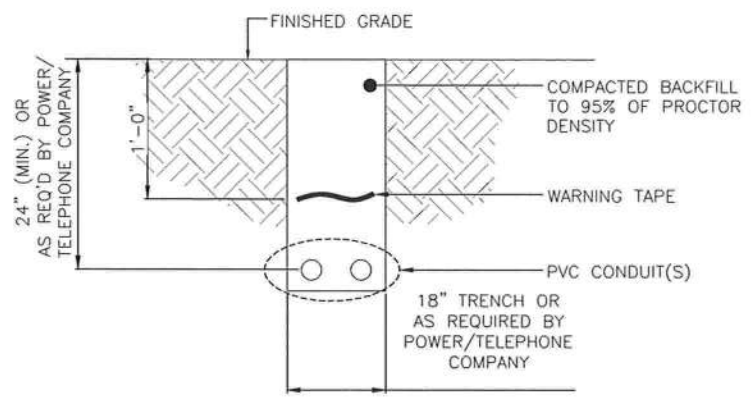
3 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

4 GROUND ROD DETAIL
SCALE: NOT TO SCALE



5 UTILITY TRENCH DETAIL
SCALE: NOT TO SCALE

verizon
7701 E. TELECOM PARKWAY
TEMPLE TERRACE, FL 33637

CROWN CASTLE
8000 AVALON BLVD, SUITE 700
ALPHARETTA, GA 30009

towersource
A NextEdge Company
1355 WINDWARD CONCOURSE
SUITE 410
ALPHARETTA, GA 30005
TEL: 678-990-2338

VERIZON WIRELESS
SITE NUMBER: **712924**

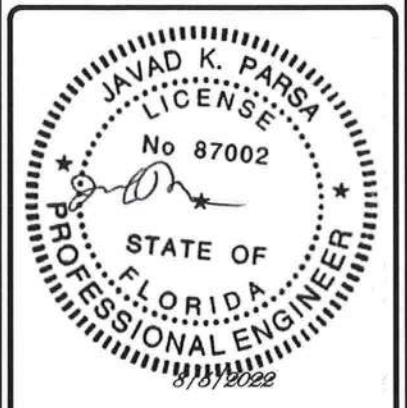
BU #: **825272**
LAKE CITY AIRPORT

336 SE NEWELL DR
LAKE CITY, FL 32025

EXISTING 133'-0" MONOPOLE

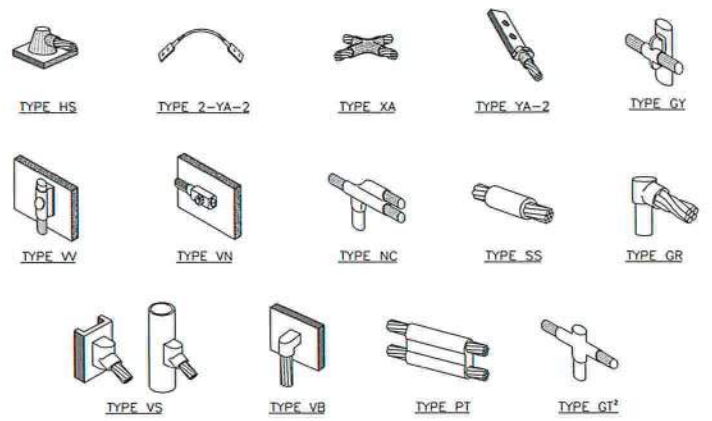
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/05/22	FS	ISSUED FOR FINALS	MAT



SHEET NUMBER: G-4

REVISION: 0

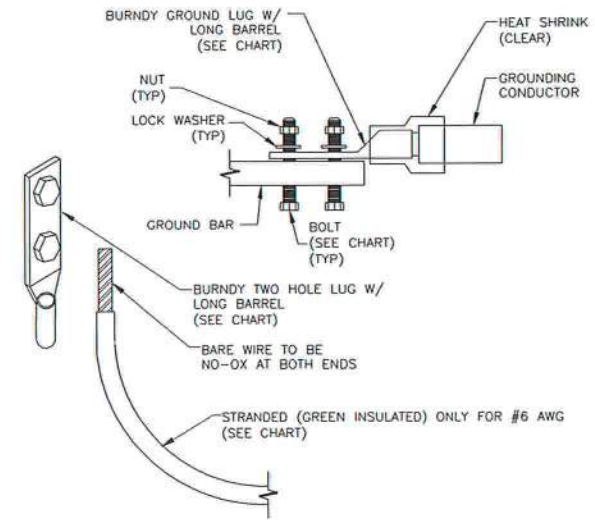


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

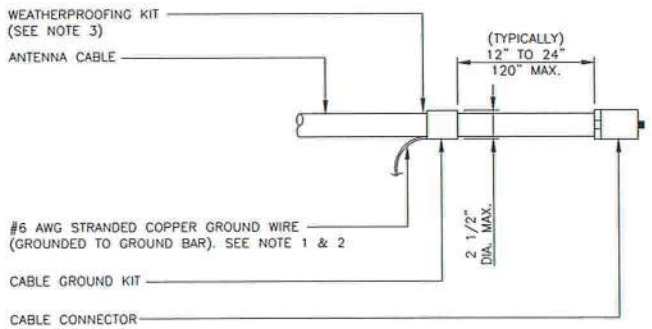
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

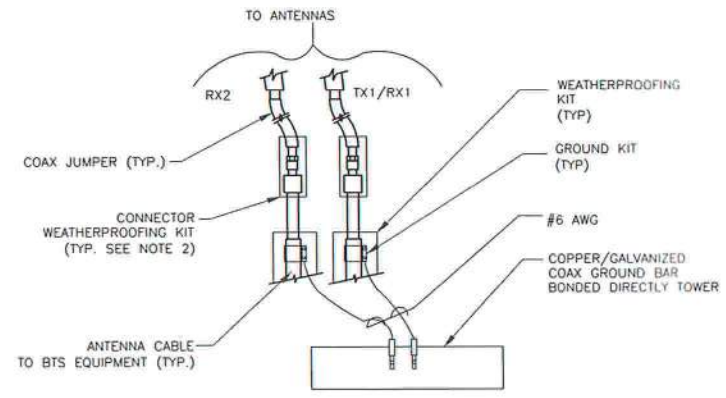
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

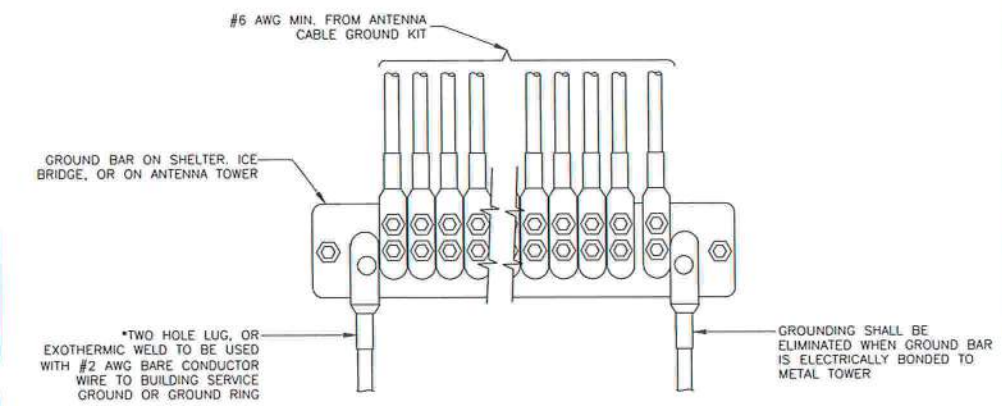
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



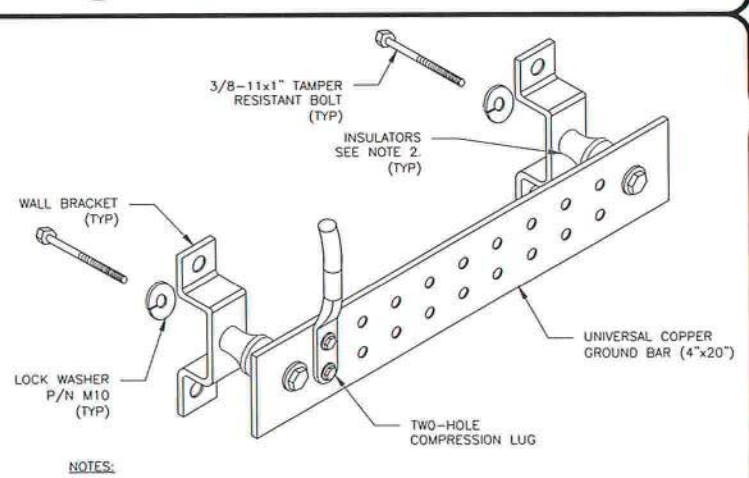
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



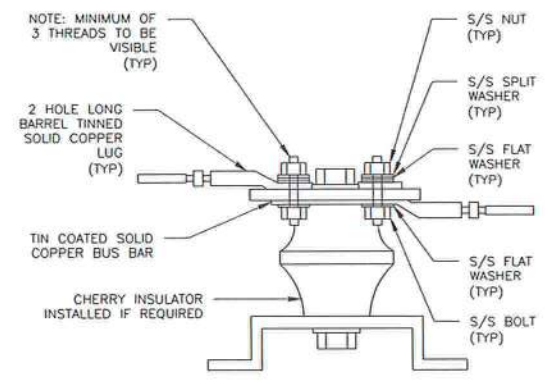
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



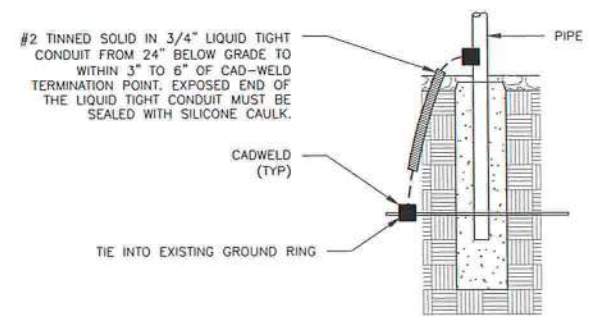
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

verizon
7701 E. TELECOM PARKWAY
TEMPLE TERRACE, FL 33637

CROWN CASTLE
8000 AVALON BLVD, SUITE 700
ALPHARETTA, GA 30009

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336 SE NEWELL DR
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EXISTING 133'-0" MONOPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
0	08/05/22	FS	ISSUED FOR FINALS	MAT

JAVAD K. PARSA LICENSE No 87002 STATE OF FLORIDA PROFESSIONAL ENGINEER
8/8/2022

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY JAVAD K. PARSA, P.E. ON THE DATE ADJACENT TO THE SEAL. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND SEALED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.

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SHEET NUMBER:	REVISION:
G-5	0