Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

January 10, 2024

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

RE: **Tower Share Application-Dish - NJJER01113B**
Crown Site ID#823531
41 Padanaram Road, Danbury, CT 06811
Latitude: 41° 25′ 8.52″ / Longitude: -73° 27′ 43.96″

Dear Ms. Bachman:

Dish proposes to add three (3) new antennas, one (1) new antenna mount and ancillary antenna equipment at the 130' mount level of the 145' monopole tower located at 41 Padanaram Road. Dish will also add one (1) 5'x7' Steel platform on the ground inside the existing compound to support their equipment cabinet. The property is owned by Robert J Kaufman and tower are owned by Crown Castle. This modification/proposal includes hardware that is both 4G (LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

Panned Modification:

Tower:

Installed New:
(3) JMA – MX08FR0665-21 Antennas
(3) Samsung- RF4450t-71A
(3) Samsung- RF4451d-70A
(1) OVP
(1) Hybrid Cable
(1) Commscope MC-PK8-DSH Antenna Platform Mount

Ground:

Install New:
(1) PPC Cabinet
(1.) Equipment Cabinet
(1) 5'x7' Steel Platform
Ice Bridge

The facility was approved by the Connecticut Siting Council in Docket No. 712 on April 25, 2005. Petition NO. 1559 was approved on April 14, 2023.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Roberto Alves, City of Danbury Mayor, Sharon B. Calitro, AICP, City of Danbury Director of Planning and Robert J Kaufman, property owner. Crown Castle is the tower.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

Connecticut General Statute 16-50aa indicates the Council must approve the share use of telecommunication facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting the Dish proposed loading. The structural analysis is included in the package.

B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this support tower in Danbury. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Dish to obtain a building permit for the proposed installation.

C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental impact. The installation of Dish equipment at the 130-foot level of the existing 145-foot tower would have an insignificant visual impact on the area around the tower. Dish ground equipment would be installed within the existing facility compound. Dish shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced of the radio frequency emissions would not increase to a

level at or above the Federal Communications Commission safety standard.

D. Economic Feasibility. Dish has authorization to collocate their antennas on the cell tower.

E. Public Safety Concerns. As discussed above, the tower is structurally capable of supporting Dish proposed loading. Dish is not aware of any public safety concerns relative to the proposed sharing of the existing tower. Dish intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of residents and individuals traveling through Danbury.

For the foregoing reasons, Dish respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Permitting Specialist
1800 W. Park Drive
Westborough, MA 01581
(781) 970-0053
Jeff.Barbadora@crowncastle.com

Attachments
cc:

Roberto Alves - Mayor
City of Danbury
155 Deer Hill Ave
Danbury, CT 06810
203-797-4500

Sharon B. Calitro, AICP, Director of Planning
City of Danbury
155 Deer Hill Ave
Danbury, CT 06810
203-797-4525

Robert J Kaufman
Property Owner
41 Padanaram Road
Danbury, CT 06811

Petition No. 712
Omnipoint (T-Mobile)
Danbury, Connecticut
Staff Report
April 27, 2005

T-Mobile seeks to replace an existing 60-foot tall wooden utility pole, on which whip antennas were formerly attached to dispatch concrete trucks, with an 80-foot tall wood laminate pole to which a platform with twelve antennas would be mounted. The antennas would be mounted with a center line of 80 feet; the tops of the antennas would reach 83 feet. The new pole would be designed to accommodate one additional carrier. At the time of its petition submittal, T-Mobile also notified all abutting property owners of its plans.

On April 26, 2005, Council member Ed Wilensky and staff analyst David Martin visited the site of the petition at 41 Pandanaram Road (Route 37) in Danbury. Stephen Humes, Jackie Slaga, Dan O'Connor, and Jeffrey York were present at the field review representing T-Mobile.

The existing pole is located near the top of a small ridge line that parallels Pandanaram Road. The lower portions of the ridge between the pole site and Pandanaram Road are occupied by a concrete plant (at street level) and several graded off levels that are used for the storage of various concrete products. A graveled access road switches back and forth up the side of the ridge to eventually reach the pole, which is in a small cleared area surrounded by mature deciduous trees that appear to be 65 to 70 feet high.

T-Mobile would install a 15-foot by 15-foot fence compound next to the proposed replacement pole to house its ground equipment which would consist of equipment cabinets on two concrete Pands. In its petition, T-Mobile states the compound would be enclosed by a six-foot high chain link fence topped with three strands of barbed wire. During the field review, T-Mobile representatives stated they would be amenable to installing an eight-foot fence without the barbed wire. Utilities would be brought underground to the compound from a utility pole to be placed somewhere lower on the ridge. Underground utilities would be preferable to overhead lines because of the truck traffic and the use of booms to pick up and move the concrete products.

From the pole site, the ridge continues to rise to the north and east. Although there is a residential area just over the crest of the ridge, no houses are visible from the base of the existing pole. Mr. Wilensky and David Martin drove the residential road nearest the ridge line and could not see the existing tower from this location.

To the south of the existing pole, the ridge falls steeply away to a condominium development. The condominium units nearest to the pole site face the side of the ridge and would not be able to see the replacement pole. Units closer to Pandanaram Road may have some views of the higher proposed tower. Mr. Wilensky and David Martin drove through the condominium development but could not see the existing tower.

To the west of the site, Danbury High School is visible on the side of an opposite ridge. There are a few residences also visible on the opposite ridge. However, existing vegetation and distance should make any visual presence of the proposed, higher tower minimal.

Danbury

Unique ID: H10140 **Card No:** 1 Of 1

Location:	PADANARAM RD	Map Id:	H10 140	Zone:	CN20	Date Printed:	1/10/2024
		Neighborhood:	6500			Last Update:	1/10/2024

Owner Of Record	Volume/Page	Date	Sales Type	Valid	Sale Price
KAUFMAN ROBERT J	0470/0094	2/7/1969	Warranty Deed	No	120,000
C/O JAMES POWERS ESQ/BRODY WILKINSON, 2507 POST ROAD, SOUTHPORT, CT 06890			Exempt		

Prior Owner History

Permit Number	Date	Permit Description
220	3/28/2019	REPLACE ANTENNAS
60516	7/24/2017	ANTENNAS
54094.	10/28/2013	SPRINT REPLACE ANT
53673	8/6/2013	80' COMMUNICATION POLE
50049	7/25/2011	3 ANT/1 CAB
40048	11/8/2005	Cell Tower

Supplemental Data

Census/Tract	2112	VisionPID	10751
Dev Map ID		Street Description	Paved
GIS ID		TC MAP	NONE
Route		TC LOT	18
District		TOPO	Level
Utilities	Sewer, Public Water		

Appraised Value

Total Land Value	980,800
Total Building Value	1,033,300
Total Outbldg Value	662,900
Total Market Value	2,677,000

Acres

Land Type	Acres	490	Total Value
Ind Excess	8.59	0.00	333,300
Industrial Prime Site	1.09	0.00	647,500
Total	9.6800	0.00	980,800

State Item Codes

Code	Quantity	Value
32-Industrial Building	1.00	723,310
31-Industrial Land	9.68	686,560
33-Industrial Improvement	1.00	464,030

Assessment History (Prior Years as of Oct 1)

	2023	2022	2021	2020	2019
Land	686,560	686,560	1,284,800	1,284,900	1,284,900
Building	723,310	723,310	475,800	580,800	580,800
Outbuilding	464,030	464,030	105,000	0	0
Total	**1,873,900**	**1,873,900**	**1,865,600**	**1,865,700**	**1,865,700**

490 Appraised Totals

Type	Acres	Value	Type	Acres	Value
			Totals	**0.00**	**0**

Application Date: **Expiration Date:**

Comments

1/23/2023 CELL VAL - 3500 MONTH 5% VAC 5% EXP 8 CAP

Revaluation Date: 10/1/2022

Danbury

Unique ID: H10140

Location:	PADANARAM RD	**Unit**	

Commercial Building Description

Building Use	Industrial
Class	Fireproof Steel
Overall Condition	Average
Construction Quality	C
Stories	1.00
Year Built	2006
Remodel	
Percent Complete	100
GLA	**23280**

Basement

Basement Area	0

HVAC

Heating Type	Hot Air No Duct
Fuel Type	Oil
Cooling Type	None

Interior

Floors	Concr-Finished
Walls	Drywall
Wall Height	

Exterior

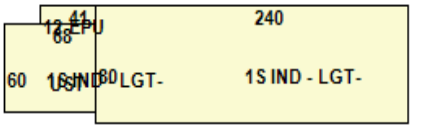
Exterior Walls	Pre-Finish Metal
Roof Type	Metal
Roof Cover	Gable

Special Features

Description	Area/Qty
Base Value	23280

Attached Component Computations

Type	Yr Blt	Area/Qty
Utility Storage	2006	4080
Under Enclosed Porch	2006	492



Detached Component Computations

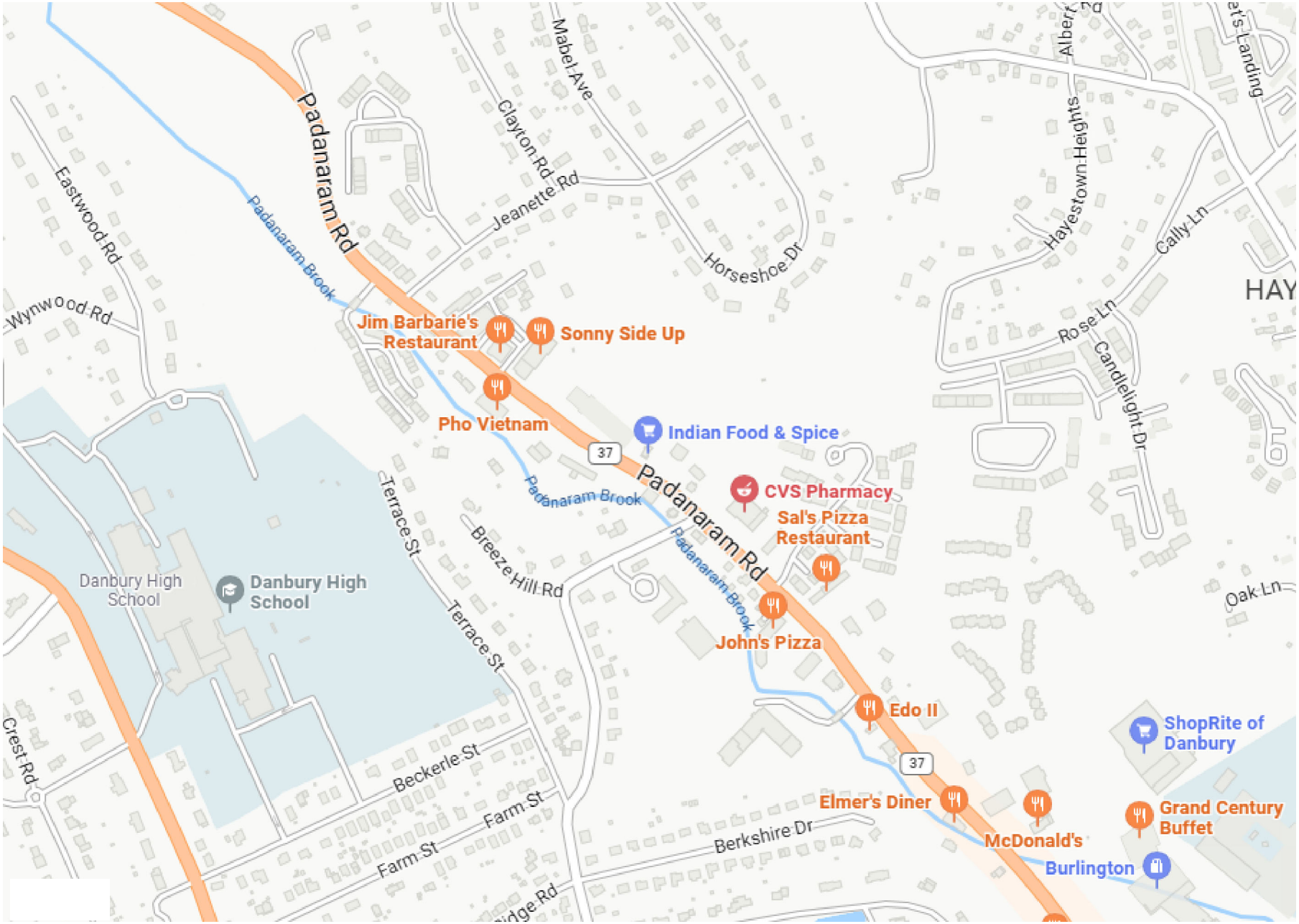
Type	Year	Condition	Area/Qty
Cell Tower	2006	Average	1

Type	Year	Condition	Area/Qty

41 padanaram rd danbury ct map

bing maps

Notes


Padanaram Rd
Mabel Ave
Clayton Rd
Jeanette Rd
Horseshoe Dr
Eastwood Rd
Wynwood Rd
Padanaram Brook
Jim Barbarie's Restaurant
Sonny Side Up
Pho Vietnam
Indian Food & Spice
37
Padanaram Rd
CVS Pharmacy
Sal's Pizza Restaurant
Padanaram Brook
Terrace St
Breeze Hill Rd
Danbury High School
Danbury High School
Terrace St
John's Pizza
Edo II
Crest Rd
Beckerle St
Farm St
Farm St
Berkshire Dr
37
Elmer's Diner
McDonald's
ShopRite of Danbury
Grand Century Buffet
Burlington
Hayestown Heights
Cally Ln
Rose Ln
Candlelight Dr
Oak Ln

Date: **August 17, 2023**

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: Structural Analysis Report

Carrier Designation:	***DISH Network* Co-Locate**	
	Site Number:	NJJER01113B
	Site Name:	N/A
Crown Castle Designation:	**BU Number:**	823531
	Site Name:	CT896/M&M Concrete Pole
	JDE Job Number:	2101084
	Work Order Number:	2252398
	Order Number:	656359 Rev. 0
Engineering Firm Designation:	**TEP Project Number:**	217231.876456
Site Data:	**41 Padanaram Rd., Danbury, Fairfield County, CT 06811** **Latitude *41° 25' 8.52"*, Longitude *-73° 27' 43.96"*** **145 Foot - Monopole Tower**	

Tower Engineering Professionals 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:

LC9.7: Proposed Equipment Configuration **Sufficient Capacity – 53.0%**

This analysis utilizes an ultimate 3-second gust wind speed of 115 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Gautam Sopal, E.I. / CLT

Respectfully submitted by:

Aaron T. Rucker, P.E.

08/17/2023

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 145-ft monopole tower designed by TAPP.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	115 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
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)
130.0	130.0	3	JMA Wireless	MX08FRO665-21 w/ Mount Pipe	1	1-1/2
		3	Samsung Telecom.	RF4451d-70A		
		1	Raycap	RDIDC-9181-PF-48_CCIV3		
		3	Samsung Telecom.	RF4450t-71A		
		1	Tower Mounts	Commscope MC-PK8-DSH		

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)
140.0	142.0	3	Ericsson	AIR 6419 B77G_CCIV3 w/ Mount Pipe	7 2	1-1/8 3/8
	140.0	3	Quintel Technology	QD8616-7 w/ Mount Pipe		
		3	CCI Antennas	DMP65R-BU8DA-K w/ Mount Pipe		
		3	Ericsson	RRUS 8843 B2/B66A		
		3	Ericsson	RRUS 4478 B14_CCIV2		
		3	Ericsson	RRUS 4449 B5/B12		
		2	Raycap	DC9-48-60-24-8C-EV_CCIV2		
		3	Ericsson	RRUS 4415 B30_CCIV2		
		3	Ericsson	2012 B29		
		1	Raycap	DC6-48-60-0-8C		
		6	Site Pro 1	MM01 Standof Mount		
		2	Site Pro 1	LWRM Collar Mount		
		3	Site Pro 1	VFA12-WLL-30120 Sector Mount		
	138.0	3	Ericsson	AIR 6449 B77D_CCVI2		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
118.0	118.0	3	Samsung Telecom.	MT6407-77A w/ Mount Pipe	1	1-5/8
		9	JMA Wireless	MX06FRO660-03 w/ Mount Pipe		
		1	Raycap	RVZDC-6627-PF-48_CCIV2		
		3	Samsung Telecom.	RF4440D-13A		
		3	Samsung Telecom.	RF4439D-25A		
		1	Site Pro 1	F3P-HRK12 Hand Rail Kit		
		1	Site Pro 1	F3P-12W Platform Mount		
106.0	106.0	3	Generic	225 ft² EPA	-	-

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
Geotechnical Report	3529191	CCISites
Foundation Design Report	10474830	CCISites
Tower Manufacturer Drawings	10976052	CCISites

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. Tower Engineering Professionals 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)	ΦP_{allow} (k)	% Capacity	Pass / Fail
L1	145 - 120	Pole	TP29.9483x24x0.1875	1	-10.16	1087.93	29.3	Pass
L2	120 - 84.25	Pole	TP38.4543x29.9483x0.3125	2	-23.19	2247.72	46.7	Pass
L3	84.25 - 41.5	Pole	TP48.0009x36.5802x0.4375	3	-35.03	3925.07	50.5	Pass
L4	41.5 - 0	Pole	TP57x45.5793x0.5	4	-54.32	5507.70	53.0	Pass
							Summary	
						Pole (L4)	53.0	Pass
						RATING =	**53.0**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC4.7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Flange Connection	120.0	48.5	Pass
1,2	Anchor Rods	-	47.9	Pass
1,2	Base Plate	-	52.9	Pass
1,2	Base Foundation Structural	-	47.1	Pass
1,2	Base Foundation Soil Interaction	-	42.7	Pass

Structure Rating (max from all components) =	**53.0%**

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

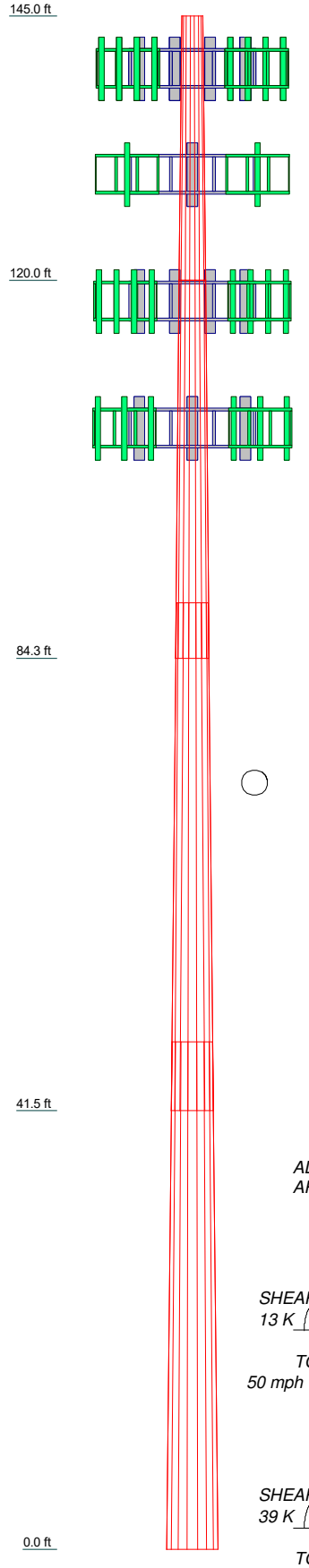
4.1) Recommendations

1) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No further modifications are required once the proposed modifications are installed.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	25.00	35.75	48.00	48.00
Number of Sides	18	18	18	18
Thickness (in)	0.1875	0.3125	0.4375	0.5000
Socket Length (ft)		5.25	6.50	
Top Dia (in)	24.0000	29.9483	36.5802	45.5793
Bot Dia (in)	29.9483	38.4543	48.0009	57.0000
Grade	A572-65			
Weight (K)	1.4	4.1	9.5	13.2



MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 115 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 53%

ALL REACTIONS ARE FACTORED

AXIAL 82 K

SHEAR 13 K — *MOMENT 1341 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 54 K

SHEAR 39 K — *MOMENT 4027 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 115 mph WIND

Tower Engineering Professionals
326 Tyron road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job:	***CT896/M&M Concrete Pole (BU 823531)***		
Project:	***TEP No. 217231.876456***		
Client: Crown Castle	Drawn by: JS	App'd:	
Code: TIA-222-H	Date: 08/17/23	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

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

Tower base elevation above sea level: 570.00 ft.
Basic wind speed of 115 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
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: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
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
L1	145.00-120.00	25.00	0.00	18	24.0000	29.9483	0.1875	0.7500	A572-65 (65 ksi)
L2	120.00-84.25	35.75	5.25	18	29.9483	38.4543	0.3125	1.2500	A572-65 (65 ksi)
L3	84.25-41.50	48.00	6.50	18	36.5802	48.0009	0.4375	1.7500	A572-65 (65 ksi)
L4	41.50-0.00	48.00		18	45.5793	57.0000	0.5000	2.0000	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	24.3413	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768
	30.3814	17.7114	1981.8896	10.5651	15.2137	130.2697	3966.3869	8.8574	4.9409	26.351
L2	30.3621	29.3950	3261.7026	10.5207	15.2137	214.3919	6527.6970	14.7003	4.7209	15.107
	38.9993	37.8319	6953.4118	13.5403	19.5348	355.9503	13915.9730	18.9195	6.2180	19.897
L3	38.3454	50.1886	8282.9116	12.8306	18.5827	445.7318	16576.7220	25.0991	5.6681	12.956
	48.6739	66.0477	18877.3534	16.8850	24.3845	774.1552	37779.5461	33.0301	7.6782	17.55
L4	47.7757	71.5409	18367.3750	16.0032	23.1543	793.2596	36758.9184	35.7773	7.1420	14.284
	57.8022	89.6655	36162.6061	20.0575	28.9560	1248.8813	72372.7958	44.8413	9.1520	18.304

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 145.00-120.00				1	1	1			
L2 120.00-84.25				1	1	1			
L3 84.25-41.50				1	1	1			
L4 41.50-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
**											

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 plf

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
Safety Line 3/8	C	No	No	CaAa (Out Of Face)	145.00 - 0.00	1	No Ice	0.04	0.22
							1/2" Ice	0.14	0.75
							1" Ice	0.24	1.28
Step Pegs (5/8" SR) 7-in. w/30" step	C	No	No	CaAa (Out Of Face)	145.00 - 0.00	1	No Ice	0.03	0.49
							1/2" Ice	0.14	1.01
							1" Ice	0.23	2.07
140									
PWRT-604-S_CCIV 2(1-1/8)	A	No	No	Inside Pole	140.00 - 0.00	7	No Ice	0.00	1.25
							1/2" Ice	0.00	1.25
							1" Ice	0.00	1.25
RFFT-48SM-001-XXX(3/8)	A	No	No	Inside Pole	140.00 - 0.00	2	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
2" Flexible Conduit	A	No	No	Inside Pole	140.00 - 0.00	4	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
130									
CU12PSM9P6XXX(1-1/2)	C	No	No	Inside Pole	130.00 - 0.00	1	No Ice	0.00	2.35
							1/2" Ice	0.00	2.35
							1" Ice	0.00	2.35
118									
HFT1206-24SVL-XXX(1-5/8)	C	No	No	Inside Pole	118.00 - 0.00	1	No Ice	0.00	1.92
							1/2" Ice	0.00	1.92
							1" Ice	0.00	1.92
106									
**									

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	145.00-120.00	A	0.000	0.000	0.000	0.000	0.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.813	0.04
L2	120.00-84.25	A	0.000	0.000	0.000	0.000	0.37
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.592	0.17
L3	84.25-41.50	A	0.000	0.000	0.000	0.000	0.44
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.099	0.21
L4	41.50-0.00	A	0.000	0.000	0.000	0.000	0.42
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.009	0.21

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	145.00-120.00	A	0.976	0.000	0.000	0.000	0.000	0.20

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.577	0.11
L2	120.00-84.25	A	0.951	0.000	0.000	0.000	0.000	0.37
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	16.193	0.26
L3	84.25-41.50	A	0.906	0.000	0.000	0.000	0.000	0.44
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	19.363	0.32
L4	41.50-0.00	A	0.812	0.000	0.000	0.000	0.000	0.42
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	18.047	0.30

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	145.00-120.00	-0.4875	0.2815	-1.5934	0.9199
L2	120.00-84.25	-0.4920	0.2841	-1.6316	0.9420
L3	84.25-41.50	-0.4954	0.2860	-1.6884	0.9748
L4	41.50-0.00	-0.4977	0.2874	-1.6684	0.9632

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

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
140									
AIR 6419 B77G_CCIV3 w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.79 4.14 4.51	2.15 2.45 2.76	0.07 0.10 0.15
AIR 6419 B77G_CCIV3 w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.79 4.14 4.51	2.15 2.45 2.76	0.07 0.10 0.15
AIR 6419 B77G_CCIV3 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.79 4.14 4.51	2.15 2.45 2.76	0.07 0.10 0.15
AIR 6449 B77D_CCVI2	A	From Face	4.00 0.00 -2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.64 4.00 4.37	1.72 2.02 2.33	0.08 0.11 0.14
AIR 6449 B77D_CCVI2	B	From Face	4.00 0.00 -2.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	3.64 4.00 4.37	1.72 2.02 2.33	0.08 0.11 0.14
AIR 6449 B77D_CCVI2	C	From Face	4.00 0.00	0.0000	140.00	No Ice 1/2" Ice	3.64 4.00	1.72 2.02	0.08 0.11

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
			-2.00			1" Ice	4.37	2.33	0.14
QD8616-7 w/ Mount Pipe	A	From Face	4.00	0.0000	140.00	No Ice	16.93	9.31	0.18
			0.00			1/2" Ice	17.87	10.17	0.31
			0.00			1" Ice	18.83	11.05	0.45
QD8616-7 w/ Mount Pipe	B	From Face	4.00	0.0000	140.00	No Ice	16.93	9.31	0.18
			0.00			1/2" Ice	17.87	10.17	0.31
			0.00			1" Ice	18.83	11.05	0.45
QD8616-7 w/ Mount Pipe	C	From Face	4.00	0.0000	140.00	No Ice	16.93	9.31	0.18
			0.00			1/2" Ice	17.87	10.17	0.31
			0.00			1" Ice	18.83	11.05	0.45
DMP65R-BU8DA-K w/ Mount Pipe	A	From Face	4.00	0.0000	140.00	No Ice	17.16	10.13	0.14
			0.00			1/2" Ice	18.17	11.06	0.26
			0.00			1" Ice	19.19	12.01	0.38
DMP65R-BU8DA-K w/ Mount Pipe	B	From Face	4.00	0.0000	140.00	No Ice	17.16	10.13	0.14
			0.00			1/2" Ice	18.17	11.06	0.26
			0.00			1" Ice	19.19	12.01	0.38
DMP65R-BU8DA-K w/ Mount Pipe	C	From Face	4.00	0.0000	140.00	No Ice	17.16	10.13	0.14
			0.00			1/2" Ice	18.17	11.06	0.26
			0.00			1" Ice	19.19	12.01	0.38
RRUS 8843 B2/B66A	A	From Face	4.00	0.0000	140.00	No Ice	1.64	1.35	0.07
			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
RRUS 8843 B2/B66A	B	From Face	4.00	0.0000	140.00	No Ice	1.64	1.35	0.07
			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
RRUS 8843 B2/B66A	C	From Face	4.00	0.0000	140.00	No Ice	1.64	1.35	0.07
			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
RRUS 4478 B14_CCIV2	A	From Face	4.00	0.0000	140.00	No Ice	2.02	1.25	0.06
			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
RRUS 4478 B14_CCIV2	B	From Face	4.00	0.0000	140.00	No Ice	2.02	1.25	0.06
			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
RRUS 4478 B14_CCIV2	C	From Face	4.00	0.0000	140.00	No Ice	2.02	1.25	0.06
			0.00			1/2" Ice	2.20	1.40	0.08
			0.00			1" Ice	2.39	1.55	0.10
RRUS 4449 B5/B12	A	From Face	4.00	0.0000	140.00	No Ice	1.97	1.41	0.07
			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
RRUS 4449 B5/B12	B	From Face	4.00	0.0000	140.00	No Ice	1.97	1.41	0.07
			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
RRUS 4449 B5/B12	C	From Face	4.00	0.0000	140.00	No Ice	1.97	1.41	0.07
			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
DC9-48-60-24-8C-EV_CCIV 2	B	From Face	4.00	0.0000	140.00	No Ice	2.74	2.74	0.02
			0.00			1/2" Ice	2.96	2.96	0.04
			0.00			1" Ice	3.20	3.20	0.07
DC9-48-60-24-8C-EV_CCIV 2	C	From Face	4.00	0.0000	140.00	No Ice	2.74	2.74	0.02
			0.00			1/2" Ice	2.96	2.96	0.04
			0.00			1" Ice	3.20	3.20	0.07
RRUS 4415 B30_CCIV2	A	From Face	4.00	0.0000	140.00	No Ice	1.84	0.82	0.05
			0.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
RRUS 4415 B30_CCIV2	B	From Face	4.00	0.0000	140.00	No Ice	1.84	0.82	0.05
			0.00			1/2" Ice	2.01	0.94	0.06

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
			0.00			1" Ice	2.19	1.07	0.08
RRUS 4415 B30_CCIV2	C	From Face	4.00	0.0000	140.00	No Ice	1.84	0.82	0.05
			0.00			1/2" Ice	2.01	0.94	0.06
			0.00			1" Ice	2.19	1.07	0.08
2012 B29	A	From Face	4.00	0.0000	140.00	No Ice	1.86	0.70	0.04
			0.00			1/2" Ice	2.03	0.81	0.06
			0.00			1" Ice	2.20	0.94	0.07
2012 B29	B	From Face	4.00	0.0000	140.00	No Ice	1.86	0.70	0.04
			0.00			1/2" Ice	2.03	0.81	0.06
			0.00			1" Ice	2.20	0.94	0.07
2012 B29	C	From Face	4.00	0.0000	140.00	No Ice	1.86	0.70	0.04
			0.00			1/2" Ice	2.03	0.81	0.06
			0.00			1" Ice	2.20	0.94	0.07
DC6-48-60-0-8C	A	From Face	4.00	0.0000	140.00	No Ice	1.14	1.14	0.03
			0.00			1/2" Ice	1.79	1.79	0.05
			0.00			1" Ice	2.00	2.00	0.07
(2) 2.9" Dia. x 10' Pipe	A	From Face	4.00	0.0000	140.00	No Ice	2.88	2.88	0.06
			0.00			1/2" Ice	3.91	3.91	0.08
			0.00			1" Ice	4.96	4.96	0.11
(2) 2.9" Dia. x 10' Pipe	B	From Face	4.00	0.0000	140.00	No Ice	2.88	2.88	0.06
			0.00			1/2" Ice	3.91	3.91	0.08
			0.00			1" Ice	4.96	4.96	0.11
(2) 2.9" Dia. x 10' Pipe	C	From Face	4.00	0.0000	140.00	No Ice	2.88	2.88	0.06
			0.00			1/2" Ice	3.91	3.91	0.08
			0.00			1" Ice	4.96	4.96	0.11
(2) Site Pro 1 MM01	A	From Face	0.50	0.0000	140.00	No Ice	0.50	0.35	0.02
			0.00			1/2" Ice	0.75	0.52	0.03
			0.00			1" Ice	1.00	0.75	0.04
(2) Site Pro 1 MM01	B	From Face	0.50	0.0000	140.00	No Ice	0.50	0.35	0.02
			0.00			1/2" Ice	0.75	0.52	0.03
			0.00			1" Ice	1.00	0.75	0.04
(2) Site Pro 1 MM01	C	From Face	0.50	0.0000	140.00	No Ice	0.50	0.35	0.02
			0.00			1/2" Ice	0.75	0.52	0.03
			0.00			1" Ice	1.00	0.75	0.04
Site Pro 1 VFA12-HD	A	From Face	2.00	0.0000	140.00	No Ice	13.20	9.20	0.66
			0.00			1/2" Ice	19.50	14.60	0.80
			0.00			1" Ice	25.80	19.50	1.01
Site Pro 1 VFA12-HD	B	From Face	2.00	0.0000	140.00	No Ice	13.20	9.20	0.66
			0.00			1/2" Ice	19.50	14.60	0.80
			0.00			1" Ice	25.80	19.50	1.01
Site Pro 1 VFA12-HD	C	From Face	2.00	0.0000	140.00	No Ice	13.20	9.20	0.66
			0.00			1/2" Ice	19.50	14.60	0.80
			0.00			1" Ice	25.80	19.50	1.01
130									
MX08FRO665-21 w/ Mount Pipe	A	From Centroid-Face	4.00	0.0000	130.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	B	From Centroid-Face	4.00	0.0000	130.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
MX08FRO665-21 w/ Mount Pipe	C	From Centroid-Face	4.00	0.0000	130.00	No Ice	8.01	4.23	0.11
			0.00			1/2" Ice	8.52	4.69	0.19
			0.00			1" Ice	9.04	5.16	0.29
RF4451d-70A	A	From Centroid-Face	4.00	0.0000	130.00	No Ice	1.88	1.11	0.06
			0.00			1/2" Ice	2.05	1.25	0.08
			0.00			1" Ice	2.22	1.39	0.10
RF4451d-70A	B	From	4.00	0.0000	130.00	No Ice	1.88	1.11	0.06

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
		Centroid-Face	0.00			1/2" Ice	2.05	1.25	0.08
			0.00			1" Ice	2.22	1.39	0.10
RF4451d-70A	C	From Centroid-Face	4.00	0.0000	130.00	No Ice	1.88	1.11	0.06
			0.00			1/2" Ice	2.05	1.25	0.08
			0.00			1" Ice	2.22	1.39	0.10
RDIDC-9181-PF-48_CCIV3	B	From Centroid-Face	4.00	0.0000	130.00	No Ice	2.01	1.17	0.02
			0.00			1/2" Ice	2.19	1.31	0.04
			0.00			1" Ice	2.37	1.46	0.06
RF4450t-71A	A	From Centroid-Face	4.00	0.0000	130.00	No Ice	2.06	1.38	0.09
			0.00			1/2" Ice	2.24	1.53	0.12
			0.00			1" Ice	2.43	1.68	0.14
RF4450t-71A	B	From Centroid-Face	4.00	0.0000	130.00	No Ice	2.06	1.38	0.09
			0.00			1/2" Ice	2.24	1.53	0.12
			0.00			1" Ice	2.43	1.68	0.14
RF4450t-71A	C	From Centroid-Face	4.00	0.0000	130.00	No Ice	2.06	1.38	0.09
			0.00			1/2" Ice	2.24	1.53	0.12
			0.00			1" Ice	2.43	1.68	0.14
Commscope MC-PK8-DSH	C	None		0.0000	130.00	No Ice	34.24	34.24	1.75
						1/2" Ice	62.95	62.95	2.10
						1" Ice	91.66	91.66	2.45
(2) 2.4" Dia x 8-ft Mount Pipe	A	From Centroid-Face	4.00	0.0000	130.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
(2) 2.4" Dia x 8-ft Mount Pipe	B	From Centroid-Face	4.00	0.0000	130.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
(2) 2.4" Dia x 8-ft Mount Pipe	C	From Centroid-Face	4.00	0.0000	130.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.04
			0.00			1" Ice	3.40	3.40	0.06
***118**									
MT6407-77A w/ Mount Pipe	A	From Centroid-Leg	4.00	0.0000	118.00	No Ice	5.94	3.10	0.10
			0.00			1/2" Ice	6.47	3.55	0.13
			0.00			1" Ice	7.02	4.02	0.18
MT6407-77A w/ Mount Pipe	B	From Centroid-Leg	4.00	0.0000	118.00	No Ice	5.94	3.10	0.10
			0.00			1/2" Ice	6.47	3.55	0.13
			0.00			1" Ice	7.02	4.02	0.18
MT6407-77A w/ Mount Pipe	C	From Centroid-Leg	4.00	0.0000	118.00	No Ice	5.94	3.10	0.10
			0.00			1/2" Ice	6.47	3.55	0.13
			0.00			1" Ice	7.02	4.02	0.18
(3) MX06FRO660-03 w/ Mount Pipe	A	From Centroid-Leg	4.00	0.0000	118.00	No Ice	6.54	5.55	0.10
			0.00			1/2" Ice	7.06	6.05	0.18
			0.00			1" Ice	7.60	6.57	0.28
(3) MX06FRO660-03 w/ Mount Pipe	B	From Centroid-Leg	4.00	0.0000	118.00	No Ice	6.54	5.55	0.10
			0.00			1/2" Ice	7.06	6.05	0.18
			0.00			1" Ice	7.60	6.57	0.28
(3) MX06FRO660-03 w/ Mount Pipe	C	From Centroid-Leg	4.00	0.0000	118.00	No Ice	6.54	5.55	0.10
			0.00			1/2" Ice	7.06	6.05	0.18
			0.00			1" Ice	7.60	6.57	0.28
RVZDC-6627-PF-48_CCIV2	B	From Centroid-Leg	4.00	0.0000	118.00	No Ice	4.06	3.10	0.03
			0.00			1/2" Ice	4.32	3.34	0.07
			0.00			1" Ice	4.58	3.58	0.11
RF4440D-13A	A	From Centroid-Leg	4.00	0.0000	118.00	No Ice	1.87	1.13	0.07
			0.00			1/2" Ice	2.03	1.27	0.09
			0.00			1" Ice	2.21	1.41	0.11
RF4440D-13A	B	From Centroid-Leg	4.00	0.0000	118.00	No Ice	1.87	1.13	0.07
			0.00			1/2" Ice	2.03	1.27	0.09
			0.00			1" Ice	2.21	1.41	0.11

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
RF4440D-13A	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.13 1.27 1.41	0.07 0.09 0.11
RF4439D-25A	A	From Centroid-Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11
RF4439D-25A	B	From Centroid-Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11
RF4439D-25A	C	From Centroid-Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice	1.87 2.03 2.21	1.25 1.39 1.54	0.07 0.09 0.11
Site Pro 1 F3P-HRK12	C	None		0.0000	118.00	No Ice 1/2" Ice 1" Ice	5.38 7.22 8.88	4.64 6.35 8.13	0.41 0.50 0.59
Platform Mount F3P-12W	C	None		0.0000	118.00	No Ice 1/2" Ice 1" Ice	25.52 31.74 40.10	25.41 32.27 39.68	2.00 2.60 3.41
106 Design Loading - 225 ft^2 / 3500 lbs ***	C	None		0.0000	106.00	No Ice 1/2" Ice 1" Ice	225.00 338.00 451.00	225.00 338.00 451.00	3.50 9.00 14.50

Load Combinations

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	145 - 120	Pole	Max Tension	8	0.00	0.00	0.00
			Max. Compression	26	-17.61	-0.13	0.08
			Max. Mx	8	-10.16	-200.69	0.20
			Max. My	2	-10.16	-0.13	200.58
			Max. Vy	8	12.53	-200.69	0.20
			Max. Vx	14	12.51	0.14	-200.45
			Max. Torque	2			-0.36
L2	120 - 84.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-46.79	-0.40	-0.22
			Max. Mx	8	-23.19	-927.68	0.11
			Max. My	14	-23.19	0.04	-926.41
			Max. Vy	8	30.27	-927.68	0.11
			Max. Vx	14	30.24	0.04	-926.41
			Max. Torque	5			-0.78
L3	84.25 - 41.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.36	-0.19	-0.34
			Max. Mx	8	-35.03	-2270.54	0.00
			Max. My	14	-35.04	0.01	-2267.94
			Max. Vy	8	34.40	-2270.54	0.00
			Max. Vx	14	34.36	0.01	-2267.94
			Max. Torque	17			0.71
L4	41.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.74	0.09	-0.50
			Max. Mx	20	-54.32	4026.86	-0.08
			Max. My	14	-54.32	0.01	-4022.72
			Max. Vy	20	-38.54	4026.86	-0.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	14	38.50	0.01	-4022.72
			Max. Torque	32			-0.68

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	30	81.74	-12.72	-0.00
	Max. H_x	20	54.35	38.50	0.00
	Max. H_z	2	54.35	0.00	38.47
	Max. M_x	2	4022.52	0.00	38.47
	Max. M_z	8	4026.82	-38.50	-0.00
	Max. Torsion	38	0.68	6.36	11.01
	Min. Vert	17	40.76	19.25	-33.32
	Min. H_x	8	54.35	-38.50	-0.00
	Min. H_z	14	54.35	-0.00	-38.47
	Min. M_x	14	-4022.72	-0.00	-38.47
	Min. M_z	20	-4026.86	38.50	0.00
	Min. Torsion	32	-0.68	-6.36	-11.01

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	45.29	0.00	0.00	0.08	0.02	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	54.35	-0.00	-38.47	-4022.52	0.04	0.21
0.9 Dead+1.0 Wind 0 deg - No Ice	40.76	-0.00	-38.47	-3990.17	0.03	0.21
1.2 Dead+1.0 Wind 30 deg - No Ice	54.35	19.25	-33.32	-3483.59	-2013.39	0.49
0.9 Dead+1.0 Wind 30 deg - No Ice	40.76	19.25	-33.32	-3455.58	-1997.19	0.49
1.2 Dead+1.0 Wind 60 deg - No Ice	54.35	33.34	-19.23	-2011.20	-3487.32	0.64
0.9 Dead+1.0 Wind 60 deg - No Ice	40.76	33.34	-19.23	-1995.04	-3459.26	0.64
1.2 Dead+1.0 Wind 90 deg - No Ice	54.35	38.50	0.00	0.11	-4026.82	0.62
0.9 Dead+1.0 Wind 90 deg - No Ice	40.76	38.50	0.00	0.09	-3994.42	0.62
1.2 Dead+1.0 Wind 120 deg - No Ice	54.35	33.35	19.24	2011.42	-3487.34	0.44
0.9 Dead+1.0 Wind 120 deg - No Ice	40.76	33.35	19.24	1995.21	-3459.28	0.44
1.2 Dead+1.0 Wind 150 deg - No Ice	54.35	19.25	33.32	3483.80	-2013.42	0.13
0.9 Dead+1.0 Wind 150 deg - No Ice	40.76	19.25	33.32	3455.74	-1997.22	0.13
1.2 Dead+1.0 Wind 180 deg - No Ice	54.35	0.00	38.47	4022.72	0.01	-0.21

Load Combination	*Vertical*	*Shear$_x$*	*Shear$_z$*	*Overturning Moment, M_x*	*Overturning Moment, M_z*	*Torque*
	K	*K*	*K*	*kip-ft*	*kip-ft*	*kip-ft*
0.9 Dead+1.0 Wind 180 deg - No Ice	40.76	0.00	38.47	3990.32	0.00	-0.21
1.2 Dead+1.0 Wind 210 deg - No Ice	54.35	-19.25	33.32	3483.79	2013.44	-0.49
0.9 Dead+1.0 Wind 210 deg - No Ice	40.76	-19.25	33.32	3455.72	1997.23	-0.49
1.2 Dead+1.0 Wind 240 deg - No Ice	54.35	-33.34	19.23	2011.40	3487.37	-0.64
0.9 Dead+1.0 Wind 240 deg - No Ice	40.76	-33.34	19.23	1995.18	3459.30	-0.64
1.2 Dead+1.0 Wind 270 deg - No Ice	54.35	-38.50	-0.00	0.08	4026.86	-0.62
0.9 Dead+1.0 Wind 270 deg - No Ice	40.76	-38.50	-0.00	0.06	3994.45	-0.62
1.2 Dead+1.0 Wind 300 deg - No Ice	54.35	-33.35	-19.24	-2011.22	3487.38	-0.44
0.9 Dead+1.0 Wind 300 deg - No Ice	40.76	-33.35	-19.24	-1995.06	3459.31	-0.44
1.2 Dead+1.0 Wind 330 deg - No Ice	54.35	-19.25	-33.32	-3483.60	2013.46	-0.13
0.9 Dead+1.0 Wind 330 deg - No Ice	40.76	-19.25	-33.32	-3455.59	1997.25	-0.13
1.2 Dead+1.0 Ice+1.0 Temp	81.74	0.00	0.00	0.50	0.09	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	81.74	-0.00	-12.71	-1339.12	0.06	-0.53
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	81.74	6.36	-11.01	-1159.65	-670.21	-0.24
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	81.74	11.01	-6.35	-669.30	-1160.87	0.12
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	81.74	12.72	0.00	0.53	-1340.46	0.45
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	81.74	11.01	6.36	670.36	-1160.86	0.65
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	81.74	6.36	11.01	1160.71	-670.19	0.68
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	81.74	0.00	12.71	1340.19	0.08	0.53
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	81.74	-6.36	11.01	1160.72	670.34	0.24
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	81.74	-11.01	6.35	670.37	1161.01	-0.12
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	81.74	-12.72	-0.00	0.55	1340.60	-0.45
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	81.74	-11.01	-6.36	-669.28	1161.00	-0.65
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	81.74	-6.36	-11.01	-1159.64	670.32	-0.68
Dead+Wind 0 deg - Service	45.29	-0.00	-9.37	-975.30	0.02	0.04
Dead+Wind 30 deg - Service	45.29	4.69	-8.12	-844.62	-488.18	0.11
Dead+Wind 60 deg - Service	45.29	8.12	-4.69	-487.60	-845.57	0.15
Dead+Wind 90 deg - Service	45.29	9.38	0.00	0.09	-976.39	0.15
Dead+Wind 120 deg - Service	45.29	8.12	4.69	487.78	-845.57	0.11
Dead+Wind 150 deg - Service	45.29	4.69	8.12	844.79	-488.19	0.04
Dead+Wind 180 deg - Service	45.29	0.00	9.37	975.46	0.02	-0.04
Dead+Wind 210 deg - Service	45.29	-4.69	8.12	844.78	488.22	-0.11
Dead+Wind 240 deg - Service	45.29	-8.12	4.69	487.77	845.61	-0.15
Dead+Wind 270 deg - Service	45.29	-9.38	-0.00	0.08	976.42	-0.15
Dead+Wind 300 deg - Service	45.29	-8.12	-4.69	-487.61	845.61	-0.11
Dead+Wind 330 deg - Service	45.29	-4.69	-8.12	-844.62	488.22	-0.04

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	0.00	-45.29	0.00	0.00	45.29	0.00	0.000%
2	-0.00	-54.35	-38.47	0.00	54.35	38.47	0.000%
3	-0.00	-40.76	-38.47	0.00	40.76	38.47	0.000%
4	19.25	-54.35	-33.32	-19.25	54.35	33.32	0.000%
5	19.25	-40.76	-33.32	-19.25	40.76	33.32	0.000%
6	33.34	-54.35	-19.23	-33.34	54.35	19.23	0.000%
7	33.34	-40.76	-19.23	-33.34	40.76	19.23	0.000%
8	38.50	-54.35	0.00	-38.50	54.35	-0.00	0.000%
9	38.50	-40.76	0.00	-38.50	40.76	-0.00	0.000%
10	33.35	-54.35	19.24	-33.35	54.35	-19.24	0.000%
11	33.35	-40.76	19.24	-33.35	40.76	-19.24	0.000%
12	19.25	-54.35	33.32	-19.25	54.35	-33.32	0.000%
13	19.25	-40.76	33.32	-19.25	40.76	-33.32	0.000%
14	0.00	-54.35	38.47	-0.00	54.35	-38.47	0.000%
15	0.00	-40.76	38.47	-0.00	40.76	-38.47	0.000%
16	-19.25	-54.35	33.32	19.25	54.35	-33.32	0.000%
17	-19.25	-40.76	33.32	19.25	40.76	-33.32	0.000%
18	-33.34	-54.35	19.23	33.34	54.35	-19.23	0.000%
19	-33.34	-40.76	19.23	33.34	40.76	-19.23	0.000%
20	-38.50	-54.35	-0.00	38.50	54.35	0.00	0.000%
21	-38.50	-40.76	-0.00	38.50	40.76	0.00	0.000%
22	-33.35	-54.35	-19.24	33.35	54.35	19.24	0.000%
23	-33.35	-40.76	-19.24	33.35	40.76	19.24	0.000%
24	-19.25	-54.35	-33.32	19.25	54.35	33.32	0.000%
25	-19.25	-40.76	-33.32	19.25	40.76	33.32	0.000%
26	0.00	-81.74	0.00	0.00	81.74	0.00	0.000%
27	-0.00	-81.74	-12.71	0.00	81.74	12.71	0.000%
28	6.36	-81.74	-11.01	-6.36	81.74	11.01	0.000%
29	11.01	-81.74	-6.35	-11.01	81.74	6.35	0.000%
30	12.72	-81.74	0.00	-12.72	81.74	-0.00	0.000%
31	11.01	-81.74	6.36	-11.01	81.74	-6.36	0.000%
32	6.36	-81.74	11.01	-6.36	81.74	-11.01	0.000%
33	0.00	-81.74	12.71	-0.00	81.74	-12.71	0.000%
34	-6.36	-81.74	11.01	6.36	81.74	-11.01	0.000%
35	-11.01	-81.74	6.35	11.01	81.74	-6.35	0.000%
36	-12.72	-81.74	-0.00	12.72	81.74	0.00	0.000%
37	-11.01	-81.74	-6.36	11.01	81.74	6.36	0.000%
38	-6.36	-81.74	-11.01	6.36	81.74	11.01	0.000%
39	-0.00	-45.29	-9.37	0.00	45.29	9.37	0.000%
40	4.69	-45.29	-8.12	-4.69	45.29	8.12	0.000%
41	8.12	-45.29	-4.69	-8.12	45.29	4.69	0.000%
42	9.38	-45.29	0.00	-9.38	45.29	-0.00	0.000%
43	8.12	-45.29	4.69	-8.12	45.29	-4.69	0.000%
44	4.69	-45.29	8.12	-4.69	45.29	-8.12	0.000%
45	0.00	-45.29	9.37	-0.00	45.29	-9.37	0.000%
46	-4.69	-45.29	8.12	4.69	45.29	-8.12	0.000%
47	-8.12	-45.29	4.69	8.12	45.29	-4.69	0.000%
48	-9.38	-45.29	-0.00	9.38	45.29	0.00	0.000%
49	-8.12	-45.29	-4.69	8.12	45.29	4.69	0.000%
50	-4.69	-45.29	-8.12	4.69	45.29	8.12	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00002291
2	Yes	4	0.00000001	0.00027592
3	Yes	4	0.00000001	0.00016523
4	Yes	5	0.00000001	0.00044669
5	Yes	5	0.00000001	0.00019982
6	Yes	5	0.00000001	0.00043478
7	Yes	5	0.00000001	0.00019403
8	Yes	4	0.00000001	0.00022192
9	Yes	4	0.00000001	0.00012832
10	Yes	5	0.00000001	0.00044116
11	Yes	5	0.00000001	0.00019713
12	Yes	5	0.00000001	0.00044263
13	Yes	5	0.00000001	0.00019785
14	Yes	4	0.00000001	0.00027430
15	Yes	4	0.00000001	0.00016415
16	Yes	5	0.00000001	0.00043420
17	Yes	5	0.00000001	0.00019378
18	Yes	5	0.00000001	0.00044633
19	Yes	5	0.00000001	0.00019963
20	Yes	4	0.00000001	0.00022335
21	Yes	4	0.00000001	0.00012931
22	Yes	5	0.00000001	0.00043943
23	Yes	5	0.00000001	0.00019629
24	Yes	5	0.00000001	0.00043773
25	Yes	5	0.00000001	0.00019551
26	Yes	4	0.00000001	0.00000001
27	Yes	5	0.00000001	0.00017439
28	Yes	5	0.00000001	0.00023604
29	Yes	5	0.00000001	0.00023568
30	Yes	5	0.00000001	0.00017474
31	Yes	5	0.00000001	0.00023750
32	Yes	5	0.00000001	0.00023550
33	Yes	5	0.00000001	0.00017457
34	Yes	5	0.00000001	0.00023611
35	Yes	5	0.00000001	0.00023661
36	Yes	5	0.00000001	0.00017456
37	Yes	5	0.00000001	0.00023487
38	Yes	5	0.00000001	0.00023673
39	Yes	4	0.00000001	0.00003403
40	Yes	4	0.00000001	0.00022495
41	Yes	4	0.00000001	0.00020847
42	Yes	4	0.00000001	0.00003245
43	Yes	4	0.00000001	0.00021702
44	Yes	4	0.00000001	0.00021907
45	Yes	4	0.00000001	0.00003402
46	Yes	4	0.00000001	0.00020786
47	Yes	4	0.00000001	0.00022433
48	Yes	4	0.00000001	0.00003245
49	Yes	4	0.00000001	0.00021444
50	Yes	4	0.00000001	0.00021239

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 120	17.214	42	1.0056	0.0010
L2	120 - 84.25	12.054	42	0.9322	0.0007
L3	89.5 - 41.5	6.705	42	0.7112	0.0003
L4	48 - 0	1.918	42	0.3653	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	AIR 6419 B77G_CCIV3 w/ Mount Pipe	42	16.157	0.9955	0.0010	48775
130.00	MX08FRO665-21 w/ Mount Pipe	42	14.069	0.9708	0.0008	16258
118.00	MT6407-77A w/ Mount Pipe	42	11.665	0.9220	0.0007	9606
106.00	Design Loading - 225 ft^2 / 3500 lbs	42	9.435	0.8447	0.0005	8518

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 120	71.052	8	4.1544	0.0044
L2	120 - 84.25	49.755	8	3.8506	0.0029
L3	89.5 - 41.5	27.675	8	2.9371	0.0012
L4	48 - 0	7.914	8	1.5079	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
140.00	AIR 6419 B77G_CCIV3 w/ Mount Pipe	8	66.691	4.1128	0.0042	11913
130.00	MX08FRO665-21 w/ Mount Pipe	8	58.071	4.0105	0.0036	3970
118.00	MT6407-77A w/ Mount Pipe	8	48.146	3.8085	0.0028	2343
106.00	Design Loading - 225 ft^2 / 3500 lbs	8	38.943	3.4890	0.0021	2075

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	145 - 120 (1)	TP29.9483x24x0.1875	25.00	0.00	0.0	17.7114	-10.16	1036.12	0.010
L2	120 - 84.25 (2)	TP38.4543x29.9483x0.3125	35.75	0.00	0.0	36.5929	-23.19	2140.69	0.011
L3	84.25 - 41.5 (3)	TP48.0009x36.5802x0.4375	48.00	0.00	0.0	63.9001	-35.03	3738.16	0.009
L4	41.5 - 0 (4)	TP57x45.5793x0.5	48.00	0.00	0.0	89.6655	-54.32	5245.43	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	145 - 120 (1)	TP29.9483x24x0.1875	200.80	677.78	0.296	0.00	677.78	0.000
L2	120 - 84.25 (2)	TP38.4543x29.9483x0.3125	927.67	1942.38	0.478	0.00	1942.38	0.000
L3	84.25 - 41.5 (3)	TP48.0009x36.5802x0.4375	2270.53	4371.18	0.519	0.00	4371.18	0.000
L4	41.5 - 0 (4)	TP57x45.5793x0.5	4026.86	7384.33	0.545	0.00	7384.33	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	145 - 120 (1)	TP29.9483x24x0.1875	12.53	310.83	0.040	0.26	810.13	0.000
L2	120 - 84.25 (2)	TP38.4543x29.9483x0.3125	30.27	642.21	0.047	0.40	2074.88	0.000
L3	84.25 - 41.5 (3)	TP48.0009x36.5802x0.4375	34.40	1121.45	0.031	0.50	4519.35	0.000
L4	41.5 - 0 (4)	TP57x45.5793x0.5	38.54	1573.63	0.024	0.62	7786.30	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	145 - 120 (1)	0.010	0.296	0.000	0.040	0.000	0.308	1.050	4.8.2
L2	120 - 84.25 (2)	0.011	0.478	0.000	0.047	0.000	0.491	1.050	4.8.2
L3	84.25 - 41.5 (3)	0.009	0.519	0.000	0.031	0.000	0.530	1.050	4.8.2
L4	41.5 - 0 (4)	0.010	0.545	0.000	0.024	0.000	0.556	1.050	4.8.2

Section Capacity Table

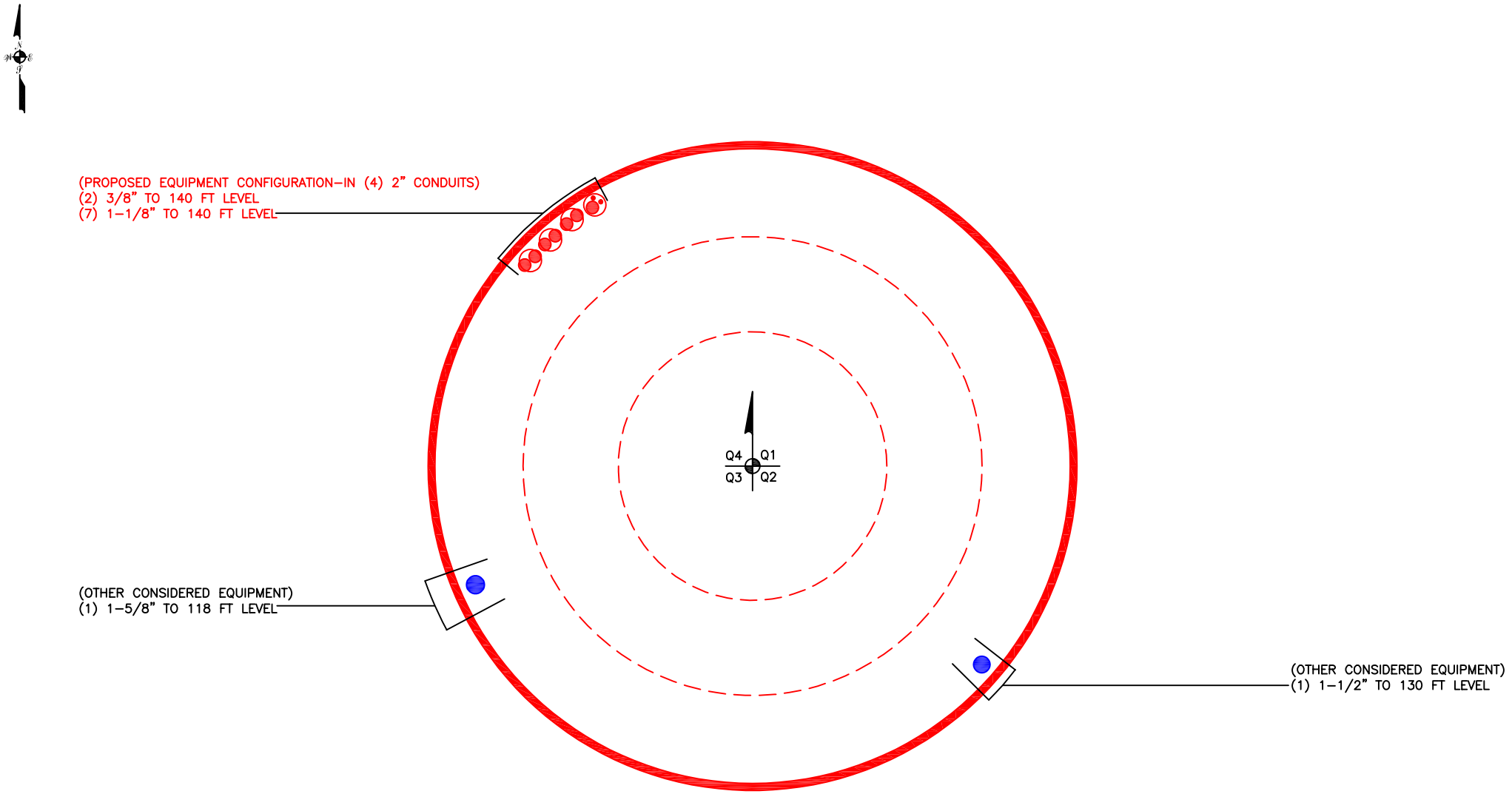
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	145 - 120	Pole	TP29.9483x24x0.1875	1	-10.16	1087.93	29.3	Pass
L2	120 - 84.25	Pole	TP38.4543x29.9483x0.3125	2	-23.19	2247.72	46.7	Pass
L3	84.25 - 41.5	Pole	TP48.0009x36.5802x0.4375	3	-35.03	3925.07	50.5	Pass
L4	41.5 - 0	Pole	TP57x45.5793x0.5	4	-54.32	5507.70	53.0	Pass
							Summary	
						Pole (L4)	53.0	Pass
						RATING =	**53.0**	**Pass**

Program Version 8.1.1.0

APPENDIX B

BASE LEVEL DRAWING


(PROPOSED EQUIPMENT CONFIGURATION–IN (4) 2" CONDUITS)
(2) 3/8" TO 140 FT LEVEL
(7) 1–1/8" TO 140 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1–5/8" TO 118 FT LEVEL
(OTHER CONSIDERED EQUIPMENT)
(1) 1–1/2" TO 130 FT LEVEL
Q4
Q1
Q3
Q2

APPENDIX C

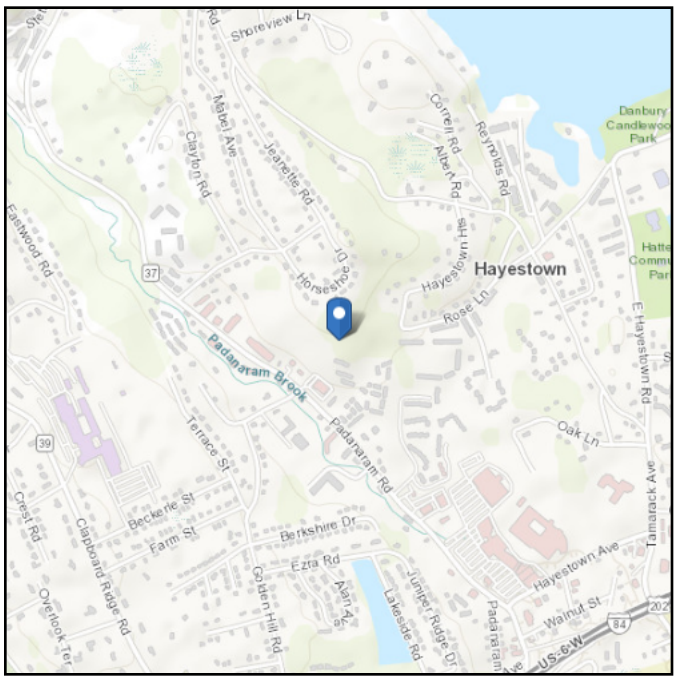
ADDITIONAL CALCULATIONS

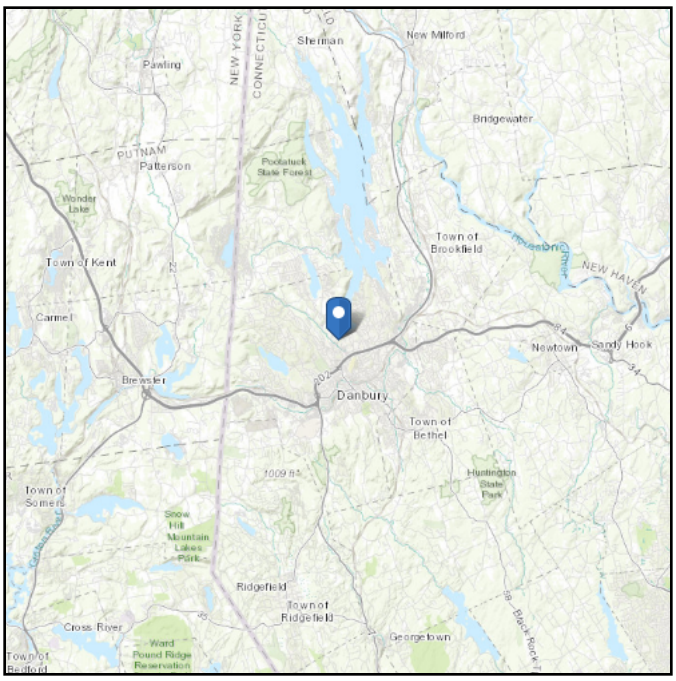
ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Stiff Soil

Latitude: 41.418917
Longitude: -73.461944
Elevation: 569.7625510243959 ft (NAVD 88)





Wind

Results:

Wind Speed	115 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	96 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: Wed Aug 16 2023

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 not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

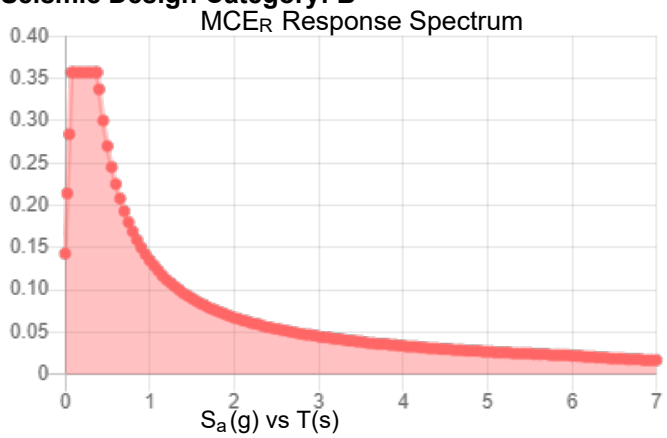
D - Stiff Soil

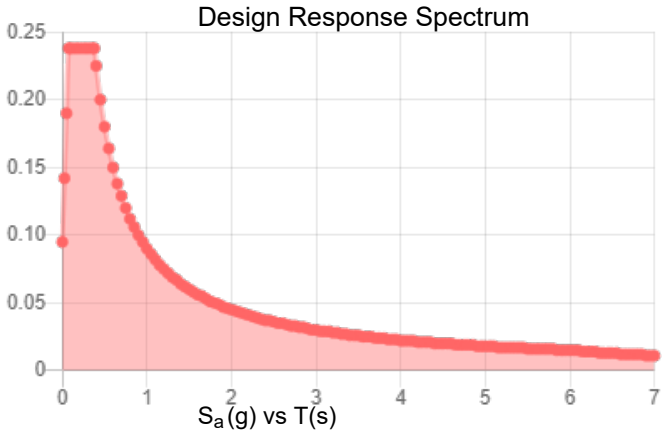
Site Soil Class:

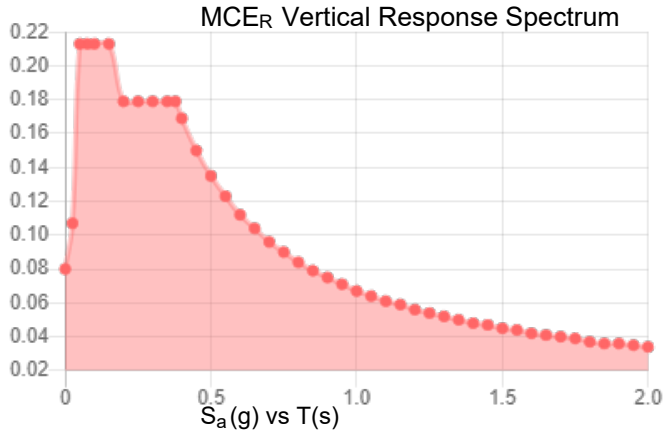
Results:

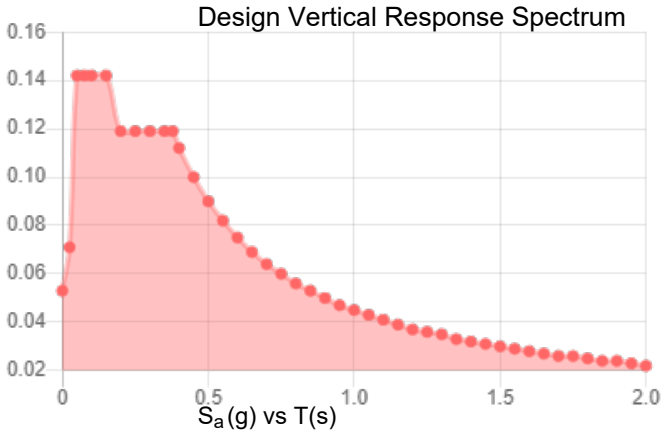
S_S :	0.223	S_{D1} :	0.09
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.128
F_v :	2.4	PGA_M :	0.198
S_{MS} :	0.357	F_{PGA} :	1.543
S_{M1} :	0.135	I_e :	1
S_{DS} :	0.238	C_v :	0.746

Seismic Design Category: B









Data Accessed: **Wed Aug 16 2023**

Date Source:

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

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Wed Aug 16 2023

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.

Monopole Flange Plate Connection

Elevation = 120 ft.

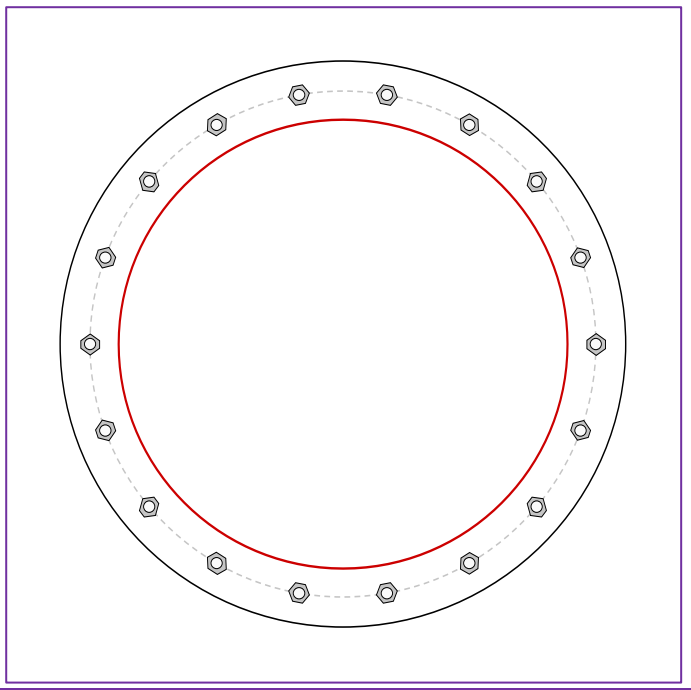
BU #	823531
Site Name	896/M&M Concrete P
Order #	656359 Rev. 0

TIA-222 Revision	H

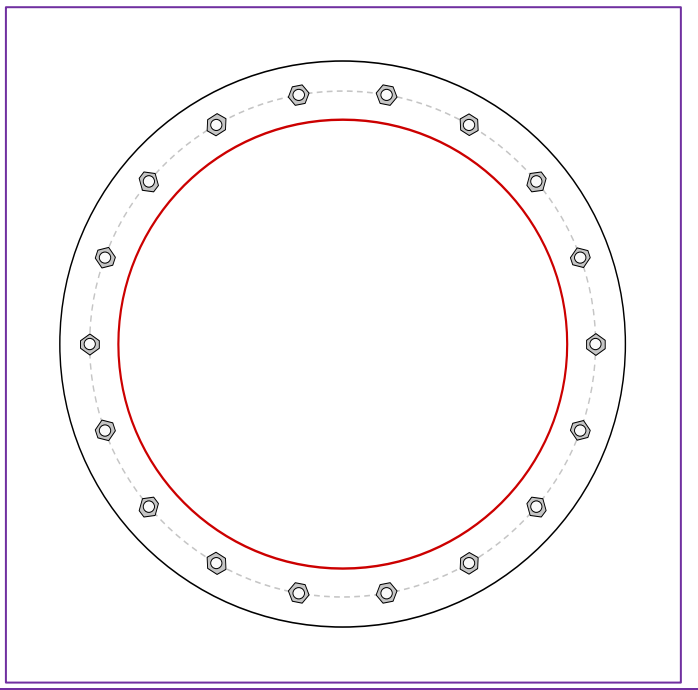
Applied Loads	
Moment (kip-ft)	200.80
Axial Force (kips)	10.16
Shear Force (kips)	12.53

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(18) 3/4" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 33.75" BC

Top Plate Data

37.75" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Plate Data

37.75" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Top Stiffener Data

N/A

Bottom Stiffener Data

N/A

Top Pole Data

29.9483" x 0.1875" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Bottom Pole Data

29.9483" x 0.3125" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	15.30	
Allowable (kips)	30.04	
Stress Rating:	**48.5%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	6.69	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**14.2%**	**Pass**
Tension Side Stress Rating:	**7.0%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	6.69	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**14.2%**	**Pass**
Tension Side Stress Rating:	**7.0%**	**Pass**

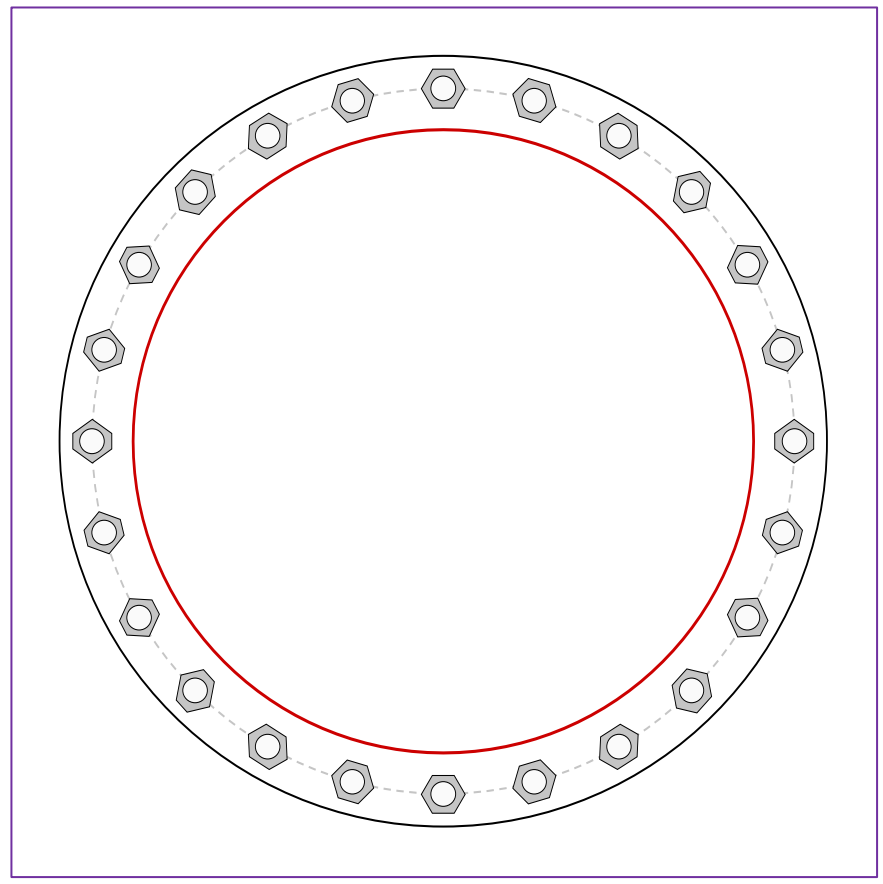
Monopole Base Plate Connection

Site Info	
BU #	823531
Site Name	CT896/M&M Concrete
Order #	656359 Rev. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2

Applied Loads	
Moment (kip-ft)	4026.86
Axial Force (kips)	54.32
Shear Force (kips)	38.54

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(24) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 64.5" BC

Base Plate Data

70.5" OD x 2.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

57" x 0.5" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

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

Pu_t = 122.54	ϕPn_t = 243.75	**Stress Rating**
Vu = 1.61	ϕVn = 149.1	**47.9%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	25.02	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**53.0%**	**Pass**

Pier and Pad Foundation

BU # :	823531
Site Name:	CT896/M&M Concr
App. Number:	656359 Rev. 0

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☐
Rectangular Pad?:	☐

Superstructure Analysis Reactions

Compression, P_{comp}:	54.35	kips
Base Shear, Vu_comp:	38.5	kips
Moment, M_u:	4026.86	ft-kips
Tower Height, **H**:	145	ft
BP Dist. Above Fdn, bp_{dist}:	4	in

Pier Properties

Pier Shape:	Circular	
Pier Diameter, **dpier**:	7.5	ft
Ext. Above Grade, **E**:	2	ft
Pier Rebar Size, **Sc**:	10	
Pier Rebar Quantity, **mc**:	40	
Pier Tie/Spiral Size, **St**:	5	
Pier Tie/Spiral Quantity, **mt**:	14	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties

Depth, **D**:	7.5	ft
Pad Width, W_1:	28	ft
Pad Thickness, **T**:	3	ft
Pad Rebar Size (Bottom dir. 2), Sp_2:	10	
Pad Rebar Quantity (Bottom dir. 2), mp_2:	28	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

Rebar Grade, **Fy**:	60	ksi
Concrete Compressive Strength, **F'c**:	4	ksi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	115	pcf
Ultimate Gross Bearing, Qult:	122.350	ksf
Cohesion, **Cu**:		ksf
Friction Angle, φ:	45	degrees
SPT Blow Count, N_{blows}:	50	
Base Friction, μ:	0.5	
Neglected Depth, **N**:	3.33	ft
Foundation Bearing on Rock?	Yes	
Groundwater Depth, **gw**:	N/A	ft

<--Toggle between Gross and Net

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	548.74	38.50	**6.7%**	**Pass**
Bearing Pressure (ksf)	91.76	2.44	**2.7%**	**Pass**
*Overturning (kip*ft)*	10317.35	4405.44	**42.7%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	8642.39	4277.11	**47.1%**	**Pass**
Pier Compression (kip)	28118.83	106.04	**0.4%**	**Pass**
*Pad Flexure (kip*ft)*	4826.39	1486.35	**29.3%**	**Pass**
Pad Shear - 1-way (kips)	991.18	209.09	**20.1%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.041	**20.5%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	5608.90	2566.27	**43.6%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Structural Rating*:	**47.1%**
Soil Rating*:	**42.7%**

Date: January 8, 2024

MTS Engineering, P.L.L.C.
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
towersupport@btgrp.com

Subject:	**Mount Analysis - Conditional Passing Report**	
Carrier Designation:	**DISH Network Co-Locate**	
	Carrier Site Number:	NJJER01113B
	Carrier Site Name:	--
Crown Castle Designation:	**BU Number:**	823531
	Site Name:	CT896/M&M Concrete Pole
	JDE Job Number:	2101084
	Order Number:	656359, Rev. 0
Engineering Firm Designation:	**Report Designation:**	137173.004.01.0001
Site Data:	**41 Padanaram Rd, Danbury, CT, Fairfield County, 06811** **Latitude 41° 25' 8.52" Longitude -73° 27' 43.96"**	
Structure Information:	**Tower Height & Type:**	**145 ft. Monopole**
	Mount Elevation:	**130 ft.**
	Mount Type:	**8 ft. Platform Mount**

We are pleased to submit this **"Mount Analysis - Conditional Passing Report"** to determine the structural integrity of DISH Network's antenna mounting system with the proposed appurtenance and equipment addition on the above mentioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

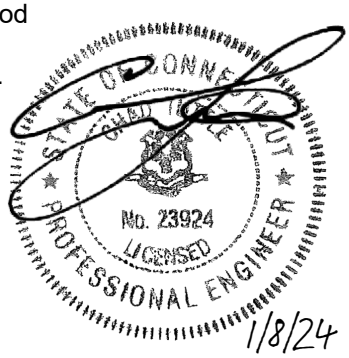
The purpose of the analysis is to determine acceptability of the mount's stress level. Based on our analysis we have determined the stress level to be:

Platform Mount **Sufficient**
***Sufficient upon completion of the changes listed in the 'Recommendations' section of the report.**

This analysis utilizes an ultimate 3-second gust wind speed of 115 mph as required by the 2022 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount structural analysis prepared by: Angela Ashwood

Respectfully submitted by: MTS Engineering, P.L.L.C.
COA: BER: 2386985 Expires: 03/31/2024



Chad E. Tuttle, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

This is a proposed 3 - sector 8' Platform Mount, designed by Commscope Part# MC-PK8-DSH.

2) ANALYSIS CRITERIA

Building Code:	2021 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	115 mph
Exposure Category:	C
Topographic Factor at Base:	1
Topographic Factor at Mount:	1
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Seismic S_s:	0.223
Seismic S_1:	0.056
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb.
Man Live Load at Mount Pipes:	500 lb.

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft.)	Antenna Centerline (ft.)	Number of Antennas	Manufacturer	Model / Type	Mount / Modification Details
130	130	3	JMA Wireless	MX08FRO665-21	8 ft. Platform Mount
		1	Raycap	RDIDC-9181-PF-48_CCIV3	
		3	Samsung Telecommunications	RF4450t-71A	
		3	Samsung Telecommunications	RF4451d-70A	

Table 2 - Documents Provided

Document	Remarks	Reference	Source
CCI Order	Proposed Loading	Date: 08/10/2023	Crown Castle
Mount Manufacturer Drawing	Commscope Part# MC-PK8-DSH	Date: 12/09/2021	Commscope

3) ANALYSIS PROCEDURE

3.1) Analysis Method

RISA-3D (Version 21.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

A tool internally developed by MTS Engineering, P.L.L.C., was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. Selected output from the analysis is included in Appendix B.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Mount Analysis* (Revision E).

Manufacturers drawing were used to create the model.

3.2) Assumptions

1. The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design, TIA Standards, and/or manufacturer's specifications.
2. The configuration of antennas, mounts, and other appurtenances are as specified in Table-1.
3. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected members unless otherwise specified in this report.
4. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
5. Serviceability with respect to antenna twist, tilt, roll or lateral translation is not checked and is left to the carrier or tower owner to ensure conformance.
6. Prior structural modifications to the tower mounting system are assumed to be installed as shown per available data.
7. The analysis will be required to be revised if the existing conditions in the field differ from those shown in the above-referenced documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.
8. The following material grades were assumed (Unless Noted Otherwise):
   (a) Connection Bolts : ASTM A325
   (b) Steel Pipe : ASTM A53 (GR. 35)
   (c) HSS (Round) : ASTM 500 (GR. B-42)
   (d) HSS (Rectangular) : ASTM 500 (GR. B-46)
   (e) Channel : ASTM A36 (GR. 36)
   (f) Steel Solid Rod : ASTM A36 (GR. 36)
   (g) Steel Plate : ASTM A36 (GR. 36)
   (h) Steel Angle : ASTM A36 (GR. 36)
   (i) UNISTRUT : ASTM A570 (GR. 33)

This analysis may be affected if any assumptions are not valid or have been made in error. MTS Engineering, P.L.L.C. should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Platform Mount)

Notes	Component	Centerline (ft.)	Critical Member	% Capacity	Pass / Fail
1,2	Main Face Horizontals	130	6	7.1	Pass
	Support Rails		22	10.7	Pass
	Support Tubes		1	48.4	Pass
	Support Channels		32	34.3	Pass
	Support Angles		10	22.5	Pass
	Mount Pipes		83	12.2	Pass
	Connection Plates		36	20.1	Pass
	Connection Angles		11	29.4	Pass
3	Mount to Tower Connection		--	23.2	Pass

Structure Rating with Recommendations (max from all components) =	**48.4%**

Notes:
1) Capacities listed are based on recommendations listed in Sec.4.1 being installed
2) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
3) See additional documentation in "Appendix D - Additional Calculations" for calculations supporting the % capacity reported.

4.1) Recommendations

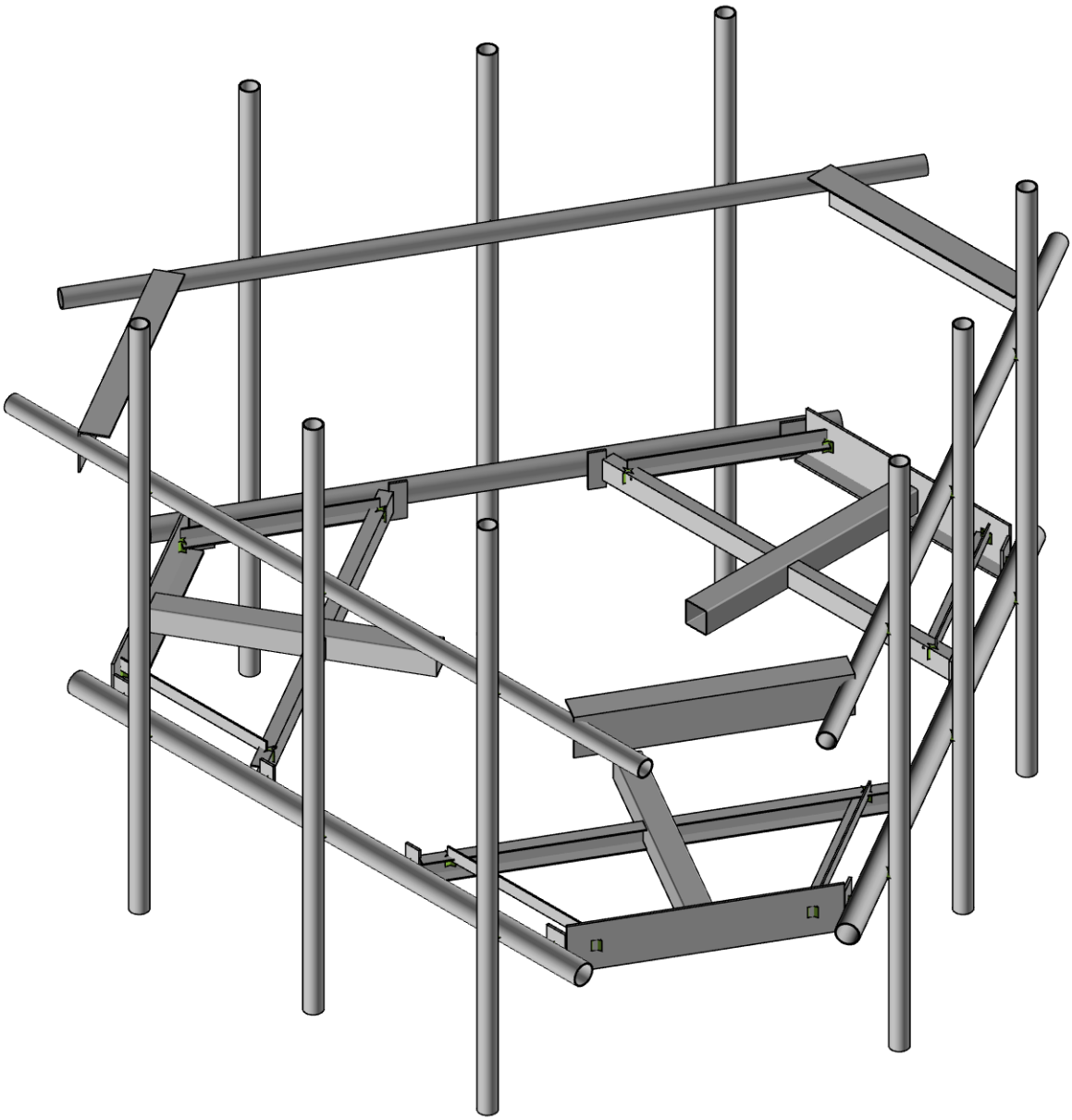
The proposed mount has sufficient capacity to support the proposed loading configuration. In order for the results of this analysis to be considered valid, the mount listed below shall be installed.

1. Commscope Part #MC-PK8-DSH.

No structural modifications are required at this time.

APPENDIX A

WIRE FRAME AND RENDERED MODELS



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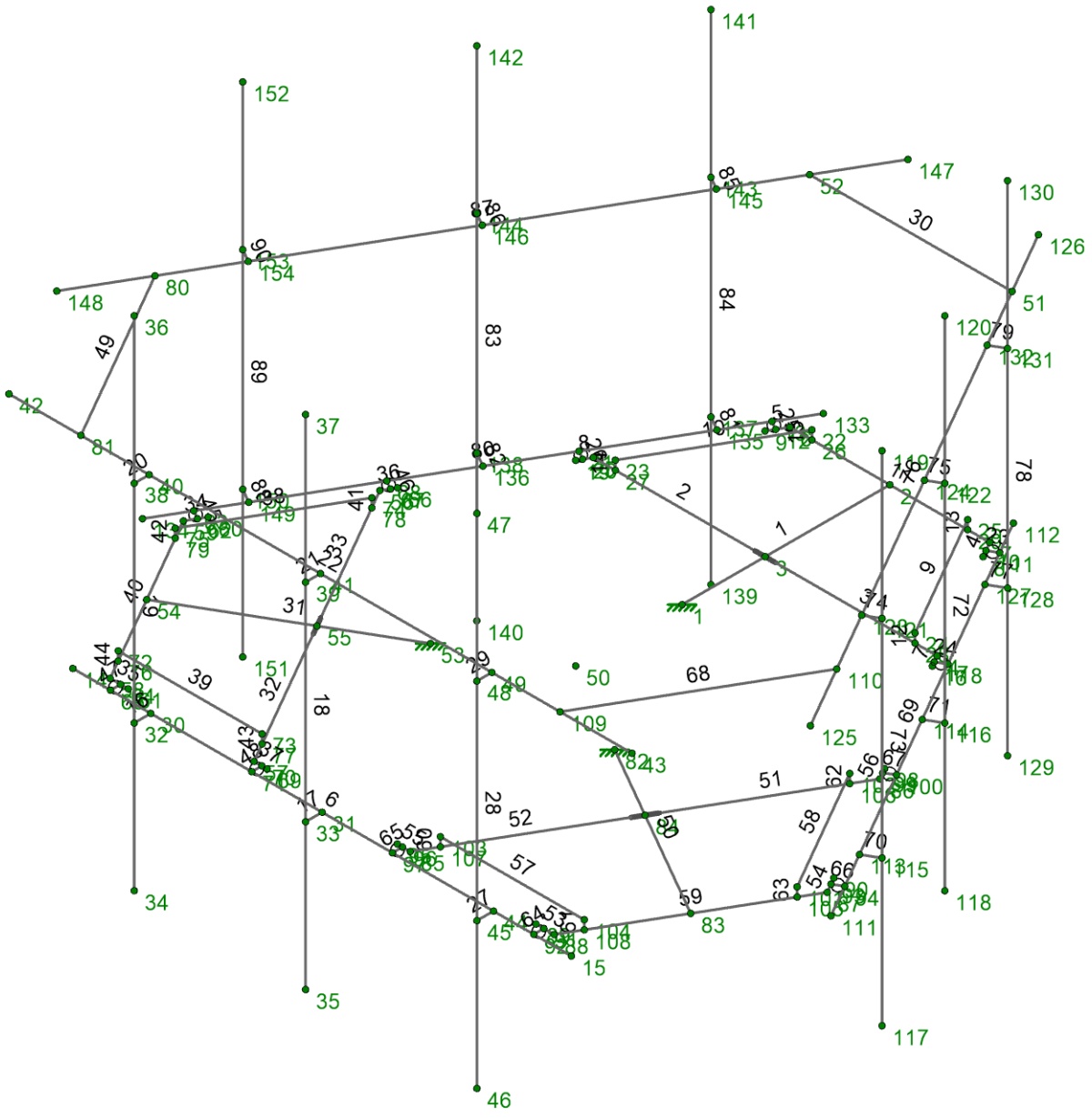

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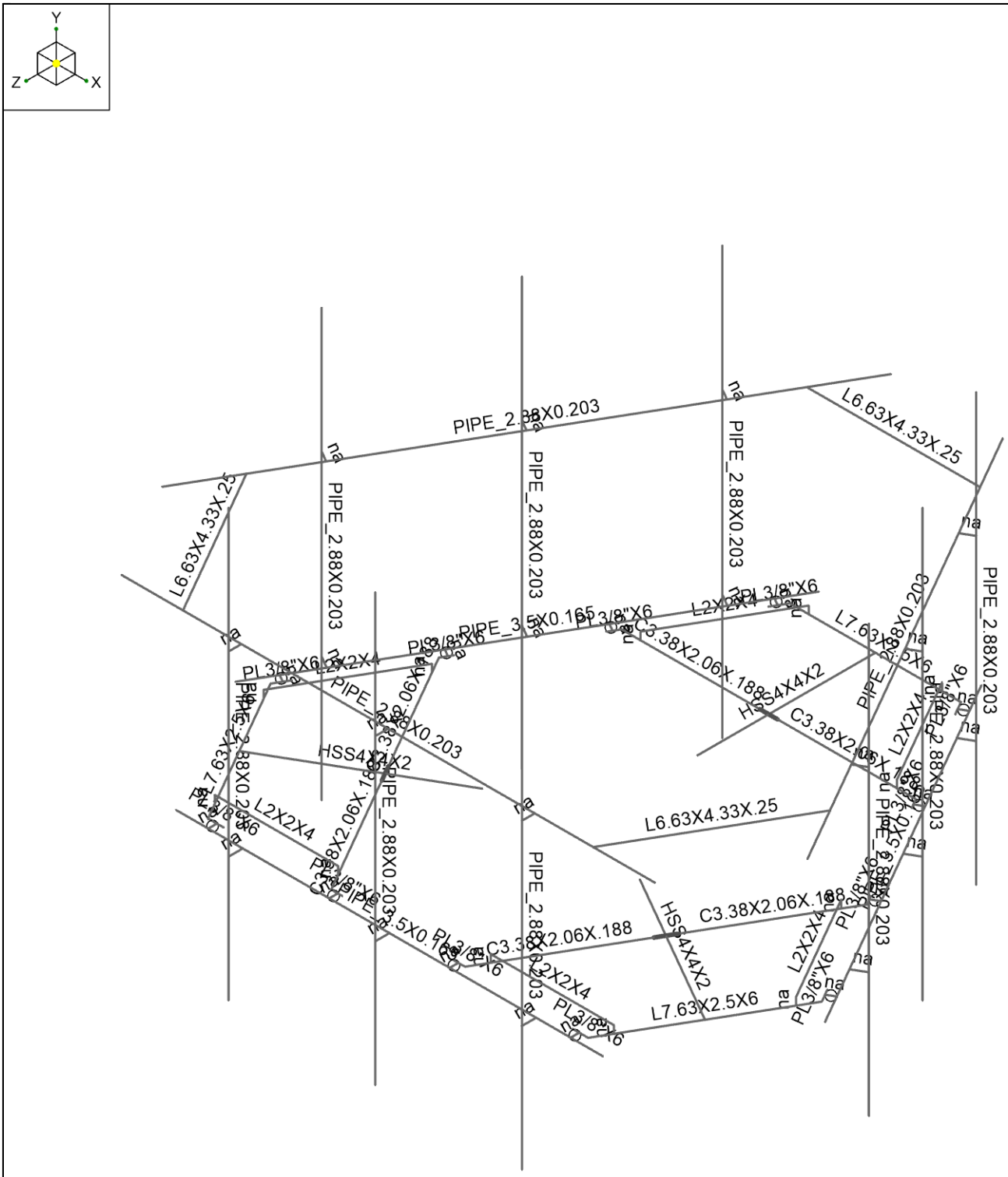
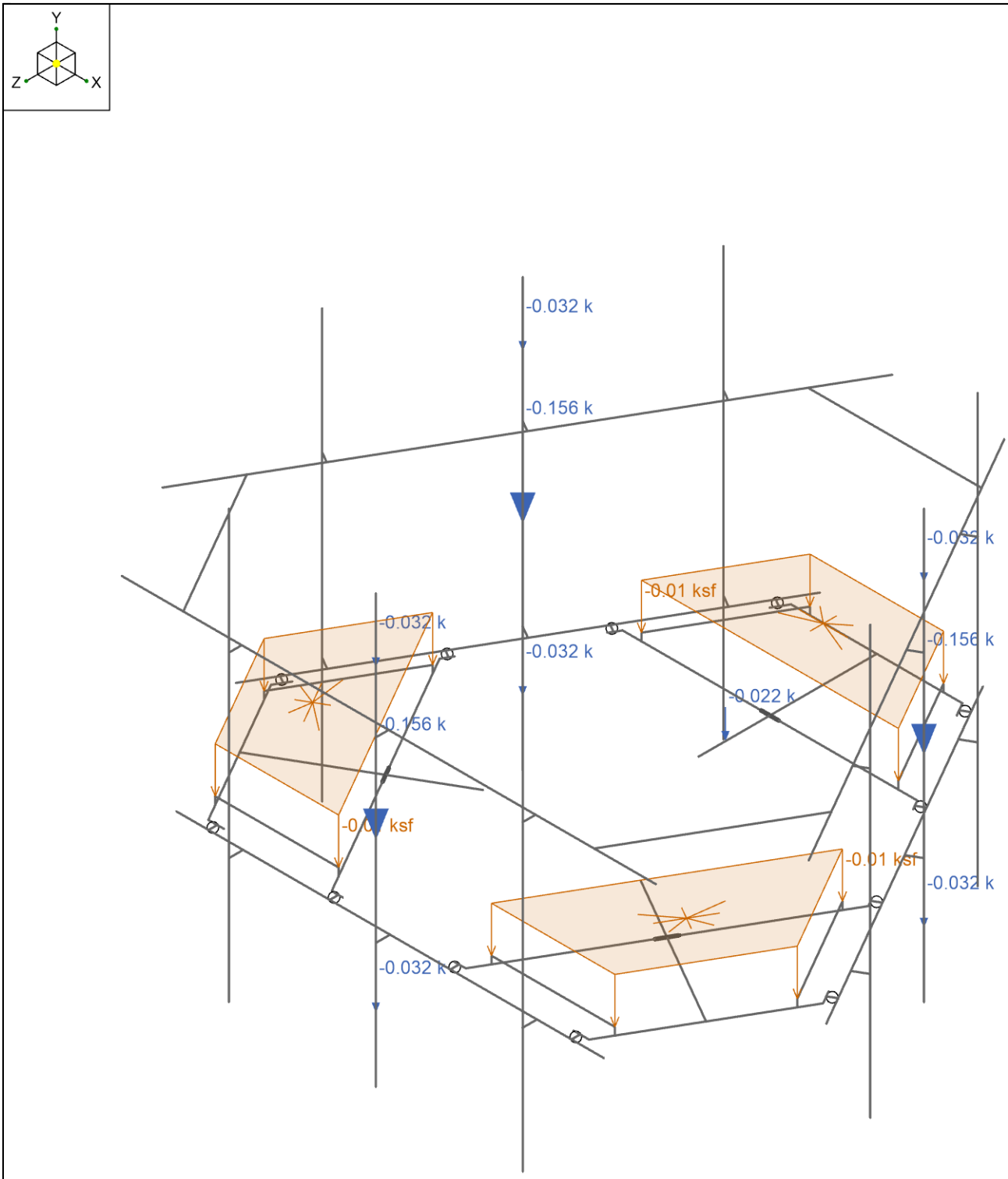


IRISA A NEMETSCHEK COMPANY	MTS Engineering, P.L.L.C.	823531 - CT896/M&M Concrete Pole	SK-3
	KP		Jan 06, 2024 at 03:31 PM
	137173.004.01.0001		137173_004_01_0001_CT89…



Loads: BLC 1, Dead

IRISA A NEMETSCHEK COMPANY	MTS Engineering, P.L.L.C.	823531 - CT896/M&M Concrete Pole	SK-4
	KP		Jan 06, 2024 at 03:32 PM
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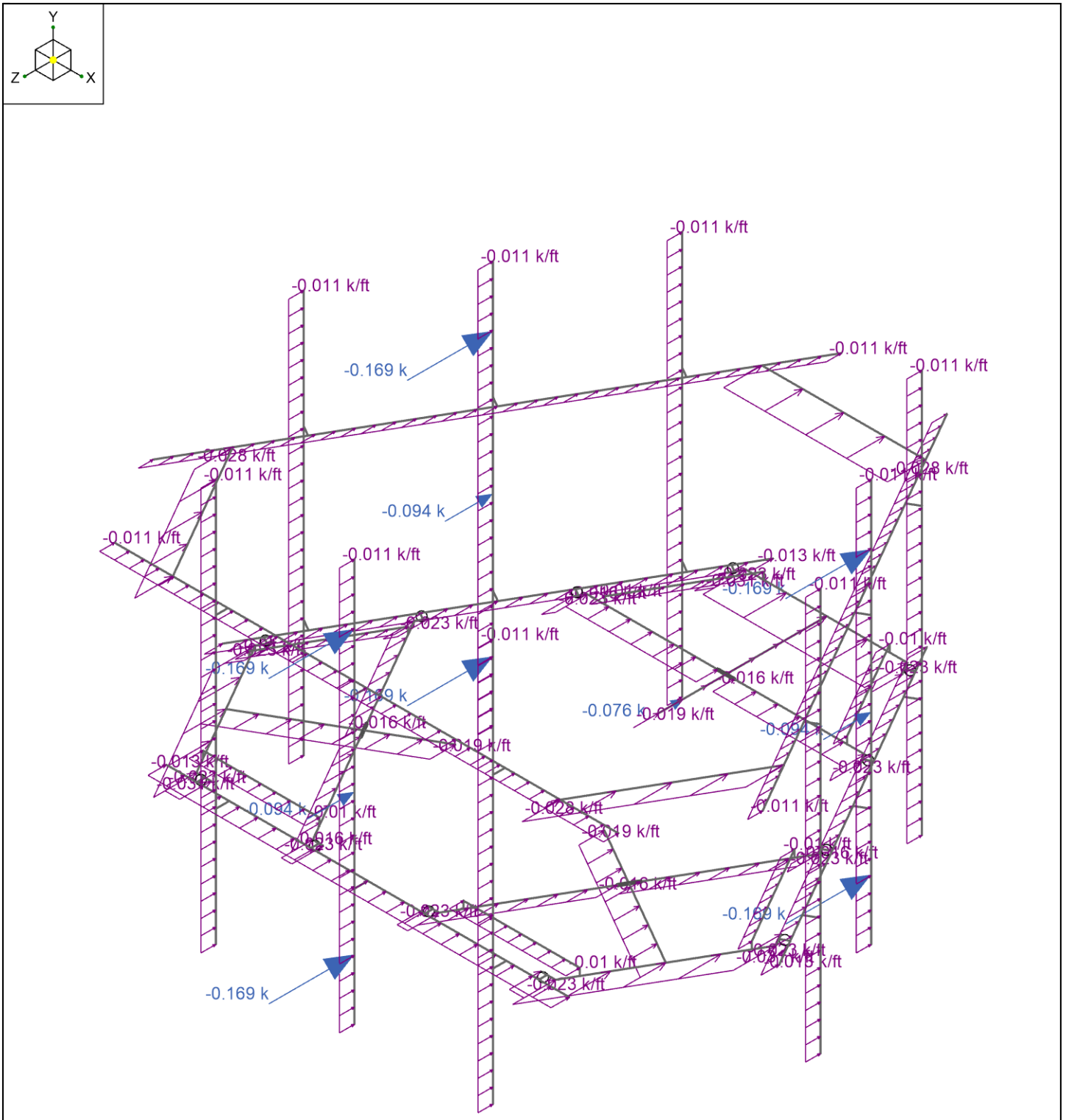

Loads: BLC 2, 0 Wind - No Ice

IRISA A NEMETSCHEK COMPANY	MTS Engineering, P.L.L.C.	823531 - CT896/M&M Concrete Pole	SK-5
	KP		Jan 06, 2024 at 03:32 PM
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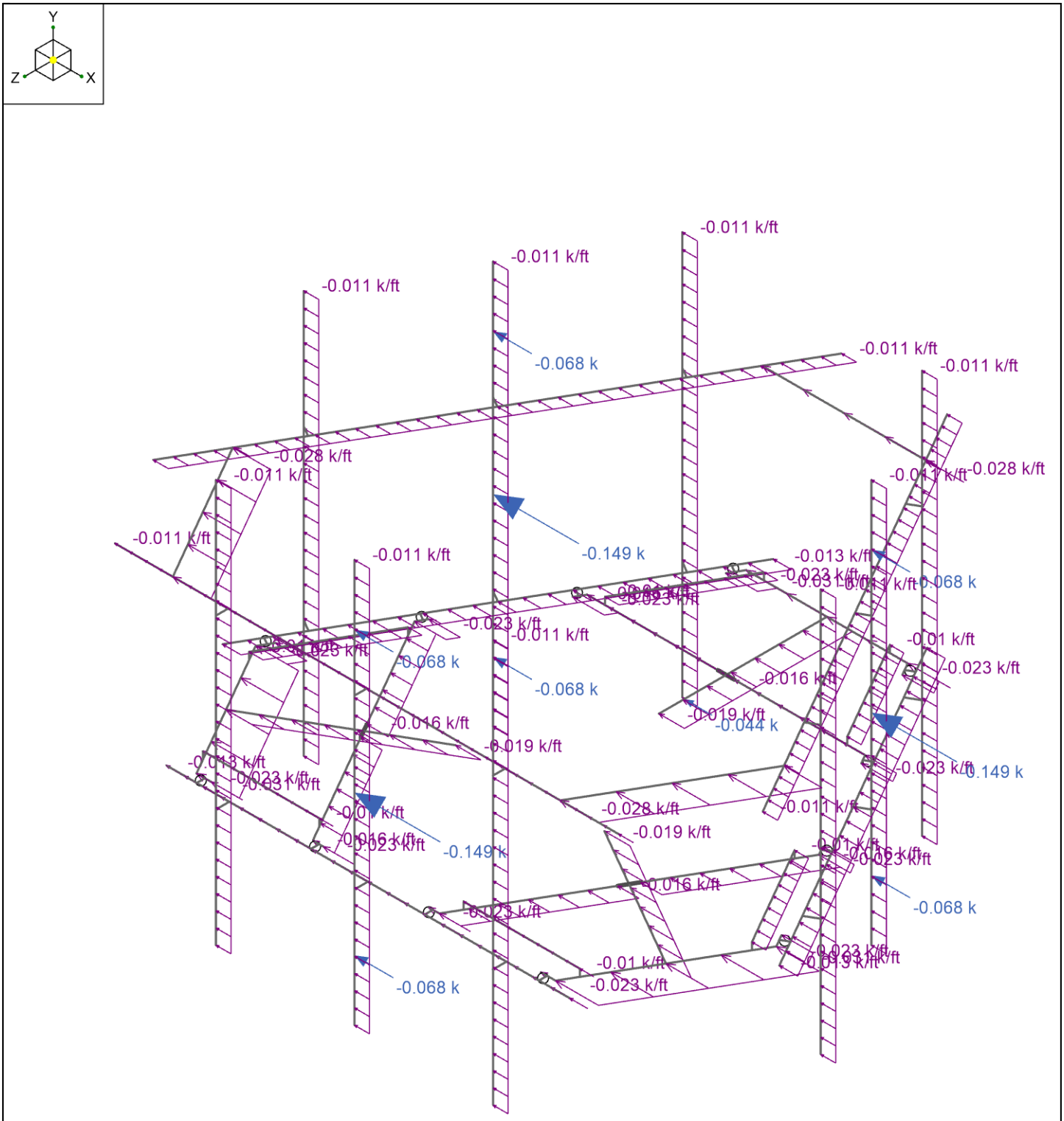

Loads: BLC 3, 90 Wind - No Ice

RISA A NEMETSCHEK COMPANY	MTS Engineering, P.L.L.C.	823531 - CT896/M&M Concrete Pole	SK-6
	KP		Jan 06, 2024 at 03:32 PM
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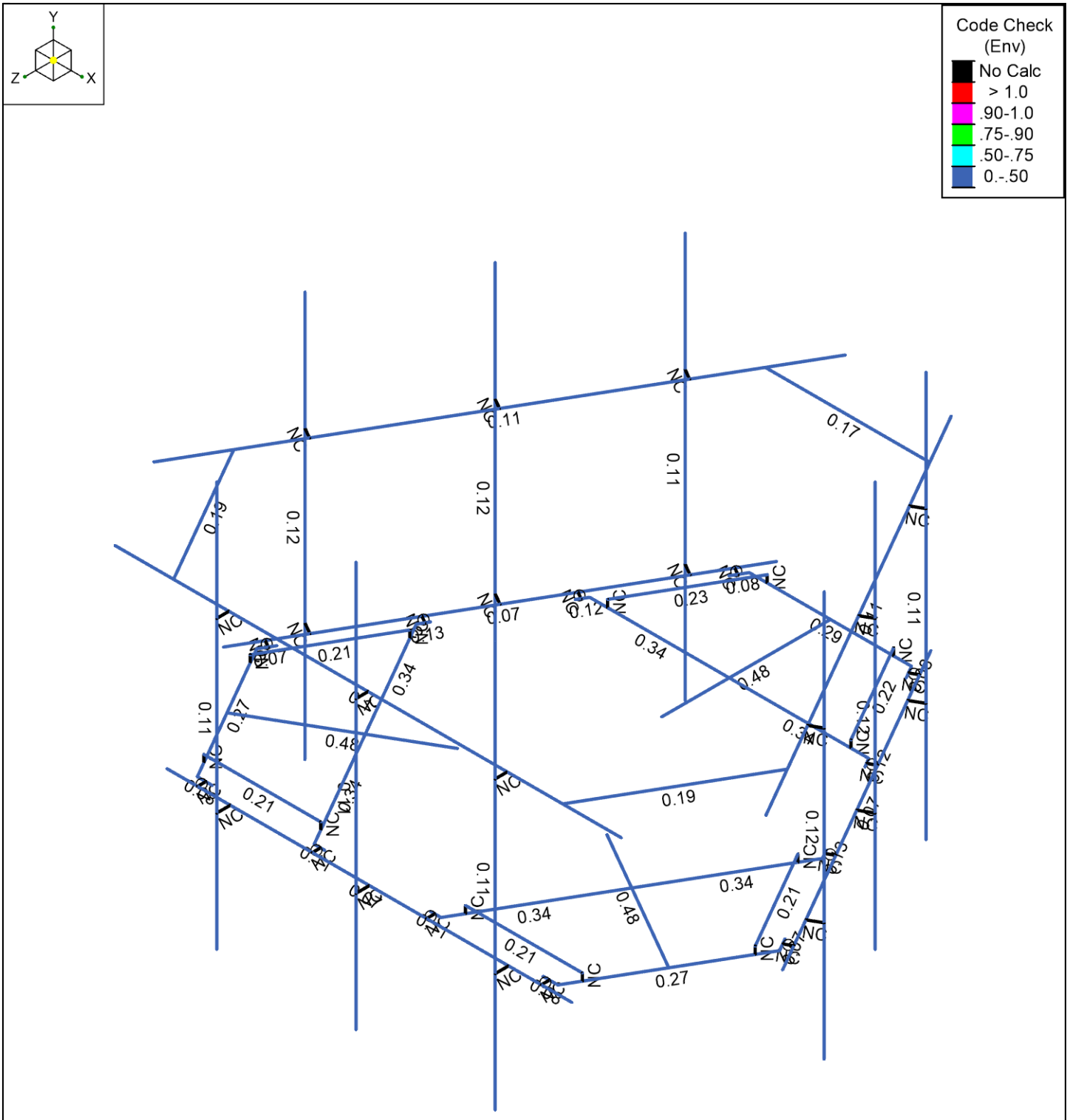
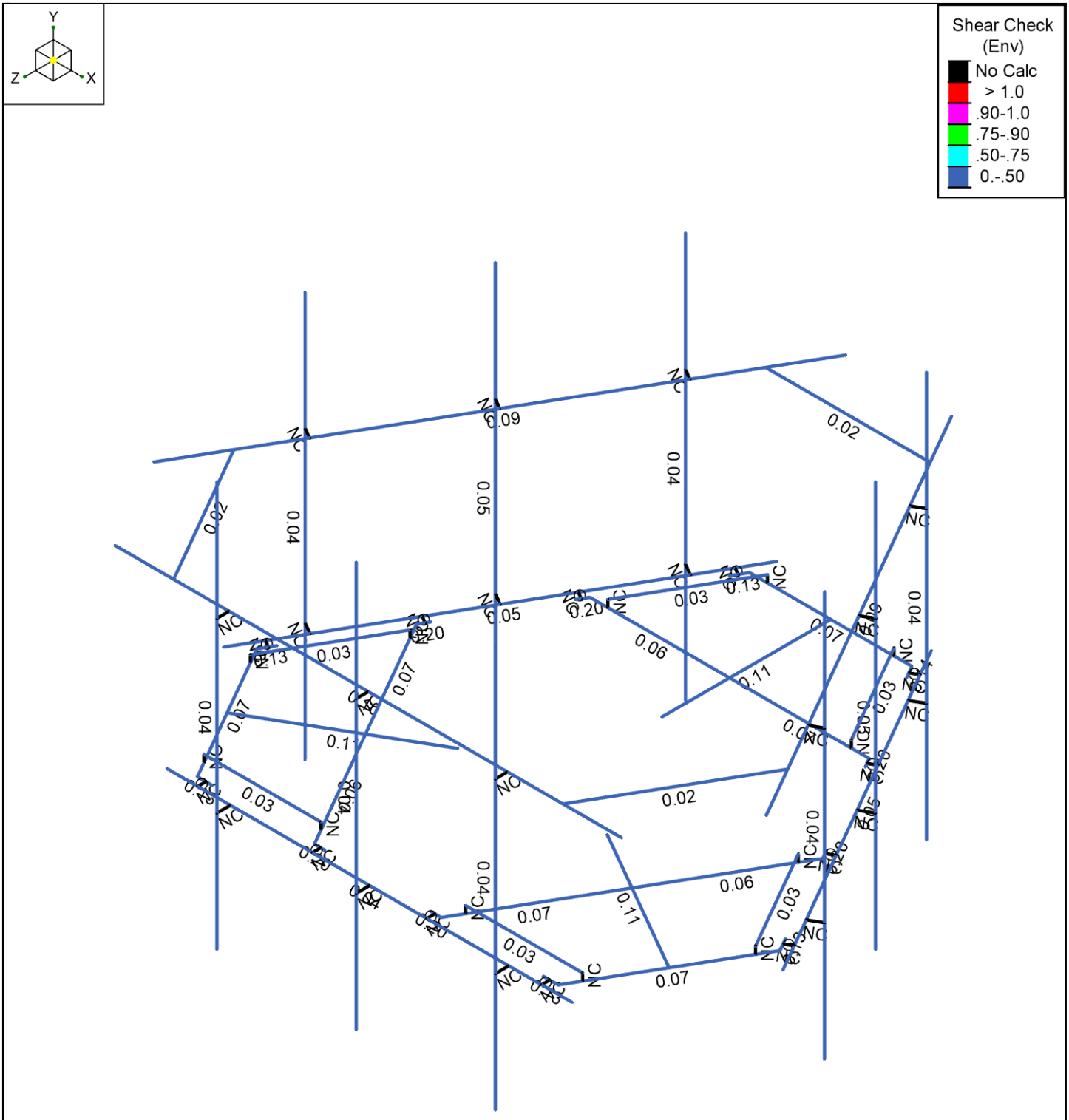


Member Code Checks Displayed (Enveloped)
Envelope Only Solution

MTS Engineering, P.L.L.C.		823531 - CT896/M&M Concrete Pole	SK-7
KP			Jan 06, 2024 at 03:33 PM
137173.004.01.0001			137173_004_01_0001_CT89…



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

RISA A NEMETSCHEK COMPANY	MTS Engineering, P.L.L.C.	823531 - CT896/M&M Concrete Pole	SK-8
	KP		Jan 06, 2024 at 03:33 PM
	137173.004.01.0001		137173_004_01_0001_CT89…

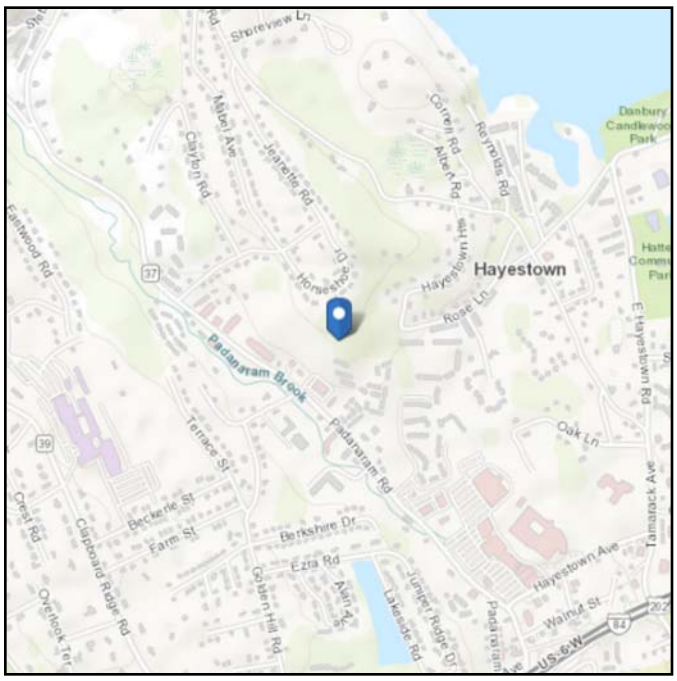
APPENDIX B

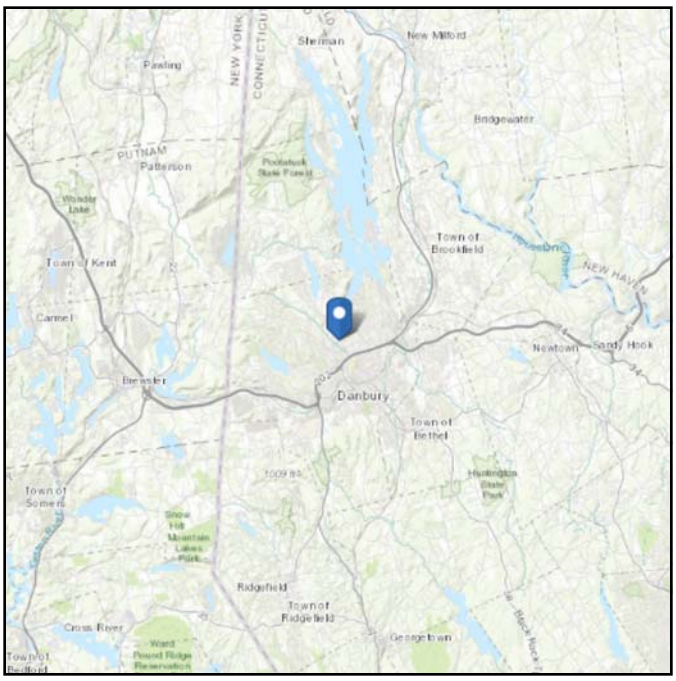
SOFTWARE INPUT CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.418917
Risk Category:	II	**Longitude:**	-73.461944
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	569.7625510243959 ft (NAVD 88)





Wind

Results:

Wind Speed	115 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	89 Vmph
100-year MRI	96 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:	Sat Jan 06 2024

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 not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

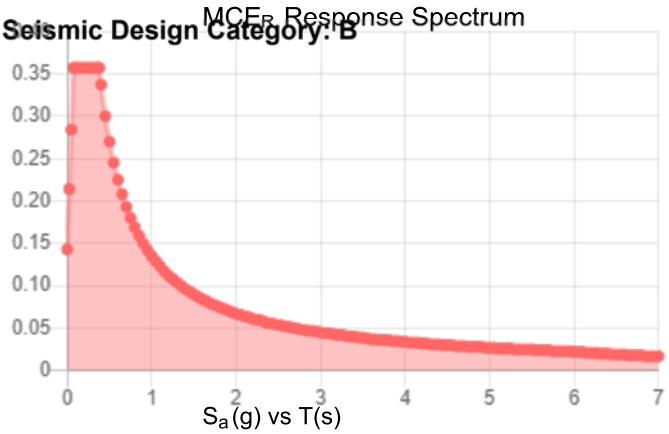
Seismic

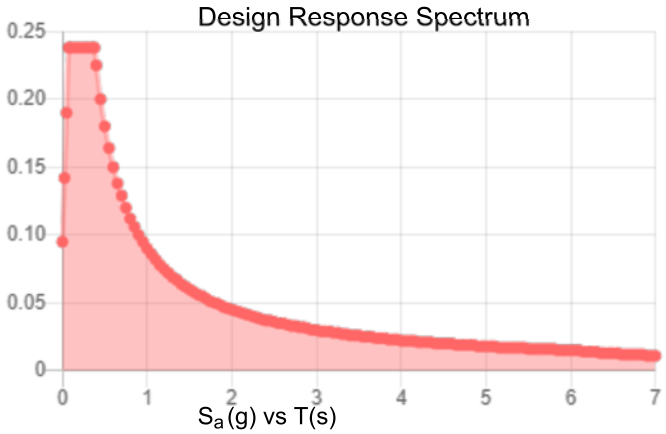
Site Soil Class: D - Default (see Section 11.4.3)

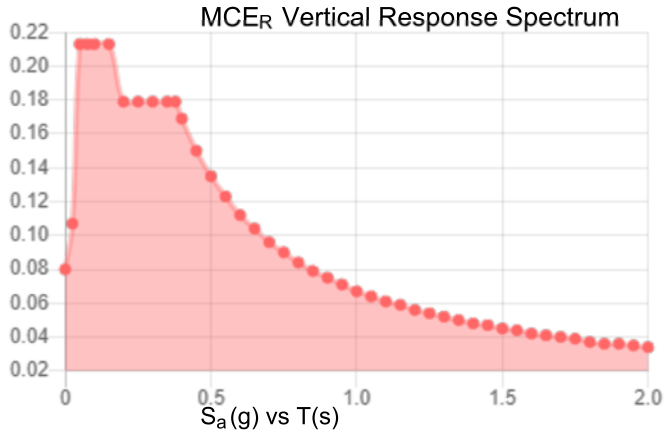
Results:

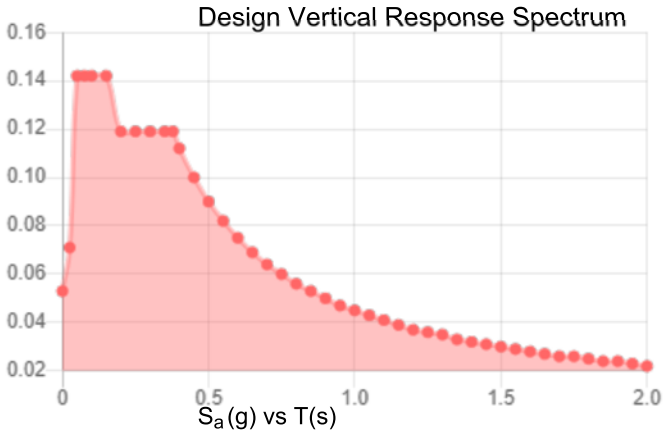
S_S :	0.223	S_{D1} :	0.09
S_1 :	0.056	T_L :	6
F_a :	1.6	PGA :	0.128
F_v :	2.4	PGA_M :	0.198
S_{MS} :	0.357	F_{PGA} :	1.543
S_{M1} :	0.135	I_e :	1
S_{DS} :	0.238	C_v :	0.746

Seismic Design Category: B









Data Accessed: Sat Jan 06 2024

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:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sat Jan 06 2024

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.

PROJECT	**137173.004.01.0001 - CT896/M&M Co**	**KSC**
SUBJECT	**Platform Mount Analysis**	
DATE	**01/06/24**	

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

Tower Type		:	Monopole		
Ground Elevation	z_s	:	570	ft	[ASCE7 Hazard Tool]
Tower Height		:	145.00	ft	
Mount Elevation		:	130.00	ft	
Antenna Elevation		:	130.00	ft	
Crest Height		:	0	ft	
Risk Category		:	II		[Table 2-1]
Exposure Category		:	C		[Sec. 2.6.5.1.2]
Topography Category		:	1.00		[Sec. 2.6.6.2]
Wind Velocity	V	:	115	mph	[ASCE7 Hazard Tool]
Ice wind Velocity	V_i	:	50	mph	[ASCE7 Hazard Tool]
Service Velocity	V_s	:	30	mph	[ASCE7 Hazard Tool]
Base Ice thickness	t_i	:	1.00	in	[ASCE7 Hazard Tool]
Seismic Design Cat.		:	B		[ASCE7 Hazard Tool]
	S_S	:	0.22		
	S_1	:	0.06		
	S_{DS}	:	0.24		
	S_{D1}	:	0.09		

Gust Factor	G_h	:	1.00		[Sec. 16.6]
Pressure Coefficient	K_z	:	1.34		[Sec. 2.6.5.2]
Topography Facto	K_{zt}	:	1.00		[Sec. 2.6.6]
Elevation Factor	K_e	:	0.98		[Sec. 2.6.8]
Directionality Factor	K_d	:	0.95		[Sec. 16.6]
Shielding Factor	K_a	:	0.90		[Sec. 16.6]
Design Ice Thickness	t_{iz}	:	1.15	in	[Sec. 2.6.10]

Importance Factor	I_e	:	1		[Table 2-3]
Response Coefficient	C_s	:	0.119		[Sec. 2.7.7.1]
Amplification	A_s	:	2.586207		[Sec. 16.7]

	q_z	:	42.14	psf

PROJECT	137173.004.01.0001 - CT896/M&M Co KSC
SUBJECT	**Platform Mount Analysis**
DATE	**01/06/24**

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

B+T GRP

Manufacturer	Model	Qty	Height (in^2)	Width (in^2)	Depth (in^2)	Weight (lbs)	C_aA_a (N) (ft^2)	C_aA_a (T) (ft^2)	C_aA_a (N) Ice (ft^2)	C_aA_a (T) Ice (ft^2)	$F_{A\ (N)}$ (k)	$F_{A\ (T)}$ (k)	$F_{A\ (N)}$ Ice (k)	$F_{A\ (T)}$ Ice (k)
JMA WIRELESS	MX08FRO665-21	0.5	72.0	20.0	8.0	64.5	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
JMA WIRELESS	MX08FRO665-21	0.5					4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
G TELECOMMUNI(	RF4450t-71A	1	15.0	11.0	16.5	94.6	1.38	2.06	1.92	2.71	0.05	0.08	0.01	0.01
G TELECOMMUNI(	RF4451d-70A	1	15.0	8.9	15.0	61.3	1.11	1.88	1.61	2.49	0.04	0.07	0.01	0.01
JMA WIRELESS	MX08FRO665-21	0.5	72.0	20.0	8.0	64.5	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
JMA WIRELESS	MX08FRO665-21	0.5					4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
G TELECOMMUNI(	RF4450t-71A	1	15.0	11.0	16.5	94.6	1.38	2.06	1.92	2.71	0.05	0.08	0.01	0.01
G TELECOMMUNI(	RF4451d-70A	1	15.0	8.9	15.0	61.3	1.11	1.88	1.61	2.49	0.04	0.07	0.01	0.01
JMA WIRELESS	MX08FRO665-21	0.5	72.0	20.0	8.0	64.5	4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
JMA WIRELESS	MX08FRO665-21	0.5					4.01	1.61	4.53	2.06	0.17	0.07	0.04	0.02
G TELECOMMUNI(	RF4450t-71A	1	15.0	11.0	16.5	94.6	1.38	2.06	1.92	2.71	0.05	0.08	0.01	0.01
G TELECOMMUNI(	RF4451d-70A	1	15.0	8.9	15.0	61.3	1.11	1.88	1.61	2.49	0.04	0.07	0.01	0.01
RAYCAP	RDIDC-9181-PF-48_CCIV3	1	16.6	14.6	8.5	21.9	2.01	1.17	2.65	1.69	0.08	0.04	0.01	0.01

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Node Coordinates

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
1	1	0	0	-1.707081	
2	2	0	0	-5.040414	
3	3	0	0	-3.040414	
4	4	2.758333	0	-3.040414	
5	5	-2.758333	0	-3.040414	
6	6	-1.603633	0	-5.040414	
7	7	1.603633	0	-5.040414	
8	8	1.749466	0	-4.787823	
9	9	-1.749466	0	-4.787823	
10	10	1.686966	0	-4.896077	
11	11	1.826825	0	-4.976824	
12	12	-1.686966	0	-4.896077	
13	13	-1.826825	0	-4.976824	
14	14	-3.999998	0	4.070489	
15	15	3.999998	0	4.070489	
16	16	2.8625	0	-2.859992	
17	17	2.820833	0	-2.932162	
18	18	2.960691	0	-3.012909	
19	19	-2.8625	0	-2.859992	
20	20	-2.820833	0	-2.932162	
21	21	-2.960691	0	-3.012909	
22	22	-1.25	0.140833	-5.040414	
23	23	-2.404701	0.140833	-3.040414	
24	24	2.404701	0.140833	-3.040414	
25	25	1.25	0.140833	-5.040414	
26	26	-1.25	0	-5.040414	
27	27	-2.404701	0	-3.040414	
28	28	2.404701	0	-3.040414	
29	29	1.25	0	-5.040414	
30	30	-2.749998	0	4.070489	
31	31	0.000002	0	4.070489	
32	32	-2.749998	0	4.336114	
33	33	0.000002	0	4.336114	
34	34	-2.749998	-2.333667	4.336114	
35	35	0.000002	-2.333667	4.336114	
36	36	-2.749998	5.666335	4.336114	
37	37	0.000002	5.666335	4.336114	
38	38	-2.749998	3.333337	4.336114	
39	39	0.000002	3.333337	4.336114	
40	40	-2.749998	3.333337	4.09653	
41	41	0.000002	3.333337	4.09653	
42	42	-5	3.333337	4.09653	
43	43	5	3.333337	4.09653	
44	44	2.749998	0	4.070489	
45	45	2.749998	0	4.336114	
46	46	2.749998	-2.333667	4.336114	
47	47	2.749998	5.666335	4.336114	
48	48	2.749998	3.333337	4.336114	
49	49	2.749998	3.333337	4.09653	
50	50	0	0	0	
51	51	1.625043	3.333337	-5.378404	
52	52	-1.625043	3.333337	-5.378404	
53	53	-1.478375	0	0.85354	
54	54	-4.365127	0	2.520207	
55	55	-2.633076	0	1.520207	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
56	56	-4.012243	0	-0.86858	
57	57	-1.253909	0	3.908994	
58	58	-3.56331	0	3.908994	
59	59	-5.166943	0	1.13142	
60	60	-5.02111	0	0.87883	
61	61	-3.271644	0	3.908994	
62	62	-5.08361	0	0.987083	
63	63	-5.223468	0	0.906335	
64	64	-3.396644	0	3.908994	
65	65	-3.396644	0	4.070489	
66	66	-3.908076	0	-1.049002	
67	67	-3.949743	0	-0.976832	
68	68	-4.089602	0	-1.057579	
69	69	-1.045576	0	3.908994	
70	70	-1.12891	0	3.908994	
71	71	-1.12891	0	4.070489	
72	72	-3.740127	0.140833	3.602739	
73	73	-1.430726	0.140833	3.602739	
74	74	-3.835426	0.140833	-0.562325	
75	75	-4.990127	0.140833	1.437675	
76	76	-3.740127	0	3.602739	
77	77	-1.430726	0	3.602739	
78	78	-3.835426	0	-0.562325	
79	79	-4.990127	0	1.437675	
80	80	-5.470356	3.333337	1.281873	
81	81	-3.845313	3.333337	4.09653	
82	82	1.478375	0	0.85354	
83	83	4.365127	0	2.520207	
84	84	2.633076	0	1.520207	
85	85	1.253909	0	3.908994	
86	86	4.012243	0	-0.86858	
87	87	5.166943	0	1.13142	
88	88	3.56331	0	3.908994	
89	89	3.271644	0	3.908994	
90	90	5.02111	0	0.87883	
91	91	3.396644	0	3.908994	
92	92	3.396644	0	4.070489	
93	93	5.08361	0	0.987083	
94	94	5.223468	0	0.906335	
95	95	1.045576	0	3.908994	
96	96	1.12891	0	3.908994	
97	97	1.12891	0	4.070489	
98	98	3.908076	0	-1.049002	
99	99	3.949743	0	-0.976832	
100	100	4.089602	0	-1.057579	
101	101	4.990127	0.140833	1.437675	
102	102	3.835426	0.140833	-0.562325	
103	103	1.430726	0.140833	3.602739	
104	104	3.740127	0.140833	3.602739	
105	105	4.990127	0	1.437675	
106	106	3.835426	0	-0.562325	
107	107	1.430726	0	3.602739	
108	108	3.740127	0	3.602739	
109	109	3.845313	3.333337	4.09653	
110	110	5.470356	3.333337	1.281873	

Node Coordinates (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Detach From Diaphragm
111	111	5.525146	0	1.428856	
112	112	1.525148	0	-5.499344	
113	113	4.900146	0	0.346324	
114	114	3.525146	0	-2.035246	
115	115	5.130184	0	0.213511	
116	116	3.755184	0	-2.168059	
117	117	5.130184	-2.333667	0.213511	
118	118	3.755184	-2.333667	-2.168059	
119	119	5.130184	5.666335	0.213511	
120	120	3.755184	5.666335	-2.168059	
121	121	5.130184	3.333337	0.213511	
122	122	3.755184	3.333337	-2.168059	
123	123	4.922698	3.333337	0.333303	
124	124	3.547698	3.333337	-2.048267	
125	125	6.047699	3.333337	2.281862	
126	126	1.047699	3.333337	-6.378392	
127	127	2.150148	0	-4.416813	
128	128	2.380186	0	-4.549625	
129	129	2.380186	-2.333667	-4.549625	
130	130	2.380186	5.666335	-4.549625	
131	131	2.380186	3.333337	-4.549625	
132	132	2.1727	3.333337	-4.429833	
133	133	-1.525148	0	-5.499344	
134	134	-5.525146	0	1.428856	
135	135	-2.150148	0	-4.416813	
136	136	-3.525148	0	-2.035243	
137	137	-2.380186	0	-4.549625	
138	138	-3.755186	0	-2.168055	
139	139	-2.380186	-2.333667	-4.549625	
140	140	-3.755186	-2.333667	-2.168055	
141	141	-2.380186	5.666335	-4.549625	
142	142	-3.755186	5.666335	-2.168055	
143	143	-2.380186	3.333337	-4.549625	
144	144	-3.755186	3.333337	-2.168055	
145	145	-2.1727	3.333337	-4.429833	
146	146	-3.5477	3.333337	-2.048264	
147	147	-1.047699	3.333337	-6.378392	
148	148	-6.047699	3.333337	2.281862	
149	149	-4.900146	0	0.346324	
150	150	-5.130184	0	0.213511	
151	151	-5.130184	-2.333667	0.213511	
152	152	-5.130184	5.666335	0.213511	
153	153	-5.130184	3.333337	0.213511	
154	154	-4.922698	3.333337	0.333303	

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	2						
3	3						
4	4						
5	5						
6	16						
7	17						
8	19						

Node Boundary Conditions (Continued)

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
9	20						
10	22						
11	25						
12	26						
13	29						
14	53	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
15	54						
16	55						
17	56						
18	57						
19	66						
20	67						
21	69						
22	70						
23	72						
24	75						
25	76						
26	79						
27	82	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
28	83						
29	84						
30	85						
31	86						
32	95						
33	96						
34	98						
35	99						
36	101						
37	104						
38	105						
39	108						

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in^{2}]	Iyy [in^{4}]	Izz [in^{4}]	J [in^{4}]
1	MF-H1	PIPE_3.5X0.165	Beam	Pipe	A500 Gr.C	Typical	1.729	2.409	2.409	4.819
2	MF-H2	PIPE_2.88X0.203	Beam	Pipe	A500 Gr.C	Typical	1.707	1.538	1.538	3.076
3	SF-H1	HSS4X4X2	Beam	Tube	A500 Gr.B Rect	Typical	1.77	4.4	4.4	6.91
4	SF-H2	C3.38X2.06X.188	Beam	Channel	A36 Gr.36	Typical	1.339	0.562	2.4	0.015
5	SF-H3	L2X2X4	Beam	Single Angle	A36 Gr.36	Typical	0.944	0.346	0.346	0.021
6	SF-H4	L7.63X2.5X6	Beam	Single Angle	A36 Gr.36	Typical	3.658	1.307	22.092	0.163
7	MF-P1	PIPE_2.88X0.203	Column	Pipe	A500 Gr.C	Typical	1.707	1.538	1.538	3.076
8	MF-CP1	PL3/8"X6	Beam	RECT	A36 Gr.36	Typical	2.25	0.026	6.75	0.101

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
9	MF-H3	L6.63X4.33X.25	Beam	Single Angle	A36 Gr.36	Typical	2.678	4.383	12.502	0.054

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	1	1	2		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
2	2	5	3	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
3	3	3	4	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
4	4	7	8		MF-CP1	Beam	RECT	A36 Gr.36	Typical
5	5	6	9		MF-CP1	Beam	RECT	A36 Gr.36	Typical
6	6	14	15		MF-H1	Beam	Pipe	A500 Gr.C	Typical
7	7	16	4		MF-CP1	Beam	RECT	A36 Gr.36	Typical
8	8	5	19		MF-CP1	Beam	RECT	A36 Gr.36	Typical
9	9	25	24		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
10	10	23	22		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
11	11	6	7		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
12	12	28	24		RIGID	None	None	RIGID	Typical
13	13	29	25		RIGID	None	None	RIGID	Typical
14	14	27	23		RIGID	None	None	RIGID	Typical
15	15	26	22		RIGID	None	None	RIGID	Typical
16	16	32	30		RIGID	None	None	RIGID	Typical
17	17	33	31		RIGID	None	None	RIGID	Typical
18	18	37	35		MF-P1	Column	Pipe	A500 Gr.C	Typical
19	19	36	34		MF-P1	Column	Pipe	A500 Gr.C	Typical
20	20	38	40		RIGID	None	None	RIGID	Typical
21	21	39	41		RIGID	None	None	RIGID	Typical
22	22	42	43		MF-H2	Beam	Pipe	A500 Gr.C	Typical
23	23	11	10		RIGID	None	None	RIGID	Typical
24	24	18	17		RIGID	None	None	RIGID	Typical
25	25	13	12		RIGID	None	None	RIGID	Typical
26	26	21	20		RIGID	None	None	RIGID	Typical
27	27	45	44		RIGID	None	None	RIGID	Typical
28	28	47	46		MF-P1	Column	Pipe	A500 Gr.C	Typical
29	29	48	49		RIGID	None	None	RIGID	Typical
30	30	51	52	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
31	31	53	54		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
32	32	57	55	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
33	33	55	56	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
34	34	59	60		MF-CP1	Beam	RECT	A36 Gr.36	Typical
35	35	58	61		MF-CP1	Beam	RECT	A36 Gr.36	Typical
36	36	66	56		MF-CP1	Beam	RECT	A36 Gr.36	Typical
37	37	57	69		MF-CP1	Beam	RECT	A36 Gr.36	Typical
38	38	75	74		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
39	39	73	72		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
40	40	58	59		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
41	41	78	74		RIGID	None	None	RIGID	Typical
42	42	79	75		RIGID	None	None	RIGID	Typical
43	43	77	73		RIGID	None	None	RIGID	Typical
44	44	76	72		RIGID	None	None	RIGID	Typical
45	45	63	62		RIGID	None	None	RIGID	Typical
46	46	68	67		RIGID	None	None	RIGID	Typical
47	47	65	64		RIGID	None	None	RIGID	Typical
48	48	71	70		RIGID	None	None	RIGID	Typical
49	49	80	81	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
50	50	82	83		SF-H1	Beam	Tube	A500 Gr.B Rect	Typical
51	51	86	84	180	SF-H2	Beam	Channel	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
52	52	84	85	180	SF-H2	Beam	Channel	A36 Gr.36	Typical
53	53	88	89		MF-CP1	Beam	RECT	A36 Gr.36	Typical
54	54	87	90		MF-CP1	Beam	RECT	A36 Gr.36	Typical
55	55	95	85		MF-CP1	Beam	RECT	A36 Gr.36	Typical
56	56	86	98		MF-CP1	Beam	RECT	A36 Gr.36	Typical
57	57	104	103		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
58	58	102	101		SF-H3	Beam	Single Angle	A36 Gr.36	Typical
59	59	87	88		SF-H4	Beam	Single Angle	A36 Gr.36	Typical
60	60	107	103		RIGID	None	None	RIGID	Typical
61	61	108	104		RIGID	None	None	RIGID	Typical
62	62	106	102		RIGID	None	None	RIGID	Typical
63	63	105	101		RIGID	None	None	RIGID	Typical
64	64	92	91		RIGID	None	None	RIGID	Typical
65	65	97	96		RIGID	None	None	RIGID	Typical
66	66	94	93		RIGID	None	None	RIGID	Typical
67	67	100	99		RIGID	None	None	RIGID	Typical
68	68	109	110	180	MF-H3	Beam	Single Angle	A36 Gr.36	Typical
69	69	111	112		MF-H1	Beam	Pipe	A500 Gr.C	Typical
70	70	115	113		RIGID	None	None	RIGID	Typical
71	71	116	114		RIGID	None	None	RIGID	Typical
72	72	120	118		MF-P1	Column	Pipe	A500 Gr.C	Typical
73	73	119	117		MF-P1	Column	Pipe	A500 Gr.C	Typical
74	74	121	123		RIGID	None	None	RIGID	Typical
75	75	122	124		RIGID	None	None	RIGID	Typical
76	76	125	126		MF-H2	Beam	Pipe	A500 Gr.C	Typical
77	77	128	127		RIGID	None	None	RIGID	Typical
78	78	130	129		MF-P1	Column	Pipe	A500 Gr.C	Typical
79	79	131	132		RIGID	None	None	RIGID	Typical
80	80	133	134		MF-H1	Beam	Pipe	A500 Gr.C	Typical
81	81	137	135		RIGID	None	None	RIGID	Typical
82	82	138	136		RIGID	None	None	RIGID	Typical
83	83	142	140		MF-P1	Column	Pipe	A500 Gr.C	Typical
84	84	141	139		MF-P1	Column	Pipe	A500 Gr.C	Typical
85	85	143	145		RIGID	None	None	RIGID	Typical
86	86	144	146		RIGID	None	None	RIGID	Typical
87	87	147	148		MF-H2	Beam	Pipe	A500 Gr.C	Typical
88	88	150	149		RIGID	None	None	RIGID	Typical
89	89	152	151		MF-P1	Column	Pipe	A500 Gr.C	Typical
90	90	153	154		RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
1	1				Yes	N/A	None
2	2			2	Yes	N/A	None
3	3		2		Yes	N/A	None
4	4				Yes	N/A	None
5	5				Yes	N/A	None
6	6				Yes	Default	None
7	7				Yes	N/A	None
8	8				Yes	N/A	None
9	9				Yes	N/A	None
10	10				Yes	N/A	None
11	11				Yes	N/A	None
12	12				Yes	** NA **	None
13	13				Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
14	14				Yes	** NA **	None
15	15				Yes	** NA **	None
16	16				Yes	** NA **	None
17	17				Yes	** NA **	None
18	18				Yes	** NA **	None
19	19				Yes	** NA **	None
20	20				Yes	** NA **	None
21	21				Yes	** NA **	None
22	22				Yes	N/A	None
23	23	OOOOOX			Yes	** NA **	None
24	24	OOOOOX			Yes	** NA **	None
25	25	OOOOOX			Yes	** NA **	None
26	26	OOOOOX			Yes	** NA **	None
27	27				Yes	** NA **	None
28	28				Yes	** NA **	None
29	29				Yes	** NA **	None
30	30				Yes	N/A	None
31	31				Yes	N/A	None
32	32			2	Yes	N/A	None
33	33		2		Yes	N/A	None
34	34				Yes	N/A	None
35	35				Yes	N/A	None
36	36				Yes	N/A	None
37	37				Yes	N/A	None
38	38				Yes	N/A	None
39	39				Yes	N/A	None
40	40				Yes	N/A	None
41	41				Yes	** NA **	None
42	42				Yes	** NA **	None
43	43				Yes	** NA **	None
44	44				Yes	** NA **	None
45	45	OOOOOX			Yes	** NA **	None
46	46	OOOOOX			Yes	** NA **	None
47	47	OOOOOX			Yes	** NA **	None
48	48	OOOOOX			Yes	** NA **	None
49	49				Yes	N/A	None
50	50				Yes	N/A	None
51	51			2	Yes	N/A	None
52	52		2		Yes	N/A	None
53	53				Yes	N/A	None
54	54				Yes	N/A	None
55	55				Yes	N/A	None
56	56				Yes	N/A	None
57	57				Yes	N/A	None
58	58				Yes	N/A	None
59	59				Yes	N/A	None
60	60				Yes	** NA **	None
61	61				Yes	** NA **	None
62	62				Yes	** NA **	None
63	63				Yes	** NA **	None
64	64	OOOOOX			Yes	** NA **	None
65	65	OOOOOX			Yes	** NA **	None
66	66	OOOOOX			Yes	** NA **	None
67	67	OOOOOX			Yes	** NA **	None
68	68				Yes	N/A	None

Member Advanced Data (Continued)

	Label	I Release	I Offset [in]	J Offset [in]	Physical	Deflection Ratio Options	Seismic DR
69	69				Yes	Default	None
70	70				Yes	** NA **	None
71	71				Yes	** NA **	None
72	72				Yes	** NA **	None
73	73				Yes	** NA **	None
74	74				Yes	** NA **	None
75	75				Yes	** NA **	None
76	76				Yes	N/A	None
77	77				Yes	** NA **	None
78	78				Yes	** NA **	None
79	79				Yes	** NA **	None
80	80				Yes	Default	None
81	81				Yes	** NA **	None
82	82				Yes	** NA **	None
83	83				Yes	** NA **	None
84	84				Yes	** NA **	None
85	85				Yes	** NA **	None
86	86				Yes	** NA **	None
87	87				Yes	N/A	None
88	88				Yes	** NA **	None
89	89				Yes	** NA **	None
90	90				Yes	** NA **	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]	Lcomp top [ft]	Channel Conn.	a [ft]	Function
1	1	SF-H1	3.333	Lbyy	N/A	N/A	Lateral
2	2	SF-H2	2.758	Lbyy	N/A	N/A	Lateral
3	3	SF-H2	2.758	Lbyy	N/A	N/A	Lateral
4	4	MF-CP1	0.292	Lbyy	N/A	N/A	Lateral
5	5	MF-CP1	0.292	Lbyy	N/A	N/A	Lateral
6	6	MF-H1	8	Lbyy	N/A	N/A	Lateral
7	7	MF-CP1	0.208	Lbyy	N/A	N/A	Lateral
8	8	MF-CP1	0.208	Lbyy	N/A	N/A	Lateral
9	9	SF-H3	2.309	Lbyy	N/A	N/A	Lateral
10	10	SF-H3	2.309	Lbyy	N/A	N/A	Lateral
11	11	SF-H4	3.207	Lbyy	N/A	N/A	Lateral
12	18	MF-P1	8	Lbyy	N/A	N/A	Lateral
13	19	MF-P1	8	Lbyy	N/A	N/A	Lateral
14	22	MF-H2	10	Lbyy	N/A	N/A	Lateral
15	28	MF-P1	8	Lbyy	N/A	N/A	Lateral
16	30	MF-H3	3.25	Lbyy	N/A	N/A	Lateral
17	31	SF-H1	3.333	Lbyy	N/A	N/A	Lateral
18	32	SF-H2	2.758	Lbyy	N/A	N/A	Lateral
19	33	SF-H2	2.758	Lbyy	N/A	N/A	Lateral
20	34	MF-CP1	0.292	Lbyy	N/A	N/A	Lateral
21	35	MF-CP1	0.292	Lbyy	N/A	N/A	Lateral
22	36	MF-CP1	0.208	Lbyy	N/A	N/A	Lateral
23	37	MF-CP1	0.208	Lbyy	N/A	N/A	Lateral
24	38	SF-H3	2.309	Lbyy	N/A	N/A	Lateral
25	39	SF-H3	2.309	Lbyy	N/A	N/A	Lateral
26	40	SF-H4	3.207	Lbyy	N/A	N/A	Lateral
27	49	MF-H3	3.25	Lbyy	N/A	N/A	Lateral
28	50	SF-H1	3.333	Lbyy	N/A	N/A	Lateral
29	51	SF-H2	2.758	Lbyy	N/A	N/A	Lateral
30	52	SF-H2	2.758	Lbyy	N/A	N/A	Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [ft]	Lcomp top [ft]	Channel Conn.	a [ft]	Function
31	53	MF-CP1	0.292	Lbyy	N/A	N/A	Lateral
32	54	MF-CP1	0.292	Lbyy	N/A	N/A	Lateral
33	55	MF-CP1	0.208	Lbyy	N/A	N/A	Lateral
34	56	MF-CP1	0.208	Lbyy	N/A	N/A	Lateral
35	57	SF-H3	2.309	Lbyy	N/A	N/A	Lateral
36	58	SF-H3	2.309	Lbyy	N/A	N/A	Lateral
37	59	SF-H4	3.207	Lbyy	N/A	N/A	Lateral
38	68	MF-H3	3.25	Lbyy	N/A	N/A	Lateral
39	69	MF-H1	8	Lbyy	N/A	N/A	Lateral
40	72	MF-P1	8	Lbyy	N/A	N/A	Lateral
41	73	MF-P1	8	Lbyy	N/A	N/A	Lateral
42	76	MF-H2	10	Lbyy	N/A	N/A	Lateral
43	78	MF-P1	8	Lbyy	N/A	N/A	Lateral
44	80	MF-H1	8	Lbyy	N/A	N/A	Lateral
45	83	MF-P1	8	Lbyy	N/A	N/A	Lateral
46	84	MF-P1	8	Lbyy	N/A	N/A	Lateral
47	87	MF-H2	10	Lbyy	N/A	N/A	Lateral
48	89	MF-P1	8	Lbyy	N/A	N/A	Lateral

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Y	-0.032	%15
2	18	Y	-0.032	%85
3	18	Y	-0.095	%50
4	18	Y	-0.061	%50
5	18	Y	0	0
6	83	Y	-0.032	%15
7	83	Y	-0.032	%85
8	83	Y	-0.095	%50
9	83	Y	-0.061	%50
10	83	Y	0	0
11	72	Y	-0.032	%15
12	72	Y	-0.032	%85
13	72	Y	-0.095	%50
14	72	Y	-0.061	%50
15	72	Y	0	0
16	1	Y	-0.022	%15
17	1	Y	0	0
18	1	Y	0	0
19	1	Y	0	0
20	1	Y	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Z	-0.169	%15
2	18	Z	-0.169	%85
3	18	Z	-0.052	%50
4	18	Z	-0.042	%50
5	18	Z	0	0
6	83	Z	-0.169	%15
7	83	Z	-0.169	%85
8	83	Z	-0.052	%50
9	83	Z	-0.042	%50

Member Point Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
10	83	Z	0	0
11	72	Z	-0.169	%15
12	72	Z	-0.169	%85
13	72	Z	-0.052	%50
14	72	Z	-0.042	%50
15	72	Z	0	0
16	1	Z	-0.076	%15
17	1	Z	0	0
18	1	Z	0	0
19	1	Z	0	0
20	1	Z	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	X	-0.068	%15
2	18	X	-0.068	%85
3	18	X	-0.078	%50
4	18	X	-0.071	%50
5	18	X	0	0
6	83	X	-0.068	%15
7	83	X	-0.068	%85
8	83	X	-0.078	%50
9	83	X	-0.071	%50
10	83	X	0	0
11	72	X	-0.068	%15
12	72	X	-0.068	%85
13	72	X	-0.078	%50
14	72	X	-0.071	%50
15	72	X	0	0
16	1	X	-0.044	%15
17	1	X	0	0
18	1	X	0	0
19	1	X	0	0
20	1	X	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Z	-0.036	%15
2	18	Z	-0.036	%85
3	18	Z	-0.01	%50
4	18	Z	-0.008	%50
5	18	Z	0	0
6	83	Z	-0.036	%15
7	83	Z	-0.036	%85
8	83	Z	-0.01	%50
9	83	Z	-0.008	%50
10	83	Z	0	0
11	72	Z	-0.036	%15
12	72	Z	-0.036	%85
13	72	Z	-0.01	%50
14	72	Z	-0.008	%50
15	72	Z	0	0
16	1	Z	-0.014	%15

Member Point Loads (BLC 4 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
17	1	Z	0	0
18	1	Z	0	0
19	1	Z	0	0
20	1	Z	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	X	-0.016	%15
2	18	X	-0.016	%85
3	18	X	-0.015	%50
4	18	X	-0.013	%50
5	18	X	0	0
6	83	X	-0.016	%15
7	83	X	-0.016	%85
8	83	X	-0.015	%50
9	83	X	-0.013	%50
10	83	X	0	0
11	72	X	-0.016	%15
12	72	X	-0.016	%85
13	72	X	-0.015	%50
14	72	X	-0.013	%50
15	72	X	0	0
16	1	X	-0.008	%15
17	1	X	0	0
18	1	X	0	0
19	1	X	0	0
20	1	X	0	0

Member Point Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Z	-0.011	%15
2	18	Z	-0.011	%85
3	18	Z	-0.004	%50
4	18	Z	-0.003	%50
5	18	Z	0	0
6	83	Z	-0.011	%15
7	83	Z	-0.011	%85
8	83	Z	-0.004	%50
9	83	Z	-0.003	%50
10	83	Z	0	0
11	72	Z	-0.011	%15
12	72	Z	-0.011	%85
13	72	Z	-0.004	%50
14	72	Z	-0.003	%50
15	72	Z	0	0
16	1	Z	-0.005	%15
17	1	Z	0	0
18	1	Z	0	0
19	1	Z	0	0
20	1	Z	0	0

Member Point Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	X	-0.005	%15
2	18	X	-0.005	%85
3	18	X	-0.005	%50
4	18	X	-0.005	%50
5	18	X	0	0
6	83	X	-0.005	%15
7	83	X	-0.005	%85
8	83	X	-0.005	%50
9	83	X	-0.005	%50
10	83	X	0	0
11	72	X	-0.005	%15
12	72	X	-0.005	%85
13	72	X	-0.005	%50
14	72	X	-0.005	%50
15	72	X	0	0
16	1	X	-0.003	%15
17	1	X	0	0
18	1	X	0	0
19	1	X	0	0
20	1	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Y	-0.118	%15
2	18	Y	-0.118	%85
3	18	Y	-0.037	%50
4	18	Y	-0.033	%50
5	18	Y	0	0
6	83	Y	-0.118	%15
7	83	Y	-0.118	%85
8	83	Y	-0.037	%50
9	83	Y	-0.033	%50
10	83	Y	0	0
11	72	Y	-0.118	%15
12	72	Y	-0.118	%85
13	72	Y	-0.037	%50
14	72	Y	-0.033	%50
15	72	Y	0	0
16	1	Y	-0.035	%15
17	1	Y	0	0
18	1	Y	0	0
19	1	Y	0	0
20	1	Y	0	0

Member Point Loads (BLC 9 : 0 Seismic)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	Z	-0.02	%15
2	18	Z	-0.02	%85
3	18	Z	-0.029	%50
4	18	Z	-0.019	%50
5	18	Z	0	0
6	83	Z	-0.02	%15

Member Point Loads (BLC 9 : 0 Seismic) (Continued)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
7	83	Z	-0.02	%85
8	83	Z	-0.029	%50
9	83	Z	-0.019	%50
10	83	Z	0	0
11	72	Z	-0.02	%15
12	72	Z	-0.02	%85
13	72	Z	-0.029	%50
14	72	Z	-0.019	%50
15	72	Z	0	0
16	1	Z	-0.007	%15
17	1	Z	0	0
18	1	Z	0	0
19	1	Z	0	0
20	1	Z	0	0

Member Point Loads (BLC 10 : 90 Seismic)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	18	X	-0.02	%15
2	18	X	-0.02	%85
3	18	X	-0.029	%50
4	18	X	-0.019	%50
5	18	X	0	0
6	83	X	-0.02	%15
7	83	X	-0.02	%85
8	83	X	-0.029	%50
9	83	X	-0.019	%50
10	83	X	0	0
11	72	X	-0.02	%15
12	72	X	-0.02	%85
13	72	X	-0.029	%50
14	72	X	-0.019	%50
15	72	X	0	0
16	1	X	-0.007	%15
17	1	X	0	0
18	1	X	0	0
19	1	X	0	0
20	1	X	0	0

Member Point Loads (BLC 15 : Maint LL 1)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.25	%5

Member Point Loads (BLC 16 : Maint LL 2)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	22	Y	-0.25	%5

Member Point Loads (BLC 17 : Maint LL 3)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	69	Y	-0.25	%5

Member Point Loads (BLC 18 : Maint LL 4)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	76	Y	-0.25	%5

Member Point Loads (BLC 19 : Maint LL 5)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	80	Y	-0.25	%5

Member Point Loads (BLC 20 : Maint LL 6)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	87	Y	-0.25	%5

Member Point Loads (BLC 21 : Maint LL 7)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	6	Y	-0.25	%95

Member Point Loads (BLC 22 : Maint LL 8)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	22	Y	-0.25	%95

Member Point Loads (BLC 23 : Maint LL 9)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	69	Y	-0.25	%95

Member Point Loads (BLC 24 : Maint LL 10)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	76	Y	-0.25	%95

Member Point Loads (BLC 25 : Maint LL 11)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	80	Y	-0.25	%95

Member Point Loads (BLC 26 : Maint LL 12)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	87	Y	-0.25	%95

Member Point Loads (BLC 27 : Maint LL 13)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	31	Y	-0.25	%95

Member Point Loads (BLC 28 : Maint LL 14)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	50	Y	-0.25	%95

Member Point Loads (BLC 29 : Maint LL 15)

	Member Label	Direction	Magnitude [k, k-ft]	Location [(ft, %)]
1	1	Y	-0.25	%95

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.018	-0.018	0	%100
2	2	Z	-0.016	-0.016	0	%100
3	3	Z	-0.016	-0.016	0	%100
4	4	Z	-0.023	-0.023	0	%100
5	5	Z	-0.023	-0.023	0	%100
6	6	Z	-0.013	-0.013	0	%100
7	7	Z	-0.023	-0.023	0	%100
8	8	Z	-0.023	-0.023	0	%100
9	9	Z	-0.01	-0.01	0	%100
10	10	Z	-0.01	-0.01	0	%100
11	11	Z	-0.031	-0.031	0	%100
12	18	Z	-0.011	-0.011	0	%100
13	19	Z	-0.011	-0.011	0	%100
14	22	Z	-0.011	-0.011	0	%100
15	28	Z	-0.011	-0.011	0	%100
16	30	Z	-0.028	-0.028	0	%100
17	31	Z	-0.018	-0.018	0	%100
18	32	Z	-0.016	-0.016	0	%100
19	33	Z	-0.016	-0.016	0	%100
20	34	Z	-0.023	-0.023	0	%100
21	35	Z	-0.023	-0.023	0	%100
22	36	Z	-0.023	-0.023	0	%100
23	37	Z	-0.023	-0.023	0	%100
24	38	Z	-0.01	-0.01	0	%100
25	39	Z	-0.01	-0.01	0	%100
26	40	Z	-0.031	-0.031	0	%100
27	49	Z	-0.028	-0.028	0	%100
28	50	Z	-0.018	-0.018	0	%100
29	51	Z	-0.016	-0.016	0	%100
30	52	Z	-0.016	-0.016	0	%100
31	53	Z	-0.023	-0.023	0	%100
32	54	Z	-0.023	-0.023	0	%100
33	55	Z	-0.023	-0.023	0	%100
34	56	Z	-0.023	-0.023	0	%100
35	57	Z	-0.01	-0.01	0	%100
36	58	Z	-0.01	-0.01	0	%100
37	59	Z	-0.031	-0.031	0	%100
38	68	Z	-0.028	-0.028	0	%100
39	69	Z	-0.013	-0.013	0	%100
40	72	Z	-0.011	-0.011	0	%100
41	73	Z	-0.011	-0.011	0	%100
42	76	Z	-0.011	-0.011	0	%100
43	78	Z	-0.011	-0.011	0	%100
44	80	Z	-0.013	-0.013	0	%100

Member Distributed Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
45	83	Z	-0.011	-0.011	0	%100
46	84	Z	-0.011	-0.011	0	%100
47	87	Z	-0.011	-0.011	0	%100
48	89	Z	-0.011	-0.011	0	%100

Member Distributed Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.018	-0.018	0	%100
2	2	X	-0.016	-0.016	0	%100
3	3	X	-0.016	-0.016	0	%100
4	4	X	-0.023	-0.023	0	%100
5	5	X	-0.023	-0.023	0	%100
6	6	X	-0.013	-0.013	0	%100
7	7	X	-0.023	-0.023	0	%100
8	8	X	-0.023	-0.023	0	%100
9	9	X	-0.01	-0.01	0	%100
10	10	X	-0.01	-0.01	0	%100
11	11	X	-0.031	-0.031	0	%100
12	18	X	-0.011	-0.011	0	%100
13	19	X	-0.011	-0.011	0	%100
14	22	X	-0.011	-0.011	0	%100
15	28	X	-0.011	-0.011	0	%100
16	30	X	-0.028	-0.028	0	%100
17	31	X	-0.018	-0.018	0	%100
18	32	X	-0.016	-0.016	0	%100
19	33	X	-0.016	-0.016	0	%100
20	34	X	-0.023	-0.023	0	%100
21	35	X	-0.023	-0.023	0	%100
22	36	X	-0.023	-0.023	0	%100
23	37	X	-0.023	-0.023	0	%100
24	38	X	-0.01	-0.01	0	%100
25	39	X	-0.01	-0.01	0	%100
26	40	X	-0.031	-0.031	0	%100
27	49	X	-0.028	-0.028	0	%100
28	50	X	-0.018	-0.018	0	%100
29	51	X	-0.016	-0.016	0	%100
30	52	X	-0.016	-0.016	0	%100
31	53	X	-0.023	-0.023	0	%100
32	54	X	-0.023	-0.023	0	%100
33	55	X	-0.023	-0.023	0	%100
34	56	X	-0.023	-0.023	0	%100
35	57	X	-0.01	-0.01	0	%100
36	58	X	-0.01	-0.01	0	%100
37	59	X	-0.031	-0.031	0	%100
38	68	X	-0.028	-0.028	0	%100
39	69	X	-0.013	-0.013	0	%100
40	72	X	-0.011	-0.011	0	%100
41	73	X	-0.011	-0.011	0	%100
42	76	X	-0.011	-0.011	0	%100
43	78	X	-0.011	-0.011	0	%100
44	80	X	-0.013	-0.013	0	%100
45	83	X	-0.011	-0.011	0	%100
46	84	X	-0.011	-0.011	0	%100
47	87	X	-0.011	-0.011	0	%100
48	89	X	-0.011	-0.011	0	%100

Member Distributed Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.006	-0.006	0	%100
2	2	Z	-0.005	-0.005	0	%100
3	3	Z	-0.005	-0.005	0	%100
4	4	Z	-0.01	-0.01	0	%100
5	5	Z	-0.01	-0.01	0	%100
6	6	Z	-0.002	-0.002	0	%100
7	7	Z	-0.011	-0.011	0	%100
8	8	Z	-0.011	-0.011	0	%100
9	9	Z	-0.004	-0.004	0	%100
10	10	Z	-0.004	-0.004	0	%100
11	11	Z	-0.008	-0.008	0	%100
12	18	Z	-0.002	-0.002	0	%100
13	19	Z	-0.002	-0.002	0	%100
14	22	Z	-0.002	-0.002	0	%100
15	28	Z	-0.002	-0.002	0	%100
16	30	Z	-0.007	-0.007	0	%100
17	31	Z	-0.006	-0.006	0	%100
18	32	Z	-0.005	-0.005	0	%100
19	33	Z	-0.005	-0.005	0	%100
20	34	Z	-0.01	-0.01	0	%100
21	35	Z	-0.01	-0.01	0	%100
22	36	Z	-0.011	-0.011	0	%100
23	37	Z	-0.011	-0.011	0	%100
24	38	Z	-0.004	-0.004	0	%100
25	39	Z	-0.004	-0.004	0	%100
26	40	Z	-0.008	-0.008	0	%100
27	49	Z	-0.007	-0.007	0	%100
28	50	Z	-0.006	-0.006	0	%100
29	51	Z	-0.005	-0.005	0	%100
30	52	Z	-0.005	-0.005	0	%100
31	53	Z	-0.01	-0.01	0	%100
32	54	Z	-0.01	-0.01	0	%100
33	55	Z	-0.011	-0.011	0	%100
34	56	Z	-0.011	-0.011	0	%100
35	57	Z	-0.004	-0.004	0	%100
36	58	Z	-0.004	-0.004	0	%100
37	59	Z	-0.008	-0.008	0	%100
38	68	Z	-0.007	-0.007	0	%100
39	69	Z	-0.002	-0.002	0	%100
40	72	Z	-0.002	-0.002	0	%100
41	73	Z	-0.002	-0.002	0	%100
42	76	Z	-0.002	-0.002	0	%100
43	78	Z	-0.002	-0.002	0	%100
44	80	Z	-0.002	-0.002	0	%100
45	83	Z	-0.002	-0.002	0	%100
46	84	Z	-0.002	-0.002	0	%100
47	87	Z	-0.002	-0.002	0	%100
48	89	Z	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.006	-0.006	0	%100
2	2	X	-0.005	-0.005	0	%100
3	3	X	-0.005	-0.005	0	%100

Member Distributed Loads (BLC 5 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
4	4	X	-0.01	-0.01	0	%100
5	5	X	-0.01	-0.01	0	%100
6	6	X	-0.002	-0.002	0	%100
7	7	X	-0.011	-0.011	0	%100
8	8	X	-0.011	-0.011	0	%100
9	9	X	-0.004	-0.004	0	%100
10	10	X	-0.004	-0.004	0	%100
11	11	X	-0.008	-0.008	0	%100
12	18	X	-0.002	-0.002	0	%100
13	19	X	-0.002	-0.002	0	%100
14	22	X	-0.002	-0.002	0	%100
15	28	X	-0.002	-0.002	0	%100
16	30	X	-0.007	-0.007	0	%100
17	31	X	-0.006	-0.006	0	%100
18	32	X	-0.005	-0.005	0	%100
19	33	X	-0.005	-0.005	0	%100
20	34	X	-0.01	-0.01	0	%100
21	35	X	-0.01	-0.01	0	%100
22	36	X	-0.011	-0.011	0	%100
23	37	X	-0.011	-0.011	0	%100
24	38	X	-0.004	-0.004	0	%100
25	39	X	-0.004	-0.004	0	%100
26	40	X	-0.008	-0.008	0	%100
27	49	X	-0.007	-0.007	0	%100
28	50	X	-0.006	-0.006	0	%100
29	51	X	-0.005	-0.005	0	%100
30	52	X	-0.005	-0.005	0	%100
31	53	X	-0.01	-0.01	0	%100
32	54	X	-0.01	-0.01	0	%100
33	55	X	-0.011	-0.011	0	%100
34	56	X	-0.011	-0.011	0	%100
35	57	X	-0.004	-0.004	0	%100
36	58	X	-0.004	-0.004	0	%100
37	59	X	-0.008	-0.008	0	%100
38	68	X	-0.007	-0.007	0	%100
39	69	X	-0.002	-0.002	0	%100
40	72	X	-0.002	-0.002	0	%100
41	73	X	-0.002	-0.002	0	%100
42	76	X	-0.002	-0.002	0	%100
43	78	X	-0.002	-0.002	0	%100
44	80	X	-0.002	-0.002	0	%100
45	83	X	-0.002	-0.002	0	%100
46	84	X	-0.002	-0.002	0	%100
47	87	X	-0.002	-0.002	0	%100
48	89	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.001	-0.001	0	%100
2	2	Z	-0.001	-0.001	0	%100
3	3	Z	-0.001	-0.001	0	%100
4	4	Z	-0.002	-0.002	0	%100
5	5	Z	-0.002	-0.002	0	%100
6	6	Z	-0.0005	-0.0005	0	%100
7	7	Z	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 6 : 0 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
8	8	Z	-0.002	-0.002	0	%100
9	9	Z	-0.0007	-0.0007	0	%100
10	10	Z	-0.0007	-0.0007	0	%100
11	11	Z	-0.002	-0.002	0	%100
12	18	Z	-0.0004	-0.0004	0	%100
13	19	Z	-0.0004	-0.0004	0	%100
14	22	Z	-0.0004	-0.0004	0	%100
15	28	Z	-0.0004	-0.0004	0	%100
16	30	Z	-0.002	-0.002	0	%100
17	31	Z	-0.001	-0.001	0	%100
18	32	Z	-0.001	-0.001	0	%100
19	33	Z	-0.001	-0.001	0	%100
20	34	Z	-0.002	-0.002	0	%100
21	35	Z	-0.002	-0.002	0	%100
22	36	Z	-0.002	-0.002	0	%100
23	37	Z	-0.002	-0.002	0	%100
24	38	Z	-0.0007	-0.0007	0	%100
25	39	Z	-0.0007	-0.0007	0	%100
26	40	Z	-0.002	-0.002	0	%100
27	49	Z	-0.002	-0.002	0	%100
28	50	Z	-0.001	-0.001	0	%100
29	51	Z	-0.001	-0.001	0	%100
30	52	Z	-0.001	-0.001	0	%100
31	53	Z	-0.002	-0.002	0	%100
32	54	Z	-0.002	-0.002	0	%100
33	55	Z	-0.002	-0.002	0	%100
34	56	Z	-0.002	-0.002	0	%100
35	57	Z	-0.0007	-0.0007	0	%100
36	58	Z	-0.0007	-0.0007	0	%100
37	59	Z	-0.002	-0.002	0	%100
38	68	Z	-0.002	-0.002	0	%100
39	69	Z	-0.0005	-0.0005	0	%100
40	72	Z	-0.0004	-0.0004	0	%100
41	73	Z	-0.0004	-0.0004	0	%100
42	76	Z	-0.0004	-0.0004	0	%100
43	78	Z	-0.0004	-0.0004	0	%100
44	80	Z	-0.0005	-0.0005	0	%100
45	83	Z	-0.0004	-0.0004	0	%100
46	84	Z	-0.0004	-0.0004	0	%100
47	87	Z	-0.0004	-0.0004	0	%100
48	89	Z	-0.0004	-0.0004	0	%100

Member Distributed Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.001	-0.001	0	%100
2	2	X	-0.001	-0.001	0	%100
3	3	X	-0.001	-0.001	0	%100
4	4	X	-0.002	-0.002	0	%100
5	5	X	-0.002	-0.002	0	%100
6	6	X	-0.0005	-0.0005	0	%100
7	7	X	-0.002	-0.002	0	%100
8	8	X	-0.002	-0.002	0	%100
9	9	X	-0.0007	-0.0007	0	%100
10	10	X	-0.0007	-0.0007	0	%100
11	11	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 7 : 90 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
12	18	X	-0.0004	-0.0004	0	%100
13	19	X	-0.0004	-0.0004	0	%100
14	22	X	-0.0004	-0.0004	0	%100
15	28	X	-0.0004	-0.0004	0	%100
16	30	X	-0.002	-0.002	0	%100
17	31	X	-0.001	-0.001	0	%100
18	32	X	-0.001	-0.001	0	%100
19	33	X	-0.001	-0.001	0	%100
20	34	X	-0.002	-0.002	0	%100
21	35	X	-0.002	-0.002	0	%100
22	36	X	-0.002	-0.002	0	%100
23	37	X	-0.002	-0.002	0	%100
24	38	X	-0.0007	-0.0007	0	%100
25	39	X	-0.0007	-0.0007	0	%100
26	40	X	-0.002	-0.002	0	%100
27	49	X	-0.002	-0.002	0	%100
28	50	X	-0.001	-0.001	0	%100
29	51	X	-0.001	-0.001	0	%100
30	52	X	-0.001	-0.001	0	%100
31	53	X	-0.002	-0.002	0	%100
32	54	X	-0.002	-0.002	0	%100
33	55	X	-0.002	-0.002	0	%100
34	56	X	-0.002	-0.002	0	%100
35	57	X	-0.0007	-0.0007	0	%100
36	58	X	-0.0007	-0.0007	0	%100
37	59	X	-0.002	-0.002	0	%100
38	68	X	-0.002	-0.002	0	%100
39	69	X	-0.0005	-0.0005	0	%100
40	72	X	-0.0004	-0.0004	0	%100
41	73	X	-0.0004	-0.0004	0	%100
42	76	X	-0.0004	-0.0004	0	%100
43	78	X	-0.0004	-0.0004	0	%100
44	80	X	-0.0005	-0.0005	0	%100
45	83	X	-0.0004	-0.0004	0	%100
46	84	X	-0.0004	-0.0004	0	%100
47	87	X	-0.0004	-0.0004	0	%100
48	89	X	-0.0004	-0.0004	0	%100

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Y	-0.01	-0.01	0	%100
2	2	Y	-0.007	-0.007	0	%100
3	3	Y	-0.007	-0.007	0	%100
4	4	Y	-0.01	-0.01	0	%100
5	5	Y	-0.01	-0.01	0	%100
6	6	Y	-0.007	-0.007	0	%100
7	7	Y	-0.01	-0.01	0	%100
8	8	Y	-0.01	-0.01	0	%100
9	9	Y	-0.006	-0.006	0	%100
10	10	Y	-0.006	-0.006	0	%100
11	11	Y	-0.013	-0.013	0	%100
12	18	Y	-0.006	-0.006	0	%100
13	19	Y	-0.006	-0.006	0	%100
14	22	Y	-0.006	-0.006	0	%100
15	28	Y	-0.006	-0.006	0	%100

Member Distributed Loads (BLC 8 : Ice) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
16	30	Y	-0.013	-0.013	0	%100
17	31	Y	-0.01	-0.01	0	%100
18	32	Y	-0.007	-0.007	0	%100
19	33	Y	-0.007	-0.007	0	%100
20	34	Y	-0.01	-0.01	0	%100
21	35	Y	-0.01	-0.01	0	%100
22	36	Y	-0.01	-0.01	0	%100
23	37	Y	-0.01	-0.01	0	%100
24	38	Y	-0.006	-0.006	0	%100
25	39	Y	-0.006	-0.006	0	%100
26	40	Y	-0.013	-0.013	0	%100
27	49	Y	-0.013	-0.013	0	%100
28	50	Y	-0.01	-0.01	0	%100
29	51	Y	-0.007	-0.007	0	%100
30	52	Y	-0.007	-0.007	0	%100
31	53	Y	-0.01	-0.01	0	%100
32	54	Y	-0.01	-0.01	0	%100
33	55	Y	-0.01	-0.01	0	%100
34	56	Y	-0.01	-0.01	0	%100
35	57	Y	-0.006	-0.006	0	%100
36	58	Y	-0.006	-0.006	0	%100
37	59	Y	-0.013	-0.013	0	%100
38	68	Y	-0.013	-0.013	0	%100
39	69	Y	-0.007	-0.007	0	%100
40	72	Y	-0.006	-0.006	0	%100
41	73	Y	-0.006	-0.006	0	%100
42	76	Y	-0.006	-0.006	0	%100
43	78	Y	-0.006	-0.006	0	%100
44	80	Y	-0.007	-0.007	0	%100
45	83	Y	-0.006	-0.006	0	%100
46	84	Y	-0.006	-0.006	0	%100
47	87	Y	-0.006	-0.006	0	%100
48	89	Y	-0.006	-0.006	0	%100

Member Distributed Loads (BLC 9 : 0 Seismic)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	Z	-0.002	-0.002	0	%100
2	2	Z	-0.001	-0.001	0	%100
3	3	Z	-0.001	-0.001	0	%100
4	4	Z	-0.002	-0.002	0	%100
5	5	Z	-0.002	-0.002	0	%100
6	6	Z	-0.002	-0.002	0	%100
7	7	Z	-0.002	-0.002	0	%100
8	8	Z	-0.002	-0.002	0	%100
9	9	Z	-0.001	-0.001	0	%100
10	10	Z	-0.001	-0.001	0	%100
11	11	Z	-0.004	-0.004	0	%100
12	18	Z	-0.002	-0.002	0	%100
13	19	Z	-0.002	-0.002	0	%100
14	22	Z	-0.002	-0.002	0	%100
15	28	Z	-0.002	-0.002	0	%100
16	30	Z	-0.003	-0.003	0	%100
17	31	Z	-0.002	-0.002	0	%100
18	32	Z	-0.001	-0.001	0	%100
19	33	Z	-0.001	-0.001	0	%100

Member Distributed Loads (BLC 9 : 0 Seismic) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
20	34	Z	-0.002	-0.002	0	%100
21	35	Z	-0.002	-0.002	0	%100
22	36	Z	-0.002	-0.002	0	%100
23	37	Z	-0.002	-0.002	0	%100
24	38	Z	-0.001	-0.001	0	%100
25	39	Z	-0.001	-0.001	0	%100
26	40	Z	-0.004	-0.004	0	%100
27	49	Z	-0.003	-0.003	0	%100
28	50	Z	-0.002	-0.002	0	%100
29	51	Z	-0.001	-0.001	0	%100
30	52	Z	-0.001	-0.001	0	%100
31	53	Z	-0.002	-0.002	0	%100
32	54	Z	-0.002	-0.002	0	%100
33	55	Z	-0.002	-0.002	0	%100
34	56	Z	-0.002	-0.002	0	%100
35	57	Z	-0.001	-0.001	0	%100
36	58	Z	-0.001	-0.001	0	%100
37	59	Z	-0.004	-0.004	0	%100
38	68	Z	-0.003	-0.003	0	%100
39	69	Z	-0.002	-0.002	0	%100
40	72	Z	-0.002	-0.002	0	%100
41	73	Z	-0.002	-0.002	0	%100
42	76	Z	-0.002	-0.002	0	%100
43	78	Z	-0.002	-0.002	0	%100
44	80	Z	-0.002	-0.002	0	%100
45	83	Z	-0.002	-0.002	0	%100
46	84	Z	-0.002	-0.002	0	%100
47	87	Z	-0.002	-0.002	0	%100
48	89	Z	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 10 : 90 Seismic)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	1	X	-0.002	-0.002	0	%100
2	2	X	-0.001	-0.001	0	%100
3	3	X	-0.001	-0.001	0	%100
4	4	X	-0.002	-0.002	0	%100
5	5	X	-0.002	-0.002	0	%100
6	6	X	-0.002	-0.002	0	%100
7	7	X	-0.002	-0.002	0	%100
8	8	X	-0.002	-0.002	0	%100
9	9	X	-0.001	-0.001	0	%100
10	10	X	-0.001	-0.001	0	%100
11	11	X	-0.004	-0.004	0	%100
12	18	X	-0.002	-0.002	0	%100
13	19	X	-0.002	-0.002	0	%100
14	22	X	-0.002	-0.002	0	%100
15	28	X	-0.002	-0.002	0	%100
16	30	X	-0.003	-0.003	0	%100
17	31	X	-0.002	-0.002	0	%100
18	32	X	-0.001	-0.001	0	%100
19	33	X	-0.001	-0.001	0	%100
20	34	X	-0.002	-0.002	0	%100
21	35	X	-0.002	-0.002	0	%100
22	36	X	-0.002	-0.002	0	%100
23	37	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 10 : 90 Seismic) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
24	38	X	-0.001	-0.001	0	%100
25	39	X	-0.001	-0.001	0	%100
26	40	X	-0.004	-0.004	0	%100
27	49	X	-0.003	-0.003	0	%100
28	50	X	-0.002	-0.002	0	%100
29	51	X	-0.001	-0.001	0	%100
30	52	X	-0.001	-0.001	0	%100
31	53	X	-0.002	-0.002	0	%100
32	54	X	-0.002	-0.002	0	%100
33	55	X	-0.002	-0.002	0	%100
34	56	X	-0.002	-0.002	0	%100
35	57	X	-0.001	-0.001	0	%100
36	58	X	-0.001	-0.001	0	%100
37	59	X	-0.004	-0.004	0	%100
38	68	X	-0.003	-0.003	0	%100
39	69	X	-0.002	-0.002	0	%100
40	72	X	-0.002	-0.002	0	%100
41	73	X	-0.002	-0.002	0	%100
42	76	X	-0.002	-0.002	0	%100
43	78	X	-0.002	-0.002	0	%100
44	80	X	-0.002	-0.002	0	%100
45	83	X	-0.002	-0.002	0	%100
46	84	X	-0.002	-0.002	0	%100
47	87	X	-0.002	-0.002	0	%100
48	89	X	-0.002	-0.002	0	%100

Member Distributed Loads (BLC 39 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	10	Y	-0.02	-0.026	1.27	2.309
2	38	Y	-0.035	-0.016	0	1.155
3	38	Y	-0.016	0.0006163	1.155	2.309
4	39	Y	-0.018	-0.016	0.231	2.309
5	57	Y	-0.018	-0.016	0	2.078
6	58	Y	0.0006164	-0.016	0	1.155
7	58	Y	-0.016	-0.035	1.155	2.309
8	9	Y	-0.015	-0.015	0	2.078
9	10	Y	-0.014	-0.02	0.231	1.27

Member Distributed Loads (BLC 40 : BLC 8 Transient Area Loads)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	9	Y	-0.008	-0.008	0	2.078
2	10	Y	-0.008	-0.011	0.231	1.27
3	10	Y	-0.011	-0.014	1.27	2.309
4	38	Y	-0.017	-0.008	0	1.155
5	38	Y	-0.008	0.0003082	1.155	2.309
6	39	Y	-0.009	-0.008	0.231	2.309
7	57	Y	-0.009	-0.008	0	2.078
8	58	Y	0.0003082	-0.008	0	1.155
9	58	Y	-0.008	-0.017	1.155	2.309

Member Area Loads (BLC 1 : Dead)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [ksf]
1	23	22	25	24	Y	Two Way	-0.01
2	73	72	75	74	Y	Two Way	-0.01
3	102	101	104	103	Y	Two Way	-0.01

Member Area Loads (BLC 8 : Ice)

	Node A	Node B	Node C	Node D	Direction	Load Direction	Magnitude [ksf]
1	23	22	25	24	Y	Two Way	-0.005
2	73	72	75	74	Y	Two Way	-0.005
3	102	101	104	103	Y	Two Way	-0.005

Node Loads and Enforced Displacements (BLC 11 : Live Load a)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	30	L	Y	-0.5
2	113	L	Y	-0.5
3	135	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 12 : Live Load b)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	31	L	Y	-0.5
2	114	L	Y	-0.5
3	136	L	Y	-0.5

Node Loads and Enforced Displacements (BLC 13 : Live Load c)

	Node Label	L, D, M	Direction	Magnitude [(k, k-ft), (in, rad), (k*s²/ft, k*s²*ft)]
1	44	L	Y	-0.5
2	127	L	Y	-0.5
3	149	L	Y	-0.5

Basic Load Cases

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
1	Dead	DL	-1		20		3
2	0 Wind - No Ice	WLZ			20	48	
3	90 Wind - No Ice	WLX			20	48	
4	0 Wind - Ice	WLZ			20	48	
5	90 Wind - Ice	WLX			20	48	
6	0 Wind - Service	WLZ			20	48	
7	90 Wind - Service	WLX			20	48	
8	Ice	OL1			20	48	3
9	0 Seismic	ELZ			20	48	
10	90 Seismic	ELX			20	48	
11	Live Load a	LL		3			
12	Live Load b	LL		3			
13	Live Load c	LL		3			
14	Live Load d	LL					
15	Maint LL 1	LL			1		
16	Maint LL 2	LL			1		
17	Maint LL 3	LL			1		
18	Maint LL 4	LL			1		

Basic Load Cases (Continued)

	BLC Description	Category	Y Gravity	Nodal	Point	Distributed	Area(Member)
19	Maint LL 5	LL			1		
20	Maint LL 6	LL			1		
21	Maint LL 7	LL			1		
22	Maint LL 8	LL			1		
23	Maint LL 9	LL			1		
24	Maint LL 10	LL			1		
25	Maint LL 11	LL			1		
26	Maint LL 12	LL			1		
27	Maint LL 13	LL			1		
28	Maint LL 14	LL			1		
29	Maint LL 15	LL			1		
30	Maint LL 16	LL					
31	Maint LL 17	LL					
32	Maint LL 18	LL					
33	Maint LL 19	LL					
34	Maint LL 20	LL					
35	Maint LL 21	LL					
36	Maint LL 22	LL					
37	Maint LL 23	LL					
38	Maint LL 24	LL					
39	BLC 1 Transient Area Loads	None				9	
40	BLC 8 Transient Area Loads	None				9	

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.4 Dead	Yes	Y	1	1.4						
2	1.2 D + 1.0 - 0 W	Yes	Y	1	1.2	2	1				
3	1.2 D + 1.0 - 30 W	Yes	Y	1	1.2	2	0.866	3	0.5		
4	1.2 D + 1.0 - 60 W	Yes	Y	1	1.2	3	0.866	2	0.5		
5	1.2 D + 1.0 - 90 W	Yes	Y	1	1.2	3	1				
6	1.2 D + 1.0 - 120 W	Yes	Y	1	1.2	3	0.866	2	-0.5		
7	1.2 D + 1.0 - 150 W	Yes	Y	1	1.2	2	-0.866	3	0.5		
8	1.2 D + 1.0 - 180 W	Yes	Y	1	1.2	2	-1				
9	1.2 D + 1.0 - 210 W	Yes	Y	1	1.2	2	-0.866	3	-0.5		
10	1.2 D + 1.0 - 240 W	Yes	Y	1	1.2	3	-0.866	2	-0.5		
11	1.2 D + 1.0 - 270 W	Yes	Y	1	1.2	3	-1				
12	1.2 D + 1.0 - 300 W	Yes	Y	1	1.2	3	-0.866	2	0.5		
13	1.2 D + 1.0 - 330 W	Yes	Y	1	1.2	2	0.866	3	-0.5		
14	1.2 D + 1.0 - 0 W/Ice	Yes	Y	1	1.2	4	1			8	1
15	1.2 D + 1.0 - 30 W/Ice	Yes	Y	1	1.2	4	0.866	5	0.5	8	1
16	1.2 D + 1.0 - 60 W/Ice	Yes	Y	1	1.2	5	0.866	4	0.5	8	1
17	1.2 D + 1.0 - 90 W/Ice	Yes	Y	1	1.2	5	1			8	1
18	1.2 D + 1.0 - 120 W/Ice	Yes	Y	1	1.2	5	0.866	4	-0.5	8	1
19	1.2 D + 1.0 - 150 W/Ice	Yes	Y	1	1.2	4	-0.866	5	0.5	8	1
20	1.2 D + 1.0 - 180 W/Ice	Yes	Y	1	1.2	4	-1			8	1
21	1.2 D + 1.0 - 210 W/Ice	Yes	Y	1	1.2	4	-0.866	5	-0.5	8	1
22	1.2 D + 1.0 - 240 W/Ice	Yes	Y	1	1.2	5	-0.866	4	-0.5	8	1
23	1.2 D + 1.0 - 270 W/Ice	Yes	Y	1	1.2	5	-1			8	1
24	1.2 D + 1.0 - 300 W/Ice	Yes	Y	1	1.2	5	-0.866	4	0.5	8	1
25	1.2 D + 1.0 - 330 W/Ice	Yes	Y	1	1.2	4	0.866	5	-0.5	8	1
26	1.2 D + 1.0 E - 0	Yes	Y	1	1.2	9	1				
27	1.2 D + 1.0 E - 30	Yes	Y	1	1.2	9	0.866	10	0.5		
28	1.2 D + 1.0 E - 60	Yes	Y	1	1.2	10	0.866	9	0.5		
29	1.2 D + 1.0 E - 90	Yes	Y	1	1.2	10	1				
30	1.2 D + 1.0 E - 120	Yes	Y	1	1.2	10	0.866	9	-0.5		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
31	1.2 D + 1.0 E - 150	Yes	Y	1	1.2	9	-0.866	10	0.5		
32	1.2 D + 1.0 E - 180	Yes	Y	1	1.2	9	-1				
33	1.2 D + 1.0 E - 210	Yes	Y	1	1.2	9	-0.866	10	-0.5		
34	1.2 D + 1.0 E - 240	Yes	Y	1	1.2	10	-0.866	9	-0.5		
35	1.2 D + 1.0 E - 270	Yes	Y	1	1.2	10	-1				
36	1.2 D + 1.0 E - 300	Yes	Y	1	1.2	10	-0.866	9	0.5		
37	1.2 D + 1.0 E - 330	Yes	Y	1	1.2	9	0.866	10	-0.5		
38	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y	1	1.2	6	1			11	1.5
39	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	11	1.5
40	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	11	1.5
41	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y	1	1.2	7	1			11	1.5
42	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	11	1.5
43	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	11	1.5
44	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y	1	1.2	6	-1			11	1.5
45	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	11	1.5
46	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	11	1.5
47	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y	1	1.2	7	-1			11	1.5
48	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	11	1.5
49	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	11	1.5
50	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y	1	1.2	6	1			12	1.5
51	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	12	1.5
52	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	12	1.5
53	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y	1	1.2	7	1			12	1.5
54	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	12	1.5
55	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	12	1.5
56	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y	1	1.2	6	-1			12	1.5
57	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	12	1.5
58	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	12	1.5
59	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y	1	1.2	7	-1			12	1.5
60	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	12	1.5
61	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	12	1.5
62	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y	1	1.2	6	1			13	1.5
63	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	13	1.5
64	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	13	1.5
65	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y	1	1.2	7	1			13	1.5
66	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	13	1.5
67	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	13	1.5
68	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y	1	1.2	6	-1			13	1.5
69	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	13	1.5
70	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	13	1.5
71	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y	1	1.2	7	-1			13	1.5
72	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	13	1.5
73	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	13	1.5
74	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y	1	1.2	6	1			14	1.5
75	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y	1	1.2	6	0.866	7	0.5	14	1.5
76	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y	1	1.2	7	0.866	6	0.5	14	1.5
77	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y	1	1.2	7	1			14	1.5
78	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y	1	1.2	7	0.866	6	-0.5	14	1.5
79	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y	1	1.2	6	-0.866	7	0.5	14	1.5
80	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y	1	1.2	6	-1			14	1.5
81	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y	1	1.2	6	-0.866	7	-0.5	14	1.5
82	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y	1	1.2	7	-0.866	6	-0.5	14	1.5
83	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y	1	1.2	7	-1			14	1.5
84	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y	1	1.2	7	-0.866	6	0.5	14	1.5
85	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y	1	1.2	6	0.866	7	-0.5	14	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
86	1.2 D + 1.5 LL Maint (1)	Yes	Y	1	1.2					15	1.5
87	1.2 D + 1.5 LL Maint (2)	Yes	Y	1	1.2					16	1.5
88	1.2 D + 1.5 LL Maint (3)	Yes	Y	1	1.2					17	1.5
89	1.2 D + 1.5 LL Maint (4)	Yes	Y	1	1.2					18	1.5
90	1.2 D + 1.5 LL Maint (5)	Yes	Y	1	1.2					19	1.5
91	1.2 D + 1.5 LL Maint (6)	Yes	Y	1	1.2					20	1.5
92	1.2 D + 1.5 LL Maint (7)	Yes	Y	1	1.2					21	1.5
93	1.2 D + 1.5 LL Maint (8)	Yes	Y	1	1.2					22	1.5
94	1.2 D + 1.5 LL Maint (9)	Yes	Y	1	1.2					23	1.5
95	1.2 D + 1.5 LL Maint (10)	Yes	Y	1	1.2					24	1.5
96	1.2 D + 1.5 LL Maint (11)	Yes	Y	1	1.2					25	1.5
97	1.2 D + 1.5 LL Maint (12)	Yes	Y	1	1.2					26	1.5
98	1.2 D + 1.5 LL Maint (13)	Yes	Y	1	1.2					27	1.5
99	1.2 D + 1.5 LL Maint (14)	Yes	Y	1	1.2					28	1.5
100	1.2 D + 1.5 LL Maint (15)	Yes	Y	1	1.2					29	1.5
101	1.2 D + 1.5 LL Maint (16)	Yes	Y	1	1.2					30	1.5
102	1.2 D + 1.5 LL Maint (17)	Yes	Y	1	1.2					31	1.5
103	1.2 D + 1.5 LL Maint (18)	Yes	Y	1	1.2					32	1.5
104	1.2 D + 1.5 LL Maint (19)	Yes	Y	1	1.2					33	1.5
105	1.2 D + 1.5 LL Maint (20)	Yes	Y	1	1.2					34	1.5
106	1.2 D + 1.5 LL Maint (21)	Yes	Y	1	1.2					35	1.5
107	1.2 D + 1.5 LL Maint (22)	Yes	Y	1	1.2					36	1.5
108	1.2 D + 1.5 LL Maint (23)	Yes	Y	1	1.2					37	1.5
109	1.2 D + 1.5 LL Maint (24)	Yes	Y	1	1.2					38	1.5

Envelope Node Reactions

	Node Label		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
0	1	max	1.292	5	1.826	14	1.208	2	3.577	2	1.245	11	0.25	94
1		min	-1.292	11	0.06	8	-1.332	8	-0.469	8	-1.244	5	-0.263	90
2	53	max	1.067	5	1.752	18	1.4	2	0.189	13	1.351	3	0.223	12
3		min	-1.175	11	0.112	12	-1.338	8	-1.785	43	-1.351	9	-2.977	18
4	82	max	1.175	5	1.747	22	1.401	2	0.189	3	1.351	7	2.968	22
5		min	-1.067	11	0.109	4	-1.338	8	-1.785	69	-1.351	13	-0.229	4
6	Totals:	max	3.534	5	4.878	21	4.008	2						
7		min	-3.534	11	2.458	3	-4.008	8						

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
0	1	HSS4X4X2	0.484	0	13	0.109	0	y	39	70.173	73.278	8.24	8.24	2.026	H1-1b
1	2	C3.38X2.06X.188	0.342	2.592	15	0.059	0.351	y	64	38.433	43.394	1.694	4.483	1.63	H1-1b
2	3	C3.38X2.06X.188	0.343	0	25	0.068	2.241	y	45	38.433	43.394	1.694	4.483	1.628	H1-1b
3	4	PL3/8"X6	0.083	0	13	0.135	0	y	62	68.997	72.9	0.57	9.113	2.11	H1-1b
4	5	PL3/8"X6	0.082	0	3	0.134	0	y	38	68.997	72.9	0.57	9.113	2.128	H1-1b
5	6	PIPE_3.5X0.165	0.071	4	52	0.044	2.917		4	45.872	71.57	6.336	6.336	1	H1-1b
6	7	PL3/8"X6	0.123	0.208	3	0.2	0.208	y	61	70.882	72.9	0.57	9.113	2.932	H1-1b
7	8	PL3/8"X6	0.123	0	13	0.199	0	y	51	70.882	72.9	0.57	9.113	2.937	H1-1b
8	9	L2X2X4	0.223	0	8	0.033	2.309	y	48	23.349	30.586	0.691	1.577	1.5	H2-1
9	10	L2X2X4	0.225	2.309	8	0.033	0	y	64	23.349	30.586	0.691	1.577	1.5	H2-1
10	11	L7.63X2.5X6	0.294	1.604	8	0.074	2.873	y	49	75.414	118.523	1.798	13.461	1.182	H2-1
11	18	PIPE_2.88X0.203	0.111	5.583	5	0.042	5.583		5	35.519	70.68	5.029	5.029	1	H1-1b
12	19	PIPE_2.88X0.203	0.11	2.333	10	0.041	5.583		8	35.519	70.68	5.029	5.029	1	H1-1b
13	22	PIPE_2.88X0.203	0.107	2.188	9	0.098	8.75		13	24.131	70.68	5.029	5.029	1	H1-1b
14	28	PIPE_2.88X0.203	0.11	2.333	6	0.041	5.583		8	35.519	70.68	5.029	5.029	1	H1-1b

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
15	30	L6.63X4.33X.25	0.167	0	10	0.02	0	y	11	51.794	86.751	2.311	6.976	1.5	H2-1
16	31	HSS4X4X2	0.483	0	7	0.108	0	y	64	70.173	73.278	8.24	8.24	2.027	H1-1b
17	32	C3.38X2.06X.188	0.343	2.592	19	0.06	0.351	y	69	38.433	43.394	1.694	4.483	1.629	H1-1b
18	33	C3.38X2.06X.188	0.34	0	17	0.068	2.241	y	49	38.433	43.394	1.694	4.483	1.627	H1-1b
19	34	PL3/8"X6	0.074	0	5	0.133	0	y	66	68.997	72.9	0.57	9.113	2.057	H1-1b
20	35	PL3/8"X6	0.081	0	7	0.135	0	y	42	68.997	72.9	0.57	9.113	2.068	H1-1b
21	36	PL3/8"X6	0.126	0.208	7	0.201	0.208	y	53	70.882	72.9	0.57	9.113	2.948	H1-1b
22	37	PL3/8"X6	0.113	0	5	0.2	0	y	55	70.882	72.9	0.57	9.113	2.96	H1-1b
23	38	L2X2X4	0.207	0	12	0.033	2.309	y	39	23.349	30.586	0.691	1.577	1.5	H2-1
24	39	L2X2X4	0.21	2.309	13	0.033	0	y	68	23.349	30.586	0.691	1.577	1.5	H2-1
25	40	L7.63X2.5X6	0.267	1.604	12	0.074	0.334	y	67	75.414	118.523	1.798	13.348	1.16	H2-1
26	49	L6.63X4.33X.25	0.187	0	2	0.024	3.25	y	9	51.794	86.751	2.311	6.976	1.5	H2-1
27	50	HSS4X4X2	0.483	0	9	0.108	0	y	68	70.173	73.278	8.24	8.24	2.026	H1-1b
28	51	C3.38X2.06X.188	0.338	2.592	23	0.06	0.351	y	73	38.433	43.394	1.694	4.483	1.627	H1-1b
29	52	C3.38X2.06X.188	0.342	0	21	0.068	2.241	y	41	38.433	43.394	1.694	4.483	1.629	H1-1b
30	53	PL3/8"X6	0.081	0	9	0.134	0	y	70	68.997	72.9	0.57	9.113	2.069	H1-1b
31	54	PL3/8"X6	0.074	0	11	0.133	0	y	46	68.997	72.9	0.57	9.113	2.058	H1-1b
32	55	PL3/8"X6	0.113	0.208	11	0.2	0.208	y	57	70.882	72.9	0.57	9.113	2.958	H1-1b
33	56	PL3/8"X6	0.126	0	9	0.2	0	y	59	70.882	72.9	0.57	9.113	2.946	H1-1b
34	57	L2X2X4	0.21	0	3	0.033	2.309	y	44	23.349	30.586	0.691	1.577	1.5	H2-1
35	58	L2X2X4	0.207	2.309	4	0.033	0	y	73	23.349	30.586	0.691	1.577	1.5	H2-1
36	59	L7.63X2.5X6	0.268	1.604	4	0.073	2.873	y	45	75.414	118.523	1.798	13.339	1.158	H2-1
37	68	L6.63X4.33X.25	0.187	3.25	2	0.024	0	y	7	51.794	86.751	2.311	6.976	1.5	H2-1
38	69	PIPE_3.5X0.165	0.07	4	52	0.05	2.917		9	45.872	71.57	6.336	6.336	1	H1-1b
39	72	PIPE_2.88X0.203	0.122	5.583	9	0.046	5.583		3	35.519	70.68	5.029	5.029	1	H1-1b
40	73	PIPE_2.88X0.203	0.121	2.333	2	0.038	5.583		13	35.519	70.68	5.029	5.029	1	H1-1b
41	76	PIPE_2.88X0.203	0.105	2.188	13	0.094	1.25		7	24.131	70.68	5.029	5.029	1	H1-1b
42	78	PIPE_2.88X0.203	0.108	2.333	10	0.035	5.583		12	35.519	70.68	5.029	5.029	1	H1-1b
43	80	PIPE_3.5X0.165	0.07	4	56	0.051	5.083		7	45.872	71.57	6.336	6.336	1	H1-1b
44	83	PIPE_2.88X0.203	0.122	5.583	7	0.046	5.583		7	35.519	70.68	5.029	5.029	1	H1-1b
45	84	PIPE_2.88X0.203	0.107	2.333	6	0.035	5.583		4	35.519	70.68	5.029	5.029	1	H1-1b
46	87	PIPE_2.88X0.203	0.105	7.813	3	0.094	8.75		9	24.131	70.68	5.029	5.029	1	H1-1b
47	89	PIPE_2.88X0.203	0.121	2.333	2	0.038	5.583		3	35.519	70.68	5.029	5.029	1	H1-1b

APPENDIX D

ADDITIONAL CALCULATIONS

PROJECT	**137173.004.01.0001 - CT896/M&M Co**				**KSC**
SUBJECT	**Platform Mount Analysis**				
DATE	**01/08/24**	PAGE	1	OF	1

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

[REF: AISC 360-05]

Reactions at Bolted Connection

Tension	:	1.332	k
Vertical Shear	:	1.826	k
Horizontal Shear	:	1.292	k
Torsion	:	0.263	k.ft
Moment from Horizontal Forces	:	1.245	k.ft
Moment from Vertical Forces	:	3.577	k.ft

Bolt Parameters

Assumed

Bolt Grade	:	A325	
Bolt Diameter	:	0.625	in
Nominal Bolt Area	:	0.307	in^2
Bolt spacing, Horizontal	:	7	in
Bolt spacing, Vertical	:	7	in
Bolt edge distance, plate height	:	1	in
Bolt edge distance, plate width	:	1	in
Total Number of Bolts	:	4	bolts

Summary of Forces

Shear Resultant Force	:	2.24	k
Force from Horz. Moment	:	1.96	k
Force from Vert. Moment	:	5.63	k
Shear Load / Bolt	:	0.56	k
Tension Load / Bolt	:	0.33	k
Resultant from Moments / Bolt	:	2.98	k

Bolt Checks

Nominal Tensile Stress, F_{nt}	:	90.00	ksi	[AISC Table J3.2]
Available Tensile Stress, ΦR_{nt}	:	20.72	k/bolt	[Eq. J3-1]
Unity Check, Bolt Tension	:	**15.99%**		**OKAY**
Nominal Shear Stress, F_{nv}	:	54.00	ksi	[AISC Table J3.2]
Available Shear Stress, ΦR_{nv}	:	12.43	k/bolt	[Eq. J3-1]
Unity Check, Bolt Shear	:	**7.18%**		**OKAY**
Unity Check, Combined	:	**23.16%**		**OKAY**
Available Bearing Strength, ΦR_n	:	18.35	k/bolt	
Unity Check, Bolt Bearing	:	**3.05%**		**OKAY**

APPENDIX E

SUPPLEMENTAL DRAWINGS

NOTES:

1.0 GENERAL
- 1.1 ALL METRIC DIMENSIONS ARE IN BRACKETS
- 1.2 FOR PATENTS, SEE WWW.CS-PAT.COM

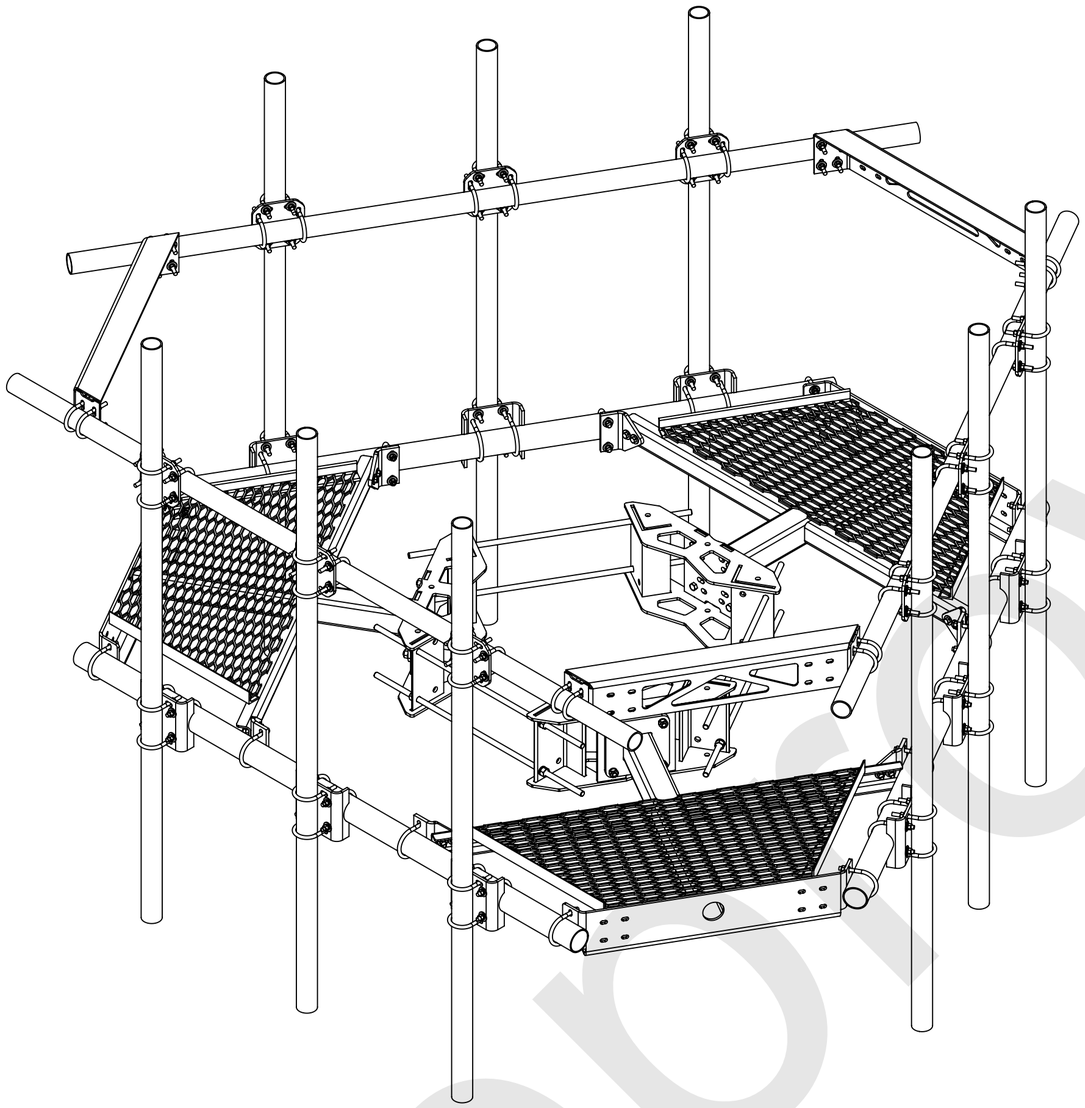
2.0 DESIGN NOTES
- 2.1 TORQUE U-BOLTS TO 44 FT-LBS

3.0 MANUFACTURING/SPECIAL REQUIREMENTS

4.0 TEST

5.0 PACKAGING

REVISIONS				
REV.	ECN	DESCRIPTION	BY	DATE
A	10272PC	INITIAL RELEASE	HDAI	03/08/2021



PATENT PENDING

COMMSCOPE, INC. OF NORTH CAROLINA

TOLERANCES				SAP MATERIAL MASTER
1 PLACE .X ±	.25	3 PLACE .XXX ±	0.06	MC-PK8-DSH
2 PLACE .XX ±	0.12	ANGLES ±	2°	

FINISH	MATERIAL
GALV A123	A500, A1011/A1018

		NAME	DATE
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES INTERPRET PER ANSI Y 14.5M-1994	CE	MRC	02/17/20
	RW	ROGHANSON	03/16/2021
	AD	BCROSS	03/17/2021
	RE	FA1024	02/27/2020
	ECN	10272PC	

TITLE: **LOW PROFILE PLATFORM FACE**

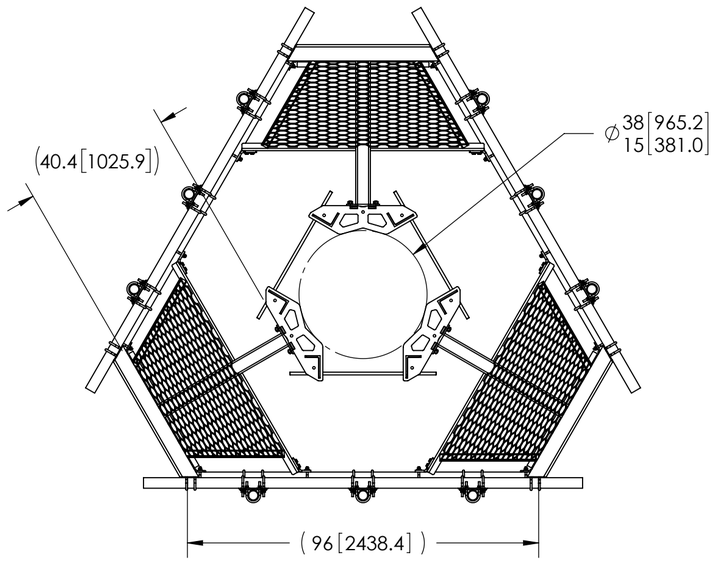
SCALE: 1:32

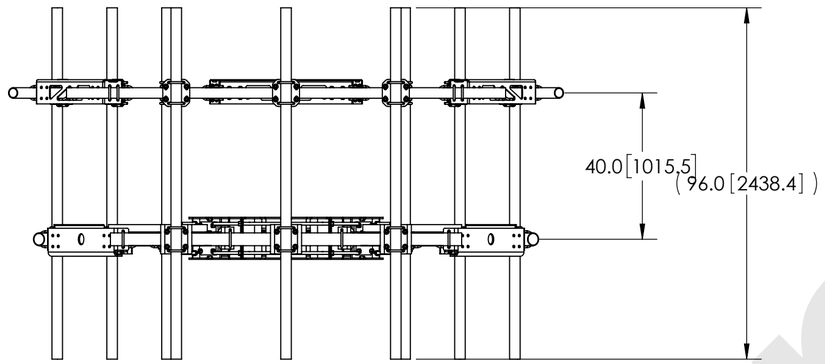
DOCUMENT NO.: MC-PK8-DSH

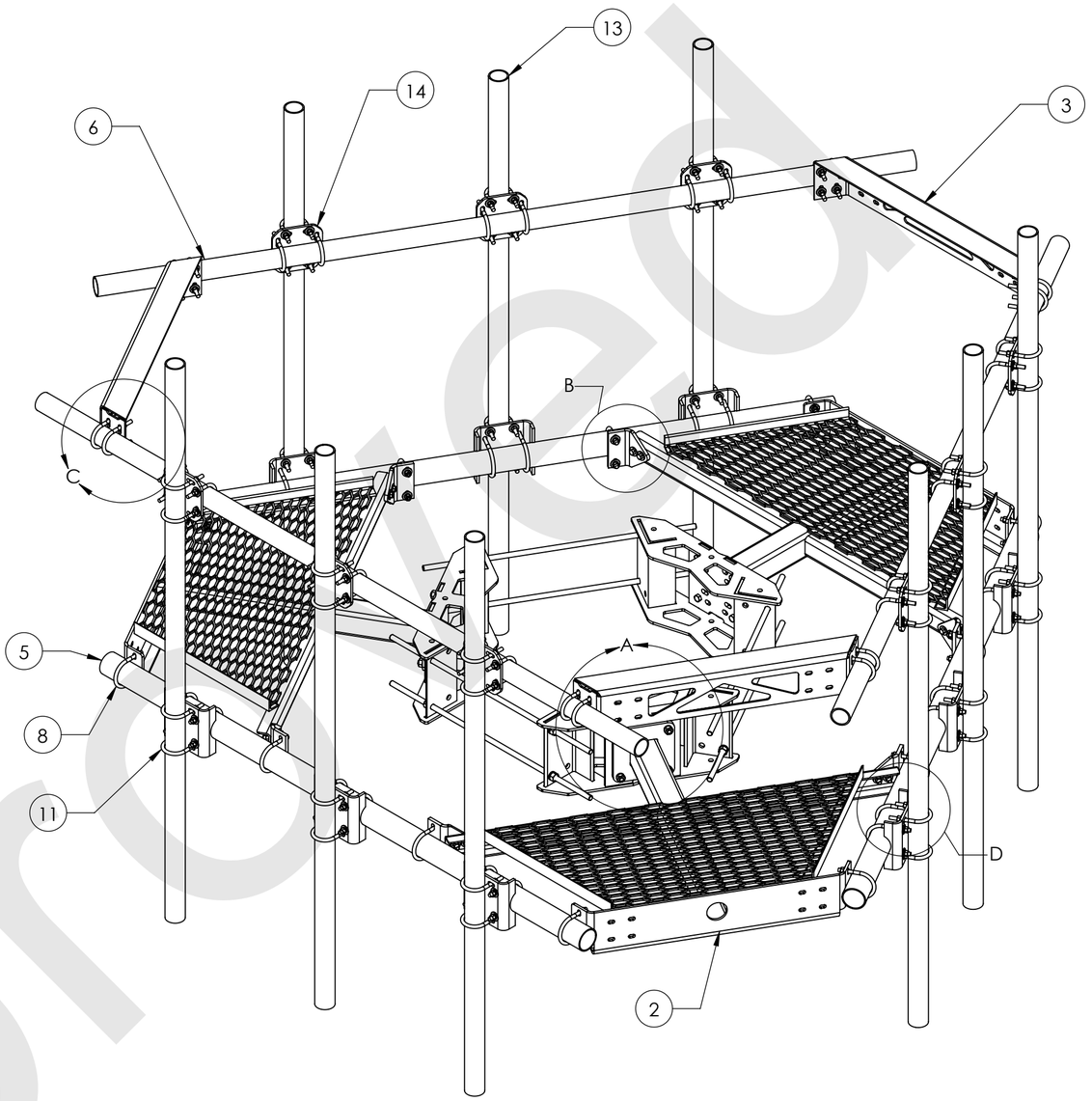
DENSITY	lbs/in³
MASS	lbs
VOLUME	in³
SURFACE AREA	in²
HEIGHT	96"
LENGTH	46"
WIDTH	29'

SIZE	Auth Group	INSL	MODEL			DRAWING			SHEET
			VERSION	STATUS	REVISION	VERSION	STATUS	REVISION	
C			01	AD		00	AD	A	1 OF 3

NOTES:







ITEM	PART NO.	DESCRIPTION	QTY.
1	MC-RM1550-3	12" - 50" OD RINGMOUNT	1
2	MTC300602	SECTOR WELDMENT FOR SNUB NOSE PLATFORM	3
3	MT195801	Corner Weldment Snub Nose Handrail	3
4	GB-0520A	5/8" X 2" GALV BOLT KIT (A325)	12
5	MT54796	3.50" OD X 96" GALV PIPE	3
6	MT546120	2.875" O.D. X 120" PIPE	3
7	GWF-04	1/2" GALV FLAT WASHER	12
8	GUB-4355	1/2" X 3-5/8" X 5" GALV U-BOLT	12
9	MTC300618	MOUNTING PLATE FOR MT-196	6
10	GB-04205	1/2" X 2" GALV BOLT KIT	12
11	MT-219M-H	3.5" OD X 2-7/8" OD Clamp Bracket Assembly	9
12	GUB-4352	1/2" X 3" X 5-1/4" GALV U-BOLT	12
13	MT54696	∅2.875" O.D. X 96 PIPE	9
14	XP-2525	CROSSOVER PLATE KIT, 2-7/8 OD X 2-7/8 OD	9

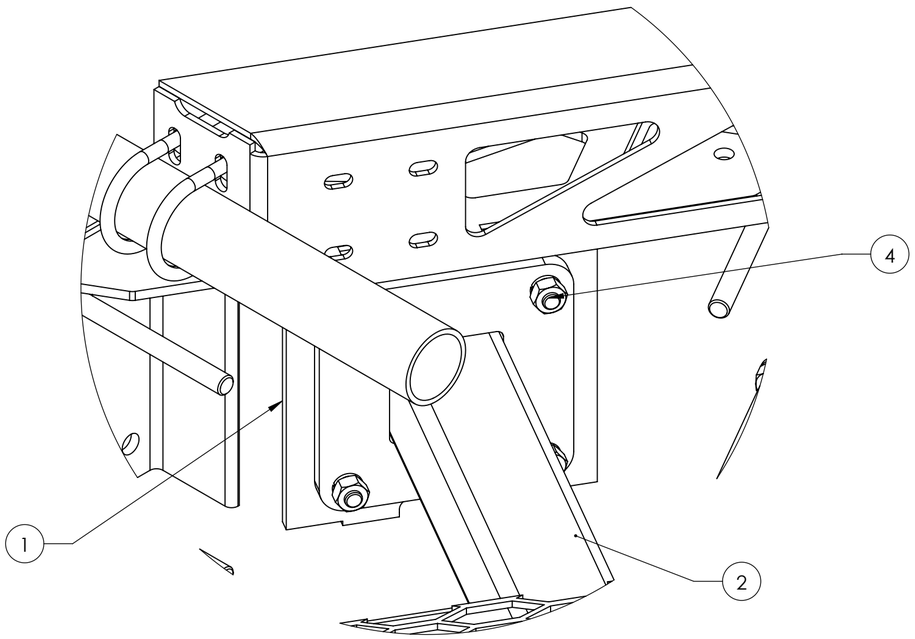
COMMSCOPE, INC. OF NORTH CAROLINA

TITLE

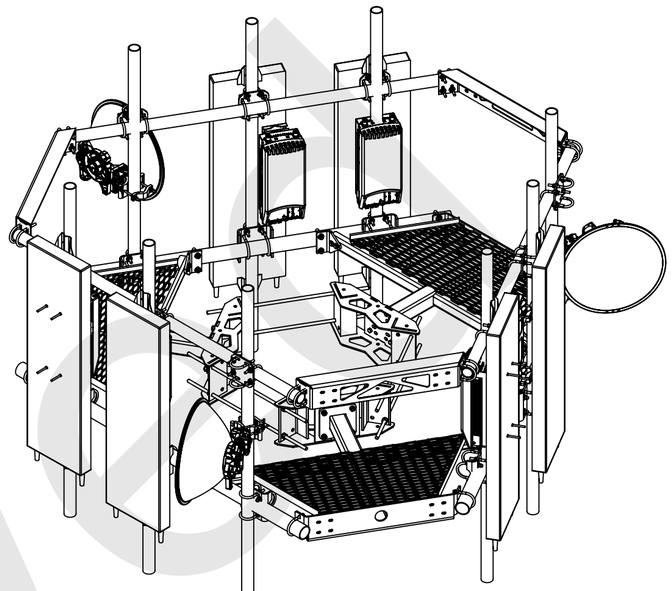
LOW PROFILE PLATFORM FACE

SIZE	SCALE	DOCUMENT NO.		
C	1:32	MC-PK8-DSH		
		DRAWING		SHEET
		VERSION	STATUS	REVISION
		00	AD	A

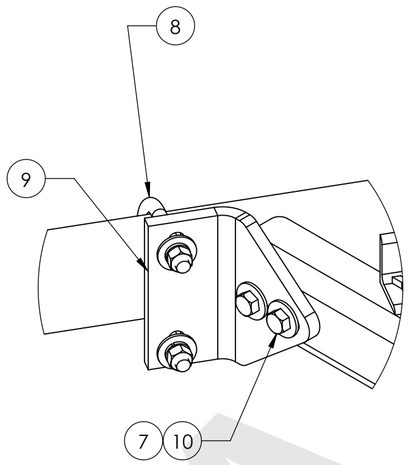
NOTES:



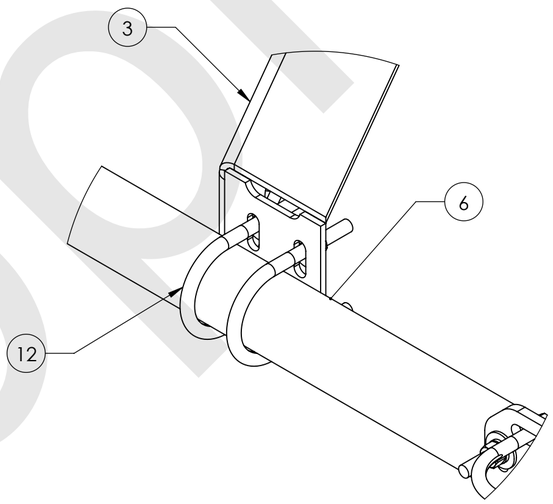
DETAIL A
SCALE 1 : 4



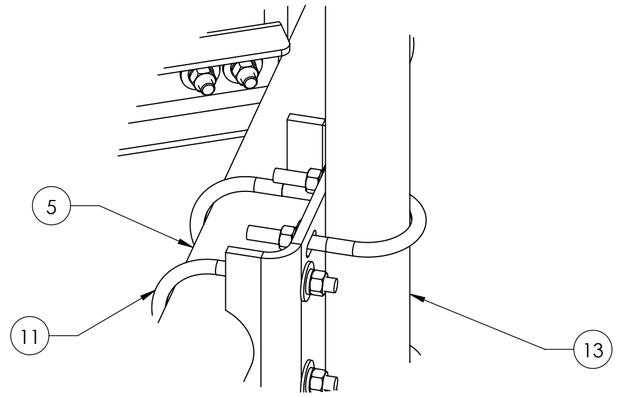
WITH ANTENNAS



DETAIL B
SCALE 1 : 4



DETAIL C
SCALE 1 : 4



DETAIL D
SCALE 1 : 4

COMMSCOPE, INC. OF NORTH CAROLINA				
TITLE: LOW PROFILE PLATFORM FACE				
SIZE: C	SCALE: 1:24	DOCUMENT NO.: MC-PK8-DSH		
		DRAWING		SHEET
		VERSION: 00	STATUS: AD	REVISION: A
				3 OF 3

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Dish Existing Facility

Site ID: NJJER01113B

NJJER01113B
41 Padanaram Road
Danbury, Connecticut 06811

December 29, 2023

EBI Project Number: 6223004352

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**5.56%**

December 29, 2023

Attn: Dish Wireless

Emissions Analysis for Site: NJJER01113B - NJJER01113B

EBI Consulting was directed to analyze the proposed Dish facility located at **41 Padanaram Road** in **Danbury, Connecticut** for the purpose of determining whether the emissions from the Proposed Dish Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Dish Wireless antenna facility located at 41 Padanaram Road in Danbury, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Dish is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 4 n71 channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

2) 4 n70 channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 4 n66 channels (AWS Band - 2190 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

5) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative

estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the JMA MX08FRO665-21 02DT 600 for the 600 MHz / 600 MHz / 1900 MHz channel(s) in Sector A, the JMA MX08FRO665-21 02DT 600 for the 600 MHz / 1900 MHz / 2100 MHz channel(s) in Sector B, the JMA MX08FRO665-21 02DT 600 for the 600 MHz / 1900 MHz / 2100 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 20 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline of the proposed antennas is 130 feet above ground level (AGL).

8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

9) All calculations were done with respect to uncontrolled / general population threshold limits.

Dish Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	JMA MX08FRO665-21 02DT 600	Make / Model:	JMA MX08FRO665-21 02DT 600	Make / Model:	JMA MX08FRO665-21 02DT 600
Frequency Bands:	600 MHz / 600 MHz / 1900 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 1900 MHz / 2100 MHz
Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd	Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd	Gain:	11.35 dBd / 15.75 dBd / 16.75 dBd
Height (AGL):	130 feet	Height (AGL):	130 feet	Height (AGL):	130 feet
Channel Count:	12	Channel Count:	12	Channel Count:	12
Total TX Power (W):	560.00 Watts	Total TX Power (W):	560.00 Watts	Total TX Power (W):	560.00 Watts
ERP (W):	15,025.44	ERP (W):	15,025.44	ERP (W):	15,025.44
Antenna A1 MPE %:	**0.11**	Antenna B1 MPE %:	**0.11**	Antenna C1 MPE %:	**0.11**

Site Composite MPE %	
Carrier	**MPE %**
Dish (Combined Sectors):	0.11%
Verizon	2.2%
AT&T	3.25%
Site Total MPE % :	5.56%

Dish MPE % Per Sector	
Dish Sector A Total:	0.11%
Dish Sector B Total:	0.11%
Dish Sector C Total:	0.11%
Dish Total MPE % :	0.11%

Dish Maximum MPE Power Values (Sector A)

Dish Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Dish 600 MHz n71	4	729.7116004	130	6.824713317	600 MHz n71	400.0	0.11 %
Dish 1900 MHz n70	4	1339.861757	130	12.53121421	1900 MHz n70	1000.0	0.11 %
Dish 2100 MHz n66	4	1686.786014	130	15.77586401	2100 MHz n66	1000.0	0.11 %
						Total:	**0.11%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the Dish facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Dish Sector	Power Density Value (%)
Sector A:	0.11%
Sector B:	0.11%
Sector C:	0.11%
Dish Maximum MPE % (Sector A):	0.11%
Dish Combined Sectors MPE %:	0.11%
Site Total:	5.56%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.56%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

DISH Wireless L.L.C. SITE ID:

NJJER01113B

DISH Wireless L.L.C. SITE ADDRESS:

41 PADANARAM RD
DANBURY, CT 06811

CONNECTICUT CODE OF COMPLIANCE

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	2018 CT STATE BUILDING CODE/2015 IBC W/ CT AMENDMENTS
MECHANICAL	2018 CT STATE BUILDING CODE/2015 IMC W/ CT AMENDMENTS
ELECTRICAL	2018 CT STATE BUILDING CODE/2017 NEC W/ CT AMENDMENTS

SHEET INDEX

SCOPE OF WORK

THIS IS NOT AN ALL INCLUSIVE LIST. CONTRACTOR SHALL UTILIZE SPECIFIED EQUIPMENT PART OR ENGINEER APPROVED EQUIVALENT. CONTRACTOR SHALL VERIFY ALL NEEDED EQUIPMENT TO PROVIDE A FUNCTIONAL SITE. THE PROJECT GENERALLY CONSISTS OF THE FOLLOWING:

TOWER SCOPE OF WORK:
- INSTALL (3) PROPOSED PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (1) PROPOSED ANTENNA PLATFORM MOUNT
- INSTALL PROPOSED JUMPERS
- INSTALL (6) PROPOSED RRUs (2 PER SECTOR)
- INSTALL (1) PROPOSED OVER VOLTAGE PROTECTION DEVICE (OVP)
- INSTALL (1) PROPOSED HYBRID CABLE

GROUND SCOPE OF WORK:
- INSTALL (1) PROPOSED METAL PLATFORM
- INSTALL (1) PROPOSED ICE BRIDGE
- INSTALL (1) PROPOSED PPC CABINET
- INSTALL (1) PROPOSED EQUIPMENT CABINET
- INSTALL (1) PROPOSED POWER CONDUIT
- INSTALL (1) PROPOSED TELCO CONDUIT
- INSTALL (1) PROPOSED TELCO-FIBER BOX
- INSTALL (1) PROPOSED GPS UNIT
- INSTALL (1) PROPOSED SAFETY SWITCH (IF REQUIRED)
- INSTALL (1) PROPOSED FIBER NID (IF REQUIRED)
- DISH WIRELESS TO UTILIZE EXISTING METER SOCKET "A"

SITE PHOTO

UNDERGROUND SERVICE ALERT CBYD 811
UTILITY NOTIFICATION CENTER OF CONNECTICUT
(800) 922-4455
WWW.CBYD.COM

CALL 2 WORKING DAYS UTILITY NOTIFICATION PRIOR TO CONSTRUCTION

GENERAL NOTES

THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. A TECHNICIAN WILL VISIT THE SITE AS REQUIRED FOR ROUTINE MAINTENANCE. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON DRAINAGE. NO SANITARY SEWER SERVICE, POTABLE WATER, OR TRASH DISPOSAL IS REQUIRED AND NO COMMERCIAL SIGNAGE IS PROPOSED.

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

SITE INFORMATION

PROPERTY OWNER:	KAUFMAN ROBERT J
ADDRESS:	X X
TOWER TYPE:	MONOPOLE
CROWN CASTLE SITE ID:	823531
CROWN CASTLE APP NUMBER:	656359
COUNTY:	FAIRFIELD
LATITUDE (NAD 83):	41° 25' 8.52" N 41.419033°
LONGITUDE (NAD 83):	73° 27' 43.96" W -73.462211°
ZONING JURISDICTION:	CITY OF DANBURY
ZONING DISTRICT:	COMMERCIAL
PARCEL NUMBER:	34-H10140
OCCUPANCY GROUP:	U
CONSTRUCTION TYPE:	II-B
POWER COMPANY:	EVERSOURCE
TELEPHONE COMPANY:	LIGHTOWER

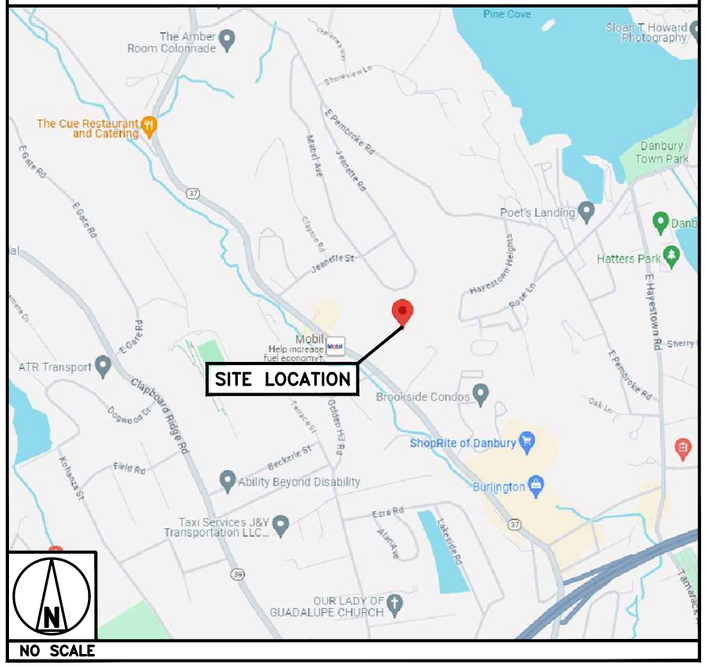
PROJECT DIRECTORY

APPLICANT:	DISH WIRELESS, LLC. 5701 SOUTH SANTA FE DRIVE LITTLETON, CO 80120
TOWER OWNER:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 (877) 486-9377
SITE DESIGNER:	KIMLEY-HORN & ASSOCIATES 3875 EMBASSY PKWY, SUITE 280 AKRON, OH 44333 (216) 505-7771 COA #: PEC.0000738
SITE ACQUISITION:	DANIEL ANDERSON DANIEL.ANDERSON@CROWNCASTLE.COM
CONSTRUCTION MANAGER:	OMAR ZEERBAN OMAR.ZEERBAN@DISH.COM
RF ENGINEER:	VAISHNAVI VAJJE VAISHNAVI.VAJJE@DISH.COM

DIRECTIONS

DIRECTIONS FROM JOHN F. KENNEDY INTERNATIONAL AIRPORT:
- TAKE I-678 N, HUTCHINSON RIV PKWY N, I-684 N AND I-84 E TO DOWNS ST IN DANBURY. TAKE EXIT 5 FROM I-84 E
- CONTINUE ONTO DOWNS ST
- CONTINUE ONTO NORTH ST
- CONTINUE ONTO PADANARAM RD
- DESTINATION WILL BE ON THE RIGHT

VICINITY MAP



NO SCALE

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

STATE OF CONNECTICUT
MICHAEL R. DOOLITTLE
PEN.0036148
LICENSED
PROFESSIONAL ENGINEER

12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
DMW	MCK	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	12/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLE-52603

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE

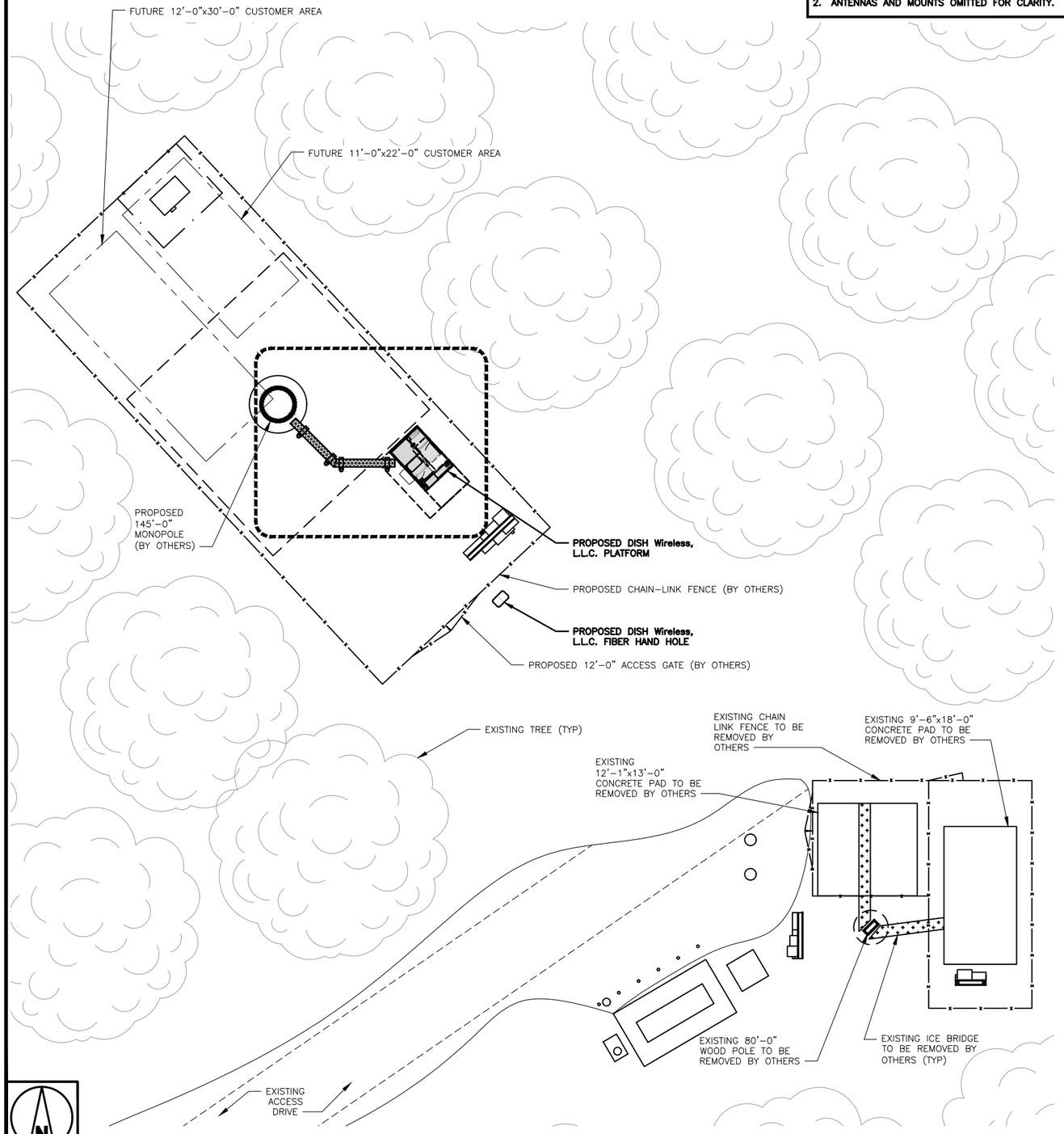
TITLE SHEET

SHEET NUMBER

T-1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



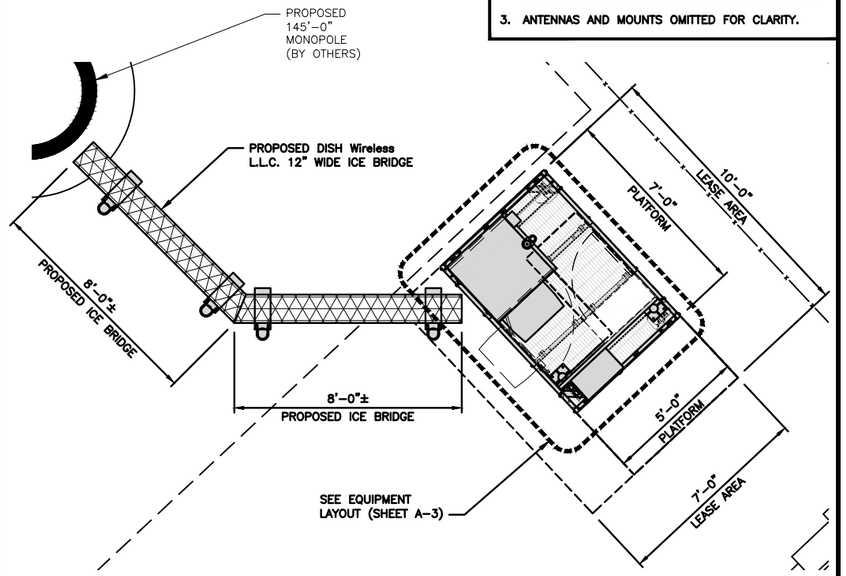
OVERALL SITE PLAN

8' 4' 0 8' 16'
1/8"=1'-0"

1

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. CONTRACTOR SHALL MAINTAIN A 10'-0" MINIMUM SEPARATION BETWEEN THE PROPOSED GPS UNIT, TRANSMITTING ANTENNAS AND EXISTING GPS UNITS.
3. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.



ENLARGED SITE PLAN

12" 6" 0 1' 2' 3' 4' 5' 6' 7'
3/8"=1'-0"

2

OVERALL UTILITY ROUTE PLAN

NO SCALE

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn

421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

STATE OF CONNECTICUT
MICHAEL R. DOOLITTLE
PEN.0036148
LICENSED
PROFESSIONAL ENGINEER

12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
DMW	MCK	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	12/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLE-52603

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE

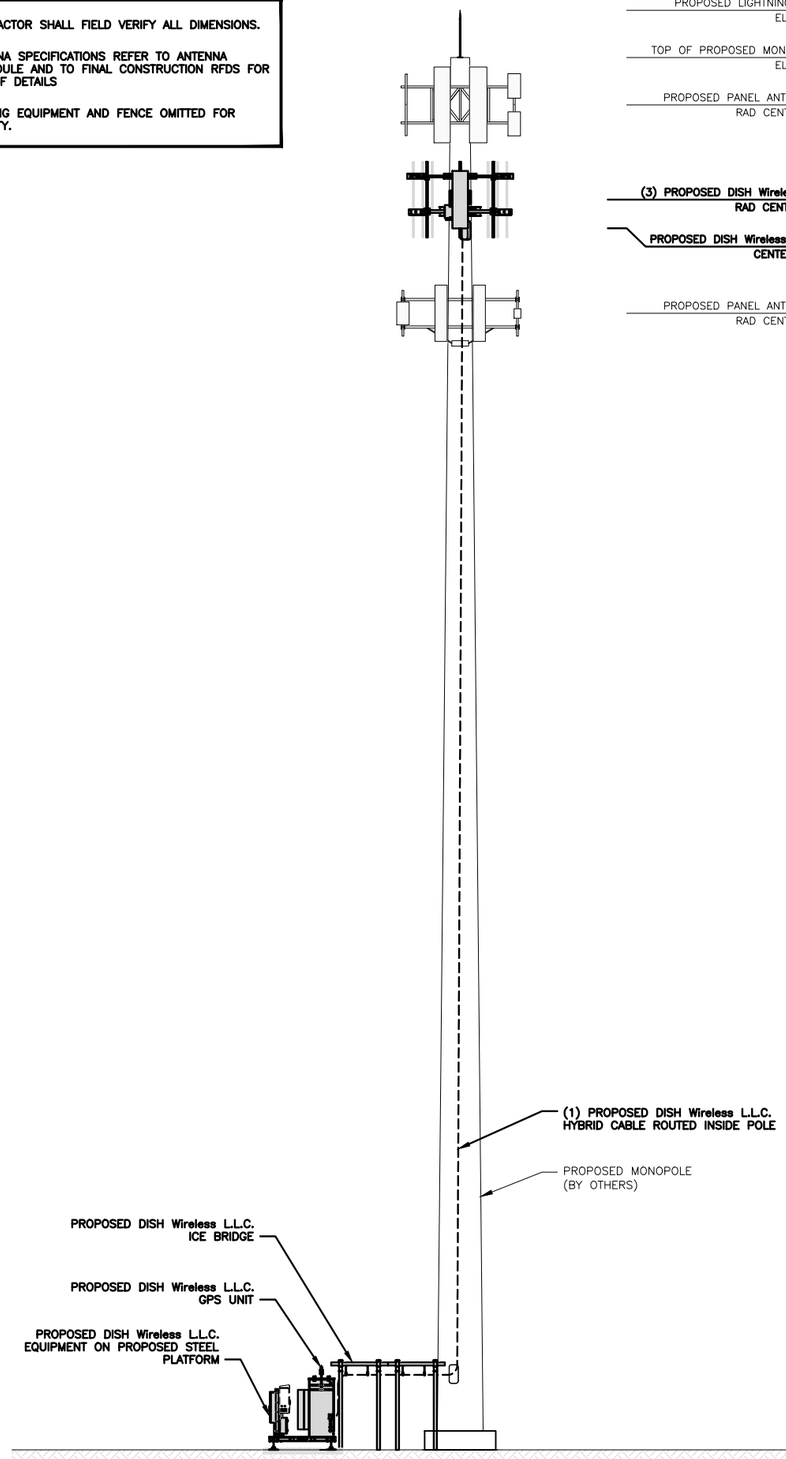
OVERALL AND ENLARGED SITE PLAN

SHEET NUMBER

A-1

NOTES

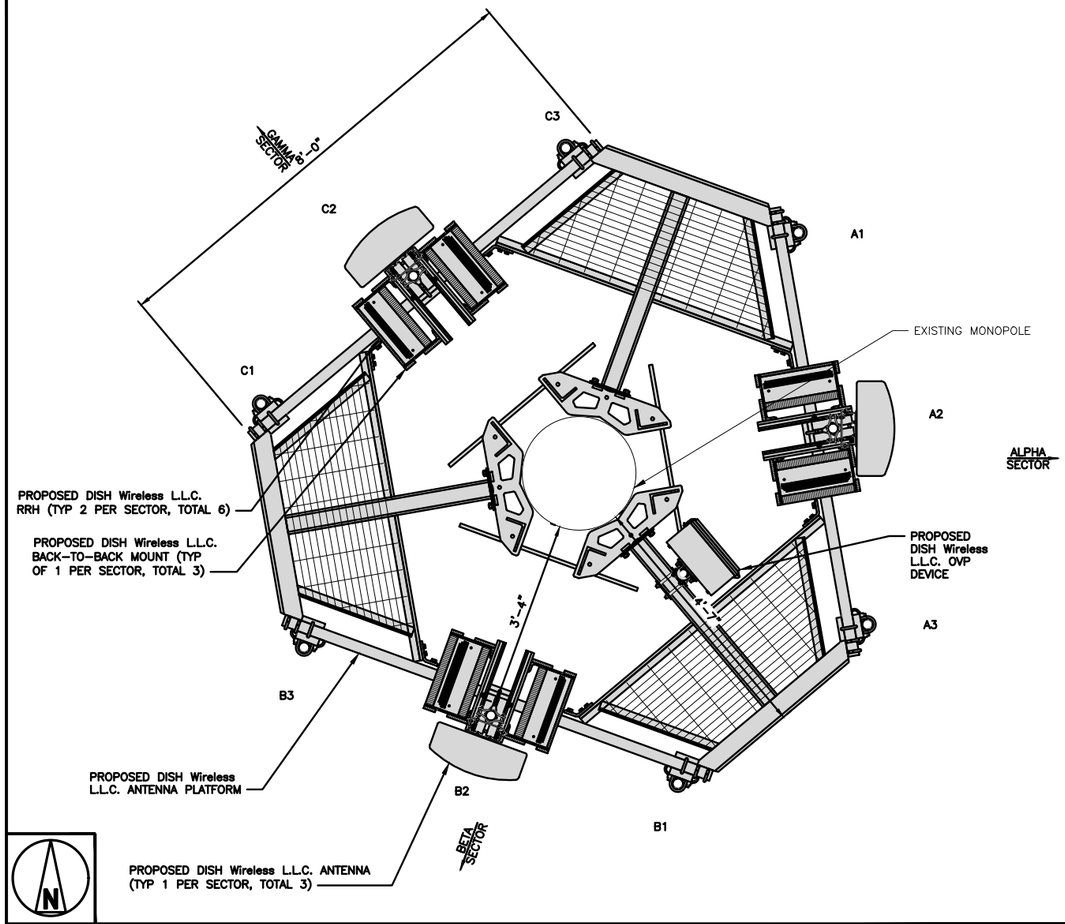
1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS.
2. ANTENNA SPECIFICATIONS REFER TO ANTENNA SCHEDULE AND TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS
3. EXISTING EQUIPMENT AND FENCE OMITTED FOR CLARITY.



PROPOSED NORTH ELEVATION

6' 4' 2' 0 5' 10'
3/16"=1'-0"

1



ANTENNA LAYOUT

12" 6" 0 1' 2' 3'
3/4"=1'-0"

2

SECTOR POS.	ANTENNA					TRANSMISSION CABLE	RRH			OVP
	EXISTING OR PROPOSED	MANUFACTURER – MODEL NUMBER	TECH	AZIMUTH	RAD CENTER	FEED LINE TYPE AND LENGTH	MANUFACTURER – MODEL NUMBER	TECH	POS.	MANUFACTURER MODEL
A1	--	--	--	--	--	(1) HIGH-CAPACITY HYBRID CABLE (170'-0" LONG)	SAMSUNG – RF4450t-71A	5G	A2	RAYCAP RDIDC-9181-PF-48
A2	PROPOSED	JMA – MX08FRO665-21	5G	90°	130'-0"		SAMSUNG – RF4451d-70A	5G	A2	
A3	--	--	--	--	--		--	--	--	
B1	--	--	--	--	--	SHARED W/ALPHA	SAMSUNG – RF4450t-71A	5G	B2	SHARED W/ALPHA
B2	PROPOSED	JMA – MX08FRO665-21	5G	200°	130'-0"		SAMSUNG – RF4451d-70A	5G	B2	
B3	--	--	--	--	--		--	--	--	
C1	--	--	--	--	--	SHARED W/ALPHA	SAMSUNG – RF4450t-71A	5G	C2	SHARED W/ALPHA
C2	PROPOSED	JMA – MX08FRO665-21	5G	320°	130'-0"		SAMSUNG – RF4451d-70A	5G	C2	
C3	--	--	--	--	--		--	--	--	

NOTES

1. CONTRACTOR TO REFER TO FINAL CONSTRUCTION RFDS FOR ALL RF DETAILS.
2. ANTENNA AND RRH MODELS MAY CHANGE DUE TO EQUIPMENT AVAILABILITY. ALL EQUIPMENT CHANGES MUST BE APPROVED AND REMAIN IN COMPLIANCE WITH THE PROPOSED DESIGN AND STRUCTURAL ANALYSES.

ANTENNA SCHEDULE

NO SCALE

3

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

STATE OF CONNECTICUT
MICHAEL R. DOOLITTLE
PEN.0036148
LICENSED
PROFESSIONAL ENGINEER

12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
DMW	MCK	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

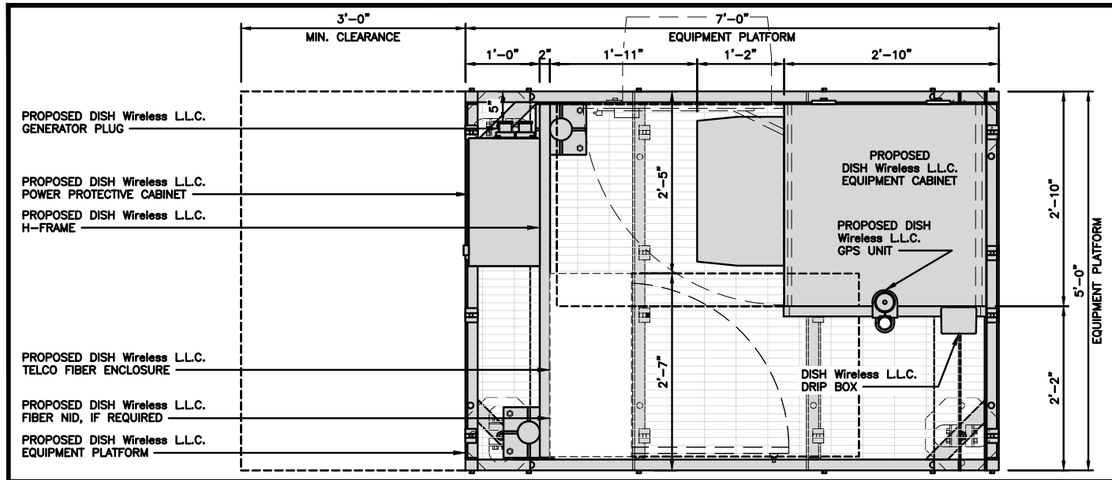
REV	DATE	DESCRIPTION
0	12/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER
KHCLE-52603

DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE
ELEVATION, ANTENNA LAYOUT AND SCHEDULE

SHEET NUMBER
A-2



PLATFORM EQUIPMENT PLAN

12" 9" 6" 3" 0 1' 2'
1"=1'-0"

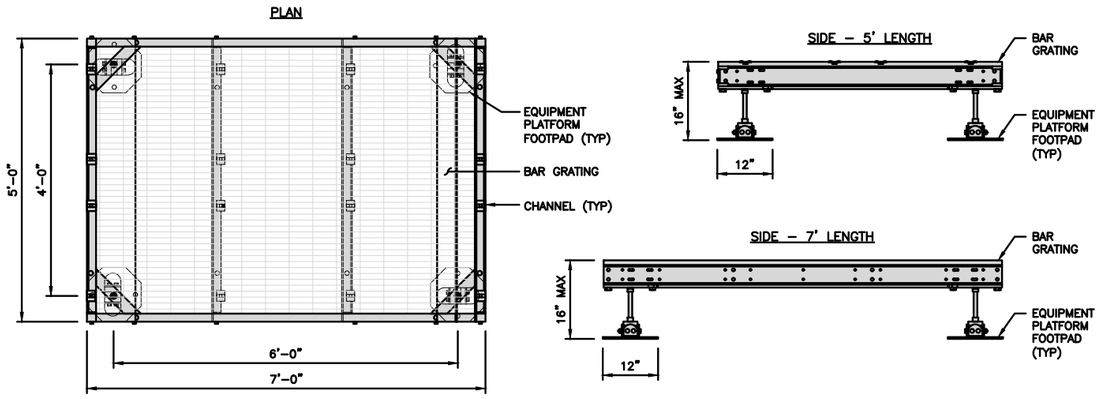
1

NOTES

1. INSTALL POSTS BASES TO GRATING JUST INSIDE PLATFORM FRAME. NO DRILLING REQUIRED.
2. GPS MAY BE MOVED TO ICE BRIDGE.
3. ALL CONDUIT TO BE ROUTED THROUGH PLATFORM GRATING USING PVC COUPLERS. CONDUIT QUANTITY AND SIZES ARE PER ONE-LINE DIAGRAM ON E-3 SHEET OF CDS. (DC PLANT DEPENDENT.)
4. CONTRACTOR MAY FIELD INSTALL CONDUIT HOLES IN BOTTOM OF PPC CABINET TO MATCH CONDUIT SIZES.
5. PROPER SEALING IS REQUIRED FOR ALL CABINET PENETRATIONS
6. H-FRAME POSTS ARE STAGGERED TO ALLOW FIBER NID BOXES TO BE INSTALLED CLOSE TO PERIMETER FRAME OF PLATFORM
7. CONDUITS FROM PPC/FIBER DEMARK CABINETS TO EQUIPMENT CABINET (BBU) SHALL BE INSTALLED INSIDE PERIMETER OF PLATFORM AND UNDER GRATING

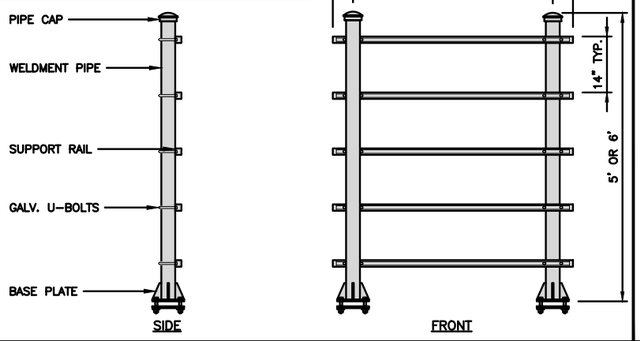
COMMSCOPE MTC4045LP 5X7 PLATFORM	
DIMENSIONS (HxWxD)	16"x84"x60"
TOTAL WEIGHT	423 LBS

NOTE:
1. GC TO PROVIDE EXTENDED THREAD FOR PLATFORM IF REQUIRED HEIGHT EXCEEDS 16"
2. PLATFORM TO BE LEVEL WITHIN 1"



PLATFORM DETAIL — NO SCALE — 2

COMMSCOPE MTC4045HFLD H-FRAME	
UNISTRUT/SUPPORT RAILS QTY	5
WEIGHT	59.74 lbs

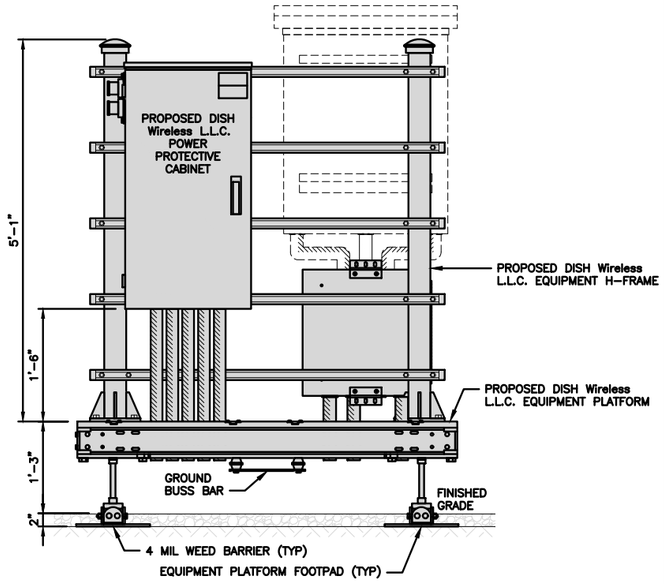


H-FRAME DETAIL — NO SCALE — 3

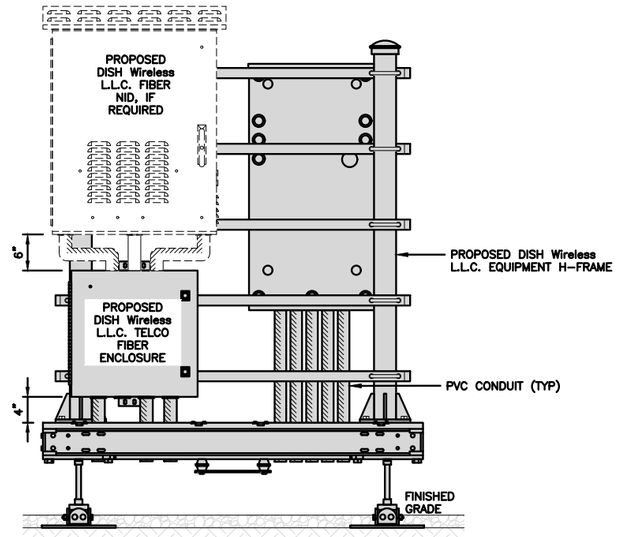
NOT USED — NO SCALE — 4

NOTES

1. CONTRACTOR TO BURY PLATFORM FEET WITH A MINIMUM OF 2" OF FILL PER EXISTING SITE SURFACE
2. WEED BARRIER FABRIC TO BE ADDED AT DISCRETION OF DISH Wireless L.L.C. CONSTRUCTION MANAGER AT TIME OF CONSTRUCTION. ONE SHEET 8'x8' INSTALLED UNDER ALL FOUR FEET OF THE PLATFORM (4 MIL BLACK PLASTIC)
3. EQUIPMENT CABINET OMITTED FOR CLARITY



FRONT ELEVATION



BACK ELEVATION

H-FRAME EQUIPMENT ELEVATION — 12" 9" 6" 3" 0 1' 2' — 1"=1'-0" — 5

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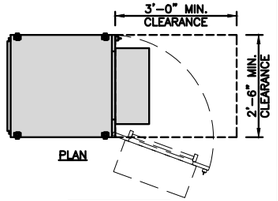
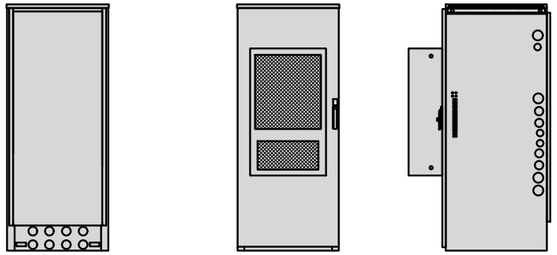
SHEET TITLE
EQUIPMENT PLATFORM AND H-FRAME DETAILS

SHEET NUMBER
A-3

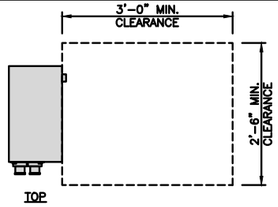
ENERSYS HEX CABINET 2000005996	
DIMENSIONS (HxWxD):	73"x30"x32"
WEIGHT EMPTY:	376 lbs
HEATER	800W
POWER SYSTEM	-48V ALPHA/600A

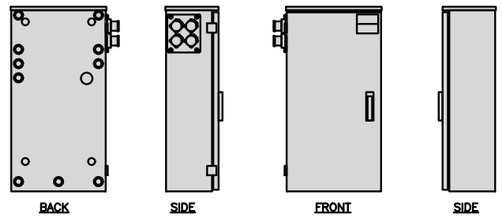




CABINET DETAIL | NO SCALE | 1

RAYCAP PPC RDIAC-2465-P-240-MTS	
ENCLOSURE DIMENSIONS (HxWxD):	39"x22.855"x12.593
WEIGHT:	80 lbs
OPERATING AC VOLTAGE	240/120 1 PHASE 3W+G

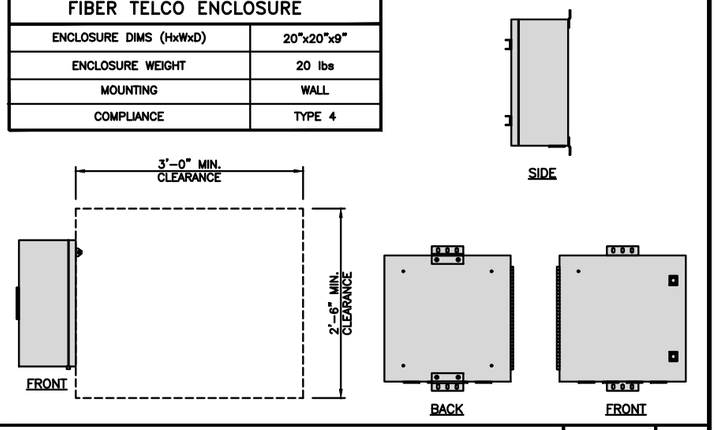




POWER PROTECTION CABINET (PPC) DETAIL | NO SCALE | 2

NOT USED | NO SCALE | 3

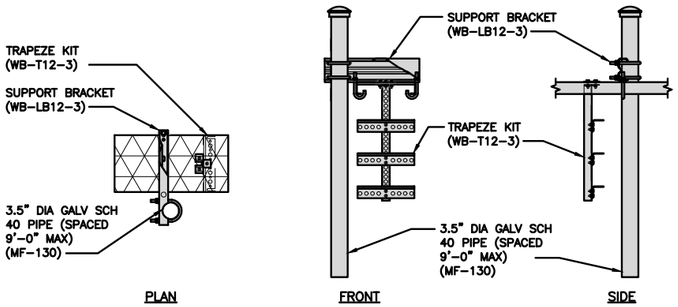
CHARLES CFIT-PF2020DSH1 FIBER TELCO ENCLOSURE	
ENCLOSURE DIMS (HxWxD)	20"x20"x9"
ENCLOSURE WEIGHT	20 lbs
MOUNTING	WALL
COMPLIANCE	TYPE 4



FIBER TELCO ENCLOSURE DETAIL | NO SCALE | 6

COMMSCOPE WB-K110-B WAVEGUIDE BRIDGE KIT	
DIMENSIONS (HxL)	160"x10'
WEIGHT/ VOLUME	325.0 LBS
CABLE RUN (QTY)	12

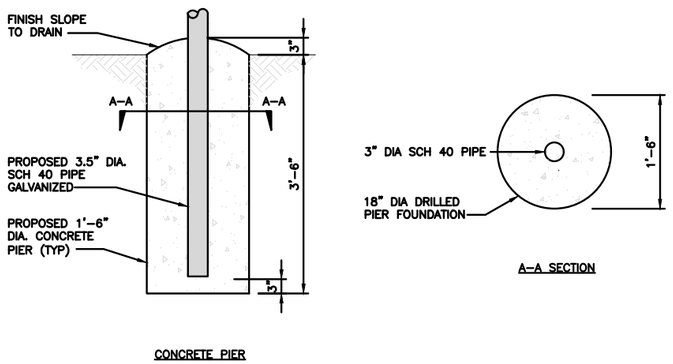
INCLUDED PRODUCTS:	
	WB-T12-3 TRAPEZE KIT, 3 RUNGS
	WB-LB12-3 SUPPORT BRACKET
	MF-130 DIRECT BURIAL PIPE COLUMN, 13'-4"



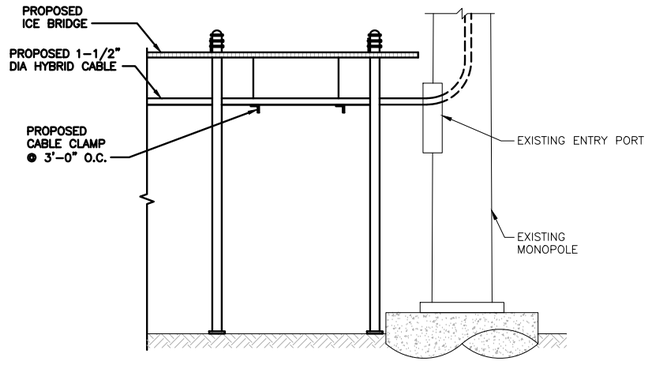
ICE BRIDGE DETAIL | NO SCALE | 7

NOT USED | NO SCALE | 4

NOT USED | NO SCALE | 5



TYPICAL ICE BRIDGE CONCRETE PIER DETAIL | NO SCALE | 8



HYBRID CABLE RUN | NO SCALE | 9

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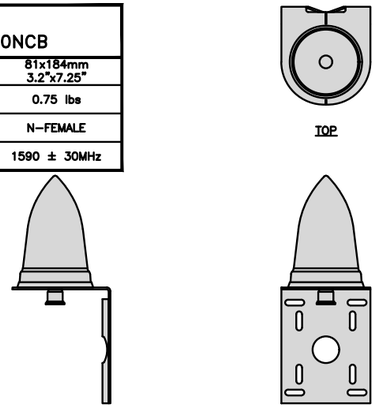
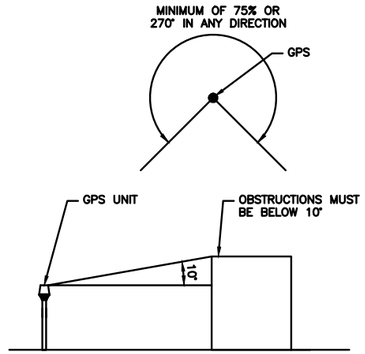
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

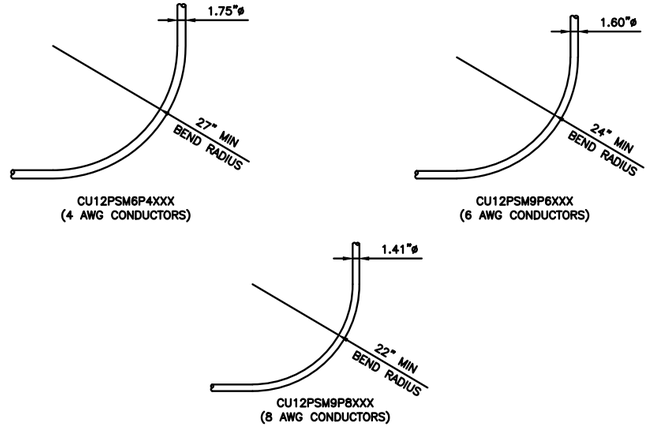
PCTEL GPSGL-TMG-SPI-40NCB	
DIMENSIONS (DIAxH) MM/INCH	81x184mm 3.2"x7.25"
WEIGHT W/ACCESSORIES	0.75 lbs
CONNECTOR	N-FEMALE
FREQUENCY RANGE	1590 ± 30MHz



GPS DETAIL — NO SCALE — 1



GPS MINIMUM SKY VIEW REQUIREMENTS — NO SCALE — 2

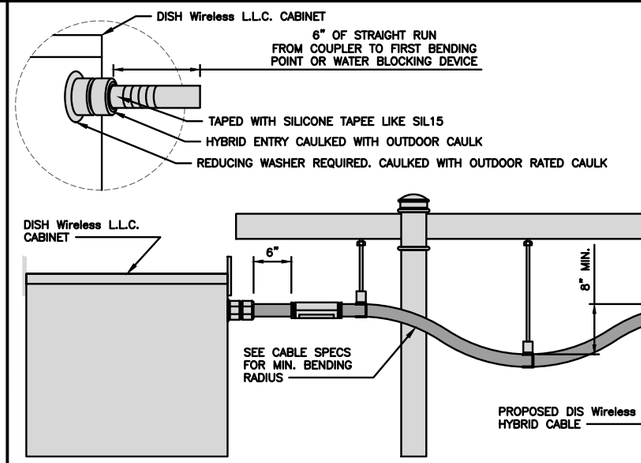


CABLES UNLIMITED HYBRID CABLE MINIMUM BEND RADIUSES — NO SCALE — 3

NOTE:

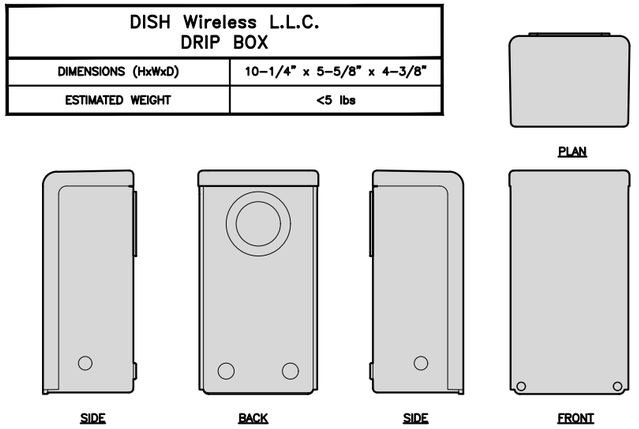
CONTRACTOR SHALL NOT LOOP EXCESS HYBRID OUTSIDE CABINET. EXCESS HYBRID LENGTH IS TO BE ADJUSTED BY STRIPPING JACKET AND SHIELDING AND TERMINATING DC CABLE TO LENGTH. FIBER EXCESS IS TO BE COILED IN FIBER SLACK TRAY INSIDE NETWORK CABINET.

HYBRID CABLE INSTALLATION NOTE — NO SCALE — 4

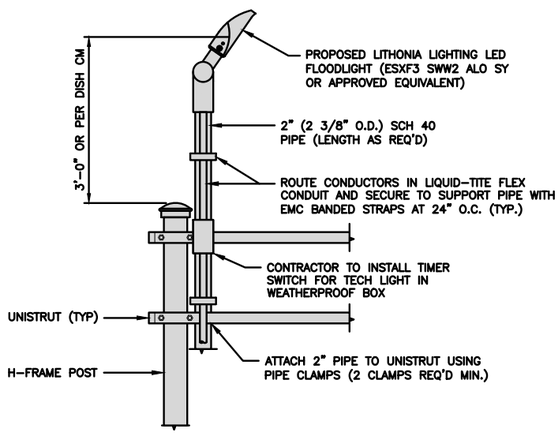


HYBRID CABLE INSTALLATION DETAIL — NO SCALE — 5

DISH Wireless L.L.C. DRIP BOX	
DIMENSIONS (HxWxD)	10-1/4" x 5-5/8" x 4-3/8"
ESTIMATED WEIGHT	<5 lbs



DISH Wireless L.L.C. DRIP BOX DETAIL — NO SCALE — 6



TECH LIGHT DETAIL — NO SCALE — 7

NOT USED — NO SCALE — 8

NOT USED — NO SCALE — 9

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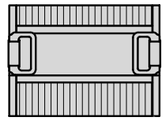
SHEET TITLE

EQUIPMENT DETAILS

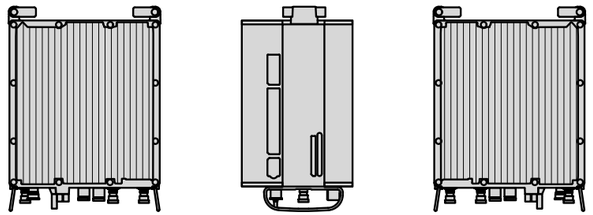
SHEET NUMBER

A-5

SAMSUNG – LOW BAND RF4450T–71A	
DIMENSIONS (HxWxD)	15"x16.5"x11"
WEIGHT	94.6 lbs
CONNECTOR TYPE	4.3–10 RF CONNECTOR
INPUT VOLTAGE	–48VDC (–36 to 58 VDC)



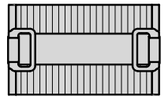
PLAN



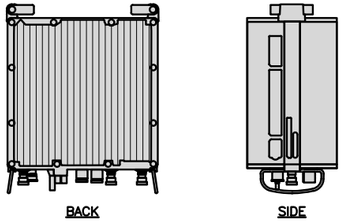
BACK SIDE FRONT

RRH DETAIL | NO SCALE | 1

SAMSUNG – MID BAND RF4451D–70A	
DIMENSIONS (HxWxD)	15"x15"x8.9"
WEIGHT	61.3 lbs
CONNECTOR TYPE	4.3–10 RF CONNECTOR
INPUT VOLTAGE	–48VDC (–36 to 58 VDC)



PLAN

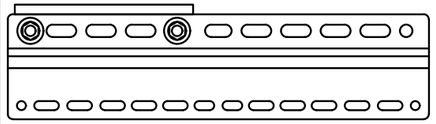


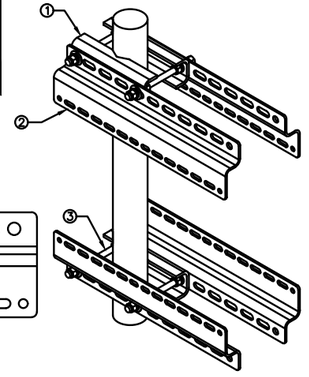
BACK SIDE FRONT

RRH DETAIL | NO SCALE | 2

SABRE DOUBLE Z–BRACKET C10123155	
DIMENSIONS (HxWxD) (1 BRACKET)	5"x20"x1–13/16"
WEIGHT (FULL ASSEMBLY)	35.79 lbs
PACKAGE QUANTITY	4

#	DESCRIPTION
1	PLATE, CHANNEL BRACKET
2	RRH Z BRACKET, 3/16"
3	THREADED ROD ASSEMBLY 1/2"x12"



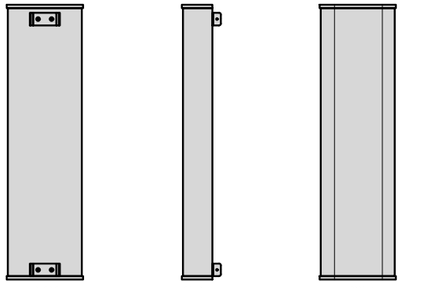


NOTE:
OR DISH Wireless L.L.C.
APPROVED EQUIVALENT

RRH MOUNT DETAIL | NO SCALE | 3

JMA WIRELESS MX08FRO665–21 ANTENNA	
DIMENSIONS (HxWxD)	72.0"x20.0"x8.0"
TOTAL WEIGHT	82.5 LB
RF PORTS, CONNECTOR TYPE	8 x 4.3–10 FEMALE

PLAN



BACK SIDE FRONT

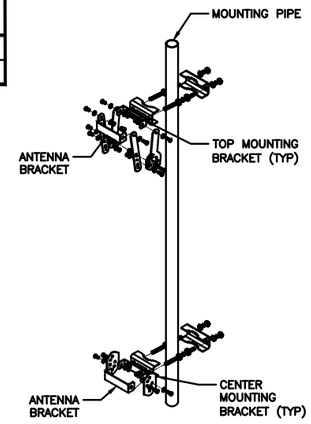
ANTENNA DETAIL | NO SCALE | 4

NOT USED | NO SCALE | 5

JMA ANTENNA MOUNTING BRACKET #91900318	
TOTAL WEIGHT (WITH BRACKETS)	18 lbs (8.18 Kg)
POLE DIAMETER RANGE	2.5 TO 4.5 INCHES

NOTE:
KIT #91900318: TOP AND BOTTOM BRACKETS FOR 4–,6–, AND 8–FOOT ANTENNAS

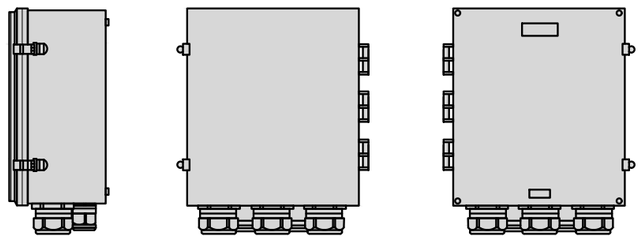
ANTENNA BRACKET NOT PART OF KIT



ANTENNA BRACKET DETAIL | NO SCALE | 6

RAYCAP RDIDC–9181–PF–48 DC SURGE PROTECTION (OVP)	
DIMENSIONS (HxWxD)	18.98"x14.39"x8.15"
WEIGHT	21.82 LBS

PLAN



SIDE BACK FRONT

SURGE SUPPRESSION DETAIL (OVP) | NO SCALE | 7

COMMSCOPE XP–2040 CROSSOVER PLATE	
DIMENSIONS (HxW)	10"x12"
WEIGHT	11 lbs

NOTE:
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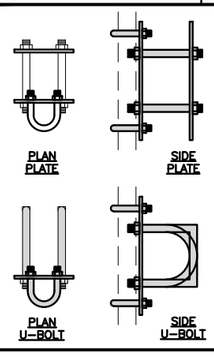
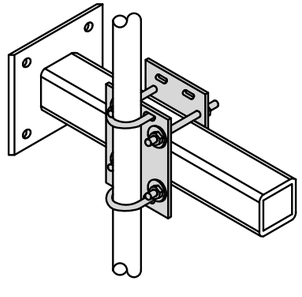
APPROVED EQUIVALENT



PLAN PLATE SIDE PLATE PLAN U–BOLT SIDE U–BOLT



RRH/OVP MOUNT DETAIL | NO SCALE | 8

COMMSCOPE MC–PK8–DSH	
FACE WIDTH	96"
WEIGHT	1373.08 lbs
NOTE: 15" TO 38" O.D.	

NOTE:
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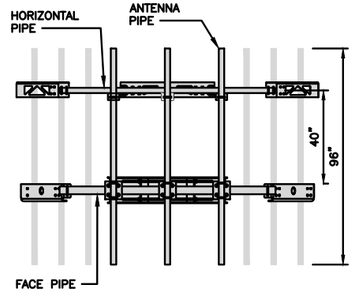
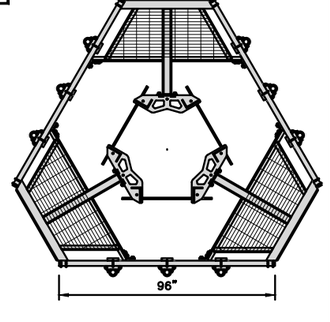
APPROVED EQUIVALENT





ANTENNA PLATFORM DETAIL | NO SCALE | 9

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SHEET TITLE

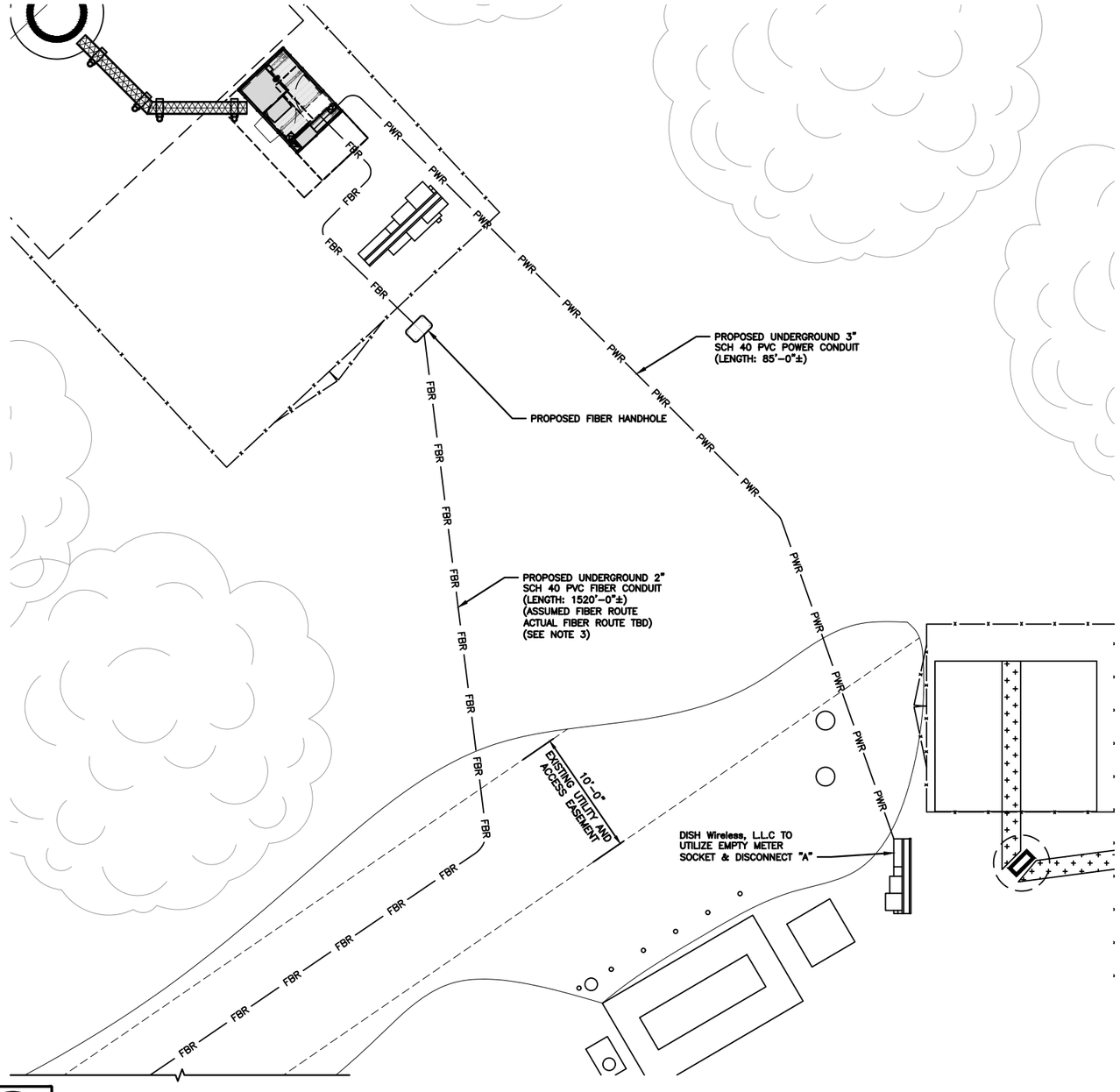
EQUIPMENT DETAILS

SHEET NUMBER

A-6

NOTES

1. CONTRACTOR SHALL FIELD VERIFY ALL PROPOSED UNDERGROUND UTILITY CONDUIT ROUTE.
2. ANTENNAS AND MOUNTS OMITTED FOR CLARITY.
3. DUE TO UTILITY EASEMENT RIGHTS SPECIFIED IN THE GROUND LEASE, CUSTOMER MAY INSTALL EQUIPMENT WITHIN SPECIFIED UTILITY EASEMENT AREA. "PWR" AND "FBR" PATH DEPICTED ON A–1 AND E–1 REPRESENT PLANNED ROUTING BASED ON BEST AVAILABLE INFORMATION INCLUDING BUT NOT LIMITED TO A SURVEY, EXHIBITS, METES AND BOUNDS OF THE UTILITY EASEMENT, FIELD VERIFICATION, PRIOR PROJECT DOCUMENTATION AND OTHER REAL PROPETY RIGHTS DOCUMENTS. WHEN INSTALLING THE UTILITIES PLEASE LOCATE AND FOLLOW EXISTING PATH. IF EXISTING PATH IS MATERIALLY INCONSISTENT WITH "PWR" AND "FBR" PATH DEPICTED ON A–1 AND E–1 AND SAID VARIANCE IS NOT NOTED ON CDs, PLEASE NOTIFY TOWER OWNER AS FURTHER COORDINATION MAY BE NEEDED.



UTILITY ROUTE PLAN

6' 4' 2' 0 5' 10'
3/16"=1'–0"

1

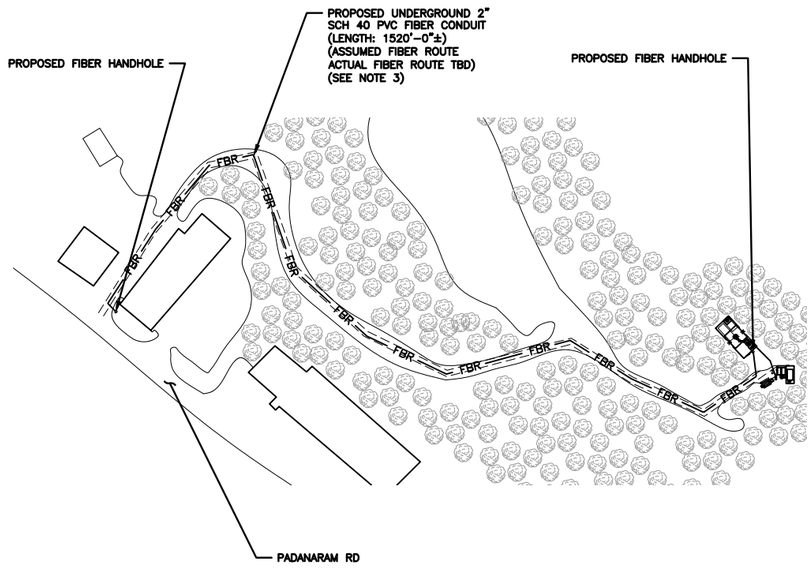
DC POWER WIRING SHALL BE COLOR CODED AT EACH END FOR IDENTIFYING +24V AND –48V CONDUCTORS. RED MARKINGS SHALL IDENTIFY +24V AND BLUE MARKINGS SHALL IDENTIFY –48V.

1. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING A BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
2. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL STATE AND LOCAL CODES, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
3. LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO CONSTRUCTION.
4. CONDUIT ROUGH–IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION CONFLICTS. VERIFY WITH THE MECHANICAL EQUIPMENT CONTRACTOR AND COMPLY AS REQUIRED.
5. CONTRACTOR SHALL PROVIDE ALL BREAKERS, CONDUITS AND CIRCUITS AS REQUIRED FOR A COMPLETE SYSTEM.
6. CONTRACTOR SHALL PROVIDE PULL BOXES AND JUNCTION BOXES AS REQUIRED BY THE NEC ARTICLE 314.
7. CONTRACTOR SHALL PROVIDE ALL STRAIN RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
8. ALL DISCONNECTS AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM.
9. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC 250. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, AND EQUIPMENT CABINETS.
10. ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
11. PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENTS REFLECT POST–CONSTRUCTION EQUIPMENT.
12. CONTRACTOR SHALL BE RESPONSIBLE FOR AS–BUILT PANEL SCHEDULE AND SITE DRAWINGS.
13. ALL TRENCHES IN COMPOUND TO BE HAND DUG

ELECTRICAL NOTES

NO SCALE

2



OVERALL UTILITY ROUTE PLAN

128' 64' 0 128' 256'
1/128"=1'–0"

3

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

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421 FAYETTEVILLE ST, SUITE 600
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STATE OF CONNECTICUT
MICHAEL R. DOOLITTLE
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LICENSED
PROFESSIONAL ENGINEER

12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
DMW	MCK	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	12/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLE–52603

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE

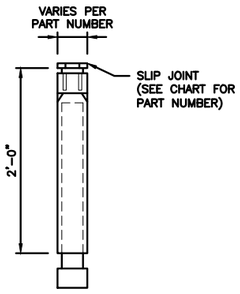
ELECTRICAL/FIBER ROUTE PLAN AND NOTES

SHEET NUMBER

E-1

CARLON EXPANSION FITTINGS

COUPLING END PART#	MALE TERMINAL ADAPTER END PART#	SIZE	STD CTN QTY.	TRAVEL LENGTH
E945D	E945DX	1/2"	20	4"
E945E	E945EX	3/4"	15	4"
E945F	E945FX	1"	10	4"
E945G	E945GX	1 1/4"	5	4"
E945H	E945HX	1 1/2"	5	4"
E945J	E945JX	2"	15	8"
E945K	E945KX	2 1/2"	10	8"
E945L	E945LX	3"	10	8"
E945M	E945MX	3 1/2"	5	8"
E945N	E945NX	4"	5	8"
E945P	E945PX	5"	1	8"
E945R	E945RX	6"	1	8"

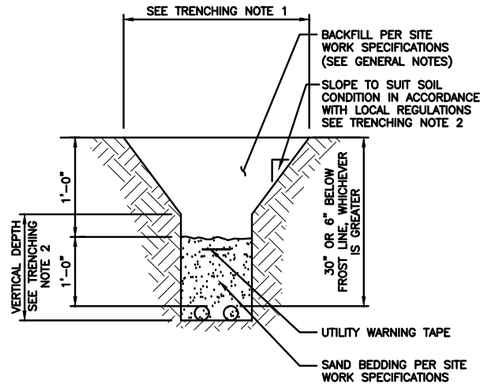


NOTE:
CONTRACTOR TO INSTALL EXPANSION FITTING SLIP JOINT AT METER CENTER CONDUIT TERMINATION, AS PER LOCAL UTILITY POLICY, ORDINANCE AND/OR SPECIFIED REQUIREMENT.

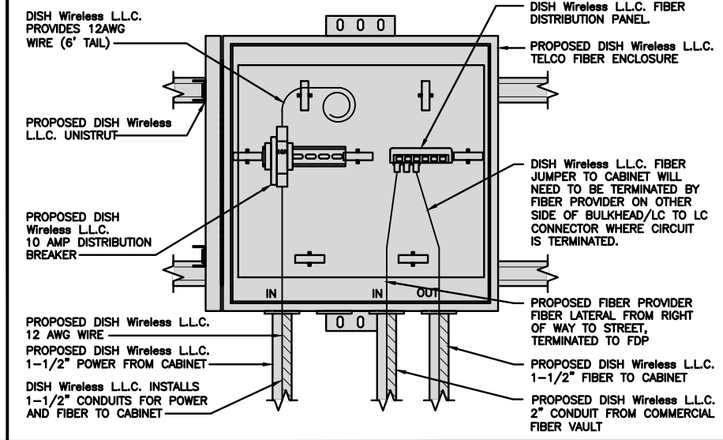
EXPANSION JOINT DETAIL | NO SCALE | 1

TRENCHING NOTES

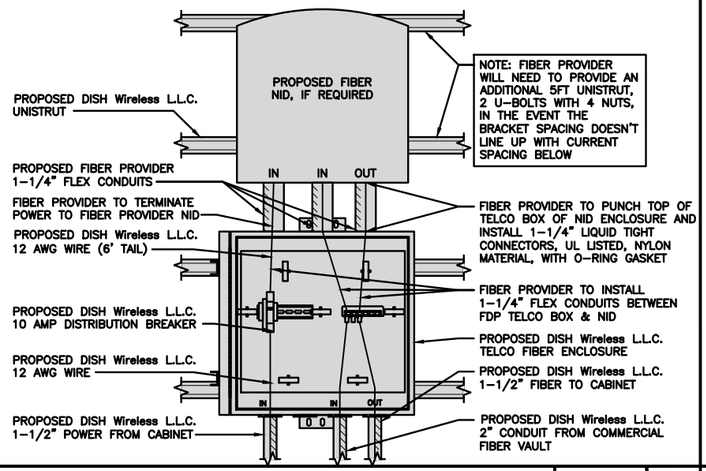
1. CONTRACTOR SHALL RESTORE THE TRENCH TO ITS ORIGINAL CONDITIONS BY EITHER SEEDING OR SODDING GRASS AREAS, OR REPLACING ASPHALT OR CONCRETE AREAS TO ITS ORIGINAL CROSS SECTION.
2. TRENCHING SAFETY; INCLUDING, BUT NOT LIMITED TO SOIL CLASSIFICATION, SLOPING, AND SHORING, SHALL BE GOVERNED BY THE CURRENT OSHA TRENCHING AND EXCAVATION SAFETY STANDARDS.
3. ALL CONDUITS SHALL BE INSTALLED IN COMPLIANCE WITH THE CURRENT NATIONAL ELECTRIC CODE (NEC) OR AS REQUIRED BY THE LOCAL JURISDICTION, WHICHEVER IS THE MOST STRINGENT.



TYPICAL UNDERGROUND TRENCH DETAIL | NO SCALE | 2



DARK TELCO BOX – INTERIOR WIRING LAYOUT | NO SCALE | 3



LIT TELCO BOX – INTERIOR WIRING LAYOUT (OPTIONAL) | NO SCALE | 4

NOT USED | NO SCALE | 5

NOT USED | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

DISH Wireless L.L.C. TEMPLATE VERSION 56 – 09/01/2023

dish wireless.
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12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
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A&E PROJECT NUMBER
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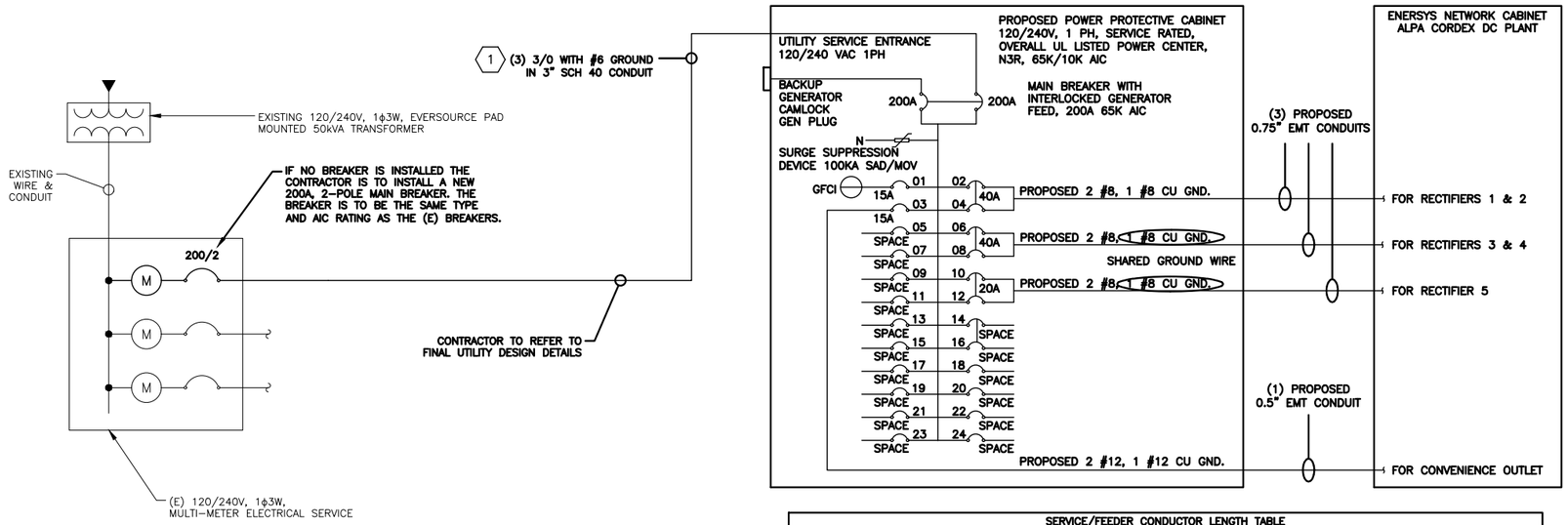
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE
ELECTRICAL DETAILS

SHEET NUMBER
E-2



NOTES

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.

THE ENGINEER OF RECORD HAS PERFORMED ALL REQUIRED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUIT AND FEEDERS COMPLY WITH THE NEC (LISTED ON T-1) ARTICLE 210.19(A)(1) FPN NO. 4.

CONDUIT SIZING: AT 40% FILL PER NEC CHAPTER 9, TABLE 4, ARTICLE 358.
- 0.5" CONDUIT – 0.122 SQ. IN AREA
- 0.75" CONDUIT – 0.213 SQ. IN AREA
- 2.0" CONDUIT – 1.316 SQ. IN AREA
- 3.0" CONDUIT – 2.907 SQ. IN AREA

CABINET CONVENIENCE OUTLET CONDUCTORS (1 CONDUIT): USING THWN-2, CU.

#12 – 0.0050 SQ. IN X 2 =	0.0100 SQ. IN
#12 – 0.0050 SQ. IN X 1 =	0.0050 SQ. IN <GROUND
TOTAL	= 0.0150 SQ. IN

0.5" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

RECTIFIER CONDUCTORS (3 CONDUITS): USING UL1015, CU.

#8 – 0.0552 SQ. IN X 2 =	0.1103 SQ. IN
#8 – 0.0131 SQ. IN X 1 =	0.0131 SQ. IN <BARE GROUND
TOTAL	= 0.1234 SQ. IN

0.75" EMT CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (3) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, CU.

3/0 – 0.2679 SQ. IN X 3 =	0.8037 SQ. IN
#6 – 0.0507 SQ. IN X 1 =	0.0507 SQ. IN <GROUND
TOTAL	= 0.8544 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

1 PPC FEED CONDUCTORS (1 CONDUIT): USING THWN, AL.

250kcmil AL – 0.3970 SQ. IN X 3 =	1.191 SQ. IN
#4 AL – 0.0824 SQ. IN X 1 =	0.0824 SQ.IN <GROUND
TOTAL	= 1.2734 SQ. IN

3.0" SCH 40 PVC CONDUIT IS ADEQUATE TO HANDLE THE TOTAL OF (4) WIRES, INCLUDING GROUND WIRE, AS INDICATED ABOVE.

NOTE:
BRANCH CIRCUIT WIRING SUPPLYING RECTIFIERS ARE TO BE RATED UL1015, 105°C, 600V, AND PVC INSULATED, IN THE SIZES SHOWN IN THE ONE-LINE DIAGRAM. CONTRACTOR MAY SUBSTITUTE UL1015 WIRE FOR THHN-2 FOR CONVENIENCE OUTLET BRANCH CIRCUIT.

BREAKERS REQUIRED: (OR EQUIVALENT MANUFACTURER)
(2) 40A, 2P BREAKER – SQUARE D P/N:QO240
(1) 20A, 2P BREAKER – SQUARE D P/N:QO220
(2) 215A, 1P BREAKER – SQUARE D P/N:QO115

SERVICE/FEEDER CONDUCTOR LENGTH TABLE
(BASED ON INDUSTRY STANDARD 3% VOLTAGE DROP AND 5% NEC ALLOWABLE LIMIT)

DESIGN LOADS	CONDUCTOR SIZES					
	250 kcmil AL	300 kcmil AL	3/0 CU	4/0 CU	250 kcmil CU	300 kcmil CU
DISH Wireless L.L.C. MAXIMUM CONTINUOUS LOAD (160A) (NEC ARTICLE 220 & 230 3% VOLTAGE DROP)	130'	155'	145'	180'	215'	255'
DISH Wireless L.L.C. MAXIMUM CONTINUOUS LOAD (160A) (NEC ARTICLE 220 & 230 5% VOLTAGE DROP)	220'	260'	240'	300'	360'	425'

NOTES:
1. 250 MCM/KCMIL AL + #2 AL GRD MAY BE USED AS A REPLACEMENT FOR 3/0 CU + #6 CU GRD SERVICE CONDUCTOR FROM THE DISH Wireless L.L.C. FIRST MEANS OF DISCONNECT/UTILITY COMPANY MEET-ME POINT. REFER TO VALUES ABOVE TO LIMIT VOLTAGE DROP TO 3%.
2. ALUMINUM/COPPER CONDUCTORS MUST BE RATED 75°C.
3. ALUMINUM TO COPPER BUSS CONNECTIONS MUST MEET AND CONFORM TO ANSI AND BE UL LISTED. USE ANTI CORROSION CONDUCTIVE LUBRICANT ON CONNECTIONS
4. PPC MAIN DISCONNECT CIRCUIT BREAKERS ACCEPT #4 – 300KCMIL AL OR CU CONDUCTORS.
5. VOLTAGE DROP FOR SINGLE METER ENCLOSURE FED FROM TRANSFORMER WITH MULTIPLE CUSTOMERS IS CALCULATED FROM THE TRANSFORMER TO PPC. (SERVICE AND FEEDER CONDUCTOR LENGTH)
6. VOLTAGE DROP FOR MULTI-METER ENCLOSURE IS CALCULATED FROM THE METER TO PPC. (FEEDER CONDUCTOR LENGTH)
7. VOLTAGE DROP CALCULATIONS ARE BASED ON A POWER FACTOR OF 1, A LINE TO GROUND VOLTAGE PER CONDUCTOR OF 120V, NO CORRECTION FACTOR FOR AMBIENT TEMPERATURE OR ADJUSTMENT FACTOR FOR MORE THAN THREE CURRENT-CARRYING CONDUCTORS IN A SINGLE CONDUCT OR RACEWAY. A POWER FACTOR LESS THAN 1 OR VOLTAGE LESS THAN 120 WILL RESULT IN SHORTER DISTANCES THAN SHOWN IN TABLE.

PPC ONE-LINE DIAGRAM — NO SCALE — 1

PROPOSED ENERSYS PANEL SCHEDULE

LOAD SERVED	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	TRIP	CKT #	PHASE	CKT #	TRIP	VOLT AMPS (WATTS) L1	VOLT AMPS (WATTS) L2	LOAD SERVED
PPC GFCI OUTLET	180		15A	1	A	2	40A	3840		ENERSYS ALPHA CORDEX
ENERSYS GFCI OUTLET		180	15A	3	B	4			3840	RECTIFIERS 1 & 2
-SPACE-				5	A	6	40A	3840		ENERSYS ALPHA CORDEX
-SPACE-				7	B	8			3840	RECTIFIER 3 & 4
-SPACE-				9	A	10	20A	1920		ENERSYS ALPHA CORDEX
-SPACE-				11	B	12			1920	RECTIFIER 5
-SPACE-				13	A	14				-SPACE-
-SPACE-				15	B	16				-SPACE-
-SPACE-				17	A	18				-SPACE-
-SPACE-				19	B	20				-SPACE-
-SPACE-				21	A	22				-SPACE-
-SPACE-				23	B	24				-SPACE-
VOLTAGE AMPS	180	180						9500	9500	
200A MCB, 1ϕ, 24 SPACE, 120/240V			L1		L2					
MB RATING: 65,000 AIC			9680		9680		VOLTAGE AMPS			
			81		81		AMPS			
			81				MAX AMPS			
			102				MAX 125%			

PANEL SCHEDULE — NO SCALE — 2

NOT USED — NO SCALE — 3

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STATE OF CONNECTICUT
MICHAEL R. DOOLITTLE
PEN.0036148
LICENSED PROFESSIONAL ENGINEER
12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
DMW	MCK	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
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A&E PROJECT NUMBER
KHCLE-52603

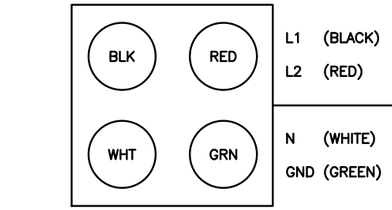
DISH Wireless L.L.C.
PROJECT INFORMATION
NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE
ELECTRICAL ONE-LINE, FAULT CALCS & PANEL SCHEDULE

SHEET NUMBER
E-3

NOTES:

1. HAZARD OF ELECTRICAL SHOCK OR BURN. TURN OFF POWER SUPPLYING THIS EQUIPMENT BEFORE WORKING INSIDE.
2. 100 OR 200 AMP, 240 VOLTS, SINGLE PHASE ALTERNATING CURRENT CIRCUIT ONLY
3. GENERATOR SHORT CIRCUIT RATING: 10,000 / 20,000 AMPS RMS SYMMETRICAL, AMPERES AT 240 VOLTS
4. UTILITY SHORT CIRCUIT RATING: 65,000 AMPS RMS SYMMETRICAL, AMPERES AT 240 VOLTS
5. SUITABLE FOR USE AS SERVICE EQUIPMENT
6. SUITABLE FOR USE IN ACCORDANCE WITH ARTICLE 702 OF THE NATIONAL ELECTRIC CODE ANSI/NFPA 70
7. BONDED NEUTRAL WHEN INSTALLED AS SHOWN IN WIRING DIAGRAM
8. RAIN PROOF TYPE 3R
9. USE CU–AL WIRE 60–75 °C
10. EQUIPPED WITH SLIDE BAR MECHANICAL INTERLOCK
11. INTERLOCK PROHIBITS BOTH POWER SOURCES FROM BEING IN THE ON POSITION SIMULTANEOUSLY
12. EQUIPPED WITH SQUARE D BREAKERS OR ALTERNATIVE MANUFACTURER EQUIVALENT
13. WHEN REPLACE LOAD CENTER BREAKERS, USE ONLY SQUARE D (QO TYPE) OF THE SAME RATING OR EQUIVALENT
14. WHEN RESETTING BREAKERS TURN TO OFF POSITION, THEN TO ON POSITION
15. WARNING: MAKE CONTINUITY CHECK WITH OHM METER TO VERIFY CORRECT PHASING AND GROUNDING CONNECTIONS BEFORE POWER UP
16. VERIFY PIN OUT CONFIGURATION OF GENERATOR PRIOR TO USE.
17. RISK OF ELECTRIC SHOCK, BOTH ENDS OF DISCONNECTING MEANS MAY BE ENERGIZED. TEST BEFORE SERVICING
18. THIS SWITCH BOARD MAY CONTAIN A TAP ON THE SERVICE SIDE OF THE MAIN POWER DISCONNECT FOR REMOTE MONITORING OF UTILITY/STANDBY POWER
19. THE NORMAL AC POWER MONITORING CIRCUIT MUST UTILIZE A DISCONNECTING MEANS WITH A SHORT CIRCUIT RATING GREATER THAN THE AVAILABLE INTERRUPTING CURRENT
20. A RED PUSH–TO–TRIP BUTTON PROVIDES A MEANS TO MECHANICALLY TRIP THE CIRCUIT BREAKER. THIS ACTION EXERCISES THE TRIPPING PORTION OF THE MECHANISM AND ALLOWS MAINTENANCE CHECK ON THE BREAKER



CAM–LOCK GENERATOR RECEPTACLE

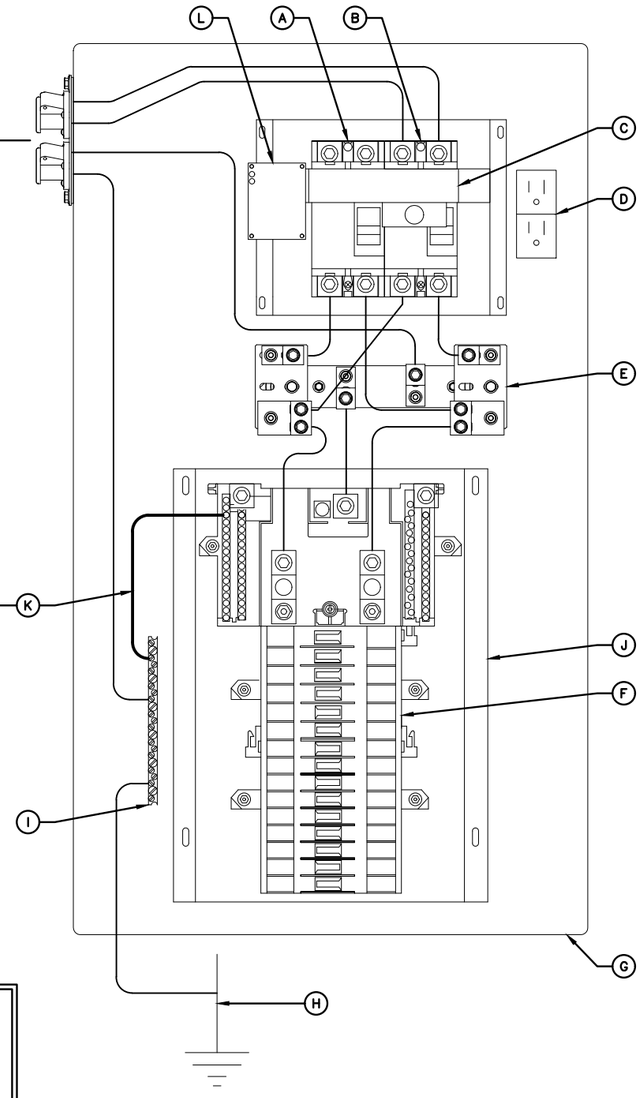
(AS VIEWED FROM OUTSIDE OF ENCLOSURE)
USE LINE UP PIN AS REFERENCE

REFER TO RECEPTACLE FOR MODEL NUMBER

DANGER:

HAZARD OF ELECTRICAL SHOCK OR BURN. TURN OFF POWER SUPPLYING THIS EQUIPMENT BEFORE WORKING INSIDE.

RAYCAP CUSTOMER SERVICE
(800) 890–2569



SUITABLE FOR USE AS SERVICE EQUIPMENT

ELECTRICAL RATING 120/240 VOLTS SINGLE PHASE 60 Hz	
NORMAL AC POWER 100A□ 200A□	GENERATOR POWER 100A□ 200A□

CAUTION:

- THE OPERATING HANDLE ASSUMES A CENTER POSITION WHEN THE CIRCUIT BREAKER IS TRIPPED
- THE BREAKER CAN BE RESET BY OPERATING THE HANDLE TO THE EXTREME OFF POSITION AND THEN TO ON
- SLIDE BAR MECHANICAL INTERLOCK TRANSFERS NORMAL AC POWER TO GENERATOR POWER. THE SLIDE BAR MECHANICAL INTERLOCK PROHIBITS BOTH POWER SOURCES FROM BEING IN THE ON POSITION SIMULTANEOUSLY
- TO TRANSFER FROM ON POWER SOURCE TO THE OTHER POWER SOURCE, SWITCH ON BREAKER TO THE OFF POSITION, MOVE THE SLIDE BAR TO THE OTHER SIDE AND THE SWITCH THE OTHER BREAKER TO THE ON POSITION

THIS SWITCHBOARD UTILITY MAN BREAKER IS SUITABLE FOR USE ON CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 65,000 RMS SYMMETRICAL AMPS, 240 VOLTS MAXIMUM.

200A UTILITY FEED

LOAD SIZE CIRCUIT BREAKERS				LINE SIDE MAIN CIRCUIT BREAKER					
MFR.	TYPE	POLES	AMP RATING	MFR.	TYPE	AMP RATING	SYMMET. AMP RMS	VOLTS AC	PHASES
SQ–D	QO	1 2	15–100A	SQ–D	QGL	200A	65,000A	240V	2

THIS SWITCHBOARD GENERATOR POWER CIRCUIT IS SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 10,000 RMS SYMMETRICAL AMPS, 240 VOLTS MAXIMUM.

200A GENERATOR FEED

LOAD SIZE CIRCUIT BREAKERS				LINE SIDE MAIN CIRCUIT BREAKER					
MFR.	TYPE	POLES	AMP RATING	MFR.	TYPE	AMP RATING	SYMMET. AMP RMS	VOLTS AC	PHASES
SQ–D	QO	1 2	15–100A	SQ–D	QGL	200A	65,000A	240V	2

MAXIMUM CONTINUOUS LOADS NOT TO EXCEED 80% OF THE OVER–CURRENT PROTECTIVE DEVICE (CIRCUIT BREAKER AND FUSES) RATINGS EMPLOYED IN OTHER THAN MOTOR CIRCUITS, EXCEPT FOR THOSE CIRCUITS EMPLOYING CIRCUIT BREAKERS MARKED AS SUITABLE FOR CONTINUOUS OPERATION AT 100% OF THEIR RATINGS. CONDUCTORS ARE NOT TO ENTER OR LEAVE THE ENCLOSURE DIRECTLY OPPOSITE THE WIRING TERMINAL

NEUTRAL–TO–GROUND NOTES:

- WHEN THE PPC IS USED AS THE SERVICE ENTRANCE DEVICE, THE NEUTRAL TO GROUND BOND NEEDS TO BE ESTABLISHED IN THE PPC.
- WHEN THE SERVICE ENTRY DEVICE IS A MULTI–METER CENTER OR A PRE–PPC DISCONNECT IS USED AND HAS "NEUTRAL TO GROUND" ACCOMMODATIONS, THE NEUTRAL TO GROUND WIRE IN THE PPC IS NOT REQUIRED.
- THE GREEN #6 WIRE IS PROVIDED WITH THE PPC CABINET AS A SEPARATE UNINSTALLED PART TO BE INSTALLED BY CONTRACTOR IF NEEDED.

NEUTRAL–TO–GROUND CONDING JUMPER

INSTALLTION INSTRUCTIONS:

- IF REQUIRED, THE N–G BONDING KIT SHOULD BE INSTALLED BY QUALIFIED PERSONNEL
- ENSURE THE MAIN BREAKERS ARE OFF
- USE THE GREEN #6 WIRE PROVIDED WITH THE PPC
- INSTALL THE JUMPER AS SHOWN IN THE WIRING DIAGRAM
- TIGHTEN TERMINALS TO TORQUE VALUE SHOWN IN TORQUE TABLE
- PLACE THE PROVIDED "SERVICE" LABEL IN THE SPACE BELOW THE WORDS "AC POWER" LOCATED ABODE THE MAIN CIRCUIT BREAKER IN THE UPPER PORTION OF THE DEAD FRONT

LEGEND:

A. UTILITY DISCONNECT (SERVICE RATED)
B. GENERATOR DISCONNECT
C. MAIN DISCONNECT CIRCUIT BREAKERS W/ MECHANICAL INTERLOCK
D. GFCI RECEPTACLE 15A
E. SPD STRIKESORB KELVIN CONNECTION (TYP OF 2)
F. BREAKER PANEL – 24 POSITION (CONTRACTOR TO ADD APPROPRIATE BREAKER PER ONE–LINE DIAGRAM PANEL SCHEDULE)
G. POWER PROTECTION CABINET (PPC) (FULLY ASSEMBLED FROM MANUFACTURER)
H. CONTRACTOR TO ATTACH TO UNDERGROUND GROUNDING HALO OR INSTALL GROUND ROD WHEN REQUIRED BY CODE
I. GROUND BAR
J. SQUARE D Q SERIES LOAD CENTER
K. NETURAL–TO–GROUND (N–G) BONDING JUMPER (CONTRACTOR INSTALLED IF REQUIRED)
L. OPTIONAL SPD STATUS INDICATORS

RAYCAP POWER PROTECTION CABINET – RDIAC–2465–P–240–MTS (NEUTRAL–TO–GROUND)

NO SCALE

1

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PEN.0036148
LICENSED
PROFESSIONAL ENGINEER

12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
DMW	MCK	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	12/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLE–52603

DISH Wireless L.L.C.
PROJECT INFORMATION

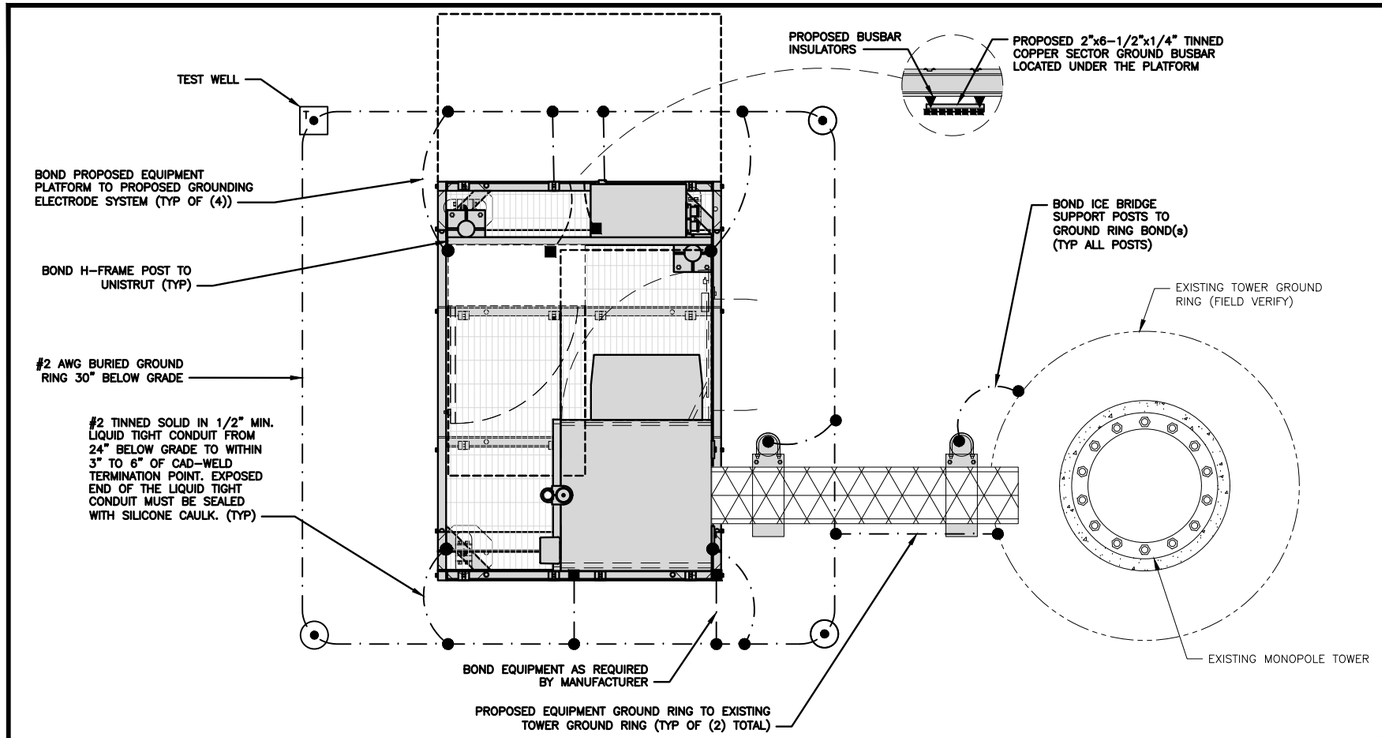
NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE

ELECTRICAL ONE–LINE, FAULT CALCS & PANEL SCHEDULE

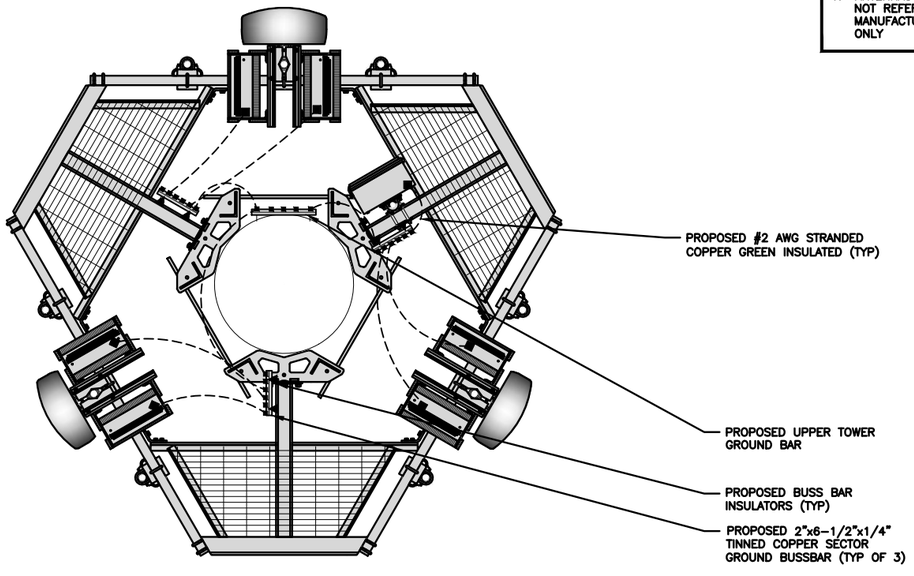
SHEET NUMBER

E-4



TYPICAL EQUIPMENT GROUNDING PLAN

NO SCALE | 1



TYPICAL ANTENNA GROUNDING PLAN

NO SCALE | 2

NOTES

1. ANTENNAS AND OVP SHOWN ARE GENERIC AND NOT REFERENCING TO A SPECIFIC MANUFACTURER. THIS LAYOUT IS FOR REFERENCE ONLY

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- GROUND BUS BAR
- GROUND ROD
- TEST GROUND ROD WITH INSPECTION SLEEVE
- #6 AWG STRANDED & INSULATED
- #2 AWG SOLID COPPER TINNED
- BUSS BAR INSULATOR

GROUNDING LEGEND

1. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
2. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND DISH Wireless L.L.C. GROUNDING AND BONDING REQUIREMENTS AND MANUFACTURER'S SPECIFICATIONS.
3. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.

GROUNDING KEY NOTES

(A) **EXTERIOR GROUND RING:** #2 AWG SOLID COPPER, BURIED AT A DEPTH OF AT LEAST 30 INCHES BELOW GRADE, OR 6 INCHES BELOW THE FROST LINE AND APPROXIMATELY 24 INCHES FROM THE EXTERIOR WALL OR FOOTING.

(B) **TOWER GROUND RING:** THE GROUND RING SYSTEM SHALL BE INSTALLED AROUND AN ANTENNA TOWER'S LEGS, AND/OR GUY ANCHORS. WHERE SEPARATE SYSTEMS HAVE BEEN PROVIDED FOR THE TOWER AND THE BUILDING, AT LEAST TWO BONDS SHALL BE MADE BETWEEN THE TOWER RING GROUND SYSTEM AND THE BUILDING RING GROUND SYSTEM USING MINIMUM #2 AWG SOLID COPPER CONDUCTORS.

(C) **INTERIOR GROUND RING:** #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTOR EXTENDED AROUND THE PERIMETER OF THE EQUIPMENT AREA. ALL NON-TELECOMMUNICATIONS RELATED METALLIC OBJECTS FOUND WITHIN A SITE SHALL BE GROUNDED TO THE INTERIOR GROUND RING WITH #6 AWG STRANDED GREEN INSULATED CONDUCTOR.

(D) **BOND TO INTERIOR GROUND RING:** #2 AWG SOLID TINNED COPPER WIRE PRIMARY BONDS SHALL BE PROVIDED AT LEAST AT FOUR POINTS ON THE INTERIOR GROUND RING, LOCATED AT THE CORNERS OF THE BUILDING.

(E) **GROUND ROD:** UL LISTED COPPER CLAD STEEL. MINIMUM 1/2" DIAMETER BY EIGHT FEET LONG. GROUND RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES. GROUND RODS SHALL BE DRIVEN TO THE DEPTH OF GROUND RING CONDUCTOR.

(F) **CELL REFERENCE GROUND BAR:** POINT OF GROUND REFERENCE FOR ALL COMMUNICATIONS EQUIPMENT FRAMES. ALL BONDS ARE MADE WITH #2 AWG UNLESS NOTED OTHERWISE STRANDED GREEN INSULATED COPPER CONDUCTORS. BOND TO GROUND RING WITH (2) #2 SOLID TINNED COPPER CONDUCTORS.

(G) **HATCH PLATE GROUND BAR:** BOND TO THE INTERIOR GROUND RING WITH TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS. WHEN A HATCH-PLATE AND A CELL REFERENCE GROUND BAR ARE BOTH PRESENT, THE CRGB MUST BE CONNECTED TO THE HATCH-PLATE AND TO THE INTERIOR GROUND RING USING (2) TWO #2 AWG STRANDED GREEN INSULATED COPPER CONDUCTORS EACH.

(H) **EXTERIOR CABLE ENTRY PORT GROUND BARS:** LOCATED AT THE ENTRANCE TO THE CELL SITE BUILDING. BOND TO GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTORS WITH AN EXOTHERMIC WELD AND INSPECTION SLEEVE.

(I) **TELCO GROUND BAR:** BOND TO BOTH CELL REFERENCE GROUND BAR OR EXTERIOR GROUND RING.

(J) **FRAME BONDING:** THE BONDING POINT FOR TELECOM EQUIPMENT FRAMES SHALL BE THE GROUND BUS THAT IS NOT ISOLATED FROM THE EQUIPMENTS METAL FRAMEWORK.

(K) **INTERIOR UNIT BONDS:** METAL FRAMES, CABINETS AND INDIVIDUAL METALLIC UNITS LOCATED WITH THE AREA OF THE INTERIOR GROUND RING REQUIRE A #6 AWG STRANDED GREEN INSULATED COPPER BOND TO THE INTERIOR GROUND RING.

(L) **FENCE AND GATE GROUNDING:** METAL FENCES WITHIN 7 FEET OF THE EXTERIOR GROUND RING OR OBJECTS BONDED TO THE EXTERIOR GROUND RING SHALL BE BONDED TO THE GROUND RING WITH A #2 AWG SOLID TINNED COPPER CONDUCTOR AT AN INTERVAL NOT EXCEEDING 25 FEET. BONDS SHALL BE MADE AT EACH GATE POST AND ACROSS GATE OPENINGS.

(M) **EXTERIOR UNIT BONDS:** METALLIC OBJECTS, EXTERNAL TO OR MOUNTED TO THE BUILDING, SHALL BE BONDED TO THE EXTERIOR GROUND RING. USING #2 TINNED SOLID COPPER WIRE

(N) **ICE BRIDGE SUPPORTS:** EACH ICE BRIDGE LEG SHALL BE BONDED TO THE GROUND RING WITH #2 AWG BARE TINNED COPPER CONDUCTOR. PROVIDE EXOTHERMIC WELDS AT BOTH THE ICE BRIDGE LEG AND BURIED GROUND RING.

(O) DURING ALL DC POWER SYSTEM CHANGES INCLUDING DC SYSTEM CHANGE OUTS, RECTIFIER REPLACEMENTS OR ADDITIONS, BREAKER DISTRIBUTION CHANGES, BATTERY ADDITIONS, BATTERY REPLACEMENTS AND INSTALLATIONS OR CHANGES TO DC CONVERTER SYSTEMS IT SHALL BE REQUIRED THAT SERVICE CONTRACTORS VERIFY ALL DC POWER SYSTEMS ARE EQUIPPED WITH A MASTER DC SYSTEM RETURN GROUND CONDUCTOR FROM THE DC POWER SYSTEM COMMON RETURN BUS DIRECTLY CONNECTED TO THE CELL SITE REFERENCE GROUND BAR

(P) TOWER TOP COLLECTOR BUSS BAR IS TO BE MECHANICALLY BONDED TO PROPOSED ANTENNA MOUNT COLLAR.

REFER TO DISH Wireless L.L.C. GROUNDING NOTES.

GROUNDING KEY NOTES

NO SCALE | 3

dish wireless.
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STATE OF CONNECTION
MICHAEL R. DOOLITTLE
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LICENSED
PROFESSIONAL ENGINEER

12/22/23
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DANBURY, CT 06811

SHEET TITLE

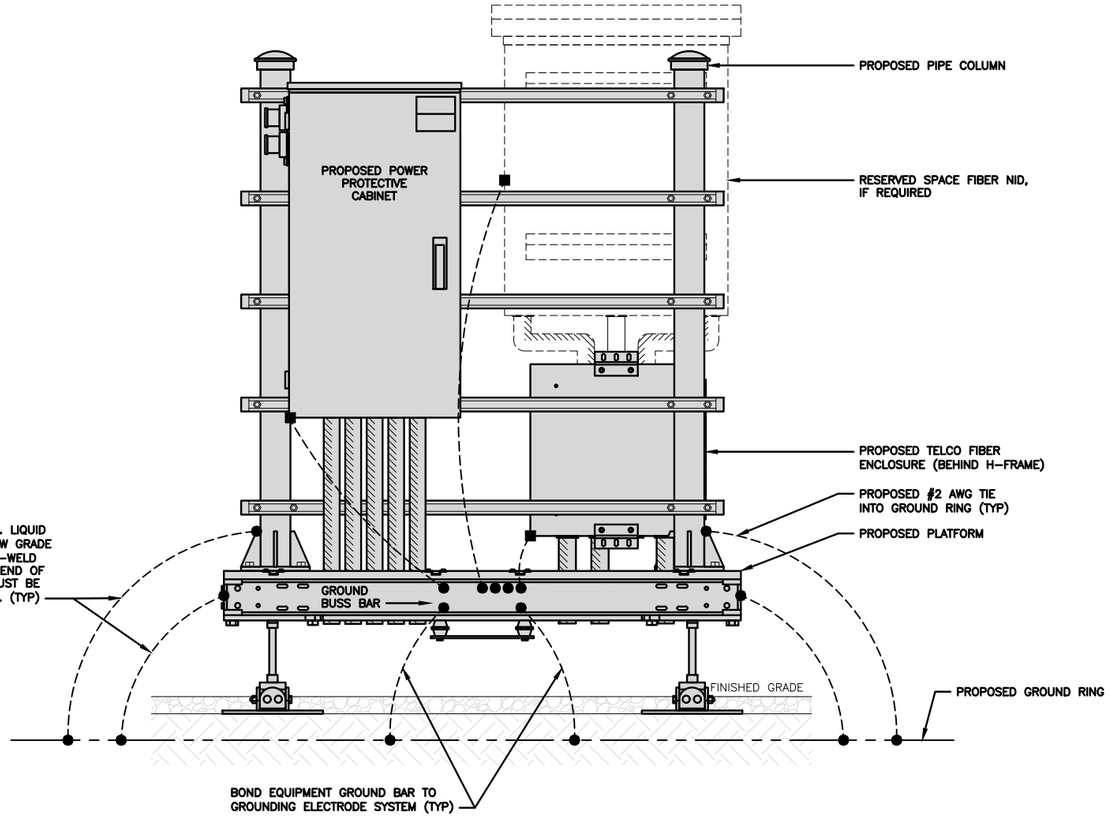
GROUNDING PLANS AND NOTES

SHEET NUMBER

G-1

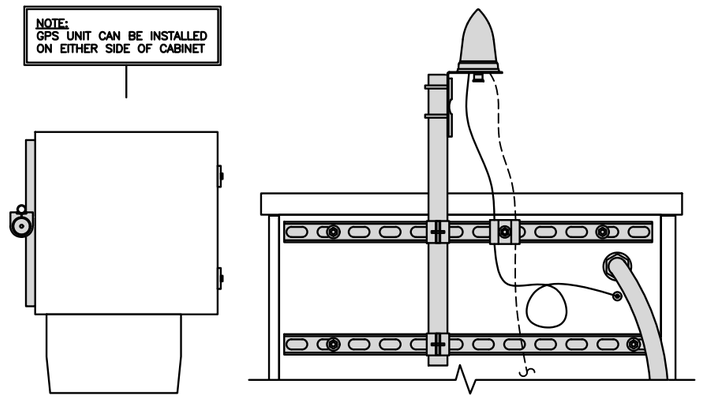
NOTES

EQUIPMENT CABINET OMITTED FOR CLARITY

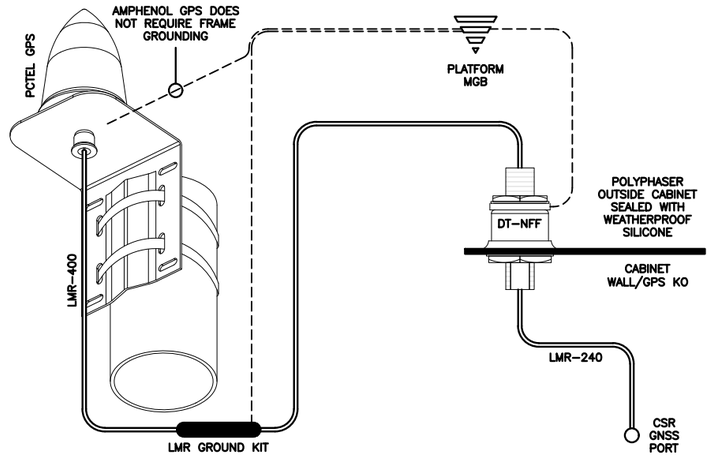


H-FRAME GROUNDING DETAIL | NO SCALE | 1

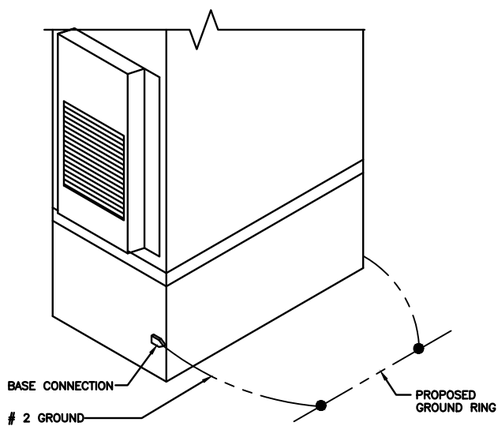
NOTE: GPS UNIT CAN BE INSTALLED ON EITHER SIDE OF CABINET



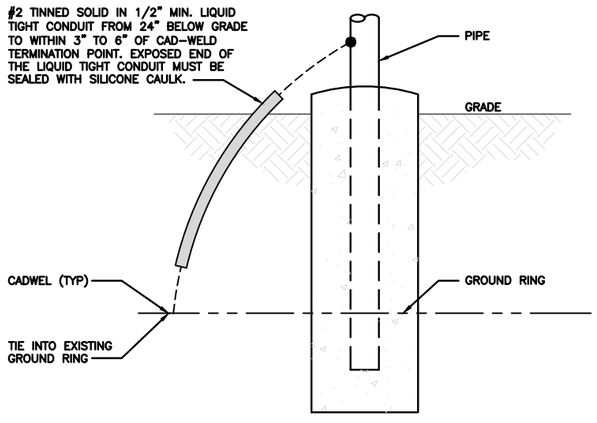
TYPICAL PCTEL GPS UNIT GROUNDING | NO SCALE | 2



TYPICAL PCTEL GPS UNIT GROUNDING DIAGRAM | NO SCALE | 3



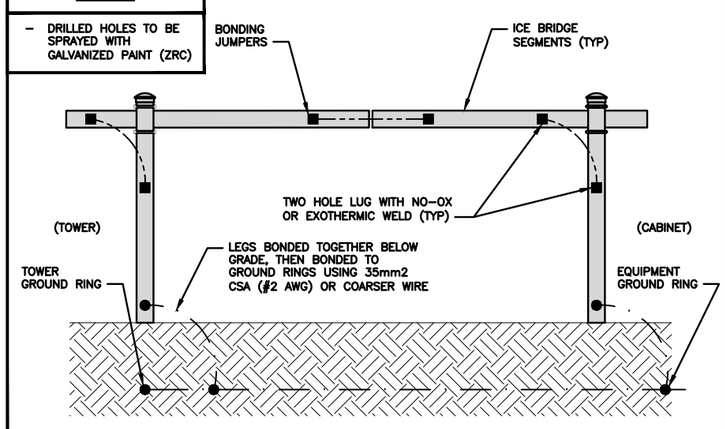
OUTDOOR CABINET GROUNDING | NO SCALE | 4



TRANSITIONING GROUND DETAIL | NO SCALE | 5

NOTES

- DRILLED HOLES TO BE SPRAYED WITH GALVANIZED PAINT (ZRC)



ICE BRIDGE GROUNDING DETAIL | NO SCALE | 6

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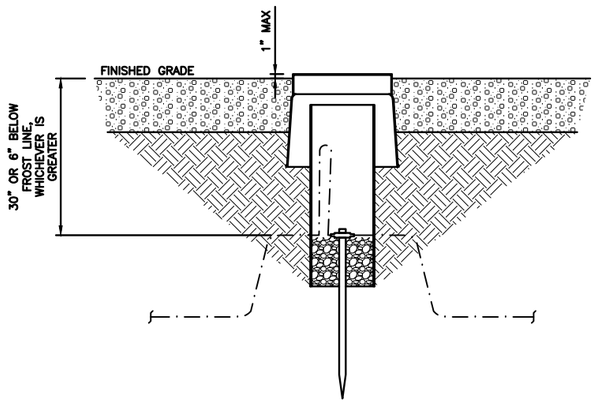
DANBURY, CT 06811

SHEET TITLE

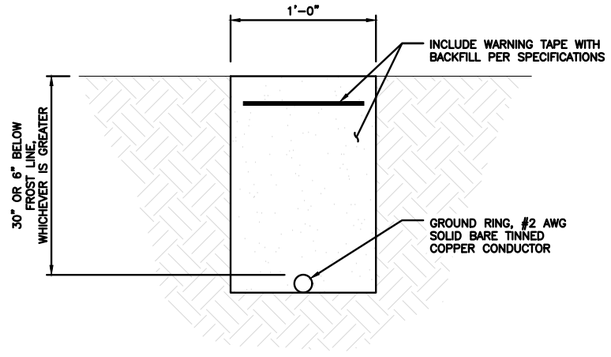
GROUNDING DETAILS

SHEET NUMBER

G-2



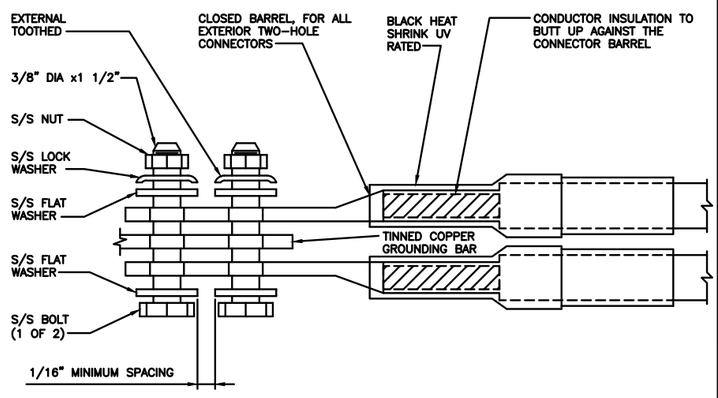
TYPICAL TEST GROUND ROD WITH INSPECTION SLEEVE | NO SCALE | 1



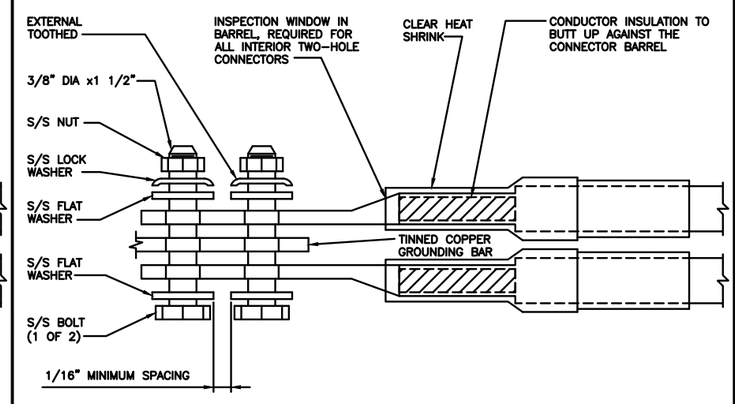
TYPICAL GROUND RING TRENCH | NO SCALE | 2

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUND BAR. ROUTE CONDUCTORS TO BURIED GROUND RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL EXTERIOR GROUNDING HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
3. FOR GROUND BOND TO STEEL ONLY: COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUND CONDUCTOR DOWN TO GROUNDING BUS.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUND BAR AND BOLTED ON THE BACK SIDE.
6. ALL GROUNDING PARTS AND EQUIPMENT TO BE SUPPLIED AND INSTALLED BY CONTRACTOR.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUND BAR AS REQUIRED.
8. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).

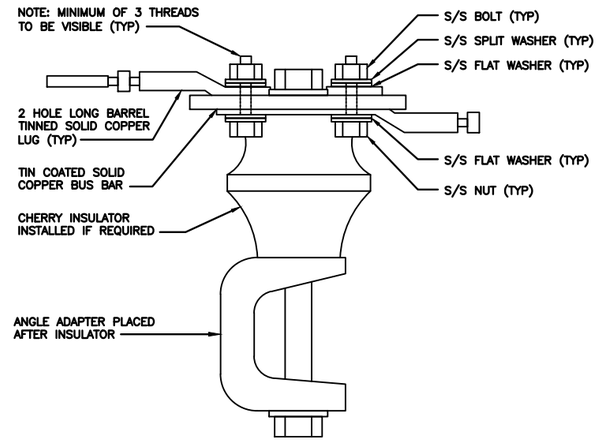
TYPICAL GROUNDING NOTES | NO SCALE | 3



TYPICAL EXTERIOR TWO HOLE LUG | NO SCALE | 4



TYPICAL INTERIOR TWO HOLE LUG | NO SCALE | 5



LUG DETAIL | NO SCALE | 6

NOT USED | NO SCALE | 7

NOT USED | NO SCALE | 8

NOT USED | NO SCALE | 9

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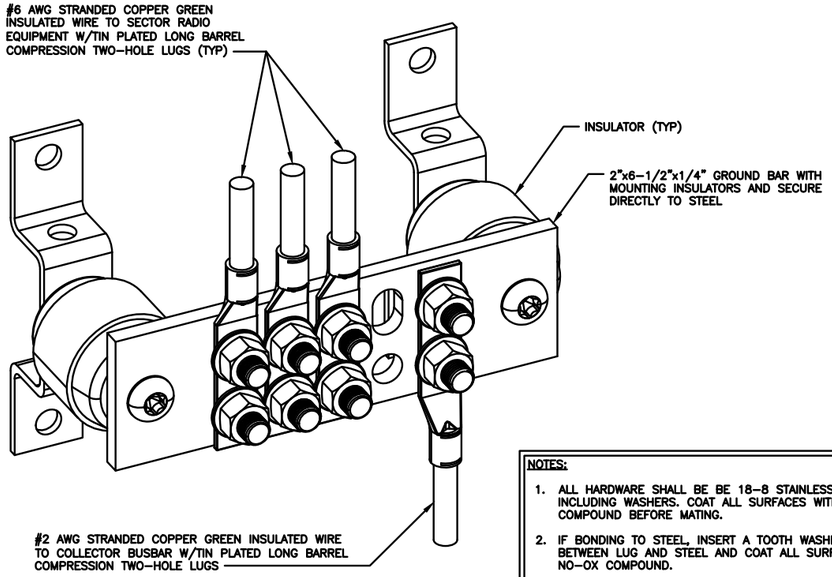
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE
GROUNDING DETAILS

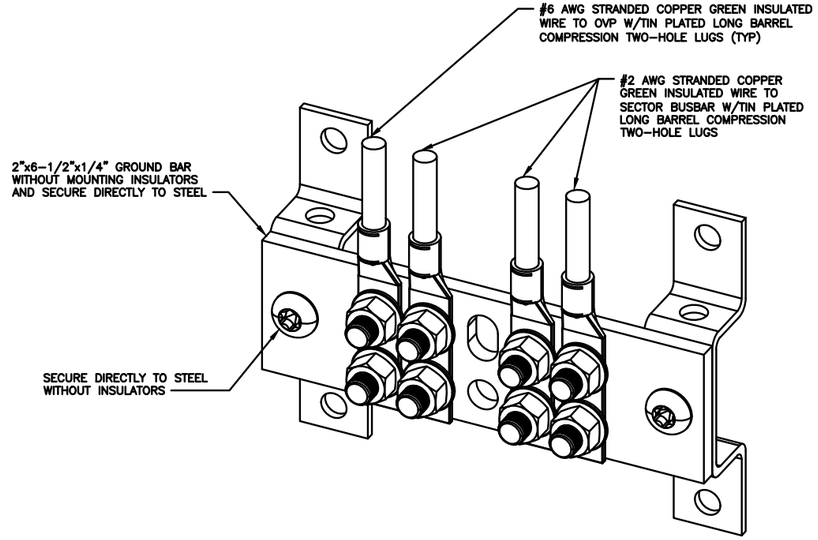
SHEET NUMBER
G-3



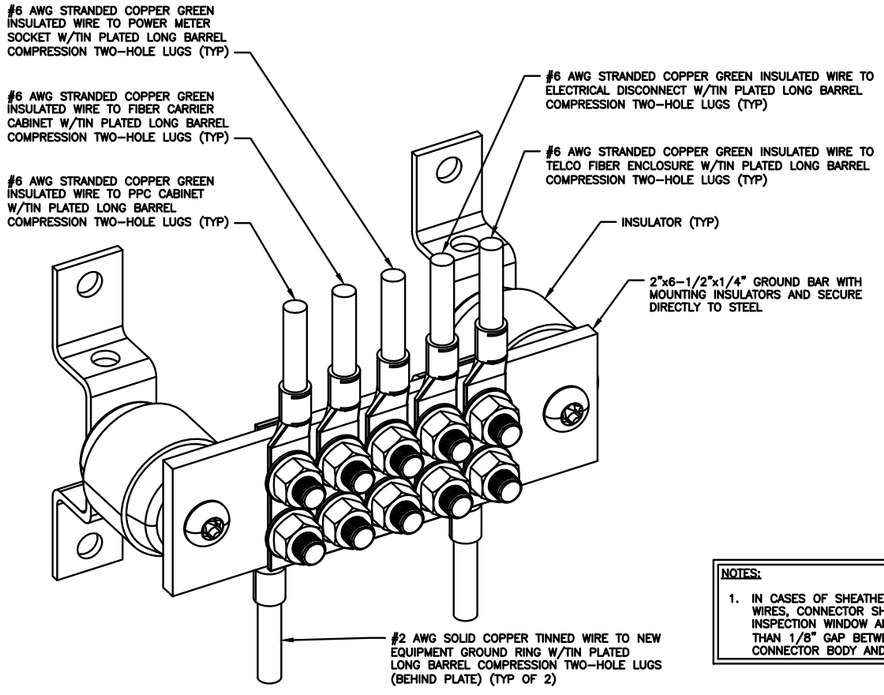
NOTES:

1. ALL HARDWARE SHALL BE BE 18-8 STAINLESS STEEL INCLUDING WASHERS. COAT ALL SURFACES WITH NO-OX COMPOUND BEFORE MATING.
2. IF BONDING TO STEEL, INSERT A TOOTH WASHER BETWEEN LUG AND STEEL AND COAT ALL SURFACE WITH NO-OX COMPOUND.
3. USE A THIN COAT OF NO-OX OR UL LISTED ANTIOXIDANT COMPOUND BETWEEN GROUNDING CONNECTIONS.

SECTOR GROUND BUSBAR DETAIL | NO SCALE | 1



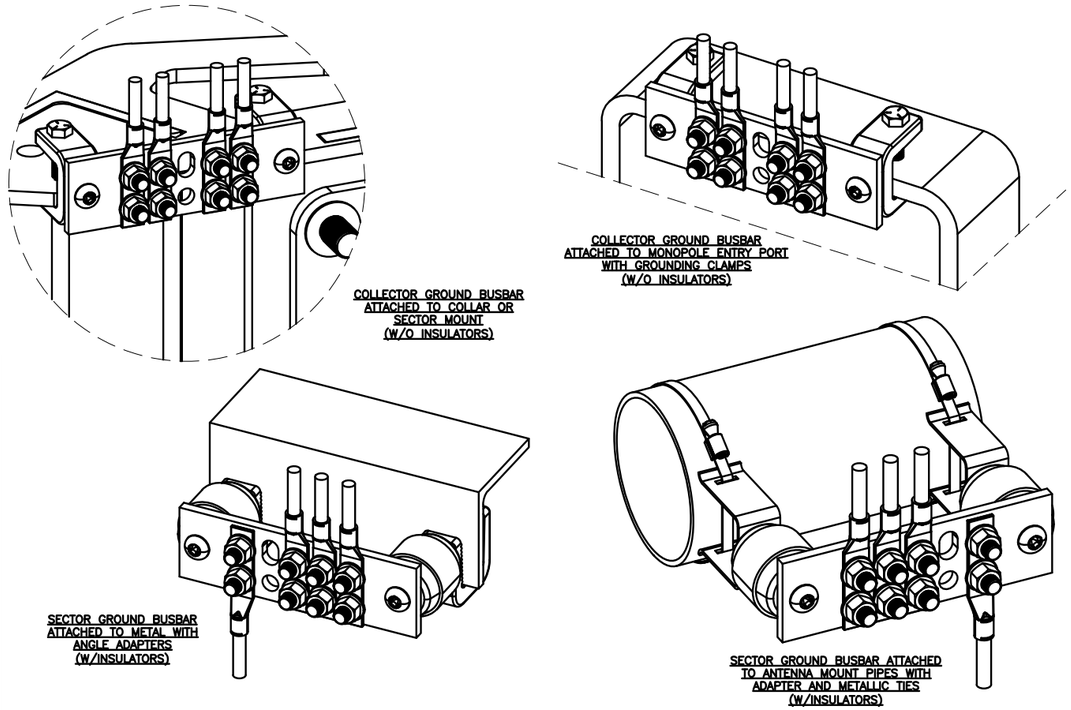
UPPER TOWER GROUND BUSBAR DETAIL | NO SCALE | 2



NOTES:

1. IN CASES OF SHEATHED STRANDED WIRES, CONNECTOR SHALL HAVE INSPECTION WINDOW AND NO MORE THAN 1/8" GAP BETWEEN CONNECTOR BODY AND SHEATH.

EQUIPMENT GROUND BUSBAR DETAIL | NO SCALE | 3



GROUND BUSBAR ATTACHMENT OPTIONS | NO SCALE | 4

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SHEET TITLE

GROUNDING DETAILS

SHEET NUMBER

G-4

HYBRID/DISCREET CABLES — 3/4" TAPE WIDTHS WITH 3/4" SPACING

LOW–BAND RRH
(600 MHz N71 BASEBAND) +
(850 MHz N26 BAND) +
(700 MHz N29 BAND) – OPTIONAL PER MARKET

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BAND)

	ALPHA RRH				BETA RRH				GAMMA RRH			
	PORT 1 + SLANT	PORT 2 – SLANT	PORT 3 + SLANT	PORT 4 – SLANT	PORT 1 + SLANT	PORT 2 – SLANT	PORT 3 + SLANT	PORT 4 – SLANT	PORT 1 + SLANT	PORT 2 – SLANT	PORT 3 + SLANT	PORT 4 – SLANT
	RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
	ORANGE	ORANGE	RED	RED	ORANGE	ORANGE	BLUE	BLUE	ORANGE	ORANGE	GREEN	GREEN
		WHITE (–) PORT	ORANGE	ORANGE		WHITE (–) PORT	ORANGE	ORANGE		WHITE (–) PORT	ORANGE	ORANGE
				WHITE (–) PORT				WHITE (–) PORT				WHITE (–) PORT

MID–BAND RRH
(AWS BANDS N66+N70)

ADD FREQUENCY COLOR TO SECTOR BAND
(CBRS WILL USE YELLOW BANDS)

RED	RED	RED	RED	BLUE	BLUE	BLUE	BLUE	GREEN	GREEN	GREEN	GREEN
PURPLE	PURPLE	RED	RED	PURPLE	PURPLE	BLUE	BLUE	PURPLE	PURPLE	GREEN	GREEN
	WHITE (–) PORT	PURPLE	PURPLE		WHITE (–) PORT	PURPLE	PURPLE		WHITE (–) PORT	PURPLE	PURPLE
			WHITE (–) PORT				WHITE (–) PORT				WHITE (–) PORT

HYBRID/DISCREET CABLES

INCLUDE SECTOR BANDS BEING SUPPORTED ALONG WITH FREQUENCY BANDS.

EXAMPLE 1 – HYBRID, OR DISCREET, SUPPORTS ALL SECTORS, BOTH LOW–BANDS AND MID–BANDS.

EXAMPLE 2 – HYBRID, OR DISCREET, SUPPORTS CBRS ONLY, ALL SECTORS.

EXAMPLE 3 – MAIN COAX WITH GROUND MOUNTED RRHs.

EXAMPLE 1	EXAMPLE 2	EXAMPLE 3 COAX#1 (ALPHA)	CANISTER COAX #2 (ALPHA)
RED	RED	RED	RED
BLUE	BLUE		RED
GREEN	GREEN		
ORANGE	YELLOW		
PURPLE			

FIBER JUMPERS TO RRHs

LOW–BAND HHR FIBER CABLES HAVE SECTOR STRIPE ONLY.

LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE

POWER CABLES TO RRHs

LOW–BAND RRH POWER CABLES HAVE SECTOR STRIPE ONLY

LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH	LOW BAND RRH	MID BAND RRH
RED	RED	BLUE	BLUE	GREEN	GREEN
ORANGE	PURPLE	ORANGE	PURPLE	ORANGE	PURPLE

RET MOTORS AT ANTENNAS

RET CONTROL IS HANDLED BY THE MID–BAND RRH WHEN ONE SET OF RET PORTS EXIST ON ANTENNA.

SEPARATE RET CABLES ARE USED WHEN ANTENNA PORTS PROVIDE INPUTS FOR BOTH LOW AND MID BANDS.

ANTENNA 1 MID BAND IN	ANTENNA 1 LOW BAND IN	ANTENNA 1 MID BAND IN	ANTENNA 1 LOW BAND IN	ANTENNA 1 MID BAND IN	ANTENNA 1 LOW BAND IN
RED	RED	BLUE	BLUE	GREEN	GREEN
PURPLE	ORANGE	PURPLE	ORANGE	PURPLE	ORANGE

MICROWAVE RADIO LINKS

LINKS WILL HAVE A 1.5–2 INCH WHITE WRAP WITH THE AZIMUTH COLOR OVERLAPPING IN THE MIDDLE.
ADD ADDITIONAL SECTOR COLOR BANDS FOR EACH ADDITIONAL MW RADIO.

MICROWAVE CABLES WILL REQUIRE P–TOUCH LABELS INSIDE THE CABINET TO IDENTIFY THE LOCAL AND REMOTE SITE ID's.

FORWARD AZIMUTH OF 0–120 DEGREES PRIMARY	FORWARD AZIMUTH OF 0–120 DEGREES SECONDARY	FORWARD AZIMUTH OF 120–240 DEGREES PRIMARY	FORWARD AZIMUTH OF 120–240 DEGREES SECONDARY	FORWARD AZIMUTH OF 240–359 DEGREES PRIMARY	FORWARD AZIMUTH OF 240–359 DEGREES SECONDARY
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
RED	RED	BLUE	BLUE	GREEN	GREEN
WHITE	WHITE	WHITE	WHITE	WHITE	WHITE
	RED		BLUE		GREEN
	WHITE		WHITE		WHITE

LOW BANDS (N71+N26) OPTIONAL – (N29): ORANGE

AWS (N66+N70+H–BLOCK): PURPLE

CBRS TECH (3 GHz): YELLOW

NEGATIVE SLANT PORT ON ANT/RRH: WHITE

ALPHA SECTOR: RED

BETA SECTOR: BLUE

GAMMA SECTOR: GREEN

COLOR IDENTIFIER		2
NOT USED		3
RF CABLE COLOR CODES		1
NOT USED		4

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SHEET TITLE
RF
CABLE COLOR CODE

SHEET NUMBER
RF-1

EXOTHERMIC CONNECTION

MECHANICAL CONNECTION

BUSS BAR INSULATOR

CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM

EXOTHERMIC WITH INSPECTION SLEEVE

GROUNDING BAR

GROUND ROD

TEST GROUND ROD WITH INSPECTION SLEEVE

SINGLE POLE SWITCH

DUPLEX RECEPTACLE

DUPLEX GFCI RECEPTACLE

FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48–T8

SMOKE DETECTION (DC)

EMERGENCY LIGHTING (DC)

SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED–1–25A400/51K–SR4–120–PE–DDBTXD

CHAIN LINK FENCE

WOOD/WROUGHT IRON FENCE

WALL STRUCTURE

LEASE AREA

PROPERTY LINE (PL)

SETBACKS

ICE BRIDGE

CABLE TRAY

WATER LINE

UNDERGROUND POWER

UNDERGROUND TELCO

OVERHEAD POWER

OVERHEAD TELCO

UNDERGROUND TELCO/POWER

ABOVE GROUND POWER

ABOVE GROUND TELCO

ABOVE GROUND TELCO/POWER

WORKPOINT

SECTION REFERENCE

DETAIL REFERENCE

LEGEND

AB	ANCHOR BOLT
ABV	ABOVE
AC	ALTERNATING CURRENT
ADDL	ADDITIONAL
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AGL	ABOVE GROUND LEVEL
AIC	AMPERAGE INTERRUPTION CAPACITY
ALUM	ALUMINUM
ALT	ALTERNATE
ANT	ANTENNA
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BEAM
BTC	BARE TINNED COPPER CONDUCTOR
BOF	BOTTOM OF FOOTING
CAB	CABINET
CANT	CANTILEVERED
CHG	CHARGING
CLG	CEILING
CLR	CLEAR
COL	COLUMN
COMM	COMMON
CONC	CONCRETE
CONSTR	CONSTRUCTION
DBL	DOUBLE
DC	DIRECT CURRENT
DEPT	DEPARTMENT
DF	DOUGLAS FIR
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DWG	DRAWING
DWL	DOWEL
EA	EACH
EC	ELECTRICAL CONDUCTOR
EL.	ELEVATION
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ENG	ENGINEER
EQ	EQUAL
EXP	EXPANSION
EXT	EXTERIOR
EW	EACH WAY
FAB	FABRICATION
FF	FINISH FLOOR
FG	FINISH GRADE
FIF	FACILITY INTERFACE FRAME
FIN	FINISH(ED)
FLR	FLOOR
FDN	FOUNDATION
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOW	FACE OF WALL
FS	FINISH SURFACE
FT	FOOT
FTG	FOOTING
GA	GAUGE
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GLB	GLUE LAMINATED BEAM
GLV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE
HDG	HOT DIPPED GALVANIZED
HDR	HEADER
HGR	HANGER
HVAC	HEAT/VENTILATION/AIR CONDITIONING
HT	HEIGHT
IGR	INTERIOR GROUND RING
IN	INCH
INT	INTERIOR
LB(S)	POUND(S)
LF	LINEAR FEET
LTE	LONG TERM EVOLUTION
MAS	MASONRY
MAX	MAXIMUM
MB	MACHINE BOLT
MECH	MECHANICAL
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
MTS	MANUAL TRANSFER SWITCH
MW	MICROWAVE
NEC	NATIONAL ELECTRIC CODE
NM	NEWTON METERS
NO.	NUMBER
#	NUMBER
NTS	NOT TO SCALE
OC	ON–CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
OPNG	OPENING
P/C	PRECAST CONCRETE
PCS	PERSONAL COMMUNICATION SERVICES
PCU	PRIMARY CONTROL UNIT
PRC	PRIMARY RADIO CABINET
PP	POLARIZING PRESERVING
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PWR	POWER CABINET
QTY	QUANTITY
RAD	RADIUS
RECT	RECTIFIER
REF	REFERENCE
REINF	REINFORCEMENT
REQ'D	REQUIRED
RET	REMOTE ELECTRIC TILT
RF	RADIO FREQUENCY
RMC	RIGID METALLIC CONDUIT
RRH	REMOTE RADIO HEAD
RRU	REMOTE RADIO UNIT
RWY	RACEWAY
SCH	SCHEDULE
SHT	SHEET
SIAD	SMART INTEGRATED ACCESS DEVICE
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
TEMP	TEMPORARY
THK	THICKNESS
TMA	TOWER MOUNTED AMPLIFIER
TN	TOE NAIL
TOA	TOP OF ANTENNA
TOC	TOP OF CURB
TOF	TOP OF FOUNDATION
TOP	TOP OF PLATE (PARAPET)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELECOMMUNICATIONS SYSTEM
UPS	UNITERRUPTIBLE POWER SYSTEM (DC POWER PLANT)
VIF	VERIFIED IN FIELD
W	WIDE
W/	WITH
WD	WOOD
WP	WEATHERPROOF
WT	WEIGHT

ABBREVIATIONS

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn

421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

STATE OF CONNECTION
MICHAEL R. DOOLITTLE
PEN.0036148
LICENSED
PROFESSIONAL ENGINEER

12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
DMW	MCK	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	12/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLE–52603

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE

LEGEND AND ABBREVIATIONS

SHEET NUMBER

GN-1

SIGN TYPES		
TYPE	COLOR	COLOR CODE PURPOSE
INFORMATION	GREEN	**"INFORMATIONAL SIGN"** TO NOTIFY OTHERS OF SITE OWNERSHIP & CONTACT NUMBER AND POTENTIAL RF EXPOSURE.
NOTICE	BLUE	**"NOTICE BEYOND THIS POINT"** RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR–1.1307(b)
CAUTION	YELLOW	**"CAUTION BEYOND THIS POINT"** RF FIELDS BEYOND THIS POINT MAY EXCEED THE FCC GENERAL PUBLIC EXPOSURE LIMIT. OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR–1.1307(b)
WARNING	ORANGE/RED	**"WARNING BEYOND THIS POINT"** RF FIELDS AT THIS SITE EXCEED FCC RULES FOR HUMAN EXPOSURE. FAILURE TO OBEY ALL POSTED SIGNS AND SITE GUIDELINES FOR WORKING IN RF ENVIRONMENTS COULD RESULT IN SERIOUS INJURY. IN ACCORDANCE WITH FEDERAL COMMUNICATIONS COMMISSION RULES ON RADIO FREQUENCY EMISSIONS 47 CFR–1.1307(b)

SIGN PLACEMENT:

- RF SIGNAGE PLACEMENT SHALL FOLLOW THE RECOMMENDATIONS OF AN EXISTING EME REPORT, CREATED BY A THIRD PARTY PREVIOUSLY AUTHORIZED BY DISH Wireless L.L.C.
- INFORMATION SIGN (GREEN) SHALL BE LOCATED ON EXISTING DISH Wireless L.L.C EQUIPMENT.
  A) IF THE INFORMATION SIGN IS A STICKER, IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C EQUIPMENT CABINET.
  B) IF THE INFORMATION SIGH IS A METAL SIGN IT SHALL BE PLACED ON EXISTING DISH Wireless L.L.C H–FRAME WITH A SECURE ATTACH METHOD.
- IF EME REPORT IS NOT AVAILABLE AT THE TIME OF CREATION OF CONSTRUCTION DOCUMENTS; PLEASE CONTACT DISH Wireless L.L.C. CONSTRUCTION MANAGER FOR FURTHER INSTRUCTION ON HOW TO PROCEED.

NOTES:

1. FOR DISH Wireless L.L.C. LOGO, SEE DISH Wireless L.L.C. DESIGN SPECIFICATIONS (PROVIDED BY DISH Wireless L.L.C.)
2. SITE ID SHALL BE APPLIED TO SIGNS USING "LASER ENGRAVING" OR ANY OTHER WEATHER RESISTANT METHOD (DISH Wireless L.L.C. APPROVAL REQUIRED)
3. TEXT FOR SIGNAGE SHALL INDICATE CORRECT SITE NAME AND NUMBER AS PER DISH Wireless L.L.C. CONSTRUCTION MANAGER RECOMMENDATIONS.
4. CABINET/SHELTER MOUNTING APPLICATION REQUIRES ANOTHER PLATE APPLIED TO THE FACE OF THE CABINET WITH WATER PROOF POLYURETHANE ADHESIVE
5. ALL SIGNS WILL BE SECURED WITH EITHER STAINLESS STEEL ZIP TIES OR STAINLESS STEEL TECH SCREWS
6. ALL SIGNS TO BE 8.5"x11" AND MADE WITH 0.04" OF ALUMINUM MATERIAL

INFORMATION

This is an access point to an area with transmitting antennas.

Obey all signs and barriers beyond this point.
Call the DISH Wireless L.L.C. NOC at 1-866-624-6874

Site ID: NJJER01113B

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

NOTICE

Transmitting Antenna(s)

Radio frequency fields beyond this point MAY *EXCEED* the FCC Occupational exposure limit.

Obey all posted signs and site guidelines for working in radio frequency environments.

Call the DISH Wireless L.L.C. NOC at 1-866-624-6874 prior to working beyond this point.

Site ID: NJJER01113B

dish

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

⚠ CAUTION

Transmitting Antenna(s)

Radio frequency fields beyond this point MAY *EXCEED* the FCC Occupational exposure limit.

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Site ID: NJJER01113B

dish

THIS SIGN IS FOR REFERENCE PURPOSES ONLY

⚠ WARNING

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Site ID: NJJER01113B

dish

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RF SIGNAGE

dish wireless.
5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn
421 FAYETTEVILLE ST, SUITE 600
RALEIGH, NC 27601

STATE OF CONNECTICUT
MICHAEL R. DOOLITTLE
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LICENSED
PROFESSIONAL ENGINEER

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DRAWN BY:	CHECKED BY:	APPROVED BY:
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DISH Wireless L.L.C.
PROJECT INFORMATION
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DANBURY, CT 06811

SHEET TITLE
RF SIGNAGE

SHEET NUMBER
GN-2

SITE ACTIVITY REQUIREMENTS:

1. NOTICE TO PROCEED – NO WORK SHALL COMMENCE PRIOR TO CONTRACTOR RECEIVING A WRITTEN NOTICE TO PROCEED (NTP) AND THE ISSUANCE OF A PURCHASE ORDER. PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE DISH Wireless L.L.C. AND TOWER OWNER NOC & THE DISH Wireless L.L.C. AND TOWER OWNER CONSTRUCTION MANAGER.
2. "LOOK UP" – DISH Wireless L.L.C. AND TOWER OWNER 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 DISH Wireless L.L.C. AND DISH Wireless L.L.C. AND TOWER OWNER 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 DISH Wireless L.L.C. AND TOWER OWNER STANDARDS, 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 DISH Wireless L.L.C. AND TOWER OWNER INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON DISH Wireless L.L.C. AND TOWER OWNER TOWER SITE 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 DISH Wireless L.L.C. AND TOWER OWNER 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 INCLUDING PRIVATE LOCATES 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 DISH 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 DISH Wireless L.L.C. AND TOWER OWNER, 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 AND RADIOS 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: DISH Wireless L.L.C.

   TOWER OWNER: TOWER OWNER
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 FABRICATION 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 CARRIER POC AND TOWER OWNER.
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 TOWER OWNER PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
11. CONTRACTOR IS TO PERFORM A SITE INVESTIGATION, BEFORE SUBMITTING BIDS, 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 DISH Wireless L.L.C. AND TOWER OWNER
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.

dish wireless.

5701 SOUTH SANTA FE DRIVE
LITTLETON, CO 80120

Kimley»Horn

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RALEIGH, NC 27601

STATE OF CONNECTICUT
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41 PADANARAM RD
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SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-3

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.

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. VERIFY 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. TIE WRAPS ARE NOT ALLOWED.
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 3 (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 DISH Wireless L.L.C. AND TOWER OWNER 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 "DISH Wireless L.L.C.".
30. ALL EMPTY/SPARE CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

dish wireless.

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MICHAEL R. DOOLITTLE
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LICENSED
PROFESSIONAL ENGINEER

12/22/23
Exp. 01/31/24

DRAWN BY:	CHECKED BY:	APPROVED BY:
DMW	MCK	---

RFDS REV #: ---

CONSTRUCTION DOCUMENTS

SUBMITTALS

REV	DATE	DESCRIPTION
0	12/21/2023	ISSUED FOR CONSTRUCTION

A&E PROJECT NUMBER

KHCLE-52603

DISH Wireless L.L.C.
PROJECT INFORMATION

NJJER01113B
41 PADANARAM RD
DANBURY, CT 06811

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-4

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-POTENTIAL 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). DO NOT ATTACH GROUNDING TO FIRE SPRINKLER SYSTEM PIPES.

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GENERAL NOTES

SHEET NUMBER

GN-5