



1 Cityplace Dr, Suite 490  
Creve Coeur, MO 63141

Phone: (314) 513-0147  
www.crowncastle.com

April 16, 2021

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

**RE: Notice of Exempt Modification for T-Mobile  
Crown Site ID# 842875; T-Mobile Site ID# CTHA267A  
99 DAY HILL ROAD WINDSOR, CT 06095  
Latitude: 41.87116388/ Longitude: -72.67107500**

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 131-foot mount on the existing 168-foot Monopole Tower located at 99 Day Hill Road in Windsor. The property is owned by The Town of Windsor and the Tower by Crown Castle. T-Mobile now intends to replace six (6) existing antennas and add three (3) new antennas. 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.

**Planned Modifications:**

**Tower:**

Remove and Replace:

(3) RFS- APXV9ERR18-C-A20 Antennas (**REMOVE**) – (3) RFS APX16DWV-16DWV-S-E-A20 Antennas – (**REPLACE**)

(3) RFS-APXVTM14-C-120 Antennas (**REMOVE**) - (3) RFS APXVAALL24\_43-U-NA20 Antennas (**REPLACE**)

(3) Lucent – TD-RRH8X20-25 Radios (**REMOVE**) – (3) Ericsson 4415 B66A Radios (**REPLACE**)

(3) Lucent 1900 MHZ Radios (**REMOVE**) - (3) Ericsson 4424 B25 Radios (**REPLACE**)

(3) Lucent –800MHZ Radios (**REMOVE**) – (3) Ericsson 4449 B71+B85 Radios (**REPLACE**)

(3) Feedlines (Coax) (**REMOVE**) – (3) 1 5/8” Hybrid Cable (**REPLACE**)



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Install New:

- (3) Ericsson AIR6449 B41 Antennas
- (1) 1 5/8" Hybrid Cable
- (1) Modify Platform

Remove:

- (1) Platform
- (3) RET Cables

**Ground:**

Remove and Replace:

- (1) Sprint Cabinet (**REMOVE**) - (1) 6160 Site Support Cabinet (SSC) (**REPLACE**)
- (1) Sprint Cabinet (**REMOVE**) – (1) B160 Cabinet (**REPLACE**)

Install New:

- (1) PSU 4813 Booster in 6160 SSC
- (3) BB 6630 in 6160 SSC
- (1) BB 6648 in 6160 SSC
- (1) IXRE Router in 6160 SSC

The facility was approved by the Town of Windsor Planning and Zoning Commission by way of Special Use Application #292A on October 10, 2000.

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 Donald Trinks, Mayor for the Town of Windsor, as well as Robert Ruzzo, Building Official for the Town of Windsor.

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.



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For the foregoing reasons, T-Mobile 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).

Sincerely,

*Colin Robinson*

Colin Robinson  
Project Manager  
NETWORK BUILDING + CONSULTING  
100 Apollo Drive Suite 303  
Chelmsford, MA 01824  
[crobinson@nbelle.com](mailto:crobinson@nbelle.com)  
(360) 561-3311

cc:

Donald Trinks, Mayor (via email only to [towncouncil@townofwindsorct.com](mailto:towncouncil@townofwindsorct.com))  
Town Hall Council Chambers  
275 Broad Street  
Windsor, CT 06095  
860- 285-1800

Robert Ruzzo, Building Official (via email only to [RUZZO@townofwindsorct.com](mailto:RUZZO@townofwindsorct.com))  
275 Broad Street  
Windsor, CT 06095  
(860) 285-1961

## Colin Robinson

---

**From:** Colin Robinson  
**Sent:** Friday, April 16, 2021 12:12 PM  
**To:** town council@townofwindsorct.com  
**Cc:** Colin Robinson  
**Subject:** CSC Exempt Modification Application 99 DAY HILL ROAD Windsor CT 842875  
**Attachments:** CSC Exempt Modification Application 99 DAY HILL RD Windsor CT 842875 041621.pdf

Good Afternoon Mr. Trinks,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 99 DAY HILL ROAD Windsor CT.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

Colin

### Colin Robinson

*Project Manager*

**NETWORK BUILDING + CONSULTING**

100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824  
M 360.561.3311



## Colin Robinson

---

**From:** Colin Robinson  
**Sent:** Friday, April 16, 2021 12:13 PM  
**To:** RUZZO@townofwindsorct.com  
**Cc:** Colin Robinson  
**Subject:** CSC Exempt Modification Application 99 DAY HILL ROAD Windsor CT 842875  
**Attachments:** CSC Exempt Modification Application 99 DAY HILL RD Windsor CT 842875 041621.pdf

Good Afternoon Mr. Ruzzo,

Please see the attached application to the Connecticut Siting Council regarding antenna work on the existing cell tower located at 99 DAY HILL ROAD Windsor CT.

Should you have any questions/comments/concerns regarding this application, please do not hesitate to contact me.

Thank you,

Colin

### Colin Robinson

*Project Manager*

**NETWORK BUILDING + CONSULTING**

100 Apollo Drive | Suite 303 | Chelmsford, MA | 01824  
M 360.561.3311



# Exhibit A

## **Original Facility Approval**

I, Anita M. Mips, Chairperson of the Windsor Town Planning and Zoning Commission, hereby certify that on October 10, 2000 the Planning and Zoning Commission of the Town of Windsor granted approval of Special Use Application #292A for a Wireless Telecommunications Tower with a monopole height of 170 feet plus 20-foot Town public service whip antennas for a total height of 190 feet, under Zoning Regulations Sections 12.2 & 2.2.19E(1).

This approval also includes the following waivers in accordance with Zoning Regulations Section 12.1:

- 1) a waiver of the height requirement for 15 feet; and
- 2) a waiver of the fall zone distance requirement for 151 feet in relation to the distance of the tower from Day Hill Road, 380 feet being required, 229 feet being proposed.

Said Special Use was granted for the property located at: 99 Day Hill Road

The owner of record of said parcel is: Town of Windsor

Dated at Windsor, Connecticut, this 30<sup>th</sup> day of November, 2000

Anita Mips Chairperson

Public Act #75-317

Received for Record this \_\_\_\_\_ day of \_\_\_\_\_, 2000

\_\_\_\_\_  
Attest: Town Clerk

RECEIVED FOR RECORD  
WINDSOR TOWN CLERK

00 NOV 30 PM 12: 58

VOL 1249 PG 156

BY Kathleen H. Quinn  
TOWN CLERK

# Exhibit B

## **Property Card**



CURRENT OWNER		TOPO	UTILITIES	STRT / ROAD	LOCATION	CURRENT ASSESSMENT				
WINDSOR TOWN OF PUBLIC WORKS GARAGE 275 BROAD STREET  WINDSOR CT 06095		1 Level	2 Public Water	1 Paved		Description	Code	Appraised	Assessed	6164  WINDSOR, CT  <b>VISION</b>
			3 Public Sewer			EX COM LN	21	766,900	536,830	
			4 Gas			EX COM BL	22	1,633,800	1,143,660	
		<b>SUPPLEMENTAL DATA</b>				EX CM OTB	25	156,300	109,410	
Alt Prcl ID 9310		INC: GH		CTRACT 4735.01 CBLOCK 0 DIST HEART GL YEAR		Total		2,557,000	1,789,900	
2007 1376200		GIS ID 9310		Assoc Pid#						

RECORD OF OWNERSHIP		BK-VOL/PAGE	SALE DATE	Q/U	V/I	SALE PRICE	VC	PREVIOUS ASSESSMENTS (HISTORY)								
WINDSOR TOWN OF		0334 0257	11-04-1977			0		Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
								2019	21	536,830	2018	21	536,830	2017	21	536,830
									22	1,143,660		22	1,143,660		22	972,790
									25	109,410		25	109,410		25	103,460
								Total		1789900	Total		1789900	Total		1613080

EXEMPTIONS				OTHER ASSESSMENTS				This signature acknowledges a visit by a Data Collector or Assessor								
Year	Code	Description	Amount	Code	Description	Number	Amount	Comm Int								
2011	BAAX	MUNICIPAL	0.00													
Total			0.00													

ASSESSING NEIGHBORHOOD				APPRaised VALUE SUMMARY			
Nbhd	Sub	Nbhd Name	B	Tracing	Batch		
300	A					Appraised Bldg. Value (Card)	1,595,900
						Appraised Xf (B) Value (Bldg)	37,900
						Appraised Ob (B) Value (Bldg)	156,300
						Appraised Land Value (Bldg)	766,900
						Special Land Value	0
						Total Appraised Parcel Value	2,557,000
						Valuation Method	C
						Total Appraised Parcel Value	2,557,000

NOTES			
9310.00 .04 AC REMOVED & ASSESSED			
0042-0108-0001 D TO AT&T WIRELESS FOR CELL			
BTR89-CLERICAL TOWER 10/01/2001			
CANOPY ADDED 10-92 ADDED STORAGE SHED 10/04			
REF:V1277 P506 7-18-01			
ELEC EASEMENT V1277 P511			

BUILDING PERMIT RECORD									VISIT / CHANGE HISTORY					
Permit Id	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments	Date	Id	Type	Is	Cd	Purpost/Result
E-190462	03-12-2019	FP	Fire Protect		08-16-2019	100	10-01-2019	UPGRADE FIRE ALARM SYS	01-18-1990	JM			43	Change - Reinspection Rer
B041271	08-24-2004	NC	New Construct					STORAGE SHED	04-13-1988	GH			00	Measur+Listed

LAND LINE VALUATION SECTION																
B	Use Code	Description	Zone	Land Type	Land Units	Unit Price	I. Factor	Site Index	Cond.	Nbhd.	Nhbd Adj	Notes	Location Adjustment	Adj Unit Pric	Land Value	
1	903W	Municipal MDL-9	NZ		5.000 AC	82,000	1.00000	1	1.00	300	1.600			0	656,000	
1	903W	Municipal MDL-9	NZ		6.760 AC	82,000	1.00000	0	0.20		1.000			0	110,900	
Total Card Land Units					11.760 AC	Parcel Total Land Area: 11.7600					Total Land Value					766,900

CONSTRUCTION DETAIL			CONSTRUCTION DETAIL (CONTINUED)		
Element	Cd	Description	Element	Cd	Description
Style:	95	Garage/Office			
Model	96	Ind/Comm			
Grade	03	Average			
Stories:	1				
Occupancy			<b>MIXED USE</b>		
Exterior Wall 1	27	Pre-finish Metl	Code	Description	Percentage
Exterior Wall 2			903W	Municipal MDL-96	100
Roof Structure	01	Flat			0
Roof Cover	09	Enam Mtl Shing			0
Interior Wall 1	01	Minim/Masonry	<b>COST / MARKET VALUATION</b>		
Interior Wall 2			RCN		2,020,095
Interior Floor 1	03	Concrete	Year Built		1982
Interior Floor 2			Effective Year Built		
Heating Fuel	03	Gas	Depreciation Code		A
Heating Type	03	Hot Air-no Duc	Remodel Rating		
AC Type	01	None	Year Remodeled		
Bldg Use	903W	Municipal MDL-96	Depreciation %		21
Total Rooms			Functional Obsol		0
Total Bedrms	00		External Obsol		0
Total Baths	2		Trend Factor		1
Heat/AC	00	None	Condition		
Frame Type	05	Steel	Condition %		79
Baths/Plumbing	02	Average	Percent Good		
Ceiling/Wall	04	Ceil & Min WI	Cns Sect Rcndd		1,595,900
Rooms/Prtns	02	Average	Dep % Ovr		
Wall Height	16.00		Dep Ovr Comment		
% Conn Wall	0.00		Misc Imp Ovr		
1st Floor Use:	903Z		Misc Imp Ovr Comment		
			Cost to Cure Ovr		
			Cost to Cure Ovr Comment		



OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)												
Code	Descripti	Sub	Sub Ty	L/B	Units	Unit Price	Yr Blt	Cond. Cd	% Gd	Grade	Grade Ad	Appr. V
PAV1	PAVING-			L	20,00	2.50	2003		50		0.00	25,000
FGR1	GARAG			L	3,800	18.00	2003		75		0.00	51,300
CNP2	GOOD			B	2,400	20.00	1997		79		0.00	37,900
SHD1	SHED F			L	10,00	8.00	2004		100		0.00	80,000

BAS  
(36,300 sf)

BUILDING SUB-AREA SUMMARY SECTION							
Code	Description	Living Area	Floor Area	Eff Area	Unit Cost	Undeprec Value	
BAS	First Floor	36,300	36,300		55.65	2,020,095	
Ttl Gross Liv / Lease Area		36,300	36,300			2,020,095	



# Exhibit C

## **Construction Drawings**

# T-Mobile

**T-MOBILE SITE NUMBER: CTHA267A**

**T-MOBILE SITE NAME: CTHA267A**

**SITE TYPE: MONOPOLE**

**TOWER HEIGHT: 168'-0"**

**BUSINESS UNIT #: 842875**

**SITE ADDRESS: 99 DAY HILL ROAD WINDSOR, CT 06095**

**COUNTY: HARTFORD**

**JURISDICTION: TOWN OF WINDSOR**

**T-MOBILE SPRINT RETAIN SITE CONFIGURATION: 67D5998C\_1xAIR+1QP+1OP**

T-Mobile

35 GRIFFIN ROAD  
BLOOMFIELD, CT 06002

**CROWN CASTLE**

2000 CORPORATE DRIVE  
CANONSBURG, PA 15317

**INFINIGY**

FROM ZERO TO INFINIGY  
the solutions are endless  
1033 Watervliet Shaker Rd | Albany, NY 12205  
Phone: 518-690-0790 | Fax: 518-690-0793  
www.infinigy.com

T-MOBILE SITE NUMBER:  
**CTHA267A**

**BU #: 842875**  
**WINDSORDAY HILL**

99 DAY HILL ROAD  
WINDSOR, CT 06095

EXISTING 168'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/17/21	RCD	PRELIMINARY	SS
0	04/01/21	BMM	FINAL	SS

**SITE INFORMATION**

CROWN CASTLE USA INC. WINDSORDAY HILL  
SITE NAME:  
SITE ADDRESS: 99 DAY HILL ROAD WINDSOR, CT 06095  
COUNTY: HARTFORD  
MAP/PARCEL #: 9310.01  
AREA OF CONSTRUCTION: EXISTING  
LATITUDE: 41.87116388° (41° 52' 16.10")  
LONGITUDE: -72.67107500° (-72° 40' 16.00")  
LAT/LONG TYPE: NAD83  
GROUND ELEVATION: 166 FT  
CURRENT ZONING: 903W  
JURISDICTION: HARTFORD COUNTY  
OCCUPANCY CLASSIFICATION: U  
TYPE OF CONSTRUCTION: IIB  
A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION  
PROPERTY OWNER: AT&T MOBILITY 575 MOROSGO DR SUITE 13-F WEST TOWER ATTN: NREA TAX DEPT ATLANTA, GA 30324  
TOWER OWNER: CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317  
CARRIER/APPLICANT: T-MOBILE 35 GRIFFIN ROAD BLOOMFIELD, CT 06002  
ELECTRIC PROVIDER: TBD  
TELCO PROVIDER: TBD

**DRAWING INDEX**

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	SITE PLAN & ENLARGED SITE PLAN
C-2	FINAL ELEVATION & ANTENNA PLANS
C-3	ANTENNA & CABLE SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECS
C-6	EQUIPMENT SPECS
E-1	AC PANEL SCHEDULES & ONE LINE DIAGRAM
G-1	ANTENNA GROUNDING DIAGRAM
G-2	GROUNDING DETAILS

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

**PROJECT DESCRIPTION**

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

**TOWER SCOPE OF WORK:**

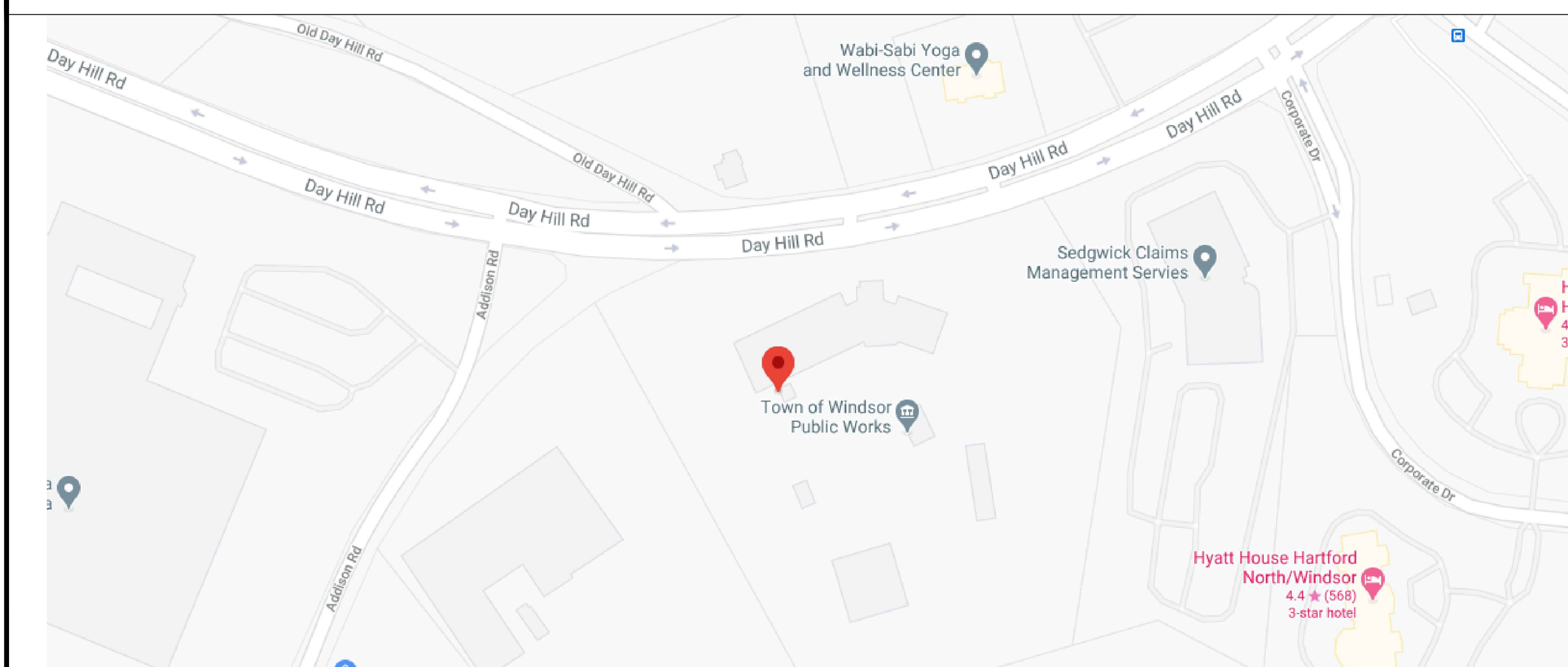
- REMOVE (6) ANTENNAS
- REMOVE (9) RRU's
- REMOVE (1) PLATFORM
- REMOVE (3) HYBRID CABLES
- REMOVE (3) RET CABLES
- INSTALL (9) ANTENNAS
- INSTALL (9) RRU's
- INSTALL (4) HYBRID CABLES
- MODIFY (1) PLATFORM

**GROUND SCOPE OF WORK:**

- REMOVE (2) EQUIPMENT CABINET
- INSTALL (1) 6160 & (1) B160 BATTERY CABINETS
- INSTALL (1) PSU4813 BOOSTER IN (P) CABINET
- INSTALL (3) BB6630 IN (P) CABINET
- INSTALL (1) BB6648 IN (P) CABINET
- INSTALL (1) IXRE ROUTER IN (P) CABINET

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

**LOCATION MAP**



NO SCALE

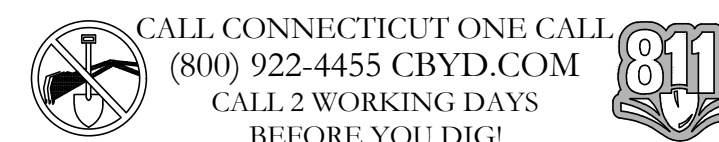
**APPLICABLE CODES/REFERENCE DOCUMENTS**

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

CODE TYPE	CODE
BUILDING	2018 CT STATE BUILDING CODE
MECHANICAL	2015 IMC
ELECTRICAL	2017 NEC

**REFERENCE DOCUMENTS:**

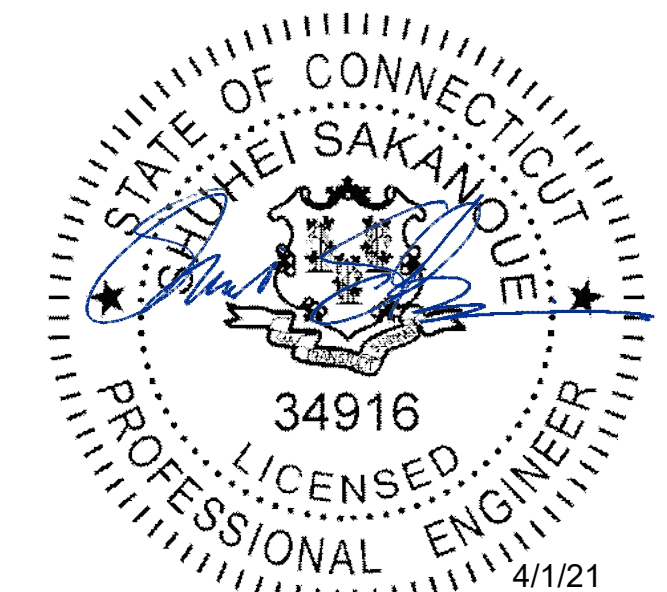
STRUCTURAL ANALYSIS:	BY OTHERS
DATED:	
MOUNT ANALYSIS:	GPD ENGINEERING AND ARCHITECTURE.
DATED:	02/22/2021
RFDS REVISION:	1
DATED:	01/15/2021
ORDER ID:	538783
REVISION:	0



**APPROVALS**

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.	_____	_____
LAND USE PLANNER	_____	_____
T-MOBILE	_____	_____
OPERATIONS	_____	_____
RF	_____	_____
NETWORK	_____	_____
BACKHAUL	_____	_____
CONSTRUCTION MANAGER	_____	_____

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.



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

SHEET NUMBER:

**T-1**

REVISION:

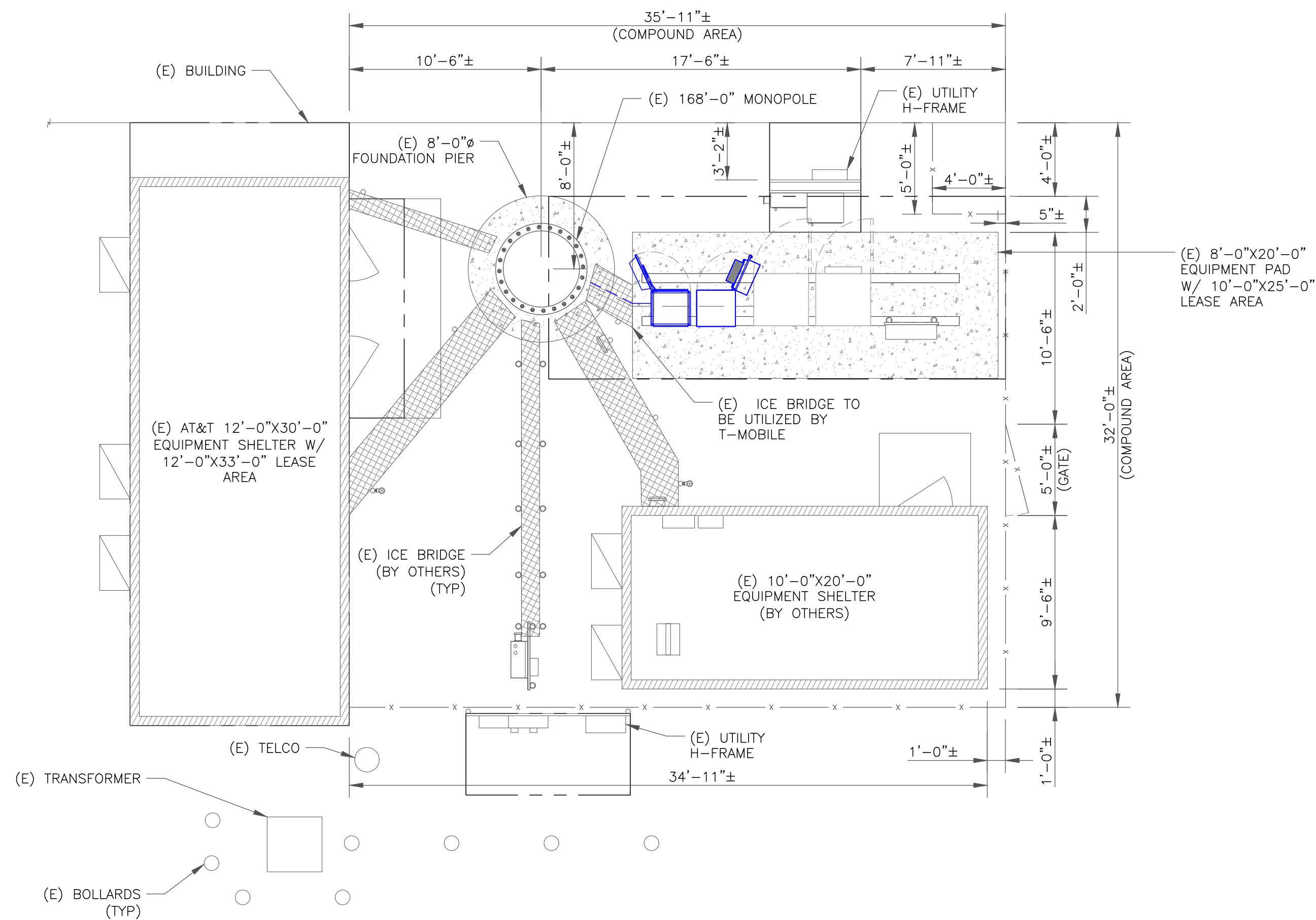
**0**

**PROJECT TEAM**

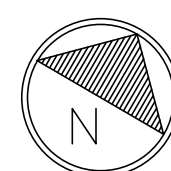
A&E FIRM: INFINIGY 1033 WATERVLIET SHAKER RD. ALBANY, NY 12205  
CROWN CASTLE USA INC. DISTRICT CONTACTS: 1500 CORPORATE DRIVE CANONSBURG, PA 15317  
TRICIA PELON - PROJECT MANAGER (518) 373-3507  
JASON D'AMICO - CONSTRUCTION MANAGER (860) 209-0104



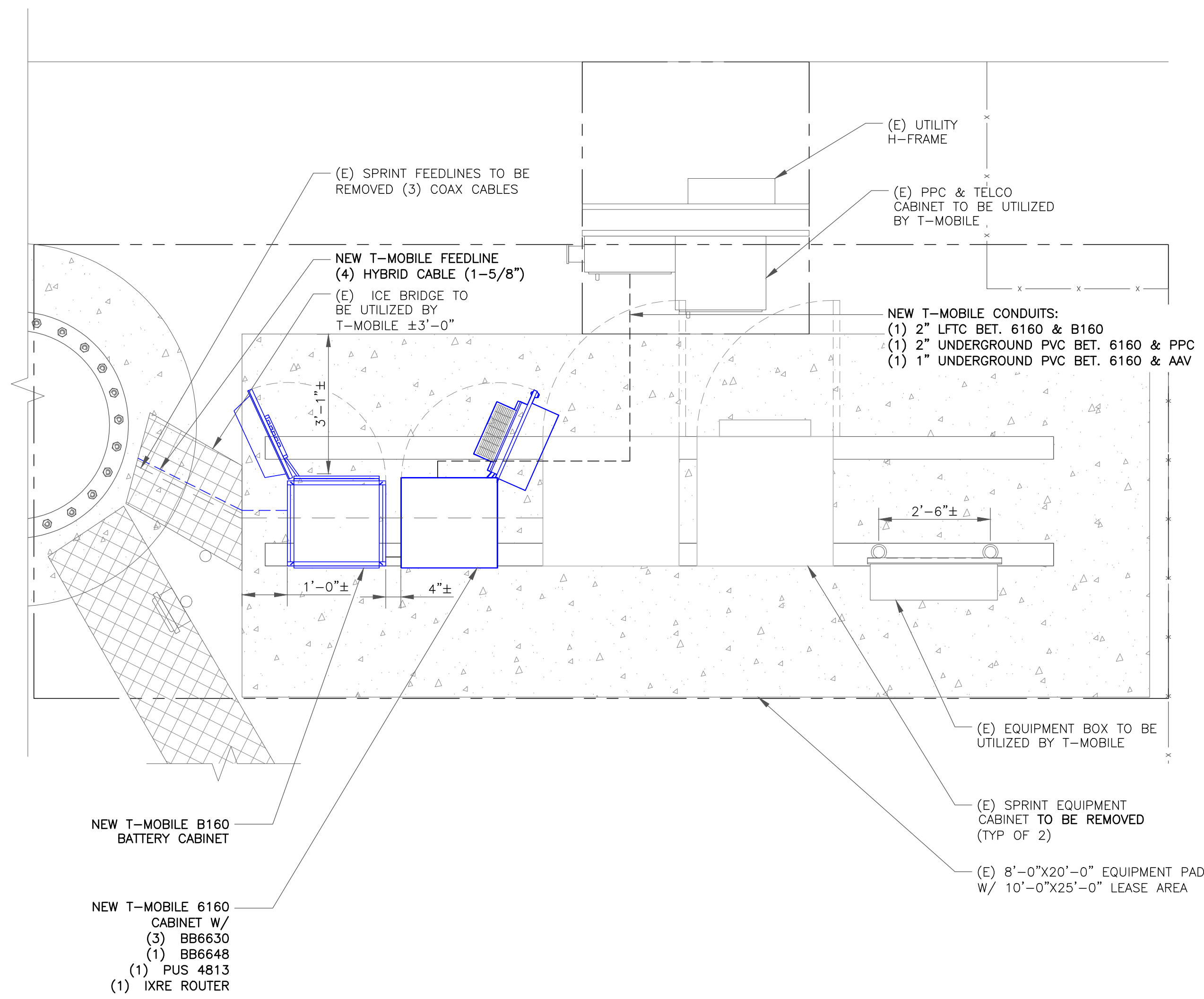
NOTE:  
 1. PLANS BASED ON SITE PLAN PROVIDED BY TOWER OWNER AND SITE VISIT PERFORMED BY INFINIGY. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING T-MOBILE EQUIPMENT.



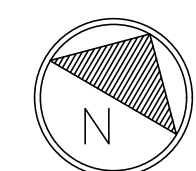
1 SITE PLAN  
 SCALE: 3/16"=1'-0" (FULL SIZE)  
 3/32"=1'-0" (11x17)



NOTES:  
 THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.



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



**T-Mobile**  
 35 GRIFFIN ROAD  
 BLOOMFIELD, CT 06002

**CROWN CASTLE**  
 2000 CORPORATE DRIVE  
 CANONSBURG, PA 15317

**INFINIGY**  
 FROM ZERO TO INFINIGY  
 the solutions are endless  
 1033 Watervliet Shaker Rd | Albany, NY 12205  
 Phone: 518-690-0790 | Fax: 518-690-0793  
 www.infinigy.com

T-MOBILE SITE NUMBER:  
**CTHA267A**

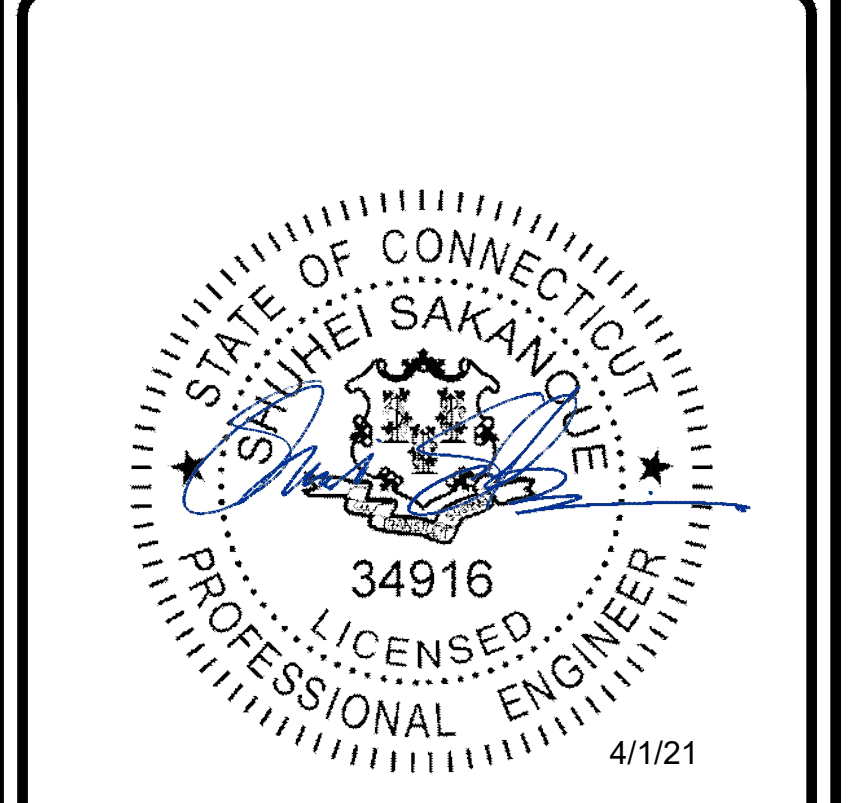
BU #: 842875  
**WINDSORDAY HILL**

99 DAY HILL ROAD  
 WINDSOR, CT 06095

EXISTING 168'-0" MONOPOLE

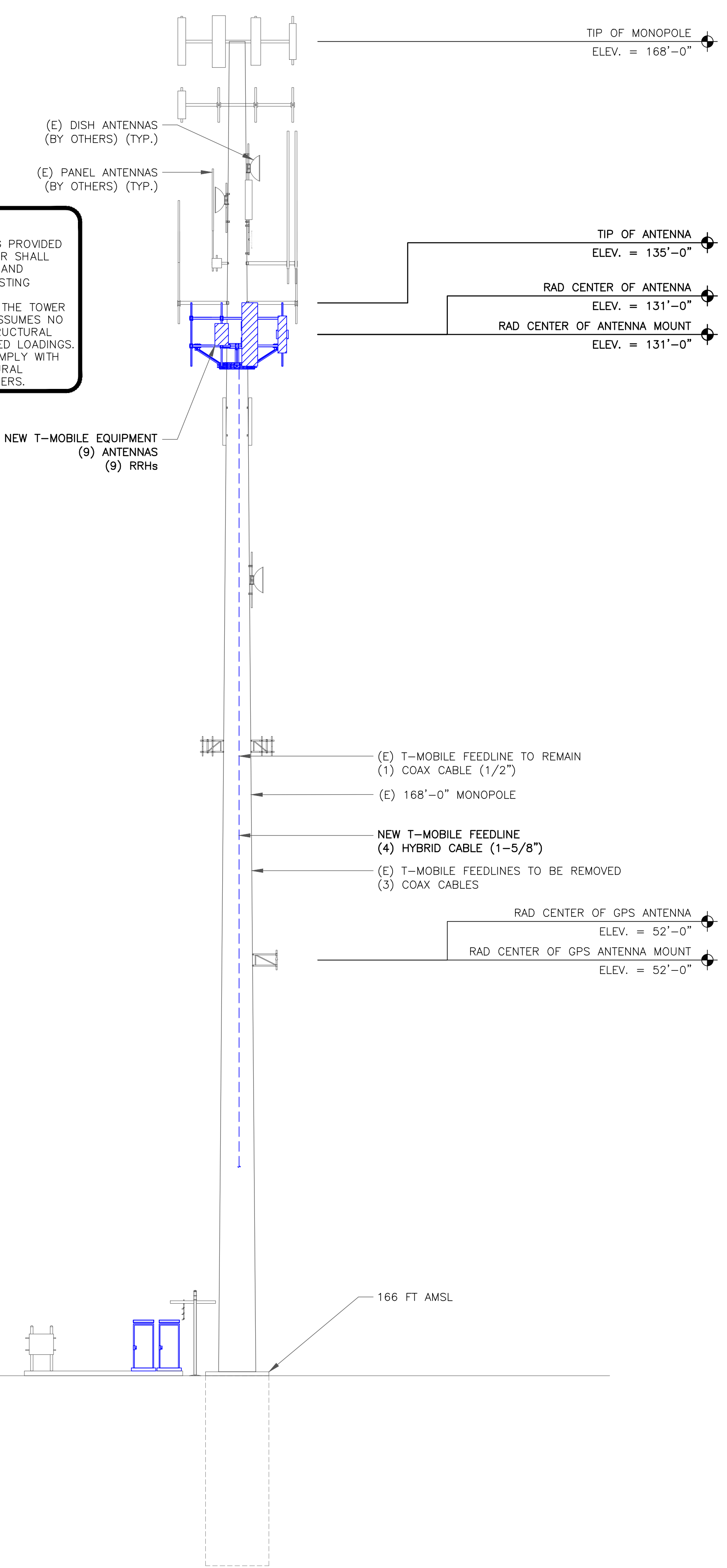
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES/QA
A	03/17/21	RCD	PRELIMINARY	SS
0	04/01/21	BMM	FINAL	SS



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

SHEET NUMBER: **C-1** REVISION: **0**



**NOTES:**

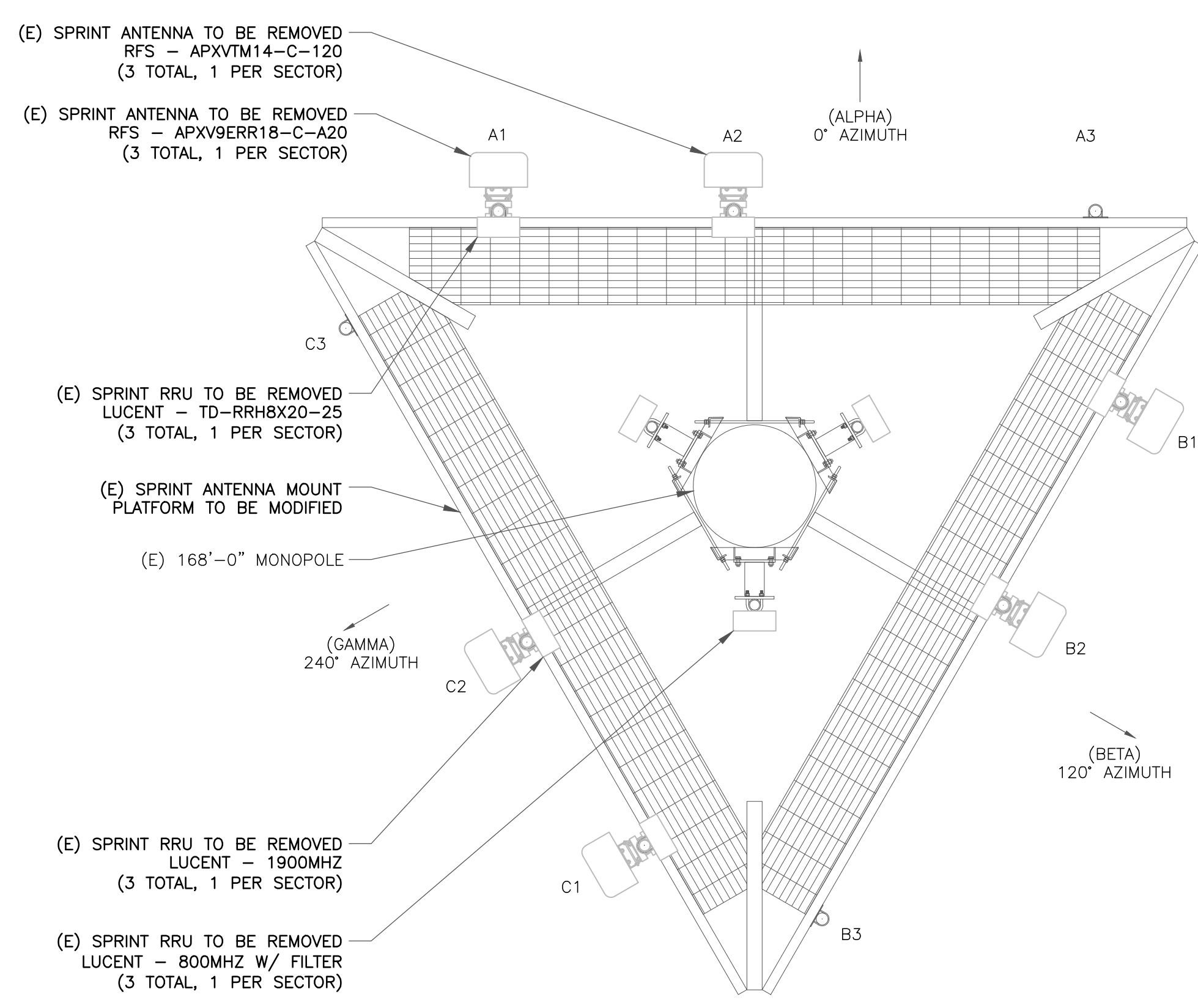
- ELEVATION BASED ON DRAWING PROVIDED BY TOWER OWNER. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.
- INFINIGY HAS NOT EVALUATED THE TOWER OR MOUNT STRUCTURE AND ASSUMES NO RESPONSIBILITY FOR THEIR STRUCTURAL INTEGRITY REGARDING PROPOSED LOADINGS. FINAL INSTALLATION SHALL COMPLY WITH RESULTS OF PASSING STRUCTURAL ANALYSES PERFORMED BY OTHERS.

**T-MOBILE EQUIPMENT**

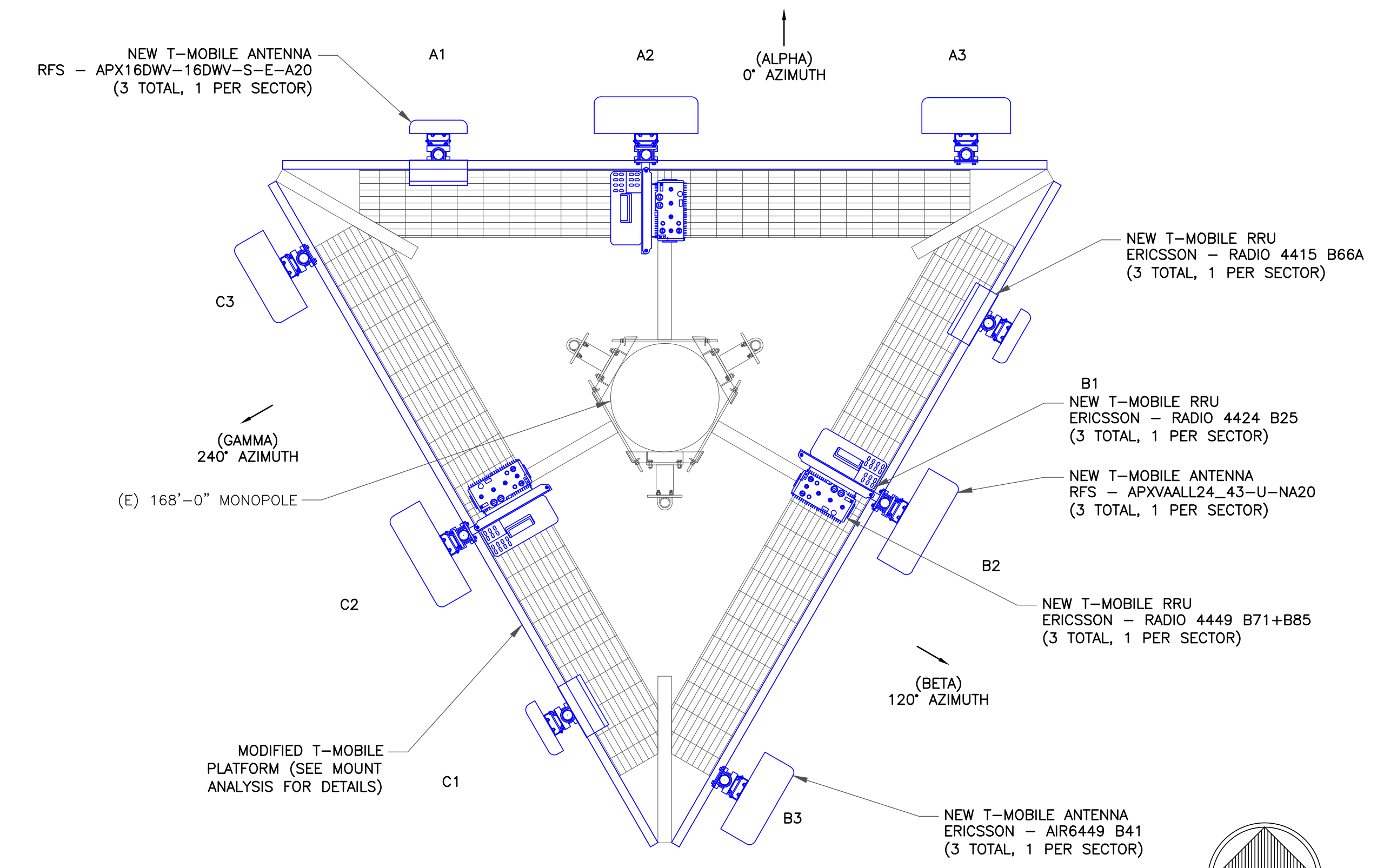
ANTENNA CL: 131'-0"  
MOUNT CL: 131'-0"  
ANTENNA CL: 52'-0"  
MOUNT CL: 52'-0"

ANY AND ALL TOWER MOUNTED EQUIPMENT MUST NOT TRAP OR INTERFERE W/ EXISTING SAFETY CLIMB

1 FINAL ELEVATION  
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT  
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT  
SCALE: NOT TO SCALE

**NOTE:**  
A STRUCTURAL EVALUATION OF THE T-MOBILE ANTENNA MOUNTS HAS BEEN PERFORMED BY IKIMLEY-HORN AND ASSOCIATES, INC. REFER TO ANTENNA MOUNT STRUCTURAL ANALYSIS DATED 01-20-2021 PRIOR TO CONSTRUCTION.

INFINIGY HAS NOT EVALUATED THE TOWER FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. CONTRACTOR TO COORDINATE LOADING WITH RF ENGINEER. REFER TO STRUCTURAL ANALYSIS PERFORMED BY OTHERS PRIOR TO CONSTRUCTION.

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T-MOBILE SITE NUMBER:  
**CTHA267A**

BU #: 842875  
**WINDSORDAY HILL**

99 DAY HILL ROAD  
WINDSOR, CT 06095

EXISTING 168'-0" MONOPOLE

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	03/17/21	RCD	PRELIMINARY	SS
0	04/01/21	BMM	FINAL	SS

STATE OF CONNECTICUT  
HUHEI SAKANO  
34916  
LICENSED PROFESSIONAL ENGINEER  
4/1/21

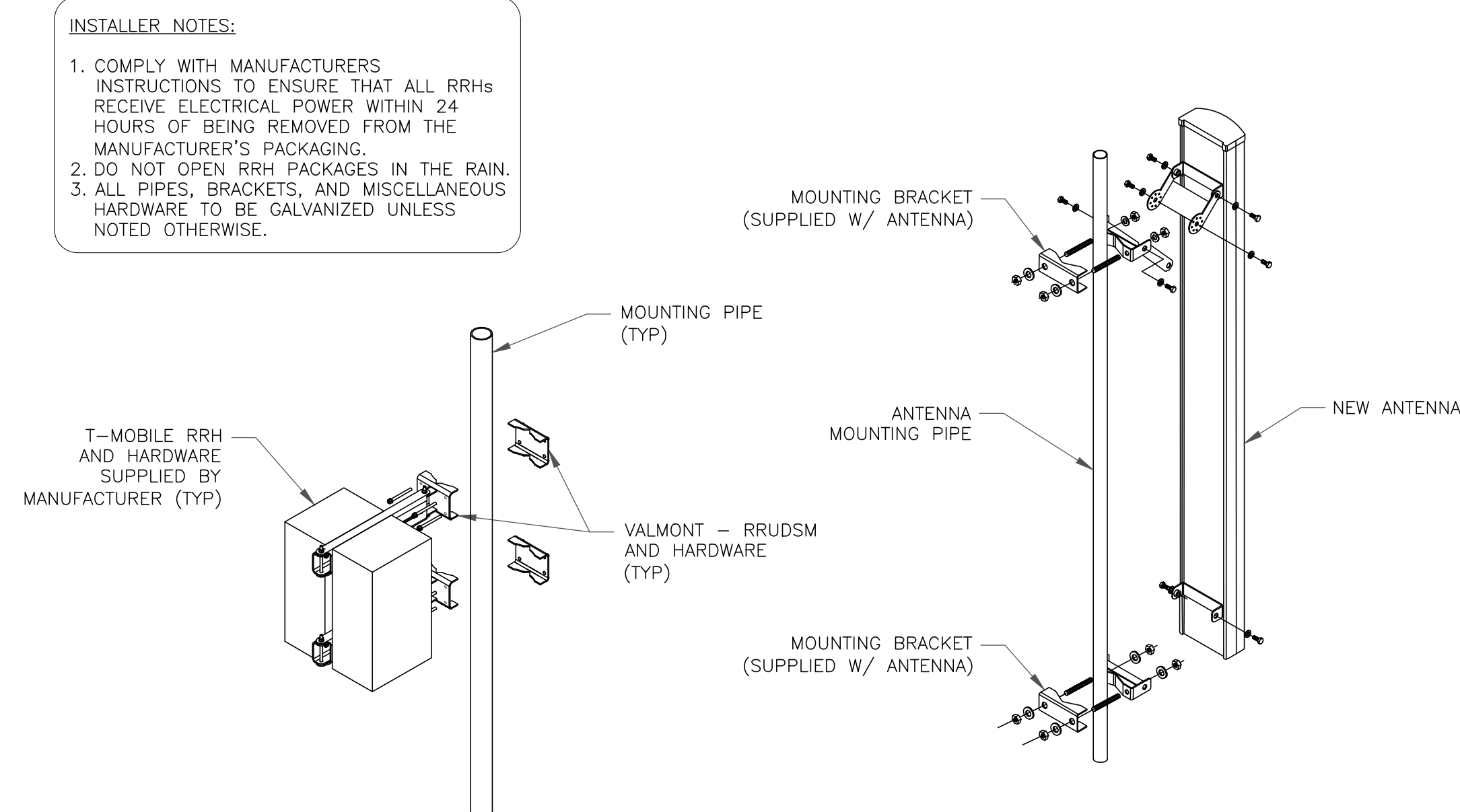
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SHEET NUMBER: **C-2** REVISION: **0**



ANTENNA SCHEDULE										
SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	L2100	131'-0"	0°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X12 HCS HYBRID (SHARED)
ALPHA	A2	L700, L600, N600, L1900, G1900	131'-0"	0°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(2) 6X12 HCS HYBRID (SHARED)
ALPHA	A3	L2500, N2500	131'-0"	0°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X12 HCS HYBRID (SHARED)
ALPHA	A4	--	--	--	--	--	--	--	--	--
BETA	B1	L2100	131'-0"	120°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X12 HCS HYBRID (SHARED)
BETA	B2	L700, L600, N600, L1900, G1900	131'-0"	120°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(2) 6X12 HCS HYBRID (SHARED)
BETA	B3	L2500, N2500	131'-0"	120°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X12 HCS HYBRID (SHARED)
BETA	B4	--	--	--	--	--	--	--	--	--
GAMMA	C1	L2100	131'-0"	240°	RFS	APX16DWV-16DWV-S-E-A20	0°	--	(1) ERICSSON - RRUS 4415 B66A	(1) 6X12 HCS HYBRID (SHARED)
GAMMA	C2	L700, L600, N600, L1900, G1900	131'-0"	240°	RFS	APXVAALL24_43-U-NA20	0°	--	(1) ERICSSON - RRUS 4449 B71+B85 (1) ERICSSON - RRUS 4424 B25	(2) 6X12 HCS HYBRID (SHARED)
GAMMA	C3	L2500, N2500	131'-0"	240°	ERICSSON	AIR6449 B41	0°	--	--	(1) 6X12 HCS HYBRID (SHARED)
GAMMA	C4	--	--	--	--	--	--	--	--	--

1 ANTENNA AND CABLE SCHEDULE  
SCALE: NOT TO SCALE



**NOTE:**

- CONTRACTOR SHALL INSTALL 3RD DUAL RRH MOUNT TO ACCOMMODATE ALL RRH BRACKETS HOLES IF NECESSARY.

2 ANTENNA WITH RRHs MOUNTING DETAIL  
SCALE: NOT TO SCALE

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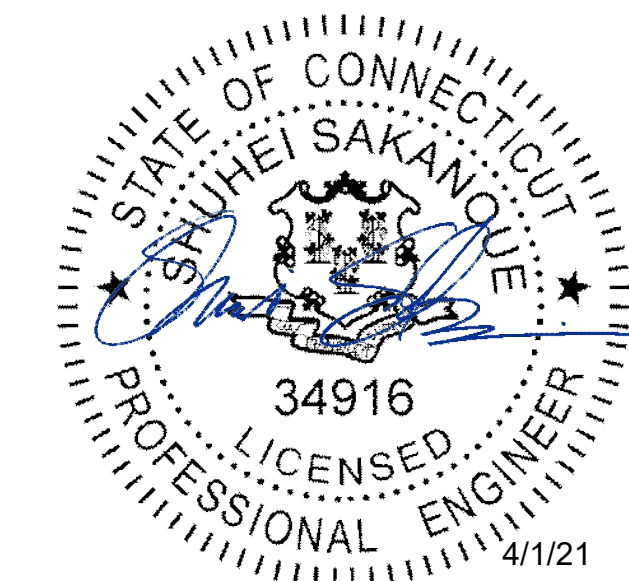
BU #: 842875  
**WINDSORDAY HILL**

99 DAY HILL ROAD  
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EXISTING 168'-0" MONOPOLE

**ISSUED FOR:**

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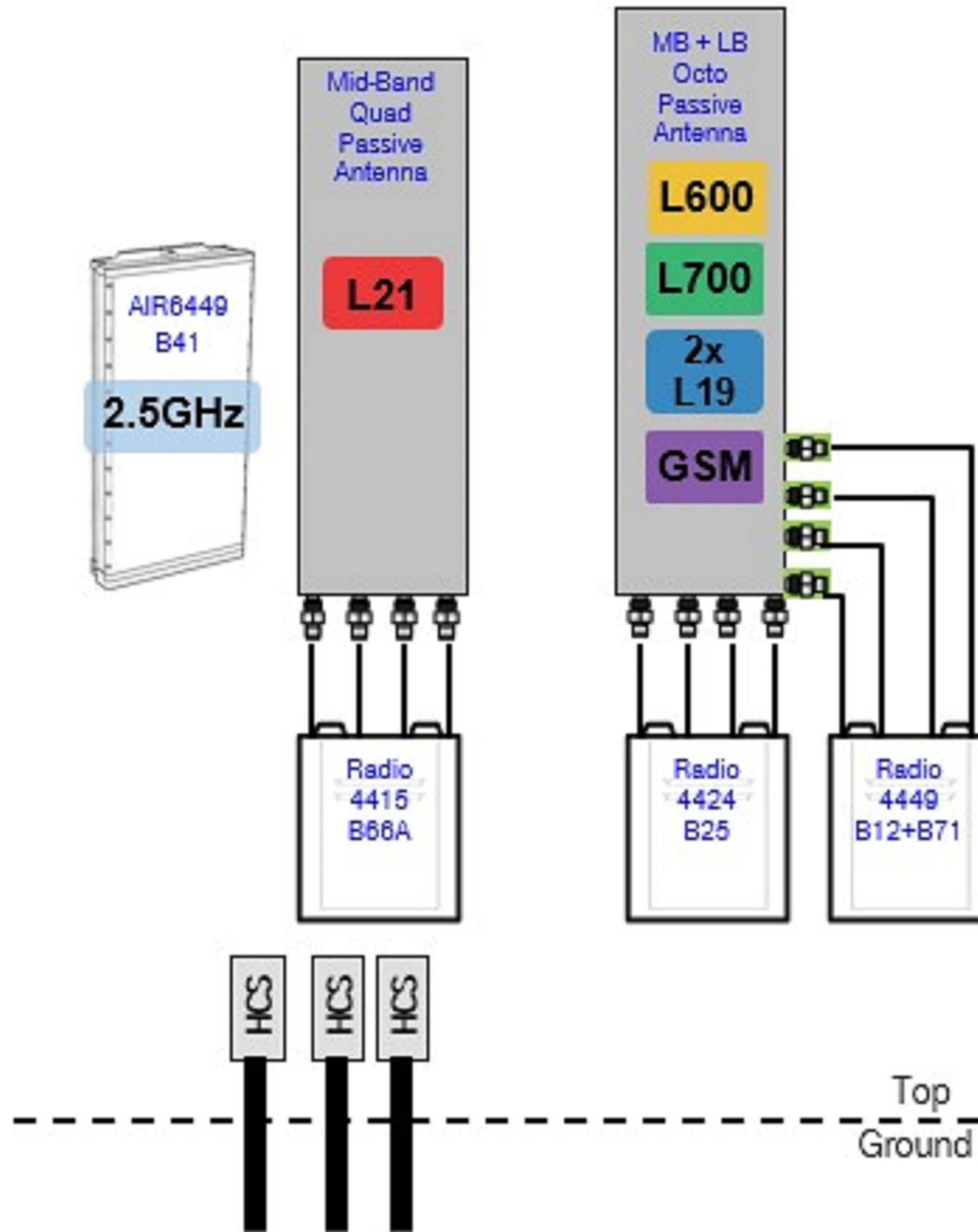
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SHEET NUMBER:

**C-3**

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1 PLUMBING DIAGRAM  
SCALE: NOT TO SCALE

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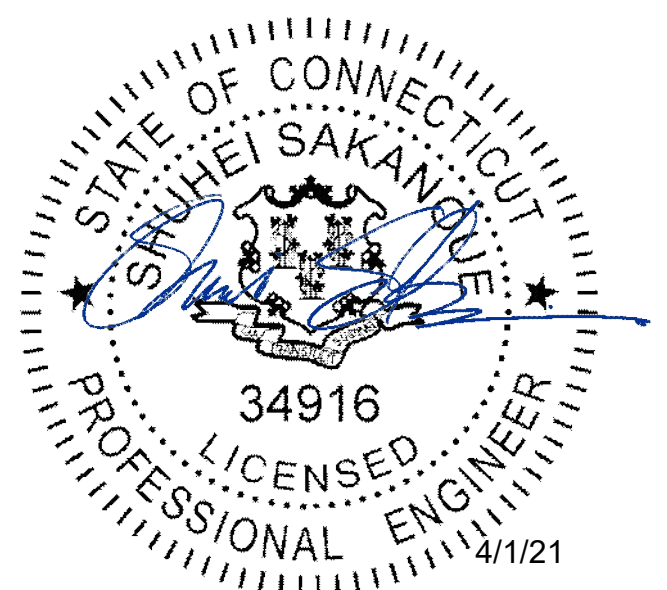
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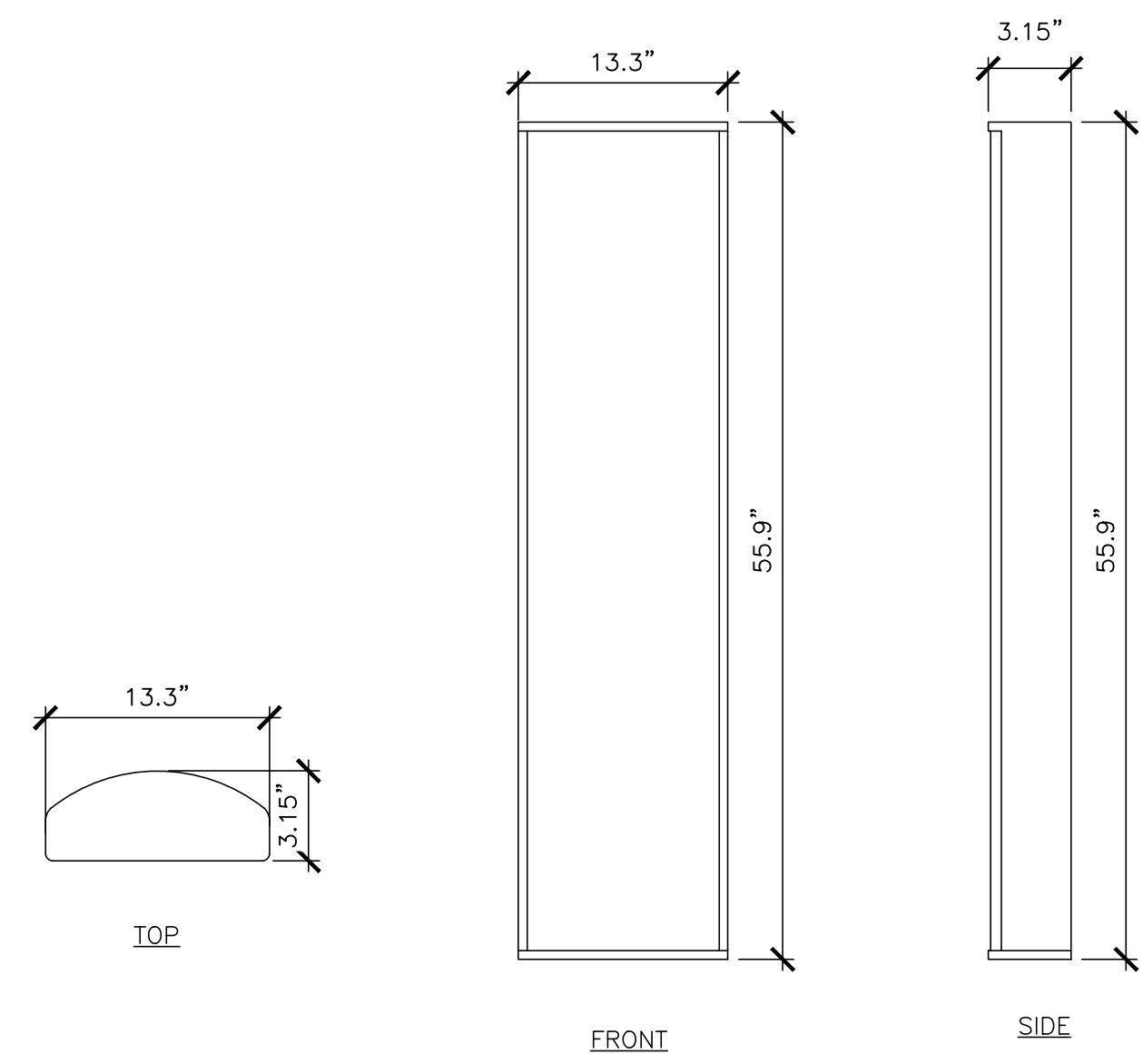
SHEET NUMBER:

C-4

REVISION:

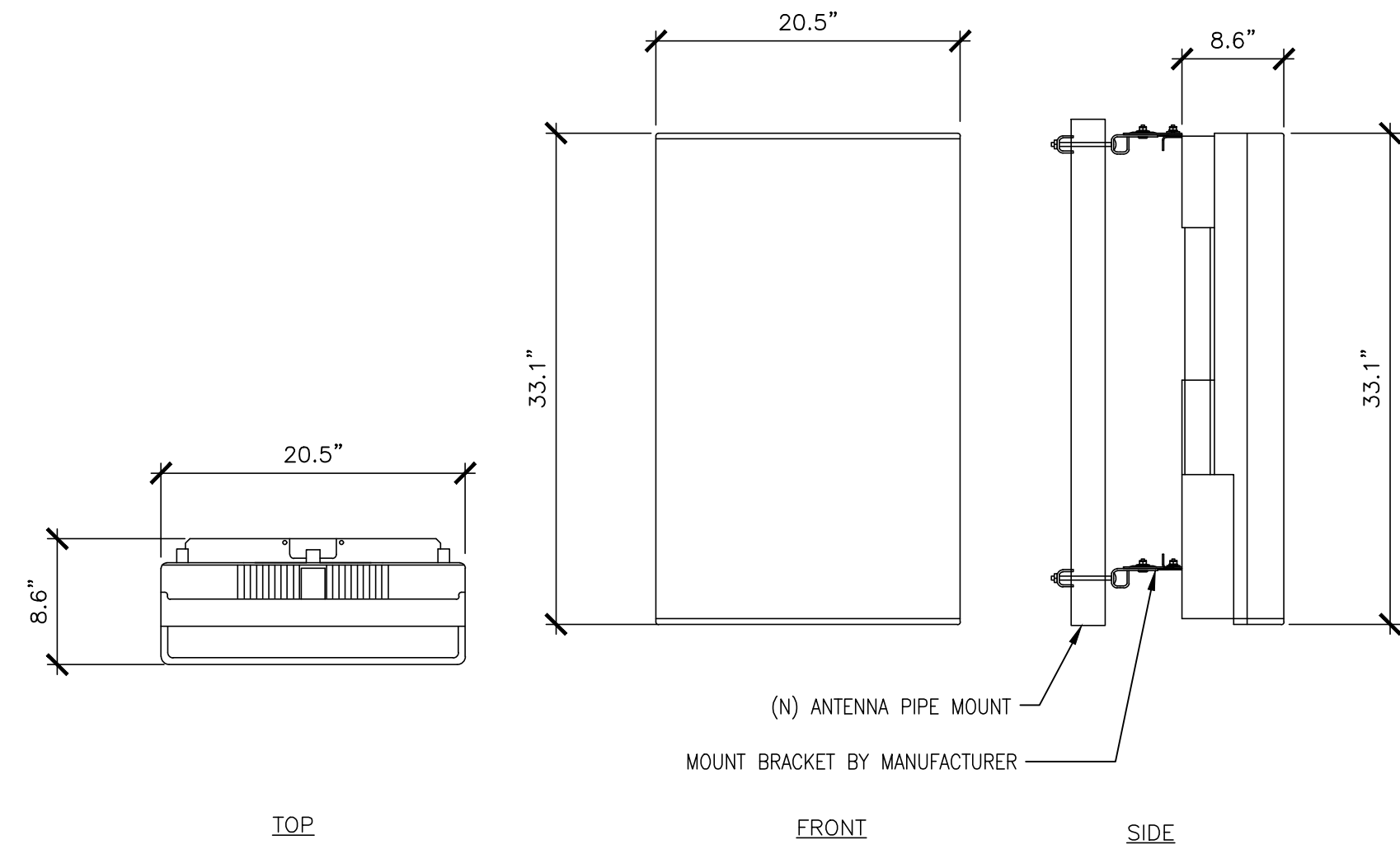
0

MANUFACTURER: RFS  
 MODEL: APX16DW-16DW-S-E-A20  
 WEIGHT: 40.7 LBS  
 DIMENSIONS: 55.9"H. X 13.3"W. X 3.15"D.  
 FREQUENCY: REFER TO RF DATA SHEET

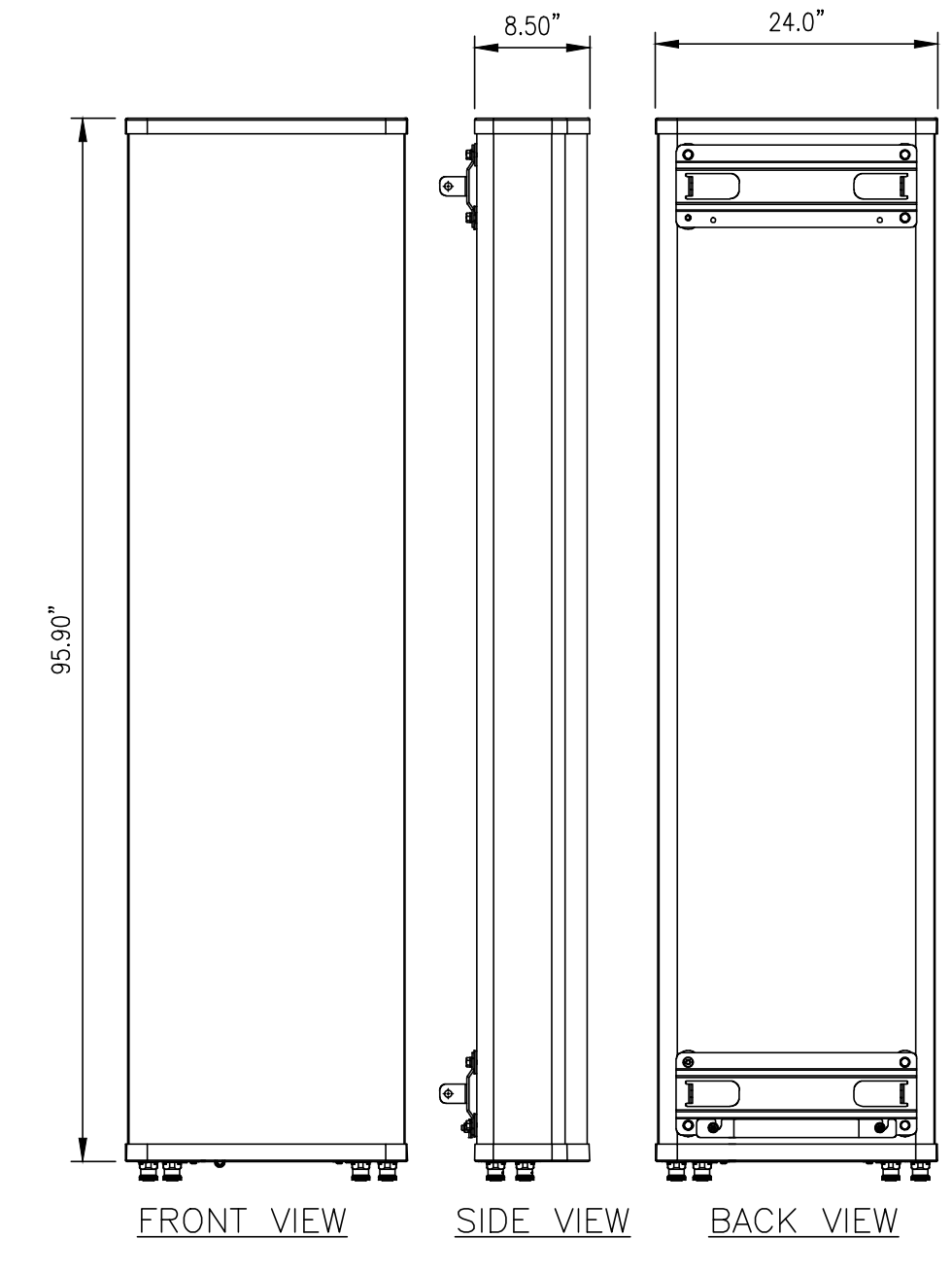


② (N) APX16DW-16DW-S-E-A20 ANTENNA SPEC  
 SCALE: NOT TO SCALE

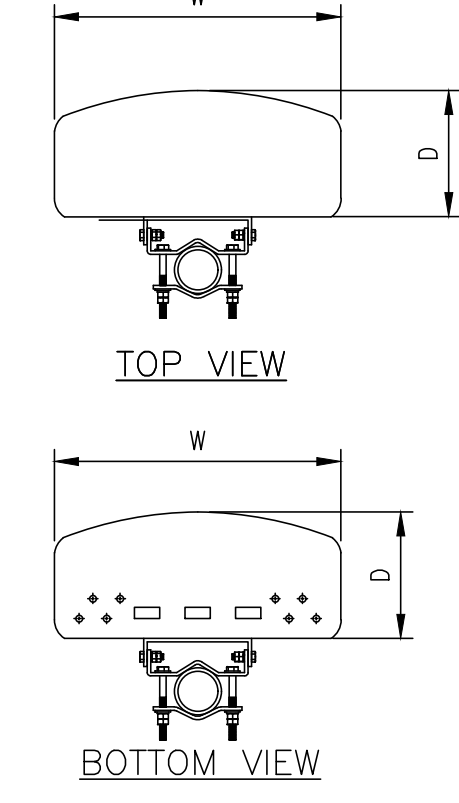
MANUFACTURER: ERICSSON  
 MODEL: AIR6449 B41  
 WEIGHT: 104 LBS (W/ MOUNT BRACKET 113)  
 DIMENSIONS: 33.1"H. X 20.5"W. X 8.6"D.  
 FREQUENCY: REFER TO RF DATA SHEET



① (N) AIR6449 B41 ANTENNA SPEC  
 SCALE: NOT TO SCALE



700MHz RFS ANTENNAS	
MODEL	WEIGHT (lb)
(8') APXVAALL24_43-UNA20	149.90
WEIGHT W/ MOUNTING BRACKET (lb):	154



③ (N) APXVAALL24\_43-UNA20 ANTENNA SPEC  
 SCALE: NOT TO SCALE

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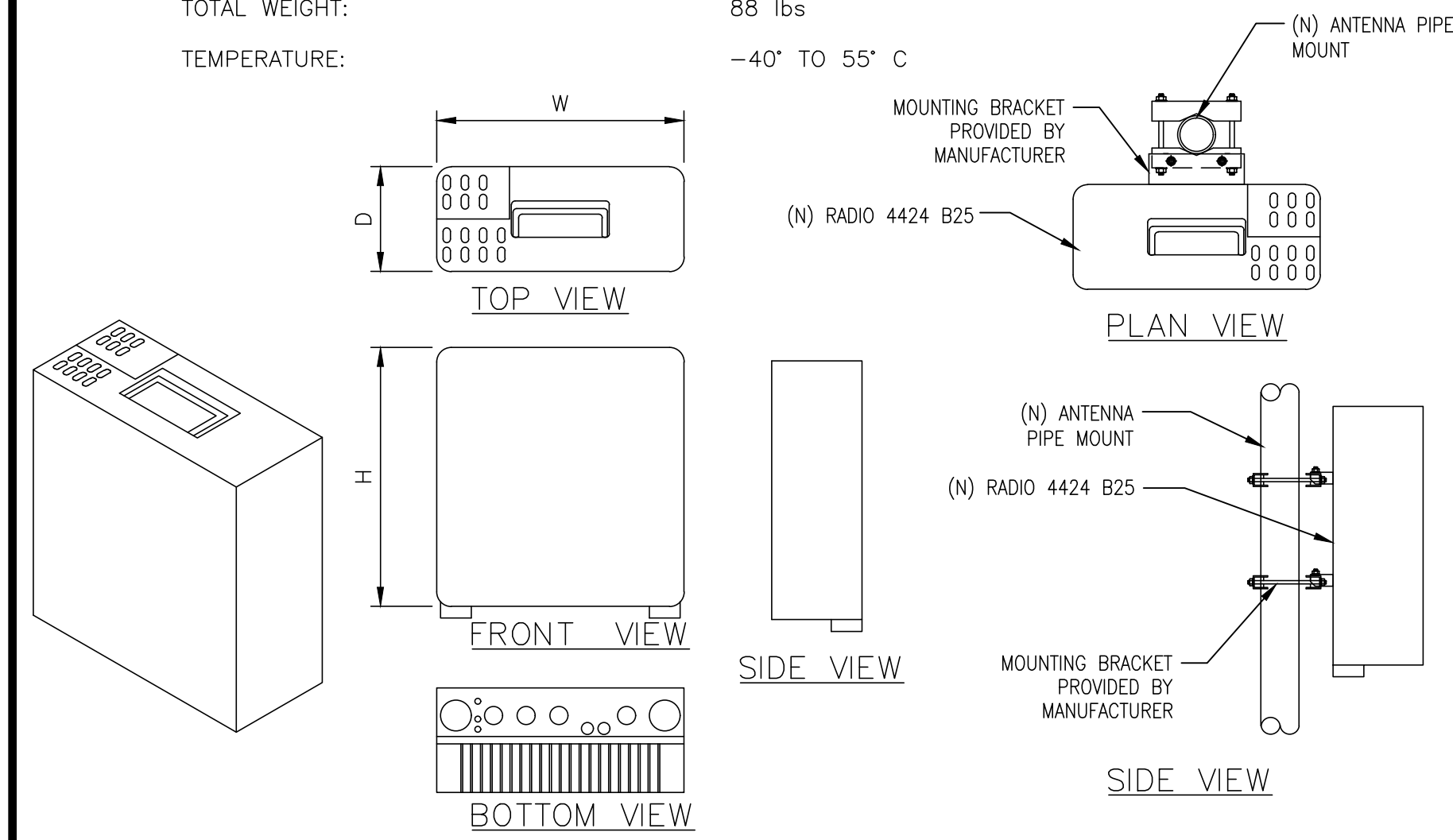
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**CTHA267A**  
 BU #: 842875  
**WINDSORDAY HILL**  
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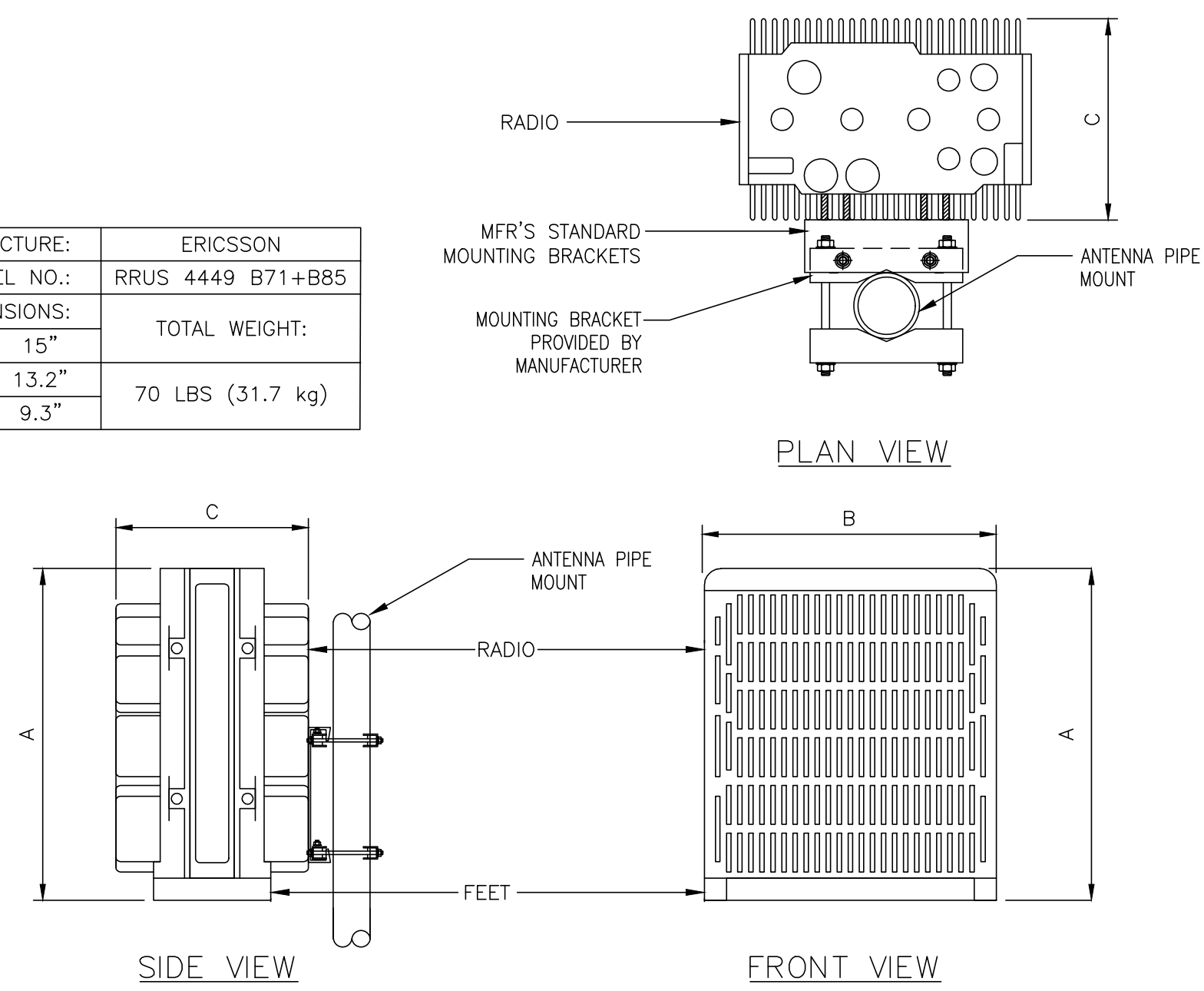
**ERICSSON RADIO-4424 B25**

DIMENSIONS, WxDxH: 13.5"x9.6"x16.5"  
 MAX OUTPUT POWER: 4x80W (2x(2x80W))  
 TOTAL WEIGHT: 88 lbs  
 TEMPERATURE: -40° TO 55° C



④ (N) RADIO 4424 B25 SPEC  
 SCALE: NOT TO SCALE

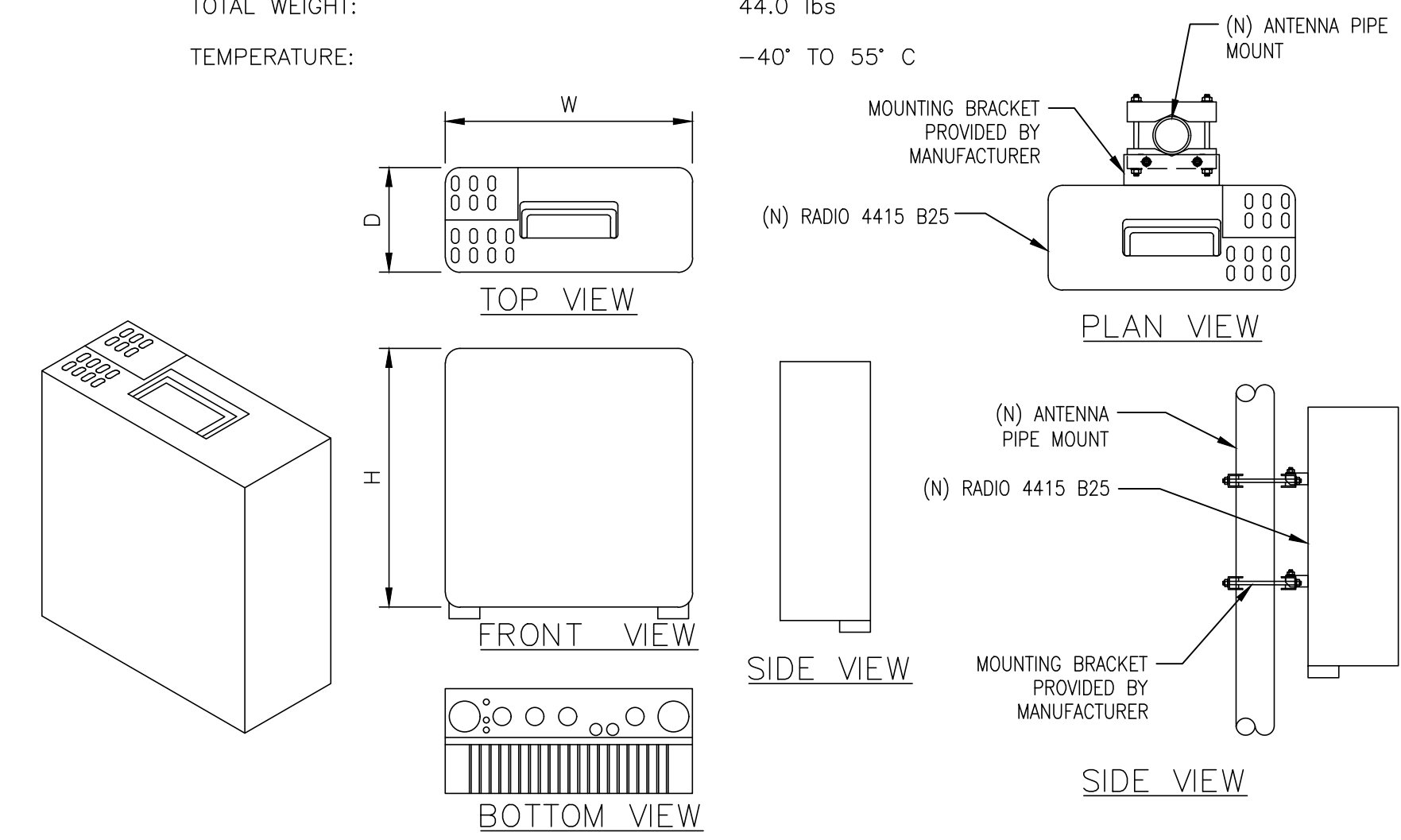
MANUFACTURE: ERICSSON	
MODEL NO.: RRS 4449 B71+B85	
DIMENSIONS:	
A	15"
B	13.2"
C	9.3"
TOTAL WEIGHT: 70 LBS (31.7 kg)	



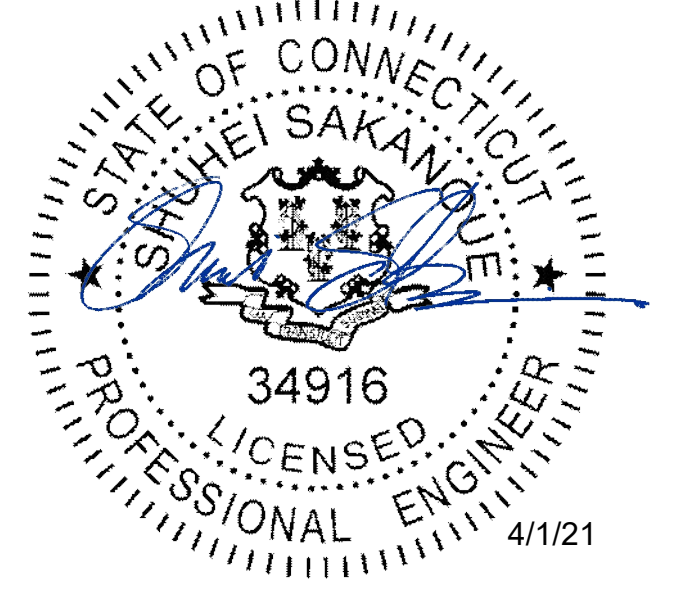
⑤ (N) RADIO 4449 B71+B85 SPEC  
 SCALE: NOT TO SCALE

**ERICSSON RADIO-4415 B66A**

DIMENSIONS, WxDxH: 13.19"x5.39"x14.96"  
 POWER CONSUMPTION: 660 WATTS  
 TOTAL WEIGHT: 44.0 lbs  
 TEMPERATURE: -40° TO 55° C

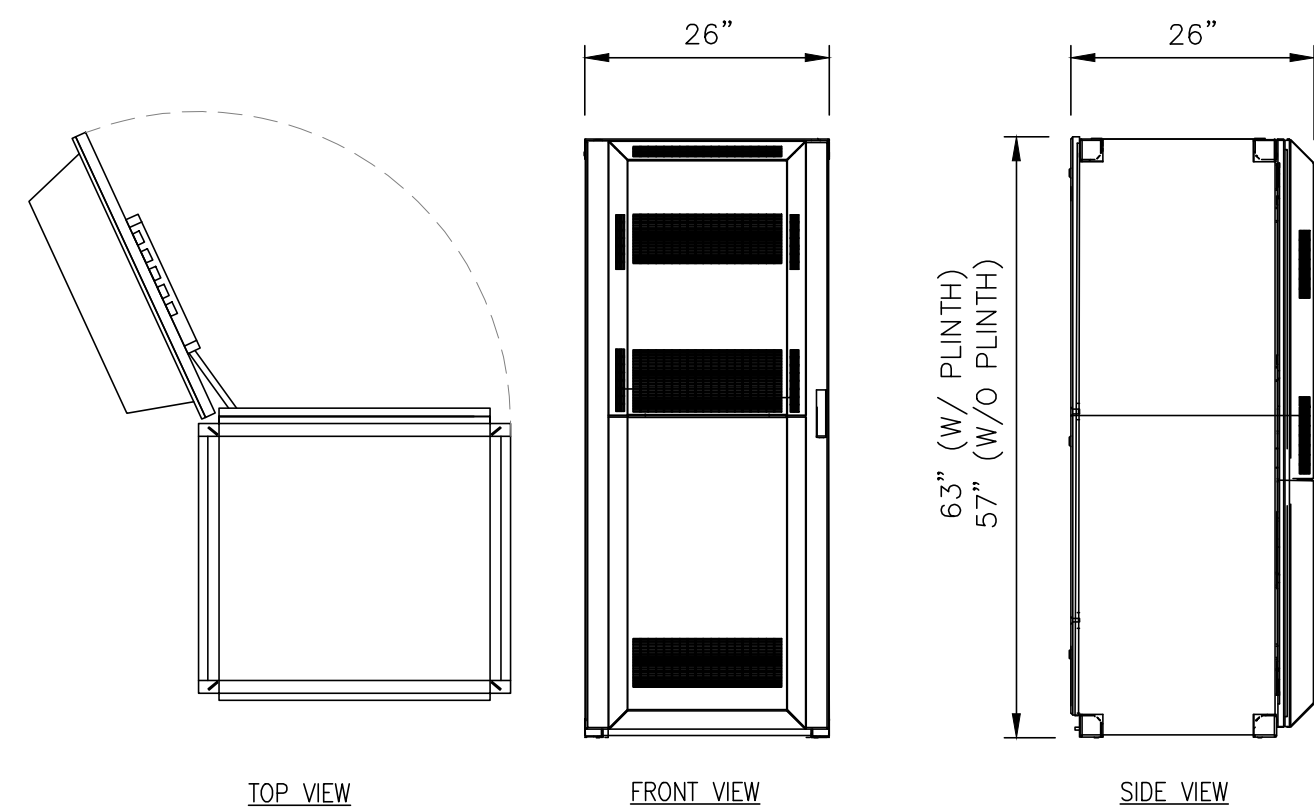


⑥ (N) RADIO 4415 B66A SPEC  
 SCALE: NOT TO SCALE



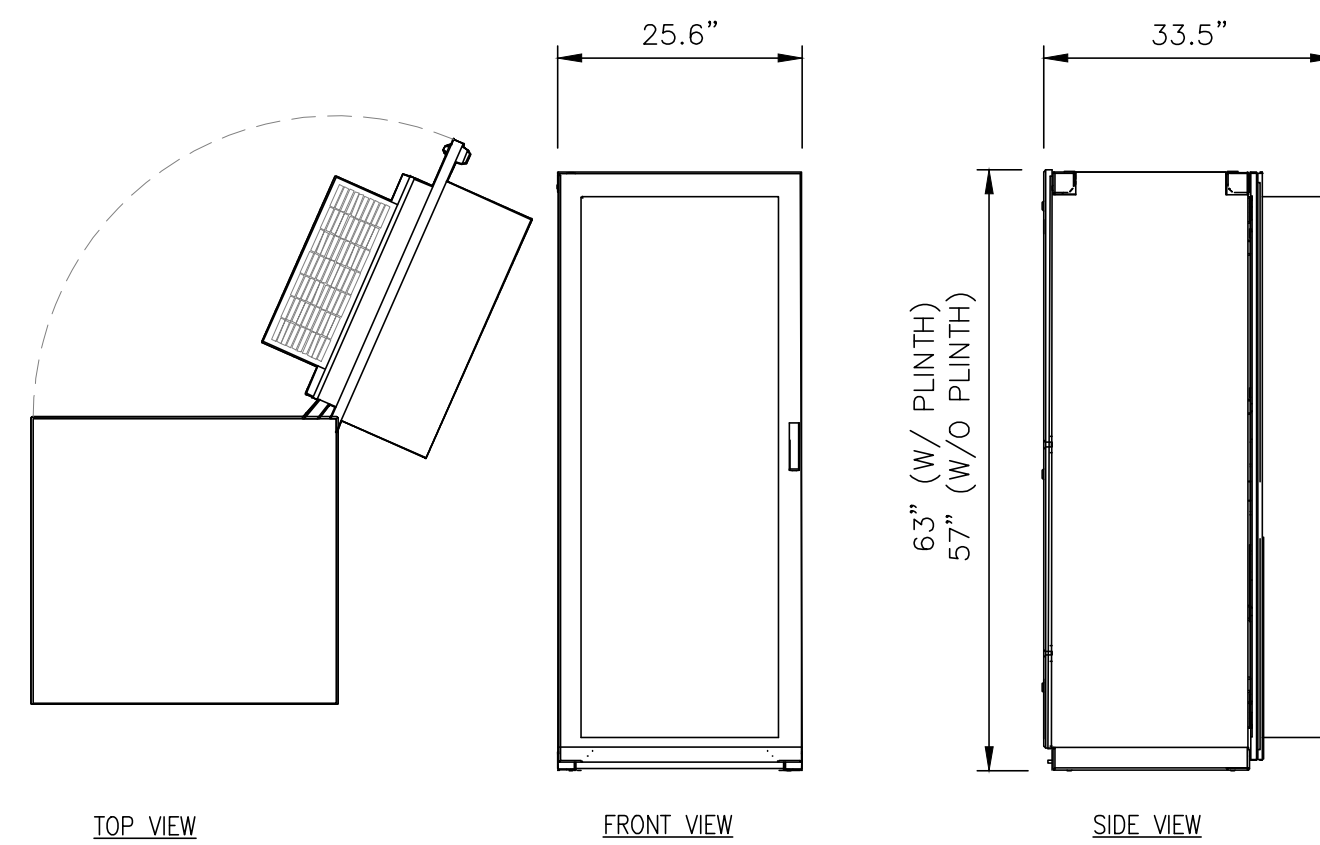
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SHEET NUMBER: **C-5** REVISION: **0**



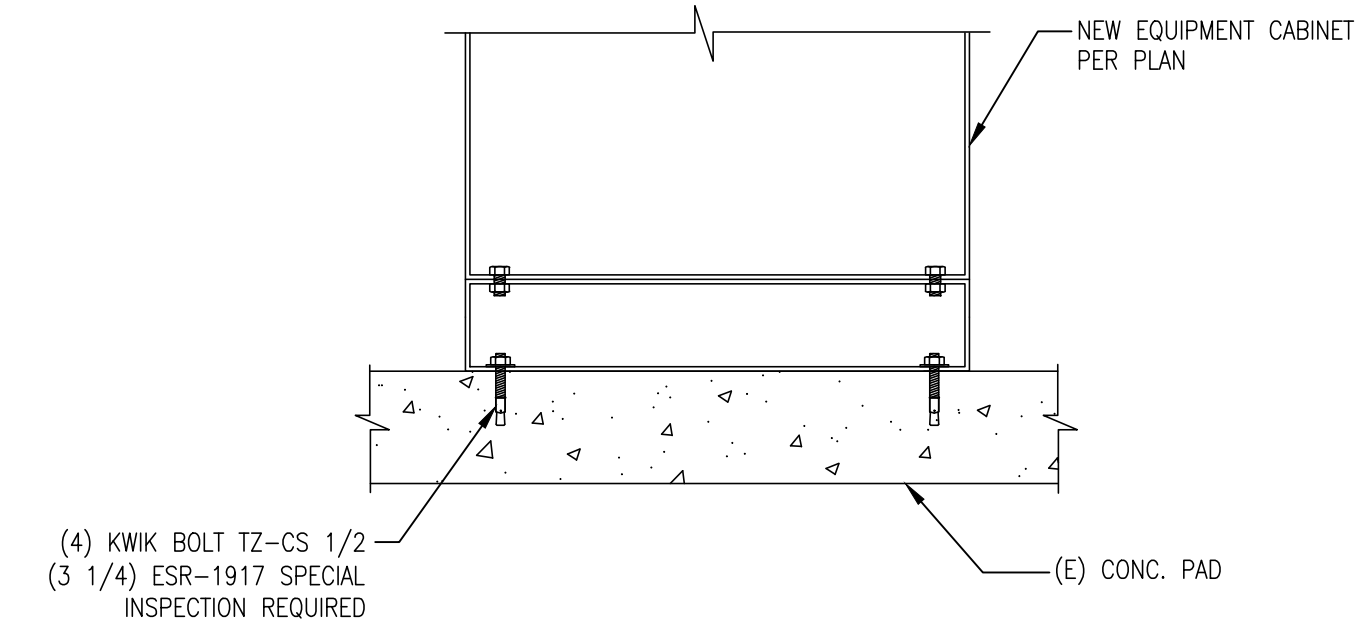
ERICSSON MODEL NO.:	B160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x26"x26" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	485 LBS
MAXIMUM WEIGHT:	2100± LBS

1 (N) B160 CABINET DETAIL  
SCALE: NOT TO SCALE



ERICSSON MODEL NO.:	6160
RACK SPACE:	19U
DIMENSIONS, HxWxD:	63"x25.6"x25.6" (W/ 6" PLINTH)
CABINET WEIGHT, EMPTY:	410 LBS
MAXIMUM WEIGHT:	770± LBS

2 (N) 6160 CABINET DETAIL  
SCALE: NOT TO SCALE



3 (N) EQUIPMENT CABINET MOUNTING DETAIL  
SCALE: NOT TO SCALE

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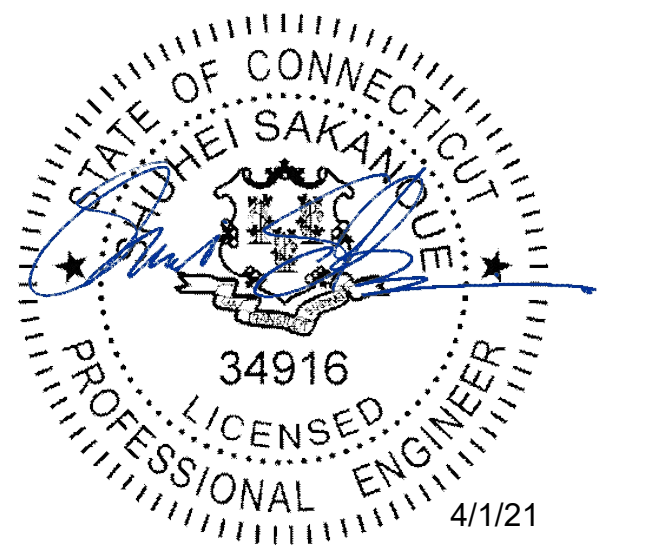
BU #: 842875  
**WINDSORDAY HILL**

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EXISTING 168'-0" MONOPOLE

**ISSUED FOR:**

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SHEET NUMBER:

**C-6**

REVISION:

**0**

4 NOT USED  
SCALE: NOT TO SCALE

5 NOT USED  
SCALE: NOT TO SCALE

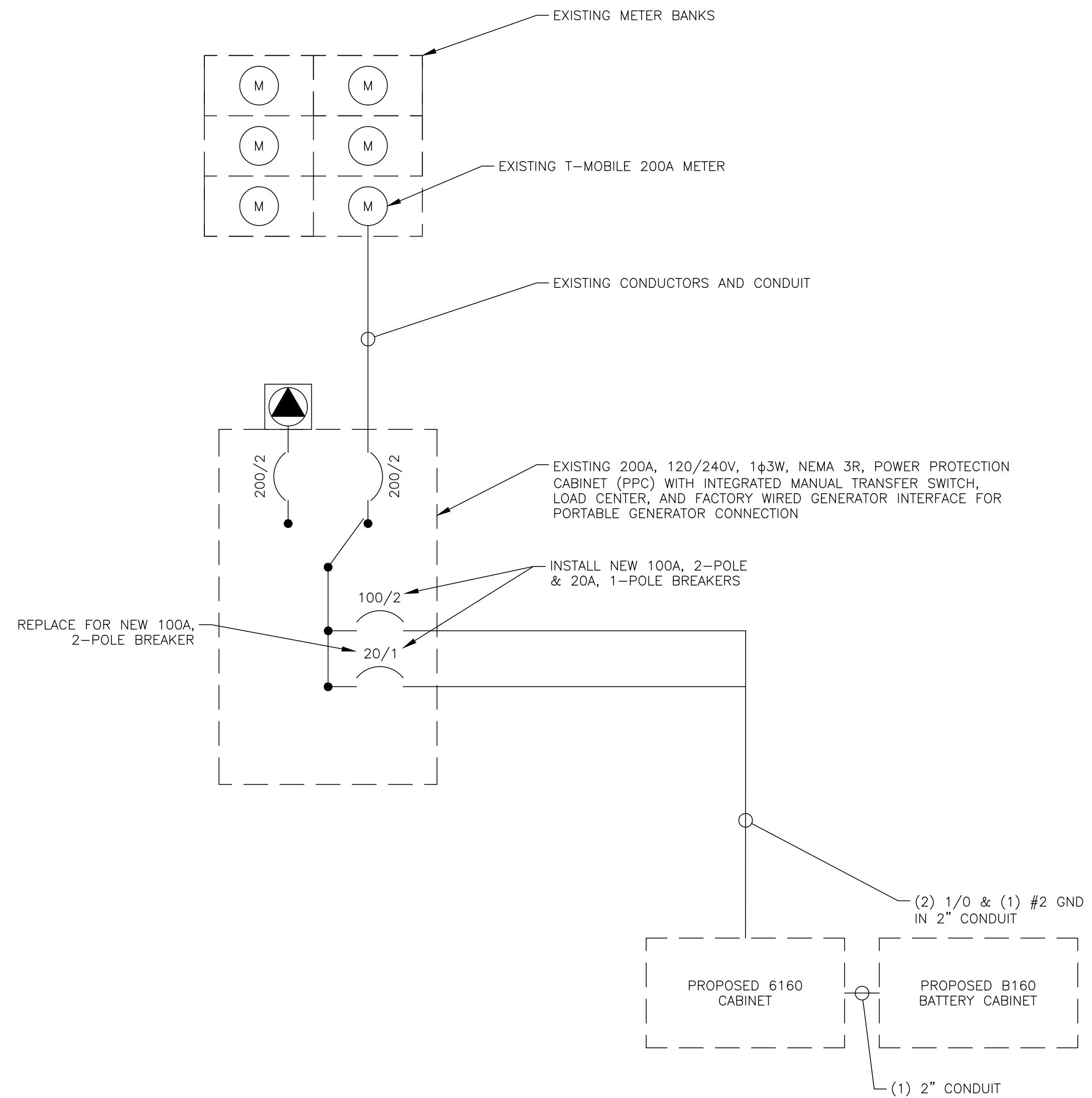
6 NOT USED  
SCALE: NOT TO SCALE

T-MOBILE PANEL SCHEDULE											
MAIN: 200A MAIN BREAKER			VOTAGE/PHASE: 120/240V, 1-PHASE, 3-WIRE						SHORT CIRCUIT CURRENT RATING: --		
MOUNTING: INSIDE PPC ENCLOSURE			ENCLOSURE: NEMA 3R						SURGE PROTECTION DEVICE: YES		
DESCRIPTION	LOAD (VA)	C or NC	C/B	CIR No.	PHASE LOADS (VA)		CIR No.	C/B	C or NC	LOAD (VA)	DESCRIPTION
					A	B					
6160**	8750	C	100	1	8750		7	60	NC	0	SURGE
	8750	C		2		8750	8		NC	0	
6160 GFI **	180	NC	20	3	1140		9	10	NC	960	FAN
BLANK				4		0	10				BLANK
				5	180		11	20	NC	180	TELCO PLUG
				6		0	12				BLANK
BASE LOAD (VA) =					10070	8750					
25% OF CONTINUOUS LOAD (VA) =					2188	2188					
TOTAL LOAD (VA) =					12,258	10938					
TOTAL LOAD (A) =					102.2	91.2					

C = CONTINUOUS LOAD; NC = NON-CONTINUOUS LOAD  
 \* REMOVE WIRE TO EXISTING BREAKER AND MARK AS SPARE  
 \*\*INDICATES NEW LOAD. ALL OTHER LOADS ARE EXISTING.  
 NEW BREAKER TO BE SAME TYPE AND HAVE SAME AIC RATING AS EXISTING. CUSTOMER HAS NOT PROVIDED LOADS FOR EQUIPMENT CABINETS THEREFORE THE CABINET LOADS SHOWN ARE ESTIMATED

NOTES:

1. ALL NEW CONDUCTORS TO BE INSTALLED SHALL BE COPPER. ALL CONDUCTORS SHALL BE THHW, THWN, THWN-2, XHHW, OR XHHW-2 UNLESS NOTED OTHERWISE.
2. CONTRACTOR IS TO FIELD VERIFY ALL EXISTING ITEMS SHOWN ON THE ELECTRICAL ONE-LINE DIAGRAM AND NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
3. ALL GROUNDING AND BONDING PER THE NEC.



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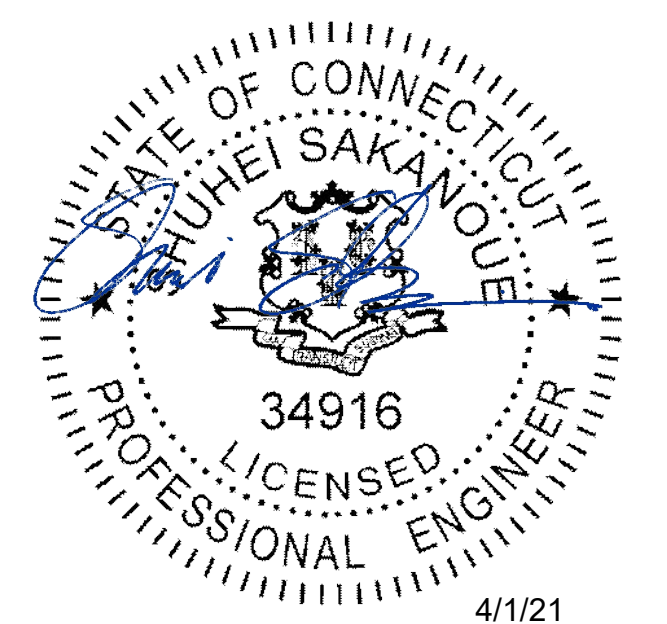
BU #: 842875  
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SHEET NUMBER:

E-1

REVISION:

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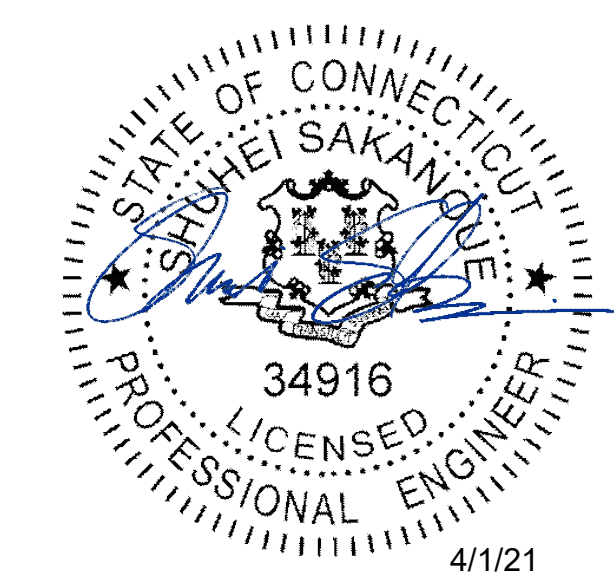
BU #: 842875  
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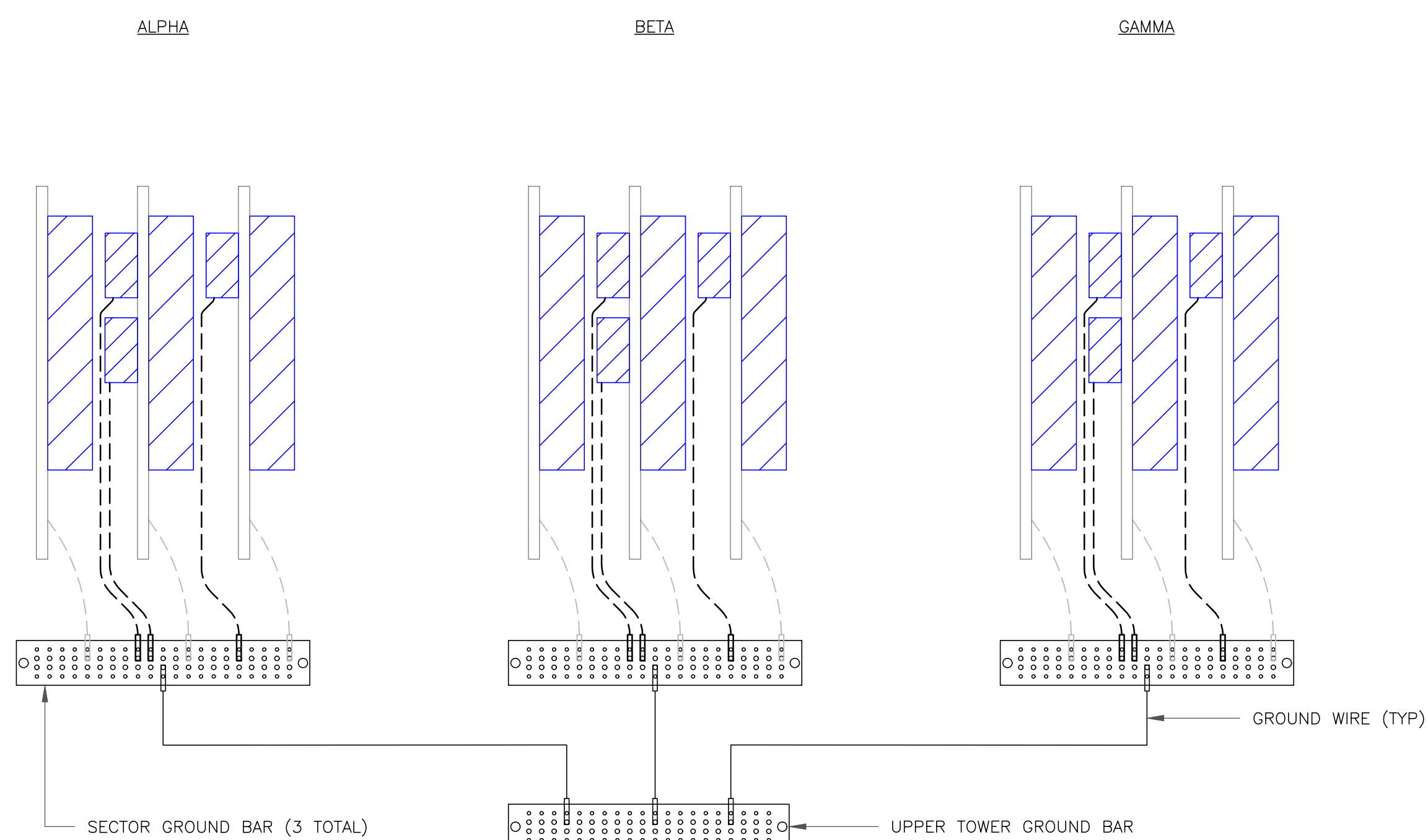
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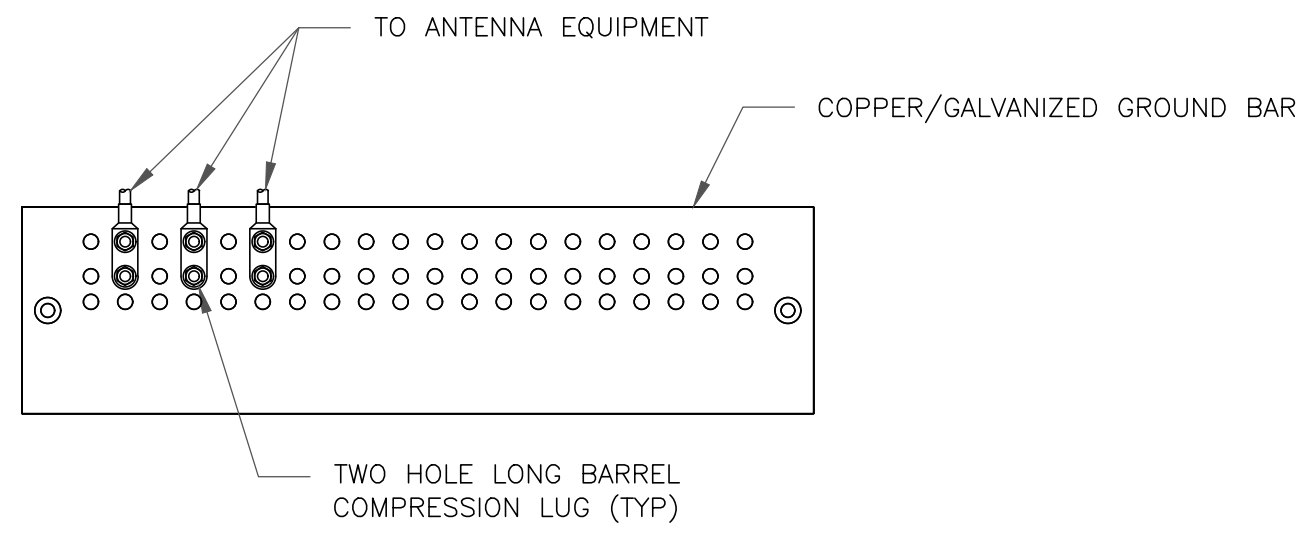
SHEET NUMBER: REVISION:

G-1 0



NOTE:  
ALL NEW GROUNDS TO BE #6 STRANDED  
COPPER WITH GREEN INSULATION UNLESS  
NOTED OTHERWISE.

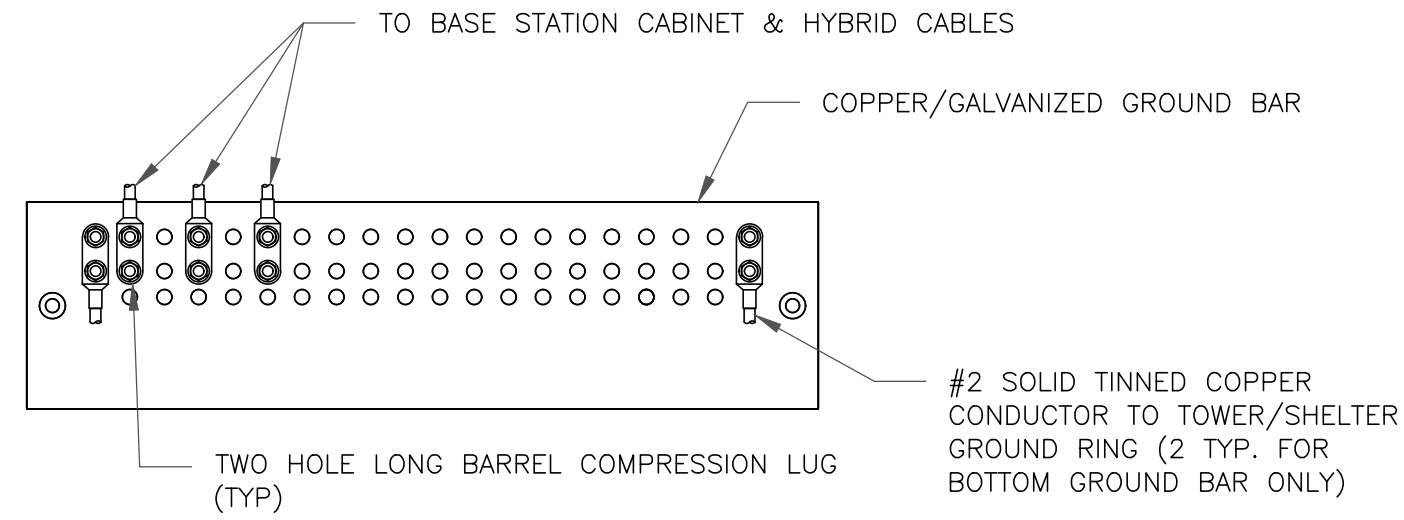
1 ANTENNA GROUNDING DIAGRAM  
SCALE: NOT TO SCALE



**NOTES:**

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO ANTENNA MOUNT STEEL.

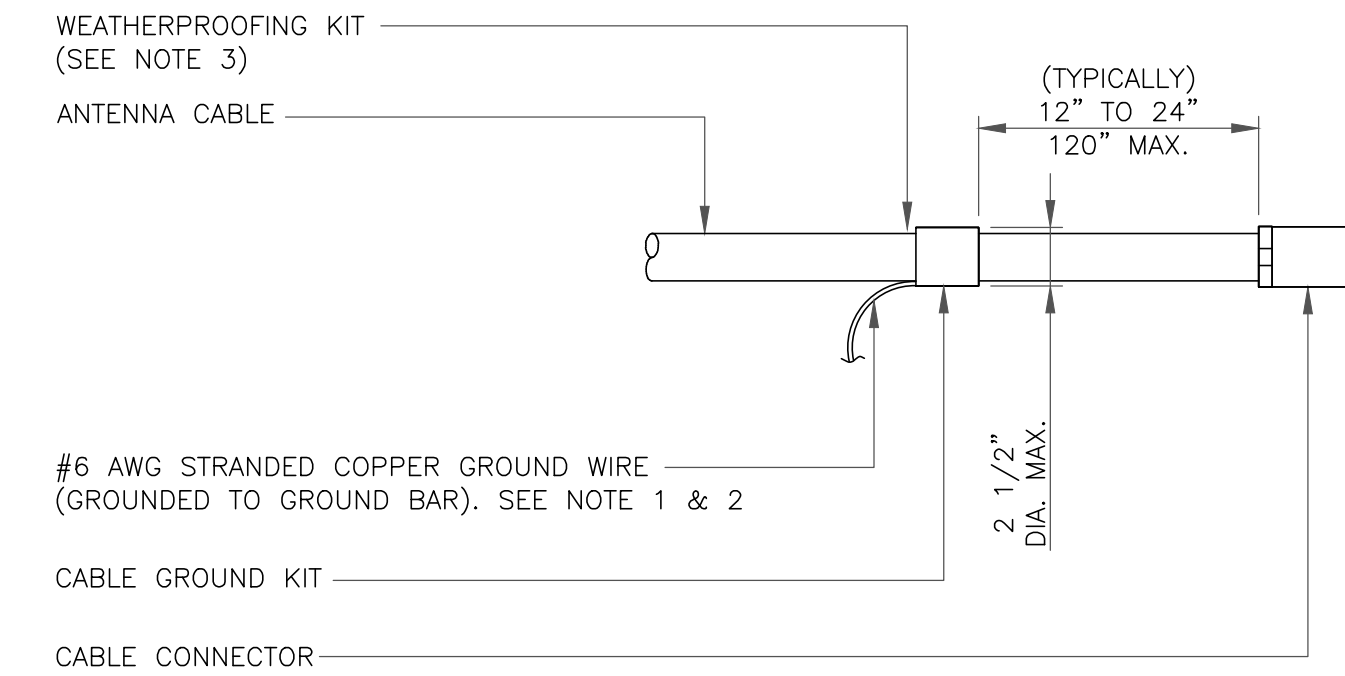
1 ANTENNA SECTOR GROUND BAR DETAIL  
SCALE: NOT TO SCALE



**NOTES:**

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

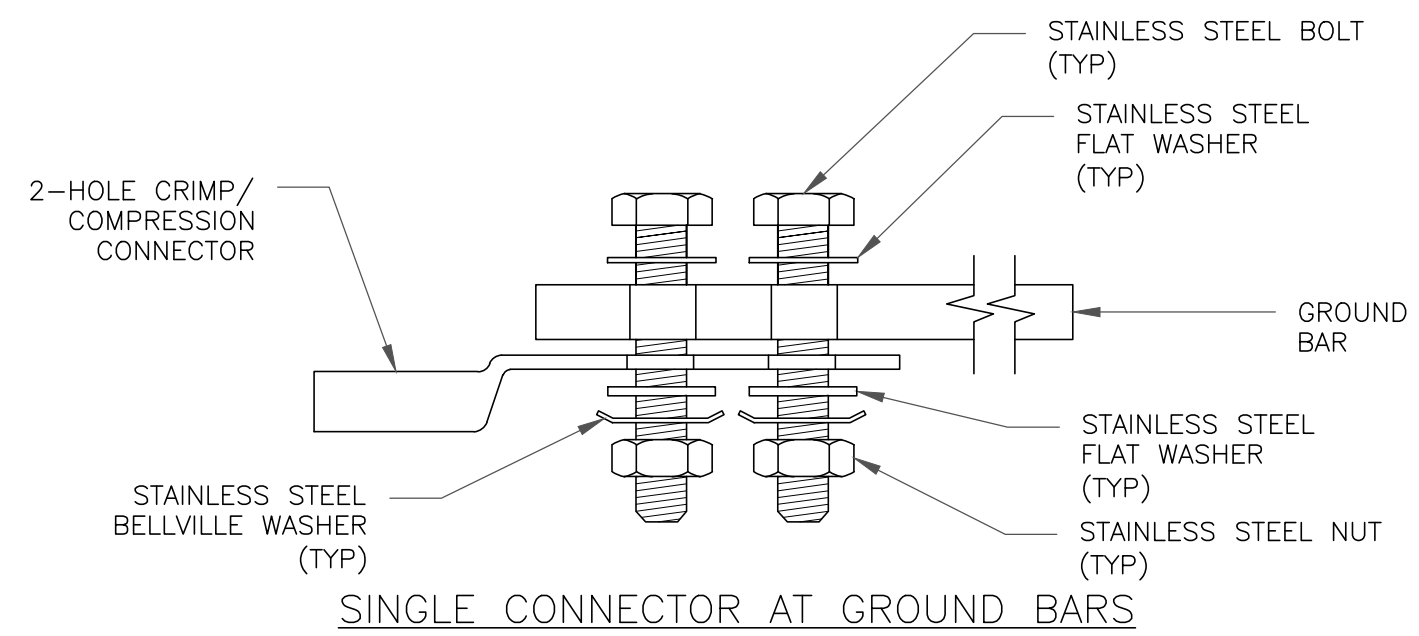
2 TOWER/SHELTER GROUND BAR DETAIL  
SCALE: NOT TO SCALE



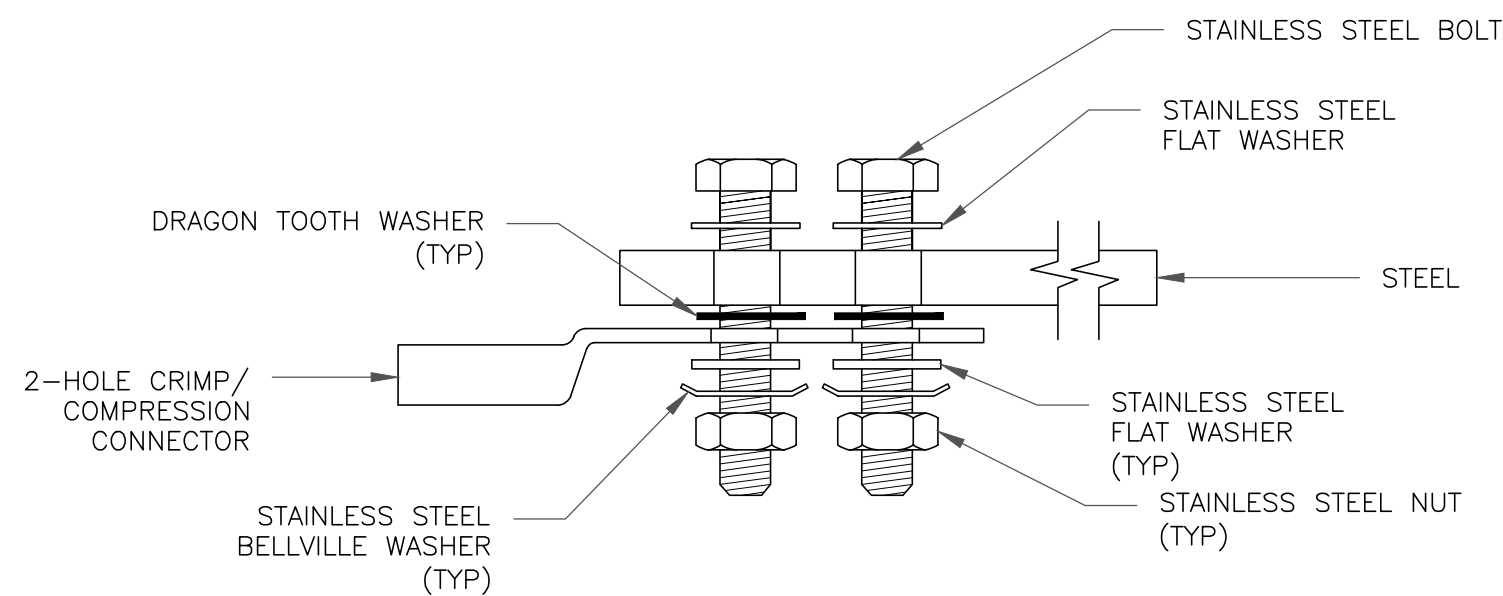
**NOTES:**

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

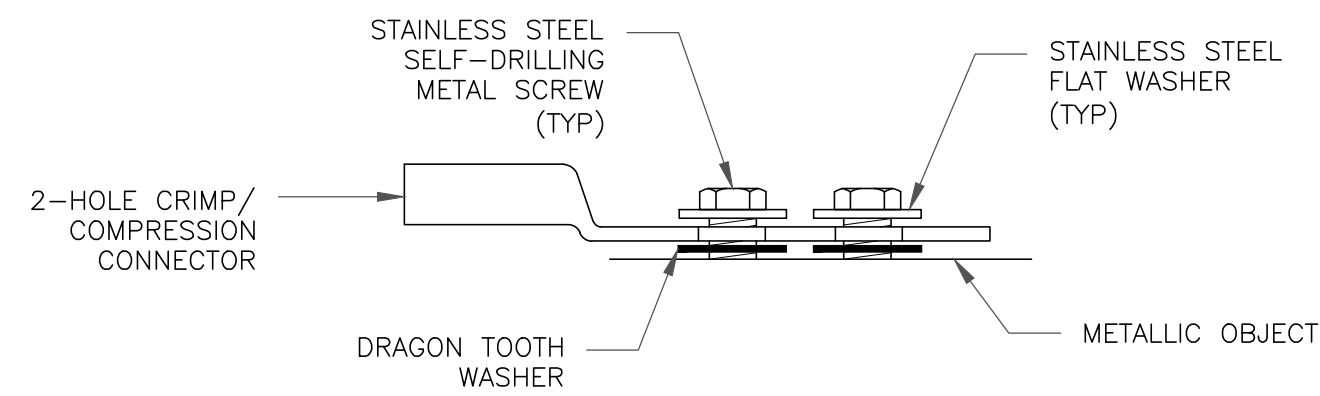
3 CABLE GROUND KIT CONNECTION  
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS



SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

4 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS  
SCALE: NOT TO SCALE

5 NOT USED  
SCALE: NOT TO SCALE

6 NOT USED  
SCALE: NOT TO SCALE

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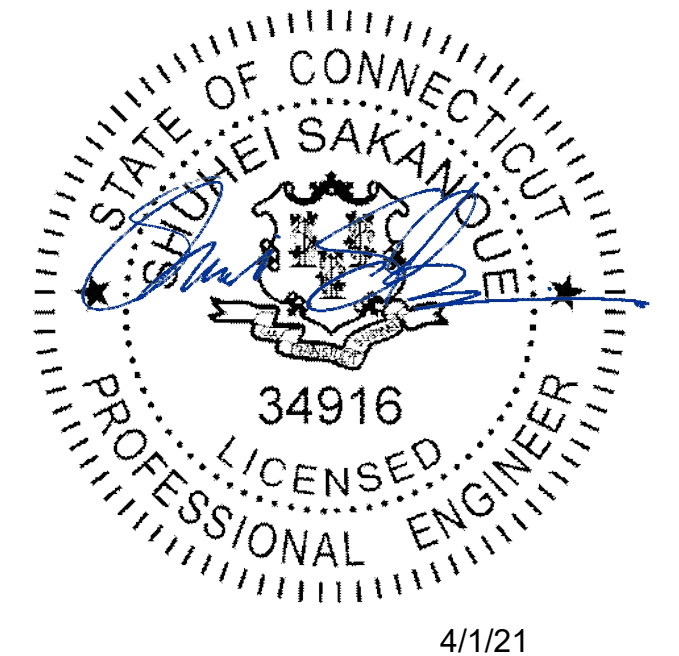
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A	03/17/21	RCD	PRELIMINARY	SS
0	04/01/21	BMM	FINAL	SS



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SHEET NUMBER: **G-2** REVISION: **0**

# Exhibit D

## **Structural Analysis Report**





MORRISON HERSHFIELD

Date: **March 03, 2021**

Morrison Hershfield  
1455 Lincoln Parkway, Suite 500  
Atlanta, GA 30346  
(770) 379 8500

**Subject:** **Structural Analysis Report**

**Carrier Designation:**

**Carrier Site Number:** CTHA267A

**Crown Castle Designation:**

**BU Number:** 842875  
**Site Name:** Windsorday Hill  
**JDE Job Number:** 628837  
**Work Order Number:** 1919222  
**Order Number:** 538783 Rev. 1

**Engineering Firm Designation:**

**Morrison Hershfield Project Number:** CN7-415 / 2101398

**Site Data:**

**99 Day Hill Road, Windsor, Hartford County, CT 06095**  
**Latitude 41° 52' 16.1", Longitude -72° 40' 16"**  
**168 Foot – Summit Monopole Tower**

Morrison Hershfield 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:

LC7: Proposed Equipment Configuration

**Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Respectfully submitted by:

G. Lance Cooke, P.E. (CT License No. PEN.0028133)  
Senior Engineer



G. Lance Cooke  
2021.03.03  
08:33:22-08'00'

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## 1) INTRODUCTION

This tower is a 168 ft Summit monopole tower designed by Paul J. Ford and Company.

## 2) ANALYSIS CRITERIA

<b>TIA-222 Revision:</b>	TIA-222-H
<b>Risk Category:</b>	II
<b>Wind Speed:</b>	125 mph
<b>Exposure Category:</b>	C
<b>Topographic Factor:</b>	1
<b>Ice Thickness:</b>	2 in
<b>Wind Speed with Ice:</b>	50 mph
<b>Service Wind Speed:</b>	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	131.0	3	ericsson	AIR6449 B41_T-MOBILE	4	1-5/8
		3	rfs/celwave	APX16DWW-16DWW-S-E-A20		
		3	rfs/celwave	APXVAALL24_43-U-NA20_TMO		
		3	ericsson	RADIO 4415 B66A		
		3	ericsson	RADIO 4424 B25_TMO		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
	130.0	1	site pro 1	12' Platform Mount [#RMQP-496-HK]		
52.0	52.0	1	pctel	GPS-TMG-HR-26NCM	1	1/2
		1	-	Sector Mount [SO 701-1]		

**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)
168.0	170.0	1	rfi antennas	CC807-08	1	1-1/4
	168.0	2	cci antennas	DMP65R-BU6D w/ Mount Pipe	12 6 2	1-5/8 3/4 3/8
		1	cci antennas	DMP65R-BU8D w/ Mount Pipe		
		1	cci antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe		
		3	kathrein	800 10121 w/ Mount Pipe		
		2	kathrein	80010965 w/ Mount Pipe		
		1	kathrein	80010966 w/ Mount Pipe		
		2	quintel technology	QS66512-2 w/ Mount Pipe		
		3	ericsson	RRUS 32 B30		
		3	ericsson	RRUS 32 B66		
		3	ericsson	RRUS 4415 B25		
		3	ericsson	RRUS 4449 B5/B12		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
168.0	168.0	3	ericsson	RRUS 4478 B14	-	-
		6	kathrein	860 10025		
		3	cci antennas	DTMABP7819VG12A		
		1	raycap	DC6-48-60-0-8F		
		2	raycap	DC6-48-60-18-8F		
		1	-	Platform Mount [LP 1201-1_KCKR-HR-1]		
160.0	165.0	3	andrew	VHLP2.5-11	3 3	5/16 1/2
	164.0	2	dragonwave	HORIZON COMPACT		
	160.0	3	argus technologies	LLPX310R-V1		
		3	samsung telecommunications	RRH-2WB		
		1	-	Platform Mount [LP 1201-1]		
	156.0	1	dragonwave	HORIZON COMPACT		
1		rosenberger leoni	FB-15-ABOX			
152.0	152.0	1	rfs/celwave	SC3-W100ASTX	1	EU 90-FR
		1	-	Pipe Mount [PM 601-1]		
147.0	148.0	1	kathrein	782 10876	1 1	EU 90-FR 1/2
		1	rfi antennas	BPA7496-180-11 w/ Mount Pipe		
		1	rfs/celwave	SC3-W100ASTX		
	147.0	1	-	Pipe Mount [PM 601-1]		
143.0	143.0	1	pctel	MPRD2449	1	1/4
		1	kathrein	782 10876		
		1	-	Pipe Mount [PM 602-1]		
140.0	148.0	1	bird technologies group	432E-83I-01-T	2 1	7/8 1/4
		2	rfi antennas	CC807-11		
		1	telewave	ANT450F6		
	140.0	1	motorola	PTP400 w/Mount Pipe		
		1	ericsson	RIU		
		2	-	Side Arm Mount [SO 306-1]		
135.0	144.0	2	telewave	ANT450F6	2	1/2
	135.0	2	-	Side Arm Mount [SO 702-1]		
120.0	120.0	3	rfs/celwave	APL199016-42T0	6	1-5/8
		1	-	Pipe Mount [PM 602-3]		
100.0	100.0	1	rfs/celwave	SC3-W100ASTX	1	EU 90-FR
		1	-	Pipe Mount [PM 601-1]		
79.0	79.0	2	-	Sector Mount [SO 901-1]	-	-

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
4-GEOTECHNICAL REPORTS	4529457	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	4529456	CCISITES
4-TOWER MANUFACTURER DRAWINGS	4589719	CCISITES

#### 3.1) Analysis Method

tnxTower (version 8.0.7.5), 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) 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. Morrison Hershfield should be notified to determine the effect on the structural integrity of the tower.

### 4) ANALYSIS RESULTS

**Table 4 - Section Capacity (Summary)**

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	168 - 119.25	Pole	TP34.288x24x0.25	1	-17.44	1615.32	62.9	Pass
L2	119.25 - 78.5	Pole	TP42.387x32.8911x0.2813	2	-25.95	2248.05	94.8	Pass
L3	78.5 - 38.75	Pole	TP50.213x40.7166x0.375	3	-38.04	3547.28	81.8	Pass
L4	38.75 - 0	Pole	TP57.64x48.1441x0.375	4	-54.15	4186.71	95.9	Pass
							Summary	
						Pole (L4)	95.9	Pass
						Rating =	95.9	Pass

**Table 5 - Tower Component Stresses vs. Capacity – LC7**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	85.1	Pass
1	Base Plate		64.5	Pass
1	Base Foundation	0	73.3	Pass
1	Base Foundation Soil Interaction		32.4	Pass

<b>Structure Rating (max from all components) =</b>	<b>95.9%*</b>
-----------------------------------------------------	---------------

Notes:

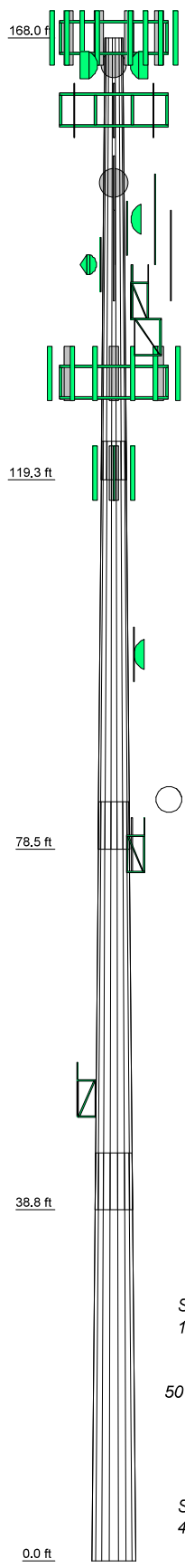
- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
- 2) \*Rating per TIA-222-H, Section 15.5.

#### 4.1) Recommendations

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

**APPENDIX A**  
**TNXTOWER OUTPUT**

Section	1	2	3	4	
Length (ft)	48.75	45.00	45.00	45.00	
Number of Sides	18	18	18	18	
Thickness (in)	0.2500	0.2813	0.3750	0.3750	
Socket Length (ft)	4.25	5.25	6.25		
Top Dia (in)	24.0000	32.8911	40.7166	48.1441	
Bot Dia (in)	34.2880	42.3870	50.2130	57.6400	
Grade		A607-65			
Weight (K)	3.8	5.1	8.2	9.6	26.7

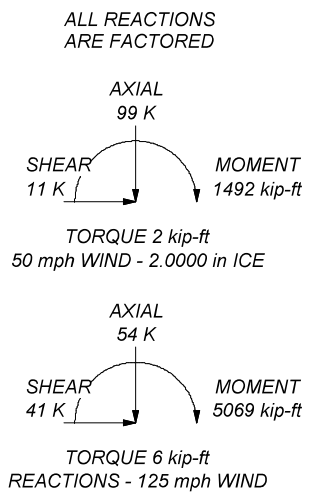


**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 95.9%



**Morrison Hershfield**  
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 Phone: (770) 379 8500  
 FAX: (770) 379 8501

Job: <b>CN7-415 / 2101398</b>		
Project: <b>842875 / Windsorday Hill</b>		
Client: Crown Castle USA	Drawn by: DB	App'd:
Code: TIA-222-H	Date: 03/03/21	Scale: NTS
Path:		Dwg No. E-1

©\Users\jdb\OneDrive\CN7-415 - 842875 - MHSORDAY\_HILL\CN7-415\_S01Analysis\CN7-415\_BU\_191922.dwg



## Tower Input Data

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

- Tower is located in Hartford County, Connecticut.
- Tower base elevation above sea level: 166.00 ft.
- Basic wind speed of 125 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 2.0000 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 1.05.
- Tower analysis based on target reliabilities in accordance with Annex S.
- Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

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

## 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	168.00-119.25	48.75	4.25	18	24.0000	34.2880	0.2500	1.0000	A607-65 (65 ksi)
L2	119.25-78.50	45.00	5.25	18	32.8911	42.3870	0.2813	1.1250	A607-65 (65 ksi)
L3	78.50-38.75	45.00	6.25	18	40.7166	50.2130	0.3750	1.5000	A607-65 (65 ksi)
L4	38.75-0.00	45.00		18	48.1441	57.6400	0.3750	1.5000	A607-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	It/Q in <sup>2</sup>	w in	w/t
L1	24.3317	18.8456	1342.9976	8.4313	12.1920	110.1540	2687.7623	9.4246	3.7840	15.136
	34.7784	27.0092	3953.4521	12.0835	17.4183	226.9711	7912.1063	13.5071	5.5947	22.379
L2	34.2658	29.1104	3910.9583	11.5765	16.7087	234.0675	7827.0628	14.5580	5.2938	18.823
	42.9975	37.5873	8419.0120	14.9475	21.5326	390.9892	16849.1019	18.7972	6.9651	24.765
L3	42.4119	48.0166	9872.7116	14.3213	20.6841	477.3102	19758.4140	24.0129	6.5061	17.35
	50.9298	59.3197	18614.7607	17.6925	25.5082	729.7558	37254.0152	29.6655	8.1775	21.807
L4	50.1681	56.8571	16391.3899	16.9580	24.4572	670.2076	32804.3480	28.4340	7.8134	20.836
	58.4713	68.1597	28238.6178	20.3291	29.2811	964.3968	56514.3927	34.0863	9.4846	25.292

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>r</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Spacing Diagonals	Double Angle Stitch Spacing Horizontals	Double Angle Stitch Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 168.00-119.25				1	1	1			
L2 119.25-78.50				1	1	1			
L3 78.50-38.75				1	1	1			
L4 38.75-0.00				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter r in	Perimeter r in	Weight plf
*****										
Safety Line 3/8"	C	No	Surface Ar (CaAa)	168.00 - 8.00	1	1	0.000 0.000	0.3750		0.22
Climbing Pegs	C	No	Surface Ar (CaAa)	168.00 - 8.00	1	1	-0.050 0.050	0.7050		1.80
***										

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
*****								
LDF6-50A(1-1/4)	A	No	No	Inside Pole	168.00 - 3.00	1	No Ice	0.60
							1/2" Ice	0.60
							1" Ice	0.60
							2" Ice	0.60
***								
LDF7-50A(1-5/8)	C	No	No	Inside Pole	168.00 - 3.00	12	No Ice	0.82
							1/2" Ice	0.82
							1" Ice	0.82
							2" Ice	0.82
FB-L98B-034-XXXXXX(3/8)	C	No	No	Inside Pole	168.00 - 3.00	2	No Ice	0.05
							1/2" Ice	0.05
							1" Ice	0.05
								0.05

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	168.00 - 3.00	6	2" Ice	0.00	0.05
							No Ice	0.00	0.58
							1/2" Ice	0.00	0.58
							1" Ice	0.00	0.58
							2" Ice	0.00	0.58
***									
LDF4-50A(1/2)	B	No	No	Inside Pole	160.00 - 7.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
							No Ice	0.00	0.08
ATCB-B01-003(5/16)	B	No	No	Inside Pole	160.00 - 7.00	3	1/2" Ice	0.00	0.08
							1" Ice	0.00	0.08
							2" Ice	0.00	0.08
							No Ice	0.00	0.08
							No Ice	0.00	0.08
***									
EU 90-FR(ELLIPTICAL)	A	No	No	Inside Pole	152.00 - 3.00	1	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
							No Ice	0.00	0.15
LDF4-50A(1/2)	A	No	No	Inside Pole	147.00 - 3.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
							No Ice	0.00	0.34
EU 90-FR(ELLIPTICAL)	A	No	No	Inside Pole	147.00 - 3.00	1	1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
							No Ice	0.00	0.06
							No Ice	0.00	0.06
LDF1-50A(1/4)	A	No	No	Inside Pole	143.00 - 3.00	1	1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
							No Ice	0.00	0.04
							No Ice	0.00	0.04
CAT5E(1/4)	A	No	No	Inside Pole	140.00 - 3.00	1	1/2" Ice	0.00	0.04
							1" Ice	0.00	0.04
							2" Ice	0.00	0.04
							No Ice	0.00	0.33
							No Ice	0.00	0.33
LDF5-50A(7/8)	A	No	No	Inside Pole	140.00 - 3.00	2	1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
							2" Ice	0.00	0.33
							No Ice	0.00	0.15
							No Ice	0.00	0.15
LDF4-50A(1/2)	A	No	No	Inside Pole	135.00 - 3.00	2	1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
							No Ice	0.00	0.15
							No Ice	0.00	0.15
***									
***									
HB158-21U6S24-xxM_TMO(1-5/8)	B	No	No	Inside Pole	130.00 - 3.00	4	No Ice	0.00	2.50
							1/2" Ice	0.00	2.50
							1" Ice	0.00	2.50
							2" Ice	0.00	2.50
							No Ice	0.00	0.82
LDF7-50A(1-5/8)	C	No	No	Inside Pole	120.00 - 3.00	6	1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
							No Ice	0.00	0.34
							No Ice	0.00	0.34
***									
EU 90-FR(ELLIPTICAL)	A	No	No	Inside Pole	100.00 - 3.00	1	No Ice	0.00	0.34
							1/2" Ice	0.00	0.34
							1" Ice	0.00	0.34
							2" Ice	0.00	0.34
							No Ice	0.00	0.15
LDF4-50A(1/2)	B	No	No	Inside Pole	52.00 - 3.00	1	1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
							No Ice	0.00	0.15
							No Ice	0.00	0.15
***									

### Feed Line/Linear Appurtenances Section Areas

Tower Sectio n	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	168.00-119.25	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.14
		C	0.000	0.000	5.265	0.000	0.76
L2	119.25-78.50	A	0.000	0.000	0.000	0.000	0.11
		B	0.000	0.000	0.000	0.000	0.44
		C	0.000	0.000	4.401	0.000	0.83
L3	78.50-38.75	A	0.000	0.000	0.000	0.000	0.11
		B	0.000	0.000	0.000	0.000	0.43
		C	0.000	0.000	4.293	0.000	0.81
L4	38.75-0.00	A	0.000	0.000	0.000	0.000	0.10
		B	0.000	0.000	0.000	0.000	0.38
		C	0.000	0.000	3.321	0.000	0.72

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

Tower Sectio n	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	168.00-119.25	A	1.968	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.14
		C		0.000	0.000	43.634	0.000	1.35
L2	119.25-78.50	A	1.896	0.000	0.000	0.000	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.44
		C		0.000	0.000	36.474	0.000	1.32
L3	78.50-38.75	A	1.800	0.000	0.000	0.000	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.43
		C		0.000	0.000	34.441	0.000	1.26
L4	38.75-0.00	A	1.613	0.000	0.000	0.000	0.000	0.10
		B		0.000	0.000	0.000	0.000	0.38
		C		0.000	0.000	25.458	0.000	1.04

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	168.00-119.25	0.0000	0.8425	0.0000	3.1308
L2	119.25-78.50	0.0000	0.8497	0.0000	3.3654
L3	78.50-38.75	0.0000	0.8540	0.0000	3.4229
L4	38.75-0.00	0.0000	0.6737	0.0000	2.7284

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

### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
L1	2	Safety Line 3/8"	119.25 - 168.00	1.0000	1.0000
L1	3	Climbing Pegs	119.25 - 168.00	1.0000	1.0000
L2	2	Safety Line 3/8"	78.50 - 119.25	1.0000	1.0000
L2	3	Climbing Pegs	78.50 - 119.25	1.0000	1.0000
L3	2	Safety Line 3/8"	38.75 - 78.50	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L3	3	Climbing Pegs	38.75 - 78.50	1.0000	1.0000
L4	2	Safety Line 3/8"	8.00 - 38.75	1.0000	1.0000
L4	3	Climbing Pegs	8.00 - 38.75	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft		C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
800 10121 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	3.60	2.95	0.07
						1/2" Ice	4.00	3.34	0.11
						Ice	4.42	3.74	0.17
						1" Ice	5.29	4.59	0.30
						2" Ice			
800 10121 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	3.60	2.95	0.07
						1/2" Ice	4.00	3.34	0.11
						Ice	4.42	3.74	0.17
						1" Ice	5.29	4.59	0.30
						2" Ice			
800 10121 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	3.60	2.95	0.07
						1/2" Ice	4.00	3.34	0.11
						Ice	4.42	3.74	0.17
						1" Ice	5.29	4.59	0.30
						2" Ice			
80010965 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	12.26	5.79	0.14
						1/2" Ice	13.03	6.47	0.23
						Ice	13.80	7.17	0.33
						1" Ice	15.41	8.60	0.57
						2" Ice			
80010965 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	12.26	5.79	0.14
						1/2" Ice	13.03	6.47	0.23
						Ice	13.80	7.17	0.33
						1" Ice	15.41	8.60	0.57
						2" Ice			
80010966 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	14.61	6.84	0.16
						1/2" Ice	15.47	7.63	0.27
						Ice	16.35	8.42	0.39
						1" Ice	18.14	10.06	0.68
						2" Ice			
QS66512-2 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	4.04	4.18	0.14
						1/2" Ice	4.42	4.57	0.21
						Ice	4.82	4.97	0.29
						1" Ice	5.63	5.79	0.48
						2" Ice			
QS66512-2 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	4.04	4.18	0.14
						1/2" Ice	4.42	4.57	0.21
						Ice	4.82	4.97	0.29
						1" Ice	5.63	5.79	0.48
						2" Ice			
TPA-65R-LCUUUU-H8 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	168.00	No Ice	11.85	8.99	0.11
						1/2" Ice	12.77	9.88	0.21
						Ice	13.71	10.79	0.32
						1" Ice	15.64	12.66	0.58
						2" Ice			
CC807-08	C	From Leg	4.00 0.00 2.00	0.0000	168.00	No Ice	2.85	2.85	0.03
						1/2" Ice	3.83	3.83	0.05
						Ice	4.67	4.67	0.07
						1" Ice	5.85	5.85	0.15
						2" Ice			
RRUS 4478 B14	A	From Leg	4.00 0.00	0.0000	168.00	No Ice	1.84	1.06	0.06
						1/2" Ice	2.01	1.20	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			0.00			Ice 2.19	1.34	0.09
						1" Ice 2.57	1.66	0.14
						2" Ice		
RRUS 4478 B14	B	From Leg	4.00	0.0000	168.00	No Ice 1.84	1.06	0.06
			0.00			1/2" 2.01	1.20	0.08
			0.00			Ice 2.19	1.34	0.09
						1" Ice 2.57	1.66	0.14
						2" Ice		
RRUS 4478 B14	C	From Leg	4.00	0.0000	168.00	No Ice 1.84	1.06	0.06
			0.00			1/2" 2.01	1.20	0.08
			0.00			Ice 2.19	1.34	0.09
						1" Ice 2.57	1.66	0.14
						2" Ice		
RRUS 32 B66	A	From Leg	4.00	0.0000	168.00	No Ice 2.74	1.67	0.05
			0.00			1/2" 2.96	1.86	0.07
			0.00			Ice 3.19	2.05	0.10
						1" Ice 3.68	2.46	0.16
						2" Ice		
RRUS 32 B66	B	From Leg	4.00	0.0000	168.00	No Ice 2.74	1.67	0.05
			0.00			1/2" 2.96	1.86	0.07
			0.00			Ice 3.19	2.05	0.10
						1" Ice 3.68	2.46	0.16
						2" Ice		
RRUS 32 B66	C	From Leg	4.00	0.0000	168.00	No Ice 2.74	1.67	0.05
			0.00			1/2" 2.96	1.86	0.07
			0.00			Ice 3.19	2.05	0.10
						1" Ice 3.68	2.46	0.16
						2" Ice		
RRUS 32 B30	A	From Leg	4.00	0.0000	168.00	No Ice 2.69	1.57	0.06
			0.00			1/2" 2.91	1.76	0.08
			0.00			Ice 3.14	1.95	0.10
						1" Ice 3.61	2.35	0.16
						2" Ice		
RRUS 32 B30	B	From Leg	4.00	0.0000	168.00	No Ice 2.69	1.57	0.06
			0.00			1/2" 2.91	1.76	0.08
			0.00			Ice 3.14	1.95	0.10
						1" Ice 3.61	2.35	0.16
						2" Ice		
RRUS 32 B30	C	From Leg	4.00	0.0000	168.00	No Ice 2.69	1.57	0.06
			0.00			1/2" 2.91	1.76	0.08
			0.00			Ice 3.14	1.95	0.10
						1" Ice 3.61	2.35	0.16
						2" Ice		
(2) 860 10025	A	From Leg	4.00	0.0000	168.00	No Ice 0.14	0.12	0.00
			0.00			1/2" 0.20	0.17	0.00
			0.00			Ice 0.26	0.23	0.01
						1" Ice 0.41	0.38	0.01
						2" Ice		
(2) 860 10025	B	From Leg	4.00	0.0000	168.00	No Ice 0.14	0.12	0.00
			0.00			1/2" 0.20	0.17	0.00
			0.00			Ice 0.26	0.23	0.01
						1" Ice 0.41	0.38	0.01
						2" Ice		
(2) 860 10025	C	From Leg	4.00	0.0000	168.00	No Ice 0.14	0.12	0.00
			0.00			1/2" 0.20	0.17	0.00
			0.00			Ice 0.26	0.23	0.01
						1" Ice 0.41	0.38	0.01
						2" Ice		
DTMABP7819VG12A	A	From Leg	4.00	0.0000	168.00	No Ice 0.98	0.34	0.02
			0.00			1/2" 1.10	0.42	0.03
			0.00			Ice 1.23	0.51	0.04
						1" Ice 1.52	0.71	0.06
						2" Ice		
DTMABP7819VG12A	B	From Leg	4.00	0.0000	168.00	No Ice 0.98	0.34	0.02
			0.00			1/2" 1.10	0.42	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			0.00			Ice 1.23	0.51	0.04
						1" Ice 1.52	0.71	0.06
						2" Ice		
DTMABP7819VG12A	C	From Leg	4.00	0.0000	168.00	No Ice 0.98	0.34	0.02
			0.00			1/2" 1.10	0.42	0.03
			0.00			Ice 1.23	0.51	0.04
						1" Ice 1.52	0.71	0.06
						2" Ice		
DC6-48-60-0-8F	A	From Leg	4.00	0.0000	168.00	No Ice 0.92	0.92	0.02
			0.00			1/2" 1.46	1.46	0.04
			0.00			Ice 1.64	1.64	0.06
						1" Ice 2.04	2.04	0.11
						2" Ice		
(2) DC6-48-60-18-8F	A	From Leg	4.00	0.0000	168.00	No Ice 0.92	0.92	0.02
			0.00			1/2" 1.46	1.46	0.04
			0.00			Ice 1.64	1.64	0.06
						1" Ice 2.04	2.04	0.11
						2" Ice		
6' x 2" Mount Pipe	A	From Leg	4.00	0.0000	168.00	No Ice 1.43	1.43	0.02
			0.00			1/2" 1.92	1.92	0.03
			0.00			Ice 2.29	2.29	0.05
						1" Ice 3.06	3.06	0.09
						2" Ice		
6' x 2" Mount Pipe	B	From Leg	4.00	0.0000	168.00	No Ice 1.43	1.43	0.02
			0.00			1/2" 1.92	1.92	0.03
			0.00			Ice 2.29	2.29	0.05
						1" Ice 3.06	3.06	0.09
						2" Ice		
6' x 2" Mount Pipe	C	From Leg	4.00	0.0000	168.00	No Ice 1.43	1.43	0.02
			0.00			1/2" 1.92	1.92	0.03
			0.00			Ice 2.29	2.29	0.05
						1" Ice 3.06	3.06	0.09
						2" Ice		
Platform Mount [LP 1201-1_KCKR-HR-1]	C	None		0.0000	168.00	No Ice 37.61	37.61	2.63
						1/2" 45.62	45.62	3.48
						Ice 53.59	53.59	4.46
						1" Ice 69.65	69.65	6.85
						2" Ice		
***								
DMP65R-BU6D w/ Mount Pipe	A	From Leg	4.00	0.0000	168.00	No Ice 11.96	5.97	0.11
			0.00			1/2" 12.70	6.63	0.20
			0.00			Ice 13.46	7.30	0.30
						1" Ice 15.02	8.69	0.53
						2" Ice		
DMP65R-BU6D w/ Mount Pipe	B	From Leg	4.00	0.0000	168.00	No Ice 11.96	5.97	0.11
			0.00			1/2" 12.70	6.63	0.20
			0.00			Ice 13.46	7.30	0.30
						1" Ice 15.02	8.69	0.53
						2" Ice		
DMP65R-BU8D w/ Mount Pipe	C	From Leg	4.00	0.0000	168.00	No Ice 15.89	7.89	0.14
			0.00			1/2" 16.81	8.74	0.25
			0.00			Ice 17.76	9.60	0.38
						1" Ice 19.70	11.37	0.68
						2" Ice		
RRUS 4449 B5/B12	A	From Leg	4.00	0.0000	168.00	No Ice 1.97	1.41	0.07
			0.00			1/2" 2.14	1.56	0.09
			0.00			Ice 2.33	1.73	0.11
						1" Ice 2.72	2.07	0.16
						2" Ice		
RRUS 4449 B5/B12	B	From Leg	4.00	0.0000	168.00	No Ice 1.97	1.41	0.07
			0.00			1/2" 2.14	1.56	0.09
			0.00			Ice 2.33	1.73	0.11
						1" Ice 2.72	2.07	0.16
						2" Ice		
RRUS 4449 B5/B12	C	From Leg	4.00	0.0000	168.00	No Ice 1.97	1.41	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K	
			0.00			1/2"	2.14	1.56	0.09
			0.00			Ice	2.33	1.73	0.11
						1" Ice	2.72	2.07	0.16
						2" Ice			
RRUS 4415 B25	A	From Leg	4.00	0.0000	168.00	No Ice	1.64	0.68	0.04
			0.00			1/2"	1.80	0.79	0.06
			0.00			Ice	1.97	0.91	0.07
						1" Ice	2.33	1.18	0.11
						2" Ice			
RRUS 4415 B25	B	From Leg	4.00	0.0000	168.00	No Ice	1.64	0.68	0.04
			0.00			1/2"	1.80	0.79	0.06
			0.00			Ice	1.97	0.91	0.07
						1" Ice	2.33	1.18	0.11
						2" Ice			
RRUS 4415 B25	C	From Leg	4.00	0.0000	168.00	No Ice	1.64	0.68	0.04
			0.00			1/2"	1.80	0.79	0.06
			0.00			Ice	1.97	0.91	0.07
						1" Ice	2.33	1.18	0.11
						2" Ice			
***									
LLPX310R-V1	A	From Leg	4.00	0.0000	160.00	No Ice	3.87	1.49	0.04
			0.00			1/2"	4.30	1.86	0.07
			0.00			Ice	4.74	2.24	0.10
						1" Ice	5.68	3.06	0.17
						2" Ice			
LLPX310R-V1	B	From Leg	4.00	0.0000	160.00	No Ice	3.87	1.49	0.04
			0.00			1/2"	4.30	1.86	0.07
			0.00			Ice	4.74	2.24	0.10
						1" Ice	5.68	3.06	0.17
						2" Ice			
LLPX310R-V1	C	From Leg	4.00	0.0000	160.00	No Ice	3.87	1.49	0.04
			0.00			1/2"	4.30	1.86	0.07
			0.00			Ice	4.74	2.24	0.10
						1" Ice	5.68	3.06	0.17
						2" Ice			
HORIZON COMPACT	A	From Leg	4.00	0.0000	160.00	No Ice	0.72	0.37	0.01
			0.00			1/2"	0.83	0.45	0.02
			4.00			Ice	0.94	0.54	0.03
						1" Ice	1.19	0.74	0.05
						2" Ice			
HORIZON COMPACT	B	From Leg	4.00	0.0000	160.00	No Ice	0.72	0.37	0.01
			0.00			1/2"	0.83	0.45	0.02
			4.00			Ice	0.94	0.54	0.03
						1" Ice	1.19	0.74	0.05
						2" Ice			
HORIZON COMPACT	B	From Leg	4.00	0.0000	160.00	No Ice	0.72	0.37	0.01
			0.00			1/2"	0.83	0.45	0.02
			-4.00			Ice	0.94	0.54	0.03
						1" Ice	1.19	0.74	0.05
						2" Ice			
RRH-2WB	A	From Leg	4.00	0.0000	160.00	No Ice	2.30	0.78	0.04
			0.00			1/2"	2.50	0.92	0.06
			0.00			Ice	2.69	1.06	0.08
						1" Ice	3.11	1.36	0.12
						2" Ice			
RRH-2WB	B	From Leg	4.00	0.0000	160.00	No Ice	2.30	0.78	0.04
			0.00			1/2"	2.50	0.92	0.06
			0.00			Ice	2.69	1.06	0.08
						1" Ice	3.11	1.36	0.12
						2" Ice			
RRH-2WB	B	From Leg	4.00	0.0000	160.00	No Ice	2.30	0.78	0.04
			0.00			1/2"	2.50	0.92	0.06
			0.00			Ice	2.69	1.06	0.08
						1" Ice	3.11	1.36	0.12
						2" Ice			



Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>Front</sub>	C <sub>A</sub> A <sub>Side</sub>	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
FB-15-ABOX	C	From Leg	4.00		0.0000	160.00	No Ice	2.70	0.51	0.01
			0.00				1/2"	2.90	0.63	0.03
			-4.00				Ice	3.11	0.75	0.04
							1" Ice	3.56	1.02	0.09
							2" Ice			
(4) 6' x 2" Mount Pipe	A	From Leg	4.00		0.0000	160.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice	3.06	3.06	0.09
							2" Ice			
(4) 6' x 2" Mount Pipe	B	From Leg	4.00		0.0000	160.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice	3.06	3.06	0.09
							2" Ice			
(4) 6' x 2" Mount Pipe	C	From Leg	4.00		0.0000	160.00	No Ice	1.43	1.43	0.02
			0.00				1/2"	1.92	1.92	0.03
			0.00				Ice	2.29	2.29	0.05
							1" Ice	3.06	3.06	0.09
							2" Ice			
7'x2 1/2" Pipe Mount	A	From Leg	4.00		0.0000	160.00	No Ice	2.01	2.01	0.04
			0.00				1/2"	2.59	2.59	0.06
			0.00				Ice	3.02	3.02	0.07
							1" Ice	3.90	3.90	0.13
							2" Ice			
7'x2 1/2" Pipe Mount	B	From Leg	4.00		0.0000	160.00	No Ice	2.01	2.01	0.04
			0.00				1/2"	2.59	2.59	0.06
			0.00				Ice	3.02	3.02	0.07
							1" Ice	3.90	3.90	0.13
							2" Ice			
7'x2 1/2" Pipe Mount	C	From Leg	4.00		0.0000	160.00	No Ice	2.01	2.01	0.04
			0.00				1/2"	2.59	2.59	0.06
			0.00				Ice	3.02	3.02	0.07
							1" Ice	3.90	3.90	0.13
							2" Ice			
Platform Mount [LP 1201-1]	C	None			0.0000	160.00	No Ice	18.38	18.38	2.10
							1/2"	22.11	22.11	2.65
							Ice	25.87	25.87	3.26
							1" Ice	33.47	33.47	4.66
							2" Ice			
***										
Pipe Mount [PM 601-1]	A	From Leg	0.50		0.0000	152.00	No Ice	1.32	1.32	0.07
			0.00				1/2"	1.58	1.58	0.08
			0.00				Ice	1.84	1.84	0.09
							1" Ice	2.40	2.40	0.13
							2" Ice			
***										
BPA7496-180-11 w/ Mount Pipe	A	From Leg	1.00		0.0000	147.00	No Ice	6.07	5.17	0.04
			0.00				1/2"	6.53	6.05	0.09
			1.00				Ice	6.99	6.81	0.15
							1" Ice	7.91	8.37	0.29
							2" Ice			
782 10876	A	From Leg	1.00		0.0000	147.00	No Ice	0.59	0.23	0.01
			0.00				1/2"	0.69	0.31	0.01
			1.00				Ice	0.80	0.39	0.02
							1" Ice	1.04	0.57	0.04
							2" Ice			
Pipe Mount [PM 601-1]	B	From Leg	0.50		0.0000	147.00	No Ice	1.32	1.32	0.07
			0.00				1/2"	1.58	1.58	0.08
			0.00				Ice	1.84	1.84	0.09
							1" Ice	2.40	2.40	0.13
							2" Ice			
***										
782 10876	C	From Leg	1.00		0.0000	143.00	No Ice	0.59	0.23	0.01
			0.00				1/2"	0.69	0.31	0.01

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
			0.00			Ice	0.80	0.39	0.02
						1" Ice	1.04	0.57	0.04
						2" Ice			
Pipe Mount [PM 602-1]	C	From Leg	0.50		0.0000	No Ice	2.78	2.78	0.09
			0.00			1/2"	3.21	3.21	0.11
			0.00			Ice	3.64	3.64	0.14
						1" Ice	4.54	4.54	0.21
						2" Ice			
***									
(2) CC807-11	A	From Leg	4.00		0.0000	No Ice	5.27	5.27	0.05
			0.00			1/2"	7.04	7.04	0.09
			8.00			Ice	8.83	8.83	0.14
						1" Ice	12.45	12.45	0.27
						2" Ice			
ANT450F6	B	From Leg	4.00		0.0000	No Ice	1.86	1.86	0.02
			0.00			1/2"	2.67	2.67	0.04
			8.00			Ice	3.30	3.30	0.05
						1" Ice	4.28	4.28	0.11
						2" Ice			
PTP400 w/Mount Pipe	B	From Leg	4.00		0.0000	No Ice	0.00	0.00	0.00
			0.00			1/2"	0.00	0.00	0.00
			0.00			Ice	0.00	0.00	0.00
						1" Ice	0.00	0.00	0.00
						2" Ice			
432E-831-01-T	A	From Leg	4.00		0.0000	No Ice	1.20	0.75	0.03
			0.00			1/2"	1.34	0.86	0.04
			8.00			Ice	1.48	0.98	0.05
						1" Ice	1.79	1.24	0.09
						2" Ice			
RIU	B	From Leg	4.00		0.0000	No Ice	0.16	0.12	0.00
			0.00			1/2"	0.21	0.16	0.00
			0.00			Ice	0.27	0.22	0.01
						1" Ice	0.42	0.35	0.02
						2" Ice			
Side Arm Mount [SO 306-1]	A	From Leg	2.00		0.0000	No Ice	0.41	2.26	0.04
			0.00			1/2"	0.81	3.83	0.06
			0.00			Ice	1.23	5.48	0.09
						1" Ice	2.08	9.37	0.19
						2" Ice			
Side Arm Mount [SO 306-1]	B	From Leg	2.00		0.0000	No Ice	0.41	2.26	0.04
			0.00			1/2"	0.81	3.83	0.06
			0.00			Ice	1.23	5.48	0.09
						1" Ice	2.08	9.37	0.19
						2" Ice			
Pipe Mount [PM 601-3]	C	None			0.0000	No Ice	3.17	3.17	0.20
						1/2"	3.79	3.79	0.23
						Ice	4.42	4.42	0.28
						1" Ice	5.76	5.76	0.40
						2" Ice			
***									
ANT450F6	A	From Leg	6.00		0.0000	No Ice	1.86	1.86	0.02
			0.00			1/2"	2.67	2.67	0.04
			9.00			Ice	3.30	3.30	0.05
						1" Ice	4.28	4.28	0.11
						2" Ice			
ANT450F6	B	From Leg	6.00		0.0000	No Ice	1.86	1.86	0.02
			0.00			1/2"	2.67	2.67	0.04
			9.00			Ice	3.30	3.30	0.05
						1" Ice	4.28	4.28	0.11
						2" Ice			
4' x 2" Pipe Mount	A	From Leg	6.00		0.0000	No Ice	0.79	0.79	0.03
			0.00			1/2"	1.03	1.03	0.04
			0.00			Ice	1.28	1.28	0.04
						1" Ice	1.81	1.81	0.07
						2" Ice			

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight
			Horz	Lateral	Vert					
			ft	ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
4' x 2" Pipe Mount	B	From Leg	6.00	0.0000	135.00	No Ice	0.79	0.79	0.03	
			0.00			1/2"	1.03	1.03	0.04	
			0.00			Ice	1.28	1.28	0.04	
						1" Ice	1.81	1.81	0.07	
						2" Ice				
Side Arm Mount [SO 702-1]	A	From Leg	3.00	0.0000	135.00	No Ice	0.62	1.49	0.03	
			0.00			1/2"	0.74	2.07	0.04	
			0.00			Ice	0.89	2.54	0.06	
						1" Ice	1.25	3.55	0.12	
						2" Ice				
Side Arm Mount [SO 702-1]	B	From Leg	3.00	0.0000	135.00	No Ice	0.62	1.49	0.03	
			0.00			1/2"	0.74	2.07	0.04	
			0.00			Ice	0.89	2.54	0.06	
						1" Ice	1.25	3.55	0.12	
						2" Ice				
***										
***										
APX16DWV-16DWV-S-E-A20	A	From Leg	4.00	0.0000	130.00	No Ice	6.26	1.50	0.04	
			0.00			1/2"	6.85	2.00	0.07	
			1.00			Ice	7.46	2.52	0.11	
						1" Ice	8.72	3.62	0.20	
						2" Ice				
APX16DWV-16DWV-S-E-A20	B	From Leg	4.00	0.0000	130.00	No Ice	6.26	1.50	0.04	
			0.00			1/2"	6.85	2.00	0.07	
			1.00			Ice	7.46	2.52	0.11	
						1" Ice	8.72	3.62	0.20	
						2" Ice				
APX16DWV-16DWV-S-E-A20	C	From Leg	4.00	0.0000	130.00	No Ice	6.26	1.50	0.04	
			0.00			1/2"	6.85	2.00	0.07	
			1.00			Ice	7.46	2.52	0.11	
						1" Ice	8.72	3.62	0.20	
						2" Ice				
APXVAALL24_43-U-NA20_TMO	A	From Leg	4.00	0.0000	130.00	No Ice	14.67	5.32	0.15	
			0.00			1/2"	15.43	5.99	0.26	
			1.00			Ice	16.21	6.68	0.38	
						1" Ice	17.81	8.08	0.65	
						2" Ice				
APXVAALL24_43-U-NA20_TMO	B	From Leg	4.00	0.0000	130.00	No Ice	14.67	5.32	0.15	
			0.00			1/2"	15.43	5.99	0.26	
			1.00			Ice	16.21	6.68	0.38	
						1" Ice	17.81	8.08	0.65	
						2" Ice				
APXVAALL24_43-U-NA20_TMO	C	From Leg	4.00	0.0000	130.00	No Ice	14.67	5.32	0.15	
			0.00			1/2"	15.43	5.99	0.26	
			1.00			Ice	16.21	6.68	0.38	
						1" Ice	17.81	8.08	0.65	
						2" Ice				
AIR6449 B41_T-MOBILE	A	From Leg	4.00	0.0000	130.00	No Ice	5.66	2.48	0.11	
			0.00			1/2"	5.96	2.70	0.15	
			1.00			Ice	6.27	2.94	0.20	
						1" Ice	6.91	3.43	0.30	
						2" Ice				
AIR6449 B41_T-MOBILE	B	From Leg	4.00	0.0000	130.00	No Ice	5.66	2.48	0.11	
			0.00			1/2"	5.96	2.70	0.15	
			1.00			Ice	6.27	2.94	0.20	
						1" Ice	6.91	3.43	0.30	
						2" Ice				
AIR6449 B41_T-MOBILE	C	From Leg	4.00	0.0000	130.00	No Ice	5.66	2.48	0.11	
			0.00			1/2"	5.96	2.70	0.15	
			1.00			Ice	6.27	2.94	0.20	
						1" Ice	6.91	3.43	0.30	
						2" Ice				
RADIO 4415 B66A	A	From Leg	4.00	0.0000	130.00	No Ice	1.86	0.87	0.05	
			0.00			1/2"	2.03	1.00	0.06	
			1.00			Ice	2.20	1.13	0.08	

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C <sub>AA</sub> <sub>Front</sub>	C <sub>AA</sub> <sub>Side</sub>	Weight	
			Horz	Lateral	Vert						ft
			ft	ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
RADIO 4415 B66A	B	From Leg	4.00	0.00	1.00	0.0000	130.00	1" Ice	2.58	1.43	0.12
								2" Ice	1.86	0.87	0.05
								No Ice	2.03	1.00	0.06
								1/2" Ice	2.20	1.13	0.08
								1" Ice	2.58	1.43	0.12
RADIO 4415 B66A	C	From Leg	4.00	0.00	1.00	0.0000	130.00	2" Ice	1.86	0.87	0.05
								No Ice	2.03	1.00	0.06
								1/2" Ice	2.20	1.13	0.08
								1" Ice	2.58	1.43	0.12
								2" Ice	1.86	0.87	0.05
RADIO 4449 B71 B85A_T-MOBILE	A	From Leg	4.00	0.00	1.00	0.0000	130.00	No Ice	1.97	1.59	0.07
								1/2" Ice	2.15	1.75	0.09
								Ice	2.33	1.92	0.12
								1" Ice	2.72	2.28	0.17
								2" Ice	1.97	1.59	0.07
RADIO 4449 B71 B85A_T-MOBILE	B	From Leg	4.00	0.00	1.00	0.0000	130.00	No Ice	1.97	1.59	0.07
								1/2" Ice	2.15	1.75	0.09
								Ice	2.33	1.92	0.12
								1" Ice	2.72	2.28	0.17
								2" Ice	1.97	1.59	0.07
RADIO 4449 B71 B85A_T-MOBILE	C	From Leg	4.00	0.00	1.00	0.0000	130.00	No Ice	1.97	1.59	0.07
								1/2" Ice	2.15	1.75	0.09
								Ice	2.33	1.92	0.12
								1" Ice	2.72	2.28	0.17
								2" Ice	1.97	1.59	0.07
RADIO 4424 B25_TMO	A	From Leg	4.00	0.00	1.00	0.0000	130.00	No Ice	2.05	1.61	0.09
								1/2" Ice	2.23	1.77	0.11
								Ice	2.42	1.94	0.13
								1" Ice	2.81	2.30	0.19
								2" Ice	2.05	1.61	0.09
RADIO 4424 B25_TMO	B	From Leg	4.00	0.00	1.00	0.0000	130.00	No Ice	2.05	1.61	0.09
								1/2" Ice	2.23	1.77	0.11
								Ice	2.42	1.94	0.13
								1" Ice	2.81	2.30	0.19
								2" Ice	2.05	1.61	0.09
RADIO 4424 B25_TMO	C	From Leg	4.00	0.00	1.00	0.0000	130.00	No Ice	2.05	1.61	0.09
								1/2" Ice	2.23	1.77	0.11
								Ice	2.42	1.94	0.13
								1" Ice	2.81	2.30	0.19
								2" Ice	2.05	1.61	0.09
12' Platform Mount [#RMQP-496-HK]	C	None			0.0000	130.00	No Ice	38.42	36.68	2.31	
							1/2" Ice	50.10	48.37	2.86	
							Ice	61.79	60.07	3.41	
							1" Ice	85.17	83.47	4.52	
							2" Ice				
***											
APL199016-42T0	A	From Leg	1.00	0.00	0.00	0.0000	120.00	No Ice	3.48	2.60	0.01
								1/2" Ice	4.18	3.28	0.03
								Ice	4.90	3.98	0.06
								1" Ice	6.38	5.45	0.14
								2" Ice	3.48	2.60	0.01
APL199016-42T0	B	From Leg	1.00	0.00	0.00	0.0000	120.00	No Ice	3.48	2.60	0.01
								1/2" Ice	4.18	3.28	0.03
								Ice	4.90	3.98	0.06
								1" Ice	6.38	5.45	0.14
								2" Ice	3.48	2.60	0.01
APL199016-42T0	C	From Leg	1.00	0.00	0.00	0.0000	120.00	No Ice	3.48	2.60	0.01
								1/2" Ice	4.18	3.28	0.03
								Ice	4.90	3.98	0.06
								1" Ice	6.38	5.45	0.14
								2" Ice	3.48	2.60	0.01
Pipe Mount [PM 602-3]	C	None			0.0000	120.00	No Ice	6.67	6.67	0.28	
							1/2" Ice	7.70	7.70	0.34	

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight K	
						Ice	8.74	8.74	0.42
						1" Ice	10.90	10.90	0.63
						2" Ice			
***									
Pipe Mount [PM 601-1]	B	From Leg	1.00 0.00 0.00	0.0000	100.00	No Ice	1.32	1.32	0.07
						1/2"	1.58	1.58	0.08
						Ice	1.84	1.84	0.09
						1" Ice	2.40	2.40	0.13
						2" Ice			
***									
1' x 2-1/2"	A	From Leg	2.00 0.00 0.00	0.0000	79.00	No Ice	0.16	0.16	0.03
						1/2"	0.23	0.23	0.03
						Ice	0.31	0.31	0.03
						1" Ice	0.51	0.51	0.04
						2" Ice			
1' x 2-1/2"	B	From Leg	2.00 0.00 0.00	0.0000	79.00	No Ice	0.16	0.16	0.03
						1/2"	0.23	0.23	0.03
						Ice	0.31	0.31	0.03
						1" Ice	0.51	0.51	0.04
						2" Ice			
Side Arm Mount [SO 901-1]	A	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice	0.33	0.62	0.11
						1/2"	0.46	0.78	0.11
						Ice	0.62	0.97	0.12
						1" Ice	1.01	1.43	0.15
						2" Ice			
Side Arm Mount [SO 901-1]	B	From Leg	1.00 0.00 0.00	0.0000	79.00	No Ice	0.33	0.62	0.11
						1/2"	0.46	0.78	0.11
						Ice	0.62	0.97	0.12
						1" Ice	1.01	1.43	0.15
						2" Ice			
***									
GPS-TMG-HR-26NCM	C	From Leg	3.00 0.00 0.00	0.0000	52.00	No Ice	0.13	0.13	0.00
						1/2"	0.18	0.18	0.00
						Ice	0.24	0.24	0.01
						1" Ice	0.37	0.37	0.01
						2" Ice			
2' x 2" Pipe Mount	C	From Leg	3.00 0.00 0.00	0.0000	52.00	No Ice	0.02	0.02	0.01
						1/2"	0.05	0.05	0.01
						Ice	0.09	0.09	0.01
						1" Ice	0.19	0.19	0.01
						2" Ice			
Side Arm Mount [SO 701-1]	C	From Leg	1.50 0.00 0.00	0.0000	52.00	No Ice	0.85	1.67	0.07
						1/2"	1.14	2.34	0.08
						Ice	1.43	3.01	0.09
						1" Ice	2.01	4.35	0.12
						2" Ice			
***									

### Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft <sup>2</sup>	Weight K	
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 5.00	38.0000		160.00	2.92	No Ice	6.68	0.05
									1/2" Ice	7.07	0.08
									1" Ice	7.46	0.12
									2" Ice	8.23	0.19
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 5.00	24.0000		160.00	2.92	No Ice	6.68	0.05
									1/2" Ice	7.07	0.08
									1" Ice	7.46	0.12

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft <sup>2</sup>	Weight K
VHLP2.5-11	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 5.00	90.0000		160.00	2.92	2" Ice 8.23 No Ice 6.68 1/2" Ice 7.07 1" Ice 7.46 2" Ice 8.23	0.19 0.05 0.08 0.12 0.19
***										
SC3-W100ASTX	A	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	-32.0000		152.00	3.29	2" Ice 8.51 No Ice 8.95 1/2" Ice 9.38 1" Ice 10.26 2" Ice 10.26	0.04 0.09 0.13 0.22
***										
SC3-W100ASTX	B	Paraboloid w/o Radome	From Leg	1.00 0.00 1.00	57.0000		147.00	3.29	2" Ice 8.51 No Ice 8.95 1/2" Ice 9.38 1" Ice 10.26 2" Ice 10.26	0.04 0.09 0.13 0.22
***										
MPRD2449	C	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	10.0000		143.00	2.17	2" Ice 3.69 No Ice 3.98 1/2" Ice 4.27 1" Ice 4.84 2" Ice 4.84	0.04 0.06 0.08 0.12
***										
SC3-W100ASTX	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	37.0000		100.00	3.29	2" Ice 8.51 No Ice 8.95 1/2" Ice 9.38 1" Ice 10.26 2" Ice 10.26	0.04 0.09 0.13 0.22
***										

## Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
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	168 - 119.25	Pole	Max Tension	39	0.00	-0.00	-0.00
			Max. Compression	26	-48.19	-1.93	4.75
			Max. Mx	8	-17.54	-766.33	-22.93
			Max. My	14	-17.44	-11.90	-779.07
			Max. Vy	8	26.29	-766.33	-22.93
			Max. Vx	14	26.75	-11.90	-779.07
			Max. Torque	22			-4.78
L2	119.25 - 78.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.48	-2.99	3.66
			Max. Mx	8	-26.05	-1930.64	-55.49
			Max. My	2	-25.95	6.22	1964.95
			Max. Vy	8	31.67	-1930.64	-55.49
			Max. Vx	2	-32.46	6.22	1964.95
			Max. Torque	22			-5.87
L3	78.5 - 38.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-77.86	-3.05	2.69
			Max. Mx	8	-38.10	-3247.17	-89.10
			Max. My	2	-38.04	17.70	3311.71
			Max. Vy	8	36.14	-3247.17	-89.10
			Max. Vx	2	-36.93	17.70	3311.71
			Max. Torque	22			-5.95
L4	38.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-98.53	-3.05	1.65
			Max. Mx	8	-54.15	-4968.86	-127.62
			Max. My	2	-54.15	31.54	5068.44
			Max. Vy	8	40.06	-4968.86	-127.62
			Max. Vx	2	-40.83	31.54	5068.44
			Max. Torque	22			-5.68

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	27	98.53	0.04	11.17
	Max. H <sub>x</sub>	20	54.19	39.99	0.65
	Max. H <sub>z</sub>	3	40.64	0.30	40.78
	Max. M <sub>x</sub>	2	5068.44	0.30	40.78
	Max. M <sub>z</sub>	8	4968.86	-40.01	-0.83

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. Torsion	8	2.96	-40.01	-0.83
	Min. Vert	7	40.64	-34.22	20.66
	Min. H <sub>x</sub>	8	54.19	-40.01	-0.83
	Min. H <sub>z</sub>	14	54.19	-0.37	-40.60
	Min. M <sub>x</sub>	14	-5052.95	-0.37	-40.60
	Min. M <sub>z</sub>	20	-4955.16	39.99	0.65
	Min. Torsion	22	-5.68	34.48	21.13

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	45.15	0.00	0.00	-0.55	-1.10	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	54.19	-0.30	-40.78	-5068.44	31.54	1.22
0.9 Dead+1.0 Wind 0 deg - No Ice	40.64	-0.30	-40.78	-4992.34	31.53	1.22
1.2 Dead+1.0 Wind 30 deg - No Ice	54.19	19.24	-35.67	-4438.52	-2379.04	-0.18
0.9 Dead+1.0 Wind 30 deg - No Ice	40.64	19.24	-35.67	-4371.88	-2342.99	-0.16
1.2 Dead+1.0 Wind 60 deg - No Ice	54.19	34.22	-20.66	-2578.98	-4243.23	-1.20
0.9 Dead+1.0 Wind 60 deg - No Ice	40.64	34.22	-20.66	-2540.11	-4179.24	-1.17
1.2 Dead+1.0 Wind 90 deg - No Ice	54.19	40.01	0.83	127.62	-4968.86	-2.96
0.9 Dead+1.0 Wind 90 deg - No Ice	40.64	40.01	0.83	125.75	-4894.00	-2.92
1.2 Dead+1.0 Wind 120 deg - No Ice	54.19	34.70	20.52	2561.95	-4306.62	-2.45
0.9 Dead+1.0 Wind 120 deg - No Ice	40.64	34.70	20.52	2523.66	-4241.74	-2.41
1.2 Dead+1.0 Wind 150 deg - No Ice	54.19	20.15	35.17	4375.98	-2499.93	-2.07
0.9 Dead+1.0 Wind 150 deg - No Ice	40.64	20.15	35.17	4310.56	-2462.15	-2.05
1.2 Dead+1.0 Wind 180 deg - No Ice	54.19	0.37	40.60	5052.95	-59.25	-1.60
0.9 Dead+1.0 Wind 180 deg - No Ice	40.64	0.37	40.60	4977.36	-57.93	-1.59
1.2 Dead+1.0 Wind 210 deg - No Ice	54.19	-19.45	35.33	4409.40	2392.44	-0.27
0.9 Dead+1.0 Wind 210 deg - No Ice	40.64	-19.45	35.33	4343.34	2357.08	-0.29
1.2 Dead+1.0 Wind 240 deg - No Ice	54.19	-34.38	20.10	2496.15	4265.39	1.77
0.9 Dead+1.0 Wind 240 deg - No Ice	40.64	-34.38	20.10	2458.91	4201.76	1.74
1.2 Dead+1.0 Wind 270 deg - No Ice	54.19	-39.99	-0.65	-76.51	4955.16	4.31
0.9 Dead+1.0 Wind 270 deg - No Ice	40.64	-39.99	-0.65	-75.36	4881.30	4.27
1.2 Dead+1.0 Wind 300 deg - No Ice	54.19	-34.48	-21.13	-2633.67	4270.22	5.68
0.9 Dead+1.0 Wind 300 deg - No Ice	40.64	-34.48	-21.13	-2594.11	4206.62	5.64
1.2 Dead+1.0 Wind 330 deg - No Ice	54.19	-19.89	-35.56	-4422.81	2455.70	3.79
0.9 Dead+1.0 Wind 330 deg - No Ice	40.64	-19.89	-35.56	-4356.40	2419.35	3.77
1.2 Dead+1.0 Ice+1.0 Temp	98.53	0.00	-0.00	-1.65	-3.05	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	98.53	-0.04	-11.17	-1492.30	1.22	0.47



Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	98.53	5.39	-9.75	-1304.10	-720.13	-0.23
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	98.53	9.50	-5.65	-758.39	-1268.64	-0.80
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	98.53	11.06	0.15	23.12	-1477.63	-1.36
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	98.53	9.58	5.60	747.74	-1279.63	-1.28
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	98.53	5.54	9.64	1285.46	-741.42	-1.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	98.53	0.06	11.14	1485.94	-13.27	-0.55
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	98.53	-5.43	9.69	1295.00	716.69	0.13
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	98.53	-9.53	5.54	737.71	1267.32	0.91
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	98.53	-11.05	-0.11	-15.19	1468.62	1.63
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	98.53	-9.53	-5.72	-765.73	1265.86	1.91
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	98.53	-5.49	-9.72	-1298.41	726.09	1.34
Dead+Wind 0 deg - Service	45.15	-0.07	-8.85	-1092.44	5.93	0.26
Dead+Wind 30 deg - Service	45.15	4.17	-7.74	-956.70	-513.42	-0.04
Dead+Wind 60 deg - Service	45.15	7.43	-4.48	-556.03	-914.98	-0.26
Dead+Wind 90 deg - Service	45.15	8.68	0.18	27.03	-1071.29	-0.65
Dead+Wind 120 deg - Service	45.15	7.53	4.45	551.48	-928.69	-0.54
Dead+Wind 150 deg - Service	45.15	4.37	7.63	942.33	-539.48	-0.45
Dead+Wind 180 deg - Service	45.15	0.08	8.81	1088.20	-13.64	-0.35
Dead+Wind 210 deg - Service	45.15	-4.22	7.67	949.51	514.57	-0.06
Dead+Wind 240 deg - Service	45.15	-7.46	4.36	537.27	917.98	0.39
Dead+Wind 270 deg - Service	45.15	-8.68	-0.14	-16.95	1066.57	0.95
Dead+Wind 300 deg - Service	45.15	-7.48	-4.58	-567.85	919.08	1.26
Dead+Wind 330 deg - Service	45.15	-4.32	-7.72	-953.33	528.20	0.83

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-45.15	0.00	0.00	45.15	0.00	0.000%
2	-0.30	-54.19	-40.78	0.30	54.19	40.78	0.000%
3	-0.30	-40.64	-40.78	0.30	40.64	40.78	0.000%
4	19.24	-54.19	-35.67	-19.24	54.19	35.67	0.000%
5	19.24	-40.64	-35.67	-19.24	40.64	35.67	0.000%
6	34.22	-54.19	-20.66	-34.22	54.19	20.66	0.000%
7	34.22	-40.64	-20.66	-34.22	40.64	20.66	0.000%
8	40.01	-54.19	0.83	-40.01	54.19	-0.83	0.000%
9	40.01	-40.64	0.83	-40.01	40.64	-0.83	0.000%
10	34.70	-54.19	20.52	-34.70	54.19	-20.52	0.000%
11	34.70	-40.64	20.52	-34.70	40.64	-20.52	0.000%
12	20.15	-54.19	35.17	-20.15	54.19	-35.17	0.000%
13	20.15	-40.64	35.17	-20.15	40.64	-35.17	0.000%
14	0.37	-54.19	40.60	-0.37	54.19	-40.60	0.000%
15	0.37	-40.64	40.60	-0.37	40.64	-40.60	0.000%
16	-19.45	-54.19	35.33	19.45	54.19	-35.33	0.000%
17	-19.45	-40.64	35.33	19.45	40.64	-35.33	0.000%
18	-34.38	-54.19	20.10	34.38	54.19	-20.10	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
19	-34.38	-40.64	20.10	34.38	40.64	-20.10	0.000%
20	-39.99	-54.19	-0.65	39.99	54.19	0.65	0.000%
21	-39.99	-40.64	-0.65	39.99	40.64	0.65	0.000%
22	-34.48	-54.19	-21.13	34.48	54.19	21.13	0.000%
23	-34.48	-40.64	-21.13	34.48	40.64	21.13	0.000%
24	-19.89	-54.19	-35.56	19.89	54.19	35.56	0.000%
25	-19.89	-40.64	-35.56	19.89	40.64	35.56	0.000%
26	0.00	-98.53	0.00	-0.00	98.53	0.00	0.000%
27	-0.04	-98.53	-11.17	0.04	98.53	11.17	0.000%
28	5.39	-98.53	-9.75	-5.39	98.53	9.75	0.000%
29	9.50	-98.53	-5.65	-9.50	98.53	5.65	0.000%
30	11.06	-98.53	0.15	-11.06	98.53	-0.15	0.000%
31	9.58	-98.53	5.60	-9.58	98.53	-5.60	0.000%
32	5.54	-98.53	9.64	-5.54	98.53	-9.64	0.000%
33	0.06	-98.53	11.14	-0.06	98.53	-11.14	0.000%
34	-5.43	-98.53	9.69	5.43	98.53	-9.69	0.000%
35	-9.53	-98.53	5.54	9.53	98.53	-5.54	0.000%
36	-11.05	-98.53	-0.11	11.05	98.53	0.11	0.000%
37	-9.53	-98.53	-5.72	9.53	98.53	5.72	0.000%
38	-5.49	-98.53	-9.72	5.49	98.53	9.72	0.000%
39	-0.07	-45.15	-8.85	0.07	45.15	8.85	0.000%
40	4.17	-45.15	-7.74	-4.17	45.15	7.74	0.000%
41	7.43	-45.15	-4.48	-7.43	45.15	4.48	0.000%
42	8.68	-45.15	0.18	-8.68	45.15	-0.18	0.000%
43	7.53	-45.15	4.45	-7.53	45.15	-4.45	0.000%
44	4.37	-45.15	7.63	-4.37	45.15	-7.63	0.000%
45	0.08	-45.15	8.81	-0.08	45.15	-8.81	0.000%
46	-4.22	-45.15	7.67	4.22	45.15	-7.67	0.000%
47	-7.46	-45.15	4.36	7.46	45.15	-4.36	0.000%
48	-8.68	-45.15	-0.14	8.68	45.15	0.14	0.000%
49	-7.48	-45.15	-4.58	7.48	45.15	4.58	0.000%
50	-4.32	-45.15	-7.72	4.32	45.15	7.72	0.000%

### Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00005637
3	Yes	4	0.00000001	0.00077016
4	Yes	6	0.00000001	0.00035892
5	Yes	6	0.00000001	0.00010467
6	Yes	6	0.00000001	0.00037360
7	Yes	6	0.00000001	0.00010886
8	Yes	5	0.00000001	0.00016302
9	Yes	5	0.00000001	0.00006702
10	Yes	6	0.00000001	0.00036260
11	Yes	6	0.00000001	0.00010458
12	Yes	6	0.00000001	0.00037535
13	Yes	6	0.00000001	0.00010929
14	Yes	5	0.00000001	0.00030189
15	Yes	5	0.00000001	0.00013057
16	Yes	6	0.00000001	0.00036139
17	Yes	6	0.00000001	0.00010570
18	Yes	6	0.00000001	0.00035555
19	Yes	6	0.00000001	0.00010369
20	Yes	5	0.00000001	0.00054753
21	Yes	5	0.00000001	0.00024139
22	Yes	6	0.00000001	0.00039201
23	Yes	6	0.00000001	0.00011448
24	Yes	6	0.00000001	0.00035479
25	Yes	6	0.00000001	0.00010246
26	Yes	4	0.00000001	0.00006870
27	Yes	6	0.00000001	0.00035263
28	Yes	6	0.00000001	0.00058214
29	Yes	6	0.00000001	0.00060152

30	Yes	6	0.00000001	0.00035136
31	Yes	6	0.00000001	0.00057440
32	Yes	6	0.00000001	0.00059373
33	Yes	6	0.00000001	0.00034936
34	Yes	6	0.00000001	0.00057212
35	Yes	6	0.00000001	0.00056186
36	Yes	6	0.00000001	0.00035204
37	Yes	6	0.00000001	0.00061266
38	Yes	6	0.00000001	0.00057121
39	Yes	4	0.00000001	0.00017499
40	Yes	5	0.00000001	0.00008076
41	Yes	5	0.00000001	0.00008762
42	Yes	4	0.00000001	0.00021932
43	Yes	5	0.00000001	0.00008063
44	Yes	5	0.00000001	0.00008919
45	Yes	4	0.00000001	0.00021316
46	Yes	5	0.00000001	0.00008091
47	Yes	5	0.00000001	0.00007672
48	Yes	4	0.00000001	0.00037765
49	Yes	5	0.00000001	0.00009982
50	Yes	5	0.00000001	0.00007682

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	168 - 119.25	34.161	39	1.8044	0.0053
L2	123.5 - 78.5	18.433	39	1.4750	0.0050
L3	83.75 - 38.75	8.247	39	0.9286	0.0022
L4	45 - 0	2.410	39	0.4878	0.0009

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.00	800 10121 w/ Mount Pipe	39	34.161	1.8044	0.0053	37603
165.00	VHLP2.5-11	39	33.038	1.7881	0.0054	37603
160.00	LLPX310R-V1	39	31.170	1.7604	0.0054	23502
152.00	SC3-W100ASTX	39	28.212	1.7133	0.0055	11750
148.00	SC3-W100ASTX	39	26.756	1.6876	0.0055	9400
147.00	BPA7496-180-11 w/ Mount Pipe	39	26.395	1.6809	0.0055	8952
143.00	MPRD2449	39	24.964	1.6529	0.0055	7520
140.00	(2) CC807-11	39	23.908	1.6303	0.0055	6714
135.00	ANT450F6	39	22.184	1.5892	0.0054	5696
130.00	APX16DWV-16DWV-S-E-A20	39	20.514	1.5433	0.0053	4946
120.00	APL199016-42T0	39	17.361	1.4338	0.0048	4256
100.00	SC3-W100ASTX	39	11.892	1.1593	0.0034	4439
79.00	1' x 2-1/2"	39	7.313	0.8670	0.0019	4546
52.00	GPS-TMG-HR-26NCM	39	3.157	0.5616	0.0010	4248

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	168 - 119.25	158.260	2	8.3709	0.0262
L2	123.5 - 78.5	85.501	2	6.8475	0.0233
L3	83.75 - 38.75	38.277	2	4.3127	0.0100
L4	45 - 0	11.189	2	2.2652	0.0040

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
168.00	800 10121 w/ Mount Pipe	2	158.260	8.3709	0.0262	8410
165.00	VHLP2.5-11	2	153.066	8.2954	0.0263	8410
160.00	LLPX310R-V1	2	144.430	8.1676	0.0264	5255
152.00	SC3-W100ASTX	2	130.750	7.9501	0.0264	2625
148.00	SC3-W100ASTX	2	124.013	7.8317	0.0263	2099
147.00	BPA7496-180-11 w/ Mount Pipe	2	122.343	7.8008	0.0263	1998
143.00	MPRD2449	2	115.726	7.6710	0.0261	1677
140.00	(2) CC807-11	2	110.840	7.5665	0.0259	1496
135.00	ANT450F6	2	102.865	7.3765	0.0254	1268
130.00	APX16DWV-16DWV-S-E-A20	2	95.132	7.1638	0.0246	1099
120.00	APL199016-42T0	2	80.537	6.6568	0.0224	942
100.00	SC3-W100ASTX	2	55.186	5.3832	0.0155	973
79.00	1' x 2-1/2"	2	33.942	4.0264	0.0088	988
52.00	GPS-TMG-HR-26NCM	2	14.654	2.6079	0.0046	918

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	$L_u$ ft	$KI/r$	A $in^2$	$P_u$ K	$\phi P_n$ K	Ratio $\frac{P_u}{\phi P_n}$
L1	168 - 119.25 (1)	TP34.288x24x0.25	48.75	0.00	0.0	26.297 5	-17.44	1538.40	0.011
L2	119.25 - 78.5 (2)	TP42.387x32.8911x0.281 3	45.00	0.00	0.0	36.598 3	-25.95	2141.00	0.012
L3	78.5 - 38.75 (3)	TP50.213x40.7166x0.375	45.00	0.00	0.0	57.749 8	-38.04	3378.36	0.011
L4	38.75 - 0 (4)	TP57.64x48.1441x0.375	45.00	0.00	0.0	68.159 7	-54.15	3987.34	0.014

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$ kip-ft	$\phi M_{nx}$ kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	$M_{uy}$ kip-ft	$\phi M_{ny}$ kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	168 - 119.25 (1)	TP34.288x24x0.25	779.16	1206.64	0.646	0.00	1206.64	0.000
L2	119.25 - 78.5 (2)	TP42.387x32.8911x0.281 3	1964.97	2002.83	0.981	0.00	2002.83	0.000
L3	78.5 - 38.75 (3)	TP50.213x40.7166x0.375	3311.76	3912.78	0.846	0.00	3912.78	0.000
L4	38.75 - 0 (4)	TP57.64x48.1441x0.375	5068.53	5107.74	0.992	0.00	5107.74	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	168 - 119.25 (1)	TP34.288x24x0.25	26.75	461.52	0.058	0.66	1339.48	0.000

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L2	119.25 - 78.5 (2)	TP42.387x32.8911x0.281 3	32.46	642.30	0.051	1.37	2306.11	0.001
L3	78.5 - 38.75 (3)	TP50.213x40.7166x0.375	36.94	1013.51	0.036	1.22	4306.46	0.000
L4	38.75 - 0 (4)	TP57.64x48.1441x0.375	40.83	1196.20	0.034	1.22	5998.93	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $P_u$ $\phi P_n$	Ratio $M_{ux}$ $\phi M_{nx}$	Ratio $M_{uy}$ $\phi M_{ny}$	Ratio $V_u$ $\phi V_n$	Ratio $T_u$ $\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	168 - 119.25 (1)	0.011	0.646	0.000	0.058	0.000	0.660	1.050	4.8.2
L2	119.25 - 78.5 (2)	0.012	0.981	0.000	0.051	0.001	0.996	1.050	4.8.2
L3	78.5 - 38.75 (3)	0.011	0.846	0.000	0.036	0.000	0.859	1.050	4.8.2
L4	38.75 - 0 (4)	0.014	0.992	0.000	0.034	0.000	1.007	1.050	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	168 - 119.25	Pole	TP34.288x24x0.25	1	-17.44	1615.32	62.9	Pass
L2	119.25 - 78.5	Pole	TP42.387x32.8911x0.2813	2	-25.95	2248.05	94.8	Pass
L3	78.5 - 38.75	Pole	TP50.213x40.7166x0.375	3	-38.04	3547.28	81.8	Pass
L4	38.75 - 0	Pole	TP57.64x48.1441x0.375	4	-54.15	4186.71	95.9	Pass
Summary								
Pole (L4)							95.9	Pass
<b>RATING =</b>							<b>95.9</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**

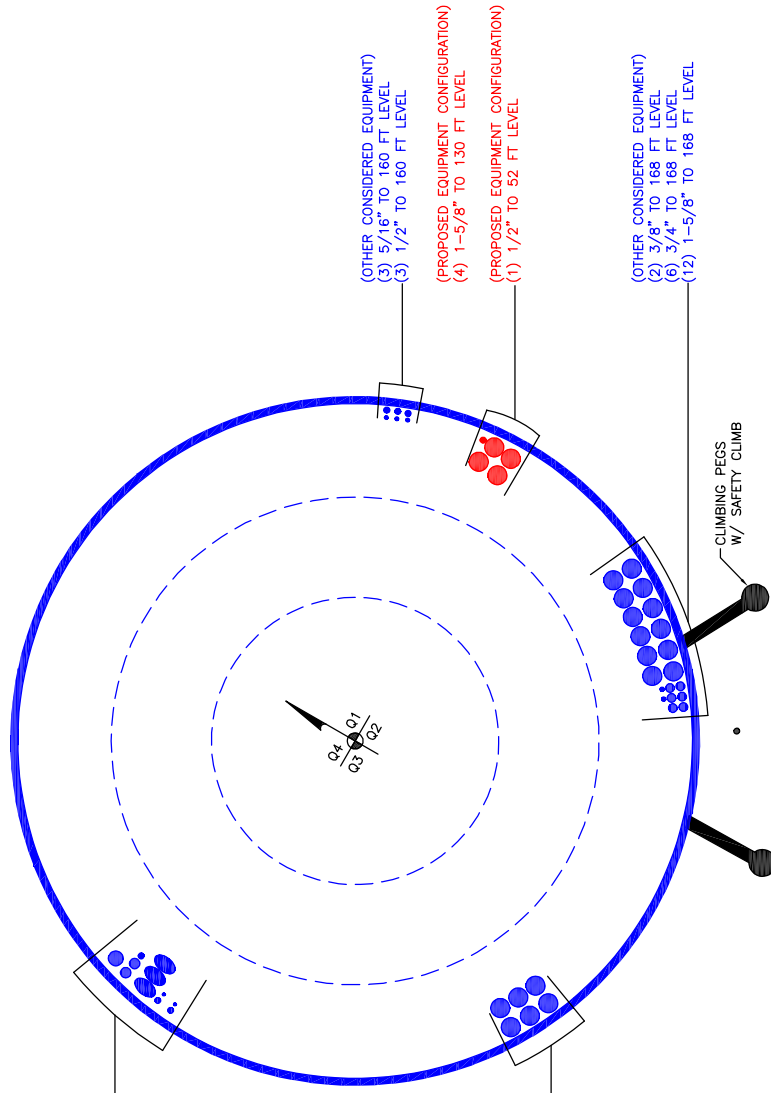


(OTHER CONSIDERED EQUIPMENT)  
 (1) 1-1/4" TO 168 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
 (1) 1/4" TO 140 FT LEVEL  
 (1) 1/4" TO 143 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
 (1) EU 90-FR TO 100 FT LEVEL  
 (2) 1/2" TO 135 FT LEVEL  
 (2) 7/8" TO 140 FT LEVEL  
 (1) EU 90-FR TO 147 FT LEVEL  
 (1) 1/2" TO 147 FT LEVEL  
 (1) EU 90-FR TO 152 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
 (6) 1-5/8" TO 120 FT LEVEL



(OTHER CONSIDERED EQUIPMENT)  
 (3) 5/16" TO 160 FT LEVEL  
 (3) 1/2" TO 160 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)  
 (4) 1-5/8" TO 130 FT LEVEL

(PROPOSED EQUIPMENT CONFIGURATION)  
 (1) 1/2" TO 52 FT LEVEL

(OTHER CONSIDERED EQUIPMENT)  
 (2) 3/8" TO 168 FT LEVEL  
 (6) 3/4" TO 168 FT LEVEL  
 (12) 1-5/8" TO 168 FT LEVEL

**APPENDIX C**  
**ADDITIONAL CALCULATIONS**



# Monopole Base Plate Connection

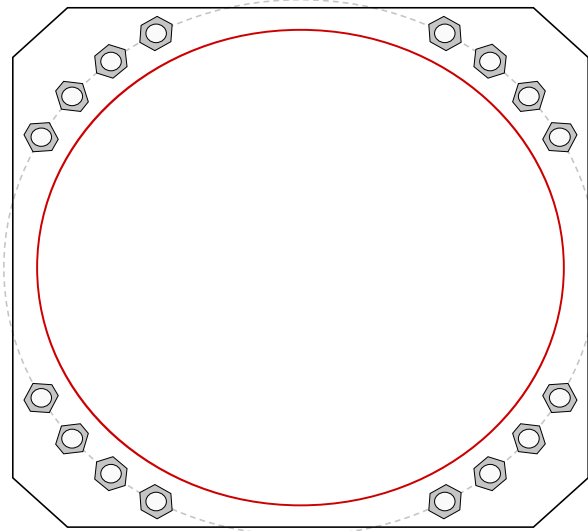


Site Info	
BU #	842875
Site Name	Windsorday Hill
Order #	538783 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$I_{ar}$ (in)	1.75

Applied Loads	
Moment (kip-ft)	5068.53
Axial Force (kips)	54.15
Shear Force (kips)	40.83

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
-----------------------	------------------

Anchor Rod Data
(16) 2-1/4" $\phi$ bolts (A615-75 N; $F_y=75$ ksi, $F_u=100$ ksi) on 65" BC <i>Anchor Spacing: 6 in</i>
Base Plate Data
63" W x 3.25" Plate (A572-55; $F_y=55$ ksi, $F_u=70$ ksi); Clip: 6 in
Stiffener Data
N/A
Pole Data
57.64" x 0.375" 18-sided pole (A607-65; $F_y=65$ ksi, $F_u=80$ ksi)

Anchor Rod Summary	(units of kips, kip-in)	
$Pu_t = 230.43$	$\phi Pn_t = 243.75$	<b>Stress Rating</b>
$Vu = 2.55$	$\phi Vn = 149.1$	<b>85.1%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>
Base Plate Summary		
Max Stress (ksi):	33.54	(Flexural)
Allowable Stress (ksi):	49.5	
Stress Rating:	<b>64.5%</b>	<b>Pass</b>

\*\*\*\*\*  
\* PIER FOUNDATIONS ANALYSIS AND DESIGN - (C) 1995, POWER LINE SYSTEMS, INC.\*  
\*\*\*\*\*

\*\*\* ANALYSIS IDENTIFICATION : CN7-415 / 2101398  
NOTES : 842875 / Windsorday Hill

\*\*\* PIER PROPERTIES CONCRETE STRENGTH (ksi) = 3.00 STEEL STRENGTH (ksi) = 60.00  
DIAMETER (ft) = 8.000 DISTANCE FROM TOP OF PIER TO GROUND LEVEL (ft) = 0.50

\*\*\* SOIL PROPERTIES

LAYER	TYPE	THICKNESS (ft)	DEPTH AT TOP OF LAYER (ft)	DENSITY (pcf)	CU (psf)	KP	PHI (degrees)
1	C	5.00	0.00	100.0	0.0		
2	S	10.00	5.00	60.0		35.000	70.81
3	S	15.00	15.00	55.0		33.000	70.25
4	S	17.00	30.00	80.0		40.000	72.03
5	C	24.00	47.00	95.0	20.0		

\*\*\* DESIGN (FACTORED) LOADS AT TOP OF PIER MOMENT (ft-k) = 5069.0 VERTICAL (k) = 54.0 SHEAR (k) = 41.0  
ADDITIONAL SAFETY FACTOR AGAINST SOIL FAILURE = 11.80

\*\*\* CALCULATED PIER LENGTH (ft) = 24.000

\*\*\* CHECK OF SOILS PROPERTIES AND ULTIMATE RESISTING FORCES ALONG PIER

TYPE	TOP OF LAYER BELOW TOP OF PIER (ft)	THICKNESS (ft)	DENSITY (pcf)	CU (psf)	KP	FORCE (k)	ARM (ft)
C	0.50	5.00	100.0	0.0		0.00	3.00
S	5.50	10.00	60.0		35.000	6720.00	11.13
S	15.50	1.52	55.0		33.000	1371.54	16.27
S	17.02	6.98	55.0		33.000	-7607.26	20.67

\*\*\* SHEAR AND MOMENTS ALONG PIER

DISTANCE BELOW TOP OF PIER (ft)	WITH THE ADDITIONAL SAFETY FACTOR		WITHOUT ADDITIONAL SAFETY FACTOR	
	SHEAR (k)	MOMENT (ft-k)	SHEAR (k)	MOMENT (ft-k)
0.00	484.3	60177.2	41.0	5099.8
2.40	484.3	61339.5	41.0	5198.3
4.80	484.3	62501.7	41.0	5296.8
7.20	-302.5	63015.8	-25.6	5340.3
9.60	-1661.3	60717.2	-140.8	5145.5
12.00	-3310.4	54809.2	-280.5	4644.8
14.40	-5249.8	44595.0	-444.9	3779.2
16.80	-7405.1	29425.0	-627.5	2493.6
19.20	-5457.2	13498.7	-462.5	1144.0
21.60	-2854.1	3475.0	-241.9	294.5
24.00	0.0	-0.0	0.0	-0.0

\*\*\* TOTAL REINFORCEMENT PCT = 0.42 REINFORCEMENT AREA (in^2) = 30.40  
\*\*\* USABLE AXIAL CAP. (k) = 54.0 USABLE MOMENT CAP. (ft-k) = 5429.7

\*\*\* US Standard Re-Bars (Select one of the following):

- 153 BARS #4 (AREA = 0.20 in^2 DIA = 0.500 in) AT SPACING (in) = 1.77
- 99 BARS #5 (AREA = 0.31 in^2 DIA = 0.625 in) AT SPACING (in) = 2.73
- 70 BARS #6 (AREA = 0.44 in^2 DIA = 0.750 in) AT SPACING (in) = 3.86
- 51 BARS #7 (AREA = 0.60 in^2 DIA = 0.875 in) AT SPACING (in) = 5.30
- 39 BARS #8 (AREA = 0.79 in^2 DIA = 1.000 in) AT SPACING (in) = 6.93
- 31 BARS #9 (AREA = 1.00 in^2 DIA = 1.128 in) AT SPACING (in) = 8.72
- 24 BARS #10 (AREA = 1.27 in^2 DIA = 1.270 in) AT SPACING (in) = 11.26
- 20 BARS #11 (AREA = 1.56 in^2 DIA = 1.410 in) AT SPACING (in) = 13.51
- 14 BARS #14 (AREA = 2.25 in^2 DIA = 1.693 in) AT SPACING (in) = 19.30

\*\*\* PRESSURE UNDER CAISSON DUE TO DESIGN AXIAL LOAD (psf) = 1074.3

Critical Depth and Shear is used to get the reinforce concrete shear capacity

## Drilled Pier Foundation

BU # :	842875
Site Name:	Windsorday Hill
Order Number:	538783 Rev. 1

TIA-222 Revision:	H
Tower Type:	Monopole

Applied Loads		Uplift
Comp.		
Moment (kip-ft)	5068.54	-
Axial Force (kips)	54.19	-
Shear Force (kips)	40.78	-

Material Properties	
Concrete Strength, f <sub>c</sub> :	3 ksi
Rebar Strength, F <sub>y</sub> :	60 ksi
Tie Yield Strength, F <sub>y</sub> :	40 ksi

Pier Design Data	
Depth	24 ft
Ext. Above Grade	0.5 ft
<b>Pier Section 1</b>	
<i>From 0.5 above grade to 24' below grade</i>	
Pier Diameter	8 ft
Rebar Quantity	24
Rebar Size	11
Clear Cover to Ties	4 in
Tie Size	5
Tie Spacing	18 in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

Report File: C:\Users\Bballada\Desktop\CNT-415 - 842875 - WINDSORDAY HILL\CNT-415 SA Analysis\C

Analysis Results		
Soil Lateral Check	Compression	Uplift
D <sub>v=0</sub> (ft from TOC)	8.73	-
Soil Safety Factor	3.91	-
Max Moment (kip-ft)	5384.27	-
Rating*	32.4%	-

Soil Vertical Check		
	Compression	Uplift
Skin Friction (kips)	1187.52	-
End Bearing (kips)	3015.93	-
Weight of Concrete (kips)	150.11	-
Total Capacity (kips)	4203.45	-
Axial (kips)	204.30	-
Rating*	4.6%	-

Reinforced Concrete Flexure		
	Compression	Uplift
Critical Depth (ft from TOC)	8.22	-
Critical Moment (kip-ft)	5382.22	-
Critical Moment Capacity	6989.32	-
Rating*	73.3%	-

Reinforced Concrete Shear		
	Compression	Uplift
Critical Depth (ft from TOC)	16.80	-
Critical Shear (kip)	627.50	-
Critical Shear Capacity	815.16	-
Rating*	73.3%	-

Soil Interaction Rating*	32.4%
Structural Foundation Rating*	73.3%

\*Rating per TIA-222-H Section 15.5

Soil Profile	
Groundwater Depth	5
# of Layers	5

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	V <sub>soil</sub> (pcf)	V <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	5	5	100	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	5	10	5	60	87.6	0	35	0.000	0.000	0.00	0.00			Cohesionless
3	10	15	5	55	87.6	0	33	0.000	0.000	0.00	0.00			Cohesionless
4	15	17	2	80	87.6	0	40	0.000	0.000	0.00	0.00			Cohesionless
5	17	24	7	95	87.6	20	0	9.000	9.000			80		Cohesive



### Check Limitation

Apply TIA-222-H Section 15.5:	N/A	<input checked="" type="checkbox"/>
-------------------------------	-----	-------------------------------------

### Shear Design Options

Check Shear along Depth of Pier:	<input checked="" type="checkbox"/>
Utilize Shear-Friction Methodology:	<input type="checkbox"/>
Override Critical Depth:	<input type="checkbox"/>

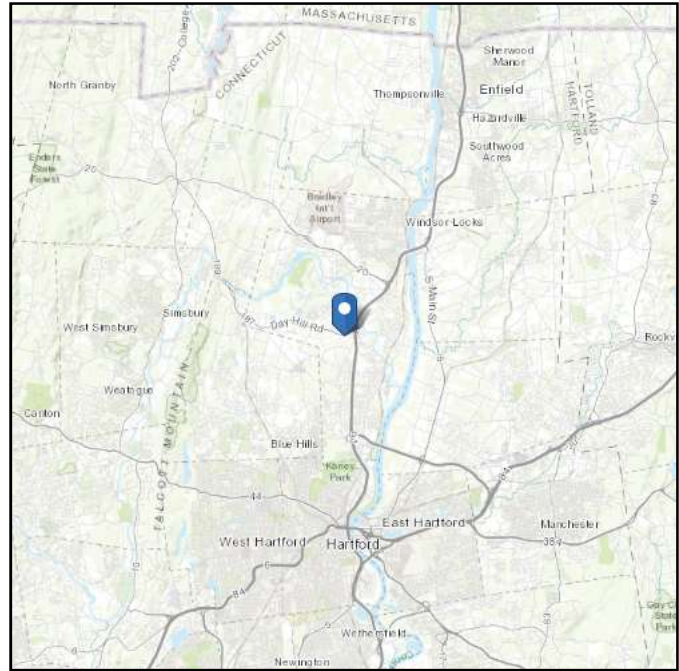
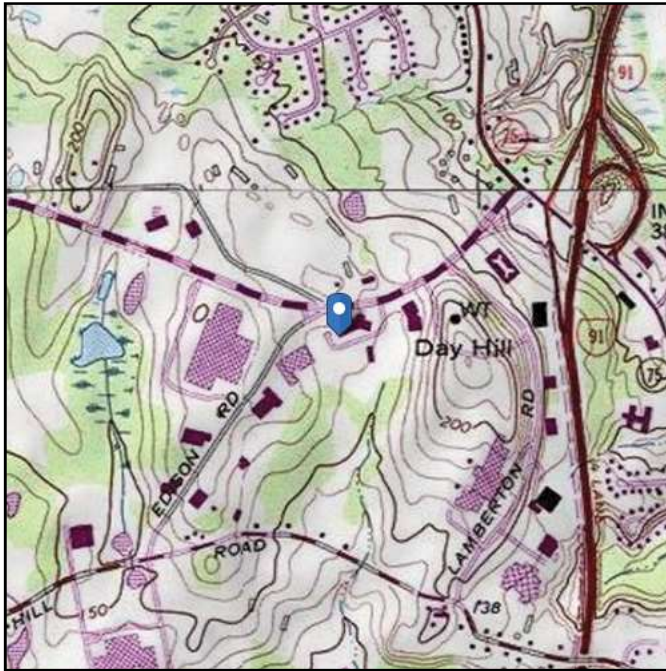
[Go to Soil Calculations](#)

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 166.35 ft (NAVD 88)  
**Latitude:** 41.871139  
**Longitude:** -72.671111



## Wind

### Results:

Wind Speed:	<b>121 Vmph</b>
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph

Ultimate wind speed of 125 mph is used as per the Windsor city exception

**Date Accessed:** 7/2/2021  
**ASCE/SEI 7-10** Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

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

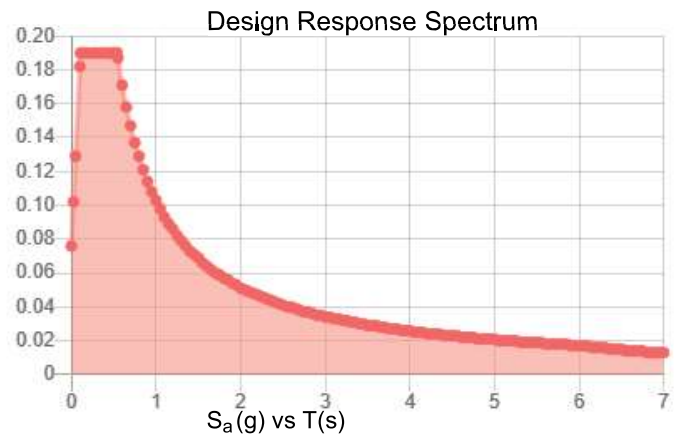
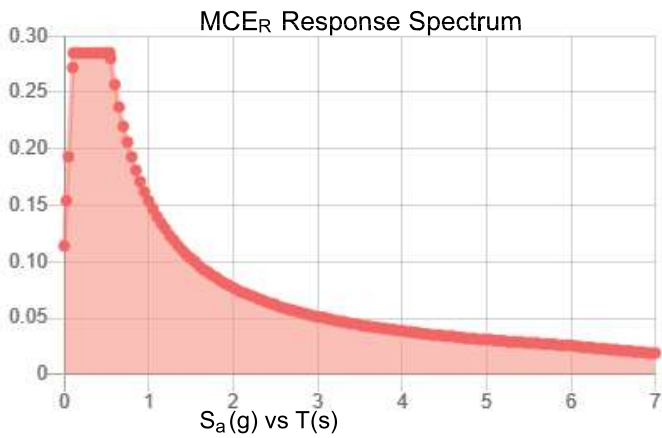
Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.178	$S_{DS}$ :	0.19
$S_1$ :	0.064	$S_{D1}$ :	0.103
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.089
$S_{MS}$ :	0.285	PGA <sub>M</sub> :	0.142
$S_{M1}$ :	0.154	$F_{PGA}$ :	1.6
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Tue Mar 02 2021

**Date Source:**

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

## Ice

---

**Results:**

Ice Thickness: 1.00 in. Design ice thickness = 1" x 2 = 2"  
Concurrent Temperature: 5 F  
Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Tue Mar 02 2021

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

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

---

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

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# Exhibit E

## **Mount Analysis**

Date: **February 3, 2021**

Darcy Tarr  
Crown Castle  
6325 Ardrey Kell Road, Suite 600  
Charlotte, NC 28277  
(704) 405-6589



**GPD Engineering and Architecture  
Professional Corporation**  
520 South Main Street, Suite 2531  
Akron, Ohio 44311  
(216) 927-8663  
CrownMA@gpdgroup.com

**Subject:** **Mount Analysis Report**

**Carrier Designation:** **Sprint PCS Loading Modification**  
**Carrier Site Number:** CTNH318A  
**Carrier Site Name:** CTNH318A

**Crown Castle Designation:** **Crown Castle BU Number:** 876361  
**Crown Castle Site Name:** SEYMOUR 2 / OXFORD TOWN GARAGE  
**Crown Castle JDE Job Number:** 628845  
**Crown Castle Order Number:** 538756 Rev. 0

**Engineering Firm Designation:** **GPD Report Designation:** 2021777.876361.01

**Site Data:** **20 Great Oak Rd., Oxford, New Haven County, CT 06478**  
**Latitude 41° 25' 34.91" Longitude -73° 8' 39.33"**

**Structure Information:** **Tower Height & Type:** **150.0 ft Monopole Tower**  
**Mount Elevation:** **150.0 ft**  
**Mount Type:** **10.7 ft Platform Mount**

Dear Darcy Tarr,

GPD is pleased to submit this “**Mount Analysis Report**” to determine the structural integrity of Sprint PCS’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 stress level. Based on our analysis we have determined the mount stress level to be:


**Platform Mount** **Sufficient – 42.3%\***  
\*The mount has sufficient capacity once the loading changes, as described in Section 4.1 Recommendations of this report, are completed.

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Mount analysis prepared by: Eric Nieto

Respectfully Submitted by:

Christopher J. Scheks, P.E.  
Connecticut #: 0030026



*Christopher J. Scheks*

2/3/2021



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Supplemental Drawings

**1) INTRODUCTION**

This is a 10.7' Platform Mount. Mount geometry was obtained from site photos and experience with similar mounts.

A proposed support rail designed by Site Pro 1 (Part #: HRK12-3HD, or engineer approved equivalent) has been assumed for the purpose of this analysis. In order for the analysis results to be valid, the proposed support rail shall be installed 36" above the existing channel horizontals. See Appendices A & E.

New mount pipes have been assumed for all positions (4 pipes per sector). In addition, it has been assumed that the new mount pipes attach to the proposed support rails, existing platform channels, and existing bottom face horizontals. See Appendix A.

**2) ANALYSIS CRITERIA**

**TIA-222 Revision:** TIA-222-H  
**Risk Category:** II  
**Ultimate Wind Speed:** 125 mph  
**Exposure Category:** B  
**Topographic Factor at Base:** 1  
**Topographic Factor at Mount:** 1  
**Ice Thickness:** 1.5 in  
**Wind Speed with Ice:** 50 mph  
**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	Antenna Manufacturer	Antenna Model	Mount Details
150.0	150.0	3	Ericsson	AIR6449 B41_T-MOBILE	10.7 ft. Platform Mount
		3	RFS/Celwave	APX16DWV-16DWV-S-E-A20	
		3	RFS/Celwave	APXVAALL24_43-U-NA20_TMO	
		3	Ericsson	RADIO 4415 B66A_CCIV3	
		3	Ericsson	RADIO 4424 B25_TMO	
		3	Ericsson	RADIO 4449 B71 B85A_T-MOBILE	

**3) ANALYSIS PROCEDURE**

**Table 2 - Documents Provided**

Document	Remarks	Reference	Source
CCI Application	Crown Order Number 538756 Rev. 0	-	CCI
RF Data Sheet	Site ID: CTNH318A, Draft Rev. 1, dated 1/11/2021	-	CCI
Support Rail Design	Site Pro 1 DWG #: HRK12-3HD, dated 4/7/2015	-	Site Pro 1

### 3.1) Analysis Method

RISA-3D Edition (Version 17.0.2), 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 GPD, using Microsoft Excel, was used to calculate wind loading on all appurtenances, dishes, and mount members for various load cases. Selected output from the analysis is included in Appendix B.

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

### 3.2) Assumptions

- 1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
- 2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
- 3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
- 4) This analysis assumes all information reference in Table 2 is current and correct.
- 5) The mount was modeled from site photos. Member information and dimensions not provided have been assumed based on previous experience with similar mounts. No guarantee can be made as to the accuracy of these assumptions without a complete mount mapping.
- 6) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle	ASTM A36 (GR 36)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. GPD 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	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,3	Platform Channels	M83	150.0	35.8	Pass
	Platform Inner Bracing	M2		29.3	Pass
	Bottom Face Horizontal	M36		13.0	Pass
	Pipe Mount	C2		31.0	Pass
	Ladder Support Bracing	M94		27.9	Pass
	Support Rail	M71		9.8	Pass
	Support Rail Corner Pipe	M80		2.1	Pass
	Support Rail Corner Angle	M77		18.9	Pass
2,3	Mount to Tower Connection	-		42.3	Pass

<b>Structure Rating (max from all components) =</b>	<b>42.3%<sup>3</sup></b>
-----------------------------------------------------	--------------------------

Notes:

- 1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
- 2) See additional documentation in "Appendix D - Additional Calculations" for calculations supporting the % capacity consumed.
- 3) Ratings per TIA-222-H section 15.5.

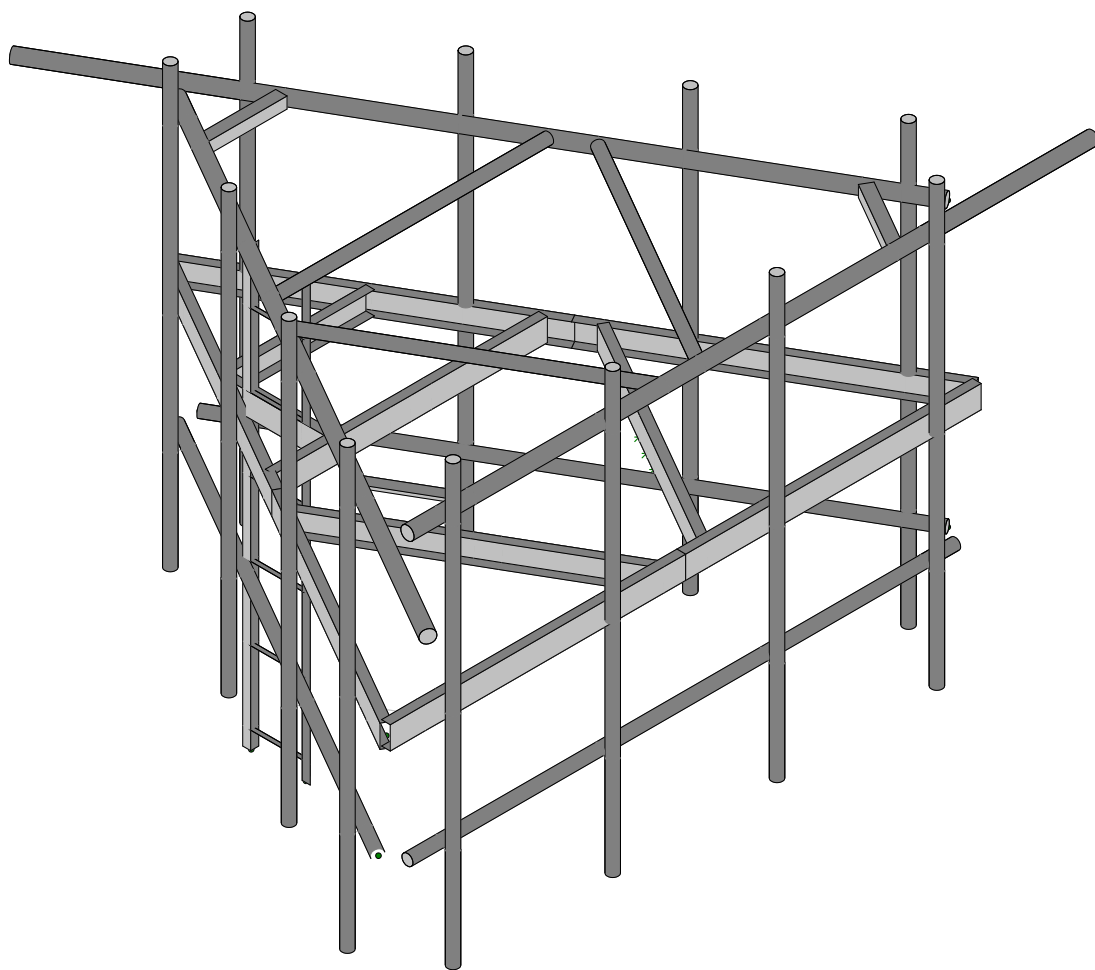
**4.1) Recommendations**

The mount has sufficient capacity to carry the proposed loading configuration. In order for the results of the analysis to be considered valid, the loading modification listed below must be completed.

1. Install a support rail designed by Site Pro 1 (Part #: HRK12-3HD, or engineer approved equivalent) 36" above the existing channel horizontals. See Appendices A & E.

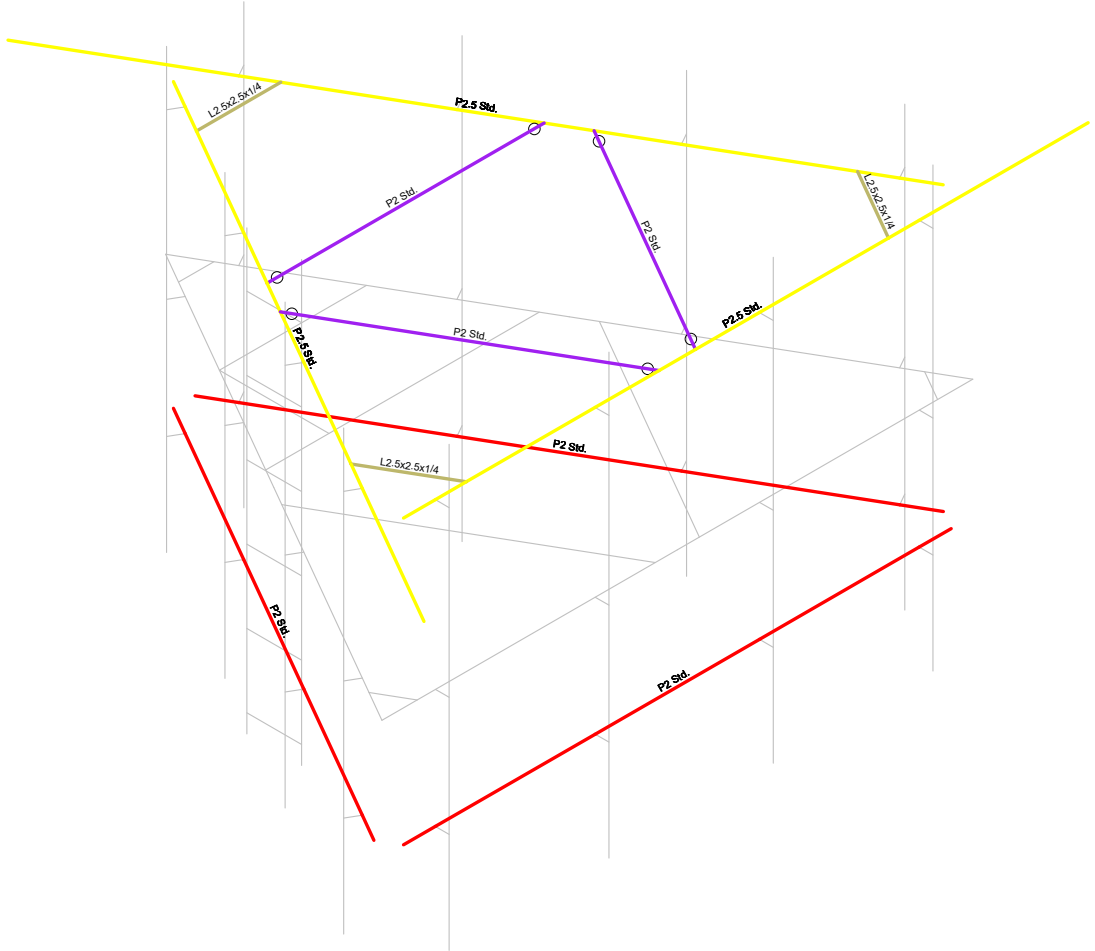
No structural modifications are required at this time, provided that the above-listed changes are implemented.

**APPENDIX A**  
**WIRE FRAME AND RENDERED MODELS**



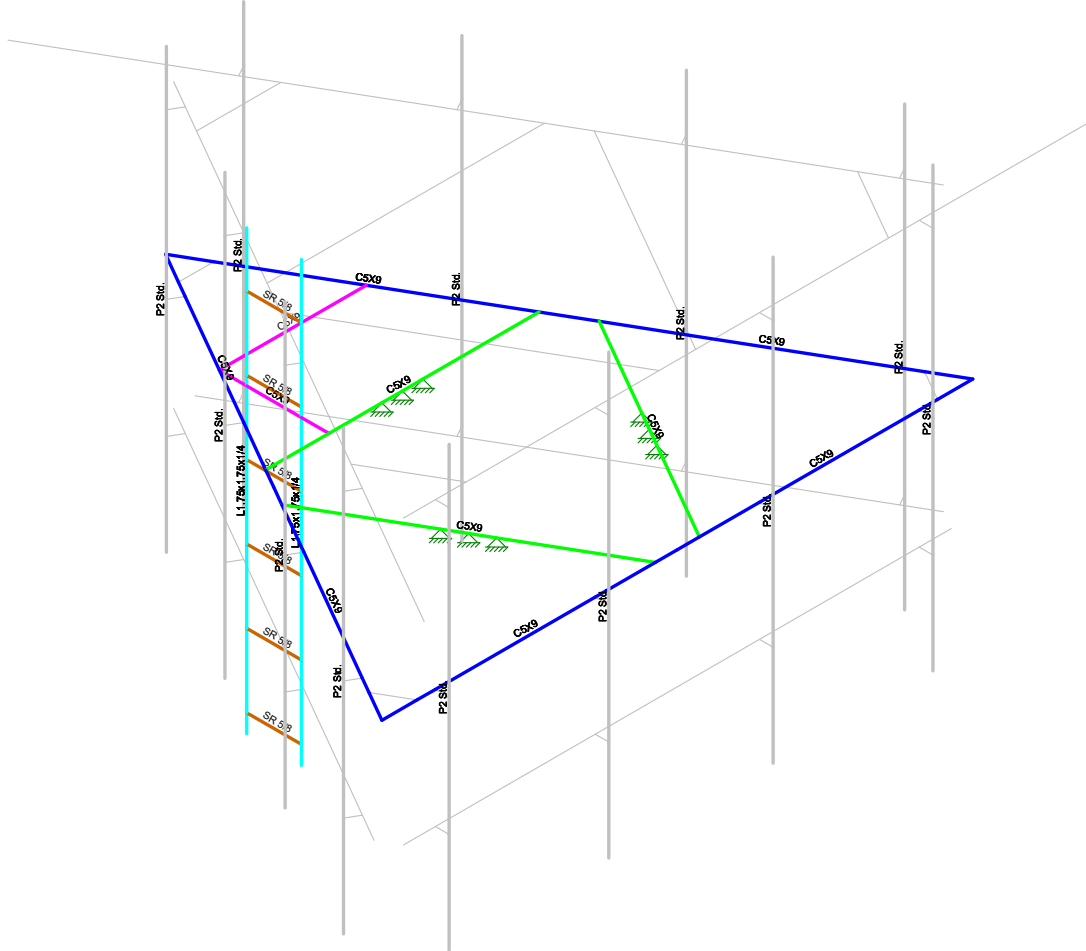


Section Sets	
Blue	Platform Channels
Green	Platform Inner Bracing
Red	Bottom Face Horizontal
Grey	Pipe Mount
Purple	Ladder Support Bracing
Cyan	Ladder Rail
Orange	Ladder Rung
Yellow	Support Rail
Light Purple	Support Rail Corner Pipe
Light Green	Support Rail Corner Angle
Dark Green	RIGID

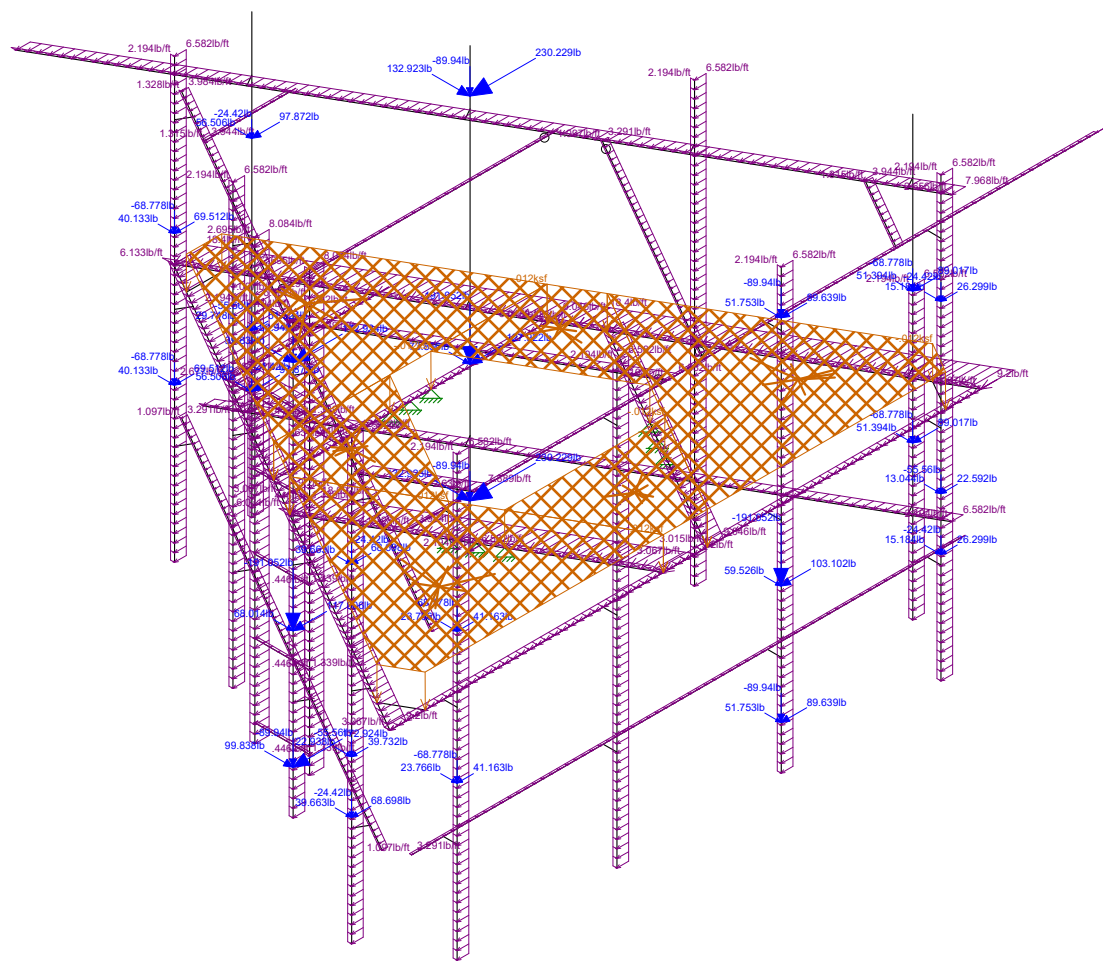




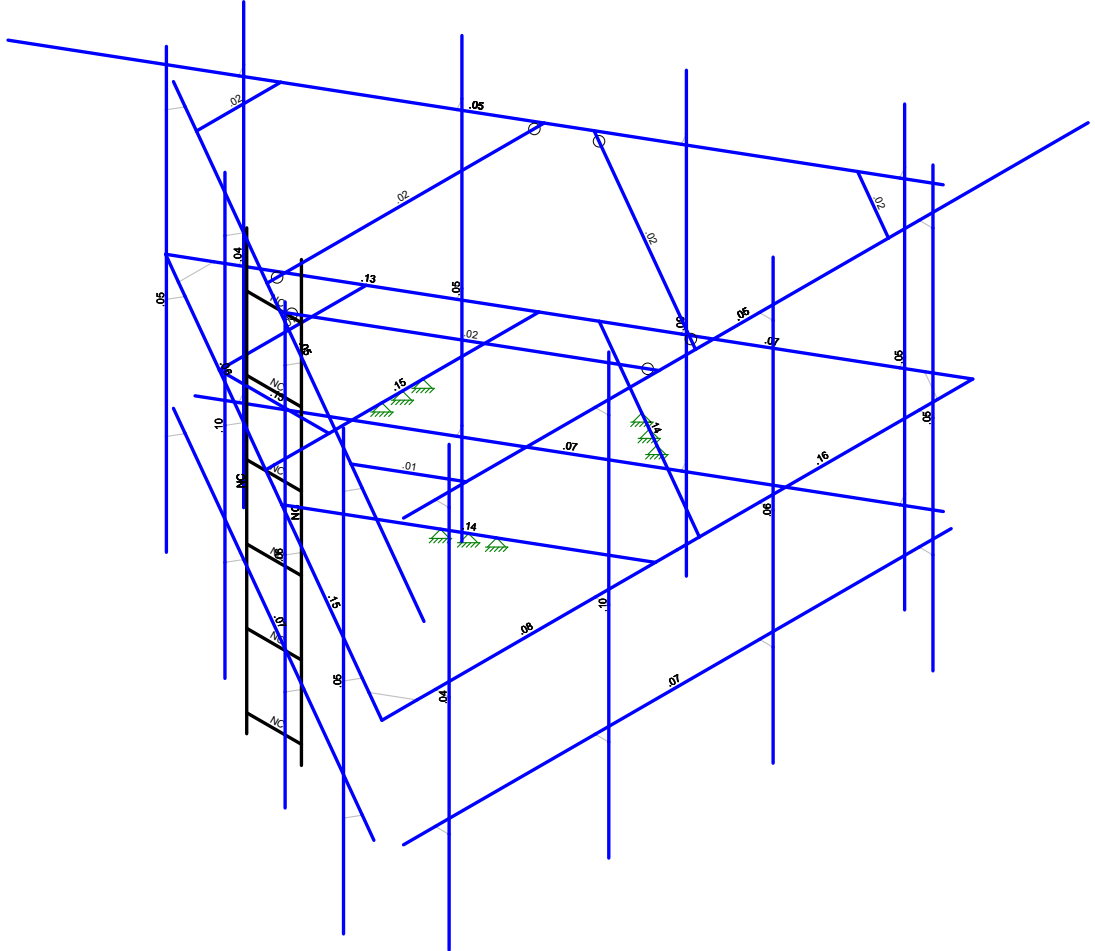
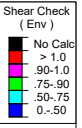
- Section Sets
- Platform Channels
  - Platform Inner Bracing
  - Bottom Face Horizontal
  - Pipe Mount
  - Ladder Support Bracing
  - Ladder Rail
  - Ladder Rung
  - Support Rail
  - Support Rail Corner Pipe
  - Support Rail Corner Angle
  - RIGID











**APPENDIX B**  
**SOFTWARE INPUT CALCULATIONS**



Structure Information		
Structure Type:	Monopole	
Structure Height:	150	ft
z (Mount Centerline) =	150	ft
Gh (Mount Gust Effect Factor) =	1.00	
Risk Category:	II	

Code Specifications		
TIA/EIA Code:	H	
Ultimate Wind Speed (No Ice) =	125	mph (3-s gust)
Ultimate Wind Speed (With Ice) =	50	mph (3-s gust)
Ice Thickness	1.5	in
Exposure Category	B	
Tower Base Elevation (AMSL)	734	ft

Topographic Inputs	
Topographic Feature:	N/A

Section Sets										No Ice		Ice Output	
Mount Components	Member Type	Length (in)	Side (Longest seeing wind) (in)	Other Side (in)	Calculated Dc, for ice weight (in)	Dc, for ice weight (in)	Area Type (Round or Flat)	K <sub>s</sub>	User's Wind Multiplier	Normal Wind Force (lb/ft)*	Normal Ice Wind Force (lb/ft)*	Ice Weight (lb/ft)*	
Platform Channels	Square/Rect.	64.000	5	1.89		5.35	Flat	0.90	1.00	27.26	5.43	15.12	
Platform Inner Bracing	Square/Rect.	60.000	5	1.89		5.35	Flat	0.90	1.00	26.80	5.37	15.12	
Bottom Face Horizontal	Pipe	120.000	2.375	2.375		2.38	Round	0.90	1.00	9.75	3.53	8.79	
Pipe Mount	Pipe	96.000	2.375	2.375		2.38	Round	0.90	1.00	9.75	3.24	8.79	
Ladder Support Bracing	Square/Rect.	34.000	5	1.89		5.35	Flat	0.90	1.00	23.80	4.87	15.12	
Ladder Rail	Angle	96.000	1.75	1.75		2.47	Flat	0.90	1.00	11.98	3.71	9.00	
Ladder Rung	Pipe	12.000	0.625	0.625		0.63	Round	0.90	1.00	2.29	1.60	5.05	
Support Rail	Pipe	150.000	2.875	2.875		2.88	Round	0.90	1.00	11.80	4.07	9.85	
Support Rail Corner Pipe	Pipe	72.000	2.375	2.375		2.38	Round	0.90	1.00	9.75	2.95	8.79	
Support Rail Corner Angle	Angle	15.600	2.5	2.5		3.54	Flat	0.90	1.00	11.69	2.99	11.26	

\*All forces are unfactored.

Appurtenances							Shielding			No Ice		Ice Output	
Appurtenance Model	Loading Elevation (ft)	Height (in)	Front Width (in)	Side Depth (in)	Wt (lbs)	Type for Area	Front Shielding (%)	Side Shielding (%)	K <sub>s</sub> and/or block shielding	Normal Wind Force (lbs)*	Wt (lbs) (no ice)*	Normal Wind Force (lbs) (w/ ice)*	Wt (lbs) (only ice)*
(3) AIR6449 B41_T-MOBILE	150	33.11	20.51	8.54	114.63	Flat	0%	0%	0.90	209.12	114.63	39.19	154.53
(3) APX16DWV-16DWV-S-E-A20	150	55.9	13.3	3.15	40.7	CFD	0%	0%	0.90	231.33	40.70	49.66	140.69
(3) APXVAALL24_43-U-NA20_TMO	150	95.9	24	8.5	149.9	CFD	0%	0%	0.90	542.11	149.90	102.89	431.04
(3) RADIO 4415 B66A_CCIV3	150	14.9	13.2	5.4	46.3	Flat	0%	0%	0.90	60.57	46.30	12.86	54.02
(3) RADIO 4424 B25_TMO	150	17.1	14.4	11.3	86	Flat	0%	0%	0.90	75.83	86.00	15.64	86.39
(3) RADIO 4449 B71 B85A_T-MOBILE	150	17.91	13.2	10.63	73.21	Flat	0%	0%	0.90	72.80	73.21	15.12	82.01

\*All forces are unfactored.

**APPENDIX C**  
**SOFTWARE ANALYSIS OUTPUT**



Company : GPD  
 Designer : Nieto, Eric  
 Job Number : 2021777.876361.01  
 Model Name : 876361 - SEYMOUR 2 / OXFORD TOWN GARAGE

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### Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (1E5 F)	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Desig... A [in2]	Iyy [i... lzz [i... J [in4]
1	Platform Channels	C5X9	None	None	A36 Gr.36	Typical 2.64	.624 8.89 .109
2	Platform Inner Bracing	C5X9	None	None	A36 Gr.36	Typical 2.64	.624 8.89 .109
3	Bottom Face Horizontal	P2 Std.	None	None	A53 Gr.B	Typical 1.077	.67 .67 1.34
4	Pipe Mount	P2 Std.	None	None	A53 Gr.B	Typical 1.077	.67 .67 1.34
5	Ladder Support Bracing	C5X9	None	None	A36 Gr.36	Typical 2.64	.624 8.89 .109
6	Ladder Rail	L1.75x1.75x1/4	None	None	A36 Gr.36	Typical .813	.227 .227 .015
7	Ladder Rung	SR 5/8	None	None	A36 Gr.36	Typical .307	.007 .007 .015
8	Support Rail	P2.5 Std.	None	None	A53 Gr.B	Typical 1.707	1.538 1.538 3.076
9	Support Rail Corner Pipe	P2 Std.	None	None	A53 Gr.B	Typical 1.077	.67 .67 1.34
10	Support Rail Corner Ang...	L2.5x2.5x1/4	None	None	A36 Gr.36	Typical 1.188	.703 .703 .023

### Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(Member)	Surface(Plate/W...
1	Dead	DL			-1		30		6	
2	No Ice Wind 0 deg	None					30	36		
3	No Ice Wind 30 deg	None					60	72		
4	No Ice Wind 60 deg	None					60	86		
5	No Ice Wind 90 deg	None					30	35		
6	No Ice Wind 120 deg	None					60	86		
7	No Ice Wind 150 deg	None					60	72		
8	No Ice Wind 180 deg	None					30	36		
9	No Ice Wind 210 deg	None					60	72		
10	No Ice Wind 240 deg	None					60	86		
11	No Ice Wind 270 deg	None					30	35		
12	No Ice Wind 300 deg	None					60	86		
13	No Ice Wind 330 deg	None					60	72		
14	Ice Weight	None					30	43	6	
15	Ice Wind 0 deg	None					30	36		
16	Ice Wind 30 deg	None					60	72		
17	Ice Wind 60 deg	None					60	86		
18	Ice Wind 90 deg	None					30	35		
19	Ice Wind 120 deg	None					60	86		
20	Ice Wind 150 deg	None					60	72		
21	Ice Wind 180 deg	None					30	36		
22	Ice Wind 210 deg	None					60	72		
23	Ice Wind 240 deg	None					60	86		
24	Ice Wind 270 deg	None					30	35		
25	Ice Wind 300 deg	None					60	86		
26	Ice Wind 330 deg	None					60	72		
27	Live Load - A1	None					1			
28	Live Load - A2	None					1			
29	Live Load - A3	None					1			
30	Live Load - A4	None					1			



Company : GPD  
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**Basic Load Cases (Continued)**

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(Member)	Surface(Plate/W...
31	Live Load - B1	None					1			
32	Live Load - B2	None					1			
33	Live Load - B3	None					1			
34	Live Load - B4	None					1			
35	Live Load - C1	None					1			
36	Live Load - C2	None					1			
37	Live Load - C3	None					1			
38	Live Load - C4	None					1			
39	Live Load - M1 (Start)	None					1			
40	Live Load - M1 (Middle)	None					1			
41	Live Load - M1 (End)	None					1			
42	Live Load - M2 (Start)	None					1			
43	Live Load - M2 (Middle)	None					1			
44	Live Load - M2 (End)	None					1			
45	Live Load - M21 (Start)	None					1			
46	Live Load - M21 (Middle)	None					1			
47	Live Load - M21 (End)	None					1			
48	Live Load - M24A (Start)	None					1			
49	Live Load - M24A (Middle)	None					1			
50	Live Load - M24A (End)	None					1			
51	Live Load - M32 (Start)	None					1			
52	Live Load - M32 (Middle)	None					1			
53	Live Load - M32 (End)	None					1			
54	Live Load - M33 (Start)	None					1			
55	Live Load - M33 (Middle)	None					1			
56	Live Load - M33 (End)	None					1			
57	Live Load - M36 (Start)	None					1			
58	Live Load - M36 (Middle)	None					1			
59	Live Load - M36 (End)	None					1			
60	Live Load - M49 (Start)	None					1			
61	Live Load - M49 (Middle)	None					1			
62	Live Load - M49 (End)	None					1			
63	Live Load - M52 (Start)	None					1			
64	Live Load - M52 (Middle)	None					1			
65	Live Load - M52 (End)	None					1			
66	Live Load - M63 (Start)	None					1			
67	Live Load - M63 (Middle)	None					1			
68	Live Load - M63 (End)	None					1			
69	Live Load - M64 (Start)	None					1			
70	Live Load - M64 (Middle)	None					1			
71	Live Load - M64 (End)	None					1			
72	Live Load - M83 (Start)	None					1			
73	Live Load - M83 (Middle)	None					1			
74	Live Load - M83 (End)	None					1			
75	Live Load - M94 (Start)	None					1			
76	Live Load - M94 (Middle)	None					1			
77	Live Load - M94 (End)	None					1			
78	Live Load - M95 (Start)	None					1			
79	Live Load - M95 (Middle)	None					1			
80	Live Load - M95 (End)	None					1			
81	BLC 1 Transient Area Loads	None						83		
82	BLC 14 Transient Area Loads	None						83		













### Envelope Joint Reactions

Joint	X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC	
1	N7	m...989.102	3	6048.438	33	1280.709	15	0	223	0	223	0	223
2		min-1002.2...	14	613.239	87	-1301.801	2	0	1	0	1	0	1
3	N6	m...1426.722	15	-2209.433	25	3.392	11	0	223	0	223	0	223
4		min-1429.2...	2	-8839.022	31	-3.392	18	0	1	0	1	0	1
5	N5	m...1133.969	24	6527.59	31	2110.636	6	0	223	0	223	0	223
6		min-1119.4...	13	731.927	181	-2092.022	19	0	1	0	1	0	1
7	N62	m...1830.828	3	5539.207	33	390.389	7	0	223	0	223	0	223
8		min-1868.4...	14	464.552	75	-434.057	18	0	1	0	1	0	1
9	N63	m...596.63	11	-2218.249	13	1059.434	22	0	223	0	223	0	223
10		min-613.32	22	-8309.796	37	-1030.526	11	0	1	0	1	0	1
11	N64	m...960.642	4	5933.044	37	1483.002	10	0	223	0	223	0	223
12		min-903.778	17	632.606	139	-1486.253	22	0	1	0	1	0	1
13	N119	m...1107.269	22	5464.107	27	1473.437	11	0	223	0	223	0	223
14		min-1055.8...	11	465.044	129	-1481.765	22	0	1	0	1	0	1
15	N120	m...664.226	21	-2210.608	17	1142.639	21	0	223	0	223	0	223
16		min-679.216	8	-8353.269	27	-1168.602	8	0	1	0	1	0	1
17	N121	m...1688.99	7	6100.181	29	702.052	10	0	223	0	223	0	223
18		min-1728.3...	18	640.389	47	-647.976	23	0	1	0	1	0	1
19	Totals:	m...4665.509	2	10024.752	29	4729.621	8						
20		min-4665.5...	15	2902.618	15	-4729.618	21						

### Envelope AISC 15th(360-16): LRFD Steel Code Checks

Member	Shape	Code Che...	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	Eqn	
1	M83	C5X9	.376	4.72	18	.061	5.394	y	35	3363..	85536	1.909	11.8...	H1-...
2	M21	C5X9	.335	4.72	14	.072	5.394	y	28	3363..	85536	1.909	11.8...	H1-...
3	M52	C5X9	.331	4.72	22	.076	5.394	y	32	3363..	85536	1.909	11.8...	H1-...
4	C2	P2 Std.	.326	48	18	.051	48		20	3724..	3392..	2.006	2.006	H1-...
5	B2	P2 Std.	.324	48	10	.058	48		10	3724..	3392..	2.006	2.006	H1-...
6	A2	P2 Std.	.312	47	2	.063	48		2	3724..	3392..	2.006	2.006	H1-...
7	M2	C5X9	.308	34.948	26	.145	34.324	y	31	3845..	85536	1.909	11.8...	H1-...
8	C1	P2 Std.	.305	48	18	.045	48		18	3724..	3392..	2.006	2.006	H1-...
9	M64	C5X9	.304	25.587	28	.145	25.587	y	29	3845..	85536	1.909	11.8...	H1-...
10	M33	C5X9	.298	25.587	36	.141	25.587	y	37	3845..	85536	1.909	11.8...	H1-...
11	M94	C5X9	.293	24	8	.154	6	z	20	7523..	85536	1.909	11.8...	H1-...
12	B1	P2 Std.	.285	48	22	.050	48		10	3724..	3392..	2.006	2.006	H1-...
13	A1	P2 Std.	.285	48	14	.052	48		2	3724..	3392..	2.006	2.006	H1-...
14	M63	C5X9	.282	60.012	14	.150	11.463	z	11	3363..	85536	1.909	11.8...	H1-...
15	M32	C5X9	.256	60.012	6	.157	11.463	z	14	3363..	85536	1.909	11.8...	H1-...
16	B3	P2 Std.	.249	48	8	.096	48		8	3724..	3392..	2.006	2.006	H1-...
17	C3	P2 Std.	.247	48	18	.090	48		16	3724..	3392..	2.006	2.006	H1-...
18	M1	C5X9	.246	60.012	20	.131	11.463	z	6	3363..	85536	1.909	11.8...	H1-...
19	A3	P2 Std.	.237	48	2	.096	48		24	3724..	3392..	2.006	2.006	H1-...
20	M77	L2.5x2.5x1/4	.198	18.483	18	.020	0	y	20	3571..	38475	1.145	2.565	H2-1
21	C4	P2 Std.	.187	48	33	.047	48		29	3724..	3392..	2.006	2.006	H1-...
22	M78	L2.5x2.5x1/4	.183	18.483	2	.016	0	y	2	3571..	38475	1.145	2.565	H2-1
23	B4	P2 Std.	.182	48	8	.050	48		29	3724..	3392..	2.006	2.006	H1-...
24	A4	P2 Std.	.172	48	24	.043	48		24	3724..	3392..	2.006	2.006	H1-...
25	M79	L2.5x2.5x1/4	.169	18.483	10	.014	0	y	10	3571..	38475	1.145	2.565	H2-1
26	M36	P2 Std.	.136	41.25	26	.071	42.5		10	1051..	3392..	2.006	2.006	H1-...
27	M49	P2 Std.	.128	41.25	32	.074	42.5		18	1051..	3392..	2.006	2.006	H1-...
28	M24A	P2 Std.	.115	41.25	36	.070	42.5		2	1051..	3392..	2.006	2.006	H1-...
29	M95	C5X9	.104	0	8	.013	10.062	y	222	6790..	85536	1.909	11.8...	H1-...
30	M71	P2.5 Std.	.103	40.625	34	.046	40.625		30	1544..	5377..	3.827	3.827	H1-...
31	M76	P2.5 Std.	.092	40.625	26	.048	104.6...		18	1544..	5377..	3.827	3.827	H1-...



Company : GPD  
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 Job Number : 2021777.876361.01  
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**Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)**

Member	Shape	Code Che...	Loc[in]	LC	Shear Che...	Loc[in]	Dir	LC	phi*...	phi*...	phi*...	phi*...	Eqn
32	M66	P2.5 Std.	.085	40.625	30	.045	104.6...	2	1544...	5377...	3.827	3.827	...H1-...
33	M80	P2 Std.	.022	30.366	26	.019	60.732	8	2504...	3392...	2.006	2.006	...H1-...
34	M82A	P2 Std.	.022	30.366	28	.018	60.732	24	2504...	3392...	2.006	2.006	...H1-...
35	M81	P2 Std.	.022	30.366	36	.018	60.732	16	2504...	3392...	2.006	2.006	...H1-...

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

Member	Shape	Code Check Actual	Code Check Allowable	Ratio (Act./Allow.)	Loc[in]	LC	Shear Check	Shear Check Allowable	Ratio (Act./Allow.)	Loc[in]	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Egn	
1	M83	C5X9	0.376	1.05	0.358*	4.72	18	0.061	1.05	0.058*	5.394	33638.136	85536	1.909	11.853	1.767	H1-1b
2	M21	C5X9	0.335	1.05	0.319*	4.72	14	0.072	1.05	0.069*	5.394	33638.135	85536	1.909	11.853	2.606	H1-1b
3	M52	C5X9	0.331	1.05	0.315*	4.72	22	0.076	1.05	0.072*	5.394	33638.135	85536	1.909	11.853	2.617	H1-1b
4	C2	P2 Std.	0.326	1.05	0.31*	48	18	0.051	1.05	0.049*	48	3724.205	33925.5	2.006	2.006	1.628	H1-1b
5	B2	P2 Std.	0.324	1.05	0.309*	48	10	0.058	1.05	0.055*	48	3724.205	33925.5	2.006	2.006	1.658	H1-1b
6	A2	P2 Std.	0.312	1.05	0.297*	47	2	0.063	1.05	0.06*	48	3724.205	33925.5	2.006	2.006	1.627	H1-1b
7	M2	C5X9	0.308	1.05	0.293*	34.95	26	0.145	1.05	0.138*	34.32	38455.723	85536	1.909	11.853	1.623	H1-1b
8	C1	P2 Std.	0.305	1.05	0.29*	48	18	0.045	1.05	0.043*	48	3724.205	33925.5	2.006	2.006	1.647	H1-1b
9	M64	C5X9	0.304	1.05	0.29*	25.59	28	0.145	1.05	0.138*	25.59	38455.723	85536	1.909	11.853	1.587	H1-1b
10	M33	C5X9	0.298	1.05	0.284*	25.59	36	0.141	1.05	0.134*	25.59	38455.722	85536	1.909	11.853	1.575	H1-1b
11	M94	C5X9	0.293	1.05	0.279*	24	8	0.154	1.05	0.147*	6	75237.284	85536	1.909	11.853	1.762	H1-1b
12	B1	P2 Std.	0.285	1.05	0.271*	48	22	0.05	1.05	0.048*	48	3724.205	33925.5	2.006	2.006	1.664	H1-1b
13	A1	P2 Std.	0.285	1.05	0.271*	48	14	0.052	1.05	0.05*	48	3724.205	33925.5	2.006	2.006	1.792	H1-1b
14	M63	C5X9	0.282	1.05	0.269*	60.01	14	0.15	1.05	0.143*	11.46	33638.135	85536	1.909	11.853	3.769	H1-1b
15	M32	C5X9	0.256	1.05	0.244*	60.01	6	0.157	1.05	0.15*	11.46	33638.136	85536	1.909	11.853	3.858	H1-1b
16	B3	P2 Std.	0.249	1.05	0.237*	48	8	0.096	1.05	0.091*	48	3724.205	33925.5	2.006	2.006	1.355	H1-1b
17	C3	P2 Std.	0.247	1.05	0.235*	48	18	0.09	1.05	0.086*	48	3724.205	33925.5	2.006	2.006	1.697	H1-1b
18	M1	C5X9	0.246	1.05	0.234*	60.01	20	0.131	1.05	0.125*	11.46	33638.135	85536	1.909	11.853	3.814	H1-1b
19	A3	P2 Std.	0.237	1.05	0.226*	48	2	0.096	1.05	0.091*	48	3724.205	33925.5	2.006	2.006	1.674	H1-1b
20	M77	L2.5x2.5x1/4	0.198	1.05	0.189*	18.48	18	0.02	1.05	0.019*	0	35714.243	38475	1.145	2.565	1.773	H2-1
21	C4	P2 Std.	0.187	1.05	0.178*	48	33	0.047	1.05	0.045*	48	3724.205	33925.5	2.006	2.006	1.53	H1-1b
22	M78	L2.5x2.5x1/4	0.183	1.05	0.174*	18.48	2	0.016	1.05	0.015*	0	35714.243	38475	1.145	2.565	1.822	H2-1
23	B4	P2 Std.	0.182	1.05	0.173*	48	8	0.05	1.05	0.048*	48	3724.205	33925.5	2.006	2.006	1.701	H1-1b
24	A4	P2 Std.	0.172	1.05	0.164*	48	24	0.043	1.05	0.041*	48	3724.205	33925.5	2.006	2.006	1.562	H1-1b
25	M79	L2.5x2.5x1/4	0.169	1.05	0.161*	18.48	10	0.014	1.05	0.013*	0	35714.243	38475	1.145	2.565	1.755	H2-1
26	M36	P2 Std.	0.136	1.05	0.13*	41.25	26	0.071	1.05	0.068*	42.5	10511.197	33925.5	2.006	2.006	2.869	H1-1b
27	M49	P2 Std.	0.128	1.05	0.122*	41.25	32	0.074	1.05	0.07*	42.5	10511.197	33925.5	2.006	2.006	2.822	H1-1b
28	M24A	P2 Std.	0.115	1.05	0.11*	41.25	36	0.07	1.05	0.067*	42.5	10511.197	33925.5	2.006	2.006	2.908	H1-1b
29	M95	C5X9	0.104	1.05	0.099*	0	8	0.013	1.05	0.012*	10.06	67900.01	85536	1.909	11.853	1.895	H1-1b
30	M71	P2.5 Std.	0.103	1.05	0.098*	40.63	34	0.046	1.05	0.044*	40.63	15442.36	53770.5	3.827	3.827	2.058	H1-1b
31	M76	P2.5 Std.	0.092	1.05	0.088*	40.63	26	0.048	1.05	0.046*	104.7	15442.36	53770.5	3.827	3.827	1.91	H1-1b
32	M66	P2.5 Std.	0.085	1.05	0.081*	40.63	30	0.045	1.05	0.043*	104.7	15442.36	53770.5	3.827	3.827	2.106	H1-1b
33	M80	P2 Std.	0.022	1.05	0.021*	30.37	26	0.019	1.05	0.018*	60.73	25045.859	33925.5	2.006	2.006	1.136	H1-1b
34	M82A	P2 Std.	0.022	1.05	0.021*	30.37	28	0.018	1.05	0.017*	60.73	25045.859	33925.5	2.006	2.006	1.136	H1-1b
35	M81	P2 Std.	0.022	1.05	0.021*	30.37	36	0.018	1.05	0.017*	60.73	25045.859	33925.5	2.006	2.006	1.136	H1-1b

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

**APPENDIX D**  
**ADDITIONAL CALCULATIONS**





**TIA-222-H CONNECTION CHECK**  
**Mount to Tower Connection - Typ. All Sectors**  
**2021777.876361.01**

<b>Bolt Information</b>	
Bolt Diameter (d)	0.75 in
Net Tensile Area (A <sub>n</sub> )	0.334 in <sup>2</sup>
# of Bolts Total (n)	1
Bolt Grade	A325N
Bolt Tensile Strength (F <sub>ub</sub> )	120 ksi

<b>RISA 3D Reactions</b>	
Moment (M)	0.00 k-ft
Axial (T)	0.30 kips
Shear (V)	8.84 kips

<b>Bolt Capacity</b>	
Nominal Tensile Strength (R <sub>nt</sub> )	40.135 kips
Nominal Shear Strength (R <sub>nv</sub> )	26.51 kips
Bolt Tensile Force (T <sub>ub</sub> )	0.30 kips
Bolt Shear Force (V <sub>ub</sub> )	8.839 kips
$T_{ub}/\phi R_{nt}$	0.00960
$V_{ub}/\phi R_{nv}$	0.42344
$(V_{ub}/\phi R_{nv})^2 + (T_{ub}/\phi R_{nt})^2$	0.18836
<b>Bolt Capacity =</b>	42.3% <b>OK</b>

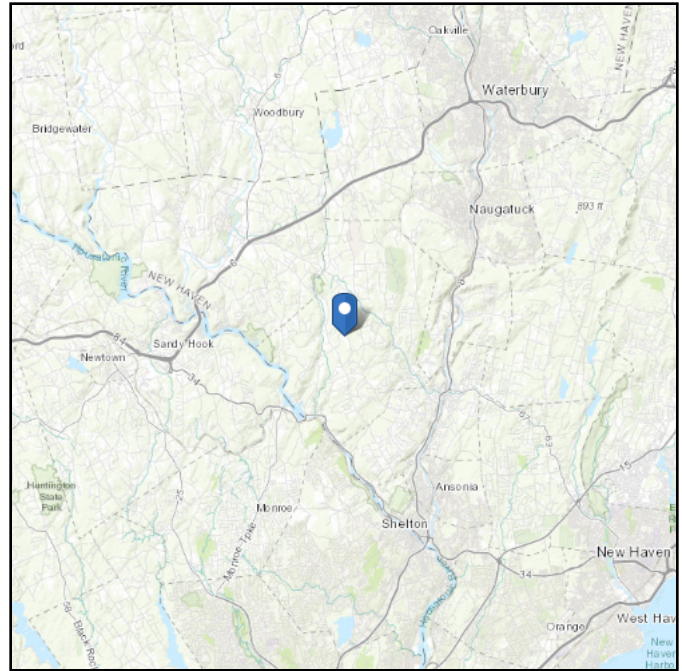
\*Rating per TIA-222-H, Section 15.5

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 734.07 ft (NAVD 88)  
**Latitude:** 41.426364  
**Longitude:** -73.144258



## Wind

### Results:

Wind Speed:	<del>121 Vmph</del>	<b>125 Vmph per 2018 Connecticut Building Code Appendix N</b>
10-year MRI	76 Vmph	
25-year MRI	86 Vmph	
50-year MRI	92 Vmph	
100-year MRI	98 Vmph	

**Data Source:** ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

**Date Accessed:** Tue Feb 02 2021

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

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

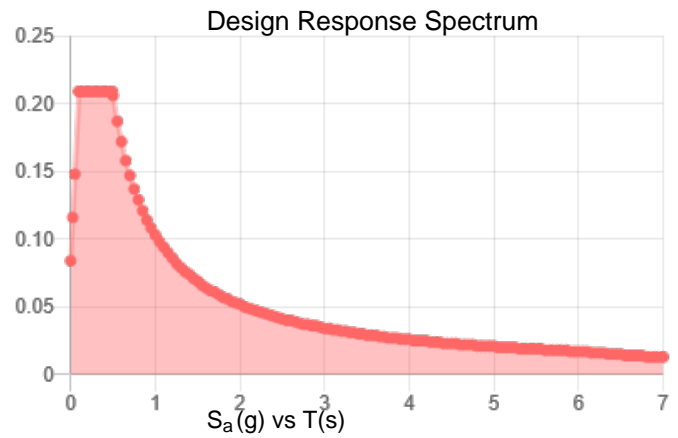
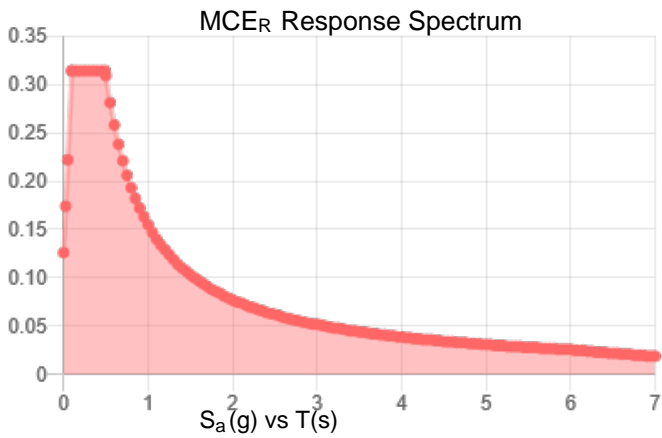
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

**Site Soil Class:** D - Stiff Soil

**Results:**

$S_s$ :	0.196	$S_{DS}$ :	0.209
$S_1$ :	0.064	$S_{D1}$ :	0.103
$F_a$ :	1.6	$T_L$ :	6
$F_v$ :	2.4	PGA :	0.104
$S_{MS}$ :	0.314	PGA <sub>M</sub> :	0.165
$S_{M1}$ :	0.155	F <sub>PGA</sub> :	1.592
		$I_e$ :	1

**Seismic Design Category** B



**Data Accessed:**

Tue Feb 02 2021

**Date Source:**

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

## Ice

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**Results:**

Ice Thickness: 0.75 in.

Concurrent Temperature: 15 F

Gust Speed: 50 mph

**Data Source:** Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

**Date Accessed:** Tue Feb 02 2021

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

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

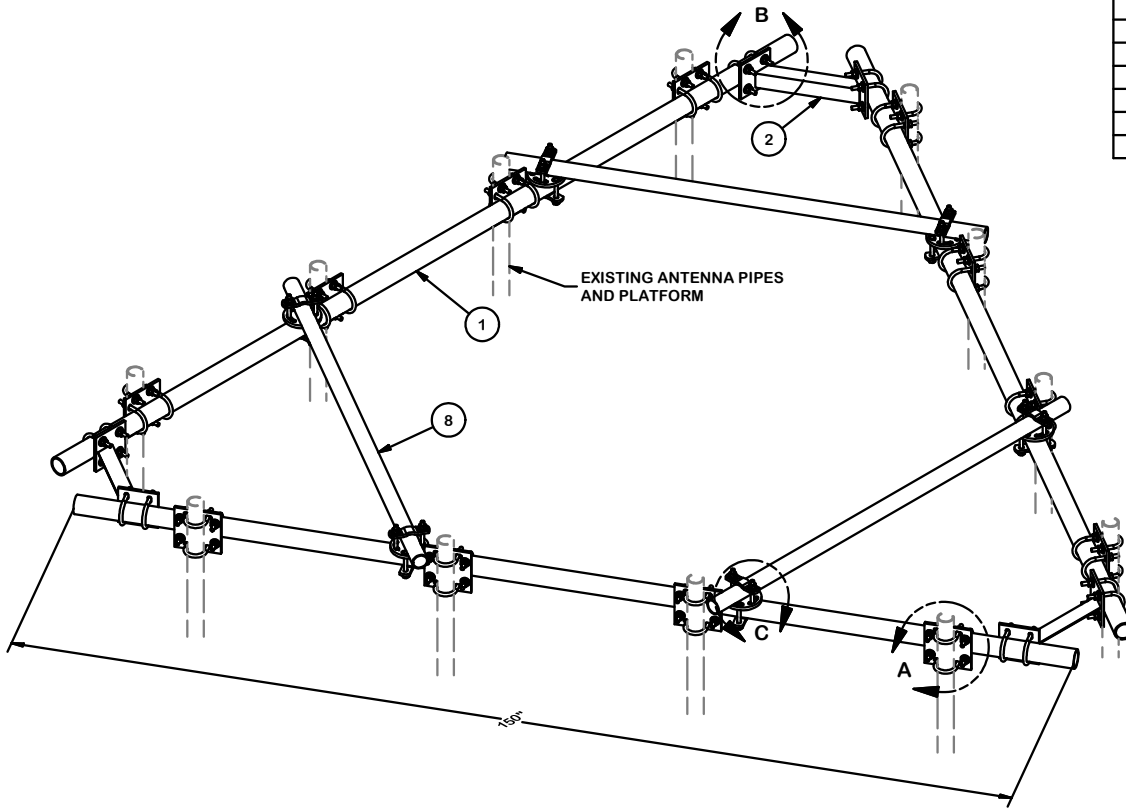
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The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained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

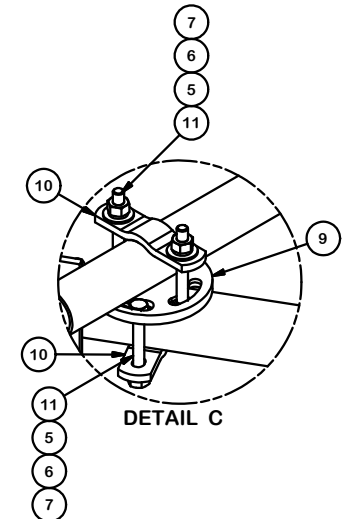
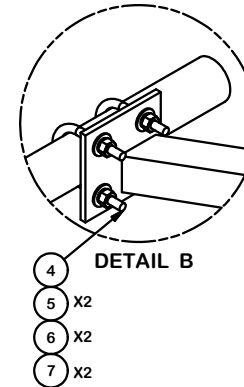
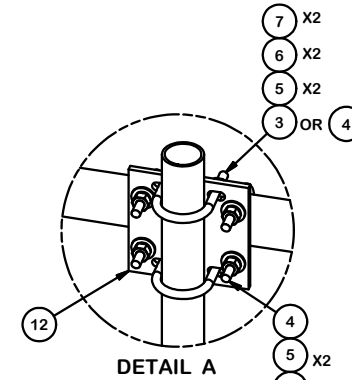
ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

**APPENDIX E**  
**SUPPLEMENTAL DRAWINGS**



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P30150	2-7/8" O.D. X 150" SCH. 40 PIPE	150 in	76.94	230.81
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	24	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.73	17.56
4	60	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.73	43.90
5	144	G12FW	1/2" HDG USS FLATWASHER		0.03	4.91
6	144	G12LW	1/2" HDG LOCKWASHER		0.01	2.00
7	144	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	10.31
8	3	P272	2-3/8" X 72" SCH 40 GALVANIZED PIPE	72 in	23.07	69.20
9	6	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALVANIZED)		2.48	14.90
10	12	X-100064	CLAMP (S) (4" V-CLAMP) GALVANIZED		0.91	10.95
11	24	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	6.48
12	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
					<b>TOTAL WT. #</b>	<b>502.34</b>



**TOLERANCE NOTES**

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:  
 SAWED, SHEARED AND GAS CUT EDGES ( $\pm 0.030"$ )  
 DRILLED AND GAS CUT HOLES ( $\pm 0.030"$ ) - NO CONING OF HOLES  
 LASER CUT EDGES AND HOLES ( $\pm 0.010"$ ) - NO CONING OF HOLES  
 BENDS ARE  $\pm 1/2$  DEGREE  
 ALL OTHER MACHINING ( $\pm 0.030"$ )  
 ALL OTHER ASSEMBLY ( $\pm 0.060"$ )

PROPRIETARY NOTE:  
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION  
 HEAVY DUTY HANDRAIL KIT  
 FOR 12' PLATFORMS WITH  
 2-7/8" HANDRAIL PIPES



Engineering Support Team:  
 1-888-753-7446

Locations:  
 New York, NY  
 Atlanta, GA  
 Los Angeles, CA  
 Plymouth, IN  
 Salem, OR  
 Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL
CLASS	DRAWING USAGE	CHECKED BY
81	01	CUSTOMER
		BMC 4/7/2015

PART NO.	HRK12-3HD	PAGE
DWG. NO.	HRK12-3HD	1 OF 1

# Exhibit F

## **Power Density/RF Emissions Report**

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

**T-Mobile Existing Facility**

**Site ID: CTHA267A**

**99 Day Hill Road  
Windsor, Connecticut 06095**

**April 6, 2021**

**EBI Project Number: 6221001639**

<b>Site Compliance Summary</b>	
Compliance Status:	<b>COMPLIANT</b>
Site total MPE% of FCC general population allowable limit:	<b>17.38%</b>



April 6, 2021

T-Mobile

Attn: Jason Overbey, RF Manager  
35 Griffin Road South  
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTHA267A

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **99 Day Hill Road in Windsor, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately  $400 \mu\text{W}/\text{cm}^2$  and  $467 \mu\text{W}/\text{cm}^2$ , respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is  $1000 \mu\text{W}/\text{cm}^2$ . 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 T-Mobile Wireless antenna facility located at 99 Day Hill Road in Windsor, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile 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 10 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 power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

- 1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.
- 3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 5) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

- 6) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 7) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 8) 1 NR channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.
- 9) 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.
- 10) 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 10 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.
- 11) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 2100 MHz channel(s), the RFS APXVAALL24\_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 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 10 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.

- 12) The antenna mounting height centerline of the proposed antennas is 131 feet above ground level (AGL).
- 13) 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.
- 14) All calculations were done with respect to uncontrolled / general population threshold limits.

## T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz	Frequency Bands:	2100 MHz
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	131 feet	Height (AGL):	131 feet	Height (AGL):	131 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts	Total TX Power (W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna AI MPE %:	1.07%	Antenna BI MPE %:	1.07%	Antenna CI MPE %:	1.07%
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd
Height (AGL):	131 feet	Height (AGL):	131 feet	Height (AGL):	131 feet
Channel Count:	11	Channel Count:	11	Channel Count:	11
Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts	Total TX Power (W):	440 Watts
ERP (W):	12,569.87	ERP (W):	12,569.87	ERP (W):	12,569.87
Antenna A2 MPE %:	4.21%	Antenna B2 MPE %:	4.21%	Antenna C2 MPE %:	4.21%
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd	Gain:	17.3 dBd / 17.3 dBd
Height (AGL):	131 feet	Height (AGL):	131 feet	Height (AGL):	131 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	12,888.76	ERP (W):	12,888.76	ERP (W):	12,888.76
Antenna A3 MPE %:	2.97%	Antenna B3 MPE %:	2.97%	Antenna C3 MPE %:	2.97%

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	8.25%
Nextel	0.24%
Sprint	3.45%
Clearwire	0.08%
Metro PCS	0.94%
Bloomfield PD	0.01%
Municipal Antennas	0.35%
AT&T	4.06%
<b>Site Total MPE % :</b>	<b>17.38%</b>

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	8.25%
T-Mobile Sector B Total:	8.25%
T-Mobile Sector C Total:	8.25%
Site Total MPE % :	17.38%

### T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ( $\mu\text{W}/\text{cm}^2$ )	Frequency (MHz)	Allowable MPE ( $\mu\text{W}/\text{cm}^2$ )	Calculated % MPE
T-Mobile 2100 MHz LTE	2	2334.27	131.0	10.74	2100 MHz LTE	1000	1.07%
T-Mobile 600 MHz LTE	2	591.73	131.0	2.72	600 MHz LTE	400	0.68%
T-Mobile 600 MHz NR	1	1577.94	131.0	3.63	600 MHz NR	400	0.91%
T-Mobile 700 MHz LTE	2	695.22	131.0	3.20	700 MHz LTE	467	0.69%
T-Mobile 1900 MHz GSM	4	1052.26	131.0	9.68	1900 MHz GSM	1000	0.97%
T-Mobile 1900 MHz LTE	2	2104.51	131.0	9.68	1900 MHz LTE	1000	0.97%
T-Mobile 2500 MHz LTE	1	6444.38	131.0	14.83	2500 MHz LTE	1000	1.48%
T-Mobile 2500 MHz NR	1	6444.38	131.0	14.83	2500 MHz NR	1000	1.48%
						<b>Total:</b>	<b>8.25%</b>

• 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 T-Mobile 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:

T-Mobile Sector	Power Density Value (%)
Sector A:	8.25%
Sector B:	8.25%
Sector C:	8.25%
T-Mobile Maximum MPE % (Sector A):	8.25%
Site Total:	17.38%
Site Compliance Status:	<b>COMPLIANT</b>

The anticipated composite MPE value for this site assuming all carriers present is **17.38%** 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.