



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

April 4, 2024

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

**RE: Notice of Exempt Modification for Verizon Wireless  
Crown #5800059  
258 Ridge Road, Madison, CT 06433  
Latitude: 41° 18' 33.30" / Longitude: -72° 36' 51.57"**

Dear Ms. Bachman:

Verizon Wireless currently maintains fifteen (15) antennas at the 130-foot mount on the existing 150-foot monopole tower located at 258 Ridge Road, Madison, CT. The property is owned by the Town of Madison and the tower is owned by Crown Castle. Verizon now intends to add two (2) interference mitigation filters at the 130-foot level. 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 Modification:**

**Tower:**

Install New:

(2) Kaelus BSF0020F3V1- Interference Mitigation Filters

The facility was approved by the Connecticut Siting Council, Docket No. 363, on October 30, 2008. Please see attached.

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 First Selectwoman Peggy Lyons on behalf of the municipality and the property owner and to Erin Mannix, Town Planner. Crown Castle is the tower owner.

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.

**The Foundation for a Wireless World.**

CrownCastle.com

Melanie A. Bachman

Page 2

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.

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

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

Attachments

cc:

First Selectwoman Peggy Lyons (as municipality & property owner)  
Town of Madison  
8 Campus Drive  
Madison, CT 06443  
203-245-5602

Erin Mannix, Town Planner  
Town of Madison  
8 Campus Drive  
Madison, CT 06443  
203-245-5631

Crown Castle, Tower Owner

**DOCKET NO. 363** – Crown Communications Inc. application } Connecticut  
for a Certificate of Environmental Compatibility and Public Need }  
for the construction, maintenance and operation of a } Siting  
telecommunications facility located at 258 Ridge Road, Madison, }  
Connecticut. } Council

October 30, 2008

### Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate, either alone or cumulatively with other effects, when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application, and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes § 16-50k, be issued to Crown Communications Inc., hereinafter referred to as the Certificate Holder, for a telecommunications facility at 258 Ridge Road, Madison, Connecticut

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of Omnipoint Communications, Inc. and other entities, both public and private, but such tower shall not exceed a height of 150 feet above ground level. The tower and compound shall be moved approximately 50 feet to the north to avoid tree clearing.
2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Madison for comment, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
  - a) a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment compound, radio equipment, access road, utility line, and landscaping; and
  - b) construction plans for site clearing, grading, landscaping, water drainage, and erosion and sedimentation controls consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.
3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of the electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of the electromagnetic radio frequency power density be submitted to the Council if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.
5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.
6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any Town of Madison public safety services (police, fire and medical services), provided such use can be accommodated and is compatible with the structural integrity of the tower.
7. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed and providing wireless services within eighteen months from the date of the mailing of the Council's Findings of Fact, Opinion, and Decision and Order (collectively called "Final Decision"), this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's Final Decision shall not be counted in calculating this deadline.
8. Any request for extension of the time period referred to in Condition 7 shall be filed with the Council not later than 60 days prior to the expiration date of this Certificate and shall be served on all parties and intervenors, as listed in the service list, and the Town of Madison. Any proposed modifications to this Decision and Order shall likewise be so served.
9. If the facility ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.
10. The Certificate Holder shall remove any nonfunctioning antenna, and associated antenna mounting equipment, within 60 days of the date the antenna ceased to function.
11. In accordance with Section 16-50j-77 of the Regulations of Connecticut State Agencies, the Certificate Holder shall provide the Council with written notice two weeks prior to the commencement of site construction activities. In addition, the Certificate Holder shall provide the Council with written notice of the completion of site construction and the commencement of site operation.

Pursuant to General Statutes § 16-50p, the Council hereby directs that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the *New Haven Register* and *The Source*.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.



The parties and intervenors to this proceeding are:

**Applicant**

Crown Communications, Inc.

**Intervenor**

Omnipoint Communications, Inc.

**Its Representative**

Christopher B. Fisher, Esq.  
Cuddy & Feder LLP  
445 Hamilton Avenue, 14<sup>th</sup> Floor  
White Plains, NY 10601

**Its Representative**

Julie Kohler, Esq.  
Jesse Langer, Esq.  
Cohen and Wolf, P.C.  
1115 Broad Street  
Bridgeport, CT 06604

# 258 RIDGE RD

Location 258 RIDGE RD

MBLU 78 / / 3 / /

Unique ID# 00453700

Owner TOWN OF MADISON

Assessment \$134,700

Appraisal \$192,400

PID 4717

Building Count 1

Dev. Map 2543, 3138

## Current Value

Appraisal					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2023	\$0	\$0	\$0	\$192,400	\$192,400

Assessment					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2023	\$0	\$0	\$0	\$134,700	\$134,700

## Owner of Record

Owner TOWN OF MADISON

Sale Price \$100,000

Co-Owner

Book & Page 0660/0162

Care Of

Sale Date 06/16/1995

## Ownership History

Ownership History			
Owner	Sale Price	Book & Page	Sale Date
TOWN OF MADISON	\$100,000	0660/0162	06/16/1995

## Building Information

### Building 1 : Section 1

Year Built:

Living Area: 0

Building Attributes	
Field	Description
Style:	Vacant Land

Model	
Grade:	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Bath Style:	
Kitchen Style:	
Fireplace(s)	
Xtra FPL Open	

**Building Photo**



(<https://images.vgsi.com/photos/MadisonCTPhotos/\01\01\64\24.jpg>)

**Building Layout**

([ParcelSketch.ashx?pid=4717&bid=4717](#))

Building Sub-Areas (sq ft)
No Data for Building Sub-Areas

**Extra Features**

Extra Features
No Data for Extra Features

**Land**

**Land Use**

Use Code 9035  
 Description Municipal Town  
 Zone RU-1

**Land Line Valuation**

Size (Acres) 3

**Outbuildings**

Outbuildings
No Data for Outbuildings







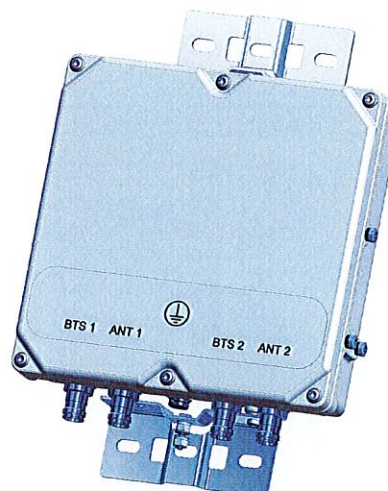
# BSF0020F3V1-1

## TWIN BANDSTOP 900MHZ INTERFERENCE MITIGATION FILTER

The BSF0020 is ideal for co-located 700, 850 and 900 networks. Utilising a 2.6MHz guardband the BSF0020 provides rejection of the 900 UL band while passing 700/850 UL and DL bands. Capable of being used in an outdoor environment the BSF0020 contains two identical bandstop filters, suitable for 2x2 MIMO configuration, offering excellent insertion loss, group delay and rejection.

### FEATURES

- Passes full 700 and 850 bands
- Low insertion loss
- Rejection of 900MHz uplink
- DC/AISG pass
- Twin unit
- Dual twin mounting available



### TECHNICAL SPECIFICATIONS

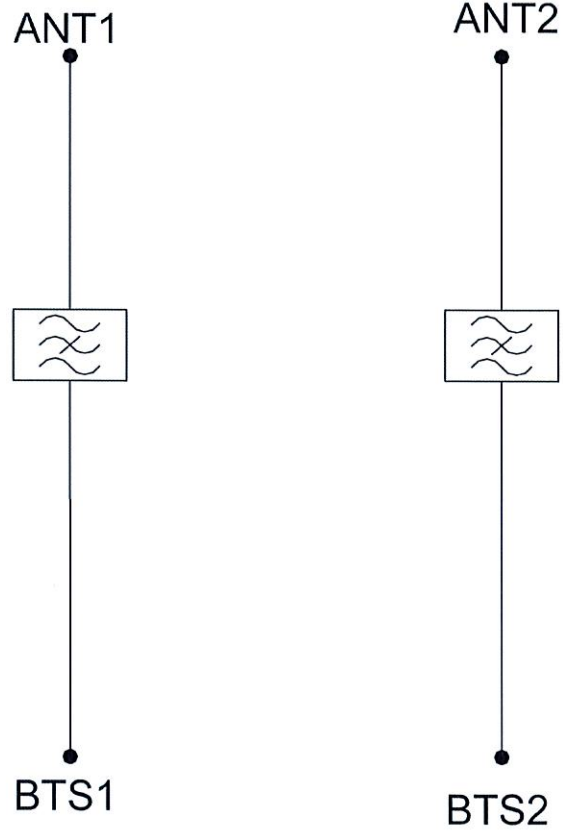
BAND NAME	700 PATH / 850 UPLINK PATH	850 DOWNLINK PATH
Passband	698 - 849MHz	869 - 891.5MHz
Insertion loss	0.1dB typical / 0.3dB maximum	0.5dB typical, 1.45dB maximum
Return loss	24dB typical, 18dB minimum	
Maximum input power (Per Port)	100W average	200W average and 66W per 5MHz
Rejection	53dB minimum @ 894.1 - 896.5MHz	
<b>ELECTRICAL</b>		
Impedance	50Ohms	
Intermodulation products	-160dBc maximum in UL Band (assuming 20MHz Signal), with 2 x 43dBm carriers -153dBc maximum with 2 x 43dBm	
<b>DC / AISG</b>		
Passband	0 - 13MHz	
Insertion loss	0.3dB maximum	
Return loss	15dB minimum	
Input voltage range	± 33V	
DC current rating	2A continuous, 4A peak	
Compliance	3GPP TS 25.461	
<b>ENVIRONMENTAL</b>		
For further details of environmental compliance, please contact Kaelus.		
Temperature range	-20°C to +60°C   -4°F to +140°F	
Ingress protection	IP67	
Altitude	2600m   8530ft	
Lightning protection	RF port: ±5kA maximum (8/20us), IEC 61000-4-5 – Unit must be terminated with some lightning protection circuits.	
MTBF	>1,000,000 hours	
Compliance	ETSI EN 300 019 class 4.1H, RoHS, NEBS GR-487-CORE	
<b>MECHANICAL</b>		
Dimensions H x D x W	269 x 277 x 80mm   10.60 x 10.90 x 3.15in (Excluding brackets and connectors)	
Weight	8.0 kg   17.6 lbs (no bracket)	
Finish	Powder coated, light grey (RAL7035)	
Connectors	RF: 4.3-10 (F) x 4	
Mounting	Optional pole/wall bracket supplied with two metal clamps 45-178mm diameter poles or custom bracket. See ordering information.	



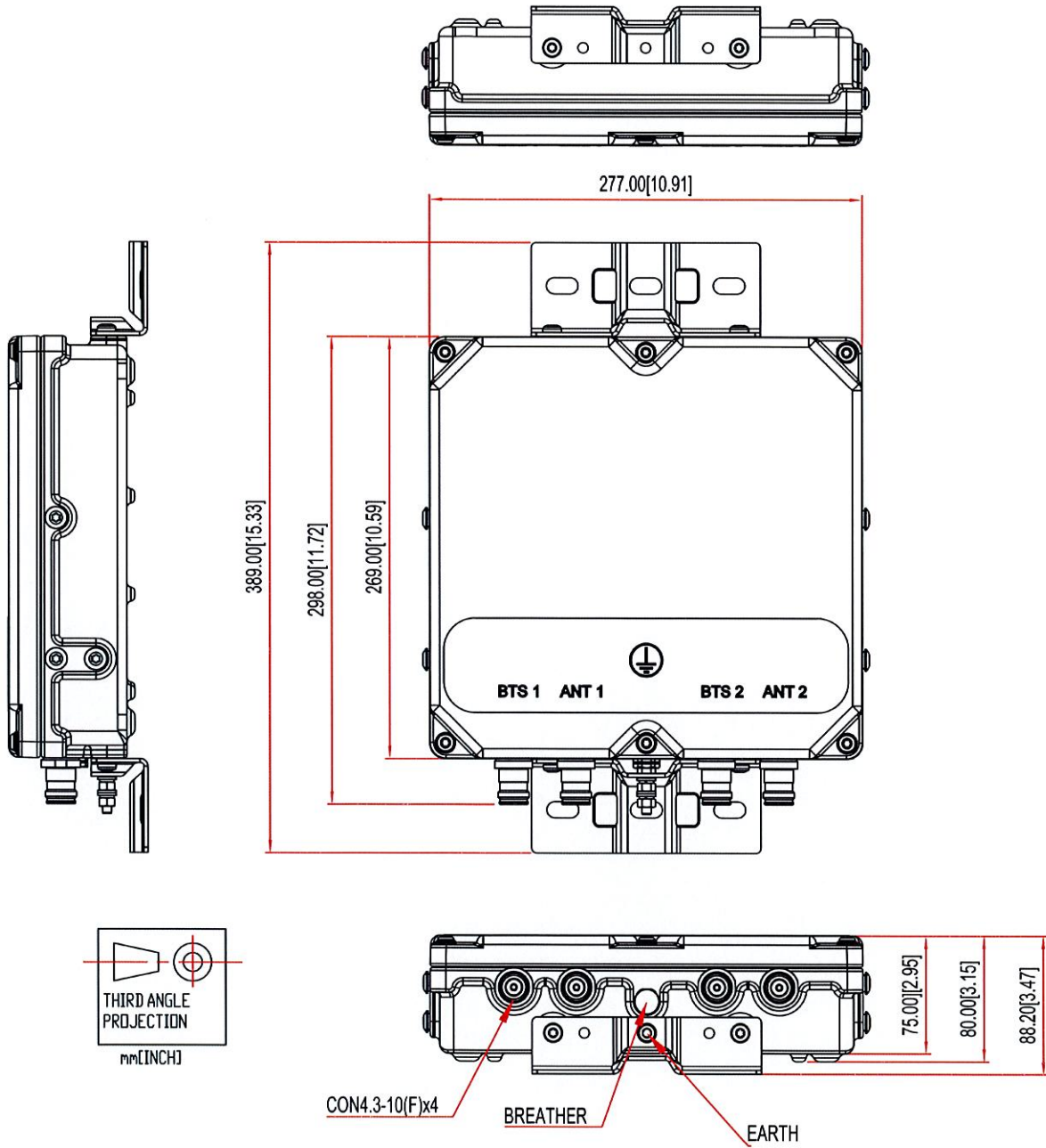
## ORDERING INFORMATION

PART NUMBER	CONFIGURATION	OPTIONAL FEATURES	CONNECTORS
BSF0020F3V1	TWIN, 2 in / 2 out	DC/AISG PASS NO BRACKET	4.3-10 (F)
BSF0020F3V1-1	TWIN, 2 in / 2 out	DC/AISG PASS	4.3-10 (F)
BSF0020F3V1-2	QUAD, 4 in / 4 out	DC/AISG PASS	4.3-10 (F)

ELECTRICAL BLOCK DIAGRAM



MECHANICAL BLOCK DIAGRAM



**Barbadora, Jeff**

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**From:** TrackingUpdates@fedex.com  
**Sent:** Friday, April 5, 2024 11:20 AM  
**To:** Barbadora, Jeff  
**Subject:** FedEx Shipment 775826514021: Your package has been delivered

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.



Hi. Your package was  
delivered Fri, 04/05/2024 at  
11:12am.



Delivered to 8 CAMPUS DR, MADISON, CT 06443  
Received by A.ANNIE

[OBTAIN PROOF OF DELIVERY](#)

# How was your delivery ?



TRACKING NUMBER	<a href="#">775826514021</a>
FROM	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Madison Peggy Lyons, First Selectwoman 8 Campus Drive MADISON, CT, US, 06443
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Thu 4/04/2024 05:12 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Pak
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	MADISON, CT, US, 06443
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Standard Overnight



**Barbadora, Jeff**

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**From:** TrackingUpdates@fedex.com  
**Sent:** Friday, April 5, 2024 11:20 AM  
**To:** Barbadora, Jeff  
**Subject:** FedEx Shipment 775826533851: Your package has been delivered

**CAUTION:** This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.



Hi. Your package was  
delivered Fri, 04/05/2024 at  
11:12am.



Delivered to 8 CAMPUS DR, MADISON, CT 06443  
Received by A.ANNIE

[OBTAIN PROOF OF DELIVERY](#)



# How was your delivery ?



TRACKING NUMBER	<a href="#">775826533851</a>
FROM	Crown Castle 1800 W. Park Drive WESTBOROUGH, MA, US, 01581
TO	Town of Madison Erin Mannix, Town Planner 8 Campus Drive MADISON, CT, US, 06443
REFERENCE	799001.7680
SHIPPER REFERENCE	799001.7680
SHIP DATE	Thu 4/04/2024 05:12 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Pak
ORIGIN	WESTBOROUGH, MA, US, 01581
DESTINATION	MADISON, CT, US, 06443
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx Standard Overnight

Colliers Engineering & Design CT, P.C.  
1055 Washington Boulevard  
Stamford, CT 06901  
203.324.0800  
peter.albano@collierseng.com

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## Antenna Mount Analysis Report and PMI Requirements

Mount ReAnalysis

SMART Tool Project #: 10209643  
Colliers Engineering & Design CT, P.C. Project #: 23777278

September 12, 2023

### Site Information

Site ID: 5000392974-VZW / MADISON 3 CT  
Site Name: MADISON 3 CT  
Carrier Name: Verizon Wireless  
Address: 252 Ridge Rd  
Madison, Connecticut 06433  
New Haven County  
Latitude: 41.309250°  
Longitude: -72.614325°

### Structure Information

Tower Type: 150-Ft Monopole  
Mount Type: 14.00-Ft Platform

FUZE ID # 17136809

### Analysis Results

Platform: 46.6% Pass\*

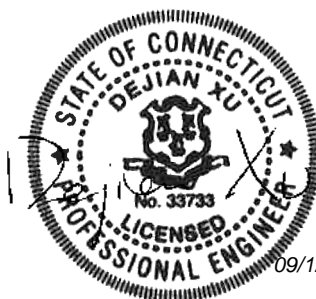
**\*Antennas and equipment to be installed in compliance with PMI Requirements of this mount analysis.**

### \*\*\*Contractor PMI Requirements:

Included at the end of this MA report  
Available & Submitted via portal at <https://pmi.vzwsmart.com>

For additional questions and support, please reach out to:  
[pmisupport@colliersengineering.com](mailto:pmisupport@colliersengineering.com)

Report Prepared By: Gianna Argentina



09/12/2023

**Executive Summary:**

The objective of this report is to determine the capacity of the antenna support mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

This analysis is inclusive of the mount structure only and does not address the structural capacity of the supporting structure. This mounting frame was not analyzed as an anchor attachment point for fall protection. All climbing activities are required to have a fall protection plan completed by a competent person.

**Sources of Information:**

Document Type	Remarks
Radio Frequency Data Sheet (RFDS)	Verizon RFDS Site ID: 650040, dated July 16, 2021
Mount Mapping Report	Hudson Design Group, LLC Site ID: 468184, dated June 15, 2020
Previous Mount Fix	Maser Consulting Connecticut Project #: 21781064A, dated October 28, 2021
Filter Add Guidance	Provided by Verizon Wireless

**Analysis Criteria:**

Codes and Standards:	ANSI/TIA-222-H Connecticut State Building Code, Effective October 1, 2022	
Wind Parameters:	Basic Wind Speed (Ultimate 3-sec. Gust), $V_{ULT}$ : Ice Wind Speed (3-sec. Gust): Design Ice Thickness: Risk Category: Exposure Category: Topographic Category: Topographic Feature Considered: Topographic Method: Ground Elevation Factor, $K_e$ :	125 mph 50 mph 1.00 in II B 1 N/A N/A 0.995
Seismic Parameters:	$S_s$ : $S_1$ :	0.206 g 0.054 g
Maintenance Parameters:	Wind Speed (3-sec. Gust): Maintenance Live Load, $L_v$ : Maintenance Live Load, $L_m$ :	30 mph 250 lbs. 500 lbs.
Analysis Software:	RISA-3D (V17)	

**Final Loading Configuration:**

The following equipment has been considered for the analysis of the mount:

Mount Elevation (ft)	Equipment Elevation (ft)	Quantity	Manufacturer	Model	Status
129.00	130.00	6	Andrew	DB846F65ZAXY	Retained
		6	Andrew	SBNHH-1D65B	
		3	Samsung	MT6407-77A	
		3	Samsung	RF4439d-25A	
		3	Samsung	RF4440d-13A	
		1	Raycap	RVZDC-6627-PF-48	
		2	KAelus	KA-6030	Added

It is acceptable to install up to any three (3) of the OVP model numbers listed below as required at any location other than the mount face without affecting the structural capacity of the mount. If OVP units are installed on the mount face, a mount re-analysis may be required unless replacing an existing OVP.

Model Number	Ports	AKA
DB-B1-6C-12AB-0Z	6	OVP-6
RVZDC-6627-PF-48	12	OVP-12

**Standard Conditions:**

1. All engineering services are performed on the basis that the information provided to Colliers Engineering & Design CT, P.C. and used in this analysis is current and correct. The existing equipment loading has been applied at locations determined from the supplied documentation. Any deviation from the loading locations specified in this report shall be communicated to Colliers Engineering & Design CT, P.C. to verify deviation will not adversely impact the analysis.
2. Mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications.

Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping and reported in the Mount Mapping Report are assumed to be corrected and documented as part of the PMI process and are not considered in the mount analysis.

The mount analysis and the mount mapping are not a condition assessment of the mount. Proper maintenance and condition assessments are still required post analysis.

3. For mount analyses completed from other data sources (including new replacement mounts) and not specifically mapped in accordance with the NSTD-446 Standard, the mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications.
4. 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.
5. The mount was checked up to, and including, the bolts that fasten it to the mount collar/attachment and threaded rod connections in collar members if applicable. Local deformation and interaction between the mount collar/attachment and the supporting tower structure are outside the scope of this analysis.

6. All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Colliers Engineering & Design CT, P.C. is not responsible for the conclusion, opinions, and recommendations made by others based on the information supplied.
7. Structural Steel Grades have been assumed as follows, if applicable, unless otherwise noted in this analysis:
  - o Channel, Solid Round, Angle, Plate      ASTM A36 (Gr. 36)
  - o HSS (Rectangular)                              ASTM 500 (Gr. B-46)
  - o Pipe    ASTM A53 (Gr. B-35)
  - o Threaded Rod                                      F1554 (Gr. 36)
  - o Bolts     ASTM A325

**Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Colliers Engineering & Design CT, P.C.**

**Analysis Results:**

Component	Utilization %	Pass/Fail
Face Horizontal	20.5 %	Pass
Standoff Horizontal	42.7 %	Pass
Platform Crossmember	26.1 %	Pass
Corner Plate	10.2 %	Pass
Grating Support	15.2 %	Pass
Cross Arm Plate	43.2 %	Pass
Mount Pipe	35.6 %	Pass
Support Rail Corner	25.2 %	Pass
Mount Connection	46.6 %	Pass

<b>Structure Rating – (Controlling Utilization of all Components)</b>	<b>46.6%</b>
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**Mount Steel (EPA)a per ANSI/TIA-222-H Section 2.6.11.2:**

Ice Thickness (In)	Mount Pipes Excluded		Mount Pipes Included	
	Front (EPA)a (Sq. Ft.)	Side (EPA)a (Sq. Ft.)	Front (EPA)a (Sq. Ft.)	Side (EPA)a (Sq. Ft.)
0	28.6	28.6	41.4	41.4
0.5	36.6	36.6	54.8	54.8
1	44.0	44.0	67.6	67.6

Notes:

- (EPA)a values listed above may be used in the absence of more precise information
- (EPA)a values in the table above include 3 sectors.
- Ka factors included in (EPA)a calculations

## **Requirements:**

The existing mount is **SUFFICIENT** for the final loading configuration shown in attachment 2 and do not require modifications. Additional requirements are noted below.

Contractor to confirm the modifications from the previous Mount Fix Report listed under the Sources of Information Table have been installed prior to installation of this equipment. If the modifications have not been installed please contact the EOR.

Contractor shall install the proposed filter units on new Site Pro 1 Dual Swivel Mount Kit (Part #: RRUDSM or EOR approved equivalent) in the location shown in the placement diagrams.

If required, ANSI/ASSP rigging plan review services compliant with the requirements of ANSI/TIA 322 are available for a Construction Class IV site or other. Separate review fees will apply.

## **Attachments:**

1. **Contractor Required Post Installation Inspection (PMI) Report Deliverables**
2. Antenna Placement Diagrams
3. Mount Photos
4. Mount Mapping Report (for reference only)
5. Analysis Calculations



# Mount Desktop – Post Modification Inspection (PMI) Report Requirements

## Documents & Photos Required from Contractor – **Passing Mount Analysis**

Passing Mount Analysis requires a PMI due to a modification in loading.

Electronic pdf version of this can be downloaded at <https://pmi.vzwsmart.com>.

For additional questions and support, please reach out to [pmisupport@colliersengineering.com](mailto:pmisupport@colliersengineering.com)

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MDG #: 5000392974

SMART Project #: 10209643

Fuze Project ID: 17136809

**Purpose** – to provide SMART Tool structural vendor the proper documentation in order to complete the required Mount Desktop review of the Post Modification Inspection Report.

- Contractor is responsible for making certain the photos provided as noted below provide confirmation that the installation was completed in accordance with this Passing Mount Analysis.
- Contractor shall relay any data that can impact the performance of the mount, this includes safety issues.

### **Base Requirements:**

- If installation will cause damage to the structure, the climbing facility, or safety climb if present or any installed system, SMART Tool vendor to be notified prior to install. Any special photos outside of the standard requirements will be indicated on the drawings.
- Provide “as built mount drawings” showing contractor’s name, contact information, preparer’s signature, and date. Any deviations from the drawings (Proposed modification) shall be shown. NOTE: If loading is different than what is conveyed in the passing mount analysis (MA) contact the SMART Tool vendor immediately.
- Each photo should be time and date stamped
- Photos should be high resolution.
- Contractor shall ensure that the safety climb wire rope is supported and not adversely impacted by the install of the modification components. This may involve the install of wire rope guides, or other items to protect the wire rope. If there is conflict, contact the SMART Tool engineer for recommendations.
- The PMI can be accessed at the following portal: <https://pmi.vzwsmart.com>

### **Photo Requirements:**

- Photos taken at ground level
  - Photo of Gate Signs showing the tower owner, site name, and number.
  - Overall tower structure after installation.
  - Photos of the mount after installation; if the mounts are at different rad elevations, pictures must be provided for all elevations that equipment was installed.
- Photos taken at Mount Elevation
  - Photos showing the safety climb wire rope above and below the mount prior to installation.
  - Photos showing the climbing facility and safety climb if present.
  - Photos showing each individual sector after installation. Each entire sector shall be in one photo to show the interconnection of members.

- These photos shall also certify that the placement and geometry of the equipment on the mount is as depicted in the antenna placement diagram in this form.
- Photos that show the model number of each antenna and piece of equipment installed per sector.

**Antenna & equipment placement and Geometry Confirmation:**

- The contractor shall certify that the antenna & equipment placement and geometry is in accordance with the sketch and table as included in the mount analysis and noted below.
  - The contractor certifies that the photos support and the equipment on the mount is as depicted on the sketch and table included in this form and with the mount analysis provided.

OR

- The contractor notes that the equipment on the mount is not in accordance with the sketch and has noted the differences below and provided photo documentation of any alterations.

**Special Instructions / Validation as required from the MA or any other information the contractor deems necessary to share that was identified:**

**Issue:**

Contractor to confirm the modifications from the previous Mount Fix Report listed under the Sources of Information Table have been installed prior to installation of this equipment. If the modifications have not been installed please contact the EOR.

Contractor shall install the proposed filter units on new Site Pro 1 Dual Swivel Mount Kit (Part #: RRUDSM or EOR approved equivalent) in the location shown in the placement diagrams.

**Response:**

**Special Instruction Confirmation:**

- The contractor has read and acknowledges the above special instructions.
- All hardware listed in the Special Instructions above (if applicable) has been properly installed, and the existing hardware was inspected.
- The material utilized was as specified in the SMART Tool engineering vendor Special Instructions above (if applicable) and included in the material certification folder is a packing list or invoice for these materials.

OR

The material utilized was approved by a SMART Tool engineering vendor as an “equivalent” and this approval is included as part of the contractor submission.

**Comments:**

--

**Contractor certifies that the climbing facility / safety climb was not damaged prior to starting work:**

Yes       No

**Contractor certifies no new damage created during the current installation:**

Yes       No

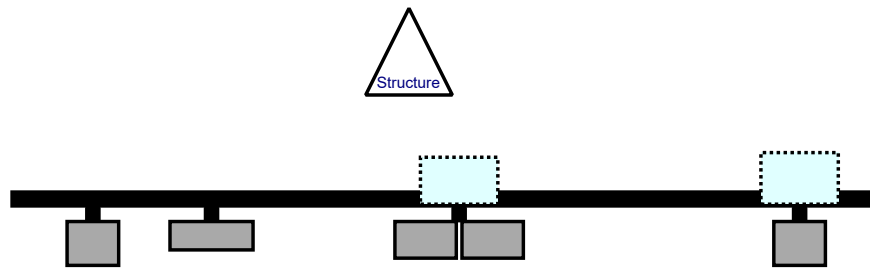
**Contractor to certify the condition of the safety climb and verify no damage when leaving the site:**

Safety Climb in Good Condition                       Safety Climb Damaged

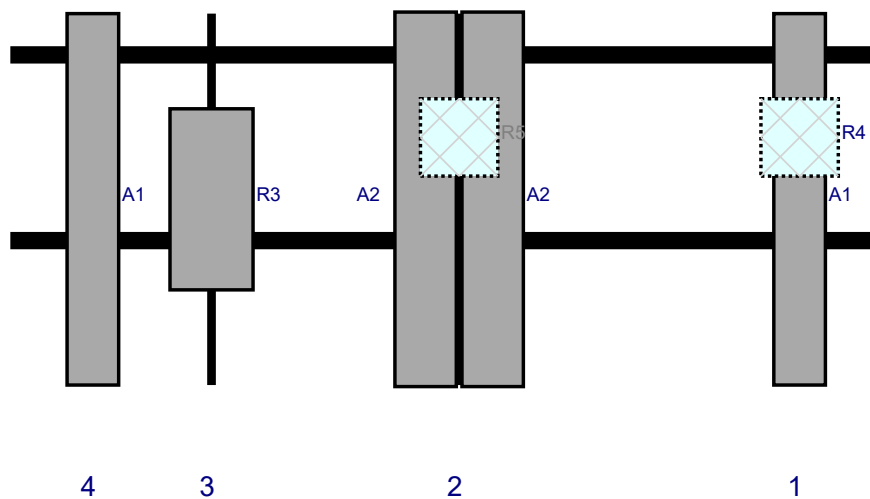
**Certifying Individual:**

Company:	
Employee Name:	
Contact Phone:	
Email:	
Date:	

Plan View

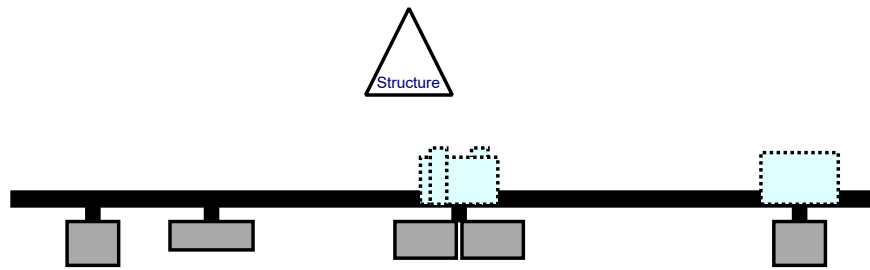


Front View - Looking at Structure

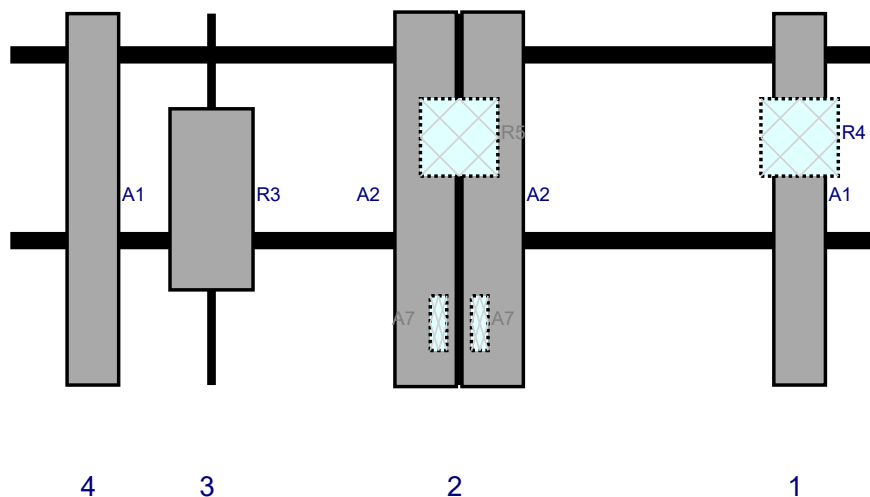


Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A1	DB846F65ZAXY	72	10	153	1	a	Front	36	0	Retained	06/15/2021
R4	RF4439d-25A	15	15	153	1	a	Behind	24	0	Retained	
A2	SBNHH-1D65B	72.6	11.9	87	2	a	Front	36	6.5	Retained	06/15/2021
A2	SBNHH-1D65B	72.6	11.9	87	2	b	Front	36	-6.5	Retained	06/15/2021
R5	RF4440d-13A	15	15	87	2	a	Behind	24	0	Retained	
R3	MT6407-77A	35.1	16.1	39	3	a	Front	36	0	Retained	
A1	DB846F65ZAXY	72	10	16	4	a	Front	36	0	Retained	06/15/2021
OVP	RVZDC-6627-PF-48	29.5	16.5			Member				Retained	

Plan View

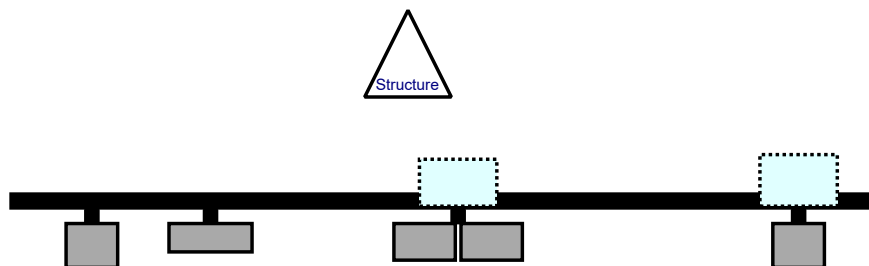


Front View - Looking at Structure

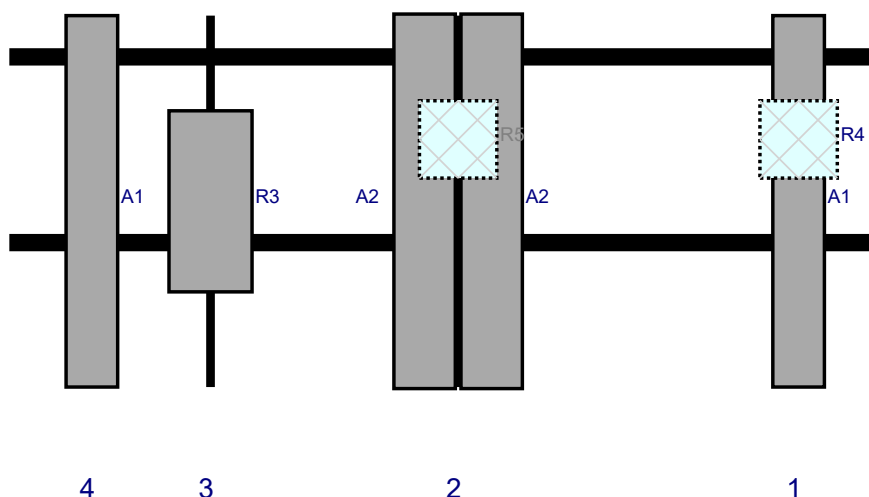


Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A1	DB846F65ZAXY	72	10	153	1	a	Front	36	0	Retained	06/15/2021
R4	RF4439d-25A	15	15	153	1	a	Behind	24	0	Retained	
A2	SBNHH-1D65B	72.6	11.9	87	2	a	Front	36	6.5	Retained	06/15/2021
A2	SBNHH-1D65B	72.6	11.9	87	2	b	Front	36	-6.5	Retained	06/15/2021
R5	RF4440d-13A	15	15	87	2	a	Behind	24	0	Retained	
A7	KA-6030	10.6	3.2	87	2	a	Behind	60	-4	Added	
A7	KA-6030	10.6	3.2	87	2	b	Behind	60	4	Added	
R3	MT6407-77A	35.1	16.1	39	3	a	Front	36	0	Retained	
A1	DB846F65ZAXY	72	10	16	4	a	Front	36	0	Retained	06/15/2021

Plan View



Front View - Looking at Structure



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A1	DB846F65ZAXY	72	10	153	1	a	Front	36	0	Retained	06/15/2021
R4	RF4439d-25A	15	15	153	1	a	Behind	24	0	Retained	
A2	SBNHH-1D65B	72.6	11.9	87	2	a	Front	36	6.5	Retained	06/15/2021
A2	SBNHH-1D65B	72.6	11.9	87	2	b	Front	36	-6.5	Retained	06/15/2021
R5	RF4440d-13A	15	15	87	2	a	Behind	24	0	Retained	
R3	MT6407-77A	35.1	16.1	39	3	a	Front	36	0	Retained	
A1	DB846F65ZAXY	72	10	16	4	a	Front	36	0	Retained	06/15/2021





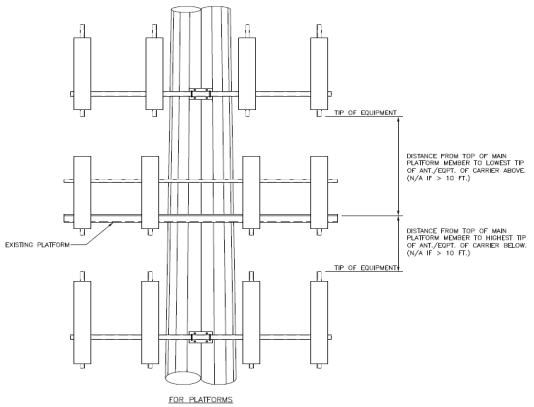


Mount Azimuth (Degree) for Each Sector			Tower Leg Azimuth (Degree) for Each Sector			Sector B									
Sector A:	15.00	Deg	Leg A:		Deg	Ant <sub>1a</sub>									
Sector B:	135.00	Deg	Leg B:		Deg	Ant <sub>1b</sub>	UNKNOWN	10.00	8.00	72.00	128.867	36.00	9.00	120.00	31,124
Sector C:	255.00	Deg	Leg C:		Deg	Ant <sub>2a</sub>									
Sector D:		Deg	Leg D:		Deg	Ant <sub>2b</sub>	SBNHH-1D65B	12.00	8.00	74.00	127.783	49.00	11.00	120.00	33,127

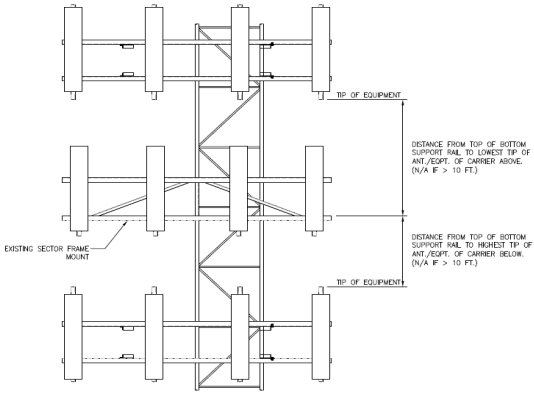
Climbing Facility Information			
Location:	180.00	Deg	N/A
Climbing Facility	Corrosion Type:	Good condition.	
	Access:	Climbing path was unobstructed.	
	Condition:	Missing safety cable.	

Ant <sub>2c</sub>															
Ant <sub>3a</sub>	B4 RRH2X60-4R	11.00	6.00	36.00	130.7	14.00	-7.00		140,148						
Ant <sub>3b</sub>	SBNHH-1D65B	12.00	8.00	74.00	127.783	49.00	11.00	120.00	33,127						
Ant <sub>3c</sub>															
Ant <sub>4a</sub>	B13 RRH4X30	12.00	8.00	21.00	130.075	21.50	-7.00		128,141						
Ant <sub>4b</sub>	UNKNOWN	10.00	8.00	72.00	128.867	36.00	9.00	120.00	34,125						
Ant <sub>4c</sub>															
Ant <sub>5a</sub>															
Ant <sub>5b</sub>															
Ant <sub>5c</sub>															
Ant on Standoff															
Ant on Standoff															
Ant on Tower															
Ant on Tower															

Please insert a photo of the mount centerline measurement here.

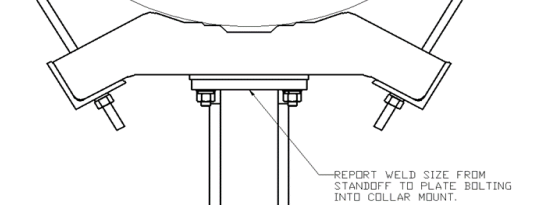


Sector C															
Ant <sub>1a</sub>															
Ant <sub>1b</sub>	UNKNOWN	10.00	8.00	72.00	128.867	36.00	9.00	270.00	41,124						
Ant <sub>1c</sub>															
Ant <sub>2a</sub>															
Ant <sub>2b</sub>	SBNHH-1D65B	12.00	8.00	74.00	127.783	49.00	11.00	270.00	44,127						
Ant <sub>2c</sub>															
Ant <sub>3a</sub>	B4 RRH2X60-4R	11.00	6.00	36.00	130.7	14.00	-7.00		145,148						
Ant <sub>3b</sub>	SBNHH-1D65B	12.00	8.00	74.00	127.783	49.00	11.00	270.00	43,127						
Ant <sub>3c</sub>															
Ant <sub>4a</sub>	B13 RRH4X30	12.00	8.00	21.00	130.075	21.50	-7.00		128,145						
Ant <sub>4b</sub>	UNKNOWN	10.00	8.00	72.00	128.867	36.00	9.00	270.00	43,125						
Ant <sub>4c</sub>															
Ant <sub>5a</sub>															
Ant <sub>5b</sub>															
Ant <sub>5c</sub>															
Ant on Standoff															
Ant on Standoff															
Ant on Tower															
Ant on Tower															



Sector D															
Ant <sub>1a</sub>															
Ant <sub>1b</sub>															
Ant <sub>1c</sub>															
Ant <sub>2a</sub>															
Ant <sub>2b</sub>															
Ant <sub>2c</sub>															
Ant <sub>3a</sub>															
Ant <sub>3b</sub>															
Ant <sub>3c</sub>															
Ant <sub>4a</sub>															
Ant <sub>4b</sub>															
Ant <sub>4c</sub>															
Ant <sub>5a</sub>															
Ant <sub>5b</sub>															
Ant <sub>5c</sub>															
Ant on Standoff															
Ant on Standoff															
Ant on Tower															
Ant on Tower															

For T-Arms/Platforms on monopoles, record the weld size from the main standoff member to the plate bolting into the collar. See below for reference.



**Observed Safety and Structural Issues During the Mount Mapping**

Issue #	Description of Issue	Photo #
1	NO CLIMB CABLE PRESENT, REPLACED WITH STEP BOLT ANCHOR BRACKETS	28
2		
3		
4		
5		
6		
7		
8		

**Observed Obstructions to Tower Lighting System**

If the tower lighting system is being obstructed by the carrier's equipment (for example: a light nested by the antennas), please provide photos and fill in the information below.		Photo #
Description of Obstruction:		
Type of Light:	Photo #	Additional Comments:
Lighting Technology:	Photo #	
Elevation (AGL) at base of light (Ft.):	Photo #	
Is a service loop available?	Photo #	
Is beacon installed on an extension?	Photo #	

**Mapping Notes**

1. Please report any visible structural or safety issues observed on the antenna mounts (Damaged members, loose connections, tilting mounts, safety climb issues, etc.)
2. If the thickness of the existing pipes or tubing can't be obtained from a general tool (such as Caliper), please use an ultrasonic measurement tool (thickness gauge) to measure the thickness.
3. Please create all required detail sketches of the mounts and insert them into the "Sketches" tab.
4. Please measure and enter the bolt sizes and types under the Members Box in the spreadsheet of the mount type.
5. Take and label the photos of the tower, mounts, connections, antennas and all measurements. Minimum 50 photos are required.
6. Please measure and report the size and length of all existing antenna mounting pipes.
7. Please measure and report the antenna information for all sectors.
8. Don't delete or rearrange any sheet or contents of any sheet from this mapping form.

**Standard Conditions**

1. Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping are to be reported in this mapping. However, this mount mapping is not a condition assessment of the mount.





### Antenna Mount Mapping Form (PATENT PENDING)

FCC #

Tower Owner:	CROWN CASTLE	Mapping Date:	6/15/2021
Site Name:	MADISON 3 CT	Tower Type:	Monopole
Site Number or ID:	468184	Tower Height (Ft.):	150
Mapping Contractor:	HUDSON DESIGN GROUP, LLC.	Mount Elevation (Ft.):	128.2

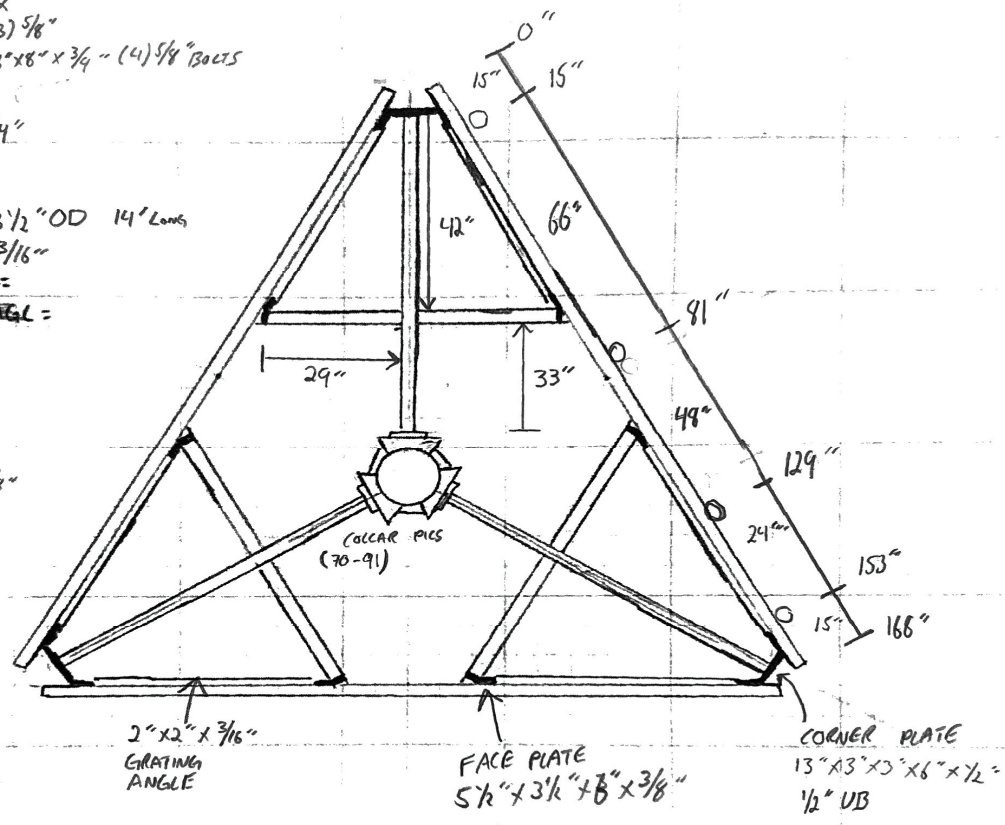
This antenna mapping form is the property of TES and under **PATENT PENDING**. The formation contained herein is considered confidential in nature and is to be used only for the specific customer it was intended for. Reproduction, transmission, publication, modification or disclosure by any method is prohibited except by express written permission of TES. All means and methods are the responsibility of the contractor and the work shall be compliant with ANSI/ASSE A 10.48, OSHA, FCC, FAA and other safety requirements that may apply. TES is not warranting the usability of the safety climb as it must be assessed prior to each use in compliance with OSHA requirements.

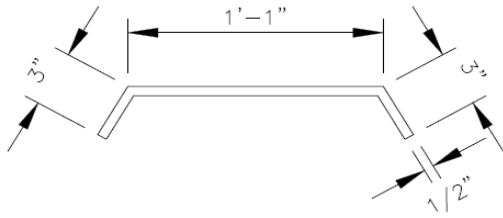
Please Insert Sketches of the Antenna Mount

TOT = 150' ±  
 MOUNT CL = FACE 128'3"  
 TOWER D = 34"  
 ↳ WALL = .265"  
 COLLAR = 9"x  
 - T ROD = (3) 5/8"  
 - PLATE = 8"x8"x3/4" (4) 5/8" BOLTS  
 HSS = 4"x4"  
 ↳ WALL = 1/4"  
 T-F = 44"  
 T-A = 82 1/2"  
 FACE PIPE = 3 1/2" OD 14' LONG  
 ↳ WALL = 3/16"  
 ANT MOUNTS =  
 TOP OF MOUNT ANGL =

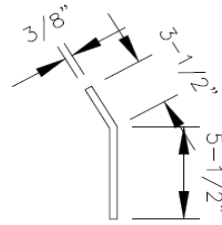
MADISON 3 CT  
 06/15/2021  
 (signature)

CROSS PLATES  
 PICS (113-122)  
 6 1/2" x 3" x 8" x 3/8"





**DETAIL J**  
**APEX 'A' PLATE DETAIL**

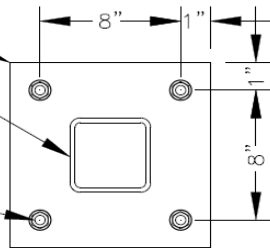


**DETAIL K**  
**'B' PLATE DETAIL**

8" X 8" X 3/4" THK. PLATE

HSS 4" X 4" X 1/4" WALL

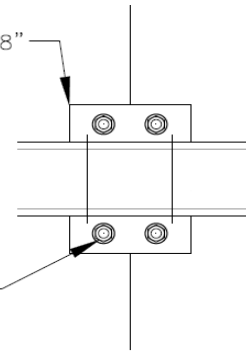
(4) 5/8"Ø BOLTS



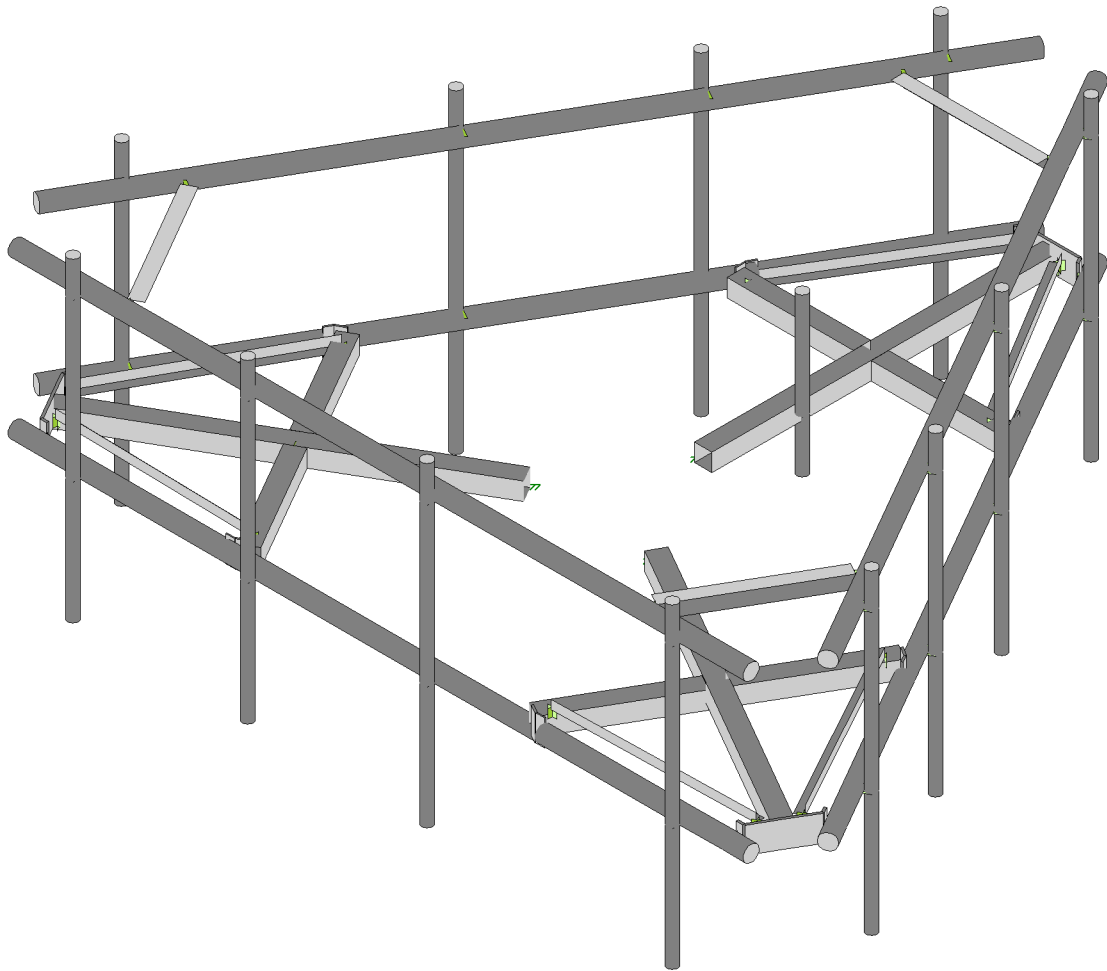
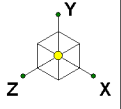
**STANDOFF TO RING MOUNT CONNECTION**

8" X 6-1/2" X 3" X 3/8" THK. CROSSOVER PLATE

1/2"Ø U-BOLTS (TYP.)



**CROSSOVER PLATE DETAIL**

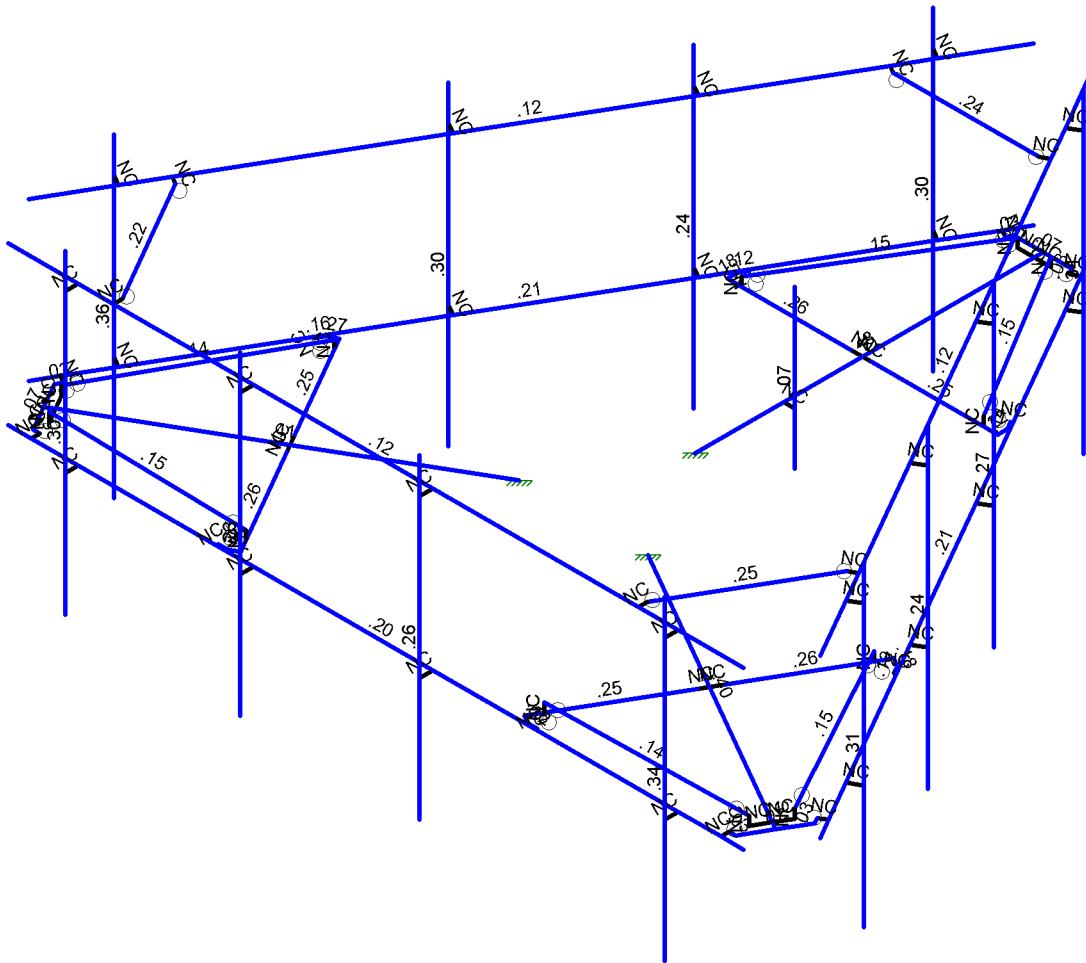
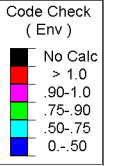
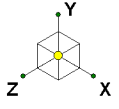


Envelope Only Solution

SK - 2

Sept 12, 2023 at 12:00 PM

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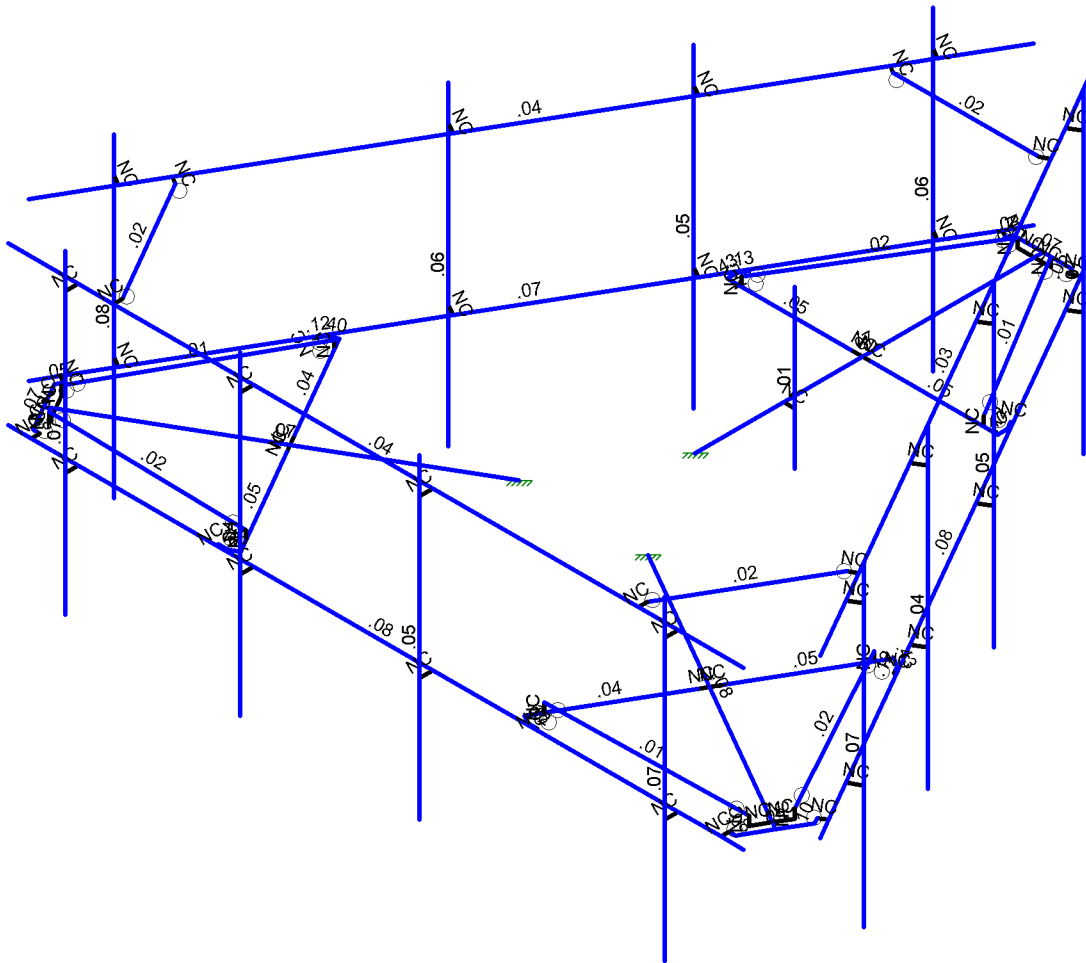
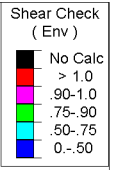
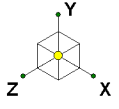
Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

SK - 3

Sept 12, 2023 at 12:00 PM

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Member Shear Checks Displayed (Enveloped)  
Envelope Only Solution

SK - 4

Sept 12, 2023 at 12:00 PM

5000392974-VZW\_MT\_LO\_H.r3d































**A Ya Vyf Dc ]bhí @ UXg f6 @ '% '5 bhYbbU8 L'f7 c bhíbi YXL**

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GE	T ÚI OE	T ^	EEI	I
GF	T ÚI OE	T :	E	I
GG	T ÚI OE	Y	EI	I
GH	T ÚI OE	T ^	EEI	I
GI	T ÚI OE	T :	E	I
GJ	T ÚI Ó	Y	EI	I
GK	T ÚI Ó	T ^	EEI	I
GL	T ÚI Ó	T :	EEG	I
GM	T ÚI Ó	Y	EI	I
GN	T ÚI Ó	T ^	EEI	I
GO	T ÚI Ó	T :	EEG	I
GP	T ÚI Ó	Y	EI	I
GQ	T ÚI Ó	T ^	EEI	I
GR	T ÚI Ó	T :	EEG	I
GS	T ÚI Ó	Y	EI	I
GT	T ÚI Ó	T ^	EEI	I
HU	T ÚGÖ	Y	E	E
HV	T ÚGÖ	T ^	E	E
HW	T ÚGÖ	T :	E	E
HX	T ÚGÖ	Y	E	E
HY	T ÚGÖ	T ^	E	E
HZ	T ÚGÖ	T :	E	E
IU	T ÚGÖ	Y	E	E
IV	T ÚGÖ	T ^	E	E
IW	T ÚGÖ	T :	E	E
IX	T ÚGÖ	Y	E	E
IY	T ÚGÖ	T ^	E	E
IZ	T ÚGÖ	T :	E	E
JU	T ÚGÖ	Y	E	E
JV	T ÚGÖ	T ^	E	E
JW	T ÚGÖ	T :	E	E
JX	T ÚGÖ	Y	E	E
JY	T ÚGÖ	T ^	E	E
JZ	T ÚGÖ	T :	E	E
KU	T ÚGÖ	Y	E	E
KV	T ÚGÖ	T ^	E	E
KW	T ÚGÖ	T :	E	E
KX	T ÚGÖ	Y	E	E
KY	T ÚGÖ	T ^	E	E
KZ	T ÚGÖ	T :	E	E
LU	T ÚGÖ	Y	E	E
LV	T ÚGÖ	T ^	E	E
LW	T ÚGÖ	T :	E	E
LX	T ÚGÖ	Y	E	E
LY	T ÚGÖ	T ^	E	E
LZ	T ÚGÖ	T :	E	E
MU	T ÚGÖ	Y	E	E
MV	T ÚGÖ	T ^	E	E
MW	T ÚGÖ	T :	E	E
MX	T ÚGÖ	Y	E	E
MY	T ÚGÖ	T ^	E	E
MZ	T ÚGÖ	T :	E	E
NU	T ÚGÖ	Y	E	E
NV	T ÚGÖ	T ^	E	E
NW	T ÚGÖ	T :	E	E
NX	T ÚGÖ	Y	E	E
NY	T ÚGÖ	T ^	E	E
NZ	T ÚGÖ	T :	E	E
OU	T ÚGÖ	Y	E	E
OV	T ÚGÖ	T ^	E	E
OW	T ÚGÖ	T :	E	E
OX	T ÚGÖ	Y	E	E
OY	T ÚGÖ	T ^	E	E
OZ	T ÚGÖ	T :	E	E



































































































**A Ya Vyf'Dc]bhi@UXg'f6 @ '&\$': '5 bhYbbUK ]fP) \$'8 Y[ k'f'7 cbh]bi YXL**

	T ^{ à^!Aæ ^	Öã^&çã }	T æ} ã à^!Aæ ^	Š &çã } Žã Á á
J	T ÚFÓ	T ç	ËEG	Ë
F€	T ÚFÓ	Ý	FFEGJ	í Èí
FF	T ÚFÓ	Z	FJÈÍÍ	í Èí
FG	T ÚFÓ	T ç	ËEG	í Èí
FH	T ÚFÔ	Ý	FÈHÍ	Ë
FI	T ÚFÔ	Z	FIÈÍÍ	Ë
FÍ	T ÚFÔ	T ç	ËF	Ë
FĪ	T ÚFÔ	Ý	FÈHÍ	í Èí
Fİ	T ÚFÔ	Z	FIÈÍÍ	í Èí
Fì	T ÚFÔ	T ç	ËF	í Èí
FJ	T ÚI œ	Ý	FFEGJ	Ë
G€	T ÚI œ	Z	FJÈJÍ	Ë
GF	T ÚI œ	T ç	ËEG	Ë
GG	T ÚI œ	Ý	FFEGJ	í Èí
GH	T ÚI œ	Z	FJÈJÍ	í Èí
G	T ÚI œ	T ç	ËEG	í Èí
Ḡ	T ÚI Ó	Ý	FFEGJ	Ë
Ġ	T ÚI Ó	Z	FJÈÍÍ	Ë
G̈	T ÚI Ó	T ç	ËEG	Ë
G̉	T ÚI Ó	Ý	FFEGJ	í Èí
G̊	T ÚI Ó	Z	FJÈÍÍ	í Èí
H€	T ÚI Ó	T ç	ËEG	í Èí
HF	T ÚI Ô	Ý	FÈHÍ	Ë
HG	T ÚI Ô	Z	FIÈÍÍ	Ë
HH	T ÚI Ô	T ç	ËF	Ë
HĪ	T ÚI Ô	Ý	FÈHÍ	í Èí
Hİ	T ÚI Ô	Z	FIÈÍÍ	í Èí
Hì	T ÚI Ô	T ç	ËF	í Èí
H̄	T ÚGœ	Ý	FGœF	È
Ḣ	T ÚGœ	Z	GG̈ÍÍ	È
HJ	T ÚGœ	T ç	ËEG	È
I €	T ÚGœ	Ý	FGœF	í Èí
IF	T ÚGœ	Z	GG̈ÍÍ	í Èí
IG	T ÚGœ	T ç	ËEG	í Èí
IH	T ÚGó	Ý	FG̈J	È
II	T ÚGó	Z	GG̈G̈	È
IÍ	T ÚGó	T ç	ËFG	È
IĪ	T ÚGó	Ý	FG̈J	í Èí
Iİ	T ÚGó	Z	GG̈G̈	í Èí
Iì	T ÚGó	T ç	ËFG	í Èí
IJ	T ÚGó	Ý	JÈJH	È
Í €	T ÚGó	Z	FIÈÍJ	È
ÍF	T ÚGó	T ç	ËFF	È
ÍG	T ÚGó	Ý	JÈJH	í Èí
ÍH	T ÚGó	Z	FIÈÍJ	í Èí
Ì	T ÚGó	T ç	ËFF	í Èí
Ī	T ÚGœ	Ý	FGœF	È
Ī̇	T ÚGœ	Z	GG̈ÍÍ	È
Ī̈	T ÚGœ	T ç	ËFG	È
Ī̉	T ÚGœ	Ý	FGœF	í Èí
Ī̊	T ÚGœ	Z	GG̈ÍÍ	í Èí
Î €	T ÚGœ	T ç	ËFG	í Èí





























































































**A Ya Vyf'Dc]bhi@UXg'f6 @ ' + : '5 bhMbUK a 'fi '\$\$'8 Y| t'f' c]b]bi YXL**

	T^{\ à^!Aæ^}	Öá^&çã}	T æ} ã à^ZãPaEca	Š &çã} ŽãÁ á
ì	T ÚHÓ	Ý	ÈÈÈ Ì	Ì
í	T ÚHÓ	Z	ÈÈÈ Í	Ì
ì	T ÚHÓ	T ç	ÈÈÈ Ì G	Ì
ì	T ÚFÖ	Ý	ÈÈÈ Í	G
ì	T ÚFÖ	Z	ÈÈÈ Í	G
ì	T ÚFÖ	T ç	ÈÈÈ ÈG	G
ì	T ÚFÓ	Ý	ÈÈÈ Ì	G
ì	T ÚFÓ	Z	ÈÈÈ Í	G
ì	T ÚFÓ	T ç	È	G
ì	T ÚFÓ	Ý	ÈÈÈ Í	G
ì	T ÚFÓ	Z	ÈÈÈ Í	G
ì	T ÚFÓ	T ç	ÈÈÈ ÈG	G
ì	T ÚGÖ	Ý	ÈÈÈ F	G
ì	T ÚGÖ	Z	ÈÈÈ H	G
ì	T ÚGÖ	T ç	ÈÈÈ Ì Ì	G
ì	T ÚGÓ	Ý	ÈÈÈ Ì	G
ì	T ÚGÓ	Z	ÈÈÈ Í	G
ì	T ÚGÓ	T ç	È	G
ì	T ÚGÓ	Ý	ÈÈÈ F	G
ì	T ÚGÓ	Z	ÈÈÈ H	G
ì	T ÚGÓ	T ç	ÈÈÈ Ì Ì	G
ì	UXÚ	Ý	ÈÈÈ F	F
ì	UXÚ	Z	ÈÈÈ È	F
ì	UXÚ	T ç	ÈÈÈ G	F
ì	T ÚGÓ	Ý	ÈÈÈ H	Ì
ì	T ÚGÓ	Z	ÈÈÈ G	Ì
ì	T ÚGÓ	T ç	ÈÈÈ F	Ì
ì	T ÚGÓ	Ý	ÈÈÈ H	Ì
ì	T ÚGÓ	Z	ÈÈÈ G	Ì
ì	T ÚGÓ	T ç	ÈÈÈ G	Ì

**A Ya Vyf'Dc]bhi@UXg'f6 @ ' , : '5 bhMbUK a 'fi' '\$'8 Y| t'**

	T^{\ à^!Aæ^}	Öá^&çã}	T æ} ã à^ZãPaEca	Š &çã} ŽãÁ á
F	T ÚFÖ	Ý	ÈÈÈ Ì	È
G	T ÚFÖ	Z	ÈÈÈ Í	È
H	T ÚFÖ	T ç	ÈÈÈ G	È
I	T ÚFÖ	Ý	ÈÈÈ Ì	ÌÈÈ
Í	T ÚFÖ	Z	ÈÈÈ Í	ÌÈÈ
Ì	T ÚFÖ	T ç	ÈÈÈ G	ÌÈÈ
Ì	T ÚFÓ	Ý	ÈÈÈ Ì	È
Ì	T ÚFÓ	Z	ÈÈÈ H	È
J	T ÚFÓ	T ç	ÈÈÈ È H	È
FÈ	T ÚFÓ	Ý	ÈÈÈ Ì	ÌÈÈ
FF	T ÚFÓ	Z	ÈÈÈ H	ÌÈÈ
FG	T ÚFÓ	T ç	ÈÈÈ È H	ÌÈÈ
FH	T ÚFÓ	Ý	ÈÈÈ GG	È
FI	T ÚFÓ	Z	ÈÈÈ F	È
FÌ	T ÚFÓ	T ç	ÈÈÈ H	È
FÌ	T ÚFÓ	Ý	ÈÈÈ GG	ÌÈÈ
FÌ	T ÚFÓ	Z	ÈÈÈ F	ÌÈÈ
FÌ	T ÚFÓ	T ç	ÈÈÈ H	ÌÈÈ







































**A Ya Vyf'8 ]g]f]Vi hYX' @ UXg'f6 @' (( : 'Gfi Wñ fy'K c'fi \$'8 Y] H'f' c bh]bi YXL**

	T { à ^! Á ð } ^	Ö à ^! Á ð } ^	Ù ç } ò } Æ } Ç } È } F } G } H } I } J } K }	á } à } ã } ä } å } ä } á } ã } ä } å }	á } à } ã } ä } å } ä } á } ã } ä } å }	Ù ç } ò } Æ } Ç } È } F } G } H } I } J } K }	Ž } Ā } á } Ò } Ó } Ô } Õ } Ö }	Ž } Ā } á } Ò } Ó } Ô } Õ } Ö }
Í J	T Í Í	Ý	F Í È Ì	F Í È Ì	€	€	À F È È	
Ì €	T Í Í	Z	€	€	€	€	À F È È	
Î F	T Í Î	Ý	F Í È Ì H	F Í È Ì H	€	€	À F È È	
Î G	T Í Î	Z	€	€	€	€	À F È È	
Î H	T Ú Í Ò	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Î I	T Ú Í Ò	Z	€	€	€	€	À F È È	
Î Í	T Ú F Ò	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Î Î	T Ú F Ò	Z	€	€	€	€	À F È È	
Î Ï	T Î J	Ý	J È È Í	J È È Í	€	€	À F È È	
Î Ì	T Î J	Z	€	€	€	€	À F È È	
Ï J	T Î €	Ý	H È È Ì	H È È Ì	€	€	À F È È	
Ï €	T Î €	Z	€	€	€	€	À F È È	
Ï F	T Î F	Ý	Ì È È Ì	Ì È È Ì	€	€	À F È È	
Ï G	T Î F	Z	€	€	€	€	À F È È	
Ï H	T Î G	Ý	Ì È È Ì	Ì È È Ì	€	€	À F È È	
Ï I	T Î G	Z	€	€	€	€	À F È È	
Ï Í	T Î H È	Ý	F Í È Ì	F Í È Ì	€	€	À F È È	
Ï Î	T Î H È	Z	€	€	€	€	À F È È	
Ï Ï	T Î Ì È	Ý	È È È	È È È	€	€	À F È È	
Ï Ò	T Î Ì È	Z	€	€	€	€	À F È È	
Ï Ó	T Î Ì Ó	Ý	Ì È È	Ì È È	€	€	À F È È	
Ï €	T Î Ì Ó	Z	€	€	€	€	À F È È	
Ï F	T Î Ó	Ý	Ì È È	Ì È È	€	€	À F È È	
Ï G	T Î Ó	Z	€	€	€	€	À F È È	
Ï H	T Î Ó	Ý	F Í È Ì	F Í È Ì	€	€	À F È È	
Ï I	T Î Ó	Z	€	€	€	€	À F È È	
Ï Í	T Î Ì È	Ý	F Í È Ì H	F Í È Ì H	€	€	À F È È	
Ï Î	T Î Ì È	Z	€	€	€	€	À F È È	
Ï Ï	T Î Ì	Ý	Ì È È	Ì È È	€	€	À F È È	
Ï Ò	T Î Ì	Z	€	€	€	€	À F È È	
Ï Ó	T Î Ì È	Ý	€	€	€	€	À F È È	
Ï €	T Î Ì È	Z	€	€	€	€	À F È È	
Ï F	T J È	Ý	€	€	€	€	À F È È	
Ï G	T J È	Z	€	€	€	€	À F È È	
Ï H	T Ú Í Ó	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Ï I	T Ú Í Ó	Z	€	€	€	€	À F È È	
Ï Í	T Ú F Ó	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Ï Î	T Ú F Ó	Z	€	€	€	€	À F È È	
Ï Ï	T F È G	Ý	€	€	€	€	À F È È	
Ï Ò	T F È G	Z	€	€	€	€	À F È È	
Ï Ó	T F È	Ý	J È È Í	J È È Í	€	€	À F È È	
Ï €	T F È	Z	€	€	€	€	À F È È	
Ï F	T F F F	Ý	J È È Í	J È È Í	€	€	À F È È	
Ï G	T F F F	Z	€	€	€	€	À F È È	
Ï H	T Ú H Ó	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Ï I	T Ú H Ó	Z	€	€	€	€	À F È È	
Ï Í	T Ú G Ó	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Ï Î	T Ú G Ó	Z	€	€	€	€	À F È È	
Ï Ï	T Ú H Ó	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Ï Ò	T Ú H Ó	Z	€	€	€	€	À F È È	
Ï Ó	T Ú G Ó	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Ï €	T Ú G Ó	Z	€	€	€	€	À F È È	
Ï F	T Ú G Ó	Ý	Ì È È J F	Ì È È J F	€	€	À F È È	
Ï G	T Ú G Ó	Z	€	€	€	€	À F È È	



**A Ya Vyf'8 ]gfh]Vi hYX' @ UXg'f6 @' ( ) : Gfi Wñ fy'K c'fv&\$ 8 Y] ttfv' cb]hbi YXL**

	T^ { à^!Àæ^ ^ }	Öã^&çã }	ÙæøÁ æ } à^ à^ZaDf(Ö) áÁ æ } à^ à^ZaDf(Ö) ÙæøÁ } &çã }	ZdÁ á	Ö) áÁ } &çã }	ZdÁ á
I H	THU	Y	GÉÍÍ	GÉÍÍ	€	À FEE
I I	THU	Z	FÈÍF	FÈÍF	€	À FEE
I Í	TIE	Y	I ÈJJ	I ÈJJ	€	À FEE
I Î	TIE	Z	GÈFH	GÈFH	€	À FEE
I Ï	TIH	Y	FÈÍÌ	FÈÍÌ	€	À FEE
I Ì	TIH	Z	Í ÈFÌ	Í ÈFÌ	€	À FEE
I J	TII	Y	GÈHH	GÈHH	€	À FEE
I €	TII	Z	FÈÍÏ	FÈÍÏ	€	À FEE
I F	TIJ	Y	FI ÈÍI	FI ÈÍI	€	À FEE
I G	TIJ	Z	Ì ÈÍJ	Ì ÈÍJ	€	À FEE
I H	TIE	Y	I ÈÍÏ	I ÈÍÏ	€	À FEE
I I	TIE	Z	GÈÍH	GÈÍH	€	À FEE
I Í	TIG	Y	I ÈÍ	I ÈÍ	€	À FEE
I Î	TIG	Z	GÈÍI	GÈÍI	€	À FEE
I Ï	TII	Y	FI ÈÍI	FI ÈÍI	€	À FEE
I Ì	TII	Z	Ì ÈÍJ	Ì ÈÍJ	€	À FEE
I J	TII	Y	FJ ÈÍÍ	FJ ÈÍÍ	€	À FEE
I €	TII	Z	FF ÈÍH	FF ÈÍH	€	À FEE
I F	TII	Y	FJ ÈÍF	FJ ÈÍF	€	À FEE
I G	TII	Z	FF ÈÍÍ	FF ÈÍÍ	€	À FEE
I H	TUI Ö	Y	Ì ÈÍ	Ì ÈÍ	€	À FEE
I I	TUI Ö	Z	I ÈJÍ	I ÈJÍ	€	À FEE
I Í	TUFÖ	Y	Ì ÈÍ	Ì ÈÍ	€	À FEE
I Î	TUFÖ	Z	I ÈJÍ	I ÈJÍ	€	À FEE
I Ï	TÍJ	Y	FÈÍÍ	FÈÍÍ	€	À FEE
I Ì	TÍJ	Z	Ì ÈH	Ì ÈH	€	À FEE
I J	TIE	Y	€	€	€	À FEE
I €	TIE	Z	€	€	€	À FEE
I F	TIF	Y	FÈÍI	FÈÍI	€	À FEE
I G	TIF	Z	Í ÈG	Í ÈG	€	À FEE
I H	TIG	Y	FÈÍI	FÈÍI	€	À FEE
I I	TIG	Z	Í ÈG	Í ÈG	€	À FEE
I Í	TIHÖE	Y	FI ÈJÍ	FI ÈJÍ	€	À FEE
I Î	TIHÖE	Z	FÈÍG	FÈÍG	€	À FEE
I Ï	TIIÖE	Y	GÈFH	GÈFH	€	À FEE
I Ì	TIIÖE	Z	FÈÍI	FÈÍI	€	À FEE
I J	TIIÖ	Y	GÈFI	GÈFI	€	À FEE
I €	TIIÖ	Z	FÈÍI	FÈÍI	€	À FEE
I F	TIGÖ	Y	€	€	€	À FEE
I G	TIGÖ	Z	€	€	€	À FEE
I H	TIHÖ	Y	I ÈÍÏ	I ÈÍÏ	€	À FEE
I I	TIHÖ	Z	GÈÍH	GÈÍH	€	À FEE
I Í	TIIÖE	Y	I ÈÍ	I ÈÍ	€	À FEE
I Î	TIIÖE	Z	GÈÍI	GÈÍI	€	À FEE
I Ï	TII	Y	€	€	€	À FEE
I Ì	TII	Z	€	€	€	À FEE
I J	TIIÖE	Y	I ÈÍÏ	I ÈÍÏ	€	À FEE
I €	TIIÖE	Z	GÈÍH	GÈÍH	€	À FEE
I F	TJE	Y	I ÈÍ	I ÈÍ	€	À FEE
I G	TJE	Z	GÈÍI	GÈÍI	€	À FEE
I H	TUI Ö	Y	Ì ÈÍ	Ì ÈÍ	€	À FEE
I I	TUI Ö	Z	I ÈJÍ	I ÈJÍ	€	À FEE









**A Ya Vyf'8 ]gfh]Vi hYX' @ UXg'f6 @' (+: 'Gfi Wñ fy'K c'fv, \$ 8 Y] tL'fV cb]hbi YXL**

	T^ { à^!Àæ^ }	Öã^&ç ]	ÙçœóÁ æ } à^ à^ZaDœ(È) áÁ æ } à^ à^ZaDœ(È) ÙçœóÁ } &œç ] ZœÁ á	ÙçœóÁ } &œç ] ZœÁ á	ÙçœóÁ } &œç ] ZœÁ á	ÙçœóÁ } &œç ] ZœÁ á
FF	TÏÏ	Ý	€	€	€	À FEE
FG	TÏÏ	Z	HÈH	HÈH	€	À FEE
FH	TÏJ	Ý	€	€	€	À FEE
FI	TÏJ	Z	HÈH	HÈH	€	À FEE
FÍ	TÏI	Ý	€	€	€	À FEE
FÌ	TÏI	Z	€	€	€	À FEE
FÏ	TÏÍ	Ý	€	€	€	À FEE
FÌ	TÏÍ	Z	Í È Ğ	Í È Ğ	€	À FEE
FJ	TÏœ	Ý	€	€	€	À FEE
G€	TÏœ	Z	Í È Ğ	Í È Ğ	€	À FEE
GF	TÏJœ	Ý	€	€	€	À FEE
GG	TÏJœ	Z	€	€	€	À FEE
GH	TJœœ	Ý	€	€	€	À FEE
G	TJœœ	Z	Í È Ğ	Í È Ğ	€	À FEE
G	TJG	Ý	€	€	€	À FEE
G	TJG	Z	Í È Ğ	Í È Ğ	€	À FEE
G	TÚIœ	Ý	€	€	€	À FEE
G	TÚIœ	Z	Í È JF	Í È JF	€	À FEE
GJ	TÚHœ	Ý	€	€	€	À FEE
H€	TÚHœ	Z	Í È JF	Í È JF	€	À FEE
HF	TÚGœ	Ý	€	€	€	À FEE
HG	TÚGœ	Z	Í È JF	Í È JF	€	À FEE
HH	TÚFœ	Ý	€	€	€	À FEE
HI	TÚFœ	Z	Í È JF	Í È JF	€	À FEE
HÍ	UXÚ	Ý	€	€	€	À FEE
HÌ	UXÚ	Z	Í È Ğ	Í È Ğ	€	À FEE
HÏ	THÏ	Ý	€	€	€	À FEE
HÌ	THÏ	Z	HÈÍ	HÈÍ	€	À FEE
HJ	THÏ	Ý	€	€	€	À FEE
I€	THÏ	Z	FÈH	FÈH	€	À FEE
IF	THÏ	Ý	€	€	€	À FEE
IG	THÏ	Z	GÈH	GÈH	€	À FEE
IH	THU	Ý	€	€	€	À FEE
II	THU	Z	GÈH	GÈH	€	À FEE
IÍ	TÍ€	Ý	€	€	€	À FEE
IÌ	TÍ€	Z	Í È Ğ	Í È Ğ	€	À FEE
IÏ	TIH	Ý	€	€	€	À FEE
IÌ	TIH	Z	GÈJ	GÈJ	€	À FEE
IJ	TII	Ý	€	€	€	À FEE
I€	TII	Z	FFÈHU	FFÈHU	€	À FEE
IF	TIJ	Ý	€	€	€	À FEE
IG	TIJ	Z	FÍÈJ	FÍÈJ	€	À FEE
IH	TÍ€	Ý	€	€	€	À FEE
IÌ	TÍ€	Z	GÈF	GÈF	€	À FEE
IÏ	TÍG	Ý	€	€	€	À FEE
IÌ	TÍG	Z	GÈJF	GÈJF	€	À FEE
IÏ	TÏI	Ý	€	€	€	À FEE
IÌ	TÏI	Z	FÍÈJ	FÍÈJ	€	À FEE
IJ	TÏI	Ý	€	€	€	À FEE
I€	TÏI	Z	Í È Ğ	Í È Ğ	€	À FEE
IF	TÏI	Ý	€	€	€	À FEE
I€	TÏI	Z	Í È Ğ	Í È Ğ	€	À FEE

























**A Ya Vyf'8 ]gfh]Vi hYX' @ UXg'f6 @' )&: 'Gfi Wñ fy'K c'fl' '\$ 8 Y] tL'fV cb]hbi YXL**

T^ { à^/Aæ^ ^	Öã^&ç] }	ÙçæóÁ æ' } æ' á^ZãD(È) áÁ æ' } æ' á^ZãD(È) ÙçæóÁ } &æ] } ZãÁ á	ÙçæóÁ æ' } æ' á^ZãD(È) áÁ æ' } æ' á^ZãD(È) ÙçæóÁ } &æ] } ZãÁ á	ÙçæóÁ æ' } æ' á^ZãD(È) áÁ æ' } æ' á^ZãD(È) ÙçæóÁ } &æ] } ZãÁ á	ÙçæóÁ æ' } æ' á^ZãD(È) áÁ æ' } æ' á^ZãD(È) ÙçæóÁ } &æ] } ZãÁ á	ÙçæóÁ æ' } æ' á^ZãD(È) áÁ æ' } æ' á^ZãD(È) ÙçæóÁ } &æ] } ZãÁ á
HĪ	THĪ	Y	€	€	€	Ä FEE
HÌ	THÌ	Z	€	€	€	Ä FEE
HJ	THĪ	Y	Ě ĚH	Ě ĚH	€	Ä FEE
I€	THĪ	Z	ĚĚFH	ĚĚFH	€	Ä FEE
IF	THĪ	Y	€	€	€	Ä FEE
IG	THĪ	Z	€	€	€	Ä FEE
IH	THU	Y	€	€	€	Ä FEE
IÌ	THU	Z	€	€	€	Ä FEE
IÍ	TI€	Y	€	€	€	Ä FEE
IÎ	TI€	Z	€	€	€	Ä FEE
IÏ	TIH	Y	Ě ĚÍ	Ě ĚÍ	€	Ä FEE
IË	TIH	Z	Ě ĚJ	Ě ĚJ	€	Ä FEE
IJ	TIĪ	Y	Ě ĚÍ	Ě ĚÍ	€	Ä FEE
I€	TIĪ	Z	Ě Ě	Ě Ě	€	Ä FEE
IF	TIJ	Y	ĚĚFJ	ĚĚFJ	€	Ä FEE
IG	TIJ	Z	ĚĚFH	ĚĚFH	€	Ä FEE
IH	TI€	Y	Ě Ě	Ě Ě	€	Ä FEE
IÌ	TI€	Z	ĚĚJ	ĚĚJ	€	Ä FEE
IÍ	TIG	Y	Ě ĚJF	Ě ĚJF	€	Ä FEE
IÎ	TIG	Z	ĚĚF	ĚĚF	€	Ä FEE
IÏ	TII	Y	ĚĚFJ	ĚĚFJ	€	Ä FEE
IË	TII	Z	ĚĚFH	ĚĚFH	€	Ä FEE
IJ	TII	Y	Ě Ě	Ě Ě	€	Ä FEE
I€	TII	Z	ĚĚJ	ĚĚJ	€	Ä FEE
IF	TII	Y	Ě ĚJF	Ě ĚJF	€	Ä FEE
IG	TII	Z	ĚĚF	ĚĚF	€	Ä FEE
IH	TUI Ô	Y	Ě ĚJ	Ě ĚJ	€	Ä FEE
IÌ	TUI Ô	Z	Ě Ě	Ě Ě	€	Ä FEE
IÍ	TUF Ô	Y	Ě ĚJ	Ě ĚJ	€	Ä FEE
IÎ	TUF Ô	Z	Ě Ě	Ě Ě	€	Ä FEE
IÏ	TIJ	Y	Ě ĚI	Ě ĚI	€	Ä FEE
IË	TIJ	Z	Ě ĚG	Ě ĚG	€	Ä FEE
IJ	TI€	Y	ĚĚH	ĚĚH	€	Ä FEE
I€	TI€	Z	ĚĚH	ĚĚH	€	Ä FEE
IF	TIF	Y	Ě ĚI	Ě ĚI	€	Ä FEE
IG	TIF	Z	Ě ĚJ	Ě ĚJ	€	Ä FEE
IH	TIG	Y	Ě ĚI	Ě ĚI	€	Ä FEE
IÌ	TIG	Z	Ě ĚJ	Ě ĚJ	€	Ä FEE
IÍ	TIHÖ	Y	Ě ĚH	Ě ĚH	€	Ä FEE
IÎ	TIHÖ	Z	ĚĚJ	ĚĚJ	€	Ä FEE
IÏ	TIOE	Y	Ě ĚI	Ě ĚI	€	Ä FEE
IË	TIOE	Z	Ě Ě	Ě Ě	€	Ä FEE
IJ	TIIÓ	Y	ĚĚH	ĚĚH	€	Ä FEE
I€	TIIÓ	Z	ĚĚ	ĚĚ	€	Ä FEE
IF	TIGÓ	Y	ĚĚH	ĚĚH	€	Ä FEE
IG	TIGÓ	Z	Ě ĚG	Ě ĚG	€	Ä FEE
IH	TIHÓ	Y	€	€	€	Ä FEE
IÌ	TIHÓ	Z	€	€	€	Ä FEE
IÍ	TIOE	Y	€	€	€	Ä FEE
IÎ	TIOE	Z	€	€	€	Ä FEE
IÏ	TIIÓ	Y	ĚĚH	ĚĚH	€	Ä FEE
IË	TII	Z	Ě ĚG	Ě ĚG	€	Ä FEE











**A Ya Vyf'8 ]gfh]Vi hYX'@ UXg'f6 @' ) ( : 'Gfi Wñ fy'K ]'fl \$'8 Yl tL'f7 cb]hbi YXL**

	T { à^!Àæ^ ^	Öã^&ç	ÙæøÁ æ } æ à^!Àæ^ ^	ÙæøÁ æ } æ à^!Àæ^ ^	ÙæøÁ æ } æ à^!Àæ^ ^	ÙæøÁ æ } æ à^!Àæ^ ^	ÙæøÁ æ } æ à^!Àæ^ ^
íí	TÍI	Ý	ËH	ËH	€	À FEE	
ïï	TÍI	Z	ËJG	ËJG	€	À FEE	
íJ	TÍI	Ý	€	€	€	À FEE	
í€	TÍI	Z	€	€	€	À FEE	
íF	TÍI	Ý	€	€	€	À FEE	
íG	TÍI	Z	€	€	€	À FEE	
íH	TÚI Ô	Ý	FËI F	FËI F	€	À FEE	
íI	TÚI Ô	Z	ËËHU	ËËHU	€	À FEE	
íÍ	TÚFÔ	Ý	FËI F	FËI F	€	À FEE	
íÎ	TÚFÔ	Z	ËËHU	ËËHU	€	À FEE	
ïï	TÎJ	Ý	€	€	€	À FEE	
ïï	TÎJ	Z	€	€	€	À FEE	
íJ	TÏ€	Ý	FËI H	FËI H	€	À FEE	
í€	TÏ€	Z	ËËF	ËËF	€	À FEE	
íF	TÏF	Ý	€	€	€	À FEE	
íG	TÏF	Z	€	€	€	À FEE	
íH	TÏG	Ý	€	€	€	À FEE	
íI	TÏG	Z	€	€	€	À FEE	
íI	TÏHÖ	Ý	€	€	€	À FEE	
íI	TÏHÖ	Z	€	€	€	À FEE	
íI	TÏÖE	Ý	FËG	FËG	€	À FEE	
íI	TÏÖE	Z	ËËI F	ËËI F	€	À FEE	
íJ	TÏÖ	Ý	FËG	FËG	€	À FEE	
í€	TÏÖ	Z	ËËI F	ËËI F	€	À FEE	
íF	TÏÓ	Ý	GËH	GËH	€	À FEE	
íG	TÏÓ	Z	ËËJ	ËËJ	€	À FEE	
íH	TÏÓ	Ý	FËI	FËI	€	À FEE	
íI	TÏÓ	Z	ËË	ËË	€	À FEE	
íI	TÏÖE	Ý	FËI	FËI	€	À FEE	
íI	TÏÖE	Z	ËËI	ËËI	€	À FEE	
íI	TÏI	Ý	GËH	GËH	€	À FEE	
íI	TÏI	Z	ËËJ	ËËJ	€	À FEE	
íJ	TÏÖE	Ý	FËI	FËI	€	À FEE	
J€	TÏÖE	Z	ËË	ËË	€	À FEE	
JF	TJ€	Ý	FËI	FËI	€	À FEE	
JG	TJ€	Z	ËËI	ËËI	€	À FEE	
JH	TÚI Ô	Ý	FËI F	FËI F	€	À FEE	
JI	TÚI Ô	Z	ËËHU	ËËHU	€	À FEE	
JÍ	TÚFÔ	Ý	FËI F	FËI F	€	À FEE	
JÎ	TÚFÔ	Z	ËËHU	ËËHU	€	À FEE	
JÏ	T FEG	Ý	FËI	FËI	€	À FEE	
JÌ	T FEG	Z	ËËI	ËËI	€	À FEE	
JJ	T FË	Ý	FËI	FËI	€	À FEE	
F€	T FË	Z	ËËI	ËËI	€	À FEE	
F€	T FFF	Ý	€	€	€	À FEE	
F€G	T FFF	Z	€	€	€	À FEE	
F€H	T ÚHÖ	Ý	FËI F	FËI F	€	À FEE	
F€I	T ÚHÖ	Z	ËËHU	ËËHU	€	À FEE	
F€I	T ÚGÖ	Ý	FËI F	FËI F	€	À FEE	
F€I	T ÚGÖ	Z	ËËHU	ËËHU	€	À FEE	
F€I	T ÚHÖ	Ý	FËI F	FËI F	€	À FEE	
F€I	T ÚHÖ	Z	ËËHU	ËËHU	€	À FEE	











**A Ya Vyf'8 ]g]f]Vi hYX' @ UXg'f6 @' )+ : 'Gfi Wñ fy'K ]''fp&\$'8 Y] tL'f c bh]bi YXL**

	T ^ { à^!āæ ^	Öā^&ā}	ÙcæóÁ æ } æ à^!āæ } àÁ æ } æ à^!āæ } ÛcæóÁ &æā } ZēÁ á	Ù] of GEGH	FGEEÜT	Ô@&^àÁK''''
J	TĪĪ	Ý	ĪĪ	ĪĪ	€	Ā FEE
F€	TĪĪ	Z	Ī F	Ī F	€	Ā FEE
FF	TĪĪ	Ý	Ī FĪ	Ī FĪ	€	Ā FEE
FG	TĪĪ	Z	Ī Í	Ī Í	€	Ā FEE
FH	TĪJ	Ý	Ī Ī	Ī Ī	€	Ā FEE
FI	TĪJ	Z	Ī ĪH	Ī ĪH	€	Ā FEE
FÍ	TĪĪ	Ý	Ī ĪG	Ī ĪG	€	Ā FEE
FĪ	TĪĪ	Z	Ī Ī	Ī Ī	€	Ā FEE
FĪ	TĪĪ	Ý	Ī ĪH	Ī ĪH	€	Ā FEE
FĪ	TĪĪ	Z	Ī Ī	Ī Ī	€	Ā FEE
FJ	TĪĪOE	Ý	Ī Ī	Ī Ī	€	Ā FEE
G€	TĪĪOE	Z	Ī EG	Ī EG	€	Ā FEE
GF	TĪJOE	Ý	Ī ĪG	Ī ĪG	€	Ā FEE
GG	TĪJOE	Z	Ī Ī	Ī Ī	€	Ā FEE
GH	TJ€OE	Ý	Ī HH	Ī HH	€	Ā FEE
G	TJ€OE	Z	Ī HU	Ī HU	€	Ā FEE
G	TJG	Ý	Ī F	Ī F	€	Ā FEE
G	TJG	Z	Ī Í	Ī Í	€	Ā FEE
G	TÚĪ OE	Ý	Ī HU	Ī HU	€	Ā FEE
G	TÚĪ OE	Z	Ī Ī F	Ī Ī F	€	Ā FEE
GJ	TÚHOE	Ý	Ī HU	Ī HU	€	Ā FEE
H€	TÚHOE	Z	Ī Ī F	Ī Ī F	€	Ā FEE
HF	TÚGOE	Ý	Ī HU	Ī HU	€	Ā FEE
HG	TÚGOE	Z	Ī Ī F	Ī Ī F	€	Ā FEE
HH	TÚFOE	Ý	Ī HU	Ī HU	€	Ā FEE
HI	TÚFOE	Z	Ī Ī F	Ī Ī F	€	Ā FEE
HÍ	UXÚ	Ý	Ī G	Ī G	€	Ā FEE
HĪ	UXÚ	Z	Ī FF	Ī FF	€	Ā FEE
HĪ	THĪ	Ý	Ī G	Ī G	€	Ā FEE
HĪ	THĪ	Z	Ī FJ	Ī FJ	€	Ā FEE
HJ	THĪ	Ý	Ī ĪH	Ī ĪH	€	Ā FEE
I€	THĪ	Z	Ī ĪH	Ī ĪH	€	Ā FEE
IF	THĪ	Ý	Ī HG	Ī HG	€	Ā FEE
IG	THĪ	Z	Ī Í	Ī Í	€	Ā FEE
IH	THJ	Ý	Ī HG	Ī HG	€	Ā FEE
II	THJ	Z	Ī Í	Ī Í	€	Ā FEE
IÍ	TI€	Ý	Ī Ī	Ī Ī	€	Ā FEE
IĪ	TI€	Z	Ī F	Ī F	€	Ā FEE
IĪ	TIH	Ý	Ī Ī	Ī Ī	€	Ā FEE
IĪ	TIH	Z	Ī ĪH	Ī ĪH	€	Ā FEE
IJ	TII	Ý	Ī FĪ	Ī FĪ	€	Ā FEE
I€	TII	Z	Ī Í	Ī Í	€	Ā FEE
IF	TIJ	Ý	Ī ĪG	Ī ĪG	€	Ā FEE
IG	TIJ	Z	Ī Ī	Ī Ī	€	Ā FEE
IH	TÍ€	Ý	Ī HH	Ī HH	€	Ā FEE
IĪ	TÍ€	Z	Ī HU	Ī HU	€	Ā FEE
IĪ	TÍG	Ý	Ī F	Ī F	€	Ā FEE
IĪ	TÍG	Z	Ī Í	Ī Í	€	Ā FEE
IĪ	TĪĪ	Ý	Ī ĪG	Ī ĪG	€	Ā FEE
IĪ	TĪĪ	Z	Ī Ī	Ī Ī	€	Ā FEE
IĪ	TĪĪ	Ý	Ī ĪH	Ī ĪH	€	Ā FEE
I€	TĪĪ	Z	Ī Ī	Ī Ī	€	Ā FEE







**A Ya Vyf'8 ]gfh]Vi hYX'@ UXg'f6 @' ), : 'Gfi Wñ fy'K ]''fp\$'8 Yl'f' c bh]bi YXL**

	T^ { à^!Àæ^	Öã^&ç	ÙæóÀ æ' à' à^ZaDf(Ö) áÀ æ' à' à^ZaDf(Ö) ÙæóÀ } &ç	ZdÁ á	Ö) áÀ } &ç } ZdÁ á
IÍ	TÍ€	Ý	€	€	€
IÏ	TÍ€	Z	€	€	€
IÏ	TÍH	Ý	FËGF	FËGF	€
IÏ	TÍH	Z	FËIF	FËIF	€
IJ	TII	Ý	FËGF	FËGF	€
I€	TII	Z	FËIF	FËIF	€
IF	TIJ	Ý	GËH	GËH	€
IG	TIJ	Z	HËJÍ	HËJÍ	€
IH	TÍ€	Ý	FËFÍ	FËFÍ	€
IÍ	TÍ€	Z	GË	GË	€
IÏ	TÍG	Ý	FËÍÍ	FËÍÍ	€
IÏ	TÍG	Z	GËÍÍ	GËÍÍ	€
IÏ	TÍI	Ý	GËH	GËH	€
IÏ	TÍI	Z	HËJÍ	HËJÍ	€
IJ	TÍÍ	Ý	FËFÍ	FËFÍ	€
I€	TÍÍ	Z	GË	GË	€
IF	TÍÍ	Ý	FËÍÍ	FËÍÍ	€
IG	TÍÍ	Z	GËÍÍ	GËÍÍ	€
IH	TÚÍ Ó	Ý	FËÍ F	FËÍ F	€
IÏ	TÚÍ Ó	Z	GËHU	GËHU	€
IÏ	TÚFÓ	Ý	FËÍ F	FËÍ F	€
IÏ	TÚFÓ	Z	GËHU	GËHU	€
IÏ	TÍJ	Ý	FËÍÍ	FËÍÍ	€
IÏ	TÍJ	Z	GËÍÍ	GËÍÍ	€
IJ	TÍ€	Ý	ËÍH	ËÍH	€
I€	TÍ€	Z	ËÍÍ	ËÍÍ	€
IF	TÍF	Ý	FËJÍ	FËJÍ	€
IG	TÍF	Z	FËJÍ	FËJÍ	€
IH	TÍG	Ý	FËJÍ	FËJÍ	€
IÏ	TÍG	Z	FËJÍ	FËJÍ	€
IÏ	TÍHÖ	Ý	FËGG	FËGG	€
IÏ	TÍHÖ	Z	GËF	GËF	€
IÏ	TÍÍÖ	Ý	FËÍJ	FËÍJ	€
IÏ	TÍÍÖ	Z	GËÍF	GËÍF	€
IJ	TÍÍÓ	Ý	ËËGJ	ËËGJ	€
I€	TÍÍÓ	Z	ËËF	ËËF	€
IF	TÍÓ	Ý	ËÍH	ËÍH	€
IG	TÍÓ	Z	ËÍG	ËÍG	€
IH	TÍHÓ	Ý	€	€	€
IÏ	TÍHÓ	Z	€	€	€
IÏ	TÍÍÖ	Ý	€	€	€
IÏ	TÍÍÖ	Z	€	€	€
IÏ	TÍÍ	Ý	ËÍH	ËÍH	€
IÏ	TÍÍ	Z	ËÍG	ËÍG	€
IJ	TÍÍÖ	Ý	FËFÍ	FËFÍ	€
J€	TÍÍÖ	Z	GË	GË	€
JF	TJ€	Ý	FËÍÍ	FËÍÍ	€
JG	TJ€	Z	GËÍÍ	GËÍÍ	€
JH	TÚÍ Ó	Ý	FËÍ F	FËÍ F	€
JÍ	TÚÍ Ó	Z	GËHU	GËHU	€
JÍ	TÚFÓ	Ý	FËÍ F	FËÍ F	€
JÍ	TÚFÓ	Z	GËHU	GËHU	€





















































**A Ya Vyf'8 jgfi]Vi hYX'@ UXg'f6 @ '\*, : 'Gfi Wi fy'Ka ''fi \$'8 Yl Lf'f cbi]bi YXL**

	T^{ à^!Àæ^}	Öá^&ç}	ÚçéóÁ æ} æ á^ZáDóE} áÁ æ} æ á^ZáDóE	ÚçéóÁ æ} æ á^ZáDóE	ÚçéóÁ æ} æ á^ZáDóE	ÚçéóÁ æ} æ á^ZáDóE	ÚçéóÁ æ} æ á^ZáDóE
Jİ	T FEG	Y	€	€	€	€	Ä FEE
Ji	T FEG	Z	€	€	€	€	Ä FEE
JJ	T Fé	Y	È I	È I	€	€	Ä FEE
F€	T Fé	Z	€	€	€	€	Ä FEE
F€	T FFF	Y	È I	È I	€	€	Ä FEE
F€G	T FFF	Z	€	€	€	€	Ä FEE
F€H	T ÚHÔ	Y	È J	È J	€	€	Ä FEE
F€	T ÚHÔ	Z	€	€	€	€	Ä FEE
F€	T ÚGÔ	Y	È J	È J	€	€	Ä FEE
F€	T ÚGÔ	Z	€	€	€	€	Ä FEE
F€	T ÚHÓ	Y	È J	È J	€	€	Ä FEE
F€	T ÚHÓ	Z	€	€	€	€	Ä FEE
F€J	T ÚGÓ	Y	È J	È J	€	€	Ä FEE
FF€	T ÚGÓ	Z	€	€	€	€	Ä FEE
FFF	T FGH	Y	È €F	È €F	€	€	Ä FEE
FFG	T FGH	Z	€	€	€	€	Ä FEE
FFH	T FG	Y	€	€	€	€	Ä FEE
FFI	T FG	Z	€	€	€	€	Ä FEE
FF	T FG	Y	È €F	È €F	€	€	Ä FEE
FF	T FG	Z	€	€	€	€	Ä FEE

**A Ya Vyf'8 jgfi]Vi hYX'@ UXg'f6 @ '\*- : 'Gfi Wi fy'Ka ''fi &\$'8 Yl Lf**

	T^{ à^!Àæ^}	Öá^&ç}	ÚçéóÁ æ} æ á^ZáDóE} áÁ æ} æ á^ZáDóE	ÚçéóÁ æ} æ á^ZáDóE	ÚçéóÁ æ} æ á^ZáDóE	ÚçéóÁ æ} æ á^ZáDóE	ÚçéóÁ æ} æ á^ZáDóE
F	T GE	Y	È I	È I	€	€	Ä FEE
G	T GE	Z	È JF	È JF	€	€	Ä FEE
H	T I GE	Y	È FJ	È FJ	€	€	Ä FEE
I	T I GE	Z	È	È	€	€	Ä FEE
Í	T I H	Y	È I	È I	€	€	Ä FEE
î	T I H	Z	È I	È I	€	€	Ä FEE
ï	T I I	Y	È I	È I	€	€	Ä FEE
ì	T I I	Z	È I	È I	€	€	Ä FEE
J	T I I	Y	È F	È F	€	€	Ä FEE
F€	T I I	Z	È I	È I	€	€	Ä FEE
FF	T I I	Y	È H	È H	€	€	Ä FEE
FG	T I I	Z	È I	È I	€	€	Ä FEE
FH	T I J	Y	È I F	È I F	€	€	Ä FEE
FI	T I J	Z	È H	È H	€	€	Ä FEE
Fí	T I I	Y	È Fí	È Fí	€	€	Ä FEE
Fï	T I I	Z	È I G	È I G	€	€	Ä FEE
Fî	T I I	Y	FÈ H	FÈ H	€	€	Ä FEE
Fì	T I I	Z	È H	È H	€	€	Ä FEE
FJ	T I I OE	Y	FÈ I H	FÈ I H	€	€	Ä FEE
G€	T I I OE	Z	È I	È I	€	€	Ä FEE
GF	T I JOE	Y	È Fí	È Fí	€	€	Ä FEE
GG	T I JOE	Z	È I G	È I G	€	€	Ä FEE
GH	T J€OE	Y	È I	È I	€	€	Ä FEE
G	T J€OE	Z	È I J	È I J	€	€	Ä FEE
G	T JG	Y	È I	È I	€	€	Ä FEE
G	T JG	Z	È I	È I	€	€	Ä FEE
G	T U I OE	Y	È GJ	È GJ	€	€	Ä FEE
G	T U I OE	Z	È I	È I	€	€	Ä FEE

**A Ya Vyf'8 jgfi]Vi hYX' @ UXg'f6 @' \*- : 'Gfi Wñ fy'K a ''fV&\$'8 Yf Lf'f' cbi]bi YXL**

	T { à^!Àæ^}	Öá^&á}	ÚcæóÁ æ} á à^ZáDæ(Ü) áÁ æ} á à^ZáDæ(Ü) ÚcæóÁ &æá} ZæÁ á	Ö) áÁ &æá} ZæÁ á		
GJ	T ÚHOE	Ý	È GJ	È GJ	€	À FEE
H€	T ÚHOE	Z	È Ì	È Ì	€	À FEE
HF	T ÚGOE	Ý	È GJ	È GJ	€	À FEE
HG	T ÚGOE	Z	È Ì	È Ì	€	À FEE
HH	T ÚFOE	Ý	È GJ	È GJ	€	À FEE
HI	T ÚFOE	Z	È Ì	È Ì	€	À FEE
HÍ	UXÚ	Ý	È Í	È Í	€	À FEE
HÏ	UXÚ	Z	È EG	È EG	€	À FEE
HĪ	THĪ	Ý	È Í	È Í	€	À FEE
HĪ	THĪ	Z	È JF	È JF	€	À FEE
HJ	THĪ	Ý	È FJ	È FJ	€	À FEE
I€	THĪ	Z	È	È	€	À FEE
IF	THĪ	Ý	È Í	È Í	€	À FEE
IG	THĪ	Z	È Í	È Í	€	À FEE
IH	THU	Ý	È Í	È Í	€	À FEE
IĪ	THU	Z	È Í	È Í	€	À FEE
IÍ	TÍ€	Ý	È F	È F	€	À FEE
IÏ	TÍ€	Z	È Í	È Í	€	À FEE
IĪ	TIH	Ý	È Í	È Í	€	À FEE
IĪ	TIH	Z	È H	È H	€	À FEE
IJ	TII	Ý	È H	È H	€	À FEE
I€	TII	Z	È Í	È Í	€	À FEE
ÍF	TIJ	Ý	È FÍ	È FÍ	€	À FEE
ÍG	TIJ	Z	È ÍG	È ÍG	€	À FEE
ÍH	TÍ€	Ý	È Í	È Í	€	À FEE
ÍĪ	TÍ€	Z	È J	È J	€	À FEE
ÍÍ	TÍG	Ý	È Í	È Í	€	À FEE
ÍÏ	TÍG	Z	È Í	È Í	€	À FEE
ÍĪ	TÍÍ	Ý	È FÍ	È FÍ	€	À FEE
ÍĪ	TÍÍ	Z	È ÍG	È ÍG	€	À FEE
ÍJ	TÍÍ	Ý	FÈH	FÈH	€	À FEE
Í€	TÍÍ	Z	È H	È H	€	À FEE
ÍF	TÍÍ	Ý	FÈIH	FÈIH	€	À FEE
ÍG	TÍÍ	Z	È Í	È Í	€	À FEE
ÍH	TÚÍ Ö	Ý	È GJ	È GJ	€	À FEE
ÍĪ	TÚÍ Ö	Z	È Ì	È Ì	€	À FEE
ÍÏ	TÚF Ö	Ý	È GJ	È GJ	€	À FEE
ÍÏ	TÚF Ö	Z	È Ì	È Ì	€	À FEE
ÍĪ	TĪJ	Ý	È HG	È HG	€	À FEE
ÍĪ	TĪJ	Z	È Í	È Í	€	À FEE
ÍJ	TÍ€	Ý	€	€	€	À FEE
Í€	TÍ€	Z	€	€	€	À FEE
ÍF	TÍF	Ý	È JF	È JF	€	À FEE
ÍG	TÍF	Z	È IF	È IF	€	À FEE
ÍH	TÍG	Ý	È JF	È JF	€	À FEE
ÍĪ	TÍG	Z	È IF	È IF	€	À FEE
ÍÏ	TÍHOE	Ý	FÈIH	FÈIH	€	À FEE
ÍÏ	TÍHOE	Z	È G	È G	€	À FEE
ÍĪ	TÍIOE	Ý	È Í	È Í	€	À FEE
ÍĪ	TÍIOE	Z	È J	È J	€	À FEE
ÍJ	TÍIO	Ý	È Í	È Í	€	À FEE
Í€	TÍIO	Z	È J	È J	€	À FEE







**A Ya Vyf'8 ]gfi]Vi hYX' @ UXg'f6 @' +%.'Gfi Wi fY'Ka ''fl% \$'8 Y' L**

	T ^{ à^!āæ ^	Öā^&ā}	ÙæøÁ æ} ā à^ZāDā(ā) āÁ æ} ā à^ZāDā(ā) ÙæøÁ &æā} ZāÁ á	ÙæøÁ &æā} ZāÁ á	ÙæøÁ &æā} ZāÁ á	ÙæøÁ &æā} ZāÁ á
F	T GE	Y	€	€	€	Ä FEE
G	T GE	Z	Ë GJ	Ë GJ	€	Ä FEE
H	T I GE	Y	€	€	€	Ä FEE
I	T I GE	Z	€	€	€	Ä FEE
Í	T I H	Y	€	€	€	Ä FEE
Î	T I H	Z	Ë I H	Ë I H	€	Ä FEE
Ï	T I I	Y	€	€	€	Ä FEE
Ï	T I I	Z	Ë I H	Ë I H	€	Ä FEE
J	T I I	Y	€	€	€	Ä FEE
F€	T I I	Z	F€	F€	€	Ä FEE
FF	T I I	Y	€	€	€	Ä FEE
FG	T I I	Z	Ë I	Ë I	€	Ä FEE
FH	T I J	Y	€	€	€	Ä FEE
FI	T I J	Z	Ë I	Ë I	€	Ä FEE
FÍ	T I I	Y	€	€	€	Ä FEE
FÎ	T I I	Z	€	€	€	Ä FEE
FÏ	T I I	Y	€	€	€	Ä FEE
FÏ	T I I	Z	Ë F I	Ë F I	€	Ä FEE
FJ	T I I OE	Y	€	€	€	Ä FEE
G€	T I I OE	Z	Ë H	Ë H	€	Ä FEE
GF	T I JOE	Y	€	€	€	Ä FEE
GG	T I JOE	Z	€	€	€	Ä FEE
GH	T J OE	Y	€	€	€	Ä FEE
G	T J OE	Z	Ë F I	Ë F I	€	Ä FEE
GÍ	T J G	Y	€	€	€	Ä FEE
GÎ	T J G	Z	Ë H	Ë H	€	Ä FEE
GÏ	T Ú I OE	Y	€	€	€	Ä FEE
GÏ	T Ú I OE	Z	Ë J I	Ë J I	€	Ä FEE
GJ	T Ú HOE	Y	€	€	€	Ä FEE
H€	T Ú HOE	Z	Ë J I	Ë J I	€	Ä FEE
HF	T Ú GOE	Y	€	€	€	Ä FEE
HG	T Ú GOE	Z	Ë J I	Ë J I	€	Ä FEE
HH	T Ú F OE	Y	€	€	€	Ä FEE
HÎ	T Ú F OE	Z	Ë J I	Ë J I	€	Ä FEE
HÏ	UXÚ	Y	€	€	€	Ä FEE
HÏ	UXÚ	Z	Ë I	Ë I	€	Ä FEE
HÍ	THÍ	Y	€	€	€	Ä FEE
HÎ	THÍ	Z	Ë I G	Ë I G	€	Ä FEE
HJ	THÍ	Y	€	€	€	Ä FEE
I€	THÍ	Z	Ë J J	Ë J J	€	Ä FEE
IF	THÍ	Y	€	€	€	Ä FEE
IG	THÍ	Z	Ë I F	Ë I F	€	Ä FEE
IH	THU	Y	€	€	€	Ä FEE
II	THU	Z	Ë I F	Ë I F	€	Ä FEE
IÍ	TI€	Y	€	€	€	Ä FEE
IÎ	TI€	Z	Ë F H	Ë F H	€	Ä FEE
IÏ	TIH	Y	€	€	€	Ä FEE
IÏ	TIH	Z	Ë I I	Ë I I	€	Ä FEE
IJ	TII	Y	€	€	€	Ä FEE
I€	TII	Z	Ë I	Ë I	€	Ä FEE
ÍF	TIJ	Y	€	€	€	Ä FEE
ÍG	TIJ	Z	Ë I H	Ë I H	€	Ä FEE

















**A Ya Vyf'8 ]gfi]Vi hYX' @ UXg'f6 @' +{ : Gfi Wi fy'K a ''f&+\$'8 Yf Lf'f' cbi]bi YXL**

	T\{ à^!Àæ^ ^	Öã^&ç	ÙæóÁ æ} à^ à^ZaDf(Ö) áÁ æ} à^ à^ZaDf(Ö) ÙæóÁ &ç	ZdÁ á	Ö) áÁ &ç} ZdÁ á	
íí	TÍI	Ý	ËFI	ËFI	€	À FEE
íi	TÍI	Z	€	€	€	À FEE
íJ	TÍI	Ý	ËJÍ	ËJÍ	€	À FEE
í€	TÍI	Z	€	€	€	À FEE
íF	TÍI	Ý	ËJJ	ËJJ	€	À FEE
íG	TÍI	Z	€	€	€	À FEE
íH	TÚI Ó	Ý	ËJÍ	ËJÍ	€	À FEE
íi	TÚI Ó	Z	€	€	€	À FEE
íí	TÚFÓ	Ý	ËJÍ	ËJÍ	€	À FEE
íi	TÚFÓ	Z	€	€	€	À FEE
íï	TÎJ	Ý	ËIÍ	ËIÍ	€	À FEE
íi	TÎJ	Z	€	€	€	À FEE
íJ	TÏ€	Ý	ËG	ËG	€	À FEE
í€	TÏ€	Z	€	€	€	À FEE
íF	TÏF	Ý	ËFG	ËFG	€	À FEE
íG	TÏF	Z	€	€	€	À FEE
íH	TÏG	Ý	ËFG	ËFG	€	À FEE
íi	TÏG	Z	€	€	€	À FEE
íï	TÏHÈ	Ý	ËH	ËH	€	À FEE
íi	TÏHÈ	Z	€	€	€	À FEE
íï	TÏÓÈ	Ý	ËËËFJ	ËËËFJ	€	À FEE
íi	TÏÓÈ	Z	€	€	€	À FEE
íJ	TÏÓ	Ý	ËFÍ	ËFÍ	€	À FEE
í€	TÏÓ	Z	€	€	€	À FEE
íF	TÏÓ	Ý	ËFI	ËFI	€	À FEE
íG	TÏÓ	Z	€	€	€	À FEE
íH	TÏÓ	Ý	ËJÍ	ËJÍ	€	À FEE
íi	TÏÓ	Z	€	€	€	À FEE
íí	TÏÓÈ	Ý	ËJJ	ËJJ	€	À FEE
íi	TÏÓÈ	Z	€	€	€	À FEE
íï	TÏI	Ý	ËFI	ËFI	€	À FEE
íi	TÏI	Z	€	€	€	À FEE
íJ	TÏÓÈ	Ý	€	€	€	À FEE
J€	TÏÓÈ	Z	€	€	€	À FEE
JF	TJ€	Ý	€	€	€	À FEE
JG	TJ€	Z	€	€	€	À FEE
JH	TÚI Ó	Ý	ËJÍ	ËJÍ	€	À FEE
Ji	TÚI Ó	Z	€	€	€	À FEE
Jí	TÚFÓ	Ý	ËJÍ	ËJÍ	€	À FEE
Ji	TÚFÓ	Z	€	€	€	À FEE
Jï	T FEG	Ý	€	€	€	À FEE
Ji	T FEG	Z	€	€	€	À FEE
JJ	T FÉ	Ý	ËIÍ	ËIÍ	€	À FEE
F€	T FÉ	Z	€	€	€	À FEE
F€	T FFF	Ý	ËIÍ	ËIÍ	€	À FEE
F€G	T FFF	Z	€	€	€	À FEE
F€H	T ÚHÓ	Ý	ËJÍ	ËJÍ	€	À FEE
F€i	T ÚHÓ	Z	€	€	€	À FEE
F€í	T ÚGÓ	Ý	ËJÍ	ËJÍ	€	À FEE
F€i	T ÚGÓ	Z	€	€	€	À FEE
F€ï	T ÚHÓ	Ý	ËJÍ	ËJÍ	€	À FEE
F€i	T ÚHÓ	Z	€	€	€	À FEE











**A Ya Vyf'8 ]gfi]Vi hYX' @ UXg'f6 @ ' + ' : 'Gfi Wi fY'Ka "fi" \$'8 Y] Lf'f' cbi]bi YXL**

	T^{ à^!Àæ^}	Öä^&ç)	ÚcæóÁ æ} æ à^ZaDæ(Ü) áÁ æ} æ à^ZaDæ(Ü) ÚcæóÁ &æç)	ZæÁ á	Ò) áÁ &æç) ZæÁ á	
ïï	TÏÏOE	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
ÿÿ	TÿÿOE	Z	ËËËË Ì	ËËËË Ì	€	Ä FEE
ÿJ	TÿÿÓ	Ý	ËËËËË Ì J	ËËËËË Ì J	€	Ä FEE
ì€	TÿÿÓ	Z	ËËËËË Ì	ËËËËË Ì	€	Ä FEE
ìF	TÿÿÓ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
ìG	TÿÿÓ	Z	ËËËË G	ËËËË G	€	Ä FEE
ìH	TÿÿÓ	Ý	€	€	€	Ä FEE
ÿÿ	TÿÿÓ	Z	€	€	€	Ä FEE
ÿÿ	TÿÿOE	Ý	€	€	€	Ä FEE
ÿÿ	TÿÿOE	Z	€	€	€	Ä FEE
ÿÿ	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
ÿÿ	Tÿÿ	Z	ËËËË G	ËËËË G	€	Ä FEE
ÿJ	TÿÿOE	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
J€	TÿÿOE	Z	ËËËË G	ËËËË G	€	Ä FEE
JF	TJ€	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
JG	TJ€	Z	ËËËË Ì	ËËËË Ì	€	Ä FEE
JH	TÿÿÓ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
Jÿ	TÿÿÓ	Z	ËËËË G	ËËËË G	€	Ä FEE
Jÿ	TÿÿÓ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
Jÿ	TÿÿÓ	Z	ËËËË G	ËËËË G	€	Ä FEE
Jÿ	TÿÿÓ	Ý	ËËËË H	ËËËË H	€	Ä FEE
Jÿ	TÿÿÓ	Z	ËËËË Ì	ËËËË Ì	€	Ä FEE
JJ	Tÿÿ	Ý	€	€	€	Ä FEE
F€€	Tÿÿ	Z	€	€	€	Ä FEE
F€F	Tÿÿ	Ý	ËËËË H	ËËËË H	€	Ä FEE
F€G	Tÿÿ	Z	ËËËË Ì	ËËËË Ì	€	Ä FEE
F€H	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
F€ÿ	Tÿÿ	Z	ËËËË G	ËËËË G	€	Ä FEE
F€ÿ	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
F€ÿ	Tÿÿ	Z	ËËËË G	ËËËË G	€	Ä FEE
F€ÿ	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
F€ÿ	Tÿÿ	Z	ËËËË G	ËËËË G	€	Ä FEE
F€ÿ	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
F€ÿ	Tÿÿ	Z	ËËËË G	ËËËË G	€	Ä FEE
F€ÿ	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	€	Ä FEE
F€ÿ	Tÿÿ	Z	ËËËË G	ËËËË G	€	Ä FEE
FFF	Tÿÿ	Ý	€	€	€	Ä FEE
FFG	Tÿÿ	Z	€	€	€	Ä FEE
FFH	Tÿÿ	Ý	ËËËË	ËËËË	€	Ä FEE
FFÿ	Tÿÿ	Z	ËËËË G	ËËËË G	€	Ä FEE
FFÿ	Tÿÿ	Ý	ËËËË	ËËËË	€	Ä FEE
FFÿ	Tÿÿ	Z	ËËËË G	ËËËË G	€	Ä FEE

**A Ya Vyf'8 ]gfi]Vi hYX' @ UXg'f6 @ ' , + ' : '6 @ ' - 'HFUbg]Ybh5 fYU @ UXg'L**

	T^{ à^!Àæ^}	Öä^&ç)	ÚcæóÁ æ} æ à^ZaDæ(Ü) áÁ æ} æ à^ZaDæ(Ü) ÚcæóÁ &æç)	ZæÁ á	Ò) áÁ &æç) ZæÁ á	
F	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	€	ËËËË
G	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	ËËËË	FËËË G
H	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	FËËË G	GËËË H
I	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	GËËË H	HËËË Ì
Í	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	HËËË Ì	HËËË G
ÿ	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	€	ËËËË
ÿ	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	ËËËË	FËËË G
ÿ	Tÿÿ	Ý	ËËËË Ì	ËËËË Ì	FËËË G	GËËË Ì

**A Ya Vyf'8 ]gfl]Vi hYX' @ UXg'f6 @' , + : '6 @' - 'HF Ubg]Ybh5 f YU @ UXgLf7 c bh]bi YXL**

	T\{ à^!āæ^	Öā&ā}	ÚcáoÁ æ} ā à^ZaDfE) áÁ æ} ā à^ZaDfE ÚcáoÁ &æā} ŽdĀ á	Ó) áÁ &æā} ŽdĀ á
J	TĪJ	Ÿ	Ě Ě Ī	Ě Ě Ī
FE	TĪJ	Ÿ	Ě Ě Ī	Ě Ě Ī
FF	TĪĪOE	Ÿ	Ě Ě Ī	€
FG	TĪĪOE	Ÿ	Ě Ě Ī	Ě Ī
FH	TĪĪOE	Ÿ	Ě Ě Ī	Ě Ě Ī
FI	TĪĪOE	Ÿ	Ě Ě Ī	Ě Ě Ī
FÍ	TĪĪOE	Ÿ	Ě Ě Ī	Ě Ě Ī
FĪ	TĪĪÓ	Ÿ	Ě Ě Ī	€
FĪ	TĪĪÓ	Ÿ	Ě Ě Ī	Ě Ě Ī
FĪ	TĪĪÓ	Ÿ	Ě Ě Ī	Ě Ě Ī
FJ	TĪĪÓ	Ÿ	Ě Ě Ī	Ě Ě Ī
GE	TĪĪÓ	Ÿ	Ě Ě Ī	Ě Ě Ī
GF	TIH	Ÿ	Ě Ě Ī	€
GG	TIH	Ÿ	Ě Ě Ī	Ě Ī
GH	TIH	Ÿ	Ě Ě Ī	Ě Ě Ī
G	TIH	Ÿ	Ě Ě Ī	Ě Ě Ī
G	TIH	Ÿ	Ě Ě Ī	Ě Ě Ī
G	TII	Ÿ	Ě Ě Ī	€
G	TII	Ÿ	Ě Ě Ī	Ě Ě Ī
G	TII	Ÿ	Ě Ě Ī	Ě Ě Ī
GJ	TII	Ÿ	Ě Ě Ī	Ě Ě Ī
HE	TII	Ÿ	Ě Ě Ī	Ě Ě Ī

**A Ya Vyf'8 ]gfl]Vi hYX' @ UXg'f6 @' , , : '6 @' (\$'HF Ubg]Ybh5 f YU @ UXgLf**

	T\{ à^!āæ^	Öā&ā}	ÚcáoÁ æ} ā à^ZaDfE) áÁ æ} ā à^ZaDfE ÚcáoÁ &æā} ŽdĀ á	Ó) áÁ &æā} ŽdĀ á
F	TĪĪ	Ÿ	Ě Ě Ī	€
G	TĪĪ	Ÿ	Ě Ě Ī	Ě Ě Ī
H	TĪĪ	Ÿ	Ě Ě Ī	Ě Ě Ī
I	TĪĪ	Ÿ	Ě Ě Ī	Ě Ě Ī
Í	TĪĪ	Ÿ	Ě Ě Ī	Ě Ě Ī
Ī	TĪJ	Ÿ	Ě Ě Ī	€
Ī	TĪJ	Ÿ	Ě Ě Ī	Ě Ě Ī
Ī	TĪJ	Ÿ	Ě Ě Ī	Ě Ě Ī
J	TĪJ	Ÿ	Ě Ě Ī	Ě Ě Ī
FE	TĪJ	Ÿ	Ě Ě Ī	Ě Ě Ī
FF	TĪĪOE	Ÿ	Ě Ě Ī	€
FG	TĪĪOE	Ÿ	Ě Ě Ī	Ě Ī
FH	TĪĪOE	Ÿ	Ě Ě Ī	Ě Ě Ī
FI	TĪĪOE	Ÿ	Ě Ě Ī	Ě Ě Ī
FÍ	TĪĪOE	Ÿ	Ě Ě Ī	Ě Ě Ī
FĪ	TĪĪÓ	Ÿ	Ě Ě Ī	€
FĪ	TĪĪÓ	Ÿ	Ě Ě Ī	Ě Ě Ī
FĪ	TĪĪÓ	Ÿ	Ě Ě Ī	Ě Ě Ī
FJ	TĪĪÓ	Ÿ	Ě Ě Ī	Ě Ě Ī
GE	TĪĪÓ	Ÿ	Ě Ě Ī	Ě Ě Ī
GF	TIH	Ÿ	Ě Ě Ī	€
GG	TIH	Ÿ	Ě Ě Ī	Ě Ī
GH	TIH	Ÿ	Ě Ě Ī	Ě Ě Ī
G	TIH	Ÿ	Ě Ě Ī	Ě Ě Ī
G	TIH	Ÿ	Ě Ě Ī	Ě Ě Ī
G	TII	Ÿ	Ě Ě Ī	€







**A Ya Vyf'8]g]f]Vi hYX' @ UXg'f6 @' - % . '6 @' ; \* 'HF Ubg]Ybhi5 fYU @ UXg'f7 c bh]bi YXL**

	T \ { à^/Äæ ^	Öä^&ç)	ÙçèÄ æ) æ à^ZaD(III) áÄ æ) æ à^ZaD(III) ÙçèÄ(II) &æ) ZcÄ á	Ó) áÄ(II) &æ) ZcÄ á
HE	TII	Y	EJI	EJ

**A Ya Vyf'5 fYU @ UXg'f6 @' " - : 'Ghi Wi fy'8 L**

	Rã óE	Rã óO	Rã óO	Rã óO	Öä^&ç)	Öäcä~ç)	Tæ) æ à^Z•-á
F	PFFI OE	PFFI	PFGG	PFGF	Y	V, [Ä æ	EEI
G	PFEI	PFEI	PFEI	PFEJ	Y	V, [Ä æ	EEI
H	PIJ	PII	PIG	PIH	Y	V, [Ä æ	EEI

**A Ya Vyf'5 fYU @ UXg'f6 @' ( \$ : 'Ghi Wi fy'8 JL**

	Rã óE	Rã óO	Rã óO	Rã óO	Öä^&ç)	Öäcä~ç)	Tæ) æ à^Z•-á
F	PFFI OE	PFFI	PFGG	PFGF	Y	V, [Ä æ	EEFF
G	PFEI	PFEI	PFEI	PFEJ	Y	V, [Ä æ	EEFF
H	PIJ	PII	PIG	PIH	Y	V, [Ä æ	EEFF

**A Ya Vyf'5 fYU @ UXg'f6 @' , ( : 'Ghi Wi fy'9 j L**

	Rã óE	Rã óO	Rã óO	Rã óO	Öä^&ç)	Öäcä~ç)	Tæ) æ à^Z•-á
F	PFFI OE	PFFI	PFGG	PFGF	Y	V, [Ä æ	EEEEGGJ
G	PFEI	PFEI	PFEI	PFEJ	Y	V, [Ä æ	EEEEGGJ
H	PIJ	PII	PIG	PIH	Y	V, [Ä æ	EEEEGGJ

**A Ya Vyf'5 fYU @ UXg'f6 @' , ) : 'Ghi Wi fy'9\ f6'8 Y L**

	Rã óE	Rã óO	Rã óO	Rã óO	Öä^&ç)	Öäcä~ç)	Tæ) æ à^Z•-á
F	PFFI OE	PFFI	PFGG	PFGF	Z	V, [Ä æ	EEIIF
G	PFEI	PFEI	PFEI	PFEJ	Z	V, [Ä æ	EEIIF
H	PIJ	PII	PIG	PIH	Z	V, [Ä æ	EEIIF

**A Ya Vyf'5 fYU @ UXg'f6 @' , \* : 'Ghi Wi fy'9\ f6'8 Y L**

	Rã óE	Rã óO	Rã óO	Rã óO	Öä^&ç)	Öäcä~ç)	Tæ) æ à^Z•-á
F	PFFI OE	PFFI	PFGG	PFGF	Y	V, [Ä æ	EEIIF
G	PFEI	PFEI	PFEI	PFEJ	Y	V, [Ä æ	EEIIF
H	PIJ	PII	PIG	PIH	Y	V, [Ä æ	EEIIF

**9bj YcdY>c]bhFYUM]cbg**

	Rã c	YÄá	SÖ	YÄá	SÖ	ZÄá	SÖ	TÝÄáEá	SÖ	TÝÄáEá	SÖ	TZÄáEá	SÖ
F	PFFOE	{ æ FHI EH	FE	GIG EIG	FH	GGI EGG	F	IIG EIG	FH	FJJI EIG	I	FEI EG	G
G		{ ä EHI EIJ	I	IIEFF	I	EIJ EJI	I	FEI EII	I	EJJI EIG	FE	EHI EFI	FE
H	PII	{ æ FIJGEI	J	GHI EIJ	GF	FIGEIJ	F	EIH EHI	H	GFEEUI	FG	EFEJIEH	H
I		{ ä EJEI EG	H	IHEI	H	EHEI EII	I	EIG EIH	GF	EJFHEI	I	EIEGEI	GF
I	PFE	{ æ FJFEJI	FF	GHI EGH	FI	FFI EIH	F	EJI EII	FF	FI EIEI	I	IIG EJI	FI
I		{ ä EJI EIE	I	IJEI	FF	EIEI EGH	I	EHI EII	GJ	EJG EIG	G	JG EIJ	FF
I	V[ ç K	{ æ IJIEI	FE	IJHEI	GE	IIEGI	H	F					
I		{ ä EIJ EII	I	GGJEG	II	EIEGI	I						

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G	TIGE	PUUIYI	EG	E	FI EI I E	^ FI FFI FÉ III FHJ FI FFI E FFI E GMP FEa
H	TIH	PUUIYIYH	EG E	GE E	FI EI I GF :	I FFI HF III FFI FG FGI FFI FGI FFI FMP FEa
I	TII	PUUIYIYH	EG F	E	G EI J GFI :	I FFI HF III FFI FG FGI FFI FGI FFI FMP FEa
I	TII	USFBI	EI E	EII	I EI I E	^ GI GJI III JI GEE FFGI FGI E FMP FEa
I	TII	SGGH	EI I	E	G EI F E	^ FI FFG H III GHU GI III EI FFI FFI EI FMP GE
I	TIJ	SGGH	EI G	HE GH	FG EI F HE GH	^ G FFG I III GHU GI III EI FFI FFI EI FMP GE
I	TII	USHC	EI I	E	FE EI HG E	^ GEI FG E III I GEE III JEH JFFGI FMP FEa
J	TII	USHC	EG	E	I EG E	^ FFI FI E III I GEE III JEH JFFGI FMP FEa
FE	TIOE	USFBI	EG	EG	G EI J EG	^ GG III III JI GEE FFGI FGI E FMP FEa
FF	TIOE	USHC	EGE	E	FE EI I E	^ FI FG E III I GEE III JEH JFFGI FMP FEa
FG	TJCE	USHC	EIJ	E	FE EG E	^ FFI FI E III I GEE III JEH JFFGI FMP FEa
FH	TJG	USFBI	EG	EG	I EI F EG	^ I JIII III JI GEE FFGI FGI E GMP FEa
FI	TUIOE	UQO'GE	EHEG	HE G	I EI G HE G	I GEI III III HGFHE FFI FEG FFI FEG GMP FEa
FI	TUHCE	UQO'GE	EHI	HE G	I EI H HE G	H GEI III III HGFHE FFI FEG FFI FEG GMP FEa
FI	TUGCE	UQO'GE	EIH	HE G	J EI E HE G	J GEI III III HGFHE FFI FEG FFI FEG GMP FEa
FI	TUFCE	UQO'GE	EIH	HE G	J EI I HE G	I GEI III III HGFHE FFI FEG FFI FEG GMP FEa
FI	UXU	UQO'GE	EI E	G	FE EHF G	FE G III III HGFHE FFI FEG FFI FEG GMP FEa
FJ	THI	UQO'HE	EI	I EIH	FI EI I JBI	H GG FGE III GEI III EI III EI GMP FEa
GE	THI	PUUIYI	EI	E	FJ EI J E	^ II FFI FÉ III FHJ FI FFI E FFI E GMP FEa
GF	THI	PUUIYIYH	EI H	GE E	GG EI H GE E	^ FI FFI HF III FFI FG FGI FFI FGI FFI FMP FEa
GG	THJ	PUUIYIYH	EI J	E	GG EI I GFI :	G FFI HF III FFI FG FGI FFI FGI FFI FMP FEa
GH	TI E	USFBI	EI I	EII	I EI I E	^ FJ I GJI III JI GEE FFGI FGI E FMP FEa
G	TIH	SGGH	EI I	E	FE EI F E	^ G FFG H III GHU GI III EI FFI FFI EI FMP GE
G	TII	SGGH	EI F	HE GH	I EI F HE GH	^ FI FFG I III GHU GI III EI FFI FFI EI FMP GE
G	TIJ	USHC	EG	E	I EG E	^ FI FG E III I GEE III JEH JFFGI FMP FEa
G	TI E	USHC	EI H	E	F EG E	^ GEI FI E III I GEE III JEH JFFGI FMP FEa
G	TIG	USFBI	EG	EG	FE EI J EG	^ FI JIII III JI GEE FFGI FGI E FMP FEa
GJ	TII	USHC	EI G	E	I EI I E	^ FFI FG E III I GEE III JEH JFFGI FMP FEa
HE	TII	USHC	EI I	E	I EGG E	^ GF FI E III I GEE III JEH JFFGI FMP FEa
HF	TII	USFBI	EG	EG	F EI I EG	^ FGJ III III JI GEE FFGI FGI E FMP FEa
HG	TUIO	UQO'GE	EIJ	HE G	F EI F HE G	G GEI III III HGFHE FFI FEG FFI FEG GMP FEa
HH	TUFO	UQO'GE	EIH	HE G	I EI H HE G	I GEI III III HGFHE FFI FEG FFI FEG GMP FEa
HI	TIJ	UQO'HE	EI	I EIH	GG EI H JBI	FGG FGE III GEI III EI III EI GMP FEa
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HI	TIHE	USFBI	EI E	EII	FG EI H E	^ G I GJI III JI GEE FFGI FGI E FMP FEa
HU	TIOE	SGGH	EI G	HE GH	I EI F E	^ GE FFG H III GHU GI III EI FFI FFI EI FMP GE
I E	TIO	SGGH	EI I	HE GH	I EI F HE GH	^ FI FFG I III GHU GI III EI FFI FFI EI FMP GE
IF	TIG	USHC	EI H	E	G EG E	^ FFI FG E III I GEE III JEH JFFGI FMP FEa
IG	TIO	USHC	EI G	E	J EG E	^ FI FI E III I GEE III JEH JFFGI FMP FEa
IH	TIOE	USFBI	EG	EG	I EFG EG	^ G JIII III JI GEE FFGI FGI E FMP FEa
II	TII	USHC	EI I	E	G EI E E	^ GG FG E III I GEE III JEH JFFGI FMP FEa
II	TIOE	USHC	EI H	E	G EGE E	^ FI FI E III I GEE III JEH JFFGI FMP FEa
II	TJE	USFBI	EG	EG	FE EI I E	^ G JIII III JI GEE FFGI FGI E GMP FEa
II	TUIO	UQO'GE	EIJ	HE G	GF EI I HE G	FE GEI III III HGFHE FFI FEG FFI FEG GMP FEa
II	TUFO	UQO'GE	EIH	HE G	F EI I HE G	FG GEI III III HGFHE FFI FEG FFI FEG GMP FEa
IJ	TFEG	UQO'HE	EI	J EIH	FI EI H FE J	FGG FGE III GEI III EI III EI GMP FEa
I E	TFE	UQO'HE	EI	J EIH	FI EI H I E H	I GG FGE III GEI III EI III EI GMP FEa
IF	TFE	UQO'HE	EI	J EIH	GG EI H J E H	I GG FGE III GEI III EI III EI GMP FEa



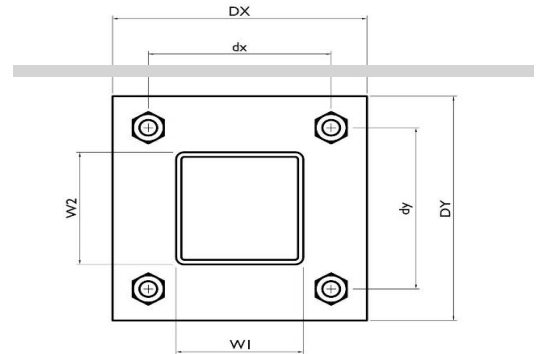
**I. Mount-to-Tower Connection Check**

Custom Orientation Required

Tower Connection Bolt Checks

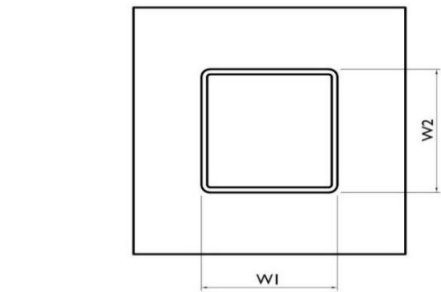
Bolt Orientation

Bolt Quantity per Reaction:	4
$d_x$ (in) (Delta X of typ. bolt config. sketch):	6
$d_y$ (in) (Delta Y of typ. bolt config. sketch):	6
Bolt Type:	A325N
Bolt Diameter (in):	0.625
Required Tensile Strength / bolt (kips):	6.9
Required Shear Strength / bolt (kips):	0.6
Tensile Capacity / bolt (kips):	20.7
Shear Capacity / bolt (kips):	12.4
Bolt Overall Utilization:	<b>33.5%</b>



Tower Connection Baseplate Checks

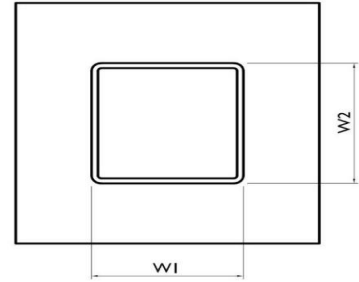
Connecting Standoff Member Shape:	Rect Tube
Weld Stiffener Configuration:	No Stiffeners
Plate Width, $D_x$ (in):	8
Plate Height, $D_y$ (in):	8
$W_1$ (in):	4
$W_2$ (in):	4
Member Thickness (in):	0.25
Stiffener location $a_1$ (in):	
Stiffener location $b_1$ (in):	
Stiffener location $a_2$ (in):	
Stiffener location $b_2$ (in):	
$F_y$ (ksi, plate):	36
Plate Thickness (in):	0.75
Length of Yield Line, $L_y$ (in):	5.85
Bolt Eccentricity, $e$ (in):	1.65
$M_u$ (kip-in):	11.42
$\Phi * M_n$ (kip-in):	26.65
Plate Bending Utilization:	<b>42.8%</b>



Tower Connection Weld Checks

Weld Shape:  
Weld Stiffener Configuration:  
Stiffener Notch Length, n (in):  
Weld Size (1/16 in):  
W1 (in):  
W2 (in):  
Weld Total Length (in):  
 $Z_x$  (in<sup>3</sup>/in):  
 $Z_y$  (in<sup>3</sup>/in):  
 $J_p$  (in<sup>4</sup>/in):  
 $c_x$  (in)  
 $c_y$  (in)  
Required combined strength (kip/in):  
Weld Capacity (kip/in):  
Weld Utilization:

Yes
Rectangle
None
4
4
4
16.00
21.33
21.33
85.33
2.25
2.25
2.60
5.57
<b>46.6%</b>



Date: **January 16, 2024**



Crown Castle  
2000 Corporate Drive  
Canonsburg, PA 15317  
(724) 416-2000

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

**Carrier Designation:** **Verizon Wireless Co-Locate**  
**Site Number:** 5000392974  
**Site Name:** MADISON 3 CT

**Crown Castle Designation:** **BU Number:** 5800059  
**Site Name:** Ridge Road, Madison  
**JDE Job Number:** 2101359  
**Work Order Number:** 2278086  
**Order Number:** 656561 Rev. 0

**Engineering Firm Designation:** **Crown Castle Project Number** 2278086

**Site Data:** **258 Ridge Road, Madison, New Haven County, CT**  
**Latitude: 41° 18' 33.3" Longitude: -72° 36' 51.57"**  
**150 ft - Monopole Tower**

Crown Castle 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**

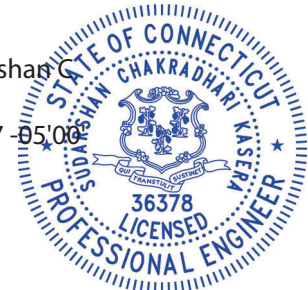
This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 123 mph. Applicable Standard references and design criteria are listed in Section 2 – “Analysis Criteria”.

Structural analysis prepared by: Steven Hu

Respectfully submitted by:

Digitally signed by Sudarshan C  
Kasera  
Date: 2024.01.16 12:01:57 -05'00'

Sudarshan C Kasera, P.E.  
Senior Project Engineer



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Table 2 - Other Considered Equipment

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Table 5 - Tower Component Stresses vs. Capacity - LC7

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### 5) APPENDIX A

tnxTower Output

### 6) APPENDIX B

Base Level Drawing

### 7) APPENDIX C

Additional Calculations

**1) INTRODUCTION**

This tower is a 150 ft Monopole Tower designed by Valmont.

**2) ANALYSIS CRITERIA**

TIA-222 Revision: TIA-222-H  
 Risk Category: II  
 Wind Speed: 123 mph  
 Exposure Category: B  
 Topographic Factor: 1  
 Ice Thickness: 1.00 in  
 Wind Speed with Ice: 50 mph  
 Service Wind Speed: 60 mph

**Table 1 - Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
130	130	1		Platform Mount [LP 301-1]	13	1-5/8
		6	commscope	SBNHH-1D65B w/ Mount Pipe		
		6	decibel	DB846F65ZAXY w/ Mount Pipe		
		2	kaelus	KA-6030		
		1	raycap	RVZDC-6627-PF-48		
		3	samsung telecommunications	MT6407-77A w/ Mount Pipe		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		

**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)
148	159	1	dbspectra	DS4C06F36D-D	2 12	7/8 1-5/8
	150	3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe		
		3	ericsson	AIR6449 B41		
		3	ericsson	ERICSSON AIR 21 B2P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B71 B85A_T-MOBILE		
		3	ericsson	RRUS 4415 B25		
	3	rfs celwave	APXVAARR24_43-U-NA20_T-MOBILE w/ Mount Pipe			
148	1	tower mounts	Platform Mount [LP 303-1_KCKR-HR-1]			
140	142	3	ericsson	AIR 6449 B77D_CCVI2	12	1-5/8
	140	3	cci antennas	OPA65R-BU6D w/ Mount Pipe	2	13/16



Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
		6	cci antennas	TPA65R-BU6D_CCIV2 w/ Mount Pipe	3	3/8
		3	ericsson	RRUS 32 B2	4	7/8
		3	ericsson	RRUS 4426 B66		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14_CCIV2		
		3	raycap	DC6-48-60-18-8F		
		1	tower mounts	Platform Mount [LP 304-1_HR-1]		
	138	3	ericsson	AIR 6419 B77G_CCIV3		
124	124	1	kathrein	800 10251 w/ Mount Pipe	2	11/32
		1	radiowaves	HP2-4.7NS	1	7/8
		1	tower mounts	Side Arm Mount [SO 701-1]		
113	113	3	kathrein	800 10252	3	7/8
		1	tower mounts	T-Arm Mount [TA 601-1]		
95	95	3	fujitsu	TA08025-B604	1	1-1/2
		3	fujitsu	TA08025-B605		
		3	jma wireless	MX08FRO665-21 w/ Mount Pipe		
		1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Valmont SNP8HR-396		

### 3) ANALYSIS PROCEDURE

**Table 3 - Documents Provided**

Document	Reference	Source
4-GEOTECHNICAL REPORTS	2354009	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	2354010	CCISITES
4-TOWER MANUFACTURER DRAWINGS	2354011	CCISITES

#### 3.1) Analysis Method

tnxTower (version 8.2.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

#### 3.2) Assumptions

- 1) 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. Crown Castle 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	150 - 110	Pole	TP39.633x28.4x0.25	1	-17.943	1847.695	27.5	Pass
L2	110 - 94.25	Pole	TP43.556x37.659x0.281	2	-22.040	2288.202	34.3	Pass
L3	94.25 - 46.25	Pole	TP56.472x41.449x0.375	3	-39.246	3952.473	38.7	Pass
L4	46.25 - 0	Pole	TP68.71x53.686x0.438	4	-62.957	5823.394	39.5	Pass
							Summary	
						Pole (L4)	39.5	Pass
						RATING =	39.5	Pass

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

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	33.7	Pass
1	Base Plate	0	28.7	Pass
1	Base Foundation (Structural)	0	41.8	Pass
1	Base Foundation (Soil)	0	28.4	Pass

<b>Structure Rating (max from all components) =</b>	<b>41.8%</b>
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed

#### 4.1) Recommendations

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

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

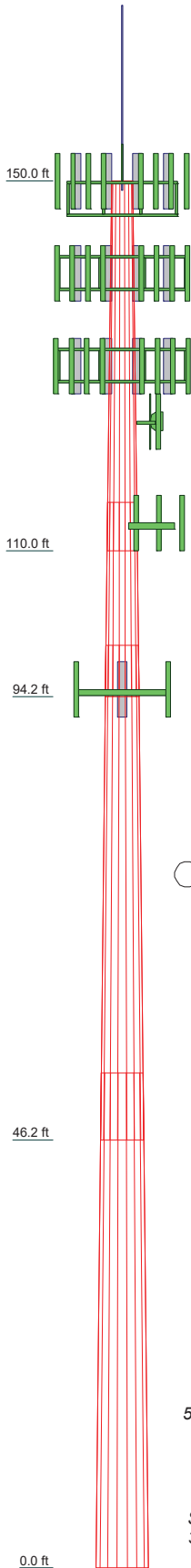
**MATERIAL STRENGTH**

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

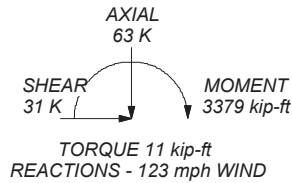
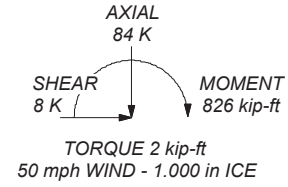
**TOWER DESIGN NOTES**

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 123 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 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 0.000 ft
8. TOWER RATING: 39.5%

Section	1	2	3	4
Length (ft)	40.000	21.000	53.500	53.500
Number of Sides	18	18	18	18
Thickness (in)	0.250	0.281	0.375	0.438
Socket Length (ft)	5.250	5.500	7.250	53.686
Top Dia (in)	28.400	37.669	41.449	68.710
Bot Dia (in)	39.633	43.566	56.472	15.4
Grade			A572-65	
Weight (K)	3.6	2.6	10.5	32.1



ALL REACTIONS  
ARE FACTORED



**Crown Castle**  
2000 Corporate Drive  
Canonsburg, PA 15317  
The Pathway to Possible Phone: (724) 416-2000  
FAX:

Job: <b>5800059</b>	Project:	
Client: <b>Crown Castle</b>	Drawn by: <b>SHu</b>	App'd:
Code: <b>TIA-222-H</b>	Date: <b>01/12/24</b>	Scale: <b>NTS</b>
Path: <b>C:\SAPI Work Area\5800059\WO 2278086 - SAPIProd\5800059.dwg</b>	Dwg No. <b>E-1</b>	

## Tower Input Data

The tower is a monopole.

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

The following design criteria apply:

Tower is located in New Haven County, Connecticut.

Tower base elevation above sea level: 133.000 ft.

Basic wind speed of 123 mph.

Risk Category II.

Exposure Category B.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.000 in.

Ice thickness is considered to increase with height.

Ice density of 56.000 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50.000 °F.

Deflections calculated using a wind speed of 60 mph.

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

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used:  $K_{es}(F_w) = 0.95$ ,  $K_{es}(t_i) = 0.85$ .

Maximum demand-capacity ratio is: 1.05.

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

## Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric Distribute Leg Loads As Uniform	Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurtenances Alternative Appurt. EPA Calculation Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs Use ASCE 10 X-Brace Ly Rules	Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation ✓ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="background-color: #e0e0e0; text-align: center; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets ✓ Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known
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## 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	150.000-110.000	40.000	5.250	18	28.400	39.633	0.250	1.000	A572-65 (65 ksi)
L2	110.000-94.250	21.000	5.500	18	37.659	43.556	0.281	1.125	A572-65 (65 ksi)
L3	94.250-46.250	53.500	7.250	18	41.449	56.472	0.375	1.500	A572-65 (65 ksi)
L4	46.250-0.000	53.500		18	53.686	68.710	0.438	1.750	A572-65 (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	28.800	22.337	2236.246	9.993	14.427	155.002	4475.435	11.171	4.558	18.234
	40.206	31.250	6123.656	13.981	20.134	304.152	12255.369	15.628	6.535	26.142
L2	39.693	33.366	5889.316	13.269	19.131	307.848	11786.381	16.686	6.133	21.806
	44.185	38.631	9139.882	15.363	22.126	413.075	18291.791	19.319	7.171	25.496
L3	43.599	48.888	10420.184	14.581	21.056	494.878	20854.080	24.449	6.635	17.693
	57.285	66.769	26545.722	19.914	28.688	925.332	53126.374	33.391	9.279	24.744
L4	56.514	73.942	26487.970	18.903	27.273	971.231	53010.794	36.978	8.679	19.837
	69.702	94.805	55829.000	24.237	34.905	1599.470	111731.461	47.411	11.323	25.881

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.000-110.000				1	1	1			
L2 110.000-94.250				1	1	1			
L3 94.250-46.250				1	1	1			
L4 46.250-0.000				1	1	1			

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

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

### 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	Weight klf
							ft <sup>2</sup> /ft	

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 klf
LDF5-50A(7/8)	A	No	No	Inside Pole	148.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
HCS 6X12 4AWG(1-5/8)	A	No	No	Inside Pole	148.000 - 0.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.002 0.002 0.002
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	A	No	No	Inside Pole	148.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
LCF158-50A(1-5/8)	A	No	No	Inside Pole	148.000 - 0.000	8	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
*									
AVA7-50(1-5/8)	C	No	No	Inside Pole	140.000 - 0.000	12	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
PWRT-608-S(13/16")	C	No	No	Inside Pole	140.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
RFFT-36SM-001-XXM(3/8)	C	No	No	Inside Pole	140.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
RFFT-36SM-001-XXM(3/8)	C	No	No	Inside Pole	140.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
PWRT-606-S(7/8)	C	No	No	Inside Pole	140.000 - 0.000	4	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
2" Rigid Conduit	C	No	No	Inside Pole	140.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.003 0.003 0.003
*									
AVA7-50(1-5/8)	B	No	No	Inside Pole	130.000 - 0.000	13	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
*									
LDF5-50A(7/8)	C	No	No	Inside Pole	124.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
7921A(11/32)	C	No	No	Inside Pole	124.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.001 0.001 0.001
*									
LDF5-50A(7/8)	C	No	No	Inside Pole	113.000 - 0.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.000 0.000 0.000
*									
CU12PSM9P6XXX(1-1/2)	B	No	No	Inside Pole	95.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.002 0.002 0.002
*									
*									

**Feed Line/Linear Appurtenances Section Areas**

Tower Section	Tower Elevation ft	Face	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	150.000-110.000	A	0.000	0.000	0.000	0.000	0.583
		B	0.000	0.000	0.000	0.000	0.182
		C	0.000	0.000	0.000	0.000	0.510
L2	110.000-94.250	A	0.000	0.000	0.000	0.000	0.241
		B	0.000	0.000	0.000	0.000	0.145
		C	0.000	0.000	0.000	0.000	0.293
L3	94.250-46.250	A	0.000	0.000	0.000	0.000	0.736
		B	0.000	0.000	0.000	0.000	0.550
		C	0.000	0.000	0.000	0.000	0.892
L4	46.250-0.000	A	0.000	0.000	0.000	0.000	0.709
		B	0.000	0.000	0.000	0.000	0.530
		C	0.000	0.000	0.000	0.000	0.860

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

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> In Face ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Out Face ft <sup>2</sup>	Weight K
L1	150.000-110.000	A	0.974	0.000	0.000	0.000	0.000	0.583
		B		0.000	0.000	0.000	0.000	0.182
		C		0.000	0.000	0.000	0.000	0.510
L2	110.000-94.250	A	0.952	0.000	0.000	0.000	0.000	0.241
		B		0.000	0.000	0.000	0.000	0.145
		C		0.000	0.000	0.000	0.000	0.293
L3	94.250-46.250	A	0.916	0.000	0.000	0.000	0.000	0.736
		B		0.000	0.000	0.000	0.000	0.550
		C		0.000	0.000	0.000	0.000	0.892
L4	46.250-0.000	A	0.818	0.000	0.000	0.000	0.000	0.709
		B		0.000	0.000	0.000	0.000	0.530
		C		0.000	0.000	0.000	0.000	0.860

**Feed Line Center of Pressure**

Section	Elevation ft	CP <sub>x</sub> in	CP <sub>z</sub> in	CP <sub>x</sub> Ice in	CP <sub>z</sub> Ice in
L1	150.000-110.000	0.000	0.000	0.000	0.000
L2	110.000-94.250	0.000	0.000	0.000	0.000
L3	94.250-46.250	0.000	0.000	0.000	0.000
L4	46.250-0.000	0.000	0.000	0.000	0.000

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

**Discrete Tower Loads**



Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement
			Horz Lateral	Vert			
			ft	ft	°	ft	
Lightning Rod 5/8" x 4'	C	None			0.000	152.000	
* DS4C06F36D-D	A	From Leg	2.000	0.000	0.000	148.000	
Pipe Mount [PM 601-1]	A	From Leg	11.000	2.000	0.000	148.000	
10' x 2" Mount Pipe	A	From Leg	0.000	4.000	0.000	148.000	
* ERICSSON AIR 21 B2P w/ Mount Pipe	A	From Leg	2.000	0.000	0.000	148.000	
ERICSSON AIR 21 B2P w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	148.000	
ERICSSON AIR 21 B2P w/ Mount Pipe	C	From Leg	2.000	4.000	0.000	148.000	
APXVAARR24_43-U-NA20_T- MOBILE w/ Mount Pipe	A	From Leg	0.000	2.000	0.000	148.000	
APXVAARR24_43-U-NA20_T- MOBILE w/ Mount Pipe	B	From Leg	2.000	4.000	0.000	148.000	
APXVAARR24_43-U-NA20_T- MOBILE w/ Mount Pipe	C	From Leg	0.000	2.000	0.000	148.000	
AIR6449 B41	A	From Leg	2.000	4.000	0.000	148.000	
AIR6449 B41	B	From Leg	0.000	2.000	0.000	148.000	
AIR6449 B41	C	From Leg	2.000	4.000	0.000	148.000	
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	0.000	2.000	0.000	148.000	
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	2.000	4.000	0.000	148.000	
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Leg	0.000	2.000	0.000	148.000	
RRUS 4415 B25	A	From Leg	2.000	4.000	0.000	148.000	
RRUS 4415 B25	B	From Leg	0.000	2.000	0.000	148.000	
RRUS 4415 B25	C	From Leg	2.000	4.000	0.000	148.000	
(2) KRY 112 144/1	A	From Leg	0.000	2.000	0.000	148.000	

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement
			Horz ft	Lateral ft	Vert ft		
							0.000
KRY 112 144/1	B	From Leg					2.000
							4.000
						0.000	148.000
							0.000
RADIO 4449 B71 B85A_T- MOBILE	A	From Leg					2.000
							4.000
						0.000	148.000
							0.000
RADIO 4449 B71 B85A_T- MOBILE	B	From Leg					2.000
							4.000
						0.000	148.000
							0.000
RADIO 4449 B71 B85A_T- MOBILE	C	From Leg					2.000
							4.000
						0.000	148.000
							0.000
8' x 2" Mount Pipe	A	From Leg					2.000
							4.000
						0.000	148.000
							0.000
8' x 2" Mount Pipe	B	From Leg					2.000
							4.000
						0.000	148.000
							0.000
8' x 2" Mount Pipe	C	From Leg					2.000
							4.000
						0.000	148.000
							0.000
Platform Mount [LP 303- 1_KCKR-HR-1] *	C	None					2.000
							4.000
						0.000	148.000
RRUS 32 B2	A	From Leg	4.000				0.000
			0.000				0.000
RRUS 32 B2	B	From Leg	4.000				0.000
			0.000				0.000
RRUS 32 B2	C	From Leg	4.000				0.000
			0.000				0.000
DC6-48-60-18-8F	A	From Leg	4.000				0.000
			0.000				0.000
(2) TPA65R-BU6D_CCIV2 w/ Mount Pipe	A	From Leg	4.000				0.000
			0.000				0.000
(2) TPA65R-BU6D_CCIV2 w/ Mount Pipe	B	From Leg	4.000				0.000
			0.000				0.000
(2) TPA65R-BU6D_CCIV2 w/ Mount Pipe	C	From Leg	4.000				0.000
			0.000				0.000
AIR 6449 B77D_CCIV12	A	From Leg	4.000				0.000
			0.000				2.000
AIR 6449 B77D_CCIV12	B	From Leg	4.000				0.000
			0.000				2.000
AIR 6449 B77D_CCIV12	C	From Leg	4.000				0.000
			0.000				2.000
AIR 6419 B77G_CCIV3	A	From Leg	4.000				0.000
			0.000				2.000

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement
			Horz ft	Lateral ft	Vert ft		
AIR 6419 B77G_CCIV3	B	From Leg	4.000	0.000	-2.000	140.000	
AIR 6419 B77G_CCIV3	C	From Leg	4.000	0.000	-2.000	140.000	
OPA65R-BU6D w/ Mount Pipe	A	From Leg	4.000	0.000	-2.000	140.000	
OPA65R-BU6D w/ Mount Pipe	B	From Leg	4.000	0.000	-2.000	140.000	
OPA65R-BU6D w/ Mount Pipe	C	From Leg	4.000	0.000	-2.000	140.000	
RRUS 4478 B14_CCIV2	A	From Leg	4.000	0.000	0.000	140.000	
RRUS 4478 B14_CCIV2	B	From Leg	4.000	0.000	0.000	140.000	
RRUS 4478 B14_CCIV2	C	From Leg	4.000	0.000	0.000	140.000	
RRUS 4426 B66	A	From Leg	4.000	0.000	0.000	140.000	
RRUS 4426 B66	B	From Leg	4.000	0.000	0.000	140.000	
RRUS 4426 B66	C	From Leg	4.000	0.000	0.000	140.000	
RRUS 4449 B5/B12	A	From Leg	4.000	0.000	0.000	140.000	
RRUS 4449 B5/B12	B	From Leg	4.000	0.000	0.000	140.000	
RRUS 4449 B5/B12	C	From Leg	4.000	0.000	0.000	140.000	
DC6-48-60-18-8F	A	From Leg	4.000	0.000	0.000	140.000	
DC6-48-60-18-8F	C	From Leg	4.000	0.000	0.000	140.000	
9' x 2" Pipe Mount	A	From Leg	4.000	0.000	0.000	140.000	
9' x 2" Pipe Mount	B	From Leg	4.000	0.000	0.000	140.000	
9' x 2" Pipe Mount	C	From Leg	4.000	0.000	0.000	140.000	

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement
			Horz Lateral	Vert			
			ft	ft	°	ft	
Side Arm Mount [SO 102-3]	C	None			0.000	140.000	
Platform Mount [LP 304-1_HR-1]	C	None			0.000	140.000	
MT6407-77A w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
MT6407-77A w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
MT6407-77A w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
(2) KA-6030	B	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
RVZDC-6627-PF-48	A	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
RFV01U-D1A	A	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
RFV01U-D1A	B	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
RFV01U-D1A	C	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
RFV01U-D2A	A	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
RFV01U-D2A	B	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
RFV01U-D2A	C	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
(2) DB846F65ZAXY w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
(2) DB846F65ZAXY w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	130.000	
			0.000	0.000			
Platform Mount [LP 301-1]	C	None			0.000	130.000	
BSAMNT-SBS-1-2	C	None			0.000	130.000	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement
			Horz Lateral	Vert		
			ft	ft	°	ft
800 10251 w/ Mount Pipe	B	From Leg	3.000	0.000	0.000	124.000
			0.000	0.000		
4' x 2" Pipe Mount	B	From Leg	2.000	0.000	0.000	124.000
			0.000	0.000		
Side Arm Mount [SO 102-3]	C	None			0.000	124.000
Side Arm Mount [SO 701-1]	B	From Leg	1.500	0.000	0.000	124.000
			0.000	0.000		
*						
(3) 800 10252	B	From Leg	3.000	0.000	0.000	113.000
			0.000	0.000		
(3) 6' x 2" Mount Pipe	B	From Leg	3.000	0.000	0.000	113.000
			0.000	0.000		
T-Arm Mount [TA 601-1]	B	From Leg	2.000	0.000	0.000	113.000
			0.000	0.000		
*						
*						
MX08FRO665-21 w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
MX08FRO665-21 w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
MX08FRO665-21 w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
TA08025-B604	A	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
TA08025-B604	B	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
TA08025-B604	C	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
TA08025-B605	A	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
TA08025-B605	B	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
TA08025-B605	C	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
RDIDC-9181-PF-48	A	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
Valmont SNP8HR-396	C	None			0.000	95.000
(2) 8' x 2" Mount Pipe	A	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		
(2) 8' x 2" Mount Pipe	B	From Leg	4.000	0.000	0.000	95.000
			0.000	0.000		

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement
			Horz Lateral Vert ft ft ft	°	ft		
(2) 8' x 2" Mount Pipe	C	From Leg	0.000	4.000	0.000	95.000	
			0.000				
			0.000				
			0.000				
**							

### Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:			3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz Lateral Vert ft	°	°					
HP2-4.7NS	B	Paraboloid w/Shroud (HP)	From Leg	2.000	-11.000		124.000	2.042	No Ice	3.274	0.027
				0.000					1/2" Ice	3.547	0.045
				0.000					1" Ice	3.819	0.063
*											

### 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

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

### Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 110	Pole	Max Tension	2	0.000	0.000	-0.000
			Max. Compression	26	-30.321	-1.422	1.452
			Max. Mx	8	-17.945	-414.062	0.425
			Max. My	2	-17.955	-0.352	413.634
			Max. Vy	20	-17.765	412.650	0.956
			Max. Vx	14	17.684	-1.281	-412.501
			Max. Torque	12			7.721
L2	110 - 94.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-35.877	-4.861	-0.502
			Max. Mx	8	-22.051	-714.931	-0.862
			Max. My	14	-22.071	-3.503	-707.712
			Max. Vy	20	-20.135	710.816	0.572
			Max. Vx	14	19.734	-3.503	-707.712
			Max. Torque	13			10.020
L3	94.25 - 46.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-57.312	-4.861	-0.141
			Max. Mx	8	-39.253	-1830.923	-1.931
			Max. My	14	-39.264	-5.576	-1807.550
			Max. Vy	20	-26.349	1828.406	2.203
			Max. Vx	14	25.972	-5.576	-1807.550
			Max. Torque	13			10.899
L4	46.25 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-84.419	-4.861	-0.141
			Max. Mx	8	-62.957	-3353.815	-3.240
			Max. My	14	-62.957	-7.859	-3312.319
			Max. Vy	20	-30.591	3353.184	3.973
			Max. Vx	14	30.221	-7.859	-3312.319
			Max. Torque	13			10.892

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	84.419	-0.000	0.000
	Max. H <sub>x</sub>	20	62.968	30.568	0.033
	Max. H <sub>z</sub>	2	62.968	0.058	30.197
	Max. M <sub>x</sub>	2	3311.699	0.058	30.197
	Max. M <sub>z</sub>	8	3353.815	-30.532	-0.024
	Max. Torsion	13	10.889	-15.338	-26.453
	Min. Vert	17	47.226	15.014	-25.953
	Min. H <sub>x</sub>	8	62.968	-30.532	-0.024
	Min. H <sub>z</sub>	14	62.968	-0.042	-30.199
	Min. M <sub>x</sub>	14	-3312.319	-0.042	-30.199
	Min. M <sub>z</sub>	20	-3353.184	30.568	0.033
	Min. Torsion	25	-10.858	15.363	26.468

### 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	52.473	0.000	0.000	0.172	-2.046	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	62.968	-0.058	-30.197	-3311.699	4.793	3.680
0.9 Dead+1.0 Wind 0 deg - No Ice	47.226	-0.058	-30.197	-3289.794	5.408	3.685
1.2 Dead+1.0 Wind 30 deg - No Ice	62.968	15.021	-25.954	-2844.369	-1649.613	-4.437
0.9 Dead+1.0 Wind 30 deg - No Ice	47.226	15.021	-25.954	-2825.555	-1638.018	-4.429
1.2 Dead+1.0 Wind 60 deg - No Ice	62.968	26.144	-15.025	-1646.479	-2869.952	1.782
0.9 Dead+1.0 Wind 60 deg - No Ice	47.226	26.144	-15.025	-1635.614	-2850.273	1.792
1.2 Dead+1.0 Wind 90 deg - No Ice	62.968	30.532	0.024	3.239	-3353.815	7.604
0.9 Dead+1.0 Wind 90 deg - No Ice	47.226	30.532	0.024	3.170	-3330.945	7.612
1.2 Dead+1.0 Wind 120 deg - No Ice	62.968	26.631	15.362	1687.116	-2927.341	-1.928
0.9 Dead+1.0 Wind 120 deg - No Ice	47.226	26.631	15.362	1675.888	-2907.303	-1.924
1.2 Dead+1.0 Wind 150 deg - No Ice	62.968	15.338	26.453	2903.810	-1687.203	-10.888
0.9 Dead+1.0 Wind 150 deg - No Ice	47.226	15.338	26.453	2884.513	-1675.381	-10.889
1.2 Dead+1.0 Wind 180 deg - No Ice	62.968	0.042	30.199	3312.319	-7.858	-3.735
0.9 Dead+1.0 Wind 180 deg - No Ice	47.226	0.042	30.199	3290.305	-7.159	-3.740
1.2 Dead+1.0 Wind 210 deg - No Ice	62.968	-15.014	25.953	2844.716	1643.528	4.464
0.9 Dead+1.0 Wind 210 deg - No Ice	47.226	-15.014	25.953	2825.791	1633.277	4.456
1.2 Dead+1.0 Wind 240 deg - No Ice	62.968	-26.172	15.015	1645.633	2868.387	-1.770
0.9 Dead+1.0 Wind 240 deg - No Ice	47.226	-26.172	15.015	1634.669	2850.014	-1.779
1.2 Dead+1.0 Wind 270 deg - No Ice	62.968	-30.568	-0.033	-3.974	3353.184	-7.617



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
No Ice						
0.9 Dead+1.0 Wind 270 deg - No Ice	47.226	-30.568	-0.033	-3.994	3331.614	-7.625
1.2 Dead+1.0 Wind 300 deg - No Ice	62.968	-26.664	-15.374	-1688.184	2926.416	1.891
0.9 Dead+1.0 Wind 300 deg - No Ice	47.226	-26.664	-15.374	-1677.055	2907.680	1.887
1.2 Dead+1.0 Wind 330 deg - No Ice	62.968	-15.363	-26.468	-2905.287	1685.399	10.857
0.9 Dead+1.0 Wind 330 deg - No Ice	47.226	-15.363	-26.468	-2886.092	1674.874	10.858
1.2 Dead+1.0 Ice+1.0 Temp	84.419	0.000	-0.000	0.141	-4.861	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	84.419	-0.011	-7.621	-809.769	-3.625	0.796
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	84.419	3.797	-6.565	-696.978	-408.461	-0.674
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	84.419	6.599	-3.797	-403.051	-706.385	0.311
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	84.419	7.681	0.005	0.739	-822.085	1.229
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	84.419	6.686	3.857	410.675	-716.691	-0.491
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	84.419	3.854	6.653	707.893	-415.284	-2.068
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	84.419	0.008	7.621	810.102	-6.089	-0.807
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	84.419	-3.796	6.565	697.255	398.164	0.679
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	84.419	-6.605	3.795	403.099	696.964	-0.309
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	84.419	-7.688	-0.006	-0.665	812.847	-1.232
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	84.419	-6.692	-3.860	-410.672	707.396	0.483
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	84.419	-3.859	-6.656	-707.972	405.812	2.062
Dead+Wind 0 deg - Service	52.473	-0.013	-6.771	-739.402	-0.486	0.822
Dead+Wind 30 deg - Service	52.473	3.368	-5.819	-635.044	-369.924	-1.004
Dead+Wind 60 deg - Service	52.473	5.862	-3.369	-367.545	-642.439	0.392
Dead+Wind 90 deg - Service	52.473	6.846	0.005	0.855	-750.491	1.701
Dead+Wind 120 deg - Service	52.473	5.971	3.444	376.876	-655.256	-0.437
Dead+Wind 150 deg - Service	52.473	3.439	5.931	648.573	-378.325	-2.446
Dead+Wind 180 deg - Service	52.473	0.009	6.771	739.798	-3.310	-0.835
Dead+Wind 210 deg - Service	52.473	-3.366	5.819	635.376	365.461	1.010
Dead+Wind 240 deg - Service	52.473	-5.868	3.367	367.614	638.980	-0.389
Dead+Wind 270 deg - Service	52.473	-6.854	-0.007	-0.754	747.241	-1.704
Dead+Wind 300 deg - Service	52.473	-5.978	-3.447	-376.859	651.940	0.429
Dead+Wind 330 deg - Service	52.473	-3.445	-5.934	-648.650	374.805	2.438

## 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	0.000	-52.473	0.000	0.000	52.473	0.000	0.000%
2	-0.058	-62.968	-30.197	0.058	62.968	30.197	0.000%
3	-0.058	-47.226	-30.197	0.058	47.226	30.197	0.000%
4	15.021	-62.968	-25.954	-15.021	62.968	25.954	0.000%
5	15.021	-47.226	-25.954	-15.021	47.226	25.954	0.000%
6	26.144	-62.968	-15.025	-26.144	62.968	15.025	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
7	26.144	-47.226	-15.025	-26.144	47.226	15.025	0.000%
8	30.532	-62.968	0.024	-30.532	62.968	-0.024	0.000%
9	30.532	-47.226	0.024	-30.532	47.226	-0.024	0.000%
10	26.631	-62.968	15.362	-26.631	62.968	-15.362	0.000%
11	26.631	-47.226	15.362	-26.631	47.226	-15.362	0.000%
12	15.338	-62.968	26.453	-15.338	62.968	-26.453	0.000%
13	15.338	-47.226	26.453	-15.338	47.226	-26.453	0.000%
14	0.042	-62.968	30.199	-0.042	62.968	-30.199	0.000%
15	0.042	-47.226	30.199	-0.042	47.226	-30.199	0.000%
16	-15.014	-62.968	25.953	15.014	62.968	-25.953	0.000%
17	-15.014	-47.226	25.953	15.014	47.226	-25.953	0.000%
18	-26.172	-62.968	15.015	26.172	62.968	-15.015	0.000%
19	-26.172	-47.226	15.015	26.172	47.226	-15.015	0.000%
20	-30.568	-62.968	-0.033	30.568	62.968	0.033	0.000%
21	-30.568	-47.226	-0.033	30.568	47.226	0.033	0.000%
22	-26.664	-62.968	-15.374	26.664	62.968	15.374	0.000%
23	-26.664	-47.226	-15.374	26.664	47.226	15.374	0.000%
24	-15.363	-62.968	-26.468	15.363	62.968	26.468	0.000%
25	-15.363	-47.226	-26.468	15.363	47.226	26.468	0.000%
26	0.000	-84.419	0.000	-0.000	84.419	0.000	0.000%
27	-0.011	-84.419	-7.621	0.011	84.419	7.621	0.000%
28	3.797	-84.419	-6.565	-3.797	84.419	6.565	0.000%
29	6.599	-84.419	-3.797	-6.599	84.419	3.797	0.000%
30	7.681	-84.419	0.005	-7.681	84.419	-0.005	0.000%
31	6.686	-84.419	3.857	-6.686	84.419	-3.857	0.000%
32	3.854	-84.419	6.653	-3.854	84.419	-6.653	0.000%
33	0.008	-84.419	7.621	-0.008	84.419	-7.621	0.000%
34	-3.796	-84.419	6.565	3.796	84.419	-6.565	0.000%
35	-6.605	-84.419	3.795	6.605	84.419	-3.795	0.000%
36	-7.688	-84.419	-0.006	7.688	84.419	0.006	0.000%
37	-6.692	-84.419	-3.860	6.692	84.419	3.860	0.000%
38	-3.859	-84.419	-6.656	3.859	84.419	6.656	0.000%
39	-0.013	-52.473	-6.771	0.013	52.473	6.771	0.000%
40	3.368	-52.473	-5.819	-3.368	52.473	5.819	0.000%
41	5.862	-52.473	-3.369	-5.862	52.473	3.369	0.000%
42	6.846	-52.473	0.005	-6.846	52.473	-0.005	0.000%
43	5.971	-52.473	3.444	-5.971	52.473	-3.444	0.000%
44	3.439	-52.473	5.931	-3.439	52.473	-5.931	0.000%
45	0.009	-52.473	6.771	-0.009	52.473	-6.771	0.000%
46	-3.366	-52.473	5.819	3.366	52.473	-5.819	0.000%
47	-5.868	-52.473	3.367	5.868	52.473	-3.367	0.000%
48	-6.854	-52.473	-0.007	6.854	52.473	0.007	0.000%
49	-5.978	-52.473	-3.447	5.978	52.473	3.447	0.000%
50	-3.445	-52.473	-5.934	3.445	52.473	5.934	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	4	0.00000001	0.00071461
3	Yes	4	0.00000001	0.00048179
4	Yes	5	0.00000001	0.00009899
5	Yes	5	0.00000001	0.00004811
6	Yes	5	0.00000001	0.00010547
7	Yes	5	0.00000001	0.00005128
8	Yes	5	0.00000001	0.00005092
9	Yes	5	0.00000001	0.00002565



Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.000	Lightning Rod 5/8" x 4'	43	9.774	0.570	0.009	90133
148.000	DS4C06F36D-D	43	9.536	0.567	0.009	90133
140.000	RRUS 32 B2	43	8.586	0.553	0.008	45067
130.000	MT6407-77A w/ Mount Pipe	43	7.423	0.532	0.007	22533
124.000	HP2-4.7NS	43	6.750	0.517	0.006	17333
113.000	(3) 800 10252	43	5.583	0.480	0.005	13185
95.000	MX08FRO665-21 w/ Mount Pipe	43	3.904	0.399	0.003	13342

### Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	43.649	10	2.547	0.041
L2	115.25 - 94.25	25.967	10	2.180	0.023
L3	99.75 - 46.25	19.300	10	1.880	0.016
L4	53.5 - 0	5.401	10	0.929	0.005

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
152.000	Lightning Rod 5/8" x 4'	10	43.649	2.547	0.041	20342
148.000	DS4C06F36D-D	10	42.584	2.532	0.040	20342
140.000	RRUS 32 B2	10	38.343	2.469	0.036	10171
130.000	MT6407-77A w/ Mount Pipe	10	33.154	2.376	0.030	5084
124.000	HP2-4.7NS	10	30.147	2.307	0.027	3910
113.000	(3) 800 10252	10	24.939	2.142	0.022	2968
95.000	MX08FRO665-21 w/ Mount Pipe	10	17.446	1.781	0.014	3008

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	KI/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
L1	150 - 110 (1)	TP39.633x28.4x0.25	40.000	0.000	0.0	30.080	-17.943	1759.710	0.010
L2	110 - 94.25 (2)	TP43.556x37.659x0.281	21.000	0.000	0.0	37.252	-22.040	2179.240	0.010
L3	94.25 - 46.25 (3)	TP56.472x41.449x0.375	53.500	0.000	0.0	64.346	-39.246	3764.260	0.010
L4	46.25 - 0 (4)	TP68.71x53.686x0.438	53.500	0.000	0.0	94.805	-62.957	5546.090	0.011

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$	$\phi M_{nx}$	Ratio	$M_{uy}$	$\phi M_{ny}$	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 110 (1)	TP39.633x28.4x0.25	414.202	1496.850	0.277	0.000	1496.850	0.000
L2	110 - 94.25 (2)	TP43.556x37.659x0.281	718.429	2059.733	0.349	0.000	2059.733	0.000
L3	94.25 - 46.25 (3)	TP56.472x41.449x0.375	1844.350	4664.408	0.395	0.000	4664.408	0.000
L4	46.25 - 0 (4)	TP68.71x53.686x0.438	3378.708	8388.250	0.403	0.000	8388.250	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual	$\phi V_n$	Ratio	Actual	$\phi T_n$	Ratio
			$V_u$ K	K	$\frac{V_u}{\phi V_n}$	$T_u$ kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	150 - 110 (1)	TP39.633x28.4x0.25	17.784	527.913	0.034	7.689	1752.592	0.004
L2	110 - 94.25 (2)	TP43.556x37.659x0.281	20.312	653.773	0.031	1.722	2389.225	0.001
L3	94.25 - 46.25 (3)	TP56.472x41.449x0.375	26.530	1129.280	0.023	1.929	5346.458	0.000
L4	46.25 - 0 (4)	TP68.71x53.686x0.438	30.767	1663.830	0.018	1.928	9947.917	0.000

### Pole Interaction Design Data

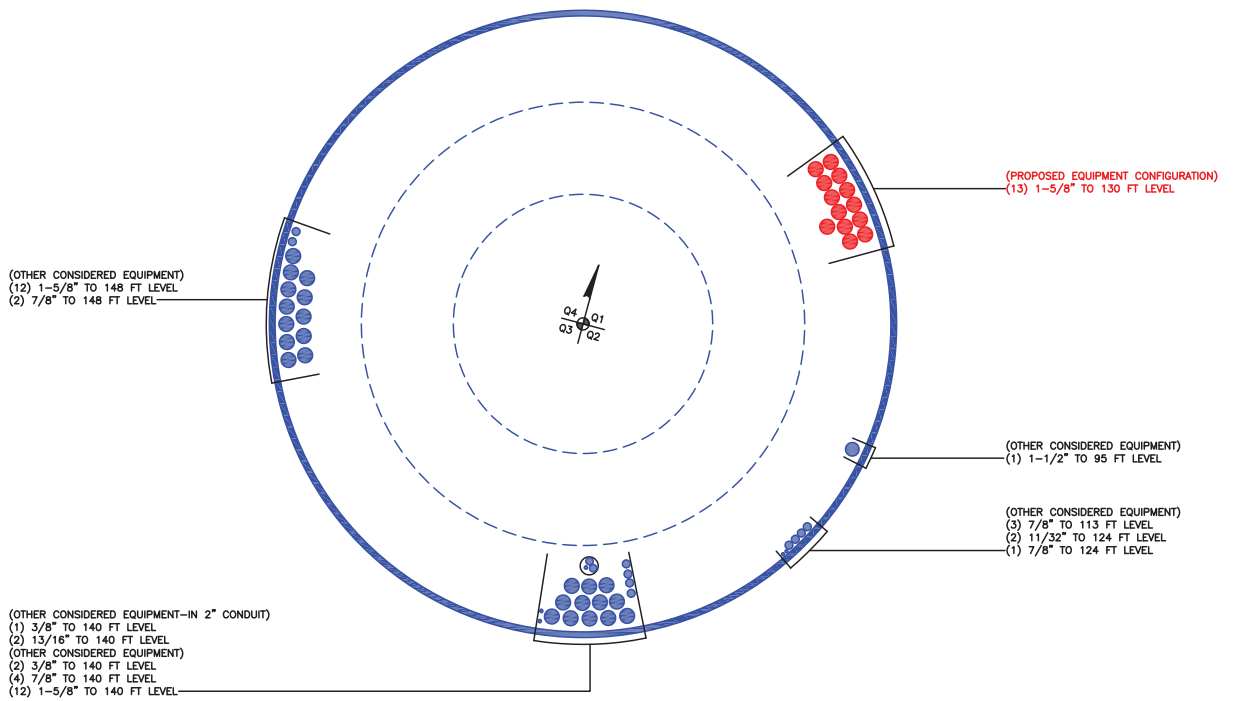
Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{nx}}$	$\frac{M_{uy}}{\phi M_{ny}}$	$\frac{V_u}{\phi V_n}$	$\frac{T_u}{\phi T_n}$			
L1	150 - 110 (1)	0.010	0.277	0.000	0.034	0.004	0.288	1.050	
L2	110 - 94.25 (2)	0.010	0.349	0.000	0.031	0.001	0.360	1.050	
L3	94.25 - 46.25 (3)	0.010	0.395	0.000	0.023	0.000	0.406	1.050	
L4	46.25 - 0 (4)	0.011	0.403	0.000	0.018	0.000	0.414	1.050	

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 110	Pole	TP39.633x28.4x0.25	1	-17.943	1847.695	27.5	Pass
L2	110 - 94.25	Pole	TP43.556x37.659x0.281	2	-22.040	2288.202	34.3	Pass
L3	94.25 - 46.25	Pole	TP56.472x41.449x0.375	3	-39.246	3952.473	38.7	Pass
L4	46.25 - 0	Pole	TP68.71x53.686x0.438	4	-62.957	5823.394	39.5	Pass
Summary								
Pole (L4)							39.5	Pass
<b>RATING =</b>							<b>39.5</b>	<b>Pass</b>



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





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

# Monopole Base Plate Connection

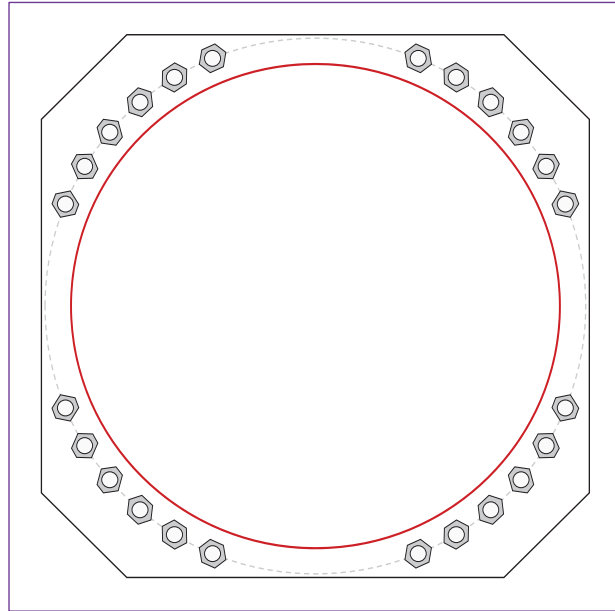


Site Info	
BU #	5800059
Site Name	Ridge Road, Madison, C
Order #	656561 REV. 0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$l_{ar}$ (in)	2.25

Applied Loads	
Moment (kip-ft)	3378.71
Axial Force (kips)	62.96
Shear Force (kips)	30.77

\*TIA-222-H Section 15.5 Applied



Connection Properties	Analysis Results
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**Anchor Rod Data**

(24) 2-1/4"  $\phi$  bolts (A615-75 N;  $F_y=75$  ksi,  $F_u=100$  ksi) on 76" BC  
 Anchor Spacing: 6 in

**Base Plate Data**

77" W x 3" Plate (A572-50;  $F_y=50$  ksi,  $F_u=65$  ksi); Clip: 12 in

**Stiffener Data**

N/A

**Pole Data**

68.71" x 0.4375" 18-sided pole (A572-65;  $F_y=65$  ksi,  $F_u=80$  ksi)

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

$Pu_t = 86.26$	$\phi Pn_t = 243.75$	<b>Stress Rating</b>
$Vu = 1.28$	$\phi Vn = 149.1$	<b>33.7%</b>
$Mu = n/a$	$\phi Mn = n/a$	<b>Pass</b>

**Base Plate Summary**

Max Stress (ksi):	13.54	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	<b>28.7%</b>	<b>Pass</b>

### Drilled Pier Foundation

BU # :	5800059
Site Name:	Ridge Road, Madison, CT
Order Number:	656561 REV. 0
TIA-222 Revision:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	3378.71	
Axial Force (kips)	62.97	
Shear Force (kips)	30.74	

Material Properties		
Concrete Strength, f <sub>c</sub> :	4	ksi
Rebar Strength, F <sub>y</sub> :	60	ksi
Tie Yield Strength, F <sub>y</sub> :	40	ksi

Pier Design Data	
Depth	39 ft
Ext. Above Grade	0.5 ft
Pier Section 1	
<i>From 0.5' above grade to 39' below grade</i>	
Pier Diameter	8 ft
Rebar Quantity	28
Rebar Size	11
Clear Cover to Ties	3 in
Tie Size	5
Tie Spacing	12 in

[Rebar & Pier Options](#)

[Embedded Pole Inputs](#)

[Belled Pier Inputs](#)

Analysis Results		
Soil Lateral Check	Compression	Uplift
D <sub>req</sub> (ft from TOC)	9.88	-
Soil Safety Factor	7.01	-
Max Moment (kip-ft)	3649.99	-
Rating*	18.1%	-
Soil Vertical Check	Compression	Uplift
Skin Friction (kips)	688.42	-
End Bearing (kips)	317.36	-
Weight of Concrete (kips)	236.89	-
Total Capacity (kips)	1005.77	-
Axial (kips)	299.86	-
Rating*	28.4%	-
Reinforced Concrete Flexure	Compression	Uplift
Critical Depth (ft from TOC)	9.46	-
Critical Moment (kip-ft)	3649.38	-
Critical Moment Capacity	8318.94	-
Rating*	41.8%	-
Reinforced Concrete Shear	Compression	Uplift
Critical Depth (ft from TOC)	28.44	-
Critical Shear (kip)	265.26	-
Critical Shear Capacity	786.20	-
Rating*	32.1%	-
<b>Structural Foundation Rating*</b>	<b>41.8%</b>	
<b>Soil Interaction Rating*</b>	<b>28.4%</b>	

\*Rating per TIA-222-H Section 15.5

Check Limitation	
Apply TIA-222-H Section 15.5:	<input checked="" type="checkbox"/>
N/A	<input type="checkbox"/>
Design Options	
Input Effective Depths (else Actual):	<input type="checkbox"/>
Consider non-tapered moment capacity:	<input type="checkbox"/>
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](#)

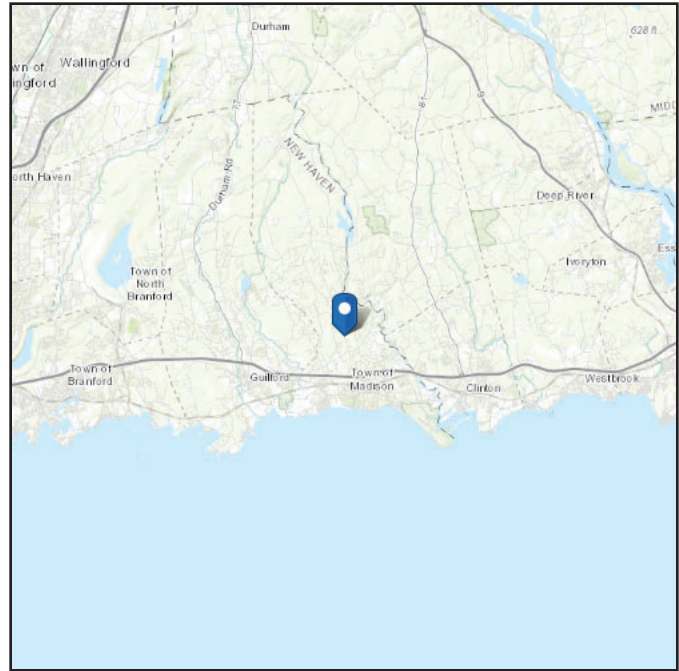
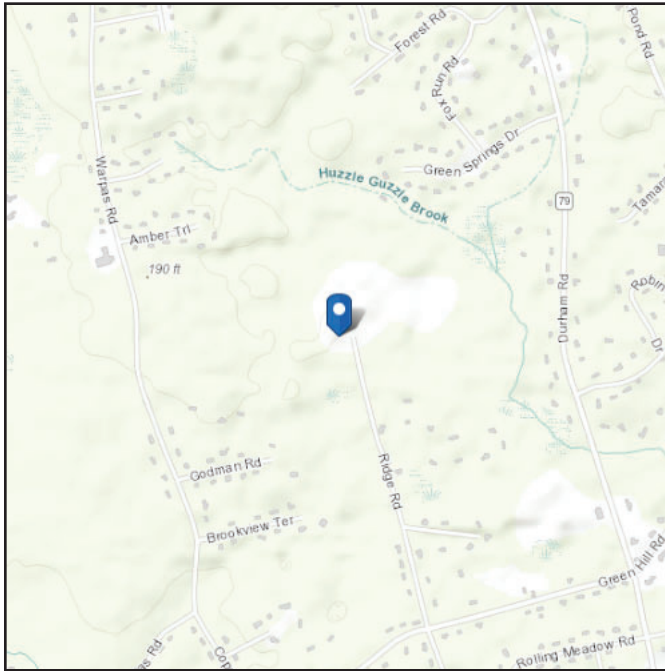
Soil Profile														
Groundwater Depth	7			# of Layers	5									
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ <sub>soil</sub> (pcf)	γ <sub>concrete</sub> (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Net Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	100	150	0	0	0.000	0.000	0.00	0.00			Cohesionless
2	4	7	3	100	150	0.1	22	0.181	0.181					Silty
3	7	12	5	37.6	87.6	0.1	22	0.257	0.257					Silty
4	12	20	8	42.6	87.6	0.4	27	1.016	1.016				70	Cohesionless
5	20	39	19	62.6	87.6	0.2	31	1.398	1.398			6	85	Cohesionless

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Latitude:** 41.30925  
**Longitude:** -72.614325  
**Elevation:** 0 ft (NAVD 88)



## Wind

### Results:

Wind Speed	123 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	94 Vmph
100-year MRI	100 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Mon Mar 06 2023

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

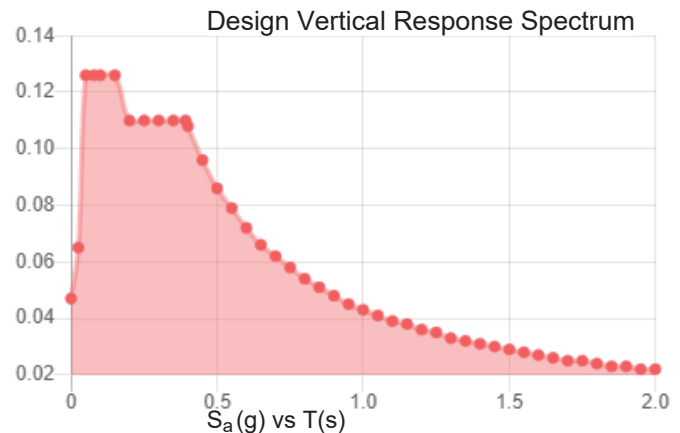
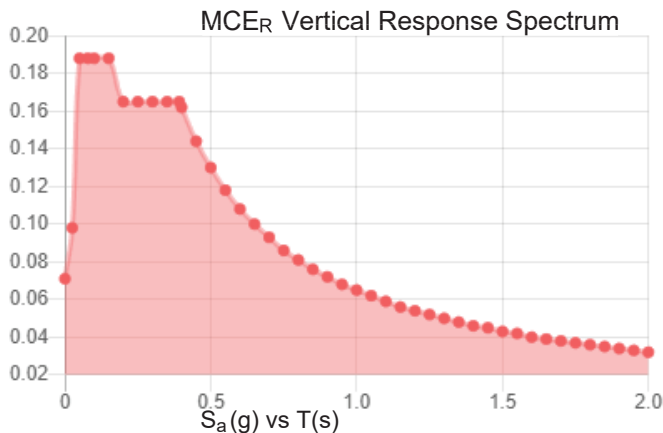
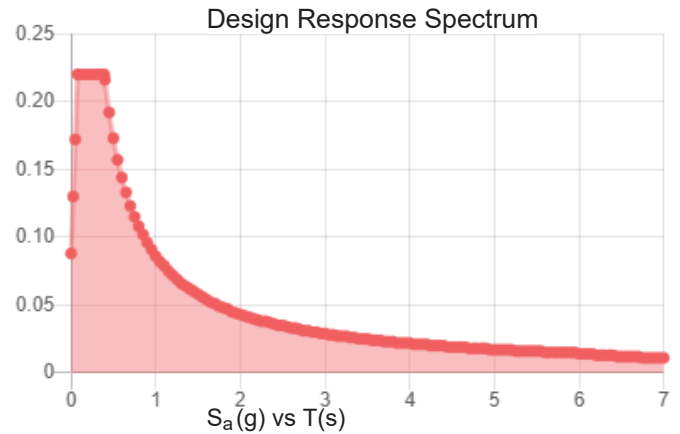
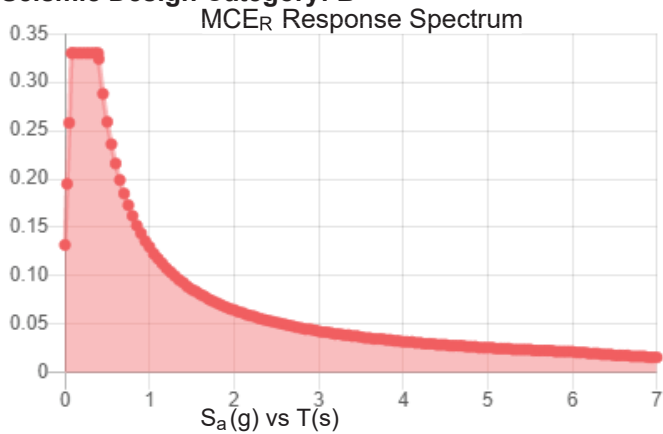
Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

**Site Soil Class:**

**Results:**

$S_s$ :	0.206	$S_{D1}$ :	0.086
$S_1$ :	0.054	$T_L$ :	6
$F_a$ :	1.6	PGA :	0.116
$F_v$ :	2.4	PGA <sub>M</sub> :	0.181
$S_{MS}$ :	0.33	$F_{PGA}$ :	1.569
$S_{M1}$ :	0.13	$I_e$ :	1
$S_{DS}$ :	0.22	$C_v$ :	0.713

**Seismic Design Category: B**



**Data Accessed:**

**Mon Mar 06 2023**

**Date Source:**

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

## Ice

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**Results:**

Ice Thickness: 1.00 in.  
Concurrent Temperature: 15 F  
Gust Speed 50 mph

**Data Source:** Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

**Date Accessed:** Mon Mar 06 2023

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

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

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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.

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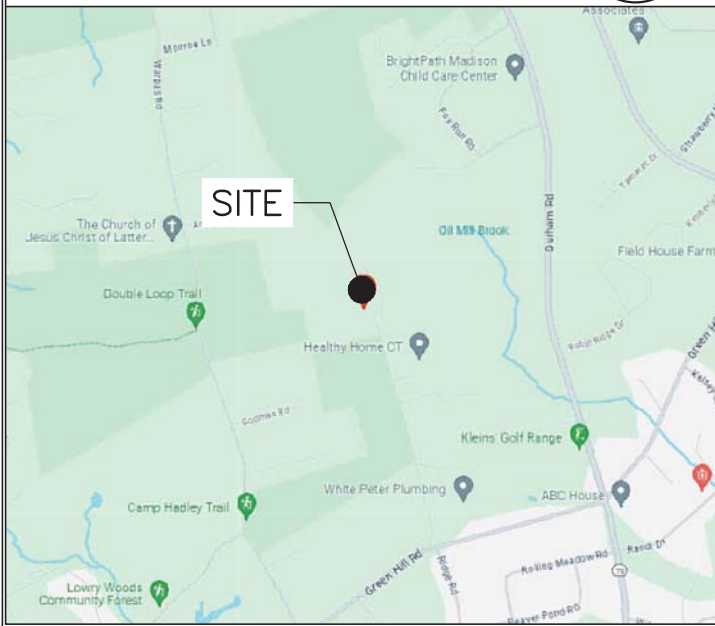
In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from 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.



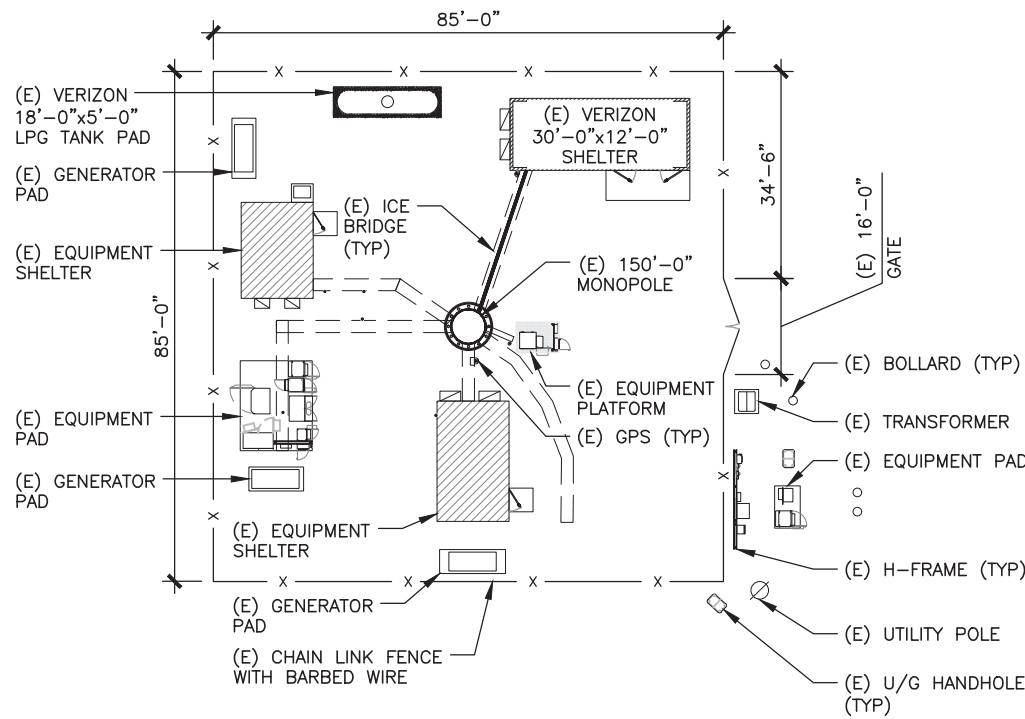
**NOTE:**  
AN ANALYSIS OF THE CAPACITY OF THE STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY CROWN CASTLE DATED JANUARY 16, 2024.

**LEASE EXHIBIT:**  
THIS LEASE EXHIBIT IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF THE SITE SURVEY AND FACILITY DESIGN.

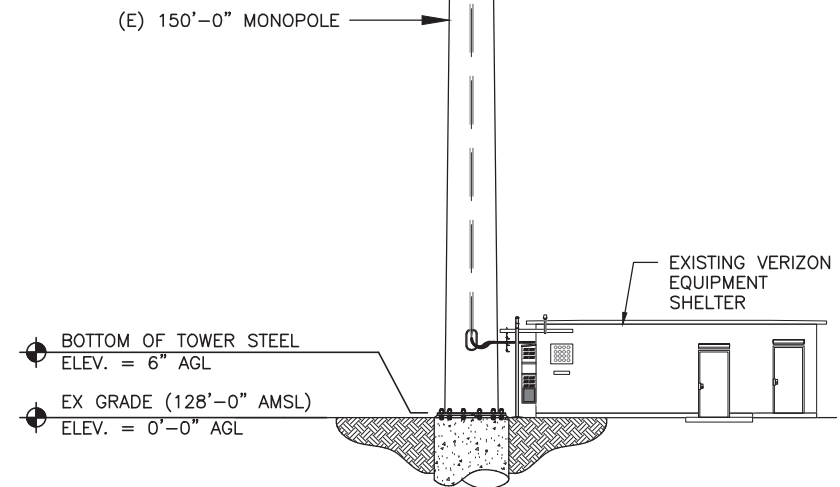
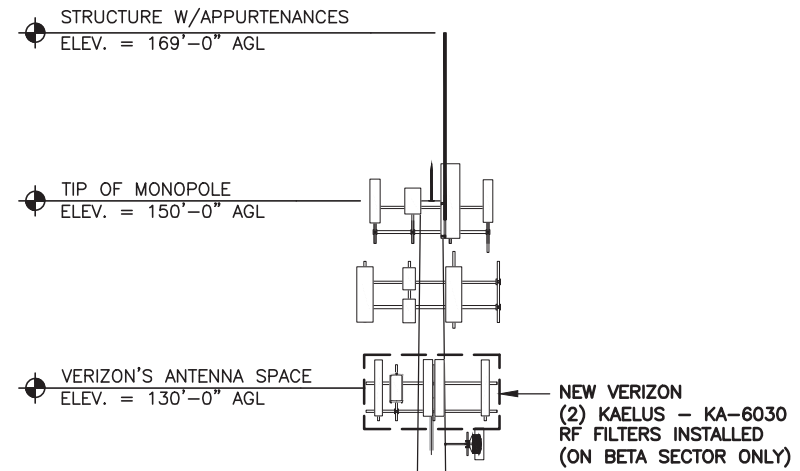
**LOCATION MAP  
N.T.S**



APPROXIMATE COORDINATES: LATITUDE: 41° 18' 33.30" N 41.309250° N  
LONGITUDE: 72° 36' 51.60" W 72.614325° W



**2 SITE PLAN**  
SCALE: 0' 16' 32' 64' 96'



**3 TOWER ELEVATION**  
SCALE: N.T.S

**verizon**

20 ALEXANDER DRIVE  
WALLINGFORD, CT 06492



MTS ENGINEERING, P.L.L.C.  
1717 S. BOULDER  
SUITE 300  
TULSA, OK 74119  
PH: (918) 587-4630  
btwo@btgrp.com

**MADISON 3 CT**

258 RIDGE ROAD  
MADISON, CT 06433  
EXISTING MONOPOLE

PROJECT NO: 87323.009.01

CHECKED BY: LR

**ISSUED FOR:**

REV	DATE	DRWN	DESCRIPTION
0	3/25/24	JDB	CONSTRUCTION

MTS ENGINEERING P.L.L.C.  
BER:2386985  
Expires 3/31/24



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: REVISION:

**LE-1 0**



87323.009.01.0001\_5600059\_RIDGE ROAD, MADISON.dwg - SheetLE-1 - User: liscarider - Mar 25, 2024 - 3:37pm

**verizon**

20 ALEXANDER DRIVE  
WALLINGFORD, CT 06492

**B+T GRP**  
 MTS ENGINEERING, P.L.L.C.  
 1717 S. BOULDER  
 SUITE 300  
 TULSA, OK 74119  
 PH: (918) 587-4830  
 btw@btgrp.com

**MADISON 3 CT**  
 258 RIDGE ROAD  
 MADISON, CT 06433  
 EXISTING MONOPOLE

PROJECT NO: 87323.009.01  
 CHECKED BY: LR

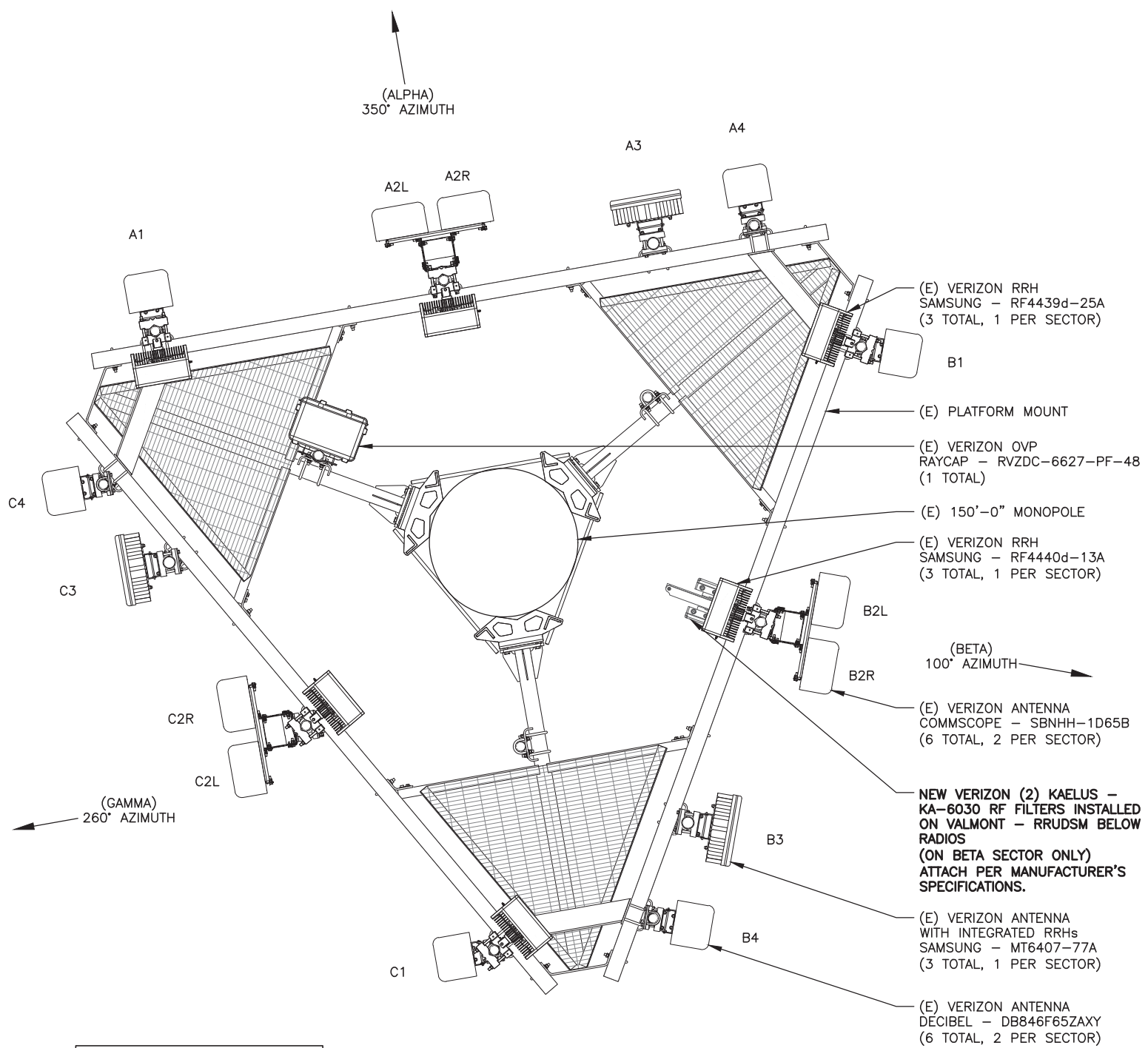
ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION
0	3/25/24	JDB	CONSTRUCTION

MTS ENGINEERING P.L.L.C.  
 BER:2386985  
 Expires 3/31/24

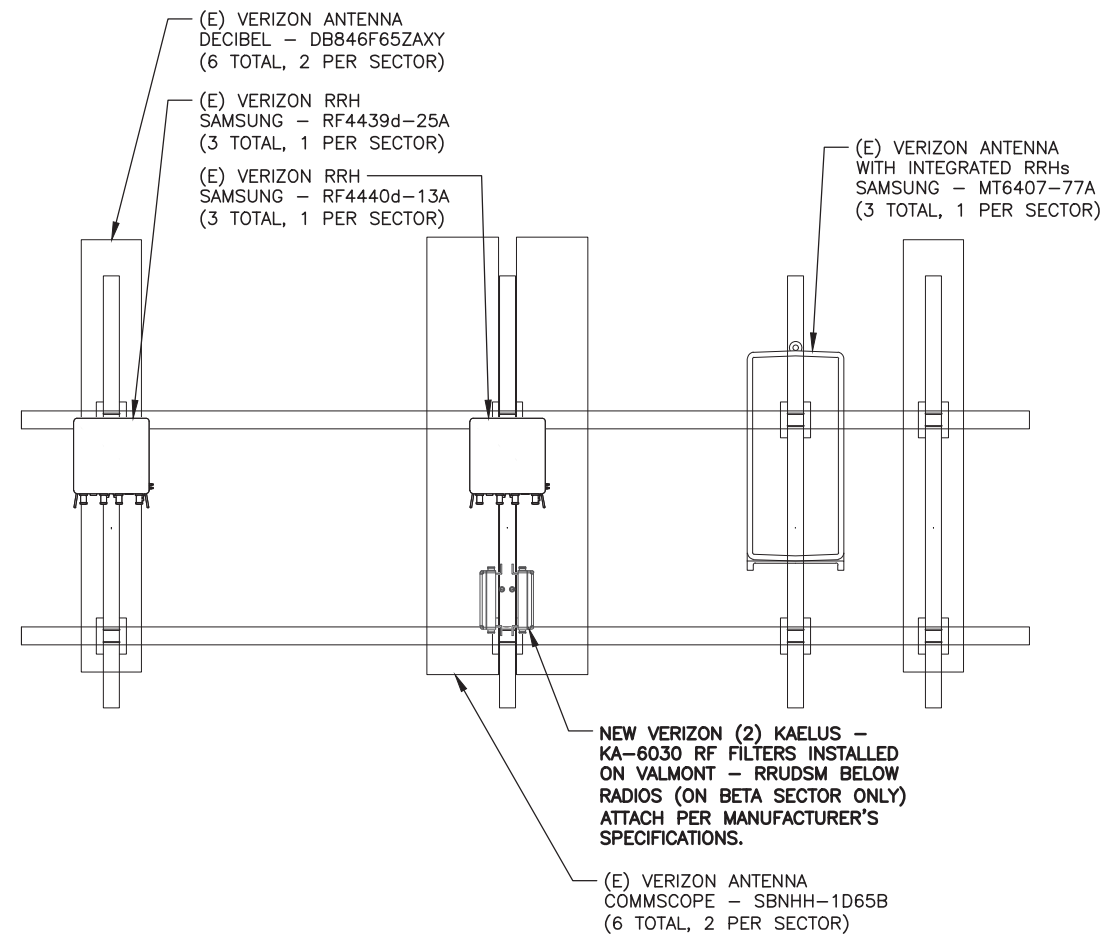
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SHEET NUMBER: **LE-2** REVISION: **0**



NOTE:  
 ANTENNA POSITIONS LABELED PER MOUNT ANALYSIS

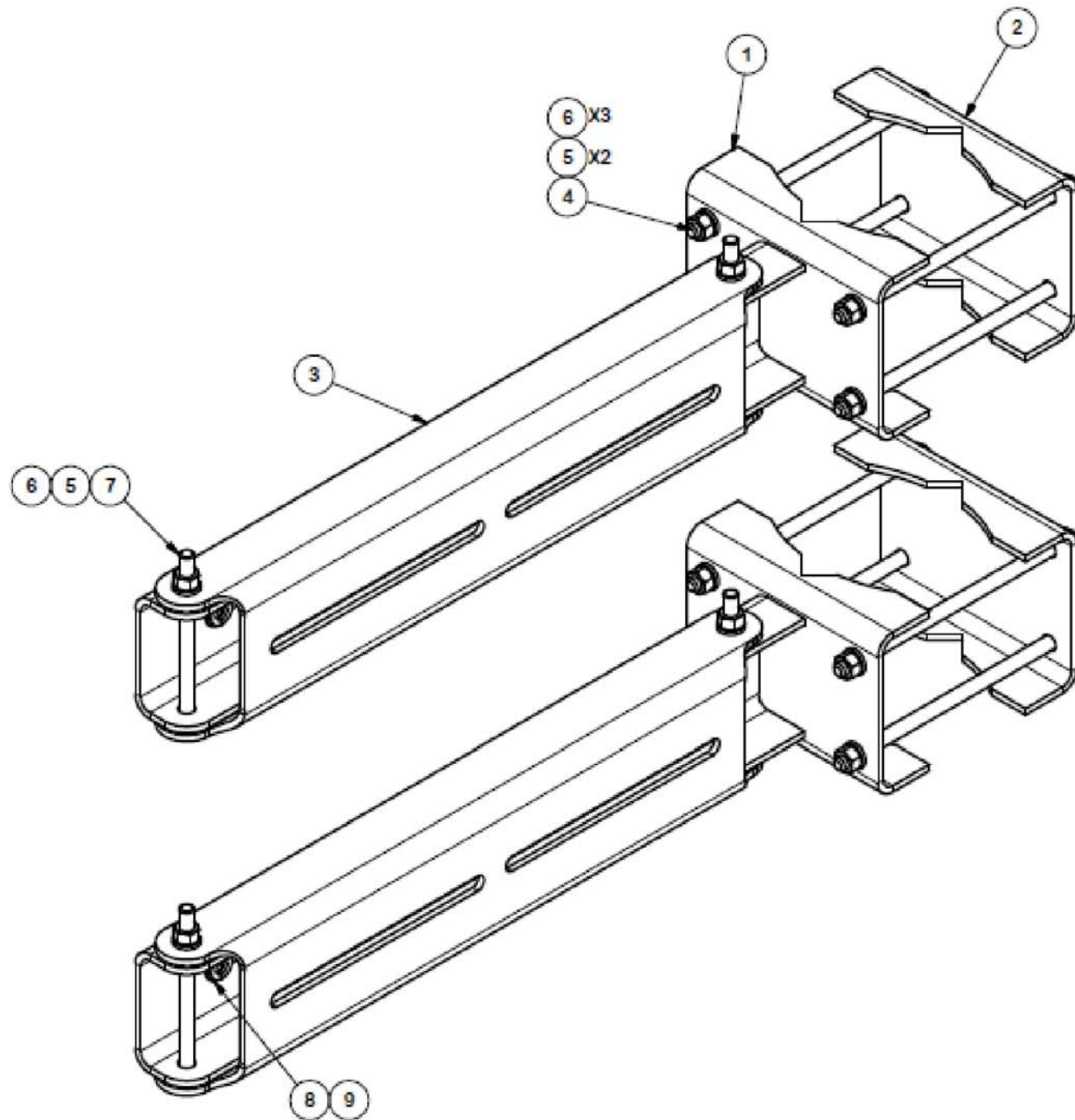
**1 NEW RF FILTER PLAN**  
 SCALE: 0' 1' 2' 4' 8'



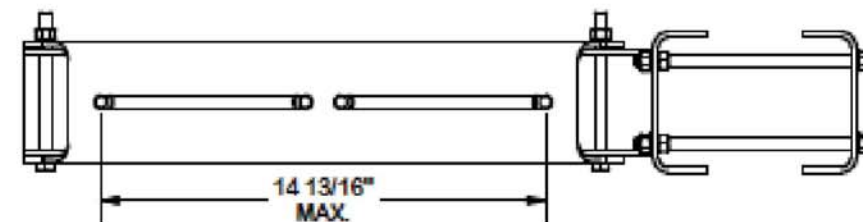
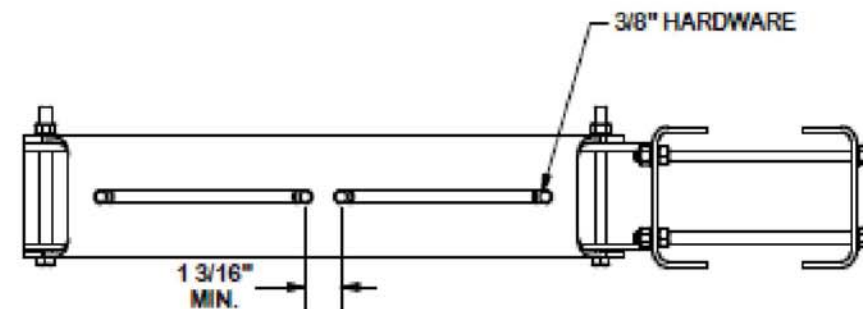
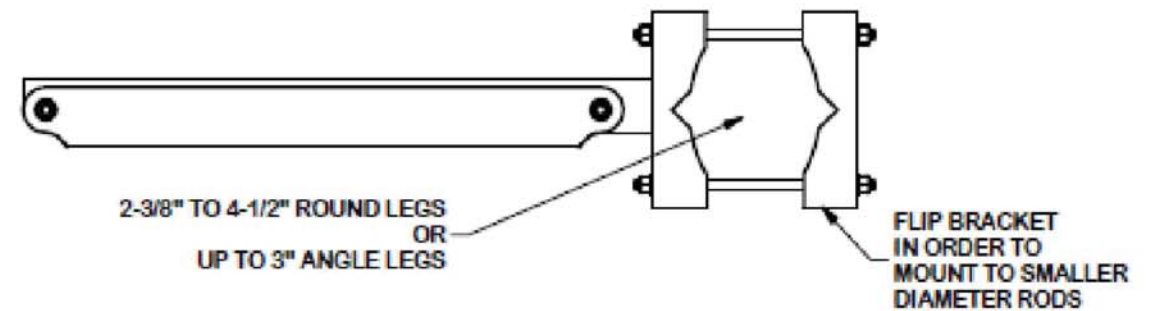
NOTE:  
 ELEVATION VIEW FROM BEHIND ANTENNAS

**2 NEW RF FILTER ELEVATION**  
 SCALE: 0' 1' 2' 4' 8'






PARTS LIST					
ITEM	QTY	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	MOUNTING ARM		8.99	17.97
2	2	CLAMP PLATE		2.35	4.69
3	2	SWIVEL MOUNT		6.65	13.30
4	8	3/8"-16 UNC X 8" GALV. THREADED ROD		0.25	2.00
5	20	3/8" GALV LOCK WASHER		0.01	0.13
6	28	3/8"-16 UNC GALV HEX NUT		0.02	0.52
7	4	3/8" X 5" GALV BOLT		0.18	0.71
8	8	3/8" SS FLAT WASHER		0.01	0.06
9	8	3/8" SS LOCK WASHER		0.01	0.05
TOTAL WT. #					39.43



**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:  
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DESCRIPTION			 Engineering Support Team: 1-866-753-7446		Locations: New York, NY Atlanta, GA Los Angeles, CA Plymouth, IN Salem, OR Dallas, TX
RRU DUAL SWIVEL MOUNT			A valmont COMPANY		
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.		
	CEK 1/12/2015		RRUDSM		
CLASS	SUB	DRAWING USAGE	DWG. NO.		
81	01	SHOP	RRUDSM		

CROWN CASTLE USA INC.  
2000 CORPORATE DRIVE  
CANONSBURG PA 15317  
724-416-2000

JPMorgan Chase Bank, N.A.  
DALLAS TX  
32-61/1110

2949900

SIX HUNDRED TWENTY FIVE AND 00/100\*\*\*\*\*

DATE 04/01/24

\$\*\*\*\*\*625.00

Pay To Connecticut Siting Council  
The Ten Franklin Square  
Order Of New Britain CT 06051

2695915

*Robert A. Cole* VP and Controller  
*[Signature]* Asst. Controller

VOID AFTER 180 DAYS

⑈ 2949900⑈ ⑆ 111000614⑆ 103410453⑈

Check No 2949900

Check Date 04/01/24

Stub 1 of 1

CKRQ 656561 ZN APP	03/27/24	Invoice Summ	625.00	625.00
			<u>625.00</u>	<u>625.00</u>