



STATE OF CONNECTICUT  
**CONNECTICUT SITING COUNCIL**

Ten Franklin Square, New Britain, CT 06051  
Phone: (860) 827-2935 Fax: (860) 827-2950A  
E-Mail: [siting.council@ct.gov](mailto:siting.council@ct.gov)  
Web Site: [portal.ct.gov/csc](http://portal.ct.gov/csc)

**VIA ELECTRONIC MAIL**

August 4, 2021

Kenneth C. Baldwin, Esq.  
Robinson & Cole LLP  
280 Trumbull Street  
Hartford, CT 06103-3597

RE: **EM-VER-117-210615** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 80 Lonetown Road, Redding, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence of August 2, 2021 submitted in response to the Council's July 6, 2021 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

*s/ Melanie A. Bachman*

Melanie A. Bachman  
Executive Director

MAB/CMW/emr

**(REVISED)**  
**STRUCTURAL ANALYSIS REPORT**

For

**SITE NAME: REDDING CT**

80 Lonetown Road  
Redding, CT 06896

**Antennas Mounted on the Tower**



Prepared for:

**verizon**✓

20 Alexander Drive  
Wallingford CT 06492

Dated: July 27, 2021 (Rev. 3)

April 16, 2021 (Rev. 2)

February 10, 2021 (Rev. 1)

January 19, 2021

Prepared by:



**HUDSON**  
Design Group LLC

45 Beechwood Drive  
North Andover, MA 01845  
(P) 978.557.5553 (F) 978.336.5586  
[www.hudsondesigngroupllc.com](http://www.hudsondesigngroupllc.com)





## SCOPE OF WORK:

Hudson Design Group, LLC (HDG) has been authorized by Verizon to conduct a structural evaluation of the 100' self-supporting tower supporting the proposed Verizon's antennas located at elevation 82' above the ground level.

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

Record drawings of the existing tower were not available for our use. The following documents were used for our reference:

- Structural Analysis Report prepared by Centek Engineering, dated July 20, 2020.
- Previous HDG Structural Analysis Report dated March 7, 2018.
- Tower Mapping data provided by ProVertic LLC, dated January 25, 2021.
- Mount Modification Drawings prepared by Maser Consulting – Connecticut dated December 31, 2020.
- Antenna Mount Analysis Report prepared by Maser Consulting – Connecticut dated April 28, 2021.

## CONCLUSION SUMMARY:

HDG performed structural analysis of the existing tower with the following proposed modifications:

### 1. Replace diagonals at EL.60' to EL.80' with proposed steel angles.

Based on our evaluation, we have determined that the existing tower **is in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report.

	Controlling	Elevation (ft)	Stress Ratio	Pass/Fail
Existing Tower	Section - T2	60 - 80	120.0 %	FAIL
Modified Tower	Section - T4	20 - 40	79.0 %	PASS

Based on our evaluation, we have determined that the existing foundation **is in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report.

	Controlling	Stress Ratio	Pass/Fail
Existing Foundation	Overtuning	97.1 %	PASS
Modified Foundation	Overtuning	88.9 %	PASS

Note:

Reference Structural Analysis Report Rev.0 dated January 19, 2021, for exiting loading conditions.



**APPURTENANCES CONFIGURATION:**

Tenant	Appurtenances	Elev.	Mount
T-Mobile	(3) APX16DWV-16DWV-S-E-A20 Antennas	92'	SitePro1 VFA12-HD***
T-Mobile	(3) APXVAARR18_43-U-NA20 Antennas	92'	SitePro1 VFA12-HD***
T-Mobile	(3) AIR6449 B41 Antennas	92'	SitePro1 VFA12-HD***
T-Mobile	(3) 4424 25 RRH's	92'	SitePro1 VFA12-HD***
T-Mobile	(3) 4449 B71+B12 RRH's	92'	SitePro1 VFA12-HD***
T-Mobile	(3) 4415 B25 RRH's	92'	SitePro1 VFA12-HD***
T-Mobile	(3) RRUS-11 RRH's	92'	SitePro1 VFA12-HD***
T-Mobile	(3) SDX1926Q-43 Diplexers	92'	SitePro1 VFA12-HD***
<b>Verizon</b>	<b>(3) MT6407-77A Antennas</b>	82'	T - Frame w/ Reinforcement Kit**
<b>Verizon</b>	<b>(3) B2/B66A RRH-BR049 RRH's</b>	82'	T - Frame w/ Reinforcement Kit**
<b>Verizon</b>	<b>(3) B5/B13 RRH-BR04C RRH's</b>	82'	T - Frame w/ Reinforcement Kit**
<b>Verizon</b>	(1) BXA-80080-4CF Antennas	82'	T - Frame w/ Reinforcement Kit**
<b>Verizon</b>	(2) NHH-65B-R2B Antennas	82'	T - Frame w/ Reinforcement Kit**
<b>Verizon</b>	(2) BXA-80063-6CF Antennas	82'	T - Frame w/ Reinforcement Kit**
<b>Verizon</b>	(4) NHH-45B-R2B Antennas	82'	T - Frame w/ Reinforcement Kit**
<b>Verizon</b>	(2) Junction Boxes	82'	T - Frame w/ Reinforcement Kit**

*\*Proposed Verizon Appurtenances shown in Bold.*

*\*\*Mount Modification proposed by Maser Consulting – Connecticut dated December 31, 2020.*

*\*\*\* T-Mobile Loading from Structural Analysis report prepared by Centek Engineering dated July 20, 2020.*

**EXISTING/PROPOSED COAX CABLES:**

Tenant	Coax Cables	Elev.	Mount
T-Mobile	(4) 1 5/8" Hybrid Cables	92'	Tower Face
<b>Verizon</b>	(2) 1 5/8" Hybrid Cables	82'	Tower Face
<b>Verizon</b>	(12) 1 5/8" Coaxial Cables	82'	Tower Face

*\*Proposed Verizon Coax Cables shown in Bold.*

*\*\* T-Mobile Loading from Structural Analysis report prepared by Centek Engineering dated July 20, 2020.*





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Design Group LLC

**ANALYSIS RESULTS SUMMARY:**

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Legs	75.0 %	20 – 40	PASS	
Diagonals	<b>79.0 %</b>	20 – 40	PASS	<b>Controlling</b>
Top Girt	18.7 %	40 – 60	PASS	

**FOUNDATION COMPARISON SUMMARY:**

	Stress Ratio	Pass/Fail	Comments
Bearing	54.8 %	PASS	
Overturning	<b>88.9 %</b>	PASS	<b>Controlling</b>
Sliding	32.1 %	PASS	



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#### **DESIGN CRITERIA:**

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

County: Fairfield

Ultimate Wind Speed: 120 mph (3 second gust)

Nominal Wind Speed: 93 mph

Structural Class: II

Exposure Category: B

Topographic Category: 1

Nominal Ice Thickness: 0.75 inch

2. Approximate height above grade to proposed antennas: 82'

**\*Calculations and referenced documents are attached.**

#### **ASSUMPTIONS:**

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

#### **SUPPORT RECOMMENDATIONS:**

HDG recommends that the proposed antennas and RRHs be mounted on the existing T - frame w/ reinforcement kit supported by the tower.

Reference HDG's Latest Construction Drawings for all component and connection requirements (attached).



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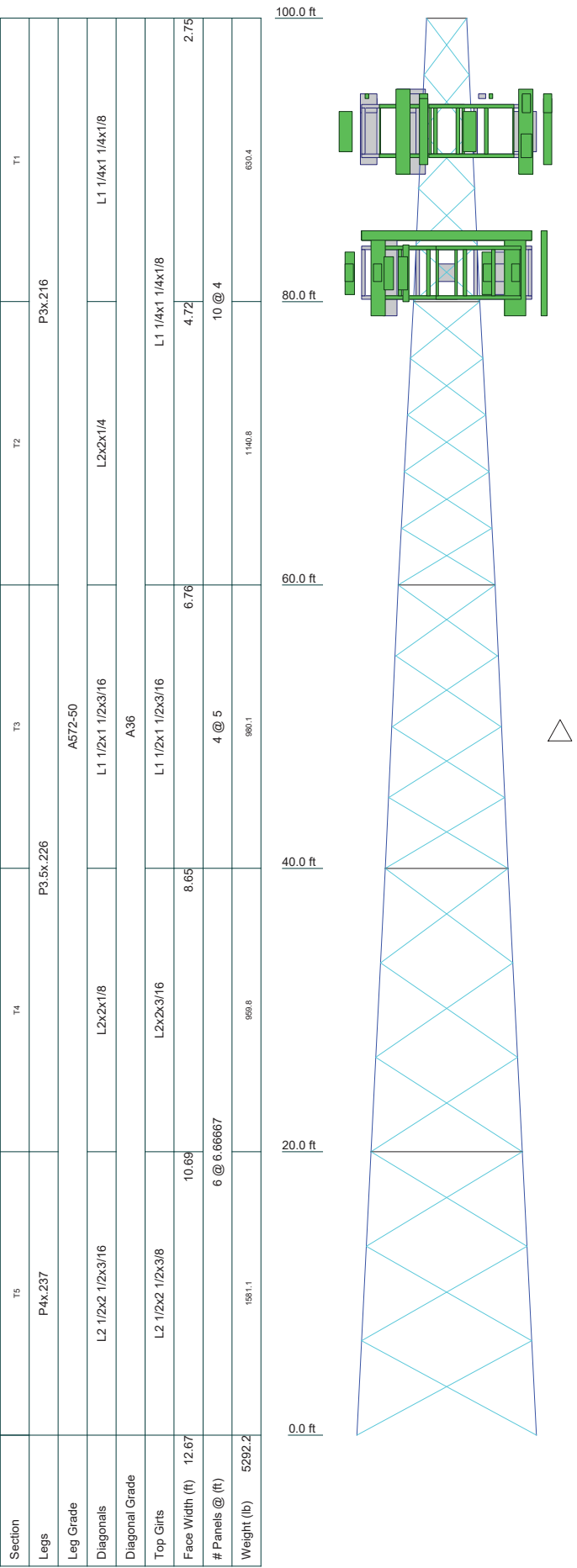


**Photo 1:** Photo illustrating the Tower with Appurtenances shown.



**HUDSON**  
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## CALCULATIONS



### DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
SitePro1 VFA12-HD Mount	92	SDX1926Q-43	92
APX16DWV-16DWV-S-E-A20 w/ Mounting Pipe	92	12' T- Arm	82
APXVAARR18_43-U-NA20 Antennas w/ Mounting Pipe	92	Sector Stabilizer Kit , SitePro1 P/N SFS-V	82
AIR 6449 B41 w/Mounting Pipe	92	BXA-80080-4CF-EDIN-X w/Mounting Pipe	82
4424 B25 RRH	92	(2) NHH-65B-R2B w/Mounting Pipe	82
4449 B71+B12 RRH	92	MT6407-77A Antenna w/Mounting Pipe	82
4415 B25 RRH	92	B2/B66A RRH-BR049 RRH	82
RRUS-11 RRH	92	B5/B13 RRH-BR04C RRH	82
SDX1926Q-43	92	Junction Box	82
SitePro1 VFA12-HD Mount	92	12' T- Arm	82
APX16DWV-16DWV-S-E-A20 w/ Mounting Pipe	92	Sector Stabilizer Kit , SitePro1 P/N SFS-V	82
APXVAARR18_43-U-NA20 Antennas w/ Mounting Pipe	92	BXA-80063/6 w/Mount Pipe	82
AIR 6449 B41 w/Mounting Pipe	92	(2) NHH-45B-R2B w/Mounting Pipe	82
4424 B25 RRH	92	MT6407-77A Antenna w/Mounting Pipe	82
4449 B71+B12 RRH	92	B2/B66A RRH-BR049 RRH	82
4415 B25 RRH	92	B5/B13 RRH-BR04C RRH	82
RRUS-11 RRH	92		

### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

### TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

**Hudson Design Group LLC**

45 Beechwood Drive  
North Andover, MA 01845  
Phone: (978) 557-5553  
FAX: (978) 336-5586

Job: **REDDING CT**

Project: **100 ft Self Supporting Tower**

Client: VERIZON

Code: TIA-222-G

Path:

Drawn by: RL

Date: 07/23/21

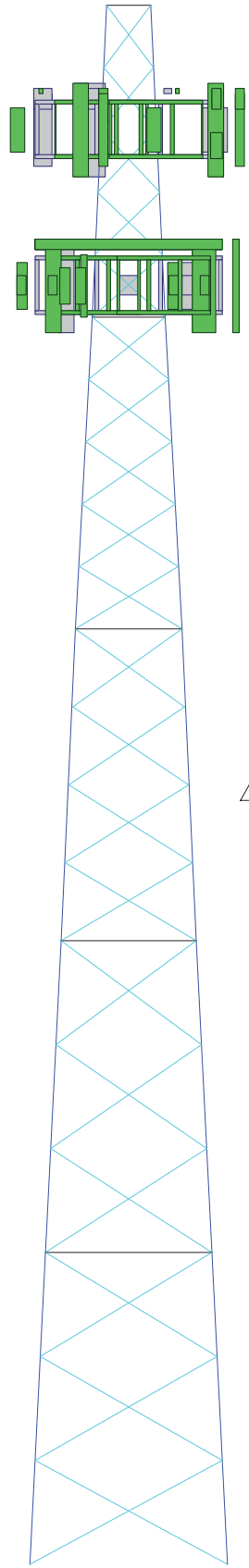
App'd:

Scale: NTS

Dwg No. E-1

Section	T5	T4	T3	T2	T1
Legs	P4x.237		P3.5x.226		P3x.216
Leg Grade			A572-50		
Diagonals	L2 1/2x2 1/2x3/16	L2x2x1/8	L1 1/2x1 1/2x3/16	L2x2x1/4	L1 1/4x1 1/4x1/8
Diagonal Grade			A36		
Top Girts	L2 1/2x2 1/2x3/8	L2x2x3/16	L1 1/2x1 1/2x3/16	L1 1/4x1 1/4x1/8	
Face Width (ft)	12.67	10.68	8.65	6.76	4.72
# Panels @ (ft)		6 @ 6.66667	4 @ 5	10 @ 4	
Weight (lb)	5292.2	1981.1	999.8	1140.8	603.4

100.0 ft  
80.0 ft  
60.0 ft  
40.0 ft  
20.0 ft  
0.0 ft



### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

### TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 93 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 79%

ALL REACTIONS  
ARE FACTORED

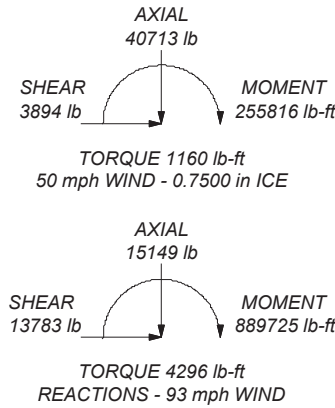
MAX. CORNER REACTIONS AT BASE:

DOWN: 85719 lb

SHEAR: 9068 lb

UPLIFT: -74655 lb

SHEAR: 7912 lb



**Hudson Design Group LLC**  
45 Beechwood Drive  
North Andover, MA 01845  
Phone: (978) 557-5553  
FAX: (978) 336-5586

Job:	<b>REDDING CT</b>		
Project:	<b>100 ft Self Supporting Tower</b>		
Client:	VERIZON	Drawn by:	RL
Code:	TIA-222-G	Date:	07/23/21
Path:		Scale:	NTS
		Dwg No.	E-1

<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	REDDING CT	<b>Page</b>	1 of 8
	<b>Project</b>	100 ft Self Supporting Tower	<b>Date</b>	15:29:39 07/23/21
	<b>Client</b>	VERIZON	<b>Designed by</b>	RL

## Tower Input Data

The main tower is a 3x free standing tower with an overall height of 100.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 2.75 ft at the top and 12.67 ft at the base.

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

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 93 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

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

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

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

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

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

## Tower Section Geometry

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Assembly Database</i>	<i>Description</i>	<i>Section Width</i>	<i>Number of Sections</i>	<i>Section Length</i>
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	100.00-80.00			2.75	1	20.00
T2	80.00-60.00			4.72	1	20.00
T3	60.00-40.00			6.76	1	20.00
T4	40.00-20.00			8.65	1	20.00
T5	20.00-0.00			10.69	1	20.00

## Tower Section Geometry (cont'd)

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	100.00-80.00	4.00	X Brace	No	No	0.0000	0.0000
T2	80.00-60.00	4.00	X Brace	No	No	0.0000	0.0000
T3	60.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T4	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T5	20.00-0.00	6.67	X Brace	No	No	0.0000	0.0000



<b>tnxTower</b>  <b>Hudson Design Group LLC</b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	<b>Page</b>
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	100 ft Self Supporting Tower	15:29:39 07/23/21
	<b>Client</b>	<b>Designed by</b>
	VERIZON	RL

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

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement  ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 Fiber Cable	A	No	No	Ar (CaAa)	92.00 - 3.00	1	1	0.0000	1.9800		1.04
1 5/8 Fiber Cable *****	A	No	No	Ar (CaAa)	92.00 - 3.00	3	3	0.0000	1.9800		1.04
1 5/8 Fiber Cable	A	No	No	Ar (CaAa)	82.00 - 3.00	6	6	0.0000	1.6250		1.04
1 5/8 Fiber Cable	A	No	No	Ar (CaAa)	82.00 - 3.00	2	2	0.0000	1.6250		1.04
1 5/8 Fiber Cable	B	No	No	Ar (CaAa)	82.00 - 3.00	6	6	0.0000	1.6250		1.04

## Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment  °	Placement  ft		C <sub>A</sub> A <sub>A</sub> Front ft <sup>2</sup>	C <sub>A</sub> A <sub>A</sub> Side ft <sup>2</sup>	Weight lb
SitePro1 VFA12-HD Mount	C	From Leg	0.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658.00 804.00 1015.00
APX16DWV-16DWV-S-E-A 20 w/ Mounting Pipe	C	From Leg	3.00 -5.50 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	6.91 7.39 7.86	3.60 4.44 5.15	62.90 112.44 168.54
APXVAARR18_43-U-NA20 Antennas w/ Mounting Pipe	C	From Leg	3.00 -2.50 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	14.67 15.18 15.71	7.70 8.66 9.50	127.90 230.28 341.32
AIR 6449 B41 w/Mounting Pipe	C	From Leg	3.00 5.50 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	6.42 7.00 7.50	3.89 4.62 5.22	124.90 179.59 240.17
4424 B25 RRH	C	From Leg	3.00 -5.50 2.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.86 2.03 2.20	1.32 1.47 1.62	88.00 105.87 126.50
4449 B71+B12 RRH	C	From Leg	3.00 -2.50 2.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.63 1.79 1.95	1.17 1.31 1.45	71.00 87.10 105.82
4415 B25 RRH	C	From Leg	3.00 -2.50 2.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	0.82 0.94 1.07	46.00 60.07 76.66
RRUS-11 RRH	C	From Leg	3.00 -2.50 -1.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	51.00 71.87 95.78
SDX1926Q-43	C	From Leg	3.00 2.50 2.50	0.0000	92.00	No Ice 1/2" Ice 1" Ice	0.24 0.31 0.38	0.10 0.14 0.20	6.00 8.47 12.04
SitePro1 VFA12-HD Mount	A	From Leg	0.00 0.00 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	13.20 19.50 25.80	9.20 14.60 19.50	658.00 804.00 1015.00
APX16DWV-16DWV-S-E-A 20 w/ Mounting Pipe	A	From Leg	3.00 -5.50 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	6.91 7.39 7.86	3.60 4.44 5.15	62.90 112.44 168.54
APXVAARR18_43-U-NA20 Antennas w/ Mounting Pipe	A	From Leg	3.00 -2.50 0.00	0.0000	92.00	No Ice 1/2" Ice 1" Ice	14.67 15.18 15.71	7.70 8.66 9.50	127.90 230.28 341.32
AIR 6449 B41 w/Mounting Pipe	A	From Leg	3.00 5.50	0.0000	92.00	No Ice 1/2" Ice	6.42 7.00	3.89 4.62	124.90 179.59

<b><i>tnxTower</i></b>  <b><i>Hudson Design Group LLC</i></b> 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	<b>Job</b>	<b>Page</b>
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	<b>Project</b>	<b>Date</b>
	100 ft Self Supporting Tower	15:29:39 07/23/21
	<b>Client</b>	<b>Designed by</b>
	VERIZON	RL

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C<sub>AA</sub> Front ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side ft<sup>2</sup></i>	<i>Weight lb</i>
4424 B25 RRH	A	From Leg	0.00 3.00 -5.50 2.00	0.0000	92.00	1" Ice 7.50 No Ice 1.86 1/2" Ice 2.03 1" Ice 2.20	5.22 1.32 1.47 1.62	240.17 88.00 105.87 126.50
4449 B71+B12 RRH	A	From Leg	3.00 -2.50 2.00	0.0000	92.00	No Ice 1.63 1/2" Ice 1.79 1" Ice 1.95	1.17 1.31 1.45	71.00 87.10 105.82
4415 B25 RRH	A	From Leg	3.00 -2.50 2.00	0.0000	92.00	No Ice 1.84 1/2" Ice 2.01 1" Ice 2.19	0.82 0.94 1.07	46.00 60.07 76.66
RRUS-11 RRH	A	From Leg	3.00 -2.50 -1.00	0.0000	92.00	No Ice 2.79 1/2" Ice 3.00 1" Ice 3.21	1.19 1.34 1.50	51.00 71.87 95.78
SDX1926Q-43	A	From Leg	3.00 2.50 2.50	0.0000	92.00	No Ice 0.24 1/2" Ice 0.31 1" Ice 0.38	0.10 0.14 0.20	6.00 8.47 12.04
SitePro1 VFA12-HD Mount	B	From Leg	0.00 0.00 0.00	0.0000	92.00	No Ice 13.20 1/2" Ice 19.50 1" Ice 25.80	9.20 14.60 19.50	658.00 804.00 1015.00
APX16DWV-16DWV-S-E-A 20 w/ Mounting Pipe	B	From Leg	3.00 -5.50 0.00	0.0000	92.00	No Ice 6.91 1/2" Ice 7.39 1" Ice 7.86	3.60 4.44 5.15	62.90 112.44 168.54
APXVAARR18_43-U-NA20 Antennas w/ Mounting Pipe	B	From Leg	3.00 -2.50 0.00	0.0000	92.00	No Ice 14.67 1/2" Ice 15.18 1" Ice 15.71	7.70 8.66 9.50	127.90 230.28 341.32
AIR 6449 B41 w/Mounting Pipe	B	From Leg	3.00 5.50 0.00	0.0000	92.00	No Ice 6.42 1/2" Ice 7.00 1" Ice 7.50	3.89 4.62 5.22	124.90 179.59 240.17
4424 B25 RRH	B	From Leg	3.00 -5.50 2.00	0.0000	92.00	No Ice 1.86 1/2" Ice 2.03 1" Ice 2.20	1.32 1.47 1.62	88.00 105.87 126.50
4449 B71+B12 RRH	B	From Leg	3.00 -2.50 2.00	0.0000	92.00	No Ice 1.63 1/2" Ice 1.79 1" Ice 1.95	1.17 1.31 1.45	71.00 87.10 105.82
4415 B25 RRH	B	From Leg	3.00 -2.50 2.00	0.0000	92.00	No Ice 1.84 1/2" Ice 2.01 1" Ice 2.19	0.82 0.94 1.07	46.00 60.07 76.66
RRUS-11 RRH	B	From Leg	3.00 -2.50 -1.00	0.0000	92.00	No Ice 2.79 1/2" Ice 3.00 1" Ice 3.21	1.19 1.34 1.50	51.00 71.87 95.78
SDX1926Q-43	B	From Leg	3.00 2.50 2.50	0.0000	92.00	No Ice 0.24 1/2" Ice 0.31 1" Ice 0.38	0.10 0.14 0.20	6.00 8.47 12.04
***** 12' T- Arm	C	From Leg	0.00 0.00 0.00	0.0000	82.00	No Ice 4.20 1/2" Ice 5.40 1" Ice 6.60	1.10 2.70 4.30	150.00 225.00 300.00
Sector Stabilizer Kit , SitePro1 P/N SFS-V	C	From Leg	0.00 0.00 3.00	0.0000	82.00	No Ice 2.84 1/2" Ice 3.30 1" Ice 3.84	2.67 3.09 3.58	66.00 84.00 113.00
BXA-80080-4CF-EDIN-X w/Mounting Pipe	C	From Leg	3.00 -4.00 0.00	0.0000	82.00	No Ice 5.27 1/2" Ice 5.76 1" Ice 6.21	4.88 5.68 6.36	36.90 86.92 143.15
(2) NHH-65B-R2B w/Mounting Pipe	C	From Leg	3.00 0.00 0.00	0.0000	82.00	No Ice 14.56 1/2" Ice 15.07 1" Ice 15.60	6.77 7.72 8.55	115.90 212.73 318.10
MT6407-77A Antenna	C	From Leg	3.00	0.0000	82.00	No Ice 5.43	3.27	109.00

<b><i>tnxTower</i></b>  <b><i>Hudson Design Group LLC</i></b> <i>45 Beechwood Drive</i> <i>North Andover, MA 01845</i> <i>Phone: (978) 557-5553</i> <i>FAX: (978) 336-5586</i>	<b>Job</b>	<b>Page</b>
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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C<sub>AA</sub> Front ft<sup>2</sup></i>	<i>C<sub>AA</sub> Side ft<sup>2</sup></i>	<i>Weight lb</i>
w/Mounting Pipe			4.00			1/2" Ice	5.97	3.99	154.17
			0.00			1" Ice	6.46	4.59	204.90
B2/B66A RRH-BR049 RRH	C	From Leg	3.00	0.0000	82.00	No Ice	1.88	1.25	98.00
			0.00			1/2" Ice	2.05	1.39	116.34
			0.00			1" Ice	2.22	1.54	137.47
B5/B13 RRH-BR04C RRH	C	From Leg	3.00	0.0000	82.00	No Ice	1.88	1.01	82.00
			4.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
Junction Box	C	From Leg	1.50	0.0000	82.00	No Ice	3.78	2.51	32.00
			1.00			1/2" Ice	4.03	2.72	63.40
			0.00			1" Ice	4.29	2.94	98.56
Junction Box	C	From Leg	1.50	0.0000	82.00	No Ice	3.78	2.51	32.00
			-1.00			1/2" Ice	4.03	2.72	63.40
			0.00			1" Ice	4.29	2.94	98.56
12' T- Arm	A	From Leg	0.00	0.0000	82.00	No Ice	4.20	1.10	150.00
			0.00			1/2" Ice	5.40	2.70	225.00
			0.00			1" Ice	6.60	4.30	300.00
Sector Stabilizer Kit , SitePro1 P/N SFS-V	A	From Leg	0.00	0.0000	82.00	No Ice	2.84	2.67	66.00
			0.00			1/2" Ice	3.30	3.09	84.00
			3.00			1" Ice	3.84	3.58	113.00
BXA-80063/6 w/Mount Pipe	A	From Leg	3.00	0.0000	82.00	No Ice	7.84	5.42	40.45
			-4.00			1/2" Ice	8.40	6.59	99.60
			0.00			1" Ice	8.92	7.46	166.44
(2) NHH-45B-R2B w/Mounting Pipe	A	From Leg	3.00	0.0000	82.00	No Ice	21.60	6.71	145.90
			0.00			1/2" Ice	22.20	7.66	274.05
			0.00			1" Ice	22.81	8.49	411.52
MT6407-77A Antenna w/Mounting Pipe	A	From Leg	3.00	0.0000	82.00	No Ice	5.43	3.27	109.00
			4.00			1/2" Ice	5.97	3.99	154.17
			0.00			1" Ice	6.46	4.59	204.90
B2/B66A RRH-BR049 RRH	A	From Leg	3.00	0.0000	82.00	No Ice	1.88	1.25	98.00
			0.00			1/2" Ice	2.05	1.39	116.34
			0.00			1" Ice	2.22	1.54	137.47
B5/B13 RRH-BR04C RRH	A	From Leg	3.00	0.0000	82.00	No Ice	1.88	1.01	82.00
			4.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
12' T- Arm	B	From Leg	0.00	0.0000	82.00	No Ice	4.20	1.10	150.00
			0.00			1/2" Ice	5.40	2.70	225.00
			0.00			1" Ice	6.60	4.30	300.00
Sector Stabilizer Kit , SitePro1 P/N SFS-V	B	From Leg	0.00	0.0000	82.00	No Ice	2.84	2.67	66.00
			0.00			1/2" Ice	3.30	3.09	84.00
			3.00			1" Ice	3.84	3.58	113.00
BXA-80063/6 w/Mount Pipe	B	From Leg	3.00	0.0000	82.00	No Ice	7.84	5.42	40.45
			-4.00			1/2" Ice	8.40	6.59	99.60
			0.00			1" Ice	8.92	7.46	166.44
(2) NHH-45B-R2B w/Mounting Pipe	B	From Leg	3.00	0.0000	82.00	No Ice	21.60	6.71	145.90
			0.00			1/2" Ice	22.20	7.66	274.05
			0.00			1" Ice	22.81	8.49	411.52
MT6407-77A Antenna w/Mounting Pipe	B	From Leg	3.00	0.0000	82.00	No Ice	5.43	3.27	109.00
			4.00			1/2" Ice	5.97	3.99	154.17
			0.00			1" Ice	6.46	4.59	204.90
B2/B66A RRH-BR049 RRH	B	From Leg	3.00	0.0000	82.00	No Ice	1.88	1.25	98.00
			0.00			1/2" Ice	2.05	1.39	116.34
			0.00			1" Ice	2.22	1.54	137.47
B5/B13 RRH-BR04C RRH	B	From Leg	3.00	0.0000	82.00	No Ice	1.88	1.01	82.00
			4.00			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53

<b><i>tnxTower</i></b>  <b><i>Hudson Design Group LLC</i></b> <i>45 Beechwood Drive</i> <i>North Andover, MA 01845</i> <i>Phone: (978) 557-5553</i> <i>FAX: (978) 336-5586</i>	<b>Job</b>	REDDING CT	<b>Page</b> 5 of 8
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	<b>Client</b>	VERIZON	<b>Designed by</b> RL

## Load Combinations

<i>Comb. No.</i>	<i>Description</i>
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

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	<b>Client</b>	VERIZON	<b>Designed by</b>	RL

## Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	84530.71	7628.10	-4562.38
	Max. H <sub>x</sub>	18	84530.71	7628.10	-4562.38
	Max. H <sub>z</sub>	7	-73070.87	-6621.64	3974.05
	Min. Vert	7	-73070.87	-6621.64	3974.05
	Min. H <sub>x</sub>	7	-73070.87	-6621.64	3974.05
	Min. H <sub>z</sub>	18	84530.71	7628.10	-4562.38
Leg B	Max. Vert	10	85719.43	-7809.86	-4607.49
	Max. H <sub>x</sub>	23	-74654.87	6810.14	4027.61
	Max. H <sub>z</sub>	23	-74654.87	6810.14	4027.61
	Min. Vert	23	-74654.87	6810.14	4027.61
	Min. H <sub>x</sub>	10	85719.43	-7809.86	-4607.49
	Min. H <sub>z</sub>	10	85719.43	-7809.86	-4607.49
Leg A	Max. Vert	2	82705.22	-51.79	8604.66
	Max. H <sub>x</sub>	21	3941.38	765.67	342.40
	Max. H <sub>z</sub>	2	82705.22	-51.79	8604.66
	Min. Vert	15	-70910.46	47.90	-7429.36
	Min. H <sub>x</sub>	9	3941.47	-769.91	342.48
	Min. H <sub>z</sub>	15	-70910.46	47.90	-7429.36

## Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
Dead Only	12624.32	-0.00	-0.00	-1857.08	1191.36	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	15149.18	-0.00	-12978.56	-852078.19	1438.53	-1086.58
0.9 Dead+1.6 Wind 0 deg - No Ice	11361.78	0.06	-12978.45	-850293.22	1077.05	-1084.54
1.2 Dead+1.6 Wind 30 deg - No Ice	15149.18	6279.97	-10877.23	-721968.73	-414098.78	-709.50
0.9 Dead+1.6 Wind 30 deg - No Ice	11361.89	6279.97	-10877.23	-720367.29	-413859.24	-706.32
1.2 Dead+1.6 Wind 60 deg - No Ice	15149.18	11116.68	-6418.22	-424566.04	-730037.16	-2928.73
0.9 Dead+1.6 Wind 60 deg - No Ice	11361.89	11116.68	-6418.22	-423395.88	-729345.28	-2925.68
1.2 Dead+1.6 Wind 90 deg - No Ice	15149.18	13780.18	-0.00	-2254.49	-886846.46	-4295.66
0.9 Dead+1.6 Wind 90 deg - No Ice	11361.89	13780.18	-0.00	-1691.67	-885943.22	-4293.55
1.2 Dead+1.6 Wind 120 deg - No Ice	15149.32	11936.55	6891.51	441511.84	-767177.59	-1841.00
0.9 Dead+1.6 Wind 120 deg - No Ice	11361.89	11936.42	6891.50	441441.76	-766441.88	-1838.70
1.2 Dead+1.6 Wind 150 deg - No Ice	15149.18	6528.08	11306.97	738835.50	-426418.68	1107.29
0.9 Dead+1.6 Wind 150 deg - No Ice	11361.89	6528.08	11306.97	738332.71	-426165.53	1107.45
1.2 Dead+1.6 Wind 180 deg - No Ice	15149.18	0.00	12344.10	820254.23	1439.26	1088.07
0.9 Dead+1.6 Wind 180 deg - No Ice	11361.89	0.00	12344.10	819624.26	1078.14	1086.30
1.2 Dead+1.6 Wind 210 deg -	15149.18	-6279.97	10877.23	717489.96	416972.84	709.51

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	VERIZON	RL

Load Combination	Vertical lb	Shear <sub>x</sub> lb	Shear <sub>z</sub> lb	Overturning Moment, M <sub>x</sub> lb-ft	Overturning Moment, M <sub>z</sub> lb-ft	Torque lb-ft
No Ice						
0.9 Dead+1.6 Wind 210 deg - No Ice	11361.89	-6279.97	10877.23	717012.30	416012.07	706.33
1.2 Dead+1.6 Wind 240 deg - No Ice	15149.18	-11666.13	6735.45	433745.70	756600.88	2927.09
0.9 Dead+1.6 Wind 240 deg - No Ice	11361.89	-11666.13	6735.45	433683.61	755159.11	2924.00
1.2 Dead+1.6 Wind 270 deg - No Ice	15149.18	-13780.18	-0.00	-2253.24	889722.00	4295.67
0.9 Dead+1.6 Wind 270 deg - No Ice	11361.89	-13780.18	-0.00	-1690.73	888096.77	4293.55
1.2 Dead+1.6 Wind 300 deg - No Ice	15149.18	-11386.97	-6574.27	-432331.41	746366.10	1841.18
0.9 Dead+1.6 Wind 300 deg - No Ice	11361.89	-11386.97	-6574.27	-431152.32	744936.38	1839.89
1.2 Dead+1.6 Wind 330 deg - No Ice	15149.18	-6528.08	-11306.97	-743312.37	429298.99	-1107.32
0.9 Dead+1.6 Wind 330 deg - No Ice	11361.89	-6528.08	-11306.97	-741685.86	428322.99	-1107.46
1.2 Dead+1.0 Ice+1.0 Temp	40713.01	0.00	0.00	-8205.66	6344.30	0.18
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	40713.01	0.00	-3668.49	-247814.61	6377.37	-602.72
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	40713.01	1804.57	-3125.61	-213477.00	-112116.04	-671.37
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	40713.01	3207.68	-1851.95	-128954.35	-202701.86	-1057.54
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	40713.01	3834.68	-0.00	-8241.46	-241090.23	-1160.27
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	40713.01	3372.33	1947.02	116787.15	-210176.55	-454.88
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	40713.01	1852.95	3209.41	201082.36	-114473.52	372.57
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	40713.01	0.00	3575.13	227420.72	6379.13	602.86
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	40713.01	-1804.57	3125.61	196997.58	124871.66	671.40
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	40713.01	-3288.53	1898.63	114429.72	218847.43	1057.52
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	40713.01	-3834.68	-0.00	-8239.96	253845.36	1160.30
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	40713.01	-3291.48	-1900.34	-131311.80	219542.99	455.26
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	40713.01	-1852.95	-3209.41	-217561.11	127229.32	-372.63
Dead+Wind 0 deg - Service	12624.32	0.00	-3376.32	-222742.19	1197.88	-282.70
Dead+Wind 30 deg - Service	12624.32	1633.71	-2829.66	-188920.33	-106798.89	-184.47
Dead+Wind 60 deg - Service	12624.32	2891.96	-1669.67	-111626.21	-188913.66	-761.52
Dead+Wind 90 deg - Service	12624.32	3584.86	-0.00	-1866.14	-229670.86	-1116.91
Dead+Wind 120 deg - Service	12624.32	3105.21	1792.79	113468.80	-198567.85	-478.52
Dead+Wind 150 deg - Service	12624.32	1698.25	2941.46	190738.23	-110002.76	287.58
Dead+Wind 180 deg - Service	12624.32	-0.00	3211.27	211899.38	1197.22	282.62
Dead+Wind 210 deg - Service	12624.32	-1633.71	2829.66	185189.92	109193.71	184.47
Dead+Wind 240 deg - Service	12624.32	-3034.89	1752.20	111451.00	197468.81	761.24
Dead+Wind 270 deg - Service	12624.32	-3584.86	-0.00	-1865.86	232064.97	1116.91
Dead+Wind 300 deg - Service	12624.32	-2962.27	-1710.27	-113645.00	194804.90	478.89
Dead+Wind 330 deg - Service	12624.32	-1698.25	-2941.46	-194468.56	112396.31	-287.59

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	VERIZON	RL

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	1.995	48	0.1546	0.0117
T2	80 - 60	1.338	48	0.1489	0.0105
T3	60 - 40	0.768	48	0.1148	0.0084
T4	40 - 20	0.344	48	0.0767	0.0051
T5	20 - 0	0.087	48	0.0355	0.0017

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

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
92.00	SitePro1 VFA12-HD Mount	48	1.727	0.1548	0.0112	131339
82.00	12' T- Arm	48	1.401	0.1507	0.0106	58531

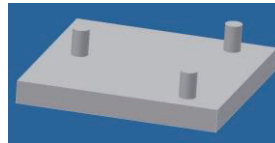
### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$\phi P_{allow}$ lb	% Capacity	Pass Fail
T1	100 - 80	Leg	P3x.216	2	-12952.70	88513.00	14.6	Pass
T2	80 - 60	Leg	P3x.216	38	-37204.80	88510.40	42.0	Pass
T3	60 - 40	Leg	P3.5x.226	74	-55481.50	104017.00	53.3	Pass
T4	40 - 20	Leg	P3.5x.226	104	-69549.60	92712.30	75.0	Pass
T5	20 - 0	Leg	P4x.237	128	-83137.30	116238.00	71.5	Pass
T1	100 - 80	Diagonal	L1 1/4x1 1/4x1/8	9	-2072.00	3217.64	64.4	Pass
T2	80 - 60	Diagonal	L2x2x1/4	69	-2834.00	17552.00	16.1	Pass
T3	60 - 40	Diagonal	L1 1/2x1 1/2x3/16	81	-2302.98	3042.09	75.7	Pass
T4	40 - 20	Diagonal	L2x2x1/8	111	-2498.92	3164.51	79.0	Pass
T5	20 - 0	Diagonal	L2 1/2x2 1/2x3/16	135	-2911.62	7100.61	41.0	Pass
T1	100 - 80	Top Girt	L1 1/4x1 1/4x1/8	6	-61.41	4505.23	1.4	Pass
T2	80 - 60	Top Girt	L1 1/4x1 1/4x1/8	42	178.60	9618.75	1.9	Pass
T3	60 - 40	Top Girt	L1 1/2x1 1/2x3/16	78	-515.66	2756.83	18.7	Pass
T4	40 - 20	Top Girt	L2x2x3/16	108	-601.59	3959.43	15.2	Pass
T5	20 - 0	Top Girt	L2 1/2x2 1/2x3/8	132	-1082.88	9529.67	11.4	Pass
Summary								
Leg (T4)							75.0	Pass
Diagonal (T4)							79.0	Pass
Top Girt (T3)							18.7	Pass
<b>RATING =</b>							<b>79.0</b>	<b>Pass</b>



# Unit Base Foundation

Checks capacity of square mat foundation with raised piers for a self-supporting tower



BU#: REDDING CT

Site Name:

App Number:

TIA-222 Revision:

Design Reactions		
Shear, <b>S</b> :	13.8	kips
Moment, <b>M</b> :	889.7	ft-kips
Compression/leg, <b>Ca</b> :	85.7	kips
Uplift/leg, <b>Ua</b> :	74.7	kips
Tower Weight, <b>Wt</b> :	15.1	kips
Tower Height, <b>H</b> :	100	ft
Base Face Width, <b>w'</b> :	12.7	ft

Pad Properties		
Depth, <b>D</b> :	4.0	ft
Pad Width, <b>W</b> :	15.5	ft
Pad Thickness, <b>T</b> :	4.5	ft
Ext. Above Grade, <b>E</b> :	0.5	ft
Neglected Depth, <b>N</b> :	0.0	ft
Pad Rebar Size, <b>Sp</b> :		
Pad Rebar Quantity, <b>mp</b> :		#N/A

Pier Properties		
Pier Shape:	Square	
Pier Width, <b>di</b> :	2.0	ft
Pier Rebar Size, <b>Sc</b> :		
Pier Rebar Quantity, <b>mc</b> :		#N/A
Pier Tie Size, <b>St</b> :		
Tie Quantity, <b>mt</b> :		#N/A

Material Properties		
Rebar Tensile, <b>Fy</b> :	60000	psi
Concrete Strength, <b>F'c</b> :	3500	psi
Concrete Density, $\delta c$ :	150	pcf
Clear Cover, <b>cc</b> :	3	in

Soil Properties		
Soil Unit Weight, $\gamma$ :	120	pcf
Ultimate Bearing, <b>Bc</b> :	6.000	ksf
Cohesion, <b>Co</b> :	0.000	ksf
Friction Angle, $\phi$ :	30	degrees
Base Sliding, $\mu$ :	0.35	

Design Checks			
	Capacity/ Availability	Demand/ Limits	Check
Base Sliding (kips):	42.95	13.78	32.1%
Overturning (k-ft):	1000.43	889.73	88.9%
Bearing (ksf):	4.50	2.47	54.8%

☐ Tower centroid is offset from foundation centroid



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greg.dulnik@colliersengineering.com

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## Post-Mod Antenna Mount Analysis Report and PMI Requirements

Mount Fix

SMART Tool Project #: 10026445  
Maser Consulting Connecticut Project #: 20777382A

April 28, 2021

### Site Information

Site ID: 468848-VZW / Redding CT  
Site Name: Redding CT  
Carrier Name: Verizon Wireless  
Address: 80 Lonetown Rd  
Redding, Connecticut 06896  
Fairfield County  
Latitude: 41.327833°  
Longitude: -73.383306°

### Structure Information

Tower Type: 100-Ft Self Support  
Mount Type: 12.33-Ft T-Frame

FUZE ID # 16244644

### Analysis Results

T-Frame: 77.3% Pass

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

***Included at the end of this MA report***

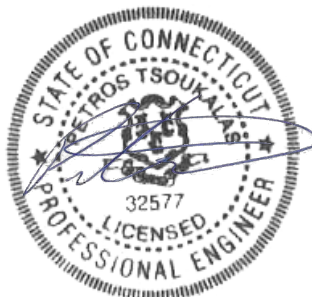
***Available & Submitted via portal at <https://pmi.vzwsmart.com>***

***Contractor - Please Review Specific Site PMI Requirements Upon Award***

***Requirements also Noted on Mount Modification Drawings***

***Requirements may also be Noted on A & E drawings***

Report Prepared By: Nathan LaPorte



## **Executive Summary:**

The objective of this report is to summarize the analysis results of the antenna support mount including the proposed modifications at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

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
<i>Radio Frequency Data Sheet (RFDS)</i>	<i>Verizon RFDS Site ID: 324760, dated November 19, 2020</i>
<i>Mount Mapping Report</i>	<i>Tower Engineering Professionals Project #: 468848, dated November 17, 2020</i>
<i>Previous Mount Analysis Report</i>	<i>Maser Consulting Connecticut, Project #: 20777382A, dated December 30, 2020</i>
<i>Mount Modification</i>	<i>Maser Consulting Connecticut, Project #: 20777382A, dated December 30,</i>

## **Analysis Criteria:**

Codes and Standards:	ANSI/TIA-222-H
Wind Parameters:	Basic Wind Speed (Ultimate 3-sec. Gust), $V_{ULT}$ : 116 mph
	Ice Wind Speed (3-sec. Gust): 50 mph
	Design Ice Thickness: 1.00 in
	Risk Category: II
	Exposure Category: B
	Topographic Category: 1
	Topographic Feature Considered: N/A
	Topographic Method: N/A
	Ground Elevation Factor, $K_e$ : 0.976
Seismic Parameters:	$S_s$ : 0.224
	$S_1$ : 0.056
Maintenance Parameters:	Wind Speed (3-sec. Gust): 30 mph
	Maintenance Live Load, $L_v$ : 250 lbs.
	Maintenance Live Load, $L_m$ : 500 lbs.
Analysis Software:	RISA-3D (V17)

### **Final Loading Configuration:**

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

Mount Elevation (ft)	Equipment Elevation (ft)	Quantity	Manufacturer	Model	Status
81.00	82.00	3	Samsung	MT6407-77A	Added
		3	Samsung	B2/B66A RRH-BR049	
		3	Samsung	B5/B13 RRH-BR04C	
		1	Amphenol Antel	BXA-80080-4CF-EDIN-X	Retained
		4	Commscope	NHH-45B-R2B	
		2	Antel	BXA-80063/6CF	
		2	Commscope	NHH-65B-R2B	
		2	Raycap	RHSDC-3315-PF-48	

### **Standard Conditions:**

1. All engineering services are performed on the basis that the information provided to Maser Consulting Connecticut 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 Maser Consulting Connecticut 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 by Maser Consulting Connecticut, 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. Maser Consulting Connecticut 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:
- Channel, Solid Round, Angle, Plate      ASTM A36 (Gr. 36)
  - HSS (Rectangular)      ASTM 500 (Gr. B-46)
  - Pipe      ASTM A53 (Gr. B-35)
  - Threaded Rod      F1554 (Gr. 36)
  - Bolts      ASTM A325
8. Any mount modifications listed under Sources of Information are assumed to have been installed per the design specifications.

**Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Maser Consulting Connecticut.**

### **Analysis Results:**

Component	Utilization %	Pass/Fail
<i>Face Horizontal</i>	<i>77.3%</i>	<i>Pass</i>
<i>Mast Pipe</i>	<i>26.6%</i>	<i>Pass</i>
<i>Standoff Horizontal</i>	<i>34.2%</i>	<i>Pass</i>
<i>Standoff Vertical</i>	<i>46.3%</i>	<i>Pass</i>
<i>Face Vertical</i>	<i>45.2%</i>	<i>Pass</i>
<i>Antenna Pipe</i>	<i>34.5%</i>	<i>Pass</i>
<i>Tie Back</i>	<i>22.5%</i>	<i>Pass</i>
<i>MOD Horizontal</i>	<i>48.4%</i>	<i>Pass</i>
<i>MOD V-Brace</i>	<i>10.6%</i>	<i>Pass</i>
<i>Mount Connection</i>	<i>62.7%</i>	<i>Pass</i>

<b>Structure Rating – (Controlling Utilization of all Components)</b>	<b>77.3%</b>
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### **Recommendation:**

The existing mounts will be **SUFFICIENT** for the final loading after the proposed modifications are successfully completed.

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

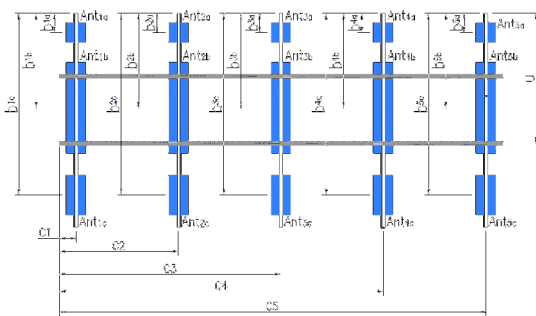
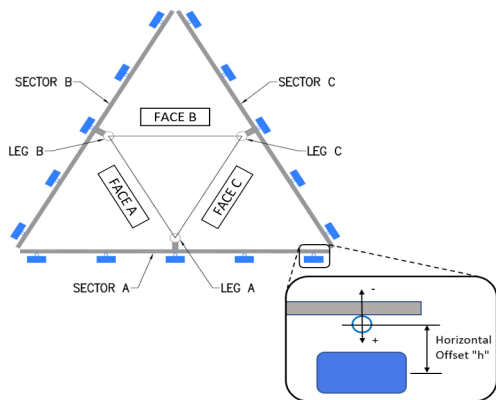
### **Attachments:**

1. Mount Photos
2. Mount Mapping Report (for reference only)
3. Analysis Calculations
- 4. Contractor Required PMI Report Deliverables**
5. Antenna Placement Diagrams
6. TIA Adoption and Wind Speed Usage Letter



## FCC #

<b>Tower Owner:</b>	Unknown	<b>Mapping Date:</b>	11/17/2020
<b>Site Name:</b>	Redding CT	<b>Tower Type:</b>	Self Support
<b>Site Number or ID:</b>	468848	<b>Tower Height (Ft.):</b>	100
<b>Mapping Contractor:</b>	TEP	<b>Mount Elevation (Ft.):</b>	80



Mount Pipe Configuration and Geometries [Unit = Inches]							
Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."	Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."
A1	2.4"x6'-0"	56.00	3.00	C1	2.4"x6'-0"	56.00	3.00
A2	2.4"x6'-0"	56.00	51.00	C2	2.9"x7'-0"	61.50	75.00
A3	2.4"x7'-0"	61.50	75.00	C3	2.4"x6'-0"	56.00	126.00
A4	2.4"x6'-0"	56.00	126.00	C4			
A5				C5			
A6				C6			
B1	2.4"x6'-0"	56.00	3.00	D1			
B2	2.9"x7'-0"	61.50	75.00	D2			
B3	2.4"x6'-0"	56.00	126.00	D3			
B4				D4			
B5				D5			
B6				D6			
Distance between bottom rail and mount CL elevation (dim d). Unit is inches. See 'Mount Elev Ref' tab for details. :							18.25
Distance from top of bottom support rail to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.) :							9.5
Distance from top of bottom support rail to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.) :							
Please enter additional information or comments below.							
Tower Face Width at Mount Elev. (ft.):		4.5	Tower Leg Size or Pole Shaft Diameter at Mount Elev. (in.):				2.9

[illegible]



Mount Azimuth (Degree) for Each Sector				Tower Leg Azimuth (Degree) for Each Sector				Sector B															
Sector A:	305.00	Deg	Leg A:	320.00	Deg	Ant <sub>1a</sub>																	
Sector B:	60.00	Deg	Leg B:	80.00	Deg	Ant <sub>1b</sub>	BXA-80063-6CF	11.20	4.50	71.10	) 1 5/8" F	80.0625	37.00	8.50	60.00	133-134							
Sector C:	142.00	Deg	Leg C:	200.00	Deg	Ant <sub>1c</sub>																	
Sector D:		Deg	Leg D:		Deg	Ant <sub>2a</sub>																	
Climbing Facility Information							Ant <sub>2b</sub>	(2) NHH-65B-R2B	11.85	7.09	71.97	) 1 5/8" F	80.9375	32.00	9.00	60.00	140-142						
							Ant <sub>2c</sub>																
Location:	320.00	Deg	On Leg A				Ant <sub>3a</sub>																
Climbing Facility	Corrosion Type:		Good condition.				Ant <sub>3b</sub>	BXA-171063-12BF	6.10	4.10	72.50	) 1 5/8" F	80.2292	35.00	8.50	60.00	146						
	Access:		Climbing path was unobstructed.				Ant <sub>3c</sub>	B66a RRH 4x45	11.80	7.20	25.80	er from R	80.1458	36.00	-7.00		147-148						
	Condition:		Good condition.				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	FD9R6004	6.50	1.50	5.80	er from Raycap					149-151						
							Ant on Standoff	B13 RRH 4x30	11.80	7.50	20.90	er from Raycap					143-144						
							Ant on Tower	(2) RHSDC-3315-PF-4	15.73	10.30	28.93	) 1 1/4" SM					135-138						
							Ant on Tower																
							Sector C																
							Ant <sub>1a</sub>						Ant <sub>1b</sub>	BXA-80063-6CF	11.20	4.50	71.10	1 5/8" FH	80.0625	37.00	8.50	145.00	87-89
							Ant <sub>1c</sub>						Ant <sub>1e</sub>										
Ant <sub>2a</sub>						Ant <sub>2b</sub>	(2) NHH-45B-R2B	11.85	7.09	71.97	1 5/8" FH	80.7292	34.50	13.00	145.00	94-96							
Ant <sub>2c</sub>						Ant <sub>2e</sub>																	
Ant <sub>3a</sub>						Ant <sub>3b</sub>	BXA-171063-12BF	6.10	4.10	72.50	1 5/8" FH	80.2292	35.00	8.50	145.00	106							
Ant <sub>3c</sub>						Ant <sub>3e</sub>	B66a RRH 4x45	11.80	7.20	25.80	er from R	80.1458	36.00	-7.00		107-108							
Ant <sub>4a</sub>						Ant <sub>4b</sub>																	
Ant <sub>4c</sub>						Ant <sub>4e</sub>																	
Ant <sub>5a</sub>						Ant <sub>5b</sub>																	
Ant <sub>5c</sub>						Ant on Standoff	FD9R6004	6.50	1.50	5.80	er from Raycap					101-104							
Ant on Standoff						Ant on Standoff	B13 RRH 4x30	11.80	7.50	20.90	er from Raycap					099-100							
Ant on Tower						Ant on Tower																	
Ant on Tower						Ant on Tower																	
Sector D																							
Ant <sub>1a</sub>						Ant <sub>1b</sub>																	
Ant <sub>1c</sub>						Ant <sub>1e</sub>																	
Ant <sub>2a</sub>						Ant <sub>2b</sub>																	
Ant <sub>2c</sub>						Ant <sub>2e</sub>																	
Ant <sub>3a</sub>						Ant <sub>3b</sub>																	
Ant <sub>3c</sub>						Ant <sub>3e</sub>																	
Ant <sub>4a</sub>						Ant <sub>4b</sub>																	
Ant <sub>4c</sub>						Ant <sub>4e</sub>																	
Ant <sub>5a</sub>						Ant <sub>5b</sub>																	
Ant <sub>5c</sub>						Ant on Standoff																	
Ant on Standoff						Ant on Standoff																	
Ant on Tower						Ant on Tower																	
Ant on Tower						Ant on Tower																	

Observed Safety and Structural Issues During the Mount Mapping		
Issue #	Description of Issue	Photo #

1		
2		
3		
4		
5		
6		
7		
8		

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:	Unknown	Mapping Date:	11/17/2020
Site Name:	Redding CT	Tower Type:	Self Support
Site Number or ID:	468848	Tower Height (Ft.):	100
Mapping Contractor:	TEP	Mount Elevation (Ft.):	80

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.

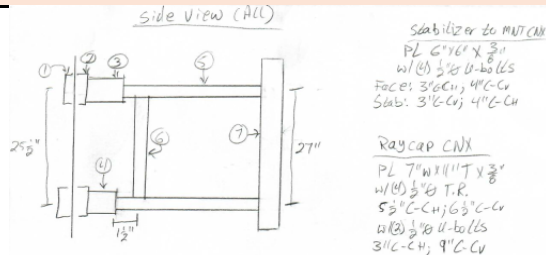
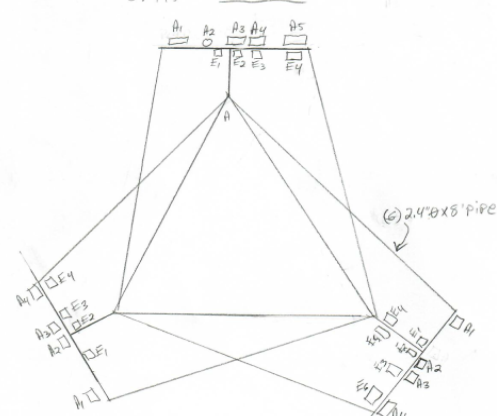
## Please Insert Sketches of the Antenna Mount

Redding CT  
468848-V2W  
11/17/2020  
MNT 9'-6"  
above V2W

A-les @ 320°  
ELE  
MNT: 50'  
ANT: 81'-6"

FW: 4'-6"  
COB: 2.9"Ø  
Coax  
(D) 1 1/8"Ø SM  
(D) 1 1/8" FH

A2  
A: 305°  
B: 60°  
G: 145°

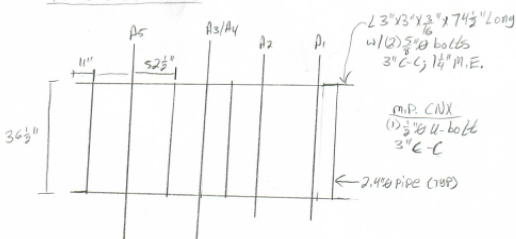


- 1: BPL 1 1/2" W X 2 1/4" D X 3 3/4" X 1 1/4"
- 2: BPL 1 1/2" W X 3 3/4" D X 4 3/4" X 1 1/4"  
w/ (4) 3/8" T.R. 1 1/2" C-C; 3/8" C-C
- 3: PL 7 1/2" W X 4" T X 3/8"  
w/ (1) 3/8" bolt 2 1/2" M.E.; 3/8" gage
- 4: PL 5" W X 4" T X 3/8"  
w/ (1) 3/8" bolt centered
- 5: HSS 3" X 3" X 1/4" X 31" Long
- 6: 1.9"Ø Pipe
- 7: 3.5"Ø X 36" Pipe  
(welded)

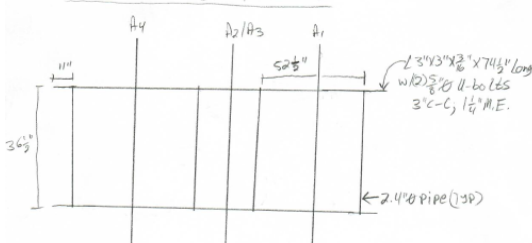
Side to face CNX  
PL 5" D X 10 1/2" W X 1 1/4"  
w/ (1) 3/8" bolt  
1" M.E.

- Stabilizer to MNT CNX  
PL 6" W X 1 1/4" T X 3/8"  
w/ (4) 3/8" U-bolts  
Face: 3" C-C; 4" C-C  
Sub: 3" C-C; 4" C-C
- RAYCAP CNX  
PL 7" W X 1 1/4" T X 3/8"  
w/ (4) 3/8" T.R.  
5 1/2" C-C; 6 3/4" C-C  
w/ (2) 3/8" U-bolts  
3" C-C; 9" C-C
- Stabilizer to COB CNX
- 1: BPL 8 3/4" W X 1 1/4" T X 1 1/4" D X 3/8"  
w/ (4) 3/8" T.R. 6 3/4" C-C
  - 2: L 3" X 3" X 1/4" X 2 1/2" W  
w/ (1) 3/8" bolt
  - 3: BPL 1 1/2" W X 1 1/4" T X 1 1/4"  
w/ (1) 3/8" bolt
  - 4: BPL 6" W X 1 1/4" T X 1/4"  
w/ (2) 3/8" T.R. 4 1/2" C-C

Front View - Alpha



Front View - Beta / Gamma



M.P. CNX  
(1) 3/8" U-bolt  
3" C-C

Alpha

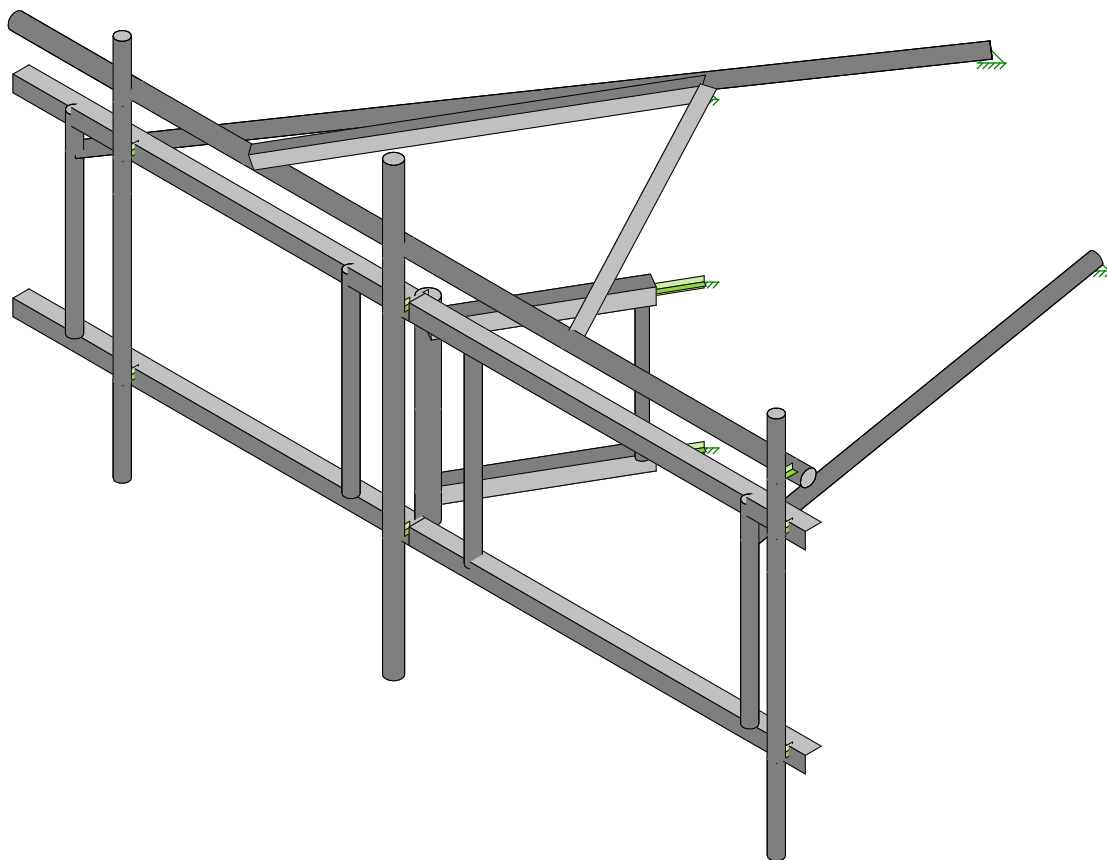
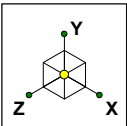
	M.P./Location	U	b	H	C	Model #
A1	2.4"Ø X 6'-0"	56"	32"	9"	3"	BXA-80080-4CF
A2	2.4"Ø X 6'-0"	56"	-	-	51"	GPS
A3	2.9"Ø X 7'-0"	61.5"	34.5"	13"	75"	NHH-45B-R2B
A4	2.9"Ø X 7'-0"	61.5"	34.5"	13"	75"	NHH-45B-P2B
A5	2.4"Ø X 6'-0"	56"	35"	8 1/2"	126"	BXA-171085-8BF
E1	MNT	-	-	-	-	FD9R6004
E2	MNT	-	-	-	-	FD9R6004
E3	MNT	-	-	-	-	B13 RRH 4Y30
E4	behind A5	-	36"	7"	-	B66a RRH 4Y45

Beta

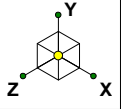
	M.P./Location	U	b	H	C	Model #
A1	2.4"Ø X 6'-0"	56"	37"	8 1/2"	3"	BXA-80063-6CF
A2/A3	2.9"Ø X 7'-0"	61.5"	32"	9"	75"	NHH-65B-R2B
A4	2.4"Ø X 6'-0"	56"	35"	8 1/2"	126"	BXA-171063-12BF
E1/E2	MNT	-	-	-	-	FD9R6004
E3	MNT	-	-	-	-	B13 RRH 4Y30
E4/E5	2.4"Ø X 6'	-	-	-	-	RHSDC-3315-PF 48 - on MNT S.O.
E6	behind A4	-	36"	7"	-	B66a RRH 4Y45

Gamma

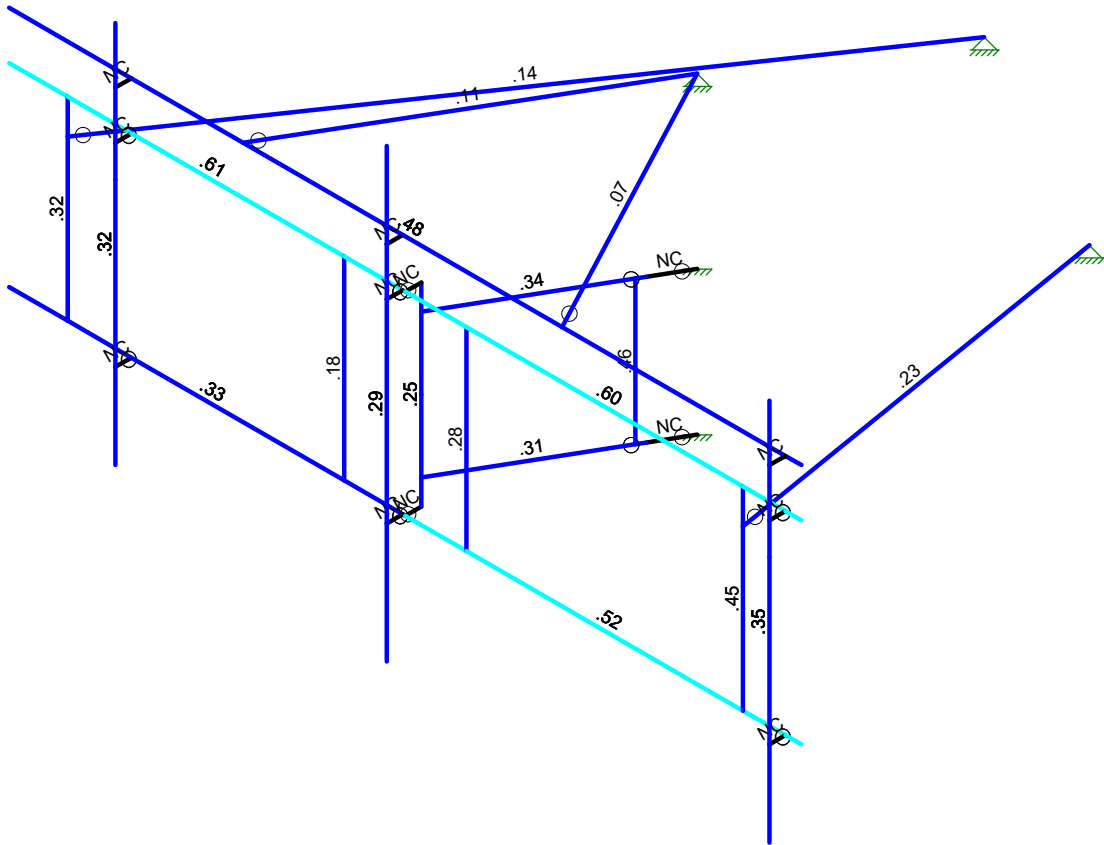
	M.P./Location	U	b	H	C	Model #
A1	2.4"Ø X 6'-0"	56"	37"	8 1/2"	3"	BXA-80063-6CF
A2/A3	2.9"Ø X 7'-0"	61.5"	34.5"	13"	75"	NHH-45B-R2B
A4	2.4"Ø X 6'-0"	56"	35"	8 1/2"	126"	BXA-171063-12BF
E1/E2	MNT	-	-	-	-	FD9R6004
E3	MNT	-	-	-	-	B13 RRH 4Y30
E4	behind A4	-	36"	7"	-	B66a RRH 4Y45



Maser Consulting	Antenna Mount Analysis	SK - 1
		Dec 31, 2020 at 11:38 AM
Project # 20777382A		Mod - Loaded - 468848-VZW_MT_...

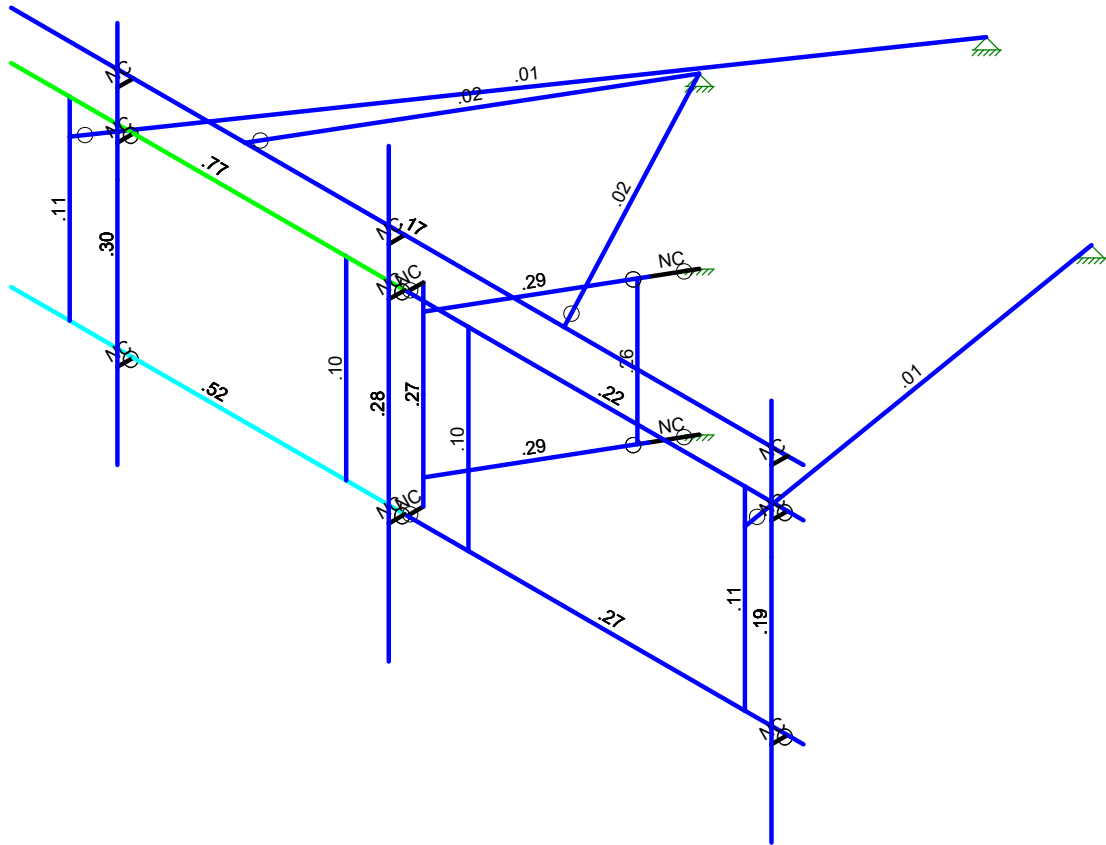
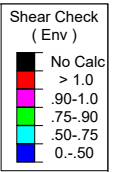
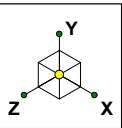


Code Check ( Env )	
No Calc	> 1.0
> 1.0	.90-1.0
.90-1.0	.75-.90
.75-.90	.50-.75
.50-.75	0-.50



Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

Maser Consulting	Antenna Mount Analysis	SK - 2
		Dec 31, 2020 at 11:39 AM
Project # 20777382A		Mod - Loaded - 468848-VZW_MT_...



Member Shear Checks Displayed (Enveloped)  
Envelope Only Solution

Maser Consulting	Antenna Mount Analysis	SK - 3
		Dec 31, 2020 at 11:39 AM
Project # 20777382A		Mod - Loaded - 468848-VZW_MT_...

Ü Q Œ Ĥ Ö Á ^ \ • ā } Ā ī ē ē Å W Z H A I A [ á Ä Š æ ^ å Ä Â ï ì ï ï Ë X Y ´ T V ´ Š U V ´ Ó Ú P Ñ Å



	ÓsŌŌ•&āā	Ôæ•[i°	ÝŌŌæā	ŸŌŌæā	ZŌŌæā	Ŕāc	Úāc	Öā dā•ā	œ^æŤ^ ā^D	ÛŌŌæ^æ
Í G	Üd° &c!^AŸ [ ÅŤHæ	p[]^						l €		
Í H	Üd° &c!^AŸ [ ÅŤŌ^D	p[]^						l €		
Í I	Üd° &c!^AŸ [ ÅŤHŌ	p[]^						l €		
Í Í	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í Î	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í Î	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í Î	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í J	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í €	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í F	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í G	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í H	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í I	Üd° &c!^AŸ [ ÅŤŌŌ	p[]^						l €		
Í Í	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í Î	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í Î	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í Î	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í J	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í €	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í F	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í G	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í H	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í I	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í Í	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Í Î	Üd° &c!^AŸ { ÅŤŌŌ	p[]^						l €		
Î Î	ŠŸ F	p[]^					F			
Î Î	ŠŸ G	p[]^					F			
Î J	ŠcF	p[]^					F			
Î €	ŠcG	p[]^					F			

[illegible]

[illegible][illegible]

Ššæ^|                      ÝŹcá                      ŸŽcá                      ZŽcá                      V^{ } | ŽCá                      Ö^ca&@{| { Äã] Æ

F	OSUPOE	FEUFI	FEUFIH	GEIGH	€	
G	PG	EE	FEUFIH	GEIGH	€	
H	PH	IFFI	FEUFIH	GEIGH	€	
I	PI	FEUFI	GEIHH	GEIGH	€	
Í	PÍ	EE	GEIHH	GEIGH	€	
Î	PÎ	IFFI	GEIHH	GEIGH	€	
İ	Pİ	EE	FEUFIH	GEIGH	€	
Ì	PÌ	EE	GEIHH	GEIGH	€	
J	PJ	FEHHHH	FEUFIH	GEIGH	€	
F€	PFE	FEHHHH	GEIHH	GEIGH	€	
FF	PFF	EEIHHH	FEUFIH	GEIGH	€	
FG	PFG	EEIHHH	GEIHH	GEIGH	€	
FH	PFH	I	FEUFIH	GEIGH	€	
FI	PFI	I	GEIHH	GEIGH	€	

Ššæ^|                  ÝǺcá                  ŸǺcá                  ZǺcá                  V{ |Ǻcá                  Ö^ca&@{| { Äã Æ Ë

[illegible]

	Sə̀ə\	Ùə̀ə^	V\^	Ö·a\ /äc	Tə̀\ə̀ə	Ö·a\ /ä	Öä Gə	Q·ä\ä	Q·ä\ä	R·ä\ä
F	œ ç\} æUä^	ÚŮÖ' GĚ	Ô\ {}	Uä^	œ HÖ:EO V\}ä	FĚG	Ě Ĝ	Ě Ĝ	FĚĜ	
G	Öä QÜä^	ÚŮÖ' HĚ	Ô\ {}	Uä^	œ HÖ:EO V\}ä	GĚĬ	GĚ Ĭ	GĚ Ĭ	Ĭ Ě J	
H	œä^ Ä\ ä\} œ	ŠYHYH	Ö'æ	Uä^* /ÄG *^	œ Ĭ:ĬĬ V\}ä	FĚJ	Ĭ Ĭ	Ĭ Ĭ	ĚFĬ	
I	œä^ Ä\ ä\} ä	ÚŮÖ' GĚ	Ô\ {}	Uä^	œ HÖ:EO V\}ä	FĚG	Ě Ĝ	Ě Ĝ	FĚĜ	
Í	Úœ ä\ ~Ä\ ä\} œ	PÜÜHYHÍ	Ö'æ	Ü~ æ^V^ à^	œ eö:äĬ V\}ä	GĚ Ĭ	HĚG	HĚG	Ĭ ĚĬ	
Î	Úœ ä\ ~Ä\ ä\} ä	ÚŮÖ' FĚ	Ô\ {}	Uä^	œ HÖ:EO V\}ä	Ě Ĭ J	ĚJH	ĚJH	Ě Ĭ Î	
Ĭ	T ə QÜä^	ÚŮÖ' HĚ	Ô\ {}	Uä^	œ HÖ:EO V\}ä	GĚĬ	GĚ Ĭ	GĚ Ĭ	Ĭ Ě J	
İ	Vä Äöä	ÚŮÖ' GĚ	Ö'æ	Uä^	œ HÖ:EO V\}ä	FĚG	Ě Ĝ	Ě Ĝ	FĚĜ	
J	œ ç\} æUä^ ÄG	ÚŮÖ' GĚ	Ö'æ	Uä^	œ HÖ:EO V\}ä	FĚ F	FĚ Ĭ	FĚ Ĭ	GĚ J	
FE	Ü\  \ ·ä /œä^ Ä\ ä\} œ	ÚŮÖ' GĚ	Ö'æ	Uä^	œ HÖ:EO V\}ä	FĚ F	FĚ Ĭ	FĚ Ĭ	GĚ J	
FF	Ü\  \ ·ä /Öä^ ää *	ŠGĚ cGĚ cĬ	Ö'æ	Uä^	œ Ĭ:ĬĬ V\}ä	FĚJ	Ě JG	Ě JG	ĚG Ĭ	

[illegible]

	Šəʌ	Ōŕ āc	Rŕ āc	Sŕ āc	Ūŕ āc Q^* D	Ū^&ā  BŪŕ ā^	V ^	Ō^* ā  Šāc	Tāc āiā	Ō^* ā  Ū ^ ſ^
F	TF	ŀI	ŀI		J€	Ōā&^Ŕ  ā  } œ	Ō^æ	Ūā^*^Ŕœ^*^	œH Ō^H	V^} œœ
G	TG	ŀI	ŀI		J€	Ōā&^Ŕ  ā  } œ	Ō^æ	Ūā^*^Ŕœ^*^	œH Ō^H	V^} œœ
H	TH	ŀH	ŌSŪPœ		J€	Ōā&^Ŕ  ā  } œ	Ō^æ	Ūā^*^Ŕœ^*^	œH Ō^H	V^} œœ
I	TI	ŌSŪPœ	ŀG		J€	Ōā&^Ŕ  ā  } œ	Ō^æ	Ūā^*^Ŕœ^*^	œH Ō^H	V^} œœ
Í	TÍ	ŀœ	ŀI			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ
Ī	TĪ	ŀFJ	ŌSŪPœ			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ
İ	Tİ	ŀFJ	ŀœ			T æ ŌŪā^	Ō ^ { }	Ūā^	œH Ō^: ŒŌ	V^} œœ
Ĭ	TĬ	ŀG	ŀGG			Ūœā  ~Ŕ  ā  } œ	Ō^æ	Ū^*^ŔV^ ā^	œH œ Ō^: ŒŒ	V^} œœ
J	TJ	ŀĜ	ŀGH			Ūœā  ~Ŕ  ā  } œ	Ō^æ	Ū^*^ŔV^ ā^	œH œ Ō^: ŒŒ	V^} œœ
F€	TF€	ŀĜ	ŀĜ			Ūœā  ~Ŕ ^} œœ	Ō ^ { }	Ūā^	œH Ō^: ŒŌ	V^} œœ
FF	TFF	ŀFG	ŀFF			Ōā&^Ŕ ^} œœ	Ō ^ { }	Ūā^	œH Ō^: ŒŌ	V^} œœ
FG	ŪŪPF	ŀİ	ŀİ			Ōā&^Ŕ ^} œœ	Ō ^ { }	Ūā^	œH Ō^: ŒŌ	V^} œœ
FH	ŪŪPG	ŀF€	ŀJ			Ōā&^Ŕ ^} œœ	Ō ^ { }	Ūā^	œH Ō^: ŒŌ	V^} œœ
FI	TFI	ŀFI	ŀFH			Ōā&^Ŕ ^} œœ	Ō ^ { }	Ūā^	œH Ō^: ŒŌ	V^} œœ
Fİ	TFİ	ŀFİ	ŀHF			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ
FĪ	TFĪ	ŀFİ	ŀHE			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ
Fİ	TŪFœ	ŀH	ŀH			œ Ō^} } œŪā^	Ō ^ { }	Ūā^	œH Ō^: ŒŌ	V^} œœ
Fİ	TĜ	ŀİİ	ŀİFœ			Vā Ōœ	Ō^æ	Ūā^	œH Ō^: ŒŌ	V^} œœ
FJ	TĜ	ŀİİ	ŀİœœ			Vā Ōœ	Ō^æ	Ūā^	œH Ō^: ŒŌ	V^} œœ
œ	TĜ	ŀIH	ŀİİ			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ
œ	TĜœ	ŀIG	ŀİİ			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ
œœ	TŪœœ	ŀİĪ	ŀİİ			œ Ō^} } œŪā^ Ā	Ō^æ	Ūā^	œH Ō^: ŒŌ	V^} œœ
œH	TĜ	ŀIJ	ŀİF			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ
œ	TĜ	ŀİİ	ŀİœ			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ
œ	TŪHœ	ŀİĜ	ŀİH			œ Ō^} } œŪā^	Ō ^ { }	Ūā^	œH Ō^: ŒŌ	V^} œœ
œ	TĜœ	ŀG	ŀİİœ			ŪŌŌ	ŀ ^ ^	ŀ ^ ^	ŪŌŌ	V^} œœ

	Šš/	Čč/ć	Žž/ć	Šš/ć	Ü œ/š/ž/đ/đ	Ü œ/š/ž/đ/đ	V	Ö/ä/ä	Tœ/š/ž	Ö/ä/ä	Ü œ/š/ž/đ/đ
Ğ	TĞŒ	ÞĞ	ÞIJŒ			ÜŒŒ	Þ	Þ	ÜŒŒ	V	ŒŒ
Ġ	TĠŒ	ÞĠŒ	ÞĠŒ			ÜŒŒ	Þ	Þ	ÜŒŒ	V	ŒŒ
GJ	TGJ	ÞÍÍ Ó	ÞÍÍ Œ			ÜŒŒ	Þ	Þ	ÜŒŒ	V	ŒŒ
HE	THE	ÞÍÍ	ÞÍÍ			ÜŒŒ	Þ	Þ	ÜŒŒ	V	ŒŒ
HF	THF	ÞÍÉÓ	ÞÍFÓ			Ü	Þ	Ü	ŒŒŒŒ	V	ŒŒ
HG	THG	ÞÍÉ	ÞÍÍ		FÍÉ	Ü	Þ	Ü	ŒŒŒŒ	V	ŒŒ
HH	THH	ÞÍJŒ	ÞÍÍ		JÉ	Ü	Þ	Ü	ŒŒŒŒ	V	ŒŒ

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	T{ à! Ša	Öä^&ç)	T æ) æ à à ža ě Eá	Š &œ) ža ě á
F	T ÚHÖ	Ÿ	Ě Ě Í	FIŠ
G	T ÚHÖ	T ^	ĚGG	FIŠ
H	T ÚHÖ	T :	€	FIŠ



	T ^{ \hat{a} / \tilde{a} }	Ö ä { \circ / \tilde{a} }	T æ { \tilde{a} / \tilde{a} }	Š { \tilde{a} / \tilde{a} }
GG	T Ú Ö	Y	Š	Š
GH	T Ú Ö	T ^	Š	Š
G	T Ú Ö	T :	Š H	Š
G	T Ú Ö	Y	Š H	Š
G	T Ú Ö	T ^	Š	Š
G	T Ú Ö	T :	€	Š
G	T Ú Ö	Y	Š H	Š
GJ	T Ú Ö	T ^	Š	Š
HE	T Ú Ö	T :	€	Š

	T { ǎ   ǎ }	Ö { ǎ   ǎ }	T { ǎ   ǎ }	ǎ { ǎ   ǎ }
F	T ÜHÖ	Ý	€	Fǎ
G	T ÜHÖ	Z	ǎ   ǎ	Fǎ
H	T ÜHÖ	T ǎ	€	Fǎ
I	T ÜHÖ	Ý	€	Hǎ
Í	T ÜHÖ	Z	ǎ   ǎ	Hǎ
Î	T ÜHÖ	T ǎ	€	Hǎ
İ	ÜÜPF	Ý	€	ǎ
İ	ÜÜPF	Z	ǎ   ǎ   H	ǎ
J	ÜÜPF	T ǎ	€	ǎ
F€	ÜÜPG	Ý	€	ǎ
FF	ÜÜPG	Z	ǎ   ǎ   H	ǎ
FG	ÜÜPG	T ǎ	€	ǎ
FH	T ÜGÖ	Ý	€	ǎ
FI	T ÜGÖ	Z	ǎ   ǎ   ǎ	ǎ
FÍ	T ÜGÖ	T ǎ	ǎ   H	ǎ
FÎ	T ÜGÖ	Ý	€	I ǎ
Fİ	T ÜGÖ	Z	ǎ   ǎ   ǎ	I ǎ
Fİ	T ÜGÖ	T ǎ	ǎ   H	I ǎ
FJ	T ÜGÖ	Ý	€	ǎ
G€	T ÜGÖ	Z	ǎ   ǎ   ǎ	ǎ
GF	T ÜGÖ	T ǎ	ǎ   H	ǎ
GG	T ÜGÖ	Ý	€	I ǎ
GH	T ÜGÖ	Z	ǎ   ǎ   ǎ	I ǎ
GI	T ÜGÖ	T ǎ	ǎ   H	I ǎ
Ğ	T ÜFOE	Ý	€	ǎ
Ğ	T ÜFOE	Z	ǎ   ǎ   ǎ	ǎ
Ğ	T ÜFOE	T ǎ	€	ǎ
Ğ	T ÜFOE	Ý	€	I ǎ
GJ	T ÜFOE	Z	ǎ   ǎ   ǎ	I ǎ
H€	T ÜFOE	T ǎ	€	I ǎ

	T <sup>h</sup> { à! / Ææ }	Öä <sup>h</sup> & c }	T æ } ä <sup>h</sup> / Zä Æ cä	Š & c }	Zä á
F	T U H C E	Y	G E H I	F I G	
G	T U H C E	Z	E I E U I	F I G	
H	T U H C E	T c	E E F I	F I G	
I	T U H C E	Y	G E H I	H I G	
Í	T U H C E	Z	E I E U I	H I G	
Î	T U H C E	T c	E E F I	H I G	



	T æ { à ^ / ã } ã	Ö ä ^ ã	T æ { à ^ / ã } ã	Š ã { à ^ / ã } ã
F	T U H O E	Ý	H E H Ì	F E G
G	T U H O E	Z	E Ì E Ì Í	F E G
H	T U H O E	T ç	E E Í	F E G
I	T U H O E	Ý	H E H Ì	H E G
Í	T U H O E	Z	E Ì E Ì Í	H E G
Î	T U H O E	T ç	E E Í	H E G
İ	Ü Ü P F	Ý	H E H G	E Ì
Ì	Ü Ü P F	Z	E E G Í	E Ì
J	Ü Ü P F	T ç	E E Í	E Ì
F€	Ü Ü P G	Ý	G E H H	E Ì
FF	Ü Ü P G	Z	E Ì E Ì J	E Ì
FG	Ü Ü P G	T ç	E E Í	E Ì
FH	T U G O E	Ý	Ì F E G	E Ì
FI	T U G O E	Z	E Ì E Ì J	E Ì
FÍ	T U G O E	T ç	E E J	E Ì
Fİ	T U G O E	Ý	Ì F E G	Ì E Ì
FÌ	T U G O E	Z	E Ì E Ì J	Ì E Ì
FÎ	T U G O E	T ç	E E J	Ì E Ì
FJ	T U G O E	Ý	Ì F E G	E Ì
G€	T U G O E	Z	E Ì E Ì J	E Ì
GF	T U G O E	T ç	E E G	E Ì
GG	T U G O E	Ý	Ì F E G	Ì E Ì
GH	T U G O E	Z	E Ì E Ì J	Ì E Ì
G	T U G O E	T ç	E E G	Ì E Ì



	T <sup>^</sup> { à!Áëä }	Öä^&ä }	T æ } ä à ã ã ã ã ã	Š &œ } ž Ğ á
Ğ	T ÚŒ	Ý	Í Î Ĳ	İ
Ğ	T ÚŒ	Z	İ Ğ Ĳ	İ
Ğ	T ÚŒ	T ĉ	İ Ğ	İ
Ğ	T ÚŒ	Ý	Í Î Ĳ	İ
Ğ	T ÚŒ	Z	İ Ğ Ĳ	İ
Ğ	T ÚŒ	T ĉ	İ Ğ	İ

	T ^ { \grave { a } / \grave { e } \grave { o } }	Ö ä ^ { \grave { o } / \grave { a } }	T æ { \grave { a } / \grave { e } \grave { o } }	Š š { \grave { s } / \grave { z } }
F	T UHCE	Ý	G Ė	Fİ
G	T UHCE	Z	€	Fİ
H	T UHCE	T ğ	Ė FH	Fİ
I	T UHCE	Ý	G Ė	Hİ
İ	T UHCE	Z	€	Hİ
İ	T UHCE	T ğ	Ė FH	Hİ
İ	ÜÜPF	Ý	H Ĩ Ĩ H	İ İ
İ	ÜÜPF	Z	€	İ İ
J	ÜÜPF	T ğ	İ Ė İ	İ İ
F€	ÜÜPG	Ý	G Ĩ F	İ İ
FF	ÜÜPG	Z	€	İ İ
FG	ÜÜPG	T ğ	İ Ė İ	İ İ
FH	T ÚGCE	Ý	İ Ğ İ İ	İ İ
FI	T ÚGCE	Z	€	İ İ
Fİ	T ÚGCE	T ğ	İ Ğ İ	İ İ
Fİ	T ÚGCE	Ý	İ Ğ İ İ	İ İ İ
Fİ	T ÚGCE	Z	€	İ İ İ
Fİ	T ÚGCE	T ğ	İ Ğ İ	İ İ İ
FJ	T ÚGCE	Ý	İ Ğ İ İ	İ İ
G€	T ÚGCE	Z	€	İ İ
GF	T ÚGCE	T ğ	İ Ğ İ	İ İ
GG	T ÚGCE	Ý	İ Ğ İ İ	İ İ İ
GH	T ÚGCE	Z	€	İ İ İ
Gİ	T ÚGCE	T ğ	İ Ğ İ	İ İ İ
Ğ	T ÚFOE	Ý	İ Fİ İ	İ
Ğ	T ÚFOE	Z	€	İ
Ğ	T ÚFOE	T ğ	İ Ğ Ė	İ
Ğ	T ÚFOE	Ý	İ Fİ İ	İ
GJ	T ÚFOE	Z	€	İ
H€	T ÚFOE	T ğ	İ Ğ Ė	İ

	T <sup>^</sup> { à <sup>^</sup>  À <sup>^</sup> æ <sup>^</sup> }	Öä <sup>^</sup> œ <sup>^</sup> {	T æ <sup>^</sup> ä <sup>^</sup> æ <sup>^</sup> ä <sup>^</sup> Ê <sup>^</sup> Ê <sup>^</sup> ä	Š <sup>^</sup> &œ <sup>^</sup> ž <sup>^</sup> Ž <sup>^</sup> á
F	T Ůœ	Ý	H Ě Ī	FI
G	T Ůœ	Z	F Ě Ī	FI
H	T Ůœ	T ě	Ě F Ī	FI
I	T Ůœ	Ý	H Ě Ī	HI
Í	T Ůœ	Z	F Ě Ī	HI
Î	T Ůœ	T ě	Ě F Ī	HI
İ	ÜÜPF	Ý	H Ě G	Ě Ī
Ì	ÜÜPF	Z	F Ě G Ī	Ě Ī
J	ÜÜPF	T ě	Ě F Ī	Ě Ī

## Š { Ž Ě á

FE	ÜÜPG	Ý	GJFH	ĖĖ
FF	ÜÜPG	Z	FĖĖIJ	ĖĖ
FG	ÜÜPG	Tç	FĖĖ	ĖĖ
FH	T ÚGÖE	Ý	ĭ FĖĖG	ĖĖ
FI	T ÚGÖE	Z	I ĭ ĖĖ ĭ J	ĖĖ
Fİ	T ÚGÖE	Tç	ĖĖĖG	ĖĖ
Fİ	T ÚGÖE	Ý	ĭ FĖĖG	I ĖĖ
Fİ	T ÚGÖE	Z	I ĭ ĖĖ ĭ J	I ĖĖ
Fİ	T ÚGÖE	Tç	ĖĖĖG	I ĖĖ
FJ	T ÚGÖE	Ý	ĭ FĖĖG	ĖĖ
GE	T ÚGÖE	Z	I ĭ ĖĖ ĭ J	ĖĖ
GF	T ÚGÖE	Tç	ĖĖ ĭ J	ĖĖ
GG	T ÚGÖE	Ý	ĭ FĖĖG	I ĖĖ
GH	T ÚGÖE	Z	I ĭ ĖĖ ĭ J	I ĖĖ
G	T ÚGÖE	Tç	ĖĖ ĭ J	I ĖĖ
G	T ÚFOE	Ý	ĭ ĖĖ ĭ J	ĖĖ
Gİ	T ÚFOE	Z	HGH ĭ	ĖĖ
Gİ	T ÚFOE	Tç	ĖĖĖ	ĖĖ
Gİ	T ÚFOE	Ý	ĭ ĖĖ ĭ J	I ĖĖ
GJ	T ÚFOE	Z	HGH ĭ	I ĖĖ
HE	T ÚFOE	Tç	ĖĖĖ	I ĖĖ

Š &cedil } Ž &tild á

F	T ÚHCE	Ý	G Ě Ě Ĩ	FĚ
G	T ÚHCE	Z	I Ě Ě Ĩ	FĚ
H	T ÚHCE	T ě	Ě Ě Ĩ	FĚ
I	T ÚHCE	Ý	G Ě Ě Ĩ	HĚ
Í	T ÚHCE	Z	I Ě Ě Ĩ	HĚ
Î	T ÚHCE	T ě	Ě Ě Ĩ	HĚ
İ	ÜÜPF	Ý	G Ě Ĩ H	Ě Ĩ
ì	ÜÜPF	Z	I Ě Ĩ J	Ě Ĩ
J	ÜÜPF	T ě	Ě Ě Ĩ	Ě Ĩ
F€	ÜÜPG	Ý	G Ě Ĩ Ĩ	Ě Ĩ
FF	ÜÜPG	Z	H Ě Ĩ G	Ě Ĩ
FG	ÜÜPG	T ě	Ě Ě Ĩ	Ě Ĩ
FH	T ÚGCE	Ý	Ĩ Ĩ Ě Ĩ	Ě Ĩ
FI	T ÚGCE	Z	F Ĩ Ě Ĩ	Ě Ĩ
Fí	T ÚGCE	T ě	Ě Ĩ Ĩ	Ě Ĩ
Fî	T ÚGCE	Ý	Ĩ Ĩ Ě Ĩ	I Ě Ĩ
Fì	T ÚGCE	Z	F Ĩ Ě Ĩ	I Ě Ĩ
Fì	T ÚGCE	T ě	Ě Ĩ Ĩ	I Ě Ĩ
FJ	T ÚGCE	Ý	Ĩ Ĩ Ě Ĩ	Ě Ĩ
G€	T ÚGCE	Z	F Ĩ Ě Ĩ	Ě Ĩ
GF	T ÚGCE	T ě	Ě Ě Ĩ	Ě Ĩ
GG	T ÚGCE	Ý	Ĩ Ĩ Ě Ĩ	I Ě Ĩ
GH	T ÚGCE	Z	F Ĩ Ě Ĩ	I Ě Ĩ
G	T ÚGCE	T ě	Ě Ě Ĩ	I Ě Ĩ
Ĝ	T ÚFCE	Ý	I Ĩ Ě Ĩ	Ě Ĩ
Ĝ	T ÚFCE	Z	Ĩ Ĩ Ě Ě	Ě Ĩ
Ĝ	T ÚFCE	T ě	Ě Ě Ĩ	Ě Ĩ

	T ʌ { ʌ̃ ʌ̄ ʌ̅ }	Ö ʌ { ʌ̃ }	T æ { æ̃ ʌ̃ ʌ̄ ʌ̅ ʌ̆ ʌ̇ }	Š { ʌ̈ ʌ̉ } ʌ̊ ʌ̋
G	T ʌ̃ ʌ̄ ʌ̅	Y	I Ĩ Ẽ J̃	I Ĩ
GJ	T ʌ̃ ʌ̄ ʌ̅	Z	Ĩ Ĩ̃ Ẽ̃ F̃	I Ĩ
HE	T ʌ̃ ʌ̄ ʌ̅	T c	Ĥ Ĥ̃ Ĥ̄ Ĥ̅	I Ĩ

	T { ă / Ȧ }	Ö { ă }	T { æ } ă / ă / ă / ă	Ş { ă } ă / ă
F	T ŮHCE	Ý	€	Fİİ
G	T ŮHCE	Z	İ İ İ İ	Fİİ
H	T ŮHCE	T ɸ	€	Fİİ
I	T ŮHCE	Ý	€	Hİİ
İ	T ŮHCE	Z	İ İ İ İ	Hİİ
Î	T ŮHCE	T ɸ	€	Hİİ
Ï	ÜÜPF	Ý	€	İ İ
İ	ÜÜPF	Z	İ İ İ İ H	İ İ
J	ÜÜPF	T ɸ	€	İ İ
F€	ÜÜPG	Ý	€	İ İ
FF	ÜÜPG	Z	İ İ İ İ H	İ İ
FG	ÜÜPG	T ɸ	€	İ İ
FH	T ŮGCE	Ý	€	İ İ
FI	T ŮGCE	Z	F İ İ İ İ	İ İ
Fİ	T ŮGCE	T ɸ	İ İ H	İ İ
FÎ	T ŮGCE	Ý	€	I İ İ
Fİ	T ŮGCE	Z	F İ İ İ İ	I İ İ
FÌ	T ŮGCE	T ɸ	İ İ H	I İ İ
FJ	T ŮGCE	Ý	€	İ İ
G€	T ŮGCE	Z	F İ İ İ İ	İ İ
GF	T ŮGCE	T ɸ	İ İ H	İ İ
GG	T ŮGCE	Ý	€	I İ İ
GH	T ŮGCE	Z	F İ İ İ İ	I İ İ
Gİ	T ŮGCE	T ɸ	İ İ H	I İ İ
Ğ	T ŮFOE	Ý	€	İ İ
Ğ	T ŮFOE	Z	F İ İ İ İ	İ İ
Ğ	T ŮFOE	T ɸ	€	İ İ
Ğ	T ŮFOE	Ý	€	I İ İ
GJ	T ŮFOE	Z	F İ İ İ İ	I İ İ
H€	T ŮFOE	T ɸ	€	I İ İ

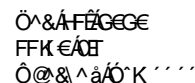
	T ʌ { ʌ̃ ʌ̂ ʌ̄ ʌ̅ }	Ö ʌ { ʌ̃ ʌ̂ ʌ̄ ʌ̅ }	T æ { æ̃ æ̂ ǣ æ̅ }	Š { š̃ š̂ š̄ š̅ }
F	T UHCE	Y	EG H I	FG
G	T UHCE	Z	I Ĩ EU I	FG
H	T UHCE	T ɕ	EF I	FG
I	T UHCE	Y	EG H I	HG
Í	T UHCE	Z	I Ĩ EU I	HG
Ī	T UHCE	T ɕ	EF I	HG
İ	ÜÜPF	Y	EG H I H	Ė I
İ	ÜÜPF	Z	I Ė I J I	Ė I
J	ÜÜPF	T ɕ	EF F	Ė I
F€	ÜÜPG	Y	EG Ė H	Ė I
FF	ÜÜPG	Z	H U Ė G	Ė I
FG	ÜÜPG	T ɕ	EF F	Ė I

## Š { Ž Ğ á

FH	T ÚGÖE	Ý	Ĥ Ĥ Ĥ	Ĥ Ĥ
FI	T ÚGÖE	Z	FF Ĥ Ĥ	Ĥ Ĥ
FÍ	T ÚGÖE	T Ĉ	Ĥ Ĥ Ĥ	Ĥ Ĥ
FĬ	T ÚGÖE	Ý	Ĥ Ĥ Ĥ	Ĥ Ĥ Ĥ
FĪ	T ÚGÖE	Z	FF Ĥ Ĥ	Ĥ Ĥ Ĥ
FÌ	T ÚGÖE	T Ĉ	Ĥ Ĥ Ĥ	Ĥ Ĥ Ĥ
FJ	T ÚGÖE	Ý	Ĥ Ĥ Ĥ	Ĥ Ĥ
GĖ	T ÚGÖE	Z	FF Ĥ Ĥ	Ĥ Ĥ
GF	T ÚGÖE	T Ĉ	Ĥ Ĥ Ĥ	Ĥ Ĥ
GG	T ÚGÖE	Ý	Ĥ Ĥ Ĥ	Ĥ Ĥ Ĥ
GH	T ÚGÖE	Z	FF Ĥ Ĥ	Ĥ Ĥ Ĥ
GĦ	T ÚGÖE	T Ĉ	Ĥ Ĥ Ĥ	Ĥ Ĥ Ĥ
GĬ	T ÚFOE	Ý	Ĥ Ĥ Ĥ Ĥ	Ĥ Ĥ
GĪ	T ÚFOE	Z	Ĥ Ĥ Ĥ Ĥ	Ĥ Ĥ
GÌ	T ÚFOE	T Ĉ	Ĥ Ĥ Ĥ	Ĥ Ĥ
GĴ	T ÚFOE	Ý	Ĥ Ĥ Ĥ Ĥ	Ĥ Ĥ Ĥ
GJ	T ÚFOE	Z	Ĥ Ĥ Ĥ Ĥ	Ĥ Ĥ Ĥ
HĖ	T ÚFOE	T Ĉ	Ĥ Ĥ Ĥ	Ĥ Ĥ

## Š { Ž Ğ á

	Uppercase	Lowercase	Uppercase	Lowercase
F	T ÚHCE	Y	ÈHÈÌ	FÈ
G	T ÚHCE	Z	FÌ ÈÌ Í	FÈ
H	T ÚHCE	Tç	ÈFÌ	FÈ
I	T ÚHCE	Y	ÈHÈÌ	HÈ
Í	T ÚHCE	Z	FÌ ÈÌ Í	HÈ
Î	T ÚHCE	Tç	ÈFÌ	HÈ
İ	ÜÜPF	Y	ÈHÈG	ÈÍ
Ì	ÜÜPF	Z	FJÈGÍ	ÈÍ
J	ÜÜPF	Tç	ÈFÌ	ÈÍ
F€	ÜÜPG	Y	ÈGJÈÌH	ÈÍ
FF	ÜÜPG	Z	FÌ ÈÌ J	ÈÍ
FG	ÜÜPG	Tç	ÈFÌ	ÈÍ
FH	T ÚGCE	Y	È FÈG	ÈÍ
FI	T ÚGCE	Z	Ì Î ÈÌ J	ÈÍ
FÍ	T ÚGCE	Tç	ÈÌ J	ÈÍ
FÌ	T ÚGCE	Y	È FÈG	Ì ÈÍ
FÎ	T ÚGCE	Z	Ì Î ÈÌ J	Ì ÈÍ
Fİ	T ÚGCE	Tç	ÈÌ J	Ì ÈÍ
FJ	T ÚGCE	Y	È FÈG	ÈÍ
G€	T ÚGCE	Z	Ì Î ÈÌ J	ÈÍ
GF	T ÚGCE	Tç	ÈÈG	ÈÍ
GG	T ÚGCE	Y	È FÈG	Ì ÈÍ
GH	T ÚGCE	Z	Ì Î ÈÌ J	Ì ÈÍ
GI	T ÚGCE	Tç	ÈÈG	Ì ÈÍ
GÍ	T ÚFOE	Y	È Î ÈGJ	È
GÌ	T ÚFOE	Z	HGHÌ	È
GÎ	T ÚFOE	Tç	ÈG	È
Gİ	T ÚFOE	Y	È Î ÈGJ	Ì È
GJ	T ÚFOE	Z	HGHÌ	Ì È
H€	T ÚFOE	Tç	ÈG	Ì È



	T æ { ä } / Ä	Ö ä / ö	T æ { ä } / Ä	Š š / š
F	T UHCE	Ý	Ě ě	FI
G	T UHCE	Z	Ě ě	FI
H	T UHCE	T ě	Ě ě	FI
I	T UHCE	Ý	Ě ě	HI
Í	T UHCE	Z	Ě ě	HI
Î	T UHCE	T ě	Ě ě	HI
Ī	ÜÜPF	Ý	Ě ě G	Ě ě
Ĭ	ÜÜPF	Z	Ě ě Ě ě	Ě ě
J	ÜÜPF	T ě	Ě ě	Ě ě
FE	ÜÜPG	Ý	Ě ě Ě ě	Ě ě
FF	ÜÜPG	Z	Ě ě Ě ě	Ě ě
FG	ÜÜPG	T ě	Ě ě	Ě ě
FH	T ÚGCE	Ý	Ě ě Ě ě	Ě ě
FI	T ÚGCE	Z	Ě ě Ě ě	Ě ě
FÍ	T ÚGCE	T ě	Ě ě	Ě ě
FÎ	T ÚGCE	Ý	Ě ě Ě ě	Ě ě
FĪ	T ÚGCE	Z	Ě ě Ě ě	Ě ě
FĬ	T ÚGCE	T ě	Ě ě	Ě ě

	T ʌ { ǎ ʌ / ǎ ʌ }	Ö ʌ { ǎ ʌ }	T æ { ǎ ʌ / ǎ ʌ }	Š { ǎ ʌ } Ž ǎ ʌ
FJ	T ʌ ǎ ʌ	ǎ ʌ	ǎ ʌ ǎ ʌ	ǎ ʌ
GE	T ʌ ǎ ʌ	Z	ǎ ʌ ǎ ʌ J	ǎ ʌ
GF	T ʌ ǎ ʌ	T ǎ ʌ	ǎ ʌ J	ǎ ʌ
GG	T ʌ ǎ ʌ	ǎ ʌ	ǎ ʌ ǎ ʌ	ǎ ʌ
GH	T ʌ ǎ ʌ	Z	ǎ ʌ ǎ ʌ J	ǎ ʌ
GI	T ʌ ǎ ʌ	T ǎ ʌ	ǎ ʌ J	ǎ ʌ
GJ	T ʌ ǎ ʌ	ǎ ʌ	ǎ ʌ ǎ ʌ J	ǎ ʌ
GK	T ʌ ǎ ʌ	Z	ǎ ʌ ǎ ʌ ǎ ʌ	ǎ ʌ
GL	T ʌ ǎ ʌ	T ǎ ʌ	ǎ ʌ	ǎ ʌ
GM	T ʌ ǎ ʌ	ǎ ʌ	ǎ ʌ ǎ ʌ J	ǎ ʌ
GN	T ʌ ǎ ʌ	Z	ǎ ʌ ǎ ʌ ǎ ʌ	ǎ ʌ
GO	T ʌ ǎ ʌ	T ǎ ʌ	ǎ ʌ	ǎ ʌ

	T ʌ { ʌ   ʌ }	Ö ʌ { ʌ }	T æ { æ   ʌ }	Š { ʌ } Ž ʌ á
F	T UHCE	Ý	Ǽ Ǽ I	FǼ
G	T UHCE	Z	Ǽ I Ǽ U I	FǼ
H	T UHCE	T ɸ	Ǽ FI	FǼ
I	T UHCE	Ý	Ǽ Ǽ I	HǼ
Í	T UHCE	Z	Ǽ I Ǽ U I	HǼ
Ī	T UHCE	T ɸ	Ǽ FI	HǼ
Ĭ	ÜÜPF	Ý	Ǽ Ǽ I H	Ī I
İ	ÜÜPF	Z	Ǽ Ǽ J I	Ī I
J	ÜÜPF	T ɸ	Ǽ FG	Ī I
F€	ÜÜPG	Ý	Ǽ Ǽ I	Ī I
FF	ÜÜPG	Z	Ǽ U Ǽ I G	Ī I
FG	ÜÜPG	T ɸ	Ǽ FF	Ī I
FH	T ÚGCE	Ý	Ǽ I Ǽ I	Ī I
FI	T ÚGCE	Z	Ǽ FI Ǽ U I	Ī I
FÍ	T ÚGCE	T ɸ	Ǽ I	Ī I
FĪ	T ÚGCE	Ý	Ǽ I Ǽ I	I Ǽ I
Fİ	T ÚGCE	Z	Ǽ FI Ǽ U I	I Ǽ I
FĬ	T ÚGCE	T ɸ	Ǽ I	I Ǽ I
FJ	T ÚGCE	Ý	Ǽ I Ǽ I	Ī I
G€	T ÚGCE	Z	Ǽ FI Ǽ U I	Ī I
GF	T ÚGCE	T ɸ	Ǽ HG	Ī I
GG	T ÚGCE	Ý	Ǽ I Ǽ I	I Ǽ I
GH	T ÚGCE	Z	Ǽ FI Ǽ U I	I Ǽ I
Gİ	T ÚGCE	T ɸ	Ǽ HG	I Ǽ I
Ğ	T ÚFOE	Ý	Ǽ I Ǽ J I	Ǽ
Ĝ	T ÚFOE	Z	Ǽ I Ǽ € F	Ǽ
Ĝ	T ÚFOE	T ɸ	Ǽ GH	Ǽ
Ğ	T ÚFOE	Ý	Ǽ I Ǽ J I	I Ǽ
GJ	T ÚFOE	Z	Ǽ I Ǽ € F	I Ǽ
H€	T ÚFOE	T ɸ	Ǽ GH	I Ǽ

	T { ^{ \grave{a} } / \grave{a} }	Ö { ^{ \grave{a} } / \grave{a} }	T { æ } { æ } { \grave{a} } { \grave{a} }	Š { & } { \grave{a} }
F	T U H O E	Y	€	F I G
G	T U H O E	Z	F H I J	F I G
H	T U H O E	T c	€	F I G

[illegible]

	T <sup>h</sup> { ã! / ãœã }	Öã^&çã }	T æ } ã ã^ ãã ã ãã	Š &œã } Žã ã á
GG	T ÚŒœ	Ý	FH Ĩ JI	I Ĩ Ĩ
GH	T ÚŒœ	Z	GH Ĩ FJ	I Ĩ Ĩ
G	T ÚŒœ	T ç	Ĥ FH	I Ĩ Ĩ
Ĝ	T ÚŒœ	Ý	J Ĩ G	I Ĩ
Ĝ	T ÚŒœ	Z	Ĥ Ĩ Ĥ FÍ	I Ĩ
Ĝ	T ÚŒœ	T ç	Ĥ Ĩ Ĩ	I Ĩ
Ĝ	T ÚŒœ	Ý	J Ĩ G	I Ĩ
GJ	T ÚŒœ	Z	Ĥ Ĩ Ĥ FÍ	I Ĩ
HE	T ÚŒœ	T ç	Ĥ Ĩ Ĩ	I Ĩ

	T ^ { à ! Æ a ^ }	Ö ä ^ & a }	T æ } æ ^ Æ Æ E a	Š & a } Ž Æ á
F	T ÚHCE	Ý	Î Ê H	FI
G	T ÚHCE	Z	Ë Ê H	FI
H	T ÚHCE	T ç	Ë Ê H	FI
I	T ÚHCE	Ý	Î Ê H	HI
Í	T ÚHCE	Z	Ë Ê H	HI
Î	T ÚHCE	T ç	Ë Ê H	HI
İ	Ü ÜPF	Ý	İ Ê İ	Ê İ
İ	Ü ÜPF	Z	Ë Ê İ	Ê İ
J	Ü ÜPF	T ç	Ë Ê	Ê İ
FE	Ü ÜPG	Ý	Î Ê F	Ê İ
FF	Ü ÜPG	Z	Ë Ê İ	Ê İ
FG	Ü ÜPG	T ç	Ë Ê H	Ê İ
FH	T ÚGCE	Ý	F Î Ê F	Ê İ
FI	T ÚGCE	Z	Ë Ê F	Ê İ
Fİ	T ÚGCE	T ç	Ë Ê F	Ê İ
FÎ	T ÚGCE	Ý	F Î Ê F	İ Ê İ
Fİ	T ÚGCE	Z	Ë Ê F	İ Ê İ
Fİ	T ÚGCE	T ç	Ë Ê F	İ Ê İ
FJ	T ÚGCE	Ý	F Î Ê F	Ê İ
GE	T ÚGCE	Z	Ë Ê F	Ê İ
GF	T ÚGCE	T ç	Ë Ê F	Ê İ
GG	T ÚGCE	Ý	F Î Ê F	İ Ê İ
GH	T ÚGCE	Z	Ë Ê F	İ Ê İ
GI	T ÚGCE	T ç	Ë Ê F	İ Ê İ
Ğ	T ÚFOE	Ý	F Ç Ê	Ç
Ğ	T ÚFOE	Z	Ë Ê H	Ç
Ğ	T ÚFOE	T ç	Ë Ê	Ç
Ğ	T ÚFOE	Ý	F Ç Ê	İ Ç
GJ	T ÚFOE	Z	Ë Ê H	İ Ç
HE	T ÚFOE	T ç	Ë Ê	İ Ç

	T { à   Å æ }	Ö Å & ç }	T æ } à à Æ Eä	ÿ & æ } Zz Á á
F	T Ú HCE	Ý	Í Ë G	FI G
G	T Ú HCE	Z	€	FI G
H	T Ú HCE	T ç	Ë ECH	FI G
I	T Ú HCE	Ý	Í Ë G	FI G
Í	T Ú HCE	Z	€	FI G
Î	T Ú HCE	T ç	Ë ECH	FI G



Š { Ž Ě á

İ	ÜÜPF	Ý	İİİJ	İİİ
ì	ÜÜPF	Z	€	İİİ
J	ÜÜPF	Tç	İİİ	İİİ
F€	ÜÜPG	Ý	İİİH	İİİ
FF	ÜÜPG	Z	€	İİİ
FG	ÜÜPG	Tç	İİİH	İİİ
FH	T ÜGÖE	Ý	FİİİH	İİİ
FI	T ÜGÖE	Z	€	İİİ
Fí	T ÜGÖE	Tç	İİİ	İİİ
Fİ	T ÜGÖE	Ý	FİİİH	I İİİ
Fĩ	T ÜGÖE	Z	€	I İİİ
Fì	T ÜGÖE	Tç	İİİ	I İİİ
FJ	T ÜGÖE	Ý	FİİİH	İİİ
G€	T ÜGÖE	Z	€	İİİ
GF	T ÜGÖE	Tç	İİİ	İİİ
GG	T ÜGÖE	Ý	FİİİH	I İİİ
GH	T ÜGÖE	Z	€	I İİİ
G	T ÜGÖE	Tç	İİİ	I İİİ
G̃	T ÜFÖE	Ý	FFİİF	İİİ
Ĝ	T ÜFÖE	Z	€	İİİ
Ḡ	T ÜFÖE	Tç	İİİ	İİİ
Ġ	T ÜFÖE	Ý	FFİİF	I İİİ
GJ	T ÜFÖE	Z	€	I İİİ
H€	T ÜFÖE	Tç	İİİ	I İİİ

## Š { Ž Ğ á

F	T ÚHCE	Ý	Î È H	FÈ
G	T ÚHCE	Z	HÈ H	FÈ
H	T ÚHCE	T Ç	ÈÈ H	FÈ
I	T ÚHCE	Ý	Î È H	HÈ
Í	T ÚHCE	Z	HÈ H	HÈ
Î	T ÚHCE	T Ç	ÈÈ H	HÈ
Ï	ÜÜPF	Ý	Î È Î	È Í
Ì	ÜÜPF	Z	I È Î	È Í
J	ÜÜPF	T Ç	ÈÈ	È Í
FE	ÜÜPG	Ý	Î È F	È Í
FF	ÜÜPG	Z	HÈ Î	È Í
FG	ÜÜPG	T Ç	ÈÈ	È Í
FH	T ÚGCE	Ý	FÎ È FÎ	È Í
FI	T ÚGCE	Z	JÈ F	È Í
FÍ	T ÚGCE	T Ç	ÈÈÈ FÎ	È Í
FÎ	T ÚGCE	Ý	FÎ È FÎ	I È Í
FÏ	T ÚGCE	Z	JÈ F	I È Í
FÌ	T ÚGCE	T Ç	ÈÈÈ FÎ	I È Í
FJ	T ÚGCE	Ý	FÎ È FÎ	È Í
GE	T ÚGCE	Z	JÈ F	È Í
GF	T ÚGCE	T Ç	ÈÈ FÎ	È Í
GG	T ÚGCE	Ý	FÎ È FÎ	I È Í
GH	T ÚGCE	Z	JÈ F	I È Í
GI	T ÚGCE	T Ç	ÈÈ FÎ	I È Í

	T <sup>^</sup> { à! / Æ æ }	Öä ^ & a }	T æ } ä à ^ z Æ Æ á	Š & œ } ž Ě á
Ğ	T Ú FÖE	Ý	FÖEJ	İ
Ġ	T Ú FÖE	Z	Î È H	İ
Ģ	T Ú FÖE	T ċ	Ĥ Ė Ġ	İ
Ğ	T Ú FÖE	Ý	FÖEJ	İ İ
GJ	T Ú FÖE	Z	Î È H	İ İ
HĖ	T Ú FÖE	T ċ	Ĥ Ė Ġ	İ İ

[illegible]

	T <sup>^</sup> { à!Àœ	Öä^&ç	T æ} ä à žāĖĖā	Š &œ  žāĖ ā
F	T ŮŮĖ	Ý	€	ĚĚ
G	T ŮŮĖ	Z	FĚĚ J	ĚĚ
H	T ŮŮĖ	T ě	€	ĚĚ
I	T ŮŮĖ	Ý	€	ĚĚ
Í	T ŮŮĖ	Z	FĚĚ J	ĚĚ
Î	T ŮŮĖ	T ě	€	ĚĚ
İ	ÜÜPF	Ý	€	Ě Ī
Ì	ÜÜPF	Z	FĚĚ HH	Ě Ī
J	ÜÜPF	T ě	€	Ě Ī

## Š ě ě } Ž Ě á

FE	ÜÜPG	Y	€	EE
FF	ÜÜPG	Z	FFHH	EE
FG	ÜÜPG	T	€	EE
FH	T ÜGÖE	Y	€	EE
FI	T ÜGÖE	Z	FFHH	EE
FI	T ÜGÖE	T	EG	EE
FI	T ÜGÖE	Y	€	EE
FI	T ÜGÖE	Z	FFHH	EE
FI	T ÜGÖE	T	EG	EE
FJ	T ÜGÖE	Y	€	EE
GE	T ÜGÖE	Z	FFHH	EE
GF	T ÜGÖE	T	EG	EE
GG	T ÜGÖE	Y	€	EE
GH	T ÜGÖE	Z	FFHH	EE
GI	T ÜGÖE	T	EG	EE
GI	T ÜFOE	Y	€	EG
GI	T ÜFOE	Z	GFHG	EG
GI	T ÜFOE	T	€	EG
GI	T ÜFOE	Y	€	EG
GJ	T ÜFOE	Z	GFHG	EG
HE	T ÜFOE	T	€	EG

Š & aecaron { Ž & aecaron á

F	T ÚHœ	Ý	Ě Ě Ī	FIĚ
G	T ÚHœ	Z	JĚJH	FIĚ
H	T ÚHœ	Tč	ĚĚH	FIĚ
I	T ÚHœ	Ý	Ě Ě Ī	HIĚ
Í	T ÚHœ	Z	JĚJH	HIĚ
Î	T ÚHœ	Tč	ĚĚH	HIĚ
Ī	ÜÜPF	Ý	Ě Ě Ī H	Ě Ī
Ĭ	ÜÜPF	Z	JĚ Ī	Ě Ī
J	ÜÜPF	Tč	ĚĚH	Ě Ī
F€	ÜÜPG	Ý	Ě Ě Ī J	Ě Ī
FF	ÜÜPG	Z	Ī Ě Ī	Ě Ī
FG	ÜÜPG	Tč	ĚĚH	Ě Ī
FH	T ÚGœ	Ý	Ě Ě Ī JI	Ě Ī
FI	T ÚGœ	Z	GĚ Ě JI	Ě Ī
FĪ	T ÚGœ	Tč	ĚĚ	Ě Ī
FĬ	T ÚGœ	Ý	Ě Ě Ī JI	Ī Ě Ī
FĬ	T ÚGœ	Z	GĚ Ě JI	Ī Ě Ī
FĪ	T ÚGœ	Tč	ĚĚ	Ī Ě Ī
FJ	T ÚGœ	Ý	Ě Ě Ī JI	Ě Ī
G€	T ÚGœ	Z	GĚ Ě JI	Ě Ī
GF	T ÚGœ	Tč	ĚĚH	Ě Ī
GG	T ÚGœ	Ý	Ě Ě Ī JI	Ī Ě Ī
GH	T ÚGœ	Z	GĚ Ě JI	Ī Ě Ī
G	T ÚGœ	Tč	ĚĚH	Ī Ě Ī
Ĝ	T ÚFœ	Ý	Ě Ě Ě G	Ě Ě
Ĝ	T ÚFœ	Z	FĪ Ě Ě Ī	Ě Ě
Ĝ	T ÚFœ	Tč	ĚĚ	Ě Ě

	T ʌ { ʌ̃ ʌ̄ ʌ̅ }	Ö ʌ { ʌ̃ }	T æ { æ̃ ʌ̃ ʌ̄ ʌ̅ ʌ̆ ʌ̇ }	Š { š̃ } ž ʌ̇ ʌ̈ ʌ̉
G	T ÚŒ	Ý	Ë È É	İ Ĭ
GJ	T ÚŒ	Z	F Ĩ F̃	İ Ĭ
HE	T ÚŒ	T ɕ	Ě ě	İ Ĭ

	T ʌ { ǎ ǎ ǎ ǎ }	Ö ʌ { ǎ ǎ }	T æ { ǎ ǎ ǎ ǎ ǎ ǎ }	Š ǎ { ǎ ǎ } ǎ ǎ ǎ
F	T UHCE	Ý	ǎ ǎ H	Fǎ
G	T UHCE	Z	Hǎ H	Fǎ
H	T UHCE	T ǎ	ǎ ǎ H	Fǎ
I	T UHCE	Ý	ǎ ǎ H	Hǎ
Í	T UHCE	Z	Hǎ H	Hǎ
Ī	T UHCE	T ǎ	ǎ ǎ H	Hǎ
Ī	ÜÜPF	Ý	ǎ ǎ Ī	ǎ Ī
Ī	ÜÜPF	Z	I ǎ Ī	ǎ Ī
J	ÜÜPF	T ǎ	ǎ ǎ	ǎ Ī
F€	ÜÜPG	Ý	ǎ ǎ F	ǎ Ī
FF	ÜÜPG	Z	Hǎ Ī	ǎ Ī
FG	ÜÜPG	T ǎ	ǎ ǎ H	ǎ Ī
FH	T ÚGCE	Ý	ǎ Ī ǎ Fİ	ǎ Ī
FI	T ÚGCE	Z	Jǎ F	ǎ Ī
Fİ	T ÚGCE	T ǎ	ǎ Fİ	ǎ Ī
FĪ	T ÚGCE	Ý	ǎ Ī ǎ Fİ	I ǎ Ī
FĪ	T ÚGCE	Z	Jǎ F	I ǎ Ī
Fİ	T ÚGCE	T ǎ	ǎ Fİ	I ǎ Ī
FJ	T ÚGCE	Ý	ǎ Ī ǎ Fİ	ǎ Ī
G€	T ÚGCE	Z	Jǎ F	ǎ Ī
GF	T ÚGCE	T ǎ	ǎ ǎ Fİ	ǎ Ī
GG	T ÚGCE	Ý	ǎ Ī ǎ Fİ	I ǎ Ī
GH	T ÚGCE	Z	Jǎ F	I ǎ Ī
Gİ	T ÚGCE	T ǎ	ǎ ǎ Fİ	I ǎ Ī
Ğ	T ÚFOE	Ý	ǎ ǎ ǎ	ǎ
Ğ	T ÚFOE	Z	Ī ǎ H	ǎ
Ğ	T ÚFOE	T ǎ	ǎ Ī	ǎ
Ğ	T ÚFOE	Ý	ǎ ǎ ǎ	I ǎ
GJ	T ÚFOE	Z	Ī ǎ H	I ǎ
H€	T ÚFOE	T ǎ	ǎ Ī	I ǎ

	T ʌ { ʌ ʌ } ʌ ʌ	Ö ʌ { ʌ ʌ }	T æ { ʌ ʌ } ʌ ʌ	Š { ʌ ʌ } ʌ ʌ
F	T UHCE	Y	Ĥ Ĥ G	FG
G	T UHCE	Z	€	FG
H	T UHCE	T ʌ	Ĥ Ĥ H	FG
I	T UHCE	Y	Ĥ Ĥ G	HG
Í	T UHCE	Z	€	HG
Ī	T UHCE	T ʌ	Ĥ Ĥ H	HG
İ	ÜÜPF	Y	Ĥ Ĥ Ī J	Ĥ Ī
İ	ÜÜPF	Z	€	Ĥ Ī
J	ÜÜPF	T ʌ	Ĥ Ĥ Ī	Ĥ Ī
F€	ÜÜPG	Y	Ĥ Ĥ Ī H	Ĥ Ī
FF	ÜÜPG	Z	€	Ĥ Ī
FG	ÜÜPG	T ʌ	Ĥ Ĥ Ī H	Ĥ Ī

## Š { Ž Ě á

Š &cedil } Ž &tilde á

[illegible]

	T ʌ { ǎ ʌ / ǎ ʌ }	Ö ʌ { ǎ ʌ }	T æ } ǎ ʌ } ǎ ʌ }	ǎ ʌ { ǎ ʌ }
F	T ʌ HCE	Ý	€	F ǎ
G	T ʌ HCE	Z	ǎ ǎ F	F ǎ
H	T ʌ HCE	T ǎ	€	F ǎ
I	T ʌ HCE	Ý	€	H ǎ
Í	T ʌ HCE	Z	ǎ ǎ F	H ǎ
Î	T ʌ HCE	T ǎ	€	H ǎ
İ	Ü ʌ PF	Ý	€	ǎ Í
Ì	Ü ʌ PF	Z	ǎ ǎ H	ǎ Í
J	Ü ʌ PF	T ǎ	€	ǎ Í
F€	Ü ʌ PG	Ý	€	ǎ Í
FF	Ü ʌ PG	Z	ǎ ǎ H	ǎ Í
FG	Ü ʌ PG	T ǎ	€	ǎ Í
FH	T ʌ GCE	Ý	€	ǎ Í
FI	T ʌ GCE	Z	ǎ ǎ I F	ǎ Í
FÍ	T ʌ GCE	T ǎ	ǎ ǎ J	ǎ Í
FÎ	T ʌ GCE	Ý	€	I ǎ Í
Fİ	T ʌ GCE	Z	ǎ ǎ I F	I ǎ Í
FÌ	T ʌ GCE	T ǎ	ǎ ǎ J	I ǎ Í

	T ʌ { ǎ ʌ / ǎ ʌ }	Ö ǎ { ǎ }	T æ } æ ʌ { ǎ ʌ }	Š { ǎ } ž ǎ á
FJ	T ʌ ǎ	ǎ	€	Š
GE	T ʌ ǎ	Z	€	Š
GF	T ʌ ǎ	T ǎ	€	Š
GG	T ʌ ǎ	ǎ	€	I Š
GH	T ʌ ǎ	Z	€	I Š
GI	T ʌ ǎ	T ǎ	€	I Š
GJ	T ʌ ǎ	ǎ	€	Š
GK	T ʌ ǎ	Z	€	Š
GL	T ʌ ǎ	T ǎ	€	Š
GM	T ʌ ǎ	ǎ	€	I Š
GN	T ʌ ǎ	Z	€	I Š
GO	T ʌ ǎ	T ǎ	€	I Š

	T ʌ { ǎ ǎ } ǎ ǎ	Ö ǎ ǎ	T æ } ǎ ǎ ǎ ǎ ǎ	ǎ ǎ ǎ ǎ
F	T UHCE	Ý	FÈ H	FÈ
G	T UHCE	Z	FÈ I	FÈ
H	T UHCE	T ǎ	FÈ U F I	FÈ
I	T UHCE	Ý	FÈ H	HÈ
Í	T UHCE	Z	FÈ I	HÈ
Î	T UHCE	T ǎ	FÈ U F I	HÈ
İ	ÜÜPF	Ý	FÈ İ	È İ
İ	ÜÜPF	Z	FÈ İ	È İ
J	ÜÜPF	T ǎ	FÈ İ İ	È İ
F€	ÜÜPG	Ý	FÈ G	È İ
FF	ÜÜPG	Z	FÈ H	È İ
FG	ÜÜPG	T ǎ	FÈ İ	È İ
FH	T ÚGCE	Ý	I È H	È İ
FI	T ÚGCE	Z	I È I G	È İ
FÍ	T ÚGCE	T ǎ	I È U	È İ
FÎ	T ÚGCE	Ý	I È H	I È İ
Fİ	T ÚGCE	Z	I È I G	I È İ
Fİ	T ÚGCE	T ǎ	I È U	I È İ
FJ	T ÚGCE	Ý	I È H	È İ
G€	T ÚGCE	Z	I È I G	È İ
GF	T ÚGCE	T ǎ	I È U	È İ
GG	T ÚGCE	Ý	I È H	I È İ
GH	T ÚGCE	Z	I È I G	I È İ
GI	T ÚGCE	T ǎ	I È U	I È İ
GÍ	T ÚFOE	Ý	HÈ H	È
Gİ	T ÚFOE	Z	HÈ I F	È
GÏ	T ÚFOE	T ǎ	HÈ G	È
GÎ	T ÚFOE	Ý	HÈ H	I È
GJ	T ÚFOE	Z	HÈ I F	I È
H€	T ÚFOE	T ǎ	HÈ G	I È

	T <sup>^</sup> { à!Áëæ	Öä^&ç	T æ} ä ä ZäÄ Eä	Š &œ  Žž Á
F	T ÚHÖE	Ý	GĖG	FIĞ
G	T ÚHÖE	Z	ĖĖĖ H	FIĞ
H	T ÚHÖE	T ĉ	ĖĖĖ F	FIĞ





	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
GG	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
GH	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
G	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
G	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
G	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
G	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
G	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
G	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
GJ	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ
HE	T ʌ { ʌ   ʌ } ʌ	Ö ʌ { ʌ   ʌ } ʌ	T ʌ { ʌ   ʌ } ʌ	Š ʌ { ʌ   ʌ } ʌ

	T ʌ { ǎ ʌ Ǟ ǣ ǣ }	Ö ǎ ǣ }	T æ } ǣ ǎ Ǟ ǣ ǣ }	Ǟ ǣ }
F	T UHCE	Ý	GĖHG	FĖG
G	T UHCE	Z	FĖĖ H	FĖG
H	T UHCE	T ɸ	FĖCF	FĖG
I	T UHCE	Ý	GĖHG	HĖG
Ī	T UHCE	Z	FĖĖ H	HĖG
Î	T UHCE	T ɸ	FĖCF	HĖG
İ	ÜÜPF	Ý	GĖĖ Ė	ĖĖ Ė
Ĭ	ÜÜPF	Z	FĖĖ F	ĖĖ Ė
J	ÜÜPF	T ɸ	FĖCF	ĖĖ Ė
F€	ÜÜPG	Ý	FĖĖ Ė	ĖĖ Ė
FF	ÜÜPG	Z	FĖĖ Ė	ĖĖ Ė
FG	ÜÜPG	T ɸ	FĖCF Ė	ĖĖ Ė
FH	T ÚGCE	Ý	Ė Ė FJ	ĖĖ Ė
FI	T ÚGCE	Z	HĖĖ Ė	ĖĖ Ė
FĪ	T ÚGCE	T ɸ	FĖCF ĖG	ĖĖ Ė
FĬ	T ÚGCE	Ý	Ė Ė FJ	Ė Ė Ė
FĪ	T ÚGCE	Z	HĖĖ Ė	Ė Ė Ė
FĬ	T ÚGCE	T ɸ	FĖCF ĖG	Ė Ė Ė
FJ	T ÚGCE	Ý	Ė Ė FJ	ĖĖ Ė
G€	T ÚGCE	Z	HĖĖ Ė	ĖĖ Ė
GF	T ÚGCE	T ɸ	FĖCF	ĖĖ Ė
GG	T ÚGCE	Ý	Ė Ė FJ	Ė Ė Ė
GH	T ÚGCE	Z	HĖĖ Ė	Ė Ė Ė
GĪ	T ÚGCE	T ɸ	FĖCF	Ė Ė Ė
GĬ	T ÚFOE	Ý	HĖĖ Ė	Ė Ė
GĪ	T ÚFOE	Z	GĖĖ Ė	Ė Ė
GĬ	T ÚFOE	T ɸ	FĖCF	Ė Ė
GĪ	T ÚFOE	Ý	HĖĖ Ė	Ė Ė
GJ	T ÚFOE	Z	GĖĖ Ė	Ė Ė
H€	T ÚFOE	T ɸ	FĖCF	Ė Ė

	T <sup>h</sup> { à   ã   é   ê   í   ï   ö   ü }	Öä <sup>h</sup> { ä   ö }	T <sup>h</sup> { æ   ā   ǣ   ǣ̃   ē   ē̃ }	Š { &#x0161   ž   ě   á }
F	T <sup>h</sup> ÜHÖE	Ý	FĚH	FĚŠ
G	T <sup>h</sup> ÜHÖE	Z	HĚĬ	FĚŠ
H	T <sup>h</sup> ÜHÖE	T <sup>h</sup> ĉ	HĚĬ ĚĚĬ FĬ	FĚŠ
I	T <sup>h</sup> ÜHÖE	Ý	FĚH	HĚŠ
Í	T <sup>h</sup> ÜHÖE	Z	HĚĬ	HĚŠ
Î	T <sup>h</sup> ÜHÖE	T <sup>h</sup> ĉ	HĚĬ ĚĚĬ FĬ	HĚŠ

## Š ě ě } Ž Ě á

Š &ael { Ž &tilde A á[illegible]

	T ʌ { ʌ } ʌ ʌ	Ö ʌ { ʌ } ʌ	T ʌ { ʌ } ʌ ʌ ʌ ʌ	Š { ʌ } ʌ ʌ ʌ
G	T ʌ { ʌ } ʌ ʌ	Y	€	Š { ʌ } ʌ ʌ ʌ
G	T ʌ { ʌ } ʌ ʌ	Z	İ İ İ H	Š { ʌ } ʌ ʌ ʌ
G	T ʌ { ʌ } ʌ ʌ	T	€	Š { ʌ } ʌ ʌ ʌ
G	T ʌ { ʌ } ʌ ʌ	Y	€	İ Š { ʌ } ʌ ʌ ʌ
GJ	T ʌ { ʌ } ʌ ʌ	Z	İ İ İ H	İ Š { ʌ } ʌ ʌ ʌ
HE	T ʌ { ʌ } ʌ ʌ	T	€	İ Š { ʌ } ʌ ʌ ʌ

	T ʌ { ʌ̃ ʌ̄ ʌ̅ ʌ̆ }	Ö ʌ { ʌ̇ ʌ̈ }	T æ { æ̃ ǣ æ̅ æ̆ }	Š { š̃ š̄ š̅ š̆ } ž { ž̃ ž̄ ž̅ ž̆ }
F	T ʌ̅ ʌ̆	Y	Š̅ Š̆ H	FI
G	T ʌ̅ ʌ̆	Z	Š̅ Š̆ I	FI
H	T ʌ̅ ʌ̆	T ʌ̆	Š̅ Š̆ FI	FI
I	T ʌ̅ ʌ̆	Y	Š̅ Š̆ H	HI
İ	T ʌ̅ ʌ̆	Z	Š̅ Š̆ I	HI
Î	T ʌ̅ ʌ̆	T ʌ̆	Š̅ Š̆ FI	HI
Ī	Ü̅Ü̆F	Y	Š̅ Š̆ Ī	Ē Ī
Ĭ	Ü̅Ü̆F	Z	Š̅ Š̆ Ĭ	Ē Ĭ
J	Ü̅Ü̆F	T ʌ̆	Š̅ Š̆ Ĭ Ī	Ē Ī
F€	Ü̅Ü̆G	Y	Š̅ Š̆ G	Ē Ī
FF	Ü̅Ü̆G	Z	Š̅ Š̆ H	Ē Ī
FG	Ü̅Ü̆G	T ʌ̆	Š̅ Š̆ Ĭ	Ē Ī
FH	T ʌ̅ ʌ̆	Y	Š̅ Š̆ H	Ē Ī
FI	T ʌ̅ ʌ̆	Z	Š̅ Š̆ Ĭ G	Ē Ī
FĪ	T ʌ̅ ʌ̆	T ʌ̆	Š̅ Š̆	Ē Ī
Fİ	T ʌ̅ ʌ̆	Y	Š̅ Š̆ H	Ī Ē Ī
FĬ	T ʌ̅ ʌ̆	Z	Š̅ Š̆ Ĭ G	Ī Ē Ī
FÎ	T ʌ̅ ʌ̆	T ʌ̆	Š̅ Š̆	Ī Ē Ī
FJ	T ʌ̅ ʌ̆	Y	Š̅ Š̆ H	Ē Ī
G€	T ʌ̅ ʌ̆	Z	Š̅ Š̆ Ĭ G	Ē Ī
GF	T ʌ̅ ʌ̆	T ʌ̆	Š̅ Š̆	Ē Ī
GG	T ʌ̅ ʌ̆	Y	Š̅ Š̆ H	Ī Ē Ī
GH	T ʌ̅ ʌ̆	Z	Š̅ Š̆ Ĭ G	Ī Ē Ī
GI	T ʌ̅ ʌ̆	T ʌ̆	Š̅ Š̆	Ī Ē Ī
GĪ	T ʌ̅ ʌ̆	Y	Š̅ Š̆ H	Ĭ Ī
Gİ	T ʌ̅ ʌ̆	Z	Š̅ Š̆ Ĭ F	Ĭ Ī
GÎ	T ʌ̅ ʌ̆	T ʌ̆	Š̅ Š̆ G	Ĭ Ī
GĬ	T ʌ̅ ʌ̆	Y	Š̅ Š̆ H	Ī Ĭ Ī
GJ	T ʌ̅ ʌ̆	Z	Š̅ Š̆ Ĭ F	Ī Ĭ Ī
H€	T ʌ̅ ʌ̆	T ʌ̆	Š̅ Š̆ G	Ī Ĭ Ī

	T <sup>^</sup> { à À æ	Öä^&ç }	T æ) æ à^ZaÆEá	Š &œ } ZæÁ á
F	T ÜHCE	Ý	ËÖHG	FIÖ
G	T ÜHCE	Z	FIË H	FIÖ
H	T ÜHCE	T ç	ËEF	FIÖ
I	T ÜHCE	Ý	ËÖHG	HIÖ
Í	T ÜHCE	Z	FIË H	HIÖ
Î	T ÜHCE	T ç	ËEF	HIÖ
İ	ÜÜPF	Ý	ËÖH	Ë İ
Ì	ÜÜPF	Z	FIÖJF	Ë İ
J	ÜÜPF	T ç	ËEF	Ë İ

## Š { Ž Ğ á

FE	ÜÜPG	Y	ÈÈÍG	ÈÍ
FF	ÜÜPG	Z	FÈG	ÈÍ
FG	ÜÜPG	Tç	FÈGÎÎ	ÈÍ
FH	T ÚGÖE	Y	È È FJ	ÈÍ
FI	T ÚGÖE	Z	HÈG	ÈÍ
FÍ	T ÚGÖE	Tç	ÈÈ	ÈÍ
FÌ	T ÚGÖE	Y	È È FJ	Ì ÈÍ
FÌ	T ÚGÖE	Z	HÈG	Ì ÈÍ
FÌ	T ÚGÖE	Tç	ÈÈ	Ì ÈÍ
FJ	T ÚGÖE	Y	È È FJ	ÈÍ
GÈ	T ÚGÖE	Z	HÈG	ÈÍ
GF	T ÚGÖE	Tç	ÈÈFÈG	ÈÍ
GG	T ÚGÖE	Y	È È FJ	Ì ÈÍ
GH	T ÚGÖE	Z	HÈG	Ì ÈÍ
G	T ÚGÖE	Tç	ÈÈFÈG	Ì ÈÍ
G	T ÚFÖE	Y	ÈÈÍG	ÈÍ
GÌ	T ÚFÖE	Z	GÈÎÎ	ÈÍ
GÌ	T ÚFÖE	Tç	ÈÈG	ÈÍ
G	T ÚFÖE	Y	ÈÈÍG	Ì ÈÍ
GJ	T ÚFÖE	Z	GÈÎÎ	Ì ÈÍ
HÈ	T ÚFÖE	Tç	ÈÈG	Ì ÈÍ

## Š { Ž Ě á

[illegible]

	T { ^ à   Å æ }	Ö Å ^ & ç }	T æ } æ à ^ z ã Ë ç á	Š & œ } ž ã á
G	T Ú F Ö	Ý	Ë Ë Í	Í Ë
GJ	T Ú F Ö	Z	€	Í Ë
HE	T Ú F Ö	T c	€ € G	Í Ë

	T ə { ə ʌ / ɔ ə }	Ö ä { ɔ }	T ə { ə ʌ / ɔ ə }	Š š { ʃ } Z z á
F	T UHCE	Ý	Ė Ė G	FI
G	T UHCE	Z	Ė Ė Ĩ H	FI
H	T UHCE	T ɕ	Ė Ė F	FI
I	T UHCE	Ý	Ė Ė G	HI
Í	T UHCE	Z	Ė Ė Ĩ H	HI
Ī	T UHCE	T ɕ	Ė Ė F	HI
Ĭ	ÜÜPF	Ý	Ė Ė Ĩ	Ė Ĩ
Ī	ÜÜPF	Z	Ė Ė Ĩ F	Ė Ĩ
J	ÜÜPF	T ɕ	Ė Ė F	Ė Ĩ
F€	ÜÜPG	Ý	Ė Ė Ĩ G	Ė Ĩ
FF	ÜÜPG	Z	Ė Ė Ĩ G	Ė Ĩ
FG	ÜÜPG	T ɕ	Ė Ė Ĩ Ĩ	Ė Ĩ
FH	T ÚGCE	Ý	Ė Ė FJ	Ė Ĩ
FI	T ÚGCE	Z	Ė Ė Ĩ G	Ė Ĩ
FĪ	T ÚGCE	T ɕ	Ė Ė Ė Ė G	Ė Ĩ
FĬ	T ÚGCE	Ý	Ė Ė FJ	ĭ Ė Ĩ
FĪ	T ÚGCE	Z	Ė Ė Ĩ G	ĭ Ė Ĩ
FĪ	T ÚGCE	T ɕ	Ė Ė Ė Ė G	ĭ Ė Ĩ
FJ	T ÚGCE	Ý	Ė Ė FJ	Ė Ĩ
G€	T ÚGCE	Z	Ė Ė Ĩ G	Ė Ĩ
GF	T ÚGCE	T ɕ	Ė Ė	Ė Ĩ
GG	T ÚGCE	Ý	Ė Ė FJ	ĭ Ė Ĩ
GH	T ÚGCE	Z	Ė Ė Ĩ G	ĭ Ė Ĩ
GĪ	T ÚGCE	T ɕ	Ė Ė	ĭ Ė Ĩ
GĬ	T ÚFOE	Ý	Ė Ė Ĩ Ĩ G	Ė Ĩ
GĪ	T ÚFOE	Z	Ė Ė Ĩ Ĩ	Ė Ĩ
GĪ	T ÚFOE	T ɕ	Ė Ė G	Ė Ĩ
GĬ	T ÚFOE	Ý	Ė Ė Ĩ Ĩ G	ĭ Ė Ĩ
GJ	T ÚFOE	Z	Ė Ė Ĩ Ĩ	ĭ Ė Ĩ
H€	T ÚFOE	T ɕ	Ė Ė G	ĭ Ė Ĩ

	T ʌ { ʌ̃ ʌ̄ ʌ̅ }	Ö ʌ { ʌ̃ ʌ̄ ʌ̅ }	T æ { æ̃ ǣ æ̅ }	Š { ʂ ʃ ʂ̃ ʃ̃ }
F	T UHCE	Y	FẼEH	FG
G	T UHCE	Z	FẼEI	FG
H	T UHCE	T ɕ	FẼEJFÍ	FG
I	T UHCE	Y	FẼEH	HI
Í	T UHCE	Z	FẼEI	HI
Ī	T UHCE	T ɕ	FẼEJFÍ	HI
İ	ÜÜPF	Y	FẼEI	İİ
İ̇	ÜÜPF	Z	FẼEJ	İİ
J	ÜÜPF	T ɕ	FẼEJFÍ	İİ
F€	ÜÜPG	Y	FẼEG	İİ
FF	ÜÜPG	Z	FẼEH	İİ
FG	ÜÜPG	T ɕ	FẼEJFÍ	İİ



	T{ ã\ĩã^	Öä^&ä}	ÜcœT æ} ä ä^ZaDũB) áT æ} ä ä^ZaDũB ÜcœS &œ} Zä á Ò) áS &œ} Zä á			
FG	T FI	ÿ	Ë Ê JI	Ë Ê JI	€	Ã FEE
FH	T ÚFœ	ÿ	Ë Ê JI	Ë Ê JI	€	Ã FEE
FI	T Ĝ	ÿ	Ë Ê JI	Ë Ê JI	€	Ã FEE
FÍ	T Ĝ	ÿ	Ë Ê JI	Ë Ê JI	€	Ã FEE
FÎ	T ÚGœ	ÿ	Ë Ê Î J	Ë Ê Î J	€	Ã FEE
Fİ	T ÚHœ	ÿ	Ë Ê JI	Ë Ê JI	€	Ã FEE
FÌ	T HF	ÿ	Ë Ê Î J	Ë Ê Î J	€	Ã FEE
FJ	T HG	ÿ	Ë Ê Ĝ	Ë Ê Ĝ	€	Ã FEE
G€	T HH	ÿ	Ë Ê Ĝ	Ë Ê Ĝ	€	Ã FEE

[illegible]

Ü Q O Æ H Ö Á ^ \ • ¤ } Ä È Ê Å W W W Z I A T A T A T A T A T A T A T A T A T A T [ å / Œ Š æ ʰ á Ą â î ï ì ñ Ě Ž Y ‘ T V ’ Š U V ’ Ó œ É Ú Á





[illegible]



	T { à\ & } Z	Ö { & } Z	Ü { & } Z	Ä { & } Z	€	Ä { & } Z
GJ	T G	Y	F E H	F E H	€	Ä { & } Z
HE	T G	Z	F E J I	F E J I	€	Ä { & } Z
HF	T Ü Ö E	Y	H E H	H E H	€	Ä { & } Z
HG	T Ü Ö E	Z	I E F I	I E F I	€	Ä { & } Z
HH	T Ü H Ö E	Y	G E I I	G E I I	€	Ä { & } Z
HI	T Ü H Ö E	Z	I E	I E	€	Ä { & } Z
HÍ	T H F	Y	G E I F	G E I F	€	Ä { & } Z
Hİ	T H F	Z	I E G J	I E G J	€	Ä { & } Z
Hİ	T H G	Y	I E I I	I E I I	€	Ä { & } Z
Hİ	T H G	Z	J E J I	J E J I	€	Ä { & } Z
HJ	T H H	Y	E E F	E E F	€	Ä { & } Z
I €	T H H	Z	F E G H	F E G H	€	Ä { & } Z

	T^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{u}\}	Ö^{\wedge}\{\grave{a}\}	Ü^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{u}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}	Ä^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{u}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}	Ö^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{u}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}	Ä^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{u}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}
F	TF	Ý	€	€	€	Ä F€€
G	TF	Z	FHĴÍ	FHĴÍ	€	Ä F€€
H	TG	Ý	€	€	€	Ä F€€
I	TG	Z	FHĴÍ	FHĴÍ	€	Ä F€€
Í	TH	Ý	€	€	€	Ä F€€
Î	TH	Z	FHĴÍ	FHĴÍ	€	Ä F€€
İ	TI	Ý	€	€	€	Ä F€€
Ì	TI	Z	FHĴÍ	FHĴÍ	€	Ä F€€
J	Tİ	Ý	€	€	€	Ä F€€
F€	Tİ	Z	ÎĤİĠG	ÎĤİĠG	€	Ä F€€
FF	TÌ	Ý	€	€	€	Ä F€€
FG	TÌ	Z	FĤÎÎ	FĤÎÎ	€	Ä F€€
FH	TJ	Ý	€	€	€	Ä F€€
FI	TJ	Z	FĤÎÎ	FĤÎÎ	€	Ä F€€
FÍ	TF€	Ý	€	€	€	Ä F€€
FÎ	TF€	Z	HĤÎÌ	HĤÎÌ	€	Ä F€€
Fİ	TF€	Ý	€	€	€	Ä F€€
FÌ	TF€	Z	IĤĖ	IĤĖ	€	Ä F€€
FJ	ÜÜPF	Ý	€	€	€	Ä F€€
G€	ÜÜPF	Z	IĤĖ	IĤĖ	€	Ä F€€
GF	ÜÜPG	Ý	€	€	€	Ä F€€
GG	ÜÜPG	Z	IĤĖ	IĤĖ	€	Ä F€€
GH	TFI	Ý	€	€	€	Ä F€€
GÍ	TFI	Z	IĤĖ	IĤĖ	€	Ä F€€
Gİ	TUFÖ€	Ý	€	€	€	Ä F€€
GÎ	TUFÖ€	Z	ÎĤİİ	ÎĤİİ	€	Ä F€€
Gİ	TG	Ý	€	€	€	Ä F€€
GÌ	TG	Z	HĤFI	HĤFI	€	Ä F€€
GJ	TĜ	Ý	€	€	€	Ä F€€
H€	TĜ	Z	ĤHH	ĤHH	€	Ä F€€
HF	TÜG€	Ý	€	€	€	Ä F€€
HG	TÜG€	Z	ÎĤİĠG	ÎĤİĠG	€	Ä F€€
HH	TÜH€	Ý	€	€	€	Ä F€€
HÍ	TÜH€	Z	ÎĤİİ	ÎĤİİ	€	Ä F€€
Hİ	THF	Ý	€	€	€	Ä F€€
HÌ	THF	Z	ÎĤĴİ	ÎĤĴİ	€	Ä F€€



T^{\wedge}\{ \grave{a}^{\wedge}|/\check{S}ae^{\wedge}| \hspace{1cm} \ddot{O}\acute{a}^{\wedge}&\grave{c}\acute{a}\} \hspace{1cm} \grave{U}cae\acute{o}\acute{A} \textit{x} \} \tilde{a} \acute{a}^{\wedge}\check{Z}\grave{a}D\grave{e}\grave{H}\grave{I}\grave{I}\grave{I}\{ \acute{a}\acute{A} \textit{x} \} \tilde{a} \acute{a}^{\wedge}\check{Z}\grave{a}D\grave{e}\grave{H}\grave{I}\grave{I}\grave{I}\grave{I}\{ \grave{U}cae\check{S} \&ae\} \check{Z}\grave{e}\check{F}\acute{a} \quad \grave{O}\{ \acute{a}\check{S} \&ae\} \check{Z}\grave{e}\check{F}\acute{a}

T ^ { à ^ ! / S e a ^ | Ö ä ^ & c ä } Ü c e o ^ T æ } æ à ^ Ž a D e i i i } à ^ T æ } æ à ^ Ž a D e i i i Ü c e o ^ Š & a a } Ž e Ā á Ò } à ^ Š & a a } Ž e Ā á

[illegible]

	T^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}	Ö^{\wedge}\{\grave{a}\}	Ü^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{u}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}	ä^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{u}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}	€	Ö^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{u}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}
F	TF	Ý	ËËÍÍ	ËËÍÍ	€	Ä F€€
G	TF	Z	ËË FG	ËË FG	€	Ä F€€
H	TG	Ý	ËËÍÍ	ËËÍÍ	€	Ä F€€
I	TG	Z	ËË FG	ËË FG	€	Ä F€€
Í	TH	Ý	ËËÍÍ	ËËÍÍ	€	Ä F€€
Î	TH	Z	ËË FG	ËË FG	€	Ä F€€
İ	TI	Ý	ËËÍÍ	ËËÍÍ	€	Ä F€€
Ì	TI	Z	ËË FG	ËË FG	€	Ä F€€
J	Tİ	Ý	ËË I F	ËË I F	€	Ä F€€
F€	Tİ	Z	ËË H	ËË H	€	Ä F€€
FF	TÌ	Ý	ËË H	ËË H	€	Ä F€€
FG	TÌ	Z	ËË FH	ËË FH	€	Ä F€€
FH	TJ	Ý	ËË H	ËË H	€	Ä F€€
FI	TJ	Z	ËË FH	ËË FH	€	Ä F€€
FÍ	TF€	Ý	ËË G	ËË G	€	Ä F€€
FÎ	TF€	Z	ËË H	ËË H	€	Ä F€€
Fİ	TFF	Ý	ËË I H	ËË I H	€	Ä F€€

	T^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}	Ö^{\wedge}\{\grave{e}\}\{\grave{o}\}	Ü^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}	Ä^{\wedge}\{\grave{a}\}\{\grave{e}\}\{\grave{o}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}	€	Ä^{\wedge}\{\grave{e}\}\{\grave{o}\}\{\grave{ä}\}\{\grave{ö}\}\{\grave{ü}\}
F	TF	Y	EH	EH	€	Ä FEE
G	TF	Z	EJ	EJ	€	Ä FEE
H	TG	Y	EH	EH	€	Ä FEE
I	TG	Z	EJ	EJ	€	Ä FEE
Í	TH	Y	EH	EH	€	Ä FEE
Î	TH	Z	EJ	EJ	€	Ä FEE
İ	TI	Y	EH	EH	€	Ä FEE
Ì	TI	Z	EJ	EJ	€	Ä FEE
J	Tİ	Y	EF	EF	€	Ä FEE
FE	Tİ	Z	EI	EI	€	Ä FEE
FF	TÌ	Y	EI	EI	€	Ä FEE
FG	TÌ	Z	EH	EH	€	Ä FEE
FH	TJ	Y	EI	EI	€	Ä FEE
FI	TJ	Z	EH	EH	€	Ä FEE
FÍ	TFE	Y	EG	EG	€	Ä FEE
Fİ	TFE	Z	EH	EH	€	Ä FEE
Fì	TFF	Y	EF	EF	€	Ä FEE
Fì	TFF	Z	EI	EI	€	Ä FEE
FJ	ÜÜPF	Y	EF	EF	€	Ä FEE
GE	ÜÜPF	Z	EI	EI	€	Ä FEE
GF	ÜÜPG	Y	EF	EF	€	Ä FEE
GG	ÜÜPG	Z	EI	EI	€	Ä FEE
GH	TFI	Y	EF	EF	€	Ä FEE
G	TFI	Z	EI	EI	€	Ä FEE
G	TÜFÖE	Y	EI	EI	€	Ä FEE



	T^{\{ \grave{a} \} \grave{a} \grave{a} \}	Ö^{\{ \grave{a} \} \grave{a} \}	Ü^{\{ \grave{a} \} \grave{a} \}	ä^{\{ \grave{a} \} \grave{a} \}	ä^{\{ \grave{a} \} \grave{a} \}	ä^{\{ \grave{a} \} \grave{a} \}
F	TF	Y	€	€	€	Ä F€€
G	TF	Z	€€ F	€€ F	€	Ä F€€
H	TG	Y	€	€	€	Ä F€€
I	TG	Z	€€ F	€€ F	€	Ä F€€
Í	TH	Y	€	€	€	Ä F€€
Î	TH	Z	€€ F	€€ F	€	Ä F€€
İ	TI	Y	€	€	€	Ä F€€
Ì	TI	Z	€€ F	€€ F	€	Ä F€€
J	Tİ	Y	€	€	€	Ä F€€
F€	Tİ	Z	€€ F	€€ F	€	Ä F€€
FF	TÌ	Y	€	€	€	Ä F€€
FG	TÌ	Z	€€ HG	€€ HG	€	Ä F€€
FH	TJ	Y	€	€	€	Ä F€€
FI	TJ	Z	€€ HG	€€ HG	€	Ä F€€
FÍ	TF€	Y	€	€	€	Ä F€€
FÎ	TF€	Z	€€ İ	€€ İ	€	Ä F€€
Fİ	TF€	Y	€	€	€	Ä F€€
FÌ	TF€	Z	€€ İ G	€€ İ G	€	Ä F€€
FJ	ÜÜPF	Y	€	€	€	Ä F€€
G€	ÜÜPF	Z	€€ İ G	€€ İ G	€	Ä F€€
G€	ÜÜPG	Y	€	€	€	Ä F€€
GG	ÜÜPG	Z	€€ İ G	€€ İ G	€	Ä F€€
GH	TFI	Y	€	€	€	Ä F€€
G	TFI	Z	€€ İ G	€€ İ G	€	Ä F€€
G	TÜF€	Y	€	€	€	Ä F€€
G	TÜF€	Z	€€ İ G	€€ İ G	€	Ä F€€
G	TĞ	Y	€	€	€	Ä F€€
G	TĞ	Z	€€ F	€€ F	€	Ä F€€
GJ	TĞ	Y	€	€	€	Ä F€€
H€	TĞ	Z	€€ G	€€ G	€	Ä F€€
HF	TÜG€	Y	€	€	€	Ä F€€
HG	TÜG€	Z	€€ İ	€€ İ	€	Ä F€€
HH	TÜH€	Y	€	€	€	Ä F€€









[illegible]

[illegible]





	T^{\{ \grave{a} \} \tilde{a} \}	Ö^{\{ \grave{a} \} }	Ü^{\{ \grave{a} \} \tilde{a} \}	Ü^{\{ \grave{a} \} \tilde{a} \}	Ü^{\{ \grave{a} \} \tilde{a} \}	Ü^{\{ \grave{a} \} \tilde{a} \}
F	TF	Y	J	J	€	Ä F€
G	TF	Z	J	J	€	Ä F€
H	TG	Y	J	J	€	Ä F€
I	TG	Z	J	J	€	Ä F€
Í	TH	Y	J	J	€	Ä F€
Î	TH	Z	J	J	€	Ä F€
Ï	TI	Y	J	J	€	Ä F€
Ì	TI	Z	J	J	€	Ä F€
J	TÏ	Y	G	G	€	Ä F€
F€	TÏ	Z	G	G	€	Ä F€
FF	TÌ	Y	I	I	€	Ä F€
FG	TÌ	Z	I	I	€	Ä F€
FH	TJ	Y	I	I	€	Ä F€
FI	TJ	Z	I	I	€	Ä F€
FÍ	TF€	Y	È	È	€	Ä F€
FÎ	TF€	Z	È	È	€	Ä F€



	T^{\wedge} \{ \grave{a} \} \{ \grave{e} \}	Öä^{\wedge} \{ \grave{e} \}	Üöä^{\wedge} \{ \grave{e} \} \{ \grave{e} \}	Üöä^{\wedge} \{ \grave{e} \} \{ \grave{e} \}	Üöä^{\wedge} \{ \grave{e} \} \{ \grave{e} \}	Üöä^{\wedge} \{ \grave{e} \} \{ \grave{e} \}
G	T ÜÖE	Y	ÜÜFF	ÜÜFF	€	Ä FEE
G	T ÜÖE	Z	ÜÜG	ÜÜG	€	Ä FEE
G	T G	Y	ÜÜÍ	ÜÜÍ	€	Ä FEE
G	T G	Z	ÜÜÍ	ÜÜÍ	€	Ä FEE
GJ	T G	Y	ÜÜÍ	ÜÜÍ	€	Ä FEE
HE	T G	Z	ÜÜÍ	ÜÜÍ	€	Ä FEE
HF	T ÜÖE	Y	ÜÜFJ	ÜÜFJ	€	Ä FEE
HG	T ÜÖE	Z	ÜÜFG	ÜÜFG	€	Ä FEE
HH	T ÜÖE	Y	ÜÜFF	ÜÜFF	€	Ä FEE
HI	T ÜÖE	Z	ÜÜG	ÜÜG	€	Ä FEE
HÍ	T HF	Y	ÜÜH	ÜÜH	€	Ä FEE
HÎ	T HF	Z	ÜÜÍ	ÜÜÍ	€	Ä FEE
HÏ	T HG	Y	ÜÜE	ÜÜE	€	Ä FEE
HÌ	T HG	Z	ÜÜÍ	ÜÜÍ	€	Ä FEE
HJ	T HH	Y	ÜÜF	ÜÜF	€	Ä FEE
I €	T HH	Z	ÜÜÍ	ÜÜÍ	€	Ä FEE

	T ^{ \grave{a} \tilde{c} a \grave{a} }	Ö ä ^{ \& c i }	Ü c a o { \r a \tilde{c} a \grave{c} } \grave{c} \grave{a} \tilde{c} a \grave{c} } \grave{c} \grave{a} \tilde{c} a \grave{c} }	Ü c a o { \r a \tilde{c} a \grave{c} } \grave{c} \grave{a} \tilde{c} a \grave{c} } \grave{c} \grave{a} \tilde{c} a \grave{c} }	Ü c a o { \r a \tilde{c} a \grave{c} } \grave{c} \grave{a} \tilde{c} a \grave{c} } \grave{c} \grave{a} \tilde{c} a \grave{c} }	Ü c a o { \r a \tilde{c} a \grave{c} } \grave{c} \grave{a} \tilde{c} a \grave{c} } \grave{c} \grave{a} \tilde{c} a \grave{c} }
F	TF	Ý	€	€	€	À F€€
G	TF	Z	€Fİ	€Fİ	€	À F€€
H	TG	Ý	€	€	€	À F€€
I	TG	Z	€Fİ	€Fİ	€	À F€€
Í	TH	Ý	€	€	€	À F€€
Î	TH	Z	€Fİ	€Fİ	€	À F€€
İ	TI	Ý	€	€	€	À F€€
Ì	TI	Z	€Fİ	€Fİ	€	À F€€
J	Tİ	Ý	€	€	€	À F€€
F€	Tİ	Z	€G	€G	€	À F€€
FF	TÌ	Ý	€	€	€	À F€€
FG	TÌ	Z	€FF	€FF	€	À F€€
FH	TJ	Ý	€	€	€	À F€€
FI	TJ	Z	€FF	€FF	€	À F€€
FÍ	TF€	Ý	€	€	€	À F€€
Fİ	TF€	Z	€G F	€G F	€	À F€€
FÌ	TF€	Ý	€	€	€	À F€€
FÌ	TF€	Z	€G	€G	€	À F€€
FJ	ÜÜPF	Ý	€	€	€	À F€€
G€	ÜÜPF	Z	€G	€G	€	À F€€
G€	ÜÜPG	Ý	€	€	€	À F€€
GG	ÜÜPG	Z	€G	€G	€	À F€€
GH	TFI	Ý	€	€	€	À F€€
G	TFI	Z	€G	€G	€	À F€€
G	T ÚF€	Ý	€	€	€	À F€€
G	T ÚF€	Z	€İ	€İ	€	À F€€
G	T G	Ý	€	€	€	À F€€
G	T G	Z	€G€G	€G€G	€	À F€€
GJ	T G	Ý	€	€	€	À F€€
H€	T G	Z	€GG	€GG	€	À F€€
HF	T ÜC€	Ý	€	€	€	À F€€
HG	T ÜC€	Z	€İİ	€İİ	€	À F€€



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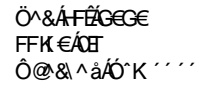






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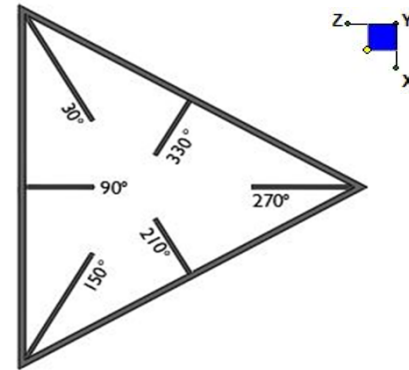
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## I. Mount-to-Tower Connection Check

### RISA Model Data

Nodes (labeled per RISA)	Orientation (per graphic of typical platform)
N48A	30
N49A	30



TYPICAL PLATFORM

### Tower Connection Bolt Checks

Any moment resistance?:

Bolt Quantity per Reaction:

$d_x$  (in) (Delta X of typ. bolt config. sketch):

$d_y$  (in) (Delta Y of typ. bolt config. sketch):

Bolt Type:

Bolt Diameter (in):

Required Tensile Strength (kips):

Required Shear Strength (kips):

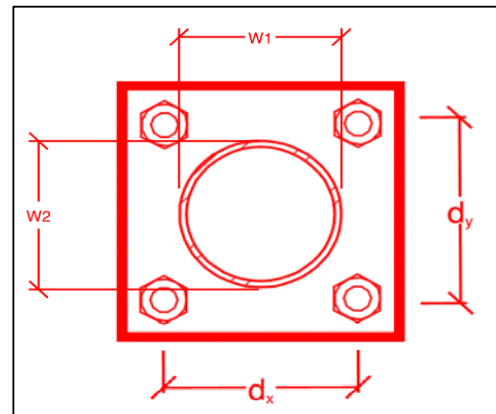
Tensile Strength / bolt (kips):

Shear Strength / bolt (kips):

Tensile Capacity Overall:

Shear Capacity Overall:

yes
4
9.5
2
A307
0.5
15.7
5.4
6.3
3.8
62.7%*
35.3%



\*Note: Tension reduction not required if tension or shear capacity < 30%

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

## Documents & Photos Required from Contractor – Mount Modification

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**Purpose** – to provide TES 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 modification was completed in accordance with the modification drawings.
- Contractor shall relay any data that can impact the performance of the mount or the mount modification, this includes safety issues.

### **Base Requirements:**

- Any special photos outside of the standard requirements will be indicated on the drawings
- Provide “as built drawings” showing contractor’s name, preparer’s signature, and date. Any deviations from the drawings (proposed modification) must be shown.
- Notation that all hardware was properly installed, and the existing hardware was inspected for any issues.
- Verification that loading is as communicated in the modification drawings. NOTE If loading is different than what is conveyed in the modification drawing contact TES immediately.
- Each photo should be time and date stamped
- Photos should be high resolution and submitted in a Zip File and should be organized in the file structure as depicted in Schedule A attached.
- 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.
- The photos in the file structure should be uploaded to <https://pmi.vzwsmart.com> as depicted on the drawings

### **Photo Requirements:**

- Base and “During Installation Photos”
  - Base pictures include
    - Photo of Gate Signs showing the tower owner, site name, and number
    - Photo of carrier shelter showing the carrier site name and number if available
    - Photos of the galvanizing compound and/or paint used (if applicable), clearly showing the label and name
  - “During Installation Photos if provided - must be placed only in this folder
- Photos taken at ground level
  - Overall tower structure before and after installation of the modifications
  - Photos of the appropriate mount before and after installation of the modifications; if the mounts are at different rad elevations, pictures must be provided for all elevations that the modifications were installed



- **Photos taken at Mount Elevation**
  - Photos showing each individual sector before and also after installation of modifications. Each entire sector must be in one photo to show in the inter-connection of members.
    - These photos should also certify that the placement and geometry of the equipment on the mount is as depicted on the sketch and table in the mount analysis
  - Close-up photos of each installed modification per the modification drawings; pictures should also include connection hardware (U-bolts, bolts, nuts, all-threaded rods, etc.)
  - Photos showing the measurements of the installed modification member sizes (i.e. lengths, widths, depths, diameters, thicknesses)
  - Photos showing the elevation or distances of the installed modifications from the appropriate reference locations shown in the modification drawings
  - Photos showing the installed modifications onto the tower with tape drop measurements (if applicable) (i.e. ring/collar mounts, tie-backs, V-bracing kits, etc.); if the existing mount elevation needs to be changed according to the modification drawings, a tape drop measurement shall be provided before the elevation change
  - Photos showing the safety climb wire rope above and below the mount prior to modification.
  - Photos showing the climbing facility and safety climb if present.

**Material Certification:**

- Materials utilized must be as per specification on the drawings or the equivalent as validated by TES.
  - If the drawings are as specified on the drawings
    - The contractor should provide the packing list or the materials utilized to perform the mount modification
  - If an equivalent is utilized
    - It is required that the TES certification of such is included in the contractor submission package. There may be an additional charge for this certification if the equivalent submission doesn't meet specifications as prescribed in the drawings.
- The contractor must certify that the materials meet these specifications by one of these methods.

☐ The Material utilized was as specified on the TES Mount Modification Drawings and included in the Material certification folder is a packing list or invoice for these materials

☐ The material utilized was an "equivalent" and included as part of the contractor submission is the TES certification, invoices, or specifications validating accepted status

Certifying Individual: Company \_\_\_\_\_

Name \_\_\_\_\_

Signature \_\_\_\_\_

### Antenna & equipment placement and Geometry Confirmation:

- The contractor must certify that the antenna & equipment placement and geometry is in accordance with the antenna placement diagrams as included in this mount analysis.
- ☐ The contractor certifies that the photos support and the equipment on the mount is as depicted on the antenna placement diagrams as included in this mount analysis.
- ☐ The contractor notes that the equipment on the mount is not in accordance with the antenna placement diagrams and has accordingly marked up the diagrams or provided a diagram outlining the differences.

Certifying Individual:

Company	<hr/>
Name	<hr/>
Signature	<hr/>

**Special Instructions / Validation as required from the MA or Mod Drawings:**

### Issue:

1. Proposed radios shall be installed on the face vertical pipes.
2. Relocate the GPS unit up or down to accommodate for new horizontal.

**Response:**

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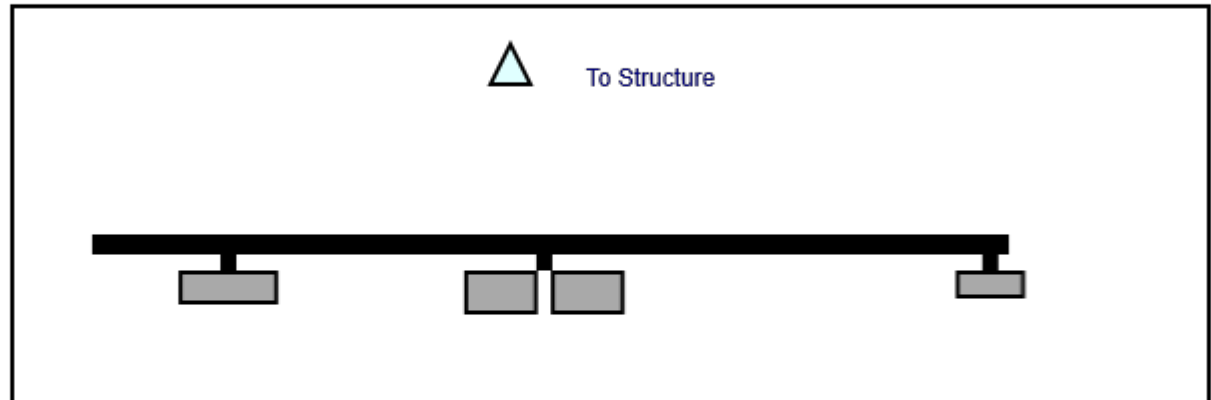
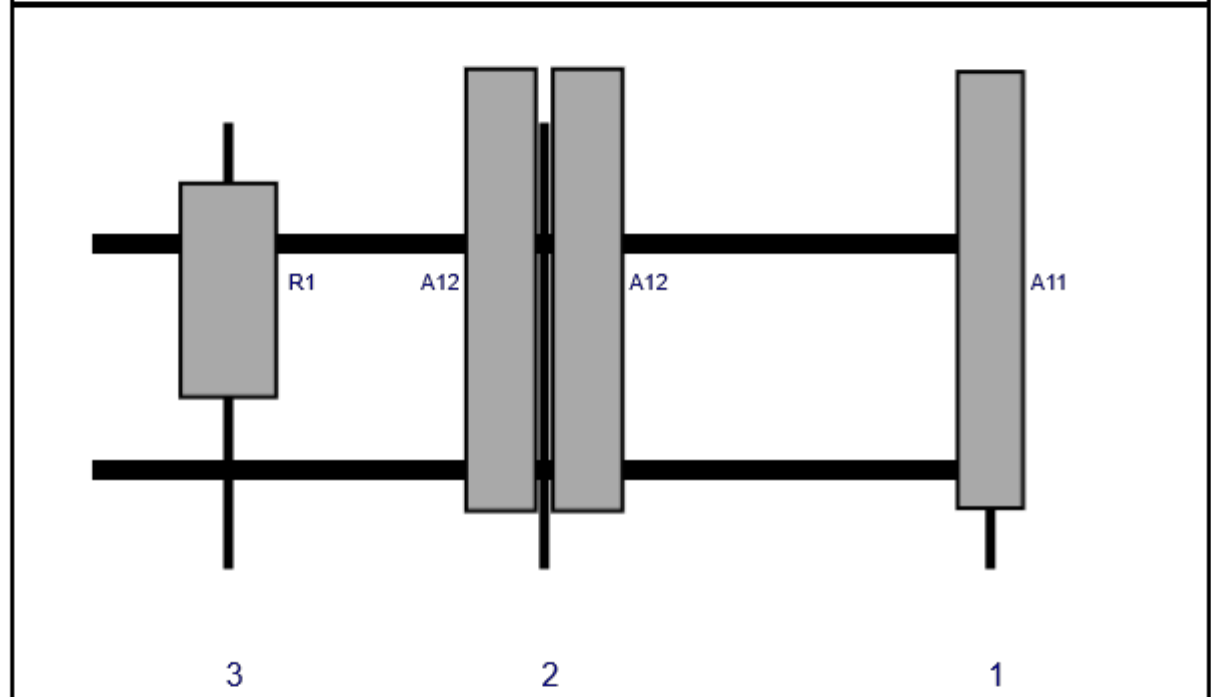
Sector: **A**

4/28/2021

Structure Type: Self Support

Mount Elev: 81.00

Page: 1

**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
A11	BXA-80063/6CF	71.1	11.2	145	1	a	Front	27	0	Retained	11/17/2020
A12	NHH-65B-R2B	72	11.9	73	2	a	Front	27	-7	Retained	11/17/2020
A12	NHH-65B-R2B	72	11.9	73	2	b	Front	27	7	Retained	11/17/2020
R1	MT6407-77A	35.1	16.1	22	3	a	Front	27	0	Added	

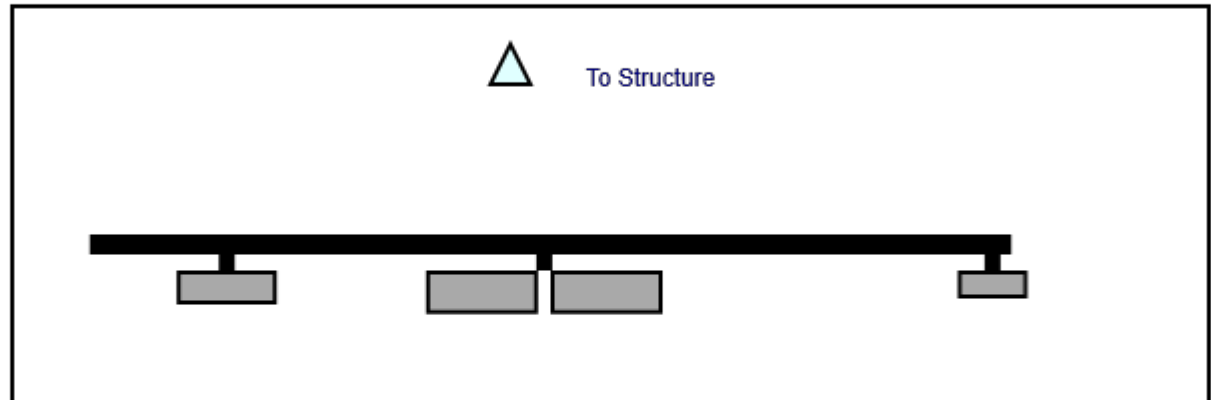
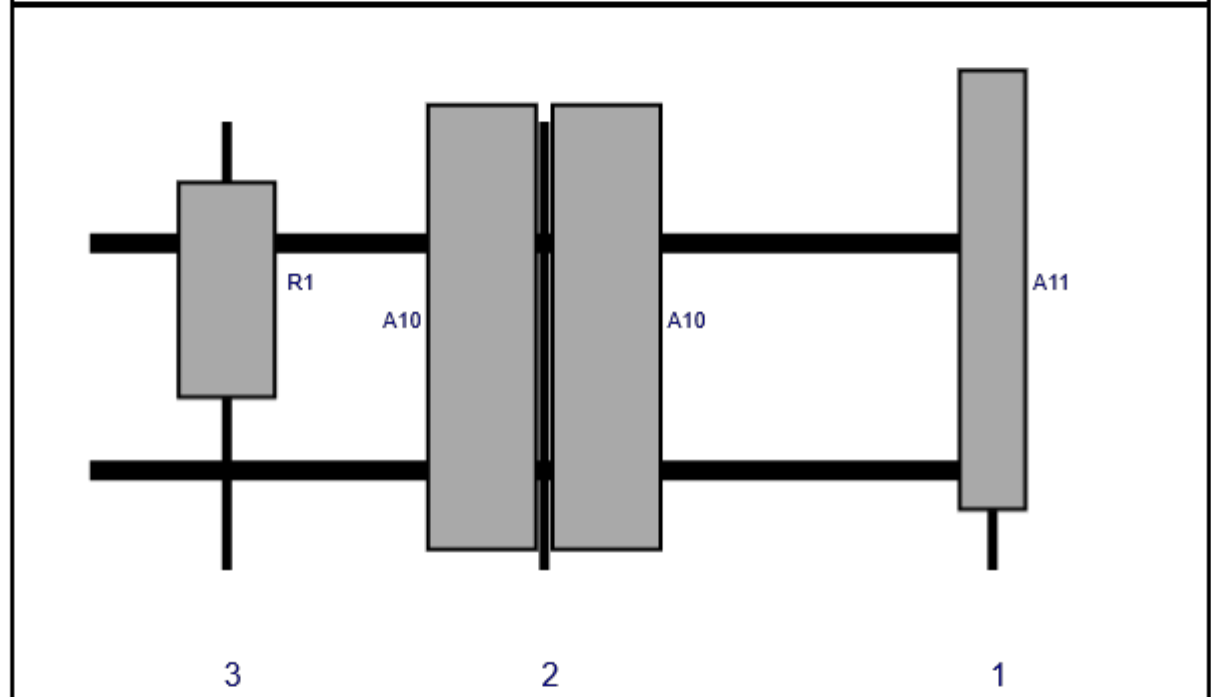
Sector: **B**

4/28/2021

Structure Type: Self Support

Mount Elev: 81.00

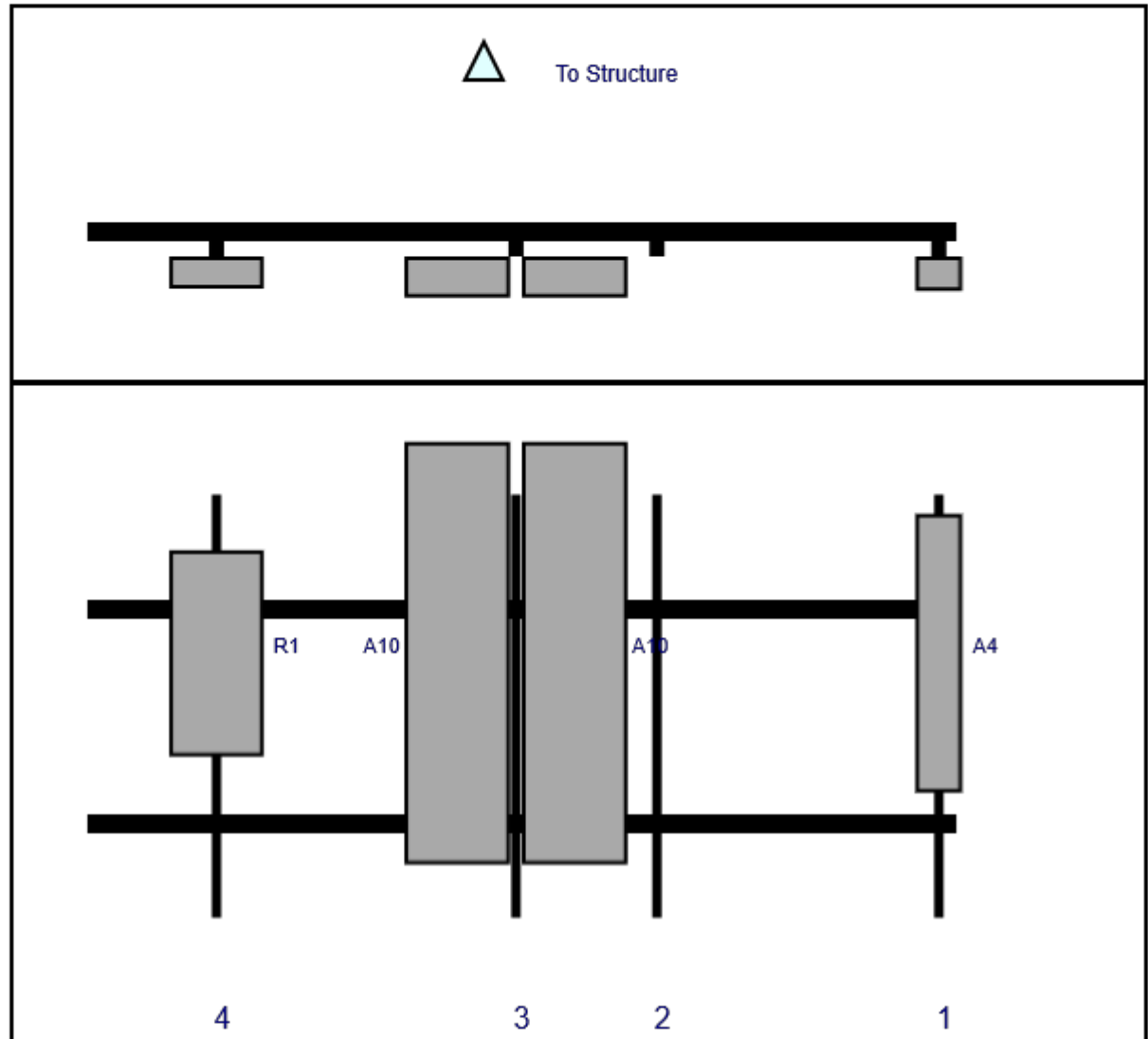
Page: 2

**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
A11	BXA-80063/6CF	71.1	11.2	145	1	a	Front	27	0	Retained	11/17/2020
A10	NHH-45B-R2B	72	18	73	2	a	Front	33	10	Retained	11/17/2020
A10	NHH-45B-R2B	72	18	73	2	b	Front	33	-10	Retained	11/17/2020
R1	MT6407-77A	35.1	16.1	22	3	a	Front	27	0	Added	



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
A4	BXA-80080-4CF-EDIN-X	47.5	8	145	1	a	Front	27	0	Retained	11/17/2020
A10	NHH-45B-R2B	72	18	73	3	a	Front	27	10	Retained	11/17/2020
A10	NHH-45B-R2B	72	18	73	3	b	Front	27	-10	Retained	11/17/2020
R1	MT6407-77A	35.1	16.1	22	4	a	Front	27	0	Added	

# Maser Consulting Connecticut

**Subject**

TIA-222-H Adoption and Wind Speed Usage

**Site Information**

Site ID: 468848-VZW / Redding CT  
Site Name: Redding CT  
Carrier Name: Verizon Wireless  
Address: 80 Lonetown Rd  
Redding, Connecticut 06896  
Fairfield County  
Latitude: 41.327833°  
Longitude: -73.383306°

**Structure Information**

Tower Type: 100-Ft Self Support  
Mount Type: 12.33-Ft T-Frame

To Whom It May Concern,

We respectfully submit the above referenced Antenna Mount Structural Analysis report in conformance with ANSI/TIA-222-H, Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures.

The 2015 International Building Code states that, in Section 3108, telecommunication towers shall be designed and constructed in accordance with the provisions of TIA-222. The TIA-222-H is the latest revision of the TIA-222 Standard, effective as of January 01, 2018.

As with all ANSI standards and engineering best practice is to apply the most current revision of the standard. This ensures the engineer is applying all updates. As an example, the TIA-222-H standard includes updates to bring it in line with the latest AISC and ACI standards and it also incorporates the latest wind speed maps by ASCE 7 based on updated studies of the wind data.

The TIA-222-H standard clarifies these specific requirements for the antenna mount analysis such as modeling methods, seismic analysis, 30-degree increment wind directions and maintenance loading. Therefore, it is our opinion that TIA-222-H is the most appropriate standard for antenna mount structural analysis and is acceptable for use at this tower site to ensure the engineer is taking into account the most current engineering standard available.

Sincerely,



## PROJECT NOTES

1. SEE MODIFICATION NOTES
2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITY COMPANIES OR OTHER PUBLIC/GOVERNING AUTHORITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
4. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE AS A RESULT OF CONSTRUCTION OF THIS FACILITY AT THE CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
6. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
7. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING THE BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND CONSTRUCTION DRAWINGS.
8. THE CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THESE DRAWINGS MUST BE VERIFIED. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
9. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY POTENTIALLY DANGEROUS EXPOSURE LEVELS.
10. NO NOISE, SMOKE, DUST OR ODOR WILL RESULT FROM THIS FACILITY AS TO CAUSE A NUISANCE.
11. THE FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION (NO HANDICAP ACCESS IS REQUIRED).

## PROJECT NOTES

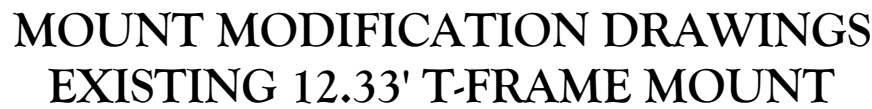
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CONSENT OF MASER CONSULTING



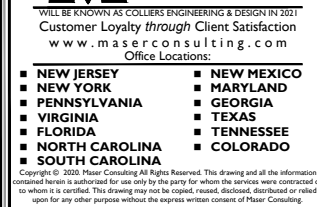
80 LONETOWN RD  
REDDING, CT 06896  
FAIRFIELD COUNTY

PROJECT INFORMATION	
<u>SITE INFORMATION</u>	
LATITUDE:	41.327833° N
LONGITUDE:	73.383306° W
JURISDICTION	FAIRFIELD COUNTY
<u>APPLICANT/LESSEE</u>	
COMPANY	VERIZON WIRELESS
<u>CLIENT REPRESENTATIVE</u>	
COMPANY	VERIZON WIRELESS
ADDRESS	118 FLANDERS ROAD, 3RD FLOOR
CITY, STATE, ZIP	WESTBOROUGH, MA 01518
CONTACT	ANDREW CANDIELLO
E-MAIL	ANDREW.CANDIELLO@VERIZONWIRELESS.COM
<u>PROJECT MANAGER</u>	
COMPANY	MASER CONSULTING
CONTACT	GREG DULNIK
PHONE	(615) 686-2575
E-MAIL	GDULNIK@MASERCONSULTING.COM

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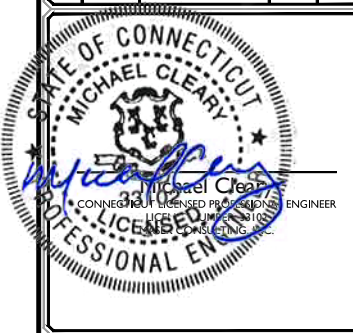
CONTRACTOR PMI REQUIREMENTS	
PMI LOCATION	<a href="https://pmi.vzwsmart.com">HTTPS://PMI.VZWSMART.COM</a>
SMART TOOL PROJECT #	10026445
VZW LOCATION CODE (PSLC)	468848
FUZE ID	16244644
PMI REQUIREMENTS EMBEDDED WITHIN MOUNT MODIFICATION REPORT	

REFERENCED DOCUMENTS	
FAILING MOUNT ANALYSIS REPORT	
SMART TOOL PROJECT #	10019484
MASER CONSULTING PROJECT #	20777382A
ANALYSIS DATE	12/01/2020



SCALE: AS SHOWN	JOB NUMBER: 20777382A
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0	12/31/2020	ISSUED FOR CONSTRUCTION	MSG	DX	
REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	


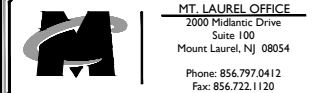


IT IS A VIOLATION OF LAW FOR ANY PERSON,  
UNLESS THEY ARE ACTING UNDER THE DIRECTION  
OF THE RESPONSIBLE LICENSED PROFESSIONAL  
ENGINEER, TO ALTER THIS DOCUMENT.

**SITE NAME:**  
**REDDING CT**  
**468848**  
**80 LONETOWN RD**  
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**FAIRFIELD COUNTY**

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2000 Midlantic Drive  
Suite 100  
Mount Laurel, NJ 08054  
Phone: 856.797.0412  
Fax: 856.722.1120

SHEET TITLE : TITLE SHEET

SHEET NUMBER : T-1

**NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.**

[illegible]

**NOTE: ALL MATERIALS REQUIRED FOR THE DESIGNED MODIFICATIONS BUT NOT LISTED IN THIS SHEET ARE ASSUMED TO BE PROVIDED BY THE CONTRACTOR**

VZWSMART KITS - APPROVED VENDORS	
COMMSCOPE	
CONTACT	SALVADOR ANGUIANO
PHONE	(817) 304-7492
EMAIL	SALVADOR.ANGUIANO@COMMSCOPE.COM
WEBSITE	WWW.COMMSCOPE.COM
METROSITE FABRICATORS, LLC	
CONTACT	KENT RAMEY
PHONE	(706) 335-7045 (O), (706) 982-9788 (M)
EMAIL	KENT@METROSITELLC.COM
WEBSITE	METROSITEFABRICATORS.COM
PERFECTVISION	
CONTACT	WIRELESS SALES
PHONE	(844) 887-6723
EMAIL	WWW.PERFECT-VISION.COM
WEBSITE	WIRELESSSALES@PERFECT-VISION.COM
SABRE INDUSTRIES, INC.	
CONTACT	ANGIE WELCH
PHONE	(866) 428-6937
EMAIL	AKWELCH@SABREINDUSTRIES.COM
WEBSITE	WWW.SABRESITESOLUTIONS.COM
SITE PRO 1	
CONTACT	PAULA BOSWELL
PHONE	(972) 236-9843
EMAIL	PAULA.BOSWELL@VALMONT.COM
WEBSITE	WWW.SITEPRO1.COM

NOTE: WHEN SPECIFIED, VZWSMART KITS SHALL BE REQUIRED AND WILL BE VERIFIED DURING THE DESKTOP PMI



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SHEET TITLE: BILL OF MATERIALS

SHEET NUMBER: S-I





MODIFICATION INSPECTION NOTES

MI CHECKLIST

CONSTRUCTION/ INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWING
X	EOR APPROVED SHOP DRAWINGS
NA	FABRICATION INSPECTION
NA	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	CONTRACTOR'S CERTIFIED WELD INSPECTION AND NDE REPORTS
X	ON SITE COLD GALVANIZING VERIFICATION
X	GC AS-BUILT DOCUMENTS
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	VZW PMI DOCUMENTS
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT REQUIRED FOR THE MI REPORT  
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER ( PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GC INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO EOR.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW THE FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH THE OWNER TO COORDINATE A REMEDIATION PLAN:

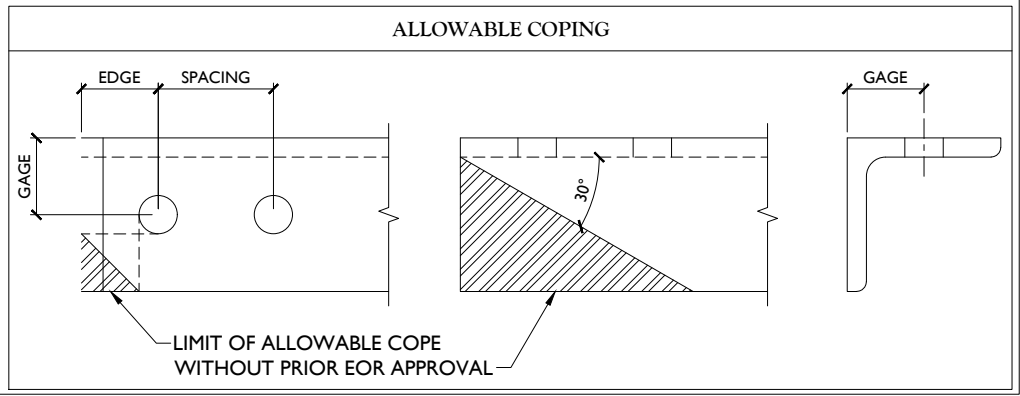
- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

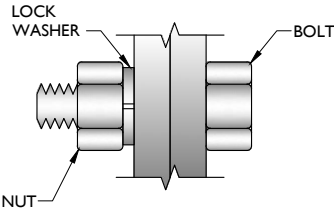
- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.



BOLT SCHEDULE (IN.)				
BOLT DIAMETER	STANDARD HOLE	SHORT SLOT	MIN. EDGE DISTANCE	SPACING
1/2	9/16	9/16 x 11/16	7/8	1 1/2
5/8	11/16	11/16 x 7/8	1 1/8	1 7/8
3/4	13/16	13/16 x 1	1 1/4	2 1/4
7/8	15/16	15/16 x 1 1/8	1 1/2	2 5/8
1	1 1/16	1 1/16 x 1 5/16	1 3/4	3

WORKABLE GAGES (IN.)	
LEG	GAGE
4	2 1/2
3 1/2	2
3	1 3/4
2 1/2	1 3/8
2	1 1/8



TYP. BOLT ASSEMBLY

NOTES:

- ALL DIMENSIONS REPRESENTED IN THE ABOVE TABLES ARE AISC MINIMUM REQUIREMENTS. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN FIELD AND NOTIFY ENGINEER IF DISTANCES ARE LESS THAN THOSE PROVIDED.
- THE DIMENSIONS PROVIDED ARE MINIMUM REQUIREMENTS. ACTUAL DIMENSIONS OF PROPOSED MEMBERS WITHIN THESE DRAWINGS MAY VARY FROM THE AISC MINIMUM REQUIREMENTS.
- SHORT SLOT HOLES SHALL ONLY BE USED WHEN DEPICTED IN THE DRAWINGS
- MATCH EXISTING GAGES WHEN APPLICABLE, UNLESS MINIMUM EDGE DISTANCES ARE COMPROMISED.

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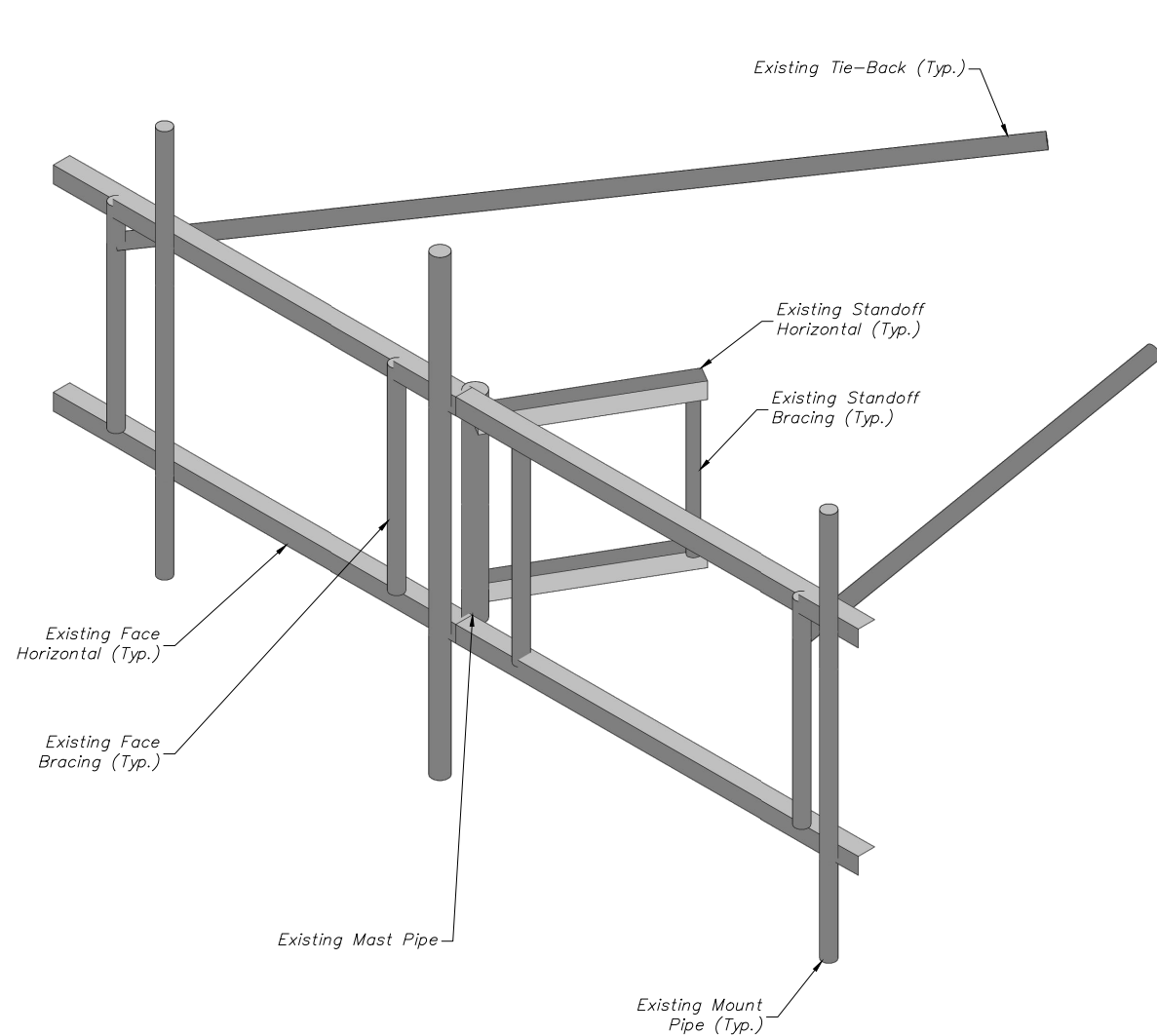
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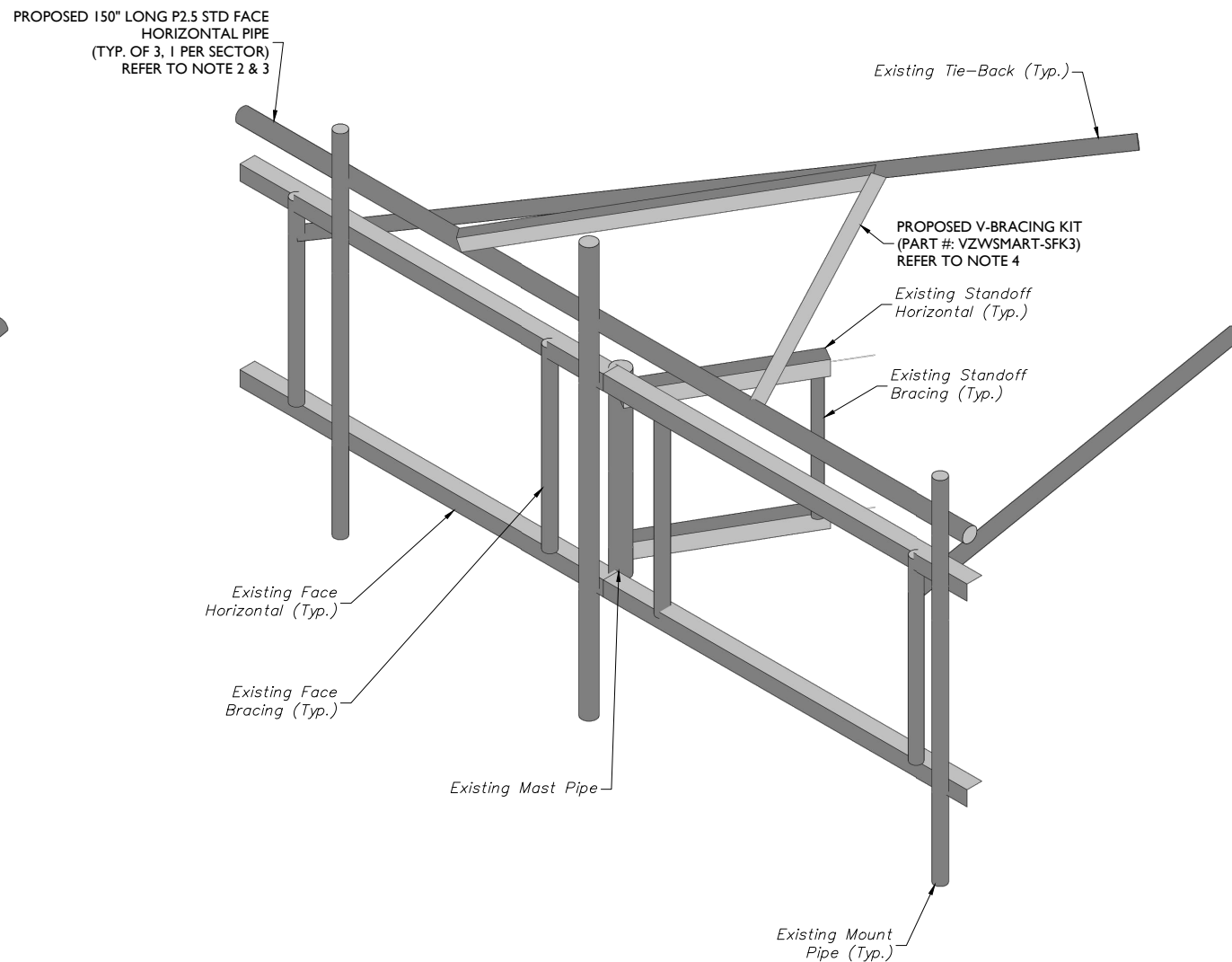
SHEET TITLE:  
MODIFICATION NOTES

SHEET NUMBER:  
S-3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



1 EXISTING FRAME ISOMETRIC VIEW (TYP. ALL SECTORS)  
SCALE : N.T.S.



2 PROPOSED FRAME ISOMETRIC VIEW (TYP. ALL SECTORS)  
SCALE : N.T.S.

STRUCTURAL NOTES:

1. PER THE MOUNT MAPPING COMPLETED BY TOWER ENGINEERING PROFESSIONALS ON 11/17/20, THE CLIMBING FACILITIES UP TO THE VERIZON MOUNT ELEVATION (89'-0") ARE IN GOOD CONDITION. MASER DOES NOT WARRANT THIS INFORMATION.
2. INSTALL SHALL NOT CAUSE HARM TO THE STRUCTURE, CLIMBING FACILITY, SAFETY CLIMB, OR ANY SYSTEM INSTALLED ON THE STRUCTURE. TIMELY NOTICE AND DOCUMENTATION SHALL BE PROVIDED BY CONTRACTORS TO THE EOR (OF STRUCTURAL DESIGN) IF AN OBSTRUCTION WAS REQUIRED TO MEET THE RF SYSTEM DESIGN REQUIREMENTS AND PERFORMANCES.

MODIFICATION NOTES:

1. MOUNT MEMBERS NOT SHOWN FOR CLARITY U.N.O.
2. RADIO AND/OR TME POSITIONS SHALL BE ADJUSTED VERTICALLY AS NEEDED IN ORDER TO ACHIEVE INSTALLATION OF HORIZONTAL AS SHOWN. EOR SHALL BE NOTIFIED IF EQUIPMENT NEEDS TO BE RELOCATED TO ANOTHER MOUNT PIPE.
3. CONNECT NEW HORIZONTAL TO ALL EXISTING VERTICAL MOUNT PIPES WITH CROSSOVER PLATES (PART #: VZWSMART-MSK1).
4. TRIM ANGLE MEMBERS AS REQUIRED FOR INSTALLATION.

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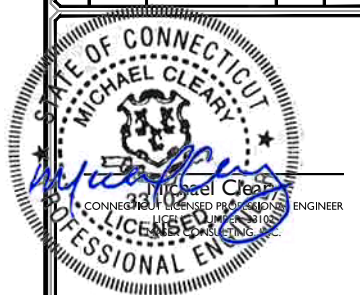
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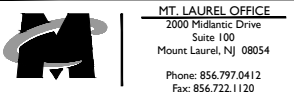


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MODIFICATION DETAILS

SHEET NUMBER : S-4







MOUNT PHOTO 1



MOUNT PHOTO 2



MOUNT PHOTO 3



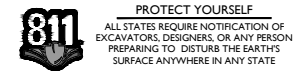
MOUNT PHOTO 4



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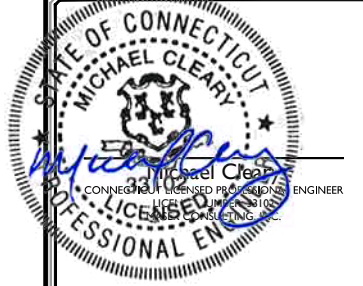


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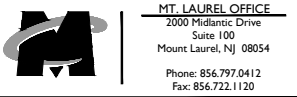


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SHEET TITLE : MOUNT PHOTOS

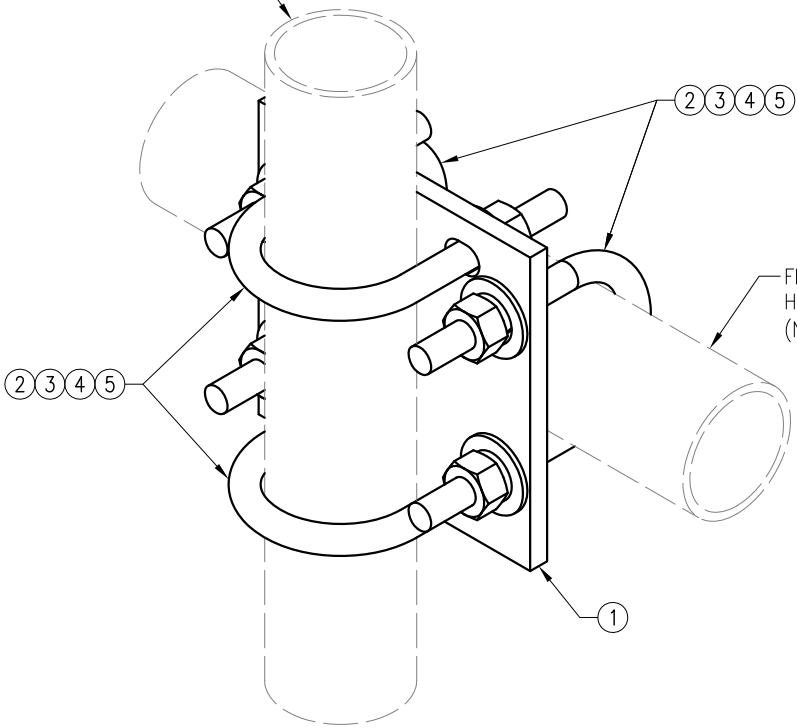
SHEET NUMBER : S-6

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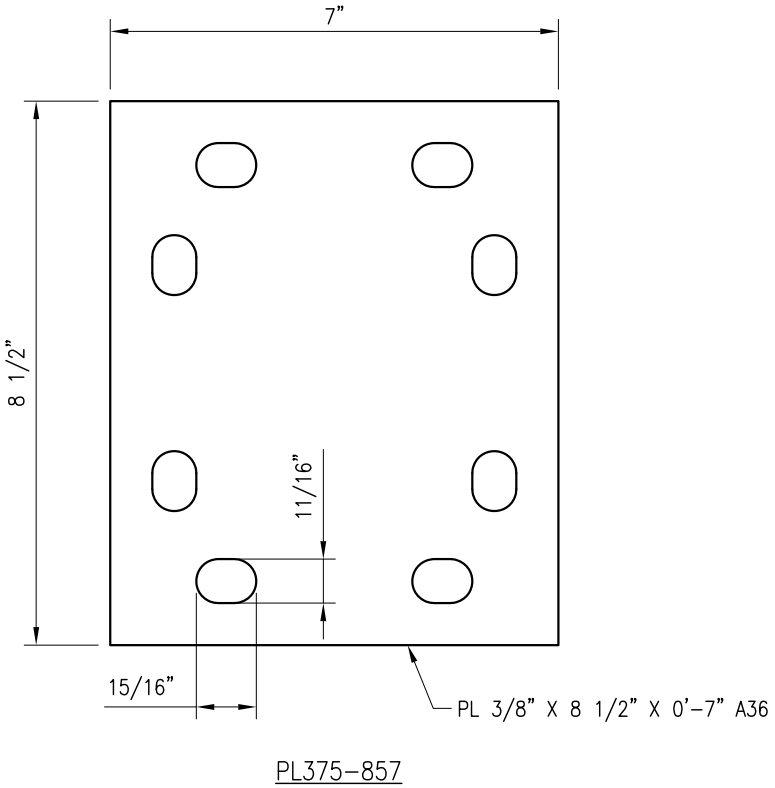




FITS 2.375" O.D. AND 2.875" O.D.  
VERTICAL PIPE.  
(NOT INCLUDED IN THIS KIT)



FITS 2.375" O.D. AND 2.875" O.D.  
HORIZONTAL PIPE.  
(NOT INCLUDED IN THIS KIT)



NOTES:  
1. HOT-DIPPED GALVANIZED PER ASTM A123.

VZWSMART-MSK1 (CROSSOVER PLATE)					
ITEM NO.	QTY.	PART NO.	DESCRIPTION	SHEET #	WT
1	1	PL375-857	PL 3/8" X 8 1/2" X 0'-7" A36	MSK1-F1	6
2	4	MS02-625-300-500	RU-BOLT 5/8" X 3" I.W. X 5" I.L. A36 (OR EQUIV.)	RBC-1	5
3	8	FW-625	5/8" HDG USS FLAT WASHER	---	1
4	8	LW-625	5/8" HDG LOCK WASHER	---	0
5	8	NUT-625	5/8" HDG HEX NUT	---	1
GALVANIZED WT					14

DRAWN BY: H.R

CHECKED BY: HMA

REV.	DESCRIPTION	BY	DATE
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SHEET TITLE:

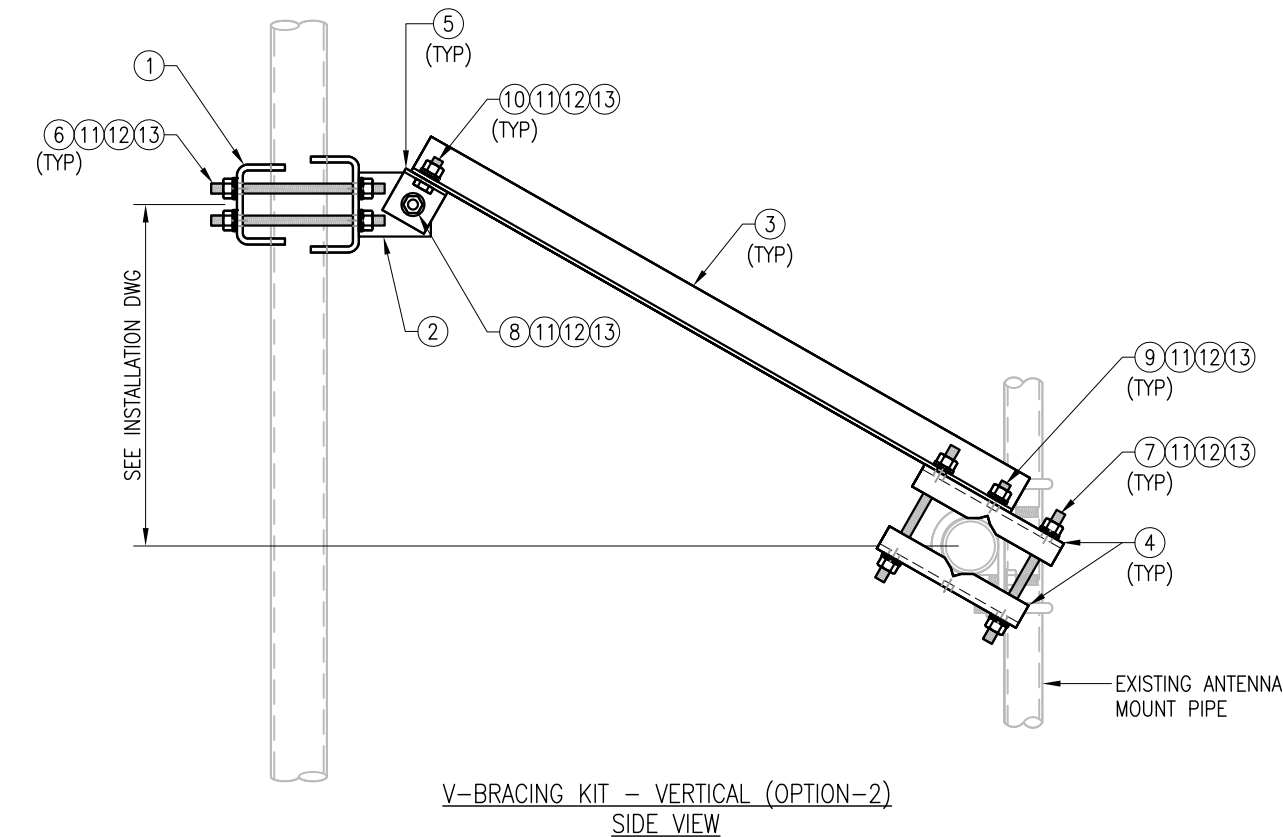
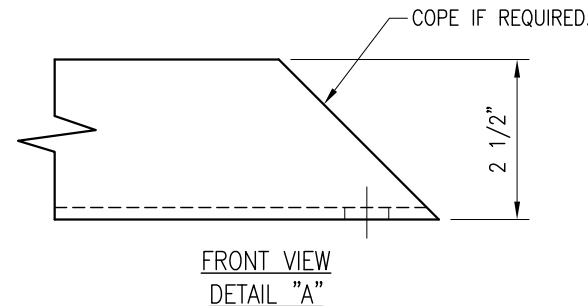
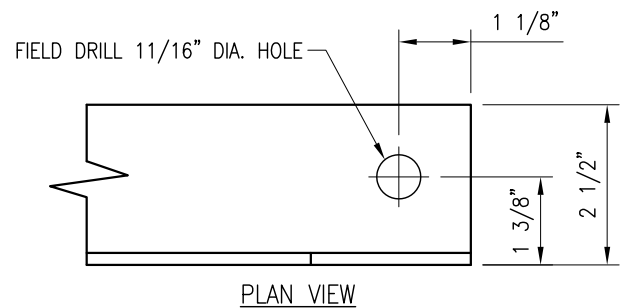
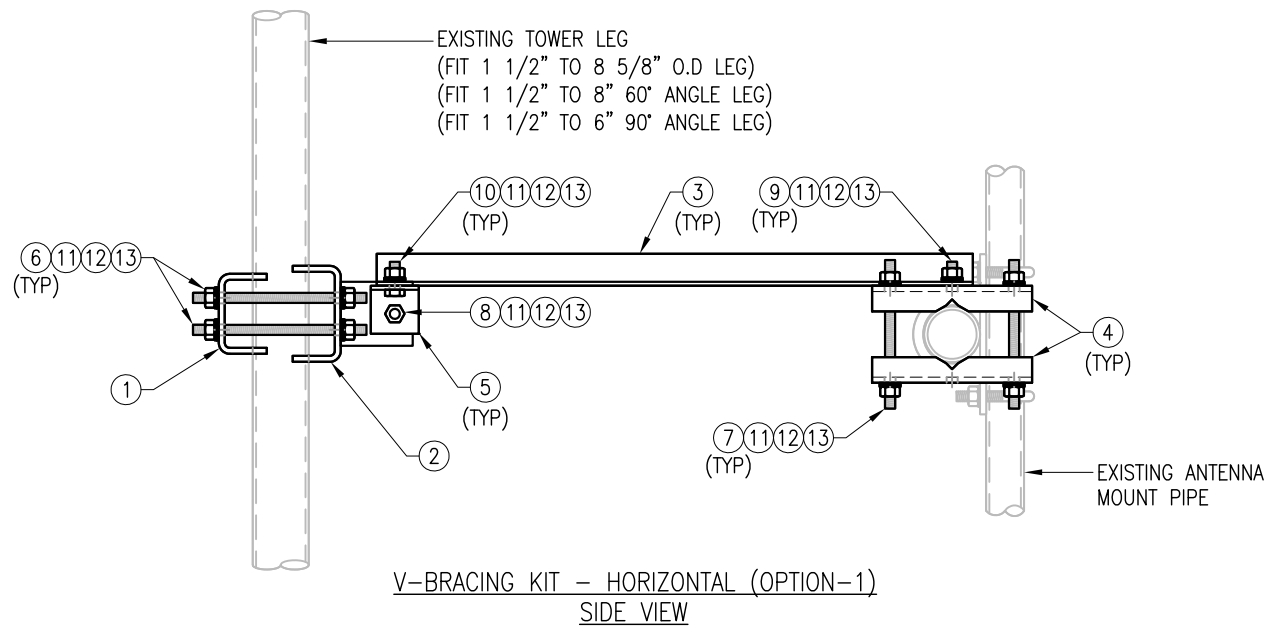
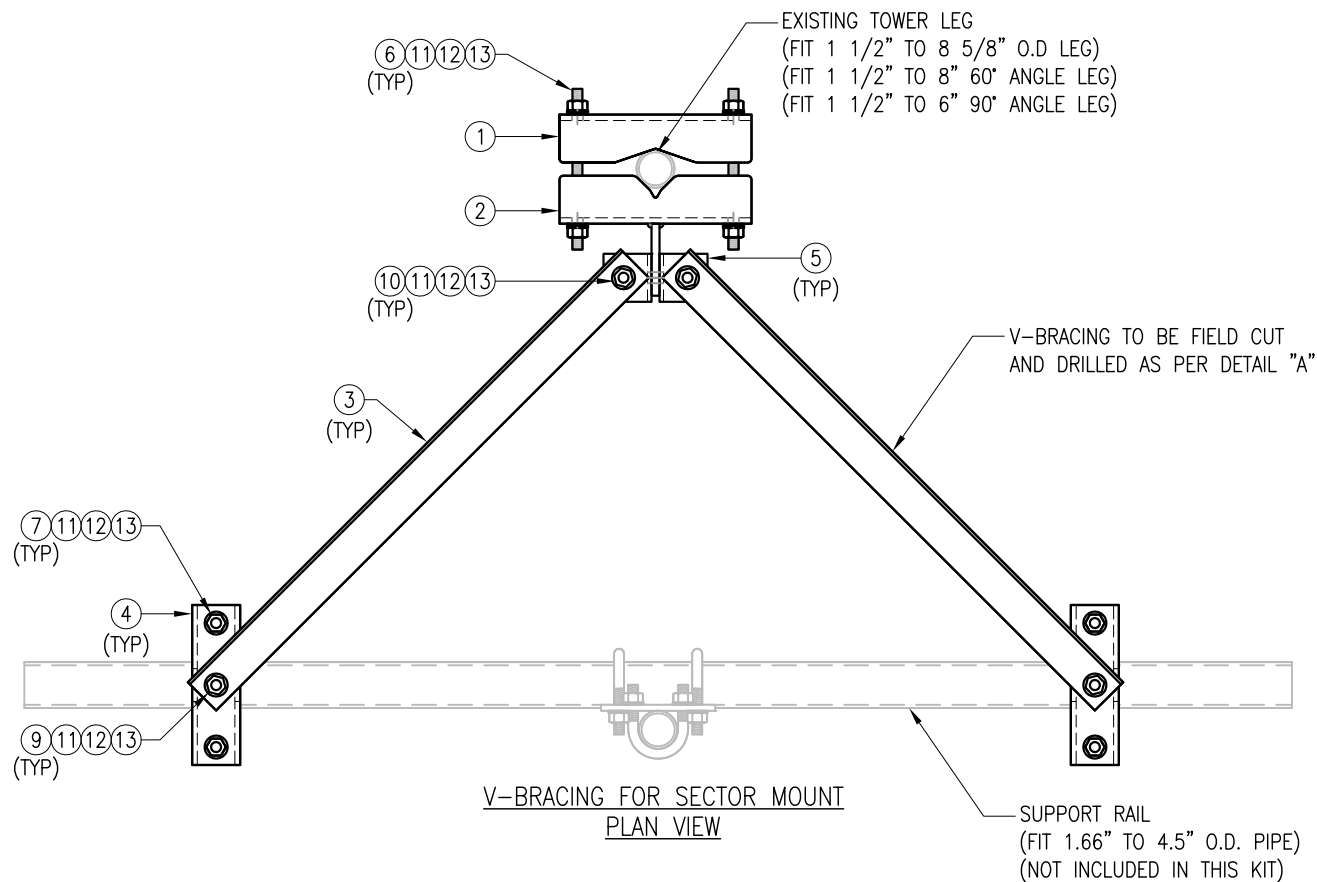
VZWSMART-MSK1  
CROSSOVER PLATE

SHEET NUMBER:

VZWSMART-MSK1

REV #:

0



VZWSMART-SFK3 (V-BRACING KIT)					
ITEM NO.	QTY.	PART NO.	DESCRIPTION	SHEET #	WT
1	1	BP9625-12	PL 3/8" X 9 5/8" X 1'-0" A36 BENT PLATE	VBSM-F1	12
2	1	BRKW-VBSM	WELDMENT BRACKET	VBSM-F3	16
3	2	L252525-8	L 2 1/2" X 2 1/2" X 1/4" X 8'-0" A36	VBSM-F5	67
4	4	BP6875-10	PL 3/8" X 6 7/8" X 10" A36 BENT PLATE	VBSM-F2	20
5	2	AL-333	L 3" X 3" X 1/4" X 3" A36	VBSM-F2	3
6	4	---	THREADED ROD 5/8" DIA. X 1'-6" F1554-36 HDG	---	---
7	4	---	THREADED ROD 5/8" DIA. X 10" F1554-36 HDG	---	---
8	1	---	BOLT 5/8" X 2 1/4" A325	---	---
9	2	---	BOLT 5/8" X 2" A325	---	---
10	2	---	BOLT 5/8" X 1 3/4" A325	---	---
11	21	FW-625	5/8" HDG USS FLAT WASHER	---	2
12	21	LW-625	5/8" HDG LOCK WASHER	---	0
13	21	NUT-625	5/8" HDG HEX NUT	---	2
GALVANIZED WT					122

NOTES:  
1. HOT-DIPPED GALVANIZED PER ASTM A123.

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