Washoe County

BLACK & VEATCH Corporation
6800 W. 115th St., Suite 2292
Overland Park, KS 66211

September 15, 2017

STRUCTURAL MODIFICATION REPORT

Washoe County Designation:	Site Name:	Slide Mountain
Site Information:	Address:	Atop Slide Mountain, off Rt. 431, Approx. 6 miles west of New Washoe City, Washoe County, NV 89704
	Description:	120' Self Support Tower
Applicable Codes:		TIA-222-G 2012 IBC 2012 Northern Nevada Amendments

Black & Veatch is pleased to submit this Structural Analysis Report to determine the structural integrity of the aforementioned tower. The purpose of the analysis is to determine the suitability of the tower with the existing and proposed loading configuration detailed in the analysis report.

A **Structural Analysis with Mod Design** was performed. Based on the analysis, the tower **does comply** with TIA-222-G standards for antenna supporting structures. Therefore, the existing tower is deemed **sufficient** for the proposed loads.

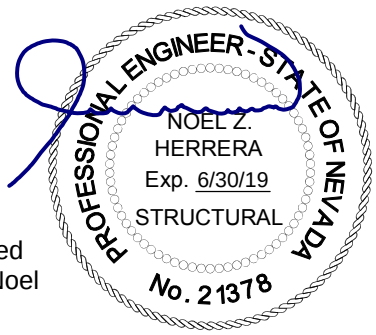
We at Black & Veatch appreciate the opportunity to provide our professional services to Washoe County. If you have any questions or need further assistance please contact us.

Analysis Results

Tower Stress Level with Proposed Equipment:	**92.8%**	**Pass**
Foundation Ratio with Proposed Equipment:	**76.0%**	**Pass**

***The results of this analysis are only valid if the county continues to monitor and inspect the leg thicknesses yearly. The leg thicknesses shall not be less than 1/16" less than the original design thickness.**

Sincerely,
Black & Veatch Corporation



Analysis Prepared by: Hyun D. Kim

Analysis Reviewed by: Noel Z. Herrera, S.E.

Digitally signed by Herrera, Noel
Date: 2017.09.15 13:08:33-05'00'

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TOWER LOADING

Existing loading

Antenna					Mount		Coax and Lines	
Carrier	Mount Height (ft)	RAD CL (ft)	Quantity	Model / Description	Quantity	Type	Quantity	Size
Washoe County	120.0	126.0	1	12' Omni	1	Pipe Mount	2 2	7/8" 1/2"
		125.0	1	10' Omni	1	Pipe Mount		
		122.0	1	4' Omni	1	Pipe Mount		
	118.0	118.0	1	12"x6" TMA	-	-	-	-
	112.0	112.0	1	Andrew 4' HP Dish	1	Pipe Mount	1	1-1/4"
	100.0	104.0	2	8' Omni	3	Stand Off	3	1-5/8"
		102.0	1	4' Omni				
	86.0	88.0	1	Ice Shield	1	Pipe Mount	1	1-1/4"
		84.0	1	6' Dish w/Radome				
	76.5	79.0	1	Ice Shield	1	Pipe Mount	1	E60
		74.0	1	RFS UXA8-59B				
	60.0	66.0	1	12' Omni	3	Stand Off	3	7/8"
		64.0	1	8' Omni				
		62.5	1	5' Omni				
	48.5	51.0	1	Ice Shield	1	Pipe Mount	1	E60
		46.0	1	RFS UXA8-59B				
	37.0	39.0	1	Ice Shield	1	Pipe Mount	1	E60
		35.0	1	RFS PAD6-65				
	31.5	33.0	1	Ice Shield	1	Pipe Mount	1	1-1/4"
		30.0	1	RFS 4' HP Dish				
	17.0	20.0	1	Ice Shield	1	Pipe Mount	1 1	1/4" 3/8"
		17.0	1	Yagi				
		14.0	1	2' Dish w/Radome				

MATERIAL STRENGTH

Capacity of the structural members is based on theoretical values obtained from the design structural and shown in the table below:

Member Type	Yield Strength
Legs	35 ksi
Diagonals/Horizontals	36 ksi
Bolts	A325X
Anchor Bolts	36 ksi

REFERENCE DOCUMENTS

Existing and Current conditions of tower, foundation, and site loading information are based on the following table.

Document Title	Description
Structural Analysis by Black & Veatch , dated 07/11/2017	Previous Structural Analysis and Loading Data
Leg Scoping Report by Tower Engineering Professionals, Inc., dated 08/18/2017	Tower Leg Inspection Report
Magnetic Particle Inspection of Existing Flange to Leg Welds Report by Tower Engineering Professionals, Inc., dated 08/16/2017	Non-Destructive Testing Inspection
Tower Mapping Report by Black & Veatch, dated 06/30/2017	Loading Data
Tower Drawing by Tower Structures, dated 05/18/2000	Tower Geometry Data
Foundation Drawing by Tower Structures, dated 05/18/2000	Foundation and Geotechnical Data

ASSUMPTIONS, DISCLAIMERS, AND NOTES

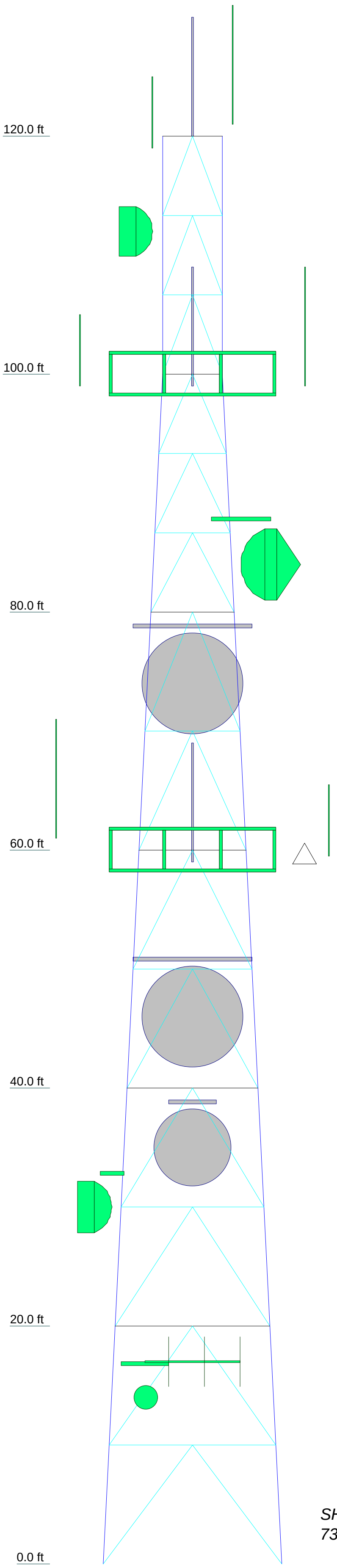
1. This analysis was performed under the assumption that all information provided to Black & Veatch is current and correct. This is to include site data, existing appurtenance loading, tower/foundation details, and geotechnical data. If this information is not current and correct, this report should be considered obsolete and further analysis will be required.
2. This analysis assumes that the tower structural components and mounts, including all steel sections and attachment hardware, are in good working order and in their original state, free of rust or other forms of corrosion. Furthermore, it is assumed that the tower and the tower foundation have been properly maintained and monitored since the time of construction. This report should be considered obsolete and further analysis will be required if the tower and/or foundation does not meet all of the above specifications.
3. This analysis assumes that all existing and/or proposed equipment's mounts on the tower will have adequate capacity to support the existing and proposed equipment loading.
4. The existing tower has been analyzed with applicable seismic loading taken into consideration. Seismic loading considerations are based on the codes criteria for this tower's jurisdiction.

RECOMMENDATIONS/COMMENTS

The tower and its foundation will have sufficient capacity to carry the proposed load after proper installation of the reinforcements shown in Appendix A.

APPENDIX A
TNX TOWER OUTPUT & ADDITIONAL CALCULATIONS

Section	T1	T2	T3	T4	T5	T6	
Legs	P2.5x.203	P3.5x.226	P6x.28	P8x.322	P10x.365	P12x.375	
Leg Grade	A53-B-35						
Diagonals	2L3x3x3/16x3/8	L3x3x1/4	2L3x3x1/4x3/8		2L3x3x3/8x3/8		
Diagonal Grade	A36						
Top Girts	L2x2x3/16	L2 1/2x2 1/2x3/16	L3x3x3/16		L3 1/2x3 1/2x1/4	2L3 1/2x3 1/2x1/4x3/8	
Horizontals	L2x2x3/16	L2 1/2x2 1/2x3/16	L3x3x3/16	2L3x3x3/16x3/8	2L3 1/2x3 1/2x1/4x3/8		
Face Width (ft)	5	7	9	11	13	15	
# Panels @ (ft)	6 @ 6.66667		8 @ 10				
Weight (K)	1.5	1.4	2.7	3.5	5.3	6.3	20.8



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Pipe Mount [PM 601-3] (Washoe County - Existing)	120	4" Dia 12' Omni (Washoe County - Existing)	60
3" Dia 10' Omni (Washoe County - Existing)	120	3" Dia 8' Omni (Washoe County - Existing)	60
3" Dia 12' Omni (Washoe County - Existing)	120	Side Arm Mount [8' SO 308-3] (Washoe County - Existing)	60
3" Dia 4' Omni (Washoe County - Existing)	120	3" Dia 5' Omni (Washoe County - Existing)	60
6' x 4-1/2" Horizontal Pipe (Existing)	118	Pipe Mount [PM 602-1] (Washoe County - Existing)	48.5
12"x6" TMA (Washoe County - Existing)	118	MD-S8 (for 8' MW) : Ice Shield (Washoe County - Existing)	48.5
6' x 4-1/2" Horizontal Pipe (Existing)	115	UXA8-59B (Washoe County - Existing)	48.5
6' x 4-1/2" Horizontal Pipe (Existing)	112	12' x 4-1/2" Horizontal Pipe (Existing)	38
Pipe Mount [PM 601-1] (Washoe County - Existing)	112	12' x 4-1/2" Horizontal Pipe (Existing)	38
Andrew 4' HP Dish (Washoe County - Existing)	112	Pipe Mount [PM 602-1] (Washoe County - Existing)	37
Side Arm Mount [8' SO 308-3] (Washoe County - Existing)	100	MD-SQ4 (4ft sq) : Ice Shield (Washoe County - Existing)	37
3" Dia 8' Omni (Washoe County - Existing)	100	PAD6-65 (Washoe County - Existing)	37
3" Dia 8' Omni (Washoe County - Existing)	100	MD-SQ4 (4ft sq) : Ice Shield (Washoe County - Existing)	31.5
3" Dia 4' Omni (Washoe County - Existing)	100	Pipe Mount [PM 602-1] (Washoe County - Existing)	31.5
Pipe Mount [PM 602-1] (Washoe County - Existing)	86	RFS 4' HP Dish (Washoe County - Existing)	31.5
MD-S6 (for 6' MW) : Ice Shield (Washoe County - Existing)	86	MD-SQ4 (4ft sq) : Ice Shield (Washoe County - Existing)	17
6' Dish w/Radome (Washoe County - Existing)	86	Yagi (small) (Washoe County - Existing)	17
Stiffener Plate at elevation 80'	80	Pipe Mount [PM 602-1] (Washoe County - Existing)	17
Stiffener Plate at elevation 80'	80	2' Dish w/Radome (Washoe County - Existing)	17
Stiffener Plate at elevation 80'	80	Stiffener Plate at elevation 0'	0
Pipe Mount [PM 602-1] (Washoe County - Existing)	76.5	Stiffener Plate at elevation 0'	0
MD-S8 (for 8' MW) : Ice Shield (Washoe County - Existing)	76.5	Stiffener Plate at elevation 0'	0
UXA8-59B (Washoe County - Existing)	76.5		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	60 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Washoe County, Nevada.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 108 mph basic wind in accordance with the TIA-222-G Standard.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 5 with Crest Height of 3896.00 ft
7. TOWER RATING: 92.8%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 339 K
SHEAR: 42 K

UPLIFT: -304 K
SHEAR: 39 K

AXIAL
36 K

SHEAR
73 K

MOMENT
4243 kip-ft

TORQUE 35 kip-ft
REACTIONS - 108 mph WIND

BLACK & VEATCH
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Job: **SLIDE MOUNTAIN**			
Project: **SLIDE MOUNTAIN**			
Client: Washoe County	Drawn by: Hyun D. Kim		App'd:
Code: TIA-222-G	Date: 09/15/17		Scale: NTS
Path:			Dwg No. E-1

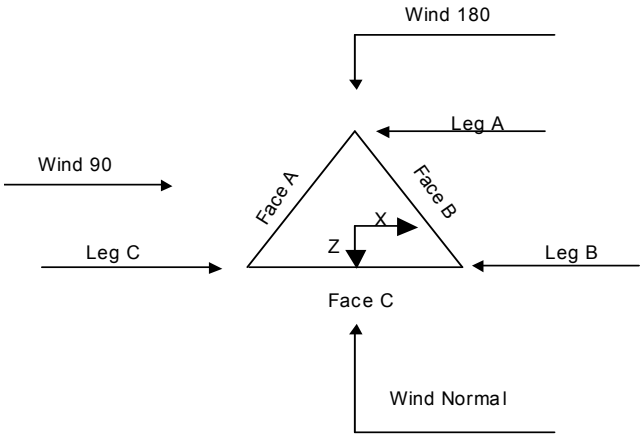
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 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 5.00 ft at the top and 15.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Washoe County, Nevada.
Basic wind speed of 108 mph.
Structure Class II.
Exposure Category C.
Topographic Category 5.
Crest Height 3896.00 ft.
SEAW RSM-03 procedures for wind speed-up calculations are used.
Topographic Feature: Hill.
Slope Distance L: 11932.80 ft.
Distance from Crest x: 490.00 ft.
Deflections calculated using a wind speed of 60 mph.
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.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	√ SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	√ Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	120.00-100.00			5.00	1	20.00
T2	100.00-80.00			5.00	1	20.00
T3	80.00-60.00			7.00	1	20.00
T4	60.00-40.00			9.00	1	20.00
T5	40.00-20.00			11.00	1	20.00
T6	20.00-0.00			13.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	120.00-100.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T2	100.00-80.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T3	80.00-60.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T4	60.00-40.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T5	40.00-20.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T6	20.00-0.00	10.00	K Brace Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 120.00-100.00	Pipe	P2.5x.203	A53-B-35 (35 ksi)	Double Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T2 100.00-80.00	Pipe	P3.5x.226	A53-B-35 (35 ksi)	Equal Angle	L3x3x1/4	A36 (36 ksi)
T3 80.00-60.00	Pipe	P6x.28	A53-B-35 (35 ksi)	Double Equal Angle	2L3x3x1/4x3/8	A36 (36 ksi)
T4 60.00-40.00	Pipe	P8x.322	A53-B-35 (35 ksi)	Double Equal Angle	2L3x3x1/4x3/8	A36 (36 ksi)
T5 40.00-20.00	Pipe	P10x.365	A53-B-35 (35 ksi)	Double Equal Angle	2L3x3x3/8x3/8	A36 (36 ksi)
T6 20.00-0.00	Pipe	P12x.375	A53-B-35 (35 ksi)	Double Equal Angle	2L3x3x3/8x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 120.00-100.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T2 100.00-80.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T3 80.00-60.00	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T4 60.00-40.00	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T5 40.00-20.00	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T6 20.00-0.00	Double Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T2 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T4 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Double Angle	2L3x3x3/16x3/8	A36 (36 ksi)
T5 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x3/8	A36 (36 ksi)
T6 20.00-0.00	None	Flat Bar		A36	Double Angle	2L3 1/2x3 1/2x1/4x3/8	A36

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
				(36 ksi)			(36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 120.00-100.00	0.00	0.3750	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T2 100.00-80.00	0.00	0.3750	A36 (36 ksi)	1.05	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T3 80.00-60.00	0.00	0.3750	A36 (36 ksi)	1.05	1	1.05	31.0000	Mid-Pt	Mid-Pt
T4 60.00-40.00	0.00	0.3750	A36 (36 ksi)	1.05	1	1.05	32.0000	Mid-Pt	Mid-Pt
T5 40.00-20.00	0.00	0.3750	A36 (36 ksi)	1.05	1	1.05	33.5000	Mid-Pt	Mid-Pt
T6 20.00-0.00	0.00	0.3750	A36 (36 ksi)	1.05	1	1.05	35.0000	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T6 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 120.00-100.00	Flange	0.6250 A325X	4	0.6250 A325X	1	0.6250 A325X	1	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	1	0.6250 A325N	0
T2 100.00-80.00	Flange	0.6250 A325X	4	0.7500 A325X	1	0.7500 A325X	1	0.6250 A325X	0	0.6250 A325N	0	0.7500 A325X	1	0.6250 A325N	0
T3 80.00-60.00	Flange	0.8750 A325X	4	0.8750 A325X	1	0.8750 A325X	1	0.6250 A325X	0	0.6250 A325N	0	0.8750 A325X	1	0.6250 A325N	0
T4 60.00-40.00	Flange	0.8750 A325X	6	0.8750 A325X	1	0.8750 A325X	1	0.6250 A325X	0	0.6250 A325N	0	0.8750 A325X	1	0.6250 A325N	0
T5 40.00-20.00	Flange	1.1250 A325X	6	0.8750 A325X	1	0.8750 A325X	1	0.6250 A325X	0	0.6250 A325N	0	0.8750 A325X	1	0.6250 A325N	0
T6 20.00-0.00	Flange	1.7500 A36	0	0.8750 A325X	1	0.8750 A325X	1	0.6250 A325X	0	0.6250 A325N	0	0.8750 A325X	1	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Climbing Ladder (Af) (Existing)	A	No	Af (CaAa)	120.00 - 0.00	0.0000	0	1	1	3.0000	3.0000		8.40
Safety Line 3/8 (Existing)	A	No	Ar (CaAa)	120.00 - 0.00	0.0000	0	1	1	0.3750	0.3750		0.22
Feedline Ladder (Af) (Existing) ***	C	No	Af (CaAa)	120.00 - 0.00	-1.5000	0	2	1	3.0000	3.0000		8.40
(2) (7/8) + (2) (1/2) (Washoe County -	C	No	Ar (CaAa)	120.00 - 8.00	1.0000	0.1	4	2	0.5000	1.0300		0.33

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Existing) ***												
LDF6-50A(1-1/4") (Washoe County - Existing) ***	C	No	Ar (CaAa)	112.00 - 8.00	0.0000	0	1	1	0.5000	1.5500		0.66
LDF7-50A(1-5/8") (Washoe County - Existing)	C	No	Ar (CaAa)	100.00 - 8.00	0.0000	0.05	2	2	0.5000	1.9800		0.82
LDF7-50A(1-5/8") (Washoe County - Existing) ***	C	No	Ar (CaAa)	100.00 - 8.00	0.0000	0.05	1	1	0.5000	1.9800		0.82
LDF6-50A(1-1/4") (Washoe County - Existing)	C	No	Ar (CaAa)	86.00 - 31.50	1.0000	0.05	1	1	0.5000	1.5500		0.66
LDF6-50A(1-1/4") (Washoe County - Existing) ***	C	No	Ar (CaAa)	31.50 - 8.00	1.5000	0.05	2	2	0.5000	1.5500		0.66
E60 (Washoe County - Existing) ***	C	No	Ar (CaAa)	76.50 - 8.00	1.0000	0.08	1	1	0.5000	2.2000		1.10
LDF5-50A(7/8") (Washoe County - Existing) ***	C	No	Ar (CaAa)	60.00 - 8.00	0.0000	0	3	3	0.5000	1.0900		0.33
E60 (Washoe County - Existing)	C	No	Ar (CaAa)	48.50 - 37.00	-1.0000	0.1	1	1	0.5000	2.2000		1.10
E60 (Washoe County - Existing) ***	C	No	Ar (CaAa)	37.00 - 8.00	-1.0000	0.1	2	2	0.5000	2.2000		1.10
(1) (1/4") + (1) (3/8) (Washoe County - Existing)	C	No	Ar (CaAa)	17.00 - 8.00	0.0000	0.4	2	2	0.4400	0.4400		0.08

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-100.00	A	0.000	0.000	10.750	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	30.100	0.000	0.37
T2	100.00-80.00	A	0.000	0.000	10.750	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	44.150	0.000	0.43
T3	80.00-60.00	A	0.000	0.000	10.750	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	49.950	0.000	0.46
T4	60.00-40.00	A	0.000	0.000	10.750	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	59.130	0.000	0.49
T5	40.00-20.00	A	0.000	0.000	10.750	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	67.183	0.000	0.53
T6	20.00-0.00	A	0.000	0.000	10.750	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	50.288	0.000	0.46

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	120.00-100.00	-0.8048	1.5783	-1.4012	1.3356
T2	100.00-80.00	-0.8675	2.3162	-1.3811	2.1561
T3	80.00-60.00	-1.0563	2.9894	-1.6052	2.8068
T4	60.00-40.00	-1.1722	3.7846	-1.7265	3.6012
T5	40.00-20.00	-1.3866	4.4695	-1.9494	4.2783
T6	20.00-0.00	-1.4494	3.8685	-2.1227	3.5314

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Climbing Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T1	2	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T1	3	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T1	5	(2) (7/8) + (2) (1/2)	100.00 - 120.00	0.6000	0.6000
T1	8	LDF6-50A(1-1/4")	100.00 - 112.00	0.6000	0.6000
T2	1	Climbing Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T2	2	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T2	3	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T2	5	(2) (7/8) + (2) (1/2)	80.00 - 100.00	0.6000	0.6000
T2	8	LDF6-50A(1-1/4")	80.00 - 100.00	0.6000	0.6000
T2	10	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	11	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.6000
T2	13	LDF6-50A(1-1/4")	80.00 - 86.00	0.6000	0.6000
T3	1	Climbing Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T3	2	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T3	3	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T3	5	(2) (7/8) + (2) (1/2)	60.00 - 80.00	0.6000	0.6000
T3	8	LDF6-50A(1-1/4")	60.00 - 80.00	0.6000	0.6000
T3	10	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T3	11	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.6000
T3	13	LDF6-50A(1-1/4")	60.00 - 80.00	0.6000	0.6000
T3	16	E60	60.00 - 76.50	0.6000	0.6000
T4	1	Climbing Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T4	2	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T4	3	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T4	5	(2) (7/8) + (2) (1/2)	40.00 - 60.00	0.6000	0.6000
T4	8	LDF6-50A(1-1/4")	40.00 - 60.00	0.6000	0.6000
T4	10	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T4	11	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.6000
T4	13	LDF6-50A(1-1/4")	40.00 - 60.00	0.6000	0.6000
T4	16	E60	40.00 - 60.00	0.6000	0.6000
T4	18	LDF5-50A(7/8")	40.00 - 60.00	0.6000	0.6000
T4	20	E60	40.00 - 48.50	0.6000	0.6000
T5	1	Climbing Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T5	2	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T5	3	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T5	5	(2) (7/8) + (2) (1/2)	20.00 - 40.00	0.6000	0.6000
T5	8	LDF6-50A(1-1/4")	20.00 - 40.00	0.6000	0.6000
T5	10	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T5	11	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T5	13	LDF6-50A(1-1/4")	31.50 - 40.00	0.6000	0.6000
T5	14	LDF6-50A(1-1/4")	20.00 - 31.50	0.6000	0.6000
T5	16	E60	20.00 - 40.00	0.6000	0.6000
T5	18	LDF5-50A(7/8")	20.00 - 40.00	0.6000	0.6000
T5	20	E60	37.00 - 40.00	0.6000	0.6000
T5	21	E60	20.00 - 37.00	0.6000	0.6000
T6	1	Climbing Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T6	2	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T6	3	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T6	5	(2) (7/8) + (2) (1/2)	8.00 - 20.00	0.6000	0.6000
T6	8	LDF6-50A(1-1/4")	8.00 - 20.00	0.6000	0.6000
T6	10	LDF7-50A(1-5/8")	8.00 - 20.00	0.6000	0.6000
T6	11	LDF7-50A(1-5/8")	8.00 - 20.00	0.6000	0.6000
T6	14	LDF6-50A(1-1/4")	8.00 - 20.00	0.6000	0.6000
T6	16	E60	8.00 - 20.00	0.6000	0.6000
T6	18	LDF5-50A(7/8")	8.00 - 20.00	0.6000	0.6000
T6	21	E60	8.00 - 20.00	0.6000	0.6000
T6	23	(1) (1/4") + (1) (3/8)	8.00 - 17.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
6' x 4-1/2" Horizontal Pipe (Existing)	A	From Face	0.00 0.00 0.00	0.0000	118.00	No Ice	1.35	0.02	0.04
6' x 4-1/2" Horizontal Pipe (Existing)	A	From Face	0.00 0.00 0.00	0.0000	115.00	No Ice	1.35	0.02	0.04
6' x 4-1/2" Horizontal Pipe (Existing)	A	From Face	0.00 0.00 0.00	0.0000	112.00	No Ice	1.35	0.02	0.04
12' x 4-1/2" Horizontal Pipe (Existing)	A	From Face	0.00 0.00 0.00	0.0000	38.00	No Ice	3.00	0.02	0.08
12' x 4-1/2" Horizontal Pipe (Existing)	B	From Face	0.00 0.00 0.00	0.0000	38.00	No Ice	3.00	0.02	0.08
***									
Pipe Mount [PM 601-3] (Washoe County - Existing)	C	None		0.0000	120.00	No Ice	4.39	4.39	0.20
3" Dia 10' Omni (Washoe County - Existing)	A	From Leg	1.00 0.00 5.00	0.0000	120.00	No Ice	2.24	2.24	0.04
3" Dia 12' Omni (Washoe County - Existing)	B	From Leg	1.00 0.00 6.00	0.0000	120.00	No Ice	2.52	2.52	0.02
3" Dia 4' Omni (Washoe County - Existing)	C	From Leg	1.00 0.00 2.00	0.0000	120.00	No Ice	0.80	0.80	0.02
***									
12"x6" TMA (Washoe County - Existing)	A	From Leg	0.00 0.00 0.00	0.0000	118.00	No Ice	0.60	0.41	0.01
***									
Pipe Mount [PM 601-1] (Washoe County - Existing)	C	From Leg	0.00 0.00 0.00	0.0000	112.00	No Ice	3.00	0.90	0.07
***									
Side Arm Mount [8' SO 308-3] (Washoe County - Existing)	C	None		0.0000	100.00	No Ice	6.01	6.01	0.21
3" Dia 8' Omni (Washoe County - Existing)	A	From Leg	8.00 0.00 4.00	0.0000	100.00	No Ice	1.82	1.82	0.03
3" Dia 8' Omni (Washoe County - Existing)	B	From Leg	8.00 0.00 4.00	0.0000	100.00	No Ice	1.82	1.82	0.03
3" Dia 4' Omni (Washoe County - Existing)	C	From Leg	8.00 0.00 2.00	0.0000	100.00	No Ice	0.81	0.81	0.02
***									
Pipe Mount [PM 602-1] (Washoe County - Existing)	B	From Leg	0.00 0.00 0.00	0.0000	86.00	No Ice	5.25	1.58	0.09
MD-S6 (for 6' MW) : Ice Shield (Washoe County - Existing)	B	From Leg	1.00 0.00 2.00	0.0000	86.00	No Ice	1.67	0.80	0.44
***									
Pipe Mount [PM 602-1]	A	From Leg	0.00	0.0000	76.50	No Ice	5.25	1.58	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Washoe County - Existing)			0.00 0.00						
MD-S8 (for 8' MW) : Ice Shield (Washoe County - Existing)	A	From Leg	1.00 0.00 2.50	11.7000	76.50	No Ice	3.80	2.40	0.57
***									
Side Arm Mount [8' SO 308-3] (Washoe County - Existing)	C	None		0.0000	60.00	No Ice	6.01	6.01	0.21
4" Dia 12' Omni (Washoe County - Existing)	C	From Leg	8.00 0.00 6.00	0.0000	60.00	No Ice	2.87	2.87	0.05
3" Dia 8' Omni (Washoe County - Existing)	A	From Leg	8.00 0.00 4.00	0.0000	60.00	No Ice	1.91	1.91	0.03
3" Dia 5' Omni (Washoe County - Existing)	B	From Leg	8.00 0.00 2.50	0.0000	60.00	No Ice	1.12	1.12	0.02
***									
Pipe Mount [PM 602-1] (Washoe County - Existing)	A	From Leg	0.00 0.00 0.00	0.0000	48.50	No Ice	5.25	1.58	0.09
MD-S8 (for 8' MW) : Ice Shield (Washoe County - Existing)	A	From Leg	1.00 0.00 2.50	11.7000	48.50	No Ice	3.80	2.40	0.57
***									
Pipe Mount [PM 602-1] (Washoe County - Existing)	A	From Leg	0.00 0.00 0.00	0.0000	37.00	No Ice	5.25	1.58	0.09
MD-SQ4 (4ft sq) : Ice Shield (Washoe County - Existing)	A	From Leg	1.00 0.00 2.00	0.0000	37.00	No Ice	0.80	0.80	0.13
***									
Pipe Mount [PM 602-1] (Washoe County - Existing)	C	From Leg	0.00 0.00 0.00	0.0000	31.50	No Ice	5.25	1.58	0.09
MD-SQ4 (4ft sq) : Ice Shield (Washoe County - Existing)	C	From Leg	1.00 0.00 1.50	0.0000	31.50	No Ice	0.80	0.80	0.13
***									
Pipe Mount [PM 602-1] (Washoe County - Existing)	C	From Face	0.00 4.00 3.00	0.0000	17.00	No Ice	5.25	1.58	0.09
MD-SQ4 (4ft sq) : Ice Shield (Washoe County - Existing)	C	From Face	1.00 4.00 0.00	0.0000	17.00	No Ice	0.80	0.80	0.13
Yagi (small) (Washoe County - Existing)	C	From Face	1.00 4.00 0.00	0.0000	17.00	No Ice	0.97	0.97	0.00
***									
Stiffener Plate at elevation 80' (Washoe County - Proposed)	A	From Leg	0.00 0.00 0.00	0.0000	80.00	No Ice	0.60	0.60	0.01
Stiffener Plate at elevation 80' (Washoe County - Proposed)	B	From Leg	0.00 0.00 0.00	0.0000	80.00	No Ice	0.60	0.60	0.01
Stiffener Plate at elevation 80'	C	From Leg	0.00	0.0000	80.00	No Ice	0.60	0.60	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Washoe County - Proposed)			0.00 0.00						
Stiffener Plate at elevation 0' (Washoe County - Proposed)	A	From Leg	0.00 0.00 0.00	0.0000	0.00	No Ice	0.70	0.70	0.01
Stiffener Plate at elevation 0' (Washoe County - Proposed)	C	From Leg	0.00 0.00 0.00	0.0000	0.00	No Ice	0.70	0.70	0.01
Stiffener Plate at elevation 0' (Washoe County - Proposed)	B	From Leg	0.00 0.00 0.00	0.0000	0.00	No Ice	0.70	0.70	0.01

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
Andrew 4' HP Dish (Washoe County - Existing)	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	-60.0000		112.00	4.23	No Ice	14.08	0.10
6' Dish w/Radome (Washoe County - Existing)	B	Paraboloid w/Radome	From Leg	1.00 0.00 -2.00	0.0000		86.00	6.00	No Ice	34.04	0.19
UXA8-59B (Washoe County - Existing)	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 -2.50	11.7000		76.50	8.62	No Ice	58.31	0.40
UXA8-59B (Washoe County - Existing)	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 -2.50	11.7000		48.50	8.62	No Ice	58.31	0.40
PAD6-65 (Washoe County - Existing)	A	Paraboloid w/Radome	From Leg	1.00 0.00 -2.00	0.0000		37.00	6.58	No Ice	34.04	0.19
RFS 4' HP Dish (Washoe County - Existing)	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 -1.50	60.0000		31.50	4.31	No Ice	14.58	0.09
2' Dish w/Radome (Washoe County - Existing)	C	Paraboloid w/Radome	From Face	1.00 4.00 -3.00	0.0000		17.00	2.00	No Ice	3.14	0.07

Load Combinations

Comb. No.	Description
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

Comb. No.	Description
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	Dead+Wind 0 deg - Service
27	Dead+Wind 30 deg - Service
28	Dead+Wind 60 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 120 deg - Service
31	Dead+Wind 150 deg - Service
32	Dead+Wind 180 deg - Service
33	Dead+Wind 210 deg - Service
34	Dead+Wind 240 deg - Service
35	Dead+Wind 270 deg - Service
36	Dead+Wind 300 deg - Service
37	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	120 - 100	Leg	Max Tension	15	9.09	0.15	-0.23
			Max. Compression	2	-11.13	0.07	0.10
			Max. Mx	4	-2.48	0.54	0.37
			Max. My	2	0.73	0.15	-0.82
			Max. Vy	4	-0.71	-0.39	0.37
			Max. Vx	2	1.14	0.15	0.67
		Diagonal	Max Tension	5	8.76	0.00	0.00
			Max. Compression	4	-8.84	0.00	0.00
			Max. Mx	2	-4.40	0.02	0.00
			Max. Vy	2	-0.01	0.00	0.00
		Horizontal	Max Tension	4	3.07	0.01	0.00
			Max. Compression	2	-3.23	0.02	0.00
			Max. Mx	14	-0.12	0.02	0.00
			Max. My	19	-0.01	-0.00	-0.00
			Max. Vy	14	-0.01	0.02	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	23	0.56	0.00	0.00
			Max. Compression	10	-0.57	0.00	0.00
			Max. Mx	22	-0.34	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	19	0.23	0.00	-0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T2	100 - 80	Leg	Max Tension	15	41.96	-1.31	0.31
			Max. Compression	2	-48.99	1.39	-0.47
			Max. Mx	22	39.64	-1.40	-0.48
			Max. My	17	-3.78	0.01	1.68
			Max. Vy	22	-0.73	-0.63	0.14
			Max. Vx	5	-0.84	-0.06	-0.76
		Diagonal	Max Tension	20	10.25	0.00	0.00
			Max. Compression	20	-10.33	0.00	0.00
			Max. Mx	2	8.00	-0.02	0.00
			Max. My	2	-0.42	0.00	0.00
			Max. Vy	2	0.01	0.00	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Horizontal	Max Tension	20	4.85	0.01	0.00
			Max. Compression	8	-4.83	0.00	0.00
			Max. Mx	14	-0.63	0.07	0.00
			Max. My	14	-0.63	0.07	0.00
			Max. Vy	14	0.03	0.07	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	5	3.27	0.01	0.00
			Max. Compression	2	-3.66	0.04	0.00
			Max. Mx	14	-0.46	0.06	0.00
			Max. My	2	0.35	-0.04	0.00
			Max. Vy	14	-0.03	0.06	0.00
			Max. Vx	2	0.00	0.00	0.00
T3	80 - 60	Leg	Max Tension	23	78.14	-2.21	-1.71
			Max. Compression	2	-92.12	0.33	-0.16
			Max. Mx	14	52.35	3.82	-0.74
			Max. My	9	-1.40	0.36	-5.18
			Max. Vy	14	1.90	-3.38	-0.74
			Max. Vx	8	-2.33	0.34	3.80
		Diagonal	Max Tension	16	20.68	0.00	0.00
			Max. Compression	16	-20.85	0.00	0.00
			Max. Mx	2	17.26	0.08	0.00
			Max. My	2	0.11	0.00	-0.01
			Max. Vy	2	-0.03	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Horizontal	Max Tension	16	8.74	0.00	0.00
			Max. Compression	18	-8.51	0.00	0.00
			Max. Mx	22	-1.19	0.11	0.01
			Max. My	2	1.69	-0.08	0.01
			Max. Vy	22	-0.04	0.11	0.01
			Max. Vx	2	0.00	0.00	0.00
		Top Girt	Max Tension	13	5.94	0.01	0.01
			Max. Compression	24	-6.18	0.00	0.00
			Max. Mx	14	-0.85	0.10	0.01
			Max. My	14	-1.59	0.10	0.01
			Max. Vy	14	0.04	0.10	0.01
			Max. Vx	2	-0.00	0.00	0.00
T4	60 - 40	Leg	Max Tension	15	135.12	-3.69	-0.45
			Max. Compression	2	-156.91	4.06	0.30
			Max. Mx	14	132.39	-4.48	-0.60
			Max. My	8	-8.51	0.29	4.73
			Max. Vy	14	-1.66	-3.70	-0.45
			Max. Vx	8	1.87	0.29	3.78
		Diagonal	Max Tension	17	23.13	0.00	0.00
			Max. Compression	16	-23.36	0.00	0.00
			Max. Mx	2	18.46	0.10	0.00
			Max. My	2	-0.15	0.00	-0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	2	-0.03	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Horizontal	Max Tension	16	11.41	0.00	0.00
			Max. Compression	16	-11.09	0.00	0.00
			Max. Mx	14	1.33	-0.18	-0.01
			Max. My	22	1.46	-0.17	-0.01
			Max. Vy	14	0.06	-0.18	-0.01
			Max. Vx	6	0.00	0.00	0.00
		Top Girt	Max Tension	16	8.39	0.00	0.00
			Max. Compression	17	-8.48	0.00	0.00
			Max. Mx	14	-0.57	0.08	0.01
			Max. My	2	0.77	-0.06	0.01
			Max. Vy	14	-0.03	0.08	0.01
			Max. Vx	2	0.00	0.00	0.00
T5	40 - 20	Leg	Max Tension	15	201.19	-4.09	0.05
			Max. Compression	2	-228.61	3.22	0.08
			Max. Mx	14	164.75	-4.48	-0.60
			Max. My	8	-10.60	0.29	4.73
			Max. Vy	11	0.93	4.04	0.68
			Max. Vx	13	-1.32	0.18	-3.72
		Diagonal	Max Tension	17	27.49	0.00	0.00
			Max. Compression	16	-27.86	0.00	0.00
			Max. Mx	2	20.42	0.18	0.00
			Max. My	2	-1.16	0.00	-0.01
			Max. Vy	2	-0.06	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Horizontal	Max Tension	16	15.10	0.00	0.00
			Max. Compression	16	-15.21	0.00	0.00
			Max. Mx	14	-1.87	-0.28	-0.03
			Max. My	18	1.69	0.13	-0.03
			Max. Vy	14	0.09	-0.28	-0.03
			Max. Vx	2	-0.01	0.00	0.00
		Top Girt	Max Tension	16	13.73	0.00	0.00
			Max. Compression	16	-13.47	0.00	0.00
			Max. Mx	14	-1.43	0.14	0.02
			Max. My	14	-1.43	0.14	0.02
			Max. Vy	14	0.04	0.14	0.02
			Max. Vx	14	0.00	0.00	0.00
T6	20 - 0	Leg	Max Tension	15	270.32	-6.66	-0.17
			Max. Compression	2	-302.48	0.00	0.00
			Max. Mx	3	-263.96	6.93	0.07
			Max. My	13	-30.00	0.53	-6.30
			Max. Vy	3	1.06	6.93	0.07
			Max. Vx	13	-1.00	0.53	-6.30
		Diagonal	Max Tension	17	27.18	0.00	0.00
			Max. Compression	16	-27.59	0.00	0.00
			Max. Mx	2	21.02	0.21	0.00
			Max. My	2	-1.21	0.00	-0.01
			Max. Vy	2	-0.07	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
		Horizontal	Max Tension	16	16.58	0.00	0.00
			Max. Compression	16	-16.53	0.00	0.00
			Max. Mx	14	2.69	-0.26	-0.03
			Max. My	18	0.78	0.07	-0.03
			Max. Vy	14	0.09	-0.26	-0.03
			Max. Vx	8	-0.01	0.00	0.00
		Top Girt	Max Tension	16	15.10	0.00	0.00
			Max. Compression	17	-14.99	0.00	0.00
			Max. Mx	14	-1.53	-0.26	-0.03
			Max. My	18	0.54	0.08	-0.03
			Max. Vy	14	0.09	-0.26	-0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	2	-0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	328.77	34.67	-21.81
	Max. H_x	18	328.77	34.67	-21.81
	Max. H_z	5	-245.65	-24.80	20.17
	Min. Vert	7	-276.17	-29.93	19.14
	Min. H_x	7	-276.17	-29.93	19.14
	Min. H_z	18	328.77	34.67	-21.81
Leg B	Max. Vert	10	317.41	-33.95	-20.49
	Max. H_x	23	-281.94	30.45	18.91
	Max. H_z	25	-247.17	25.34	18.98
	Min. Vert	23	-281.94	30.45	18.91
	Min. H_x	10	317.41	-33.95	-20.49
	Min. H_z	10	317.41	-33.95	-20.49
Leg A	Max. Vert	2	338.56	-0.70	41.90
	Max. H_x	21	-1.37	8.11	-0.63
	Max. H_z	2	338.56	-0.70	41.90
	Min. Vert	15	-304.19	0.99	-39.17
	Min. H_x	8	20.01	-8.23	1.75
	Min. H_z	15	-304.19	0.99	-39.17

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	29.84	0.00	0.00	-5.77	4.17	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	35.81	0.17	-73.10	-4242.91	-4.65	-17.44
0.9 Dead+1.6 Wind 0 deg - No Ice	26.86	0.17	-73.10	-4241.18	-5.90	-17.44
1.2 Dead+1.6 Wind 30 deg - No Ice	35.81	31.39	-60.57	-3531.10	-1780.07	-32.57
0.9 Dead+1.6 Wind 30 deg - No Ice	26.86	31.39	-60.57	-3529.37	-1781.32	-32.57
1.2 Dead+1.6 Wind 60 deg - No Ice	35.81	53.42	-36.56	-2170.67	-3023.29	-31.58
0.9 Dead+1.6 Wind 60 deg - No Ice	26.86	53.42	-36.56	-2168.94	-3024.54	-31.58
1.2 Dead+1.6 Wind 90 deg - No Ice	35.81	64.52	-1.52	-104.85	-3710.70	-35.35
0.9 Dead+1.6 Wind 90 deg - No Ice	26.86	64.52	-1.52	-103.12	-3711.95	-35.35
1.2 Dead+1.6 Wind 120 deg - No Ice	35.81	57.34	39.17	2270.99	-3270.90	-7.52
0.9 Dead+1.6 Wind 120 deg - No Ice	26.86	57.34	39.17	2272.72	-3272.16	-7.52
1.2 Dead+1.6 Wind 150 deg -	35.81	30.27	63.85	3688.93	-1702.40	15.96

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice 0.9 Dead+1.6 Wind 150 deg - No Ice	26.86	30.27	63.85	3690.66	-1703.65	15.96
1.2 Dead+1.6 Wind 180 deg - No Ice	35.81	-0.87	71.03	4066.16	75.52	24.16
0.9 Dead+1.6 Wind 180 deg - No Ice	26.86	-0.87	71.03	4067.89	74.27	24.16
1.2 Dead+1.6 Wind 210 deg - No Ice	35.81	-33.38	62.96	3624.02	1908.96	26.73
0.9 Dead+1.6 Wind 210 deg - No Ice	26.86	-33.38	62.96	3625.75	1907.71	26.73
1.2 Dead+1.6 Wind 240 deg - No Ice	35.81	-58.65	41.35	2404.33	3364.33	24.48
0.9 Dead+1.6 Wind 240 deg - No Ice	26.86	-58.65	41.35	2406.06	3363.08	24.48
1.2 Dead+1.6 Wind 270 deg - No Ice	35.81	-64.79	2.25	132.38	3766.56	32.84
0.9 Dead+1.6 Wind 270 deg - No Ice	26.86	-64.79	2.25	134.11	3765.30	32.84
1.2 Dead+1.6 Wind 300 deg - No Ice	35.81	-54.26	-36.09	-2146.00	3126.57	21.15
0.9 Dead+1.6 Wind 300 deg - No Ice	26.86	-54.26	-36.09	-2144.27	3125.31	21.15
1.2 Dead+1.6 Wind 330 deg - No Ice	35.81	-30.30	-61.86	-3638.22	1743.56	-4.83
0.9 Dead+1.6 Wind 330 deg - No Ice	26.86	-30.30	-61.86	-3636.49	1742.31	-4.83
Dead+Wind 0 deg - Service	29.84	0.03	-14.10	-822.89	2.31	-3.36
Dead+Wind 30 deg - Service	29.84	6.06	-11.68	-685.58	-340.17	-6.28
Dead+Wind 60 deg - Service	29.84	10.30	-7.05	-423.16	-579.99	-6.09
Dead+Wind 90 deg - Service	29.84	12.45	-0.29	-24.66	-712.59	-6.82
Dead+Wind 120 deg - Service	29.84	11.06	7.56	433.65	-627.76	-1.45
Dead+Wind 150 deg - Service	29.84	5.84	12.32	707.17	-325.19	3.08
Dead+Wind 180 deg - Service	29.84	-0.17	13.70	779.94	17.77	4.66
Dead+Wind 210 deg - Service	29.84	-6.44	12.15	694.65	371.45	5.16
Dead+Wind 240 deg - Service	29.84	-11.31	7.98	459.37	652.19	4.72
Dead+Wind 270 deg - Service	29.84	-12.50	0.43	21.11	729.78	6.33
Dead+Wind 300 deg - Service	29.84	-10.47	-6.96	-418.40	606.32	4.08
Dead+Wind 330 deg - Service	29.84	-5.84	-11.93	-706.25	339.54	-0.93

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-29.84	0.00	0.00	29.84	0.00	0.000%
2	0.17	-35.81	-73.10	-0.17	35.81	73.10	0.000%
3	0.17	-26.86	-73.10	-0.17	26.86	73.10	0.000%
4	31.39	-35.81	-60.57	-31.39	35.81	60.57	0.000%
5	31.39	-26.86	-60.57	-31.39	26.86	60.57	0.000%
6	53.42	-35.81	-36.56	-53.42	35.81	36.56	0.000%
7	53.42	-26.86	-36.56	-53.42	26.86	36.56	0.000%
8	64.52	-35.81	-1.52	-64.52	35.81	1.52	0.000%
9	64.52	-26.86	-1.52	-64.52	26.86	1.52	0.000%
10	57.34	-35.81	39.17	-57.34	35.81	-39.17	0.000%
11	57.34	-26.86	39.17	-57.34	26.86	-39.17	0.000%
12	30.27	-35.81	63.85	-30.27	35.81	-63.85	0.000%
13	30.27	-26.86	63.85	-30.27	26.86	-63.85	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
14	-0.87	-35.81	71.03	0.87	35.81	-71.03	0.000%
15	-0.87	-26.86	71.03	0.87	26.86	-71.03	0.000%
16	-33.38	-35.81	62.96	33.38	35.81	-62.96	0.000%
17	-33.38	-26.86	62.96	33.38	26.86	-62.96	0.000%
18	-58.65	-35.81	41.35	58.65	35.81	-41.35	0.000%
19	-58.65	-26.86	41.35	58.65	26.86	-41.35	0.000%
20	-64.79	-35.81	2.25	64.79	35.81	-2.25	0.000%
21	-64.79	-26.86	2.25	64.79	26.86	-2.25	0.000%
22	-54.26	-35.81	-36.09	54.26	35.81	36.09	0.000%
23	-54.26	-26.86	-36.09	54.26	26.86	36.09	0.000%
24	-30.30	-35.81	-61.86	30.30	35.81	61.86	0.000%
25	-30.30	-26.86	-61.86	30.30	26.86	61.86	0.000%
26	0.03	-29.84	-14.10	-0.03	29.84	14.10	0.000%
27	6.06	-29.84	-11.68	-6.06	29.84	11.68	0.000%
28	10.30	-29.84	-7.05	-10.30	29.84	7.05	0.000%
29	12.45	-29.84	-0.29	-12.45	29.84	0.29	0.000%
30	11.06	-29.84	7.56	-11.06	29.84	-7.56	0.000%
31	5.84	-29.84	12.32	-5.84	29.84	-12.32	0.000%
32	-0.17	-29.84	13.70	0.17	29.84	-13.70	0.000%
33	-6.44	-29.84	12.15	6.44	29.84	-12.15	0.000%
34	-11.31	-29.84	7.98	11.31	29.84	-7.98	0.000%
35	-12.50	-29.84	0.43	12.50	29.84	-0.43	0.000%
36	-10.47	-29.84	-6.96	10.47	29.84	6.96	0.000%
37	-5.84	-29.84	-11.93	5.84	29.84	11.93	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 100	1.55	26	0.1128	0.0282
T2	100 - 80	1.08	26	0.1062	0.0206
T3	80 - 60	0.67	26	0.0795	0.0206
T4	60 - 40	0.37	26	0.0577	0.0162
T5	40 - 20	0.16	26	0.0366	0.0098
T6	20 - 0	0.04	26	0.0177	0.0033

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	Pipe Mount [PM 601-3]	26	1.55	0.1128	0.0282	236203
118.00	6' x 4-1/2" Horizontal Pipe	26	1.50	0.1127	0.0275	236203
115.00	6' x 4-1/2" Horizontal Pipe	26	1.43	0.1125	0.0263	236203
112.00	Andrew 4' HP Dish	26	1.36	0.1121	0.0251	147627
100.00	Side Arm Mount [8' SO 308-3]	26	1.08	0.1062	0.0206	60806
86.00	Pipe Mount [PM 602-1]	26	0.78	0.0880	0.0185	46226
84.00	6' Dish w/Radome	26	0.75	0.0851	0.0194	44135
80.00	Stiffener Plate at elevation 80'	26	0.67	0.0795	0.0206	41786
76.50	Pipe Mount [PM 602-1]	26	0.61	0.0750	0.0208	43161
74.00	UXA8-59B	26	0.57	0.0721	0.0206	44997

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
60.00	Side Arm Mount [8' SO 308-3]	26	0.37	0.0577	0.0162	55870
48.50	Pipe Mount [PM 602-1]	26	0.24	0.0455	0.0124	55464
46.00	UXA8-59B	26	0.22	0.0428	0.0117	55173
38.00	12' x 4-1/2" Horizontal Pipe	26	0.15	0.0345	0.0091	54146
37.00	Pipe Mount [PM 602-1]	26	0.14	0.0336	0.0088	53990
35.00	PAD6-65	26	0.13	0.0316	0.0081	53669
31.50	Pipe Mount [PM 602-1]	26	0.10	0.0282	0.0069	53113
30.00	RFS 4' HP Dish	26	0.09	0.0268	0.0063	52878
17.00	Pipe Mount [PM 602-1]	26	0.03	0.0150	0.0026	60629
14.00	2' Dish w/Radome	26	0.03	0.0124	0.0020	73377
0.00	Stiffener Plate at elevation 0'	0	0.00	0.0000	0.0000	205454

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 100	7.97	2	0.5850	0.1463
T2	100 - 80	5.52	2	0.5492	0.1067
T3	80 - 60	3.45	2	0.4066	0.1068
T4	60 - 40	1.92	2	0.2947	0.0838
T5	40 - 20	0.85	2	0.1868	0.0507
T6	20 - 0	0.23	2	0.0910	0.0169

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	Pipe Mount [PM 601-3]	2	7.97	0.5850	0.1463	47365
118.00	6' x 4-1/2" Horizontal Pipe	2	7.72	0.5845	0.1423	47365
115.00	6' x 4-1/2" Horizontal Pipe	2	7.34	0.5833	0.1364	47365
112.00	Andrew 4' HP Dish	2	6.97	0.5810	0.1304	29603
100.00	Side Arm Mount [8' SO 308-3]	2	5.52	0.5492	0.1067	12096
86.00	Pipe Mount [PM 602-1]	2	4.02	0.4519	0.0961	8798
84.00	6' Dish w/Radome	2	3.82	0.4363	0.1007	8488
80.00	Stiffener Plate at elevation 80'	2	3.45	0.4066	0.1068	8136
76.50	Pipe Mount [PM 602-1]	2	3.14	0.3834	0.1081	8358
74.00	UXA8-59B	2	2.94	0.3683	0.1069	8686
60.00	Side Arm Mount [8' SO 308-3]	2	1.92	0.2947	0.0838	10976
48.50	Pipe Mount [PM 602-1]	2	1.25	0.2326	0.0644	10938
46.00	UXA8-59B	2	1.12	0.2189	0.0605	10886
38.00	12' x 4-1/2" Horizontal Pipe	2	0.77	0.1765	0.0473	10676
37.00	Pipe Mount [PM 602-1]	2	0.73	0.1715	0.0455	10637
35.00	PAD6-65	2	0.65	0.1615	0.0419	10556
31.50	Pipe Mount [PM 602-1]	2	0.53	0.1445	0.0356	10414
30.00	RFS 4' HP Dish	2	0.48	0.1373	0.0329	10355
17.00	Pipe Mount [PM 602-1]	2	0.17	0.0773	0.0132	11776
14.00	2' Dish w/Radome	3	0.13	0.0636	0.0101	14251
0.00	Stiffener Plate at elevation 0'	0	0.00	0.0000	0.0000	39902

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	120	Leg	A325X	0.6250	4	2.27	20.71	0.110 ✔	1	Bolt Tension
		Diagonal	A325X	0.6250	1	8.76	15.66	0.559 ✔	1	Member Bearing
		Horizontal	A325X	0.6250	1	3.07	6.83	0.450 ✔	1	Member Block Shear
		Top Girt	A325X	0.6250	1	0.56	6.83	0.082 ✔	1	Member Block Shear
T2	100	Leg	A325X	0.6250	4	10.49	20.71	0.507 ✔	1	Bolt Tension
		Diagonal	A325X	0.7500	1	10.25	12.62	0.813 ✔	1	Member Bearing
		Horizontal	A325X	0.7500	1	4.85	8.97	0.540 ✔	1	Member Block Shear
		Top Girt	A325X	0.7500	1	3.27	8.97	0.365 ✔	1	Member Block Shear
T3	80	Leg	A325X	0.8750	4	19.53	40.59	0.481 ✔	1	Bolt Tension
		Diagonal	A325X	0.8750	1	20.68	26.92	0.768 ✔	1	Member Block Shear
		Horizontal	A325X	0.8750	1	8.74	10.09	0.866 ✔	1	Member Block Shear
		Top Girt	A325X	0.8750	1	5.94	10.09	0.588 ✔	1	Member Block Shear
T4	60	Leg	A325X	0.8750	6	22.52	40.59	0.555 ✔	1	Bolt Tension
		Diagonal	A325X	0.8750	1	23.13	26.92	0.859 ✔	1	Member Block Shear
		Horizontal	A325X	0.8750	1	11.41	20.19	0.565 ✔	1	Member Block Shear
		Top Girt	A325X	0.8750	1	8.39	10.09	0.831 ✔	1	Member Block Shear
T5	40	Leg	A325X	1.1250	6	33.54	67.10	0.500 ✔	1	Bolt Tension
		Diagonal	A325X	0.8750	1	27.86	36.54	0.762 ✔	1	Gusset Bearing
		Horizontal	A325X	0.8750	1	15.10	29.58	0.510 ✔	1	Member Bearing
		Top Girt	A325X	0.8750	1	13.73	14.79	0.928 ✔	1	Member Bearing
T6	20	Diagonal	A325X	0.8750	1	27.59	36.54	0.755 ✔	1	Gusset Bearing
		Horizontal	A325X	0.8750	1	16.58	29.58	0.560 ✔	1	Member Bearing
		Top Girt	A325X	0.8750	1	15.10	29.58	0.511 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	P2.5x.203	20.00	6.67	84.4 K=1.00	1.7040	-11.13	37.27	0.299 [1] ✔
T2	100 - 80	P3.5x.226	20.03	6.68	59.9 K=1.00	2.6795	-48.99	70.22	0.698 [1] ✔
T3	80 - 60	P6x.28	20.03	10.02	53.5 K=1.00	5.5813	-92.12	151.83	0.607 [1] ✔
T4	60 - 40	P8x.322	20.03	10.02	40.9 K=1.00	8.3993	-156.91	242.85	0.646 [1] ✔
T5	40 - 20	P10x.365	20.03	10.02	32.7 K=1.00	11.9083	-228.61	355.11	0.644 [1] ✔
T6	20 - 0	P12x.375	20.03	10.02	27.5 K=1.00	14.5790	-302.46	441.85	0.685 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	2L3x3x3/16x3/8	7.12	6.54	87.0 K=1.00	2.1800	-8.84	46.44	0.190 [1] ✔
T2	100 - 80	2L 'a' > 37.3552 in - 14 L3x3x1/4	7.53	6.90	139.9 K=1.00	1.4400	-10.33	16.61	0.622 [1] ✔
T3	80 - 60	2L3x3x1/4x3/8	10.97	10.00	129.0 K=1.00	2.8800	-20.85	38.87	0.537 [1] ✔
T4	60 - 40	2L3x3x1/4x3/8	11.42	10.37	133.8 K=1.00	2.8800	-23.36	36.34	0.643 [1] ✔
T5	40 - 20	2L3x3x3/8x3/8	11.93	10.81	142.0 K=1.00	4.2200	-27.86	47.25	0.590 [1] ✔
T6	20 - 0	2L3x3x3/8x3/8	12.50	11.32	148.7 K=1.00	4.2200	-27.59	43.09	0.640 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	L2x2x3/16	5.00	2.26	94.4 K=1.37	0.7150	-3.23	14.49	0.223 [1] ✔
T2	100 - 80	L2 1/2x2 1/2x3/16	6.33	2.86	94.7 K=1.36	0.9020	-4.83	18.22	0.265 [1] ✔
T3	80 - 60	L3x3x3/16	8.00	3.57	96.0 K=1.33	1.0900	-8.51	21.36	0.399 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	60 - 40	2L3x3x3/16x3/8	10.00	6.81	74.5 K=1.00	2.1800	-11.09	51.46	0.216 [1] ✔
		2L 'a' > 26.4698 in - 94							
T5	40 - 20	2L3 1/2x3 1/2x1/4x3/8	12.00	8.18	77.4 K=1.00	3.3800	-15.21	79.90	0.190 [1] ✔
		2L 'a' > 32.1221 in - 115							
T6	20 - 0	2L3 1/2x3 1/2x1/4x3/8	14.00	9.55	90.4 K=1.00	3.3800	-16.53	71.19	0.232 [1] ✔
		2L 'a' > 37.5235 in - 136							

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	L2x2x3/16	5.00	2.26	94.4 K=1.37	0.7150	-0.57	14.49	0.039 [1] ✔
T2	100 - 80	L2 1/2x2 1/2x3/16	5.00	2.24	87.2 K=1.60	0.9020	-3.66	19.58	0.187 [1] ✔
T3	80 - 60	L3x3x3/16	7.00	3.18	92.0 K=1.44	1.0900	-6.18	22.18	0.279 [1] ✔
T4	60 - 40	L3x3x3/16	9.00	4.07	101.0 K=1.23	1.0900	-8.48	20.31	0.418 [1] ✔
T5	40 - 20	L3 1/2x3 1/2x1/4	11.00	4.99	103.1 K=1.20	1.6900	-13.47	31.28	0.431 [1] ✔
T6	20 - 0	2L3 1/2x3 1/2x1/4x3/8	13.00	8.93	84.5 K=1.00	3.3800	-14.99	75.19	0.199 [1] ✔
		2L 'a' > 35.0683 in - 129							

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	P2.5x.203	20.00	6.67	84.4	1.7040	9.09	53.68	0.169 [1] ✔
T2	100 - 80	P3.5x.226	20.03	6.68	59.9	2.6795	41.96	84.41	0.497 [1] ✔
T3	80 - 60	P6x.28	20.03	10.02	53.5	5.5813	78.14	175.81	0.444 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	60 - 40	P8x.322	20.03	10.02	40.9	8.3993	135.12	264.58	0.511 [1]
T5	40 - 20	P10x.365	20.03	10.02	32.7	11.9083	201.21	375.11	0.536 [1]
T6	20 - 0	P12x.375	20.03	10.02	27.5	14.5790	270.32	459.24	0.589 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	2L3x3x3/16x3/8	7.12	6.54	86.6	1.4241	8.76	61.95	0.141 [1]
T2	100 - 80	2L 'a' > 37.3552 in - 15 L3x3x1/4	7.53	6.90	92.6	0.9159	10.25	39.84	0.257 [1]
T3	80 - 60	2L3x3x1/4x3/8	10.97	10.00	132.9	1.7850	20.68	77.65	0.266 [1]
T4	60 - 40	2L3x3x1/4x3/8	11.42	10.37	137.7	1.7850	23.13	77.65	0.298 [1]
T5	40 - 20	2L3x3x3/8x3/8	11.93	10.81	146.0	2.6025	27.49	113.21	0.243 [1]
T6	20 - 0	2L3x3x3/8x3/8	12.50	11.32	152.7	2.6025	27.18	113.21	0.240 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	L2x2x3/16	5.00	2.26	69.4	0.4308	3.07	18.74	0.164 [1]
T2	100 - 80	L2 1/2x2 1/2x3/16	6.33	2.86	69.4	0.5535	4.85	24.08	0.201 [1]
T3	80 - 60	L3x3x3/16	8.00	3.57	71.4	0.6769	8.74	29.44	0.297 [1]
T4	60 - 40	2L3x3x3/16x3/8	10.00	6.81	60.5	1.3537	11.41	58.89	0.194 [1]
T5	40 - 20	2L 'a' > 26.4698 in - 94 2L3 1/2x3 1/2x1/4x3/8	12.00	8.18	62.9	2.1600	15.10	93.96	0.161 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T6	20 - 0	2L 'a' > 32.1221 in - 115 2L3 1/2x3 1/2x1/4x3/8 2L 'a' > 37.5235 in - 136	14.00	9.55	73.2	2.1600	16.58	93.96	0.176 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	L2x2x3/16	5.00	2.26	69.4	0.4308	0.56	18.74	0.030 [1] ✔
T2	100 - 80	L2 1/2x2 1/2x3/16	5.00	2.24	55.1	0.5535	3.27	24.08	0.136 [1] ✔
T3	80 - 60	L3x3x3/16	7.00	3.18	63.9	0.6769	5.94	29.44	0.202 [1] ✔
T4	60 - 40	L3x3x3/16	9.00	4.07	81.0	0.6769	8.39	29.44	0.285 [1] ✔
T5	40 - 20	L3 1/2x3 1/2x1/4	11.00	4.99	84.9	1.0800	13.73	46.98	0.292 [1] ✔
T6	20 - 0	2L3 1/2x3 1/2x1/4x3/8 2L 'a' > 35.0683 in - 129	13.00	8.93	68.5	2.1600	15.10	93.96	0.161 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	120 - 100	Leg	P2.5x.203	3	-11.13	37.27	29.9	Pass
		Diagonal	2L3x3x3/16x3/8	14	-8.84	46.44	19.0 55.9 (b)	Pass
		Horizontal	L2x2x3/16	13	-3.23	14.49	22.3 45.0 (b)	Pass
		Top Girt	L2x2x3/16	5	-0.57	14.49	3.9 8.2 (b)	Pass
T2	100 - 80	Leg	P3.5x.226	33	-48.99	70.22	69.8	Pass
		Diagonal	L3x3x1/4	38	-10.33	16.61	62.2 81.3 (b)	Pass
		Horizontal	L2 1/2x2 1/2x3/16	37	-4.83	18.22	26.5 54.0 (b)	Pass
		Top Girt	L2 1/2x2 1/2x3/16	36	-3.66	19.58	18.7 36.5 (b)	Pass
T3	80 - 60	Leg	P6x.28	63	-92.12	151.83	60.7	Pass
		Diagonal	2L3x3x1/4x3/8	75	-20.85	38.87	53.7 76.8 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Horizontal	L3x3x3/16	73	-8.51	21.36	39.9	Pass
							86.6 (b)	
		Top Girt	L3x3x3/16	65	-6.18	22.18	27.9	Pass
							58.8 (b)	
T4	60 - 40	Leg	P8x.322	84	-156.91	242.85	64.6	Pass
		Diagonal	2L3x3x1/4x3/8	96	-23.36	36.34	64.3	Pass
							85.9 (b)	
		Horizontal	2L3x3x3/16x3/8	94	-11.09	51.46	21.6	Pass
							56.5 (b)	
		Top Girt	L3x3x3/16	87	-8.48	20.31	41.8	Pass
							83.1 (b)	
T5	40 - 20	Leg	P10x.365	105	-228.61	355.11	64.4	Pass
		Diagonal	2L3x3x3/8x3/8	117	-27.86	47.25	59.0	Pass
							76.2 (b)	
		Horizontal	2L3 1/2x3 1/2x1/4x3/8	115	-15.21	79.90	19.0	Pass
							51.0 (b)	
		Top Girt	L3 1/2x3 1/2x1/4	108	-13.47	31.28	43.1	Pass
							92.8 (b)	
T6	20 - 0	Leg	P12x.375	126	-302.46	441.85	68.5	Pass
		Diagonal	2L3x3x3/8x3/8	138	-27.59	43.09	64.0	Pass
							75.5 (b)	
		Horizontal	2L3 1/2x3 1/2x1/4x3/8	136	-16.53	71.19	23.2	Pass
							56.0 (b)	
		Top Girt	2L3 1/2x3 1/2x1/4x3/8	129	-14.99	75.19	19.9	Pass
							51.1 (b)	
							Summary	
						Leg (T2)	69.8	Pass
						Diagonal (T4)	85.9	Pass
						Horizontal (T3)	86.6	Pass
						Top Girt (T5)	92.8	Pass
						Bolt Checks	92.8	Pass
						RATING =	**92.8**	**Pass**

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9 Rev. 6.1

Site Data	
BU#:	
Site Name:	**Slide Mountain**
App #:	

Anchor Rod Data		
Qty:	**6**	
Diam:	**1.75**	in
Rod Material:	**A36**	
Strength (Fu):	58	ksi
Yield (Fy):	36	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

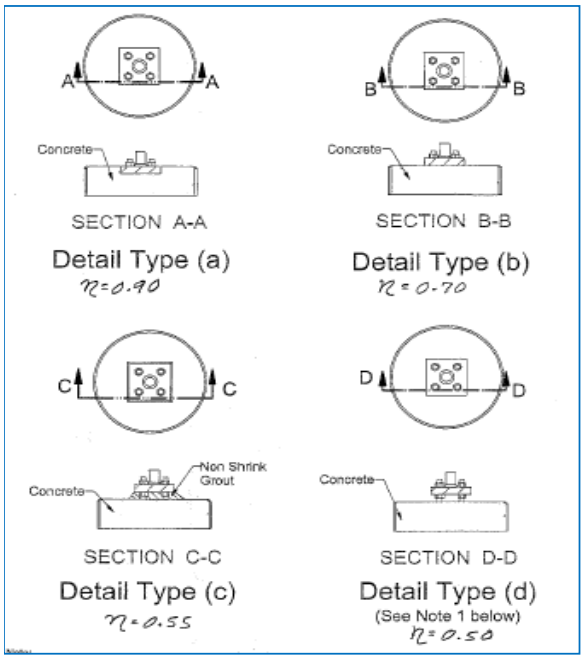


Figure 4-4 of TIA-222-G

Reactions		
Eta Factor, η	**0.55**	Detail Type
Uplift, Pu:	**304**	kips
Shear, Vu:	**39**	kips

l_{ar}:		in
Mu = 0.65*l_{ar}*V_u		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ŕ):	62.5	Kips
Design Axial, Φ*Fu*Anet:	88.2	Kips
Anchor Rod Stress Ratio:	70.9%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

Maximum Acceptable Ratio:	**105**	%
Governing Stress Ratio:	**70.9%**	**Pass**

SST Unit Base Foundation

BU # :	
Site Name:	Slide Mountain
App. Number:	

TIA-222 Revision:	G

Tower Centroid Offset?:	☐
Block Foundation?:	☑

Superstructure Analysis Reactions		
Global Moment, **M**:	4243	ft-kips
Global Axial, **P**:	36	kips
Global Shear, **V**:	73	kips
Leg Compression, $\mathbf{P_{comp}}$:	339	kips
Leg Comp. Shear, $\mathbf{V_{u\_comp}}$:	42	kips
Leg Uplift, $\mathbf{P_{uplift}}$:	304	kips
Leg Uplift. Shear, $\mathbf{V_{u\_uplift}}$:	39	kips
Tower Height, **H**:	120	ft
Base Face Width, **BW**:	15	ft
BP Dist. Above Fdn, $\mathbf{bp_{dist}}$:	3	in
Anchor Bolt Circle, **BC**:	16	in

Foundation Analysis Checks	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	112.14	73.00	**65.1%**	**Pass**
Bearing Pressure (ksf)	11.25	2.39	**21.2%**	**Pass**
*Overturning (kip*ft)*	5991.70	4553.25	**76.0%**	**Pass**
*Pad Flexure (kip*ft)*	6259.65	2311.63	**36.9%**	**Pass**
Pad Shear - 1-way (kips)	1195.53	246.05	**20.6%**	**Pass**
Pad Shear - 2-way (ksi)	0.16	0.03	**20.3%**	**Pass**

Soil Rating:	**76.0%**
Structural Rating:	**36.9%**

Pad Properties		
Depth, **D**:	3.5	ft
Pad Width, **W**:	28.0	ft
Pad Thickness, **T**:	4.0	ft
Pad Rebar Size (Bottom), **Sp**:	9	
Pad Rebar Quantity (Bottom), **mp**:	33	
Pad Clear Cover, $\mathbf{cc_{pad}}$:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	3000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties		
Total Soil Unit Weight, γ:	110	pcf
Ultimate Gross Bearing, Qult:	15.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	0	degrees
SPT Blow Count, $\mathbf{N_{blows}}$:		
Base Friction, μ:	0.3	
Neglected Depth, **N**:	1.7	ft
Foundation Bearing on Rock?	No	

<-- Toggle between Gross and Net

SELF-SUPPORT TOWER
REINFORCEMENT DRAWINGS

SITE NAME: SLIDE MOUNTAIN

SITE ADDRESS:
ATOP SLIDE MOUNTAIN,
OFF RT 431, ~ 6 MILES WEST OF
NEW WASHOE CITY, NV 89704
WASHOE COUNTY, USA

ATTENTION ALL CONTRACTORS

ANYTIME YOU ACCESS A CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.

CODE COMPLIANCE

THIS REINFORCEMENT DESIGN IS BASED ON THE REQUIREMENTS OF TIA-222-G STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, IBC 2012, AND 2012 NORTHERN NEVADA AMENDMENTS USING A 3-SECOND GUST WIND SPEED OF 108 MPH WITH NO ICE, AND 60 MPH UNDER SERVICE LOADS, EXPOSURE CATEGORY C.

TOWER INFORMATION

TOWER MANUFACTURER / DWG#:	PAUL J FORD / DWG #00-055-01
TOWER HEIGHT / TYPE:	120 FT SELF-SUPPORT TOWER
TOWER LOCATION: DATUM: NAD 1983	LATITUDE 39° 18' 15.24" LONGITUDE -119° 53' 3.0"

PROJECT CONTACTS

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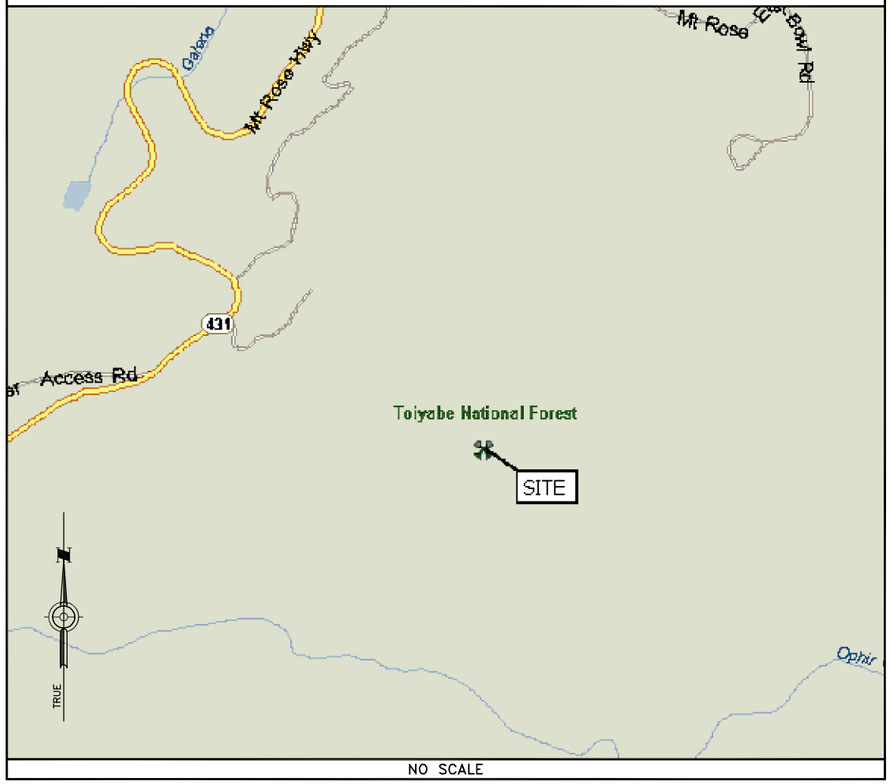
OVERLAND PARK, KS 66211

LOCATION MAP



NO SCALE

DRAWING INDEX

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS & EXISTING DIMENSIONS & CONDITIONS ON THE JOB SITE & SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211

PROJECT NO:	196487
DRAWN BY:	TYW
CHECKED BY:	HK

REV	DATE	DESCRIPTION
0	09/13/17	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER - STATE OF NEVADA
NOEL Z. HERRERA
Exp. 6/30/19
STRUCTURAL
No. 21378
9-15-2017

SLIDE MOUNTAIN
ATOP SLIDE MOUNTAIN,
OFF RT 431,
~ 6 MILES WEST OF
NEW WASHOE CITY, NV 89704
WASHOE COUNTY, USA

SHEET TITLE
TITLE PAGE

SHEET NUMBER
TM-1

MODIFICATION INSPECTION NOTES

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF TOWER 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.

2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION ITSELF, NOR DOES THE MODIFICATION INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD AT ALL TIMES.

3. ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE CROWN ENG-BUL-10173, "APPROVED MI VENDORS".

4. TO ENSURE THAT THE REQUIREMENTS OF THE MODIFICATION INSPECTION ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS PO OR PAYMENT IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN COMMUNICATION WITH THE OTHER PARTY. CONTACT LISTED ON TITLE SHEET SHALL BE CONTACTED IF SPECIFIC INSPECTOR CONTACT INFORMATION IS NOT KNOWN.

5. ALL REQUEST FOR INFORMATION (RFI'S) SHALL BE MADE AVAILABLE TO THE MODIFICATION INSPECTOR BY GC.

6. REFER TO CROWN ENG-SOW-10007, "MODIFICATION INSPECTION SOW", FOR FURTHER DETAILS AND REQUIREMENTS.

MODIFICATION INSPECTOR

1. THE MODIFICATION INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PURCHASE ORDER (PO) OR PAYMENT FOR THE MODIFICATION INSPECTION TO:

   * REVIEW THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST.
   * WORK WITH GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS.
   * DISCUSS ANY SITE SPECIFIC INSPECTIONS OR CONCERNS.

2. THE MODIFICATION INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MODIFICATION INSPECTION REPORT TO CROWN.

GENERAL CONTRACTOR

1. THE GC IS REQUIRED TO CONTACT THE MODIFICATION INSPECTOR AS SOON AS RECEIVING A PO OR PAYMENT FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO:

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

2. THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MODIFICATION INSPECTION CHECKLIST AND CROWN ENG-SOW-10007.

RECOMMENDATIONS

1. THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MODIFICATION INSPECTION REPORT:

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

CANCELLATION OR DELAY IN SCHEDULED MODIFICATION INSPECTION

1. IF THE GC AND MODIFICATION INSPECTOR AGREE TO A DATE ON WHICH THE MODIFICATION INSPECTION WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, THE TOWER OWNER SHALL NOT BE RESPONSIBLE FOR COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC). EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. IF THE MODIFICATION INSTALLATION SHOULD FAIL THE MODIFICATION INSPECTION ("FAILED MODIFICATION INSPECTION"), THE GC SHALL WORK WITH MODIFICATION INSPECTOR TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

   * CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENTAL MODIFICATION INSPECTION.
   * OR, WITH TOWER OWNER'S APPROVAL, THE GC MAY WORK WITH ENGINEER OF RECORD TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION.

VERIFICATION INSPECTIONS

1. TOWER OWNER RESERVES THE RIGHT TO CONDUCT A VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MODIFICATION INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

2. ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH CROWN ENG-SOW-10007.

3. VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MODIFICATION INSPECTION" OR "PASS AS NOTED MODIFICATION INSPECTION" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

1. BETWEEN THE GC AND THE MODIFICATION INSPECTOR, THE FOLLOWING PHOTOGRAPHS ARE TO BE TAKEN AND INCLUDED IN THE MODIFICATION INSPECTION REPORT:

   * PRE-CONSTRUCTION GENERAL SITE CONDITIONS.
   * PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION.
     ** RAW MATERIALS
     ** PHOTOS OF CRITICAL DETAILS
     ** FOUNDATION MODIFICATIONS
     ** REBAR PLACEMENT
     ** FOUNDATION DEPTH VERIFICATION
     ** SOIL COMPACTION PROCESS
     ** COLD GALVANIZED VERIFICATION
     ** GUY WIRE GROUNDING SYSTEM VERIFICATION
     ** POST INSTALL ANCHOR DRILL HOLE DIAMETER AND DEPTH
     ** WELD PREPARATION
     ** WELD INSTALLATION PRIOR TO SURFACE COATING
     ** BOLT INSTALLATION AND TORQUE
     ** FINAL INSTALLED CONDITION
     ** SURFACE COATING REPAIR
   * POST CONSTRUCTION PHOTOGRAPHS.
     ** FINAL IN FIELD CONDITION
   * ANY OTHER PHOTOS DEEMED RELEVANT TO SHOW COMPLETE DETAILS OF MODIFICATION.

   THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS PLEASE REFER TO CROWN ENG-SOW-10007.

2. PHOTOS OF ABOVE GROUND MODIFICATIONS TAKEN FROM GROUND LEVEL SHALL BE CONSIDERED INADEQUATE.

MODIFICATION INSPECTION CHECKLIST

BEFORE CONSTRUCTION		DURING CONSTRUCTION		AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED	REPORT ITEM	CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED	REPORT ITEM	CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED	REPORT ITEM
X	MODIFICATION INSPECTION CHECKLIST DRAWING	X	CONSTRUCTION INSPECTION	X	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWING(S)
X	FABRICATOR QUALITY MANAGEMENT DOCUMENTATION	–	FOUNDATION INSPECTION/REBAR INSPECTION	–	POST INSTALLED ANCHOR ROD PULL-OUT TESTING (OR ALTERNATE MANUFACTURER'S APPROVED METHOD)
–	FABRICATOR CERTIFIED WELD INSPECTION	–	CONCRETE COMPRESSIVE STRENGTH AND SLUMP TESTS (7 DAY AND 28 DAY CYLINDER BREAKS – REPORT REQUIRED)	–	HELICAL PILE PULL-OUT TESTING (OR ALTERNATE MANUFACTURER'S APPROVED METHOD)
X	MATERIAL TEST REPORTS				
–	FABRICATION NDE INSPECTION	–	POST INSTALLED ANCHOR ROD VERIFICATION	–	HOLLOW BAR ANCHOR PULL-OUT TESTING (OR ALTERNATE MANUFACTURER'S APPROVED METHOD)
X	PACKING SLIPS	X	BASE PLATE GROUT VERIFICATION		
–	NDE REPORT OF MONOPOLE BASE PLATE PER ENG-SOW-10033	X	THIRD PARTY CERTIFIED WELD INSPECTION (NDE REPORT REQUIRED)		
ADDITIONAL TESTING AND INSPECTIONS:		–	EARTHWORK: LIFT PLACEMENT AND DENSITY (REPORT REQUIRED)	X	PHOTOGRAPHS
NOTE: NDE DENOTES NON-DESTRUCTIVE EXAMINATION		X	ON-SITE COLD GALVANIZED VERIFICATION	ADDITIONAL TESTING AND INSPECTIONS:	
		–	GUY WIRE TENSION REPORT		
		X	GC AS-BUILT DOCUMENTS		
		ADDITIONAL TESTING AND INSPECTIONS:			

NOTE: X DENOTES A DOCUMENT REQUIRED FOR THE MODIFICATION INSPECTION REPORT
– DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MODIFICATION INSPECTION REPORT

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211

PROJECT NO:	196487
DRAWN BY:	TYW
CHECKED BY:	HK

REV	DATE	DESCRIPTION
0	09/13/17	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER - STATE OF NEVADA
NOEL Z. HERRERA
Exp. 6/30/19
STRUCTURAL
No. 21378
9-15-2017

SLIDE MOUNTAIN
ATOP SLIDE MOUNTAIN,
OFF RT 431,
~ 6 MILES WEST OF
NEW WASHOE CITY, NV 89704
WASHOE COUNTY, USA

SHEET TITLE

MODIFICATION INSPECTION CHECKLIST

SHEET NUMBER

TM-2

GENERAL NOTES

1. ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE. THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH IT IS TO BE PERFORMED.

2. THE GENERAL NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS.

3. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.

5. ERECT GUARDS AND BARRIERS PER APPLICABLE LABOR AND CONSTRUCTION SAFETY REGULATIONS.

6. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE ENGINEER OF RECORD (EOR) AND FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION.

7. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE DATE OF COMPLETED CONSTRUCTION.

8. USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNO.

9. ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, ACI, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODE.

10. STRUCTURAL ELEMENTS SHOWN ON THESE DRAWINGS ARE DESIGNED IN ACCORDANCE WITH APPLICABLE BUILDING CODES/STANDARDS. ALL CONSTRUCTION, EXCEPT WHERE NOTED OTHERWISE, SHALL COMPLY WITH THOSE CODES/STANDARDS.

11. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE DULY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.

12. ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES MEET THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS. CONSTRUCTION SHALL BE PERFORMED ONLY IN "GOOD WEATHER". "GOOD WEATHER" MEANS LITTLE OR NO WIND AND RAIN AND MINIMUM TEMPERATURE OF 50 DEGREES F. CONTACT ENGINEER FOR ADDITIONAL INSTRUCTIONS IF "GOOD WEATHER" CANNOT BE ACHIEVED.

14. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.

15. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK.

16. STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.

17. DO NOT SCALE DRAWINGS.

18. FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.

19. MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS / OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK TO BE INSTALLED.

20. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED OR ALTERED WITHOUT THE EXPRESS APPROVAL OF THE ENGINEER OF RECORD.

21. CONTRACTOR TO VERIFY REQUIRED STEEL PLATE LENGTHS FROM BOTTOM OF SECTION TO BOTTOM OF NEXT SECTION.

22. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES AND PROCEDURES.

23. ALL CHANGES/ALTERNATES/REVISIONS TO THESE DRAWINGS SHALL BE DOCUMENTED BY REQUEST FOR INFORMATION (RFI) FORM APPROVED BY ENGINEER OF RECORD. FINAL WORK AUTHORIZATION AND ALL CHANGE ORDERS SHALL BE APPROVED BY CLIENT AND/OR CLIENT REPRESENTATIVE PRIOR TO PROCEEDING WITH ANY WORK THAT DEVIATES FROM THE ORIGINAL DESIGN, SCOPE, PRICE AND/OR SCHEDULE.

24. ENGINEERING CONSULTING SERVICES PROVIDED TO THE GENERAL CONTRACTOR BY THE ENGINEER OF RECORD (EOR) REQUIRES AN ADDITIONAL $900.00 CONSULTING FEE. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THIS COMPENSATION DIRECTLY TO THE EOR AS AS "ONE-TIME" FEE ENCOMPASSING ALL CONSTRUCTION ADMINISTRATION ITEMS (CURSORY FABRICATION DRAWING REVIEWS, RFI'S, MODIFICATION INSPECTION CLOSEOUT REVIEW AND APPROVALS) FOR THE STRUCTURAL DESIGN DRAWINGS (SDD). BLACK & VEATCH RESERVES THE RIGHT TO INCREASE THIS FEE IF FIELD ISSUES ARE A RESULT OF CONTRACTOR ERROR. BLACK & VEATCH ALSO RESERVES THE RIGHT TO CEASE CONSTRUCTION ADMINISTRATION CONSULTATION AS A RESULT OF NON-PAYMENT/NON-COMPLIANCE BY THE GENERAL CONTRACTOR.

25. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH ANSI/TIA-322 (LATEST EDITION).

26. IN THE EVENT OF AN EMERGENCY, CONTRACTOR SHALL CONTACT BLACK & VEATCH AND AT&T PERSONNEL TO REPORT ANY EVENT OR EMERGENCY INCIDENT AT ANY TOWER OWNER SITE PER THE CONTACT INFORMATION PROVIDED ON SHEET TM-1.

27. ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE GC AND/OR FABRICATOR.

STRUCTURAL STEEL NOTES

1. DESIGN, FABRICATION, ERECTION, ALTERATION AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE (UNO).
   A. TIA-222: STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
   B. TIA-1019-A: INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
   C. AISC: MANUAL OF STEEL CONSTRUCTION

2. ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS, UNO.
   A. STRUCTURAL STEEL.
      1. LEG MODIFICATION MATERIAL (ROUND LEGS), ASTM A1085 GRADE 50 (F_Y = 50 KSI). CONTRACTOR MAY SUBSTITUTE WITH ASTM A500 GRADE B (F_Y = 46 KSI MIN) IF A1085 IS NOT AVAILABLE UPON REVIEW AND APPROVAL OF EOR.
      2. LEG MODIFICATION MATERIAL (ANGLE/BENT PLATE LEGS), ASTM A572 GRADE 50 OR A529 GRADE 50.
      3. BRACING MODIFICATION MATERIAL, ASTM A572 GRADE 50 OR A529 GRADE 50.
   B. ALL BOLTS, ASTM A325-N TYPE 1 GALVANIZED HIGH STRENGTH BOLTS.
   C. ALL NUTS, ASTM A563 CARBON AND ALLOY STEEL NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.
   E. ALL U-BOLTS, FOR LEG MODIFICATION MATERIAL, ASTM A193 GRADE B7. FOR ALL OTHERS, ASTM A36/A307, SEA 429 GRADE 2.

3. ALL HOLES SHALL BE CUT WITH A GRINDER OR DRILLED. HOLES SHALL NOT BE FLAME CUT THRU STEEL UNLESS APPROVED BY THE ENGINEER OF RECORD.

4. ALL FASTENERS SHALL NOT BE REUSED.

5. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED ASTM A325 BOLTS.

6. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.

7. HOT-DIP GALVANIZE ALL ITEMS, UNO.
   GALVANIZE PER ASTM A123, ASTM A153/A153M OR ASTM A653 G90, AS APPLICABLE.

8. AFTER FINAL INSPECTION, ALL EXPOSED STRUCTURAL STEEL AS THE RESULT OF THIS SCOPE OF WORK INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE CLEANED AND COLD GALVANIZING APPLIED BY BRUSH. PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.

9. ASTM A490 BOLTS SHALL NOT BE MECHANICALLY OR HOT-DIP GALVANIZED. ASTM A490 BOLTS SHALL BE COATED WITH TWO (2) ASTM F1136 GRADE 3 COATINGS, SUCH AS "DACROMET", "SHERWIN-WILLIAMS ZINC CLAD 5", OR ENGINEER APPROVED EQUIVALENT. EACH COATING SHALL BE 2 MILS MINIMUM AND 3 MILS MAXIMUM THICKNESS.

10. ONLY ONE BRACING MEMBER SHALL BE REMOVED AND REPLACED AT A TIME FOR ALL EXISTING BRACING MEMBERS.

11. WHEN REMOVING AND INSTALLING NEW BOLTS ONLY ONE BOLT SHALL BE REMOVED AND REPLACED AT A TIME.

DETAIL DRAWINGS SHALL GOVERN OVER ANY VARIANCE FROM THIS SHEET

BOLT-TIGHTENING PROCDURE

1. TIGHTEN CONNECTION BOLTS BY AISC – "TURN OF THE NUT" METHOD. USING THE CHART BELOW.

   BOLT LENGTHS UP TO AND INCLUDING FOUR DIAMETER:
   3/8" BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   1/2" BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT
   5/8" BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH +1/3 TURN BEYOND SNUG TIGHT

   BOLT LENGTHS OVER FOUR DIAMETER BUT NOT EXCEEDING EIGHT DIAMETER:
   3/8" BOLTS 4.25 TO 6.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   1/2" BOLTS 3.75 TO 7.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT
   5/8" BOLTS 4.25 TO 8.0 INCH LENGTH +1/2 TURN BEYOND SNUG TIGHT

2. CONNECTION BOLTS SUBJECT TO DIRECT TENSION SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8(d)(1) OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS. LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS.

   8(d)(1) TURN-OF-THE-NUT TIGHTENING METHOD
   BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c). UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED ABOVE DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY.

3. FASTENERS SHALL BE INSTALLED IN PROPERLY ALIGNED HOLES AND TIGHTENED BY ONE OF THE METHODS DESCRIBED IN SUBSECTION 8(d)(1) THROUGH 8(d)(4).

4. ALL OTHER BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8(c) OF THE SPECIFICATION.

WELDING NOTES

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE-STEEL".

2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.

3. ALL ARC WELDING ON AT&T STRUCTURES SHALL BE DONE IN ACCORDANCE WITH AWS D1.1 (LATEST EDITION). THIS SHALL INCLUDE A CERTIFIED WELDING INSPECTOR (CWI) FOR ACCEPTANCE OR REJECTION OF ALL WELDING OPERATIONS, PRE-DURING-POST, USING THE ACCEPTANCE CRITERIA OF AWS D1.1. THE CWI SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE WELDING INSPECTION. THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.

4. WELDING WILL CONFORM TO AWS D1.1 WELDING CODE, USING E70XX ELECTRODES.

5. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING.

6. REPAIR THE GALVANIZED COATING. ALL AREAS AFFECTED BY THE FIELD DRILLING, FIELD GRINDING AND FIELD WELDING, SHALL BE REPAIRED. PRODUCTS TO BE APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. AREAS THAT HAVE BEEN TOUCHED UP SHOULD BE INSPECTED AS PART OF THE ROUTINE MAINTENANCE OF THE STRUCTURE. NO SPRAY PAINT IS ALLOWED. AFTER ZINC-RICH PAINT IS DRY, OVERCOAT WITH OWNER'S PAINT SPECIFICATIONS, APPLIED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

7. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0° F. WHEN THE TEMPERATURE IS BETWEEN 0° F AND 32° F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70° F DURING THE WELDING PROCESS.

8. DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.

9. FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY UT IN ACCORDANCE WITH AWS D1.1 (MONOPOLE TOWER ONLY).

10. PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MP IN ACCORDANCE WITH AWS D1.1 (MONOPOLE TOWER ONLY).

11. MOVE ALL COAX AND OTHER FLAMMABLE MATERIALS FROM ANY AREA THAT MAY BE HEATED DURING CONSTRUCTION.

12. CONTRACTOR SHALL MAKE PROPER PRECAUTIONS AND PROCEDURES TO PROTECT THE STRUCTURE FROM CATCHING FIRE DURING ALL WELDING OPERATIONS. THE FOLLOWING FIRE SAFETY PREVENTION PROTOCOL IS THE MINIMUM REQUIREMENTS DURING WELDING OPERATIONS.
   – 500 GALLON WATER TANK WITH PUMP TO BE ON SITE AT ALL TIMES.
   – 2 FIRE EXTINGUISHERS ON SITE AT ALL TIMES.
   – 2 MAN FIRE WATCH ON ANY ADJACENT STRUCTURES, FIELDS AND POLE.
   – INTERMITTENT COOLING OF WELDED SURFACE TO REDUCE HEAT IN STRUCTURE.

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211

PROJECT NO:	196487
DRAWN BY:	TYW
CHECKED BY:	HK

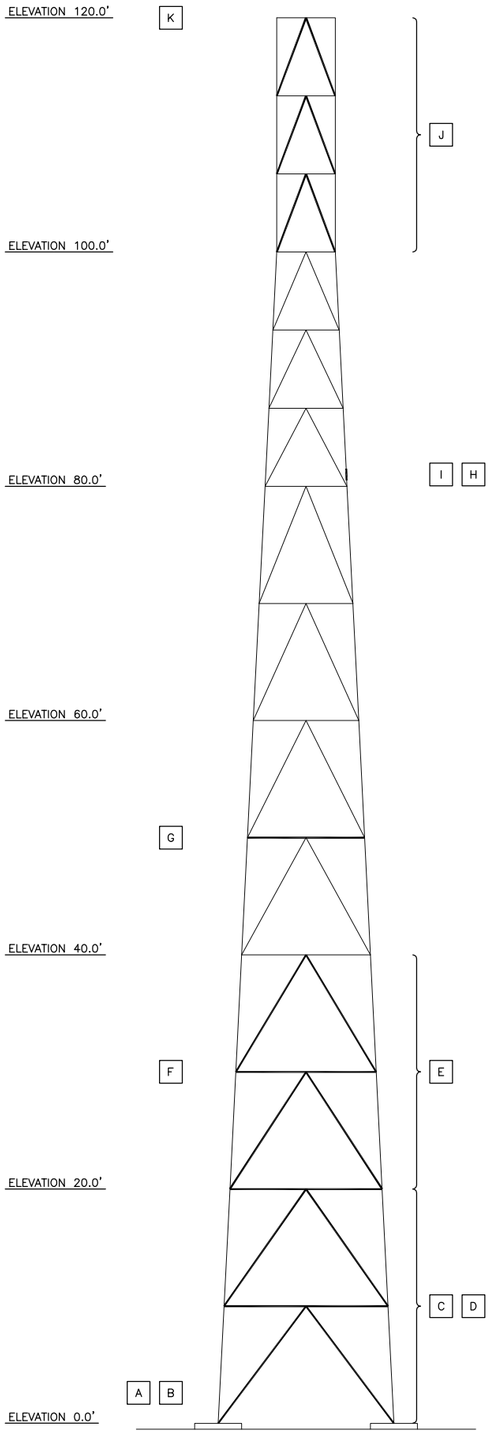
REV	DATE	DESCRIPTION
0	09/13/17	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER - STATE OF NEVADA
NOEL Z. HERRERA
Exp. 6/30/19
STRUCTURAL
No. 21378
9-15-2017

SLIDE MOUNTAIN
ATOP SLIDE MOUNTAIN,
OFF RT 431,
~ 6 MILES WEST OF
NEW WASHOE CITY, NV 89704
WASHOE COUNTY, USA

SHEET TITLE
NOTES

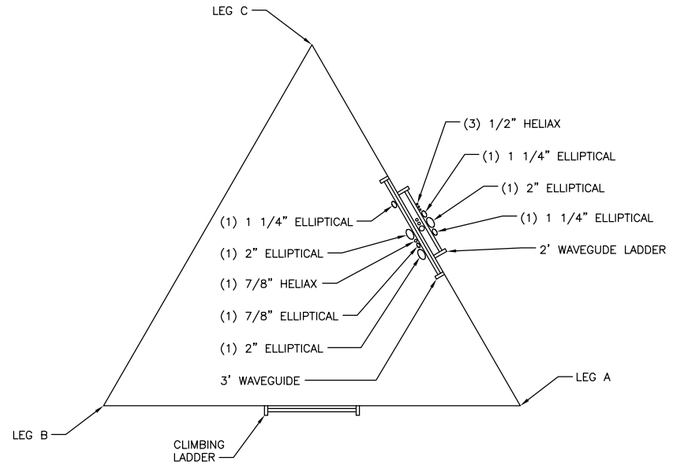
SHEET NUMBER
TM-3



TOWER ELEVATION
NO SCALE

TOWER MODIFICATION SCHEDULE				
CALLOUT	FROM (FT)	TO (FT)	MODIFICATION	REFERENCE SHEET
A	0.0		INSTALL (4) NEW STIFFENER PLATES TO TOWER LEG BASE PLATE (TOTAL OF 12)	TM-5 & TM-6
B	0.0		REMOVE AND REPLACE BASE PLATE GROUT	TM-6
C	0.0	20.0	REMOVE AND REPLACE EXISTING DOUBLE ANGLE 2∠3x3x1/4 DIAGONAL MEMBERS WITH NEW DOUBLE ANGLE 2∠3x3x3/8 DIAGONAL MEMBERS	TM-5
D	0.0	20.0	INSTALL ADDITIONAL ∠3 1/2x3 1/2x1/4 HORIZONTAL MEMBERS TO RECONFIGURE FROM SINGLE ANGLE TO DOUBLE ANGLE 2∠3 1/2x3 1/2x1/4 HORIZONTAL MEMBERS	TM-5
E	20.0	40.0	REMOVE AND REPLACE EXISTING DOUBLE ANGLE 2∠3x3x1/4 DIAGONAL MEMBERS WITH NEW DOUBLE ANGLE 2∠3x3x3/8 DIAGONAL MEMBERS	TM-7
F	30.0		INSTALL ADDITIONAL ∠3 1/2x3 1/2x1/4 HORIZONTAL MEMBERS TO RECONFIGURE FROM SINGLE ANGLE TO DOUBLE ANGLE 2∠3 1/2x3 1/2x1/4 HORIZONTAL MEMBERS	TM-7
G	50.0		INSTALL ADDITIONAL ∠3x3x3/16 HORIZONTAL MEMBERS TO RECONFIGURE FROM SINGLE ANGLE TO DOUBLE ANGLE 2∠3x3x3/16 HORIZONTAL MEMBERS	TM-8
H	80.0±		INSTALL (3) NEW STIFFENER PLATES TO TOWER LEG FLANGE PLATE (TOTAL OF 9)	TM-9
I	80.5	81.5	INSTALL NEW HALF PIPE HSS4.5x0.237 (ASTM 1085) TO CRACKED TOWER LEG (OD = 4.5" & THICKNESS = 0.237")	TM-9
J	100.0	120.0	INSTALL ADDITIONAL ∠3x3x3/16 DIAGONAL MEMBERS TO RECONFIGURE FROM SINGLE ANGLE TO DOUBLE ANGLE 2∠3x3x3/16 DIAGONAL MEMBERS	TM-10
K	120.0±		REPAIR BROKEN OFF TOWER LEG	TM-10
L	0.0	120.0	WIRE BRUSH AND APPLY TWO COATS OF COLD GALVANIZING COMPOUND TO ALL SIGNS OF CORROSION AND SURFACE OF WELDING	–

PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTH AND QUANTITIES GIVEN. LENGTHS AND QUANTITIES GIVEN ARE FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.



COAX FEEDLINE PLAN
NO SCALE

EXISTING FEEDLINE PLAN SHOWN ON THIS DRAWING IS BASED ON CURRENT BEST KNOWLEDGE OF THE EXISTING CONDITION. IF THE EXISTING FEEDLINE LAYOUT IS NOT AS SHOWN ON THIS DRAWING CONTRACTOR SHALL NOTIFY ENGINEER.

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
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PROFESSIONAL ENGINEER - STATE OF NEVADA
NOEL Z. HERRERA
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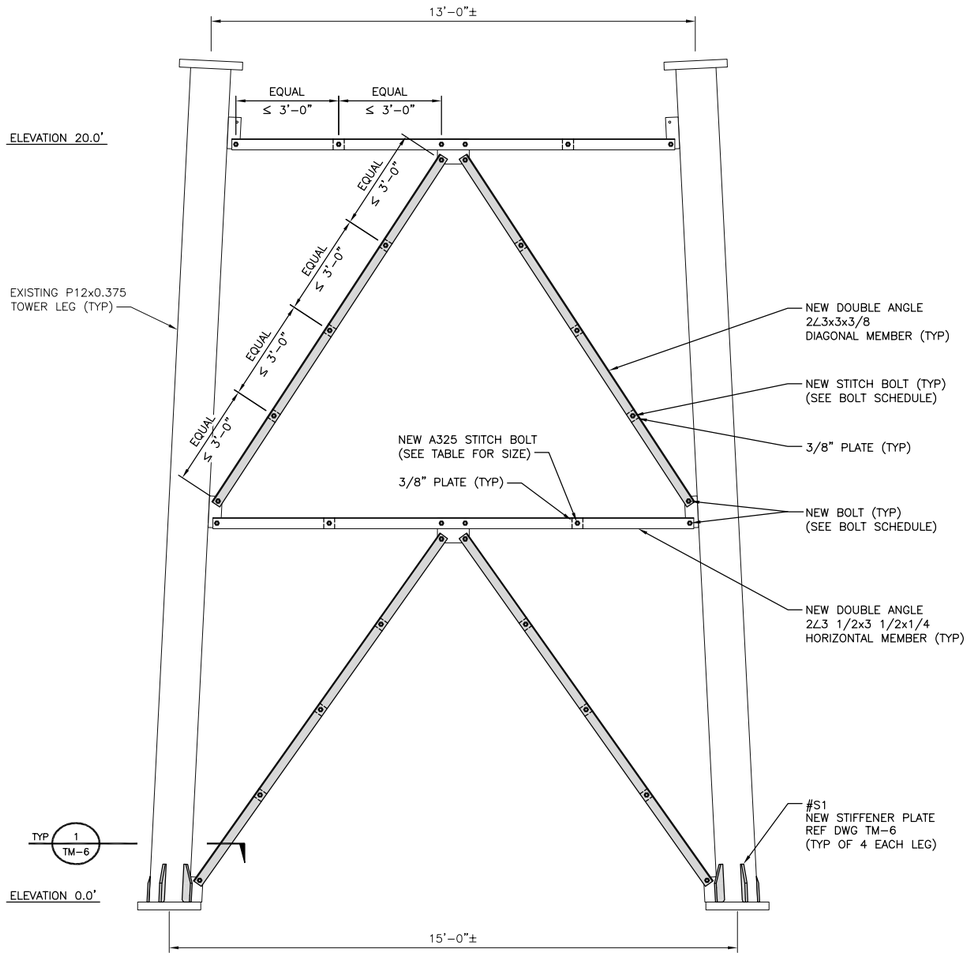
STRUCTURAL
No. 21378
9-15-2017

SLIDE MOUNTAIN
ATOP SLIDE MOUNTAIN,
OFF RT 431,
~ 6 MILES WEST OF
NEW WASHOE CITY, NV 89704
WASHOE COUNTY, USA

SHEET TITLE
TOWER ELEVATION

SHEET NUMBER
TM-4



ELEVATION
NO SCALE

BILL OF MATERIALS – DIAGONAL			
ELEVATION	QUANTITY OF ANGLES	ANGLE SIZE	ANGLE LENGTH
0' – 20.0'	24	∠3x3x3/8	12'-6"±

NOTE: ANGLE LENGTHS SHALL BE FIELD VERIFIED.

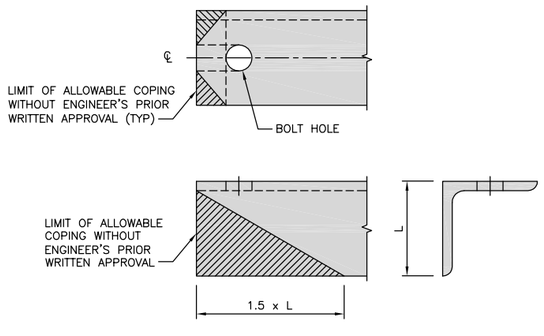
BILL OF MATERIALS – HORIZONTAL			
ELEVATION	QUANTITY OF ANGLES	ANGLE SIZE	ANGLE LENGTH
0' – 20.0'	6	∠3 1/2x3 1/2x1/4	14'-0"±

NOTE: ANGLE LENGTHS SHALL BE FIELD VERIFIED.

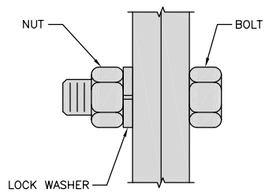
NOTES

1. INSTALL NEW SINGLE ANGLE HORIZONTAL MEMBERS TO RECONFIGURE FROM SINGLE ANGLES TO DOUBLE ANGLES. INSTALL NEW STITCH PLATE. DO NOT REUSE BOLTS. FOR EDGE DISTANCES AND FOR COPING DETAILS (ONLY IF NEEDED), REFER TO THE TABLE AND DETAILS THIS SHEET.
2. ALL DOUBLE ANGLES TO HAVE MINIMUM 1 STITCH BOLT WITH 3/8" PLATE PER UNBRACED SPAN. MAXIMUM SPACING BETWEEN STITCH BOLTS SHALL NOT BE GREATER THAN 3'–0". SHIM AT EXISTING LEG GUSSETS AS REQUIRED TO MAINTAIN PROPER DOUBLE ANGLE SPACING.
3. ONLY ONE CONNECTION BOLT SHALL BE REMOVED AT A TIME.
4. REMOVE EXISTING DIAGONAL MEMBERS AND USE FOR TEMPLATES TO FIELD CUT. INSTALL NEW DOUBLE ANGLE DIAGONAL MEMBERS. INSTALL NEW STITCH PLATE. DO NOT REUSE BOLTS. FOR EDGE DISTANCES AND FOR COPING DETAILS (ONLY IF NEEDED), REFER TO THE TABLE AND DETAILS THIS SHEET.

BOLT SCHEDULE						
MEMBER SIZE	CONNECTION TYPE	BOLT SIZE & GRADE	MIN EDGE DISTANCE	BOLT SPACING	BOLT HOLE	BOLT QUANTITY
2∠3x3x3/8	END	7/8"x2 3/4" LONG A325	1 1/8"	NA	15/16"	24
	STITCH		NA			FIELD VERIFY
2∠3 1/2x3 1/2x1/4	END	7/8"x2 1/2" LONG A325	1 1/8"	NA	15/16"	12
	STITCH		NA			FIELD VERIFY



COPING ALLOWANCES
NO SCALE



TYPICAL BOLT ASSEMBLY
NO SCALE

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
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NOEL Z. HERRERA
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9-15-2017

SLIDE MOUNTAIN
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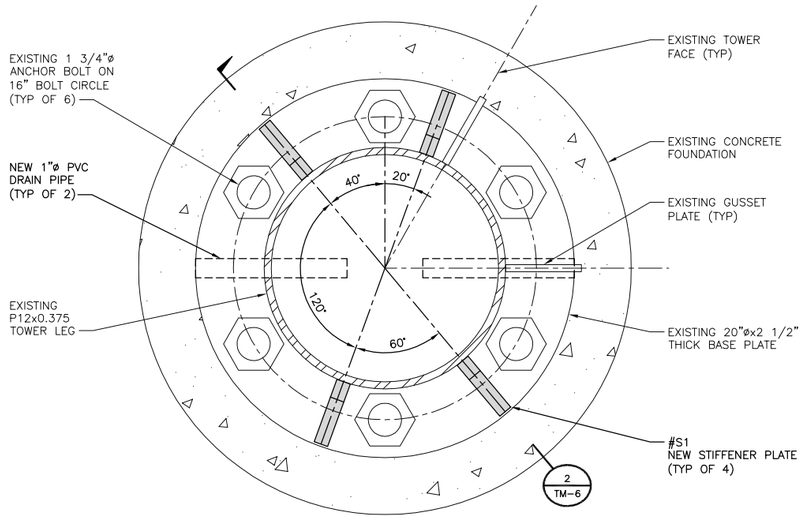
WASHOE COUNTY, USA

SHEET TITLE
REINFORCEMENT DETAILS

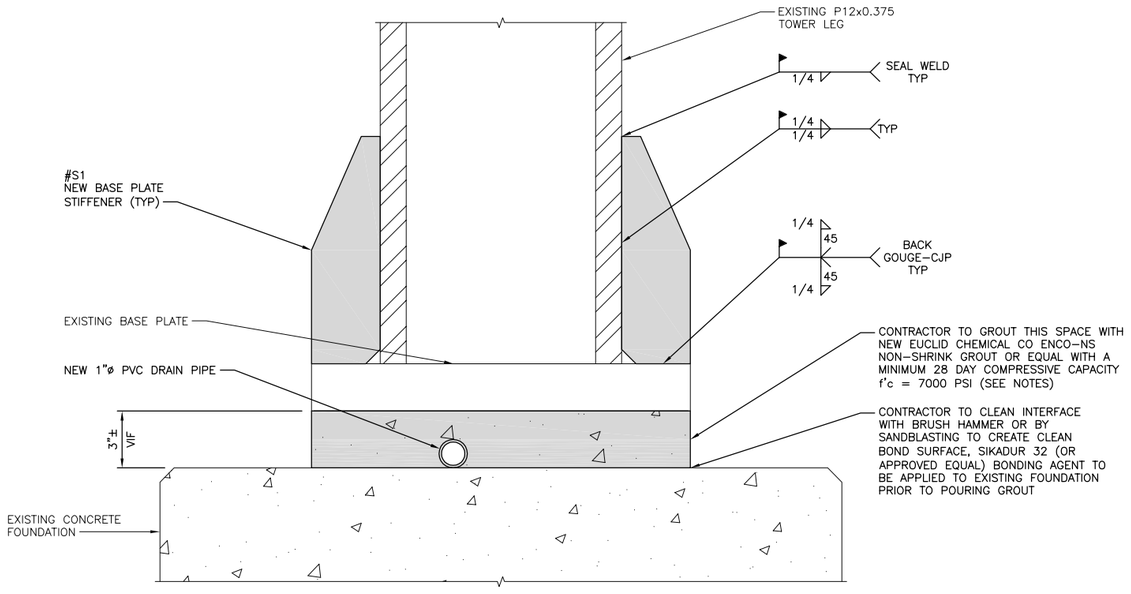
SHEET NUMBER
TM-5



NOTE

1. TYPICAL FOR ALL 3 TOWER LEGS.

SECTION 1
BASE PLATE STIFFENER PLATE PLAN
NO SCALE



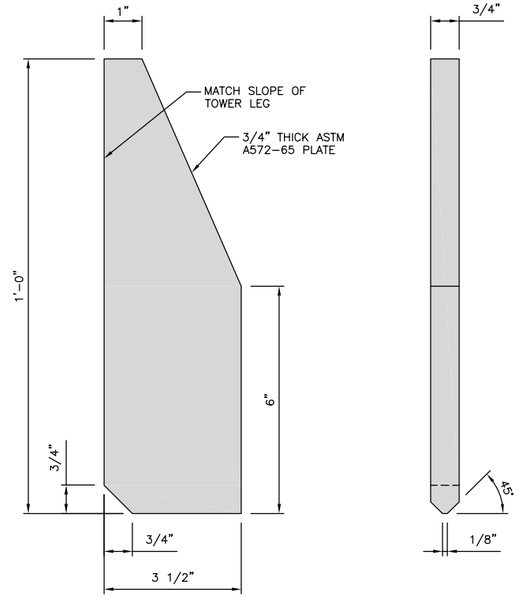
NOTE

1. TYPICAL FOR ALL 3 TOWER LEGS.

SECTION 2
NO SCALE

NOTES

1. FIELD LOCATE STIFFENER PLATES SPACED ABOUT LEG AS SHOWN AND AS REQUIRED TO AVOID EXISTING INTERFERENCES.
2. ALL NEW PLATES SHALL BE HOT–DIPPED GALVANIZED.
3. AS A MINIMUM, GROUT SHALL DEVELOP A COMPRESSIVE STRENGTH OF 7000 PSI MINIMUM IN 28 DAYS.
4. MATERIAL SHALL BE IN ACCORDANCE WITH ASTM C1107–02, STANDARD SPECIFICATION FOR PACKAGED DRY, HYDRAULIC–CEMENT GROUT (NON–SHRINK).
5. RECOMMENDED MANUFACTURES (LISTED IN ORDER OF PREFERENCE):
   1) EUCLID CHEMICAL CO. – ENCO–NS
   2) BASF (DEGUSSA, MASTER BUILDER) – MASTERFLOW 95
   3) SIKA–SIKAGROUT 212
   4) FIVE STAR – FIVE STAR GROUT
   5) QUIKRETE NON–SHRINK PRECISION GROUT (NO. 1585–00)
   6) OR ENGINEER APPROVED EQUAL
5. PERFORM ALL REPAIR OR REPLACEMENT ACTIVITIES ONLY IN NON–SEVERE WEATHER CONDITIONS. GROUND WIND SPEED SHALL BE LESS THAN 20 MPH.
6. LOOSE MATERIAL SHALL BE REMOVED PRIOR TO GROUT PLACEMENT, ANY FAYING SURFACES MUST BE FREE OF DIRT, GREASE, SCALE, ETC, AND UNSOUND GROUT MUST BE CHIPPED OUT.
7. CHECK THE LEVELING NUT FOR TIGHTNESS: USING A SPUD WRENCH AND THE FULL EFFORT OF A PERSON, CHECKING THE LEVELING NUT FOR TIGHTNESS IN ALL LOCATIONS WHERE THE GROUT IS BEING REPAIR. CHECK THE ANCHOR ROD NUT ATOP THE BASE PLATE FOR TIGHTNESS.
8. WORK/PLACEMENT SHALL BE PER MANUFACTURER'S RECOMMENDATIONS USING ESTABLISHED PROCEDURES ACCORDING TO AMERICAN CONCRETE INSTITUTE (ACI) 318 RECOMMENDATIONS.
9. GROUT SHALL BE PLACED IN A MANNER THAT WILL PREVENT SEGREGATION OF GROUT MATERIALS.
10. GROUT SHALL BE INSTALLED TO PROVIDE BEARING TO THE ENTIRE BASE PLATE SURFACE.



#S1
STIFFENER PLATE
NO SCALE

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH

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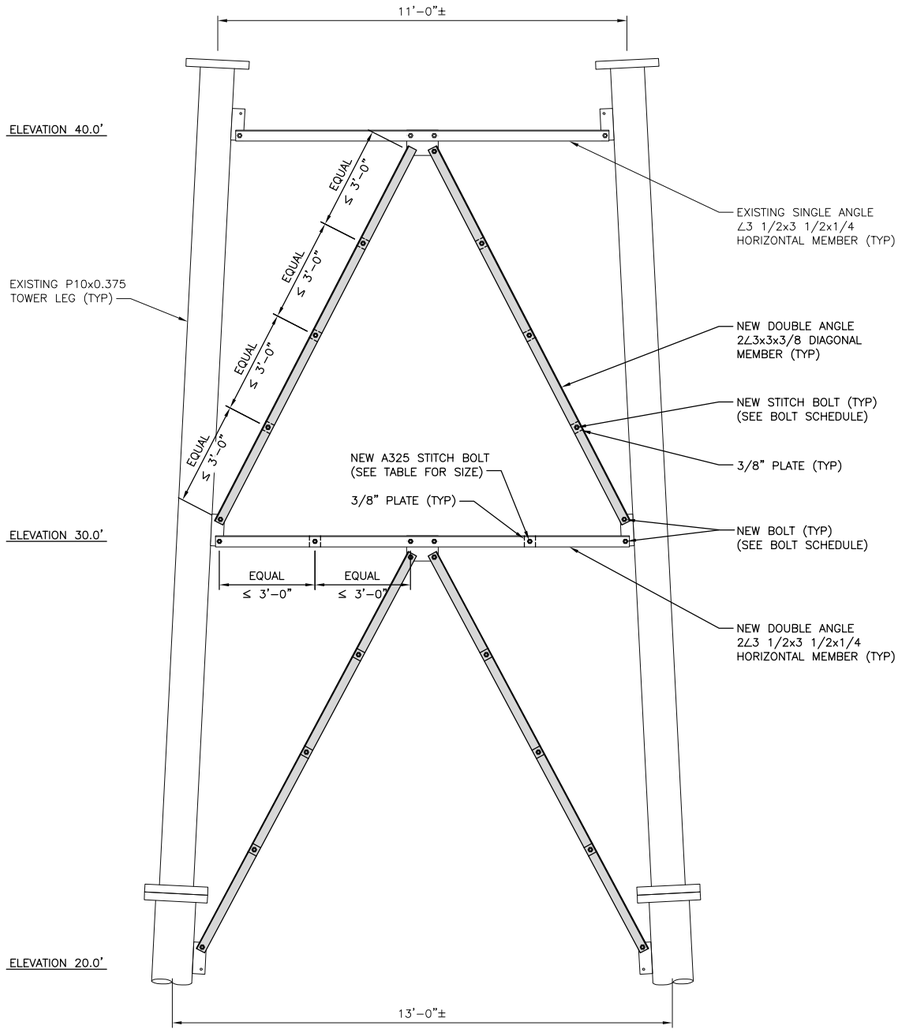
SHEET TITLE
REINFORCEMENT DETAILS

SHEET NUMBER
TM-6



ELEVATION
NO SCALE

BILL OF MATERIALS – DIAGONAL			
ELEVATION	QUANTITY OF ANGLES	ANGLE SIZE	ANGLE LENGTH
20.0' – 40.0'	24	∠3x3x3/8	11'-11"±

NOTE: ANGLE LENGTHS SHALL BE FIELD VERIFIED.

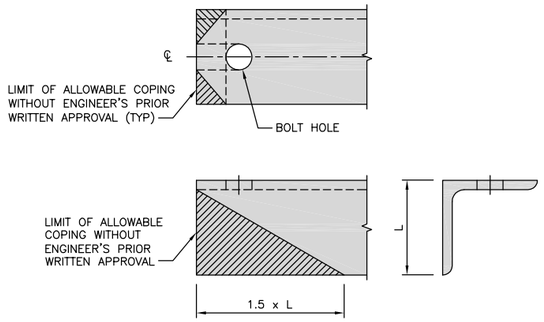
BILL OF MATERIALS – HORIZONTAL			
ELEVATION	QUANTITY OF ANGLES	ANGLE SIZE	ANGLE LENGTH
30.0'	3	∠3 1/2x3 1/2x1/4	12'-0"±

NOTE: ANGLE LENGTHS SHALL BE FIELD VERIFIED.

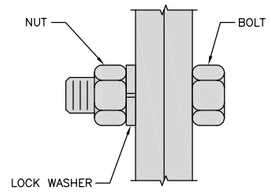
NOTES

1. INSTALL NEW SINGLE ANGLE HORIZONTAL MEMBERS TO RECONFIGURE FROM SINGLE ANGLES TO DOUBLE ANGLES. INSTALL NEW STITCH PLATE. DO NOT REUSE BOLTS. FOR EDGE DISTANCES AND FOR COPING DETAILS (ONLY IF NEEDED), REFER TO THE TABLE AND DETAILS THIS SHEET.
2. ALL DOUBLE ANGLES TO HAVE MINIMUM 1 STITCH BOLT WITH 3/8" PLATE PER UNBRACED SPAN. MAXIMUM SPACING BETWEEN STITCH BOLTS SHALL NOT BE GREATER THAN 3'-0". SHIM AT EXISTING LEG GUSSETS AS REQUIRED TO MAINTAIN PROPER DOUBLE ANGLE SPACING.
3. ONLY ONE CONNECTION BOLT SHALL BE REMOVED AT A TIME.
4. REMOVE EXISTING DIAGONAL MEMBERS AND USE FOR TEMPLATES TO FIELD CUT. INSTALL NEW DOUBLE ANGLE DIAGONAL MEMBERS. INSTALL NEW STITCH PLATE. DO NOT REUSE BOLTS. FOR EDGE DISTANCES AND FOR COPING DETAILS (ONLY IF NEEDED), REFER TO THE TABLE AND DETAILS THIS SHEET.

BOLT SCHEDULE						
MEMBER SIZE	CONNECTION TYPE	BOLT SIZE & GRADE	MIN EDGE DISTANCE	BOLT SPACING	BOLT HOLE	BOLT QUANTITY
2∠3x3x3/8	END	7/8"x2 3/4" LONG A325	1 1/8"	NA	15/16"	24
	STITCH		NA			FIELD VERIFY
2∠3 1/2x3 1/2x1/4	END	7/8"x2 1/2" LONG A325	1 1/8"	NA	15/16"	6
	STITCH		NA			FIELD VERIFY



COPING ALLOWANCES
NO SCALE



TYPICAL BOLT ASSEMBLY
NO SCALE

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211

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NOEL Z. HERRERA
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9-15-2017

SLIDE MOUNTAIN
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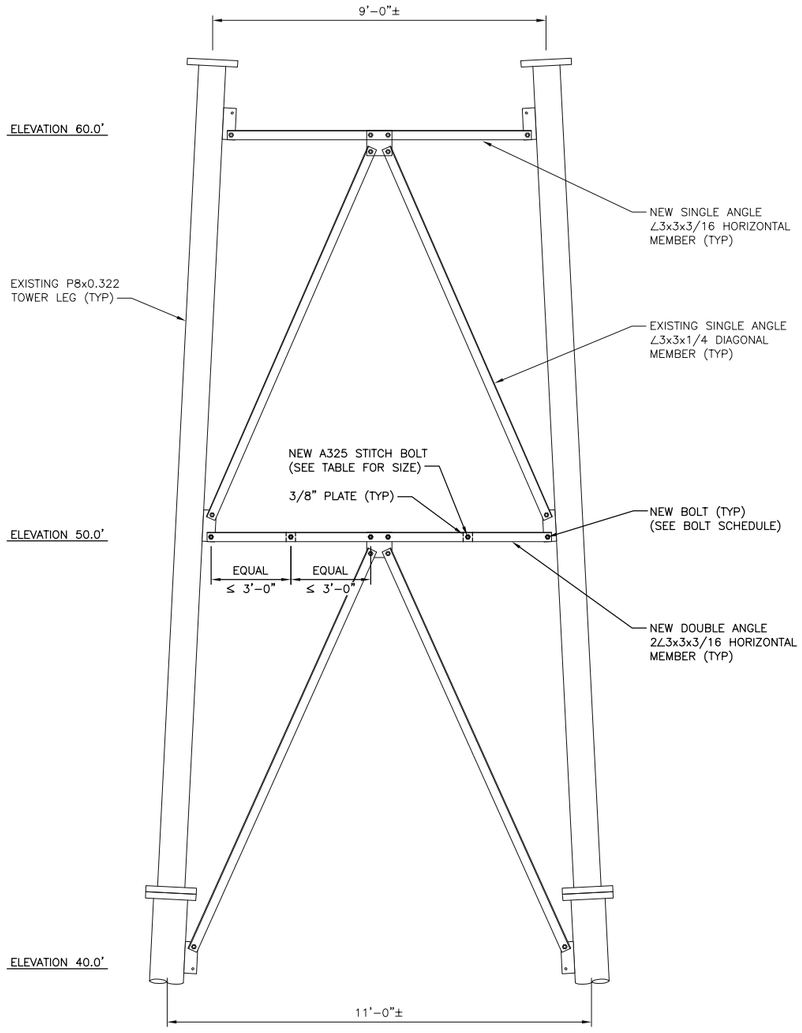
NEW WASHOE CITY, NV 89704
WASHOE COUNTY, USA

SHEET TITLE
REINFORCEMENT DETAILS

SHEET NUMBER
TM-7



ELEVATION
NO SCALE

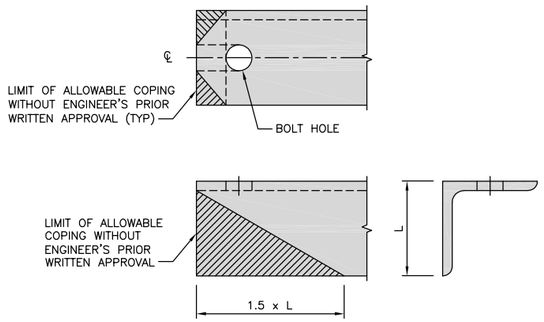
BILL OF MATERIALS – HORIZONTAL			
ELEVATION	QUANTITY OF ANGLES	ANGLE SIZE	ANGLE LENGTH
50.0'	3	∠3x3x3/16	10'–0"±

NOTE: ANGLE LENGTHS SHALL BE FIELD VERIFIED.

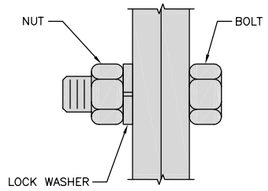
NOTES

1. INSTALL NEW SINGLE ANGLE HORIZONTAL MEMBERS TO RECONFIGURE FROM SINGLE ANGLES TO DOUBLE ANGLES. INSTALL NEW STITCH PLATE. DO NOT REUSE BOLTS. FOR EDGE DISTANCES AND FOR COPING DETAILS (ONLY IF NEEDED), REFER TO THE TABLE AND DETAILS THIS SHEET.
2. ALL DOUBLE ANGLES TO HAVE MINIMUM 1 STITCH BOLT WITH 3/8" PLATE PER UNBRACED SPAN. MAXIMUM SPACING BETWEEN STITCH BOLTS SHALL NOT BE GREATER THAN 3'–0". SHIM AT EXISTING LEG GUSSETS AS REQUIRED TO MAINTAIN PROPER DOUBLE ANGLE SPACING.
3. ONLY ONE CONNECTION BOLT SHALL BE REMOVED AT A TIME.

BOLT SCHEDULE						
MEMBER SIZE	CONNECTION TYPE	BOLT SIZE & GRADE	MIN EDGE DISTANCE	BOLT SPACING	BOLT HOLE	BOLT QUANTITY
2∠3x3x3/16	END	7/8"x2 1/4" LONG A325	1 1/8"	NA	15/16"	6
	STITCH		NA			FIELD VERIFY



COPING ALLOWANCES
NO SCALE



TYPICAL BOLT ASSEMBLY
NO SCALE

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH
6800 W 115TH ST, SUITE 2292
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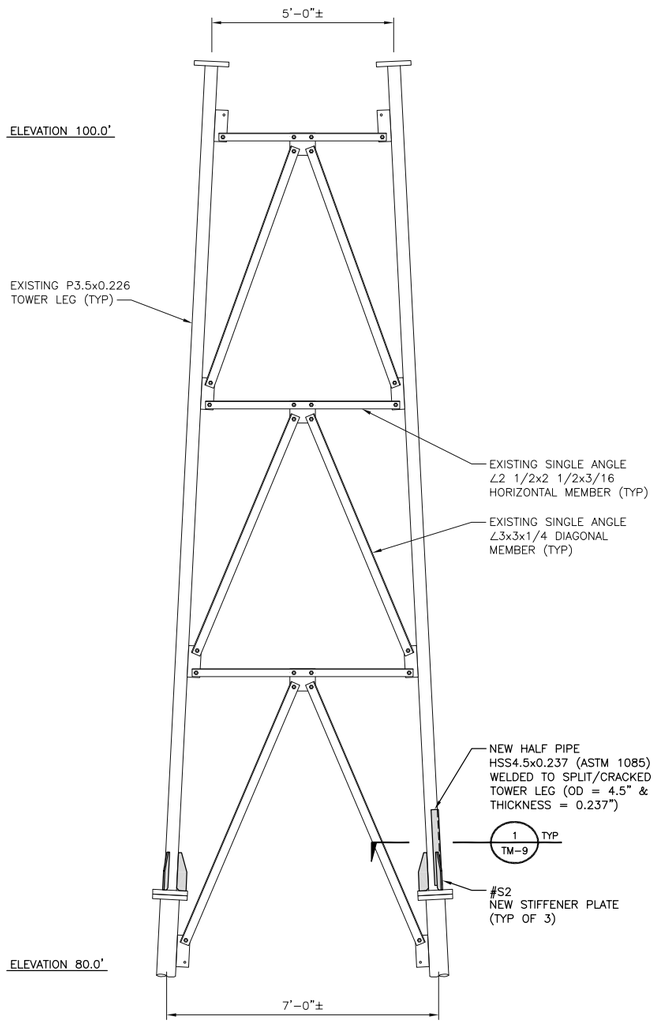
SHEET TITLE
REINFORCEMENT DETAILS

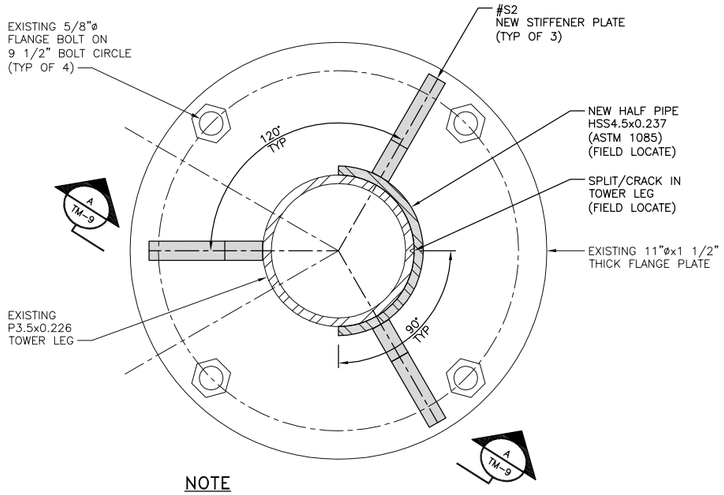
SHEET NUMBER
TM-8

NOTES

1. FIELD LOCATE STIFFENER PLATES SPACED ABOUT LEG AS SHOWN AND AS REQUIRED TO AVOID EXISTING INTERFERENCES.
2. ALL NEW PLATES SHALL BE HOT-DIPPED GALVANIZED.



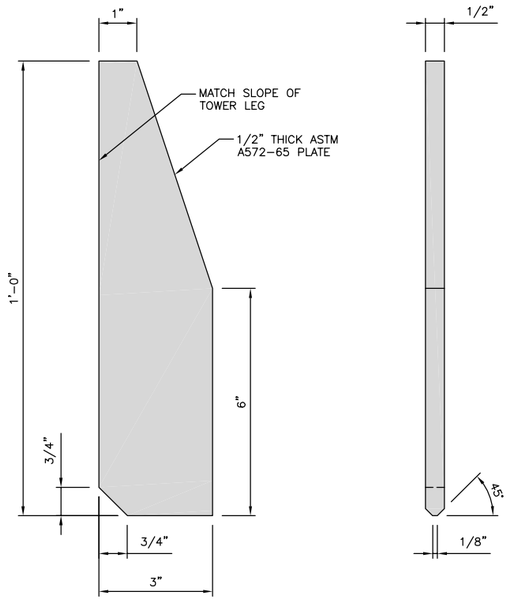
ELEVATION
NO SCALE



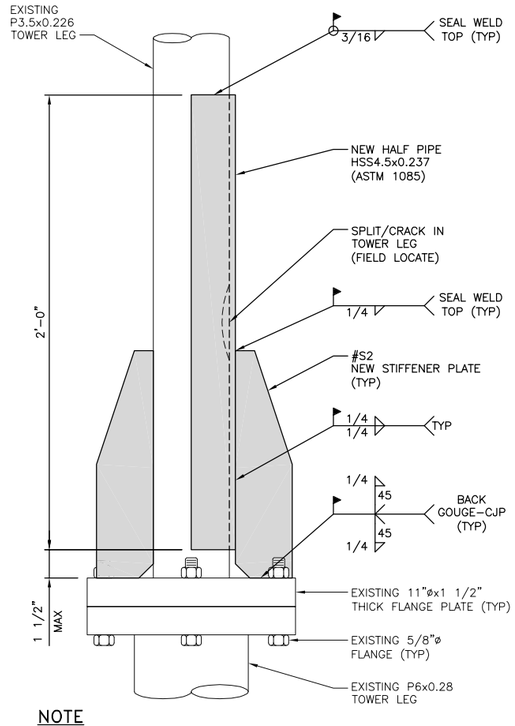
NOTE

1. TYPICAL FOR SPLT/CRACKED TOWER LEG ONLY.

SECTION 1
FLANGE PLATE STIFFENER PLATE PLAN
NO SCALE



#S2
STIFFENER PLATE
NO SCALE



NOTE

1. TYPICAL FOR SPLT/CRACKED TOWER LEG ONLY.

DETAIL A
NO SCALE

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211

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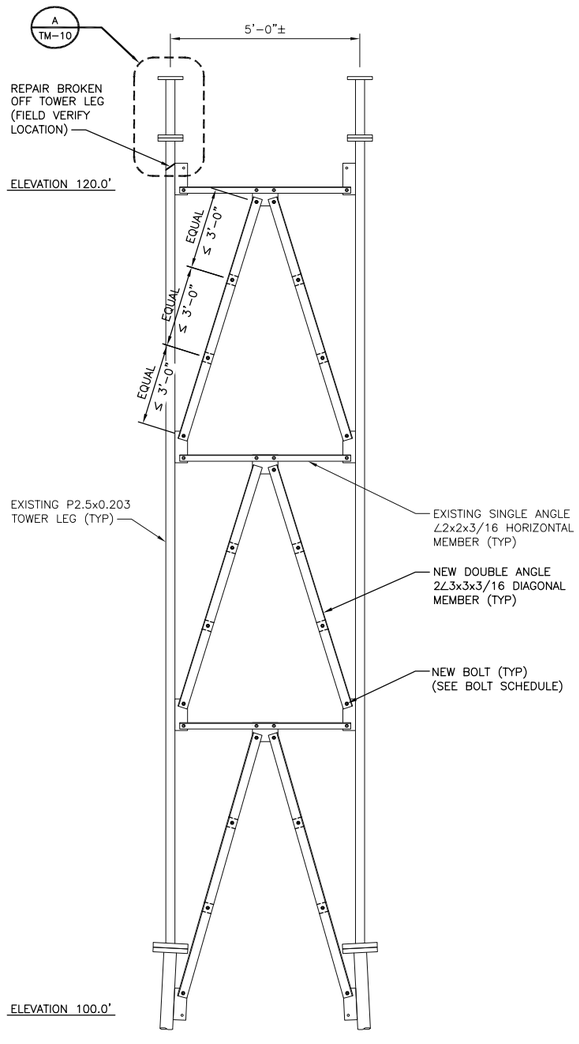
SHEET TITLE
REINFORCEMENT DETAILS

SHEET NUMBER
TM-9



ELEVATION
NO SCALE

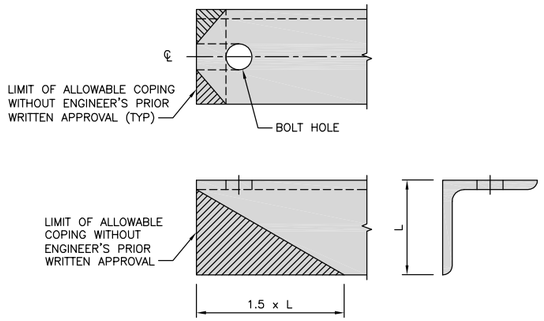
BILL OF MATERIALS – DIAGONAL			
ELEVATION	QUANTITY OF ANGLES	ANGLE SIZE	ANGLE LENGTH
100.0' – 120.0'	18	∠3x3x3/16	7'–2"±

NOTE: ANGLE LENGTHS SHALL BE FIELD VERIFIED.

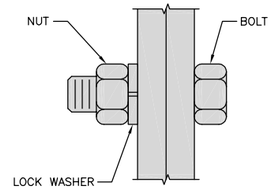
NOTES

1. INSTALL NEW SINGLE ANGLE DIAGONAL MEMBERS TO RECONFIGURE FROM SINGLE ANGLES TO DOUBLE ANGLES. INSTALL NEW STITCH PLATE. DO NOT REUSE BOLTS. FOR EDGE DISTANCES AND FOR COPING DETAILS (ONLY IF NEEDED), REFER TO THE TABLE AND DETAILS THIS SHEET.
2. ALL DOUBLE ANGLES TO HAVE MINIMUM 1 STITCH BOLT WITH 3/8" PLATE PER UNBRACED SPAN. MAXIMUM SPACING BETWEEN STITCH BOLTS SHALL NOT BE GREATER THAN 3'–0". SHIM AT EXISTING LEG GUSSETS AS REQUIRED TO MAINTAIN PROPER DOUBLE ANGLE SPACING.
3. ONLY ONE CONNECTION BOLT SHALL BE REMOVED AT A TIME.

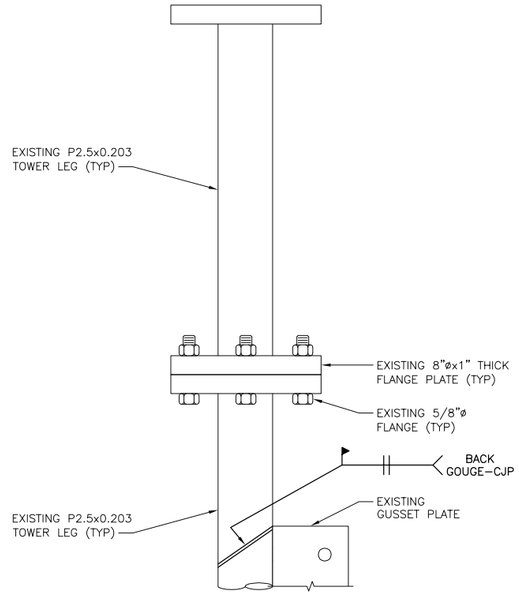
BOLT SCHEDULE						
MEMBER SIZE	CONNECTION TYPE	BOLT SIZE & GRADE	MIN EDGE DISTANCE	BOLT SPACING	BOLT HOLE	BOLT QUANTITY
2∠3x3x3/16	END	7/8"x2 1/2" LONG A325	1 1/8"	NA	15/16"	36
	STITCH		NA			FIELD VERIFY



COPING ALLOWANCES
NO SCALE



TYPICAL BOLT ASSEMBLY
NO SCALE



DETAIL A
LEG REPAIR
NO SCALE

PREPARED FOR:

WASHOE COUNTY, NEVADA 1861

BLACK & VEATCH

6800 W 115TH ST, SUITE 2292
OVERLAND PARK, KS 66211

PROJECT NO:	196487
DRAWN BY:	TYW
CHECKED BY:	HK

REV	DATE	DESCRIPTION
0	09/13/17	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER - STATE OF NEVADA
NOEL Z. HERRERA
Exp. 6/30/19
STRUCTURAL
No. 21378
9-15-2017

SLIDE MOUNTAIN
ATOP SLIDE MOUNTAIN,
OFF RT 431,
~ 6 MILES WEST OF
NEW WASHOE CITY, NV 89704
WASHOE COUNTY, USA

SHEET TITLE
REINFORCEMENT DETAILS

SHEET NUMBER
TM-10