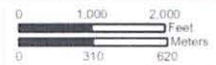


MORGAN VALLEY – MET TOWER LOCATIONS

- ▲ MET Tower Options
- Access Route
- Contours
- Parcels
- Bureau of Land Management
- Private
- California State Lands Commission

Lake County, CA
 USGS 7.5' Quadrangle:
 Morgan Valley, CA
 NAD 1983 UTM Zone 10N
 38.9023°N 122.4477°W



1:30,000



Base Map: ESRI ArcGIS Online
 accessed December 2021
 Updated: 12/16/2021
 Project No: T0273
 Aprx: T0273_MorganValleyWind
 Layout: T0273_SitePlan

SWCA
 ENVIRONMENTAL CONSULTANTS

60m XHD with Standard Footprint

Stamped Drawing

Materials						
Item	Outer Diameter	Wall Thickness	Description	Yield Strength	Breaking Strength	Corrosion Protection
1	10 inch 254 mm	0.098 inch 2.51 mm	MT 1020	45.0 ksi 310 mPa	N/A	Hot Dipped Galvanized
2	8 inch 203 mm	0.095 inch 2.41 mm	MT 1020	45.0 ksi 310 mPa	N/A	ASTM 653
3	10-8 inch taper 254-203 mm	0.109 inch 2.8 mm	MT 1015	45.0 ksi 310 mPa	N/A	
4	0.25 inch 6.35 mm	N/A	7x19 Galv. Aircraft	N/A	7000 Lb 31.1 kN	Galvanized

	Reactions and member forces									
	No Ice		6.4mm (1/4") Ice		12.7mm (1/2") Ice		19 mm (3/4") Ice		25 mm(1") Ice	
	Imperial	SI	Imperial	SI	Imperial	SI	Imperial	SI	Imperial	SI
10 m (33 feet) wind velocity (Fastest mile)	111 mph	49.6 m/s	83 mph	37.1 m/s	66 mph	29.5 m/s	51 mph	22.8 m/s	33 mph	14.8 m/s
Top of tower wind velocity (Fastest mile)	143 mph	64.1 m/s	107 mph	47.8 m/s	85 mph	38.1 m/s	66 mph	29.4 m/s	43 mph	19.1 m/s
Radial ice thickness	0 in	0 mm	0.25 in	6.35 mm	0.50 in	12.7 mm	0.75 in	19.1 mm	1.00 in	25.4 mm
Inner guy anchor force (angle from horizontal)	4.2 kLb 23°	18.7 kN 23°	2.4 kLb 22°	10.7 kN 22°	2.2 kLb 22°	9.7 kN 22°	2.1 kLb 20°	9.3 kN 20°	2.1 kLb 18°	9.2 kN 18°
Middle guy anchor force (angle from horizontal)	3.5 kLb 37°	15.7 kN 37°	2.4 kLb 36°	10.6 kN 36°	2.2 kLb 35°	9.7 kN 35°	2.2 kLb 34°	10.0 kN 34°	2.2 kLb 32°	9.9 kN 32°
Outer guy anchor force (angle from horizontal)	5.1 kLb 45°	22.7 kN 45°	4.2 kLb 44°	18.7 kN 44°	3.6 kLb 43°	16.7 kN 43°	3.0 kLb 42°	13.4 kN 42°	2.6 kLb 40°	11.6 kN 40°
Tower base force (Note K) (horizontal- during erection)	5.2 kLb	23.1 kN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tower base force (vertical)	12.2 kLb	54.5 kN	16.6 kLb	73.9 kN	18.6 kLb	82.6 kN	19.9 kLb	88.5 kN	22.1 kLb	98.2 kN
Erection anchor force (Note K) (angle from horizontal)	7.2 kLb 44°	32.0 kN 44°	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Maximum guy tension	2.8 kLb	12.6 kN	2.4 kLb	10.7 kN	2.2 kLb	9.8 kN	1.7 kLb	7.5 kN	1.5 kLb	6.9 kN
Maximum tower tube stress (compression)	15.1 ksi	104 MPa	11.5 ksi	79 MPa	11.0 ksi	76 MPa	8.9 ksi	62 MPa	8.3 ksi	58 MPa
Maximum tower tube stress (tension)	13.9 ksi	95.8 MPa	6.2 ksi	43 MPa	4.1 ksi	29 MPa	2.6 ksi	18 MPa	1.1 ksi	7 MPa
Maximum tower tube moment	75 in-kLb	8.4 kN-m	37 in-kLb	4.2 kN-m	28 in-kLb	3.2 kN-m	19 in-kLb	2.2 kN-m	9.9 in-kLb	1.1 kN-m
Maximum tower tube axial load	12.2 kLb	54.4 kN	16.6 kLb	73.9 kN	18.6 kLb	82.6 kN	19.9 kLb	88.5 kN	22.1 kLb	98.1 kN
Maximum top deflection	32 inches	812 mm	26 inches	667 mm	23 inches	582 mm	12 inches	312 mm	6 inches	153 mm
Initial guy tension	0.18 kLb	0.8 kN	0.18 kLb	0.8 kN	0.18 kLb	0.8 kN	0.18 kLb	0.8 kN	0.18 kLb	0.8 kN

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	Initial release	1 July 2007	A. Booth
B	Revised guy/anchor force. Added Note K.	26 Apr 2010	A. Booth

Notes

- A) Wind forces and allowable member loads are calculated using ANSI TIA/EIA-222-F, (1996), "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures".
- B) Wind speeds are fastest mile wind velocity per EIA-222-F. EIA-222-F wind loading coefficients: G=1.69, Ct=1.0, c=2/7.
- C) Fastest mile (fm) wind speed can be converted to an approximate three second (3sec) wind speed using the equation:
 $V(3sec) = 1.22 \sqrt{V(fm)}$ for $V(fm) \leq 100$ mph
- D) Guy joint efficiency = 0.9 and the guy safety factor is greater than or equal to 2.0.
- E) An ANSYS large deflection FEA model using beam (Pipe16) and tension (Link10) elements with distributed wind load was used to calculate member forces and reactions.
- F) Tower allowable stress design per American Institute of Steel Construction (AISC), "Allowable Stress Design", 9th Ed. 1989, Chapter H, equations H1-1, H1-2
- G) This tower design meets the structural requirements of EIA-222-F, sections 1.2,3,6,8 for the given loading condition. This analysis does not apply to EIA-222-F sections 7.11,12,13.
- H) Foundation design must be considered separately and is not a part of this analysis. Foundation details must be approved for the specific application and site by a qualified professional.
- I) A locally qualified professional must determine the applicability of this analysis for the expected site conditions. Due to the lack of involvement in the siting or construction phase of this product at a specific location, liability is strictly limited to issues arising from negligence or willful misconduct by NRG or the professional engineer completing this analysis. No warranty, expressed or implied, is made concerning the suitability of this product for a given application or location.
- J) Given dimensions are nominal. Actual dimensions may vary.
- K) Erection forces are at zero wind speed and do not include any tower appurtenances.

Units notation

- mm - Millimeters
- m - Meters
- m/s - Meters per second
- kN - 1,000 Newtons
- mPa - 1,000,000 Pascals
- kLb - 1,000 US pounds
- ksi - 1,000 US pounds per inch²
- mph - Miles per hour
- Ø - Diameter

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± 1/16	± .030	± 1°	
	± .015	± .005	
DO NOT SCALE DRAWING		APPROVALS	DATE
DESIGNED: APB	DATE: 07/01/07	DATE: 06/21/07	
SCALE: NTS			

NRG SYSTEMS INC
 110 RIGGS RD, HINESBURG, VT., 05461

60(50)mHD_60m with Large Footprint
 254, 203 mm
 (10.0, 8.0 inch) diameter tube

PROJECT: N4344

SHEET: 1 of 1

66

NRG_60m_and_50m_XHD_TallTower_Installation_Manual_and_Specifications_Rev_3.0.docx

9 December 2011