RYKA LAND SERVICES

MOUNT MODIFICATION REPORT

PRCTI20241032

City of Puyallup
Building
REVIEWED
FOR
COMPLIANCE
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07/15/2024
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Prepared For:

AT&T

AT&T Mobility
16221 NE 72nd Way
Redmond, WA 98052

Project Name:

Good Samaritan
WA6659

Project Address:

407 14th Avenue Southeast
Puyallup, WA 98371

Site Coordinates:

47.1795
-122.2906

Prepared By:

Ryan McDaniel, P.E.

May 30, 2024

Calculations required to be provided by the Permittee on site for all Inspections

PROJECT SCOPE:

AT&T Mobility proposes the following: Remove (12) radioheads, (11) distribution units. Add (6) active radio antennas, (12) radioheads, (3) distribution units and (3) antenna mounts.

ANALYSIS:

The purpose of this analysis is to determine if the existing installation is adequately supported under the proposed loadings and provide any recommendations for modification in order to bring the support structure into compliance if needed. The installation has been analyzed in accordance with ASCE 7-16. The following parameters were used for lateral analysis:

Basic Wind Speed:	98	Risk Category:	IV
Wind Exposure:	B	Seismic Design Category:	D
Topographic Factor, kzt:	1.00	Mapped Parameter, Ss:	1.267
		Mapped Parameter, S1:	0.436

This Mount Analysis Report for the existing AT&T equipment is limited to the equipment mounting and support frames. This analysis is based on the specific assumptions and conditions as stated within the following report.

RESULTS:

Based on our review of the existing structure loadings, we have determined the following:

Design Element	Capacity	Status
Antenna Mount	16.9%	PASS

Equipment Support Rating: 16.9% PASS (with modifications)

Please refer to Appendix A for structural calculations supporting the above results and conclusions sections below for additional comments.

CONTENTS:

1 Antenna Sector Equipment Inventory

Existing Equipment Configuration

Elev. (ft)	Equipment Model	Sector	Mount	Qty.	Carrier
79.00	EPBQ-654L8H8-L2	A	Antenna Mount	1	AT&T
79.00	EPBQ-654L8H8-L2	A	Antenna Mount	1	AT&T
79.00	RRH 4T4R B5 160W AHCA	A	Antenna Mount	1	AT&T
79.00	RRH4x25-WCS-4R	A	Antenna Mount	1	AT&T
79.00	RRH 4T4R B12/14 320W AHLBA	A	Antenna Mount	1	AT&T
79.00	RRH 4T4R B25/66 320W AHFIB	A	Antenna Mount	1	AT&T
79.00	DC2-48-60-0-9E	A	Antenna Mount	1	AT&T
79.00	DC2-48-60-0-9E	A	Antenna Mount	1	AT&T
79.00	DC2-48-60-0-9E	A	Antenna Mount	1	AT&T
79.00	FC12-PC6-10E	A	Antenna Mount	1	AT&T
79.00	FC12-PC6-10E	A	Antenna Mount	1	AT&T

Final Equipment Configuration

88.75	AIR6419 B77D	A	Antenna Mount	1	AT&T
88.75	AIR6419 B77G	A	Antenna Mount	1	AT&T
80.00	EPBQ-654L8H8-L2	A	Antenna Mount	1	AT&T
80.00	EPBQ-654L8H8-L2	A	Antenna Mount	1	AT&T
80.00	4490 B5/B12A	A	Antenna Mount	1	AT&T
80.00	4415 B30	A	Antenna Mount	1	AT&T
80.00	4478 B14	A	Antenna Mount	1	AT&T
80.00	4890 B25/B66	A	Antenna Mount	1	AT&T
80.00	DC9-48-60-24-PC16-EV	A	Antenna Mount	1	AT&T

See the Architectural and Structural Drawings for configuration, location, and elevations. See the structural calculations for a detailed account of the equipment and the capacity of the support structure.

1 Antenna Sector Equipment Inventory

Existing Equipment Configuration

Elev. (ft)	Equipment Model	Sector	Mount	Qty.	Carrier
80.00	EPBQ-654L8H8-L2	B	Antenna Mount	1	AT&T
80.00	EPBQ-654L8H8-L2	B	Antenna Mount	1	AT&T
80.00	RRH 4T4R B5 160W AHCA	B	Antenna Mount	1	AT&T
80.00	RRH4x25-WCS-4R	B	Antenna Mount	1	AT&T
80.00	RRH 4T4R B12/14 320W AHLBA	B	Antenna Mount	1	AT&T
80.00	RRH 4T4R B25/66 320W AHFIB	B	Antenna Mount	1	AT&T
80.00	DC2-48-60-0-9E	B	Antenna Mount	1	AT&T
80.00	DC2-48-60-0-9E	B	Antenna Mount	1	AT&T
80.00	DC2-48-60-0-9E	B	Antenna Mount	1	AT&T

Final Equipment Configuration

88.75	AIR6419 B77D	B	Antenna Mount	1	AT&T
88.75	AIR6419 B77G	B	Antenna Mount	1	AT&T
80.00	EPBQ-654L8H8-L2	B	Antenna Mount	1	AT&T
80.00	EPBQ-654L8H8-L2	B	Antenna Mount	1	AT&T
80.00	4490 B5/B12A	B	Antenna Mount	1	AT&T
80.00	4415 B30	B	Antenna Mount	1	AT&T
80.00	4478 B14	B	Antenna Mount	1	AT&T
80.00	4890 B25/B66	B	Antenna Mount	1	AT&T
80.00	DC9-48-60-24-PC16-EV	B	Antenna Mount	1	AT&T

See the Architectural and Structural Drawings for configuration, location, and elevations. See the structural calculations for a detailed account of the equipment and the capacity of the support structure.

1 Antenna Sector Equipment Inventory

Existing Equipment Configuration

Elev. (ft)	Equipment Model	Sector	Mount	Qty.	Carrier
79.00	EPBQ-654L8H8-L2	C	Antenna Mount	1	AT&T
79.00	EPBQ-654L8H8-L2	C	Antenna Mount	1	AT&T
79.00	RRH 4T4R B5 160W AHCA	C	Antenna Mount	1	AT&T
79.00	RRH4x25-WCS-4R	C	Antenna Mount	1	AT&T
79.00	RRH 4T4R B12/14 320W AHLBA	C	Antenna Mount	1	AT&T
79.00	RRH 4T4R B25/66 320W AHFIB	C	Antenna Mount	1	AT&T
79.00	DC2-48-60-0-9E	C	Antenna Mount	1	AT&T
79.00	DC2-48-60-0-9E	C	Antenna Mount	1	AT&T
79.00	DC2-48-60-0-9E	C	Antenna Mount	1	AT&T

Final Equipment Configuration

88.75	AIR6419 B77D	C	Antenna Mount	1	AT&T
88.75	AIR6419 B77G	C	Antenna Mount	1	AT&T
80.00	EPBQ-654L8H8-L2	C	Antenna Mount	1	AT&T
80.00	EPBQ-654L8H8-L2	C	Antenna Mount	1	AT&T
80.00	4490 B5/B12A	C	Antenna Mount	1	AT&T
80.00	4415 B30	C	Antenna Mount	1	AT&T
80.00	4478 B14	C	Antenna Mount	1	AT&T
80.00	4890 B25/B66	C	Antenna Mount	1	AT&T
80.00	DC9-48-60-24-PC16-EV	C	Antenna Mount	1	AT&T

See the Architectural and Structural Drawings for configuration, location, and elevations. See the structural calculations for a detailed account of the equipment and the capacity of the support structure.

2 Reference Documents

The following data was used to model and analyze the structure.

Date	Document	Author
	2018 IBC	International Code Council
	ASCE 7-16	ASCE
2/21/2024	RFDS	AT&T
09-12-11	Construction Drawings	Cornerstone Engineering
May 12, 2015	Structural Calculations	Cornerstone Engineering

3 Design Comments

Telecommunication equipment is being reconfigured on an existing building. New active antennas will be mounted on existing modified mounts at existing mount locations. Existing antennas will be relocated. Some cabinets will be reconfigured at the equipment platform.

Load combinations are applied per ASCE 7-16 Sections 2.4.1. Combinations involving reduced dead loads, live loads, and seismic loads are eliminated because they do not apply, or by inspection. The following load combinations remain:

1. D
2. D + L
3. D + S
5. D + 0.6W

The new antenna mount is checked for the new antenna loads.

The new mounts and building support are analyzed for the scope of this report. The telecommunications equipment does not add an additional %5 weight or 10% lateral load to the existing building and does not require retrofit. Local elements are checked.

1 Conclusion / Recommendations

To the best of our knowledge and belief, the modified Antenna Mount will be in compliance with the requirements of the specifications codes and agencies having jurisdiction over the work.

2 Scope and Liability

1. This report is prepared with the information furnished to Ryka by our client. If the conditions of the site change, or if new information becomes available, the results of this report are not valid. Ryka should be notified so that the report can be updated and resubmitted.

2. This report is meant to show the level of conformance for the site with the referenced codes. No other assessment is implied.

3. Ryka has not performed invasive testing or inspection which might reveal corrosion, damage, or work not installed per plan. The contractor should report any of these occurrences upon discovery.

4. The contractor hired for construction of items included in this report are responsible for verifying that work described in previous plan sheets has been installed per plan.

5. Ryka has not engineered, tested, or inspected the manufacture of third party vendor items such as mounts, poles, and other support structures. We select equipment from vendors which provide their own engineering and quality control. Ryka cannot be responsible for defective hardware or supports which do not meet the published support capacity.

6. Ryka is not responsible for the conclusions, opinions and recommendations made by others based on the information contained herein.

7. It is assumed that the existing mounting structure is in good condition with no damage that could cause a reduced capacity.

A Appendix – Structural Calculations

SITE PARAMETERS:

Risk Category =	IV	(Table 1-1)	Latitude =	47.1795	(USGS)
Site Soil Classification =	D	(Table 20.3-1)	Longitude =	-122.2906	(USGS)

MAPPED ACCELERATION PARAMETERS:

Mapped Parameter, Ss =	1.267	(USGS)
Mapped Parameter, S_1 =	0.436	(USGS)

MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS:

Site Coefficient, F_a =	1.20g	(Table 11.4-1)
Site Coefficient, F_v =	1.864g	(Table 11.4-2)
$S_{MS} = F_a S_S$ =	1.52g	(Eq 11.4-4)
$S_{M1} = F_v S_1$ =	0.813g	(Eq 11.4-1)

DESIGN SPECTRAL RESPONSE PARAMETERS:

$S_{DS} = ⅔ S_{MS}$ =	1.014g	(Eq 11.4-3)
$S_{D1} = ⅔ S_{M1}$ =	0.542g	(Eq 11.4-4)

SESIMIC DESIGN CATEGORY

Seismic Design Category =	D	(Tables 11.6-1 and 11.6-2)

SEISMIC DESIGN FORCE FOR NONSTRUCTURAL COMPONENTS:

Average Structure Height, h =	64.67	ft
Height of Component, z =	88.75	ft
Importance Factor, I_e =	1.50	(Sec 13.1-3)
Response Mod. Factor, R_p =	2.5	(Table 13.5-1 or 13.6-1)
Amplification Factor, a_p =	1.0	(Table 13.6-1)
$F_{p\,max}$ =	2.433	(Eqn 13.3-2)
$F_{p\,min}$ =	0.456	(Eqn 13.3-3)
Seismic Design Force, F_p =	0.730	(Eqn 13.3-1)
Seismic Design Force, Fp =	0.730	(Eq 12.8-1)
Seismic Design Force, Fp =	0.511	(ASD)

DESCRIPTION: ASCE 7-16 Wind Factors

Risk Category =	IV		(Table 1.5-1)
Wind Speed, V =	98	mph	(Figure 26.5-1)
Directionality Factor, K_d =	0.90		(Table 26.6-1)
Exposure Category =	B		(Section 26.7)
Topographic Factor, K_{zt} =	1.00		(Section 26.8 & Figure 26.8-1)
Ground Elevation Factor, K_e =	0.997		(Section 26.9 and Table 26.9-1)
Gust Factor, G =	0.85		(Section 26.11.1)
Avg Height of Equipment, z =	88.8	ft	
Velocity Pressure Coeff., K_h =	0.96		(Table 27.3-1)
velocity pressure, q_h =	0.00256 K_h K_{zt} K_d K_e V^2		(Eq 26.10-1)
velocity pressure, q_h =	21.1	psf	(Section 27.4.7 indicates 16 psf min. pressure)

DESIGN WIND LOADS: OTHER STRUCTURES

Design Lateral Wind Pressure, P_h =	17.9	psf	(From Eq. 29.4-2, where F = P Cf A_f)
Design Lateral Wind Pressure, P_h =	10.8	psf	(ASD)

Velocity Pressure, qz =	21.1	psf
G =	0.85	

Item	Flat / Round	Dish / Panel	Height in	Width in	Depth in	Cf(n)			Cf(t)		
						1	7	25	1	7	25
EPBQ-654L8H8-L2	F	P	96.00	21.00	6.30	1.3	1.4	2	1.3	1.4	2
RRH 4T4R B5 160W AHCA	F	P	13.37	11.61	6.50	1.3	1.4	2	1.3	1.4	2
RRH4x25-WCS-4R	F	P	31.50	12.00	8.70	1.3	1.4	2	1.3	1.4	2
RRH 4T4R B12/14 320W AHLBA	F	P	15.70	11.80	4.70	1.3	1.4	2	1.3	1.4	2
RRH 4T4R B25/66 320W AHFIB	F	P	28.70	15.40	9.40	1.3	1.4	2	1.3	1.4	2
DC2-48-60-0-9E	F	P	10.25	10.40	6.30	1.3	1.4	2	1.3	1.4	2
FC12-PC6-10E	F	P	14.75	16.10	6.59	1.3	1.4	2	1.3	1.4	2
AIR6419 B77D	F	P	28.20	16.10	7.20	1.3	1.4	2	1.3	1.4	2
AIR6419 B77G	F	P	28.20	16.10	7.20	1.3	1.4	2	1.3	1.4	2
4490 B5/B12A	F	P	20.60	15.60	7.00	1.3	1.4	2	1.3	1.4	2
4415 B30	F	P	16.50	13.40	5.90	1.3	1.4	2	1.3	1.4	2
4478 B14	F	P	18.10	13.40	8.26	1.3	1.4	2	1.3	1.4	2
4890 B25/B66	F	P	17.50	15.20	7.00	1.3	1.4	2	1.3	1.4	2
DC9-48-60-24-PC16-EV	F	P	16.57	14.58	9.64	1.3	1.4	2	1.3	1.4	2
2"x 120" S40 Stl Pipe	R	P	120.00	2.38	2.38	0.7	0.8	1.2	0.7	0.8	1.2
2"x 42" S40 Stl Pipe	R	P	42.00	2.38	2.38	0.7	0.8	1.2	0.7	0.8	1.2
2"x 30" S40 Stl Pipe	R	P	30.00	2.38	2.38	0.7	0.8	1.2	0.7	0.8	1.2
FLX42 Purcell Cabinet	F	P	78.00	30.00	31.02	1.3	1.4	2	1.3	1.4	2
Emerson 5100	F	P	72.00	32.00	39.00	1.3	1.4	2	1.3	1.4	2
Emerson Netsure Battery Cabinet	F	P	72.06	36.02	36.79	1.3	1.4	2	1.3	1.4	2

Item	Height in	Width in	Depth in	Aspect (norm)	Aspect (tan)	Cf (norm)	Cf (tan)	Af (norm)	Af (tan)
EPBQ-654L8H8-L2	96.00	21.00	6.30	4.57	15.24	1.36	1.67	14.00	4.20
RRH 4T4R B5 160W AHCA	13.37	11.61	6.50	1.15	2.06	1.30	1.32	1.08	0.60
RRH4x25-WCS-4R	31.50	12.00	8.70	2.63	3.62	1.33	1.34	2.63	1.90
RRH 4T4R B12/14 320W AHLBA	15.70	11.80	4.70	1.33	3.34	1.31	1.34	1.29	0.51
RRH 4T4R B25/66 320W AHFIB	28.70	15.40	9.40	1.86	3.05	1.31	1.33	3.07	1.87
DC2-48-60-0-9E	10.25	10.40	6.30	0.99	1.63	1.30	1.31	0.74	0.45
FC12-PC6-10E	14.75	16.10	6.59	0.92	2.24	1.30	1.32	1.65	0.68
AIR6419 B77D	28.20	16.10	7.20	1.75	3.92	1.31	1.35	3.15	1.41
AIR6419 B77G	28.20	16.10	7.20	1.75	3.92	1.31	1.35	3.15	1.41
4490 B5/B12A	20.60	15.60	7.00	1.32	2.94	1.31	1.33	2.23	1.00
4415 B30	16.50	13.40	5.90	1.23	2.80	1.30	1.33	1.54	0.68
4478 B14	18.10	13.40	8.26	1.35	2.19	1.31	1.32	1.68	1.04
4890 B25/B66	17.50	15.20	7.00	1.15	2.50	1.30	1.33	1.85	0.85
DC9-48-60-24-PC16-EV	16.57	14.58	9.64	1.14	1.72	1.30	1.31	1.68	1.11
2"x 120" S40 Stl Pipe	120.00	2.38	2.38	50.42	50.42	1.20	1.20	1.98	1.98
2"x 42" S40 Stl Pipe	42.00	2.38	2.38	17.65	17.65	1.04	1.04	0.69	0.69
2"x 30" S40 Stl Pipe	30.00	2.38	2.38	12.61	12.61	0.92	0.92	0.50	0.50
FLX42 Purcell Cabinet	78.00	30.00	31.02	2.60	2.51	1.33	1.33	16.25	16.80
Emerson 5100	72.00	32.00	39.00	2.25	1.85	1.32	1.31	16.00	19.50
Emerson Netsure Battery Cabinet	72.06	36.02	36.79	2.00	1.96	1.32	1.32	18.03	18.41

		Fp =	0.511	W		Design Lateral Wind Pressure, P_h =		10.8	psf	
		S_{DS} =	1.014	g						

Applied Forces (lbs)									
Item	Weight	Eh	Ev	F_{no}	F_{to}				
EPBQ-654L8H8-L2	86.0	43.9	17.4	204.7	75.7				
RRH 4T4R B5 160W AHCA	36.8	18.8	7.5	15.1	8.6				
RRH4x25-WCS-4R	70.0	35.8	14.2	37.5	27.5				
RRH 4T4R B12/14 320W AHLBA	32.6	16.7	6.6	18.1	7.4				
RRH 4T4R B25/66 320W AHFIB	88.2	45.1	17.9	43.4	26.9				
DC2-48-60-0-9E	16.0	8.2	3.2	10.4	6.3				
FC12-PC6-10E	35.0	17.9	7.1	23.1	9.6				
AIR6419 B77D	66.0	33.7	13.4	44.5	20.5				
AIR6419 B77G	66.0	33.7	13.4	44.5	20.5				
4490 B5/B12A	65.0	33.2	13.2	31.3	14.4				
4415 B30	46.3	23.7	9.4	21.5	9.7				
4478 B14	59.4	30.3	12.0	23.7	14.7				
4890 B25/B66	69.5	35.5	14.1	25.9	12.1				
DC9-48-60-24-PC16-EV	34.9	17.8	7.1	23.5	15.7				
2"x 120" S40 Stl Pipe	36.5	18.6	7.4	25.6	25.6				
2"x 42" S40 Stl Pipe	12.8	6.5	2.6	7.7	7.7				
2"x 30" S40 Stl Pipe	9.1	4.7	1.8	4.9	4.9				
FLX42 Purcell Cabinet	440.0	224.8	89.2	231.9	239.5				
Emerson 5100	2,300.0	1175.0	466.3	227.3	275.6				
Emerson Netsure Battery Cabinet	4,010.0	2048.5	812.9	255.3	260.6				

Existing Sector A Equipment (lbs)			
Item	Weight	F_{no}	F_{to}
EPBQ-654L8H8-L2	86.0	204.7	75.7
EPBQ-654L8H8-L2	86.0	204.7	75.7
RRH 4T4R B5 160W AHCA	36.8	15.1	8.6
RRH4x25-WCS-4R	tember 23, 2	37.5	27.5
RRH 4T4R B12/14 320W AHLBA	04-21-11	18.1	rmit Drawir
RRH 4T4R B25/66 320W AHFIB	nuary 12, 20	43.4	tural Calcula
DC2-48-60-0-9E	01-28-11	10.4	omment Dra
DC2-48-60-0-9E	16.0	10.4	6.3
DC2-48-60-0-9E	16.0	10.4	6.3
FC12-PC6-10E	35.0	23.1	9.6
FC12-PC6-10E	35.0	23.1	9.6
Sector Total	311		

Existing Sector B Equipment (lbs)			
Item	Weight	F_{no}	F_{to}
EPBQ-654L8H8-L2	86.0	204.7	75.7
EPBQ-654L8H8-L2	86.0	204.7	75.7
RRH 4T4R B5 160W AHCA	36.8	15.1	8.6
RRH4x25-WCS-4R	70.0	37.5	27.5
RRH 4T4R B12/14 320W AHLBA	PTS	18.1	7.4
RRH 4T4R B25/66 320W AHFIB	rstone Engir	43.4	26.9
DC2-48-60-0-9E	rstone Engir	10.4	6.3
DC2-48-60-0-9E	16.0	10.4	6.3
DC2-48-60-0-9E	16.0	10.4	6.3
Sector Total	311		

Proposed Sector A Equipment (lbs)			
Item	Weight	F_{no}	F_{to}
AIR6419 B77D	66.0	44.5	20.5
AIR6419 B77G	66.0	44.5	20.5
EPBQ-654L8H8-L2	86.0	204.7	75.7
EPBQ-654L8H8-L2	86.0	204.7	75.7
4490 B5/B12A	65.0	31.3	14.4
4415 B30	46.3	21.5	9.7
4478 B14	59.4	23.7	14.7
4890 B25/B66	69.5	25.9	12.1
DC9-48-60-24-PC16-EV	34.9	23.5	15.7
Sector Total	579		

Proposed Sector B Equipment (lbs)			
Item	Weight	F_{no}	F_{to}
AIR6419 B77D	66.0	44.5	20.5
AIR6419 B77G	66.0	44.5	20.5
EPBQ-654L8H8-L2	86.0	204.7	75.7
EPBQ-654L8H8-L2	86.0	204.7	75.7
4490 B5/B12A	65.0	31.3	14.4
4415 B30	46.3	21.5	9.7
4478 B14	59.4	23.7	14.7
4890 B25/B66	69.5	25.9	12.1
DC9-48-60-24-PC16-EV	34.9	23.5	15.7
Sector Total	579		

Existing Sector C Equipment (lbs)				Existing Sector D Equipment (lbs)			
Item	Weight	F_{no}	F_{to}	Item	Weight	F_{no}	F_{to}
EPBQ-654L8H8-L2	86.0	204.7	75.7				
EPBQ-654L8H8-L2	86.0	204.7	75.7				
RRH 4T4R B5 160W AHCA	36.8	15.1	8.6				
RRH4x25-WCS-4R	70.0	37.5	27.5				
RRH 4T4R B12/14 320W AHLBA	32.6	18.1	7.4				
RRH 4T4R B25/66 320W AHFIB	88.2	43.4	26.9				
DC2-48-60-0-9E	16.0	10.4	6.3				
DC2-48-60-0-9E	16.0	10.4	6.3				
DC2-48-60-0-9E	16.0	10.4	6.3				
Sector Total	448						

Proposed Sector C Equipment (lbs)				Proposed Sector D Equipment (lbs)			
Item	Weight	F_{no}	F_{to}	Item	Weight	F_{no}	F_{to}
AIR6419 B77D	66.0	44.5	20.5				
AIR6419 B77G	66.0	44.5	20.5				
EPBQ-654L8H8-L2	86.0	204.7	75.7				
EPBQ-654L8H8-L2	86.0	204.7	75.7				
4490 B5/B12A	65.0	31.3	14.4				
4415 B30	46.3	21.5	9.7				
4478 B14	59.4	23.7	14.7				
4890 B25/B66	69.5	25.9	12.1				
DC9-48-60-24-PC16-EV	34.9	23.5	15.7				
Sector Total	579			Sector Total			

Applied Forces (lbs)										
Item			Weight	Eh	Ev	F_{no}	F_{to}				
New Cabinets											
Emerson 5100			2,300	1,175	466	227	276				
Emerson Netsure Battery Cabinet			4,010	2,049	813	255	261				
FLX42 Purcell Cabinet			440	225	89	232	240				
Total			**6,750**	**3,448**	**1,368**	**715**	**776**	(least of all previous configs)			

DESCRIPTION: Antenna Mast

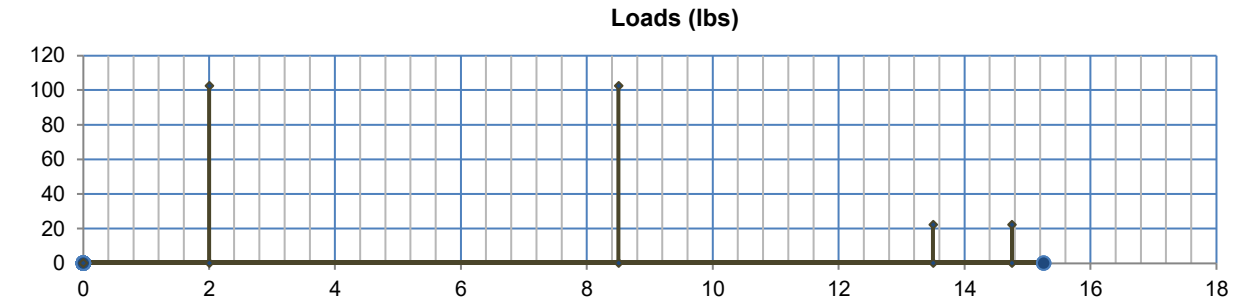
BEAM AND LOADING ATTRIBUTES:

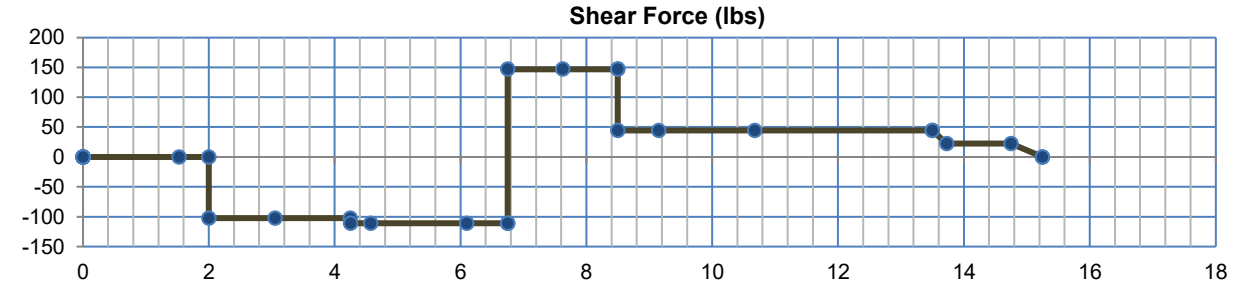
Beam Segments	
x End	EI
0	50,683
15.25	50,683
0	0
0	0

Supports
x
4.25
7
0
0
0

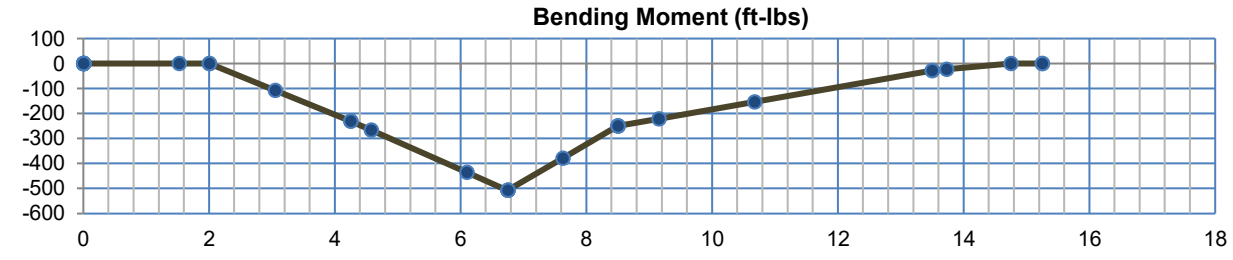
Point Loads		
x	lbs	Moment
2.0	-102.37	0
8.5	-102.37	0
13.5	-22.257	0
14.75	-22.257	0
0	0	0

Distributed Loads			
x Start	x End	lbs	lbs
0.00	15.25	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00

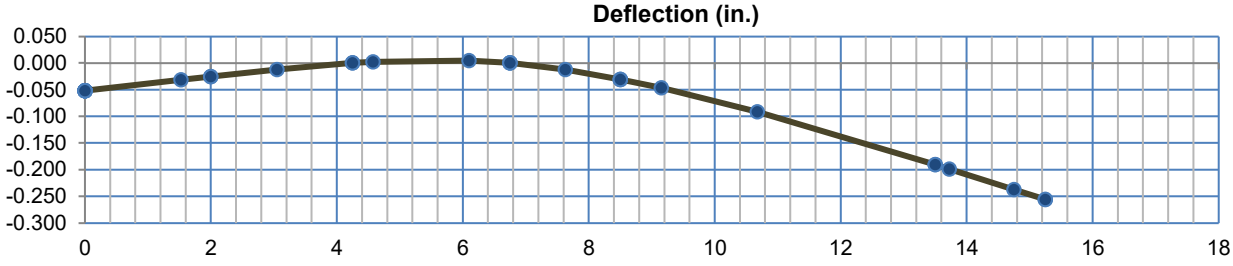




Max. = 147 lbs



Max. = 507 ft-lbs



Max. = 0.256 in.

DESCRIPTION: Antenna Mast

BEAM PROPERTIES: Beam shape = **P 3" Sch 40**

A =	2.230	in^2	Sx =	1.720	in^3
Weight =	7.580	plf	Sy =	1.720	in^3
O.D. =	3.500	in	Ix =	3.020	in^4
			Iy =	3.020	in^4
			rx =	1.160	in.
			ry =	1.160	in.

MATERIAL PROPERTIES:

E =	29,000	ksi
F_y =	35,000	psi

BEAM LOADING:

Unsupported Length, L =	183	in.	
Moment, M =	0.507	kip-ft	
=	6,089	in-lbs	
Shear, V =	0.147	kips	
Deflection, Δ =	0.256	in.	
Span Length / Deflection =	715		

BEAM STRESS:

Bending stress, f_{bx} =	3,540	psi	
Allowable Bending , $F_{bx} = 0.6\ F_y$ =	21,000	psi	
Required S_x =	0.3	in^3	**O.K.**
Shear Stress fv =	66	psi	
Allowable Shear Stress = 0.4 Fy =	14,000	psi	**O.K.**
Required Area, A =	0.002	in^2	

SUMMARY: The calculated shear at the pipe supports is also the load to the mast anchorage. The load is small compared to the capacity of a 1/2" diameter A307 bolt.

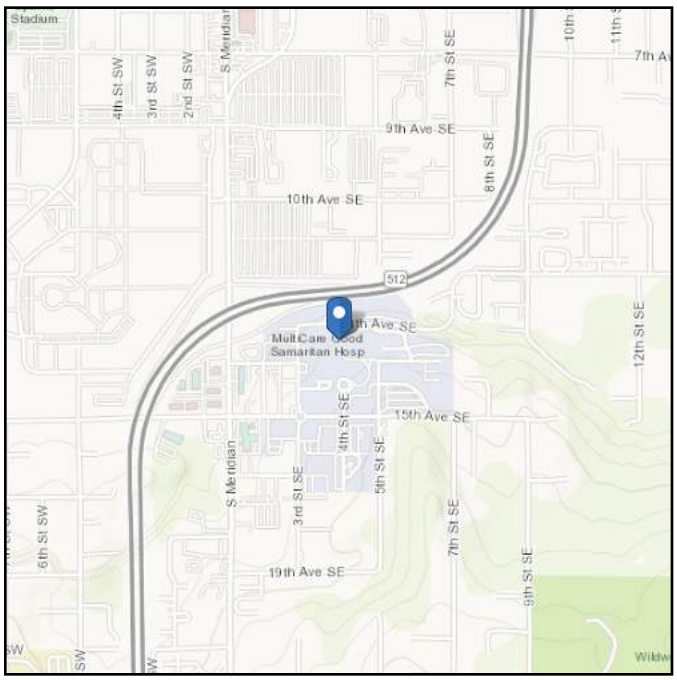
Utilization = **16.86%** of capacity

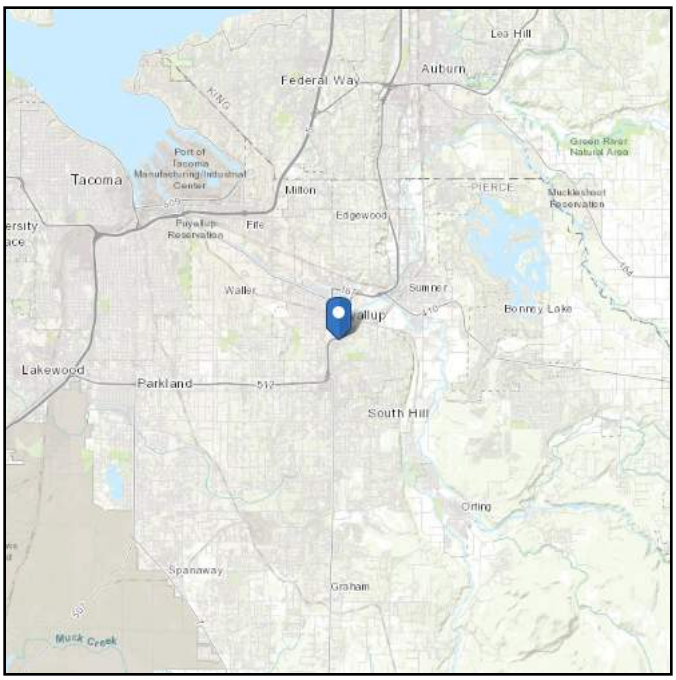
B Appendix – Referenced Documents

ASCE 7 Hazards Report

Address:
407 14th Ave SE
Puyallup, Washington
98372

Standard:	ASCE/SEI 7-16	**Latitude:**	47.179251
Risk Category:	II	**Longitude:**	-122.289637
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	122.28247765975831 ft (NAVD 88)





Wind

Results:

Wind Speed	98 Vmph
10-year MRI	67 Vmph
25-year MRI	73 Vmph
50-year MRI	78 Vmph
100-year MRI	83 Vmph

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

Date Accessed: Sun Apr 02 2023

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

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Seismic

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.267	S_{D1} :	N/A
S_1 :	0.436	T_L :	6
F_a :	1.2	PGA :	0.5
F_v :	N/A	PGA_M :	0.6
S_{MS} :	1.52	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1
S_{DS} :	1.013	C_v :	1.353

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Sun Apr 02 2023

Date Source: USGS Seismic Design Maps

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	25 F
Gust Speed	30 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sun Apr 02 2023

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

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