



AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure : 100 ft Monopole
ATC Site Name : Mlfd - Milford,CT
ATC Site Number : 302516
Engineering Number : 13958547_C3_04
Proposed Carrier : AT&T MOBILITY
Carrier Site Name : MRCTB050833
Carrier Site Number : CTCN002111
Site Location : 438 Bridgeport Ave
Milford, CT 06460-4105
41.2066, -73.0934
County : New Haven
Date : February 28, 2022
Max Usage : 88%
Result : Pass

Prepared By:

Lucas Tait
Structural Engineer I

Reviewed By:



COA : PEC.0001553



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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 100 ft Monopole to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower Drawings	ITT Meyer Specification #AT-8935, Type D, dated April 13, 1984 Mapping by Smith Cullum, SpectraSite #CT-0052, dated May 31, 2002
Foundation Drawing	Mapping by FDH Project #02-1210, dated January 9, 2003
Geotechnical Report	AET Job #002GT03, dated January 7, 2003
Modifications	SpectraSite Drawing #CT-0052, dated January 14, 2003 ATC Job #40870132, dated September 28, 2007 American Tower #27094034, dated April 21, 2008

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	120 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.00" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	$S_s = 0.20$, $S_i = 0.05$
Site Class:	D - Stiff Soil - Default

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
106.0	2	Commscope WCS-IMFQ-AMT	Triangular Platform with Handrails and Side Arms	(1) 2" conduit	AT&T MOBILITY
	3	Ericsson RRUS 32 B2			
	3	Ericsson RRUS 4478 B14			
93.0	3	JMA Wireless MX08FRO665-21	Triangular Platform with Handrails	(1) 1.60" (40.6mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B605			
	3	Fujitsu TA08025-B604			
	1	Raycap RDIDC-9181-PF-48			
	1	Generic Flat Platform with Handrails			
77.6	3	Ericsson Radio 4449 B71 B85A	Perfect Vision PV-LPP12M-HR-12-96 Platform with Handrails w/ PV-PKBK-M Kickers	(3) 1 1/4" (1.25"-31.8mm) Fiber (12) 7/8" Coax	T-MOBILE
73.0	3	Ericsson AIR32 B66Aa/B2a			
	6	Ericsson KRY 112 144/2			
	3	Ericsson RRUS 4415 B25			
	3	Ericsson Air6449 B41			
	3	RFS APX16DWV-16DWVS-E-A20			
	3	RFS APXVAARR24_43-U-NA20			

Equipment to be Removed

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
108.0	1	Generic 10' Omni	-	-	OTHER
106.0	6	Powerwave Allgon LGP21401	-	(2) 0.39" (10mm) Fiber Trunk (6) 0.78" (19.7mm) 8 AWG 6 (12) 1 5/8" Coax (2) 3" conduit	AT&T MOBILITY
	3	Kaelus DBC0061F1V51-2			
102.0	3	CCI OPA-65R-LCUU-H4			
	3	Kathrein Scala 80010964			
	3	Ericsson RRUS 32 (50.8 lbs)			
	3	Ericsson RRUS 32 B66			
	3	Powerwave Allgon 7770.00			
	2	Raycap DC6-48-60-18-8F			
	1	Raycap DC6-48-60-18-8C			
	3	Commscope SBNHH-1D65A			
3	Ericsson RRUS 11 (Band 12)				

Proposed Equipment

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
108.0	3	Ericsson Air 6449 B77D	Triangular Platform with Handrails and Side Arms	(2) 0.41" (10.3mm) Fiber (8) 0.78" (19.7mm) 8 AWG 6 (1) 0.92" (23.4mm) Cable (6) 1 1/4" Coax (3) 2" conduit	AT&T MOBILITY
106.0	2	Raycap DC6-48-60-18-8F			
	3	Ericsson RRUS 4449 B5, B12			
	3	Ericsson RRUS 32 B66A			
	3	Ericsson RRUS 32 B30			
	3	Ericsson RRUS E2 B29			
	1	Raycap DC9-48-60-24-8C-EV			
	3	CCI DMP65R-BU4D			
	3	Quintel QD4616-7			
104.0	3	Ericsson AIR 6419 B77G			

¹ Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	40%	Pass
Shaft	86%	Pass
Baseplate	47%	Pass
Reinforcement	88%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kip-Ft)	1527.1	59%
Axial (Kips)	34.2	2%
Shear (Kips)	20.0	31%

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
108.0	Ericsson Air 6449 B77D	AT&T MOBILITY	0.000	0.000
106.0	Ericsson RRUS 4449 B5, B12	AT&T MOBILITY	0.000	0.000
	Ericsson RRUS 32 B66A			
	Raycap DC6-48-60-18-8F			
	Ericsson RRUS 32 B30			
	Quintel QD4616-7			
	Ericsson RRUS E2 B29			
	Raycap DC9-48-60-24-8C-EV			
104.0	CCI DMP65R-BU4D	AT&T MOBILITY	0.000	0.000
104.0	Ericsson AIR 6419 B77G	AT&T MOBILITY	0.000	0.000

*Deflection, Twist and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

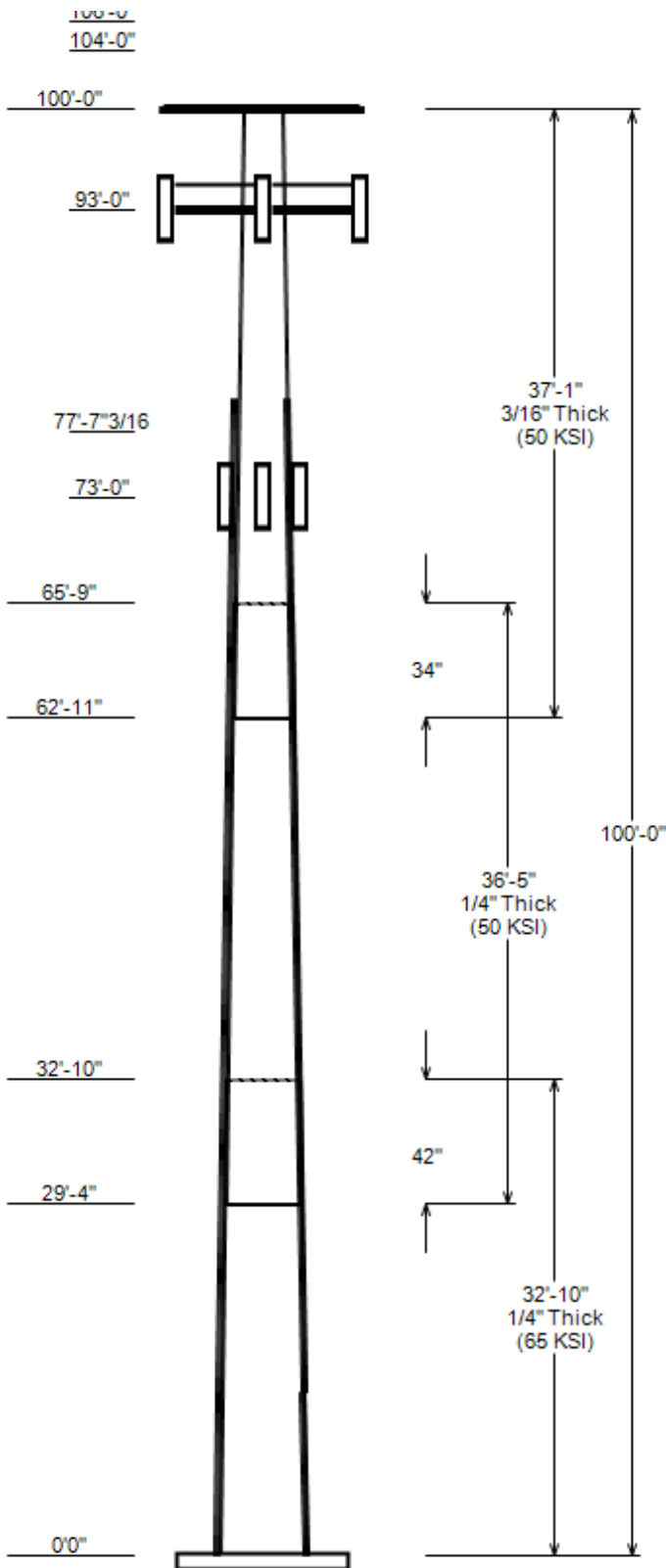
All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively “American Tower”) are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

Asset : 302516, Mlfd - Milford
 Client : AT&T MOBILITY
 Code : ANSI/TIA-222-H

Height : 100 ft
 Base Width : 30
 Shape : 12 Sides



SITE PARAMETERS

Nominal Wind: 120 mph wind with no ice **Topo Category:** 1
 Ice Wind: 50 mph wind with 1" radial **Topo Method:** Method 1
 Base Elev (ft): 0.00 **Taper :** 0.16400 (ln/ft) **Topo Feature:**
 Structure Class: II **Exposure :** B **S_s :** 0.203 **S₁ :** 0.053

SECTION PROPERTIES

Shaft Section	Length (ft)	Diameter (in)		Thick Joint (in)	Type	Overlap Length (in)	Shape	Steel Grade (ksi)
		Across Flats Top	Across Flats Bottom					
1	32.833	24.62	30.00	0.250		0.000	12 Sides	65
2	36.417	19.73	25.70	0.250	Slip Joint	42.000	12 Sides	50
3	37.083	14.50	20.57	0.188	Slip Joint	34.000	12 Sides	50

DISCRETE APPURTENANCE

Attach Elev (ft)	Force Elev (ft)	Qty	Description
108.0	108.0	3	Ericsson Air 6449 B77D
106.0	106.0	2	Commscope WCS-IMFQ-AMT
106.0	106.0	2	Raycap DC6-48-60-18-8F
106.0	106.0	3	Ericsson RRUS 4449 B5, B12
106.0	106.0	3	Ericsson RRUS 4478 B14
106.0	106.0	3	Ericsson RRUS 32 B66A
106.0	106.0	3	Ericsson RRUS 32 B2
106.0	106.0	3	Ericsson RRUS 32 B30
106.0	106.0	3	Ericsson RRUS E2 B29
106.0	106.0	1	Raycap DC9-48-60-24-8C-EV
106.0	106.0	3	CCI DMP65R-BU4D
106.0	106.0	3	Quintel QD4616-7
104.0	104.0	3	Ericsson AIR 6419 B77G
100.0	100.0	3	Generic Flat Side Arm
100.0	100.0	1	Heavy Platform w/ Handrails
93.0	93.0	1	Raycap RDIDC-9181-PF-48
93.0	93.0	3	Fujitsu TA08025-B605
93.0	93.0	3	Fujitsu TA08025-B604
93.0	93.0	3	JMA Wireless MX08FRO665-21
93.0	93.0	1	Generic Flat Platform with Han
77.6	77.6	3	Ericsson Radio 4449 B71 B85A
73.0	73.0	6	Ericsson KRY 112 144/2
73.0	73.0	3	Ericsson RRUS 4415 B25
73.0	73.0	3	Ericsson Air6449 B41
73.0	73.0	3	Ericsson AIR32 B66Aa/B2a
73.0	73.0	3	RFS APX16DWV-16DWVS-E-A20
73.0	73.0	3	RFS APXVAARR24_43-U-NA20
73.0	73.0	1	Perfect Vison PV-LLP12M-HR-12-

LINEAR APPURTENANCE

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	106.0	2" conduit	No
0.0	106.0	2" conduit	No
0.0	106.0	1 1/4" Coax	No
0.0	106.0	0.92" (23.4mm) Cable	No
0.0	106.0	0.78" (19.7mm) 8 AWG 6	No
0.0	106.0	0.41" (10.3mm) Fiber	No
0.0	93.0	1.60" (40.6mm) Hybrid	Yes
0.0	85.0	#20 w/ Angle Brackets	Yes
0.0	85.0	#20 w/ Angle Brackets	Yes
0.0	85.0	#20 w/ Angle Brackets	Yes
0.0	85.0	#20 w/ Angle Brackets	Yes

JOB INFORMATION

Asset : 302516, Mlfd - Milford
 Client : AT&T MOBILITY
 Code : ANSI/TIA-222-H

Height : 100 ft
 Base Width : 30
 Shape : 12 Sides

LINEAR APPURTENANCE

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	73.0	7/8" Coax	Yes
0.0	73.0	1 1/4" (1.25"- 31.8mm) Fiber	Yes

LOAD CASES

1.2D + 1.0W	120 mph wind with no ice
0.9D + 1.0W	120 mph wind with no ice
1.2D + 1.0Di + 1.0Wi	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice

REACTIONS

Load Case	Moment (kip-ft)	Shear (Kip)	Axial (Kip)
1.2D + 1.0W	1527.08	19.94	34.21
0.9D + 1.0W	1501.89	19.91	25.65
1.2D + 1.0Di + 1.0Wi	361.92	4.58	46.60
1.2D + 1.0Ev + 1.0Eh	77.83	0.86	34.27
0.9D - 1.0Ev + 1.0Eh	76.16	0.86	23.61
1.0D + 1.0W	338.25	4.46	28.56

DISH DEFLECTIONS

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
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ASSET: 302516, Mlfd - Milford
CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-H
ENG NO: 13958547_C3_04

ANALYSIS PARAMETERS

Location:	New Haven County,CT	Height:	100 ft
Type and Shape:	Taper, 12 Sides	Base Diameter:	30.00 in
Manufacturer:	ITT Meyer	Top Diameter:	14.50 in
K_d (non-service):	0.95	Taper:	0.1640 in/ft
K_e:	1.00	Rotation:	0.000°

ICE & WIND PARAMETERS

Exposure Category:	B	Design Wind Speed w/o Ice:	120 mph
Risk Category:	II	Design Wind Speed w/Ice:	50 mph
Topo Factor Procedure:	Method 1	Operational Wind Speed:	60 mph
Topographic Category:	1	Design Ice Thickness:	1.00 in
Crest Height:	0 ft	HMSL:	77.00 ft

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	D - Stiff Soil	Period Based on Rayleigh Method (sec):	2.36
T_L (sec):	6	P:	1
S_s:	0.203	S₁:	0.053
F_a:	1.600	F_v:	2.400
S_{ds}:	0.217	S_{dt}:	0.085
		C_s:	0.030
		C_s Max:	0.030
		C_s Min:	0.030

LOAD CASES

1.2D + 1.0W	120 mph wind with no ice
0.9D + 1.0W	120 mph wind with no ice
1.2D + 1.0Di + 1.0Wi	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice

ASSET: 302516, Mlfd - Milford
 CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-H
 ENG NO: 13958547_C3_04

SHAFT SECTION PROPERTIES

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint len (in)	Weight (lb)	Bottom						Top							
							Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Taper (in/ft)	
1-12	32.83	0.2500	65		0.00	2,434	30.00	-0.003	23.95	2,705.5	29.47	120.00	24.62	32.83	19.62	1,487.8	23.71	98.50	0.1637	
2-12	36.42	0.2500	50	Slip	42.00	2,241	25.70	29.333	20.48	1,693.1	24.86	102.79	19.73	65.75	15.68	759.9	18.47	78.93	0.1637	
3-12	37.08	0.1875	50	Slip	34.00	1,322	20.57	62.917	12.31	652.8	26.72	109.72	14.50	100.00	8.64	225.9	18.04	77.33	0.1637	
Shaft Weight						5,997														

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice			Ice		
					Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor
108.00	Ericsson Air 6449 B77D	3	0.75	0.000	81.60	4.028	0.65	147.40	4.908	0.65
106.00	Quintel QD4616-7	3	0.75	0.000	109.00	9.442	0.64	247.87	10.827	0.64
106.00	Ericsson RRUS 4478 B14	3	0.75	0.000	59.40	2.021	0.67	98.67	2.625	0.67
106.00	Commscope WCS-IMFQ-AMT	2	0.75	0.000	29.50	0.989	0.50	51.05	1.412	0.50
106.00	Raycap DC6-48-60-18-8F	2	0.75	0.000	20.00	1.260	1.00	53.69	1.681	1.00
106.00	Ericsson RRUS 4449 B5, B12	3	0.75	0.000	71.00	1.969	0.50	112.24	2.566	0.50
106.00	CCI DMP65R-BU4D	3	0.75	0.000	67.90	8.280	0.62	183.46	9.576	0.62
106.00	Ericsson RRUS 32 B66A	3	0.75	0.000	50.70	2.720	0.67	97.60	3.464	0.67
106.00	Ericsson RRUS 32 B2	3	0.75	0.000	53.00	2.743	0.67	100.06	3.491	0.67
106.00	Ericsson RRUS 32 B30	3	0.75	0.000	60.00	2.743	0.67	107.07	3.491	0.67
106.00	Ericsson RRUS E2 B29	3	0.75	0.000	60.00	3.145	0.62	111.75	3.887	0.62
106.00	Raycap DC9-48-60-24-8C-EV	1	0.75	0.000	16.00	4.788	1.00	98.61	5.729	1.00
104.00	Ericsson AIR 6419 B77G	3	0.75	0.000	66.10	3.797	0.65	128.18	4.640	0.65
100.00	Generic Flat Side Arm	3	1.00	0.000	187.50	6.300	0.67	272.75	8.294	0.67
100.00	Heavy Platform w/ Handrails	1	1.00	0.000	3000.00	59.800	1.00	4377.42	76.594	1.00
93.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	227.92	14.276	0.64
93.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	114.83	2.547	0.50
93.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	100.98	2.547	0.50
93.00	Raycap RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	58.08	2.439	1.00
93.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3629.51	55.734	1.00
77.60	Ericsson Radio 4449 B71 B85A	3	0.75	0.000	75.00	1.650	0.50	112.55	2.180	0.50
73.00	RFS APXVAARR24_43-U-NA20	3	0.75	0.000	127.90	20.243	0.63	371.43	22.544	0.63
73.00	RFS APX16DWV-16DWVS-E-A20	3	0.75	0.000	40.70	6.586	0.60	113.17	7.929	0.60
73.00	Ericsson AIR32 B66Aa/B2a	3	0.75	0.000	132.20	6.510	0.71	231.21	7.869	0.71
73.00	Ericsson Air6449 B41	3	0.75	0.000	104.00	5.682	0.63	188.54	6.667	0.63
73.00	Ericsson RRUS 4415 B25	3	0.75	0.000	46.00	1.842	0.50	76.42	2.398	0.50
73.00	Ericsson KRY 112 144/2	6	0.75	0.000	9.70	0.480	0.50	18.51	0.774	0.50
73.00	Perfect Vison PV-LLP12M-HR-12-	1	1.00	0.000	2000.00	36.800	1.00	2864.31	52.703	1.00
Totals	Num Loadings: 28	75			12,481.30			20,780.77		

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg) : .

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Max Coax/ Row	Dist Between Rows (in)	Dist Between Cols (in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	106.00	8	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	N	AT&T MOBILITY
0.00	106.00	6	1 1/4" Coax	1.55	0.63	N	0	0	0	0	N	AT&T MOBILITY
0.00	106.00	3	2" conduit	2.38	3.65	N	0	0	0	0	N	AT&T MOBILITY
0.00	106.00	2	0.41" (10.3mm) Fiber	0.41	0.09	N	0	0	0	0	N	AT&T MOBILITY
0.00	106.00	1	2" conduit	2.38	3.65	N	0	0	0	0	N	AT&T MOBILITY
0.00	106.00	1	0.92" (23.4mm) Cable	0.92	0.89	N	0	0	0	0	N	AT&T MOBILITY
0.00	93.00	1	1.60" (40.6mm) Hybrid	1.6	2.34	N	1	1	0	1	Y	DISH WIRELESS
0.00	85.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	180	0	Y	
0.00	85.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	90	0	Y	
0.00	85.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	270	0	Y	
0.00	85.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	0	Y	
0.00	73.00	12	7/8" Coax	1.09	0.33	N	2	1	30	1	Y	T-MOBILE
0.00	73.00	3	1 1/4" (1.25"- 31.8mm)	1.25	1.05	N	2	1	35	1	Y	T-MOBILE

ASSET: 302516, Mlfd - Milford
 CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-H
 ENG NO: 13958547_C3_04

ADDITIONAL STEEL

Intermediate Connectors

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Description	Spacing (in)	Len (in)	Connectors	Continuation?
0.00	11.25	4	SOL #20 All Thread Bar	80	2.19	6" Angle Bracket	39.50	3.13	5/8" A36 U-Bolt	N
11.25	79.94	4	SOL #20 All Thread Bar	80	2.19	6" Angle Bracket	30.00	3.13	5/8" A36 U-Bolt	Y

SEGMENT PROPERTIES

(Max Len: 5.ft)

Additional Reinforcing

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in ³)	Z (in ³)	Weight (lb)	Area (in ²)	Ix (in ⁴)	Weight (lb)
0.00		0.2500	30.000	23.949	2,705.50	29.47	120.00	72.6	174.2	0.0	0.0	19.640	3,346.80	0.0
5.00		0.2500	29.181	23.290	2,488.20	28.60	116.73	73.5	164.7	0.0	401.9	19.640	3,200.20	334.0
10.00		0.2500	28.363	22.631	2,282.90	27.72	113.45	74.5	155.5	0.0	390.6	19.640	3,056.90	334.0
11.25	Reinf. Top Reinf Bottom	0.2500	28.158	22.466	2,233.40	27.50	112.63	74.7	153.2	0.0	95.9	19.640	3,021.50	83.5
15.00		0.2500	27.544	21.971	2,089.20	26.84	110.18	75.4	146.5	0.0	283.5	19.640	2,916.80	250.5
20.00		0.2500	26.725	21.312	1,906.70	25.96	106.90	76.4	137.8	0.0	368.2	19.640	2,780.10	334.0
25.00		0.2500	25.906	20.653	1,735.50	25.09	103.63	77.4	129.4	0.0	357.0	19.640	2,646.60	334.0
29.33	Bot - Section 2	0.2500	25.197	20.082	1,595.20	24.33	100.79	78.2	122.3	0.0	300.3	19.640	2,533.70	289.5
30.00		0.2500	25.088	19.994	1,574.40	24.21	100.35	78.3	121.2	0.0	91.8	19.640	2,595.60	44.5
32.83	Top - Section 1	0.2500	25.124	20.023	1,581.20	24.25	100.49	62.7	121.6	0.0	385.8	19.640	2,522.10	189.3
35.00		0.2500	24.769	19.738	1,514.50	23.87	99.08	63	118.1	0.0	146.6	19.640	2,466.70	144.7
40.00		0.2500	23.950	19.079	1,367.80	22.99	95.80	63	110.3	0.0	330.2	19.640	2,341.10	334.0
45.00		0.2500	23.131	18.419	1,230.90	22.11	92.53	63	102.8	0.0	319.0	19.640	2,218.80	334.0
50.00		0.2500	22.313	17.760	1,103.40	21.23	89.25	63	95.5	0.0	307.8	19.640	2,099.80	334.0
55.00		0.2500	21.494	17.101	985.10	20.36	85.98	63	88.5	0.0	296.6	19.640	1,984.10	334.0
60.00		0.2500	20.675	16.442	875.50	19.48	82.70	63	81.8	0.0	285.4	19.640	1,871.70	334.0
62.92	Bot - Section 3	0.2500	20.197	16.058	815.50	18.97	80.79	63	78.0	0.0	161.3	19.640	1,807.60	194.8
65.00		0.2500	19.856	15.783	774.40	18.60	79.43	63	75.3	0.0	199.4	19.640	1,812.10	139.2
65.75	Top - Section 2	0.1875	20.108	12.027	609.20	26.06	107.25	61.4	58.5	0.0	70.9	19.640	1,795.80	50.1
70.00		0.1875	19.413	11.607	547.60	25.06	103.53	62.1	54.5	0.0	170.9	19.640	1,704.80	283.9
73.00		0.1875	18.921	11.311	506.70	24.36	100.91	62.6	51.7	0.0	117.0	19.640	1,642.00	200.4
75.00		0.1875	18.594	11.113	480.60	23.89	99.17	63	49.9	0.0	76.3	19.640	1,600.80	133.6
77.60		0.1875	18.168	10.856	448.00	23.28	96.90	63	47.6	0.0	97.2	19.640	1,547.90	173.7
79.94	Reinf. Top	0.1875	17.785	10.624	419.90	22.74	94.85	63	45.6	0.0	85.5	19.640	1,501.20	156.3
80.00		0.1875	17.775	10.618	419.20	22.72	94.80	63	45.6	0.0	2.2			
85.00		0.1875	16.956	10.124	363.40	21.55	90.43	63	41.4	0.0	176.5			
90.00		0.1875	16.138	9.630	312.70	20.38	86.07	63	37.4	0.0	168.0			
93.00		0.1875	15.646	9.333	284.70	19.68	83.45	63	35.2	0.0	96.8			
95.00		0.1875	15.319	9.135	267.00	19.21	81.70	63	33.7	0.0	62.8			
100.00		0.1875	14.500	8.641	225.90	18.04	77.33	63	30.1	0.0	151.2			

Totals: 5,996.6 5,340.0

Load Case: 1.2D + 1.0W	120 mph wind with no ice	22 Iterations
Gust Response Factor:	1.10	
Dead load Factor:	1.20	
Wind Load Factor:	1.00	

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-34.21	-19.94	0.00	-1,527.1	0.00	1,527.08	1,564.13	420.30	1,179.53	948.21	0	0	0.734
5.00	-32.90	-19.62	0.00	-1,427.4	0.00	1,427.38	1,541.15	408.73	1,115.51	908.35	0.19	-0.35	0.701
10.00	-31.65	-19.37	0.00	-1,329.3	0.00	1,329.27	1,517.03	397.17	1,053.29	868.61	0.74	-0.69	0.668
11.25	-31.30	-19.24	0.00	-1,305.1	0.00	1,305.06	1,510.82	394.27	1,038.01	858.70	0.93	-0.78	0.659
15.00	-30.33	-18.97	0.00	-1,232.9	0.00	1,232.90	1,491.77	385.60	992.85	829.06	1.65	-1.04	0.634
20.00	-29.08	-18.64	0.00	-1,138.0	0.00	1,138.04	1,465.38	374.03	934.19	789.74	2.92	-1.37	0.599
25.00	-27.85	-18.31	0.00	-1,044.8	0.00	1,044.85	1,437.85	362.47	877.32	750.71	4.53	-1.71	0.564
29.33	-26.83	-18.09	0.00	-965.5	0.00	965.50	1,413.08	352.44	829.48	717.18	6.21	-1.99	0.532
30.00	-26.59	-17.99	0.00	-953.4	0.00	953.44	1,409.19	350.90	822.24	712.04	6.5	-2.03	0.518
32.83	-25.68	-17.79	0.00	-902.5	0.00	902.47	1,130.05	270.31	634.33	571.84	7.76	-2.21	0.624
35.00	-25.14	-17.56	0.00	-863.9	0.00	863.93	1,119.12	266.46	616.37	558.15	8.79	-2.35	0.604
40.00	-23.97	-17.15	0.00	-776.2	0.00	776.15	1,081.75	257.56	575.90	521.31	11.41	-2.64	0.564
45.00	-22.82	-16.73	0.00	-690.4	0.00	690.39	1,044.38	248.66	536.82	485.73	14.33	-2.92	0.522
50.00	-21.69	-16.29	0.00	-606.8	0.00	606.75	1,007.01	239.76	499.10	451.41	17.53	-3.19	0.478
55.00	-20.58	-15.83	0.00	-525.3	0.00	525.31	969.64	230.87	462.76	418.35	21.01	-3.44	0.431
60.00	-19.50	-15.42	0.00	-446.2	0.00	446.16	932.27	221.97	427.79	386.54	24.74	-3.67	0.382
62.92	-18.88	-15.16	0.00	-401.2	0.00	401.19	910.47	216.78	408.02	368.57	27.02	-3.8	0.353
65.00	-18.34	-14.99	0.00	-369.6	0.00	369.60	894.90	213.07	394.19	355.99	28.7	-3.89	0.325
65.75	-18.14	-14.81	0.00	-358.4	0.00	358.36	664.38	162.37	305.14	269.42	29.31	-3.92	0.356
70.00	-17.32	-14.43	0.00	-295.4	0.00	295.41	648.81	156.70	284.20	253.83	32.87	-4.07	0.301
73.00	-12.91	-10.54	0.00	-252.1	0.00	252.12	637.49	152.69	269.87	242.97	35.47	-4.18	0.257
75.00	-12.55	-10.32	0.00	-231.0	0.00	231.04	629.79	150.02	260.52	235.80	37.23	-4.24	0.238
77.60	-11.83	-9.98	0.00	-204.2	0.00	204.22	615.52	146.55	248.61	225.07	39.56	-4.32	0.215
79.94	-11.42	-9.80	0.00	-180.9	0.00	180.87	602.40	143.43	238.13	215.53	41.69	-4.38	0.195
80.00	-11.38	-9.70	0.00	-180.3	0.00	180.29	602.07	143.35	237.86	215.29	41.75	-4.38	0.861
85.00	-10.86	-9.32	0.00	-131.8	0.00	131.81	574.04	136.68	216.24	195.61	46.63	-4.91	0.697
90.00	-10.47	-9.15	0.00	-85.2	0.00	85.22	546.01	130.00	195.65	176.87	52.01	-5.34	0.506
93.00	-6.74	-6.22	0.00	-57.8	0.00	57.78	529.19	126.00	183.79	166.09	55.42	-5.53	0.363
95.00	-6.61	-6.06	0.00	-45.3	0.00	45.34	517.98	123.33	176.08	159.08	57.76	-5.64	0.300
100.00	0.00	-5.37	0.00	-15.0	0.00	15.05	489.95	116.66	157.55	142.23	63.75	-5.8	0.108

Load Case: 0.9D + 1.0W	120 mph wind with no ice	22 Iterations
Gust Response Factor:	1.10	
Dead load Factor:	0.90	
Wind Load Factor:	1.00	

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-25.65	-19.91	0.00	-1,501.9	0.00	1,501.89	1,564.13	420.30	1,179.53	948.21	0	0	0.719
5.00	-24.63	-19.54	0.00	-1,402.3	0.00	1,402.33	1,541.15	408.73	1,115.51	908.35	0.18	-0.34	0.686
10.00	-23.68	-19.26	0.00	-1,304.6	0.00	1,304.62	1,517.03	397.17	1,053.29	868.61	0.72	-0.68	0.653
11.25	-23.40	-19.11	0.00	-1,280.5	0.00	1,280.53	1,510.82	394.27	1,038.01	858.70	0.91	-0.77	0.644
15.00	-22.66	-18.80	0.00	-1,208.9	0.00	1,208.87	1,491.77	385.60	992.85	829.06	1.62	-1.02	0.619
20.00	-21.70	-18.43	0.00	-1,114.9	0.00	1,114.87	1,465.38	374.03	934.19	789.74	2.86	-1.35	0.584
25.00	-20.76	-18.07	0.00	-1,022.7	0.00	1,022.73	1,437.85	362.47	877.32	750.71	4.45	-1.67	0.549
29.33	-19.98	-17.83	0.00	-944.4	0.00	944.43	1,413.08	352.44	829.48	717.18	6.1	-1.95	0.518
30.00	-19.80	-17.72	0.00	-932.5	0.00	932.54	1,409.19	350.90	822.24	712.04	6.38	-1.99	0.504
32.83	-19.11	-17.51	0.00	-882.3	0.00	882.33	1,130.05	270.31	634.33	571.84	7.61	-2.17	0.607
35.00	-18.69	-17.26	0.00	-844.4	0.00	844.39	1,119.12	266.46	616.37	558.15	8.63	-2.3	0.588
40.00	-17.80	-16.83	0.00	-758.1	0.00	758.10	1,081.75	257.56	575.90	521.31	11.19	-2.59	0.549
45.00	-16.92	-16.39	0.00	-673.9	0.00	673.93	1,044.38	248.66	536.82	485.73	14.05	-2.86	0.507
50.00	-16.07	-15.94	0.00	-592.0	0.00	591.96	1,007.01	239.76	499.10	451.41	17.19	-3.12	0.464
55.00	-15.23	-15.48	0.00	-512.3	0.00	512.26	969.64	230.87	462.76	418.35	20.6	-3.37	0.418
60.00	-14.42	-15.06	0.00	-434.9	0.00	434.88	932.27	221.97	427.79	386.54	24.25	-3.6	0.370
62.92	-13.95	-14.81	0.00	-390.9	0.00	390.94	910.47	216.78	408.02	368.57	26.48	-3.72	0.341
65.00	-13.54	-14.64	0.00	-360.1	0.00	360.09	894.90	213.07	394.19	355.99	28.12	-3.8	0.314
65.75	-13.39	-14.46	0.00	-349.1	0.00	349.11	664.38	162.37	305.14	269.42	28.72	-3.83	0.344
70.00	-12.77	-14.08	0.00	-287.7	0.00	287.66	648.81	156.70	284.20	253.83	32.21	-3.98	0.291
73.00	-9.52	-10.27	0.00	-245.4	0.00	245.42	637.49	152.69	269.87	242.97	34.74	-4.09	0.248
75.00	-9.26	-10.05	0.00	-224.9	0.00	224.87	629.79	150.02	260.52	235.80	36.47	-4.15	0.230
77.60	-8.72	-9.72	0.00	-198.7	0.00	198.73	615.52	146.55	248.61	225.07	38.75	-4.22	0.208
79.94	-8.41	-9.56	0.00	-176.0	0.00	175.98	602.40	143.43	238.13	215.53	40.83	-4.29	0.188
79.94	-8.41	-9.56	0.00	-176.0	0.00	175.98	602.40	143.43	238.13	215.53	40.83	-4.29	0.835
80.00	-8.37	-9.43	0.00	-175.4	0.00	175.41	602.07	143.35	237.86	215.29	40.89	-4.29	0.833
85.00	-7.97	-9.04	0.00	-128.2	0.00	128.24	574.04	136.68	216.24	195.61	45.66	-4.8	0.674
90.00	-7.68	-8.86	0.00	-83.0	0.00	83.03	546.01	130.00	195.65	176.87	50.92	-5.22	0.488
93.00	-4.94	-6.03	0.00	-56.4	0.00	56.45	529.19	126.00	183.79	166.09	54.25	-5.41	0.351
95.00	-4.84	-5.87	0.00	-44.4	0.00	44.39	517.98	123.33	176.08	159.08	56.54	-5.51	0.291
100.00	0.00	-5.37	0.00	-15.0	0.00	15.05	489.95	116.66	157.55	142.23	62.39	-5.67	0.108

Load Case: 1.2D + 1.0Di + 1.0Wi	50 mph wind with 1" radial ice			21 Iterations
Gust Response Factor: 1.10	Ice Dead Load Factor	1.00		
Dead load Factor: 1.20			Ice Importance Factor	1.00
Wind Load Factor: 1.00				

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-46.60	-4.58	0.00	-361.9	0.00	361.92	1,564.13	420.30	1,179.53	948.21	0	0	0.187
5.00	-45.09	-4.55	0.00	-339.0	0.00	339.03	1,541.15	408.73	1,115.51	908.35	0.04	-0.08	0.179
10.00	-43.57	-4.52	0.00	-316.3	0.00	316.29	1,517.03	397.17	1,053.29	868.61	0.17	-0.16	0.171
11.25	-43.18	-4.50	0.00	-310.6	0.00	310.64	1,510.82	394.27	1,038.01	858.70	0.22	-0.19	0.169
15.00	-42.04	-4.47	0.00	-293.8	0.00	293.75	1,491.77	385.60	992.85	829.06	0.39	-0.25	0.163
20.00	-40.53	-4.43	0.00	-271.4	0.00	271.38	1,465.38	374.03	934.19	789.74	0.69	-0.33	0.154
25.00	-39.03	-4.37	0.00	-249.2	0.00	249.23	1,437.85	362.47	877.32	750.71	1.08	-0.41	0.146
29.33	-37.74	-4.33	0.00	-230.3	0.00	230.28	1,413.08	352.44	829.48	717.18	1.48	-0.47	0.138
30.00	-37.49	-4.31	0.00	-227.4	0.00	227.40	1,409.19	350.90	822.24	712.04	1.54	-0.48	0.134
32.83	-36.41	-4.27	0.00	-215.2	0.00	215.17	1,130.05	270.31	634.33	571.84	1.85	-0.53	0.162
35.00	-35.77	-4.23	0.00	-205.9	0.00	205.91	1,119.12	266.46	616.37	558.15	2.09	-0.56	0.157
40.00	-34.30	-4.15	0.00	-184.7	0.00	184.74	1,081.75	257.56	575.90	521.31	2.72	-0.63	0.147
45.00	-32.84	-4.05	0.00	-164.0	0.00	163.98	1,044.38	248.66	536.82	485.73	3.41	-0.7	0.136
50.00	-31.40	-3.94	0.00	-143.7	0.00	143.71	1,007.01	239.76	499.10	451.41	4.17	-0.76	0.125
55.00	-29.98	-3.82	0.00	-124.0	0.00	124.01	969.64	230.87	462.76	418.35	5	-0.82	0.113
60.00	-28.57	-3.69	0.00	-104.9	0.00	104.93	932.27	221.97	427.79	386.54	5.89	-0.87	0.101
62.92	-27.76	-3.62	0.00	-94.2	0.00	94.16	910.47	216.78	408.02	368.57	6.43	-0.9	0.093
65.00	-27.08	-3.56	0.00	-86.6	0.00	86.62	894.90	213.07	394.19	355.99	6.83	-0.92	0.087
65.75	-26.83	-3.52	0.00	-84.0	0.00	83.95	664.38	162.37	305.14	269.42	6.98	-0.93	0.095
70.00	-25.73	-3.40	0.00	-69.0	0.00	68.99	648.81	156.70	284.20	253.83	7.82	-0.97	0.081
73.00	-18.95	-2.47	0.00	-58.8	0.00	58.80	637.49	152.69	269.87	242.97	8.44	-0.99	0.068
75.00	-18.50	-2.42	0.00	-53.8	0.00	53.85	629.79	150.02	260.52	235.80	8.86	-1.01	0.064
77.60	-17.58	-2.34	0.00	-47.6	0.00	47.55	615.52	146.55	248.61	225.07	9.41	-1.02	0.058
79.94	-17.06	-2.30	0.00	-42.1	0.00	42.07	602.40	143.43	238.13	215.53	9.92	-1.04	0.053
79.94	-17.06	-2.30	0.00	-42.1	0.00	42.07	602.40	143.43	238.13	215.53	9.92	-1.04	0.224
80.00	-17.05	-2.28	0.00	-41.9	0.00	41.93	602.07	143.35	237.86	215.29	9.93	-1.04	0.223
85.00	-16.37	-2.19	0.00	-30.5	0.00	30.53	574.04	136.68	216.24	195.61	11.09	-1.16	0.185
90.00	-15.88	-2.15	0.00	-19.6	0.00	19.58	546.01	130.00	195.65	176.87	12.36	-1.26	0.140
93.00	-10.39	-1.45	0.00	-13.1	0.00	13.14	529.19	126.00	183.79	166.09	13.17	-1.31	0.099
95.00	-10.21	-1.41	0.00	-10.2	0.00	10.24	517.98	123.33	176.08	159.08	13.72	-1.33	0.084
100.00	0.00	-1.17	0.00	-3.2	0.00	3.17	489.95	116.66	157.55	142.23	15.13	-1.36	0.022

ASSET: 302516, Mlfd - Milford
 CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-H
 ENG NO: 13958547_C3_04

Load Case: 1.0D + 1.0W	60 mph Wind with No Ice	21 Iterations
Gust Response Factor: 1.10		
Dead load Factor: 1.00		
Wind Load Factor: 1.00		

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-28.56	-4.46	0.00	-338.2	0.00	338.25	1,564.13	420.30	1,179.53	948.21	0	0	0.170
5.00	-27.56	-4.38	0.00	-316.0	0.00	315.97	1,541.15	408.73	1,115.51	908.35	0.04	-0.08	0.162
10.00	-26.57	-4.32	0.00	-294.1	0.00	294.08	1,517.03	397.17	1,053.29	868.61	0.16	-0.15	0.154
11.25	-26.32	-4.29	0.00	-288.7	0.00	288.68	1,510.82	394.27	1,038.01	858.70	0.21	-0.17	0.152
15.00	-25.58	-4.22	0.00	-272.6	0.00	272.61	1,491.77	385.60	992.85	829.06	0.36	-0.23	0.146
20.00	-24.62	-4.14	0.00	-251.5	0.00	251.52	1,465.38	374.03	934.19	789.74	0.65	-0.3	0.138
25.00	-23.66	-4.06	0.00	-230.8	0.00	230.82	1,437.85	362.47	877.32	750.71	1	-0.38	0.130
29.33	-22.84	-4.01	0.00	-213.2	0.00	213.22	1,413.08	352.44	829.48	717.18	1.38	-0.44	0.123
30.00	-22.67	-3.99	0.00	-210.6	0.00	210.55	1,409.19	350.90	822.24	712.04	1.44	-0.45	0.120
32.83	-21.94	-3.94	0.00	-199.2	0.00	199.25	1,130.05	270.31	634.33	571.84	1.72	-0.49	0.144
35.00	-21.53	-3.89	0.00	-190.7	0.00	190.72	1,119.12	266.46	616.37	558.15	1.95	-0.52	0.140
40.00	-20.61	-3.79	0.00	-171.3	0.00	171.29	1,081.75	257.56	575.90	521.31	2.52	-0.58	0.131
45.00	-19.69	-3.70	0.00	-152.3	0.00	152.32	1,044.38	248.66	536.82	485.73	3.17	-0.65	0.121
50.00	-18.78	-3.60	0.00	-133.8	0.00	133.84	1,007.01	239.76	499.10	451.41	3.88	-0.7	0.111
55.00	-17.89	-3.49	0.00	-115.8	0.00	115.85	969.64	230.87	462.76	418.35	4.65	-0.76	0.101
60.00	-17.01	-3.40	0.00	-98.4	0.00	98.38	932.27	221.97	427.79	386.54	5.47	-0.81	0.090
62.92	-16.50	-3.35	0.00	-88.5	0.00	88.46	910.47	216.78	408.02	368.57	5.98	-0.84	0.083
65.00	-16.05	-3.31	0.00	-81.5	0.00	81.49	894.90	213.07	394.19	355.99	6.35	-0.86	0.077
65.75	-15.89	-3.27	0.00	-79.0	0.00	79.01	664.38	162.37	305.14	269.42	6.48	-0.87	0.084
70.00	-15.21	-3.18	0.00	-65.1	0.00	65.12	648.81	156.70	284.20	253.83	7.27	-0.9	0.071
73.00	-11.34	-2.32	0.00	-55.6	0.00	55.57	637.49	152.69	269.87	242.97	7.84	-0.92	0.061
75.00	-11.04	-2.27	0.00	-50.9	0.00	50.92	629.79	150.02	260.52	235.80	8.23	-0.94	0.056
77.60	-10.43	-2.20	0.00	-45.0	0.00	45.01	615.52	146.55	248.61	225.07	8.75	-0.95	0.051
79.94	-10.08	-2.16	0.00	-39.9	0.00	39.87	602.40	143.43	238.13	215.53	9.22	-0.97	0.047
79.94	-10.08	-2.16	0.00	-39.9	0.00	39.87	602.40	143.43	238.13	215.53	9.22	-0.97	0.202
80.00	-10.07	-2.14	0.00	-39.7	0.00	39.74	602.07	143.35	237.86	215.29	9.23	-0.97	0.202
85.00	-9.67	-2.05	0.00	-29.1	0.00	29.06	574.04	136.68	216.24	195.61	10.31	-1.08	0.166
90.00	-9.37	-2.01	0.00	-18.8	0.00	18.80	546.01	130.00	195.65	176.87	11.5	-1.18	0.124
93.00	-6.07	-1.37	0.00	-12.8	0.00	12.77	529.19	126.00	183.79	166.09	12.25	-1.22	0.088
95.00	-5.96	-1.33	0.00	-10.0	0.00	10.03	517.98	123.33	176.08	159.08	12.77	-1.24	0.075
100.00	0.00	-1.20	0.00	-3.4	0.00	3.37	489.95	116.66	157.55	142.23	14.1	-1.28	0.024

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

(Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period (S_S):	0.203
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.053
Long-Period Transition Period (T_L – Seconds):	6
Importance Factor (I_e):	1.000
Site Coefficient F_a :	1.600
Site Coefficient F_v :	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.217
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.085
Seismic Response Coefficient (C_s):	0.030
Upper Limit C_s :	0.030
Lower Limit C_s :	0.030
Period based on Rayleigh Method (sec):	2.360
Redundancy Factor (ρ):	1.000
Seismic Force Distribution Exponent (k):	1.930
Total Unfactored Dead Load:	28.560 k
Seismic Base Shear (E):	0.860 k

1.2D + 1.0Ev + 1.0Eh Seismic

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
29	97.5	272	1,858	0.018	15	338
28	94	111	708	0.007	6	138
27	91.5	176	1,066	0.010	9	219
26	87.5	301	1,667	0.016	14	374
25	82.5	403	1,993	0.019	16	501
24	79.97	5	23	0.000	0	6
23	78.77	348	1,574	0.015	13	432
22	76.3	388	1,654	0.016	14	483
21	74	300	1,206	0.012	10	373
20	71.5	474	1,782	0.017	15	590
19	67.875	677	2,301	0.022	19	842
18	65.375	160	507	0.005	4	199
17	63.9583	448	1,356	0.013	11	556
16	61.4583	509	1,427	0.014	12	633
15	57.5	881	2,174	0.021	18	1,095
14	52.5	892	1,848	0.018	15	1,109
13	47.5	903	1,543	0.015	13	1,123
12	42.5	915	1,260	0.012	10	1,137
11	37.5	926	1,002	0.010	8	1,151
10	33.9167	405	361	0.004	3	503
9	31.4167	723	557	0.005	5	899
8	29.6667	171	118	0.001	1	213
7	27.1667	817	475	0.005	4	1,015
6	22.5	953	385	0.004	3	1,184
5	17.5	964	240	0.002	2	1,198
4	13.125	730	104	0.001	1	908
3	10.625	245	23	0.000	0	304
2	7.5	986	48	0.000	0	1,226
1	2.5	998	6	0.000	0	1,240
Ericsson Air 6449 B77D	100	245	1,756	0.017	14	304
Commscope WCS-IMFQ-AMT	100	59	423	0.004	3	73
Raycap DC6-48-60-18-8F	100	40	287	0.003	2	50
Ericsson RRUS 4449 B5, B12	100	213	1,528	0.015	13	265
Ericsson RRUS 4478 B14	100	178	1,278	0.012	11	222

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
Ericsson RRUS 32 B66A	100	152	1,091	0.010	9	189
Ericsson RRUS 32 B2	100	159	1,140	0.011	9	198
Ericsson RRUS 32 B30	100	180	1,291	0.012	11	224
Ericsson RRUS E2 B29	100	180	1,291	0.012	11	224
Raycap DC9-48-60-24-8C-EV	100	16	115	0.001	1	20
CCI DMP65R-BU4D	100	204	1,461	0.014	12	253
Quintel QD4616-7	100	327	2,345	0.022	19	407
Ericsson AIR 6419 B77G	100	198	1,422	0.014	12	247
Generic Flat Side Arm	100	562	4,034	0.039	33	699
Heavy Platform w/ Handrails	100	3,000	21,515	0.207	177	3,730
Raycap RDIDC-9181-PF-48	93	22	137	0.001	1	27
Fujitsu TA08025-B604	93	192	1,195	0.012	10	238
Fujitsu TA08025-B605	93	225	1,403	0.014	12	280
JMA Wireless MX08FRO665-21	93	194	1,207	0.012	10	241
Generic Flat Platform with Handrails	93	2,500	15,589	0.150	128	3,108
Ericsson Radio 4449 B71 B85A	77.6	225	990	0.010	8	280
Ericsson KRY 112 144/2	73	58	228	0.002	2	72
Ericsson RRUS 4415 B25	73	138	540	0.005	4	172
Ericsson Air6449 B41	73	312	1,220	0.012	10	388
Ericsson AIR32 B66Aa/B2a	73	397	1,551	0.015	13	493
RFS APX16DWV-16DWVS-E-A20	73	122	477	0.005	4	152
RFS APXVAARR24_43-U-NA20	73	384	1,500	0.014	12	477
Perfect Vison PV-LLP12M-HR-12-96 Platform w/ PV-PKBK-M Kicker Kit	73	2,000	7,819	0.075	64	2,487
		28,563	104,095	1.000	857	35,512

0.9D - 1.0Ev + 1.0Eh Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
29	97.5	272	1,858	0.018	15	233
28	94	111	708	0.007	6	95
27	91.5	176	1,066	0.010	9	151
26	87.5	301	1,667	0.016	14	258
25	82.5	403	1,993	0.019	16	345
24	79.97	5	23	0.000	0	4
23	78.77	348	1,574	0.015	13	298
22	76.3	388	1,654	0.016	14	333
21	74	300	1,206	0.012	10	257
20	71.5	474	1,782	0.017	15	406
19	67.875	677	2,301	0.022	19	580
18	65.375	160	507	0.005	4	137
17	63.9583	448	1,356	0.013	11	383
16	61.4583	509	1,427	0.014	12	436
15	57.5	881	2,174	0.021	18	755
14	52.5	892	1,848	0.018	15	764
13	47.5	903	1,543	0.015	13	774
12	42.5	915	1,260	0.012	10	784
11	37.5	926	1,002	0.010	8	793
10	33.9167	405	361	0.004	3	347
9	31.4167	723	557	0.005	5	620
8	29.6667	171	118	0.001	1	147
7	27.1667	817	475	0.005	4	700
6	22.5	953	385	0.004	3	816
5	17.5	964	240	0.002	2	826
4	13.125	730	104	0.001	1	626
3	10.625	245	23	0.000	0	210
2	7.5	986	48	0.000	0	845
1	2.5	998	6	0.000	0	855
Ericsson Air 6449 B77D	100	245	1,756	0.017	14	210
CommScope WCS-IMFQ-AMT	100	59	423	0.004	3	51
Raycap DC6-48-60-18-8F	100	40	287	0.003	2	34
Ericsson RRUS 4449 B5, B12	100	213	1,528	0.015	13	182

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
Ericsson RRUS 4478 B14	100	178	1,278	0.012	11	153
Ericsson RRUS 32 B66A	100	152	1,091	0.010	9	130
Ericsson RRUS 32 B2	100	159	1,140	0.011	9	136
Ericsson RRUS 32 B30	100	180	1,291	0.012	11	154
Ericsson RRUS E2 B29	100	180	1,291	0.012	11	154
Raycap DC9-48-60-24-8C-EV	100	16	115	0.001	1	14
CCI DMP65R-BU4D	100	204	1,461	0.014	12	175
Quintel QD4616-7	100	327	2,345	0.022	19	280
Ericsson AIR 6419 B77G	100	198	1,422	0.014	12	170
Generic Flat Side Arm	100	562	4,034	0.039	33	482
Heavy Platform w/ Handrails	100	3,000	21,515	0.207	177	2,570
Raycap RDIDC-9181-PF-48	93	22	137	0.001	1	19
Fujitsu TA08025-B604	93	192	1,195	0.012	10	164
Fujitsu TA08025-B605	93	225	1,403	0.014	12	193
JMA Wireless MX08FRO665-21	93	194	1,207	0.012	10	166
Generic Flat Platform with Handrails	93	2,500	15,589	0.150	128	2,142
Ericsson Radio 4449 B71 B85A	77.6	225	990	0.010	8	193
Ericsson KRY 112 144/2	73	58	228	0.002	2	50
Ericsson RRUS 4415 B25	73	138	540	0.005	4	118
Ericsson Air6449 B41	73	312	1,220	0.012	10	267
Ericsson AIR32 B66Aa/B2a	73	397	1,551	0.015	13	340
RFS APX16DWV-16DWVS-E-A20	73	122	477	0.005	4	105
RFS APXVAARR24_43-U-NA20	73	384	1,500	0.014	12	329
Perfect Vision PV-LLP12M-HR-12-96 Platform w/ PV-PKBK-M Kicker Kit	73	2,000	7,819	0.075	64	1,713
		28,563	104,095	1.000	857	24,469

1.2D + 1.0Ev + 1.0Eh Seismic

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-34.27	-0.86	0.00	-77.83	0.00	77.83	1,564.13	420.30	1,180	948.21	0.00	0.00	0.05
5.00	-33.05	-0.87	0.00	-73.52	0.00	73.52	1,541.15	408.73	1,116	908.35	0.01	-0.02	0.05
10.00	-32.74	-0.88	0.00	-69.16	0.00	69.16	1,517.03	397.17	1,053	868.61	0.04	-0.04	0.05
11.25	-31.83	-0.88	0.00	-68.06	0.00	68.06	1,510.82	394.27	1,038	858.70	0.05	-0.04	0.05
11.25	-31.83	-0.88	0.00	-68.06	0.00	68.06	1,510.82	394.27	1,038	858.70	0.05	-0.04	0.05
15.00	-30.63	-0.89	0.00	-64.76	0.00	64.76	1,491.77	385.60	993	829.06	0.08	-0.05	0.04
20.00	-29.45	-0.89	0.00	-60.33	0.00	60.33	1,465.38	374.03	934	789.74	0.15	-0.07	0.04
25.00	-28.43	-0.89	0.00	-55.87	0.00	55.87	1,437.85	362.47	877	750.71	0.23	-0.09	0.04
29.33	-28.22	-0.90	0.00	-52.00	0.00	52.00	1,413.08	352.44	829	717.18	0.32	-0.10	0.04
30.00	-27.32	-0.89	0.00	-51.40	0.00	51.40	1,409.19	350.90	822	712.04	0.34	-0.11	0.04
32.83	-26.82	-0.89	0.00	-48.87	0.00	48.87	1,130.05	270.31	634	571.84	0.40	-0.12	0.05
35.00	-25.67	-0.89	0.00	-46.93	0.00	46.93	1,119.12	266.46	616	558.15	0.46	-0.12	0.04
40.00	-24.53	-0.88	0.00	-42.49	0.00	42.49	1,081.75	257.56	576	521.31	0.60	-0.14	0.04
45.00	-23.41	-0.87	0.00	-38.08	0.00	38.08	1,044.38	248.66	537	485.73	0.75	-0.16	0.04
50.00	-22.30	-0.86	0.00	-33.72	0.00	33.72	1,007.01	239.76	499	451.41	0.92	-0.17	0.04
55.00	-21.20	-0.84	0.00	-29.42	0.00	29.42	969.64	230.87	463	418.35	1.11	-0.18	0.03
60.00	-20.57	-0.83	0.00	-25.20	0.00	25.20	932.27	221.97	428	386.54	1.31	-0.20	0.03
62.92	-20.01	-0.82	0.00	-22.77	0.00	22.77	910.47	216.78	408	368.57	1.43	-0.20	0.03
65.00	-19.81	-0.82	0.00	-21.06	0.00	21.06	894.90	213.07	394	355.99	1.52	-0.21	0.03
65.75	-18.97	-0.80	0.00	-20.44	0.00	20.44	664.38	162.37	305	269.42	1.55	-0.21	0.03
70.00	-18.38	-0.78	0.00	-17.05	0.00	17.05	648.81	156.70	284	253.83	1.75	-0.22	0.03
73.00	-13.77	-0.65	0.00	-14.70	0.00	14.70	637.49	152.69	270	242.97	1.89	-0.23	0.02
75.00	-13.28	-0.63	0.00	-13.40	0.00	13.40	629.79	150.02	261	235.80	1.98	-0.23	0.02
77.60	-12.57	-0.61	0.00	-11.76	0.00	11.76	615.52	146.55	249	225.07	2.11	-0.23	0.02
79.94	-12.57	-0.61	0.00	-10.33	0.00	10.33	602.40	143.43	238	215.53	2.22	-0.24	0.07
79.94	-12.57	-0.61	0.00	-10.33	0.00	10.33	602.40	143.43	238	215.53	2.22	-0.24	0.02
80.00	-12.06	-0.59	0.00	-10.30	0.00	10.30	602.07	143.35	238	215.29	2.23	-0.24	0.07
85.00	-11.69	-0.59	0.00	-7.32	0.00	7.32	574.04	136.68	216	195.61	2.49	-0.27	0.06
90.00	-11.47	-0.58	0.00	-4.40	0.00	4.40	546.01	130.00	196	176.87	2.79	-0.29	0.05
93.00	-7.44	-0.39	0.00	-2.66	0.00	2.66	529.19	126.00	184	166.09	2.97	-0.30	0.03
95.00	-7.10	-0.38	0.00	-1.88	0.00	1.88	517.98	123.33	176	159.08	3.10	-0.30	0.03
100.00	0.00	-0.34	0.00	0.00	0.00	0.00	489.95	116.66	158	142.23	3.42	-0.31	0.00

0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-23.61	-0.86	0.00	-76.16	0.00	76.16	1,564.13	420.30	1,180	948.21	0.00	0.00	0.04
5.00	-22.77	-0.87	0.00	-71.86	0.00	71.86	1,541.15	408.73	1,116	908.35	0.01	-0.02	0.04
10.00	-22.56	-0.87	0.00	-67.53	0.00	67.53	1,517.03	397.17	1,053	868.61	0.04	-0.03	0.04
11.25	-21.93	-0.87	0.00	-66.44	0.00	66.44	1,510.82	394.27	1,038	858.70	0.05	-0.04	0.04
11.25	-21.93	-0.87	0.00	-66.44	0.00	66.44	1,510.82	394.27	1,038	858.70	0.05	-0.04	0.04
15.00	-21.11	-0.88	0.00	-63.17	0.00	63.17	1,491.77	385.60	993	829.06	0.08	-0.05	0.04
20.00	-20.29	-0.88	0.00	-58.79	0.00	58.79	1,465.38	374.03	934	789.74	0.15	-0.07	0.04
25.00	-19.59	-0.88	0.00	-54.40	0.00	54.40	1,437.85	362.47	877	750.71	0.23	-0.09	0.04
29.33	-19.44	-0.88	0.00	-50.60	0.00	50.60	1,413.08	352.44	829	717.18	0.32	-0.10	0.03
30.00	-18.82	-0.88	0.00	-50.01	0.00	50.01	1,409.19	350.90	822	712.04	0.33	-0.10	0.03
32.83	-18.48	-0.88	0.00	-47.53	0.00	47.53	1,130.05	270.31	634	571.84	0.39	-0.11	0.04
35.00	-17.68	-0.87	0.00	-45.63	0.00	45.63	1,119.12	266.46	616	558.15	0.45	-0.12	0.04
40.00	-16.90	-0.86	0.00	-41.29	0.00	41.29	1,081.75	257.56	576	521.31	0.58	-0.14	0.04
45.00	-16.13	-0.85	0.00	-36.98	0.00	36.98	1,044.38	248.66	537	485.73	0.73	-0.15	0.04
50.00	-15.36	-0.84	0.00	-32.73	0.00	32.73	1,007.01	239.76	499	451.41	0.90	-0.17	0.03
55.00	-14.61	-0.82	0.00	-28.54	0.00	28.54	969.64	230.87	463	418.35	1.08	-0.18	0.03
60.00	-14.17	-0.81	0.00	-24.44	0.00	24.44	932.27	221.97	428	386.54	1.27	-0.19	0.03
62.92	-13.79	-0.80	0.00	-22.08	0.00	22.08	910.47	216.78	408	368.57	1.39	-0.20	0.03
65.00	-13.65	-0.79	0.00	-20.42	0.00	20.42	894.90	213.07	394	355.99	1.48	-0.20	0.02
65.75	-13.07	-0.77	0.00	-19.82	0.00	19.82	664.38	162.37	305	269.42	1.51	-0.21	0.03
70.00	-12.66	-0.76	0.00	-16.53	0.00	16.53	648.81	156.70	284	253.83	1.70	-0.21	0.02
73.00	-9.49	-0.63	0.00	-14.25	0.00	14.25	637.49	152.69	270	242.97	1.84	-0.22	0.02
75.00	-9.15	-0.62	0.00	-12.99	0.00	12.99	629.79	150.02	261	235.80	1.93	-0.22	0.02
77.60	-8.66	-0.59	0.00	-11.39	0.00	11.39	615.52	146.55	249	225.07	2.05	-0.23	0.02
79.94	-8.66	-0.59	0.00	-10.00	0.00	10.00	602.40	143.43	238	215.53	2.17	-0.23	0.06
79.94	-8.66	-0.59	0.00	-10.00	0.00	10.00	602.40	143.43	238	215.53	2.17	-0.23	0.02
80.00	-8.31	-0.58	0.00	-9.97	0.00	9.97	602.07	143.35	238	215.29	2.17	-0.23	0.06
85.00	-8.05	-0.57	0.00	-7.08	0.00	7.08	574.04	136.68	216	195.61	2.43	-0.26	0.05
90.00	-7.90	-0.56	0.00	-4.25	0.00	4.25	546.01	130.00	196	176.87	2.71	-0.28	0.04
93.00	-5.13	-0.38	0.00	-2.57	0.00	2.57	529.19	126.00	184	166.09	2.89	-0.29	0.03
95.00	-4.89	-0.36	0.00	-1.81	0.00	1.81	517.98	123.33	176	159.08	3.02	-0.30	0.02
100.00	0.00	-0.34	0.00	0.00	0.00	0.00	489.95	116.66	158	142.23	3.33	-0.30	0.00

ANALYSIS SUMMARY

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W	19.94	0.00	34.21	0.00	0.00	1527.08	79.94	0.86
0.9D + 1.0W	19.91	0.00	25.65	0.00	0.00	1501.89	79.94	0.83
1.2D + 1.0Di + 1.0Wi	4.58	0.00	46.60	0.00	0.00	361.92	79.94	0.22
1.2D + 1.0Ev + 1.0Eh	0.90	0.00	34.27	0.00	0.00	77.83	79.94	0.07
0.9D - 1.0Ev + 1.0Eh	0.88	0.00	23.61	0.00	0.00	76.16	79.94	0.06
1.0D + 1.0W	4.46	0.00	28.56	0.00	0.00	338.25	79.94	0.2

ADDITIONAL STEEL SUMMARY

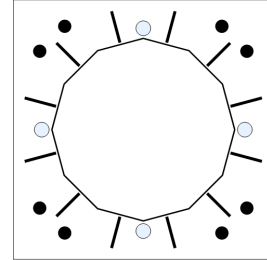
Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors			Max member			
			VQ/I	Shear Applied (kips)	Shear (phiVn) (kips)	Ratio	Pu (kip)	PhiPn (kip)	Ratio
0.00	11.25	SOL #20 All Thread Bar	315.0	12.4	16.8	0.7402	278.0	314.5	0.8838
11.25	79.94	SOL #20 All Thread Bar	413.5	12.4	16.8	0.738	260.0	330.5	0.7867

Elev From (ft)	Elev To (ft)	Member	Upper Termination Connectors				Lower Termination Connectors					
			MQ/I	phiVn (kips)	Num Reqd	Num Actual	Ratio	MQ/I (kips)	phiVn (kip)	Num Reqd	Num Actual	Ratio
0.00	11.25	SOL #20 All Thread Bar	0	12	0	0	0.0000	0	12	0	0	0.0000
11.25	79.94	SOL #20 All Thread Bar	68.4123	12	6	12	0.4751	0	12	0	0	0.0000

BASE PLATE ANALYSIS @ 0 FT

PLATE PARAMETERS (ID# 15737)

Width: 44 in
 Shape: Square
 Thickness: 2 in
 Grade: A572-60
 Yield Strength: 60 ksi
 Tensile Strength: 75 ksi
 Clip Length: in
 Rod Detail Type: c
 Clear Distance: - in
 Base Weld Size: 0.125 in
 Orientation Offset: - °
 Analysis Type: Elastic
 Neutral Axis: 42 °



ANCHOR ROD PARAMETERS

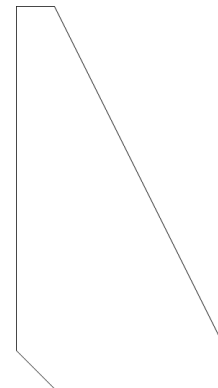
Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	Fy (ksi)	Fu (ksi)	Spacing (in)	Offset (°)
Original [ID# 16109]	Cluster	8	2.25	44	A615-75	75	100	6	-

DYWIDAG BAR PARAMETERS

Quantity	Bar Size	Bar Diameter (in)	Fy (ksi)	Fu (ksi)	Bracket Type	Bracket Offset (in)	Circle (in)	Offset (°)
4 [ID# 968]	#20	2.5	80	100	Angle	2.19	36.88	-

STIFFENER PARAMETERS

Arrangement: Radial
 Quantity: 12
 Height: 10 in
 Width: 5.5 in
 Thickness: 0.5 in
 Notch: 1 in
 Grade: A36
 Yield Strength: 36 ksi
 Tensile Strength: 58 ksi
 Horizontal Weld Type: Fillet
 Horizontal Weld Fillet Size: 0.375 in
 Vertical Weld Fillet Size: 0.375 in
 Weld Strength: 70 ksi
 Orientation Offset: - °



ANCHOR ROD GEOMETRY AND APPLIED LOADS --- ORIGINAL (8) 2.25"Ø [ID 16109]

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in ⁴)	Axial Load (k)	Shear Load (k)
1	0.649	17.53	13.30	-1.736	10.624	-6.18	4.42
2	0.922	13.30	17.53	3.881	49.759	19.82	4.35
3	2.220	-13.30	17.53	20.615	1380.977	97.30	0.37
4	2.493	-17.53	13.30	20.320	1341.842	95.94	0.83
5	3.791	-17.53	-13.30	1.736	10.624	9.89	4.42
6	4.063	-13.30	-17.53	-3.881	49.759	-16.12	4.35
7	5.361	13.30	-17.53	-20.615	1380.977	-93.60	0.37
8	5.634	17.53	-13.30	-20.320	1341.842	-92.24	0.83

DYWIDAG BAR GEOMETRY AND APPLIED LOADS --- (4) #20 [ID 968]

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in ⁴)	Axial Load (k)
1	1.571	0.00	18.44	13.704	923.722	213.70
2	3.142	-18.44	0.00	12.339	749.249	192.90
3	4.712	0.00	-18.44	-13.704	923.722	-204.01
4	6.283	18.44	0.00	-12.339	749.249	-183.21

STIFFENER GEOMETRY AND APPLIED LOADS

Position	Radians	Moment Arm (in)	Inertia (in ⁴)	Axial Load (k)	Shear Load (k)
1	0.262	-8.058	137.012	-19.41	1.42
2	0.785	0.929	8.661	3.07	1.59
3	1.309	9.667	194.144	24.92	1.33
4	1.833	15.815	507.979	40.30	0.72
5	2.356	17.726	636.330	45.07	0.08
6	2.880	14.886	450.847	37.97	0.86
7	3.403	8.058	137.012	20.90	1.42
8	3.927	-0.929	8.661	-1.58	1.59
9	4.451	-9.667	194.144	-23.43	1.33
10	4.974	-15.815	507.979	-38.81	0.72
11	5.498	-17.726	636.330	-43.59	0.08
12	6.021	-14.886	450.847	-36.49	0.86

REACTION DISTRIBUTION

Component	ID	Moment Mu (k-ft)	Axial Load Pu (k)	Shear Vu (k)	Moment Factor
Pole	30"Ø x 0.25" (12 Sides)	661.4	34.21	19.94	0.433
Bolt Group	Original (8) 2.25"Ø	661.4	-	19.94	0.433
Dywidag Group	(4) #20	865.7	-	-	0.567
Stiffeners	(12) 10"H x 5.5"W x 0.5"T	398.3	-	12.01	0.261
TOTALS		1527.08	34.21	19.94	

ASSET: 302516, Mlfd - Milford
 CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-H
 ENG NO: 13958547

COMPONENT PROPERTIES

Component	ID	Gross Area (in ²)	Net Area (in ²)	Individual Inertia (in ⁴)	Moment of Inertia (in ⁴)	Threads/in
Pole	30"Ø x 0.25" (12 Sides)	23.0996	-	-	2556.06	-
Bolt Group	Original (8) 2.25"Ø	3.9761	3.2477	0.8393	5566.40	4.5
Dywidag Group	(4) #20	4.9087	4.9087	1.9175	3345.94	-
Stiffeners	(12) 10"H x 5.5"W x 0.5"T	2.2500	2.0250	27.7292	3869.95	-

EXTERNAL BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES

Flat-to-Flat Diameter: 30.12 in
 Point-to-Point Diameter: 31.19 in
 Flat Width: 8.072 in
 Flat Radians: 0.524 rad

PLATE PROPERTIES

Neutral Axis: 42 °
 Bend Line Lower Limit: rad
 Bend Line Upper Limit: -0.504 rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in ³)	Applied Moment Mu (k-in)	Moment Capacity φMn (k-in)	Ratio
Flat	32.100	3.60	35.696	1044.7	1927.6	0.542
Corner	31.038	2.79	33.826	942.0	1826.6	0.516

ELASTIC ANCHOR ROD ANALYSIS

Class	Group Quantity	Rod Diameter (in)	Applied Axial Load Pu (k)	Applied Shear Load Vu (k)	Compressive Capacity φPn (k)	Ratio	Interaction
Original	8	2.25	97.3	0.4	243.6	0.399	0.399

DYWIDAG BAR ANALYSIS

Group Quantity	Bar Size	Bar Circle (in)	Applied Axial Load Pu (k)	Compressive Capacity φPn (k)	Ratio
4	#20	36.88	213.7	368.2	0.580

BASE PLATE STIFFENER ANALYSIS

Quantity:	12	
Height:	10	in
Width:	5.5	in
Effective Width:	5.500	in
Thickness:	0.5	in
Notch:	1	in
Grade:	A36	
Yield Strength:	36	ksi
Tensile Strength:	58	ksi
Horizontal Weld Type:	Fillet	
Horizontal Weld Fillet Size:	0.375	in
Horizontal Weld Bevel Size:		in
Vertical Weld Fillet Size:	0.375	in
Weld Strength:	70	ksi
Electrode Coefficient:	1.000	

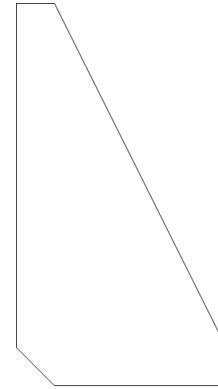


PLATE COMPRESSION

Radius of Gyration:	0.144	in ³
kl/r:	41.57	
4.71 √(E/Fy):	133.68	
Buckling Stress, Fe:	165.64	ksi
Crit. Buckling Stress, Fcr:	145.26	ksi
Applied Compression, Pu:	45.07	k
Compressive Capacity, φPn:	294.16	k
Pu/φPn:	0.077	

PLATE TENSION

Gross Cross Section:	2.2500	in ²
Net Cross Section:	2.0250	in ²
Applied Tension, Tu:	43.59	k
Tensile Capacity, φTn:	72.90	k
Tu/φTn:	0.299	

VERTICAL WELD TO POLE

Vertical Eccentricity Ratio, a=e _x /l:	0.183	
Spacing Ratio, k:	0.050	
Weld Coefficient, C:	3.670	
Applied Compression, Pu:	45.07	k
Compressive Capacity, φPn:	165.15	k
Horizontal Eccentricity Ratio, a=e _x /l:	0.333	
Weld Coefficient, C:	2.940	
Applied Shear, Vu:	0.08	k
Shear Capacity, φVn:	132.30	k
Pu/φPn + Vu/φVn:	0.274	

HORIZONTAL WELD TO PLATE

Horizontal Eccentricity Ratio, a=e _x /l:	0.167	
Spacing Ratio, k:	0.091	
Weld Coefficient, C:	3.900	
Effective Fillet Size:	0.375	in
Applied Compression, Pu:	45.07	k
Compressive Capacity, φPn:	96.53	k
Vertical Eccentricity Ratio, a=e _x /l:	0.303	
Weld Coefficient, C:	3.090	
Applied Shear, Vu:	0.08	k
Shear Capacity, φVn:	76.48	k
Pu/φPn + Vu/φVn:	0.468	

Site Name:	Mlfd-Milford
Site Number:	302516
Engineering Number:	13958547_C3_04
Engineer:	LET
Date:	9/20/2021

Design Base Loads (Factored) - Design per TIA-222-H Standard

Moment (Overturning) (M_u):	1527.1 k-ft
Shear/Leg (V_u):	19.9 k
Compression/Leg (P_u):	34.2 k
Uplift/Leg (T_u):	0.0 k
Tower Type (GT / SST / MP):	MP
Length / Width of Block:	8.0 ft
Thickness of Block:	6.5 ft
Block Height Above Ground:	1.0 ft
Depth Below Ground Surface to Water Table (w):	99.0 ft
Unit Weight of Concrete:	150.0 pcf
Unit Weight of Soil:	120.0 pcf
Unit Weight of Water:	62.4 pcf
Ultimate Compressive Bearing Pressure:	50000 psf
Capacity Increase (Due to Transient Loads):	1.00
Pullout Angle:	45.0 degrees
Rod Diameter:	1.00 in
Rod Ultimate Strength:	60 ksi
Rod Net Area:	0.85 in ²
Number of Rods:	16
Diameter of Cored Hole:	3.00 in
Ultimate Grout / Rock Interface Bond Strength:	150 psi
Ultimate Grout / Rock Anchor Interface Bond Strength:	450 psi
Overall Rod Embedment Length:	78 in
Rod Exposure Above Lock Off Nut in Foundation:	0 in
Rod Embedment Circle:	84 in (Adjustment necessary if square co
Free Stress Length:	0 in
Soil / Concrete Friction Coefficient:	0.30
Lock Off Load:	0 k
Rock Anchor Design Plastic or Elastic:	Plastic
Ignore Pullout Weight Resistance (Y/N):	Y
Weight of Concrete (Buoyancy Effect Considered):	62.4 k
Compressive Bearing Resistance:	2513.3 k
Depth to Base of Rock Anchor minus Development Length:	10.2 ft
Total Rock / Grout Bond Strength:	1764.3 k
Total Grout / Rod Bond Strength:	1764.3 k
Total Rod Mechanical Strength:	816.0 k
Pullout Weight / Rod:	k - Ignored
Rock / Grout Bond Strength / Rod:	110.3 k
Grout / Rod Bond Strength / Rod:	110.3 k
Rod Mechanical Strength / Rod:	60.0 k
Soil Strength Reduction Factor (ϕ_s):	0.75
Factored Nominal Moment Capacity per Leg ($\phi_s M_n$):	2809.8 k
Factored Nominal Uplift Capacity per Leg ($\phi_s T_n$):	72.5 k
Factored Nominal Compressive Capacity per Leg ($\phi_s P_n$):	1885.0 k
Factored Nominal Shear Capacity per Leg ($\phi_s V_n$):	367.2 k
M_u :	1656.7 k-ft
T_u :	0.0 k
P_u :	46.9 k
V_u :	19.9 k
$T_u/\phi_s T_n + M_u/\phi_s M_n$:	0.59 Result: OK
$P_u/\phi_s P_n$:	0.02 Result: OK
$V_u/\phi_s V_n$:	0.05 Result: OK

Caisson Strength Capacity

Concrete Compressive Strength (f'_c):	4000 psi
Vertical Steel Rebar Size #:	11
Vertical Steel Rebar Area:	1.56 in ²
# of Vertical Steel Rebars:	52 Minimum # of vertical rebar met
Vertical Steel Rebar Yield Strength (F_y):	60 ksi
Horizontal Tie / Stirrup Size #:	4
Horizontal Tie / Stirrup Area:	0.20 in ²
Horizontal Tie / Stirrup Spacing:	12.0 in
Horizontal Tie / Stirrup Steel Yield Strength (F_y):	40 ksi
Rod Bearing Plate Diameter:	8.0 in
Rod Bearing Plate Thickness:	1.0 in
Anchor Bearing Plate Yield Strength:	36 ksi
Anchor Rod Nut Diameter:	2.02 in
Rebar Cage Diameter:	88.0 in
Strength Bending/Tension Reduction Factor (ϕ_B):	0.90 ACI318-05 - 9.3.2.1
Strength Shear Reduction Factor (ϕ_V):	0.75 ACI318-05 - 9.3.2.3
Strength Compression/Bearing Reduction Factor ($\phi_{P/B}$):	0.65 ACI318-05 - 9.3.2.2
Steel Elastic Modulus:	29000 ksi
Design Moment (M_u):	1656.7 k-ft
Factored Nominal Moment Capacity ($\phi_B M_n$):	15706.9 k-ft - ACI318-05 - 10.2
$M_u / \phi_B M_n$:	0.11 Result: OK
Design Shear (V_u):	212.3 k
Factored Nominal Shear Capacity ($\phi_V V_n$):	673.9 k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u / \phi_V V_n$:	0.31 Result: OK
Design Tension (T_u):	0.0 k
Factored Nominal Tension Capacity ($\phi_T T_n$):	4380.5 k - ACI318-05 - 10.2
$T_u / \phi_T T_n$:	0.00 Result: OK
Design Compression (P_u):	34.2 k
Factored Nominal Compression Capacity ($\phi_P P_n$):	14886.8 k - ACI318-05 - 10.3.6.2
$P_u / \phi_P P_n$:	0.00 Result: OK

Bearing Plate Design

Plate Bearing Design Load (P_u):	26.5 k
Plate Shear Design Load (V_u):	26.5 k
Factored Rod Bearing Plate Capacity of a Single Anchor ($\phi_B P_n$):	218.7 k
Bearing Plate Pressure:	0.6 ksi
Plate Design Moment (M_u):	7.6 k-in
Critical Length:	6.88 in
Plastic Modulus:	1.72 in ³
Factored Nominal Plate Flexural Resistance ($\phi_B M_n$):	55.7 k-in
Factored Nominal Plate Shear Resistance ($\phi_V V_n$):	123.4 k
Factored Punch Shear Capacity Resisting Plate Load ($\phi_P P_n$):	514.4 k - ACI318-05 - 11.11.2.1
Interaction Equation:	0.22 Result: OK
Recommended Lock Off Load:	16.6 k
Recommended Test Load:	26.5 k
Maximum Allowable Test Load:	48.0 k