



Derek Maheux Program Manager
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379
Mobile: (508)649-3407
Dmaheux@clinellc.com

February 16, 2024

Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Tower Share Application // Site: BRISTOL SW CT (ATC: 302500)
790 Willis Street, Bristol, CT 06010
N 41.64909486 // W -72.94801487

Dear Ms. Bachman,

Cellco Partnership d/b/a Verizon Wireless is proposing a wireless telecommunications facility on an existing 120 ft Tower, located at 790 Willis Street, Bristol, CT. The tower is owned by American Tower.

Verizon Wireless proposes to install a WIC (Walk -in Cabinet) and a generator on concrete pads inside a 12'x30' ground space within the existing compound and install nine (9) antenna, nine (9) RRH, two (2) Hybrid Cables and one (1) OVP on the existing tower at the 112' centerline as described in the enclosed construction drawings.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50aa, of Verizon's intent to share a telecommunications facility pursuant to R.C.S.A. § 16-50j-73. In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Bristol's Chief Elected Official and Land Use Officer.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-89. Enclosed to accommodate this filing are construction drawings dated January 22, 2024, by A.T Engineering Services, LLC, a structural analysis dated August 15, 2023, by American Tower Corp., and a structural mount analysis by Colliers Engineering and Design dated November 6, 2023, and Non-Ionizing Electromagnetic Radiation (NIER) Study dated February 5, 2024, by Tower Engineering Professionals.

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the new antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading, as shown in the attached structural analysis and a structural mount analysis, pursuant to certain conditions defined therein. Design and engineering are fully illustrated within final construction drawings.

Connecticut General Statute 16-50aa indicates that the Council must approve the shared use of telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, Verizon Wireless respectfully indicates that the shared use of this facility satisfies these criteria:

- A. **Technical Feasibility.** The existing tower has been deemed structurally capable of supporting Verizon Wireless proposed loading.
- B. **Legal Feasibility.** As referenced above, C.G.S 16-50aa has been authorized to issue orders approving the shared use of an existing tower. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit Verizon to obtain a building permit for the proposed installation.
- C. **Environmental Feasibility.** The installation of Verizon equipment at the 112-foot level of the existing 120-foot tower would have an insignificant visual impact on the area around the tower. Verizon ground equipment would be installed within the existing facility compound. Verizon shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by the attached NIER report, the proposed antennas would not increase radio frequency emissions to a level at or about the Federal Communications Commission safety standard.
- D. **Economic Feasibility.** Verizon will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist Verizon with this tower sharing application.
- E. **Public Safety Concerns.** As discussed above, the tower is structurally capable of supporting Verizon proposed loading. Verizon is not aware of any public safety concerns relative to the proposed sharing of the existing tower. Verizon's intentions of providing new and improved wireless service through the shared use of this facility



is expected to enhance the safety and welfare of local residents and individuals traveling through Bristol.

For the foregoing reasons, Verizon Wireless respectfully requests that the Council approve this request for the shared use of this tower at 790 Willis Street, Bristol, CT 06010.

Sincerely,

Derek Maheux

Derek Maheux, Program Manager
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
750 West Center Street, Suite 301
West Bridgewater, MA 02379
Mobile: (508) 649 2307
Dmaheux@clinellc.com

Attachments: Exhibit 1 – Construction Drawings
Exhibit 2 – Property Card and GIS
Exhibit 3 – Structural Analysis
Exhibit 4 – Mount Analysis
Exhibit 5 – RF Emissions Analysis Report Evaluation
Exhibit 6 – Available Original Tower Approval Records
Exhibit 7 – Letter of Authorization
Exhibit 8 – Notice Deliver Confirmations

cc: Jeffery Caggiano – Mayor – Chief Elected Official
Thomas Damon Smith – Code Enforcement Officer - as P&Z official
Connecticut Light and Power – as ground owner
American Tower Corporation - as tower owner

EXHIBIT 1



EXHIBIT 2



790 WILLIS ST

Location 790 WILLIS ST

Mblu 06 / / 8A / /

Acct# 0034800

Owner CONN LIGHT + POWER CO

Assessment \$449,190

Appraisal \$641,700

PID 5681

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$392,100	\$249,600	\$641,700

Assessment			
Valuation Year	Improvements	Land	Total
2017	\$274,470	\$174,720	\$449,190

Owner of Record

Owner CONN LIGHT + POWER CO
Co-Owner
Address 107 SELDEN ST
BERLIN, CT 06037

Sale Price \$0
Certificate 1
Book & Page 0277/0293
Sale Date 01/25/1952

Ownership History

Ownership History				
Owner	Sale Price	Certificate	Book & Page	Sale Date
CONN LIGHT + POWER CO	\$0	1	0277/0293	01/25/1952

Building Information

Building 1 : Section 1

Year Built: 1950
Living Area: 900
Replacement Cost: \$40,248
Building Percent 65
Good:
Replacement Cost
Less Depreciation: \$26,200

Building Attributes	
Field	Description

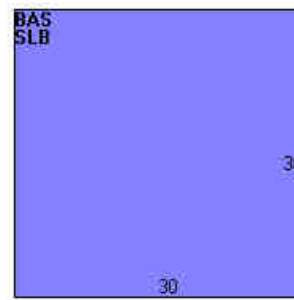
STYLE	Warehouse
MODEL	Ind/Comm
Stories:	1
Occupancy	1.00
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt Shingl
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Hot Air-no Duc
AC Type	Unit/AC
Struct Class	
Bldg Use	Public Utility
Bedrooms	
Full Baths	
Half Baths	
Usrflid 218	
Usrflid 219	
1st Floor Use:	
Heat/AC	Heat/AC Pkgs
Frame Type	Masonry
Baths/Plumbing	Light
Ceiling/Wall	None
Rooms/Prtns	Light
Wall Height	8.00
% Comn Wall	

Building Photo



(<http://images.vgsi.com/photos2/BristolCTPhotos/\00\05\61\14>)

Building Layout



(<http://images.vgsi.com/photos2/BristolCTPhotos//Sketches/568>)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	900	900
SLB	Slab	900	0
		1,800	900

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 436

Land Line Valuation

Size (Acres) 6.9

Description Public Utility
Zone R-25
Neighborhood 50
Alt Land Appr No
Category

Frontage 300
Depth
Assessed Value \$174,720
Appraised Value \$249,600

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CELL	Cell Tower/Site			2.00 UNITS	\$210,000	1
CB3	PreCastConcCel			300.00 S.F.	\$54,000	1
CB3	PreCastConcCel			300.00 S.F.	\$54,000	1
FCP	Carport			900.00 S.F.	\$5,600	1
GAR1	Garage	FR	Frame	420.00 S.F.	\$6,300	1
CB3	PreCastConcCel			200.00 S.F.	\$36,000	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
19	\$392,100	\$249,600	\$641,700
2018	\$392,100	\$249,600	\$641,700
2017	\$392,100	\$249,600	\$641,700

Assessment			
Valuation Year	Improvements	Land	Total
19	\$274,470	\$174,720	\$449,190
2018	\$274,470	\$174,720	\$449,190
2017	\$274,470	\$174,720	\$449,190

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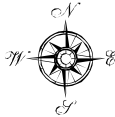
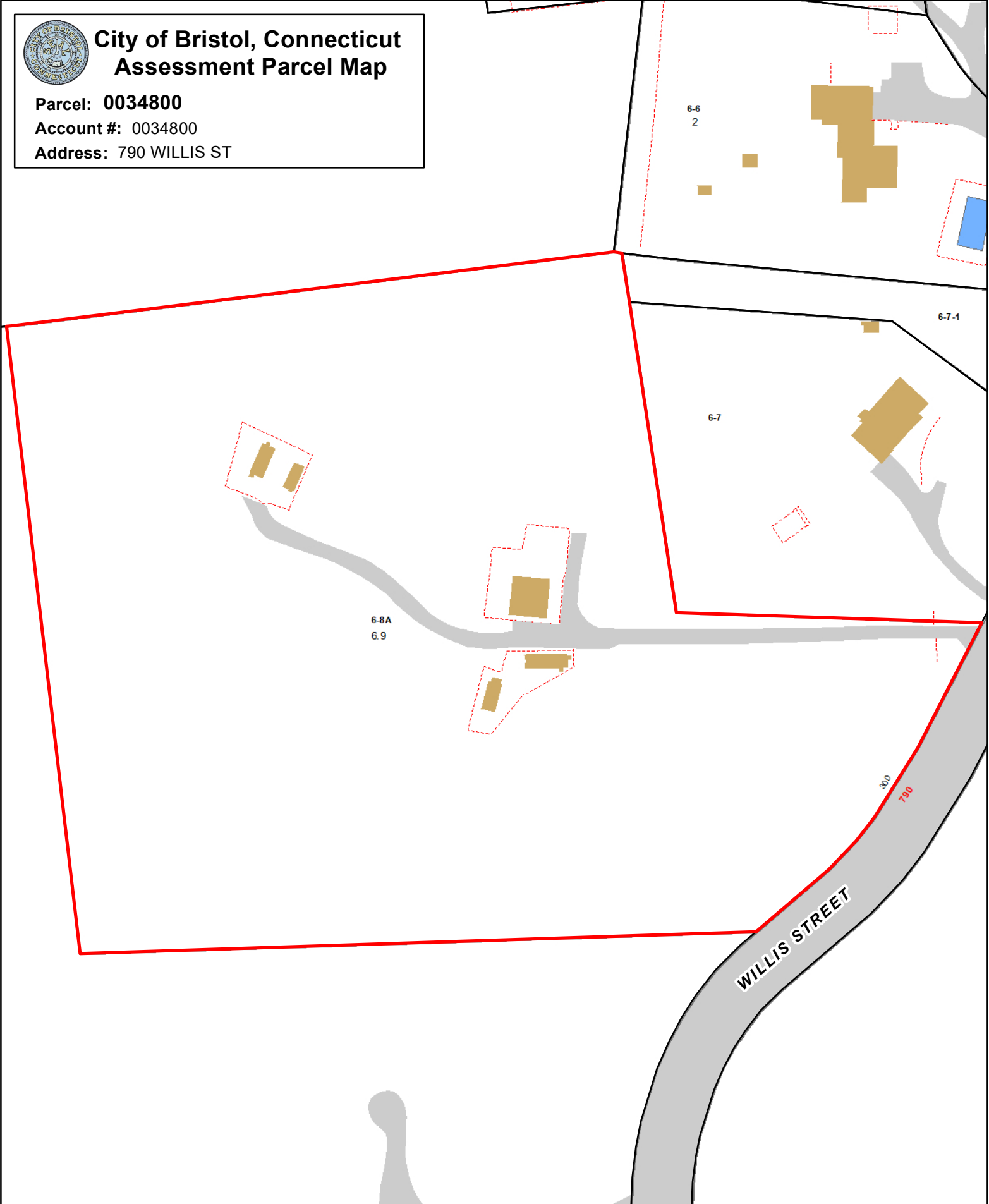


City of Bristol, Connecticut Assessment Parcel Map

Parcel: **0034800**

Account #: 0034800

Address: 790 WILLIS ST



Approximate Scale: 1 inch = 100 feet

Map Produced March 2018

Disclaimer: This map is for informational purposes only. All information is subject to verification by any user. The City of Bristol and its mapping contractors assume no legal responsibility for the information contained herein.

EXHIBIT 3





AMERICAN TOWER®
CORPORATION

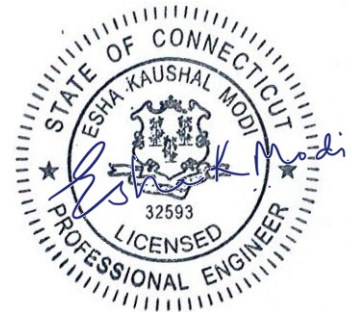
Structural Analysis Report

Structure : 120 ft Monopole
ATC Asset Name : Brst - Bristol
ATC Asset Number : 302500
Engineering Number : 14430738_C3_04
Proposed Carrier : VERIZON WIRELESS
Carrier Site Name : BRISTOL SW CT
Carrier Site Number : 5000917346
Site Location : 790 Willis Street
Bristol, CT 06010-7269
41.6491° N, 72.948° W
County : Hartford
Date : August 15, 2023
Max Usage : 96%
Analysis Result : Pass

Created By:

Aviskar Ghansam
Structural Engineer I

Aviskar Ghansam



COA: PEC.0001553

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 120 ft Monopole tower to reflect the change in loading by VERIZON WIRELESS.

Supporting Documents

Tower:	Valmont Drawing #DC1671Z, dated December 29, 1993
Foundation:	Aria Services Job #13104 dated May 25, 2023
Geotechnical:	Johnson Soils Engineering, Job #15220-B, dated May 21, 2002
Modification:	Spectrasite Site #CT-0036, dated June 12, 2002 ATC Project #64490338, dated May 5, 2016
Site Specific Study:	ICE Study for Site #302500, dated June 16, 2023

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(s):	ANSI/TIA-222-H / 2021 IBC / 2022 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 2
Feature:	Escarpment
Crest Height (H):	70 ft
Crest Length (L):	520 ft
Spectral Response:	S _s = 0.19, S _i = 0.05
Site Class:	D - Stiff Soil - Default

**Wind pressures have been determined per the site-specific climatic study in accordance with ASCE 7-16 Section 26.5.3, IBC Section 1609.3, and TIA-222-H Section 2.6.6.2.3.*

**Ice thickness and wind pressures have been determined per the site-specific climatic study in accordance with ASCE 7-16 Section 10.1.1, IBC Section 1614, and TIA-222-H Section 2.6.4.1.*

**Wind load and Ice thickness have been reduced by applicable existing structure load modification factors in accordance with TIA-222-H, ANNEX-S*

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 Engineering via email at Engineering@americantower.com. Please include the American Tower asset name, asset number, and engineering number in the subject line for any questions.

Structure Usages

Structural Component	Usage	Control	Result
Pole Shaft	95%	1.2D + 1.0W	Pass
Reinforcement	96%	0 ft to 79.5 ft	Pass
Upper Termination	83%	0 ft to 15.48 ft	Pass
Intermediate Connector	69%	79.5 ft to 97.44 ft	Pass
Base Plate @ 0.0 ft	57%	Dywidag	Pass
Mat & Pier	80%	Moment [Soil]	Pass

Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Shear (k)
Monopole Base	1,973.5	37.4	22.4

**Reactions shown reflect the results from the Load Case with maximum Moment*

Structure base reactions were analyzed using available geotechnical and foundation information.

VERIZON WIRELESS Final Loading

Elev (ft)	Qty	Equipment	Lines
112.0	1	Low Profile Platform	(2) 1 5/8" Hybriflex
	1	Raycap RCMD-6627-PF-48	
	3	Commscope NHH-45B-R2B	
	3	Commscope NHHSS-45B-R2BT4	
	3	Samsung B2/B66A RRH ORAN (RF 4439d-25A)	
	3	Samsung MT6413-77A	
	3	Samsung RF4461d-13A	
	3	Samsung RT4423-48A	

Install proposed lines inside the pole shaft.

Other Existing/Reserved Loading

Elev (ft)	Qty	Equipment	Lines	Carrier
128.6	3	Ericsson RRUS 4478 B14	-	AT&T MOBILITY
	3	Ericsson Radio 8843 - B2 + B66A		
128.5	3	Ericsson RRUS 4449 B5, B12	-	AT&T MOBILITY
126.0	3	Ericsson AIR 6449 B77D/ C-Band	-	AT&T MOBILITY
124.0	1	CCI DMP65R-BU6DA	(1) 0.39" (10mm) Fiber Trunk (2) 0.40" (10.3mm) Fiber (1) 0.41" (10.3mm) Fiber (4) 0.78" (19.7mm) 8 AWG 6 (4) 0.92" (23.4mm) Cable (4) 2" conduit (1) 7/8" Coax	AT&T MOBILITY
	1	Commscope NNHH-65B-R4		
	1	2' Std. Dish		
	1	Quintel QD6616-7		
	2	CCI DMP65R-BU8D		
	2	Quintel QD8616-7		
	3	Ericsson RRUS 32 B30		
122.0	4	Raycap DC6-48-60-18-8F	(6) 1 1/4" Coax	AT&T MOBILITY
	1	24" X 12" Panel		
120.0	3	Ericsson AIR 6419 B77G	-	AT&T MOBILITY
	1	SitePro1 RMQP-496-HK		
	3	Mount Reinforcement		

(If table breaks across pages, please see previous page for data in merged cells)

Standard Conditions

All engineering services performed by A.T. Engineering Services LLC 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 Services LLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Services LLC 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 Services LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

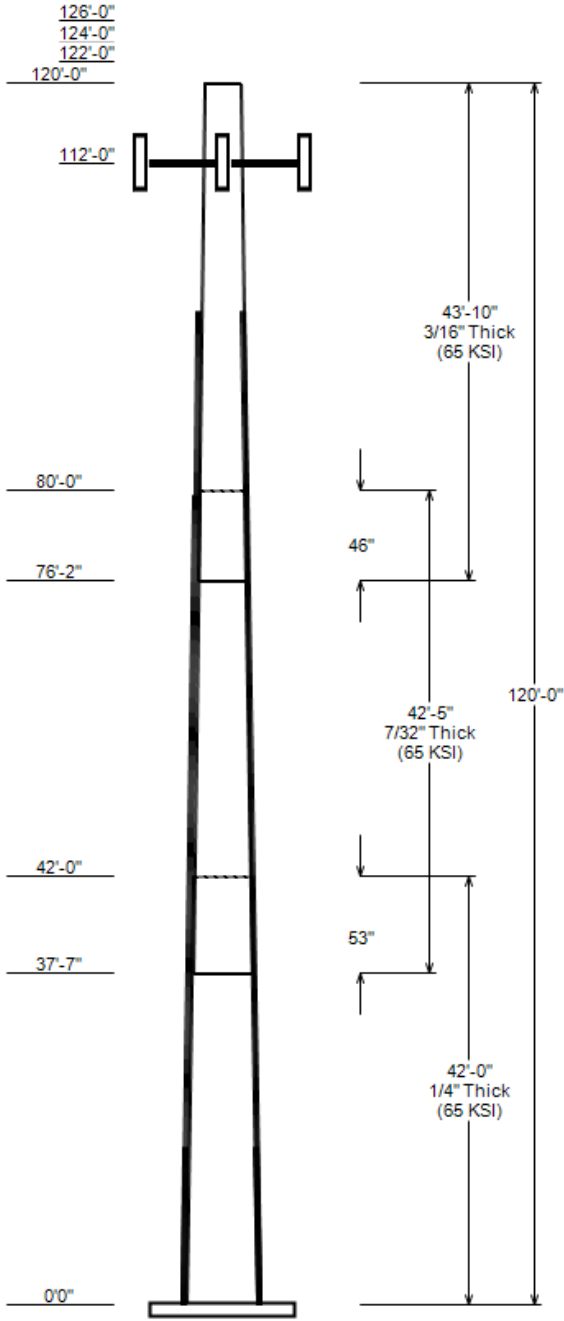
All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Services LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

ANALYSIS PARAMETERS

Nominal Wind: 117 mph	Ice Wind: 49 mph w/ 0.85" ice	Service Wind: 60 mph
Risk Category: II	Exposure: B	S _s : 0.189 S _i : 0.054
Topo Category: 0	Topo Factor: Method 2	Topo Feature: Escarpment
Structure Height: 120 ft	Base Elevation: 0.00 ft	Structure Type: Taper
Base Diameter: 31 in	Base Rotation: 0°	Taper: 0.1450 (in/ft)

POLE SECTION PROPERTIES

Section	Length (ft)	Flat Diameter (in)		Thick (in)	Joint Type	Joint Length (in)	Pole Shape	Yield Strength (ksi)
		Top	Bottom					
1	42.000	24.91	31.00	0.250		0.000	12 Sides	65
2	42.417	19.84	25.99	0.219	Slip Joint	53.000	12 Sides	65
3	43.833	14.41	20.77	0.188	Slip Joint	46.000	12 Sides	65



DISCRETE APPURTENANCE

Elev (ft)	Description
128.6	(3) Ericsson Radio 8843 - B2 + B66
128.6	(3) Ericsson RRUS 4478 B14
128.5	(3) Ericsson RRUS 4449 B5, B12
126.0	(3) Ericsson AIR 6449 B77D/ C-Band
124.0	(4) Raycap DC6-48-60-18-8F
124.0	(3) Ericsson RRUS 32 B30
124.0	(1) Generic 2' Std. Dish
124.0	(1) Commscope NNHH-65B-R4
124.0	(1) CCI DMP65R-BU6DA
124.0	(1) Quintel QD6616-7
124.0	(2) CCI DMP65R-BU8D
124.0	(2) Quintel QD8616-7
122.0	(1) Generic 24" X 12" Panel
122.0	(3) Ericsson AIR 6419 B77G
120.0	(3) Generic Mount Reinforcement
120.0	(1) SitePro1 RMQP-496-HK
112.0	(3) Samsung RT4423-48A
112.0	(3) Samsung RF4461d-13A
112.0	(3) Samsung B2/B66A RRH ORAN (RF 4
112.0	(3) Samsung MT6413-77A
112.0	(1) Raycap RCMDC-6627-PF-48
112.0	(3) Commscope NHH-45B-R2B
112.0	(3) Commscope NHHSS-45B-R2BT4
112.0	(1) Generic Flat Low Profile Plat

LINEAR APPURTENANCE

Elev To (ft)	Description
128.0	(2) 0.39" (10mm) Fiber Trunk
127.0	(3) 3" conduit
124.0	(1) 7/8" Coax
124.0	(4) 2" conduit
124.0	(4) 0.92" (23.4mm) Cable
124.0	(4) 0.78" (19.7mm) 8 AWG 6
124.0	(1) 0.41" (10.3mm) Fiber
124.0	(2) 0.40" (10.3mm) Fiber
124.0	(1) 0.39" (10mm) Fiber Trunk
122.0	(6) 1 1/4" Coax
112.0	(2) 1 5/8" Hybriflex
102.0	(1) #20 w/ Angle Brackets
102.0	(1) #20 w/ Angle Brackets
102.0	(1) #20 w/ Angle Brackets
102.0	(1) #20 w/ Angle Brackets
22.5	(1) #20 w/ Angle Brackets
22.5	(1) #20 w/ Angle Brackets
22.5	(1) #20 w/ Angle Brackets
22.5	(1) #20 w/ Angle Brackets

DISH SERVICEABILITY

Load Case	Elevation (ft)	Deflection (in)	Rotation (°)
1.0D + 1.0W	120.00	23.272	1.897

GLOBAL BASE REACTIONS

Load Case	Moment (kip-ft)	Axial (kip)	Shear (kip)
1.2D + 1.0W	1973.45	37.37	22.38
0.9D + 1.0W	1937.08	28.01	22.36
1.2D + 1.0Di + 1.0Wi	431.80	46.13	4.47
1.2D + 1.0Ev + 1.0Eh	102.45	36.79	0.94
0.9D + 1.0Ev + 1.0Eh	99.99	25.50	0.94
1.0D + 1.0W	461.07	31.18	5.28

ANALYSIS PARAMETERS

Location:	Hartford County,CT	Height:	120 ft
Type and Shape:	Taper, 12 Sides	Base Diameter:	31.00 in
Manufacturer:	Valmont	Top Diameter:	14.41 in
K_d (non-service):	0.95	Taper:	0.1450 in/ft
K_e:	0.96	Rotation:	0.000°

ICE & WIND PARAMETERS

Risk Category:	II	Design Wind Speed:	117 mph
Exposure Category:	B	Design Wind Speed w/ Ice:	49 mph
Topo Factor Procedure:	Method 2	Design Ice Thickness:	0.85 in
		Service Wind Speed:	60 mph
		HMSL:	1034.00 ft
Crest Height(H):	70 ft	Distance from Apex (x):	0 ft
Crest Length(L):	520 ft	Upwind/Downwind:	Upwind
Feature:	Escarpment		

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	D - Stiff Soil	Period Based on Rayleigh Method (sec):	2.73
T_L (sec):	6	P:	1
S_s:	0.189	S₁:	0.054
F_a:	1.600	F_v:	2.400
S_{ds}:	0.202	S_{d1}:	0.086
		C_s:	0.030
		C_s Max:	0.030
		C_s Min:	0.030

LOAD CASES

1.2D + 1.0W	116.96 mph Wind with No Ice
0.9D + 1.0W	116.96 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	48.73 mph Wind with 0.85" 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

SHAFT SECTION PROPERTIES

Section	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Bottom						Top								
						Weight (lb)	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Taper (in/ft)	
1-12	42.00	0.2500	65		0.00	3,187	31.00	0.000	24.75	2,987.6	30.55	124.00	24.91	42.00	19.85	1,540.7	24.02	99.64	0.1450	
2-12	42.42	0.2188	65	Slip	53.00	2,307	25.99	37.583	18.15	1,538.7	29.15	118.77	19.84	80.00	13.82	678.9	21.61	90.66	0.1450	
3-12	43.83	0.1875	65	Slip	46.00	1,567	20.77	76.167	12.42	671.6	27.00	110.76	14.41	120.00	8.59	221.7	17.91	76.85	0.1450	
Total Shaft Weight						7,061														

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
128.60	Ericsson Radio 8843 - B2 + B66	3	0.75	4.000	71.90	1.650	0.50	107.60	2.141	0.50
128.60	Ericsson RRUS 4478 B14	3	0.75	0.000	59.90	1.842	0.50	91.94	2.362	0.50
128.50	Ericsson RRUS 4449 B5, B12	3	0.75	4.000	71.00	1.969	0.50	108.35	2.510	0.50
126.00	Ericsson AIR 6449 B77D/ C-Band	3	0.75	0.000	81.60	4.028	0.70	149.10	4.823	0.70
124.00	Commscope NNHH-65B-R4	1	0.75	0.000	83.80	12.271	0.72	229.42	13.896	0.72
124.00	Generic 2' Std. Dish	1	0.75	4.000	14.00	5.228	1.00	46.11	6.125	1.00
124.00	Ericsson RRUS 32 B30	3	0.75	0.000	60.00	2.743	0.50	102.63	3.421	0.50
124.00	CCI DMP65R-BU6DA	1	0.75	4.000	79.40	12.709	0.72	228.69	14.325	0.72
124.00	CCI DMP65R-BU8D	2	0.75	4.000	95.70	17.871	0.72	292.67	20.007	0.72
124.00	Quintel QD8616-7	2	0.75	0.000	150.00	18.815	0.74	370.68	20.957	0.74
124.00	Raycap DC6-48-60-18-8F	4	0.75	4.000	20.00	1.260	1.00	50.51	1.642	1.00
124.00	Quintel QD6616-7	1	0.75	0.000	130.00	13.578	1.00	299.53	15.223	1.00
122.00	Generic 24" X 12" Panel	1	0.75	0.000	20.00	2.400	1.00	55.79	3.022	1.00
122.00	Ericsson AIR 6419 B77G	3	0.75	0.000	66.10	3.797	0.65	122.33	4.560	0.65
120.00	SitePro1 RMQP-496-HK	1	1.00	0.000	2446.00	42.400	1.00	3433.53	59.518	1.00
120.00	Generic Mount Reinforcement	3	1.00	0.000	200.00	4.980	1.00	312.16	7.861	1.00
112.00	Commscope NHH-45B-R2B	3	0.80	0.000	73.60	11.400	0.63	205.63	13.011	0.63
112.00	Samsung MT6413-77A	3	0.80	0.000	57.30	3.805	0.61	106.36	4.572	0.61
112.00	Samsung B2/B66A RRH ORAN (RF 4	3	0.80	0.000	74.70	1.875	0.50	111.63	2.395	0.50
112.00	Samsung RF4461d-13A	3	0.80	0.000	79.10	1.875	0.50	116.36	2.397	0.50
112.00	Samsung RT4423-48A	3	0.80	0.000	18.70	0.855	0.50	31.83	1.215	0.50
112.00	Commscope NHHSS-45B-R2BT4	3	0.80	0.000	76.90	11.400	0.63	208.81	13.011	0.63
112.00	Generic Flat Low Profile Platf	1	1.00	0.000	1875.00	26.100	1.00	2342.98	37.132	1.00
112.00	Raycap RCMDC-6627-PF-48	1	0.80	0.000	32.00	4.056	0.50	105.44	4.845	0.50
Totals	Row Count: 24	55			8,224.00			13,594.42		

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg): 0.00

Elev From (ft)	Elev To (ft)	Qty	Description	Diameter (in)	Weight (lb/ft)	Flat	Max/Row	Distance Between Rows (in)	Distance Between Cols (in)	Azimuth (deg)	Distance From Face (in)	Exposed To Wind	Carrier
0.00	128.00	2	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	127.00	3	3" conduit	3.5	7.58	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	124.00	4	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	124.00	4	0.92" (23.4mm) Cable	0.92	0.89	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	124.00	4	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	124.00	2	0.40" (10.3mm) Fiber	0.4	0.09	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	124.00	1	0.41" (10.3mm) Fiber	0.41	0.09	N	0	0	0	0	0	N	AT&T MOBILITY
7.00	124.00	1	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	124.00	1	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	122.00	6	1 1/4" Coax	1.55	0.63	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	112.00	2	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIRELESS
0.00	102.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	90	0	Y	
0.00	102.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	0	0	Y	
0.00	102.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	180	0	Y	
0.00	102.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	270	0	Y	
0.00	22.50	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	210	0	Y	
0.00	22.50	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	30	0	Y	
0.00	22.50	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	300	0	Y	
0.00	22.50	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	120	0	Y	

ADDITIONAL STEEL

Intermediate Connectors

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Bracket Type	Spacing (in)	Length (in)	Connectors	Continuation?
0.00	15.48	4	SOL #20 All Thread Bar	80	2.19	6" Angle Bracket	30.00	3.31	5/8" A36 U-Bolt	N
0.00	79.50	4	SOL #20 All Thread Bar	80	2.19	6" Angle Bracket	30.00	3.31	5/8" A36 U-Bolt	Y
79.50	97.44	4	SOL #20 All Thread Bar	80	2.19	6" Angle Bracket	30.00	3.31	5/8" A36 U-Bolt	Y

SEGMENT PROPERTIES

Seg Top Elev (ft)	Description	(Max Length: 5 ft)	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)	Additional Reinforcing		
													Area (in ²)	Ix (in ⁴)	Weight (lb)
0.00			0.2500	31.000	24.754	2,987.60	30.55	124.00	71.4	186.2	0.0	0.0	39.280	7,139.20	0.0
5.00			0.2500	30.275	24.170	2,781.20	29.77	121.10	72.2	177.5	0.0	416.2	39.280	6,865.80	668.0
10.00			0.2500	29.550	23.586	2,584.50	28.99	118.20	73.1	169.0	0.0	406.3	39.280	6,597.80	668.0
15.00			0.2500	28.825	23.003	2,397.30	28.21	115.30	73.9	160.7	0.0	396.3	39.280	6,335.20	668.0
15.48	Reinf. Top		0.2500	28.755	22.947	2,379.80	28.14	115.02	74	159.9	0.0	37.5	39.280	6,310.20	64.1
20.00			0.2500	28.100	22.419	2,219.40	27.44	112.40	74.8	152.6	0.0	348.9	19.640	3,010.90	301.9
25.00			0.2500	27.374	21.835	2,050.50	26.66	109.50	75.6	144.7	0.0	376.5	19.640	2,887.60	334.0
30.00			0.2500	26.649	21.251	1,890.40	25.88	106.60	76.5	137.0	0.0	366.5	19.640	2,767.00	334.0
35.00			0.2500	25.924	20.668	1,738.90	25.11	103.70	77.3	129.6	0.0	356.6	19.640	2,648.90	334.0
37.58	Bot - Section 2		0.2500	25.550	20.366	1,663.90	24.70	102.20	77.8	125.8	0.0	180.4	19.640	2,588.90	172.6
40.00			0.2500	25.199	20.084	1,595.70	24.33	100.80	78.2	122.3	0.0	314.6	19.640	2,602.80	161.4
42.00	Top - Section 1		0.2188	25.347	17.704	1,426.80	28.36	115.84	73.8	108.7	0.0	257.1	19.640	2,556.70	133.6
45.00			0.2188	24.912	17.397	1,354.00	27.83	113.86	74.4	105.0	0.0	179.2	19.640	2,488.30	200.4
50.00			0.2188	24.187	16.886	1,238.10	26.94	110.54	75.3	98.9	0.0	291.6	19.640	2,376.50	334.0
55.00			0.2188	23.461	16.375	1,129.10	26.05	107.23	76.3	93.0	0.0	283.0	19.640	2,267.20	334.0
60.00			0.2188	22.736	15.864	1,026.70	25.16	103.91	77.3	87.2	0.0	274.3	19.640	2,160.40	334.0
65.00			0.2188	22.011	15.354	930.70	24.28	100.60	78.2	81.7	0.0	265.6	19.640	2,056.30	334.0
70.00			0.2188	21.286	14.843	840.80	23.39	97.29	79.2	76.3	0.0	256.9	19.640	1,954.70	334.0
75.00			0.2188	20.561	14.332	757.00	22.50	93.97	80.2	71.1	0.0	248.2	19.640	1,855.80	334.0
76.17	Bot - Section 3		0.2188	20.392	14.213	738.30	22.29	93.20	80.4	69.9	0.0	56.7	19.640	1,833.10	77.9
79.50	Reinf. Top Reinf Bottom		0.2188	19.908	13.872	686.40	21.70	90.99	81	66.6	0.0	298.6	19.640	1,818.60	222.7
80.00	Top - Section 2		0.1875	20.211	12.089	618.70	26.20	107.79	76.1	59.1	0.0	44.2	19.640	1,808.90	33.4
85.00			0.1875	19.486	11.651	553.90	25.17	103.92	77.3	54.9	0.0	202.0	19.640	1,713.80	334.0
90.00			0.1875	18.761	11.214	493.70	24.13	100.06	78.4	50.8	0.0	194.5	19.640	1,621.20	334.0
95.00			0.1875	18.036	10.776	438.10	23.09	96.19	79.5	46.9	0.0	187.1	19.640	1,531.20	334.0
97.44	Reinf. Top		0.1875	17.682	10.562	412.60	22.59	94.30	80.1	45.1	0.0	88.6	19.640	1,488.20	163.0
100.00			0.1875	17.311	10.338	386.90	22.06	92.32	80.7	43.2	0.0	91.0			
105.00			0.1875	16.585	9.900	339.80	21.02	88.46	81.8	39.6	0.0	172.2			
110.00			0.1875	15.860	9.462	296.70	19.99	84.59	81.9	36.1	0.0	164.7			
112.00			0.1875	15.570	9.287	280.50	19.57	83.04	81.9	34.8	0.0	63.8			
115.00			0.1875	15.135	9.025	257.40	18.95	80.72	81.9	32.9	0.0	93.5			
120.00			0.1875	14.410	8.587	221.70	17.91	76.85	81.9	29.7	0.0	149.8			
Totals:												7,062.4	7,543.0		

CALCULATED FORCES

Load Case: 1.2D + 1.0W 116.96 mph Wind with No Ice 24 Iterations

Gust Response Factor: 1.10
 Dead load Factor: 1.20
 Wind Load Factor: 1.00

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	-37.37	-22.38	0.00	-1,973.4	0.00	1,973.45	1,590.66	434.43	1,260.13	996.98	0	0	0.596
5.00	-35.44	-21.85	0.00	-1,861.5	0.00	1,861.54	1,571.59	424.18	1,201.42	961.61	0.15	-0.27	0.569
10.00	-33.53	-21.32	0.00	-1,752.3	0.00	1,752.30	1,551.63	413.94	1,144.11	926.28	0.57	-0.54	0.543
15.00	-31.68	-20.96	0.00	-1,645.7	0.00	1,645.70	1,530.78	403.70	1,088.20	891.03	1.28	-0.8	0.517
15.48	-31.47	-20.76	0.00	-1,635.6	0.00	1,635.64	1,528.73	402.71	1,082.90	887.65	1.36	-0.82	0.515
15.48	-31.47	-20.76	0.00	-1,635.6	0.00	1,635.64	1,528.73	402.71	1,082.90	887.65	1.36	-0.82	0.810
20.00	-30.11	-20.32	0.00	-1,541.8	0.00	1,541.79	1,509.04	393.45	1,033.69	855.89	2.26	-1.06	0.778
25.00	-28.66	-19.89	0.00	-1,440.2	0.00	1,440.18	1,486.41	383.21	980.58	820.91	3.58	-1.47	0.741

CALCULATED FORCES

30.00	-27.28	-19.45	0.00	-1,340.7	0.00	1,340.72	1,462.88	372.96	928.87	786.12	5.33	-1.87	0.705
35.00	-25.96	-19.07	0.00	-1,243.5	0.00	1,243.46	1,438.47	362.72	878.56	751.57	7.5	-2.26	0.668
37.58	-25.27	-18.83	0.00	-1,194.2	0.00	1,194.20	1,425.51	357.43	853.11	733.82	8.78	-2.46	0.649
40.00	-24.46	-18.60	0.00	-1,148.7	0.00	1,148.70	1,413.16	352.48	829.65	717.29	10.08	-2.65	0.620
42.00	-23.78	-18.36	0.00	-1,111.5	0.00	1,111.51	1,175.60	310.70	736.48	601.77	11.22	-2.81	0.675
45.00	-23.00	-17.99	0.00	-1,056.4	0.00	1,056.44	1,164.34	305.32	711.21	585.60	13.06	-3.03	0.648
50.00	-21.76	-17.47	0.00	-966.5	0.00	966.48	1,144.87	296.35	670.07	558.75	16.44	-3.41	0.605
55.00	-20.54	-16.93	0.00	-879.1	0.00	879.12	1,124.51	287.39	630.15	532.06	20.2	-3.77	0.561
60.00	-19.34	-16.39	0.00	-794.4	0.00	794.45	1,103.25	278.42	591.46	505.56	24.34	-4.12	0.518
65.00	-18.16	-15.83	0.00	-712.5	0.00	712.53	1,081.11	269.46	553.99	479.31	28.83	-4.46	0.474
70.00	-17.00	-15.26	0.00	-633.4	0.00	633.40	1,058.07	260.49	517.75	453.33	33.67	-4.78	0.431
75.00	-15.88	-14.81	0.00	-557.1	0.00	557.12	1,034.15	251.52	482.73	427.68	38.83	-5.08	0.387
76.17	-15.61	-14.60	0.00	-539.8	0.00	539.84	1,028.44	249.43	474.74	421.74	40.08	-5.15	0.377
79.50	-14.71	-14.29	0.00	-491.2	0.00	491.18	1,011.86	243.45	452.27	404.89	43.74	-5.34	0.342
80.00	-14.56	-14.07	0.00	-484.0	0.00	484.04	828.38	212.16	400.78	337.68	44.3	-5.37	0.376
85.00	-13.50	-13.48	0.00	-413.7	0.00	413.67	810.23	204.48	372.28	318.21	50.06	-5.62	0.328
90.00	-12.46	-12.89	0.00	-346.3	0.00	346.26	791.20	196.80	344.84	298.94	56.07	-5.86	0.280
95.00	-11.44	-12.38	0.00	-281.8	0.00	281.81	771.27	189.12	318.45	279.92	62.32	-6.07	0.234
97.44	-10.95	-12.08	0.00	-251.6	0.00	251.61	761.22	185.37	305.95	270.74	65.44	-6.17	0.211
97.44	-10.95	-12.08	0.00	-251.6	0.00	251.61	761.22	185.37	305.95	270.74	65.44	-6.17	0.948
100.00	-10.58	-11.78	0.00	-220.7	0.00	220.67	750.45	181.43	293.11	261.19	68.77	-6.26	0.863
105.00	-9.96	-11.36	0.00	-161.8	0.00	161.79	728.74	173.75	268.82	242.77	75.7	-6.96	0.684
110.00	-9.42	-11.17	0.00	-105.0	0.00	105.00	697.48	166.07	245.58	221.97	83.29	-7.52	0.491
112.00	-5.99	-7.56	0.00	-82.7	0.00	82.66	684.57	162.99	236.58	213.78	86.47	-7.7	0.398
115.00	-5.71	-7.34	0.00	-60.0	0.00	60.00	665.21	158.38	223.39	201.79	91.37	-7.92	0.308
120.00	0.00	-6.47	0.00	-23.3	0.00	23.30	632.94	150.70	202.25	182.57	99.77	-8.15	0.129

CALCULATED FORCES

Load Case: 0.9D + 1.0W 116.96 mph Wind with No Ice (Reduced DL) 24 Iterations
 Gust Response Factor: 1.10
 Dead load Factor: 0.90
 Wind Load Factor: 1.00

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	-28.01	-22.36	0.00	-1,937.1	0.00	1,937.08	1,590.66	434.43	1,260.13	996.98	0	0	0.583
5.00	-26.55	-21.78	0.00	-1,825.3	0.00	1,825.29	1,571.59	424.18	1,201.42	961.61	0.14	-0.26	0.556
10.00	-25.09	-21.22	0.00	-1,716.4	0.00	1,716.38	1,551.63	413.94	1,144.11	926.28	0.56	-0.53	0.530
15.00	-23.70	-20.84	0.00	-1,610.3	0.00	1,610.30	1,530.78	403.70	1,088.20	891.03	1.25	-0.78	0.505
15.48	-23.52	-20.62	0.00	-1,600.3	0.00	1,600.30	1,528.73	402.71	1,082.90	887.65	1.33	-0.81	0.502
15.48	-23.52	-20.62	0.00	-1,600.3	0.00	1,600.30	1,528.73	402.71	1,082.90	887.65	1.33	-0.81	0.790
20.00	-22.48	-20.14	0.00	-1,507.1	0.00	1,507.08	1,509.04	393.45	1,033.69	855.89	2.21	-1.04	0.758
25.00	-21.37	-19.66	0.00	-1,406.4	0.00	1,406.36	1,486.41	383.21	980.58	820.91	3.51	-1.43	0.722
30.00	-20.31	-19.19	0.00	-1,308.0	0.00	1,308.04	1,462.88	372.96	928.87	786.12	5.22	-1.83	0.685
35.00	-19.30	-18.77	0.00	-1,212.1	0.00	1,212.11	1,438.47	362.72	878.56	751.57	7.34	-2.21	0.649
37.58	-18.77	-18.52	0.00	-1,163.6	0.00	1,163.62	1,425.51	357.43	853.11	733.82	8.59	-2.41	0.630
40.00	-18.15	-18.27	0.00	-1,118.9	0.00	1,118.87	1,413.16	352.48	829.65	717.29	9.86	-2.59	0.602
42.00	-17.63	-18.02	0.00	-1,082.3	0.00	1,082.32	1,175.60	310.70	736.48	601.77	10.98	-2.74	0.655
45.00	-17.04	-17.63	0.00	-1,028.3	0.00	1,028.26	1,164.34	305.32	711.21	585.60	12.78	-2.96	0.629
50.00	-16.09	-17.09	0.00	-940.1	0.00	940.09	1,144.87	296.35	670.07	558.75	16.07	-3.33	0.586
55.00	-15.16	-16.54	0.00	-854.6	0.00	854.64	1,124.51	287.39	630.15	532.06	19.75	-3.68	0.543
60.00	-14.25	-15.97	0.00	-772.0	0.00	771.97	1,103.25	278.42	591.46	505.56	23.78	-4.02	0.501
65.00	-13.36	-15.41	0.00	-692.1	0.00	692.09	1,081.11	269.46	553.99	479.31	28.17	-4.35	0.459
70.00	-12.49	-14.84	0.00	-615.0	0.00	615.05	1,058.07	260.49	517.75	453.33	32.89	-4.66	0.416
75.00	-11.65	-14.40	0.00	-540.9	0.00	540.86	1,034.15	251.52	482.73	427.68	37.92	-4.95	0.374
76.17	-11.44	-14.19	0.00	-524.1	0.00	524.07	1,028.44	249.43	474.74	421.74	39.14	-5.02	0.365
79.50	-10.77	-13.89	0.00	-476.8	0.00	476.78	1,011.86	243.45	452.27	404.89	42.71	-5.2	0.330
80.00	-10.65	-13.67	0.00	-469.8	0.00	469.83	828.38	212.16	400.78	337.68	43.25	-5.23	0.364
85.00	-9.86	-13.09	0.00	-401.5	0.00	401.50	810.23	204.48	372.28	318.21	48.86	-5.48	0.317
90.00	-9.08	-12.51	0.00	-336.1	0.00	336.06	791.20	196.80	344.84	298.94	54.72	-5.71	0.271
95.00	-8.32	-12.02	0.00	-273.5	0.00	273.53	771.27	189.12	318.45	279.92	60.81	-5.92	0.225
97.44	-7.95	-11.73	0.00	-244.2	0.00	244.21	761.22	185.37	305.95	270.74	63.85	-6.01	0.203
97.44	-7.95	-11.73	0.00	-244.2	0.00	244.21	761.22	185.37	305.95	270.74	63.85	-6.01	0.916
100.00	-7.67	-11.41	0.00	-214.2	0.00	214.17	750.45	181.43	293.11	261.19	67.09	-6.1	0.834
105.00	-7.19	-10.98	0.00	-157.1	0.00	157.12	728.74	173.75	268.82	242.77	73.84	-6.78	0.661
110.00	-6.78	-10.78	0.00	-102.2	0.00	102.23	697.48	166.07	245.58	221.97	81.23	-7.32	0.474
112.00	-4.29	-7.30	0.00	-80.7	0.00	80.66	684.57	162.99	236.58	213.78	84.33	-7.5	0.386
115.00	-4.08	-7.09	0.00	-58.8	0.00	58.75	665.21	158.38	223.39	201.79	89.1	-7.71	0.299
120.00	0.00	-6.47	0.00	-23.3	0.00	23.30	632.94	150.70	202.25	182.57	97.29	-7.94	0.129

CALCULATED FORCES

Load Case: 1.2D + 1.0Di + 1.0Wi 48.73 mph Wind with 0.85" Radial Ice 23 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

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	-46.13	-4.47	0.00	-431.8	0.00	431.80	1,590.66	434.43	1,260.13	996.98	0	0	0.139
5.00	-44.07	-4.41	0.00	-409.4	0.00	409.45	1,571.59	424.18	1,201.42	961.61	0.03	-0.06	0.134
10.00	-42.00	-4.34	0.00	-387.4	0.00	387.41	1,551.63	413.94	1,144.11	926.28	0.13	-0.12	0.128
15.00	-39.93	-4.31	0.00	-365.7	0.00	365.68	1,530.78	403.70	1,088.20	891.03	0.28	-0.18	0.122
15.48	-39.73	-4.28	0.00	-363.6	0.00	363.62	1,528.73	402.71	1,082.90	887.65	0.3	-0.18	0.122
15.48	-39.73	-4.28	0.00	-363.6	0.00	363.62	1,528.73	402.71	1,082.90	887.65	0.3	-0.18	0.191
20.00	-38.23	-4.23	0.00	-344.3	0.00	344.29	1,509.04	393.45	1,033.69	855.89	0.5	-0.23	0.184
25.00	-36.66	-4.18	0.00	-323.2	0.00	323.16	1,486.41	383.21	980.58	820.91	0.79	-0.33	0.177
30.00	-35.18	-4.14	0.00	-302.2	0.00	302.25	1,462.88	372.96	928.87	786.12	1.18	-0.42	0.169
35.00	-33.72	-4.09	0.00	-281.6	0.00	281.57	1,438.47	362.72	878.56	751.57	1.66	-0.5	0.161
37.58	-32.97	-4.06	0.00	-271.0	0.00	271.00	1,425.51	357.43	853.11	733.82	1.95	-0.55	0.156
40.00	-32.09	-4.04	0.00	-261.2	0.00	261.18	1,413.16	352.48	829.65	717.29	2.24	-0.59	0.150
42.00	-31.37	-4.00	0.00	-253.1	0.00	253.11	1,175.60	310.70	736.48	601.77	2.49	-0.63	0.163
45.00	-30.53	-3.96	0.00	-241.1	0.00	241.09	1,164.34	305.32	711.21	585.60	2.91	-0.68	0.158
50.00	-29.15	-3.89	0.00	-221.3	0.00	221.31	1,144.87	296.35	670.07	558.75	3.66	-0.77	0.148
55.00	-27.79	-3.81	0.00	-201.9	0.00	201.88	1,124.51	287.39	630.15	532.06	4.51	-0.85	0.138
60.00	-26.44	-3.71	0.00	-182.8	0.00	182.85	1,103.25	278.42	591.46	505.56	5.44	-0.93	0.127
65.00	-25.10	-3.61	0.00	-164.3	0.00	164.29	1,081.11	269.46	553.99	479.31	6.46	-1.01	0.117
70.00	-23.78	-3.50	0.00	-146.2	0.00	146.24	1,058.07	260.49	517.75	453.33	7.55	-1.08	0.107
75.00	-22.48	-3.41	0.00	-128.8	0.00	128.75	1,034.15	251.52	482.73	427.68	8.72	-1.15	0.097
76.17	-22.17	-3.36	0.00	-124.8	0.00	124.78	1,028.44	249.43	474.74	421.74	9.01	-1.17	0.094
79.50	-21.14	-3.30	0.00	-113.6	0.00	113.57	1,011.86	243.45	452.27	404.89	9.84	-1.21	0.086
80.00	-20.99	-3.25	0.00	-111.9	0.00	111.92	828.38	212.16	400.78	337.68	9.96	-1.22	0.094
85.00	-19.75	-3.12	0.00	-95.7	0.00	95.67	810.23	204.48	372.28	318.21	11.27	-1.28	0.083
90.00	-18.52	-2.99	0.00	-80.1	0.00	80.06	791.20	196.80	344.84	298.94	12.64	-1.33	0.071
95.00	-17.30	-2.87	0.00	-65.1	0.00	65.12	771.27	189.12	318.45	279.92	14.06	-1.38	0.060
97.44	-16.71	-2.80	0.00	-58.1	0.00	58.12	761.22	185.37	305.95	270.74	14.77	-1.4	0.055
97.44	-16.71	-2.80	0.00	-58.1	0.00	58.12	761.22	185.37	305.95	270.74	14.77	-1.4	0.237
100.00	-16.30	-2.74	0.00	-51.0	0.00	50.95	750.45	181.43	293.11	261.19	15.53	-1.42	0.217
105.00	-15.60	-2.67	0.00	-37.3	0.00	37.28	728.74	173.75	268.82	242.77	17.11	-1.59	0.175
110.00	-14.99	-2.62	0.00	-24.0	0.00	23.95	697.48	166.07	245.58	221.97	18.84	-1.71	0.130
112.00	-9.80	-1.78	0.00	-18.7	0.00	18.70	684.57	162.99	236.58	213.78	19.57	-1.75	0.102
115.00	-9.46	-1.73	0.00	-13.4	0.00	13.36	665.21	158.38	223.39	201.79	20.69	-1.8	0.081
120.00	0.00	-1.43	0.00	-4.7	0.00	4.71	632.94	150.70	202.25	182.57	22.61	-1.85	0.026

CALCULATED FORCES

Load Case: 1.0D + 1.0W

60 mph Wind with No Ice

23 Iterations

Gust Response Factor: 1.10
 Dead load Factor: 1.00
 Wind Load Factor: 1.00

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	-31.18	-5.28	0.00	-461.1	0.00	461.07	1,590.66	434.43	1,260.13	996.98	0	0	0.144
5.00	-29.66	-5.15	0.00	-434.7	0.00	434.68	1,571.59	424.18	1,201.42	961.61	0.03	-0.06	0.138
10.00	-28.14	-5.02	0.00	-409.0	0.00	408.95	1,551.63	413.94	1,144.11	926.28	0.13	-0.13	0.131
15.00	-26.63	-4.93	0.00	-383.9	0.00	383.87	1,530.78	403.70	1,088.20	891.03	0.3	-0.19	0.125
15.48	-26.49	-4.88	0.00	-381.5	0.00	381.50	1,528.73	402.71	1,082.90	887.65	0.32	-0.19	0.124
15.48	-26.49	-4.88	0.00	-381.5	0.00	381.50	1,528.73	402.71	1,082.90	887.65	0.32	-0.19	0.195
20.00	-25.43	-4.77	0.00	-359.4	0.00	359.45	1,509.04	393.45	1,033.69	855.89	0.53	-0.25	0.187
25.00	-24.32	-4.66	0.00	-335.6	0.00	335.60	1,486.41	383.21	980.58	820.91	0.84	-0.34	0.179
30.00	-23.27	-4.55	0.00	-312.3	0.00	312.29	1,462.88	372.96	928.87	786.12	1.24	-0.44	0.170
35.00	-22.23	-4.46	0.00	-289.5	0.00	289.52	1,438.47	362.72	878.56	751.57	1.75	-0.53	0.161
37.58	-21.70	-4.40	0.00	-278.0	0.00	278.01	1,425.51	357.43	853.11	733.82	2.05	-0.57	0.156
40.00	-21.05	-4.34	0.00	-267.4	0.00	267.37	1,413.16	352.48	829.65	717.29	2.35	-0.62	0.149
42.00	-20.52	-4.29	0.00	-258.7	0.00	258.68	1,175.60	310.70	736.48	601.77	2.62	-0.65	0.162
45.00	-19.93	-4.20	0.00	-245.8	0.00	245.82	1,164.34	305.32	711.21	585.60	3.05	-0.71	0.156
50.00	-18.95	-4.07	0.00	-224.8	0.00	224.83	1,144.87	296.35	670.07	558.75	3.83	-0.79	0.146
55.00	-17.99	-3.95	0.00	-204.5	0.00	204.46	1,124.51	287.39	630.15	532.06	4.71	-0.88	0.135
60.00	-17.03	-3.82	0.00	-184.7	0.00	184.73	1,103.25	278.42	591.46	505.56	5.68	-0.96	0.125
65.00	-16.08	-3.68	0.00	-165.7	0.00	165.66	1,081.11	269.46	553.99	479.31	6.72	-1.04	0.114
70.00	-15.14	-3.55	0.00	-147.2	0.00	147.24	1,058.07	260.49	517.75	453.33	7.85	-1.11	0.104
75.00	-14.21	-3.44	0.00	-129.5	0.00	129.50	1,034.15	251.52	482.73	427.68	9.06	-1.18	0.094
76.17	-14.00	-3.40	0.00	-125.5	0.00	125.48	1,028.44	249.43	474.74	421.74	9.35	-1.2	0.091
79.50	-13.25	-3.32	0.00	-114.2	0.00	114.16	1,011.86	243.45	452.27	404.89	10.2	-1.24	0.083
80.00	-13.13	-3.27	0.00	-112.5	0.00	112.50	828.38	212.16	400.78	337.68	10.33	-1.25	0.091
85.00	-12.25	-3.13	0.00	-96.1	0.00	96.14	810.23	204.48	372.28	318.21	11.67	-1.31	0.080
90.00	-11.38	-3.00	0.00	-80.5	0.00	80.47	791.20	196.80	344.84	298.94	13.07	-1.36	0.068
95.00	-10.51	-2.88	0.00	-65.5	0.00	65.49	771.27	189.12	318.45	279.92	14.53	-1.41	0.057
97.44	-10.09	-2.81	0.00	-58.5	0.00	58.48	761.22	185.37	305.95	270.74	15.26	-1.44	0.052
97.44	-10.09	-2.81	0.00	-58.5	0.00	58.48	761.22	185.37	305.95	270.74	15.26	-1.44	0.229
100.00	-9.82	-2.73	0.00	-51.3	0.00	51.29	750.45	181.43	293.11	261.19	16.04	-1.46	0.210
105.00	-9.36	-2.63	0.00	-37.6	0.00	37.62	728.74	173.75	268.82	242.77	17.65	-1.62	0.168
110.00	-8.94	-2.59	0.00	-24.4	0.00	24.45	697.48	166.07	245.58	221.97	19.42	-1.75	0.123
112.00	-5.75	-1.75	0.00	-19.3	0.00	19.27	684.57	162.99	236.58	213.78	20.17	-1.79	0.099
115.00	-5.51	-1.70	0.00	-14.0	0.00	14.01	665.21	158.38	223.39	201.79	21.31	-1.84	0.078
120.00	0.00	-1.52	0.00	-5.5	0.00	5.49	632.94	150.70	202.25	182.57	23.27	-1.9	0.030

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

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

Spectral Response Acceleration for Short Period (S_S):	0.189
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.054
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}):	0.202
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.086
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):	2.730
Redundancy Factor (ρ):	1.000
Seismic Force Distribution Exponent (k):	2.000
Total Unfactored Dead Load:	31.190 k
Seismic Base Shear (E):	0.940 k

SEISMIC FORCES

Segment	Seismic	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
31		117.5	389	5,370	0.028	26	482
30		113.5	237	3,052	0.016	15	294
29		111	165	2,029	0.010	10	204
28		107.5	417	4,817	0.025	23	517
27		102.5	462	4,851	0.025	23	573
26		98.72	268	2,612	0.014	13	332
25		96.22	420	3,891	0.020	19	521
24		92.5	867	7,416	0.038	36	1,075
23		87.5	874	6,693	0.035	32	1,084
22		82.5	882	6,001	0.031	29	1,094
21		79.75	112	713	0.004	3	139
20		77.8333	752	4,554	0.024	22	932
19		75.5833	215	1,230	0.006	6	267
18		72.5	928	4,877	0.025	24	1,151
17		67.5	937	4,267	0.022	21	1,162
16		62.5	945	3,692	0.019	18	1,172
15		57.5	954	3,154	0.016	15	1,183
14		52.5	963	2,653	0.014	13	1,194
13		47.5	971	2,192	0.011	11	1,205
12		43.5	587	1,111	0.006	5	728
11		41	529	889	0.005	4	656
10		38.7917	643	968	0.005	5	798
9		36.2917	532	700	0.004	3	659
8		32.5	1,036	1,095	0.006	5	1,285
7		27.5	1,046	791	0.004	4	1,298
6		22.5	1,103	558	0.003	3	1,368
5		17.74	1,048	330	0.002	2	1,300
4		15.24	144	33	0.000	0	178
3		12.5	1,504	235	0.001	1	1,865
2		7.5	1,513	85	0.000	0	1,876
1		2.5	1,522	10	0.000	0	1,888
Ericsson Radio 8843 - B2 + B66A		120	216	3,106	0.016	15	268
Ericsson RRUS 4478 B14		120	180	2,588	0.013	13	223
Ericsson RRUS 4449 B5, B12		120	213	3,067	0.016	15	264
Ericsson AIR 6449 B77D/ C-Band		120	245	3,525	0.018	17	304
Raycap DC6-48-60-18-8F		120	80	1,152	0.006	6	99
Ericsson RRUS 32 B30		120	180	2,592	0.013	13	223
Generic 2' Std. Dish		120	14	202	0.001	1	17

SEISMIC FORCES

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)
Commscope NNHH-65B-R4	120	84	1,207	0.006	6	104
CCI DMP65R-BU6DA	120	79	1,143	0.006	6	98
Quintel QD6616-7	120	130	1,872	0.010	9	161
CCI DMP65R-BU8D	120	191	2,756	0.014	13	237
Quintel QD8616-7	120	300	4,320	0.022	21	372
Generic 24" X 12" Panel	120	20	288	0.002	1	25
Ericsson AIR 6419 B77G	120	198	2,856	0.015	14	246
Generic Mount Reinforcement	120	600	8,640	0.045	42	744
SitePro1 RMQP-496-HK	120	2,446	35,222	0.182	170	3,034
Samsung RT4423-48A	112	56	704	0.004	3	70
Samsung RF4461d-13A	112	237	2,977	0.015	14	294
Samsung B2/B66A RRH ORAN (RF 4439d-25A)	112	224	2,811	0.014	14	278
Samsung MT6413-77A	112	172	2,156	0.011	10	213
Raycap RCMDC-6627-PF-48	112	32	401	0.002	2	40
Commscope NHH-45B-R2B	112	221	2,770	0.014	13	274
Commscope NHHSS-45B-R2BT4	112	231	2,894	0.015	14	286
Generic Flat Low Profile Platform	112	1,875	23,520	0.122	114	2,326
Totals:		31,187	193,637	1.000	936	38,682

SEISMIC FORCES

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)
31	117.5	389	5,370	0.028	26	334
30	113.5	237	3,052	0.016	15	204
29	111	165	2,029	0.010	10	142
28	107.5	417	4,817	0.025	23	358
27	102.5	462	4,851	0.025	23	397
26	98.72	268	2,612	0.014	13	230
25	96.22	420	3,891	0.020	19	361
24	92.5	867	7,416	0.038	36	745
23	87.5	874	6,693	0.035	32	752
22	82.5	882	6,001	0.031	29	758
21	79.75	112	713	0.004	3	96
20	77.8333	752	4,554	0.024	22	646
19	75.5833	215	1,230	0.006	6	185
18	72.5	928	4,877	0.025	24	798
17	67.5	937	4,267	0.022	21	805
16	62.5	945	3,692	0.019	18	813
15	57.5	954	3,154	0.016	15	820
14	52.5	963	2,653	0.014	13	828
13	47.5	971	2,192	0.011	11	835
12	43.5	587	1,111	0.006	5	505
11	41	529	889	0.005	4	455
10	38.7917	643	968	0.005	5	553
9	36.2917	532	700	0.004	3	457
8	32.5	1,036	1,095	0.006	5	891
7	27.5	1,046	791	0.004	4	899
6	22.5	1,103	558	0.003	3	948
5	17.74	1,048	330	0.002	2	901
4	15.24	144	33	0.000	0	124
3	12.5	1,504	235	0.001	1	1,293
2	7.5	1,513	85	0.000	0	1,301
1	2.5	1,522	10	0.000	0	1,308
Ericsson Radio 8843 - B2 + B66A	120	216	3,106	0.016	15	185
Ericsson RRUS 4478 B14	120	180	2,588	0.013	13	154
Ericsson RRUS 4449 B5, B12	120	213	3,067	0.016	15	183
Ericsson AIR 6449 B77D/ C-Band	120	245	3,525	0.018	17	210
Raycap DC6-48-60-18-8F	120	80	1,152	0.006	6	69
Ericsson RRUS 32 B30	120	180	2,592	0.013	13	155
Generic 2' Std. Dish	120	14	202	0.001	1	12

SEISMIC FORCES

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)
Commscope NNHH-65B-R4	120	84	1,207	0.006	6	72
CCI DMP65R-BU6DA	120	79	1,143	0.006	6	68
Quintel QD6616-7	120	130	1,872	0.010	9	112
CCI DMP65R-BU8D	120	191	2,756	0.014	13	165
Quintel QD8616-7	120	300	4,320	0.022	21	258
Generic 24" X 12" Panel	120	20	288	0.002	1	17
Ericsson AIR 6419 B77G	120	198	2,856	0.015	14	170
Generic Mount Reinforcement	120	600	8,640	0.045	42	516
SitePro1 RMQP-496-HK	120	2,446	35,222	0.182	170	2,103
Samsung RT4423-48A	112	56	704	0.004	3	48
Samsung RF4461d-13A	112	237	2,977	0.015	14	204
Samsung B2/B66A RRH ORAN (RF 4439d-25A)	112	224	2,811	0.014	14	193
Samsung MT6413-77A	112	172	2,156	0.011	10	148
Raycap RCMDC-6627-PF-48	112	32	401	0.002	2	28
Commscope NHH-45B-R2B	112	221	2,770	0.014	13	190
Commscope NHHSS-45B-R2BT4	112	231	2,894	0.015	14	198
Generic Flat Low Profile Platform	112	1,875	23,520	0.122	114	1,612
Totals:		31,187	193,637	1.000	936	26,811

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	-36.79	-0.94	0.00	-102.45	0.00	102.45	1,590.66	434.43	1,260	996.98	0.00	0.00	0.04
5.00	-34.92	-0.95	0.00	-97.75	0.00	97.75	1,571.59	424.18	1,201	961.61	0.01	-0.01	0.04
10.00	-33.05	-0.95	0.00	-93.01	0.00	93.01	1,551.63	413.94	1,144	926.28	0.03	-0.03	0.04
15.00	-32.87	-0.96	0.00	-88.24	0.00	88.24	1,530.78	403.70	1,088	891.03	0.07	-0.04	0.04
15.48	-31.57	-0.96	0.00	-87.78	0.00	87.78	1,528.73	402.71	1,083	887.65	0.07	-0.04	0.04
15.48	-31.57	-0.96	0.00	-87.78	0.00	87.78	1,528.73	402.71	1,083	887.65	0.07	-0.04	0.05
20.00	-30.21	-0.96	0.00	-83.44	0.00	83.44	1,509.04	393.45	1,034	855.89	0.12	-0.06	0.05
25.00	-28.91	-0.97	0.00	-78.62	0.00	78.62	1,486.41	383.21	981	820.91	0.19	-0.08	0.05
30.00	-27.62	-0.97	0.00	-73.77	0.00	73.77	1,462.88	372.96	929	786.12	0.28	-0.10	0.05
35.00	-26.96	-0.98	0.00	-68.90	0.00	68.90	1,438.47	362.72	879	751.57	0.40	-0.12	0.05
37.58	-26.16	-0.98	0.00	-66.37	0.00	66.37	1,425.51	357.43	853	733.82	0.47	-0.13	0.05
40.00	-25.51	-0.97	0.00	-64.02	0.00	64.02	1,413.16	352.48	830	717.29	0.54	-0.14	0.04
42.00	-24.78	-0.97	0.00	-62.07	0.00	62.07	1,175.60	310.70	736	601.77	0.60	-0.15	0.05
45.00	-23.57	-0.96	0.00	-59.16	0.00	59.16	1,164.34	305.32	711	585.60	0.70	-0.17	0.05
50.00	-22.38	-0.96	0.00	-54.34	0.00	54.34	1,144.87	296.35	670	558.75	0.89	-0.19	0.04
55.00	-21.20	-0.94	0.00	-49.56	0.00	49.56	1,124.51	287.39	630	532.06	1.09	-0.21	0.04
60.00	-20.02	-0.93	0.00	-44.84	0.00	44.84	1,103.25	278.42	591	505.56	1.32	-0.23	0.04
65.00	-18.86	-0.91	0.00	-40.20	0.00	40.20	1,081.11	269.46	554	479.31	1.57	-0.25	0.03
70.00	-17.71	-0.89	0.00	-35.65	0.00	35.65	1,058.07	260.49	518	453.33	1.83	-0.26	0.03
75.00	-17.44	-0.88	0.00	-31.22	0.00	31.22	1,034.15	251.52	483	427.68	2.12	-0.28	0.03
76.17	-16.51	-0.86	0.00	-30.19	0.00	30.19	1,028.44	249.43	475	421.74	2.19	-0.28	0.03
79.50	-16.37	-0.85	0.00	-27.34	0.00	27.34	1,011.86	243.45	452	404.89	2.39	-0.29	0.03
79.50	-16.37	-0.85	0.00	-27.34	0.00	27.34	1,011.86	243.45	452	404.89	2.39	-0.29	0.03
80.00	-15.28	-0.82	0.00	-26.91	0.00	26.91	828.38	212.16	401	337.68	2.42	-0.30	0.03
85.00	-14.20	-0.79	0.00	-22.80	0.00	22.80	810.23	204.48	372	318.21	2.74	-0.31	0.02
90.00	-13.12	-0.75	0.00	-18.86	0.00	18.86	791.20	196.80	345	298.94	3.07	-0.32	0.02
95.00	-12.60	-0.73	0.00	-15.11	0.00	15.11	771.27	189.12	318	279.92	3.42	-0.34	0.02
97.44	-12.27	-0.72	0.00	-13.33	0.00	13.33	761.22	185.37	306	270.74	3.59	-0.34	0.02
97.44	-12.27	-0.72	0.00	-13.33	0.00	13.33	761.22	185.37	306	270.74	3.59	-0.34	0.07
100.00	-11.69	-0.69	0.00	-11.50	0.00	11.50	750.45	181.43	293	261.19	3.77	-0.34	0.06
105.00	-11.18	-0.67	0.00	-8.04	0.00	8.04	728.74	173.75	269	242.77	4.15	-0.38	0.05
110.00	-10.97	-0.66	0.00	-4.68	0.00	4.68	697.48	166.07	246	221.97	4.57	-0.41	0.04
112.00	-6.90	-0.44	0.00	-3.35	0.00	3.35	684.57	162.99	237	213.78	4.74	-0.42	0.03
115.00	-6.42	-0.41	0.00	-2.04	0.00	2.04	665.21	158.38	223	201.79	5.00	-0.42	0.02
120.00	0.00	-0.36	0.00	0.00	0.00	0.00	632.94	150.70	202	182.57	5.45	-0.43	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 (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	-25.50	-0.94	0.00	-99.99	0.00	99.99	1,590.66	434.43	1,260	996.98	0.00	0.00	0.04
5.00	-24.20	-0.94	0.00	-95.30	0.00	95.30	1,571.59	424.18	1,201	961.61	0.01	-0.01	0.03
10.00	-22.91	-0.95	0.00	-90.59	0.00	90.59	1,551.63	413.94	1,144	926.28	0.03	-0.03	0.03
15.00	-22.78	-0.95	0.00	-85.85	0.00	85.85	1,530.78	403.70	1,088	891.03	0.07	-0.04	0.03
15.48	-21.88	-0.95	0.00	-85.40	0.00	85.40	1,528.73	402.71	1,083	887.65	0.07	-0.04	0.03
15.48	-21.88	-0.95	0.00	-85.40	0.00	85.40	1,528.73	402.71	1,083	887.65	0.07	-0.04	0.05
20.00	-20.94	-0.95	0.00	-81.10	0.00	81.10	1,509.04	393.45	1,034	855.89	0.12	-0.05	0.05
25.00	-20.04	-0.96	0.00	-76.34	0.00	76.34	1,486.41	383.21	981	820.91	0.18	-0.08	0.05
30.00	-19.14	-0.96	0.00	-71.57	0.00	71.57	1,462.88	372.96	929	786.12	0.28	-0.10	0.04
35.00	-18.69	-0.96	0.00	-66.79	0.00	66.79	1,438.47	362.72	879	751.57	0.39	-0.12	0.04
37.58	-18.13	-0.95	0.00	-64.32	0.00	64.32	1,425.51	357.43	853	733.82	0.46	-0.13	0.04
40.00	-17.68	-0.95	0.00	-62.01	0.00	62.01	1,413.16	352.48	830	717.29	0.52	-0.14	0.04
42.00	-17.17	-0.95	0.00	-60.11	0.00	60.11	1,175.60	310.70	736	601.77	0.59	-0.15	0.04
45.00	-16.34	-0.94	0.00	-57.26	0.00	57.26	1,164.34	305.32	711	585.60	0.68	-0.16	0.04
50.00	-15.51	-0.93	0.00	-52.56	0.00	52.56	1,144.87	296.35	670	558.75	0.86	-0.18	0.04
55.00	-14.69	-0.92	0.00	-47.91	0.00	47.91	1,124.51	287.39	630	532.06	1.06	-0.20	0.04
60.00	-13.88	-0.90	0.00	-43.33	0.00	43.33	1,103.25	278.42	591	505.56	1.28	-0.22	0.03
65.00	-13.07	-0.88	0.00	-38.83	0.00	38.83	1,081.11	269.46	554	479.31	1.52	-0.24	0.03
70.00	-12.27	-0.86	0.00	-34.42	0.00	34.42	1,058.07	260.49	518	453.33	1.78	-0.26	0.03
75.00	-12.09	-0.85	0.00	-30.13	0.00	30.13	1,034.15	251.52	483	427.68	2.06	-0.27	0.03
76.17	-11.44	-0.83	0.00	-29.14	0.00	29.14	1,028.44	249.43	475	421.74	2.12	-0.28	0.03
79.50	-11.35	-0.83	0.00	-26.37	0.00	26.37	1,011.86	243.45	452	404.89	2.32	-0.29	0.02
79.50	-11.35	-0.83	0.00	-26.37	0.00	26.37	1,011.86	243.45	452	404.89	2.32	-0.29	0.02
80.00	-10.59	-0.80	0.00	-25.96	0.00	25.96	828.38	212.16	401	337.68	2.35	-0.29	0.02
85.00	-9.84	-0.76	0.00	-21.98	0.00	21.98	810.23	204.48	372	318.21	2.66	-0.30	0.02
90.00	-9.09	-0.72	0.00	-18.17	0.00	18.17	791.20	196.80	345	298.94	2.98	-0.31	0.02
95.00	-8.73	-0.70	0.00	-14.56	0.00	14.56	771.27	189.12	318	279.92	3.31	-0.32	0.02
97.44	-8.50	-0.69	0.00	-12.84	0.00	12.84	761.22	185.37	306	270.74	3.48	-0.33	0.01
97.44	-8.50	-0.69	0.00	-12.84	0.00	12.84	761.22	185.37	306	270.74	3.48	-0.33	0.06
100.00	-8.10	-0.67	0.00	-11.07	0.00	11.07	750.45	181.43	293	261.19	3.66	-0.33	0.05
105.00	-7.75	-0.65	0.00	-7.73	0.00	7.73	728.74	173.75	269	242.77	4.03	-0.37	0.04
110.00	-7.60	-0.64	0.00	-4.50	0.00	4.50	697.48	166.07	246	221.97	4.43	-0.39	0.03
112.00	-4.78	-0.42	0.00	-3.22	0.00	3.22	684.57	162.99	237	213.78	4.60	-0.40	0.02
115.00	-4.45	-0.39	0.00	-1.96	0.00	1.96	665.21	158.38	223	201.79	4.85	-0.41	0.02
120.00	0.00	-0.36	0.00	0.00	0.00	0.00	632.94	150.70	202	182.57	5.28	-0.41	0.00

ANALYSIS SUMMARY

Load Case	Base 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	22.38	0.00	37.37	0.00	0.00	1973.45	97.44	0.95
0.9D + 1.0W	22.36	0.00	28.01	0.00	0.00	1937.08	97.44	0.92
1.2D + 1.0Di + 1.0Wi	4.47	0.00	46.13	0.00	0.00	431.80	97.44	0.24
1.2D + 1.0Ev + 1.0Eh	0.98	0.00	36.79	0.00	0.00	102.45	97.44	0.07
0.9D - 1.0Ev + 1.0Eh	0.96	0.00	25.50	0.00	0.00	99.99	97.44	0.06
1.0D + 1.0W	5.28	0.00	31.18	0.00	0.00	461.07	97.44	0.23

ADDITIONAL STEEL SUMMARY

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors				Max Member		
			VQ/I (k/in)	Shear Applied (kips)	phiVn (kips)	Ratio	Pu (kip)	phiPn (kip)	Ratio
0.00	15.48	SOL #20 All Thread Bar	212.4	6.4	16.8	0.3791	222.8	330.5	
0.00	79.50	SOL #20 All Thread Bar	381.7	11.5	16.8	0.6812	315.5	330.5	
79.50	97.44	SOL #20 All Thread Bar	384.8	11.5	16.8	0.6867	159.0	330.5	

Elev From (ft)	Elev To (ft)	Member	Upper Termination Connectors					Lower Termination Connectors				
			MQ/I (kips)	phiVn (kips)	Number Required	Number Actual	Ratio	MQ/I (kips)	phiVn (kip)	Number Required	Number Actual	Ratio
0.00	15.48	SOL #20 All Thread Bar	199.5045	12	17	20	0.8313	0	12	0	0	0.0000
0.00	79.50	SOL #20 All Thread Bar	0	12	0	0	0.0000	0	12	0	0	0.0000
79.50	97.44	SOL #20 All Thread Bar	95.7645	12	8	12	0.6650	0	12	0	0	0.0000

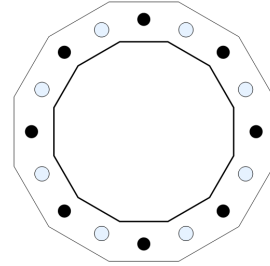
BASE PLATE ANALYSIS @ 0 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
1973.45	37.37	22.38

PLATE PARAMETERS (ID# 16769)

Width:	44.59	in
Shape:	12	
Thickness:	2.125	in
Grade:	A871-60	
Yield Strength:	60	ksi
Tensile Strength:	75	ksi
Rod Detail Type:	d	
Clear Distance	3.5	in
Base Weld Size:	0.125	in
Orientation Offset:	15	°
Analysis Type:	Elastic	
Neutral Axis:	95	°



ANCHOR ROD PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F _y (ksi)	F _u (ksi)	Spacing (in)	Offset (°)
Original [ID#17163]	Radial	8	2.25	38.59	A615-75	75	100	-	-

DYWIDAG BAR PARAMETERS

Quantity	Bar Size	Bar Diameter (in)	F _y (ksi)	F _u (ksi)	Bracket Type	Bracket Offset (in)	Circle (in)	Offset (°)
8 [ID# 1091]	#20	2.5	80	100	Angle	2.19	37.88	22.5

COMPONENT PROPERTIES

Component	ID	Gross Area (in ²)	Net Area (in ²)	Individual Inertia (in ⁴)	Moment of Inertia (in ⁴)	Threads/in
Pole	31"Ø x 0.25" (12 Sides)	23.8761	-	-	2822.54	-
Bolt Group	Original (8) 2.25"Ø	3.9761	3.2477	0.8393	4207.54	4.5
Dywidag Group	(8) #20	4.9087	4.9087	1.9175	7058.86	-

REACTION DISTRIBUTION

Component	ID	Moment M _u (k-ft)	Axial Load P _u (k)	Shear V _u (k)	Moment Factor
Pole	31"Ø x 0.25" (12 Sides)	563.7	37.37	22.38	0.286
Bolt Group	Original (8) 2.25"Ø	563.7	-	22.38	0.286
Dywidag Group	(8) #20	1409.8	-	-	0.714

ASSET: 302500, Brst - Bristol
 CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
 PROJECT: 14430738

BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES

Flat-to-Flat Diameter: 31.12 in
 Point-to-Point Diameter: 32.22 in
 Orientation Offset: 15 °

Flat Width: 8.340 in
 Flat Radians: 0.524 rad

PLATE PROPERTIES

Neutral Axis: 95 °
 Bend Line Limits: 2.606 to 3.677 rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in ³)	Applied Moment M _u (k-in)	Moment Capacity ΦM _n (k-in)	Flexure Result M _u /ΦM _n	
Flats	28.170	0.00	31.801	223.1	1717.3	13.0%	✓
Corners	26.907	0.00	30.376	171.0	1640.3	10.4%	✓
Circumferential	32.589	0.00	36.790	177.5	1986.6	8.9%	✓

ELASTIC ANCHOR ROD ANALYSIS

Class	Group Quantity	Rod Diameter (in)	Applied Axial Load P _u (k)	Applied Shear Load V _u (k)	Compressive Capacity ΦP _n (k)	Compressive Result	Interaction Result	
Original	8	2.25	94.9	0.4	243.6	0.389	39.3%	✓

DYWIDAG BAR ANALYSIS

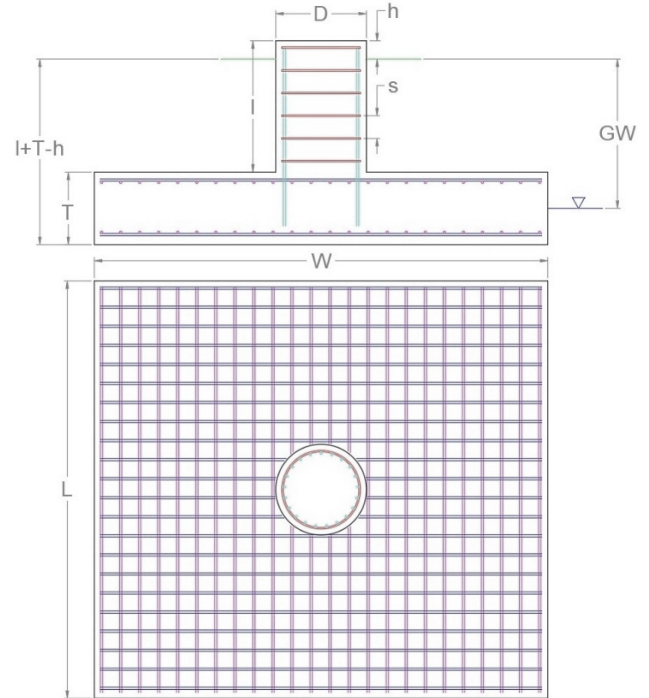
Group Quantity	Bar Size	Bar Circle (in)	Applied Axial Load P _u (k)	Compressive Capacity ΦP _n (k)	Compressive Result P _u / ΦP _n	
8	#20	37.88	215.8	368.2	58.6%	✓

APPLIED GLOBAL REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
1,973.45	37.37	22.38

FOUNDATION PARAMETERS

Mat Length:	L	18	ft
Mat Width:	W	17	ft
Mat Thickness:	T	2.5	ft
Base Depth:	L+T-h	6.33	ft
Pier Shape:		Square	
Pier Width:	D	6	ft
Pier Height above Grade:	h	3	ft
Tower Eccentricity:	ecc	0	ft
Tower Leg Count		1	



SOIL PARAMETERS

Water Table Depth [BGL]:	GW		ft
Soil Unit Weight:		140	pcf
Ultimate Skin Friction:		6,450	psf
Ultimate Bearing Pressure:		102,200	psf
Bearing Pressure Type:		Gross	
Coefficient of Shear Friction:		0.5	

SOIL STRENGTH ANALYSIS

Soil Strength Reduction Factor, Φ_s	Uplift Strength Reduction Factor, Φ_s	Asset Dead Load Factor	Dead Load Factor
0.75	0.75	0.9	1.2

SOIL OVERTURNING ANALYSIS

Design Moment, $M_{u,Design}$ (k-ft)	Nominal Overturning Capacity, $\Phi_m M_n$ (k-ft)	Soil Overturning Usage, $M_{u,Design} / \Phi_m M_n$
2,182.26	2,713.96	80.4%

SOIL BEARING ANALYSIS

Net Bearing Pressure, $P_{u,Net}$ (psf)	Nominal Bearing Capacity, $\Phi_b P_n$ (k-ft)	Bearing Pressure Controlling Load Direction	Soil Bearing Usage, $P_{u,net} / \Phi_b P_n$
4,390.00	76,650.00	Parallel to Pad Edge	5.7%

SOIL SLIDING SHEAR ANALYSIS

Applied Shear Force, V_u (k)	Friction Resistance (k)	Passive Pressure (psf)	Passive Pressure Resistance (k)	Nominal Shear Capacity, $\Phi_s V_n$ (k)	Soil Sliding Shear Usage, $V_u / \Phi_s V_n$
22.38	1,128.75	711.2	32.00	146.83	15.0%

EXHIBIT 4



Colliers Engineering & Design, Architecture,
Landscape Architecture, Surveying, CT P.C.
1055 Washington Boulevard
Stamford, CT 06901
203.324.0800
peter.albano@collierseng.com

New/Replacement Antenna Mount Analysis Report and PMI Requirements

Mount Analysis-N

SMART Tool Project #: 10211171
Colliers Engineering & Design Project #: 23777300A

November 6, 2023

Site Information

Site ID: 5000917346-VZW / BRISTOL SW CT
Site Name: BRISTOL SW CT
Carrier Name: Verizon Wireless
Address: 790 Willis Street
Bristol, Connecticut 06010
Hartford County
Latitude: 41.649095°
Longitude: -72.948015°

Structure Information

Tower Type: 120-Ft Monopole
Mount Type: 12.50-Ft Platform

FUZE ID # 17060569

Analysis Results

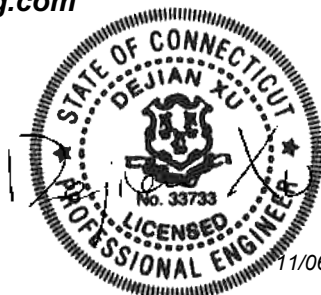
Platform: **74.1% Pass w/ Mount Replacement***
((1) Site Pro 1 RMQP-496 w/ HRK12)

***Antennas and equipment to be installed in compliance with PMI Requirements of this mount analysis.**

***Contractor PMI Requirements:

Included at the end of this MA report
Available & Submitted via portal at <https://pmi.vzwsmart.com>
For additional questions and support, please reach out to:
pmisupport@colliersengineering.com

Report Prepared By: Nathan LaPorte



11/06/2023

Executive Summary:

The objective of this report is to determine the capacity of the proposed antenna support mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards. The proposed mount was assumed to be installed properly to the existing tower per the manufacturer's instructions. Colliers Engineering & Design cannot verify that the proposed mount will fit properly and is not liable for any fit-up issues during installation.

This analysis is inclusive of the mount structure only and does not address the structural capacity of the supporting structure. This mounting frame was not analyzed as an anchor attachment point for fall protection. All climbing activities are required to have a fall protection plan completed by a competent person.

Sources of Information:

Document Type	Remarks
Radio Frequency Data Sheet (RFDS)	Verizon RFDS Site ID: 617360052, dated July 28, 2023
Tower Structural Analysis	American Tower Corporation Project #: 14430738_C1_04, dated August 15, 2023
Mount Specification	Site Pro 1 Part #: RMQP-496
Support Rail Specification	Site Pro 1 Part #: HRK12
Pipe Connections	Perfect Vision Part #: PV-DC-PTPC-2020-12

Analysis Criteria:

Codes and Standards:	ANSI/TIA-222-H 2022 Connecticut State Building Code (CSBC), Effective October 1, 2022
Wind Parameters:	Basic Wind Speed (Ultimate 3-sec. Gust), V_{ULT} : 120 mph Ice Wind Speed (3-sec. Gust): 50 mph Design Ice Thickness: 1.00 in Risk Category: II Exposure Category: B Topographic Feature Considered: Escarpment Topographic Method: Method 2 Ground Elevation Factor, K_e : 0.963
Seismic Parameters:	S_s : 0.188 g S_1 : 0.054 g
Maintenance Parameters:	Wind Speed (3-sec. Gust): 30 mph Maintenance Load, L_v : 250 lbs. Maintenance Load, L_m : 500 lbs.
Analysis Software:	RISA-3D (V20)

Final Loading Configuration:

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

Mount Elevation (ft)	Equipment Elevation (ft)	Quantity	Manufacturer	Model	Status
112.00	112.00	3	Samsung	MT6413-77A	Added
		3	Commscope	NHHSS-45B-R2BT4	
		3	Commscope	NHH-45B-R2B	
		3	Samsung	RF4439d-25A	
		3	Samsung	RF4461d-13A	
		3	Samsung	RT4423-48A	
		1	Raycap	RVZDC-6627-PF-48	

Any proposed antennas not currently installed should be mounted such that the centerline of the antennas does not exceed 6 inches vertically from the center of the antenna mount(s).

It is acceptable to install up to any three (3) of the OVP model numbers listed below as required at any location other than the mount face without affecting the structural capacity of the mount. If OVP units are installed on the mount face, a mount re-analysis may be required.

Model Number	Ports	AKA
DB-B1-6C-12AB-0Z	6	OVP-6
RVZDC-6627-PF-48	12	OVP-12

Standard Conditions:

1. All engineering services are performed on the basis that the information provided to Colliers Engineering & Design and used in this analysis is current and correct. The existing equipment loading has been applied at locations determined from the supplied documentation. Any deviation from the loading locations specified in this report shall be communicated to Colliers Engineering & Design to verify deviation will not adversely impact the analysis.
2. Mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications.
3. For mount analyses completed from other data sources (including new replacement mounts) and not specifically mapped in accordance with the NSTD-446 Standard, the mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer’s specifications.
4. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
5. The mount was checked up to, and including, the bolts that fasten it to the mount collar/attachment and threaded rod connections in collar members if applicable. Local deformation and interaction between the mount collar/attachment and the supporting tower structure are outside the scope of this analysis.
6. All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Colliers Engineering & Design is not responsible for the conclusion, opinions, and recommendations made by others based on the information supplied.

7. Structural Steel Grades have been assumed as follows, if applicable, unless otherwise noted in this analysis:
- Channel, Solid Round, Angle, Plate ASTM A36 (Gr. 36)
 - HSS (Rectangular) ASTM 500 (Gr. B-46)
 - Pipe ASTM A53 (Gr. B-35)
 - Threaded Rod F1554 (Gr. 36)
 - Bolts ASTM A325

Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Colliers Engineering & Design.

Analysis Results:

Component	Utilization %	Pass/Fail
Pipe Connection	23.2%	Pass
Mount Pipe	74.1%	Pass
Support Rail Corner	24.6%	Pass
Support Rail	23.3%	Pass
Face Horizontal	17.6%	Pass
Corner Plate	20.6%	Pass
Cross Arm Plate	38.6%	Pass
Grating Support	21.8%	Pass
Platform Crossmember	18.7%	Pass
Standoff Horizontal	34.5%	Pass
Mount Connection	49.9%	Pass

Structure Rating – (Controlling Utilization of all Components)	74.1%
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Mount Steel (EPA)a per ANSI/TIA-222-H Section 2.6.11.2:

Ice Thickness (In)	Mount Pipes Excluded		Mount Pipes Included	
	Front (EPA)a (Sq. Ft.)	Side (EPA)a (Sq. Ft.)	Front (EPA)a (Sq. Ft.)	Side (EPA)a (Sq. Ft.)
0	23.3	23.3	40.4	40.4
0.5	30.6	30.6	54.9	54.9
1	37.4	37.4	68.9	68.9

- Notes:
- (EPA)a values listed above may be used in the absence of more precise information
 - (EPA)a values in the table above include 3 sector(s).
 - Ka factors included in (EPA)a calculations

Requirements:

The proposed antenna mount is **SUFFICIENT** for the final loading configuration (attachment 2) upon completion of the mount replacement (attachment 3) and requirements below.

Contractor shall inspect climbing facilities and safety climb and ensure they are in good condition. Contractor shall install safety climb wire rope guides in locations where wire rope is rubbing against the mount or mount-to-tower connection steel. Wire brush clean any observed corrosion and protect with two (2) coats of cold galvanization (Zinga or Zinc Kote). Contractor shall provide photos of wire rope guide installation as part of PMI documents. Contact EOR if additional guidance is required.

Contractor shall install the proposed Site Pro 1 RMQP-496 platform mount in accordance with manufacturer specifications and the Mount Replacement Sketch. Contact EOR if these documents are not available.

Contractor shall install proposed support rail (Site Pro 1 HRK12) 36" above face horizontal. Refer to Mount Installation Sketch.

Contractor shall install a new 48" long PIPE 2 SCH 40 OVP pipe between beta and gamma sector standoff horizontals with crossover plate (VZWSMART-MSK6 or EOR approved equal).

Contractor shall install a new 96" long Pipe 2 SCH 40 mount pipe on position 3 of all sectors, connected to mount pipe included in platform kit using three (3) new pipe to pipe connections (Perfect Vision Part #: PV-DC-PTPC-2020-12 or EOR approved equal). Refer to Mount Installation Sketch.

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

Attachments:

1. **Contractor Required Post Installation Inspection (PMI) Report Deliverables**
2. Antenna Placement Diagrams
3. Mount Manufacturer Drawings
4. Analysis Calculations

Mount Desktop – Post Modification Inspection (PMI) Report Requirements

Documents & Photos Required from Contractor – **New Mount Passing MA**

Electronic pdf version of this can be downloaded at <https://pmi.vzwsmart.com>

For additional questions and support, please reach out to pmisupport@colliersengineering.com

MDG #: 5000917346

SMART Project #: 10211171

Fuze Project ID: 17060569

Purpose – to provide SMART Tool structural vendor the proper documentation in order to complete the required Mount Desktop review of the Post Modification Inspection Report.

- Contractor is responsible for making certain the photos provided as noted below provide confirmation that the installation was completed in accordance with this Passing Mount Analysis.
- Contractor shall relay any data that can impact the performance of the mount, this includes safety issues.

Base Requirements:

- If installation will cause damage to the structure, the climbing facility, or safety climb if present or any installed system, SMART Tool vendor to be notified prior to install. Any special photos outside of the standard requirements will be indicated on the drawings.
- Provide “as built mount drawings” showing contractor’s name, contact information, preparer’s signature, and date. Any deviations from the drawings (Proposed modification) shall be shown. NOTE: If loading is different than what is conveyed in the passing mount analysis (MA) contact the SMART Tool vendor immediately.
- Each photo should be time and date stamped.
- Photos should be high resolution.
- Contractor shall ensure that the safety climb wire rope is supported and not adversely impacted by the install of the modification components. This may involve the install of wire rope guides, or other items to protect the wire rope. If there is conflict, contact the SMART Tool engineer for recommendations.
- The PMI can be accessed at the following portal: <https://pmi.vzwsmart.com>

Photo Requirements:

- Photos taken at ground level
 - Photo of Gate Signs showing the tower owner, site name, and number.
 - Overall tower structure after installation.
 - Photos of the mount after installation; if the mounts are at different rad elevations, pictures must be provided for all elevations that equipment was installed.
- Photos taken at Mount Elevation
 - Photos showing the safety climb wire rope above and below the mount prior to installation.
 - Photos showing the climbing facility and safety climb if present.
 - Photos showing each individual sector after installation of mounts. Each entire sector shall be in one photo to show the interconnection of members.

- These photos shall also certify that the placement and geometry of the equipment on the mount is as depicted in the antenna placement diagram in this form.
- Photos that show the model number of each antenna and piece of equipment installed per sector.
- Photos of each installed mount; pictures shall also include connection hardware (U-bolts, bolts, nuts, all-threaded rods, etc.)
- Photos showing the installed mount elevation.

Antenna & Equipment Placement and Geometry Confirmation:

- The contractor shall certify that the antenna & equipment placement and geometry is in accordance with the sketch and table as included in the mount analysis and noted below.
 - The contractor certifies that the photos support and the equipment on the mount is as depicted on the sketch and table included in this form and with the mount analysis provided.
- OR
- The contractor notes that the equipment on the mount is not in accordance with the sketch and has noted the differences below and provided photo documentation of any alterations.

Special Instructions / Validation as required from the MA or any other information the contractor deems necessary to share that was identified:

Issue:

Contractor shall inspect climbing facilities and safety climb and ensure they are in good condition. Contractor shall install safety climb wire rope guides in locations where wire rope is rubbing against the mount or mount-to-tower connection steel. Wire brush clean any observed corrosion and protect with two (2) coats of cold galvanization (Zinga or Zinc Kote). Contractor shall provide photos of wire rope guide installation as part of PMI documents. Contact EOR if additional guidance is required.

Contractor shall install the proposed Site Pro 1 RMQP-496 platform mount in accordance with manufacturer specifications and the Mount Replacement Sketch. Contact EOR if these documents are not available.

Contractor shall install proposed support rail (Site Pro 1 HRK12) 36" above face horizontal. Refer to Mount Installation Sketch.

Contractor shall install a new 48" long PIPE 2 SCH 40 OVP pipe between beta and gamma sector standoff horizontals with crossover plate (VZWSMART-MSK6 or EOR approved equal).

Contractor shall install a new 96" long Pipe 2 SCH 40 mount pipe on position 3 of all sectors, connected to mount pipe included in platform kit using three (3) new pipe to pipe connections (Perfect Vision Part #: PV-DC-PTPC-2020-12 or EOR approved equal). Refer to Mount Installation Sketch.

Response:

--

Special Instruction Confirmation:

The contractor has read and acknowledges the above special instructions.

Contractor certifies that the climbing facility / safety climb was not damaged prior to starting work:

Yes No

Contractor certifies no new damage created during the current installation:

Yes No

Contractor to certify the condition of the safety climb and verify no damage when leaving the site:

Safety Climb in Good Condition Safety Climb Damaged

Comments:

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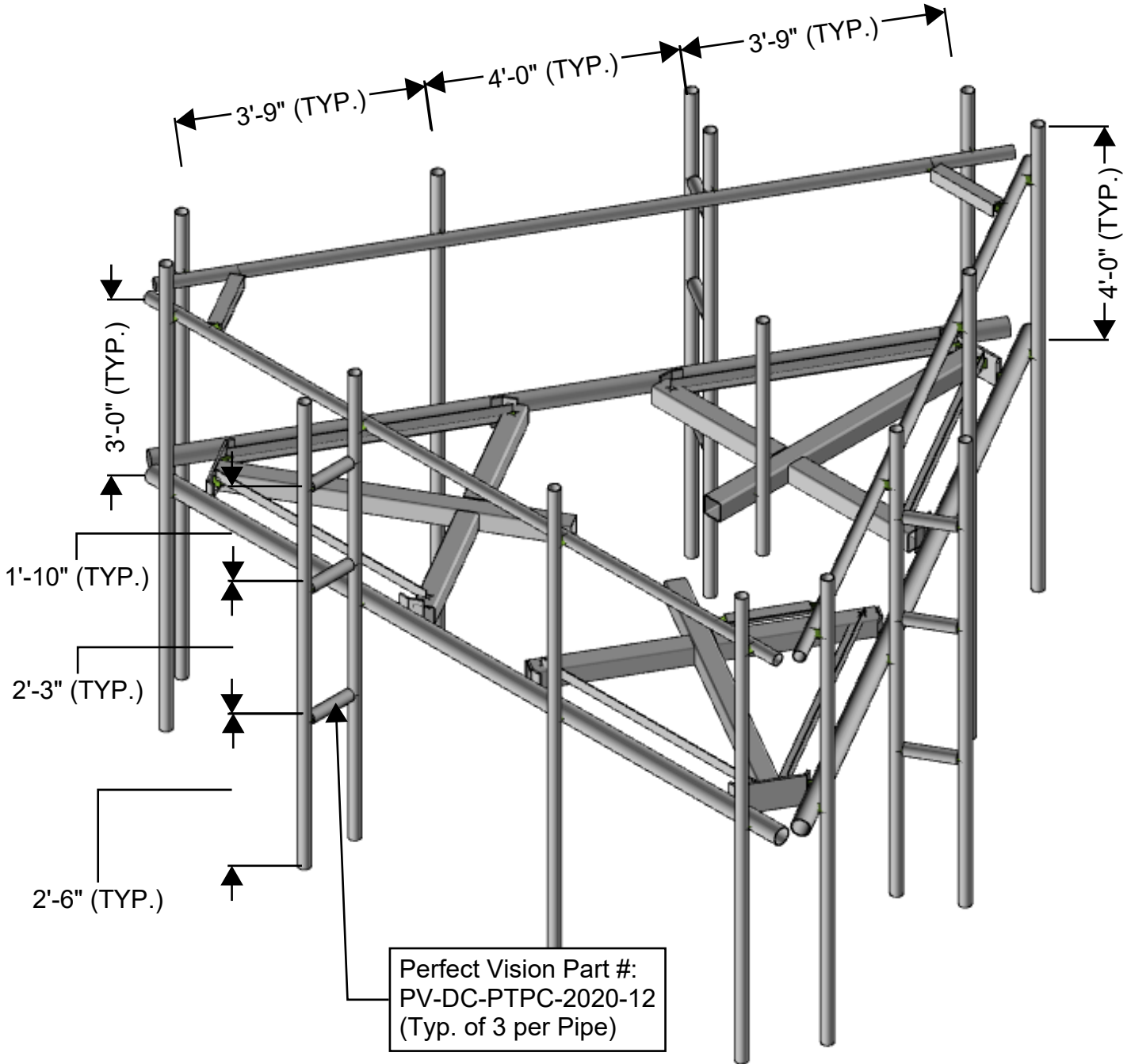
New Mount Certification:

- The contractor certifies that the New Mount installed is as specified in the Passing Mount Analysis.
- The contractor notes that the New Mount installed is not as specified and engineering approval was received for the New Mount installed.

Certifying Individual:

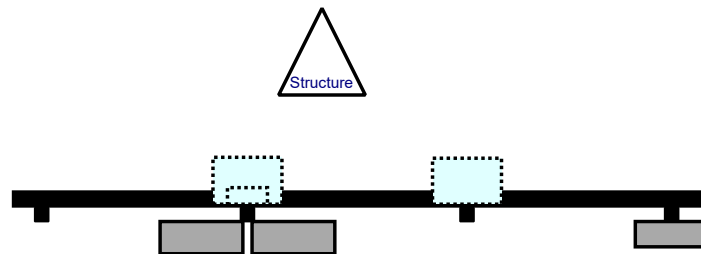
Company:	
Employee Name:	
Contact Phone:	
Email:	
Date:	

MOUNT INSTALLATION SKETCH

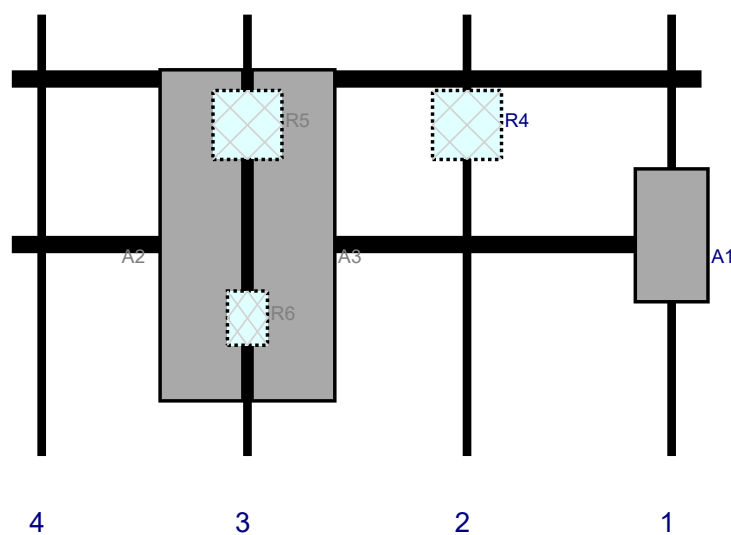


MOUNT ISOMETRIC VIEW
N.T.S

Plan View

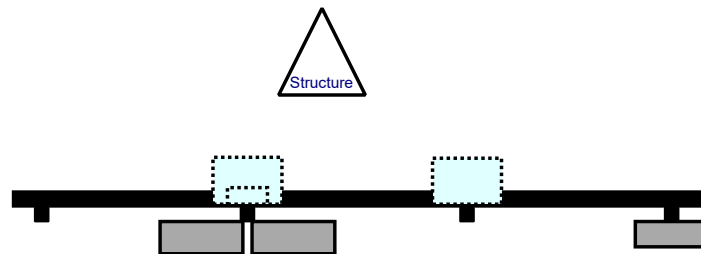


Front View - Looking at Structure

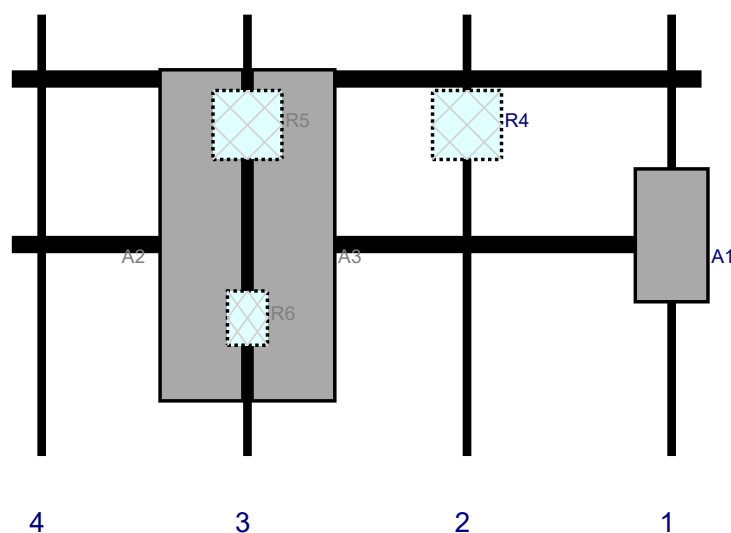


Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A1	MT6413-77A	28.9	15.8	143.5	1	a	Front	48	0	Added	
R4	RF4439d-25A	15	15	99	2	a	Behind	24	0	Added	
A2	NHHSS-45B-R2BT4	72	18	51.25	3	a	Front	48	-10	Added	
A3	NHH-45B-R2B	72	18	51.25	3	a	Front	48	10	Added	
R5	RF4461d-13A	15	15	51.25	3	a	Behind	24	0	Added	
R6	RT4423-48A	11.8	8.7	51.25	3	a	Behind	66	0	Added	
OVP	RVZDC-6627-PF-48	29.5	16.5			Member				Added	

Plan View

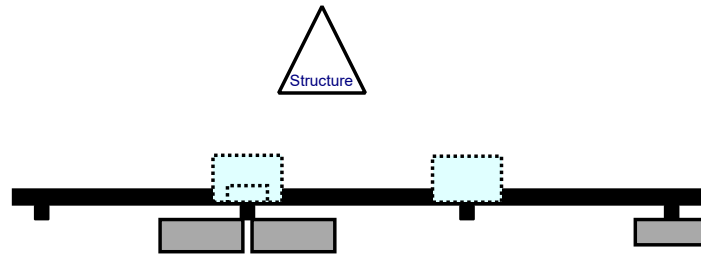


Front View - Looking at Structure

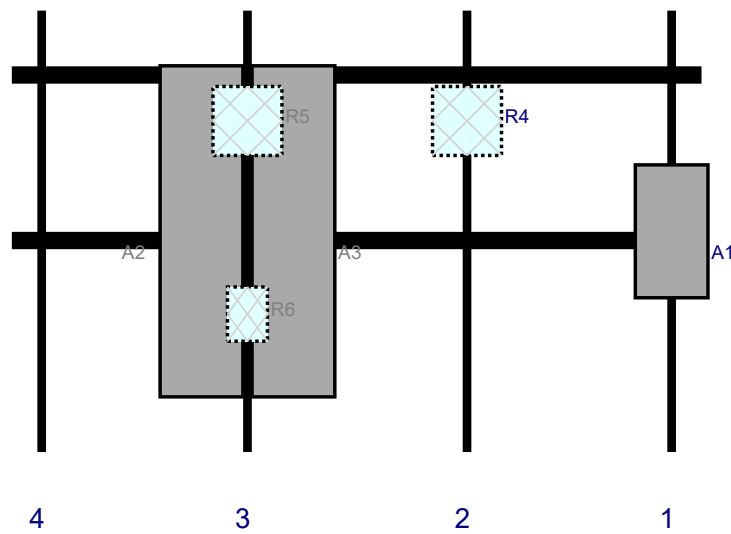


Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A1	MT6413-77A	28.9	15.8	143.5	1	a	Front	48	0	Added	
R4	RF4439d-25A	15	15	99	2	a	Behind	24	0	Added	
A2	NHHSS-45B-R2BT4	72	18	51.25	3	a	Front	48	-10	Added	
A3	NHH-45B-R2B	72	18	51.25	3	a	Front	48	10	Added	
R5	RF4461d-13A	15	15	51.25	3	a	Behind	24	0	Added	
R6	RT4423-48A	11.8	8.7	51.25	3	a	Behind	66	0	Added	

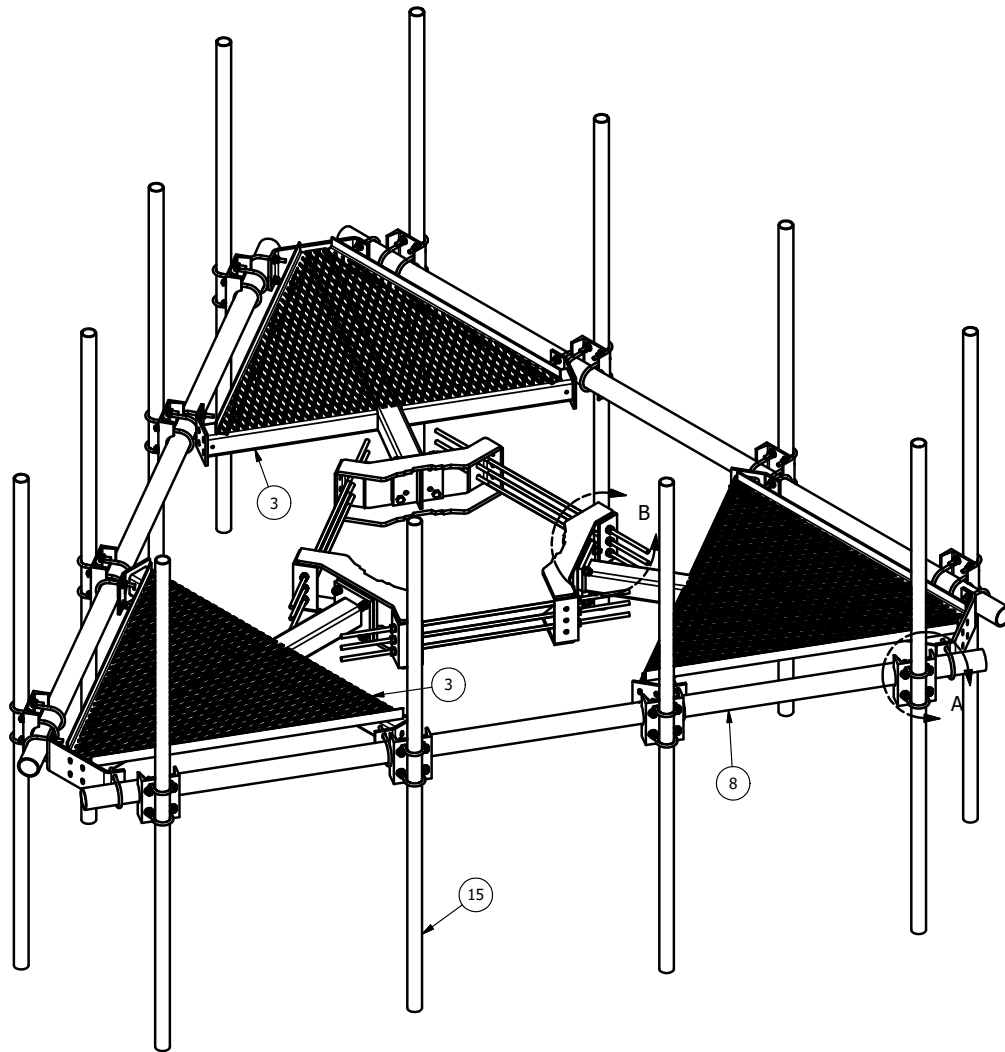
Plan View



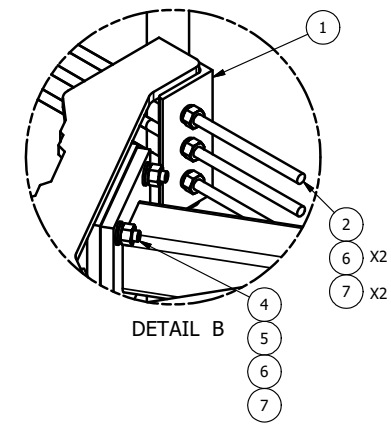
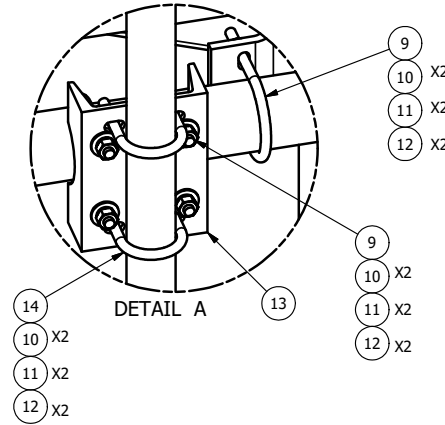
Front View - Looking at Structure



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
A1	MT6413-77A	28.9	15.8	143.5	1	a	Front	48	0	Added	
R4	RF4439d-25A	15	15	99	2	a	Behind	24	0	Added	
A2	NHHSS-45B-R2BT4	72	18	51.25	3	a	Front	48	-10	Added	
A3	NHH-45B-R2B	72	18	51.25	3	a	Front	48	10	Added	
R5	RF4461d-13A	15	15	51.25	3	a	Behind	24	0	Added	
R6	RT4423-48A	11.8	8.7	51.25	3	a	Behind	66	0	Added	



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
2	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)		0.40	3.59
2	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)		0.40	3.59
3	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
4	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2.75	0.36	4.27
5	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
6	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
7	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
8	3	P3150	3-1/2" X 150" SCH 40 GALVANIZED PIPE	150.000 in	94.80	284.40
9	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.26	9.25
10	120	G12FW	1/2" HDG USS FLATWASHER		0.03	4.09
11	120	G12LW	1/2" HDG LOCKWASHER		0.01	1.67
12	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
13	12	X-SP219	SMALL SUPPORT CROSS PLATE	8.250 in	8.61	103.33
14	24	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.26	6.17
15	12	B	ANTENNA MOUNTING PIPE	C	D	E



2-3/8" O.D. VERTICAL MOUNTING PIPES					
ASSEMBLY NO. "A"	PART NO. "B"	LENGTH, "C"	UNIT WEIGHT, "D"	NET WEIGHT, "E"	TOTAL WEIGHT
RMQP-463	P263	63"	20.18	242.16	1591.11
RMQP-472	P272	72"	23.07	276.84	1625.79
RMQP-484	P284	84"	26.91	322.92	1671.87
RMQP-496	P296	96"	30.76	369.12	1718.07
RMQP-4126	P2126	126"	40.75	489.00	1837.95

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	ADDED 10' 6" ANTENNA MOUNTING PIPES	CEK		7/9/2015
	REVISION HISTORY			

TOLERANCE NOTE
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE: SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE - ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

PROPRIETARY NOTE
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION
 LOW PROFILE CO-LOCATION PLATFORM
 FOR 12 ANTENNAS WITH 12' 6" FACE WIDTH
 FOR 12" - 38" DIAMETER POLES

DRAWN BY
 CEK 1/20/2012

CPD NO.
 semb

DRAWING USAGE
 CUSTOMER

CHECKED BY
 BMC 7/9/2015

Engineering Support Team:
1-888-753-7446

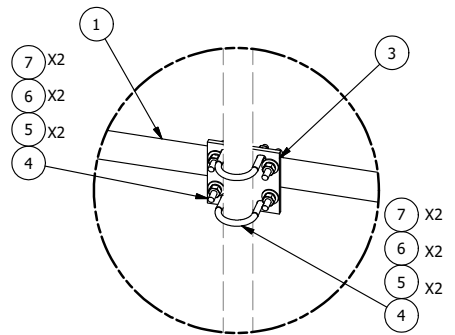
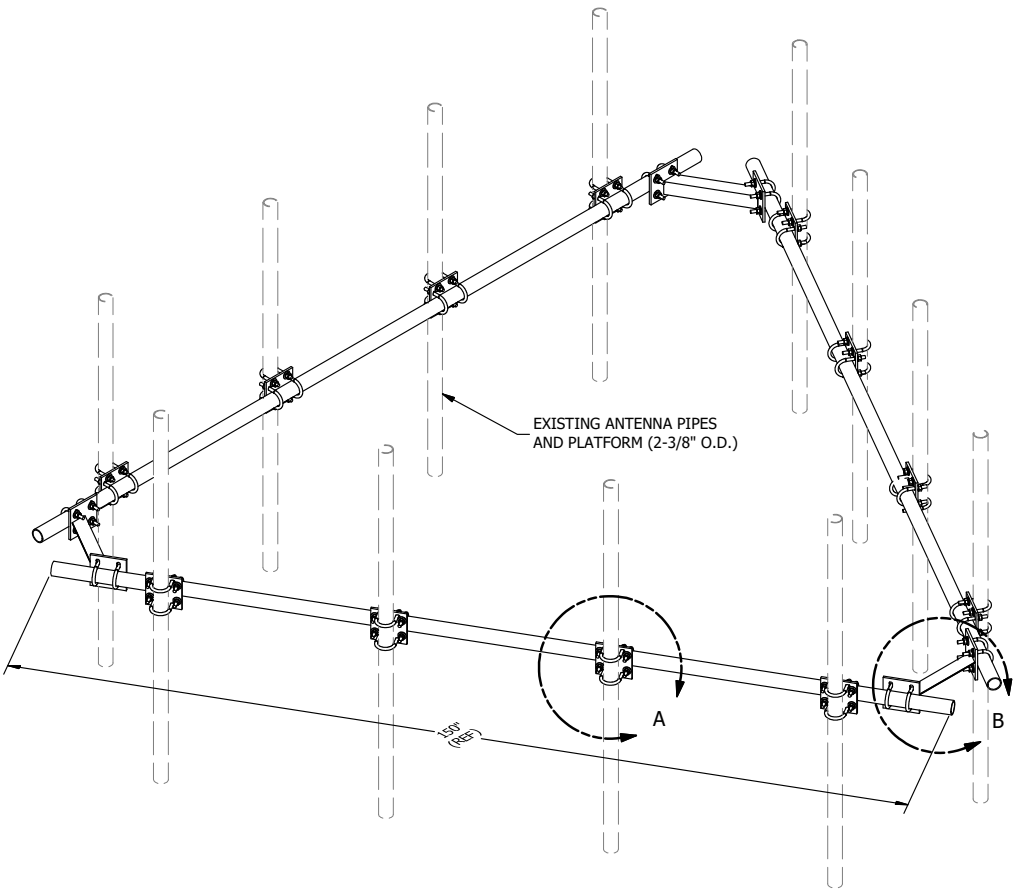
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

A valmont COMPANY

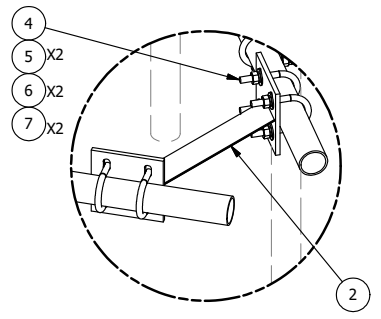
PART NO.
SEE ASSEMBLY NO. "A"

DWG. NO.
RMQP-4XX

PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	P2150	2-3/8" O.D. X 150" SCH 40 GALVANIZED PIPE	150 in	45.77	137.31
2	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
3	12	SCX1	CROSSOVER PLATE 2-3/8" X 2-3/8"	6 in	3.71	44.50
4	60	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	37.51
5	120	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	4.09
6	120	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	1.67
7	120	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	8.60
TOTAL WT. #						272.43



DETAIL A



DETAIL B

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
A	REPLACED HCP WITH X-AHCP	CEK		7/10/2014
REVISION HISTORY				

TOLERANCE NOTES
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES ($\pm 0.030"$)
DRILLED AND GAS CUT HOLES ($\pm 0.030"$) - NO CONING OF HOLES
LASER CUT EDGES AND HOLES ($\pm 0.010"$) - NO CONING OF HOLES
BENDS ARE $\pm 1/2$ DEGREE
ALL OTHER MACHINING ($\pm 0.030"$)
ALL OTHER ASSEMBLY ($\pm 0.060"$)

PROPRIETARY NOTE:
 THE DATA AND TECHNIQUES CONTAINED IN THIS DRAWING ARE PROPRIETARY INFORMATION OF VALMONT INDUSTRIES AND CONSIDERED A TRADE SECRET. ANY USE OR DISCLOSURE WITHOUT THE CONSENT OF VALMONT INDUSTRIES IS STRICTLY PROHIBITED.

DESCRIPTION			
HANDRAIL KIT FOR 12'-6" FACE			
CPD NO.	DRAWN BY	ENG. APPROVAL	
	KC8 5/30/2012		
CLASS	SUB	DRAWING USAGE	CHECKED BY
81	01	CUSTOMER	BMC 7/13/2014

SITE PRO 1 A valmont COMPANY	Locations: New York, NY Atlanta, GA Los Angeles, CA Plymouth, IN Salem, OR Dallas, TX
	Engineering Support Team: 1-888-753-7446
PART NO.	HRK12
DWG. NO.	HRK12

PV-DC-PTPC

DUALCROSS - PIPE TO PIPE CONNECTION

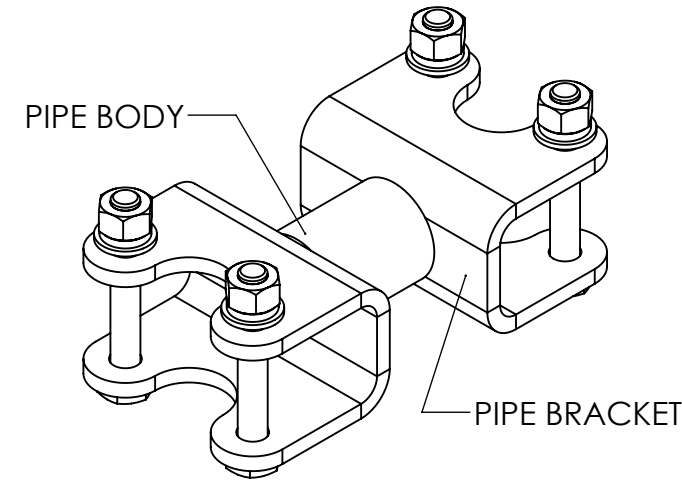
Table 1: Crossover Pipe to Pipe Connection Configurations

Part Number	Weight	Pipe to Pipe C-C	Pipe 1 Size	Pipe 2 Size	Pipe 1 Bolt Size	Pipe 2 Bolt Size
	<i>lbs</i>	<i>in</i>	<i>in</i>	<i>in</i>	<i>in</i>	<i>in</i>
PV-DC-PTPC-2020-6	13	6	Ø 2.375	Ø 2.375	Ø 5/8 x 4-1/2	Ø 5/8 x 4-1/2
PV-DC-PTPC-2020-12	14.8	12	Ø 2.375	Ø 2.375	Ø 5/8 x 4-1/2	Ø 5/8 x 4-1/2
PV-DC-PTPC-2020-24	18.5	24	Ø 2.375	Ø 2.375	Ø 5/8 x 4-1/2	Ø 5/8 x 4-1/2
PV-DC-PTPC-2025-6	13.8	6	Ø 2.375	Ø 2.875	Ø 5/8 x 4-1/2	Ø 5/8 x 5
PV-DC-PTPC-2025-12	15.7	12	Ø 2.375	Ø 2.875	Ø 5/8 x 4-1/2	Ø 5/8 x 5
PV-DC-PTPC-2025-24	19.3	24	Ø 2.375	Ø 2.875	Ø 5/8 x 4-1/2	Ø 5/8 x 5
PV-DC-PTPC-2030-6	15	6	Ø 2.375	Ø 3.5	Ø 5/8 x 4-1/2	Ø 5/8 x 5-1/2
PV-DC-PTPC-2030-12	19.1	12	Ø 2.375	Ø 3.5	Ø 5/8 x 4-1/2	Ø 5/8 x 5-1/2
PV-DC-PTPC-2030-24	20.4	24	Ø 2.375	Ø 3.5	Ø 5/8 x 4-1/2	Ø 5/8 x 5-1/2
PV-DC-PTPC-2525-6	15.2	6	Ø 2.875	Ø 2.875	Ø 5/8 x 5	Ø 5/8 x 5
PV-DC-PTPC-2525-12	18	12	Ø 2.875	Ø 2.875	Ø 5/8 x 5	Ø 5/8 x 5
PV-DC-PTPC-2525-24	23.9	24	Ø 2.875	Ø 2.875	Ø 5/8 x 5	Ø 5/8 x 5
PV-DC-PTPC-2530-6	16.2	6	Ø 2.875	Ø 3.5	Ø 5/8 x 5	Ø 5/8 x 5-1/2
PV-DC-PTPC-2530-12	19.1	12	Ø 2.875	Ø 3.5	Ø 5/8 x 5	Ø 5/8 x 5-1/2
PV-DC-PTPC-2530-24	25	24	Ø 2.875	Ø 3.5	Ø 5/8 x 5	Ø 5/8 x 5-1/2
PV-DC-PTPC-3030-6	17.5	6	Ø 3.5	Ø 3.5	Ø 5/8 x 5-1/2	Ø 5/8 x 5-1/2
PV-DC-PTPC-3030-12	21.3	12	Ø 3.5	Ø 3.5	Ø 5/8 x 5-1/2	Ø 5/8 x 5-1/2
PV-DC-PTPC-3030-24	28.9	24	Ø 3.5	Ø 3.5	Ø 5/8 x 5-1/2	Ø 5/8 x 5-1/2
PV-DC-PTPC-3040-6	19.1	6	Ø 3.5	Ø 4.5	Ø 5/8 x 5-1/2	Ø 5/8 x 6-1/2
PV-DC-PTPC-3040-12	23	12	Ø 3.5	Ø 4.5	Ø 5/8 x 5-1/2	Ø 5/8 x 6-1/2
PV-DC-PTPC-3040-24	30.5	24	Ø 3.5	Ø 4.5	Ø 5/8 x 5-1/2	Ø 5/8 x 6-1/2

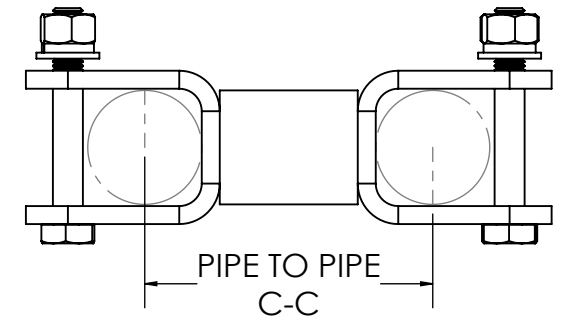
NOTE: 'PIPE BODY' DIAMETER IS ALWAYS EQUIVALENT TO 'PIPE 1' DIAMETER SIZE

NOTES:

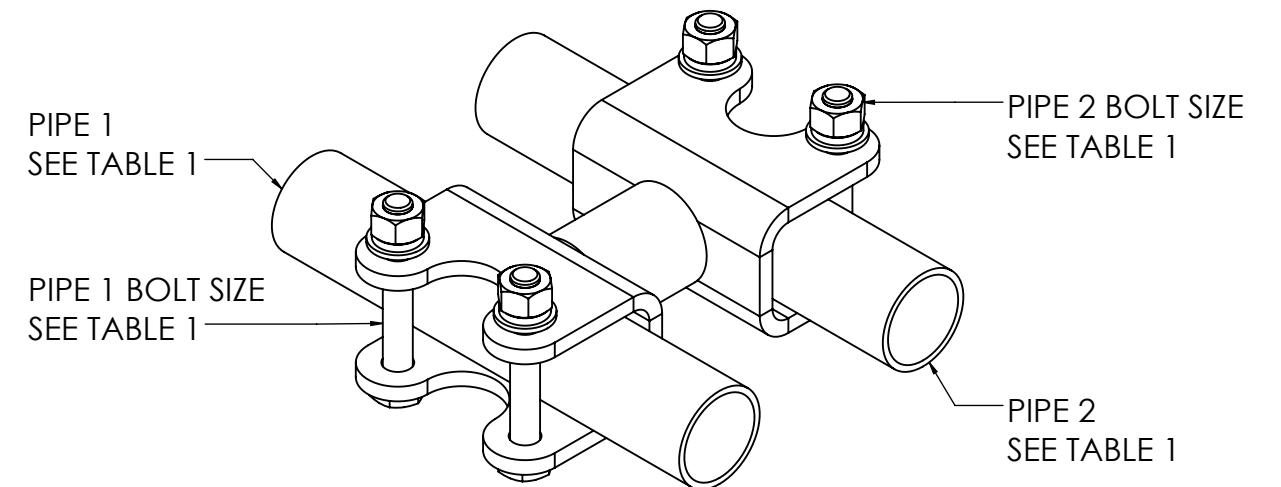
- INSTALLATION REQUIREMENTS:
 - MINIMUM BOLT TORQUE: 100 FT-LBS
 - CLEAN, DRY ASSEMBLY
 - GALVANIZED WELDMENT AND HARDWARE
 - COLORED WAX COATING ON NUTS
- MATERIALS
 - PIPE BRACKET: A36 HDG
 - PIPE BODY: A500 GR. C
 - HARDWARE: A325 HDG BOLT, A563DH NUT



PV-DC-PTPC
DUALCROSS - PIPE TO PIPE CONNECTION



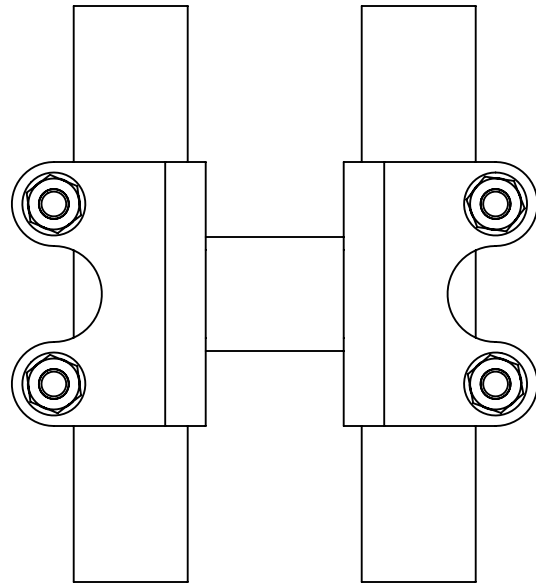
PV-DC-PTPC
SIDE VIEW



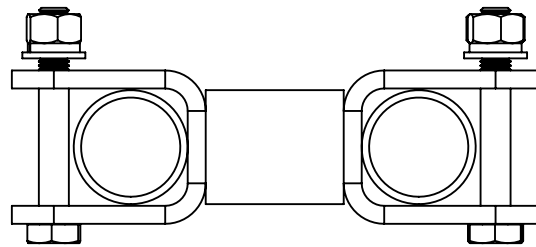
SHEET 1 OF 2	THIRD ANGLE PROJECTION 	CATEGORY 06_Pipe and Attachment Hardware	4	PERFECT VISION
12/30/2020	SCALE 1:4	SERIES 01_Crossovers	3	
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4°, BEND ±2° ALL OTHERS: ±1/16"		TYPE PV-DC-PTPC_Pipe to Pipe connection	2	DUALCROSS - PIPE TO PIPE CONNECTION
		BY INT	1	DOCUMENT NUMBER
		CHECKED	0 INITIAL RELEASE	3/30/20
		STATUS APPROVED	REV	DESCRIPTION
				DATE
				PTPC-ENG-01-R0
				REV 0

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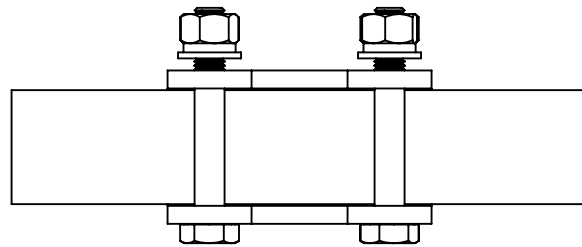
PRE-INSTALL ASSEMBLY:



TOP

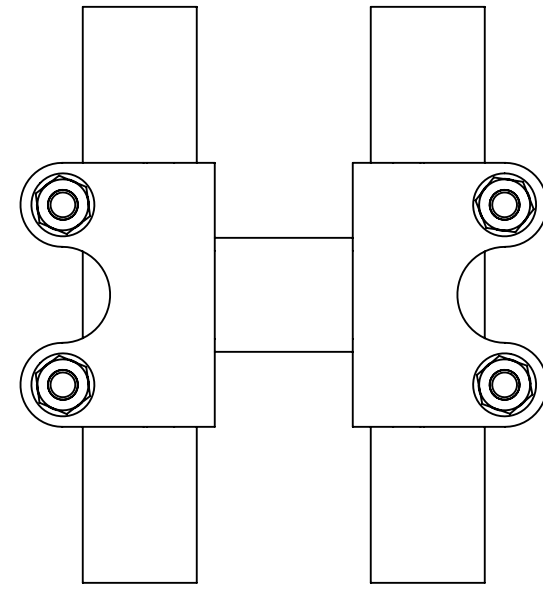


FRONT

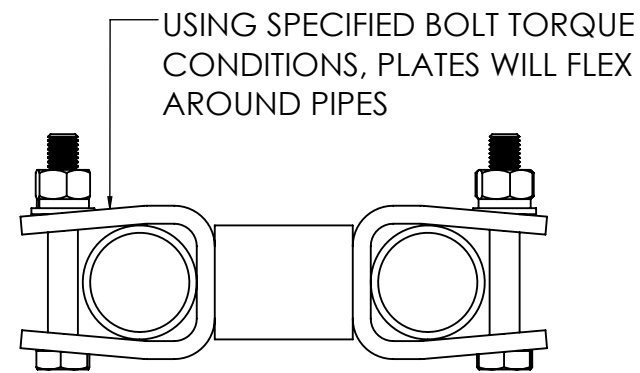


SIDE

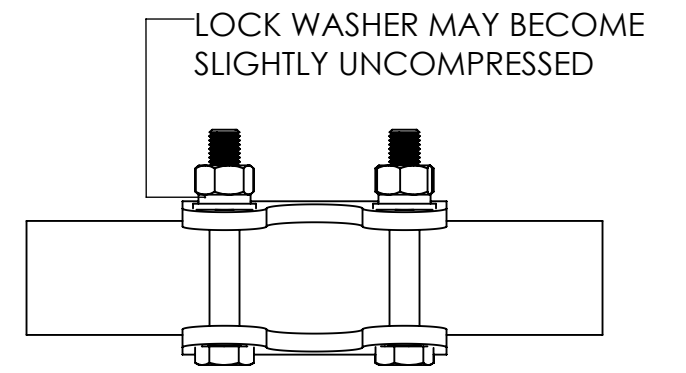
POST-INSTALL ASSEMBLY:



TOP



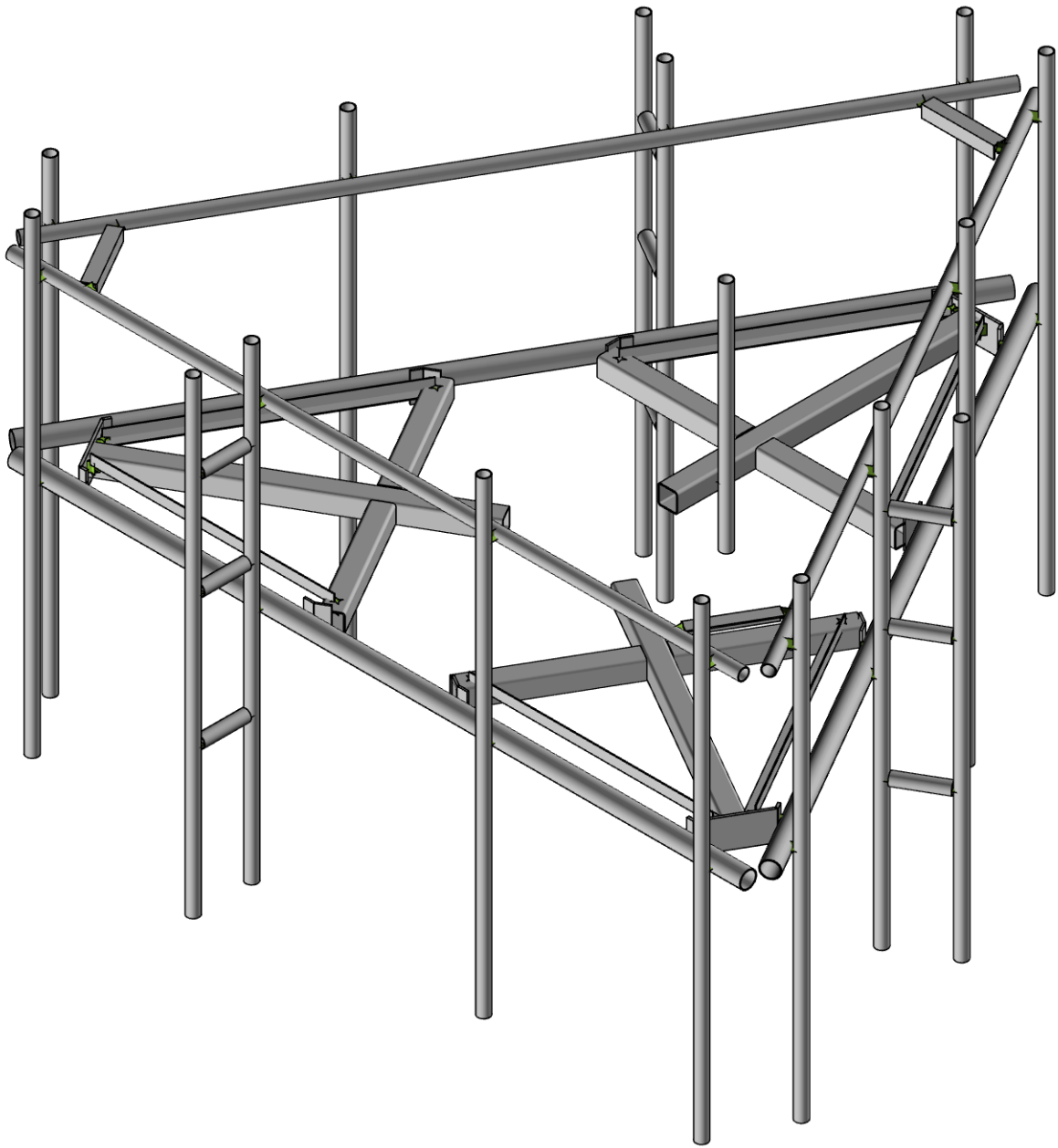
FRONT



SIDE

SHEET 2 OF 2	THIRD ANGLE PROJECTION 	CATEGORY 06_Pipe and Attachment Hardware	4				
12/30/2020	SCALE 1:1	SERIES 01_Crossovers	3				
DIMENSIONS ARE IN INCHES TOLERANCES U.N.O. HOLES: +1/16", -1/32" ANGULAR: PROFILE ±1/4°, BEND ±2° ALL OTHERS: ±1/16"		TYPE PV-DC-PTPC_Pipe to Pipe connection	2	DUALCROSS - PIPE TO PIPE CONNECTION			
		BY INT	1	DOCUMENT NUMBER			
		CHECKED	0	INITIAL RELEASE	3/30/20	REV	
		STATUS APPROVED	REV	DESCRIPTION	DATE	PTPC-ENG-01-R0	0

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23777300

new Mount Analysis

SK-1

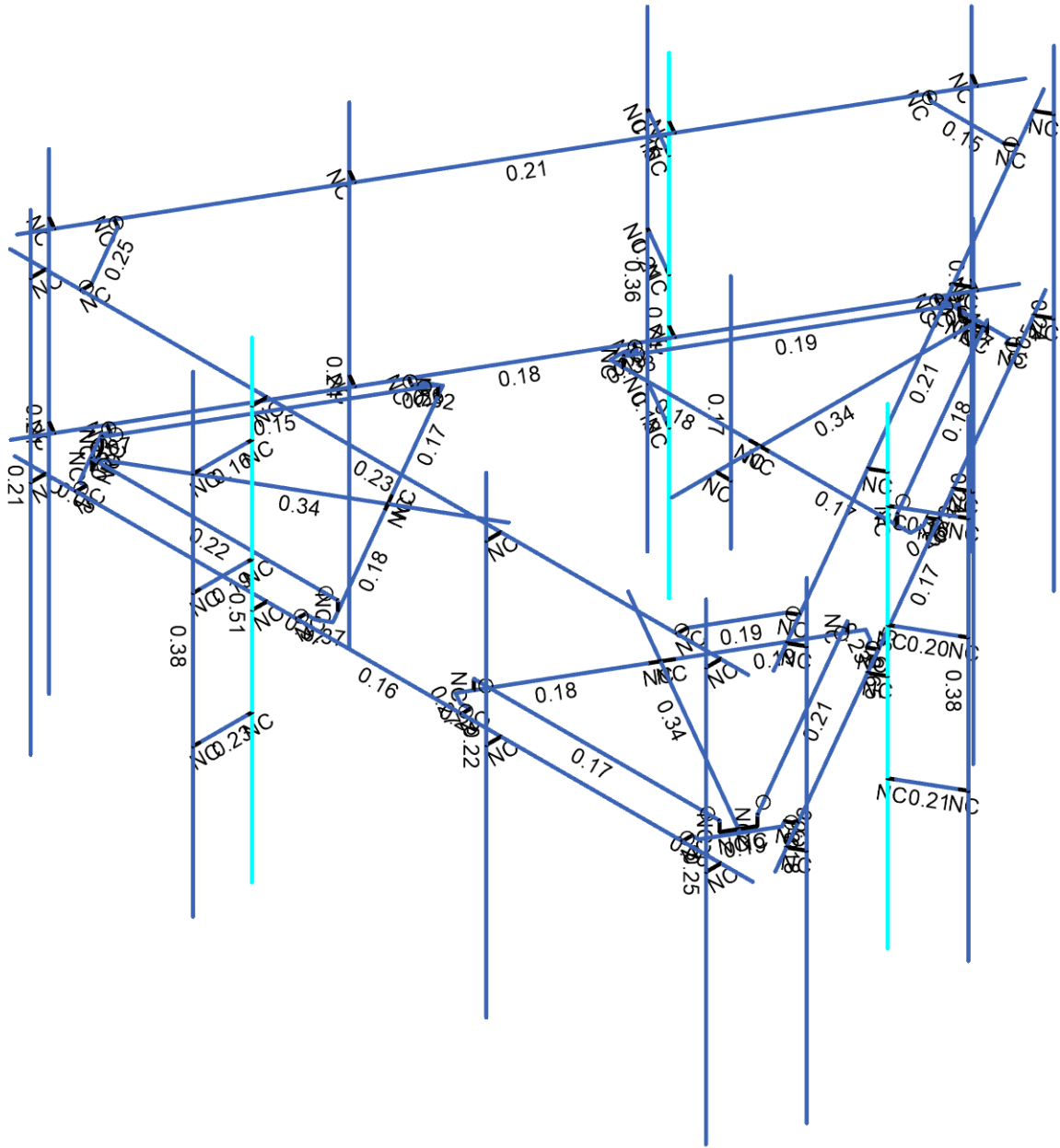
Nov 06, 2023

5000917346-VZW_MT_LO_H.r3d



Code Check (Env)

- No Calc
- > 1.0
- .90-1.0
- .75-.90
- .50-.75
- 0-.50

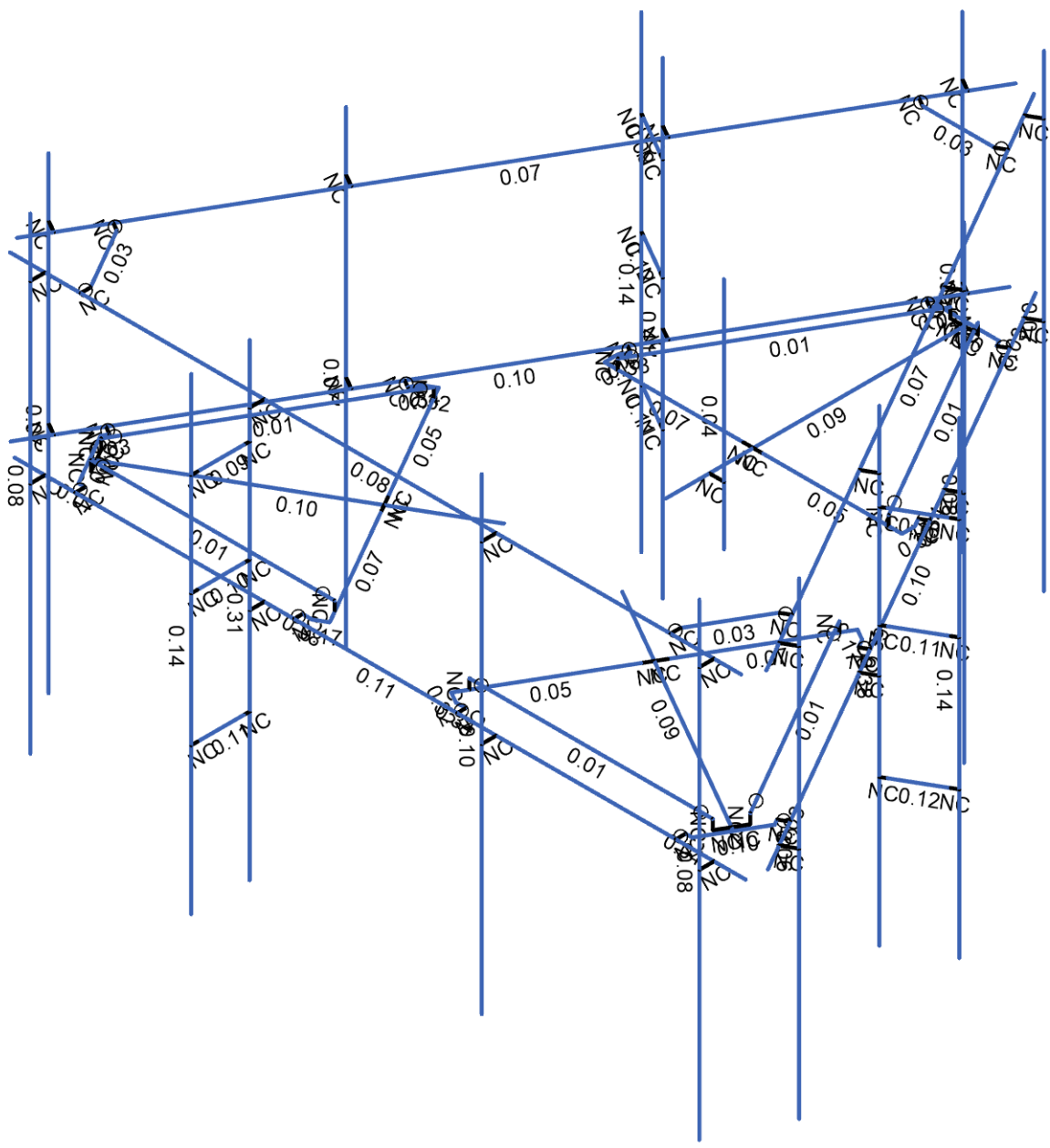
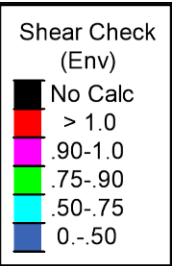


Member Code Checks Displayed (Enveloped)
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new Mount Analysis

SK-2
Nov 06, 2023
5000917346-VZW_MT_LO_H.r3d



Member Shear Checks Displayed (Enveloped)
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23777300

new Mount Analysis

SK-3
Nov 06, 2023
5000917346-VZW_MT_LO_H.r3d

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e ⁵ F ⁻¹]	Density [k/ft ³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
8	Q235	29000	11154	0.3	0.65	0.49	35	1.5	58	1.2
9	A500 Gr.C RND	29000	11154	0.3	0.65	0.527	46	1.4	62	1.3

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in ²]	Iyy [in ⁴]	Izz [in ⁴]	J [in ⁴]
1	Face Horizontal	PIPE 3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	Standoff Horizontal	HSS4X4X4	Beam	SquareTube	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
3	Corner Plate	PL1/2X6	Beam	BAR	A36 Gr.36	Typical	3	0.063	9	0.237
4	Platform Crossmember	HSS4X4X4	Beam	SquareTube	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
5	Grating Support	L2X2X3	Beam	Single Angle	A36 Gr.36	Typical	0.722	0.271	0.271	0.009
6	Mount Pipe	PIPE 2.0	Column	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
7	Cross Arm Plate	PL3/8X6	Column	RECT	A36 Gr.36	Typical	2.25	0.026	6.75	0.101
8	Support Rail	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
9	Support Rail Corner	L2.5X2.5X4	Beam	Single Angle	A36 Gr.36	Typical	1.19	0.692	0.692	0.026
10	Kicker	LL2.5X2.5X3X0	Column	Double Angle (No Gap)	A36 Gr.36	Typical	1.8	1.91	1.07	0.023
11	Pipe Connection	PIPE 2.0	Beam	HSS Pipe	A500 Gr.C RND	Typical	1.02	0.627	0.627	1.25

Member Primary Data

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M25	N30	N35		Standoff Horizontal	Beam	SquareTube	A500 Gr.B Rect	Typical
2	M26	N38	N40		Platform Crossmember	Beam	SquareTube	A500 Gr.B Rect	Typical
3	M27	N39	N31		Platform Crossmember	Beam	SquareTube	A500 Gr.B Rect	Typical
4	M28	N49	N50		Corner Plate	Beam	BAR	A36 Gr.36	Typical
5	M29	N33	N37	240	RIGID	None	None	RIGID	Typical
6	M30	N32	N36	240	RIGID	None	None	RIGID	Typical
7	M31	N54	N32		Grating Support	Beam	Single Angle	A36 Gr.36	Typical
8	M32	N33	N56		Grating Support	Beam	Single Angle	A36 Gr.36	Typical
9	M33	N56	N57	240	RIGID	None	None	RIGID	Typical
10	M34	N39	N34		RIGID	None	None	RIGID	Typical
11	M35	N34	N40		RIGID	None	None	RIGID	Typical
12	M36	N38	N42		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
13	M37	N42	N43		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
14	M38	N43	N47		RIGID	None	None	RIGID	Typical
15	M39	N50	N44		Corner Plate	Beam	BAR	A36 Gr.36	Typical
16	M40	N44	N51		RIGID	None	None	RIGID	Typical
17	M41	N31	N41		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
18	M42	N41	N45		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
19	M43	N45	N48		RIGID	None	None	RIGID	Typical
20	M44	N49	N46		Corner Plate	Beam	BAR	A36 Gr.36	Typical
21	M45	N46	N52		RIGID	None	None	RIGID	Typical
22	M46	N57	N53		RIGID	None	None	RIGID	Typical
23	M47	N53	N55		RIGID	None	None	RIGID	Typical
24	M48	N54	N55	240	RIGID	None	None	RIGID	Typical
25	M73	N86	N87		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
26	M76	N92	N93		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
27	MP1A	N94	N95		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
28	M78	N96	N97		RIGID	None	None	RIGID	Typical
29	MP2A	N98	N99		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
30	M80	N100	N101		RIGID	None	None	RIGID	Typical
31	MP3A	N102	N103		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
32	M82	N104	N105		RIGID	None	None	RIGID	Typical
33	MP4A	N106	N107		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
34	M101	N142	N143		RIGID	None	None	RIGID	Typical
35	OVP	N144	N145		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
36	M107	N161	N162		RIGID	None	None	RIGID	Typical
37	M108	N159	N163		RIGID	None	None	RIGID	Typical
38	M109	N164	N165		RIGID	None	None	RIGID	Typical
39	M110	N156	N158		RIGID	None	None	RIGID	Typical
40	M111	N160	N157		Support Rail	Beam	Pipe	A53 Gr.B	Typical
41	M122	N166	N187		RIGID	None	None	RIGID	Typical
42	M49	N91	N69		RIGID	None	None	RIGID	Typical
43	M50	N79	N83		Standoff Horizontal	Beam	SquareTube	A500 Gr.B Rect	Typical
44	M52	N88	N82		RIGID	None	None	RIGID	Typical
45	M55	N76	N89		Platform Crossmember	Beam	SquareTube	A500 Gr.B Rect	Typical
46	M56	N88	N67		Platform Crossmember	Beam	SquareTube	A500 Gr.B Rect	Typical
47	M57	N111	N112		Corner Plate	Beam	BAR	A36 Gr.36	Typical
48	M58	N81	N85	120	RIGID	None	None	RIGID	Typical
49	M59	N80	N84	120	RIGID	None	None	RIGID	Typical
50	M60	N115	N80		Grating Support	Beam	Single Angle	A36 Gr.36	Typical
51	M61	N81	N116		Grating Support	Beam	Single Angle	A36 Gr.36	Typical
52	M62	N116	N77	120	RIGID	None	None	RIGID	Typical
53	M63	N82	N89		RIGID	None	None	RIGID	Typical
54	M64	N76	N90		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
55	M65	N90	N91		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
56	M66	N112	N108		Corner Plate	Beam	BAR	A36 Gr.36	Typical
57	M67	N108	N113		RIGID	None	None	RIGID	Typical
58	M68	N67	N73		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
59	M69	N73	N109		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
60	M70	N109	N75		RIGID	None	None	RIGID	Typical
61	M71	N111	N110		Corner Plate	Beam	BAR	A36 Gr.36	Typical
62	M72	N110	N66		RIGID	None	None	RIGID	Typical
63	M74	N77	N114		RIGID	None	None	RIGID	Typical
64	M75	N114	N71		RIGID	None	None	RIGID	Typical
65	M77	N115	N71	120	RIGID	None	None	RIGID	Typical
66	M83	N122	N128		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
67	M93	N149	N150		Support Rail	Beam	Pipe	A53 Gr.B	Typical
68	M96	N186	N155		RIGID	None	None	RIGID	Typical
69	M97	N176	N180		Standoff Horizontal	Beam	SquareTube	A500 Gr.B Rect	Typical
70	M99	N183	N179		RIGID	None	None	RIGID	Typical
71	M104	N173	N184		Platform Crossmember	Beam	SquareTube	A500 Gr.B Rect	Typical
72	M105	N183	N153		Platform Crossmember	Beam	SquareTube	A500 Gr.B Rect	Typical
73	M106	N193	N194		Corner Plate	Beam	BAR	A36 Gr.36	Typical
74	M112	N178	N182		RIGID	None	None	RIGID	Typical
75	M113	N177	N181		RIGID	None	None	RIGID	Typical
76	M114	N197	N177		Grating Support	Beam	Single Angle	A36 Gr.36	Typical
77	M115	N178	N198		Grating Support	Beam	Single Angle	A36 Gr.36	Typical
78	M116	N198	N174		RIGID	None	None	RIGID	Typical
79	M117	N179	N184		RIGID	None	None	RIGID	Typical
80	M118	N173	N185		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
81	M119	N185	N186		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
82	M120	N194	N190		Corner Plate	Beam	BAR	A36 Gr.36	Typical
83	M121	N190	N195		RIGID	None	None	RIGID	Typical
84	M124	N153	N170		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
85	M125	N170	N191		Cross Arm Plate	Column	RECT	A36 Gr.36	Typical
86	M126	N191	N172		RIGID	None	None	RIGID	Typical
87	M127	N193	N192		Corner Plate	Beam	BAR	A36 Gr.36	Typical
88	M128	N192	N152		RIGID	None	None	RIGID	Typical
89	M129	N174	N196		RIGID	None	None	RIGID	Typical
90	M130	N196	N168		RIGID	None	None	RIGID	Typical
91	M131	N197	N168		RIGID	None	None	RIGID	Typical
92	M134	N204	N210		Face Horizontal	Beam	Pipe	A53 Gr.B	Typical
93	M144	N227	N228		Support Rail	Beam	Pipe	A53 Gr.B	Typical
94	M123	N189	N188		RIGID	None	None	RIGID	Typical
95	M98	N139	N200		RIGID	None	None	RIGID	Typical
96	M100	N147	N137		RIGID	None	None	RIGID	Typical
97	M102	N167	N138		RIGID	None	None	RIGID	Typical
98	M103	N140	N141		RIGID	None	None	RIGID	Typical
99	MP4C	N136	N146	240	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
100	M133	N134	N133		RIGID	None	None	RIGID	Typical
101	MP1C	N148	N154	240	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
102	M136	N171	N175		RIGID	None	None	RIGID	Typical
103	MP2C	N169	N199	240	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
104	M141	N207	N206		RIGID	None	None	RIGID	Typical
105	M142	N209	N208		RIGID	None	None	RIGID	Typical
106	M143	N218	N232		RIGID	None	None	RIGID	Typical
107	M145	N222	N216		RIGID	None	None	RIGID	Typical
108	M146	N225	N217		RIGID	None	None	RIGID	Typical
109	M147	N219	N220		RIGID	None	None	RIGID	Typical
110	MP4B	N215	N221	120	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
111	M149	N213	N212		RIGID	None	None	RIGID	Typical
112	MP1B	N223	N224	120	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
113	M151	N229	N230		RIGID	None	None	RIGID	Typical
114	MP2B	N226	N231	120	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
115	M156	N238	N237		RIGID	None	None	RIGID	Typical
116	M157	N240	N239		RIGID	None	None	RIGID	Typical
117	M158	N187	N239	180	Support Rail Corner	Beam	Single Angle	A36 Gr.36	Typical
118	M159	N237	N208	180	Support Rail Corner	Beam	Single Angle	A36 Gr.36	Typical
119	M160	N206	N188	180	Support Rail Corner	Beam	Single Angle	A36 Gr.36	Typical
120	M132	N202	N211		Mount Pipe	Column	Pipe	A53 Gr.B	Typical
121	M135	N234	N241		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical
122	M137	N242	N243		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical
123	M139	N246	N234		RIGID	None	None	RIGID	Typical
124	M148	N244	N241		RIGID	None	None	RIGID	Typical
125	M150	N247	N242		RIGID	None	None	RIGID	Typical
126	M152	N245	N243		RIGID	None	None	RIGID	Typical
127	M138	N205	N233		RIGID	None	None	RIGID	Typical
128	M140	N236	N203		RIGID	None	None	RIGID	Typical
129	MP3C	N201	N214	240	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
130	M154	N248	N249	240	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
131	M155	N250	N235		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical
132	M161	N251	N252		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical
133	M162	N255	N250		RIGID	None	None	RIGID	Typical
134	M163	N253	N235		RIGID	None	None	RIGID	Typical
135	M164	N256	N251		RIGID	None	None	RIGID	Typical
136	M165	N254	N252		RIGID	None	None	RIGID	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
137	M166	N259	N261		RIGID	None	None	RIGID	Typical
138	M167	N263	N258		RIGID	None	None	RIGID	Typical
139	MP3B	N257	N260	120	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
140	M169	N264	N265	120	Mount Pipe	Column	Pipe	A53 Gr.B	Typical
141	M170	N266	N262		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical
142	M171	N267	N268		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical
143	M172	N271	N266		RIGID	None	None	RIGID	Typical
144	M173	N269	N262		RIGID	None	None	RIGID	Typical
145	M174	N272	N267		RIGID	None	None	RIGID	Typical
146	M175	N270	N268		RIGID	None	None	RIGID	Typical
147	M153	N275	N274		RIGID	None	None	RIGID	Typical
148	M168	N276	N273		RIGID	None	None	RIGID	Typical
149	M176	N273	N274		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical
150	M177	N281	N280		RIGID	None	None	RIGID	Typical
151	M178	N277	N279		RIGID	None	None	RIGID	Typical
152	M179	N284	N278		RIGID	None	None	RIGID	Typical
153	M180	N283	N282		RIGID	None	None	RIGID	Typical
154	M181	N280	N279		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical
155	M182	N278	N282		Pipe Connection	Beam	HSS Pipe	A500 Gr.C RND	Typical

Member Advanced Data

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
1	M25			Yes	N/A	None
2	M26			Yes	Default	None
3	M27			Yes	Default	None
4	M28			Yes	Default	None
5	M29			Yes	** NA **	None
6	M30			Yes	** NA **	None
7	M31	OOOOOX	OOOOOX	Yes	Default	None
8	M32	OOOOOX	OOOOOX	Yes	Default	None
9	M33			Yes	** NA **	None
10	M34			Yes	** NA **	None
11	M35			Yes	** NA **	None
12	M36			Yes	** NA **	None
13	M37			Yes	** NA **	None
14	M38		BenPIN	Yes	** NA **	None
15	M39			Yes	N/A	None
16	M40		BenPIN	Yes	** NA **	None
17	M41			Yes	** NA **	None
18	M42			Yes	** NA **	None
19	M43		BenPIN	Yes	** NA **	None
20	M44			Yes	N/A	None
21	M45		BenPIN	Yes	** NA **	None
22	M46			Yes	** NA **	None
23	M47			Yes	** NA **	None
24	M48			Yes	** NA **	None
25	M73			Yes	N/A	None
26	M76			Yes	** NA **	None
27	MP1A			Yes	** NA **	None
28	M78			Yes	** NA **	None
29	MP2A			Yes	** NA **	None
30	M80			Yes	** NA **	None
31	MP3A			Yes	** NA **	None
32	M82			Yes	** NA **	None
33	MP4A			Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
34	M101			Yes	** NA **	None
35	OVP			Yes	** NA **	None
36	M107			Yes	** NA **	None
37	M108			Yes	** NA **	None
38	M109			Yes	** NA **	None
39	M110			Yes	** NA **	None
40	M111			Yes	Default	None
41	M122	OOOOOX		Yes	** NA **	None
42	M49		BenPIN	Yes	** NA **	None
43	M50			Yes	N/A	None
44	M52			Yes	** NA **	None
45	M55			Yes	Default	None
46	M56			Yes	Default	None
47	M57			Yes	Default	None
48	M58			Yes	** NA **	None
49	M59			Yes	** NA **	None
50	M60	OOOOOX	OOOOOX	Yes	Default	None
51	M61	OOOOOX	OOOOOX	Yes	Default	None
52	M62			Yes	** NA **	None
53	M63			Yes	** NA **	None
54	M64			Yes	** NA **	None
55	M65			Yes	** NA **	None
56	M66			Yes	N/A	None
57	M67		BenPIN	Yes	** NA **	None
58	M68			Yes	** NA **	None
59	M69			Yes	** NA **	None
60	M70		BenPIN	Yes	** NA **	None
61	M71			Yes	N/A	None
62	M72		BenPIN	Yes	** NA **	None
63	M74			Yes	** NA **	None
64	M75			Yes	** NA **	None
65	M77			Yes	** NA **	None
66	M83			Yes	N/A	None
67	M93			Yes	Default	None
68	M96		BenPIN	Yes	** NA **	None
69	M97			Yes	N/A	None
70	M99			Yes	** NA **	None
71	M104			Yes	Default	None
72	M105			Yes	Default	None
73	M106			Yes	Default	None
74	M112			Yes	** NA **	None
75	M113			Yes	** NA **	None
76	M114	OOOOOX	OOOOOX	Yes	Default	None
77	M115	OOOOOX	OOOOOX	Yes	Default	None
78	M116			Yes	** NA **	None
79	M117			Yes	** NA **	None
80	M118			Yes	** NA **	None
81	M119			Yes	** NA **	None
82	M120			Yes	N/A	None
83	M121		BenPIN	Yes	** NA **	None
84	M124			Yes	** NA **	None
85	M125			Yes	** NA **	None
86	M126		BenPIN	Yes	** NA **	None
87	M127			Yes	N/A	None
88	M128		BenPIN	Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
89	M129			Yes	** NA **	None
90	M130			Yes	** NA **	None
91	M131			Yes	** NA **	None
92	M134			Yes	N/A	None
93	M144			Yes	Default	None
94	M123	OOOOOX		Yes	** NA **	None
95	M98			Yes	** NA **	None
96	M100			Yes	** NA **	None
97	M102			Yes	** NA **	None
98	M103			Yes	** NA **	None
99	MP4C			Yes	** NA **	None
100	M133			Yes	** NA **	None
101	MP1C			Yes	** NA **	None
102	M136			Yes	** NA **	None
103	MP2C			Yes	** NA **	None
104	M141	OOOOOX		Yes	** NA **	None
105	M142	OOOOOX		Yes	** NA **	None
106	M143			Yes	** NA **	None
107	M145			Yes	** NA **	None
108	M146			Yes	** NA **	None
109	M147			Yes	** NA **	None
110	MP4B			Yes	** NA **	None
111	M149			Yes	** NA **	None
112	MP1B			Yes	** NA **	None
113	M151			Yes	** NA **	None
114	MP2B			Yes	** NA **	None
115	M156	OOOOOX		Yes	** NA **	None
116	M157	OOOOOX		Yes	** NA **	None
117	M158			Yes	Default	None
118	M159			Yes	Default	None
119	M160			Yes	Default	None
120	M132			Yes	** NA **	None
121	M135			Yes	Default	None
122	M137			Yes	Default	None
123	M139			Yes	** NA **	None
124	M148			Yes	** NA **	None
125	M150			Yes	** NA **	None
126	M152			Yes	** NA **	None
127	M138			Yes	** NA **	None
128	M140			Yes	** NA **	None
129	MP3C			Yes	** NA **	None
130	M154			Yes	** NA **	None
131	M155			Yes	Default	None
132	M161			Yes	Default	None
133	M162			Yes	** NA **	None
134	M163			Yes	** NA **	None
135	M164			Yes	** NA **	None
136	M165			Yes	** NA **	None
137	M166			Yes	** NA **	None
138	M167			Yes	** NA **	None
139	MP3B			Yes	** NA **	None
140	M169			Yes	** NA **	None
141	M170			Yes	Default	None
142	M171			Yes	Default	None
143	M172			Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
144	M173			Yes	** NA **	None
145	M174			Yes	** NA **	None
146	M175			Yes	** NA **	None
147	M153			Yes	** NA **	None
148	M168			Yes	** NA **	None
149	M176			Yes	Default	None
150	M177			Yes	** NA **	None
151	M178			Yes	** NA **	None
152	M179			Yes	** NA **	None
153	M180			Yes	** NA **	None
154	M181			Yes	Default	None
155	M182			Yes	Default	None

Hot Rolled Steel Design Parameters

	Label	Shape	Length [ft]	Lcomp top [ft]	Channel Conn.	a [ft]	Function
1	M25	Standoff Horizontal	5.187	Lbyy	N/A	N/A	Lateral
2	M26	Platform Crossmember	2.375	Lbyy	N/A	N/A	Lateral
3	M27	Platform Crossmember	2.375	Lbyy	N/A	N/A	Lateral
4	M28	Corner Plate	1.031	Lbyy	N/A	N/A	Lateral
5	M31	Grating Support	4.162	Lbyy	N/A	N/A	Lateral
6	M32	Grating Support	4.162	Lbyy	N/A	N/A	Lateral
7	M36	Cross Arm Plate	0.219		N/A	N/A	Lateral
8	M37	Cross Arm Plate	0.167		N/A	N/A	Lateral
9	M39	Corner Plate	0.112	Lbyy	N/A	N/A	Lateral
10	M41	Cross Arm Plate	0.219		N/A	N/A	Lateral
11	M42	Cross Arm Plate	0.167		N/A	N/A	Lateral
12	M44	Corner Plate	0.112	Lbyy	N/A	N/A	Lateral
13	M73	Face Horizontal	12.5	Lbyy	N/A	N/A	Lateral
14	MP1A	Mount Pipe	8		N/A	N/A	Lateral
15	MP2A	Mount Pipe	8		N/A	N/A	Lateral
16	MP3A	Mount Pipe	8		N/A	N/A	Lateral
17	MP4A	Mount Pipe	8		N/A	N/A	Lateral
18	OVP	Mount Pipe	4		N/A	N/A	Lateral
19	M111	Support Rail	12.5	Lbyy	N/A	N/A	Lateral
20	M50	Standoff Horizontal	5.187	Lbyy	N/A	N/A	Lateral
21	M55	Platform Crossmember	2.375	Lbyy	N/A	N/A	Lateral
22	M56	Platform Crossmember	2.375	Lbyy	N/A	N/A	Lateral
23	M57	Corner Plate	1.031	Lbyy	N/A	N/A	Lateral
24	M60	Grating Support	4.162	Lbyy	N/A	N/A	Lateral
25	M61	Grating Support	4.162	Lbyy	N/A	N/A	Lateral
26	M64	Cross Arm Plate	0.219		N/A	N/A	Lateral
27	M65	Cross Arm Plate	0.167		N/A	N/A	Lateral
28	M66	Corner Plate	0.112	Lbyy	N/A	N/A	Lateral
29	M68	Cross Arm Plate	0.219		N/A	N/A	Lateral
30	M69	Cross Arm Plate	0.167		N/A	N/A	Lateral
31	M71	Corner Plate	0.112	Lbyy	N/A	N/A	Lateral
32	M83	Face Horizontal	12.5	Lbyy	N/A	N/A	Lateral
33	M93	Support Rail	12.5	Lbyy	N/A	N/A	Lateral
34	M97	Standoff Horizontal	5.187	Lbyy	N/A	N/A	Lateral
35	M104	Platform Crossmember	2.375	Lbyy	N/A	N/A	Lateral
36	M105	Platform Crossmember	2.375	Lbyy	N/A	N/A	Lateral
37	M106	Corner Plate	1.031	Lbyy	N/A	N/A	Lateral
38	M114	Grating Support	4.162	Lbyy	N/A	N/A	Lateral
39	M115	Grating Support	4.162	Lbyy	N/A	N/A	Lateral
40	M118	Cross Arm Plate	0.219		N/A	N/A	Lateral

Hot Rolled Steel Design Parameters (Continued)

Label	Shape	Length [ft]	Lcomp top [ft]	Channel Conn.	a [ft]	Function
41	M119	Cross Arm Plate	0.167		N/A	Lateral
42	M120	Corner Plate	0.112	Lbyy	N/A	Lateral
43	M124	Cross Arm Plate	0.219		N/A	Lateral
44	M125	Cross Arm Plate	0.167		N/A	Lateral
45	M127	Corner Plate	0.112	Lbyy	N/A	Lateral
46	M134	Face Horizontal	12.5	Lbyy	N/A	Lateral
47	M144	Support Rail	12.5	Lbyy	N/A	Lateral
48	MP4C	Mount Pipe	8		N/A	Lateral
49	MP1C	Mount Pipe	8		N/A	Lateral
50	MP2C	Mount Pipe	8		N/A	Lateral
51	MP4B	Mount Pipe	8		N/A	Lateral
52	MP1B	Mount Pipe	8		N/A	Lateral
53	MP2B	Mount Pipe	8		N/A	Lateral
54	M158	Support Rail Corner	1.234	Lbyy	N/A	Lateral
55	M159	Support Rail Corner	1.234	Lbyy	N/A	Lateral
56	M160	Support Rail Corner	1.234	Lbyy	N/A	Lateral
57	M132	Mount Pipe	8		N/A	Lateral
58	M135	Pipe Connection	0.792	Lbyy	N/A	Lateral
59	M137	Pipe Connection	0.792	Lbyy	N/A	Lateral
60	MP3C	Mount Pipe	8		N/A	Lateral
61	M154	Mount Pipe	8		N/A	Lateral
62	M155	Pipe Connection	0.792	Lbyy	N/A	Lateral
63	M161	Pipe Connection	0.792	Lbyy	N/A	Lateral
64	MP3B	Mount Pipe	8		N/A	Lateral
65	M169	Mount Pipe	8		N/A	Lateral
66	M170	Pipe Connection	0.792	Lbyy	N/A	Lateral
67	M171	Pipe Connection	0.792	Lbyy	N/A	Lateral
68	M176	Pipe Connection	0.792	Lbyy	N/A	Lateral
69	M181	Pipe Connection	0.792	Lbyy	N/A	Lateral
70	M182	Pipe Connection	0.792	Lbyy	N/A	Lateral

Design Size and Code Check Parameters

Label	Max Axial/Bending Chk	Max Shear Chk
1 Typical	1	1

Load Combinations

Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1 1.2D+1.0Wo (0 Deg)	Yes	Y	1	1.2	39	1.2	3	1	41	1								
2 1.2D+1.0Wo (30 Deg)	Yes	Y	1	1.2	39	1.2	4	1	42	1								
3 1.2D+1.0Wo (60 Deg)	Yes	Y	1	1.2	39	1.2	5	1	43	1								
4 1.2D+1.0Wo (90 Deg)	Yes	Y	1	1.2	39	1.2	6	1	44	1								
5 1.2D+1.0Wo (120 Deg)	Yes	Y	1	1.2	39	1.2	7	1	45	1								
6 1.2D+1.0Wo (150 Deg)	Yes	Y	1	1.2	39	1.2	8	1	46	1								
7 1.2D+1.0Wo (180 Deg)	Yes	Y	1	1.2	39	1.2	9	1	47	1								
8 1.2D+1.0Wo (210 Deg)	Yes	Y	1	1.2	39	1.2	10	1	48	1								
9 1.2D+1.0Wo (240 Deg)	Yes	Y	1	1.2	39	1.2	11	1	49	1								
10 1.2D+1.0Wo (270 Deg)	Yes	Y	1	1.2	39	1.2	12	1	50	1								
11 1.2D+1.0Wo (300 Deg)	Yes	Y	1	1.2	39	1.2	13	1	51	1								
12 1.2D+1.0Wo (330 Deg)	Yes	Y	1	1.2	39	1.2	14	1	52	1								
13 1.2D + 1.0Di + 1.0Wi (0 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	15	1	53	1				
14 1.2D + 1.0Di + 1.0Wi (30 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	16	1	54	1				
15 1.2D + 1.0Di + 1.0Wi (60 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	17	1	55	1				
16 1.2D + 1.0Di + 1.0Wi (90 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	18	1	56	1				

Load Combinations (Continued)

Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	
17 1.2D + 1.0Di + 1.0Wi (120 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	19	1	57	1				
18 1.2D + 1.0Di + 1.0Wi (150 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	20	1	58	1				
19 1.2D + 1.0Di + 1.0Wi (180 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	21	1	59	1				
20 1.2D + 1.0Di + 1.0Wi (210 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	22	1	60	1				
21 1.2D + 1.0Di + 1.0Wi (240 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	23	1	61	1				
22 1.2D + 1.0Di + 1.0Wi (270 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	24	1	62	1				
23 1.2D + 1.0Di + 1.0Wi (300 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	25	1	63	1				
24 1.2D + 1.0Di + 1.0Wi (330 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	26	1	64	1				
25 1.2D + 1.5Lm1 + 1.0Wm (0 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	27	1	65	1						
26 1.2D + 1.5Lm1 + 1.0Wm (30 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	28	1	66	1						
27 1.2D + 1.5Lm1 + 1.0Wm (60 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	29	1	67	1						
28 1.2D + 1.5Lm1 + 1.0Wm (90 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	30	1	68	1						
29 1.2D + 1.5Lm1 + 1.0Wm (120 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	31	1	69	1						
30 1.2D + 1.5Lm1 + 1.0Wm (150 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	32	1	70	1						
31 1.2D + 1.5Lm1 + 1.0Wm (180 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	33	1	71	1						
32 1.2D + 1.5Lm1 + 1.0Wm (210 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	34	1	72	1						
33 1.2D + 1.5Lm1 + 1.0Wm (240 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	35	1	73	1						
34 1.2D + 1.5Lm1 + 1.0Wm (270 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	36	1	74	1						
35 1.2D + 1.5Lm1 + 1.0Wm (300 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	37	1	75	1						
36 1.2D + 1.5Lm1 + 1.0Wm (330 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	38	1	76	1						
37 1.2D + 1.5Lm2 + 1.0Wm (0 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	27	1	65	1						
38 1.2D + 1.5Lm2 + 1.0Wm (30 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	28	1	66	1						
39 1.2D + 1.5Lm2 + 1.0Wm (60 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	29	1	67	1						
40 1.2D + 1.5Lm2 + 1.0Wm (90 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	30	1	68	1						
41 1.2D + 1.5Lm2 + 1.0Wm (120 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	31	1	69	1						
42 1.2D + 1.5Lm2 + 1.0Wm (150 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	32	1	70	1						
43 1.2D + 1.5Lm2 + 1.0Wm (180 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	33	1	71	1						
44 1.2D + 1.5Lm2 + 1.0Wm (210 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	34	1	72	1						
45 1.2D + 1.5Lm2 + 1.0Wm (240 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	35	1	73	1						
46 1.2D + 1.5Lm2 + 1.0Wm (270 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	36	1	74	1						
47 1.2D + 1.5Lm2 + 1.0Wm (300 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	37	1	75	1						
48 1.2D + 1.5Lm2 + 1.0Wm (330 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	38	1	76	1						
49 1.2D + 1.5Lv1	Yes	Y	1	1.2	39	1.2	79	1.5										
50 1.2D + 1.5Lv2	Yes	Y	1	1.2	39	1.2	80	1.5										
51 1.4D	Yes	Y	1	1.4	39	1.4												
52 1.2D + 1.0Ev + 1.0Eh (0 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	1	83		ELZ	1	ELX	
53 1.2D + 1.0Ev + 1.0Eh (30 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	0.866	83	0.5	ELZ	0.866	ELX	0.5
54 1.2D + 1.0Ev + 1.0Eh (60 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	0.5	83	0.866	ELZ	0.5	ELX	0.866
55 1.2D + 1.0Ev + 1.0Eh (90 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82		83	1	ELZ		ELX	1
56 1.2D + 1.0Ev + 1.0Eh (120 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-0.5	83	0.866	ELZ	-0.5	ELX	0.866
57 1.2D + 1.0Ev + 1.0Eh (150 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-0.866	83	0.5	ELZ	-0.866	ELX	0.5
58 1.2D + 1.0Ev + 1.0Eh (180 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-1	83		ELZ	-1	ELX	
59 1.2D + 1.0Ev + 1.0Eh (210 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-0.866	83	-0.5	ELZ	-0.866	ELX	-0.5
60 1.2D + 1.0Ev + 1.0Eh (240 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-0.5	83	-0.866	ELZ	-0.5	ELX	-0.866
61 1.2D + 1.0Ev + 1.0Eh (270 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82		83	-1	ELZ		ELX	-1
62 1.2D + 1.0Ev + 1.0Eh (300 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	0.5	83	-0.866	ELZ	0.5	ELX	-0.866
63 1.2D + 1.0Ev + 1.0Eh (330 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	0.866	83	-0.5	ELZ	0.866	ELX	-0.5
64 0.9D - 1.0Ev + 1.0Eh (0 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	1	83		ELZ	1	ELX	
65 0.9D - 1.0Ev + 1.0Eh (30 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	0.866	83	0.5	ELZ	0.866	ELX	0.5
66 0.9D - 1.0Ev + 1.0Eh (60 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	0.5	83	0.866	ELZ	0.5	ELX	0.866
67 0.9D - 1.0Ev + 1.0Eh (90 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82		83	1	ELZ		ELX	1
68 0.9D - 1.0Ev + 1.0Eh (120 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-0.5	83	0.866	ELZ	-0.5	ELX	0.866
69 0.9D - 1.0Ev + 1.0Eh (150 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-0.866	83	0.5	ELZ	-0.866	ELX	0.5
70 0.9D - 1.0Ev + 1.0Eh (180 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-1	83		ELZ	-1	ELX	
71 0.9D - 1.0Ev + 1.0Eh (210 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-0.866	83	-0.5	ELZ	-0.866	ELX	-0.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor	BLCFactor		
72	0.9D - 1.0Ev + 1.0Eh (240 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-0.5	83	-0.866	ELZ	-0.5	ELX	-0.866
73	0.9D - 1.0Ev + 1.0Eh (270 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82		83	-1	ELZ		ELX	-1
74	0.9D - 1.0Ev + 1.0Eh (300 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	0.5	83	-0.866	ELZ	0.5	ELX	-0.866
75	0.9D - 1.0Ev + 1.0Eh (330 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	0.866	83	-0.5	ELZ	0.866	ELX	-0.5

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed	Area(Member)
1	Antenna D	None				84		
2	Antenna Di	None				84		
3	Antenna Wo (0 Deg)	None				84		
4	Antenna Wo (30 Deg)	None				84		
5	Antenna Wo (60 Deg)	None				84		
6	Antenna Wo (90 Deg)	None				84		
7	Antenna Wo (120 Deg)	None				84		
8	Antenna Wo (150 Deg)	None				84		
9	Antenna Wo (180 Deg)	None				84		
10	Antenna Wo (210 Deg)	None				84		
11	Antenna Wo (240 Deg)	None				84		
12	Antenna Wo (270 Deg)	None				84		
13	Antenna Wo (300 Deg)	None				84		
14	Antenna Wo (330 Deg)	None				84		
15	Antenna Wi (0 Deg)	None				84		
16	Antenna Wi (30 Deg)	None				84		
17	Antenna Wi (60 Deg)	None				84		
18	Antenna Wi (90 Deg)	None				84		
19	Antenna Wi (120 Deg)	None				84		
20	Antenna Wi (150 Deg)	None				84		
21	Antenna Wi (180 Deg)	None				84		
22	Antenna Wi (210 Deg)	None				84		
23	Antenna Wi (240 Deg)	None				84		
24	Antenna Wi (270 Deg)	None				84		
25	Antenna Wi (300 Deg)	None				84		
26	Antenna Wi (330 Deg)	None				84		
27	Antenna Wm (0 Deg)	None				84		
28	Antenna Wm (30 Deg)	None				84		
29	Antenna Wm (60 Deg)	None				84		
30	Antenna Wm (90 Deg)	None				84		
31	Antenna Wm (120 Deg)	None				84		
32	Antenna Wm (150 Deg)	None				84		
33	Antenna Wm (180 Deg)	None				84		
34	Antenna Wm (210 Deg)	None				84		
35	Antenna Wm (240 Deg)	None				84		
36	Antenna Wm (270 Deg)	None				84		
37	Antenna Wm (300 Deg)	None				84		
38	Antenna Wm (330 Deg)	None				84		
39	Structure D	None		-1				3
40	Structure Di	None					67	3
41	Structure Wo (0 Deg)	None					134	
42	Structure Wo (30 Deg)	None					134	
43	Structure Wo (60 Deg)	None					134	
44	Structure Wo (90 Deg)	None					134	
45	Structure Wo (120 Deg)	None					134	
46	Structure Wo (150 Deg)	None					134	
47	Structure Wo (180 Deg)	None					134	
48	Structure Wo (210 Deg)	None					134	

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed	Area(Member)
49	Structure Wo (240 Deg)	None					134	
50	Structure Wo (270 Deg)	None					134	
51	Structure Wo (300 Deg)	None					134	
52	Structure Wo (330 Deg)	None					134	
53	Structure Wi (0 Deg)	None					134	
54	Structure Wi (30 Deg)	None					134	
55	Structure Wi (60 Deg)	None					134	
56	Structure Wi (90 Deg)	None					134	
57	Structure Wi (120 Deg)	None					134	
58	Structure Wi (150 Deg)	None					134	
59	Structure Wi (180 Deg)	None					134	
60	Structure Wi (210 Deg)	None					134	
61	Structure Wi (240 Deg)	None					134	
62	Structure Wi (270 Deg)	None					134	
63	Structure Wi (300 Deg)	None					134	
64	Structure Wi (330 Deg)	None					134	
65	Structure Wm (0 Deg)	None					134	
66	Structure Wm (30 Deg)	None					134	
67	Structure Wm (60 Deg)	None					134	
68	Structure Wm (90 Deg)	None					134	
69	Structure Wm (120 Deg)	None					134	
70	Structure Wm (150 Deg)	None					134	
71	Structure Wm (180 Deg)	None					134	
72	Structure Wm (210 Deg)	None					134	
73	Structure Wm (240 Deg)	None					134	
74	Structure Wm (270 Deg)	None					134	
75	Structure Wm (300 Deg)	None					134	
76	Structure Wm (330 Deg)	None					134	
77	Lm1	None				1		
78	Lm2	None				1		
79	Lv1	None				1		
80	Lv2	None				1		
81	Antenna Ev	None				84		
82	Antenna Eh (0 Deg)	None				56		
83	Antenna Eh (90 Deg)	None				56		
84	Structure Ev	ELY		-0.04				3
85	Structure Eh (0 Deg)	ELZ			-0.1			3
86	Structure Eh (90 Deg)	ELX	0.1					3
87	BLC 39 Transient Area Loads	None					30	
88	BLC 40 Transient Area Loads	None					30	
89	BLC 84 Transient Area Loads	None					30	
90	BLC 85 Transient Area Loads	None					30	
91	BLC 86 Transient Area Loads	None					30	

Envelope Node Reactions

Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC	
1	N30	max	1439.92	10	2682.472	13	2860.557	1	5.15	13	1.902	4	0.152	4
2		min	-1469.515	4	831.941	70	-3137.041	7	1.281	7	-2.004	10	-0.327	10
3	N79	max	2022.657	9	2527.558	21	2663.564	1	-0.768	2	2.152	1	-1.256	3
4		min	-2213.072	3	798.09	66	-2462.26	7	-2.775	21	-2.169	7	-4.31	21
5	N176	max	2835.567	10	2545.812	17	1264.649	11	-0.723	74	1.216	9	4.596	17
6		min	-2609.381	4	804.541	74	-1198.775	5	-2.395	29	-1.291	3	1.39	74
7	Totals:	max	5638.437	10	7552.297	19	6543.138	1						
8		min	-5638.447	4	2488.132	64	-6543.091	7						

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks

Member	Shape	Code	Check	Loc [ft]	LC	Shear	Check	Loc [ft]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M25	HSS4X4X4	0.345	0	23	0.088	0	y	23	124657.752	139518	16.181	16.181	3	H1-1b	
2	M26	HSS4X4X4	0.172	2.375	14	0.05	2.375	y	21	136263.03	139518	16.181	16.181	1.634	H1-1b	
3	M27	HSS4X4X4	0.182	0	24	0.065	0	y	17	136263.03	139518	16.181	16.181	1.661	H1-1b	
4	M28	PL1/2X6	0.173	0.516	2	0.1	0	y	22	66212.275	97200	1.012	12.15	1.183	H1-1b	
5	M31	L2X2X3	0.177	4.162	2	0.013	4.162	y	17	9823.122	23392.8	0.558	1.14	1.5	H2-1	
6	M32	L2X2X3	0.192	0	12	0.013	4.162	y	21	9823.122	23392.8	0.558	1.135	1.465	H2-1	
7	M36	PL3/8X6	0.262	0	5	0.32	0	y	19	70677.939	72900	0.57	9.113	1.743	H1-1b	
8	M37	PL3/8X6	0.289	0.167	8	0.339	0	y	13	71601.728	72900	0.57	9.113	1.235	H1-1b	
9	M39	PL1/2X6	0.055	0.112	11	0.026	0.112	y	5	96761.011	97200	1.012	12.15	1.423	H1-1b	
10	M41	PL3/8X6	0.186	0	4	0.163	0	y	18	70677.939	72900	0.57	9.113	1.293	H1-1b	
11	M42	PL3/8X6	0.327	0.167	6	0.382	0	y	13	71601.728	72900	0.57	9.113	1.862	H1-1b	
12	M44	PL1/2X6	0.064	0.112	2	0.021	0.112	y	10	96761.011	97200	1.012	12.15	1.079	H1-1b	
13	M73	PIPE 3.0	0.164	4.948	18	0.109	7.813		14	28250.554	65205	5.749	5.749	1	H1-1b	
14	MP1A	PIPE 2.0	0.245	4	22	0.075	1		8	14916.096	32130	1.872	1.872	1	H1-1b	
15	MP2A	PIPE 2.0	0.217	4	9	0.098	4		20	14916.096	32130	1.872	1.872	1	H1-1b	
16	MP3A	PIPE 2.0	0.38	5.5	1	0.144	5.5		6	14916.096	32130	1.872	1.872	1	H1-1b	
17	MP4A	PIPE 2.0	0.209	4	16	0.078	1		18	14916.096	32130	1.872	1.872	1	H1-1b	
18	OVP	PIPE 2.0	0.166	3	7	0.042	3		10	26521.424	32130	1.872	1.872	1	H1-1b	
19	M111	PIPE 2.0	0.233	4.297	17	0.085	11.328		7	6295.422	32130	1.872	1.872	1	H1-1b	
20	M50	HSS4X4X4	0.341	0	19	0.102	0	y	44	124657.752	139518	16.181	16.181	3	H1-1b	
21	M55	HSS4X4X4	0.175	2.375	22	0.049	2.375	y	18	136263.03	139518	16.181	16.181	1.634	H1-1b	
22	M56	HSS4X4X4	0.184	0	20	0.067	0	y	13	136263.03	139518	16.181	16.181	1.663	H1-1b	
23	M57	PL1/2X6	0.206	0.516	8	0.103	0.516	y	18	66212.275	97200	1.012	12.15	1.382	H1-1b	
24	M60	L2X2X3	0.155	4.162	9	0.013	4.162	y	13	9823.122	23392.8	0.558	1.078	1.154	H2-1	
25	M61	L2X2X3	0.218	0	8	0.013	4.162	y	17	9823.122	23392.8	0.558	1.135	1.464	H2-1	
26	M64	PL3/8X6	0.324	0	8	0.317	0	y	14	70677.939	72900	0.57	9.113	1.233	H1-1b	
27	M65	PL3/8X6	0.265	0.167	3	0.341	0	y	22	71601.728	72900	0.57	9.113	1.213	H1-1b	
28	M66	PL1/2X6	0.073	0.112	8	0.028	0	y	7	96761.011	97200	1.012	12.15	1.189	H1-1b	
29	M68	PL3/8X6	0.372	0	7	0.172	0	y	25	70677.939	72900	0.57	9.113	1.202	H1-1b	
30	M69	PL3/8X6	0.373	0.167	2	0.385	0	y	21	71601.728	72900	0.57	9.113	1.56	H1-1b	
31	M71	PL1/2X6	0.054	0.112	12	0.073	0	y	50	96761.011	97200	1.012	12.15	2.201	H1-1b	
32	M83	PIPE 3.0	0.169	8.203	10	0.096	7.812		22	28250.554	65205	5.749	5.749	1	H1-1b	
33	M93	PIPE 2.0	0.208	4.297	24	0.072	4.297		16	6295.422	32130	1.872	1.872	1	H1-1b	
34	M97	HSS4X4X4	0.34	0	15	0.087	0	y	32	124657.752	139518	16.181	16.181	3	H1-1b	
35	M104	HSS4X4X4	0.177	2.375	18	0.053	2.375	y	36	136263.03	139518	16.181	16.181	1.634	H1-1b	
36	M105	HSS4X4X4	0.187	0	16	0.066	0	y	21	136263.03	139518	16.181	16.181	1.661	H1-1b	
37	M106	PL1/2X6	0.193	0.516	6	0.097	0.516	y	14	66212.275	97200	1.012	12.15	1.279	H1-1b	
38	M114	L2X2X3	0.173	4.162	6	0.013	4.162	y	21	9823.122	23392.8	0.558	1.135	1.465	H2-1	
39	M115	L2X2X3	0.207	0	4	0.013	4.162	y	13	9823.122	23392.8	0.558	1.14	1.5	H2-1	
40	M118	PL3/8X6	0.273	0	12	0.317	0	y	22	70677.939	72900	0.57	9.113	2.181	H1-1b	
41	M119	PL3/8X6	0.293	0.167	12	0.344	0	y	18	71601.728	72900	0.57	9.113	1.244	H1-1b	
42	M120	PL1/2X6	0.059	0.112	5	0.044	0	y	26	96761.011	97200	1.012	12.15	1.057	H1-1b	
43	M124	PL3/8X6	0.23	0	3	0.168	0	y	33	70677.939	72900	0.57	9.113	1.215	H1-1b	
44	M125	PL3/8X6	0.351	0.167	10	0.386	0	y	17	71601.728	72900	0.57	9.113	1.942	H1-1b	
45	M127	PL1/2X6	0.056	0.112	5	0.028	0.112	y	25	96761.011	97200	1.012	12.15	1.015	H1-1b	
46	M134	PIPE 3.0	0.176	8.333	2	0.1	7.812		22	28250.554	65205	5.749	5.749	1	H1-1b	
47	M144	PIPE 2.0	0.211	4.297	8	0.066	11.328		11	6295.422	32130	1.872	1.872	1	H1-1b	
48	MP4C	PIPE 2.0	0.184	4	24	0.063	4		2	14916.096	32130	1.872	1.872	1	H1-1b	
49	MP1C	PIPE 2.0	0.237	4	18	0.072	4		4	14916.096	32130	1.872	1.872	1	H1-1b	
50	MP2C	PIPE 2.0	0.236	4	5	0.076	4		16	14916.096	32130	1.872	1.872	1	H1-1b	
51	MP4B	PIPE 2.0	0.178	4	20	0.053	4		10	14916.096	32130	1.872	1.872	1	H1-1b	
52	MP1B	PIPE 2.0	0.213	4	1	0.073	4		12	14916.096	32130	1.872	1.872	1	H1-1b	
53	MP2B	PIPE 2.0	0.238	4	1	0.073	1		23	14916.096	32130	1.872	1.872	1	H1-1b	
54	M158	L2.5X2.5X4	0.246	1.234	18	0.033	1.234	z	6	36688.248	38556	1.114	2.537	1.449	H2-1	
55	M159	L2.5X2.5X4	0.155	1.234	9	0.028	1.234	z	10	36688.248	38556	1.114	2.537	1.5	H2-1	

Envelope AISC 15TH (360-16): LRFD Member Steel Code Checks (Continued)

Member	Shape	Code	Check	Loc[ft]	LC	Shear	Check	Loc[ft]	Dir	LC	Pnc [lb]	Pnt [lb]	Mn y-y [k-ft]	Mn z-z [k-ft]	Cb	Eqn
56	M160	L2.5X2.5X4	0.189	1.234	15	0.033	1.234	z	2	36688.248	38556	1.114	2.537	1.195	H2-1	
57	M132	PIPE 2.0	0.507	4	3	0.314	4		3	14916.096	32130	1.872	1.872	1	H3-6	
58	M135	PIPE 2.0	0.156	0.792	12	0.087	0.792		2	41812.829	42228	2.46	2.46	1	H1-1b	
59	M137	PIPE 2.0	0.232	0	1	0.11	0		2	41812.829	42228	2.46	2.46	1	H1-1b	
60	MP3C	PIPE 2.0	0.379	5.5	4	0.143	5.5		3	14916.096	32130	1.872	1.872	1	H1-1b	
61	M154	PIPE 2.0	0.652	4	5	0.384	4		11	14916.096	32130	1.872	1.872	1	H3-6	
62	M155	PIPE 2.0	0.156	0.792	11	0.098	0.792		11	41812.829	42228	2.46	2.46	1	H1-1b	
63	M161	PIPE 2.0	0.21	0	4	0.12	0.792		4	41812.829	42228	2.46	2.46	1	H1-1b	
64	MP3B	PIPE 2.0	0.359	5.5	1	0.144	5.5		12	14916.096	32130	1.872	1.872	1	H1-1b	
65	M169	PIPE 2.0	0.741	4	2	0.413	4		8	14916.096	32130	1.872	1.872	1	H3-6	
66	M170	PIPE 2.0	0.16	0.792	2	0.091	0.792		7	41812.829	42228	2.46	2.46	1	H1-1b	
67	M171	PIPE 2.0	0.183	0	12	0.112	0.792		1	41812.829	42228	2.46	2.46	1	H1-1b	
68	M176	PIPE 2.0	0.205	0.792	11	0.114	0.792		11	41812.829	42228	2.46	2.46	1	H1-1b	
69	M181	PIPE 2.0	0.193	0.792	2	0.1	0.792		2	41812.829	42228	2.46	2.46	1	H1-1b	
70	M182	PIPE 2.0	0.206	0.792	8	0.122	0.792		8	41812.829	42228	2.46	2.46	1	H1-1b	

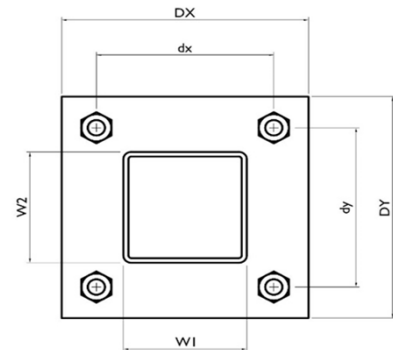
I. Mount-to-Tower Connection Check

Custom Orientation Required

Tower Connection Bolt Checks

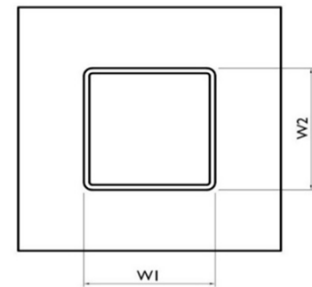
Bolt Orientation

Bolt Quantity per Reaction:	4
d_x (in) (Delta X of typ. bolt config. sketch):	6
d_y (in) (Delta Y of typ. bolt config. sketch):	6
Bolt Type:	A325N
Bolt Diameter (in):	0.625
Required Tensile Strength / bolt (kips):	5.6
Required Shear Strength / bolt (kips):	0.8
Tensile Capacity / bolt (kips):	20.7
Shear Capacity / bolt (kips):	12.4
Bolt Overall Utilization:	27.1%



Tower Connection Baseplate Checks

Connecting Standoff Member Shape:	Rect Tube
Weld Stiffener Configuration:	No Stiffeners
Plate Width, D_x (in):	8
Plate Height, D_y (in):	8
W1 (in):	4
W2 (in):	4
Member Thickness (in):	0.25
Stiffener location a_1 (in):	
Stiffener location b_1 (in):	
Stiffener location a_2 (in):	
Stiffener location b_2 (in):	
F_y (ksi, plate):	36
Plate Thickness (in):	0.625
Length of Yield Line, L_y (in):	5.85
Bolt Eccentricity, e (in):	1.65
M_u (kip-in):	9.23
$\Phi * M_n$ (kip-in):	18.51
Plate Bending Utilization:	49.9%



Tower Connection Weld Checks

Weld Shape:
 Weld Stiffener Configuration:
 Stiffener Notch Length, n (in):
 Weld Size (1/16 in):
 W1 (in):
 W2 (in):
 Weld Total Length (in):
 Z_x (in³/in):
 Z_y (in³/in):
 J_p (in⁴/in):
 c_x (in)
 c_y (in)
 Required combined strength (kip/in):
 Weld Capacity (kip/in):
 Weld Utilization:

Yes
Rectangle
None
0
4
4
4
16.00
21.33
21.33
85.33
2.25
2.25
2.11
5.57
37.9%

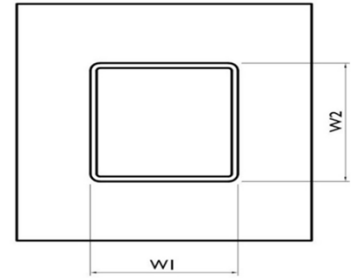


EXHIBIT 5





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Non-Ionizing Electromagnetic Radiation (NIER) Study

Site Number:

302500

Site Name:

Brst - Bristol

Location:

Bristol, Connecticut

Tenants:

AT&T Mobility, & Verizon Wireless

Prepared For:

American Tower, Inc.
Woburn, Massachusetts

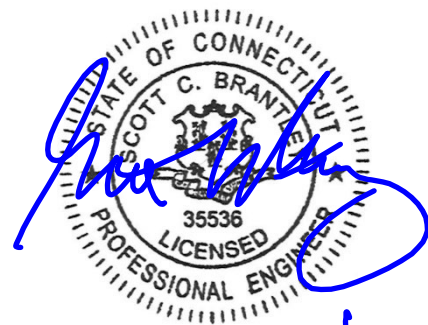
February 5th, 2024

93997 P-419855

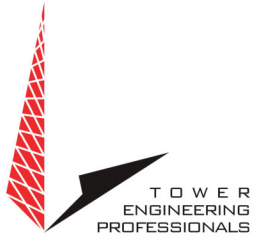
Prepared By:

Adam Carlson MS, CBRE, CPI
Program Manager RF Design & Service
Tower Engineering Professionals

Approved By:



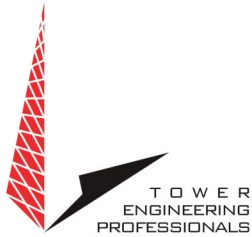
02/08/2024



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RALIEGH, NORTH CAROLINA



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Non-Ionizing Electromagnetic Radiation (NIER) Study

302500 Brst - Bristol
Bristol, Connecticut

INTRODUCTION

Tower Engineering Professionals RF Design & Services Division (TEP-RF) of Raleigh, North Carolina, has been retained by American Tower, Inc. (ATC), of Woburn, Massachusetts to evaluate the RF emissions compared to the Maximum Permissible Exposure (MPE) limit for facilities at this location. This evaluation uses compliance standards as outlined in Federal Communications Commission (FCC) document OET-65.

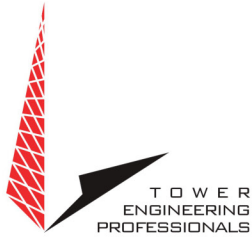
SITE AND FACILITY CONSIDERATIONS

Site 302500 Brst - Bristol is located at 790 Willis St., in Bristol, Connecticut at coordinates 41.649082, -72.948057. The support structure is a 127' monopole. An aerial view of the tower can be found in Appendix 1, Site Photos. The tenants are (AT&T) & Verizon Wireless (VZW). A table listing all antennae and effective radiated power (ERP) levels that were used in this study may be found in Appendix 2, Antenna Inventory.

POWER DENSITY CALCULATIONS

Power densities were calculated based on FCC MPE limits for both General Population/Uncontrolled and Occupational/Controlled environments.

For the purpose of this study, a radius of 100' from the base of the tower with a height of 6' above ground level was used, beyond 100' the MPE levels become *di minimus*. This study utilized FCC recognized and accepted software programs using the maximum ERP levels for the antenna models provided by ATC. Diagrams depicting the predicted spatial average power density level at any specific location may be found in Appendix 3, MPE Limit Study. A discussion regarding the FCC limits may be found in Appendix 4, Information Pertaining to MPE Studies. Study methodology describing Non-ionizing Radiation Prediction Models used in this study may be found in Appendix 5, MPE Standards Methodology.



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All data used in this study was collected from one or more of the following sources:

- ATC furnished data and does not include other unidentified communication facilities.
- Load List at 302500 Brst - Bristol.RF NIER Study 01/19/24.
- FCC databases.
- Carrier standard configurations.
- Empirical data collected by TEP.

SITE MITIGATION & CONTROL

In order to comply with FCC, tenant, & ATC requirements, TEP recommends the placement of signage at the base of the tower and all compound access points to alert workers of potential exposure to RF fields while working on or near the antennae.

TEP recommends that all personnel working on this tower be trained in RF safety procedures and carry a personal RF monitor at all times.

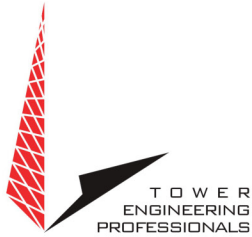
COMPLIANCE DETERMINATION

This installation **IS** in compliance with current FCC MPE limits as described in FCC OET-65.

APPENDIX 1 Site Photos



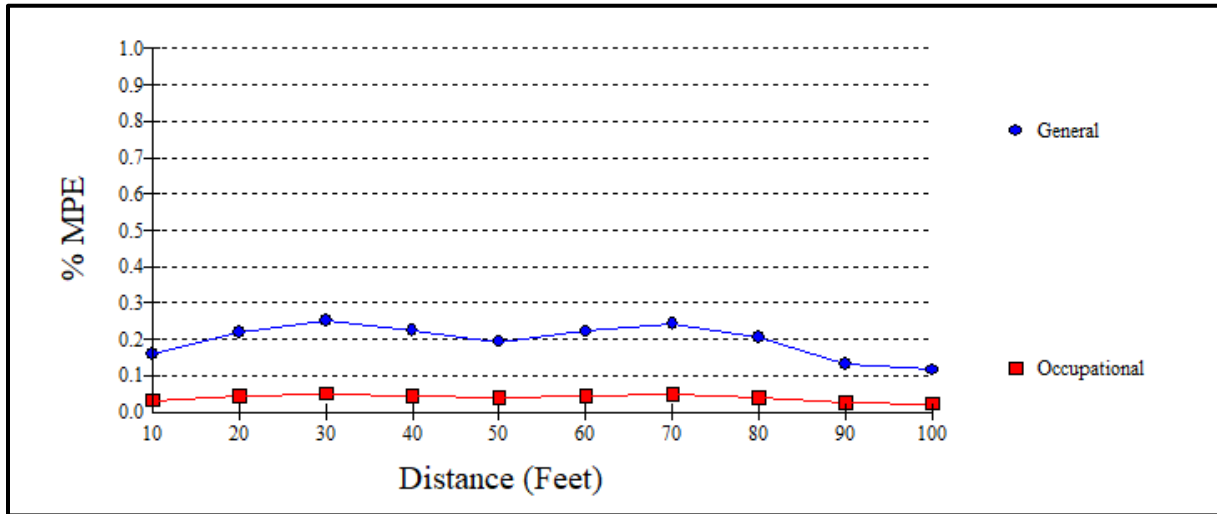
Aerial View of Site



Appendix 2 Antenna Inventory

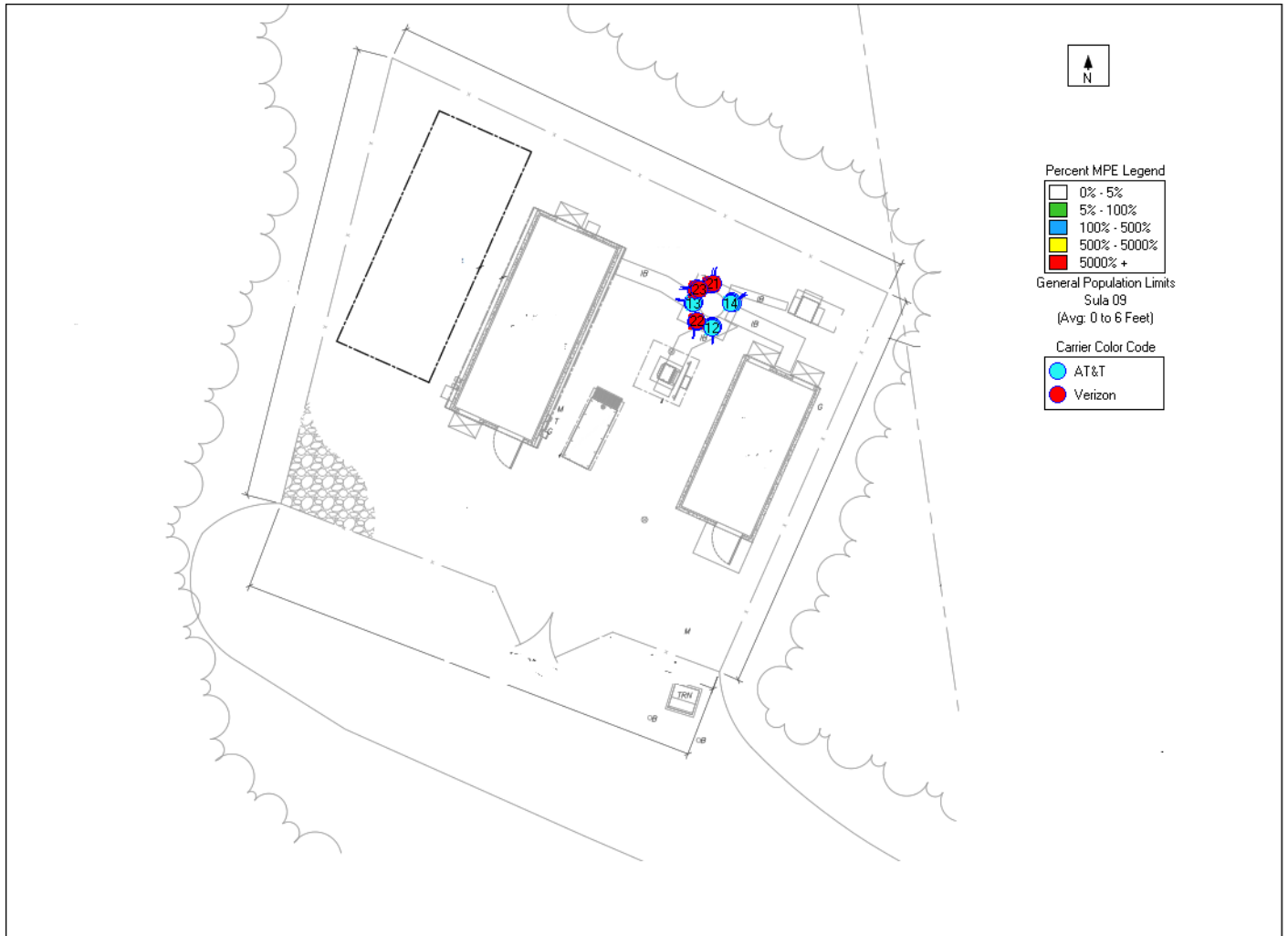
302500 Brst - Bristol							
Antenna Inventory							
Antenna #	Carrier	Antenna Manufacturer	Antenna Model	Frequency Band (MHz)	Azmiuth (°)	Effective Radiated Power (W)	Radiation Center (ft)
1	AT&T	Ericsson	Air 6449	3600-3900	060	70300	126.0
2	AT&T	Ericsson	Air 6449	3600-3900	180	70300	126.0
3	AT&T	Ericsson	Air 6449	3600-3900	280	70300	126.0
4	AT&T	Quintel	QD6616-7	1900/2100	060	42370	124.0
5	AT&T	Quintel	QD6616-7	1900/2100	280	42370	124.0
6	AT&T	Commscope	NNHH-65C-R4	1900	180	7997	124.0
7	AT&T	Quintel	QD6616-7	1900/2100	180	42370	124.0
8	AT&T	CCI	DMP65R-BU8DA	700/800	060	159261	124.0
9	AT&T	CCI	DMP65R-BU8DA	700/800	280	159261	124.0
10	AT&T	CCI	DMP65R-BU6DA	700/800	280	159261	124.0
11	AT&T	Generic	2' Dish	unknown	n/a	500	124.0
12	AT&T	Ericsson	Air 6419	3600-3900	060	70300	122.0
13	AT&T	Ericsson	Air 6419	3600-3900	180	70300	122.0
14	AT&T	Ericsson	Air 6419	3600-3900	280	70300	122.0
15	Verizon	Commscope	NHHSS-45B-R2BT4	3500-3700	010	1216186	112.0
16	Verizon	Commscope	NHHSS-45B-R2BT4	3500-3700	190	1216186	112.0
17	Verizon	Commscope	NHHSS-45B-R2BT4	3500-3700	275	1216186	112.0
18	Verizon	Samsung	MT6413-77A	3700-3900	010	18286	112.0
19	Verizon	Samsung	MT6413-77A	3700-3900	190	18286	112.0
20	Verizon	Samsung	MT6413-77A	3700-3900	275	18286	112.0
21	Verizon	Commscope	NHH-65B-R2B	700/800/1900/2100	010	32167	112.0
22	Verizon	Commscope	NHH-65B-R2B	700/800/1900/2100	190	32167	112.0
23	Verizon	Commscope	NHH-65B-R2B	700/800/1900/2100	275	32167	112.0

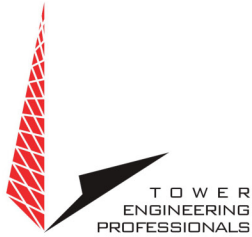
Appendix 3.1 MPE Limit Study



Maximum Power Density (@30'):	0.0017 mW/cm ²
General Population MPE (@30'):	0.2497%
Occupational MPE (@30'):	0.0499%

Appendix 3.2 MPE Limit Study





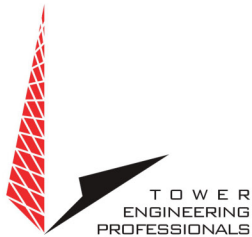
Appendix 4 Information Pertaining to MPE Studies

In 1985, the FCC first adopted guidelines to be used for evaluating human exposure to RF emissions. The FCC revised and updated these guidelines on August 1, 1996, as a result of a rule-making proceeding initiated in 1993. The new guidelines incorporate limits for Maximum Permissible Exposure (MPE) in terms of electric and magnetic field strength and power density for transmitters operating at frequencies between 300 kHz and 100 GHz.

The FCC's MPE limits are based on exposure limits recommended by the National Council on Radiation Protection and Measurements (NCRP), and, over a wide range of frequencies, the exposure limits were developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI) to replace the 1982 ANSI guidelines. Limits for localized absorption are based on recommendations of both ANSI/IEEE and NCRP.

The FCC's limits, and the NCRP and ANSI/IEEE limits on which they are based, are derived from exposure criteria quantified in terms of specific absorption rate (SAR). The basis for these limits is a whole-body averaged SAR threshold level of 4 watts per kilogram (4 W/kg), as averaged over the entire mass of the body, above which expert organizations have determined that potentially hazardous exposures may occur. The MPE limits are derived by incorporating safety factors that lead, in some cases, to limits that are more conservative than the limits originally adopted by the FCC in 1985. Where more conservative limits exist, they do not arise from a fundamental change in the RF safety criteria for whole-body averaged SAR, but from a precautionary desire to protect subgroups of the general population who, potentially, may be more at risk.

The FCC exposure limits are also based on data showing that the human body absorbs RF energy at some frequencies more efficiently than at others. The most restrictive limits occur in the frequency range of 30-300 MHz where whole-body absorption of RF energy by human beings is most efficient. At other frequencies, whole-body absorption is less efficient, and consequently, the MPE limits are less restrictive.



MPE limits are defined in terms of power density (units of milliwatts per centimeter squared: mW/cm^2), electric field strength (units of volts per meter: V/m) and magnetic field strength (units of amperes per meter: A/m). The far-field of a transmitting antenna is where the electric field vector (E), the magnetic field vector (H), and the direction of propagation can be considered to be all mutually orthogonal ("plane-wave" conditions).

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

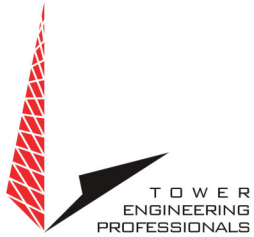
General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment-related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area. Additional details can be found in FCC OET 65.



Appendix 5 MPE Standards Methodology

This study predicts RF field strength and power density levels that emanate from communications system antennae. It considers all transmitter power levels (less filter and line losses) delivered to each active transmitting antenna at the communications site. Calculations are performed to determine power density and MPE levels for each antenna as well as composite levels from all antennas. The calculated levels are based on where a human (Observer) would be standing at various locations at the site. The point of interest where the MPE level is predicted is based on the height of the Observer.

Compliance with the FCC limits on RF emissions are determined by spatially averaging a person's exposure over the projected area of an adult human body, that is approximately six-feet or two-meters, as defined in the ANSI/IEEE C95.1 standard. The MPE limits are specified as time-averaged exposure limits. This means that exposure is averaged over an identifiable time interval. It is 30 minutes for the general population/uncontrolled RF environment and 6 minutes for the occupational/controlled RF environment. However, in the case of the general public, time averaging should not be applied because the general public is typically not aware of RF exposure, and they do not have control of their exposure time. Therefore, it should be assumed that any RF exposure to the general public will be continuous.



The FCC's limits for exposure at different frequencies are shown in the following Tables.

Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3 - 3.0	614	1.63	100*	6
3.0 - 30	1842/f	4.89/f	900/F ²	6
30 - 300	61.4	0.163	1.0	6
300 - 1500	--	--	f/300	6
1500 - 100,000	--	--	5	6

f = frequency

* = Plane-wave equivalent power density



Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

Limits for General Population/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3 - 1.34	614	1.63	100*	30
1.34 - 30	824/f	2.19/f	180/F ²	30
30 -300	27.5	0.073	0.2	30
300 -1500	--	--	f/1500	30
1500 -100,000	--	--	1.0	30

f = frequency

* = Plane-wave equivalent power density

General population/uncontrolled exposures apply in situations in which the general public may be exposed or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

It is important to understand that these limits apply cumulatively to all sources of RF emissions affecting a given area. For example, if several different communications system antennas occupy a shared facility such as a tower or rooftop, then the total exposure from all systems at the facility must be within compliance of the FCC guidelines.



The field strength emanating from an antenna can be estimated based on the characteristics of an antenna radiating in free space. There are basically two field areas associated with a radiating antenna. When close to the antenna, the region is known as the Near Field. Within this region, the characteristics of the RF fields are very complex, and the wave front is extremely curved. As you move further from the antenna, the wave front has less curvature and becomes planar. The wave front still has a curvature, but it appears to occupy a flat plane in space (plane-wave radiation). This region is known as the Far Field.

Two models are utilized to predict Near and Far field power densities. They are based on the formulae in FCC OET 65.

Cylindrical Model (Near Field Predictions)

Spatially averaged plane-wave equivalent power densities parallel to the antenna may be estimated by dividing the antenna input power by the surface area of an imaginary cylinder surrounding the length of the radiating antenna. While the actual power density will vary along the height of the antenna, the average value along its length will closely follow the relation given by the following equation:

$$S = P \div 2\pi RL$$

Where:

S = Power Density

P = Total Power into antenna

R = Distance from the antenna

L = Antenna aperture length



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For directional-type antennas, power densities can be estimated by dividing the input power by that portion of a cylindrical surface area corresponding to the angular beam width of the antenna. For example, for the case of a 120-degree azimuthal beam width, the surface area should correspond to 1/3 that of a full cylinder. This would increase the power density near the antenna by a factor of three over that for a purely omni-directional antenna. Mathematically, this can be represented by the following formula:

$$S = (180 / \theta_{BW}) P \div \pi RL$$

Where:

S = Power Density

θ_{BW} = Beam width of antenna in degrees (3 dB half-power point)

P = Total Power into antenna

R = Distance from the antenna

L = Antenna aperture length

If the antenna is a 360-degree omni-directional antenna, this formula would be equivalent to the previous formula.



Spherical Model (Far Field Predictions)

Spatially averaged plane-wave power densities in the Far Field of an antenna may be estimated by considering the additional factors of antenna gain and reflective waves that would contribute to exposure.

The radiation pattern of an antenna has developed in the Far Field region and the power gain needs to be considered in exposure predictions. Also, if the vertical radiation pattern of the antenna is considered, the exposure predictions would most likely be reduced significantly at ground level, resulting in a more realistic estimate of the actual exposure levels.

Additionally, to model a truly "worst case" prediction of exposure levels at or near a surface, such as at ground-level or on a rooftop, reflection off the surface of antenna radiation power can be assumed, resulting in a potential four-fold increase in power density.

These additional factors are considered, and the Far Field prediction model is determined by the following equation:

$$S = EIRP \times Rc \div 4\pi R^2$$

Where:

S = Power Density

EIRP = Effective Radiated Power from antenna

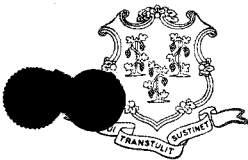
Rc = Reflection Coefficient (2.56)

R = Distance from the antenna

The EIRP includes the antenna gain. If the antenna pattern is considered, the antenna gain is relative based on the horizontal and vertical pattern gain values at that particular location in space, on a rooftop or on the ground. However, it is recommended that the antenna radiation pattern characteristics not be considered to provide a conservative "worst case" prediction. This is the equation is utilized for the Far Field exposure predictions herein.

EXHIBIT 6





STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

136 Main Street, Suite 401
New Britain, Connecticut 06051-4225
Phone: 827-7682

December 20, 1993

Peter J. Tyrrell
Senior Attorney
Springwich Cellular Limited Partnership
227 Church Street
New Haven, CT 06510

Re: PETITION NO. 314 - Springwich Cellular Limited Partnership petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the installation of a new cellular telecommunications monopole tower and cellular antennas at an existing multiple tower site located on South Mountain off Willis Street in Bristol, Connecticut.

Dear Attorney Tyrrell:


At a public meeting on December 15, 1993, the Connecticut Siting Council (Council) ruled that the proposed construction of a 120-foot replacement telecommunications tower, equipment building, security fence, and access road improvements, and the removal of two existing 80-foot towers and a portable equipment building, located off Willis Street in Bristol, Connecticut, would not have a substantial adverse environmental effect and pursuant to Connecticut General Statutes section 16-50k, would not require a Certificate of Environmental Compatibility and Public Need.

The construction is to be implemented as specified in the petition, dated November 22, 1993.

Please notify the Council upon completion of construction.

Enclosed for your information is a copy of the staff report on this project.

Very truly yours,


Mortimer A. Gelston
Chairman

MAG:RKE:mmb
Enclosure

7569E

SCANNED

EXHIBIT 7





AMERICAN TOWER®
CORPORATION

LETTER OF AUTHORIZATION FOR PERMITTING

ATC SITE#/NAME/PROJECT: 302500 / Brst - Bristol / 14430738

SITE ADDRESS: 790 Willis St, Bristol, CT 06010

APN: BRIS M:06 L:8A

LICENSEE: VERIZON WIRELESS d/b/a CELLCO PARTNERSHIP

I, Margaret Robinson, Vice President, UST Legal for American Tower*, owner of the tower facility located at the address identified above (the “Tower Facility”), do hereby authorize VERIZON WIRELESS d/b/a CELLCO PARTNERSHIP, its successors and assigns, and/or its agent, (collectively, the “Licensee”) to act as American Tower’s non-exclusive agent for the sole purpose of filing and consummating any land-use or building permit application(s) as may be required by the applicable permitting authorities for Licensee’s telecommunications’ installation.

I understand that these applications may be approved with conditions. The above authorization is limited to the acceptance by Licensee only of conditions related to Licensee’s installation and any such conditions of approval or modifications will be Licensee’s sole responsibility.

Signature:

Print Name: Margaret Robinson
Vice President, UST Legal
American Tower*

NOTARY BLOCK

Commonwealth of MASSACHUSETTS
County of Middlesex

This instrument was acknowledged before me by Margaret Robinson, Vice President, UST Legal for American Tower*, personally known to me (or proved to me based on satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same.

WITNESS my hand and official seal, this 11th day of July 2023.

NOTARY SEAL



GERARD T. HEFFRON
Notary Public
Commonwealth of Massachusetts
My Commission Expires
August 9, 2024

Notary Public
My Commission Expires: August 9th, 2024

*American Tower includes all affiliates and subsidiaries of American Tower Corporation.

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Package Weight:	1.0 LBS
Reference Number:	14430738

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UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	14430738

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Delivery Time: 1:24 PM

Signed by: MAIL ROOM

CENTERLINE SITE ACQUISITION

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Ship To:	JEFFREY CAGGIANO, MAYOR 111 NORTH MAIN STREET MAYORS OFFICE 3RD FLOOR BRISTOL, CT 060108107 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	14430738

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UPS <pkginfo@ups.com>

Wed 2/14/2024 1:26 PM

To: Barbara Kassabian <BKASSABIAN@CLINELLC.COM>



Hello, your package has been delivered.

Delivery Date: Wednesday, 02/14/2024

Delivery Time: 1:24 PM

Signed by: MAIL ROOM

CENTERLINE SITE ACQUISITION

Tracking Number:	1Z9Y45030320655233
Ship To:	THOMAS DAMON SMITH 111 NORTH MAIN STREET 2ND FLOOR BRISTOL, CT 060108107 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	14430738

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