

Alex Murshteyn, Site Acquisition Consultant
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
750 West Center Street, Floor 3
West Bridgewater, MA 02379
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

March 20, 2020

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

**RE: Notice of Exempt Modification // Site: Waterbury CT (ATC: 302476)
(1) Farmdale Drive (aka Off Garden Circle), Waterbury, CT 06704
N 41.57066 // W 72.0176**

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless currently maintains 9 antennas at the 129-foot level on the existing 150-foot guyed monopole tower, located at Farmdale Drive (off Garden Circle), Waterbury, CT. The Council approved Verizon Wireless use of the tower in 1994. The tower is owned by American Tower. The property is owned by Springwich Cellular Tower Holdings, LLC and AT&T c/o American Tower. Verizon Wireless now intends to remove 6 of its existing antennas and to update existing equipment as part of its (700/850/1900/2100/3500 MHz) PCS/AWS/LTE/CBRS upgrade. Additionally, Verizon Wireless will replace all of its remote radio head units (RRUs) and over-voltage protectors (OVPs) with 9 new RRUs, 1 OVP and 3 diplexers, and remove and upgrade certain cabling; altogether updating leased equipment rights, as reflected by the final configuration outlined in the structural analysis and proposed hereby.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Neil O'Leary, Mayor for the City of Waterbury via his Executive Secretary Tiadora Santiago, City Planner James A. Sequin, AICP, including for the City Plan Commission and Planning Department and American Tower, as tower owner and in care of the ground owner.

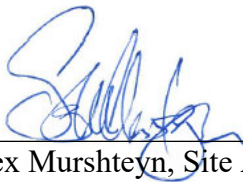
The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2). Enclosed to accommodate this filing are construction drawings dated March 6, 2020, structural analysis dated December 12, 2019 and antenna mount analysis dated February 11, 2020 by A.T. Engineering Service, PLLC, as well as radio frequency

(RF) analysis table showing worst-case RF emission calculation by Verizon Wireless RF Design Engineering.

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 by A.T. Engineering Service, PLLC, dated December 12, 2019 and mount analysis dated February 11, 2020.

For the foregoing reasons, Verizon Wireless respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,



Alex Murshteyn, Site Acquisition Consultant
c/o Cellco Partnership d/b/a Verizon Wireless
Centerline Communications, LLC
750 West Center Street, Floor 3
West Bridgewater, MA 02379
Mobile: (508) 821-0159
AMurshteyn@centerlinecommunications.com

Attachments

cc: Neil O'Leary, Mayor - as elected official
James A. Sequin, City Planner - as P&Z official
American Tower Corporation - as tower owner and c/o property owner

DOCKET NO. 44

AN APPLICATION SUBMITTED BY THE SOUTHERN : CONNECTICUT SITING
NEW ENGLAND TELEPHONE COMPANY FOR A :
CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY : COUNCIL
AND PUBLIC NEED FOR THE CONSTRUCTION,
MAINTENANCE AND OPERATION OF FACILITIES TO
PROVIDE CELLULAR SERVICE IN NEW HAVEN COUNTY : July 24, 1984

D E C I S I O N A N D O R D E R

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut, revisions of 1958, revised to 1983, as amended, be issued to the Southern New England Telephone Company for the construction, operation, and maintenance of a telecommunications tower and associated equipment to provide cellular service at each of the following sites:

Jasudowich tract, Brushy Plain Road, Branford, Connecticut;
Town of Guilford tract, Tanner Marsh Road, Guilford, Connecticut;
Bridgeport Avenue, Milford, Connecticut;
Quagliaro tract, Farmdale Drive, Waterbury, Connecticut;
Pease Road, Woodbridge, Connecticut; and
Dwight Street, North Haven, Connecticut.

The facilities shall be constructed, operated, and maintained as specified in the Council's record on this matter, and subject to the following conditions:

1. The towers including antennas shall be no taller than necessary to provide the proposed service and in no event shall exceed
 - a) 167' at the Branford site,
 - b) 167' at the Guilford site,
 - c) 117' at the Milford site,
 - d) 167' at the Waterbury site,
 - e) 167' at the Woodbridge site,
 - f) 167' at the North Haven site;
2. A fence not lower than eight feet shall surround each tower and its associated equipment;

3. The applicant or its successor shall notify the Council if and when directional antennas or any other equipment is added to any of these facilities;
4. The applicant or its successor shall permit, in accordance with representations made by it during the proceeding, public or private entities to share space on the facilities, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing;
5. Unless necessary to comply with condition number six, below, no lights shall be installed on any of these towers;
6. The facilities shall be constructed in accordance with all applicable federal, state, and municipal laws and regulations;
7. The applicant shall submit a development and management plan (D&M) for the Branford, Milford, Woodbridge, and North Haven sites pursuant to sections 16-50j-85 through 16-50j-87 of the regulations of state agencies, except that irrelevant items in section 16-50j-86 need only be identified as such. The D&M plans shall include appropriate evergreen screening of the sites, erosion control measures, reseeding plans, and tree removal plans. The applicant shall comply with the reporting requirements of section 16-50j-87 for all sites;
8. Construction activities shall take place during daylight working hours;
9. This decision and order shall be void and the towers and associated equipment approved herein shall be dismantled and removed, or reapplication for any new use shall be made to the Connecticut

Siting Council before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction;

10. This decision and order shall be void if all construction authorized is not completed within three years of the issuance of this decision.

Pursuant to section 16-50p of the General Statutes, we hereby direct that a copy of the opinion and decision and order be served on each person listed below. A notice of the issuance shall be published in the Hartford Courant, New Haven Register, and the Waterbury Republican.

The parties to this proceeding are

The Southern New England Telephone Company (Applicant)
Room 314
227 Church Street
New Haven, Connecticut 06506

ATTENTION: Mr. Peter J. Tyrrell (its attorney)
Senior Attorney

Town of Hamden represented by:
Peter F. Villano, Mayor
Shirley Gonzales, Town Planner
Mr. Hugh Manke, Esquire
Office of the Town Attorney
Memorial Town Hall
2372 Whitney Avenue
Hamden, Connecticut 06518

Inland Wetlands Agency represented by:
Town of Woodbridge
Robert J. Klancko
Chairman
Town Hall
11 Meeting House Lane
Woodbridge, Connecticut 06525

Town Plan and Zoning
Commission
Town of Woodbridge

represented by:

Norman Fineberg
Chairman
Town Hall
11 Meeting House Lane
Woodbridge, Connecticut 06525

The Honorable Peter M. Lerner
State Representative
State of Connecticut
House of Representatives
State Capitol
Hartford, Connecticut 06115

John Menta
Felicia Tencza

represented by:

Ms. Felicia Tencza
580 Gaylord Mountain Road
Hamden, Connecticut 06518

Ms. Renee Robinson
265 Blue Trail
Hamden, Connecticut 06518

(service waived)

Irene L. Wong
Edson H. Mount
Dr. & Mrs. H.M. Fiskio
Dr. & Mrs. Alexander Gottschalk

represented by:

Dr. & Mrs. Alexander Gottschalk
230 Six Rod Highway
Hamden, Connecticut 06518

The Sleeping Giant Park Association

represented by:

Mr. Dag Pfeiffer
President
Box 14
Quinnipiac College
Hamden, Connecticut 06518

West Rock Ridge Park Association

represented by:

Mr. William L. Dohney, Jr., D.D.S.
President
220 Mountain Road
Hamden, Connecticut 06514

Sierra Club

represented by:

Ms. M. Kim Yanoshick
Executive Director
Hartford Chapter
118 Oak Street
Hartford, Connecticut 06106

Quinnipiac College

represented by:

Mr. Richard A. Terry
President
Hamden, Connecticut 06518

Guilford Conservation Commission

represented by:

Ms. Carolyn K. Evans
Chairman
Town Hall
Park Street
Guilford, Connecticut 06437

Mrs. Barbara R. Peterson
Mary & Phil Faust
Anita L. & Richard M. Sullivan

represented by:

Anita L. & Richard M. Sullivan
315 Chestnut Lane
Hamden, Connecticut 06518

Mrs. Pauline H. Hoff

represented by:

Herbert L. Emanuelson, Jr.
Emanuelson and Wynne
205 Church Street
New Haven, Connecticut 06510

Hamden League of Women Voters

represented by:

Mrs. Sherrill Zoller
605 West Woods Road
Hamden, Connecticut 06518
(service waived)

Joan Rosenberg
230 Ridewood Avenue
Hamden, Connecticut 06517

Mr. & Mrs. Richard Sykes
110 Blue Trail
Hamden, Connecticut 06518

Thomas & Claudia Sullivan, Jr.
100 Blue Trail
Hamden, Connecticut 06518

Mr. William N. Pantalone
27 Pease Road
Woodbridge, Connecticut 06525

(service waived)

INTERVENORS

Metromedia TeleCommunications
Nutmeg Telecommunications, Inc.
CSI of New Haven
CSI of Stamford
Cellular Communications, Inc.
LIN Cellular Corp.
Cellular Mobile Services
Maxcell TeleCommunications, Inc.
Mobile Cellular Telephone, Inc.
Cellular Dynamics
Connecticut Corridor Cellular
Chase/Post Cellular

represented by:

Dwight A. Johnson
Murtha, Cullina, Richter
and Pinney
101 Pearl Street
P.O. Box 3197
Hartford, Connecticut 06103-0197

C E R T I F I C A T I O N

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:


Dated at New Britain, Connecticut, this 24th day of July, 1984.

<u>Council Members</u>	<u>Vote Cast</u>
_____) Gloria Dibble Pond Chairperson	Absent
_____) Commissioner John Downey Designee: Commissioner Peter G. Boucher	Absent
<i>Brian Emerick</i> _____) Commissioner Stanley Pac Designee: Brian Emerick	Yes Absent Abstain
<i>Owen L. Clark</i> _____) Owen L. Clark	Yes
<i>Fred J. Doocy</i> _____) Fred J. Doocy	Yes
<i>Mortimer A. Gelston</i> _____) Mortimer A. Gelston	Yes
<i>James G. Horsfall</i> _____) James G. Horsfall	Yes
_____) Janet Sitty	Absent
<i>Colin C. Tait</i> _____) Colin C. Tait Acting Chairperson	Yes

STATE OF CONNECTICUT)
 :
COUNTY OF HARTFORD) ss. New Britain, July 24, 1984

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:



Christopher S. Wood, Executive Director
Connecticut Siting Council



AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure : 150 ft Guyed Monopole
ATC Site Name : Wtbr - Waterbury, CT
ATC Asset Number : 302476
Engineering Number : 13002888_C3_02
Proposed Carrier : VERIZON WIRELESS
Carrier Site Name : WATERBURY CT
Carrier Site Number : 469238
Site Location : 352 Garden Circle
Waterbury, CT 06704-2833
41.570700,-73.017600
County : New Haven
Date : December 12, 2019
Max Usage : 93%
Result : Pass

Prepared By:
Garret D. Heath
Structural Engineer I

Reviewed By:



COA: PEC.0001553



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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 150 ft guyed monopole to reflect the change in loading by VERIZON WIRELESS.

Supporting Documents

Tower Drawings	SpectraSite Site #CT-0012, Rev 1, dated November 18, 2004
Foundation Drawing	Girard & Co. Engineers Job #38926, dated July 10, 1984

Analysis

The tower was analyzed using tnxTower version 8.0.5.0 tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	97 mph (3-Second Gust V_{asd}) / 125 mph (3-Second Gust V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft

Conclusion

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

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



Existing and Reserved Equipment

Elev. ¹ (ft)	Qty	Antenna	Mount Type	Lines	Carrier
154.0	1	CCI OPA-65R-LCUU-H6	T-Arm with Platform	(2) 0.39" (10mm) Fiber Trunk (6) 0.78" (19.7mm) 8 AWG 6 (12) 1 1/4" Coax	AT&T MOBILITY
	2	Raycap DC6-48-60-18-8F			
	3	ADC DD1900			
	3	Ericsson RRUS 4478 B14			
	3	Ericsson RRUS 32 (50.8 lbs)			
	3	Ericsson RRUS 32 B2			
	3	Ericsson RRUS 32 B66			
	3	Ericsson RRUS 11 B12			
	3	Powerwave Allgon 7770.00			
	1	Quintel QS66512-2			
	1	Raycap DC6-48-60-0-8F (24" Height)			
	2	CCI OPA-65R-LCUU-H8 (92.7")			
	2	CCI TPA-65R-LCUUUU-H8			
	1	Kathrein Scala 80010965			
	2	Kathrein Scala 80010966			
6	CCI TPX-070821				
3	CCI DTMABP7819VG12A				
129.0	3	Amphenol Antel BXA-80063-4CF-EDIN-X	Platform with Handrails	(2) 1 5/8" Hybriflex	VERIZON WIRELESS
	1	Raycap RCMDC-6627-PF-48			

Equipment to be Removed

Elev. ¹ (ft)	Qty	Antenna	Mount Type	Lines	Carrier
129.0	3	Alcatel-Lucent RRH4x30W-B25	-	-	VERIZON WIRELESS
	3	Alcatel-Lucent B13 RRH4x30-4R 700U			
	3	Alcatel-Lucent B66 RRH4x45			
	3	Nokia B5 RRH4x40-850			
	2	Commscope JAHH-45B-R3B			
	6	RFS FD9R6004/2C-3L (3.1 lbs)			
	4	Commscope JAHH-65B-R3B			

Proposed Equipment

Elev. ¹ (ft)	Qty	Antenna	Mount Type	Lines	Carrier
129.0	3	Commscope SSPX310R	Platform with Handrails	-	VERIZON WIRELESS
	6	Commscope JAHH-65C-R3B-V2			
	3	Commscope CBC78T-DS-43-2X			
	3	Samsung Outdoor CBRS 20W RRH			
	3	Samsung B5/B13 RRH-BR04C			
	3	Samsung B2/B66A RRH-BR049			

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



Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	12%	Pass
Shaft	93%	Pass
Base Plate	9%	Pass
Guys	71%	Pass
Flanges	73%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Base Moment (Kips-Ft)	185.5	5%
Anchor Resultant (Kips)	33.9	67%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (in)	Sway (Rotation) (°)
129.0	Commscope SSPX310R	VERIZON WIRELESS	2.864	0.568
	Commscope JAHH-65C-R3B-V2			
	Commscope CBC78T-DS-43-2X			
	Samsung Outdoor CBRS 20W RRH			
	Samsung B5/B13 RRH-BR04C			
	Samsung B2/B66A RRH-BR049			

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



Standard Conditions

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

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

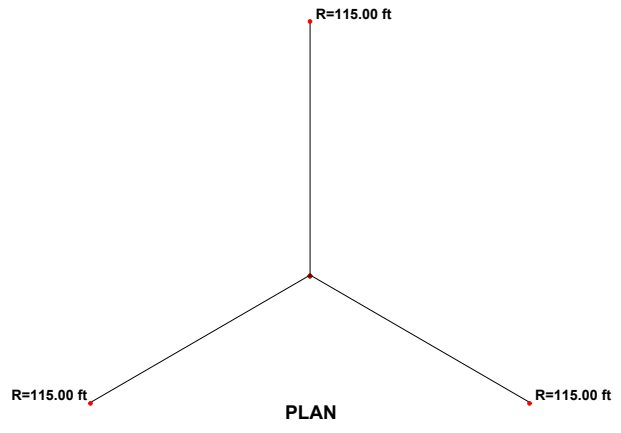
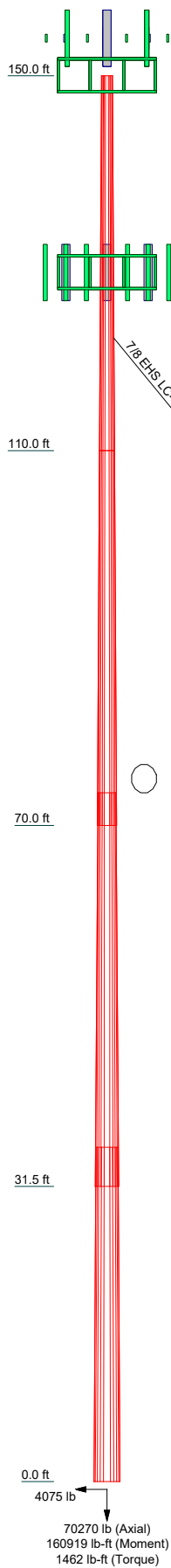
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

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

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

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

Section	1	2	3	4
Length (ft)	40.00	40.00	42.00	35.67
Number of Sides	12	12	12	12
Thickness (in)	0.1875	0.2500	0.3125	0.3750
Socket Length (ft)		3.50	4.17	
Top Dia (in)	15.0000	21.2500	26.5535	31.8255
Bot Dia (in)	21.2500	27.6100	33.1000	37.3800
Grade		A572-65		
Weight (lb)	1474.1	2649.4	4244.5	5016.1



DESIGNED APPURTENANCE LOADING

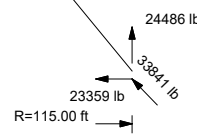
TYPE	ELEVATION	TYPE	ELEVATION
RRUS 32 B66	150	QS66512-2	150
RRUS 32 B66	150	TPA-65R-LCUUUU-H8	150
RRUS 32 B66	150	TPA-65R-LCUUUU-H8	150
7770.00	150	80010965	150
7770.00	150	80010966	150
7770.00	150	80010966	150
DC6-48-60-18-8F	150	(2) TPX-070821	150
DC6-48-60-18-8F	150	(2) TPX-070821	150
DTMABP7819VG12A	150	(2) TPX-070821	150
DTMABP7819VG12A	150	10.75' Flat Platform w/ Handrails	129
DTMABP7819VG12A	150	BXA-80063-4CF-EDIN-X	129
DD1900	150	BXA-80063-4CF-EDIN-X	129
DD1900	150	BXA-80063-4CF-EDIN-X	129
DD1900	150	RCMDC-6627-PF-48	129
RRUS 32 (50.8 lbs)	150	CBC78T-DS-43-2X	129
RRUS 32 (50.8 lbs)	150	Outdoor CBRS 20W RRH	129
RRUS 32 (50.8 lbs)	150	B2/B66A RRH-BR049	129
DC6-48-60-0-8F	150	B5/B13 RRH-BR04C	129
RRUS 4478 B14	150	SSPX310R	129
RRUS 4478 B14	150	(2) JAHH-65C-R3B-V2	129
RRUS 4478 B14	150	CBC78T-DS-43-2X	129
RRUS 32 B2	150	Outdoor CBRS 20W RRH	129
RRUS 32 B2	150	B2/B66A RRH-BR049	129
RRUS 32 B2	150	B5/B13 RRH-BR04C	129
RRUS 11 B12	150	SSPX310R	129
RRUS 11 B12	150	(2) JAHH-65C-R3B-V2	129
RRUS 11 B12	150	CBC78T-DS-43-2X	129
OPA-65R-LCUU-H6	150	Outdoor CBRS 20W RRH	129
OPA-65R-LCUU-H8 (92.7")	150	B2/B66A RRH-BR049	129
OPA-65R-LCUU-H8 (92.7")	150	B5/B13 RRH-BR04C	129
Flat T-Arms w/ Platforms	150	SSPX310R	129
Flat T-Arms w/ Platforms	150	(2) JAHH-65C-R3B-V2	129
Flat T-Arms w/ Platforms	150		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 92.5%



ALL REACTIONS ARE FACTORED

ATC Engineering 3500 Regency Parkway, Suite 100 Cary, NC 27518-7723 Phone: (919) 466-5121 FAX: (919) 466-5415 Engineering	Job: 302476 - Wtbr - Waterbury, CT		
	Project: 13002888_C3_02		
	Client: Verizon Wireless	Drawn by: Garret.Heath	App'd:
	Code: TIA-222-G	Date: 12/12/19	Scale: NTS
Path:		Dwg No. E-1	

tnxTower ATC Engineering 3500 Regency Parkway, Suite 100 Cary, NC 27518-7723 Phone: (919) 466-5121 FAX: (919) 466-5415	Job 302476 - Wtbr - Waterbury, CT	Page 1 of 14
	Project 13002888_C3_02	Date 09:59:06 12/12/19
	Client Verizon Wireless	Designed by Garret.Heath

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- Tower is located in New Haven County, Connecticut.
- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 97 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Safety factor used in guy design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <li style="text-align: center;">Poles √ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known |
|--|---|---|

Tapered Pole Section Geometry

Section	Elevation	Section Length	Splice Length	Number of Sides	Top Diameter	Bottom Diameter	Wall Thickness	Bend Radius	Pole Grade
	ft	ft	ft		in	in	in	in	

tnxTower ATC Engineering 3500 Regency Parkway, Suite 100 Cary, NC 27518-7723 Phone: (919) 466-5121 FAX: (919) 466-5415	Job	302476 - Wtbr - Waterbury, CT	Page	2 of 14
	Project	13002888_C3_02	Date	09:59:06 12/12/19
	Client	Verizon Wireless	Designed by	Garret.Heath

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-110.00	40.00	0.00	12	15.0000	21.2500	0.1875	4.0000	A572-65 (65 ksi)
L2	110.00-70.00	40.00	3.50	12	21.2500	27.6100	0.2500	4.0000	A572-65 (65 ksi)
L3	70.00-31.50	42.00	4.17	12	26.5535	33.1000	0.3125	4.0000	A572-65 (65 ksi)
L4	31.50-0.00	35.67		12	31.8255	37.3800	0.3750	4.0000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	15.4630	8.9430	250.4541	5.3029	7.7700	32.2335	507.4880	4.4015	3.5175	18.76
	21.9335	12.7165	720.0669	7.5404	11.0075	65.4160	1459.0508	6.2587	5.1925	27.693
L2	21.9114	16.9050	951.5678	7.5180	11.0075	86.4472	1928.1342	8.3201	5.0250	20.1
	28.4958	22.0248	2104.4088	9.7949	14.3020	147.1411	4264.1028	10.8399	6.7295	26.918
L3	27.9448	26.4050	2320.7747	9.3943	13.7547	168.7258	4702.5188	12.9957	6.2788	20.092
	34.1574	32.9924	4527.0653	11.7379	17.1458	264.0335	9173.0615	16.2379	8.0333	25.707
L4	33.4877	37.9765	4794.6345	11.2593	16.4856	290.8376	9715.2293	18.6909	7.5242	20.065
	38.5663	44.6835	7810.0590	13.2478	19.3628	403.3530	15825.2970	21.9919	9.0128	24.034

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _f	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 150.00-110.00				1	1	1			
L2 110.00-70.00				1	1	1			
L3 70.00-31.50				1	1	1			
L4 31.50-0.00				1	1	1			

Guy Data

Guy Elevation ft	Guy Grade	Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L _u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
122	EHS	A 7/8	7970.00	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%
		B 7/8	7970.00	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%
		C 7/8	7970.00	10%	19000	1.581	166.95	115.00	0.0000	0.00	100%

Guy Data(cont'd)

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Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
122	Corner						

Guy Data (cont'd)

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
122.00	A572-50 (50 ksi)	Solid Round			No	A572-50 (50 ksi)	Solid Round	1 1/4

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
122	263.95	263.95	263.95		2.73	2.73	2.73	
					2.9 sec/pulse	2.9 sec/pulse	2.9 sec/pulse	

Guy Data (cont'd)

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm		Pull Off		Diagonal	
			K _x	K _y	K _x	K _y	K _x	K _y
122	No	No			1	1	1	1

Guy Data (cont'd)

Guy Elevation ft	Torque-Arm				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U
122	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

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Guy Elevation ft	Guy Location	z ft	q _z psf	q _z Ice psf	Ice Thickness in
122	A	61.00	20	5	1.5950
	B	61.00	20	5	1.5950
	C	61.00	20	5	1.5950

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
0.78" (19.7 mm) 8 AWG 6	A	No	Surface Ar (CaAa)	150.00 - 7.00	2	2	-0.200 0.200	0.7800		0.59
0.39" (10mm) Fiber Trunk **	A	No	Surface Ar (CaAa)	150.00 - 7.00	1	1	0.200 0.250	0.3900		0.07
1 5/8" Hybriflex	C	No	Surface Ar (CaAa)	129.00 - 7.00	1	1	0.250 0.260	1.9800		1.30
1 5/8" Hybriflex	C	No	Surface Ar (CaAa)	129.00 - 7.00	1	1	0.250 0.260	1.9800		1.30

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _{AA}	Weight plf
1 1/4" Coax	A	No	No	Inside Pole	150.00 - 7.00	12	No Ice	0.63
							1/2" Ice	0.63
							1" Ice	0.63
0.39" (10mm) Fiber Trunk	A	No	No	Inside Pole	150.00 - 7.00	1	No Ice	0.07
							1/2" Ice	0.07
							1" Ice	0.07
0.78" (19.7 mm) 8 AWG 6	A	No	No	Inside Pole	150.00 - 7.00	4	No Ice	0.59
							1/2" Ice	0.59
							1" Ice	0.59

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	150.00-110.00	A	0.000	0.000	7.800	0.000	449.60
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.524	0.000	49.40
L2	110.00-70.00	A	0.000	0.000	7.800	0.000	449.60
		B	0.000	0.000	0.000	0.000	0.00

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L3	70.00-31.50	C	0.000	0.000	15.840	0.000	104.00
		A	0.000	0.000	7.507	0.000	432.74
		B	0.000	0.000	0.000	0.000	0.00
L4	31.50-0.00	C	0.000	0.000	15.246	0.000	100.10
		A	0.000	0.000	4.777	0.000	275.38
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	9.702	0.000	63.70

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	150.00-110.00	A	1.719	0.000	0.000	40.305	0.000	880.52
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	20.590	0.000	344.65
L2	110.00-70.00	A	1.657	0.000	0.000	39.191	0.000	855.05
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	42.357	0.000	693.17
L3	70.00-31.50	A	1.566	0.000	0.000	37.721	0.000	822.99
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	40.768	0.000	667.17
L4	31.50-0.00	A	1.390	0.000	0.000	22.994	0.000	501.46
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	25.045	0.000	396.01

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	150.00-110.00	-1.2954	0.3710	-2.3207	-0.2599
L2	110.00-70.00	-1.7198	1.1563	-3.0123	0.8033
L3	70.00-31.50	-1.7753	1.1843	-3.3187	0.8651
L4	31.50-0.00	-1.4400	0.9564	-2.9025	0.7627

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	4	0.78" (19.7 mm) 8 AWG 6	110.00 - 150.00	1.0000	1.0000
L1	5	0.39" (10mm) Fiber Trunk	110.00 - 150.00	1.0000	1.0000
L1	10	1 5/8" Hybriflex	110.00 -	1.0000	1.0000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L1	11	1 5/8" Hybriflex	129.00 110.00 - 129.00	1.0000	1.0000
L2	4	0.78" (19.7 mm) 8 AWG 6	70.00 - 110.00	1.0000	1.0000
L2	5	0.39" (10mm) Fiber Trunk	70.00 - 110.00	1.0000	1.0000
L2	10	1 5/8" Hybriflex	70.00 - 110.00	1.0000	1.0000
L2	11	1 5/8" Hybriflex	70.00 - 110.00	1.0000	1.0000
L3	4	0.78" (19.7 mm) 8 AWG 6	31.50 - 70.00	1.0000	1.0000
L3	5	0.39" (10mm) Fiber Trunk	31.50 - 70.00	1.0000	1.0000
L3	10	1 5/8" Hybriflex	31.50 - 70.00	1.0000	1.0000
L3	11	1 5/8" Hybriflex	31.50 - 70.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	lb	
RRUS 32 B66	A	From Leg	5.00	0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11
			4.00			1" Ice	3.19	2.05	98.42
RRUS 32 B66	B	From Leg	5.00	0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11
			4.00			1" Ice	3.19	2.05	98.42
RRUS 32 B66	C	From Leg	5.00	0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11
			4.00			1" Ice	3.19	2.05	98.42
7770.00	A	From Leg	5.00	0.0000	150.00	No Ice	5.51	2.93	35.00
			0.00			1/2" Ice	5.87	3.27	67.63
			4.00			1" Ice	6.23	3.63	105.06
7770.00	B	From Leg	5.00	0.0000	150.00	No Ice	5.51	2.93	35.00
			0.00			1/2" Ice	5.87	3.27	67.63
			4.00			1" Ice	6.23	3.63	105.06
7770.00	C	From Leg	5.00	0.0000	150.00	No Ice	5.51	2.93	35.00
			0.00			1/2" Ice	5.87	3.27	67.63
			4.00			1" Ice	6.23	3.63	105.06
DC6-48-60-18-8F	B	From Leg	5.00	0.0000	150.00	No Ice	1.11	1.47	31.80
			0.00			1/2" Ice	1.67	1.67	49.52
			4.00			1" Ice	1.88	1.88	69.72
DC6-48-60-18-8F	C	From Leg	5.00	0.0000	150.00	No Ice	1.11	1.47	31.80
			0.00			1/2" Ice	1.67	1.67	49.52
			4.00			1" Ice	1.88	1.88	69.72
DTMABP7819VG12A	A	From Leg	5.00	0.0000	150.00	No Ice	0.97	0.39	19.20
			0.00			1/2" Ice	1.36	0.49	26.49
			4.00			1" Ice	1.43	0.60	35.63
DTMABP7819VG12A	B	From Leg	5.00	0.0000	150.00	No Ice	0.97	0.39	19.20
			0.00			1/2" Ice	1.36	0.49	26.49
			4.00			1" Ice	1.43	0.60	35.63
DTMABP7819VG12A	C	From Leg	5.00	0.0000	150.00	No Ice	0.97	0.39	19.20
			0.00			1/2" Ice	1.36	0.49	26.49
			4.00			1" Ice	1.43	0.60	35.63
DD1900	A	From Leg	5.00	0.0000	150.00	No Ice	1.09	0.30	12.10

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
			0.00			1/2" Ice	1.43	0.40	19.21
			4.00			1" Ice	1.59	0.51	28.18
DD1900	B	From Leg	5.00	0.0000	150.00	No Ice	1.09	0.30	12.10
			0.00			1/2" Ice	1.43	0.40	19.21
			4.00			1" Ice	1.59	0.51	28.18
DD1900	C	From Leg	5.00	0.0000	150.00	No Ice	1.09	0.30	12.10
			0.00			1/2" Ice	1.43	0.40	19.21
			4.00			1" Ice	1.59	0.51	28.18
RRUS 32 (50.8 lbs)	A	From Leg	4.00	0.0000	150.00	No Ice	2.69	1.57	50.80
			0.00			1/2" Ice	3.53	2.06	71.30
			4.00			1" Ice	4.37	2.55	91.80
RRUS 32 (50.8 lbs)	B	From Leg	4.00	0.0000	150.00	No Ice	2.69	1.57	50.80
			0.00			1/2" Ice	3.53	2.06	71.30
			4.00			1" Ice	4.37	2.55	91.80
RRUS 32 (50.8 lbs)	C	From Leg	4.00	0.0000	150.00	No Ice	2.69	1.57	50.80
			0.00			1/2" Ice	3.53	2.06	71.30
			4.00			1" Ice	4.37	2.55	91.80
DC6-48-60-0-8F	A	From Leg	5.00	0.0000	150.00	No Ice	1.28	1.28	32.80
			0.00			1/2" Ice	1.46	1.46	50.52
			4.00			1" Ice	1.64	1.64	68.24
RRUS 4478 B14	A	From Leg	5.00	0.0000	150.00	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.10	1.27	75.78
			4.00			1" Ice	2.36	1.48	91.66
RRUS 4478 B14	B	From Leg	5.00	0.0000	150.00	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.10	1.27	75.78
			4.00			1" Ice	2.36	1.48	91.66
RRUS 4478 B14	C	From Leg	5.00	0.0000	150.00	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.10	1.27	75.78
			4.00			1" Ice	2.36	1.48	91.66
RRUS 32 B2	A	From Leg	5.00	0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11
			4.00			1" Ice	3.19	2.05	98.42
RRUS 32 B2	B	From Leg	5.00	0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11
			4.00			1" Ice	3.19	2.05	98.42
RRUS 32 B2	C	From Leg	5.00	0.0000	150.00	No Ice	2.74	1.67	53.00
			0.00			1/2" Ice	2.96	1.86	74.11
			4.00			1" Ice	3.19	2.05	98.42
RRUS 11 B12	A	From Leg	5.00	0.0000	150.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.11	1.42	71.57
			4.00			1" Ice	3.43	1.65	92.44
RRUS 11 B12	B	From Leg	5.00	0.0000	150.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.11	1.42	71.57
			4.00			1" Ice	3.43	1.65	92.44
RRUS 11 B12	C	From Leg	5.00	0.0000	150.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.11	1.42	71.57
			4.00			1" Ice	3.43	1.65	92.44
OPA-65R-LCUU-H6	A	From Leg	5.00	0.0000	150.00	No Ice	9.66	5.52	73.00
			0.00			1/2" Ice	10.13	5.97	131.43
			4.00			1" Ice	10.61	6.43	196.17
OPA-65R-LCUU-H8 (92.7")	B	From Leg	5.00	0.0000	150.00	No Ice	12.75	7.25	88.00
			0.00			1/2" Ice	13.33	7.82	159.29
			4.00			1" Ice	13.92	8.40	238.16
OPA-65R-LCUU-H8 (92.7")	C	From Leg	5.00	0.0000	150.00	No Ice	12.75	7.25	88.00
			0.00			1/2" Ice	13.33	7.82	159.29
			4.00			1" Ice	13.92	8.40	238.16
Flat T-Arms w/ Platforms	A	None		0.0000	150.00	No Ice	17.90	8.95	400.00

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Lateral						Vert
						1/2" Ice	22.20	13.00	510.00	
						1" Ice	26.50	17.05	620.00	
Flat T-Arms w/ Platforms	B	None			0.0000	150.00	No Ice	17.90	8.95	400.00
							1/2" Ice	22.20	13.00	510.00
							1" Ice	26.50	17.05	620.00
Flat T-Arms w/ Platforms	C	None			0.0000	150.00	No Ice	17.90	8.95	400.00
							1/2" Ice	22.20	13.00	510.00
							1" Ice	26.50	17.05	620.00
QS66512-2	A	From Leg	5.00		0.0000	150.00	No Ice	8.13	6.80	111.00
			0.00				1/2" Ice	8.82	7.50	168.20
			4.00				1" Ice	9.51	8.20	225.40
TPA-65R-LCUUUU-H8	B	From Leg	5.00		0.0000	150.00	No Ice	13.30	8.82	82.10
			0.00				1/2" Ice	13.90	9.42	161.56
			4.00				1" Ice	14.50	10.03	248.92
TPA-65R-LCUUUU-H8	C	From Leg	5.00		0.0000	150.00	No Ice	13.30	8.82	82.10
			0.00				1/2" Ice	13.90	9.42	161.56
			4.00				1" Ice	14.50	10.03	248.92
80010965	A	From Leg	5.00		0.0000	150.00	No Ice	13.81	5.83	97.60
			0.00				1/2" Ice	14.62	6.57	174.13
			4.00				1" Ice	15.43	7.31	250.66
80010966	B	From Leg	5.00		0.0000	150.00	No Ice	17.36	7.50	114.60
			0.00				1/2" Ice	18.31	8.39	206.78
			4.00				1" Ice	19.26	9.28	298.96
80010966	C	From Leg	5.00		0.0000	150.00	No Ice	17.36	7.50	114.60
			0.00				1/2" Ice	18.31	8.39	206.78
			4.00				1" Ice	19.26	9.28	298.96
(2) TPX-070821	A	From Leg	5.00		0.0000	150.00	No Ice	0.47	0.18	7.50
			0.00				1/2" Ice	0.56	0.25	10.98
			4.00				1" Ice	0.66	0.32	15.80
(2) TPX-070821	B	From Leg	5.00		0.0000	150.00	No Ice	0.47	0.18	7.50
			0.00				1/2" Ice	0.56	0.25	10.98
			4.00				1" Ice	0.66	0.32	15.80
(2) TPX-070821	C	From Leg	5.00		0.0000	150.00	No Ice	0.47	0.18	7.50
			0.00				1/2" Ice	0.56	0.25	10.98
			4.00				1" Ice	0.66	0.32	15.80

10.75' Flat Platform w/ Handrails	B	None			0.0000	129.00	No Ice	26.40	26.40	2000.00
							1/2" Ice	32.40	32.40	2450.00
							1" Ice	38.40	38.40	2900.00
BXA-80063-4CF-EDIN-X	A	From Leg	5.00		0.0000	129.00	No Ice	4.71	2.25	9.90
			0.00				1/2" Ice	5.55	2.55	37.73
			0.00				1" Ice	5.94	2.85	69.84
BXA-80063-4CF-EDIN-X	B	From Leg	5.00		0.0000	129.00	No Ice	4.71	2.25	9.90
			0.00				1/2" Ice	5.55	2.55	37.73
			0.00				1" Ice	5.94	2.85	69.84
BXA-80063-4CF-EDIN-X	C	From Leg	5.00		0.0000	129.00	No Ice	4.71	2.25	9.90
			0.00				1/2" Ice	5.55	2.55	37.73
			0.00				1" Ice	5.94	2.85	69.84
RCMDC-6627-PF-48	B	From Leg	5.00		0.0000	129.00	No Ice	4.06	3.10	32.00
			0.00				1/2" Ice	4.45	3.46	68.49
			0.00				1" Ice	4.84	3.82	104.98
CBC78T-DS-43-2X	A	From Leg	5.00		0.0000	129.00	No Ice	0.64	0.59	20.70
			0.00				1/2" Ice	0.81	0.75	27.00
			0.00				1" Ice	0.98	0.91	33.30
Outdoor CBRS 20W RRH	A	From Leg	5.00		0.0000	129.00	No Ice	0.86	0.42	18.60
			0.00				1/2" Ice	1.21	0.59	25.50

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	lb	
B2/B66A RRH-BR049	A	From Leg	0.00		0.0000	129.00	1" Ice	1.56	0.76	32.40
			5.00				No Ice	1.88	1.25	84.40
			0.00				1/2" Ice	2.48	1.65	102.80
			0.00				1" Ice	3.08	2.05	121.20
B5/B13 RRH-BR04C	A	From Leg	5.00		0.0000	129.00	No Ice	1.88	1.02	70.30
			0.00				1/2" Ice	2.48	1.34	86.80
			0.00				1" Ice	3.08	1.66	103.30
			SSPX310R	A			From Leg	5.00		0.0000
0.00		1/2" Ice	3.80		0.95	35.30				
0.00		1" Ice	4.70		1.17	54.10				
(2) JAHH-65C-R3B-V2	A	From Leg	5.00			0.0000		129.00	No Ice	
0.00				1/2" Ice	13.91		5.35		155.90	
0.00				1" Ice	15.01		5.78		231.60	
CBC78T-DS-43-2X			B	From Leg	5.00				0.0000	129.00
0.00		1/2" Ice			0.81	0.75	27.00			
0.00		1" Ice			0.98	0.91	33.30			
Outdoor CBRS 20W RRH	B	From Leg			5.00		0.0000	129.00		
0.00				1/2" Ice	1.21	0.59			25.50	
0.00				1" Ice	1.56	0.76			32.40	
B2/B66A RRH-BR049			B	From Leg	5.00				0.0000	129.00
0.00		1/2" Ice			2.48	1.65	102.80			
0.00		1" Ice			3.08	2.05	121.20			
B5/B13 RRH-BR04C	B	From Leg			5.00		0.0000	129.00		
0.00				1/2" Ice	2.48	1.34			86.80	
0.00				1" Ice	3.08	1.66			103.30	
SSPX310R			B	From Leg	5.00				0.0000	129.00
0.00		1/2" Ice			3.80	0.95	35.30			
0.00		1" Ice			4.70	1.17	54.10			
(2) JAHH-65C-R3B-V2	B	From Leg			5.00		0.0000	129.00		
0.00				1/2" Ice	13.91	5.35			155.90	
0.00				1" Ice	15.01	5.78			231.60	
CBC78T-DS-43-2X			C	From Leg	5.00				0.0000	129.00
0.00		1/2" Ice			0.81	0.75	27.00			
0.00		1" Ice			0.98	0.91	33.30			
Outdoor CBRS 20W RRH	C	From Leg			5.00		0.0000	129.00		
0.00				1/2" Ice	1.21	0.59			25.50	
0.00				1" Ice	1.56	0.76			32.40	
B2/B66A RRH-BR049			C	From Leg	5.00				0.0000	129.00
0.00		1/2" Ice			2.48	1.65	102.80			
0.00		1" Ice			3.08	2.05	121.20			
B5/B13 RRH-BR04C	C	From Leg			5.00		0.0000	129.00		
0.00				1/2" Ice	2.48	1.34			86.80	
0.00				1" Ice	3.08	1.66			103.30	
SSPX310R			C	From Leg	5.00				0.0000	129.00
0.00		1/2" Ice			3.80	0.95	35.30			
0.00		1" Ice			4.70	1.17	54.10			
(2) JAHH-65C-R3B-V2	C	From Leg			5.00		0.0000	129.00		
0.00				1/2" Ice	13.91	5.35			155.90	
0.00				1" Ice	15.01	5.78			231.60	

Tower Pressures - No Ice

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$$G_H = 1.100$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 150.00-110.00	129.06	1.063	24	62.327	A	0.000	62.327	62.327	100.00	7.800	0.000
					B	0.000	62.327		100.00	0.000	0.000
					C	0.000	62.327		100.00	7.524	0.000
L2 110.00-70.00	89.45	0.957	22	84.012	A	0.000	84.012	84.012	100.00	7.800	0.000
					B	0.000	84.012		100.00	0.000	0.000
					C	0.000	84.012		100.00	15.840	0.000
L3 70.00-31.50	50.64	0.814	18	99.622	A	0.000	99.622	99.622	100.00	7.507	0.000
					B	0.000	99.622		100.00	0.000	0.000
					C	0.000	99.622		100.00	15.246	0.000
L4 31.50-0.00	15.38	0.7	16	94.571	A	0.000	94.571	94.571	100.00	4.777	0.000
					B	0.000	94.571		100.00	0.000	0.000
					C	0.000	94.571		100.00	9.702	0.000

Tower Pressure - With Ice

$$G_H = 1.100$$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		psf	in	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 150.00-110.00	129.06	1.063	6	1.7192	73.789	A	0.000	73.789	73.789	100.00	40.305	0.000
						B	0.000	73.789		100.00	0.000	0.000
						C	0.000	73.789		100.00	20.590	0.000
L2 110.00-70.00	89.45	0.957	6	1.6573	95.061	A	0.000	95.061	95.061	100.00	39.191	0.000
						B	0.000	95.061		100.00	0.000	0.000
						C	0.000	95.061		100.00	42.357	0.000
L3 70.00-31.50	50.64	0.814	5	1.5656	110.256	A	0.000	110.256	110.256	100.00	37.721	0.000
						B	0.000	110.256		100.00	0.000	0.000
						C	0.000	110.256		100.00	40.768	0.000
L4 31.50-0.00	15.38	0.7	4	1.3897	102.790	A	0.000	102.790	102.790	100.00	22.994	0.000
						B	0.000	102.790		100.00	0.000	0.000
						C	0.000	102.790		100.00	25.045	0.000

Tower Pressure - Service

$$G_H = 1.100$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face	C _A A _A Out Face
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 150.00-110.00	129.06	1.063	8	62.327	A	0.000	62.327	62.327	100.00	7.800	0.000
					B	0.000	62.327		100.00	0.000	0.000
					C	0.000	62.327		100.00	7.524	0.000
L2 110.00-70.00	89.45	0.957	7	84.012	A	0.000	84.012	84.012	100.00	7.800	0.000
					B	0.000	84.012		100.00	0.000	0.000
					C	0.000	84.012		100.00	15.840	0.000

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Section Elevation	z	K _Z	q _z	A _G	F _a	A _F	A _R	A _{leg}	Leg %	C _{AA} _{In} Face	C _{AA} _{Out} Face
ft	ft		psf	ft ²	c	ft ²	ft ²	ft ²		ft ²	ft ²
L3 70.00-31.50	50.64	0.814	6	99.622	A	0.000	99.622	99.622	100.00	7.507	0.000
					B	0.000	99.622		100.00	0.000	0.000
					C	0.000	99.622		100.00	15.246	0.000
L4 31.50-0.00	15.38	0.7	5	94.571	A	0.000	94.571	94.571	100.00	4.777	0.000
					B	0.000	94.571		100.00	0.000	0.000
					C	0.000	94.571		100.00	9.702	0.000

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Tower Deflections - Service Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	6.058	30	1.0258	0.0138
L2	110 - 70	0.603	37	0.1977	0.0050
L3	73.5 - 31.5	0.099	37	0.0092	0.0019
L4	35.667 - 0	0.045	37	0.0082	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	RRUS 32 B66	30	6.058	1.0258	0.0138	19174
129.00	10.75' Flat Platform w/ Handrails	31	2.664	0.5322	0.0086	4565
122.00	Guy	31	1.751	0.3909	0.0071	3423

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	39.551	6	5.4412	0.0789
L2	110 - 70	8.713	6	1.5166	0.0235
L3	73.5 - 31.5	2.710	6	0.3727	0.0090
L4	35.667 - 0	0.672	6	0.1614	0.0029

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.00	RRUS 32 B66	6	39.551	5.4412	0.0789	3958
129.00	10.75' Flat Platform w/ Handrails	6	20.901	3.1296	0.0461	940
122.00	Guy	6	15.655	2.4582	0.0366	704

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
L1	122.00 (A) (7)	7/8 EHS	7970.00	79699.84	33642.80	47820.00	1.000	1.421
	122.00 (B) (6)	7/8 EHS	7970.00	79699.84	34029.80	47820.00	1.000	1.405
	122.00 (C) (5)	7/8 EHS	7970.00	79699.84	34032.50	47820.00	1.000	1.405

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Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 110 (1)	TP21.25x15x0.1875	40.00	28.00	48.9	11.5845	-52535.60	615724.00	0.085
L2	110 - 70 (2)	TP27.61x21.25x0.25	40.00	122.00	194.7	16.9050	-53205.00	100711.00	0.528
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	42.00	122.00	152.7	26.9540	-56659.00	261264.00	0.217
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	35.67	122.00	127.4	38.7601	-63218.60	539514.00	0.117

Pole Bending Design Data

Section No.	Elevation ft	Size	M _{ux} lb-ft	φM _{ux} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	M _{uy} lb-ft	φM _{uy} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{uy}}$
L1	150 - 110 (1)	TP21.25x15x0.1875	263279.17	315006.67	0.836	0.00	315006.67	0.000
L2	110 - 70 (2)	TP27.61x21.25x0.25	210368.33	531001.67	0.396	0.00	531001.67	0.000
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	81934.42	1080200.00	0.076	0.00	1080200.00	0.000
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	72642.25	1861400.00	0.039	0.00	1861400.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V _u lb	φV _n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u lb-ft	φT _n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 110 (1)	TP21.25x15x0.1875	4332.52	403664.00	0.011	930.95	640848.33	0.001
L2	110 - 70 (2)	TP27.61x21.25x0.25	4555.52	623034.00	0.007	928.14	1081041.67	0.001
L3	70 - 31.5 (3)	TP33.1x26.5535x0.3125	2026.97	993388.00	0.002	1406.38	2198941.67	0.001
L4	31.5 - 0 (4)	TP37.38x31.8255x0.375	1705.13	1439990.00	0.001	927.09	3789241.67	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{ux}}$	Ratio $\frac{M_{uy}}{\phi M_{uy}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 110 (1)	0.085	0.836	0.000	0.011	0.001	0.921	1.000	4.8.2
L2	110 - 70 (2)	0.528	0.396	0.000	0.007	0.001	0.925	1.000	4.8.2
L3	70 - 31.5 (3)	0.217	0.076	0.000	0.002	0.001	0.293	1.000	4.8.2
L4	31.5 - 0 (4)	0.117	0.039	0.000	0.001	0.000	0.156	1.000	4.8.2

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Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	150 - 110	Pole	TP21.25x15x0.1875	1	-52535.60	615724.00	92.1	Pass
		Guy A@122	7/8	7	33642.80	47820.00	70.4	Pass
		Guy B@122	7/8	6	34029.80	47820.00	71.2	Pass
		Guy C@122	7/8	5	34032.50	47820.00	71.2	Pass
L2	110 - 70	Pole	TP27.61x21.25x0.25	2	-53205.00	100711.00	92.5	Pass
L3	70 - 31.5	Pole	TP33.1x26.5535x0.3125	3	-56659.00	261264.00	29.3	Pass
L4	31.5 - 0	Pole	TP37.38x31.8255x0.375	4	-63218.60	539514.00	15.6	Pass
Summary								
Pole (L2)							92.5	Pass
Guy A (L1)							70.4	Pass
Guy B (L1)							71.2	Pass
Guy C (L1)							71.2	Pass
RATING =							92.5	Pass



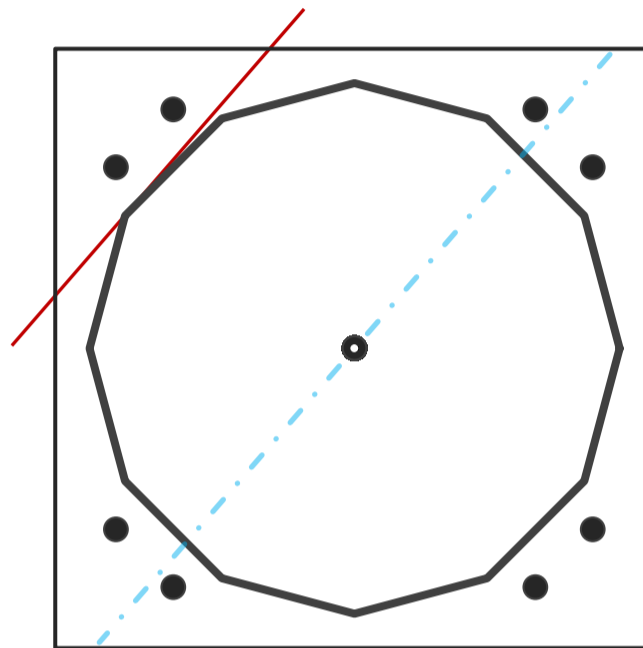
Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	12	-
Diameter	37.38	in
Thickness	0.375	in
Orientation Offset		°

Base Reactions		
Moment, Mu	160.9	k-ft
Axial, Pu	70.2	k
Shear, Vu	4.1	k
Neutral Axis	49	°

Report Capacities		
Component	Capacity	Result
Base Plate	9%	Pass
Anchor Rods	12%	Pass
Dwyidag	-	-

Base Plate		
Shape	Square	-
Width	44	in
Thickness	2 1/2	in
Grade	A633 Gr. E	
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	80	ksi
Clip	0	in
Orientation Offset		°
Anchor Rod Detail	c	$\eta=0.55$
Clear Distance	N/A	in
Applied Moment, Mu	178.3	k
Bending Stress, ϕMn	2075.2	k



Original Anchor Rods		
Arrangement	Cluster	-
Quantity	8	-
Diameter, ϕ	2 1/4	in
Bolt Circle	44	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	6.0	in
Orientation Offset		°
Applied Force, Pu	30.6	k
Anchor Rods, ϕPn	259.8	k

Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	4.1	160.9	1.00
Anchor Rod Forces	4.1	160.9	1.00
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	0.0	0.00
Stiffener Forces	0.0	0.0	0.00

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in ²	in ²	in ⁴	#	in ⁴
Pole	43.0992	3.5916	0.1692		7379.37
Bolt	3.9761	3.2477	0.8393	4.5	6294.24
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	0.0000	0.0000	0.0000		0.00
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate

Shape	Square	-
Width, W	44	in
Thickness, t	2.5	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	80	ksi
Base Plate Chord	23.211	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

Anchor Rods

Anchor Rod Quantity, N	8	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	44	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	30.6	k
Applied Shear, Vu	0.1	k
Compressive Capacity, ϕP_n	259.8	k
Tensile Capacity, ϕR_n	0.118	OK
Interaction Capacity	0.118	OK

External Base Plate

Chord Length AA	24.595	in
Additional AA	0.000	in
Section Modulus, Z	38.430	in ³
Applied Moment, Mu	178.3	k-ft
Bending Capacity, ϕM_n	2075.2	k-ft
Capacity, $M_u/\phi M_n$	0.086	OK

Chord Length AB	23.268	in
Additional AB	0.000	in
Section Modulus, Z	36.356	in ³
Applied Moment, Mu	137.9	k-ft
Bending Capacity, ϕM_n	1963.2	k-ft
Capacity, $M_u/\phi M_n$	0.070	OK

Bend Line Length	0.000	in
Additional Bend Line	0.000	in
Section Modulus, Z	0.000	in ³
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕM_n	0.0	k-ft
Capacity, $M_u/\phi M_n$		

Internal Base Plate

Arc Length	0.000	in
Section Modulus, Z	0.000	in ³
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕM_n	0.0	k-ft
Capacity, $M_u/\phi M_n$		

Flange Plate Analysis

Flange Plate	Plate Type	Flange	@ 110 ft
	Pole Diameter	21.25	in
	Pole Thickness	0.1875	in
	Plate Diameter	28.5	in
	Plate Thickness	1	in
	Plate Fy	60	ksi
	Weld Length	0.1875	in
	f _s Resistance	75.10	k-in
	Applied	54.84	k-in

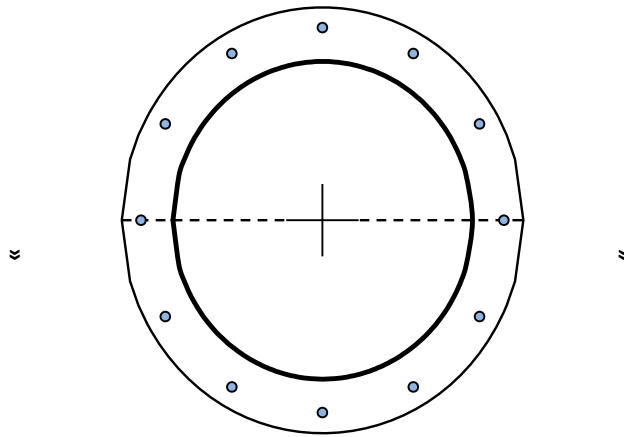
Code Rev.	G
Moment	263.7 k-ft
Axial	52.5 k

Date	12/12/2019
Engineer	Garret.Heath
Site #	302476
Carrier	Verizon Wireless

Required Flange Thickness:
0.85 in OK

Stiffeners	#	
-------------------	---	--

Bolts	#	12	
	Bolt Circle	25.75	in
	(R)adial / (S)quare	R	
	Diameter	1	in
	Hole Diameter	1.125	in
	Type	A325	
	Fy	92	ksi
	Fu	120	ksi
	f _s Resistance	54.52	k
	Applied	36.56	k

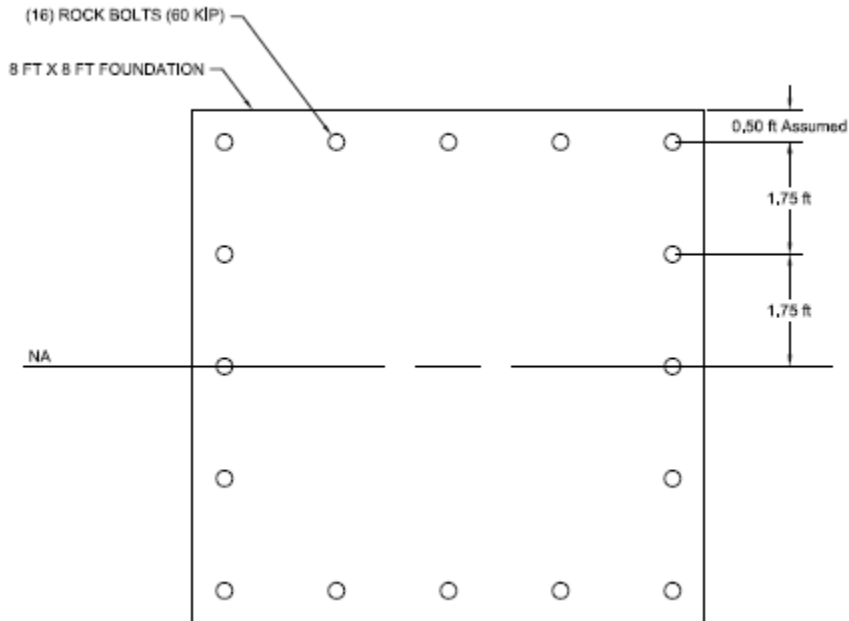


Reinforcement	#	
----------------------	---	--

Plate Stress Ratio:
73% Pass

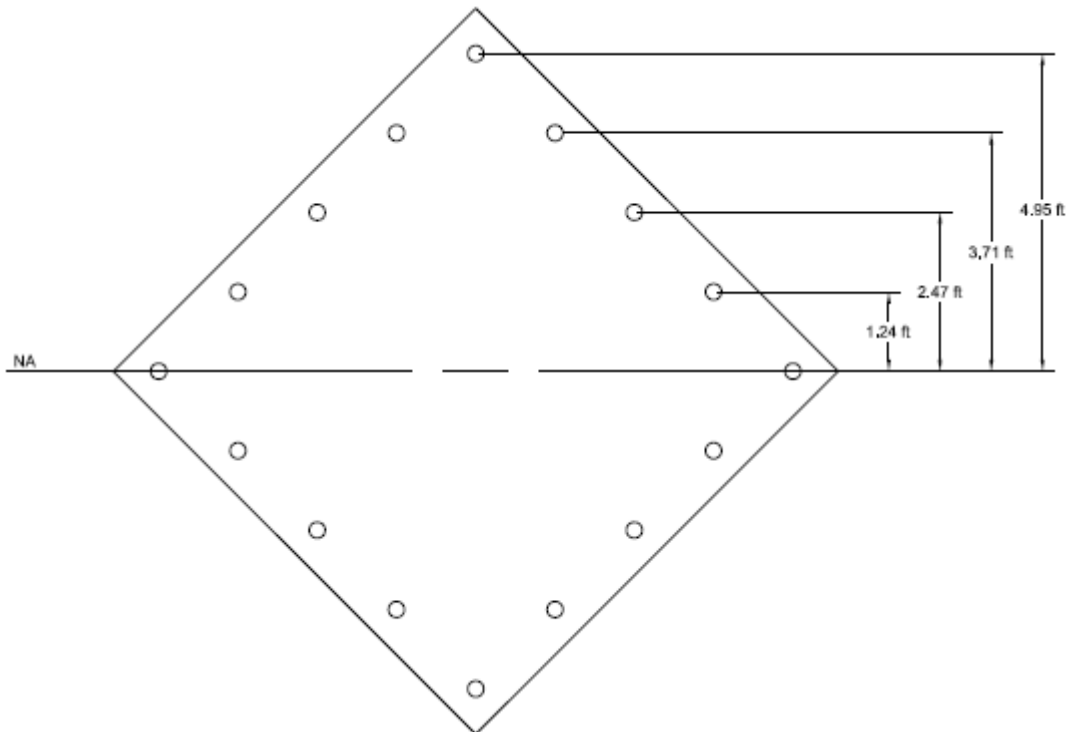
Bolt Stress Ratio:
67% Pass

Extra Bolts	#	
--------------------	---	--



$$I_0 = \sum d^2$$

$$I_0 = 4 * 1.75^2 + 10 * 3.5^2 = \mathbf{134.8}$$



$$I_0 = \sum d^2$$

$$I_0 = 4 * 1.24^2 + 4 * 2.47^2 + 4 * 3.71^2 + 2 * 4.95^2 = \mathbf{134.6}$$



CONTROLLING USAGE

$$M_{Overturning} = M + V * D = 160.9 + 4.1 * 6 = 185.5k - ft$$

$$T_{U-Rock-Bolt} = \frac{M_{Overturning} * L_{Max}}{I_0} - \frac{P}{\#Rock Bolts}$$

$$T_{U-Rock-Bolt} = \frac{185.5 * 4.95}{134.6} - \frac{75.9}{16} = 2.1k$$

$$\frac{T_{ub}}{\phi R_{nt}} = \frac{2.1k}{0.75(60k)} = 0.05 OK$$

GUY ANCHOR ROD CHECK

$$\left. \begin{array}{l} \text{Uplift} = 24.5k \\ \text{Shear} = 23.4k \end{array} \right\} \text{Guy Anchor Reactions}$$

$$T_{ub} = T_{applied} = \sqrt{(24.5)^2 + (23.4k)^2} = 33.9k$$

1.5" Diameter Anchor Rod
A36 Grade Assumed

$$A_g = 1.77 in^2$$

$$\frac{T_{ub}}{\phi R_{nt}} = \frac{33.9k}{0.8(36ksi * 1.77in^2)} = 0.67 OK$$



AMERICAN TOWER®
CORPORATION

Antenna Mount Analysis Report

ATC Site Name : Wtbr - Waterbury, CT
ATC Site Number : 302476
Engineering Number : 13002888_C8_04
Mount Elevation : 128 ft
Carrier : Verizon Wireless
Carrier Site Name : WATERBURY CT
Carrier Site Number : 469238
Site Location : 352 Garden Circle
Waterbury, CT 06704-2833
41.57066667 , -73.0176
County : New Haven
Date : February 11, 2020
Max Usage : 52%
Result : Pass

Prepared By:
Mitchell Chen
Structural Engineer

Reviewed By:



COA: PEC.0001553



Table of Contents

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Structure Usages..... 2

Mount Layout 3

Equipment Layout 4

Standard Conditions9

Calculations Attached



Introduction

The purpose of this report is to summarize results of the antenna mount analysis performed for Verizon Wireless at 128 ft.

Supporting Documents

Mount Mapping	Infinigy Project #1009-Z0003-H/317-505, dated January 24, 2020
RFDS	RFDS dated November 25, 2019
Photos	Site photos from 2019

Analysis

This antenna mount was analyzed using American Tower Corporation's Mount Analysis Program and RISA-3D

Basic Wind Speed:	97 mph (3-Second Gust, Vasd) / 125 mph (3-Second Gust, Vult)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Codes:	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	$S_s = 0.161$, $S_1 = 0.058$
Site Class:	D - Stiff Soil
Live Loads:	$L_m = 500$ lbs, $L_v = 250$ lbs

Conclusion

Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed above. The mount can support the equipment as described in this report.

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



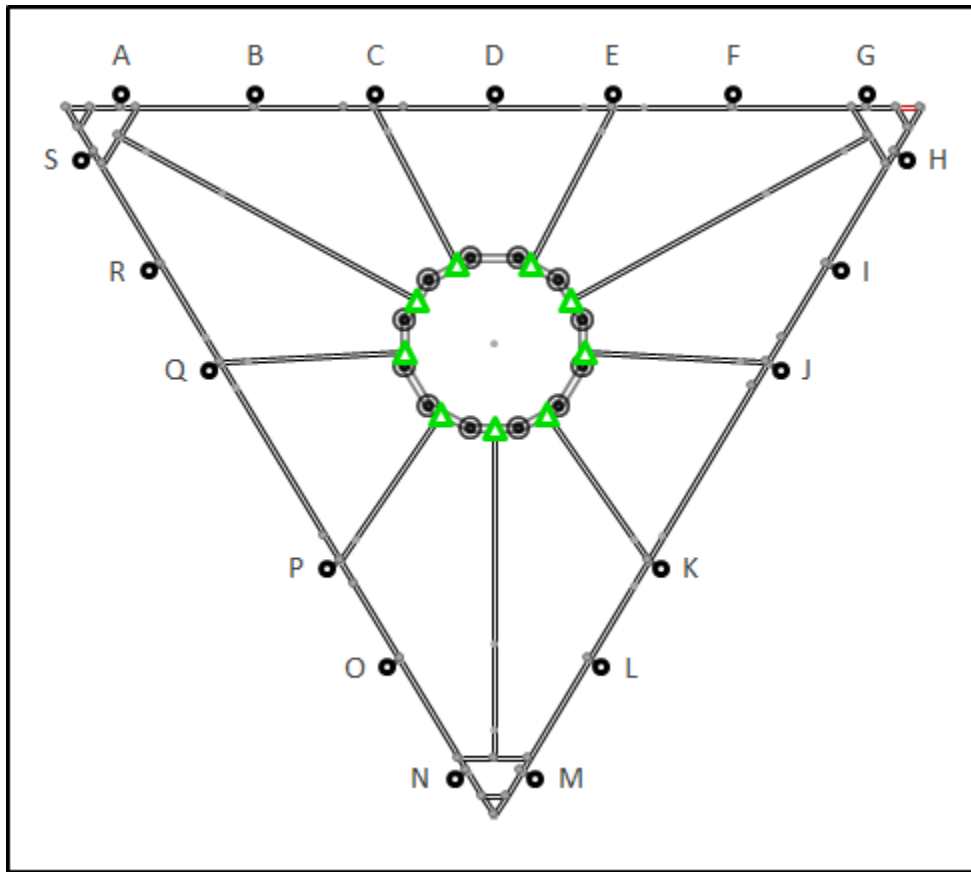
Application Loading

Mount Centerline (ft)	Antenna Centerline (ft)	Qty	Antenna Model
128.0	129.0	6	Commscope JAHH-65C-R3B-V2
		3	Commscope SSPX310R
		3	Amphenol Antel BXA-80063-4CF-EDIN-X
		3	Commscope CBC78T-DS-43-2X
		1	Raycap RCMDC-6627-PF-48
		3	Samsung B2/B66A RRH-BR049
		3	Samsung B5/B13 RRH-BR04C
		3	Samsung Outdoor CBRS 20W RRH

Structure Usages

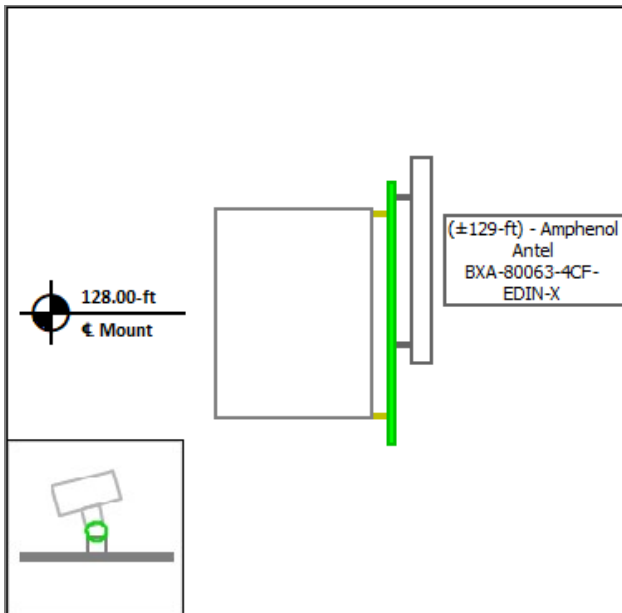
Structural Component	Controlling Usage	Pass/Fail
Horizontals	52%	Pass
Verticals	9%	Pass
Diagonals	13%	Pass
Mount Pipes	28%	Pass
Handrails	27%	Pass

Mount Layout

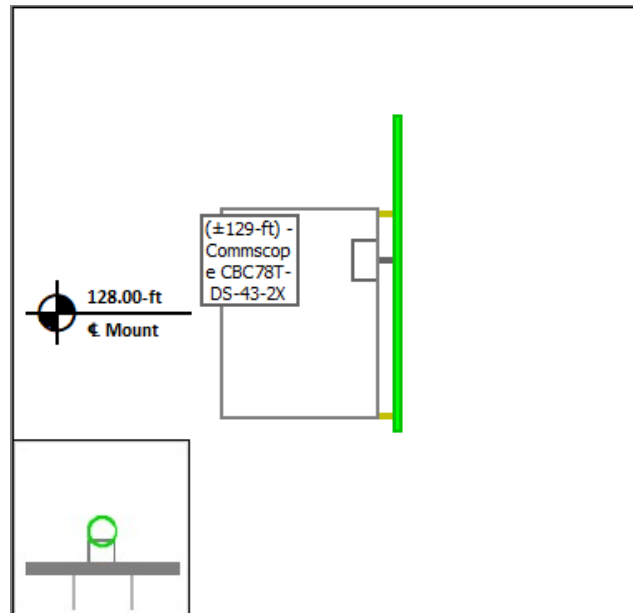


Equipment Layout

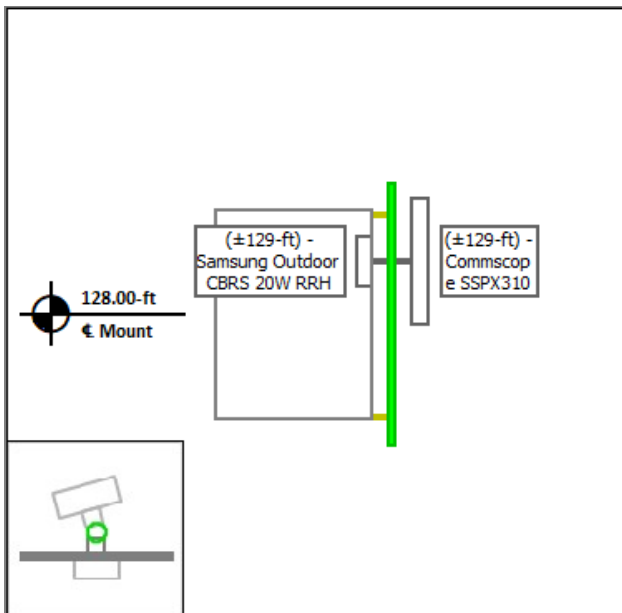
Mount Pipe A



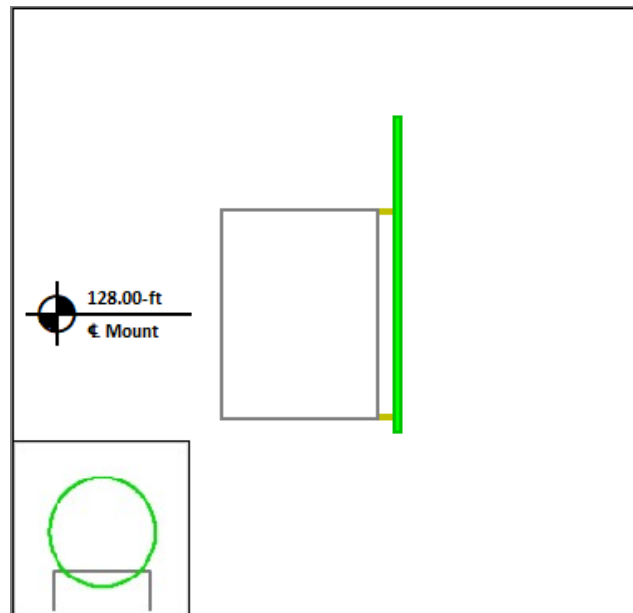
Mount Pipe B



Mount Pipe C

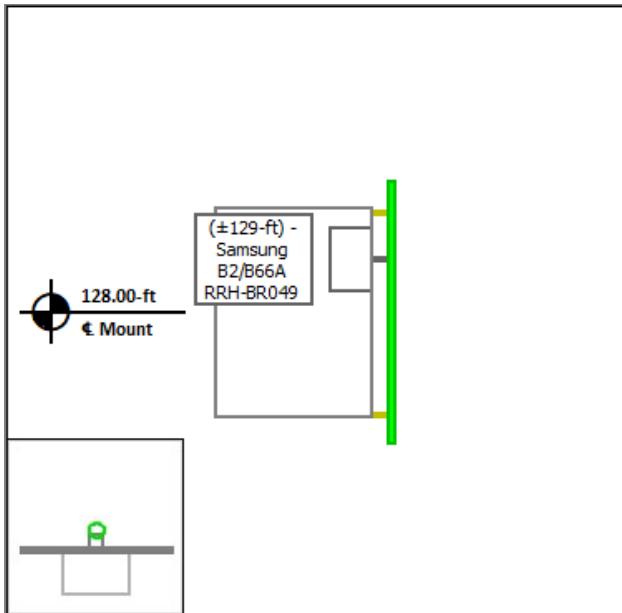


Mount Pipe D

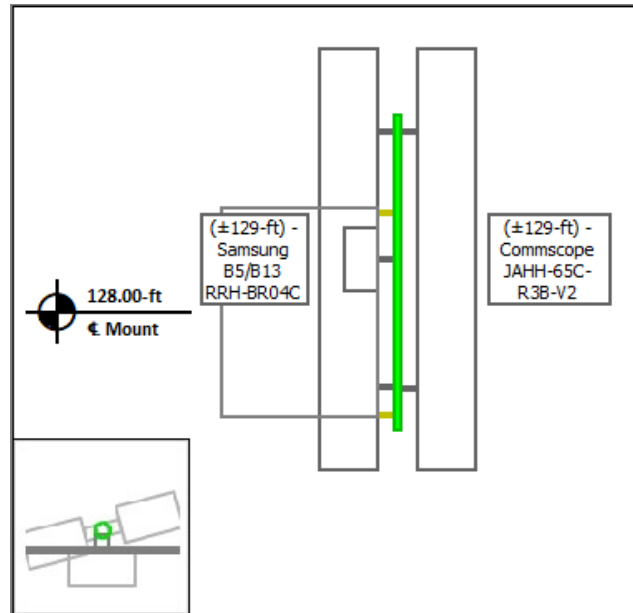


Equipment Layout Cont'd.

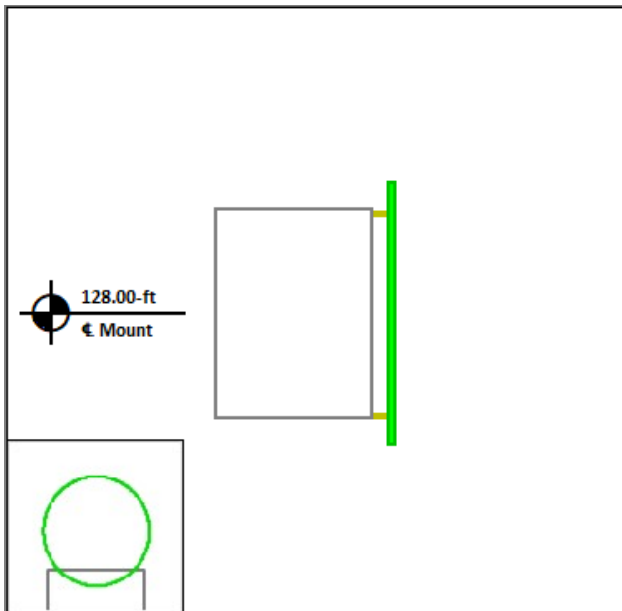
Mount Pipe E



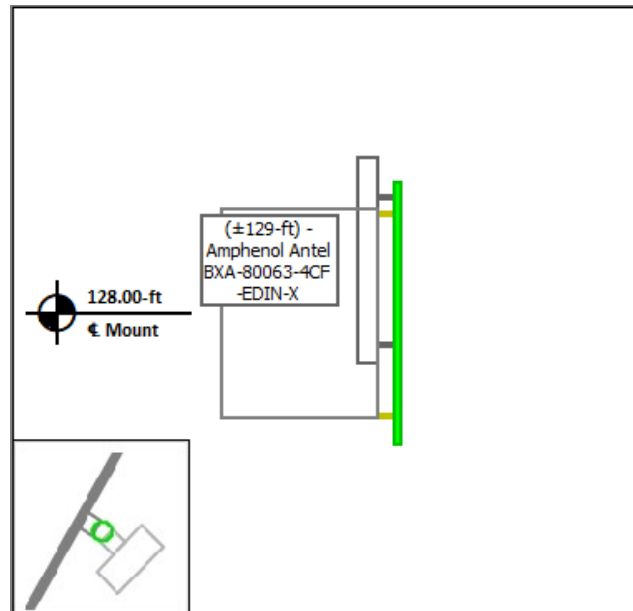
Mount Pipe F



Mount Pipe G

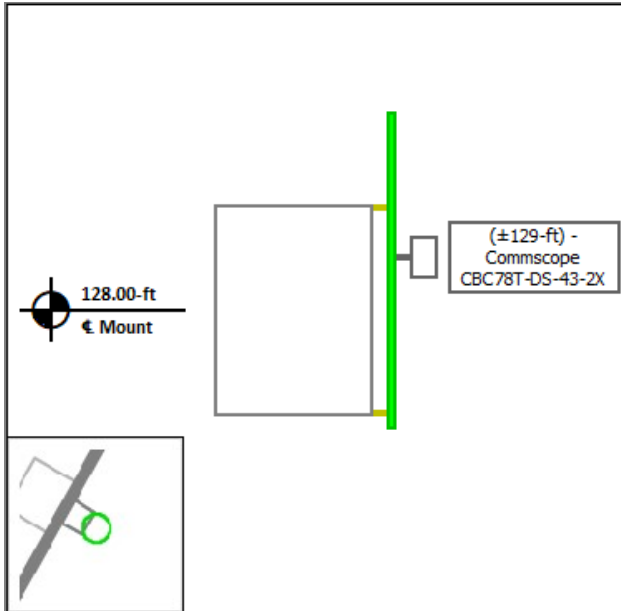


Mount Pipe H

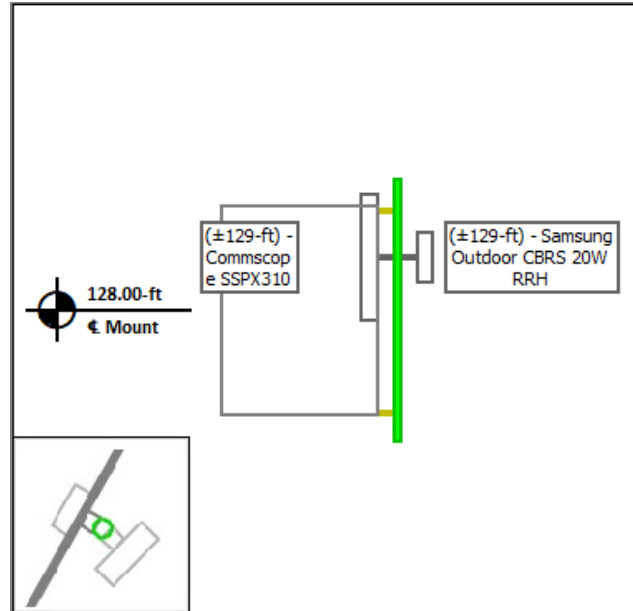


Equipment Layout Cont'd.

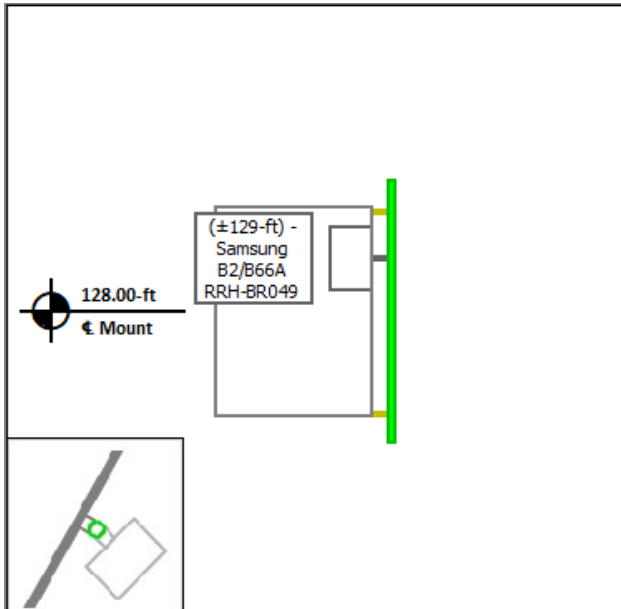
Mount Pipe I



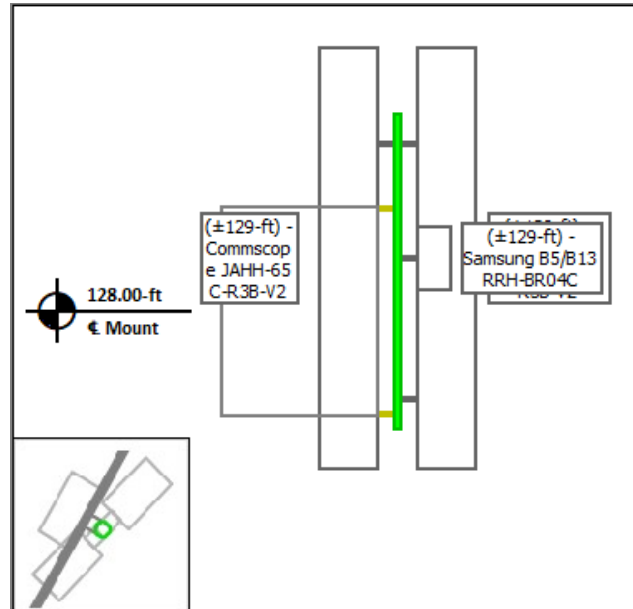
Mount Pipe J



Mount Pipe K

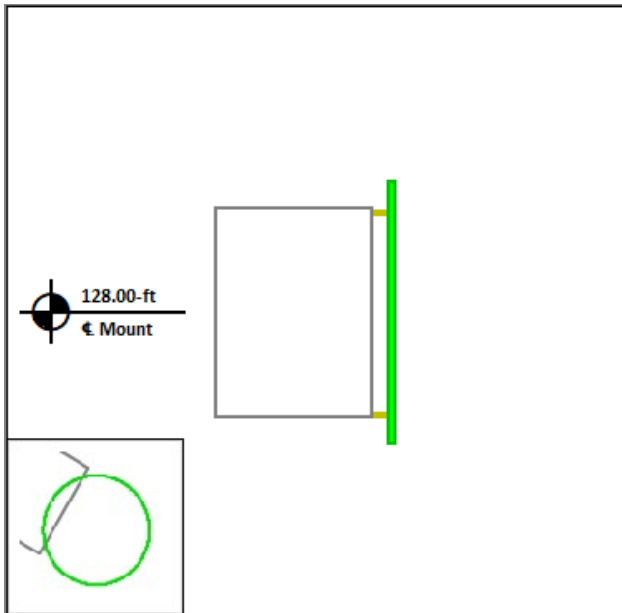


Mount Pipe L

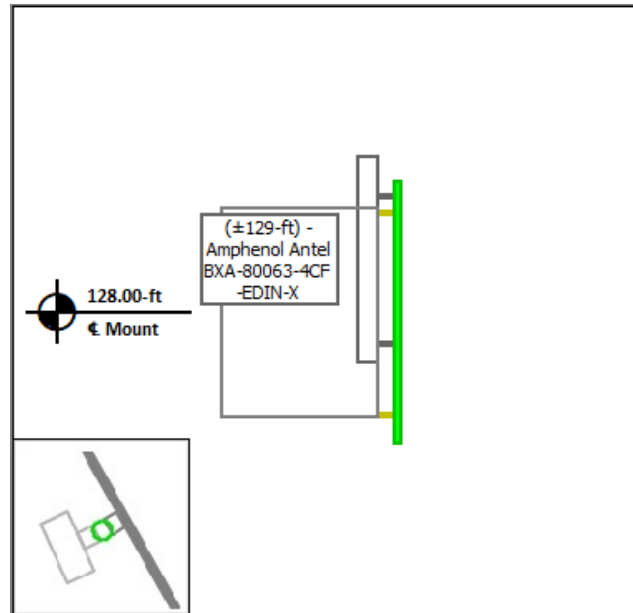


Equipment Layout Cont'd.

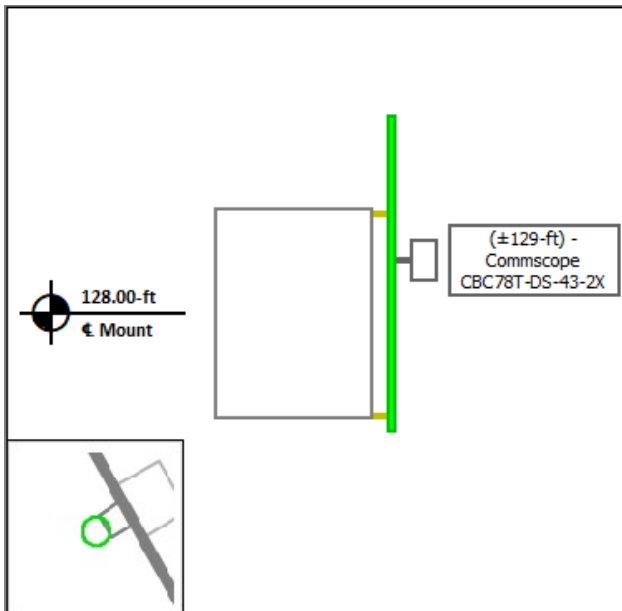
Mount Pipe M



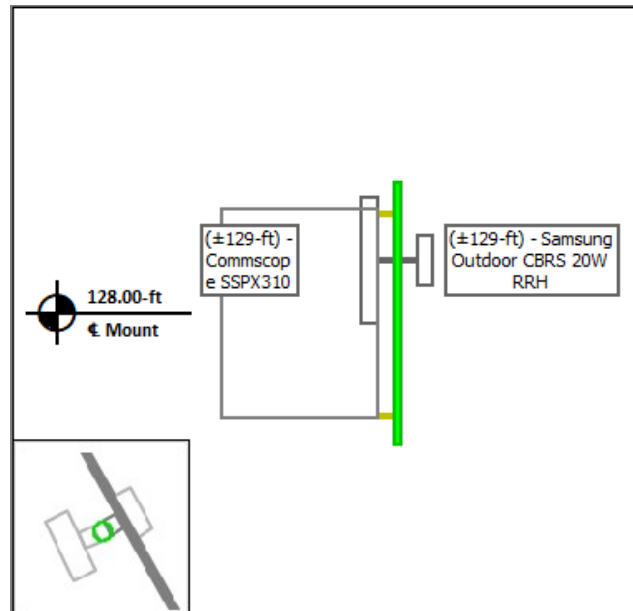
Mount Pipe N



Mount Pipe O

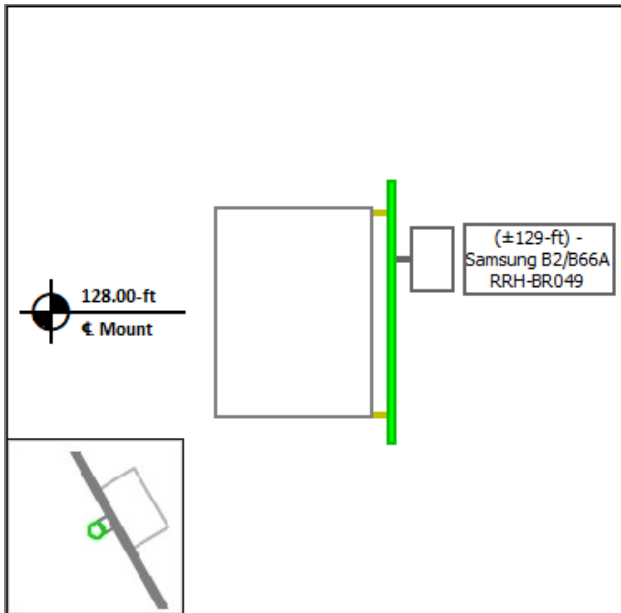


Mount Pipe P

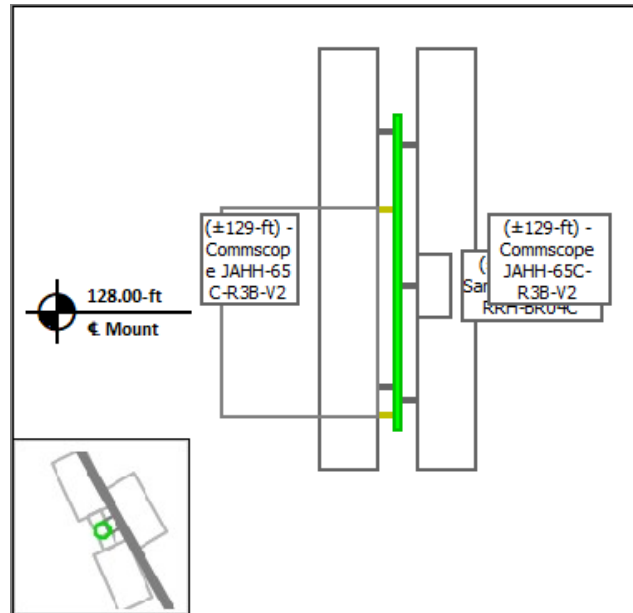


Equipment Layout Cont'd.

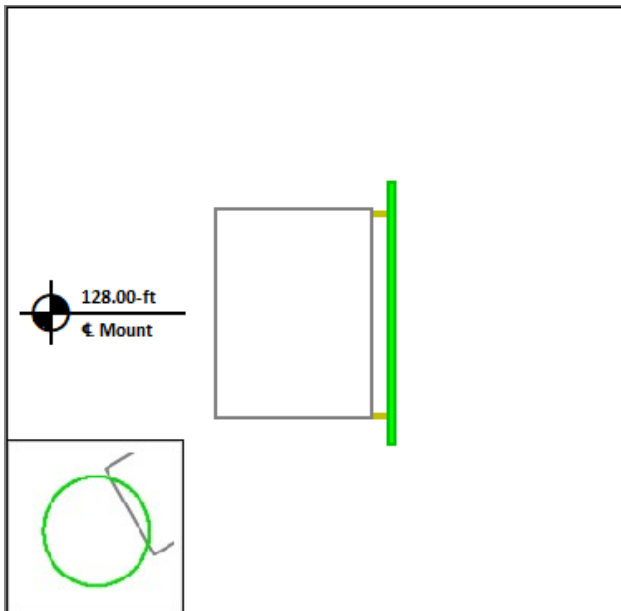
Mount Pipe Q



Mount Pipe R



Mount Pipe S





Standard Conditions

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

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

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

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

All connections are to be verified for condition and tightness by the installation contractor preceding any changes to the appurtenance mounting system and/or equipment attached to it.

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

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



Site Number: 302476
Project Number: 13002888_C8_04
Carrier: Verizon Wireless
Mount Elevation: 128 ft
Date: 2/11/2020

Mount Analysis Force Calculations

Wind & Ice Load Calculations

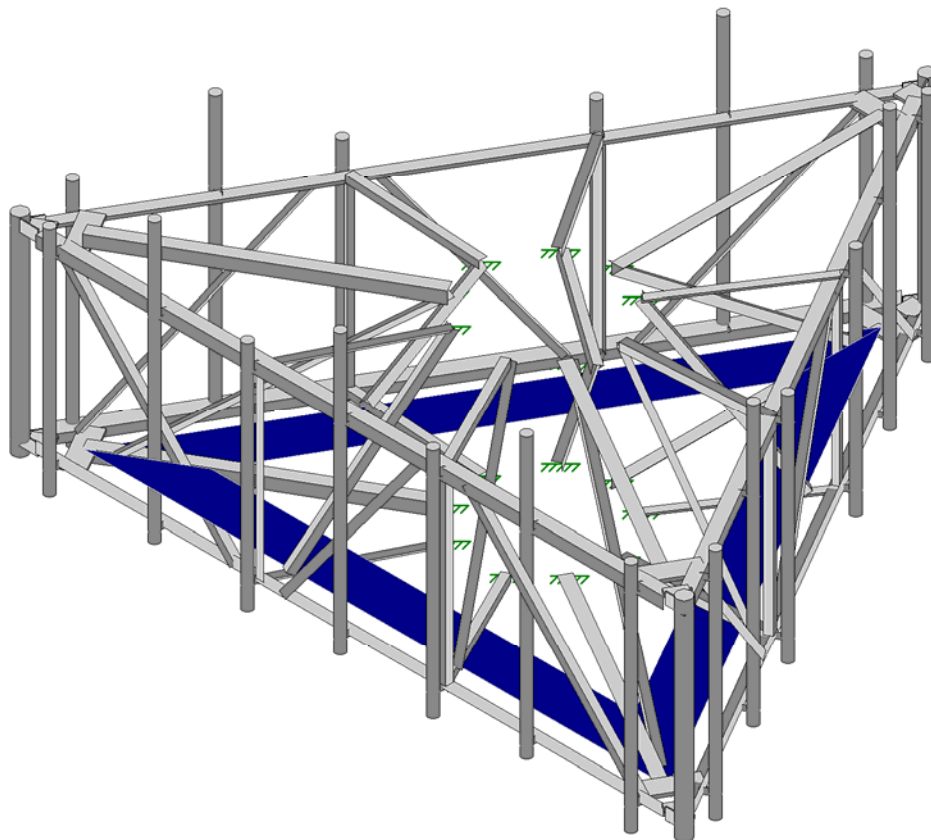
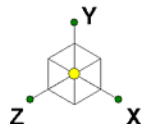
Shielding Factor	K_z	1.06	
Topographic Factor	K_{zt}	1.00	
Rooftop Wind Speed-up Factor	K_s	1.00	
Shielding Factor	K_a	0.90	
Ground Elevation Factor	K_e	1.00	
Wind Direction Probability Factor	K_d	0.95	
Basic Wind Speed	V	97	mph
Velocity Pressure	q_z	24.3	psf
Height Escalation Factor	K_{iz}	1.15	
Thickness of Radial Glaze Ice	T_{iz}	1.72	in

Seismic Load Calculations

Short Period DSRAP	S_{DS}	0.172	
1 Second DSRAP	S_{D1}	0.093	
Importance Factor	I	1.0	
Response Modification Coefficient	R	2.0	
Seismic Response Coefficient	C_s	0.086	
Amplification Factor	A	3.0	
Total Weight	W	2920.6	lbs
Total Shear Force	V_s	250.8	lbs
Horizontal Seismic Load	E_h	752.3	lbs
Vertical Seismic Load	E_v	300.9	lbs

Antenna Calculations

Equipment	Height	Width	Depth	Weight	EPA_N	EPA_T	EPA_{Ni}	EPA_{Ti}
Model #	in	in	in	lbs	sqft	sqft	sqft	sqft
Commscope JAHH-65C-R3B-V2	95.7	13.8	8.2	80.2	12.81	3.53	16.58	5.18
Commscope SSPX310R	29.5	11.8	4.5	16.5	2.90	0.73	4.18	1.43
Amphenol Antel BXA-80063-4CF-EDIN-X	47.4	11.2	5.2	9.9	4.71	1.37	6.60	2.45
Commscope CBC78T-DS-43-2X	9.6	6.9	6.4	20.7	0.55	0.51	1.12	1.07
Raycap RCMDC-6627-PF-48	29.5	16.5	12.6	32.0	N/A	N/A		
Samsung B2/B66A RRH-BR049	15.0	15.0	10.0	84.4	1.88	1.25	2.83	2.06
Samsung B5/B13 RRH-BR04C	15.0	15.0	8.1	70.3	1.88	1.01	2.83	1.77
Samsung Outdoor CBRS 20W RRH	12.1	8.5	4.1	18.6	0.86	0.42	1.55	0.99



American Tower Corp.

Mitchell.Chen

13002888_C8_04

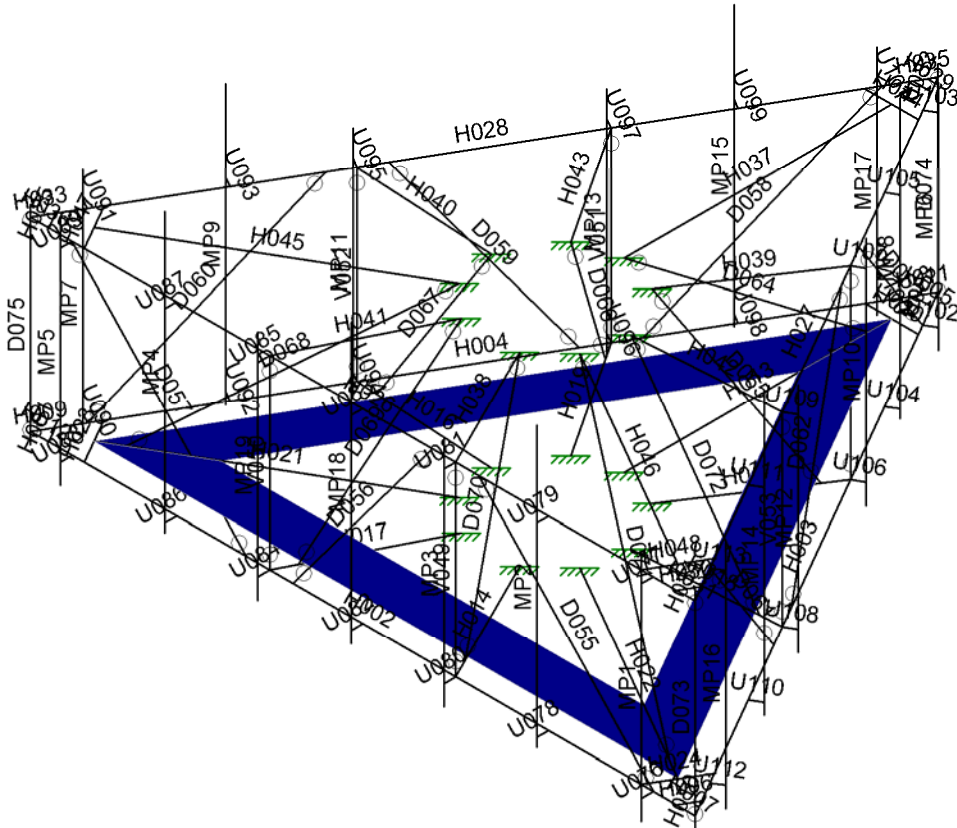
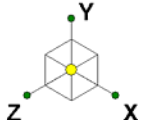
302476, Wtbr - Waterbury

3D Rendering

SK - 1

Feb 11, 2020 at 4:39 PM

R3D. VERIZON WIRELESS @ 302...



American Tower Corp.

Mitchell.Chen

13002888_C8_04

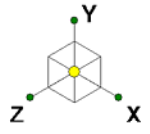
302476, Wtbr - Waterbury

Member Labels

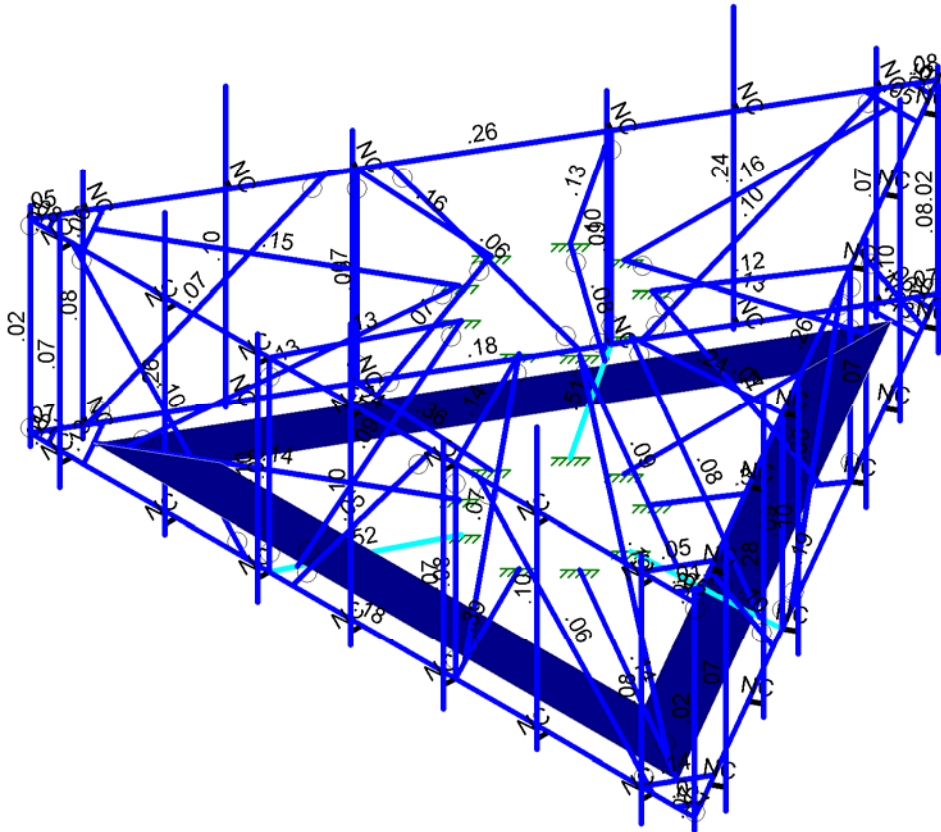
SK - 2

Feb 11, 2020 at 4:39 PM

R3D. VERIZON WIRELESS @ 302...

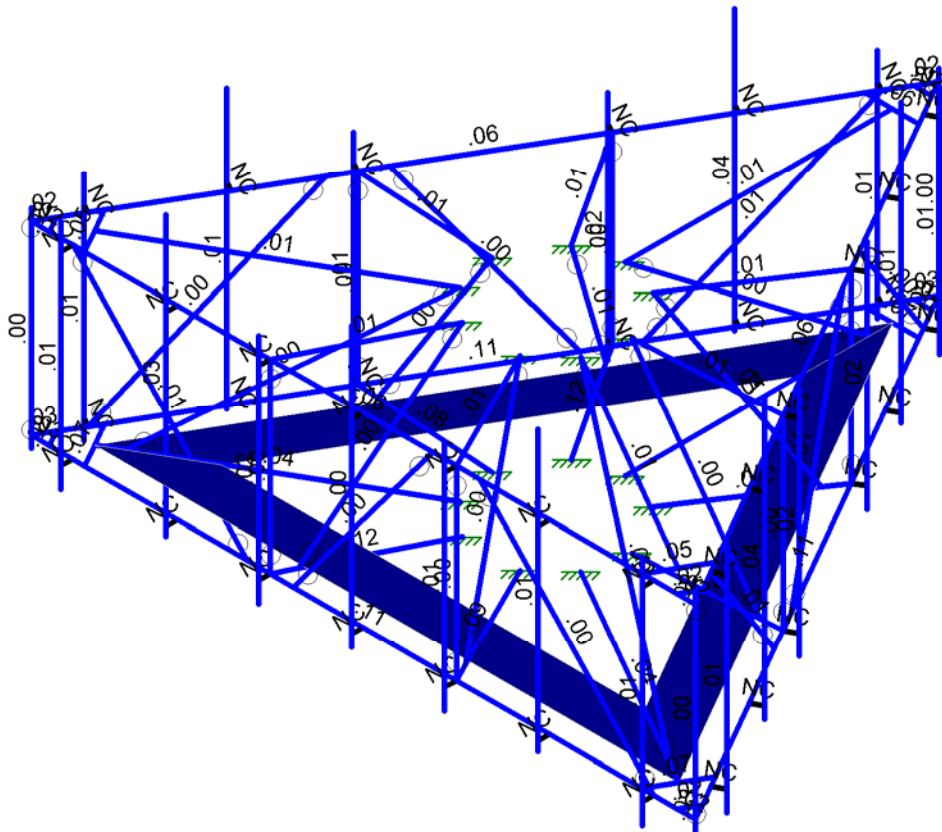
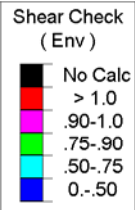
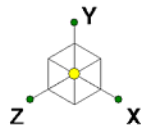


Code Check (Env)	
Black	No Calc
Red	> 1.0
Magenta	.90-1.0
Green	.75-.90
Cyan	.50-.75
Blue	0-.50



Member Code Checks Displayed (Enveloped)
Results for LC 1, 1.4D

American Tower Corp.	302476, Wtbr - Waterbury Unity Bending Checks	SK - 3
Mitchell.Chen		Feb 11, 2020 at 4:39 PM
13002888_C8_04		R3D. VERIZON WIRELESS @ 302...



Member Shear Checks Displayed (Enveloped)
Results for LC 1, 1.4D

American Tower Corp.	302476, Wtbr - Waterbury	SK - 4
Mitchell.Chen		Feb 11, 2020 at 4:39 PM
13002888_C8_04		R3D. VERIZON WIRELESS @ 302...
Shear Checks		



Company : American Tower Corp.
 Designer : Mitchell.Chen
 Job Number : 13002888_C8_04
 Model Name : 302476, Wtbr - Waterbury

Feb 11, 2020
 4:40 PM
 Checked By: -

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm (/...	Density[lb/ft^3]	Yield[psi]	Ry	Fu[psi]	Rt
1	A36	2.9e+7	1.115e+7	.3	.65	490	36000	1.5	58000	1.2
2	A572-50	2.9e+7	1.115e+7	.3	.65	490	50000	1.1	65000	1.1
3	A500 Gr. B [RND]	2.9e+7	1.115e+7	.3	.65	527	42000	1.4	58000	1.3
4	A500 Gr. B [SQR]	2.9e+7	1.115e+7	.3	.65	527	46000	1.4	58000	1.3
5	A1085	2.9e+7	1.115e+7	.3	.65	490	50000	1.1	65000	1.1
6	A53 Gr. B	2.9e+7	1.115e+7	.3	.65	490	35000	1.6	60000	1.2
7	A992	2.9e+7	1.115e+7	.3	.65	490	50000	1.1	65000	1.1
8	SAE J429 Gr. 2	2.9e+7	1.115e+7	.3	.65	490	57000	1.1	74000	1.1

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	H001	N003	N005		90	PL5x0.75	Beam	None	A36	Typical
2	H002	N002	N003			L3x3x6	Beam	None	A36	Typical
3	H003	N004	N006			L3x3x6	Beam	None	A36	Typical
4	H004	N005	N007			L3x3x6	Beam	None	A36	Typical
5	H005	N004	N007		90	PL5x0.75	Beam	None	A36	Typical
6	H006	N002	N006		90	PL5x0.75	Beam	None	A36	Typical
7	H007	N008	N002			PL3x0.375	Beam	None	A36	Typical
8	H008	N009	N004			PL3x0.375	Beam	None	A36	Typical
9	H009	N010	N005			PL3x0.375	Beam	None	A36	Typical
10	H010	N008	N006			PL3x0.375	Beam	None	A36	Typical
11	H011	N009	N007			PL3x0.375	Beam	None	A36	Typical
12	H012	N010	N003			PL3x0.375	Beam	None	A36	Typical
13	H013	N017	N020		90	L3x3x6	Beam	None	A36	Typical
14	H014	N021	N011		90	L2x2x4	Beam	None	A36	Typical
15	H015	N023	N012		90	L2x2x4	Beam	None	A36	Typical
16	H016	N024	N013		90	L2x2x4	Beam	None	A36	Typical
17	H017	N022	N014		180	L2x2x4	Beam	None	A36	Typical
18	H018	N025	N015		180	L2x2x4	Beam	None	A36	Typical
19	H019	N026	N016		180	L2x2x4	Beam	None	A36	Typical
20	H020	N027	N028		90	PL5x0.75	Beam	None	A36	Typical
21	H021	N018	N033		90	L3x3x6	Beam	None	A36	Typical
22	H022	N019	N034		90	L3x3x6	Beam	None	A36	Typical
23	H023	N029	N031		90	PL5x0.75	Beam	None	A36	Typical
24	H024	N030	N032		90	PL5x0.75	Beam	None	A36	Typical
25	H025	N039	N041		90	PL5x0.75	Beam	None	A36	Typical
26	H026	N038	N039		90	L3x3x6	Beam	None	A36	Typical
27	H027	N040	N042		90	L3x3x6	Beam	None	A36	Typical
28	H028	N041	N043		90	L3x3x6	Beam	None	A36	Typical
29	H029	N040	N043		90	PL5x0.75	Beam	None	A36	Typical
30	H030	N038	N042		90	PL5x0.75	Beam	None	A36	Typical
31	H031	N044	N038			PL3x0.375	Beam	None	A36	Typical
32	H032	N045	N040			PL3x0.375	Beam	None	A36	Typical
33	H033	N046	N041			PL3x0.375	Beam	None	A36	Typical
34	H034	N044	N042			PL3x0.375	Beam	None	A36	Typical
35	H035	N045	N043			PL3x0.375	Beam	None	A36	Typical
36	H036	N046	N039			PL3x0.375	Beam	None	A36	Typical
37	H037	N053	N056		90	L3x3x6	Beam	None	A36	Typical
38	H038	N057	N047		90	L2x2x4	Beam	None	A36	Typical
39	H039	N059	N048		90	L2x2x4	Beam	None	A36	Typical



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 Designer : Mitchell.Chen
 Job Number : 13002888_C8_04
 Model Name : 302476, Wtbr - Waterbury

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Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
40	H040	N060	N049		90	L2x2x4	Beam	None	A36	Typical
41	H041	N058	N050		180	L2x2x4	Beam	None	A36	Typical
42	H042	N061	N051		180	L2x2x4	Beam	None	A36	Typical
43	H043	N062	N052		180	L2x2x4	Beam	None	A36	Typical
44	H044	N063	N064		90	PL5x0.75	Beam	None	A36	Typical
45	H045	N054	N069		90	L3x3x6	Beam	None	A36	Typical
46	H046	N055	N070		90	L3x3x6	Beam	None	A36	Typical
47	H047	N065	N067		90	PL5x0.75	Beam	None	A36	Typical
48	H048	N066	N068		90	PL5x0.75	Beam	None	A36	Typical
49	V049	N011	N047		270	L2x2x4	Column	None	A36	Typical
50	V050	N014	N050		180	L2x2x4	Column	None	A36	Typical
51	V051	N016	N052		60	L2x2x4	Column	None	A36	Typical
52	V052	N013	N049		150	L2x2x4	Column	None	A36	Typical
53	V053	N051	N015		330	L2x2x4	Column	None	A36	Typical
54	V054	N012	N048		30	L2x2x4	Column	None	A36	Typical
55	D055	N071	N072		90	L2x2x4	Column	None	A36	Typical
56	D056	N073	N074		90	L2x2x4	Column	None	A36	Typical
57	D057	N075	N076		90	L2x2x4	Column	None	A36	Typical
58	D058	N084	N082		180	L2x2x4	Column	None	A36	Typical
59	D059	N086	N080		90	L2x2x4	Column	None	A36	Typical
60	D060	N088	N078		180	L2x2x4	Column	None	A36	Typical
61	D061	N083	N081		180	L2x2x4	Column	None	A36	Typical
62	D062	N079	N085		180	L2x2x4	Column	None	A36	Typical
63	D063	N087	N077		180	L2x2x4	Column	None	A36	Typical
64	D064	N053	N089		180	L2x2x4	Column	None	A36	Typical
65	D065	N059	N092		180	L2x2x4	Column	None	A36	Typical
66	D066	N062	N095		90	L2x2x4	Column	None	A36	Typical
67	D067	N060	N093		180	L2x2x4	Column	None	A36	Typical
68	D068	N054	N090		180	L2x2x4	Column	None	A36	Typical
69	D069	N058	N096		90	L2x2x4	Column	None	A36	Typical
70	D070	N057	N094		180	L2x2x4	Column	None	A36	Typical
71	D071	N055	N091		180	L2x2x4	Column	None	A36	Typical
72	D072	N061	N097		90	L2x2x4	Column	None	A36	Typical
73	D073	N105	N102			HSS3.500X0.188	Column	None	A500 Gr...	Typical
74	D074	N106	N103			HSS3.500X0.188	Column	None	A500 Gr...	Typical
75	D075	N107	N104			HSS3.500X0.188	Column	None	A500 Gr...	Typical
76	U076	N121	N071			(2) 5/8 U-Bolts	Beam	None	A36	Typical
77	U077	N098	N122			(2) 5/8 U-Bolts	Beam	None	A36	Typical
78	U078	N123	N124			(1) 1/2 U-Bolt	Beam	None	A36	Typical
79	U079	N099	N125			(1) 1/2 U-Bolt	Beam	None	A36	Typical
80	U080	N126	N011			(2) 5/8 U-Bolts	Beam	None	A36	Typical
81	U081	N100	N047			(2) 5/8 U-Bolts	Beam	None	A36	Typical
82	U082	N129	N130			(1) 1/2 U-Bolt	Beam	None	A36	Typical
83	U083	N127	N131			(1) 1/2 U-Bolt	Beam	None	A36	Typical
84	U084	N132	N014			(2) 5/8 U-Bolts	Beam	None	A36	Typical
85	U085	N128	N050			(2) 5/8 U-Bolts	Beam	None	A36	Typical
86	U086	N133	N134			(1) 1/2 U-Bolt	Beam	None	A36	Typical
87	U087	N101	N135			(1) 1/2 U-Bolt	Beam	None	A36	Typical
88	U088	N136	N137			(2) 5/8 U-Bolts	Beam	None	A36	Typical
89	U089	N108	N076			(2) 5/8 U-Bolts	Beam	None	A36	Typical
90	U090	N138	N078			(2) 5/8 U-Bolts	Beam	None	A36	Typical
91	U091	N110	N139			(2) 5/8 U-Bolts	Beam	None	A36	Typical
92	U092	N140	N141			(1) 1/2 U-Bolt	Beam	None	A36	Typical
93	U093	N112	N142			(1) 1/2 U-Bolt	Beam	None	A36	Typical
94	U094	N143	N013			(2) 5/8 U-Bolts	Beam	None	A36	Typical
95	U095	N114	N049			(2) 5/8 U-Bolts	Beam	None	A36	Typical
96	U096	N144	N016			(2) 5/8 U-Bolts	Beam	None	A36	Typical



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Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
97	U097	N116	N052			(2) 5/8 U-Bolts	Beam	None	A36	Typical
98	U098	N145	N146			(1) 1/2 U-Bolt	Beam	None	A36	Typical
99	U099	N118	N147			(1) 1/2 U-Bolt	Beam	None	A36	Typical
100	U100	N148	N149			(2) 5/8 U-Bolts	Beam	None	A36	Typical
101	U101	N120	N084			(2) 5/8 U-Bolts	Beam	None	A36	Typical
102	U102	N150	N077			(2) 5/8 U-Bolts	Beam	None	A36	Typical
103	U103	N109	N151			(2) 5/8 U-Bolts	Beam	None	A36	Typical
104	U104	N152	N153			(1) 1/2 U-Bolt	Beam	None	A36	Typical
105	U105	N111	N154			(1) 1/2 U-Bolt	Beam	None	A36	Typical
106	U106	N155	N012			(2) 5/8 U-Bolts	Beam	None	A36	Typical
107	U107	N113	N048			(2) 5/8 U-Bolts	Beam	None	A36	Typical
108	U108	N156	N015			(2) 5/8 U-Bolts	Beam	None	A36	Typical
109	U109	N115	N051			(2) 5/8 U-Bolts	Beam	None	A36	Typical
110	U110	N157	N158			(1) 1/2 U-Bolt	Beam	None	A36	Typical
111	U111	N117	N159			(1) 1/2 U-Bolt	Beam	None	A36	Typical
112	U112	N160	N161			(2) 5/8 U-Bolts	Beam	None	A36	Typical
113	U113	N119	N083			(2) 5/8 U-Bolts	Beam	None	A36	Typical
114	MP1	MP1t	MP1b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
115	MP2	MP2t	MP2b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
116	MP3	MP3t	MP3b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
117	MP4	MP4t	MP4b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
118	MP5	MP5t	MP5b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
119	MP6	MP6t	MP6b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
120	MP7	MP7t	MP7b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
121	MP8	MP8t	MP8b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
122	MP9	MP9t	MP9b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
123	MP10	MP10t	MP10b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
124	MP11	MP11t	MP11b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
125	MP12	MP12t	MP12b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
126	MP13	MP13t	MP13b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
127	MP14	MP14t	MP14b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
128	MP15	MP15t	MP15b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
129	MP16	MP16t	MP16b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
130	MP17	MP17t	MP17b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
131	MP18	MP18t	MP18b			HSS2.375X0.188	Column	None	A500 Gr...	Typical
132	MP19	MP19t	MP19b			HSS2.375X0.188	Column	None	A500 Gr...	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
1	Dead	DL		-1			33		
2	Ice	IL					33	94	3
3	Wind -Z	WLZ					33		1
4	Wind -X	WLX					33		1
5	Wind -Z (Ice)	WL-Z					33	94	1
6	Wind -X (Ice)	WL-X					33	94	1
7	Wind -Z (Working)	WLZP1					33		1
8	Wind -X (Working)	WLXP1					33		1
9	Ev -Y (Seismic)	ELY						94	
10	Eh -Z (Seismic)	ELZ						94	
11	Eh -X (Seismic)	ELX						94	
12	Lm (1)	LL				1			
13	Lm (2)	LL				1			
14	Lm (3)	LL				1			
15	Lm (4)	LL				1			
16	Lm (5)	LL				1			



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Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(P...
17	Lm (6)	LL				1			
18	Lm (7)	LL				1			
19	Lm (8)	LL				1			
20	Lm (9)	LL				1			
21	Lm (10)	LL				1			
22	Lm (11)	LL				1			
23	Lm (12)	LL				1			
24	Lm (13)	LL				1			
25	Lm (14)	LL				1			
26	Lm (15)	LL				1			
27	Lm (16)	LL				1			
28	Lm (17)	LL				1			
29	Lm (18)	LL				1			
30	Lm (19)	LL				1			
31	BLC 3 Transient Area...	None						116	
32	BLC 4 Transient Area...	None						122	
33	BLC 5 Transient Area...	None						116	
34	BLC 6 Transient Area...	None						122	
35	BLC 7 Transient Area...	None						116	
36	BLC 8 Transient Area...	None						122	

Load Combinations

	Description	So...	P...	S...	BLCFac...	BLCFac...	BLCFac...	BLCFac...	BLCFac...	BLCFac...	BLCFac...	BLCFac...	BLCFac...
1	1.4D	Yes	Y		DL 1.4								
2	1.2D + 1.6Wo [0°]	Yes	Y		DL 1.2	W...001	W... 1.6						
3	1.2D + 1.6Wo [30°]	Yes	Y		DL 1.2	W... .8	W... 1.3...						
4	1.2D + 1.6Wo [60°]	Yes	Y		DL 1.2	W... 1.3...	W... .8						
5	1.2D + 1.6Wo [90°]	Yes	Y		DL 1.2	W... 1.6	W...001						
6	1.2D + 1.6Wo [120°]	Yes	Y		DL 1.2	W... 1.3...	W... -.8						
7	1.2D + 1.6Wo [150°]	Yes	Y		DL 1.2	W... .8	W...-1.3...						
8	1.2D + 1.6Wo [180°]	Yes	Y		DL 1.2	W...001	W...-1.6						
9	1.2D + 1.6Wo [210°]	Yes	Y		DL 1.2	W... -.8	W...-1.3...						
10	1.2D + 1.6Wo [240°]	Yes	Y		DL 1.2	W...-1.3...	W... -.8						
11	1.2D + 1.6Wo [270°]	Yes	Y		DL 1.2	W...-1.6	W...001						
12	1.2D + 1.6Wo [300°]	Yes	Y		DL 1.2	W...-1.3...	W... .8						
13	1.2D + 1.6Wo [330°]	Yes	Y		DL 1.2	W... -.8	W... 1.3...						
14	0.9D + 1.6Wo [0°]	Yes	Y		DL .9	W...001	W... 1.6						
15	0.9D + 1.6Wo [30°]	Yes	Y		DL .9	W... .8	W... 1.3...						
16	0.9D + 1.6Wo [60°]	Yes	Y		DL .9	W... 1.3...	W... .8						
17	0.9D + 1.6Wo [90°]	Yes	Y		DL .9	W... 1.6	W...001						
18	0.9D + 1.6Wo [120°]	Yes	Y		DL .9	W... 1.3...	W... -.8						
19	0.9D + 1.6Wo [150°]	Yes	Y		DL .9	W... .8	W...-1.3...						
20	0.9D + 1.6Wo [180°]	Yes	Y		DL .9	W...001	W...-1.6						
21	0.9D + 1.6Wo [210°]	Yes	Y		DL .9	W... -.8	W...-1.3...						
22	0.9D + 1.6Wo [240°]	Yes	Y		DL .9	W...-1.3...	W... -.8						
23	0.9D + 1.6Wo [270°]	Yes	Y		DL .9	W...-1.6	W...001						
24	0.9D + 1.6Wo [300°]	Yes	Y		DL .9	W...-1.3...	W... .8						
25	0.9D + 1.6Wo [330°]	Yes	Y		DL .9	W... -.8	W... 1.3...						
26	1.2D + 1.0Di + 1.0Wi [0...	Yes	Y		DL 1.2	IL 1	W...001	W... 1					
27	1.2D + 1.0Di + 1.0Wi [3...	Yes	Y		DL 1.2	IL 1	W... .5	W... .866					
28	1.2D + 1.0Di + 1.0Wi [6...	Yes	Y		DL 1.2	IL 1	W... .866	W... .5					
29	1.2D + 1.0Di + 1.0Wi [9...	Yes	Y		DL 1.2	IL 1	W... 1	W...001					
30	1.2D + 1.0Di + 1.0Wi [1...	Yes	Y		DL 1.2	IL 1	W... .866	W... -.5					
31	1.2D + 1.0Di + 1.0Wi [1...	Yes	Y		DL 1.2	IL 1	W... .5	W...-.866					
32	1.2D + 1.0Di + 1.0Wi [1...	Yes	Y		DL 1.2	IL 1	W...001	W... -1					



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 Model Name : 302476, Wtbr - Waterbury

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Load Combinations (Continued)

	Description	So...	P...	S...	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..
33	1.2D + 1.0Di + 1.0Wi [2...	Yes	Y		DL 1.2	IL 1	W...	-.5	W...	-.866					
34	1.2D + 1.0Di + 1.0Wi [2...	Yes	Y		DL 1.2	IL 1	W...	-.866	W...	-.5					
35	1.2D + 1.0Di + 1.0Wi [2...	Yes	Y		DL 1.2	IL 1	W...	-.1	W...	.001					
36	1.2D + 1.0Di + 1.0Wi [3...	Yes	Y		DL 1.2	IL 1	W...	-.866	W...	.5					
37	1.2D + 1.0Di + 1.0Wi [3...	Yes	Y		DL 1.2	IL 1	W...	-.5	W...	.866					
38	1.2D + 1.0Ev + 1.0Eh [0°]	Yes	Y		DL 1.2	ELY 1	ELZ 1	ELX	.001						
39	1.2D + 1.0Ev + 1.0Eh [3...	Yes	Y		DL 1.2	ELY 1	ELZ .866	ELX	.5						
40	1.2D + 1.0Ev + 1.0Eh [6...	Yes	Y		DL 1.2	ELY 1	ELZ .5	ELX	.866						
41	1.2D + 1.0Ev + 1.0Eh [9...	Yes	Y		DL 1.2	ELY 1	ELZ .001	ELX	1						
42	1.2D + 1.0Ev + 1.0Eh [1...	Yes	Y		DL 1.2	ELY 1	ELZ -.5	ELX	.866						
43	1.2D + 1.0Ev + 1.0Eh [1...	Yes	Y		DL 1.2	ELY 1	ELZ -.866	ELX	.5						
44	1.2D + 1.0Ev + 1.0Eh [1...	Yes	Y		DL 1.2	ELY 1	ELZ -.1	ELX	.001						
45	1.2D + 1.0Ev + 1.0Eh [2...	Yes	Y		DL 1.2	ELY 1	ELZ -.866	ELX	-.5						
46	1.2D + 1.0Ev + 1.0Eh [2...	Yes	Y		DL 1.2	ELY 1	ELZ -.5	ELX	-.866						
47	1.2D + 1.0Ev + 1.0Eh [2...	Yes	Y		DL 1.2	ELY 1	ELZ .001	ELX	-.1						
48	1.2D + 1.0Ev + 1.0Eh [3...	Yes	Y		DL 1.2	ELY 1	ELZ .5	ELX	-.866						
49	1.2D + 1.0Ev + 1.0Eh [3...	Yes	Y		DL 1.2	ELY 1	ELZ .866	ELX	-.5						
50	0.9D + 1.0Ev + 1.0Eh [0°]	Yes	Y		DL .9	ELY 1	ELZ 1	ELX	.001						
51	0.9D + 1.0Ev + 1.0Eh [3...	Yes	Y		DL .9	ELY 1	ELZ .866	ELX	.5						
52	0.9D + 1.0Ev + 1.0Eh [6...	Yes	Y		DL .9	ELY 1	ELZ .5	ELX	.866						
53	0.9D + 1.0Ev + 1.0Eh [9...	Yes	Y		DL .9	ELY 1	ELZ .001	ELX	1						
54	0.9D + 1.0Ev + 1.0Eh [1...	Yes	Y		DL .9	ELY 1	ELZ -.5	ELX	.866						
55	0.9D + 1.0Ev + 1.0Eh [1...	Yes	Y		DL .9	ELY 1	ELZ -.866	ELX	.5						
56	0.9D + 1.0Ev + 1.0Eh [1...	Yes	Y		DL .9	ELY 1	ELZ -.1	ELX	.001						
57	0.9D + 1.0Ev + 1.0Eh [2...	Yes	Y		DL .9	ELY 1	ELZ -.866	ELX	-.5						
58	0.9D + 1.0Ev + 1.0Eh [2...	Yes	Y		DL .9	ELY 1	ELZ -.5	ELX	-.866						
59	0.9D + 1.0Ev + 1.0Eh [2...	Yes	Y		DL .9	ELY 1	ELZ .001	ELX	-.1						
60	0.9D + 1.0Ev + 1.0Eh [3...	Yes	Y		DL .9	ELY 1	ELZ .5	ELX	-.866						
61	0.9D + 1.0Ev + 1.0Eh [3...	Yes	Y		DL .9	ELY 1	ELZ .866	ELX	-.5						
62	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	.001	W...	1					
63	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	.5	W...	.866					
64	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	.866	W...	.5					
65	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	1	W...	.001					
66	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	.866	W...	-.5					
67	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	.5	W...	-.866					
68	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	.001	W...	-.5					
69	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	-.5	W...	-.866					
70	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	-.866	W...	-.5					
71	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	-.1	W...	.001					
72	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	-.866	W...	.5					
73	1.2D + 1.5Lm(1) + 1.0W...	Yes	Y		DL 1.2	12 1.5	W...	-.5	W...	.866					
74	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	.001	W...	1					
75	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	.5	W...	.866					
76	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	.866	W...	.5					
77	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	1	W...	.001					
78	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	.866	W...	-.5					
79	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	.5	W...	-.866					
80	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	.001	W...	-.5					
81	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	-.5	W...	-.866					
82	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	-.866	W...	-.5					
83	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	-.1	W...	.001					
84	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	-.866	W...	.5					
85	1.2D + 1.5Lm(2) + 1.0W...	Yes	Y		DL 1.2	13 1.5	W...	-.5	W...	.866					
86	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14 1.5	W...	.001	W...	1					
87	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14 1.5	W...	.5	W...	.866					
88	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14 1.5	W...	.866	W...	.5					
89	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14 1.5	W...	1	W...	.001					



Company : American Tower Corp.
 Designer : Mitchell.Chen
 Job Number : 13002888_C8_04
 Model Name : 302476, Wtbr - Waterbury

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 Checked By: -

Load Combinations (Continued)

	Description	So...	P...	S...	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.
90	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14	1.5	W...	.866	W...	-.5				
91	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14	1.5	W...	.5	W...	-.866				
92	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14	1.5	W...	.001	W...	-.5				
93	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14	1.5	W...	-.5	W...	-.866				
94	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14	1.5	W...	-.866	W...	-.5				
95	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14	1.5	W...	-.1	W...	.001				
96	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14	1.5	W...	-.866	W...	.5				
97	1.2D + 1.5Lm(3) + 1.0W...	Yes	Y		DL 1.2	14	1.5	W...	-.5	W...	.866				
98	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	.001	W...	.1				
99	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	.5	W...	.866				
100	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	.866	W...	.5				
101	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	.1	W...	.001				
102	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	.866	W...	-.5				
103	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	.5	W...	-.866				
104	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	.001	W...	-.5				
105	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	-.5	W...	-.866				
106	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	-.866	W...	-.5				
107	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	-.1	W...	.001				
108	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	-.866	W...	.5				
109	1.2D + 1.5Lm(4) + 1.0W...	Yes	Y		DL 1.2	15	1.5	W...	-.5	W...	.866				
110	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	.001	W...	.1				
111	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	.5	W...	.866				
112	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	.866	W...	.5				
113	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	.1	W...	.001				
114	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	.866	W...	-.5				
115	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	.5	W...	-.866				
116	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	.001	W...	-.5				
117	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	-.5	W...	-.866				
118	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	-.866	W...	-.5				
119	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	-.1	W...	.001				
120	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	-.866	W...	.5				
121	1.2D + 1.5Lm(5) + 1.0W...	Yes	Y		DL 1.2	16	1.5	W...	-.5	W...	.866				
122	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	.001	W...	.1				
123	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	.5	W...	.866				
124	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	.866	W...	.5				
125	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	.1	W...	.001				
126	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	.866	W...	-.5				
127	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	.5	W...	-.866				
128	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	.001	W...	-.5				
129	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	-.5	W...	-.866				
130	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	-.866	W...	-.5				
131	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	-.1	W...	.001				
132	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	-.866	W...	.5				
133	1.2D + 1.5Lm(6) + 1.0W...	Yes	Y		DL 1.2	17	1.5	W...	-.5	W...	.866				
134	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	.001	W...	.1				
135	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	.5	W...	.866				
136	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	.866	W...	.5				
137	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	.1	W...	.001				
138	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	.866	W...	-.5				
139	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	.5	W...	-.866				
140	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	.001	W...	-.5				
141	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	-.5	W...	-.866				
142	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	-.866	W...	-.5				
143	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	-.1	W...	.001				
144	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	-.866	W...	.5				
145	1.2D + 1.5Lm(7) + 1.0W...	Yes	Y		DL 1.2	18	1.5	W...	-.5	W...	.866				
146	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	.001	W...	.1				



Company : American Tower Corp.
 Designer : Mitchell.Chen
 Job Number : 13002888_C8_04
 Model Name : 302476, Wtbr - Waterbury

Feb 11, 2020
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Load Combinations (Continued)

	Description	So...	P...	S...	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..
147	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	.5	W...	.866				
148	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	.866	W...	.5				
149	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	1	W...	.001				
150	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	.866	W...	-.5				
151	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	.5	W...	-.866				
152	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	.001	W...	-.5				
153	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	-.5	W...	-.866				
154	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	-.866	W...	-.5				
155	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	-1	W...	.001				
156	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	-.866	W...	.5				
157	1.2D + 1.5Lm(8) + 1.0W...	Yes	Y		DL 1.2	19	1.5	W...	-.5	W...	.866				
158	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	.001	W...	1				
159	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	.5	W...	.866				
160	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	.866	W...	.5				
161	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	1	W...	.001				
162	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	.866	W...	-.5				
163	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	.5	W...	-.866				
164	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	.001	W...	-.5				
165	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	-.5	W...	-.866				
166	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	-.866	W...	-.5				
167	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	-1	W...	.001				
168	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	-.866	W...	.5				
169	1.2D + 1.5Lm(9) + 1.0W...	Yes	Y		DL 1.2	20	1.5	W...	-.5	W...	.866				
170	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	.001	W...	1				
171	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	.5	W...	.866				
172	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	.866	W...	.5				
173	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	1	W...	.001				
174	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	.866	W...	-.5				
175	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	.5	W...	-.866				
176	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	.001	W...	-.5				
177	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	-.5	W...	-.866				
178	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	-.866	W...	-.5				
179	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	-1	W...	.001				
180	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	-.866	W...	.5				
181	1.2D + 1.5Lm(10) + 1.0...	Yes	Y		DL 1.2	21	1.5	W...	-.5	W...	.866				
182	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	.001	W...	1				
183	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	.5	W...	.866				
184	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	.866	W...	.5				
185	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	1	W...	.001				
186	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	.866	W...	-.5				
187	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	.5	W...	-.866				
188	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	.001	W...	-.5				
189	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	-.5	W...	-.866				
190	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	-.866	W...	-.5				
191	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	-1	W...	.001				
192	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	-.866	W...	.5				
193	1.2D + 1.5Lm(11) + 1.0...	Yes	Y		DL 1.2	22	1.5	W...	-.5	W...	.866				
194	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	.001	W...	1				
195	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	.5	W...	.866				
196	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	.866	W...	.5				
197	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	1	W...	.001				
198	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	.866	W...	-.5				
199	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	.5	W...	-.866				
200	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	.001	W...	-.5				
201	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	-.5	W...	-.866				
202	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	-.866	W...	-.5				
203	1.2D + 1.5Lm(12) + 1.0...	Yes	Y		DL 1.2	23	1.5	W...	-1	W...	.001				



Company : American Tower Corp.
 Designer : Mitchell.Chen
 Job Number : 13002888_C8_04
 Model Name : 302476, Wtbr - Waterbury

Feb 11, 2020
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Load Combinations (Continued)

Description	So...	P...	S...	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.	BLCFac.
204	1.2D + 1.5Lm(12) + 1.0...	Yes	Y	DL 1.2	23	1.5	W...	-.866	W...	.5					
205	1.2D + 1.5Lm(12) + 1.0...	Yes	Y	DL 1.2	23	1.5	W...	-.5	W...	.866					
206	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	.001	W...	1					
207	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	.5	W...	.866					
208	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	.866	W...	.5					
209	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	1	W...	.001					
210	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	.866	W...	-.5					
211	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	.5	W...	-.866					
212	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	.001	W...	-.5					
213	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	-.5	W...	-.866					
214	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	-.866	W...	-.5					
215	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	-.1	W...	.001					
216	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	-.866	W...	.5					
217	1.2D + 1.5Lm(13) + 1.0...	Yes	Y	DL 1.2	24	1.5	W...	-.5	W...	.866					
218	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	.001	W...	1					
219	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	.5	W...	.866					
220	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	.866	W...	.5					
221	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	1	W...	.001					
222	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	.866	W...	-.5					
223	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	.5	W...	-.866					
224	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	.001	W...	-.5					
225	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	-.5	W...	-.866					
226	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	-.866	W...	-.5					
227	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	-.1	W...	.001					
228	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	-.866	W...	.5					
229	1.2D + 1.5Lm(14) + 1.0...	Yes	Y	DL 1.2	25	1.5	W...	-.5	W...	.866					
230	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	.001	W...	1					
231	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	.5	W...	.866					
232	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	.866	W...	.5					
233	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	1	W...	.001					
234	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	.866	W...	-.5					
235	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	.5	W...	-.866					
236	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	.001	W...	-.5					
237	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	-.5	W...	-.866					
238	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	-.866	W...	-.5					
239	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	-.1	W...	.001					
240	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	-.866	W...	.5					
241	1.2D + 1.5Lm(15) + 1.0...	Yes	Y	DL 1.2	26	1.5	W...	-.5	W...	.866					
242	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	.001	W...	1					
243	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	.5	W...	.866					
244	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	.866	W...	.5					
245	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	1	W...	.001					
246	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	.866	W...	-.5					
247	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	.5	W...	-.866					
248	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	.001	W...	-.5					
249	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	-.5	W...	-.866					
250	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	-.866	W...	-.5					
251	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	-.1	W...	.001					
252	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	-.866	W...	.5					
253	1.2D + 1.5Lm(16) + 1.0...	Yes	Y	DL 1.2	27	1.5	W...	-.5	W...	.866					
254	1.2D + 1.5Lm(17) + 1.0...	Yes	Y	DL 1.2	28	1.5	W...	.001	W...	1					
255	1.2D + 1.5Lm(17) + 1.0...	Yes	Y	DL 1.2	28	1.5	W...	.5	W...	.866					
256	1.2D + 1.5Lm(17) + 1.0...	Yes	Y	DL 1.2	28	1.5	W...	.866	W...	.5					
257	1.2D + 1.5Lm(17) + 1.0...	Yes	Y	DL 1.2	28	1.5	W...	1	W...	.001					
258	1.2D + 1.5Lm(17) + 1.0...	Yes	Y	DL 1.2	28	1.5	W...	.866	W...	-.5					
259	1.2D + 1.5Lm(17) + 1.0...	Yes	Y	DL 1.2	28	1.5	W...	.5	W...	-.866					
260	1.2D + 1.5Lm(17) + 1.0...	Yes	Y	DL 1.2	28	1.5	W...	.001	W...	-.5					



Company : American Tower Corp.
 Designer : Mitchell.Chen
 Job Number : 13002888_C8_04
 Model Name : 302476, Wtbr - Waterbury

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Load Combinations (Continued)

	Description	So..	P...	S...	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..	BLCFac..
261	1.2D + 1.5Lm(17) + 1.0...	Yes	Y		DL 1.2	28 1.5	W...	-.5	W...	-.866					
262	1.2D + 1.5Lm(17) + 1.0...	Yes	Y		DL 1.2	28 1.5	W...	-.866	W...	-.5					
263	1.2D + 1.5Lm(17) + 1.0...	Yes	Y		DL 1.2	28 1.5	W...	-.1	W...	.001					
264	1.2D + 1.5Lm(17) + 1.0...	Yes	Y		DL 1.2	28 1.5	W...	-.866	W...	.5					
265	1.2D + 1.5Lm(17) + 1.0...	Yes	Y		DL 1.2	28 1.5	W...	-.5	W...	.866					
266	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	.001	W...	.1					
267	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	.5	W...	.866					
268	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	.866	W...	.5					
269	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	.1	W...	.001					
270	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	.866	W...	-.5					
271	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	.5	W...	-.866					
272	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	.001	W...	-.5					
273	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	-.5	W...	-.866					
274	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	-.866	W...	-.5					
275	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	-.1	W...	.001					
276	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	-.866	W...	.5					
277	1.2D + 1.5Lm(18) + 1.0...	Yes	Y		DL 1.2	29 1.5	W...	-.5	W...	.866					
278	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	.001	W...	.1					
279	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	.5	W...	.866					
280	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	.866	W...	.5					
281	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	.1	W...	.001					
282	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	.866	W...	-.5					
283	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	.5	W...	-.866					
284	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	.001	W...	-.5					
285	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	-.5	W...	-.866					
286	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	-.866	W...	-.5					
287	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	-.1	W...	.001					
288	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	-.866	W...	.5					
289	1.2D + 1.5Lm(19) + 1.0...	Yes	Y		DL 1.2	30 1.5	W...	-.5	W...	.866					

Envelope Joint Reactions

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
1	N017	max	124.125	17	50.786	6	727.893	14	158.156	18	346.756	11	.445	151
2		min	-137.581	11	-42.634	24	-1285.392	8	-166.833	12	-330.173	17	-1.282	241
3	N018	max	677.926	18	29.145	7	755.577	12	56.808	12	236.609	13	99.147	12
4		min	-1169.558	12	-20.512	25	-459.12	18	-53.534	18	-220.455	18	-92.231	18
5	N019	max	1125.658	4	29.347	5	684.688	4	55.604	11	160.56	11	87.66	17
6		min	-645.054	22	-21.834	23	-424.747	22	-50.426	17	-143.676	17	-95.383	11
7	N021	max	376.898	26	19.149	18	738.143	26	72.391	12	100.611	24	21.962	18
8		min	-52.161	19	-61.75	36	-14.811	19	-44.266	18	-103.014	6	-36.072	12
9	N022	max	44.04	21	7.7	23	985.816	26	70.674	6	100.073	11	35.115	6
10		min	-482.308	26	-82.075	29	-79.019	20	-36.232	24	-83.599	17	-18.07	24
11	N023	max	425.162	30	11.353	17	-63.122	24	37.015	18	102.899	23	24.494	18
12		min	-24.719	23	-56.767	35	-633.279	30	-61.804	12	-105.699	5	-40.873	12
13	N024	max	40.89	16	23.699	17	49.459	24	3.405	18	118.075	24	85.291	12
14		min	-774.146	34	-60.268	35	-76.62	6	-5.194	12	-120.751	6	-55.657	18
15	N025	max	1096.318	30	16.691	23	28.047	17	3.111	23	133.23	11	52.004	23
16		min	-172.556	24	-85.16	29	-74.996	33	-5.619	5	-115.973	17	-90.448	5
17	N026	max	64.796	16	10.271	24	47.27	16	39.384	24	120.617	12	47.319	6
18		min	-606.535	34	-83.246	30	-892.96	34	-71.268	6	-103.385	18	-26.029	24
19	N053	max	192.137	5	1102.149	37	2254.959	2	228.689	5	379.602	23	.702	147
20		min	-178.39	23	252.886	19	-1302.815	20	-97.94	23	-423.222	5	-1.239	238
21	N054	max	1977.73	6	1087.834	29	736.175	24	32.573	24	260.011	25	56.667	24
22		min	-1145.891	24	293.054	23	-1237.284	6	-97.893	6	-302.865	7	-168.818	6
23	N055	max	1251.171	16	1113.72	33	759.407	16	5.912	23	79.054	22	146.32	28



Company : American Tower Corp.
 Designer : Mitchell.Chen
 Job Number : 13002888_C8_04
 Model Name : 302476, Wtbr - Waterbury

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Envelope Joint Reactions (Continued)

Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC	
24		min	-2071.773	10	249.958	16	-1219.908	10	-83.386	28	-122.764	4	-10.683	23
25	N057	max	89.543	25	987.014	27	109.653	25	42.456	24	101.221	24	35.339	6
26		min	-400.939	32	280.89	19	-782.387	32	-70.222	6	-113.881	6	-21.533	24
27	N058	max	541.301	32	1311.846	31	414.283	14	29.815	17	93.401	11	15.164	17
28		min	-216.406	14	370.388	24	-1076.715	32	-60.648	11	-78.311	17	-30.638	11
29	N059	max	126.833	17	918.279	32	694.764	36	52.861	5	85.314	23	34.75	5
30		min	-463.37	35	270.228	24	-70.814	17	-27.472	23	-98.25	5	-17.913	23
31	N060	max	832.631	28	920.029	35	91.807	12	5.173	5	120.688	24	58.723	23
32		min	-139.508	22	247.821	17	-68.509	18	-3.293	23	-133.525	6	-89.035	5
33	N061	max	536.966	18	1301.351	36	80.002	4	6.371	11	163.008	11	106.176	11
34		min	-1216.041	12	378.705	17	-44.874	22	-4.287	17	-146.756	17	-70.725	17
35	N062	max	659.137	28	1297.147	28	999.292	28	57.691	13	105.935	12	18.417	19
36		min	-267.541	22	364.686	22	-377.541	22	-28.162	19	-89.787	18	-37.861	13
37	Totals:	max	7102.939	17	9500.854	37	6569.491	14						
38		min	-7102.939	11	2937.593	14	-6569.491	8						

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

Member	Shape	Code Ch...	Loc[in]	LC	Shear Check	Loc.....	phi*Pn...	phi*Pn...	phi*M...	phi*M.....	Eqn	
1	H001	PL5x0.75	.012	0	31	.021	0	y ... 12021...	121500	1898....	12656....	H1-1b
2	H002	L3x3x6	.180	128.25	31	.105	153...	y 32 14511...	68364	2307....	4889.89...	H2-1
3	H003	L3x3x6	.186	128.25	35	.108	153...	y 36 14511...	68364	2307....	4712....	H2-1
4	H004	L3x3x6	.185	128.25	27	.106	153...	y 28 14511...	68364	2307....	4715....	H2-1
5	H005	PL5x0.75	.013	4.737	27	.021	0	y ... 12021...	121500	1898....	12656....	H1-1b
6	H006	PL5x0.75	.013	4.737	35	.021	0	y ... 12021...	121500	1898....	12656....	H1-1b
7	H007	PL3x0.375	.066	0	246	.025	4.7...	y ... 34930...	36450	284.766	2278....	H1-1b
8	H008	PL3x0.375	.067	0	263	.025	4.7...	y ... 34930...	36450	284.766	2278....	H1-1b
9	H009	PL3x0.375	.066	0	111	.025	4.7...	y ... 34930...	36450	284.766	2278....	H1-1b
10	H010	PL3x0.375	.072	0	222	.027	0	y ... 34930...	36450	284.766	2278....	H1-1b
11	H011	PL3x0.375	.073	0	239	.027	0	y ... 34930...	36450	284.766	2278....	H1-1b
12	H012	PL3x0.375	.072	0	98	.027	0	y ... 34930...	36450	284.766	2278....	H1-1b
13	H013	L3x3x6	.143	62.531	32	.040	63....	z 37 32535...	68364	2307....	5322....	H2-1
14	H014	L2x2x4	.391	36.895	26	.088	31....	z 27 18954...	30585.6	690.934	1576....	H2-1
15	H015	L2x2x4	.355	36.895	30	.081	31....	z 31 18954...	30585.6	690.934	1576....	H2-1
16	H016	L2x2x4	.356	36.895	34	.081	31....	z 35 18954...	30585.6	690.934	1576....	H2-1
17	H017	L2x2x4	.521	36.895	27	.119	31....	y 30 18954...	30585.6	690.934	1576....	H2-1
18	H018	L2x2x4	.511	36.895	30	.118	31....	y 37 18954...	30585.6	690.934	1576....	H2-1
19	H019	L2x2x4	.508	36.895	35	.118	31....	y 35 18954...	30585.6	690.934	1576....	H2-1
20	H020	PL5x0.75	.133	6.928	26	.068	6.9...	y 27 11092...	121500	1898....	12656....	H1-1b
21	H021	L3x3x6	.143	62.531	36	.040	63....	z 29 32535...	68364	2307....	5322....	H2-1
22	H022	L3x3x6	.144	62.531	28	.041	63....	z 33 32535...	68364	2307....	5322....	H2-1
23	H023	PL5x0.75	.130	6.928	30	.067	6.9...	y 31 11092...	121500	1898....	12656....	H1-1b
24	H024	PL5x0.75	.136	6.928	34	.068	6.9...	y 35 11092...	121500	1898....	12656....	H1-1b
25	H025	PL5x0.75	.007	0	37	.020	0	y 99 12021...	121500	1898....	12656....	H1-1b
26	H026	L3x3x6	.244	128.25	20	.059	106...	y 2 14511...	68364	2307....	4839....	H2-1
27	H027	L3x3x6	.265	128.25	23	.060	106...	y 6 14511...	68364	2307....	4752....	H2-1
28	H028	L3x3x6	.257	129.937	16	.058	106...	y 10 14511...	68364	2307....	4805....	H2-1
29	H029	PL5x0.75	.008	4.737	33	.020	4.7...	y ... 12021...	121500	1898....	12656....	H1-1b
30	H030	PL5x0.75	.009	4.737	5	.020	0	y ... 12021...	121500	1898....	12656....	H1-1b
31	H031	PL3x0.375	.049	0	78	.022	4.7...	y ... 34930...	36450	284.766	2278....	H1-1b
32	H032	PL3x0.375	.049	0	154	.022	4.7...	y ... 34930...	36450	284.766	2278....	H1-1b
33	H033	PL3x0.375	.049	0	158	.022	4.7...	y ... 34930...	36450	284.766	2278....	H1-1b
34	H034	PL3x0.375	.079	0	222	.022	0	y ... 34930...	36450	284.766	2278....	H1-1b
35	H035	PL3x0.375	.080	0	238	.022	0	y ... 34930...	36450	284.766	2278....	H1-1b
36	H036	PL3x0.375	.079	0	98	.022	0	y ... 34930...	36450	284.766	2278....	H1-1b
37	H037	L3x3x6	.160	0	18	.008	0	y 11 32535...	68364	2307....	5322....	H2-1



Company : American Tower Corp.
 Designer : Mitchell.Chen
 Job Number : 13002888_C8_04
 Model Name : 302476, Wtbr - Waterbury

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

Member	Shape	Code Ch...	Loc[in]	LC	Shear Check	Loc.....	phi*Pn...	phi*Pn...	phi*M...	phi*M...	Egn	
38	H038	L2x2x4	.136	0	24	.009	36... y 6	18954...	30585.6	690.934	1576....	H2-1
39	H039	L2x2x4	.123	0	17	.005	0 y 5	18954...	30585.6	690.934	1576....	H2-1
40	H040	L2x2x4	.156	0	23	.008	0 y 6	18954...	30585.6	690.934	1576....	H2-1
41	H041	L2x2x4	.133	36.895	15	.007	36... z 4	18954...	30585.6	690.934	1576....	H2-1
42	H042	L2x2x4	.235	36.895	18	.013	36... z 6	18954...	30585.6	690.934	1576....	H2-1
43	H043	L2x2x4	.132	0	24	.006	0 z 13	18954...	30585.6	690.934	1576....	H2-1
44	H044	PL5x0.75	.050	6.928	10	.057	6.9... y 4	11092...	121500	1898....	12656....	H1-1b
45	H045	L3x3x6	.148	0	13	.005	0 y 2	32535...	68364	2307....	5322....	H2-1
46	H046	L3x3x6	.089	0	5	.005	0 z 28	32535...	68364	2307....	5322....	H2-1
47	H047	PL5x0.75	.056	6.928	13	.052	6.9... y 7	11092...	121500	1898....	12656....	H1-1b
48	H048	PL5x0.75	.045	6.928	5	.046	6.9... y 35	11092...	121500	1898....	12656....	H1-1b
49	V049	L2x2x4	.083	23	32	.003	0 y 2	13608...	30585.6	690.934	1470....	H2-1
50	V050	L2x2x4	.087	23	32	.004	0 z 2	13608...	30585.6	690.934	1470....	H2-1
51	V051	L2x2x4	.089	23	27	.004	0 z 10	13608...	30585.6	690.934	1470....	H2-1
52	V052	L2x2x4	.083	23	29	.003	0 y 10	13608...	30585.6	690.934	1470....	H2-1
53	V053	L2x2x4	.090	25	36	.005	0 y 6	13608...	30585.6	690.934	1470....	H2-1
54	V054	L2x2x4	.083	23	36	.003	0 y 6	13608...	30585.6	690.934	1470....	H2-1
55	D055	L2x2x4	.060	32.898	28	.004	65... y 13	7378....	30585.6	690.934	1376....	H2-1
56	D056	L2x2x4	.047	30	36	.004	0 y 8	8872....	30585.6	690.934	1405....	H2-1
57	D057	L2x2x4	.099	32.212	112	.005	65... y 2	7378....	30585.6	690.934	1376....	H2-1
58	D058	L2x2x4	.098	33.583	264	.006	65... z 11	7378....	30585.6	690.934	1376....	H2-1
59	D059	L2x2x4	.057	30	8	.005	60 y 4	8872....	30585.6	690.934	1405....	H2-1
60	D060	L2x2x4	.070	32.898	11	.004	0 z 10	7378....	30585.6	690.934	1376....	H2-1
61	D061	L2x2x4	.099	33.583	32	.005	65... z 6	7378....	30585.6	690.934	1376....	H2-1
62	D062	L2x2x4	.060	30	5	.005	60 z 12	8872....	30585.6	690.934	1405....	H2-1
63	D063	L2x2x4	.064	32.898	8	.003	0 z 6	7378....	30585.6	690.934	1376....	H2-1
64	D064	L2x2x4	.126	39.601	31	.004	0 z 5	5091....	30585.6	690.934	1314....	H2-1
65	D065	L2x2x4	.070	28.696	30	.006	0 z 11	9697....	30585.6	690.934	1418....	H2-1
66	D066	L2x2x4	.084	28.696	34	.006	57... y 6	9697....	30585.6	690.934	1418....	H2-1
67	D067	L2x2x4	.069	28.696	34	.005	57... y 11	9697....	30585.6	690.934	1418....	H2-1
68	D068	L2x2x4	.129	39.601	35	.004	79... y 12	5091....	30585.6	690.934	1314....	H2-1
69	D069	L2x2x4	.085	28.696	26	.005	57... y 5	9697....	30585.6	690.934	1418....	H2-1
70	D070	L2x2x4	.073	28.696	26	.005	0 z 12	9697....	30585.6	690.934	1418....	H2-1
71	D071	L2x2x4	.130	39.601	27	.004	79... z 7	5091....	30585.6	690.934	1314....	H2-1
72	D072	L2x2x4	.083	28.696	30	.005	57... z 5	9697....	30585.6	690.934	1418....	H2-1
73	D073	HSS3.500X0.188	.023	50.625	220	.004	3.3... ..	60448...	68796	6079.5	6079.5	H1-1b
74	D074	HSS3.500X0.188	.023	50.625	238	.005	3.3... 11	60448...	68796	6079.5	6079.5	H1-1b
75	D075	HSS3.500X0.188	.023	50.625	109	.004	3.3... 3	60448...	68796	6079.5	6079.5	H1-1b
76	MP1	HSS2.375X0.188	.078	54.375	73	.011	54... 6	10430...	45360	2661.75	2661.75	H1-1b
77	MP2	HSS2.375X0.188	.105	21.75	85	.007	21... 6	7243....	45360	2661.75	2661.75	H1-1b*
78	MP3	HSS2.375X0.188	.072	6.25	97	.012	6.8... 33	10430...	45360	2661.75	2661.75	H1-1b*
79	MP4	HSS2.375X0.188	.256	21.75	8	.034	21... 8	7243....	45360	2661.75	2661.75	H1-1b
80	MP5	HSS2.375X0.188	.072	6.25	121	.010	54... 3	10430...	45360	2661.75	2661.75	H1-1b*
81	MP6	HSS2.375X0.188	.078	54.375	125	.012	54... 11	10430...	45360	2661.75	2661.75	H1-1b
82	MP7	HSS2.375X0.188	.078	54.375	141	.011	54... 2	10430...	45360	2661.75	2661.75	H1-1b
83	MP8	HSS2.375X0.188	.105	21.75	157	.008	21... 11	7243....	45360	2661.75	2661.75	H1-1b*
84	MP9	HSS2.375X0.188	.105	21	169	.007	21 3	7243....	45360	2661.75	2661.75	H1-1b*
85	MP10	HSS2.375X0.188	.073	54.375	174	.015	6.8... 5	10430...	45360	2661.75	2661.75	H1-1b
86	MP11	HSS2.375X0.188	.072	6.25	193	.013	6.8... 4	10430...	45360	2661.75	2661.75	H1-1b*
87	MP12	HSS2.375X0.188	.096	54.375	27	.021	54... 29	10430...	45360	2661.75	2661.75	H1-1b
88	MP13	HSS2.375X0.188	.096	54.375	33	.021	54... 34	10430...	45360	2661.75	2661.75	H1-1b
89	MP14	HSS2.375X0.188	.282	21	11	.041	21 5	7243....	45360	2661.75	2661.75	H1-1b
90	MP15	HSS2.375X0.188	.239	21	11	.043	21 5	7243....	45360	2661.75	2661.75	H1-1b
91	MP16	HSS2.375X0.188	.072	6.25	253	.010	54... 6	10430...	45360	2661.75	2661.75	H1-1b*
92	MP17	HSS2.375X0.188	.072	6.25	265	.010	54... 11	10430...	45360	2661.75	2661.75	H1-1b*
93	MP18	HSS2.375X0.188	.105	21	277	.005	69 ...	7243....	45360	2661.75	2661.75	H1-1b*
94	MP19	HSS2.375X0.188	.095	54.375	36	.020	54... 26	10430...	45360	2661.75	2661.75	H1-1b

Site Name: Waterbury CT
Cumulative Power Density

Operator	Operating Frequency	Number of Trans.	ERP Per Trans.	Total ERP	Distance to Target	Calculated Power Density	Maximum Permissible Exposure*	Fraction of MPE
	(MHz)		(watts)	(watts)	(feet)	(mW/cm ²)	(mW/cm ²)	(%)
VZW 700	746	4	768	3,070	128	0.0674	0.4973333333	13.55%
VZW Cellular	869	2	303	605	128	0.0133	0.5793333333	2.29%
VZW Cellular	880	4	449	1,798	128	0.0395	0.5866666667	6.73%
VZW PCS	1970	4	1,657	6,626	128	0.1454	1.0	14.54%
VZW AWS	2145	4	1,694	6,776	128	0.1487	1.0	14.87%
VZW CBRS	3550	4	42	168	128	0.0037	1.0	0.37%

Total Percentage of Maximum Permissible Exposure 52.36%

*Guidelines adopted by the FCC on August 1, 1996, 47 CFR Section 1.13101 based on NCRP Report 86, 1986 and generally on ANSI/IEEE C95.1-1992

MHz = Megahertz

mW/cm² = milliwatts per square centimeter

ERP = Effective Radiated Power

Absolute worst case maximum values used, including the following assumptions:

1. closest accessible point is distance from antenna to base of pole;
2. continuous transmission from all available channels at full power for indefinite time period; and,
3. all RF energy is assumed to be directed solely to the base of the pole.



City of Waterbury
Public Works Department

MBL: **0167-0559-0024**
ADDRESS: **FARMDALE DR**

This map is for informational purposes only and has not been prepared for, or suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to verify the usability of the information. The City of Waterbury makes no warranties, express or implied, as to the use of the information obtained herein.

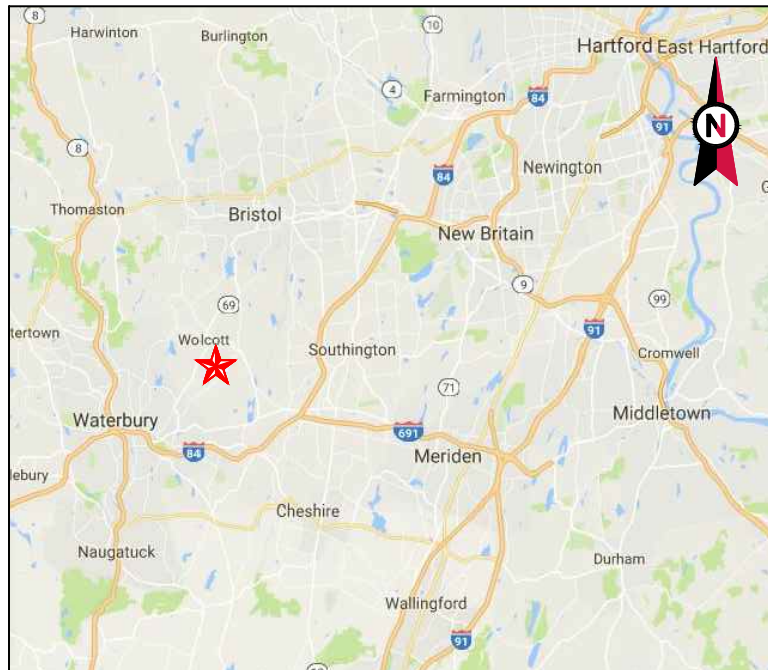


Location: FARMDALE DR **Owner:** SPRINGWICH CELLULAR TOWER HOLDINGS LLC

Property Information:			
Map Block Lot:	0167-0559-0024	Acres:	4.75
Primary Use:	Res Vac Land (5-1)	Zone:	RL
Neighborhood:	14100-Long Hill	Vol/Page:	5156
Mailing Address:	SPRINGWICH CELLULAR TOWER HOLDINGS LLC 909 CHESTNUT RM 36-M-1 ST LOUIS MO 63101		
Property Values:			
	Appraised Value	Assessed Value (70%)	
Building	0	0	
Land	321578	225100	
OutBuilding	0	0	
Total	321578	225100	
Sales Information:			
Sale Date	Sale Price	Sale Type	Valid sale
8/23/1984	20000		No
10/29/2004	0	Quit Claim	No
Outbuilding Information:			
Type	Area (sq.ft)	Year Built	Condition
Special Features:			
Permit Information:			
Permit Date	Permit Number	Permit Type	Click for Details
08/28/2015	PR20150002331	BD - Electrical	Details
08/09/2013	PR20130002198	BD - Electrical	Details
06/20/2014	PR20140001587	BD - Building	Details
05/26/2016	PR20160001522	BD - Electrical	Details
04/28/2015	PR20150000950	BD - Electrical	Details
02/03/2014	PR20140000177	BD - Electrical	Details
Planning Application:			
Application Date	Application Number	Application Type	Click for Details

Code Enforcement:			
Case Date	Case Number	Case Type	Click for Details

[Close](#)



VICINITY MAP



AMERICAN TOWER®

ATC SITE NAME: WTBR - WATERBURY
 ATC SITE NUMBER: 302476
 VERIZON SITE NAME: WATERBURY CT
 VERIZON SITE NUMBER: 469238
 SITE ADDRESS: 352 GARDEN CIRCLE
 WATERBURY, CT 06704



LOCATION MAP

**VERIZON WIRELESS
 ANTENNA MODIFICATION DRAWINGS**

AMERICAN TOWER®
 A.T. ENGINEERING SERVICE, PLLC
 3500 REGENCY PARKWAY
 SUITE 100
 CARY, NC 27518
 PHONE: (919) 468-0112
 COA: PEC.0001553

THESE DRAWINGS AND/OR THE ACCOMPANYING SPECIFICATION AS INSTRUMENTS OR SERVICE ARE THE EXCLUSIVE PROPERTY OF AMERICAN TOWER. THEIR USE AND PUBLICATION SHALL BE RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY ARE PREPARED. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO AMERICAN TOWER OR THE SPECIFIED CARRIER IS STRICTLY PROHIBITED. TITLE TO THESE DOCUMENTS SHALL REMAIN THE PROPERTY OF AMERICAN TOWER WHETHER OR NOT THE PROJECT IS EXECUTED. NEITHER THE ARCHITECT NOR THE ENGINEER WILL BE PROVIDING ON-SITE CONSTRUCTION REVIEW OF THIS PROJECT. CONTRACTOR(S) MUST VERIFY ALL DIMENSIONS AND ADVISE AMERICAN TOWER OF ANY DISCREPANCIES. ANY PRIOR ISSUANCE OF THIS DRAWING IS SUPERSEDED BY THE LATEST VERSION ON FILE WITH AMERICAN TOWER.

REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	CWB	03/06/20
1	UPDATED OVPS	CWB	03/17/20

ATC SITE NUMBER:
302476
 ATC SITE NAME:
WTBR - WATERBURY
 SITE ADDRESS:
 352 GARDEN CIRCLE
 WATERBURY, CT 06704

SEAL:



DRAWN BY: CWB
 APPROVED BY: PB
 DATE DRAWN: 03/06/20
 ATC JOB NO: 13002888
 CUSTOMER ID: WATERBURY CT
 CUSTOMER #: 469238

COVER SHEET

SHEET NUMBER:
G-001
 REVISION:
1

COMPLIANCE CODE	PROJECT SUMMARY	PROJECT DESCRIPTION	SHEET INDEX					
ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES. 1. INTERNATIONAL BUILDING CODE (IBC) 2. NATIONAL ELECTRIC CODE (NEC) 3. LOCAL BUILDING CODE 4. CITY/COUNTY ORDINANCES	<u>SITE ADDRESS:</u> 352 GARDEN CIRCLE WATERBURY, CT 06704 COUNTY: NEW HAVEN <u>GEOGRAPHIC COORDINATES:</u> LATITUDE: 41.57066667 LONGITUDE: -73.0176 GROUND ELEVATION: 826' AMSL	THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW: REMOVE (6) PANELS, (12) RRUs, AND (2) OVPS INSTALL (9) NEW PANELS, (9) RRUs, (3) DIPLEXERS, AND (1) OVP EXISTING (3) PANELS AND (2) 1-5/8" HYBRID CABLES TO REMAIN	SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:	
	<u>PROJECT TEAM</u> <u>TOWER OWNER:</u> AMERICAN TOWER 10 PRESIDENTIAL WAY WOBURN, MA 01801 <u>ENGINEER:</u> ATC TOWER SERVICES, LLC 3500 REGENCY PKWY STE 100 CARY, NC 27518 <u>PROPERTY OWNER:</u> AMERICAN TOWER 116 HUNTINGTON AVE BOSTON, MA 02116 <u>APPLICANT:</u> VERIZON WIRELESS 20 ALEXANDER DRIVE, 2ND FLOOR WALLINGFORD, CT 06492	<u>PROJECT NOTES</u> 1. THE FACILITY IS UNMANNED. 2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE. 3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE. 4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED. 5. HANDICAP ACCESS IS NOT REQUIRED.	G-001 COVER SHEET G-002 GENERAL NOTES C-101 DETAILED SITE PLAN C-102 TOWER ELEVATION C-501 RF SCHEDULE AND ANTENNA INSTALLATION C-502 CONSTRUCTION DETAILS R-601 SUPPLEMENTAL					
	<u>PROJECT LOCATION DIRECTIONS</u> FROM HARTFORD TAKE I-84 WEST TO EXIT 23. FOLLOW RT 69 NORTH TO WOLCOTT RD AND TURN LEFT. AT FIRST LIGHT TURN RIGHT ONTO LONG HILL RD. GO UP HILL, THROUGH THE STOP SIGN AND TAKE THE FIRST RIGHT ONTO WARNER RD. GO UP HILL AND TAKE FIRST RIGHT ONTO GARDEN CIRCLE. FOLLOW TO END TO ACCESS ROAD FOR THE 5 TOWERS. PAST THE FIRST TOWER ON LEFT THERE IS AN ACCESS ROAD ON THE LEFT. FOLLOW THAT TO THE TOWER.							
<u>UTILITY COMPANIES</u> POWER COMPANY: EVERSOURCE PHONE: (877) 659-6326 TELEPHONE COMPANY: FRONTIER COMMUNICATIONS PHONE: (800) 376-6843								



Know what's below.
 Call before you dig.

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GENERAL CONSTRUCTION NOTES:

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSIEIA/TIA-222, AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE VERIZON WIRELESS REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE VERIZON WIRELESS REP PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE VERIZON WIRELESS REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE VERIZON WIRELESS REP IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
17. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
18. CONTRACTOR SHALL FURNISH VERIZON WIRELESS WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
19. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH VERIZON WIRELESS REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
20. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH VERIZON WIRELESS REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY VERIZON WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
21. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH VERIZON WIRELESS SPECIFICATIONS AND REQUIREMENTS.
22. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO VERIZON WIRELESS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
23. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO VERIZON WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
24. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
25. CONTRACTOR SHALL NOTIFY VERIZON WIRELESS REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.
26. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.

27. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLIGENCE ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLIGENCE ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.
28. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE VERIZON WIRELESS REP. ANY WORK FOUND BY THE VERIZON WIRELESS REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
29. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
 - A. ASTM A-572, GRADE 50 - ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
 - B. ASTM A-36 - ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
 - C. ASTM A-500, GRADE B - HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
 - D. ASTM A-325, TYPE SC OR N - ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
 - E. ASTM F-1554 07 - ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
 - A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
 - B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
 - C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
 - D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
 - E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
 - F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
 - G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING 1/2" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.



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 SUITE 100
 CARY, NC 27518
 PHONE: (919) 468-0112
 COA: PEC.0001553

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	CWB	03/06/20

ATC SITE NUMBER:

302476

ATC SITE NAME:

WTBR - WATERBURY

SITE ADDRESS:

352 GARDEN CIRCLE
 WATERBURY, CT 06704

SEAL:



DRAWN BY:	CWB
APPROVED BY:	PB
DATE DRAWN:	03/06/20
ATC JOB NO:	13002888
CUSTOMER ID:	WATERBURY CT
CUSTOMER #:	469238

GENERAL NOTES

SHEET NUMBER:

G-002

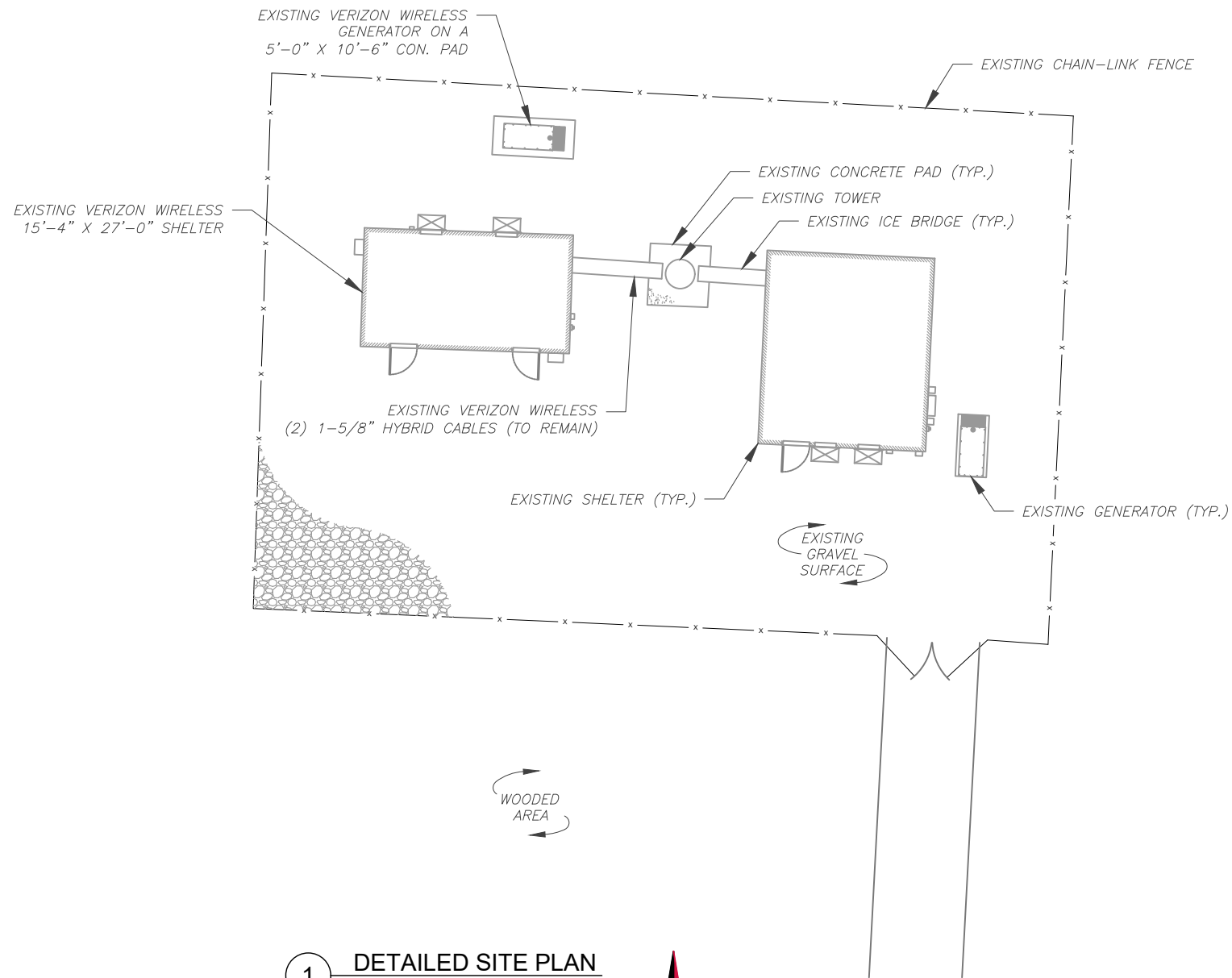
REVISION:

0

SITE PLAN NOTES:

1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.
2. ICE BRIDGE, CABLE LADDER, COAX PORT, AND COAX CABLE ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE UTILIZING EXISTING CABLE SUPPORTS, COAX PORTS, INSTALLING NEW PORTS OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.
3. THIS PROJECT INCLUDES NO INSTALL OR MODIFICATION AT GRADE.

LEGEND	
⊗	GROUNDING TEST WELL
ATS	AUTOMATIC TRANSFER SWITCH
B	BOLLARD
CSC	CELL SITE CABINET
D	DISCONNECT
E	ELECTRICAL
F	FIBER
GEN	GENERATOR
G	GENERATOR RECEPTACAL
HH, V	HAND HOLE, VAULT
IB	ICE BRIDGE
K	KENTROX BOX
LC	LIGHTING CONTROL
M	METER
PB	PULL BOX
PP	POWER POLE
T	TELCO
TRN	TRANSFORMER
x	CHAINLINK FENCE



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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	CWB	03/06/20

ATC SITE NUMBER:
302476

ATC SITE NAME:
WTBR - WATERBURY

SITE ADDRESS:
 352 GARDEN CIRCLE
 WATERBURY, CT 06704

SEAL:

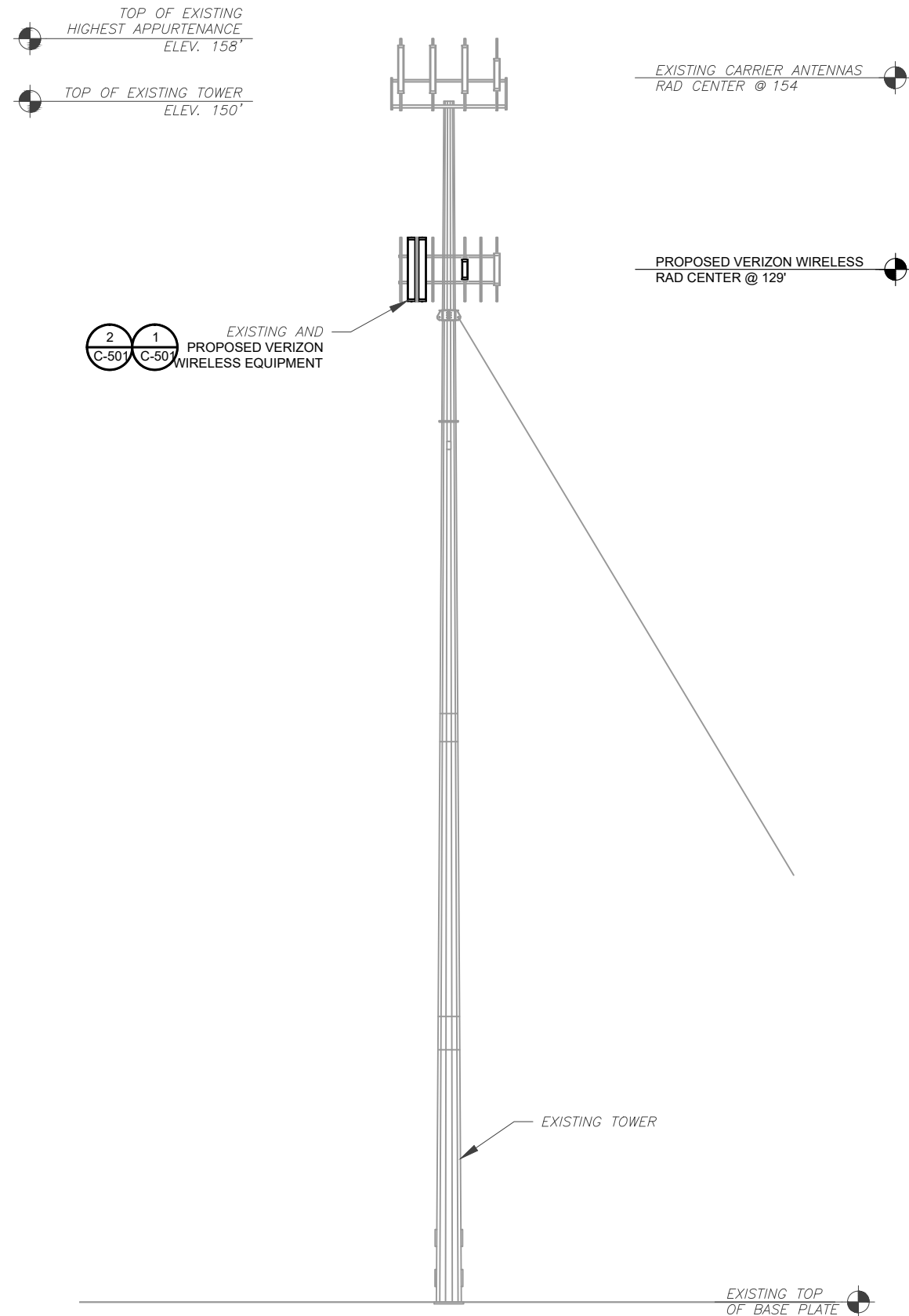
DRAWN BY:	CWB
APPROVED BY:	PB
DATE DRAWN:	03/06/20
ATC JOB NO:	13002888
CUSTOMER ID:	WATERBURY CT
CUSTOMER #:	469238

DETAILED SITE PLAN

SHEET NUMBER: C-101	REVISION: 0
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PER MOUNT ANALYSIS COMPLETED BY AMERICAN TOWER CORPORATION, DATED 02/11/20, THE EXISTING MOUNT CAN ADEQUATELY SUPPORT THE PROPOSED LOADING



1 FINAL TOWER ELEVATION
SCALE: NOT TO SCALE

TOWER NOTE:

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE AMERICAN TOWER CONSTRUCTION MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
- ATC DID NOT CONFIRM EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO, ANTENNA HEIGHTS, ANTENNA AZIMUTHS AND MOUNT CONFIGURATIONS.
- TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

ANTENNA NOTES:

- ALL ANTENNAS TO BE FURNISHED WITH DOWNTILT BRACKETS. CONTRACTOR TO COORDINATE REQUIRED MECHANICAL DOWNTILT FOR EACH ANTENNA WITH VERIZON RF ENGINEER.
- ANTENNA CENTERLINE HEIGHT IS ABOVE GROUND LEVEL (AGL).
- CONTRACTOR SHALL VERIFY ANTENNA TYPE, AZIMUTH, DOWNTILT, AND ANTENNA NUMBER PER SECTOR WITH CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.
- ALL PERSONNEL WORKING ON THE TOWER MUST COMPLY WITH VERIZON'S RF EMISSIONS GUIDELINE POLICY.
- CHECK WITH RF ENGINEER FOR LATEST ANTENNA TYPE AND AZIMUTH.
- CONTRACTOR SHALL NOT INSTALL SHRINK WRAP UNTIL AFTER CABLES HAVE BEEN SWEEPED.
- THE USE OF ALTERNATE GROUNDING MEANS (SUCH AS LYNCOLE XIT) SHALL COMPLY WITH O.C.E.I. CONSTRUCTION SPECIFICATIONS AND BUILDING PRACTICES.



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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	CWB	03/06/20

ATC SITE NUMBER:

302476

ATC SITE NAME:

WTBR - WATERBURY

SITE ADDRESS:

352 GARDEN CIRCLE
 WATERBURY, CT 06704

SEAL:

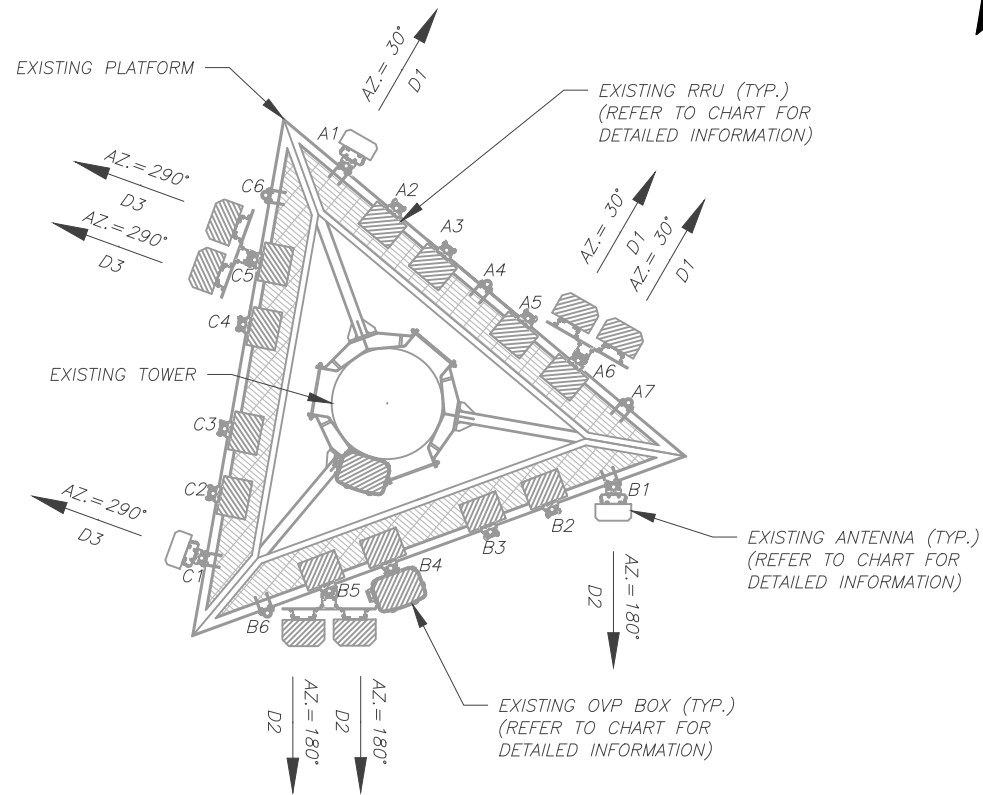


DRAWN BY:	CWB
APPROVED BY:	PB
DATE DRAWN:	03/06/20
ATC JOB NO:	13002888
CUSTOMER ID:	WATERBURY CT
CUSTOMER #:	469238

TOWER ELEVATION

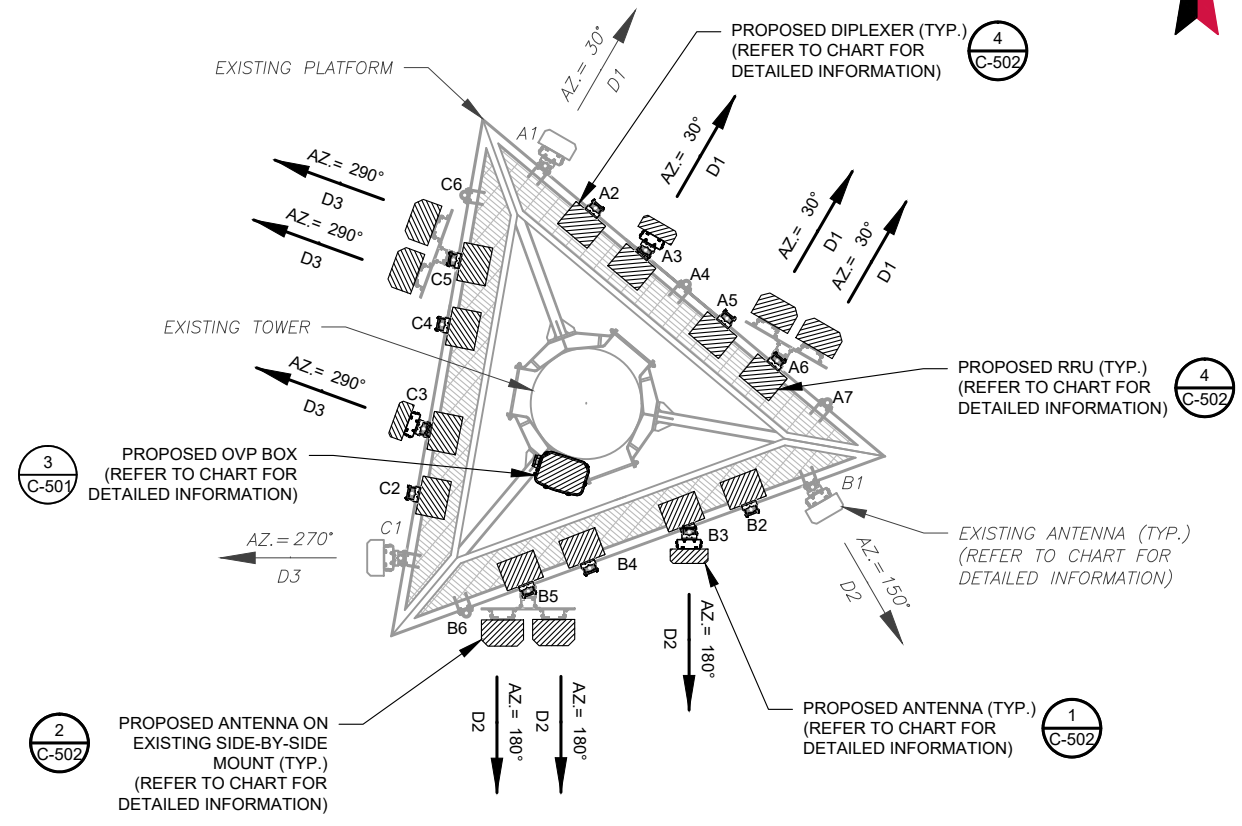
SHEET NUMBER:	REVISION:
C-102	0

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1 CURRENT ANTENNA PLAN

PER MOUNT ANALYSIS COMPLETED BY AMERICAN TOWER CORPORATION, DATED 02/11/20, THE EXISTING MOUNT CAN ADEQUATELY SUPPORT THE PROPOSED LOADING



2 FINAL ANTENNA PLAN

EXISTING ANTENNA SCHEDULE								
LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
D1	129'	30°	A1	BXA-80063-4CF-EDIN-X	850 CDMA	RMN	-	-
			A2	-	-	-	B66 RRH4X45	RMV
			A3	-	-	-	RRH4X30W-B25	RMV
			A4	-	-	-	-	-
			A5	-	-	-	B13 RRH4X30-4R 700U	RMV
			A6	(2) JAHH-65B-R3B	700 LTE	RMV	B5 RRH4x40-850	RMV
			A7	-	-	-	-	-
D2	129'	180°	B1	BXA-80063-4CF-EDIN-X	850 CDMA	RMN	-	-
			B2	-	-	-	B66 RRH4X45	RMV
			B3	-	-	-	RRH4X30W-B25	RMV
			B4	-	-	-	B13 RRH4X30-4R 700U	RMV
			B5	(2) JAHH-65B-R3B	700 LTE	RMV	B5 RRH4x40-850	RMV
			B6	-	-	-	-	-
D3	129'	290°	C1	BXA-80063-4CF-EDIN-X	850 CDMA	RMN	-	-
			C2	-	-	-	B66 RRH4X45	RMV
			C3	-	-	-	RRH4X30W-B25	RMV
			C4	-	-	-	B13 RRH4X30-4R 700U	RMV
			C5	(2) JAHH-45B-R3B	700, 850, 1900, 2100 LTE	RMV	B5 RRH4x40-850	RMV
			C6	-	-	-	-	-

- NOTES
- BASED ON APPROVED ATC APPLICATION 13002888, DATED 12/02/2019. CONFIRM WITH VERIZON WIRELESS REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS.
 - ATC HAS NOT YET VERIFIED ANY EXISTING ANTENNA CONFIG OR MOUNT CONFIG. CONTRACTOR TO VERIFY MOUNT CONFIG HAS SUFFICIENT SPACE FOR PROPOSED LESSEE EQUIPMENT (EQUIP) (I.E. CLEARANCES, MOUNT PIPE, SUFFICIENT LENGTH, ETC.) ATC DID NOT ANALYZE ANTENNA MOUNT TO DETERMINE ADEQUATE STRUCTURAL CAPACITY FOR ANY LESSEE LOADING.
 - ALL PROPOSED EQUIP INCLUDING ANTENNAS, COAX, ETC. SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS ON FILE WITH ATC'S CM.
 - CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.
 - POSITIONS START WITH FIRST PIPE ON THE LEFT SIDE (AS VIEWED FROM BEHIND THE MOUNT).

FINAL ANTENNA SCHEDULE								
LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
D1	129'	30°	A1	BXA-80063-4CF-EDIN-X	850 CDMA	RMN	-	-
			A2	-	-	-	CBC78T-DS-43-2X	ADD
			A3	SSPX310R	-	ADD	OUTDOOR CBRS 20W RRH	ADD
			A4	-	-	-	-	-
			A5	-	-	-	B2/B66A RRH-BR049	ADD
			A6	(2) JAHH-65C-R3B-V2	700, 850, 1900, 2100 LTE	ADD	B5/B13 RRH-BR04C	ADD
			A7	-	-	-	-	-
D2	129'	180°	B1	BXA-80063-4CF-EDIN-X	850 CDMA	RMN	-	-
			B2	-	-	-	CBC78T-DS-43-2X	ADD
			B3	SSPX310R	-	ADD	OUTDOOR CBRS 20W RRH	ADD
			B4	-	-	-	B2/B66A RRH-BR049	ADD
			B5	(2) JAHH-65C-R3B-V2	700, 850, 1900, 2100 LTE	ADD	B5/B13 RRH-BR04C	ADD
			B6	-	-	-	-	-
D3	129'	290°	C1	BXA-80063-4CF-EDIN-X	850 CDMA	RMN	-	-
			C2	-	-	-	CBC78T-DS-43-2X	ADD
			C3	SSPX310R	-	ADD	OUTDOOR CBRS 20W RRH	ADD
			C4	-	-	-	B2/B66A RRH-BR049	ADD
			C5	(2) JAHH-65C-R3B-V2	700, 850, 1900, 2100 LTE	ADD	B5/B13 RRH-BR04C	ADD
			C6	-	-	-	-	-

EXISTING FIBER DISTRIBUTION/OVP BOX					EXISTING CABLING SUMMARY				
MODEL NUMBER	STATUS	COAX	HYBRID	STATUS	MODEL NUMBER	STATUS	COAX	HYBRID	STATUS
(2) RCMD-3315-PF-48	RMV	-	(2) 1-5/8"	RMN					

3 EQUIPMENT SCHEDULES

CABLE LENGTHS FOR JUMPERS
FIBER DISTRIBUTION/OVP TO RRU: 15'
RRU TO ANTENNA: 10'

FINAL FIBER DISTRIBUTION/OVP BOX			FINAL CABLING SUMMARY		
MODEL NUMBER	STATUS	COAX	HYBRID	STATUS	
RCMD-6627-PF-48	ADD	-	(2) 1-5/8"	RMN	

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REV.	DESCRIPTION	BY	DATE
0	FOR CONSTRUCTION	CWB	03/06/20
1	UPDATED OVPS	CWB	03/17/20

ATC SITE NUMBER:
302476

ATC SITE NAME:
WTBR - WATERBURY

SITE ADDRESS:
352 GARDEN CIRCLE
WATERBURY, CT 06704

SEAL:

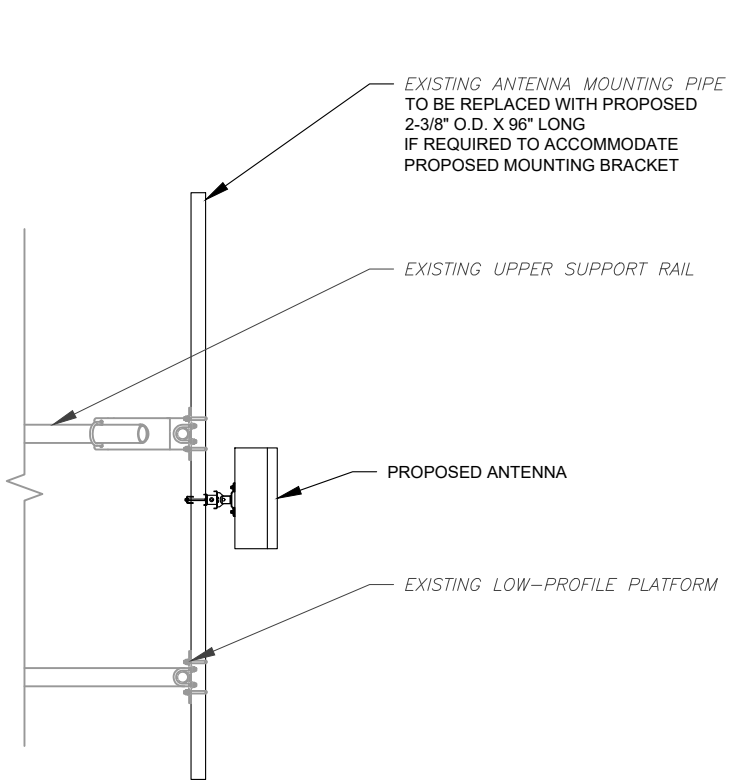
DRAWN BY: CWB
APPROVED BY: PB
DATE DRAWN: 03/06/20
ATC JOB NO: 13002888
CUSTOMER ID: WATERBURY CT
CUSTOMER #: 469238

RF SCHEDULE AND ANTENNA INSTALLATION

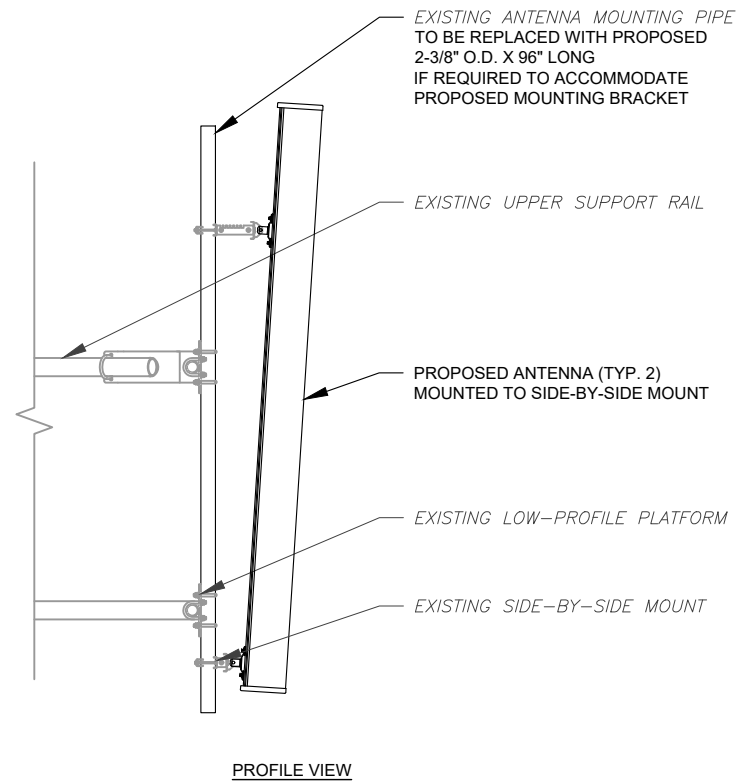
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C-501

REVISION:
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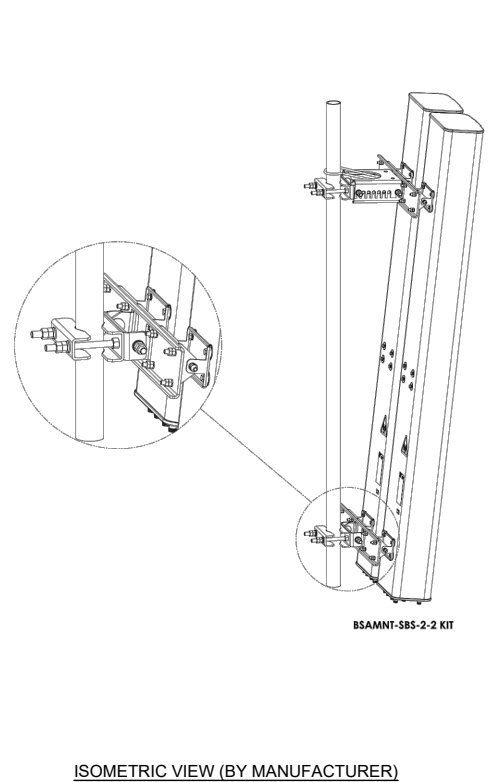
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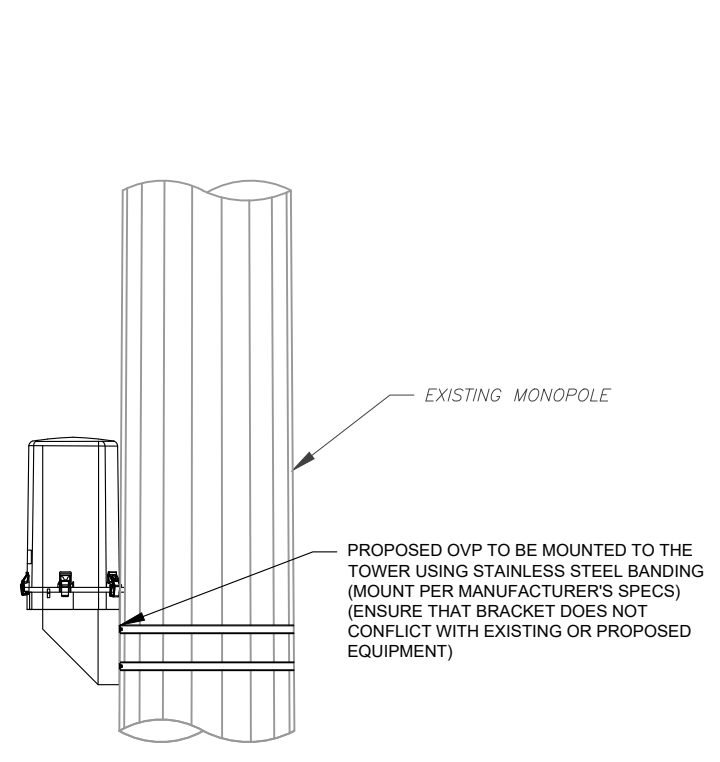
1 PROPOSED ANTENNA MOUNTING DETAIL - TYPICAL
SCALE: NOT TO SCALE



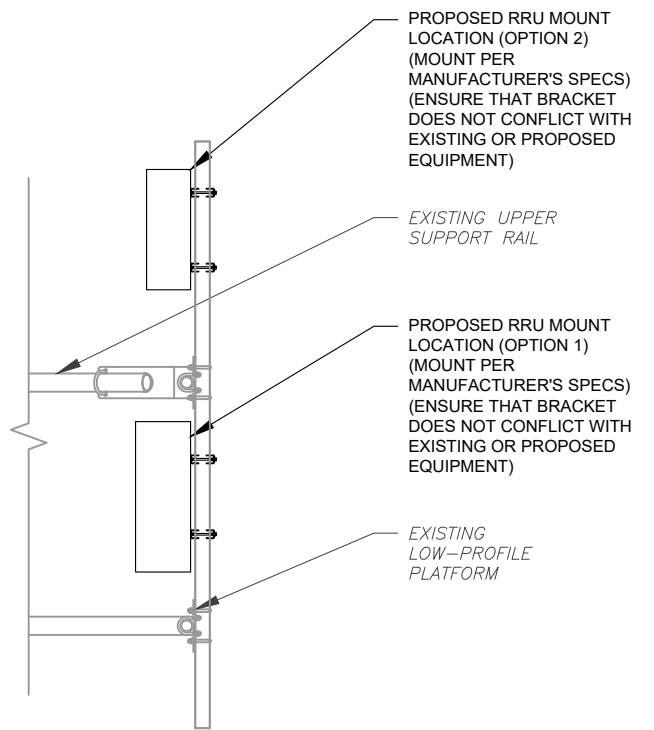
PROFILE VIEW



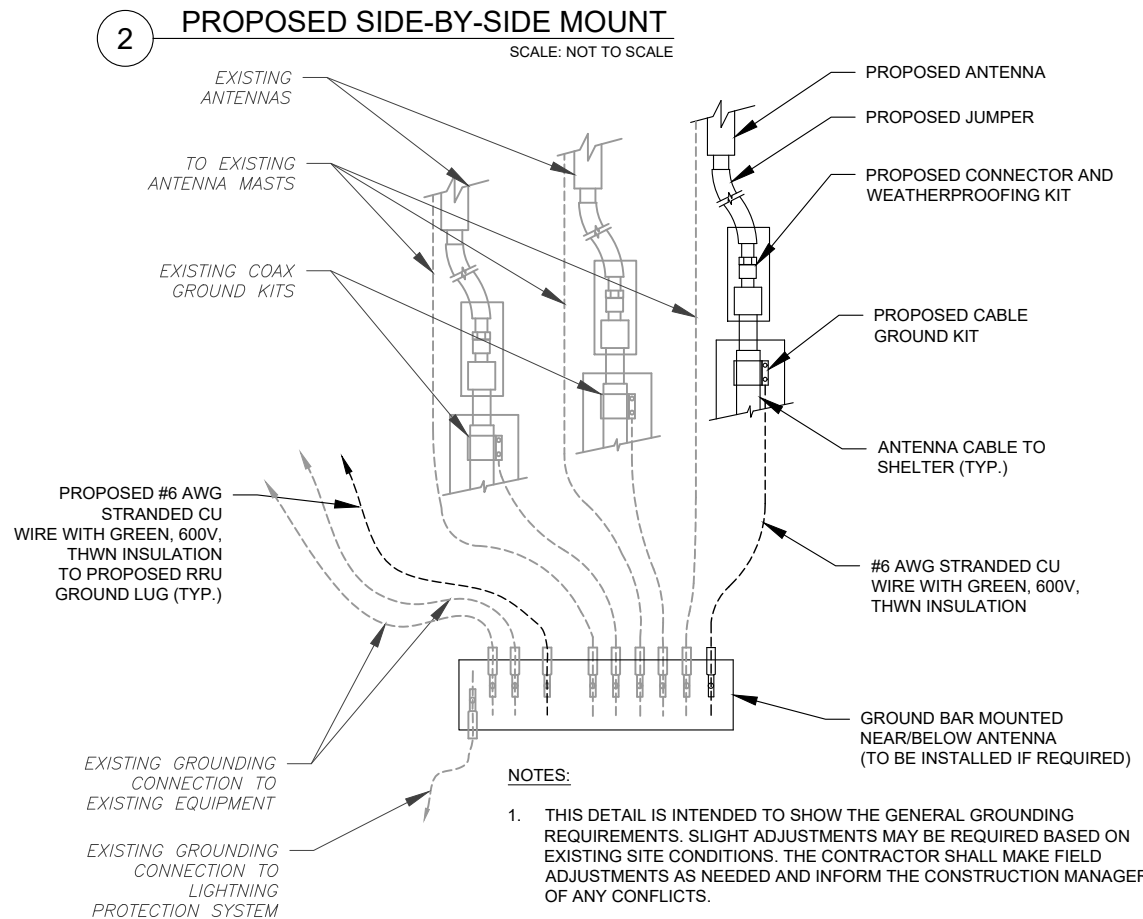
ISOMETRIC VIEW (BY MANUFACTURER)



3 PROPOSED OVP MOUNTING
SCALE: NOT TO SCALE



4 PROPOSED RRU MOUNTING DETAIL - TYPICAL
SCALE: NOT TO SCALE



5 TYPICAL ANTENNA GROUNDING DIAGRAM
SCALE: NOT TO SCALE

- NOTES:**
1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
 2. SITE GROUNDING SHALL COMPLY WITH VERIZON WIRELESS GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH VERIZON WIRELESS GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

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1	UPDATED OVPS	CWB	03/17/20

ATC SITE NUMBER:
302476

ATC SITE NAME:
WTBR - WATERBURY

SITE ADDRESS:
352 GARDEN CIRCLE
WATERBURY, CT 06704

SEAL:

DRAWN BY:	CWB
APPROVED BY:	PB
DATE DRAWN:	03/06/20
ATC JOB NO:	13002888
CUSTOMER ID:	WATERBURY CT
CUSTOMER #:	469238

CONSTRUCTION DETAILS

SHEET NUMBER: C-502	REVISION: 1
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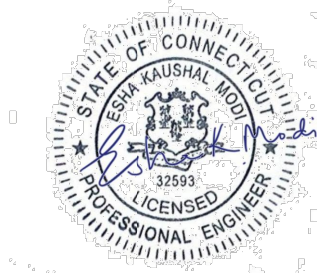


Antenna Mount Analysis Report

ATC Site Name : Wtbr - Waterbury, CT
ATC Site Number : 302476
Engineering Number : 13002888_C8_04
Mount Elevation : 128 ft
Carrier : Verizon Wireless
Carrier Site Name : WATERBURY CT
Carrier Site Number : 469238
Site Location : 352 Garden Circle
 Waterbury, CT 06704-2833
 41.57066667, -73.0176
County : New Haven
Date : February 11, 2020
Max Usage : 52%
Result : Pass

Prepared By:
Mitchell Chen
Structural Engineer

Reviewed By:



Authorized by "EOR"
11 Feb 2020 04:48:48 cosign

COA: PEC.0001553

Introduction

The purpose of this report is to summarize results of the antenna mount analysis performed for Verizon Wireless at 128 ft.

Supporting Documents

Mount Mapping	Infinigy Project #1009-Z0003-H/317-505, dated January 24, 2020
RFDS	RFDS dated November 25, 2019
Photos	Site photos from 2019

Analysis

This antenna mount was analyzed using American Tower Corporation's Mount Analysis Program and RISA-3D

Basic Wind Speed:	97 mph (3-Second Gust, Vasd) / 125 mph (3-Second Gust, Vult)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Codes:	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	$S_s = 0.161, S_1 = 0.058$
Site Class:	D - Stiff Soil
Live Loads:	$L_m = 500 \text{ lbs}, L_v = 250 \text{ lbs}$

Conclusion

Based on the analysis results, the antenna mount meets the requirements per the applicable codes listed above. The mount can support the equipment as described in this report.

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