STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

June 14, 2022

Jack Andrews
Zoning Manager
Centerline Communications
10130 Donleigh Drive
Columbia, MD 21046
jmandrews@clinellc.com

RE: **EM-CING-007-220513** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 286 (a/k/a 260) Beckley Road, Berlin, Connecticut.

Dear Mr. Andrews:

The Connecticut Siting Council (Council) is in receipt of your correspondence of June 13, 2022 submitted in response to the Council's June 9, 2022 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie Bachman
Executive Director

MAB/CW/laf

From: John Andrews <jmandrews@clinellc.com>
Sent: Monday, June 13, 2022 3:54 PM
To: Robidoux, Evan <Evan.Robidoux@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: RE: Council Incomplete Letter for EM-CING-007-220513 (Beckley Road, Berlin)

In reply to your "incomplete" letter, I have attached a copy of the CSC D&O in Docket Number 40, which approved the tower in this matter on 5/15/1984. I also have included the "All documents" attachment with the same D&O combined as the last 6 pages.

I will mail a hard copy to you this afternoon. My apologies for my omission. Thanks for your understanding.

John Andrews Jr. | Project Manager
10130 Donleigh Drive, Columbia, MD 21046
Centerline Communications
750 W Center St, Suite 301 | West Bridgewater, MA 02379
Mobile: 443.677.0144
jmandrews@clinellc.com | www.centerlinecommunications.com

DOCKET NO. 40

ORIGINAL

AN APPLICATION SUBMITTED BY THE SOUTHERN NEW ENGLAND TELEPHONE COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN THE HARTFORD AND MIDDLESEX COUNTIES.	:	CONNECTICUT SITING COUNCIL
	:	May 15, 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 Southern New England Telephone for the construction, operation, and maintenance of a telecommunications tower and associated equipment to provide cellular service at each of the following sites:

Shuttle Meadow Road, Southington, Connecticut;
Mountain Street, Hartford, Connecticut;
Prestige Park Road, East Hartford, Connecticut;
Beckley Road, Berlin, Connecticut;
Slicer tract, Niederwerfer Road, South Windsor, Connecticut; and
Kikapoo Road, Middlefield, 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 shall be no taller than necessary to provide the proposed service and in no event shall exceed

   a) 150 feet at the Southington site,
   b) 100 feet at the Hartford site,
   c) 150 feet at the East Hartford site,
   d) 150 feet at the Berlin site,
   e) 75 feet at the South Windsor site, and
   f) 75 feet at the Middlefield 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 seven, below, no lights shall be installed on any of these towers.
6. The facility construction shall be conducted 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 South Windsor, Southington, and Berlin 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. The applicant shall comply with the reporting requirements of section 16-50j-87 for all sites. The applicant shall consult with Mrs. Claire Aubin and the Town of South Windsor in the preparation of the South Windsor site D&M.
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(c) 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, Journal Inquirer, and the Middletown Press.

The parties to this proceeding are

Southern New England Telephone Company Room 314 227 Church Street New Haven, Connecticut 06506	(Applicant)
ATTN: Mr. Peter J. Tyrrell, Esquire	(its attorney)
Town of South Windsor 1540 Sullivan Avenue South Windsor, Connecticut 06074	represented by: Mr. Richard M. Rittenband Town Attorney 1734 Ellington Road South Windsor, Connecticut 06074
Frank Niederwerfer 260 Niederwerfer Road South Windsor, Connecticut 06074	(service waived)
Claire Aubin 407 Niederwerfer Road South Windsor, Connecticut 06074	(service waived)

Betty S. Kleiner
Chairman
Hartford Audubon Society, Inc.
5 Flintlock Ridge
Simsbury, Connecticut 06070

(service waived)

Roger Thorpe
2916 Ellington Road
South Windsor, Connecticut 06074

Intervenors in this proceeding are

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

representing:

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

April 14, 2022

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

Re: Exempt Modification Application – AT&T Site 13682691
AT&T Mobility Telecommunications Facility @ 286 Beckley Road, Berlin, CT

Dear Ms. Bachman,

New Cingular Wireless, PCS, LLC (dba AT&T) currently maintains antennas on a wireless telecommunications facility on an existing telecommunications tower at the above referenced address. AT&T desires to modify its existing equipment as described in the attached Construction Drawings:

- Remove three (3) antennas and nine (9) RRHs.
- Install twelve (12) antennas, nine (9) RRHs, and three (3) "Y" cables.
- Ground work includes removal/decommission UMTS BBU; installation of three (3) RRUs, six (6) surge arrestors, one (1) 5216, one (1) XMU, three (3) Fronthall Gateways, and one (1) 6630.

Please accept this letter as notification pursuant to R.C.S.A §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 the following individuals: American Tower Corporation as Tower Operator/Owner; Southern New England c/o Frontier Communications as Property Owner; the Honorable Arosha Jayawickrema as Town Manager of the Town of Berlin and Maureen Giusti, the Berlin Town Planner/Zoning Enforcement Officer.

The applicant's proposal falls squarely within those activities explicitly provided for in R.C.S.A. §16-50j-89. Specifically:

1. The proposed modifications will NOT result in an increase in the height of the existing structure.
2. The proposed modifications will NOT require an extension of the site boundary.

Jack Andrews, Zoning Manager 10130 Donleigh Drive, Columbia, MD 21046 (443) 677-0144
Centerline Communications • 750 W Center Street, Suite 301, W Bridgewater, MA 02379

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 modified facility will NOT increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Please see the RF emissions calculation for AT&T's modified facility enclosed herewith.
5. The proposed modifications will NOT cause an ineligible change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading. Please see the structural analysis enclosed herewith.

For the foregoing reasons, AT&T respectfully requests that the Council approve this Exempt Modification request for this tower located at 286 Beckley Road, Berlin, CT. If you have any questions, please feel free to contact me.

Sincerely,

Jack Andrews
Zoning Manager, Centerline Communications
443-677-0144

Enclosures:
Exhibit 1 – Letter of Authorization from tower owner
Exhibit 2 – Property Card and GIS
Exhibit 3 – Construction Drawings
Exhibit 4 – Structural Analysis Report
Exhibit 5 – Antenna Mount Analysis Report
Exhibit 6 – EME Study Report
Exhibit 7 – Four (4) Notice Confirmations

cc: American Tower Corporation – Tower Operator/Owner
Southern New England c/o Frontier Communications – Property Owner
The Honorable Arosha Jayawickrema – Berlin Town Manager
Maureen Giusti - Berlin Town Planner/Zoning Enforcement Officer

AMERICAN TOWER®
CORPORATION

LETTER OF AUTHORIZATION

SITE NO: See Site List Below **SITE NAME: See Site List Below**

ADDRESS: See Site List Below

I, Margaret Robinson, Senior Counsel, US Tower Division on behalf of American Tower*, owner and/or operator of the tower facilities located at the addresses identified below (the "Tower Facilities"), do hereby authorize Centerline Communications, LLC ("Centerline"), its agents, successors and assigns, to act as American Tower's non-exclusive agent for the purpose of filing and securing any zoning, land-use, building permit and/or electrical permit application(s) and approvals of the applicable jurisdiction for and to conduct the construction of the installation of antennas and related telecommunications equipment owned and operated by AT&T on the Tower Facilities located at the addresses identified below. This installation shall not affect adjoining lands and will occur only within the areas leased or owned by American Tower.

American Tower understands that the applications may be denied, modified or approved with conditions. The above authorization is limited to the acceptance by American Tower of conditions related to American Tower's installations. Any such conditions of approval or modifications will not be effective unless approved in writing by American Tower.

The above authorization does not permit Centerline to modify or alter any existing permit(s) and/or zoning or land-use conditions or impose any additional conditions unrelated to American Tower's installations of telecommunications equipment without the prior written approval of American Tower.

Site Authorized:

ATC Project #	ATC Asset #	Address
13682691	302483	286 Beckley Road, Berlin, CT 06037
~~13682687~~	~~302469~~	~~1069 Connecticut Ave. Bridgeport, CT 06607~~
13682699	383598	1000 Truumball Ave. Bridgeport, CT 06606
13682693	302468	99 Meadow St. Harftford, CT 06114
13682696	370627	605 Willard Ave. Newington, CT 06111
13682689	370629	125 Washington Ave. North Haven, CT 06473
13683386	283418	50 Devine St. North Haven, CT 06473
13683396	88018	168 Catoona Lane, Stamford, CT 06902
13682841	243036	668 Jones Hill Rd. West Haven, CT 06516
13958523	283422	171 Short Beach Rd. Brandford, CT 06405
13958547	302516	438 Bridgeport Ave. Milford, CT 06460
13683394	302479	699 West St. Rocky Hill, CT 06067
13958510	302511	20 Post Office Lane. Westport, CT 06880

AMERICAN TOWER®
CORPORATION

Signature: _____

Margaret Robinson, Senior Counsel
US Tower Division

NOTARY BLOCK

COMMONWEALTH OF MASSACHUSETTS
County of Middlesex

This instrument was acknowledged before me by Margaret Robinson, Senior Counsel of American Tower (owner and/or operator of the above referenced Tower Facilities), personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same.

WITNESS my hand and official seal, this 22nd day of April, 2022.

NOTARY SEAL

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

Notary Public _____
My Commission Expires: August 9th, 2024

* American Tower as used herein is defined as American Tower Corporation and any of its affiliates or subsidiaries.

Google Maps 286 Beckley Rd

 100 ft

286 Beckley Rd

Directions | Save | Nearby | Send to your phone | Share

286 Beckley Rd, Berlin, CT 06037

J7H9+HF Berlin, Connecticut

Photos

Town of Berlin, CT

Property Listing Report

Map Block Lot	11-3-132-7-1	Building #	1	PID	7922	Account	1060060

Property Information

Property Location	286 BECKLEY RD
Owner	SO NEW ENGLAND %FRONTIER COMMUNICATIONS
Co-Owner	ATTENTION TAX DEPT
Mailing Address	PO BOX 2629 ADDISON TX 75001
Land Use	4310 Tel Rel Twr
Land Class	I
Zoning Code	R-43
Census Tract	4001

District	0
Acreage	0
Utilities	UNKNOWN
Book / Page	0230/0842

Photo

Sketch

No Photo Available

Primary Construction Details

Year Built	0
Building Desc.	Tel Rel Twr
Building Style	UNKNOWN
Stories	
Occupancy	
Exterior Walls	
Exterior Walls 2	
Roof Style	
Roof Cover	
Interior Walls	
Interior Walls 2	
Interior Floors 1	
Interior Floors 2	

Heating Fuel	
Heating Type	
AC Type	
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	
Kitchen Style	
Fin BSMT Area	
Fin BSMT Quality	
Fin BSMT Area 2	
Fin BSMT Qual 2	

BSMT Garages	0
Fireplaces	0
Whirlpool Tub	0
Building Use	Vacant
Building Condition	

Industrial / Commercial Details
(*Residential Not Applicable)

Heat / AC	NA
Frame Type	NA
Baths / Plumbing	NA
Ceiling / Wall	NA
Rooms / Prtns	NA
Wall Height	NA
First Floor Use	NA

Report Created On 4/12/2022

Town of Berlin, CT

Property Listing Report

Map Block Lot	11-3-132-7-1	Building #	1	PID	7922	Account	1060060

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Improvements		
Outbuildings	431200	301800
Land	0	0
Total	431200	301800

Outbuilding and Extra Features

Type	Description
FENCE-6' CHAIN	270 L.F.
Cell Tower	150 L.F.
Shed PreFab Cell	240 S.F.
Generator	130 UNITS

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	0	0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
SO NEW ENGLAND %FRONTIER COMMUNICATIONS	0230/0842	2007-10-02	0
SOUTHERN NEW ENGLAND	0230/0000	1983-07-19	0

Report Created On 4/12/2022

Town of Berlin, Connecticut - Assessment Parcel Map

Parcel: 11-3-132-7-1 Address: 286 BECKLEY RD

N
W E
S

NEGEO
New England GeoSystems
www.negeosystems.com
420 East Main Street - Bldg 3 Suite 18
Branford, CT 06405 • (203) 404 - 7129

Approximate Scale: 1 inch = 5 feet

0 2 4 6 8 Feet

Map Produced: February 2022

Radio Frequency Emissions Analysis Report

February 24, 2022

Centerline Communications on behalf of AT&T

Site Name: BERLIN NE
Site Address: 260 BECKLEY ROAD, BERLIN, CT 06037
FA#: 10034969
USID: 25935

Site Compliance Summary

Compliance Status:	Compliant
Carrier MPE% of FCC General Population Allowable Limit:	0.73023000%
Composite MPE% of FCC General Population Allowable Limit:	1.05712100%

February 24, 2022

AT&T New England
Attn: John Benedetto, RF Manager
5050 Cochituate Road Suite 550 - 13&14
Framingham, MA 01701

Emissions Analysis for Site: **BERLIN NE**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility to be located a monopole near **260 BECKLEY ROAD, BERLIN CT 06037** for the purpose of determining whether the emissions from the proposed facility are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of µW/cm^2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (µW/cm^2). The general population exposure limits for the 700 MHz (LTE) band is 467 µW/cm^2, 850 (5G) band is 567 µW/cm^2, 1900 MHz (PCS), 2100 (AWS), 2300 (WCS) and 5 GHz (B46) bands is 1000 µW/cm^2.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits, as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means. Additional details can be found in FCC OET 65.

Calculations

Calculations were performed for the proposed facility using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing focused omnidirectional antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. This is a very conservative estimate since the gain reduction in actual applications is typically greater than 10 dB in the direction of ground immediately surrounding the facility. Real world emissions values from this facility are expected to be lower than values listed in this report at ground level. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

RRH #	Frequency Band	Technology	Channel Count	Transmit Power per Channel (W)
1	700	LTE	4	40
2	1900	PCS	4	40
3	2100	AWS	4	60
4	3700	C-Band	1	108.4
5	3450	DoD	1	54.2
5	3450	DoD	1	54
6	700	LTE	4	40
6	850	LTE	4	40
7	2300	WCS	4	25
8	700	LTE	2	40
N/A	700	LTE	1	0

Table 1: Channel Data Table

The following antennas listed in Table 2 were used in the modeling for transmission in the 700 MHz (LTE), 850 MHz (5G), 1900 MHz (PCS), 2100 MHz (AWS), 2300 MHz (WCS) and 5 GHz (Band 46) frequency bands. This is based on information from the carrier with regard to anticipated antenna selection.

Sector	Antenna Number	Make / Model	Centerline (ft)
A	1	CCI TPA65R-BU6D	151.5
A	1	CCI TPA65R-BU6D	151.5
A	1	CCI TPA65R-BU6D	151.5
A	2	ERICSSON AIR6449	150.3
A	3	ERICSSON AIR6419	154
A	3	ERICSSON AIR6419	154
A	4	CCI DMP65R-BU6D	151.5
A	4	CCI DMP65R-BU6D	151.5
A	4	CCI DMP65R-BU6D	151.5
A	5	CCI OPA-65R-LCUU-H6	151.5
A	6	QUINTEL QS66512-2	151.5
B	7	CCI TPA65R-BU6D	151.5
B	7	CCI TPA65R-BU6D	151.5
B	7	CCI TPA65R-BU6D	151.5
B	8	ERICSSON AIR6449	150.3
B	9	ERICSSON AIR6419	154
B	9	ERICSSON AIR6419	154
B	10	CCI DMP65R-BU6D	151.5
B	10	CCI DMP65R-BU6D	151.5
B	10	CCI DMP65R-BU6D	151.5
B	11	CCI OPA-65R-LCUU-H6	151.5
B	12	QUINTEL QS66512-2	151.5
G	13	CCI TPA65R-BU6D	151.5
G	13	CCI TPA65R-BU6D	151.5
G	13	CCI TPA65R-BU6D	151.5
G	14	ERICSSON AIR6449	150.3
G	15	ERICSSON AIR6419	154
G	15	ERICSSON AIR6419	154
G	16	CCI DMP65R-BU6D	151.5
G	16	CCI DMP65R-BU6D	151.5
G	16	CCI DMP65R-BU6D	151.5
G	17	CCI OPA-65R-LCUU-H6	151.5
G	18	QUINTEL QS66512-2	151.5

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.

Results

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

ID	Make / Model	Frequency Band	Gain (dBd)	Centerline (ft)	Channel Count	TX Power (W)	ERP (W)	MPE %
AT&T 1	CCI TPA65R-BU6D	700	11.35	151.5	4	40	2183.3330	0.011919000
AT&T 1	CCI TPA65R-BU6D	1900	15.55	151.5	4	40	5742.7510	0.005527000
AT&T 1	CCI TPA65R-BU6D	2100	16.05	151.5	4	60	9665.2088	0.008388000
AT&T 2	ERICSSON AIR6449	3700	23.55	150.3	1	108.4	24548.7443	0.058929000
AT&T 3	ERICSSON AIR6419	3450	22.85	154.0	1	54.2	10447.1850	0.065978000
AT&T 3	ERICSSON AIR6419	3450	22.85	154.0	1	54	10408.6345	0.061574000
AT&T 4	CCI DMP65R-BU6D	700	11.25	151.5	4	40	2133.6343	0.011758000
AT&T 4	CCI DMP65R-BU6D	850	11.35	151.5	4	40	2183.3330	0.009078000
AT&T 4	CCI DMP65R-BU6D	2300	15.55	151.5	4	25	3589.2193	0.004165000
AT&T 5	CCI OPA-65R-LCUU-H6	700	11.96	151.5	2	40	1256.2902	0.005591000
AT&T 6	QUINTEL QS66512-2	700	11.45	151.5	1	0	0	0.000000000
AT&T 7	CCI TPA65R-BU6D	700	11.55	151.5	4	40	2286.2303	0.011831000
AT&T 7	CCI TPA65R-BU6D	1900	15.45	151.5	4	40	5612.0300	0.005674000
AT&T 7	CCI TPA65R-BU6D	2100	15.95	151.5	4	60	9445.2018	0.008669000
AT&T 8	ERICSSON AIR6449	3700	23.55	150.3	1	108.4	24548.7443	0.062306000
AT&T 9	ERICSSON AIR6419	3450	22.85	154.0	1	54.2	10447.1850	0.065978000
AT&T 9	ERICSSON AIR6419	3450	22.85	154.0	1	54	10408.6345	0.061574000
AT&T 10	CCI DMP65R-BU6D	700	11.55	151.5	4	40	2286.2303	0.011934000
AT&T 10	CCI DMP65R-BU6D	850	11.35	151.5	4	40	2183.3330	0.008793000
AT&T 10	CCI DMP65R-BU6D	2300	15.55	151.5	4	25	3589.2193	0.004196000
AT&T 11	CCI OPA-65R-LCUU-H6	700	11.96	151.5	2	40	1256.2902	0.005669000
AT&T 12	QUINTEL QS66512-2	700	11.45	151.5	1	0	0	0.000000000
AT&T 13	CCI TPA65R-BU6D	700	11.45	151.5	4	40	2234.1894	0.011788000
AT&T 13	CCI TPA65R-BU6D	1900	15.55	151.5	4	40	5742.7510	0.005410000
AT&T 13	CCI TPA65R-BU6D	2100	15.95	151.5	4	60	9445.2018	0.008556000
AT&T 14	ERICSSON AIR6449	3700	23.55	150.3	1	108.4	24548.7443	0.062597000
AT&T 15	ERICSSON AIR6419	3450	22.85	154.0	1	54.2	10447.1850	0.063913000
AT&T 15	ERICSSON AIR6419	3450	22.85	154.0	1	54	10408.6345	0.058289000
AT&T 16	CCI DMP65R-BU6D	700	11.35	151.5	4	40	2183.3330	0.012080000
AT&T 16	CCI DMP65R-BU6D	850	11.35	151.5	4	40	2183.3330	0.008729000
AT&T 16	CCI DMP65R-BU6D	2300	15.45	151.5	4	25	3507.5187	0.003717000

AT&T 17	CCI OPA-65R-LCUU-H6	700	11.96	151.5	2	40	1256.2902	0.005620000
AT&T 18	QUINTEL QS66512-2	700	11.45	151.5	1	0	0	0.000000000
							AT&T MPE%	**0.73023000 %**

Table 3: AT&T Antenna Inventory & Power Level

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 4* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s).

Frequency Band	Technology	Centerline (ft.)	# of Channels	ERP W (Per Channel)	Total Power Density ($\mu W/cm^2$)	Allowable MPE ($\mu W/cm^2$)	MPE %
700	LTE	151.5	4	545.8332546	0.0556230	467	0.01191900
1900	PCS	151.5	4	1435.687739	0.0552690	1000	0.00552700
2100	AWS	151.5	4	2416.302206	0.0838760	1000	0.00838800
3700	C-Band	150.3	1	24548.74429	0.5892890	1000	0.05892900
3450	DoD	154.0	1	10447.18503	0.6597780	1000	0.06597800
3450	DoD	154.0	1	10408.63453	0.6157400	1000	0.06157400
700	LTE	151.5	4	533.4085729	0.0548690	467	0.01175800
850	LTE	151.5	4	545.8332546	0.0514440	567	0.00907800
2300	WCS	151.5	4	897.3048366	0.0416490	1000	0.00416500
700	LTE	151.5	2	628.1451217	0.0260900	467	0.00559100
700	LTE	151.5	1	0	0.0000000	467	0.00000000
						Alpha MPE%	**0.24290700**
700	LTE	151.5	4	571.5575834	0.0552130	467	0.01183100
1900	PCS	151.5	4	1403.007496	0.0567370	1000	0.00567400
2100	AWS	151.5	4	2361.300453	0.0866880	1000	0.00866900
3700	C-Band	150.3	1	24548.74429	0.6230580	1000	0.06230600
3450	DoD	154.0	1	10447.18503	0.6597780	1000	0.06597800
3450	DoD	154.0	1	10408.63453	0.6157400	1000	0.06157400
700	LTE	151.5	4	571.5575834	0.0556900	467	0.01193400
850	LTE	151.5	4	545.8332546	0.0498290	567	0.00879300
2300	WCS	151.5	4	897.3048366	0.0419610	1000	0.00419600
700	LTE	151.5	2	628.1451217	0.0264530	467	0.00566900
700	LTE	151.5	1	0	0.0000000	467	0.00000000
						Beta MPE%	**0.24662400**
700	LTE	151.5	4	558.5473444	0.0550100	467	0.01178800
1900	PCS	151.5	4	1435.687739	0.0541010	1000	0.00541000
2100	AWS	151.5	4	2361.300453	0.0855560	1000	0.00855600
3700	C-Band	150.3	1	24548.74429	0.6259680	1000	0.06259700
3450	DoD	154.0	1	10447.18503	0.6391310	1000	0.06391300
3450	DoD	154.0	1	10408.63453	0.5828950	1000	0.05828900
700	LTE	151.5	4	545.8332546	0.0563710	467	0.01208000

850	LTE	151.5	4	545.8332546	0.0494650	567	0.00872900
2300	WCS	151.5	4	876.8796849	0.0371750	1000	0.00371700
700	LTE	151.5	2	628.1451217	0.0262280	467	0.00562000
700	LTE	151.5	1	0	0.0000000	467	0.00000000
						Gamma MPE%	**0.24069900**
						AT&T MPE%	**0.73023000 %**

Table 4: AT&T Maximum Sector MPE Power Values

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Carrier	Predicted MPE %
AT&T	0.73023000%
T-Mobile	0.09018300%
Verizon	0.16332800%
Unknown	0.07338000%
Composite	**1.05712100%**

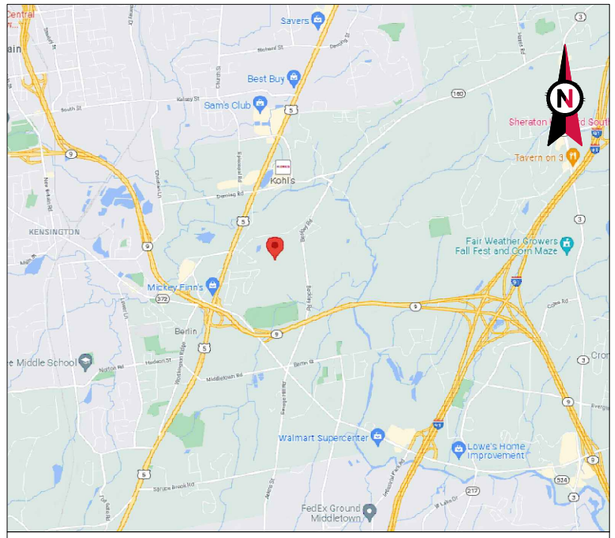
Table 5: Total Predicted MPE(%) by Carrier

Compliance Status:

The anticipated composite MPE value for this site assuming all carriers present is **1.05712100%** of the allowable FCC established general population limit sampled at the ground level.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Katrina Styx
RF Compliance Consultant
Centerline Communications, LLC
750 West Center St. Suite 301
West Bridgewater, MA 02379

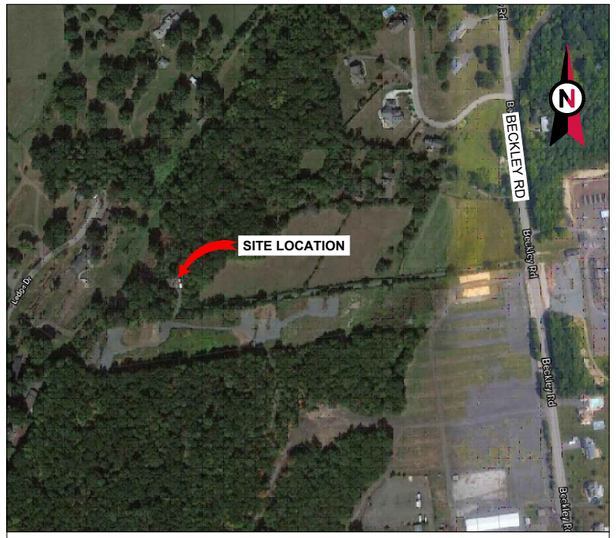


VICINITY MAP

AT&T MOBILITY
LTE7C/5GNR/BWE/RETROFIT
ANTENNA AMENDMENT PLAN

AMERICAN TOWER®

ATC SITE NAME: BRLN - BERLIN
ATC SITE NUMBER: 302483
AT&T PACE NUMBERS: MRCTB052343/MRCTB051028/
MRCTB051134/MRCTB051296/
MRCTB054270/MRCTB054198
AT&T SITE ID: CTL01014
AT&T FA CODE:10034969
AT&T SITE NAME: BERLIN NE
SITE ADDRESS: 286 BECKLEY ROAD
BERLIN, CT 06037



LOCATION MAP

COMPLIANCE CODE

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. 2018 CONNECTICUT STATE BUILDING CODE-AMENDMENTS TO IBC 2015
2. INTERNATIONAL BUILDING CODE 2015, INTERNATIONAL CODE COUNCIL
3. TIA-222-G-4, STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
4. ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, AMERICAN SOCIETY OF CIVIL ENGINEERS
5. STEEL CONSTRUCTION MANUAL 14TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
6. CITY/COUNTY ORDINANCES

UTILITY COMPANIES

POWER COMPANY: EVERSOURCE
PHONE: (877) 659-6326

TELEPHONE COMPANY: FRONTIER COMMUNICATIONS
PHONE: (800) 376-6843

811
Know what's **below.**
Call before you dig.

PROJECT SUMMARY

SITE ADDRESS:

286 BECKLEY ROAD

BERLIN, CT 06037

COUNTY: HARTFORD

GEOGRAPHIC COORDINATES:

LATITUDE: 41.63171802

LONGITUDE: -72.72991843

GROUND ELEVATION: 185' AMSL

PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

ENGINEER:

DEWBERRY ENGINEERS INC
99 SUMMER STREET, SUITE 700
BOSTON, MA 02110

PROPERTY OWNER:

JOHN C MATULIS JR
286 BECKLEY ROAD
BERLIN, CT 06037

APPLICANT:

AT&T MOBILITY
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES MODIFYING GROUND BASED AND TOWER MOUNTED EQUIPMENT AS INDICATED PER BELOW:

TOWER WORK:

REMOVE (3) ANTENNA(S) AND (9) RRH(S)

INSTALL (12) ANTENNA(S), (9) RRH(S), AND (3) Y-CABLE(S)

EXISTING (6) ANTENNA(S), (6) RRH(S), (3) SQUID(S), (12) COAX CABLE(S), (7) DC TRUNK(S), AND (3) FIBER TRUNK(S) TO REMAIN

GROUND WORK:

REMOVE/DECOM UMTS BBU(S)

INSTALL (3) RRU(S), (6) SURGE ARRESTOR(S), (3) 6673 FRONTHAUL GATEWAY(S), (1) 5216, (1) XMU, AND (1) 6630-IDLe

PROJECT NOTES

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.
6. THE PROJECT DEPICTED IN THESE PLANS QUALIFIES AS AN ELIGIBLE FACILITIES REQUEST ENTITLED TO EXPEDITED REVIEW UNDER 47 U.S.C. § 1455(A) AS A MODIFICATION OF AN EXISTING WIRELESS TOWER THAT INVOLVES THE COLLOCATION, REMOVAL, AND/OR REPLACEMENT OF TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE UNDER CFR § 1.61000 (B)(7).

PROJECT LOCATION DIRECTIONS

I-91 S VIA EXIT 52 TOWARD NEW HAVEN. 10.9 MIMAP AVOID 5: MERGE ONTO CT-9 N VIA EXIT 22N TOWARD NEW BRITAIN. 2.2 MIMAP AVOID 6: TAKE THE CT-372 E EXIT, EXIT 21, TOWARD EAST BERLIN. 0.3 MIMAP AVOID 7: TURN LEFT ONTO CT-372/MILL ST. 0.4 MIMAP AVOID 8: TURN LEFT ONTO BERLIN ST. 0.1 MIMAP AVOID 9: TURN LEFT ONTO BECKLEY RD. 1.1 MIMAP AVOID 10: END AT 261 BECKLEY RD BERLIN, CT 06037-2505 MAP ESTIMATED TIME: 20 MINUTES ESTIMATED DISTANCE: 16.12 MILES

SHEET INDEX

SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	TITLE SHEET	A	11/11/21	JW
G-002	GENERAL NOTES	A	11/11/21	JW
C-101	DETAILED SITE PLAN	A	11/11/21	JW
C-201	TOWER ELEVATION	A	11/11/21	JW
C-401	ANTENNA INFORMATION & SCHEDULE	A	11/11/21	JW
C-501	CONSTRUCTION DETAILS	A	11/11/21	JW
E-501	GROUNDING DETAILS	A	11/11/21	JW
R-601	SUPPLEMENTAL			
R-602	SUPPLEMENTAL			
R-603	SUPPLEMENTAL			

AMERICAN TOWER®

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400

REV.	DESCRIPTION	BY	DATE
A	PRELIM	JW	11/11/21

ATC SITE NUMBER:
302483

ATC SITE NAME:
BRLN - BERLIN

AT&T MOBILITY SITE NAME:
BERLIN NE

SITE ADDRESS:
286 BECKLEY ROAD
BERLIN, CT 06037

SEAL:

PRELIMINARY: NOT FOR CONSTRUCTION

AT&T

DATE DRAWN:	11/11/21
ATC JOB NO:	13682691
CUSTOMER ID:	BERLIN NE
CUSTOMER #:	10034969

TITLE SHEET

SHEET NUMBER:	REVISION:
G-001	A

GENERAL CONSTRUCTION NOTES:

1. OWNER FURNISHED MATERIALS, AT&T MOBILITY "THE COMPANY" WILL PROVIDE AND THE CONTRACTOR WILL INSTALL
   - A. BTS EQUIPMENT FRAME (PLATFORM) AND ICEBRIDGE SHELTER (GROUND BUILD/CO-LOCATE ONLY)
   - B. AC/TELCO INTERFACE BOX (PPC)
   - C. ICE BRIDGE (CABLE TRAY WITH COVER) (GROUND BUILD/CO-LOCATE ONLY, GC TO FURNISH AND INSTALL FOR ROOFTOP INSTALLATION)
   - D. TOWERS, MONOPOLES
   - E. TOWER LIGHTING
   - F. GENERATORS & LIQUID PROPANE TANK
   - G. ANTENNA STANDARD BRACKETS, FRAMES AND PIPES FOR MOUNTING
   - H. ANTENNAS (INSTALLED BY OTHERS)
   - I. TRANSMISSION LINE
   - J. TRANSMISSION LINE JUMPERS
   - K. TRANSMISSION LINE CONNECTORS WITH WEATHERPROOFING KITS
   - L. TRANSMISSION LINE GROUND KITS
   - M. HANGERS
   - N. HOISTING GRIPS
   - O. BTS EQUIPMENT
2. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL OTHER MATERIALS FOR THE COMPLETE INSTALLATION OF THE SITE INCLUDING, BUT NOT LIMITED TO, SUCH MATERIALS AS FENCING, STRUCTURAL STEEL SUPPORTING SUB-FRAME FOR PLATFORM, ROOFING LABOR AND MATERIALS, GROUNDING RINGS, GROUNDING WIRES, COPPER-CLAD OR XIT CHEMICAL GROUND ROD(S), BUSS BARS, TRANSFORMERS AND DISCONNECT SWITCHES WHERE APPLICABLE, TEMPORARY ELECTRICAL POWER, CONDUIT, LANDSCAPING COMPOUND STONE, CRANES, CORE DRILLING, SLEEPERS AND RUBBER MATTING, REBAR, CONCRETE CAISSONS, PADS AND/OR AUGER MOUNTS, MISCELLANEOUS FASTENERS, CABLE TRAYS, NON-STANDARD ANTENNA FRAMES AND ALL OTHER MATERIAL AND LABOR REQUIRED TO COMPLETE THE JOB ACCORDING TO THE DRAWINGS AND SPECIFICATIONS. IT IS THE POSITION OF AT&T MOBILITY TO APPLY FOR PERMITTING AND CONTRACTOR RESPONSIBLE FOR PICKUP AND PAYMENT OF REQUIRED PERMITS.
3. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS.
4. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
6. 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.
7. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
8. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
9. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
10. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
11. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
12. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE AT&T MOBILITY REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE AT&T MOBILITY REP PRIOR TO PROCEEDING.
13. EACH CONTRACTOR SHALL COOPERATE WITH THE AT&T MOBILITY REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
14. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE AT&T MOBILITY CONSTRUCTION MANAGER.
15. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
16. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE AT&T MOBILITY REP AND ENGINEER OF RECORD IMMEDIATELY.
17. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
18. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
19. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH AMERICAN TOWER CORPORATION (ATC) AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
20. CONTRACTOR SHALL FURNISH AT&T MOBILITY AND AMERICAN TOWER CORPORATION (ATC) WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
21. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH AT&T MOBILITY 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.
22. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH AT&T MOBILITY REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY AT&T MOBILITY MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
23. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH AT&T MOBILITY SPECIFICATIONS AND REQUIREMENTS.
24. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO AT&T MOBILITY FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
25. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO AT&T MOBILITY SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
26. 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.
27. CONTRACTOR SHALL NOTIFY AT&T MOBILITY 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.
28. 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.
29. 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 NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT 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.
30. 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 AT&T MOBILITY REP. ANY WORK FOUND BY THE AT&T MOBILITY REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
31. 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.
32. AT&T MOBILITY FURNISHED EQUIPMENT SHALL BE PICKED-UP AT THE AT&T MOBILITY WAREHOUSE, NO LATER THAN 48HR AFTER BEING NOTIFIED INSURED, STORED, UNCRATE, PROTECTED AND INSTALLED BY THE CONTRACTOR WITH ALL APPURTENANCES REQUIRED TO PLACE THE EQUIPMENT IN OPERATION, READY FOR USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EQUIPMENT AFTER PICKING IT UP.
33. AT&T MOBILITY OR HIS ARCHITECT/ENGINEER RESERVES THE RIGHT TO REJECT ANY EQUIPMENT OR MATERIALS WHICH, IN HIS OWN OPINION ARE NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS, EITHER BEFORE OR AFTER INSTALLATION AND THE EQUIPMENT SHALL BE REPLACED WITH EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BY THE CONTRACTOR AT NO COST TO AT&T MOBILITY OR THEIR ARCHITECT/ENGINEER.

SPECIAL CONSTRUCTION ANTENNA INSTALLATION NOTES:

1. WORK INCLUDED:
   - A. ANTENNA AND COAXIAL CABLES ARE FURNISHED BY AT&T MOBILITY UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OD COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND
   - B. INSTALL ANTENNA AS INDICATE ON DRAWINGS AND AT&T MOBILITY SPECIFICATIONS.
   - C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS
   - D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE.
   - E. CONTRACTOR SHALL PROVIDE FOUR (4) SETS OF SWEEP TESTS USING ANRITZU-PACKARD 8713B RF SCALAR NETWORK ANALYZER. SUBMIT FREQUENCY DOMAIN REFLECTOMETER(FDR) TESTS RESULTS TO THE PROJECT MANAGER. SWEEP TESTS SHALL BE AS PER ATTACHED RFS "MINIMUM FIELD TESTING RECOMMENDED FOR ANTENNA AND HELIAX COAXIAL CABLE SYSTEMS" DATED 10/5/93. TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING SERVICE AND BE BOUND AND SUBMITTED WITHIN ONE WEEK OF WORK COMPLETION.
   - F. INSTALL COAXIAL CABLES AND TERMINATING BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTIONS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.
   - G. ANTENNA AND COAXIAL CABLE GROUNDING:
2. ALL EXTERIOR #6 GREED GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH RFS CONNECTORS/SPLICE WEATHERPROOFING KIT #221213 OR EQUAL.
3. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS)

ALL DISCREPANCIES FROM WHAT IS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE COMMUNICATED TO ATC ENGINEERING IMMEDIATELY FOR CORRECTION OR RE-DESIGN. FAILURE TO COMMUNICATE DIRECTLY WITH ATC ENGINEERING OR ANY CHANGES FROM THE DESIGN CONDUCTED WITHOUT PRIOR APPROVAL FROM ATC ENGINEERING SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

AMERICAN TOWER®

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400

REV.	DESCRIPTION	BY	DATE
A	PRELIM	JW	11/11/21

ATC SITE NUMBER:
302483

ATC SITE NAME:
BRLN - BERLIN

AT&T MOBILITY SITE NAME:
BERLIN NE

SITE ADDRESS:
286 BECKLEY ROAD
BERLIN, CT 06037

SEAL:

PRELIMINARY: NOT FOR CONSTRUCTION

AT&T

DATE DRAWN:	11/11/21
ATC JOB NO:	13682691
CUSTOMER ID:	BERLIN NE
CUSTOMER #:	10034969

GENERAL NOTES

SHEET NUMBER:	REVISION:
G-002	A

SITE PLAN NOTES:

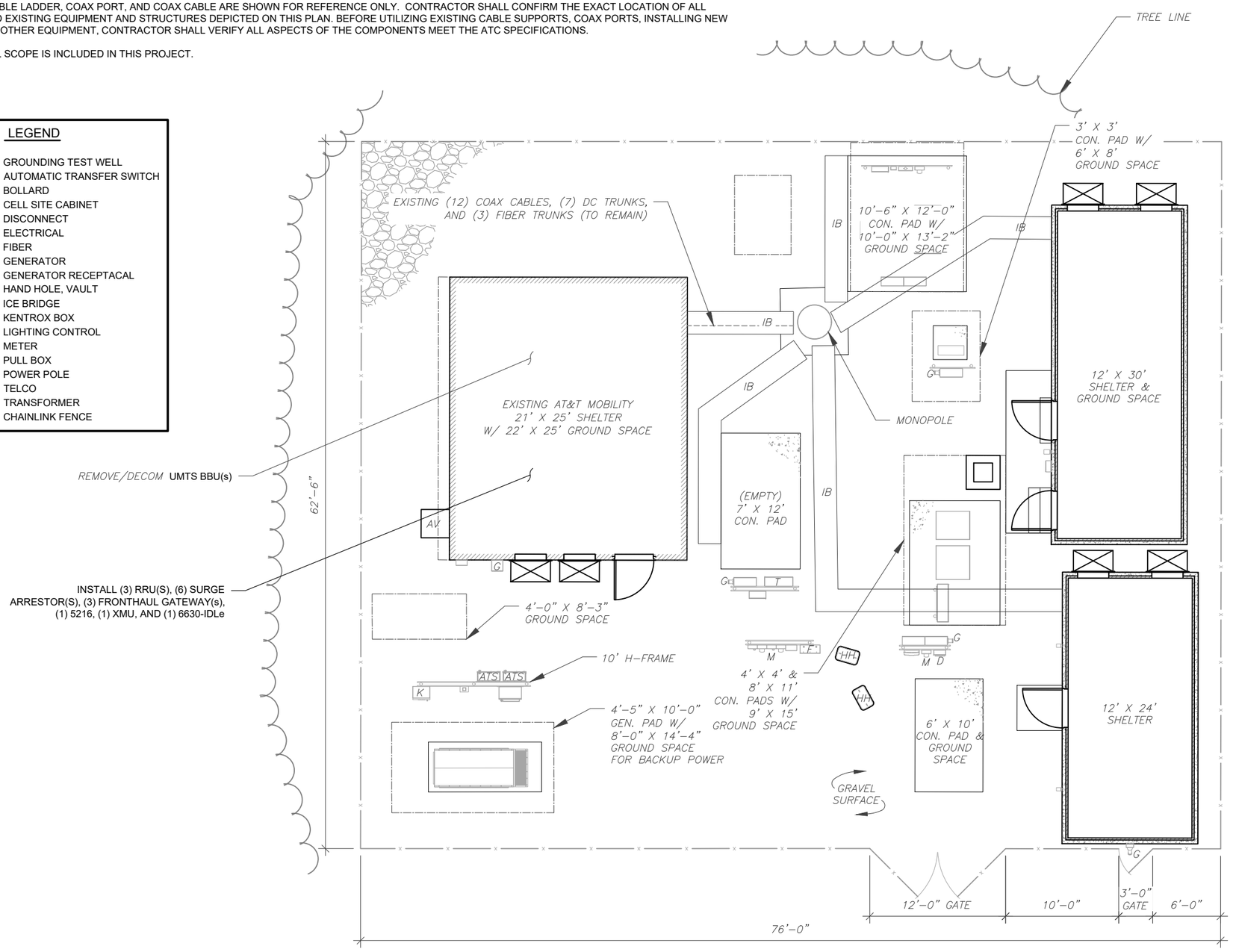
1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.

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. NO ELECTRICAL SCOPE IS INCLUDED IN THIS PROJECT.

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



1 DETAILED SITE PLAN

GRAPHIC SCALE

10 0 5 10

(IN FEET)
1 UNIT = 10 FEET

N

AMERICAN TOWER®

Dewberry®

Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400

REV.	DESCRIPTION	BY	DATE
A	PRELIM	JW	11/11/21

ATC SITE NUMBER:
302483

ATC SITE NAME:
BRLN - BERLIN

AT&T MOBILITY SITE NAME:
BERLIN NE

SITE ADDRESS:
286 BECKLEY ROAD
BERLIN, CT 06037

SEAL:

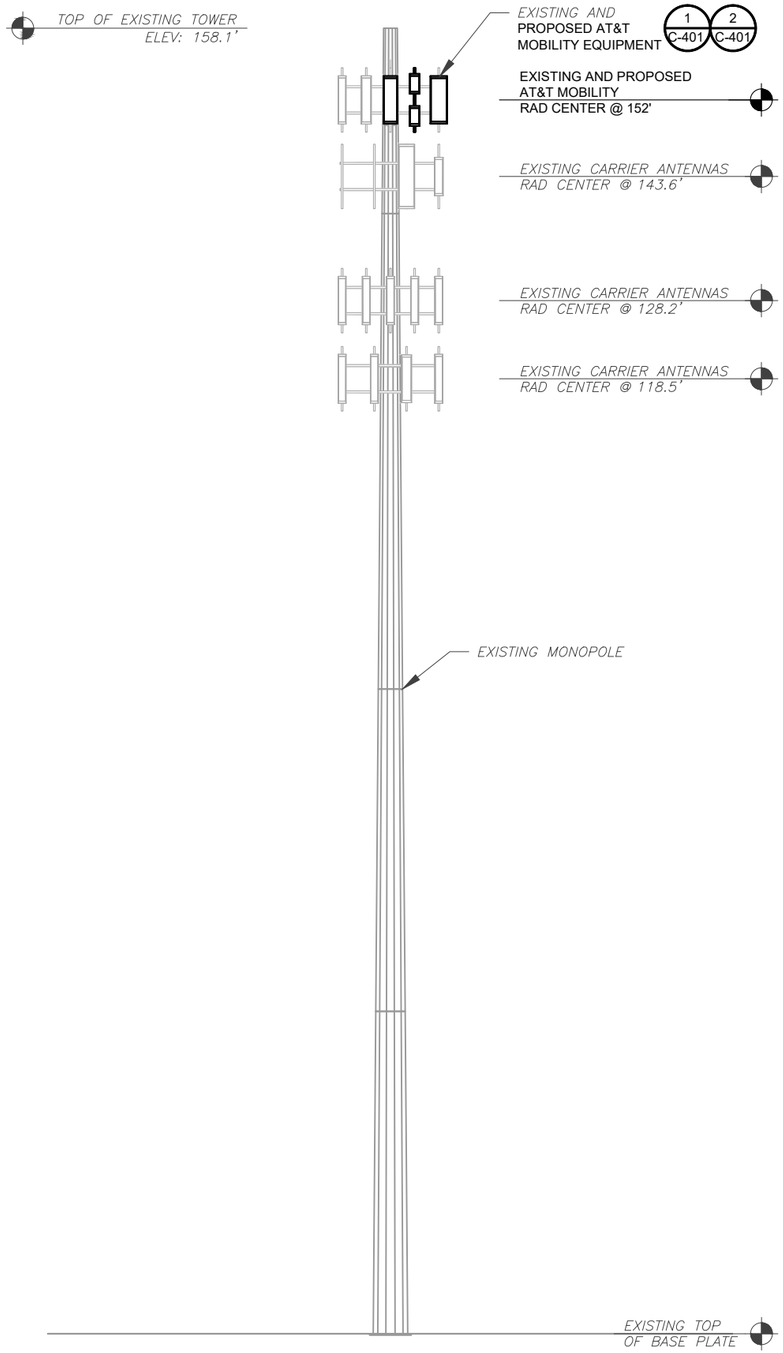
PRELIMINARY: NOT FOR CONSTRUCTION

AT&T

DATE DRAWN:	11/11/21
ATC JOB NO:	13682691
CUSTOMER ID:	BERLIN NE
CUSTOMER #:	10034969

DETAILED SITE PLAN

SHEET NUMBER:	REVISION:
C-101	A



1 TOWER ELEVATION
SCALE: N.T.S.

ATC IS ANALYZING THE ANTENNA MOUNT UNDER A SEPARATE PROJECT. CONSTRUCTION IS NOT TO PROCEED UNTIL THE MOUNT ANALYSIS IS COMPLETE AND INDICATES THE ADDITIONAL LOADING DOES NOT OVERSTRESS THE MOUNT.

TOWER NOTE:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE PROJECT 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.
2. WHERE APPLICABLE, ALL NEW ANTENNAS, EQUIPMENT, MOUNTS, CABLING, ETC. SHALL BE PAINTED/SOCKED TO MATCH EXISTING EQUIPMENT IN ACCORDANCE WITH FAA, JURISDICTION, AND/OR OTHER LOCAL REQUIREMENTS.
3. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. IF ADEQUATE SPACE EXISTS, ROUTE CABLES THROUGH ENTRY PORT HOLE, UP INSIDE OF MONOPOLE, AND THROUGH EXIT PORT HOLE. IF ROUTING OUTSIDE THE MONOPOLE, ATTACH CABLES USING STAND-OFF ADAPTERS MOUNTED TO TOWER USING STAINLESS STEEL BANDING. ADEQUATELY SECURE CABLES USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER.
4. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

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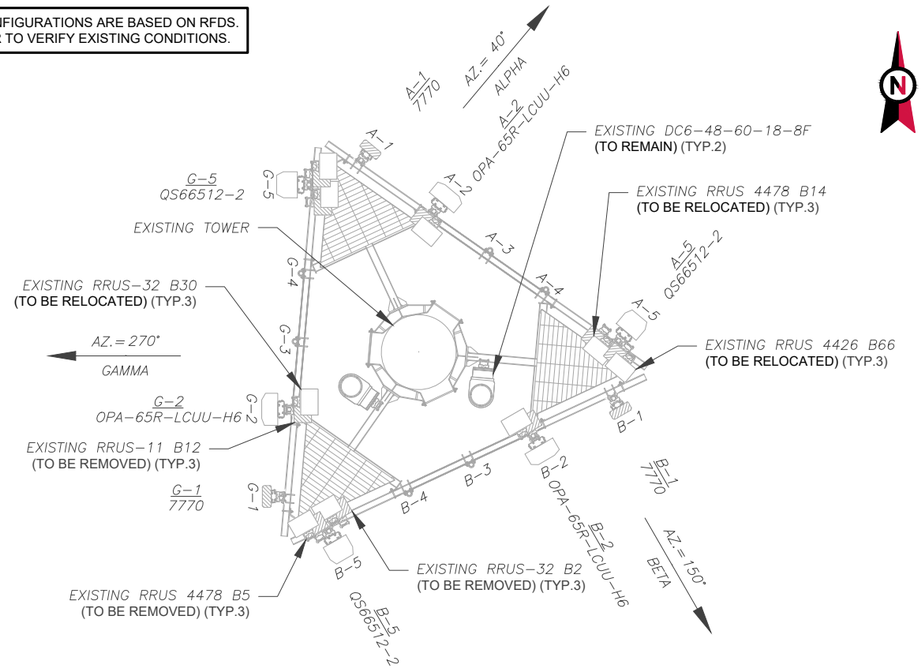
CUSTOMER #:	10034969

TOWER ELEVATION

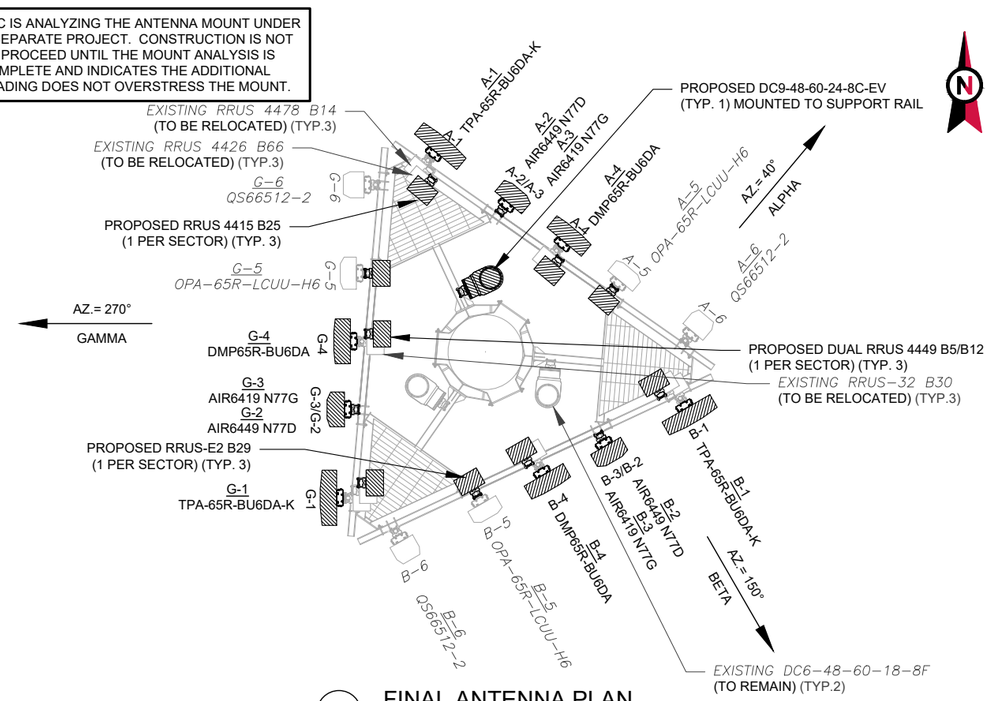
SHEET NUMBER:	REVISION:
C-201	A

EXISTING CONFIGURATIONS ARE BASED ON RFDS.
CONTRACTOR TO VERIFY EXISTING CONDITIONS.



1 CURRENT ANTENNA PLAN
SCALE: N.T.S.

ATC IS ANALYZING THE ANTENNA MOUNT UNDER A SEPARATE PROJECT. CONSTRUCTION IS NOT TO PROCEED UNTIL THE MOUNT ANALYSIS IS COMPLETE AND INDICATES THE ADDITIONAL LOADING DOES NOT OVERSTRESS THE MOUNT.



2 FINAL ANTENNA PLAN
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
ALPHA	152'	40°	A1	7770	U850	RMV	–	–
			A2	OPA-65R-LCUU-H6	700/WCS	REL	RRUS-11 B12	RMV
							RRUS-32 B30	REL
			A3	–	–	–	–	–
			A4	–	–	–	–	–
			A5	QS66512-2	850/700/1900/ 1900/850 5G/AWS	RMN	RRUS 4478 B14	REL
							RRUS 4478 B5	RMV
							RRUS-32 B2	RMV
							RRUS 4426 B66	REL
BETA	152'	150°	B1	7770	U850	RMV	–	–
			B2	OPA-65R-LCUU-H6	700/WCS	REL	RRUS-11 B12	RMV
							RRUS-32 B30	REL
			B3	–	–	–	–	–
			B4	–	–	–	–	–
			B5	QS66512-2	850/700/1900/ 1900/850 5G/AWS	RMN	RRUS 4478 B14	REL
							RRUS 4478 B5	RMV
							RRUS-32 B2	RMV
							RRUS 4426 B66	REL
GAMMA	152'	270°	G1	7770	U850	RMV	–	–
			G2	OPA-65R-LCUU-H6	700/WCS	REL	RRUS-11 B12	RMV
							RRUS-32 B30	REL
			G3	–	–	–	–	–
			G4	–	–	–	–	–
			G5	QS66512-2	850/700/1900/ 1900/850 5G/AWS	RMN	RRUS 4478 B14	REL
							RRUS 4478 B5	RMV
							RRUS-32 B2	RMV
							RRUS 4426 B66	REL

NOTES

1. CONFIRM WITH AT&T MOBILITY REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS.
2. CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.
3. THE ANTENNA ORIENTATION PLAN IS A SCHEMATIC. ATC DID NOT CONFIRM EXISTING SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO, ANTENNA AZIMUTHS, MOUNT CONFIGURATIONS AND TOWER ORIENTATION. SCALES SHOWN ARE FOR REFERENCE ONLY AND EXISTING DIMENSIONS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS PRIOR TO INSTALLATION AND NOTIFY ATC OF ANY DISCREPANCIES.
4. CONTRACTOR TO ENSURE PROPER SEPARATION IN ACCORDANCE WITH AT&T'S FIRSTNET REQUIREMENTS (SEE SHEET R-602)

CABLE LENGTHS FOR JUMPERS

JUNCTION BOX TO RRU: 15'
RRU TO ANTENNA: 10'

STATUS ABBREVIATIONS

RMV: TO BE REMOVED
RMN: TO REMAIN
REL: TO BE RELOCATED
ADD: TO BE ADDED

FINAL ANTENNA SCHEDULE

LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	STATUS	ADDITIONAL TOWER MOUNTED EQUIPMENT	STATUS
ALPHA	152'	40°	A1	TPA-65R-BU6DA-K	700/1900/AWS/ 1900 5G/AWS 5G	ADD	RRUS 4478 B14	REL
							RRUS 4415 B25	ADD
							RRUS 4426 B66	REL
			A2	AIR6449 N77D	5G C-BAND	ADD	-	-
			A3	AIR6419 N77G	5G DOD	ADD	-	-
			A4	DMP65R-BU6DA	700/850 5G/WCS	ADD	RRUS 4449 B5/B12	ADD
							RRUS-32 B30	REL
			A5	OPA-65R-LCUU-H6	700	REL	-	-
			A6	QS66512-2	SPARE	-	-	-
BETA	152'	150°	B1	TPA-65R-BU6DA-K	700/1900/AWS/ 1900 5G/AWS 5G	ADD	RRUS 4478 B14	REL
							RRUS 4415 B25	ADD
							RRUS 4426 B66	REL
			B2	AIR6449 N77D	5G C-BAND	ADD	-	-
			B3	AIR6419 N77G	5G DOD	ADD	-	-
			B4	DMP65R-BU6DA	700/850 5G/WCS	ADD	RRUS 4449 B5/B12	ADD
							RRUS-32 B30	REL
			B5	OPA-65R-LCUU-H6	700	REL	-	-
			B6	QS66512-2	SPARE	-	-	-
GAMMA	152'	270°	G1	TPA-65R-BU6DA-K	700/1900/AWS/ 1900 5G/AWS 5G	ADD	RRUS 4478 B14	REL
							RRUS 4415 B25	ADD
							RRUS 4426 B66	REL
			G2	AIR6449 N77D	5G C-BAND	ADD	-	-
			G3	AIR6419 N77G	5G DOD	ADD	-	-
			G4	DMP65R-BU6DA	700/850 5G/WCS	ADD	RRUS 4449 B5/B12	ADD
							RRUS-32 B30	REL
			G5	OPA-65R-LCUU-H6	700	REL	-	-
			G6	QS66512-2	SPARE	-	-	-

EXISTING FIBER DISTRIBUTION/SQUID		EXISTING CABLING SUMMARY			
MODEL NUMBER	STATUS	COAX	DC	FIBER	STATUS
(2) DC6-48-60-18-8F	RMN	(12)	(7)	(3)	RMN

FINAL FIBER DISTRIBUTION/SQUID		FINAL CABLING SUMMARY			
MODEL NUMBER	STATUS	COAX	DC	FIBER	STATUS
(1) DC9-48-60-24-8C-EV	ADD	-	-	-	-
(2) DC6-48-60-18-8F	RMN	(12)	(7)	(3)	RMN

3 EQUIPMENT SCHEDULES

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BERLIN, CT 06037

SEAL:

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AT&T

DATE DRAWN:	11/11/21
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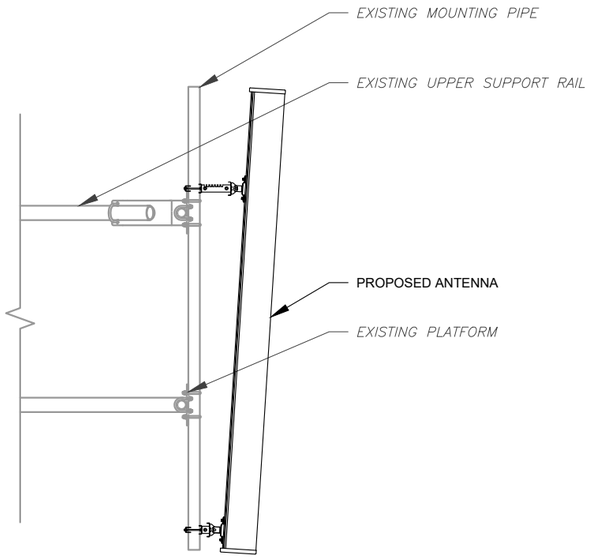
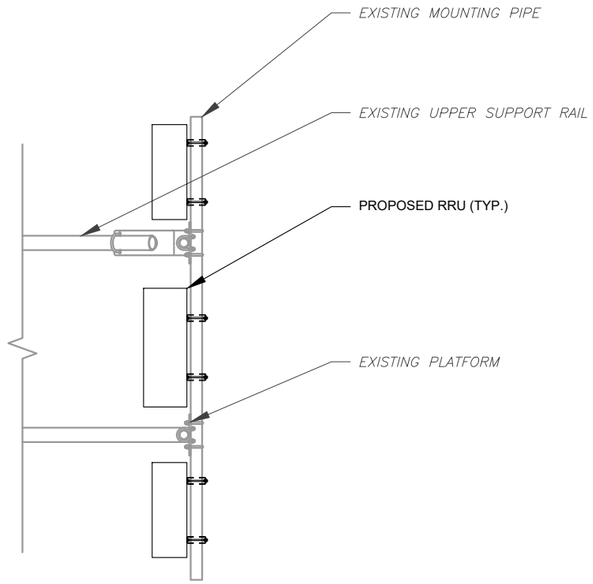
CUSTOMER ID:	BERLIN NE
CUSTOMER #:	10034969

RF SCHEDULE AND ANTENNA INSTALLATION

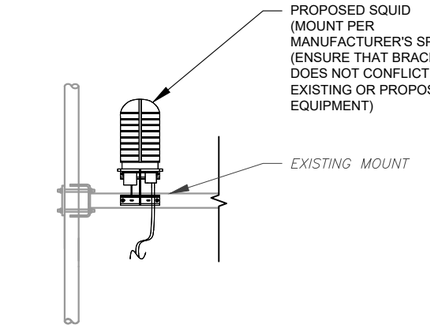
SHEET NUMBER:	REVISION:
C-401	A



1 ANTENNA DETAIL
SCALE: N.T.S.



2 PROPOSED RRU MOUNTING DETAIL - TYPICAL
SCALE: N.T.S.



3 PROPOSED SQUID MOUNTING
SCALE: N.T.S.

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REV.	DESCRIPTION	BY	DATE
A	PRELIM	JW	11/11/21

ATC SITE NUMBER:
302483

ATC SITE NAME:
BRLN - BERLIN

AT&T MOBILITY SITE NAME:
BERLIN NE

SITE ADDRESS:
286 BECKLEY ROAD
BERLIN, CT 06037

SEAL:

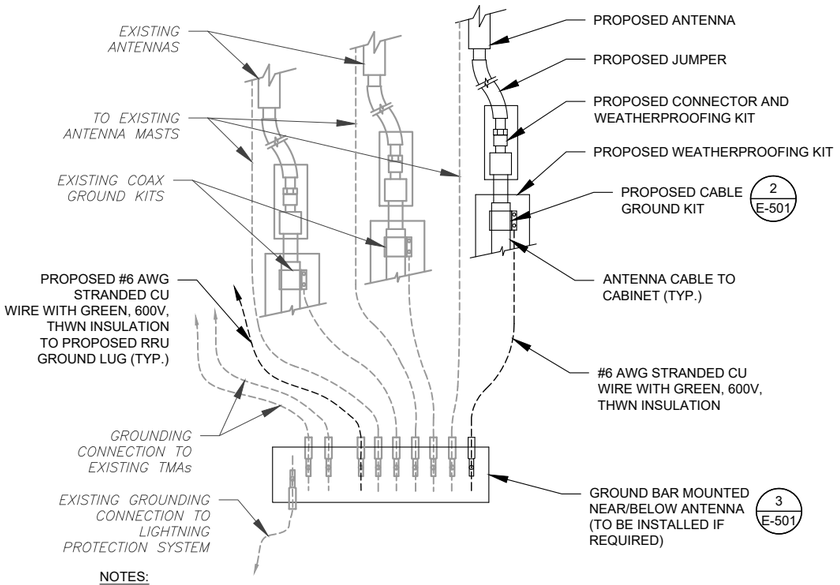
PRELIMINARY: NOT FOR CONSTRUCTION

AT&T

DATE DRAWN:	11/11/21
ATC JOB NO:	13682691
CUSTOMER ID:	BERLIN NE
CUSTOMER #:	10034969

CONSTRUCTION DETAILS

SHEET NUMBER:	REVISION:
C-501	A

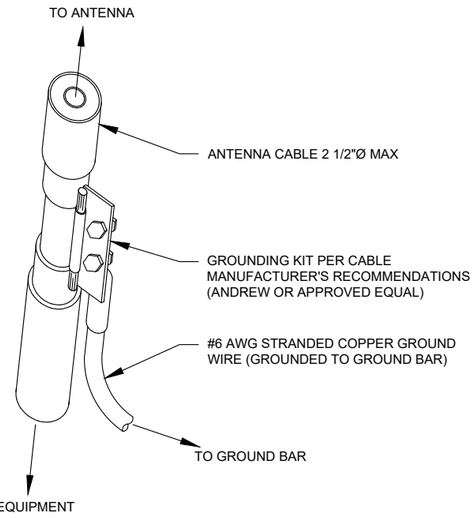


NOTES:

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 AT&T MOBILITY GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH AT&T MOBILITY GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

1 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: N.T.S.

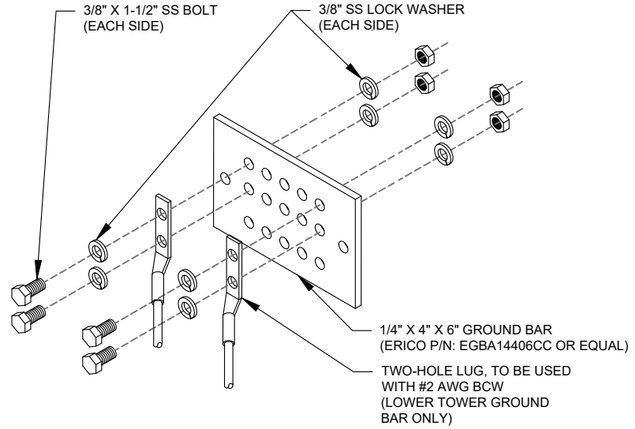


GROUND KIT NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. CONTRACTOR SHALL PROVIDE WEATHERPROOFING KIT (ANDREW PART NUMBER 221213) AND INSTALL/TAPE PER MANUFACTURER'S SPECIFICATIONS.

2 CABLE GROUND KIT CONNECTION DETAIL

SCALE: N.T.S.

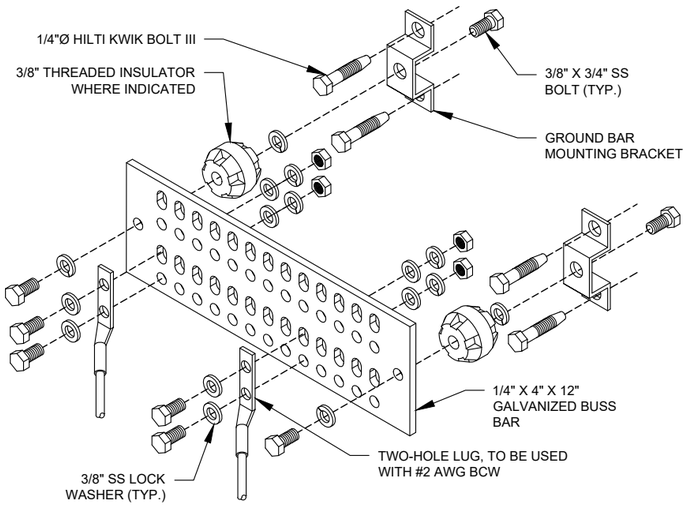


GROUND BAR NOTES:

1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

3 TOWER GROUND BAR DETAIL

SCALE: N.T.S.

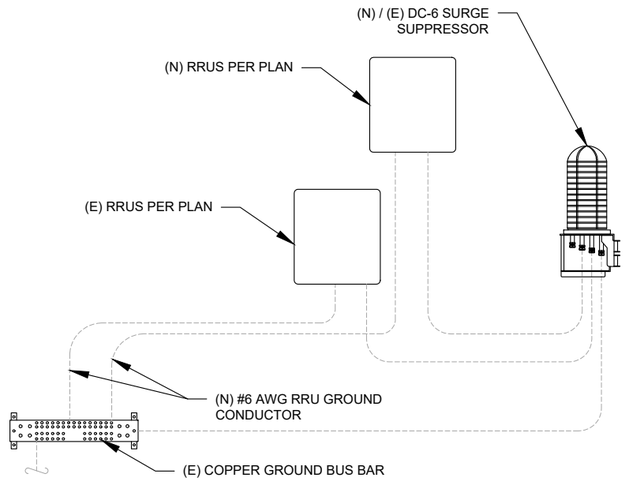


GROUND BAR NOTES

1. GROUND KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR SHALL BE BOLTED TO STRUCTURAL MEMBER OR ANCHORED TO CONCRETE SLAB W/ HILTI KWIK BOLT III.

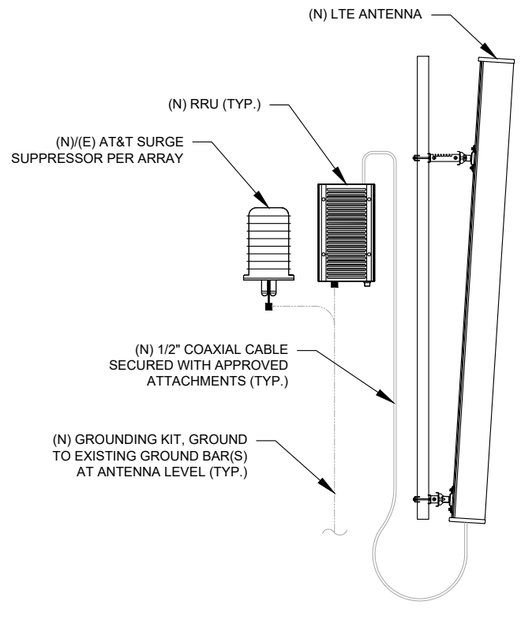
4 MAIN GROUND BAR DETAIL

SCALE: N.T.S.



5 RRU GROUNDING

SCALE: N.T.S.



6 ANTENNA/RRU GROUNDING

SCALE: N.T.S.

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AT&T MOBILITY SITE NAME:
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BERLIN, CT 06037

SEAL:

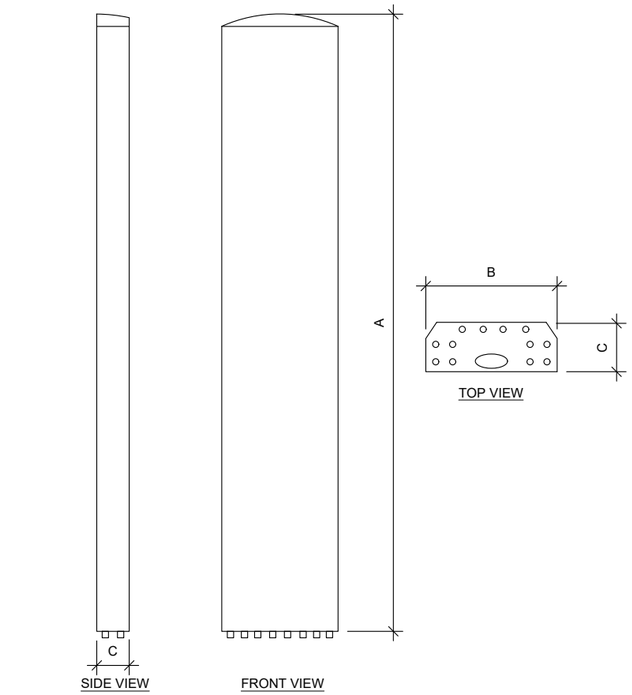
PRELIMINARY: NOT FOR CONSTRUCTION

AT&T

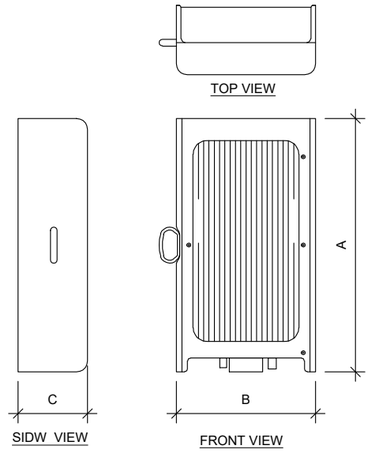
DATE DRAWN:	11/11/21
ATC JOB NO:	13682691
CUSTOMER ID:	BERLIN NE
CUSTOMER #:	10034969

GROUNDING DETAILS

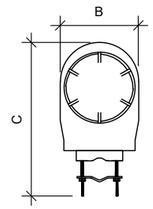
SHEET NUMBER:	REVISION:
E-501	A

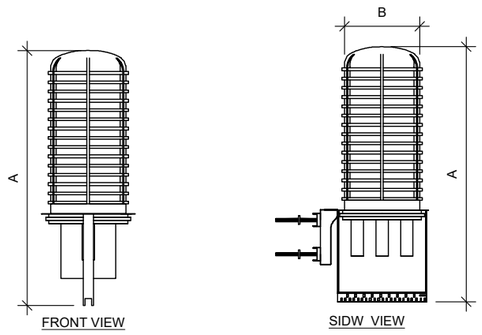


ANTENNA SPECIFICATIONS				
ANTENNA MODEL	A	B	C	WEIGHT (LBS)
TPA-65R-BU6DA-K	71.2"	20.7"	7.7"	52.6
AIR6449 N77D	30.4"	15.9"	8.1"	81.6
AIR6419 N77G	30.0"	15.7"	6.7"	70.0
DMP65R-BUD6DA	71.2"	20.7"	7.7"	79.4



RRU SPECIFICATIONS				
RRU MODEL	A	B	C	WEIGHT (LBS)
4415 B25	16.5"	13.4"	5.9"	46.0
4449 B5, B12	17.9"	13.2"	9.4"	71.0
RRUS-E2 B29	20.4"	18.5"	7.5"	60.0





RAYCAP SPECIFICATIONS				
RAYCAP MODEL	A	B	C	WEIGHT (LBS)
DC99-48-60-24-8C-EV	31.4"	18.3"	10.2"	16.0

1 EQUIPMENT SPECIFICATIONS

SCALE: N.T.S.

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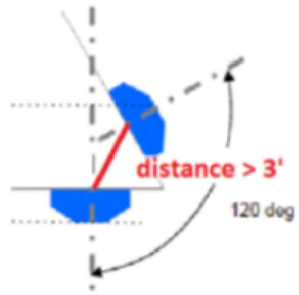
SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-601	

RF REQUIREMENTS FOR 700 B14 FIRSTNET, 700 B12, 700D B29 ANTENNA SEPARATION

- ❑ Horizontal separation (side to side of antenna): >= 3’
- ❑ Vertical separation (between the tips of the antennas): > 3’
- ❑ Inter-sector separation: > 3’ between the center of the antenna backplanes.



- ❑ Please note additional horizontal separation may be required if B14 antennas azimuth are different from others or antennas are severely angled with respect to the mount.
- ❑ Typical 3' horizontal separation can tolerate skew angle up to 6°.

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

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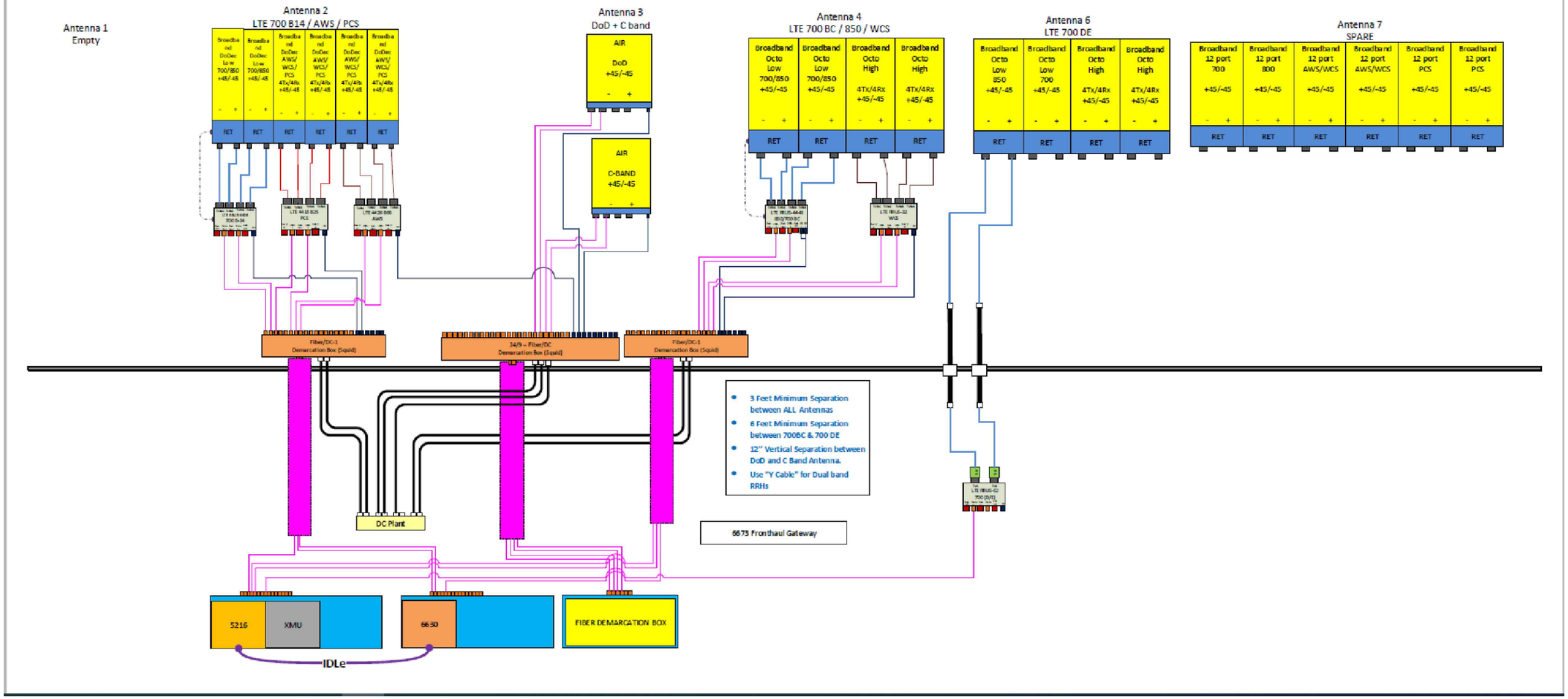
SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-602	

Diagram - Sector	A	Diagram File Name - CT1014_ABC_C-BAND DOD_Rev1.vsd					
Atoll Site Name -	CTL01014	Location Name -	BERLIN NE	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND

Comments: "Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings- Playbook v8.0_Ericsson "



1 RFDS PLUMBING DIAGRAM

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. GENERAL CONTRACTOR IS TO CHECK WITH THE AT&T MOBILITY CM TO ENSURE THIS IS THE MOST RECENT VERSION OF THE RFDS.

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AT&T

DATE DRAWN:	11/11/21
ATC JOB NO:	13682691
CUSTOMER ID:	BERLIN NE
CUSTOMER #:	10034969

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-603	

AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

CLS ENGINEERING PLLC

Structural Analysis Report

Structure	:	**151.5 ft Monopole**
ATC Site Name	:	**Brln - Berlin,CT**
ATC Site Number	:	**302483**
Engineering Number	:	**13682691_C3_04**
Proposed Carrier	:	**AT&T MOBILITY**
Carrier Site Name	:	**MRCTB051296**
Carrier Site Number	:	**N/A**
Site Location	:	**286 Beckley Road** **Berlin, CT 06037-2419** **41.6317, -72.7299**
County	:	**Hartford**
Date	:	**November 4, 2021**
Max Usage	:	**92%**
Result	:	**Pass**

Prepared By:

Ravi Siddharth Raja
CLS

Reviewed By:

STATE OF CONNECTICUT
TYLER M BARKER
No. 32402
LICENSED
PROFESSIONAL ENGINEER

Tyler M. Barker
CLS Engineering PLLC
PE # 32402 Exp. 1/31/2022
COA # PEC.001833 Exp. 8/14/2022
11/05/2021

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 151.5 ft Monopole to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower Drawings	ITT Meyer Type "B", dated July 21, 2001 Mapping by Smith Cullum Acq. #CT-0019, dated July 21, 2001 Mapping by ATC Report #0682, dated January 7, 2016
Foundation Drawing	SpectraSite Project #CT-0019, dated May 29, 2003
Geotechnical Report	Daniel G. Loucks Project #CT-0019, dated December 21, 2001
Modifications	Scientel Project #Berlin-CT0019, dated July 30, 2002 ATC Project #11912109_P5_02, dated October 3, 2017

Analysis

The tower was analyzed using tnx Tower Version 8.1.1.0 tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	118 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.50" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	Ss = 0.20, S_1 = 0.06
Site Class:	D - Stiff Soil - Default

Conclusion

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

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

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
152.0	2	Raycap DC6-48-60-18-8F(32.8 lbs)	Triangular Platform with Handrails	(2) 0.82" (20.8mm) 8 AWG 6 (12) 1 1/4" Coax	AT&T MOBILITY
	3	Ericsson RRUS 4426 B66			
	3	Quintel QS66512-2			
	3	CCI OPA-65R-LCUU-H6			
142.0	3	RFS APXVAARR24_43-U-NA20	Triangular Platform with Handrails	(2) 1 1/4" (1.25"-31.8mm) Fiber (1) 1 5/8" Hybriflex	T-MOBILE
	3	Ericsson AIR32 B66Aa/B2a			
	3	Ericsson Air6449 B41			
	3	Ericsson Radio 4449 B71 B85A			
	3	Ericsson Radio 4460 B25+B66			
132.7	3	Alcatel-Lucent 800 MHz 2X50W RRH w/ Filter	Triangular Platform with Handrails	(4) 1 1/4" Hybriflex Cable	SPRINT NEXTEL
127.0	3	Alcatel-Lucent TD-RRH8x20			
	3	Commscope DT465B-2XR			
	2	RFS APXVSPP18-C-A20			
	1	RFS APXV9ERR18-C-A20			
	3	Alcatel-Lucent RRH2x50-08			
	3	Alcatel-Lucent 4x40W RRH (88 lb)			
116.0	3	Samsung B2/B66A RRH-BR049	Triangular Low Profile Platform	(2) 1 5/8" (1.63"-41.3mm) Fiber (6) 1 5/8" Coax	VERIZON WIRELESS
	3	Samsung B5/B13 RRH-BR04C			
	3	Samsung Outdoor CBRS 20W RRH –Clip-on Antenna			
	6	Commscope SBNHH-1D65B			
	2	Raycap RRFDC-3315-PF-48 (32lbs)			
	3	Samsung RT4401-48A			
	3	Samsung MT6407-77A			
	3	Amphenol Antel BXA-70063-6CF-EDIN-X			
105.0	3	JMA Wireless MX08FRO665-21	Triangular Platform with Handrails	(1) 1.60" (40.6mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B605			
	1	Commscope RDIDC-9181-PF-48			
	3	Fujitsu TA08025-B604			

Equipment to be Removed

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
152.0	3	Commscope CBC23SR-43	-	(1) 3" conduit	AT&T MOBILITY
	6	CCI TPX-070821			
	1	Raycap DC6-48-60-0-8C-EV			
	3	Commscope ION-M23 SDARS			
	3	Powerwave Allgon 7770.00			
	3	Ericsson RRUS 11 (Band 12) (55 lb)			
	3	Ericsson RRUS 32 (50.8 lbs)			
	3	Ericsson RRUS 32 B2			
	6	Powerwave Allgon LGP21401			

Proposed Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
153.0	3	Ericsson AIR 6449 n77D	Triangular Platform with Handrails	(3) 0.40" (10.3mm) Fiber (2) 0.82" (20.8mm) 8 AWG 6 (3) 0.92" (23.4mm) Cable (4) 2" conduit	AT&T MOBILITY
152.0	3	Ericsson RRUS 4415 B25			
	3	Ericsson RRUS 4449 B5, B12			
	3	Ericsson RRUS 4478 B14			
	3	Ericsson RRUS 32 B30			
	3	Ericsson RRUS E2 B29			
	1	Raycap DC9-48-60-24-8C-EV			
	3	CCI DMP65R-BU6DA			
	3	CCI TPA-65R-BU6DA-K			
150.0	3	Ericsson AIR 6419 N77G			

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

Install proposed lines inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	92%	Pass
Shaft	76%	Pass
Base Plate	22%	Pass

Foundation

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	3884.0	90%
Shear (Kips)	35.2	2%
Axial (Kips)	58.6	4%

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 and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
153.0	Ericsson AIR 6449 n77D	AT&T MOBILITY	2.086	1.449
152.0	Ericsson RRUS 4415 B25			
	Ericsson RRUS 4449 B5, B12			
	Ericsson RRUS 4478 B14			
	Ericsson RRUS 32 B30			
	Ericsson RRUS E2 B29			
	Raycap DC9-48-60-24-8C-EV			
	CCI DMP65R-BU6DA			
	CCI TPA-65R-BU6DA-K			
150.0	Ericsson AIR 6419 N77G			

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

Standard Conditions

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

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

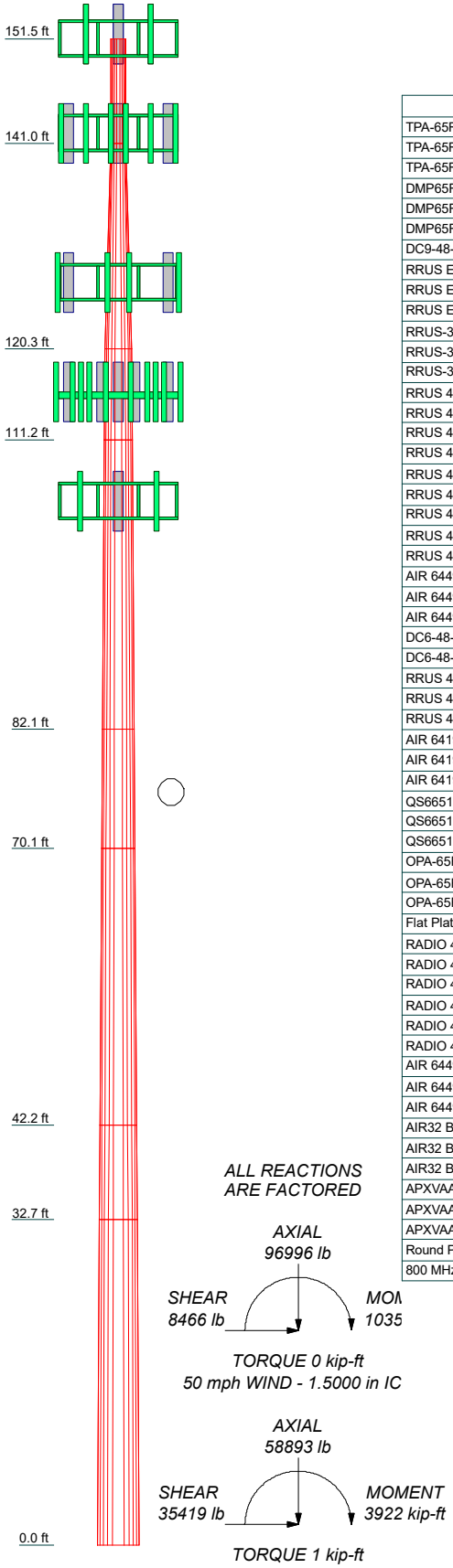
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

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

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

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

Section	Length (ft)	Number of Sides	Thickness (in)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	10.50	12	0.2400	17.1872	17.7841	A572-65	476.2
2	20.67	12	0.3059	17.7841	31.5570		1688.0
3	9.14	12	0.3063	31.5570	33.0280		981.2
4	29.11	12	0.3141	33.0280	38.3470		3543.9
5	12.02	12	0.3804	38.3470	39.7110		1936.3
6	27.82	12	0.4014	39.7110	43.9500		5069.1
7	9.53	12	0.4706	43.9500	45.0640		2164.0
8	32.71	12	0.4906	45.0640	49.5520		8232.0
							24090.6



DESIGNED APPURTENANCE LOADING

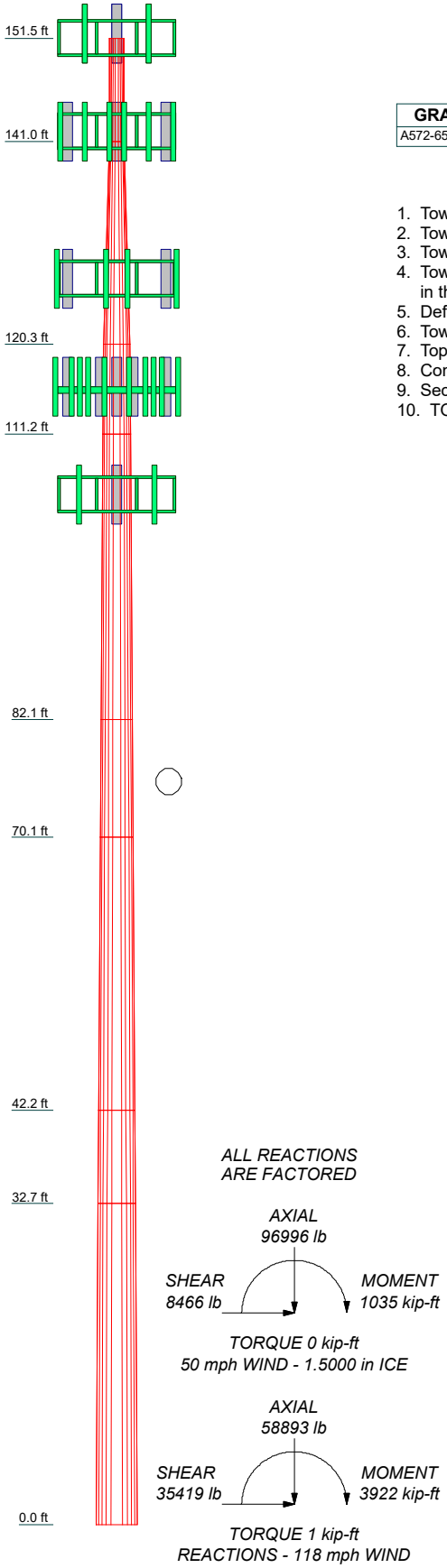
TYPE	ELEVATION	TYPE	ELEVATION
TPA-65R-BU6DA-K	151.5	800 MHz 2X50W RRH w/ Filter	132.7
TPA-65R-BU6DA-K	151.5	800 MHz 2X50W RRH w/ Filter	132.7
TPA-65R-BU6DA-K	151.5	RRH2x50-08	127
DMP65R-BU6DA	151.5	RRH2x50-08	127
DMP65R-BU6DA	151.5	RRH2x50-08	127
DMP65R-BU6DA	151.5	4x40W RRH (88 lb)	127
DC9-48-60-24-8C-EV	151.5	4x40W RRH (88 lb)	127
RRUS E2 B29	151.5	4x40W RRH (88 lb)	127
RRUS E2 B29	151.5	TD-RRH8x20	127
RRUS E2 B29	151.5	TD-RRH8x20	127
RRUS-32 B30	151.5	TD-RRH8x20	127
RRUS-32 B30	151.5	APXVSPP18-C-A20	127
RRUS-32 B30	151.5	APXVSPP18-C-A20	127
RRUS 4478 B14	151.5	APXV9ERR18-C-A20	127
RRUS 4478 B14	151.5	DT465B-2XR	127
RRUS 4478 B14	151.5	DT465B-2XR	127
RRUS 4449 B5/B12	151.5	DT465B-2XR	127
RRUS 4449 B5/B12	151.5	Round Platform w/ Handrails	127
RRUS 4449 B5/B12	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
RRUS 4415 B25	151.5		
RRUS 4415 B25	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
RRUS 4415 B25	151.5		
AIR 6449 n77D	151.5	Outdoor CBRS 20W rRH - Clip on Antenna	116
AIR 6449 n77D	151.5		
AIR 6449 n77D	151.5	RT4401-48A	116
DC6-48-60-18-8F(32.8 lbs)	151.5	RT4401-48A	116
DC6-48-60-18-8F(32.8 lbs)	151.5	RT4401-48A	116
RRUS 4426 B66	151.5	(2) SBNHH-1D65B	116
RRUS 4426 B66	151.5	(2) SBNHH-1D65B	116
RRUS 4426 B66	151.5	(2) SBNHH-1D65B	116
AIR 6419 N77G	151.5	B2/B66A RRH-BR049	116
AIR 6419 N77G	151.5	B2/B66A RRH-BR049	116
AIR 6419 N77G	151.5	B2/B66A RRH-BR049	116
QS66512-2	151.5	B5/B13 RRH-BR04C	116
QS66512-2	151.5	B5/B13 RRH-BR04C	116
QS66512-2	151.5	B5/B13 RRH-BR04C	116
OPA-65R-LCUU-H6	151.5	RRFDC-3315-PF-48	116
OPA-65R-LCUU-H6	151.5	RRFDC-3315-PF-48	116
OPA-65R-LCUU-H6	151.5	MT6407-77A	116
Flat Platform w/ Handrails	151.5	MT6407-77A	116
RADIO 4449 B71/B85A	142	MT6407-77A	116
RADIO 4449 B71/B85A	142	BXA-70063-6CF-EDIN-X	116
RADIO 4449 B71/B85A	142	BXA-70063-6CF-EDIN-X	116
RADIO 4460 B2/B25 B66	142	BXA-70063-6CF-EDIN-X	116
RADIO 4460 B2/B25 B66	142	Round Low Profile Platform	116
RADIO 4460 B2/B25 B66	142	Flat Platform w/ Handrails	105
AIR 6449 B41	142	MX08FRO665-21	105
AIR 6449 B41	142	MX08FRO665-21	105
AIR 6449 B41	142	MX08FRO665-21	105
AIR32 B66Aa/B2a	142	TA08025-B604	105
AIR32 B66Aa/B2a	142	TA08025-B604	105
AIR32 B66Aa/B2a	142	TA08025-B604	105
APXVAARR24_43-U-NA20	142	TA08025-B605	105
APXVAARR24_43-U-NA20	142	TA08025-B605	105
APXVAARR24_43-U-NA20	142	TA08025-B605	105
Round Platform w/ Handrails	142	RDIDC-9181-PF-48	105
800 MHz 2X50W RRH w/ Filter	132.7		

telamon CLS

Telamon CLS Group
319 Chapanoke Road, Suite 118,
Raleigh, NC 27603
Phone: (405) 348-5460
FAX: (405) 348-5460

Job: ***Brln-Berlin (302483)***			
Project: ***13682691_C3_04***			
Client: AT&T MOBILITY	Drawn by: Ravi.Raja		App'd:
Code: TIA-222-H	Date: 11/05/21		Scale: NTS
Path: C:\Users\ravi.raja\Desktop\302483\302483 Brln-Berlin, CT.eri			Dwg No. E-1

Section	1	2	3	4	5	6	7	8	
Length (ft)	10.50	20.67	9.14	29.11	12.02	27.82	9.53	32.71	
Number of Sides	12	12	12	12	12	12	12	12	
Thickness (in)	0.2400	0.3059	0.3063	0.3141	0.3804	0.4014	0.4706	0.4906	
Top Dia (in)	17.1872	17.7841	31.5570	33.0280	38.3470	39.7110	43.9500	45.0640	
Bot Dia (in)	17.7841	31.5570	33.0280	38.3470	39.7110	43.9500	45.0640	49.5520	
Grade	A572-65								
Weight (lb)	476.2	1688.0	981.2	3543.9	1936.3	5069.1	2164.0	8232.0	24090.6



MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Combined pole and wrap structure.
9. Sections modeled to have equivalent inertia to pole and wrap combined.
10. TOWER RATING: 76.1%

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Path: C:\Users\ravi.raja\Desktop\302483\302483 Brln-Berlin, CT.eri		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 196.00 ft.
Basic wind speed of 118 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 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.
Combined pole and wrap structure..
Sections modeled to have equivalent inertia to pole and wrap combined..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

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	151.50-141.00	10.50	0.00	12	17.1872	17.7841	0.2400	0.9600	A572-65 (65 ksi)
L2	141.00-120.33	20.67	0.00	12	17.7841	31.5570	0.3059	2.0000	A572-65 (65 ksi)
L3	120.33-111.19	9.14	0.00	12	31.5570	33.0280	0.3063	2.0000	A572-65 (65 ksi)
L4	111.19-82.08	29.11	0.00	12	33.0280	38.3470	0.3141	2.2000	A572-65 (65 ksi)
L5	82.08-70.06	12.02	0.00	12	38.3470	39.7110	0.3804	2.4000	A572-65 (65 ksi)
L6	70.06-42.24	27.82	0.00	12	39.7110	43.9500	0.4014	2.6000	A572-65 (65 ksi)
L7	42.24-32.71	9.53	0.00	12	43.9500	45.0640	0.4706	2.8000	A572-65 (65 ksi)
L8	32.71-0.00	32.71		12	45.0640	49.5520	0.4906	3.0000	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	17.7088	13.0968	480.1168	6.0671	8.9030	53.9277	972.8469	6.4458	3.9630	16.512
	18.3268	13.5581	532.6554	6.2808	9.2122	57.8209	1079.3043	6.6729	4.1229	17.179
L2	18.2488	17.2160	671.2919	6.2572	9.2122	72.8702	1360.2194	8.4732	3.5302	11.54
	32.5075	30.7823	3837.2246	11.1879	16.3465	234.7425	7775.2574	15.1501	7.2213	23.607
L3	32.5075	30.8221	3842.0947	11.1878	16.3465	235.0404	7785.1256	15.1697	7.2211	23.575
	34.0304	32.2730	4410.5870	11.7144	17.1085	257.8009	8937.0451	15.8838	7.6153	24.862
L4	34.0157	33.0869	4519.6700	11.7116	17.1085	264.1768	9158.0767	16.2844	7.5039	23.89
	39.5224	38.4666	7102.1213	13.6158	19.8637	357.5419	14390.8231	18.9321	8.9294	28.429
L5	39.5036	46.5048	8556.3285	13.5920	19.8637	430.7510	17337.4413	22.8883	8.7867	23.099
	40.9157	48.1756	9512.0483	14.0804	20.5703	462.4166	19273.9886	23.7106	9.1523	24.06
L6	40.9001	50.8080	10021.0923	14.0728	20.5703	487.1632	20305.4499	25.0061	9.0338	22.506
	45.2886	56.2869	13625.1654	15.5904	22.7661	598.4848	27608.2791	27.7027	10.1698	25.336
L7	45.2696	65.8857	15898.0688	15.5656	22.7661	698.3220	32213.7975	32.4270	10.0256	21.304
	46.4229	67.5738	17151.6341	15.9644	23.3432	734.7608	34753.8607	33.2578	10.3241	21.938
L8	46.4074	70.4140	17856.5130	15.9573	23.3432	764.9572	36182.1365	34.6556	10.2062	20.803
	51.0537	77.5039	23811.6328	17.5640	25.6679	927.6801	48248.8237	38.1450	11.4090	23.255

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 151.50-141.00				1	1	1			
L2 141.00-120.33				1	1	1			
L3 120.33-111.19				1	1	1			
L4 111.19-82.08				1	1	1			
L5 82.08-70.06				1	1	1			
L6 70.06-42.24				1	1	1			
L7 42.24-32.71				1	1	1			

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
L8 32.71-0.00				1	1	1			

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
***										
1 5/8" Coax	B	No	Surface Ar (CaAa)	116.00 - 5.00	6	6	0.100 0.500	1.9800		0.82
1 5/8" (1.63"-41.3mm) Fiber	B	No	Surface Ar (CaAa)	116.00 - 5.00	2	2	0.000 0.100	1.6300		1.61
***										
4" Wrap Seams	A	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00
4" Wrap Seams	B	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00
4" Wrap Seams	C	No	Surface Ar (CaAa)	141.00 - 5.00	1	1	0.000 0.000	4.0000		0.00

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_A ft^2/ft	Weight plf
1 1/4" Coax	C	No	No	Inside Pole	151.50 - 5.00	12	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
							2" Ice	0.00	0.66
***									
1 5/8" Hybriflex	C	No	No	Inside Pole	142.00 - 5.00	1	No Ice	0.00	1.61
							1/2" Ice	0.00	1.61
							1" Ice	0.00	1.61
							2" Ice	0.00	1.61
1 1/4" (1.25"-31.8mm) Fiber	C	No	No	Inside Pole	142.00 - 5.00	2	No Ice	0.00	1.05
							1/2" Ice	0.00	1.05
							1" Ice	0.00	1.05
							2" Ice	0.00	1.05
***									
1 1/4" Hybriflex	C	No	No	Inside Pole	127.00 - 5.00	4	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
							2" Ice	0.00	0.66
***									
0.82" (20.8mm) 8 AWG 6	C	No	No	Inside Pole	151.50 - 0.00	2	No Ice	0.00	0.62
							1/2" Ice	0.00	0.62
							1" Ice	0.00	0.62
							2" Ice	0.00	0.62
1.6" (40.6mm) Hybrid	A	No	No	Inside Pole	105.00 - 5.00	1	No Ice	0.00	0.56
							1/2" Ice	0.00	0.56

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							1" Ice	0.00	0.56
							2" Ice	0.00	0.56
***									
0.82" (20.8mm) 8 AWG 6	C	No	No	Inside Pole	151.50 - 0.00	2	No Ice	0.00	0.62
							1/2" Ice	0.00	0.62
							1" Ice	0.00	0.62
							2" Ice	0.00	0.62
2" Conduit	C	No	No	Inside Pole	151.50 - 0.00	4	No Ice	0.00	3.65
							1/2" Ice	0.00	3.65
							1" Ice	0.00	3.65
							2" Ice	0.00	3.65
0.40" (10.3mm) Fiber	C	No	No	Inside Pole	151.50 - 0.00	3	No Ice	0.00	0.09
							1/2" Ice	0.00	0.09
							1" Ice	0.00	0.09
							2" Ice	0.00	0.09
0.92 (23.4mm) Cable	C	No	No	Inside Pole	151.50 - 0.00	3	No Ice	0.00	0.89
							1/2" Ice	0.00	0.89
							1" Ice	0.00	0.89
							2" Ice	0.00	0.89

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	151.50-141.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	297.08
L2	141.00-120.33	A	0.000	0.000	8.268	0.000	0.00
		B	0.000	0.000	8.268	0.000	0.00
		C	0.000	0.000	8.268	0.000	671.81
L3	120.33-111.19	A	0.000	0.000	3.656	0.000	0.00
		B	0.000	0.000	10.938	0.000	39.15
		C	0.000	0.000	3.656	0.000	313.41
L4	111.19-82.08	A	0.000	0.000	11.644	0.000	12.84
		B	0.000	0.000	55.717	0.000	236.96
		C	0.000	0.000	11.644	0.000	998.18
L5	82.08-70.06	A	0.000	0.000	4.808	0.000	6.73
		B	0.000	0.000	23.006	0.000	97.84
		C	0.000	0.000	4.808	0.000	412.17
L6	70.06-42.24	A	0.000	0.000	11.128	0.000	15.58
		B	0.000	0.000	53.247	0.000	226.45
		C	0.000	0.000	11.128	0.000	953.95
L7	42.24-32.71	A	0.000	0.000	3.812	0.000	5.34
		B	0.000	0.000	18.240	0.000	77.57
		C	0.000	0.000	3.812	0.000	326.78
L8	32.71-0.00	A	0.000	0.000	11.084	0.000	15.52
		B	0.000	0.000	53.037	0.000	225.56
		C	0.000	0.000	11.084	0.000	1050.28

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_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	151.50-141.00	A	1.741	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	297.08
L2	141.00-120.33	A	1.720	0.000	0.000	15.379	0.000	248.46
		B		0.000	0.000	15.379	0.000	248.46
		C		0.000	0.000	15.379	0.000	920.27
L3	120.33-111.19	A	1.701	0.000	0.000	6.765	0.000	108.25
		B		0.000	0.000	19.957	0.000	299.75
		C		0.000	0.000	6.765	0.000	421.66
L4	111.19-82.08	A	1.670	0.000	0.000	21.364	0.000	349.47
		B		0.000	0.000	100.754	0.000	1476.10
		C		0.000	0.000	21.364	0.000	1334.81
L5	82.08-70.06	A	1.631	0.000	0.000	8.728	0.000	141.56
		B		0.000	0.000	41.276	0.000	595.29
		C		0.000	0.000	8.728	0.000	546.99
L6	70.06-42.24	A	1.581	0.000	0.000	19.926	0.000	315.53
		B		0.000	0.000	94.570	0.000	1336.55
		C		0.000	0.000	19.926	0.000	1253.90
L7	42.24-32.71	A	1.519	0.000	0.000	6.707	0.000	102.95
		B		0.000	0.000	31.982	0.000	440.31
		C		0.000	0.000	6.707	0.000	424.40
L8	32.71-0.00	A	1.396	0.000	0.000	18.821	0.000	270.55
		B		0.000	0.000	90.605	0.000	1181.58
		C		0.000	0.000	18.821	0.000	1305.31

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	151.50-141.00	0.0000	0.0000	0.0000	0.0000
L2	141.00-120.33	0.0000	0.0000	0.0000	0.0000
L3	120.33-111.19	2.9044	-0.0139	3.0147	-0.1541
L4	111.19-82.08	4.8420	-0.0236	4.8596	-0.2459
L5	82.08-70.06	5.1029	-0.0252	5.1176	-0.2556
L6	70.06-42.24	5.2815	-0.0263	5.3181	-0.2608
L7	42.24-32.71	5.4122	-0.0272	5.4956	-0.2629
L8	32.71-0.00	4.9739	-0.0251	5.1798	-0.2348

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
L2	15	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L2	16	4" Wrap Seams	120.33 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			141.00		
L2	17	4" Wrap Seams	120.33 - 141.00	1.0000	1.0000
L3	12	1 5/8" Coax	111.19 - 116.00	1.0000	1.0000
L3	13	1 5/8" (1.63"-41.3mm) Fiber	111.19 - 116.00	1.0000	1.0000
L3	15	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L3	16	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L3	17	4" Wrap Seams	111.19 - 120.33	1.0000	1.0000
L4	12	1 5/8" Coax	82.08 - 111.19	1.0000	1.0000
L4	13	1 5/8" (1.63"-41.3mm) Fiber	82.08 - 111.19	1.0000	1.0000
L4	15	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L4	16	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L4	17	4" Wrap Seams	82.08 - 111.19	1.0000	1.0000
L5	12	1 5/8" Coax	70.06 - 82.08	1.0000	1.0000
L5	13	1 5/8" (1.63"-41.3mm) Fiber	70.06 - 82.08	1.0000	1.0000
L5	15	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L5	16	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L5	17	4" Wrap Seams	70.06 - 82.08	1.0000	1.0000
L6	12	1 5/8" Coax	42.24 - 70.06	1.0000	1.0000
L6	13	1 5/8" (1.63"-41.3mm) Fiber	42.24 - 70.06	1.0000	1.0000
L6	15	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L6	16	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L6	17	4" Wrap Seams	42.24 - 70.06	1.0000	1.0000
L7	12	1 5/8" Coax	32.71 - 42.24	1.0000	1.0000
L7	13	1 5/8" (1.63"-41.3mm) Fiber	32.71 - 42.24	1.0000	1.0000
L7	15	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L7	16	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L7	17	4" Wrap Seams	32.71 - 42.24	1.0000	1.0000
L8	12	1 5/8" Coax	5.00 - 32.71	1.0000	1.0000
L8	13	1 5/8" (1.63"-41.3mm) Fiber	5.00 - 32.71	1.0000	1.0000
L8	15	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000
L8	16	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000
L8	17	4" Wrap Seams	5.00 - 32.71	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Offsets: ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
TPA-65R-BU6DA-K	A	From Leg	3.00			0.0000	151.50	No Ice	15.27	5.55	79.60
			0.00					1/2" Ice	15.79	6.00	165.56
			0.50					1" Ice	16.32	6.46	258.46
								2" Ice	17.39	7.40	465.90
TPA-65R-BU6DA-K	B	From Leg	3.00			0.0000	151.50	No Ice	15.27	5.55	79.60
			0.00					1/2" Ice	15.79	6.00	165.56
			0.50					1" Ice	16.32	6.46	258.46

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	17.39	7.40	465.90
TPA-65R-BU6DA-K	C	From Leg	3.00	0.0000	151.50	No Ice	15.27	5.55	79.60
			0.00			1/2" Ice	15.79	6.00	165.56
			0.50			1" Ice	16.32	6.46	258.46
						2" Ice	17.39	7.40	465.90
DMP65R-BU6DA	A	From Leg	3.00	0.0000	151.50	No Ice	12.71	5.62	79.40
			0.00			1/2" Ice	13.21	6.07	153.36
			0.50			1" Ice	13.71	6.53	233.96
						2" Ice	14.74	7.47	415.90
DMP65R-BU6DA	B	From Leg	3.00	0.0000	151.50	No Ice	12.71	5.62	79.40
			0.00			1/2" Ice	13.21	6.07	153.36
			0.50			1" Ice	13.71	6.53	233.96
						2" Ice	14.74	7.47	415.90
DMP65R-BU6DA	C	From Leg	3.00	0.0000	151.50	No Ice	12.71	5.62	79.40
			0.00			1/2" Ice	13.21	6.07	153.36
			0.50			1" Ice	13.71	6.53	233.96
						2" Ice	14.74	7.47	415.90
DC9-48-60-24-8C-EV	A	From Leg	3.00	0.0000	151.50	No Ice	2.74	4.78	26.20
			0.00			1/2" Ice	2.96	5.06	63.27
			0.50			1" Ice	3.20	5.35	104.42
						2" Ice	3.68	5.95	199.74
RRUS E2 B29	A	From Leg	3.00	0.0000	151.50	No Ice	3.15	1.29	60.00
			0.00			1/2" Ice	3.36	1.44	83.22
			0.50			1" Ice	3.59	1.60	109.64
						2" Ice	4.07	1.95	172.88
RRUS E2 B29	B	From Leg	3.00	0.0000	151.50	No Ice	3.15	1.29	60.00
			0.00			1/2" Ice	3.36	1.44	83.22
			0.50			1" Ice	3.59	1.60	109.64
						2" Ice	4.07	1.95	172.88
RRUS E2 B29	C	From Leg	3.00	0.0000	151.50	No Ice	3.15	1.29	60.00
			0.00			1/2" Ice	3.36	1.44	83.22
			0.50			1" Ice	3.59	1.60	109.64
						2" Ice	4.07	1.95	172.88
RRUS-32 B30	A	From Leg	3.00	0.0000	151.50	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.50			1" Ice	3.81	2.86	136.47
						2" Ice	4.33	3.32	211.15
RRUS-32 B30	B	From Leg	3.00	0.0000	151.50	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.50			1" Ice	3.81	2.86	136.47
						2" Ice	4.33	3.32	211.15
RRUS-32 B30	C	From Leg	3.00	0.0000	151.50	No Ice	3.31	2.42	77.00
			0.00			1/2" Ice	3.56	2.64	104.93
			0.50			1" Ice	3.81	2.86	136.47
						2" Ice	4.33	3.32	211.15
RRUS 4478 B14	A	From Leg	3.00	0.0000	151.50	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.01	1.20	75.78
			0.50			1" Ice	2.19	1.34	94.29
						2" Ice	2.57	1.66	139.98
RRUS 4478 B14	B	From Leg	3.00	0.0000	151.50	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.01	1.20	75.78
			0.50			1" Ice	2.19	1.34	94.29
						2" Ice	2.57	1.66	139.98
RRUS 4478 B14	C	From Leg	3.00	0.0000	151.50	No Ice	1.84	1.06	59.90
			0.00			1/2" Ice	2.01	1.20	75.78
			0.50			1" Ice	2.19	1.34	94.29
						2" Ice	2.57	1.66	139.98

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RRUS 4449 B5/B12	A	From Leg	3.00	0.0000	151.50	No Ice	1.97	1.41	71.00
			0.00			1/2" Ice	2.14	1.56	89.51
			0.50			1" Ice	2.33	1.73	110.84
						2" Ice	2.72	2.07	162.74
RRUS 4449 B5/B12	B	From Leg	3.00	0.0000	151.50	No Ice	1.97	1.41	71.00
			0.00			1/2" Ice	2.14	1.56	89.51
			0.50			1" Ice	2.33	1.73	110.84
						2" Ice	2.72	2.07	162.74
RRUS 4449 B5/B12	C	From Leg	3.00	0.0000	151.50	No Ice	1.97	1.41	71.00
			0.00			1/2" Ice	2.14	1.56	89.51
			0.50			1" Ice	2.33	1.73	110.84
						2" Ice	2.72	2.07	162.74
RRUS 4415 B25	A	From Leg	3.00	0.0000	151.50	No Ice	1.84	0.82	46.00
			0.00			1/2" Ice	2.01	0.94	60.07
			0.50			1" Ice	2.19	1.07	76.66
						2" Ice	2.57	1.37	118.17
RRUS 4415 B25	B	From Leg	3.00	0.0000	151.50	No Ice	1.84	0.82	46.00
			0.00			1/2" Ice	2.01	0.94	60.07
			0.50			1" Ice	2.19	1.07	76.66
						2" Ice	2.57	1.37	118.17
RRUS 4415 B25	C	From Leg	3.00	0.0000	151.50	No Ice	1.84	0.82	46.00
			0.00			1/2" Ice	2.01	0.94	60.07
			0.50			1" Ice	2.19	1.07	76.66
						2" Ice	2.57	1.37	118.17
AIR 6449 n77D	A	From Leg	3.00	0.0000	151.50	No Ice	4.03	2.15	81.60
			0.00			1/2" Ice	4.29	2.36	111.21
			1.50			1" Ice	4.56	2.57	144.55
						2" Ice	5.12	3.03	223.15
AIR 6449 n77D	B	From Leg	3.00	0.0000	151.50	No Ice	4.03	2.15	81.60
			0.00			1/2" Ice	4.29	2.36	111.21
			1.50			1" Ice	4.56	2.57	144.55
						2" Ice	5.12	3.03	223.15
AIR 6449 n77D	C	From Leg	3.00	0.0000	151.50	No Ice	4.03	2.15	81.60
			0.00			1/2" Ice	4.29	2.36	111.21
			1.50			1" Ice	4.56	2.57	144.55
						2" Ice	5.12	3.03	223.15
DC6-48-60-18-8F(32.8 lbs)	B	From Leg	3.00	0.0000	151.50	No Ice	1.28	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.50			1" Ice	1.45	1.45	52.57
						2" Ice	1.83	1.83	95.09
DC6-48-60-18-8F(32.8 lbs)	C	From Leg	3.00	0.0000	151.50	No Ice	1.28	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.50			1" Ice	1.45	1.45	52.57
						2" Ice	1.83	1.83	95.09
RRUS 4426 B66	A	From Leg	3.00	0.0000	151.50	No Ice	1.64	0.73	48.40
			0.00			1/2" Ice	1.80	0.84	61.22
			0.50			1" Ice	1.97	0.97	76.43
						2" Ice	2.33	1.24	114.82
RRUS 4426 B66	B	From Leg	3.00	0.0000	151.50	No Ice	1.64	0.73	48.40
			0.00			1/2" Ice	1.80	0.84	61.22
			0.50			1" Ice	1.97	0.97	76.43
						2" Ice	2.33	1.24	114.82
RRUS 4426 B66	C	From Leg	3.00	0.0000	151.50	No Ice	1.64	0.73	48.40
			0.00			1/2" Ice	1.80	0.84	61.22
			0.50			1" Ice	1.97	0.97	76.43
						2" Ice	2.33	1.24	114.82
AIR 6419 N77G	A	From Leg	3.00	0.0000	151.50	No Ice	3.92	0.88	70.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	4.18	1.00	96.92
			-1.50			1" Ice	4.45	1.14	127.43
						2" Ice	5.00	1.43	199.99
AIR 6419 N77G	B	From Leg	3.00	0.0000	151.50	No Ice	3.92	0.88	70.00
			0.00			1/2" Ice	4.18	1.00	96.92
			-1.50			1" Ice	4.45	1.14	127.43
						2" Ice	5.00	1.43	199.99
AIR 6419 N77G	C	From Leg	3.00	0.0000	151.50	No Ice	3.92	0.88	70.00
			0.00			1/2" Ice	4.18	1.00	96.92
			-1.50			1" Ice	4.45	1.14	127.43
						2" Ice	5.00	1.43	199.99
QS66512-2	A	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	111.00
			0.00			1/2" Ice	9.23	5.80	168.00
			0.50			1" Ice	10.33	6.60	225.00
						2" Ice	12.53	8.20	339.00
QS66512-2	B	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	111.00
			0.00			1/2" Ice	9.23	5.80	168.00
			0.50			1" Ice	10.33	6.60	225.00
						2" Ice	12.53	8.20	339.00
QS66512-2	C	From Leg	3.00	0.0000	151.50	No Ice	8.13	5.00	111.00
			0.00			1/2" Ice	9.23	5.80	168.00
			0.50			1" Ice	10.33	6.60	225.00
						2" Ice	12.53	8.20	339.00
OPA-65R-LCUU-H6	A	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	70.00
			0.00			1/2" Ice	10.13	5.97	131.43
			0.50			1" Ice	10.61	6.43	196.17
						2" Ice	11.58	7.38	345.32
OPA-65R-LCUU-H6	B	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	70.00
			0.00			1/2" Ice	10.13	5.97	131.43
			0.50			1" Ice	10.61	6.43	196.17
						2" Ice	11.58	7.38	345.32
OPA-65R-LCUU-H6	C	From Leg	3.00	0.0000	151.50	No Ice	9.66	5.52	70.00
			0.00			1/2" Ice	10.13	5.97	131.43
			0.50			1" Ice	10.61	6.43	196.17
						2" Ice	11.58	7.38	345.32
Flat Platform w/ Handrails	C	None		0.0000	151.50	No Ice	42.40	42.40	2500.00
						1/2" Ice	48.40	48.40	2450.00
						1" Ice	54.40	54.40	2900.00
						2" Ice	66.40	66.40	3800.00
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RADIO 4449 B71/B85A	A	From Leg	3.00	0.0000	142.00	No Ice	1.65	1.31	75.00
			0.00			1/2" Ice	1.80	1.46	92.22
			0.00			1" Ice	1.97	1.61	112.19
						2" Ice	2.33	1.94	161.00
RADIO 4449 B71/B85A	B	From Leg	3.00	0.0000	142.00	No Ice	1.65	1.31	75.00
			0.00			1/2" Ice	1.80	1.46	92.22
			0.00			1" Ice	1.97	1.61	112.19
						2" Ice	2.33	1.94	161.00
RADIO 4449 B71/B85A	C	From Leg	3.00	0.0000	142.00	No Ice	1.65	1.31	75.00
			0.00			1/2" Ice	1.80	1.46	92.22
			0.00			1" Ice	1.97	1.61	112.19
						2" Ice	2.33	1.94	161.00
RADIO 4460 B2/B25 B66	A	From Leg	3.00	0.0000	142.00	No Ice	2.56	1.61	109.00
			0.00			1/2" Ice	2.95	1.85	131.16
			0.00			1" Ice	3.33	2.02	156.36
						2" Ice	4.10	2.39	216.68
RADIO 4460 B2/B25 B66	B	From Leg	3.00	0.0000	142.00	No Ice	2.56	1.61	109.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	2.95	1.85	131.16
			0.00			1" Ice	3.33	2.02	156.36
						2" Ice	4.10	2.39	216.68
RADIO 4460 B2/B25 B66	C	From Leg	3.00	0.0000	142.00	No Ice	2.56	1.61	109.00
			0.00			1/2" Ice	2.95	1.85	131.16
			0.00			1" Ice	3.33	2.02	156.36
						2" Ice	4.10	2.39	216.68
AIR 6449 B41	A	From Leg	3.00	0.0000	142.00	No Ice	5.68	2.48	104.00
			0.00			1/2" Ice	5.96	2.70	153.54
			0.00			1" Ice	6.27	2.94	196.67
						2" Ice	6.91	3.43	296.37
AIR 6449 B41	B	From Leg	3.00	0.0000	142.00	No Ice	5.68	2.48	104.00
			0.00			1/2" Ice	5.96	2.70	153.54
			0.00			1" Ice	6.27	2.94	196.67
						2" Ice	6.91	3.43	296.37
AIR 6449 B41	C	From Leg	3.00	0.0000	142.00	No Ice	5.68	2.48	104.00
			0.00			1/2" Ice	5.96	2.70	153.54
			0.00			1" Ice	6.27	2.94	196.67
						2" Ice	6.91	3.43	296.37
AIR32 B66Aa/B2a	A	From Leg	3.00	0.0000	142.00	No Ice	6.51	2.70	132.20
			0.00			1/2" Ice	7.78	3.22	178.00
			0.00			1" Ice	9.05	3.74	223.80
						2" Ice	11.59	4.78	315.40
AIR32 B66Aa/B2a	B	From Leg	3.00	0.0000	142.00	No Ice	6.51	2.70	132.20
			0.00			1/2" Ice	7.78	3.22	178.00
			0.00			1" Ice	9.05	3.74	223.80
						2" Ice	11.59	4.78	315.40
AIR32 B66Aa/B2a	C	From Leg	3.00	0.0000	142.00	No Ice	6.51	2.70	132.20
			0.00			1/2" Ice	7.78	3.22	178.00
			0.00			1" Ice	9.05	3.74	223.80
						2" Ice	11.59	4.78	315.40
APXVAARR24_43-U-NA20	A	From Leg	3.00	0.0000	142.00	No Ice	20.24	5.15	127.90
			0.00			1/2" Ice	23.53	5.99	240.00
			0.00			1" Ice	26.82	6.83	352.10
						2" Ice	33.40	8.51	576.30
APXVAARR24_43-U-NA20	B	From Leg	3.00	0.0000	142.00	No Ice	20.24	5.15	127.90
			0.00			1/2" Ice	23.53	5.99	240.00
			0.00			1" Ice	26.82	6.83	352.10
						2" Ice	33.40	8.51	576.30
APXVAARR24_43-U-NA20	C	From Leg	3.00	0.0000	142.00	No Ice	20.24	5.15	127.90
			0.00			1/2" Ice	23.53	5.99	240.00
			0.00			1" Ice	26.82	6.83	352.10
						2" Ice	33.40	8.51	576.30
Round Platform w/ Handrails	C	None		0.0000	142.00	No Ice	27.20	27.20	2500.00
						1/2" Ice	34.20	34.20	2400.00
						1" Ice	41.20	41.20	2800.00
						2" Ice	55.20	55.20	3600.00
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RRH2x50-08	A	From Face	3.00	0.0000	127.00	No Ice	1.70	1.10	52.90
			0.00			1/2" Ice	2.27	1.80	69.90
			0.00			1" Ice	2.84	2.50	86.90
						2" Ice	3.98	3.90	120.90
RRH2x50-08	B	From Face	3.00	0.0000	127.00	No Ice	1.70	1.10	52.90
			0.00			1/2" Ice	2.27	1.80	69.90
			0.00			1" Ice	2.84	2.50	86.90
						2" Ice	3.98	3.90	120.90
RRH2x50-08	C	From Face	3.00	0.0000	127.00	No Ice	1.70	1.10	52.90

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	2.27	1.80	69.90
			0.00			1" Ice	2.84	2.50	86.90
						2" Ice	3.98	3.90	120.90
800 MHz 2X50W RRH w/ Filter	A	From Leg	3.00	0.0000	132.70	No Ice	0.00	1.93	60.00
			0.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
						2" Ice	2.83	2.68	171.62
800 MHz 2X50W RRH w/ Filter	B	From Leg	3.00	0.0000	132.70	No Ice	0.00	1.93	60.00
			0.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
						2" Ice	2.83	2.68	171.62
800 MHz 2X50W RRH w/ Filter	C	From Leg	3.00	0.0000	132.70	No Ice	0.00	1.93	60.00
			0.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
						2" Ice	2.83	2.68	171.62
4x40W RRH (88 lb)	A	From Leg	3.00	0.0000	127.00	No Ice	0.00	3.80	90.00
			0.00			1/2" Ice	0.00	4.06	119.27
			0.00			1" Ice	0.00	4.34	154.18
						2" Ice	0.00	4.91	235.65
4x40W RRH (88 lb)	C	From Leg	3.00	0.0000	127.00	No Ice	0.00	3.80	90.00
			0.00			1/2" Ice	0.00	4.06	119.27
			0.00			1" Ice	0.00	4.34	154.18
						2" Ice	0.00	4.91	235.65
4x40W RRH (88 lb)	B	From Leg	3.00	0.0000	127.00	No Ice	0.00	3.80	90.00
			0.00			1/2" Ice	0.00	4.06	119.27
			0.00			1" Ice	0.00	4.34	154.18
						2" Ice	0.00	4.91	235.65
TD-RRH8x20	A	From Face	3.00	0.0000	127.00	No Ice	0.00	1.40	70.00
			0.00			1/2" Ice	4.59	1.61	89.96
			0.00			1" Ice	4.88	1.82	117.16
						2" Ice	5.48	2.27	182.34
TD-RRH8x20	B	From Face	3.00	0.0000	127.00	No Ice	0.00	1.40	70.00
			0.00			1/2" Ice	4.59	1.61	89.96
			0.00			1" Ice	4.88	1.82	117.16
						2" Ice	5.48	2.27	182.34
TD-RRH8x20	C	From Face	3.00	0.0000	127.00	No Ice	0.00	1.40	70.00
			0.00			1/2" Ice	4.59	1.61	89.96
			0.00			1" Ice	4.88	1.82	117.16
						2" Ice	5.48	2.27	182.34
APXVSPP18-C-A20	A	From Leg	3.00	0.0000	127.00	No Ice	8.02	5.28	60.00
			0.00			1/2" Ice	8.48	5.74	106.52
			0.00			1" Ice	8.94	6.20	162.12
						2" Ice	9.89	7.14	292.33
APXVSPP18-C-A20	B	From Leg	3.00	0.0000	127.00	No Ice	8.02	5.28	60.00
			0.00			1/2" Ice	8.48	5.74	106.52
			0.00			1" Ice	8.94	6.20	162.12
						2" Ice	9.89	7.14	292.33
APXV9ERR18-C-A20	C	From Leg	3.00	0.0000	127.00	No Ice	8.02	5.81	60.00
			0.00			1/2" Ice	8.48	6.27	113.99
			0.00			1" Ice	8.94	6.73	172.12
						2" Ice	9.89	7.68	307.57
DT465B-2XR	A	From Leg	3.00	0.0000	127.00	No Ice	9.10	5.97	60.00
			0.00			1/2" Ice	9.56	6.43	116.01
			0.00			1" Ice	10.04	6.90	180.29
						2" Ice	11.00	7.84	328.48
DT465B-2XR	B	From Leg	3.00	0.0000	127.00	No Ice	9.10	5.97	60.00
			0.00			1/2" Ice	9.56	6.43	116.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	10.04	6.90	180.29
						2" Ice	11.00	7.84	328.48
DT465B-2XR	C	From Leg	3.00	0.0000	127.00	No Ice	9.10	5.97	60.00
			0.00			1/2" Ice	9.56	6.43	116.01
			0.00			1" Ice	10.04	6.90	180.29
						2" Ice	11.00	7.84	328.48
Round Platform w/ Handrails	C	None		0.0000	127.00	No Ice	27.20	27.20	2500.00
						1/2" Ice	34.20	34.20	2400.00
						1" Ice	41.20	41.20	2800.00
						2" Ice	55.20	55.20	3600.00
**									
Outdoor CBRS 20W rRH - Clip on Antenna	A	From Leg	3.00	0.0000	116.00	No Ice	0.89	0.75	4.40
			0.00			1/2" Ice	1.03	0.87	5.06
			0.00			1" Ice	1.16	0.99	5.72
						2" Ice	1.43	1.27	7.04
Outdoor CBRS 20W rRH - Clip on Antenna	B	From Leg	3.00	0.0000	116.00	No Ice	0.89	0.75	4.40
			0.00			1/2" Ice	1.03	0.87	5.06
			0.00			1" Ice	1.16	0.99	5.72
						2" Ice	1.43	1.27	7.04
Outdoor CBRS 20W rRH - Clip on Antenna	C	From Leg	3.00	0.0000	116.00	No Ice	0.89	0.75	4.40
			0.00			1/2" Ice	1.03	0.87	5.06
			0.00			1" Ice	1.16	0.99	5.72
						2" Ice	1.43	1.27	7.04
RT4401-48A	A	From Leg	3.00	0.0000	116.00	No Ice	1.00	1.00	18.60
			0.00			1/2" Ice	1.15	1.15	21.39
			0.00			1" Ice	1.29	1.29	24.18
						2" Ice	1.59	1.59	29.76
RT4401-48A	B	From Leg	3.00	0.0000	116.00	No Ice	1.00	1.00	18.60
			0.00			1/2" Ice	1.15	1.15	21.39
			0.00			1" Ice	1.29	1.29	24.18
						2" Ice	1.59	1.59	29.76
RT4401-48A	C	From Leg	3.00	0.0000	116.00	No Ice	1.00	1.00	18.60
			0.00			1/2" Ice	1.15	1.15	21.39
			0.00			1" Ice	1.29	1.29	24.18
						2" Ice	1.59	1.59	29.76
(2) SBNHH-1D65B	A	From Leg	3.00	0.0000	116.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83
(2) SBNHH-1D65B	B	From Leg	3.00	0.0000	116.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83
(2) SBNHH-1D65B	C	From Leg	3.00	0.0000	116.00	No Ice	4.16	2.49	40.60
			0.00			1/2" Ice	4.57	2.88	91.24
			0.00			1" Ice	4.99	3.27	148.02
						2" Ice	5.85	4.09	280.83
B2/B66A RRH-BR049	A	From Leg	3.00	0.0000	116.00	No Ice	2.05	1.54	38.30
			0.00			1/2" Ice	2.23	1.70	59.84
			0.00			1" Ice	2.41	1.86	84.37
						2" Ice	2.81	2.21	143.23
B2/B66A RRH-BR049	B	From Leg	3.00	0.0000	116.00	No Ice	2.05	1.54	38.30
			0.00			1/2" Ice	2.23	1.70	59.84
			0.00			1" Ice	2.41	1.86	84.37
						2" Ice	2.81	2.21	143.23
B2/B66A RRH-BR049	C	From Leg	3.00	0.0000	116.00	No Ice	2.05	1.54	38.30
			0.00			1/2" Ice	2.23	1.70	59.84

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	2.41	1.86	84.37
						2" Ice	2.81	2.21	143.23
B5/B13 RRH-BR04C	A	From Leg	3.00	0.0000	116.00	No Ice	1.88	1.01	70.30
			0.00			1/2" Ice	2.05	1.14	86.73
			0.00			1" Ice	2.22	1.28	105.83
						2" Ice	2.60	1.59	152.80
B5/B13 RRH-BR04C	B	From Leg	3.00	0.0000	116.00	No Ice	1.88	1.01	70.30
			0.00			1/2" Ice	2.05	1.14	86.73
			0.00			1" Ice	2.22	1.28	105.83
						2" Ice	2.60	1.59	152.80
B5/B13 RRH-BR04C	C	From Leg	3.00	0.0000	116.00	No Ice	1.88	1.01	70.30
			0.00			1/2" Ice	2.05	1.14	86.73
			0.00			1" Ice	2.22	1.28	105.83
						2" Ice	2.60	1.59	152.80
RRFDC-3315-PF-48	A	From Leg	3.00	0.0000	116.00	No Ice	2.80	2.19	32.00
			0.00			1/2" Ice	3.60	2.39	49.94
			0.00			1" Ice	3.84	2.61	82.01
						2" Ice	4.34	3.05	157.57
RRFDC-3315-PF-48	B	From Leg	3.00	0.0000	116.00	No Ice	2.80	2.19	32.00
			0.00			1/2" Ice	3.60	2.39	49.94
			0.00			1" Ice	3.84	2.61	82.01
						2" Ice	4.34	3.05	157.57
MT6407-77A	A	From Leg	3.00	0.0000	116.00	No Ice	4.71	1.84	81.57
			0.00			1/2" Ice	4.98	2.06	110.81
			0.00			1" Ice	5.28	2.29	143.92
						2" Ice	5.89	2.77	222.51
MT6407-77A	B	From Leg	3.00	0.0000	116.00	No Ice	4.71	1.84	81.57
			0.00			1/2" Ice	4.98	2.06	110.81
			0.00			1" Ice	5.28	2.29	143.92
						2" Ice	5.89	2.77	222.51
MT6407-77A	C	From Leg	3.00	0.0000	116.00	No Ice	4.71	1.84	81.57
			0.00			1/2" Ice	4.98	2.06	110.81
			0.00			1" Ice	5.28	2.29	143.92
						2" Ice	5.89	2.77	222.51
BXA-70063-6CF-EDIN-X	A	From Leg	3.00	0.0000	116.00	No Ice	7.44	3.80	33.00
			0.00			1/2" Ice	8.21	4.51	75.49
			0.00			1" Ice	8.99	5.25	123.83
						2" Ice	10.62	6.77	238.88
BXA-70063-6CF-EDIN-X	B	From Leg	3.00	0.0000	116.00	No Ice	7.44	3.80	33.00
			0.00			1/2" Ice	8.21	4.51	75.49
			0.00			1" Ice	8.99	5.25	123.83
						2" Ice	10.62	6.77	238.88
BXA-70063-6CF-EDIN-X	C	From Leg	3.00	0.0000	116.00	No Ice	7.44	3.80	33.00
			0.00			1/2" Ice	8.21	4.51	75.49
			0.00			1" Ice	8.99	5.25	123.83
						2" Ice	10.62	6.77	238.88
Round Low Profile Platform	C	None		0.0000	116.00	No Ice	21.70	21.70	1875.00
						1/2" Ice	27.20	27.20	1700.00
						1" Ice	32.70	32.70	1900.00
						2" Ice	43.70	43.70	2300.00
**									
Flat Platform w/ Handrails	C	None		0.0000	105.00	No Ice	42.40	42.40	2500.00
						1/2" Ice	48.40	48.40	2450.00
						1" Ice	54.40	54.40	2900.00
						2" Ice	66.40	66.40	3800.00
MX08FRO665-21	A	From Leg	3.00	0.0000	105.00	No Ice	12.49	5.87	64.50
			0.00			1/2" Ice	12.99	6.32	138.29

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	13.49	6.79	218.76
						2" Ice	14.52	7.74	400.50
MX08FRO665-21	B	From Leg	3.00	0.0000	105.00	No Ice	12.49	5.87	64.50
			0.00			1/2" Ice	12.99	6.32	138.29
			0.00			1" Ice	13.49	6.79	218.76
						2" Ice	14.52	7.74	400.50
MX08FRO665-21	C	From Leg	3.00	0.0000	105.00	No Ice	12.49	5.87	64.50
			0.00			1/2" Ice	12.99	6.32	138.29
			0.00			1" Ice	13.49	6.79	218.76
						2" Ice	14.52	7.74	400.50
TA08025-B604	A	From Leg	3.00	0.0000	105.00	No Ice	1.96	1.03	63.93
			0.00			1/2" Ice	2.14	1.17	80.68
			0.00			1" Ice	2.32	1.31	100.13
						2" Ice	2.71	1.62	147.88
TA08025-B604	B	From Leg	3.00	0.0000	105.00	No Ice	1.96	1.03	63.93
			0.00			1/2" Ice	2.14	1.17	80.68
			0.00			1" Ice	2.32	1.31	100.13
						2" Ice	2.71	1.62	147.88
TA08025-B604	C	From Leg	3.00	0.0000	105.00	No Ice	1.96	1.03	63.93
			0.00			1/2" Ice	2.14	1.17	80.68
			0.00			1" Ice	2.32	1.31	100.13
						2" Ice	2.71	1.62	147.88
TA08025-B605	A	From Leg	3.00	0.0000	105.00	No Ice	2.23	1.19	74.95
			0.00			1/2" Ice	2.41	1.33	94.60
			0.00			1" Ice	2.60	1.48	117.15
						2" Ice	3.01	1.80	171.73
TA08025-B605	B	From Leg	3.00	0.0000	105.00	No Ice	2.23	1.19	74.95
			0.00			1/2" Ice	2.41	1.33	94.60
			0.00			1" Ice	2.60	1.48	117.15
						2" Ice	3.01	1.80	171.73
TA08025-B605	C	From Leg	3.00	0.0000	105.00	No Ice	2.23	1.19	74.95
			0.00			1/2" Ice	2.41	1.33	94.60
			0.00			1" Ice	2.60	1.48	117.15
						2" Ice	3.01	1.80	171.73
RDIDC-9181-PF-48	A	From Leg	1.50	0.0000	105.00	No Ice	1.87	1.17	21.85
			0.00			1/2" Ice	2.19	1.31	39.53
			0.00			1" Ice	2.37	1.46	59.97
						2" Ice	2.76	1.78	109.90

**

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	146.22	1.102	37	15.766	A	0.000	15.766	15.766	100.00	0.000	0.000
151.50-141.00					B	0.000	15.766		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	15.766		100.00	0.000	0.000
L2	129.70	1.064	36	43.714	A	0.000	43.714	43.714	100.00	8.268	0.000
141.00-120.33					B	0.000	43.714		100.00	8.268	0.000
					C	0.000	43.714		100.00	8.268	0.000
L3	115.73	1.03	35	25.340	A	0.000	25.340	25.340	100.00	3.656	0.000
120.33-111.19					B	0.000	25.340		100.00	10.938	0.000
					C	0.000	25.340		100.00	3.656	0.000
L4	96.27	0.978	33	89.196	A	0.000	89.196	89.196	100.00	11.644	0.000
111.19-82.08					B	0.000	89.196		100.00	55.717	0.000
					C	0.000	89.196		100.00	11.644	0.000
L5 82.08-70.06	76.03	0.914	31	40.277	A	0.000	40.277	40.277	100.00	4.808	0.000
					B	0.000	40.277		100.00	23.006	0.000
					C	0.000	40.277		100.00	4.808	0.000
L6 70.06-42.24	55.92	0.837	28	99.907	A	0.000	99.907	99.907	100.00	11.128	0.000
					B	0.000	99.907		100.00	53.247	0.000
					C	0.000	99.907		100.00	11.128	0.000
L7 42.24-32.71	37.46	0.746	25	36.410	A	0.000	36.410	36.410	100.00	3.812	0.000
					B	0.000	36.410		100.00	18.240	0.000
					C	0.000	36.410		100.00	3.812	0.000
L8 32.71-0.00	16.10	0.7	24	132.831	A	0.000	132.831	132.831	100.00	11.084	0.000
					B	0.000	132.831		100.00	53.037	0.000
					C	0.000	132.831		100.00	11.084	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	146.22	1.102	7	1.7408	18.812	A	0.000	18.812	18.812	100.00	0.000	0.000
151.50-141.00						B	0.000	18.812		100.00	0.000	0.000
						C	0.000	18.812		100.00	0.000	0.000
L2	129.70	1.064	6	1.7200	49.639	A	0.000	49.639	49.639	100.00	15.379	0.000
141.00-120.33						B	0.000	49.639		100.00	15.379	0.000
						C	0.000	49.639		100.00	15.379	0.000
L3	115.73	1.03	6	1.7005	27.930	A	0.000	27.930	27.930	100.00	6.765	0.000
120.33-111.19						B	0.000	27.930		100.00	19.957	0.000
						C	0.000	27.930		100.00	6.765	0.000
L4 111.19-82.08	96.27	0.978	6	1.6695	97.296	A	0.000	97.296	97.296	100.00	21.364	0.000
						B	0.000	97.296		100.00	100.754	0.000
						C	0.000	97.296		100.00	21.364	0.000
L5 82.08-70.06	76.03	0.914	6	1.6306	43.543	A	0.000	43.543	43.543	100.00	8.728	0.000
						B	0.000	43.543		100.00	41.276	0.000
						C	0.000	43.543		100.00	8.728	0.000
L6 70.06-42.24	55.92	0.837	5	1.5812	107.239	A	0.000	107.239	107.239	100.00	19.926	0.000
						B	0.000	107.239		100.00	94.570	0.000
						C	0.000	107.239		100.00	19.926	0.000
L7 42.24-32.71	37.46	0.746	5	1.5191	38.822	A	0.000	38.822	38.822	100.00	6.707	0.000
						B	0.000	38.822		100.00	31.982	0.000
						C	0.000	38.822		100.00	6.707	0.000
L8 32.71-0.00	16.10	0.7	4	1.3961	140.442	A	0.000	140.442	140.442	100.00	18.821	0.000
						B	0.000	140.442		100.00	90.605	0.000
						C	0.000	140.442		100.00	18.821	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	146.22	1.102	9	15.766	A	0.000	15.766	15.766	100.00	0.000	0.000
151.50-141.00					B	0.000	15.766		100.00	0.000	0.000
					C	0.000	15.766		100.00	0.000	0.000
L2	129.70	1.064	8	43.714	A	0.000	43.714	43.714	100.00	8.268	0.000
141.00-120.33					B	0.000	43.714		100.00	8.268	0.000
					C	0.000	43.714		100.00	8.268	0.000
L3	115.73	1.03	8	25.340	A	0.000	25.340	25.340	100.00	3.656	0.000
120.33-111.19					B	0.000	25.340		100.00	10.938	0.000
					C	0.000	25.340		100.00	3.656	0.000
L4	96.27	0.978	8	89.196	A	0.000	89.196	89.196	100.00	11.644	0.000
111.19-82.08					B	0.000	89.196		100.00	55.717	0.000
					C	0.000	89.196		100.00	11.644	0.000
L5 82.08-70.06	76.03	0.914	7	40.277	A	0.000	40.277	40.277	100.00	4.808	0.000
					B	0.000	40.277		100.00	23.006	0.000
					C	0.000	40.277		100.00	4.808	0.000
L6 70.06-42.24	55.92	0.837	7	99.907	A	0.000	99.907	99.907	100.00	11.128	0.000
					B	0.000	99.907		100.00	53.247	0.000
					C	0.000	99.907		100.00	11.128	0.000
L7 42.24-32.71	37.46	0.746	6	36.410	A	0.000	36.410	36.410	100.00	3.812	0.000
					B	0.000	36.410		100.00	18.240	0.000
					C	0.000	36.410		100.00	3.812	0.000
L8 32.71-0.00	16.10	0.7	5	132.831	A	0.000	132.831	132.831	100.00	11.084	0.000
					B	0.000	132.831		100.00	53.037	0.000
					C	0.000	132.831		100.00	11.084	0.000

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice

Comb. No.	Description
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	151.5 - 141	Pole	Max Tension	1	0.00	0.000	0.000
			Max. Compression	26	-22687.95	-0.031	0.374
			Max. Mx	8	-10879.26	-85.590	-0.014
			Max. My	2	-10905.75	-0.001	84.655
			Max. Vy	8	11777.27	-85.590	-0.014
			Max. Vx	2	-11682.30	-0.001	84.655
			Max. Torque	8			0.459
L2	141 - 120.33	Pole	Max Tension	1	0.00	0.000	0.000
			Max. Compression	26	-35116.07	-0.096	0.441
			Max. Mx	8	-17800.68	-369.719	-0.044
			Max. My	2	-17857.07	0.034	364.170
			Max. Vy	8	16972.78	-369.719	-0.044
			Max. Vx	2	-16595.70	0.034	364.170
			Max. Torque	8			0.459
L3	120.33 - 111.19	Pole	Max Tension	1	0.00	0.000	0.000
			Max. Compression	26	-44444.22	-0.947	0.947
			Max. Mx	8	-22632.42	-544.869	-0.035
			Max. My	2	-22695.39	-0.050	535.557
			Max. Vy	8	21153.29	-544.869	-0.035
			Max. Vx	2	-20724.74	-0.050	535.557
			Max. Torque	11			0.592
L4	111.19 - 82.08	Pole	Max Tension	1	0.00	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-60507.55	-2.824	2.366
			Max. Mx	8	-32193.20	-1271.212	-0.164
			Max. My	2	-32241.30	-0.013	1250.332
			Max. Vy	8	27052.72	-1271.212	-0.164
			Max. Vx	2	-26685.86	-0.013	1250.332
			Max. Torque	11			0.673
L5	82.08 - 70.06	Pole	Max Tension	1	0.00	0.000	0.000
			Max. Compression	26	-65216.19	-3.635	2.849
			Max. Mx	8	-35320.13	-1603.260	-0.240
			Max. My	2	-35360.89	-0.012	1578.001
			Max. Vy	8	28197.10	-1603.260	-0.240
			Max. Vx	2	-27847.43	-0.012	1578.001
			Max. Torque	11			0.672
L6	70.06 - 42.24	Pole	Max Tension	1	0.00	0.000	0.000
			Max. Compression	26	-76835.58	-5.500	3.947
			Max. Mx	8	-43383.78	-2420.607	-0.403
			Max. My	2	-43408.33	-0.034	2385.552
			Max. Vy	8	30552.52	-2420.607	-0.403
			Max. Vx	2	-30211.28	-0.034	2385.552
			Max. Torque	11			0.671
L7	42.24 - 32.71	Pole	Max Tension	1	0.00	0.000	0.000
			Max. Compression	26	-81316.34	-6.100	4.293
			Max. Mx	8	-46675.98	-2715.094	-0.455
			Max. My	2	-46695.08	-0.050	2676.741
			Max. Vy	8	31258.46	-2715.094	-0.455
			Max. Vx	2	-30920.69	-0.050	2676.741
			Max. Torque	11			0.670
L8	32.71 - 0	Pole	Max Tension	1	0.00	0.000	0.000
			Max. Compression	26	-96995.58	-7.811	5.281
			Max. Mx	8	-58871.87	-3772.201	-0.665
			Max. My	2	-58872.36	-0.047	3722.847
			Max. Vy	8	33350.71	-3772.201	-0.665
			Max. Vx	2	-33028.68	-0.047	3722.847
			Max. Torque	11			0.669

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	30	96995.58	-8462.70	-4.26
	Max. H_x	20	58893.36	33312.76	14.68
	Max. H_z	2	58893.36	14.68	32991.22
	Max. M_x	2	3722.847	14.68	32991.22
	Max. M_z	8	3772.201	-33312.76	-14.68
	Max. Torsion	11	0.669	-28494.12	-16438.56
	Min. Vert	19	44170.02	28479.44	-16413.14
	Min. H_x	8	58893.36	-33312.76	-14.68
	Min. H_z	14	58893.36	-14.68	-32991.22
	Min. M_x	14	-3720.384	-14.68	-32991.22
	Min. M_z	20	-3768.337	33312.76	14.68
	Min. Torsion	23	-0.665	28494.12	16438.56

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
Dead Only	49077.80	0.00	0.00	-0.963	-1.518	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	58893.36	-14.68	-32991.22	-3722.847	-0.047	0.192
0.9 Dead+1.0 Wind 0 deg - No Ice	44170.02	-14.68	-32991.22	-3661.595	0.430	0.193
1.2 Dead+1.0 Wind 30 deg - No Ice	58893.36	17262.59	-29877.98	-3343.962	-1935.021	-0.161
0.9 Dead+1.0 Wind 30 deg - No Ice	44170.02	17262.59	-29877.98	-3289.279	-1903.054	-0.161
1.2 Dead+1.0 Wind 60 deg - No Ice	58893.36	28479.44	-16413.14	-1853.503	-3219.420	-0.473
0.9 Dead+1.0 Wind 60 deg - No Ice	44170.02	28479.44	-16413.14	-1822.831	-3166.155	-0.473
1.2 Dead+1.0 Wind 90 deg - No Ice	58893.36	33312.76	14.68	0.665	-3772.201	-0.659
0.9 Dead+1.0 Wind 90 deg - No Ice	44170.02	33312.75	14.68	0.956	-3709.889	-0.659
1.2 Dead+1.0 Wind 120 deg - No Ice	58893.36	28494.12	16438.56	1854.318	-3221.295	-0.669
0.9 Dead+1.0 Wind 120 deg - No Ice	44170.02	28494.12	16438.56	1824.238	-3168.001	-0.669
1.2 Dead+1.0 Wind 150 deg - No Ice	58893.36	17731.53	30660.86	3392.979	-1966.916	-0.497
0.9 Dead+1.0 Wind 150 deg - No Ice	44170.02	17731.53	30660.86	3338.374	-1934.587	-0.498
1.2 Dead+1.0 Wind 180 deg - No Ice	58893.36	14.68	32991.22	3720.384	-3.826	-0.192
0.9 Dead+1.0 Wind 180 deg - No Ice	44170.02	14.68	32991.22	3659.780	-3.287	-0.193
1.2 Dead+1.0 Wind 210 deg - No Ice	58893.36	-17262.59	29877.98	3341.507	1931.145	0.165
0.9 Dead+1.0 Wind 210 deg - No Ice	44170.02	-17262.59	29877.98	3287.469	1900.195	0.164
1.2 Dead+1.0 Wind 240 deg - No Ice	58893.36	-28479.44	16413.14	1851.054	3215.548	0.476
0.9 Dead+1.0 Wind 240 deg - No Ice	44170.02	-28479.44	16413.14	1821.025	3163.298	0.476
1.2 Dead+1.0 Wind 270 deg - No Ice	58893.36	-33312.76	-14.68	-3.114	3768.337	0.659
0.9 Dead+1.0 Wind 270 deg - No Ice	44170.02	-33312.75	-14.68	-2.761	3707.037	0.659
1.2 Dead+1.0 Wind 300 deg - No Ice	58893.36	-28494.12	-16438.56	-1856.774	3217.433	0.665
0.9 Dead+1.0 Wind 300 deg - No Ice	44170.02	-28494.12	-16438.56	-1826.048	3165.152	0.665
1.2 Dead+1.0 Wind 330 deg - No Ice	58893.36	-17731.53	-30660.86	-3395.441	1963.052	0.494
0.9 Dead+1.0 Wind 330 deg - No Ice	44170.02	-17731.53	-30660.86	-3340.188	1931.736	0.494
1.2 Dead+1.0 Ice+1.0 Temp	96995.58	0.03	-0.02	-5.281	-7.811	-0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	96995.58	-4.26	-8459.99	-1030.371	-7.408	0.048
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	96995.58	4227.66	-7324.43	-892.764	-520.451	-0.031
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	96995.58	7326.78	-4226.30	-517.388	-896.177	-0.102
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	96995.58	8462.70	4.26	-4.824	-1033.911	-0.146

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	96995.58	7331.04	4233.68	507.586	-896.748	-0.150
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	96995.58	4235.04	7328.70	882.545	-521.440	-0.115
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	96995.58	4.26	8459.99	1019.581	-8.550	-0.048
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	96995.58	-4227.66	7324.43	881.976	504.495	0.031
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	96995.58	-7326.78	4226.30	506.599	880.223	0.102
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	96995.58	-8462.69	-4.26	-5.966	1017.958	0.145
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	96995.58	-7331.04	-4233.68	-518.378	880.793	0.150
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	96995.58	-4235.04	-7328.70	-893.336	505.483	0.114
Dead+Wind 0 deg - Service	49077.80	-3.40	-7631.90	-853.791	-1.168	0.045
Dead+Wind 30 deg - Service	49077.80	3993.37	-6911.70	-767.098	-444.617	-0.038
Dead+Wind 60 deg - Service	49077.80	6588.18	-3796.87	-425.453	-738.855	-0.111
Dead+Wind 90 deg - Service	49077.80	7706.28	3.40	-0.586	-865.552	-0.154
Dead+Wind 120 deg - Service	49077.80	6591.57	3802.75	424.164	-739.287	-0.156
Dead+Wind 150 deg - Service	49077.80	4101.85	7092.81	776.913	-451.960	-0.116
Dead+Wind 180 deg - Service	49077.80	3.40	7631.90	851.753	-2.033	-0.045
Dead+Wind 210 deg - Service	49077.80	-3993.37	6911.70	765.060	441.416	0.038
Dead+Wind 240 deg - Service	49077.80	-6588.18	3796.87	423.415	735.654	0.111
Dead+Wind 270 deg - Service	49077.80	-7706.28	-3.40	-1.452	862.351	0.154
Dead+Wind 300 deg - Service	49077.80	-6591.57	-3802.75	-426.203	736.087	0.156
Dead+Wind 330 deg - Service	49077.80	-4101.85	-7092.81	-778.952	448.760	0.116

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-49077.80	0.00	0.00	49077.80	0.00	0.000%
2	-14.68	-58893.36	-32991.21	14.68	58893.36	32991.22	0.000%
3	-14.68	-44170.02	-32991.21	14.68	44170.02	32991.22	0.000%
4	17262.59	-58893.36	-29877.98	-17262.59	58893.36	29877.98	0.000%
5	17262.59	-44170.02	-29877.98	-17262.59	44170.02	29877.98	0.000%
6	28479.44	-58893.36	-16413.14	-28479.44	58893.36	16413.14	0.000%
7	28479.44	-44170.02	-16413.14	-28479.44	44170.02	16413.14	0.000%
8	33312.75	-58893.36	14.68	-33312.76	58893.36	-14.68	0.000%
9	33312.75	-44170.02	14.68	-33312.75	44170.02	-14.68	0.000%
10	28494.12	-58893.36	16438.56	-28494.12	58893.36	-16438.56	0.000%
11	28494.12	-44170.02	16438.56	-28494.12	44170.02	-16438.56	0.000%
12	17731.53	-58893.36	30660.86	-17731.53	58893.36	-30660.86	0.000%
13	17731.53	-44170.02	30660.86	-17731.53	44170.02	-30660.86	0.000%
14	14.68	-58893.36	32991.21	-14.68	58893.36	-32991.22	0.000%
15	14.68	-44170.02	32991.21	-14.68	44170.02	-32991.22	0.000%
16	-17262.59	-58893.36	29877.98	17262.59	58893.36	-29877.98	0.000%
17	-17262.59	-44170.02	29877.98	17262.59	44170.02	-29877.98	0.000%
18	-28479.44	-58893.36	16413.14	28479.44	58893.36	-16413.14	0.000%
19	-28479.44	-44170.02	16413.14	28479.44	44170.02	-16413.14	0.000%
20	-33312.75	-58893.36	-14.68	33312.76	58893.36	14.68	0.000%
21	-33312.75	-44170.02	-14.68	33312.75	44170.02	14.68	0.000%
22	-28494.12	-58893.36	-16438.56	28494.12	58893.36	16438.56	0.000%
23	-28494.12	-44170.02	-16438.56	28494.12	44170.02	16438.56	0.000%
24	-17731.53	-58893.36	-30660.86	17731.53	58893.36	30660.86	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
25	-17731.53	-44170.02	-30660.86	17731.53	44170.02	30660.86	0.000%
26	0.00	-96995.58	0.00	-0.03	96995.58	0.02	0.000%
27	-4.26	-96995.58	-8459.92	4.26	96995.58	8459.99	0.000%
28	4227.62	-96995.58	-7324.38	-4227.66	96995.58	7324.43	0.000%
29	7326.72	-96995.58	-4226.27	-7326.78	96995.58	4226.30	0.000%
30	8462.63	-96995.58	4.26	-8462.70	96995.58	-4.26	0.000%
31	7330.98	-96995.58	4233.65	-7331.04	96995.58	-4233.68	0.000%
32	4235.00	-96995.58	7328.64	-4235.04	96995.58	-7328.70	0.000%
33	4.26	-96995.58	8459.92	-4.26	96995.58	-8459.99	0.000%
34	-4227.62	-96995.58	7324.38	4227.66	96995.58	-7324.43	0.000%
35	-7326.72	-96995.58	4226.27	7326.78	96995.58	-4226.30	0.000%
36	-8462.63	-96995.58	-4.26	8462.69	96995.58	4.26	0.000%
37	-7330.98	-96995.58	-4233.65	7331.04	96995.58	4233.68	0.000%
38	-4235.00	-96995.58	-7328.64	4235.04	96995.58	7328.70	0.000%
39	-3.40	-49077.80	-7631.89	3.40	49077.80	7631.90	0.000%
40	3993.37	-49077.80	-6911.70	-3993.37	49077.80	6911.70	0.000%
41	6588.18	-49077.80	-3796.87	-6588.18	49077.80	3796.87	0.000%
42	7706.27	-49077.80	3.40	-7706.28	49077.80	-3.40	0.000%
43	6591.57	-49077.80	3802.75	-6591.57	49077.80	-3802.75	0.000%
44	4101.85	-49077.80	7092.81	-4101.85	49077.80	-7092.81	0.000%
45	3.40	-49077.80	7631.89	-3.40	49077.80	-7631.90	0.000%
46	-3993.37	-49077.80	6911.70	3993.37	49077.80	-6911.70	0.000%
47	-6588.18	-49077.80	3796.87	6588.18	49077.80	-3796.87	0.000%
48	-7706.27	-49077.80	-3.40	7706.28	49077.80	3.40	0.000%
49	-6591.57	-49077.80	-3802.75	6591.57	49077.80	3802.75	0.000%
50	-4101.85	-49077.80	-7092.81	4101.85	49077.80	7092.81	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00015259
3	Yes	5	0.00000001	0.00005861
4	Yes	7	0.00000001	0.00008347
5	Yes	6	0.00000001	0.00036819
6	Yes	7	0.00000001	0.00007965
7	Yes	6	0.00000001	0.00035358
8	Yes	5	0.00000001	0.00025205
9	Yes	5	0.00000001	0.00011431
10	Yes	7	0.00000001	0.00007845
11	Yes	6	0.00000001	0.00034799
12	Yes	7	0.00000001	0.00008555
13	Yes	6	0.00000001	0.00037678
14	Yes	5	0.00000001	0.00016849
15	Yes	5	0.00000001	0.00006754
16	Yes	7	0.00000001	0.00008362
17	Yes	6	0.00000001	0.00036921
18	Yes	7	0.00000001	0.00007836
19	Yes	6	0.00000001	0.00034780
20	Yes	5	0.00000001	0.00028124
21	Yes	5	0.00000001	0.00012907
22	Yes	7	0.00000001	0.00007990
23	Yes	6	0.00000001	0.00035482
24	Yes	7	0.00000001	0.00008440
25	Yes	6	0.00000001	0.00037152

26	Yes	4	0.00000001	0.00016757
27	Yes	6	0.00000001	0.00040230
28	Yes	6	0.00000001	0.00056944
29	Yes	6	0.00000001	0.00057081
30	Yes	6	0.00000001	0.00040365
31	Yes	6	0.00000001	0.00056063
32	Yes	6	0.00000001	0.00056428
33	Yes	6	0.00000001	0.00039757
34	Yes	6	0.00000001	0.00055131
35	Yes	6	0.00000001	0.00055058
36	Yes	6	0.00000001	0.00039755
37	Yes	6	0.00000001	0.00056254
38	Yes	6	0.00000001	0.00055832
39	Yes	4	0.00000001	0.00039666
40	Yes	5	0.00000001	0.00019849
41	Yes	5	0.00000001	0.00018759
42	Yes	4	0.00000001	0.00043155
43	Yes	5	0.00000001	0.00017872
44	Yes	5	0.00000001	0.00020798
45	Yes	4	0.00000001	0.00039638
46	Yes	5	0.00000001	0.00019850
47	Yes	5	0.00000001	0.00017819
48	Yes	4	0.00000001	0.00043214
49	Yes	5	0.00000001	0.00018827
50	Yes	5	0.00000001	0.00019983

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection ft	Gov. Load Comb.	Tilt °	Twist °
L1	151.5 - 141	2.086	50	1.4492	0.0020
L2	141 - 120.33	1.824	50	1.3941	0.0012
L3	120.33 - 111.19	1.351	50	1.2394	0.0007
L4	111.19 - 82.08	1.158	50	1.1746	0.0006
L5	82.08 - 70.06	0.630	50	0.8835	0.0003
L6	70.06 - 42.24	0.458	50	0.7578	0.0003
L7	42.24 - 32.71	0.165	50	0.4433	0.0001
L8	32.71 - 0	0.099	50	0.3442	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection ft	Tilt °	Twist °	Radius of Curvature ft
151.50	TPA-65R-BU6DA-K	50	2.086	1.4492	0.0020	12812
142.00	RADIO 4449 B71/B85A	50	1.848	1.4002	0.0013	7122
132.70	800 MHz 2X50W RRH w/ Filter	50	1.627	1.3353	0.0009	7145
127.00	RRH2x50-08	50	1.497	1.2904	0.0008	8097
116.00	Outdoor CBRS 20W rRH - Clip on Antenna	50	1.258	1.2092	0.0007	8086
105.00	Flat Platform w/ Handrails	50	1.034	1.1222	0.0006	6420

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection ft	Gov. Load Comb.	Tilt °	Twist °
L1	151.5 - 141	9.109	24	6.3431	0.0087
L2	141 - 120.33	7.966	24	6.1030	0.0053
L3	120.33 - 111.19	5.900	24	5.4254	0.0031
L4	111.19 - 82.08	5.058	24	5.1411	0.0027
L5	82.08 - 70.06	2.753	24	3.8650	0.0014
L6	70.06 - 42.24	1.999	24	3.3141	0.0011
L7	42.24 - 32.71	0.719	24	1.9372	0.0005
L8	32.71 - 0	0.433	24	1.5036	0.0004

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection ft	Tilt °	Twist °	Radius of Curvature ft
151.50	TPA-65R-BU6DA-K	24	9.109	6.3431	0.0087	2993
142.00	RADIO 4449 B71/B85A	24	8.073	6.1295	0.0055	1663
132.70	800 MHz 2X50W RRH w/ Filter	24	7.106	5.8454	0.0039	1663
127.00	RRH2x50-08	24	6.540	5.6487	0.0035	1881
116.00	Outdoor CBRS 20W rRH - Clip on Antenna	24	5.495	5.2929	0.0030	1874
105.00	Flat Platform w/ Handrails	24	4.517	4.9113	0.0024	1485

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	151.5 - 150.45	TP17.7841x17.1872x0.24	10.50	0.00	0.0	13.1429	-5485.36	768861.00	0.007
	150.45 - 149.4					13.1891	-5571.15	771560.00	0.007
	149.4 - 148.35					13.2352	-5657.72	774258.00	0.007
	148.35 - 147.3					13.2813	-5745.09	776957.00	0.007
	147.3 - 146.25					13.3274	-5833.27	779655.00	0.007
	146.25 - 145.2					13.3736	-5922.27	782354.00	0.008
	145.2 - 144.15					13.4197	-6012.09	785052.00	0.008
	144.15 - 143.1					13.4658	-6102.75	787751.00	0.008
	143.1 - 142.05					13.5120	-6194.26	790449.00	0.008
	142.05 - 141					13.5581	-10879.30	793148.00	0.014
L2	141 - 139.967	TP31.557x17.7841x0.3059	20.67	0.00	0.0	17.8943	-10994.20	1046820.00	0.011
	139.967 - 138.933					18.5726	-11111.20	1086500.00	0.010
	138.933 - 137.899					19.2509	-11230.80	1126180.00	0.010
	137.899 - 136.866					19.9292	-11353.20	1165860.00	0.010

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	136.866 - 135.833					20.6076	-11478.20	1205540.00	0.010
	135.833 - 134.799					21.2859	-11605.70	1245220.00	0.009
	134.799 - 133.766					21.9642	-11735.90	1284910.00	0.009
	133.766 - 132.732					22.6425	-11868.70	1324590.00	0.009
	132.732 - 131.699					23.3208	-12210.40	1364270.00	0.009
	131.699 - 130.665					23.9991	-12348.30	1403950.00	0.009
	130.665 - 129.631					24.6774	-12488.70	1443630.00	0.009
	129.631 - 128.598					25.3558	-12631.70	1483310.00	0.009
	128.598 - 127.565					26.0341	-12777.20	1522990.00	0.008
	127.565 - 126.531					26.7124	-16847.90	1562670.00	0.011
	126.531 - 125.498					27.3907	-17000.20	1602360.00	0.011
	125.498 - 124.464					28.0690	-17155.10	1642040.00	0.010
	124.464 - 123.43					28.7473	-17312.60	1681720.00	0.010
	123.43 - 122.397					29.4256	-17472.70	1721400.00	0.010
	122.397 - 121.364					30.1040	-17635.40	1761080.00	0.010
	121.364 - 120.33					30.7823	-17800.70	1800760.00	0.010
L3	120.33 - 119.314	TP33.028x31.557x0.3063	9.14	0.00	0.0	30.9833	-17973.70	1812520.00	0.010
	119.314 - 118.299					31.1445	-18147.50	1821960.00	0.010
	118.299 - 117.283					31.3057	-18322.40	1831390.00	0.010
	117.283 - 116.268					31.4669	-18498.20	1840820.00	0.010
	116.268 - 115.252					31.6281	-21907.50	1850250.00	0.012
	115.252 - 114.237					31.7893	-22087.10	1859680.00	0.012
	114.237 - 113.221					31.9505	-22267.80	1869110.00	0.012
	113.221 - 112.206					32.1118	-22449.50	1878540.00	0.012
	112.206 - 111.19					32.2730	-22632.40	1887970.00	0.012
L4	111.19 - 109.735	TP38.347x33.028x0.3141	29.11	0.00	0.0	33.3559	-22906.80	1951320.00	0.012
	109.735 - 108.279					33.6249	-23186.10	1967050.00	0.012
	108.279 - 106.824					33.8939	-23408.80	1982790.00	0.012
	106.824 - 105.368					34.1628	-23689.70	1998530.00	0.012
	105.368 - 103.912					34.4318	-27491.20	2014260.00	0.014

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	103.912 - 102.457					34.7008	-27779.90	2030000.00	0.014
	102.457 - 101.001					34.9698	-28071.20	2045730.00	0.014
	101.001 - 99.546					35.2388	-28365.10	2061470.00	0.014
	99.546 - 98.0905					35.5077	-28661.50	2077200.00	0.014
	98.0905 - 96.635					35.7767	-28960.40	2092940.00	0.014
	96.635 - 95.1795					36.0457	-29261.90	2108670.00	0.014
	95.1795 - 93.724					36.3147	-29565.90	2124410.00	0.014
	93.724 - 92.2685					36.5837	-29872.40	2140150.00	0.014
	92.2685 - 90.813					36.8527	-30181.40	2155880.00	0.014
	90.813 - 89.3575					37.1216	-30492.90	2171620.00	0.014
	89.3575 - 87.902					37.3906	-30806.90	2187350.00	0.014
	87.902 - 86.4465					37.6596	-31123.30	2203090.00	0.014
	86.4465 - 84.991					37.9286	-31442.20	2218820.00	0.014
	84.991 - 83.5355					38.1976	-31763.60	2234560.00	0.014
	83.5355 - 82.08					38.4666	-32087.30	2250290.00	0.014
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	12.02	0.00	0.0	46.6441	-32349.00	2728680.00	0.012
	81.0783 - 80.0767					46.7833	-32603.70	2736820.00	0.012
	80.0767 - 79.075					46.9225	-32859.50	2744970.00	0.012
	79.075 - 78.0733					47.0617	-33116.20	2753110.00	0.012
	78.0733 - 77.0717					47.2010	-33374.00	2761260.00	0.012
	77.0717 - 76.07					47.3402	-33632.80	2769400.00	0.012
	76.07 - 75.0683					47.4794	-33892.60	2777550.00	0.012
	75.0683 - 74.0667					47.6187	-34153.50	2785690.00	0.012
	74.0667 - 73.065					47.7579	-34415.30	2793840.00	0.012
	73.065 - 72.0633					47.8971	-34678.10	2801980.00	0.012
	72.0633 - 71.0617					48.0364	-34942.00	2810130.00	0.012
	71.0617 - 70.06					48.1756	-35206.80	2818270.00	0.012
L6	70.06 - 68.669	TP43.95x39.711x0.4014	27.82	0.00	0.0	51.0819	-35586.80	2988290.00	0.012
	68.669 - 67.278					51.3559	-35972.90	3004320.00	0.012
	67.278 - 65.887					51.6298	-36361.20	3020340.00	0.012
	65.887 -					51.9038	-36751.70	3036370.00	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	64.496								
	64.496 - 63.105					52.1777	-37144.30	3052400.00	0.012
	63.105 - 61.714					52.4517	-37539.10	3068420.00	0.012
	61.714 - 60.323					52.7256	-37936.00	3084450.00	0.012
	60.323 - 58.932					52.9995	-38335.10	3100470.00	0.012
	58.932 - 57.541					53.2735	-38736.30	3116500.00	0.012
	57.541 - 56.15					53.5474	-39139.60	3132530.00	0.012
	56.15 - 54.759					53.8214	-39545.10	3148550.00	0.013
	54.759 - 53.368					54.0953	-39952.70	3164580.00	0.013
	53.368 - 51.977					54.3693	-40362.40	3180600.00	0.013
	51.977 - 50.586					54.6432	-40774.30	3196630.00	0.013
	50.586 - 49.195					54.9172	-41188.30	3212660.00	0.013
	49.195 - 47.804					55.1911	-41604.30	3228680.00	0.013
	47.804 - 46.413					55.4651	-42022.50	3244710.00	0.013
	46.413 - 45.022					55.7390	-42442.90	3260730.00	0.013
	45.022 - 43.631					56.0130	-42865.30	3276760.00	0.013
	43.631 - 42.24					56.2869	-43289.80	3292780.00	0.013
L7	42.24 - 41.1811	TP45.064x43.95x0.4706	9.53	0.00	0.0	66.0733	-43659.10	3865290.00	0.011
	41.1811 - 40.1222					66.2609	-44022.40	3876260.00	0.011
	40.1222 - 39.0633					66.4484	-44386.90	3887230.00	0.011
	39.0633 - 38.0044					66.6360	-44752.40	3898210.00	0.011
	38.0044 - 36.9456					66.8235	-45119.20	3909180.00	0.012
	36.9456 - 35.8867					67.0111	-45487.00	3920150.00	0.012
	35.8867 - 34.8278					67.1987	-45855.90	3931120.00	0.012
	34.8278 - 33.7689					67.3862	-46226.00	3942100.00	0.012
	33.7689 - 32.71					67.5738	-46597.20	3953070.00	0.012
L8	32.71 - 31.0745	TP49.552x45.064x0.4906	32.71	0.00	0.0	70.7685	-47177.00	4139960.00	0.011
	31.0745 - 29.439					71.1230	-47766.50	4160700.00	0.011
	29.439 - 27.8035					71.4775	-48359.00	4181430.00	0.012
	27.8035 - 26.168					71.8320	-48954.40	4202170.00	0.012
	26.168 - 24.5325					72.1865	-49552.60	4222910.00	0.012
	24.5325 - 22.897					72.5410	-50153.80	4243650.00	0.012

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	22.897 - 21.2615					72.8955	-50757.80	4264390.00	0.012
	21.2615 - 19.626					73.2500	-51364.70	4285120.00	0.012
	19.626 - 17.9905					73.6045	-51974.50	4305860.00	0.012
	17.9905 - 16.355					73.9589	-52587.10	4326600.00	0.012
	16.355 - 14.7195					74.3134	-53202.60	4347340.00	0.012
	14.7195 - 13.084					74.6679	-53820.90	4368070.00	0.012
	13.084 - 11.4485					75.0224	-54442.10	4388810.00	0.012
	11.4485 - 9.813					75.3769	-55066.10	4409550.00	0.012
	9.813 - 8.1775					75.7314	-55693.00	4430290.00	0.013
	8.1775 - 6.542					76.0859	-56322.70	4451030.00	0.013
	6.542 - 4.9065					76.4404	-56955.20	4471760.00	0.013
	4.9065 - 3.271					76.7949	-57590.50	4492500.00	0.013
	3.271 - 1.6355					77.1494	-58228.70	4513240.00	0.013
	1.6355 - 0					77.5039	-58869.60	4533980.00	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	151.5 - 150.45	TP17.7841x17.1872x0.24	9.889	333.605	0.030	0.000	333.605	0.000
	150.45 - 149.4		17.584	335.967	0.052	0.000	335.967	0.000
	149.4 - 148.35		25.350	338.337	0.075	0.000	338.337	0.000
	148.35 - 147.3		33.189	340.717	0.097	0.000	340.717	0.000
	147.3 - 146.25		41.100	343.103	0.120	0.000	343.103	0.000
	146.25 - 145.2		49.082	345.499	0.142	0.000	345.499	0.000
	145.2 - 144.15		57.136	347.903	0.164	0.000	347.903	0.000
	144.15 - 143.1		65.260	350.315	0.186	0.000	350.315	0.000
	143.1 - 142.05		73.456	352.736	0.208	0.000	352.736	0.000
	142.05 - 141		85.590	355.165	0.241	0.000	355.165	0.000
L2	141 - 139.967	TP31.557x17.7841x0.3059	97.795	483.887	0.202	0.000	483.887	0.000
	139.967 - 138.933		110.080	521.582	0.211	0.000	521.582	0.000
	138.933 - 137.899		122.446	560.693	0.218	0.000	560.693	0.000
	137.899 - 136.866		134.896	601.217	0.224	0.000	601.217	0.000
	136.866 - 135.833		147.433	643.154	0.229	0.000	643.154	0.000
	135.833 - 134.799		160.062	686.507	0.233	0.000	686.507	0.000
	134.799 - 133.766		172.783	731.273	0.236	0.000	731.273	0.000
	133.766 - 132.732		185.600	777.452	0.239	0.000	777.452	0.000
	132.732 - 131.699		198.625	825.047	0.241	0.000	825.047	0.000
	131.699 -		211.755	874.058	0.242	0.000	874.058	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	130.665							
	130.665 - 129.631		224.990	924.475	0.243	0.000	924.475	0.000
	129.631 - 128.598		238.333	969.008	0.246	0.000	969.008	0.000
	128.598 - 127.565		251.789	1013.583	0.248	0.000	1013.583	0.000
	127.565 - 126.531		266.794	1058.692	0.252	0.000	1058.692	0.000
	126.531 - 125.498		283.642	1104.283	0.257	0.000	1104.283	0.000
	125.498 - 124.464		300.609	1150.333	0.261	0.000	1150.333	0.000
	124.464 - 123.43		317.697	1196.808	0.265	0.000	1196.808	0.000
	123.43 - 122.397		334.909	1243.675	0.269	0.000	1243.675	0.000
	122.397 - 121.364		352.249	1290.892	0.273	0.000	1290.892	0.000
	121.364 - 120.33		369.719	1338.433	0.276	0.000	1338.433	0.000
L3	120.33 - 119.314	TP33.028x31.557x0.3063	387.014	1352.175	0.286	0.000	1352.175	0.000
	119.314 - 118.299		404.425	1363.550	0.297	0.000	1363.550	0.000
	118.299 - 117.283		421.950	1374.933	0.307	0.000	1374.933	0.000
	117.283 - 116.268		439.590	1386.325	0.317	0.000	1386.325	0.000
	116.268 - 115.252		459.855	1397.742	0.329	0.000	1397.742	0.000
	115.252 - 114.237		480.938	1409.167	0.341	0.000	1409.167	0.000
	114.237 - 113.221		502.135	1420.608	0.353	0.000	1420.608	0.000
	113.221 - 112.206		523.445	1432.058	0.366	0.000	1432.058	0.000
	112.206 - 111.19		544.869	1443.525	0.377	0.000	1443.525	0.000
L4	111.19 - 109.735	TP38.347x33.028x0.3141	575.774	1514.267	0.380	0.000	1514.267	0.000
	109.735 - 108.279		606.897	1533.842	0.396	0.000	1533.842	0.000
	108.279 - 106.824		638.327	1553.450	0.411	0.000	1553.450	0.000
	106.824 - 105.368		670.252	1573.092	0.426	0.000	1573.092	0.000
	105.368 - 103.912		705.732	1592.758	0.443	0.000	1592.758	0.000
	103.912 - 102.457		742.503	1612.458	0.460	0.000	1612.458	0.000
	102.457 - 101.001		779.539	1632.192	0.478	0.000	1632.192	0.000
	101.001 - 99.546		816.840	1651.942	0.494	0.000	1651.942	0.000
	99.546 - 98.0905		854.408	1671.725	0.511	0.000	1671.725	0.000
	98.0905 - 96.635		892.242	1691.525	0.527	0.000	1691.525	0.000
	96.635 -		930.342	1711.342	0.544	0.000	1711.342	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	95.1795							
	95.1795 - 93.724		968.708	1731.175	0.560	0.000	1731.175	0.000
	93.724 - 92.2685		1007.342	1751.033	0.575	0.000	1751.033	0.000
	92.2685 - 90.813		1046.242	1770.892	0.591	0.000	1770.892	0.000
	90.813 - 89.3575		1085.408	1790.775	0.606	0.000	1790.775	0.000
	89.3575 - 87.902		1124.850	1810.658	0.621	0.000	1810.658	0.000
	87.902 - 86.4465		1164.558	1830.558	0.636	0.000	1830.558	0.000
	86.4465 - 84.991		1204.533	1850.458	0.651	0.000	1850.458	0.000
	84.991 - 83.5355		1244.775	1870.367	0.666	0.000	1870.367	0.000
	83.5355 - 82.08		1285.292	1890.267	0.680	0.000	1890.267	0.000
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	1313.333	2490.342	0.527	0.000	2490.342	0.000
	81.0783 - 80.0767		1341.492	2502.450	0.536	0.000	2502.450	0.000
	80.0767 - 79.075		1369.767	2514.567	0.545	0.000	2514.567	0.000
	79.075 - 78.0733		1398.175	2526.700	0.553	0.000	2526.700	0.000
	78.0733 - 77.0717		1426.700	2538.833	0.562	0.000	2538.833	0.000
	77.0717 - 76.07		1455.342	2550.983	0.571	0.000	2550.983	0.000
	76.07 - 75.0683		1484.108	2563.142	0.579	0.000	2563.142	0.000
	75.0683 - 74.0667		1513.000	2575.308	0.588	0.000	2575.308	0.000
	74.0667 - 73.065		1542.008	2587.492	0.596	0.000	2587.492	0.000
	73.065 - 72.0633		1571.133	2599.675	0.604	0.000	2599.675	0.000
	72.0633 - 71.0617		1600.383	2611.875	0.613	0.000	2611.875	0.000
	71.0617 - 70.06		1629.750	2624.083	0.621	0.000	2624.083	0.000
L6	70.06 - 68.669	TP43.95x39.711x0.4014	1670.725	2847.817	0.587	0.000	2847.817	0.000
	68.669 - 67.278		1711.892	2872.833	0.596	0.000	2872.833	0.000
	67.278 - 65.887		1753.275	2897.892	0.605	0.000	2897.892	0.000
	65.887 - 64.496		1794.858	2923.000	0.614	0.000	2923.000	0.000
	64.496 - 63.105		1836.642	2948.133	0.623	0.000	2948.133	0.000
	63.105 - 61.714		1878.633	2973.317	0.632	0.000	2973.317	0.000
	61.714 - 60.323		1920.833	2998.533	0.641	0.000	2998.533	0.000
	60.323 - 58.932		1963.233	3023.792	0.649	0.000	3023.792	0.000
	58.932 - 57.541		2005.833	3049.075	0.658	0.000	3049.075	0.000

Section No.	Elevation	Size	M_{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
	57.541 - 56.15		2048.642	3074.400	0.666	0.000	3074.400	0.000
	56.15 - 54.759		2091.642	3099.758	0.675	0.000	3099.758	0.000
	54.759 - 53.368		2134.858	3125.150	0.683	0.000	3125.150	0.000
	53.368 - 51.977		2178.267	3150.575	0.691	0.000	3150.575	0.000
	51.977 - 50.586		2221.875	3176.025	0.700	0.000	3176.025	0.000
	50.586 - 49.195		2265.692	3201.508	0.708	0.000	3201.508	0.000
	49.195 - 47.804		2309.708	3227.017	0.716	0.000	3227.017	0.000
	47.804 - 46.413		2353.925	3252.558	0.724	0.000	3252.558	0.000
	46.413 - 45.022		2398.333	3278.125	0.732	0.000	3278.125	0.000
	45.022 - 43.631		2442.950	3303.717	0.739	0.000	3303.717	0.000
	43.631 - 42.24		2487.767	3329.325	0.747	0.000	3329.325	0.000
L7	42.24 - 41.1811	TP45.064x43.95x0.4706	2522.008	4150.825	0.608	0.000	4150.825	0.000
	41.1811 - 40.1222		2556.350	4170.475	0.613	0.000	4170.475	0.000
	40.1222 - 39.0633		2590.800	4190.150	0.618	0.000	4190.150	0.000
	39.0633 - 38.0044		2625.350	4209.850	0.624	0.000	4209.850	0.000
	38.0044 - 36.9456		2660.000	4229.567	0.629	0.000	4229.567	0.000
	36.9456 - 35.8867		2694.758	4249.300	0.634	0.000	4249.300	0.000
	35.8867 - 34.8278		2729.617	4269.058	0.639	0.000	4269.058	0.000
	34.8278 - 33.7689		2764.567	4288.833	0.645	0.000	4288.833	0.000
	33.7689 - 32.71		2799.625	4308.633	0.650	0.000	4308.633	0.000
L8	32.71 - 31.0745	TP49.552x45.064x0.4906	2853.950	4589.608	0.622	0.000	4589.608	0.000
	31.0745 - 29.439		2908.467	4628.125	0.628	0.000	4628.125	0.000
	29.439 - 27.8035		2963.183	4666.725	0.635	0.000	4666.725	0.000
	27.8035 - 26.168		3018.092	4705.392	0.641	0.000	4705.392	0.000
	26.168 - 24.5325		3073.200	4744.133	0.648	0.000	4744.133	0.000
	24.5325 - 22.897		3128.500	4782.950	0.654	0.000	4782.950	0.000
	22.897 - 21.2615		3183.983	4821.833	0.660	0.000	4821.833	0.000
	21.2615 - 19.626		3239.658	4860.792	0.666	0.000	4860.792	0.000
	19.626 - 17.9905		3295.525	4899.817	0.673	0.000	4899.817	0.000
	17.9905 - 16.355		3351.583	4938.908	0.679	0.000	4938.908	0.000
	16.355 - 14.7195		3407.817	4978.058	0.685	0.000	4978.058	0.000
	14.7195 -		3464.242	5017.283	0.690	0.000	5017.283	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	13.084							
	13.084 - 11.4485		3520.842	5056.567	0.696	0.000	5056.567	0.000
	11.4485 - 9.813		3577.625	5095.917	0.702	0.000	5095.917	0.000
	9.813 - 8.1775		3634.592	5135.325	0.708	0.000	5135.325	0.000
	8.1775 - 6.542		3691.742	5174.800	0.713	0.000	5174.800	0.000
	6.542 - 4.9065		3749.058	5214.325	0.719	0.000	5214.325	0.000
	4.9065 - 3.271		3806.550	5253.917	0.725	0.000	5253.917	0.000
	3.271 - 1.6355		3864.225	5293.558	0.730	0.000	5293.558	0.000
	1.6355 - 0		3922.067	5333.258	0.735	0.000	5333.258	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 kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	151.5 - 150.45	TP17.7841x17.1872x0.24	7293.55	230658.00	0.032	0.459	345.059	0.001
	150.45 - 149.4		7362.90	231468.00	0.032	0.459	347.486	0.001
	149.4 - 148.35		7432.01	232277.00	0.032	0.459	349.921	0.001
	148.35 - 147.3		7500.85	233087.00	0.032	0.459	352.364	0.001
	147.3 - 146.25		7569.42	233897.00	0.032	0.459	354.816	0.001
	146.25 - 145.2		7637.69	234706.00	0.033	0.459	357.277	0.001
	145.2 - 144.15		7705.65	235516.00	0.033	0.459	359.745	0.001
	144.15 - 143.1		7773.29	236325.00	0.033	0.459	362.223	0.001
	143.1 - 142.05		7840.59	237135.00	0.033	0.459	364.708	0.001
	142.05 - 141		11777.30	237944.00	0.049	0.459	367.203	0.001
L2	141 - 139.967	TP31.557x17.7841x0.3059	11851.40	314045.00	0.038	0.459	501.847	0.001
	139.967 - 138.933		11929.00	325949.00	0.037	0.459	540.615	0.001
	138.933 - 137.899		12009.30	337854.00	0.036	0.459	580.825	0.001
	137.899 - 136.866		12092.40	349758.00	0.035	0.459	622.477	0.001
	136.866 - 135.833		12178.40	361663.00	0.034	0.459	665.572	0.001
	135.833 - 134.799		12267.30	373567.00	0.033	0.459	710.108	0.001
	134.799 - 133.766		12359.00	385472.00	0.032	0.458	756.087	0.001
	133.766 - 132.732		12453.70	397376.00	0.031	0.458	803.508	0.001
	132.732 - 131.699		12658.40	409280.00	0.031	0.458	852.375	0.001
	131.699 - 130.665		12758.80	421185.00	0.030	0.458	902.675	0.001
	130.665 - 129.631		12862.20	433089.00	0.030	0.458	954.425	0.000
	129.631 - 128.598		12968.50	444994.00	0.029	0.458	1007.617	0.000
	128.598 - 127.565		13077.80	456898.00	0.029	0.458	1062.250	0.000
	127.565 - 126.531		16250.90	468802.00	0.035	0.458	1118.325	0.000
	126.531 - 125.498		16364.00	480707.00	0.034	0.427	1175.842	0.000

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	125.498 - 124.464		16479.90	492611.00	0.033	0.427	1234.800	0.000
	124.464 - 123.43		16598.70	504516.00	0.033	0.427	1295.200	0.000
	123.43 - 122.397		16720.50	516420.00	0.032	0.426	1357.042	0.000
	122.397 - 121.364		16845.20	528324.00	0.032	0.426	1420.325	0.000
	121.364 - 120.33		16972.80	540229.00	0.031	0.426	1485.058	0.000
L3	120.33 - 119.314	TP33.028x31.557x0.3063	17085.70	543757.00	0.031	0.426	1502.558	0.000
	119.314 - 118.299		17198.90	546587.00	0.031	0.426	1518.233	0.000
	118.299 - 117.283		17312.20	549416.00	0.032	0.426	1533.992	0.000
	117.283 - 116.268		17425.80	552245.00	0.032	0.426	1549.825	0.000
	116.268 - 115.252		20705.00	555074.00	0.037	0.570	1565.750	0.000
	115.252 - 114.237		20817.00	557903.00	0.037	0.570	1581.750	0.000
	114.237 - 113.221		20929.10	560732.00	0.037	0.570	1597.833	0.000
	113.221 - 112.206		21041.20	563561.00	0.037	0.570	1613.992	0.000
	112.206 - 111.19		21153.30	566390.00	0.037	0.570	1630.242	0.000
L4	111.19 - 109.735	TP38.347x33.028x0.3141	21305.30	585396.00	0.036	0.570	1698.233	0.000
	109.735 - 108.279		21455.00	590116.00	0.036	0.570	1725.733	0.000
	108.279 - 106.824		21852.90	594837.00	0.037	0.450	1753.458	0.000
	106.824 - 105.368		22038.00	599558.00	0.037	0.450	1781.400	0.000
	105.368 - 103.912		25186.30	604278.00	0.042	0.497	1809.558	0.000
	103.912 - 102.457		25368.80	608999.00	0.042	0.497	1837.942	0.000
	102.457 - 101.001		25551.50	613720.00	0.042	0.497	1866.550	0.000
	101.001 - 99.546		25734.50	618440.00	0.042	0.497	1895.375	0.000
	99.546 - 98.0905		25917.70	623161.00	0.042	0.497	1924.417	0.000
	98.0905 - 96.635		26101.10	627882.00	0.042	0.497	1953.683	0.000
	96.635 - 95.1795		26284.80	632602.00	0.042	0.497	1983.175	0.000
	95.1795 - 93.724		26468.80	637323.00	0.042	0.497	2012.883	0.000
	93.724 - 92.2685		26653.00	642044.00	0.042	0.496	2042.808	0.000
	92.2685 - 90.813		26837.50	646764.00	0.041	0.496	2072.958	0.000
	90.813 - 89.3575		27022.30	651485.00	0.041	0.496	2103.333	0.000
	89.3575 - 87.902		27207.40	656205.00	0.041	0.496	2133.925	0.000

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	87.902 - 86.4465		27392.70	660926.00	0.041	0.496	2164.733	0.000
	86.4465 - 84.991		27578.30	665647.00	0.041	0.496	2195.767	0.000
	84.991 - 83.5355		27764.20	670367.00	0.041	0.496	2227.025	0.000
	83.5355 - 82.08		27950.40	675088.00	0.041	0.496	2258.500	0.000
L5	82.08 - 81.0783	TP39.711x38.347x0.3804	28064.10	818603.00	0.034	0.496	2742.033	0.000
	81.0783 - 80.0767		28186.40	821047.00	0.034	0.496	2758.433	0.000
	80.0767 - 79.075		28308.30	823490.00	0.034	0.496	2774.875	0.000
	79.075 - 78.0733		28430.10	825934.00	0.034	0.496	2791.367	0.000
	78.0733 - 77.0717		28551.50	828377.00	0.034	0.496	2807.908	0.000
	77.0717 - 76.07		28672.70	830821.00	0.035	0.496	2824.492	0.000
	76.07 - 75.0683		28793.60	833264.00	0.035	0.496	2841.133	0.000
	75.0683 - 74.0667		28914.30	835708.00	0.035	0.496	2857.825	0.000
	74.0667 - 73.065		29034.60	838151.00	0.035	0.495	2874.558	0.000
	73.065 - 72.0633		29154.70	840595.00	0.035	0.495	2891.342	0.000
	72.0633 - 71.0617		29274.50	843038.00	0.035	0.495	2908.175	0.000
	71.0617 - 70.06		29394.00	845481.00	0.035	0.495	2925.058	0.000
L6	70.06 - 68.669	TP43.95x39.711x0.4014	29546.70	896488.00	0.033	0.495	3116.575	0.000
	68.669 - 67.278		29694.50	901295.00	0.033	0.495	3150.100	0.000
	67.278 - 65.887		29842.10	906103.00	0.033	0.495	3183.792	0.000
	65.887 - 64.496		29989.50	910911.00	0.033	0.495	3217.667	0.000
	64.496 - 63.105		30136.60	915719.00	0.033	0.495	3251.725	0.000
	63.105 - 61.714		30283.60	920527.00	0.033	0.495	3285.958	0.000
	61.714 - 60.323		30430.30	925334.00	0.033	0.495	3320.375	0.000
	60.323 - 58.932		30576.80	930142.00	0.033	0.495	3354.967	0.000
	58.932 - 57.541		30723.10	934950.00	0.033	0.495	3389.742	0.000
	57.541 - 56.15		30869.10	939758.00	0.033	0.495	3424.692	0.000
	56.15 - 54.759		31014.90	944565.00	0.033	0.495	3459.817	0.000
	54.759 - 53.368		31160.50	949373.00	0.033	0.495	3495.133	0.000
	53.368 - 51.977		31305.80	954181.00	0.033	0.495	3530.617	0.000
	51.977 - 50.586		31450.90	958989.00	0.033	0.495	3566.292	0.000
	50.586 - 49.195		31595.70	963797.00	0.033	0.494	3602.133	0.000
	49.195 -		31740.30	968604.00	0.033	0.494	3638.167	0.000

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
	47.804							
	47.804 - 46.413		31884.60	973412.00	0.033	0.494	3674.367	0.000
	46.413 - 45.022		32028.70	978220.00	0.033	0.494	3710.758	0.000
	45.022 - 43.631		32172.50	983028.00	0.033	0.494	3747.325	0.000
	43.631 - 42.24		32316.00	987835.00	0.033	0.494	3784.067	0.000
L7	42.24 - 41.1811	TP45.064x43.95x0.4706	32404.50	1159590.00	0.028	0.494	4447.550	0.000
	41.1811 - 40.1222		32502.00	1162880.00	0.028	0.494	4472.842	0.000
	40.1222 - 39.0633		32599.20	1166170.00	0.028	0.494	4498.200	0.000
	39.0633 - 38.0044		32696.00	1169460.00	0.028	0.494	4523.625	0.000
	38.0044 - 36.9456		32792.30	1172750.00	0.028	0.494	4549.125	0.000
	36.9456 - 35.8867		32888.30	1176050.00	0.028	0.494	4574.700	0.000
	35.8867 - 34.8278		32983.90	1179340.00	0.028	0.494	4600.350	0.000
	34.8278 - 33.7689		33079.00	1182630.00	0.028	0.494	4626.067	0.000
	33.7689 - 32.71		33173.80	1185920.00	0.028	0.494	4651.850	0.000
L8	32.71 - 31.0745	TP49.552x45.064x0.4906	33305.10	1241990.00	0.027	0.494	4894.108	0.000
	31.0745 - 29.439		33426.10	1248210.00	0.027	0.494	4943.267	0.000
	29.439 - 27.8035		33546.10	1254430.00	0.027	0.494	4992.667	0.000
	27.8035 - 26.168		33665.40	1260650.00	0.027	0.494	5042.308	0.000
	26.168 - 24.5325		33783.90	1266870.00	0.027	0.494	5092.200	0.000
	24.5325 - 22.897		33901.50	1273090.00	0.027	0.494	5142.333	0.000
	22.897 - 21.2615		34018.30	1279320.00	0.027	0.494	5192.717	0.000
	21.2615 - 19.626		34134.30	1285540.00	0.027	0.494	5243.342	0.000
	19.626 - 17.9905		34249.40	1291760.00	0.027	0.494	5294.217	0.000
	17.9905 - 16.355		34363.60	1297980.00	0.026	0.494	5345.333	0.000
	16.355 - 14.7195		34477.10	1304200.00	0.026	0.494	5396.700	0.000
	14.7195 - 13.084		34589.60	1310420.00	0.026	0.494	5448.308	0.000
	13.084 - 11.4485		34701.30	1316640.00	0.026	0.494	5500.167	0.000
	11.4485 - 9.813		34812.10	1322860.00	0.026	0.494	5552.267	0.000
	9.813 - 8.1775		34922.00	1329090.00	0.026	0.494	5604.608	0.000
	8.1775 - 6.542		35031.10	1335310.00	0.026	0.494	5657.208	0.000
	6.542 - 4.9065		35139.20	1341530.00	0.026	0.494	5710.041	0.000
	4.9065 - 3.271		35246.50	1347750.00	0.026	0.494	5763.125	0.000
	3.271 - 1.6355		35352.80	1353970.00	0.026	0.494	5816.458	0.000
	1.6355 - 0		35458.30	1360190.00	0.026	0.494	5870.033	0.000

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	151.5 - 150.45	0.007	0.030	0.000	0.032	0.001	0.038 ✔	1.000	4.8.2 ✔
	150.45 - 149.4	0.007	0.052	0.000	0.032	0.001	0.061 ✔	1.000	4.8.2 ✔
	149.4 - 148.35	0.007	0.075	0.000	0.032	0.001	0.083 ✔	1.000	4.8.2 ✔
	148.35 - 147.3	0.007	0.097	0.000	0.032	0.001	0.106 ✔	1.000	4.8.2 ✔
	147.3 - 146.25	0.007	0.120	0.000	0.032	0.001	0.128 ✔	1.000	4.8.2 ✔
	146.25 - 145.2	0.008	0.142	0.000	0.033	0.001	0.151 ✔	1.000	4.8.2 ✔
	145.2 - 144.15	0.008	0.164	0.000	0.033	0.001	0.173 ✔	1.000	4.8.2 ✔
	144.15 - 143.1	0.008	0.186	0.000	0.033	0.001	0.195 ✔	1.000	4.8.2 ✔
	143.1 - 142.05	0.008	0.208	0.000	0.033	0.001	0.217 ✔	1.000	4.8.2 ✔
	142.05 - 141	0.014	0.241	0.000	0.049	0.001	0.257 ✔	1.000	4.8.2 ✔
L2	141 - 139.967	0.011	0.202	0.000	0.038	0.001	0.214 ✔	1.000	4.8.2 ✔
	139.967 - 138.933	0.010	0.211	0.000	0.037	0.001	0.223 ✔	1.000	4.8.2 ✔
	138.933 - 137.899	0.010	0.218	0.000	0.036	0.001	0.230 ✔	1.000	4.8.2 ✔
	137.899 - 136.866	0.010	0.224	0.000	0.035	0.001	0.235 ✔	1.000	4.8.2 ✔
	136.866 - 135.833	0.010	0.229	0.000	0.034	0.001	0.240 ✔	1.000	4.8.2 ✔
	135.833 - 134.799	0.009	0.233	0.000	0.033	0.001	0.244 ✔	1.000	4.8.2 ✔
	134.799 - 133.766	0.009	0.236	0.000	0.032	0.001	0.246 ✔	1.000	4.8.2 ✔
	133.766 - 132.732	0.009	0.239	0.000	0.031	0.001	0.249 ✔	1.000	4.8.2 ✔
	132.732 - 131.699	0.009	0.241	0.000	0.031	0.001	0.251 ✔	1.000	4.8.2 ✔
	131.699 - 130.665	0.009	0.242	0.000	0.030	0.001	0.252 ✔	1.000	4.8.2 ✔
	130.665 - 129.631	0.009	0.243	0.000	0.030	0.000	0.253 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	129.631 - 128.598	0.009	0.246	0.000	0.029	0.000	0.255 ✔	1.000	4.8.2 ✔
	128.598 - 127.565	0.008	0.248	0.000	0.029	0.000	0.258 ✔	1.000	4.8.2 ✔
	127.565 - 126.531	0.011	0.252	0.000	0.035	0.000	0.264 ✔	1.000	4.8.2 ✔
	126.531 - 125.498	0.011	0.257	0.000	0.034	0.000	0.269 ✔	1.000	4.8.2 ✔
	125.498 - 124.464	0.010	0.261	0.000	0.033	0.000	0.273 ✔	1.000	4.8.2 ✔
	124.464 - 123.43	0.010	0.265	0.000	0.033	0.000	0.277 ✔	1.000	4.8.2 ✔
	123.43 - 122.397	0.010	0.269	0.000	0.032	0.000	0.281 ✔	1.000	4.8.2 ✔
	122.397 - 121.364	0.010	0.273	0.000	0.032	0.000	0.284 ✔	1.000	4.8.2 ✔
	121.364 - 120.33	0.010	0.276	0.000	0.031	0.000	0.287 ✔	1.000	4.8.2 ✔
L3	120.33 - 119.314	0.010	0.286	0.000	0.031	0.000	0.297 ✔	1.000	4.8.2 ✔
	119.314 - 118.299	0.010	0.297	0.000	0.031	0.000	0.308 ✔	1.000	4.8.2 ✔
	118.299 - 117.283	0.010	0.307	0.000	0.032	0.000	0.318 ✔	1.000	4.8.2 ✔
	117.283 - 116.268	0.010	0.317	0.000	0.032	0.000	0.328 ✔	1.000	4.8.2 ✔
	116.268 - 115.252	0.012	0.329	0.000	0.037	0.000	0.342 ✔	1.000	4.8.2 ✔
	115.252 - 114.237	0.012	0.341	0.000	0.037	0.000	0.355 ✔	1.000	4.8.2 ✔
	114.237 - 113.221	0.012	0.353	0.000	0.037	0.000	0.367 ✔	1.000	4.8.2 ✔
	113.221 - 112.206	0.012	0.366	0.000	0.037	0.000	0.379 ✔	1.000	4.8.2 ✔
	112.206 - 111.19	0.012	0.377	0.000	0.037	0.000	0.391 ✔	1.000	4.8.2 ✔
L4	111.19 - 109.735	0.012	0.380	0.000	0.036	0.000	0.393 ✔	1.000	4.8.2 ✔
	109.735 - 108.279	0.012	0.396	0.000	0.036	0.000	0.409 ✔	1.000	4.8.2 ✔
	108.279 - 106.824	0.012	0.411	0.000	0.037	0.000	0.424 ✔	1.000	4.8.2 ✔
	106.824 - 105.368	0.012	0.426	0.000	0.037	0.000	0.439 ✔	1.000	4.8.2 ✔
	105.368 - 103.912	0.014	0.443	0.000	0.042	0.000	0.458 ✔	1.000	4.8.2 ✔
	103.912 - 102.457	0.014	0.460	0.000	0.042	0.000	0.476 ✔	1.000	4.8.2 ✔
	102.457 - 101.001	0.014	0.478	0.000	0.042	0.000	0.493 ✔	1.000	4.8.2 ✔
	101.001 - 99.546	0.014	0.494	0.000	0.042	0.000	0.510 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	99.546 - 98.0905	0.014	0.511	0.000	0.042	0.000	0.527 ✔	1.000	4.8.2 ✔
	98.0905 - 96.635	0.014	0.527	0.000	0.042	0.000	0.543 ✔	1.000	4.8.2 ✔
	96.635 - 95.1795	0.014	0.544	0.000	0.042	0.000	0.559 ✔	1.000	4.8.2 ✔
	95.1795 - 93.724	0.014	0.560	0.000	0.042	0.000	0.575 ✔	1.000	4.8.2 ✔
	93.724 - 92.2685	0.014	0.575	0.000	0.042	0.000	0.591 ✔	1.000	4.8.2 ✔
	92.2685 - 90.813	0.014	0.591	0.000	0.041	0.000	0.607 ✔	1.000	4.8.2 ✔
	90.813 - 89.3575	0.014	0.606	0.000	0.041	0.000	0.622 ✔	1.000	4.8.2 ✔
	89.3575 - 87.902	0.014	0.621	0.000	0.041	0.000	0.637 ✔	1.000	4.8.2 ✔
	87.902 - 86.4465	0.014	0.636	0.000	0.041	0.000	0.652 ✔	1.000	4.8.2 ✔
	86.4465 - 84.991	0.014	0.651	0.000	0.041	0.000	0.667 ✔	1.000	4.8.2 ✔
	84.991 - 83.5355	0.014	0.666	0.000	0.041	0.000	0.681 ✔	1.000	4.8.2 ✔
	83.5355 - 82.08	0.014	0.680	0.000	0.041	0.000	0.696 ✔	1.000	4.8.2 ✔
L5	82.08 - 81.0783	0.012	0.527	0.000	0.034	0.000	0.540 ✔	1.000	4.8.2 ✔
	81.0783 - 80.0767	0.012	0.536	0.000	0.034	0.000	0.549 ✔	1.000	4.8.2 ✔
	80.0767 - 79.075	0.012	0.545	0.000	0.034	0.000	0.558 ✔	1.000	4.8.2 ✔
	79.075 - 78.0733	0.012	0.553	0.000	0.034	0.000	0.567 ✔	1.000	4.8.2 ✔
	78.0733 - 77.0717	0.012	0.562	0.000	0.034	0.000	0.575 ✔	1.000	4.8.2 ✔
	77.0717 - 76.07	0.012	0.571	0.000	0.035	0.000	0.584 ✔	1.000	4.8.2 ✔
	76.07 - 75.0683	0.012	0.579	0.000	0.035	0.000	0.592 ✔	1.000	4.8.2 ✔
	75.0683 - 74.0667	0.012	0.588	0.000	0.035	0.000	0.601 ✔	1.000	4.8.2 ✔
	74.0667 - 73.065	0.012	0.596	0.000	0.035	0.000	0.609 ✔	1.000	4.8.2 ✔
	73.065 - 72.0633	0.012	0.604	0.000	0.035	0.000	0.618 ✔	1.000	4.8.2 ✔
	72.0633 - 71.0617	0.012	0.613	0.000	0.035	0.000	0.626 ✔	1.000	4.8.2 ✔
	71.0617 - 70.06	0.012	0.621	0.000	0.035	0.000	0.635 ✔	1.000	4.8.2 ✔
L6	70.06 - 68.669	0.012	0.587	0.000	0.033	0.000	0.600 ✔	1.000	4.8.2 ✔
	68.669 - 67.278	0.012	0.596	0.000	0.033	0.000	0.609 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	67.278 - 65.887	0.012	0.605	0.000	0.033	0.000	0.618 ✔	1.000	4.8.2 ✔
	65.887 - 64.496	0.012	0.614	0.000	0.033	0.000	0.627 ✔	1.000	4.8.2 ✔
	64.496 - 63.105	0.012	0.623	0.000	0.033	0.000	0.636 ✔	1.000	4.8.2 ✔
	63.105 - 61.714	0.012	0.632	0.000	0.033	0.000	0.645 ✔	1.000	4.8.2 ✔
	61.714 - 60.323	0.012	0.641	0.000	0.033	0.000	0.654 ✔	1.000	4.8.2 ✔
	60.323 - 58.932	0.012	0.649	0.000	0.033	0.000	0.663 ✔	1.000	4.8.2 ✔
	58.932 - 57.541	0.012	0.658	0.000	0.033	0.000	0.671 ✔	1.000	4.8.2 ✔
	57.541 - 56.15	0.012	0.666	0.000	0.033	0.000	0.680 ✔	1.000	4.8.2 ✔
	56.15 - 54.759	0.013	0.675	0.000	0.033	0.000	0.688 ✔	1.000	4.8.2 ✔
	54.759 - 53.368	0.013	0.683	0.000	0.033	0.000	0.697 ✔	1.000	4.8.2 ✔
	53.368 - 51.977	0.013	0.691	0.000	0.033	0.000	0.705 ✔	1.000	4.8.2 ✔
	51.977 - 50.586	0.013	0.700	0.000	0.033	0.000	0.713 ✔	1.000	4.8.2 ✔
	50.586 - 49.195	0.013	0.708	0.000	0.033	0.000	0.722 ✔	1.000	4.8.2 ✔
	49.195 - 47.804	0.013	0.716	0.000	0.033	0.000	0.730 ✔	1.000	4.8.2 ✔
	47.804 - 46.413	0.013	0.724	0.000	0.033	0.000	0.738 ✔	1.000	4.8.2 ✔
	46.413 - 45.022	0.013	0.732	0.000	0.033	0.000	0.746 ✔	1.000	4.8.2 ✔
	45.022 - 43.631	0.013	0.739	0.000	0.033	0.000	0.754 ✔	1.000	4.8.2 ✔
	43.631 - 42.24	0.013	0.747	0.000	0.033	0.000	0.761 ✔	1.000	4.8.2 ✔
L7	42.24 - 41.1811	0.011	0.608	0.000	0.028	0.000	0.620 ✔	1.000	4.8.2 ✔
	41.1811 - 40.1222	0.011	0.613	0.000	0.028	0.000	0.625 ✔	1.000	4.8.2 ✔
	40.1222 - 39.0633	0.011	0.618	0.000	0.028	0.000	0.631 ✔	1.000	4.8.2 ✔
	39.0633 - 38.0044	0.011	0.624	0.000	0.028	0.000	0.636 ✔	1.000	4.8.2 ✔
	38.0044 - 36.9456	0.012	0.629	0.000	0.028	0.000	0.641 ✔	1.000	4.8.2 ✔
	36.9456 - 35.8867	0.012	0.634	0.000	0.028	0.000	0.647 ✔	1.000	4.8.2 ✔
	35.8867 - 34.8278	0.012	0.639	0.000	0.028	0.000	0.652 ✔	1.000	4.8.2 ✔
	34.8278 - 33.7689	0.012	0.645	0.000	0.028	0.000	0.657 ✔	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $P_u/\phi P_n$	Ratio $M_{ux}/\phi M_{nx}$	Ratio $M_{uy}/\phi M_{ny}$	Ratio $V_u/\phi V_n$	Ratio $T_u/\phi T_n$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	33.7689 - 32.71	0.012	0.650	0.000	0.028	0.000	0.662 ✔	1.000	4.8.2 ✔
L8	32.71 - 31.0745	0.011	0.622	0.000	0.027	0.000	0.634 ✔	1.000	4.8.2 ✔
	31.0745 - 29.439	0.011	0.628	0.000	0.027	0.000	0.641 ✔	1.000	4.8.2 ✔
	29.439 - 27.8035	0.012	0.635	0.000	0.027	0.000	0.647 ✔	1.000	4.8.2 ✔
	27.8035 - 26.168	0.012	0.641	0.000	0.027	0.000	0.654 ✔	1.000	4.8.2 ✔
	26.168 - 24.5325	0.012	0.648	0.000	0.027	0.000	0.660 ✔	1.000	4.8.2 ✔
	24.5325 - 22.897	0.012	0.654	0.000	0.027	0.000	0.667 ✔	1.000	4.8.2 ✔
	22.897 - 21.2615	0.012	0.660	0.000	0.027	0.000	0.673 ✔	1.000	4.8.2 ✔
	21.2615 - 19.626	0.012	0.666	0.000	0.027	0.000	0.679 ✔	1.000	4.8.2 ✔
	19.626 - 17.9905	0.012	0.673	0.000	0.027	0.000	0.685 ✔	1.000	4.8.2 ✔
	17.9905 - 16.355	0.012	0.679	0.000	0.026	0.000	0.691 ✔	1.000	4.8.2 ✔
	16.355 - 14.7195	0.012	0.685	0.000	0.026	0.000	0.698 ✔	1.000	4.8.2 ✔
	14.7195 - 13.084	0.012	0.690	0.000	0.026	0.000	0.703 ✔	1.000	4.8.2 ✔
	13.084 - 11.4485	0.012	0.696	0.000	0.026	0.000	0.709 ✔	1.000	4.8.2 ✔
	11.4485 - 9.813	0.012	0.702	0.000	0.026	0.000	0.715 ✔	1.000	4.8.2 ✔
	9.813 - 8.1775	0.013	0.708	0.000	0.026	0.000	0.721 ✔	1.000	4.8.2 ✔
	8.1775 - 6.542	0.013	0.713	0.000	0.026	0.000	0.727 ✔	1.000	4.8.2 ✔
	6.542 - 4.9065	0.013	0.719	0.000	0.026	0.000	0.732 ✔	1.000	4.8.2 ✔
	4.9065 - 3.271	0.013	0.725	0.000	0.026	0.000	0.738 ✔	1.000	4.8.2 ✔
	3.271 - 1.6355	0.013	0.730	0.000	0.026	0.000	0.744 ✔	1.000	4.8.2 ✔
	1.6355 - 0	0.013	0.735	0.000	0.026	0.000	0.749 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	151.5 - 141	Pole	TP17.7841x17.1872x0.24	1	-10879.30	793148.00	25.7	Pass
L2	141 - 120.33	Pole	TP31.557x17.7841x0.3059	2	-17800.70	1800760.00	28.7	Pass
L3	120.33 - 111.19	Pole	TP33.028x31.557x0.3063	3	-22632.40	1887970.00	39.1	Pass
L4	111.19 - 82.08	Pole	TP38.347x33.028x0.3141	4	-32087.30	2250290.00	69.6	Pass
L5	82.08 - 70.06	Pole	TP39.711x38.347x0.3804	5	-35206.80	2818270.00	63.5	Pass
L6	70.06 - 42.24	Pole	TP43.95x39.711x0.4014	6	-43289.80	3292780.00	76.1	Pass
L7	42.24 - 32.71	Pole	TP45.064x43.95x0.4706	7	-46597.20	3953070.00	66.2	Pass
L8	32.71 - 0	Pole	TP49.552x45.064x0.4906	8	-58869.60	4533980.00	74.9	Pass
							Summary	
						Pole (L6)	76.1	Pass
						RATING =	**76.1**	**Pass**

Base Plate & Anchor Rod Analysis

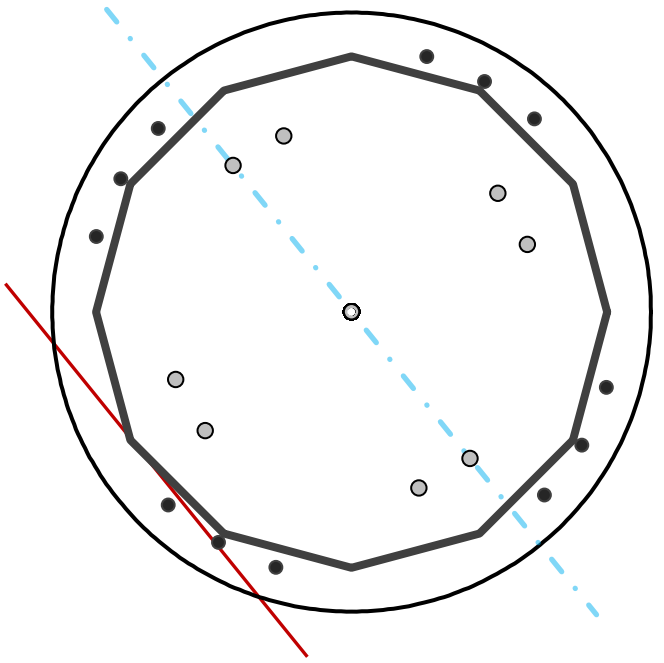
Pole Dimensions		
Number of Sides	12	-
Diameter	51	in
Thickness	3/4	in
Orientation Offset		°

Base Reactions		
Moment, Mu	3,922.0	k-ft
Axial, Pu	58.9	k
Shear, Vu	35.4	k
Neutral Axis	129	°

Report Capacities		
Component	Capacity	Result
Base Plate	22%	Pass
Anchor Rods	92%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, ø	62	in
Thickness	2	in
Grade	A572-60	
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Clip	N/A	in
Orientation Offset		°
Anchor Rod Detail	c	η=0.55
Clear Distance	N/A	in
Applied Moment, Mu	345.0	k
Bending Stress, ϕMn	1589.2	k

Original Anchor Rods		
Arrangement	Cluster	-
Quantity	12	-
Diameter, ø	1 3/4	in
Bolt Circle	55	in
Grade	Other	
Yield Strength, Fy	128	ksi
Tensile Strength, Fu	150	ksi
Spacing	6.5	in
Orientation Offset	15	°
Applied Force, Pu	181.4	k
Anchor Rods, ϕPn	213.7	k



Additional Anchor Rods		
Quantity	8	-
Diameter, ø	2 1/4	in
Bolt Circle	39	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Bypass Base?	No	
Orientation Offset		°
Applied Force, Pu	220.2	k
Additional Rod, ϕPn	243.6	k

Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	35.4	3922.0	1.00
Anchor Rod Forces	32.0	2495.5	0.64
Additional Bolt (Grp1) Forces	3.5	1426.5	0.36
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	117.0509	9.7542	1.8426		36967.22
Bolt	2.4053	1.8995	0.2871	5	8653.61
Bolt1	3.9761	3.2477	0.8393	4.5	4946.45
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	Round	-
Diameter, D	62	in
Thickness, t	2	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	35.256	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

Anchor Rods		
Anchor Rod Quantity, N	12	-
Rod Diameter, d	1.75	in
Bolt Circle, BC	55.1	in
Yield Strength, Fy	128	ksi
Tensile Strength, Fu	150	ksi
Applied Axial, Pu	181.4	k
Applied Shear, Vu	0.5	k
Compressive Capacity, ϕPn	213.7	k
Tensile Capacity, ϕRnt	0.849	OK
Interaction Capacity	0.854	OK

External Base Plate		
Chord Length AA	25.429	in
Additional AA	4.000	in
Section Modulus, Z	29.429	in^3
Applied Moment, Mu	345.0	k-ft
Bending Capacity, ϕMn	1589.2	k-ft
Capacity, Mu/ϕMn	0.217	OK
Chord Length AB	21.424	in
Additional AB	4.000	in
Section Modulus, Z	25.424	in^3
Applied Moment, Mu	154.4	k-ft
Bending Capacity, ϕMn	1372.9	k-ft
Capacity, Mu/ϕMn	0.112	OK
Bend Line Length	0.000	in
Additional Bend Line	0.000	in
Section Modulus, Z	0.000	in^3
Applied Moment, Mu	#N/A	k-ft
Bending Capacity, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

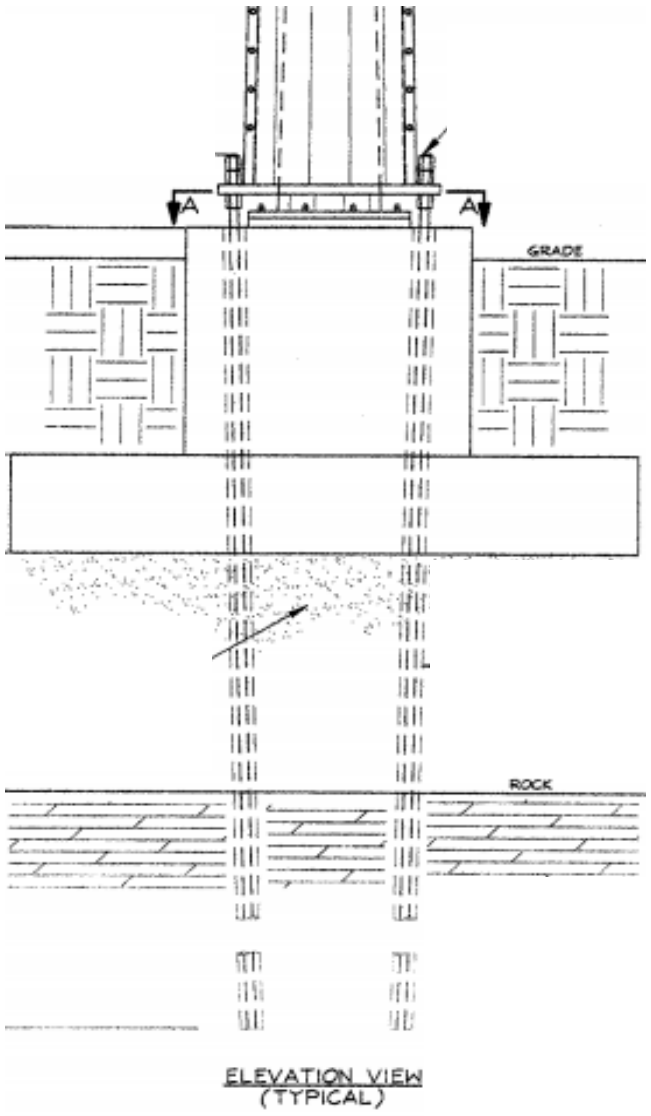
Additional Bolt Group 1		
Bolt Quantity, N	8	-
Bolt Diameter, d	2.25	in
Bolt Circle, BC	39	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	220.2	k
Applied Shear, Vu	2.2	k
Compressive Capacity, ϕPn	243.6	k
Compressive Capacity, ϕPn	0.904	OK
Interaction Capacity	0.920	OK

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, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

Site Name: Brln-Berlin, CT
Site Number: 302483
Date: 11/4/2021

Rock Anchor Group Foundation Analysis

Foundation Parameters		
Foundation Mapped:	Y	
Moment (Overturning) (M_u):	3922.0	k-ft
Shear/Leg (V_u):	35.4	k
Compression/Leg (P_u):	58.9	k
Tower Type (GT / SST / MP):	MP	
Length / Width of Block:	11.0	ft
Pier Width	8.0	ft
Height of Block:	8.58	ft
Mat Thickness	2.58	ft
Block Height Above Ground:	0.83	ft
Depth Below Ground Surface to Water Table (w):	99.0	ft
Unit Weight of Concrete:	150	pcf
Unit Weight of Soil:	135	pcf
Unit Weight of Water:	62.4	pcf
Ultimate Compressive Bearing Pressure:	26,000	psf
Pullout Angle:	40	°
Rod Diameter:	1.75	in
Rod Ultimate Strength:	150	ksi
Rod Net Area:	2.60	in^2
Number of Rods:	12	
Diameter of Cored Hole:	3.63	in
Ultimate Grout / Rock Interface Bond Strength:	150	psi
Ultimate Grout / Rock Anchor Interface Bond Strength:	300	psi
Overall Rod Embedment Length:	386.0	in
Rod Embedment Circle:	54.6	in
Free Stress Length:	182	in
Soil / Concrete Friction Coefficient:	0.25	
Rock Anchor Design Plastic or Elastic:	Elastic	
Ignore Pullout Weight Resistance (Y/N):	N	



ELEVATION VIEW
(TYPICAL)

Governing Strengths		
Total Pullout Weight:	3490.8	k
Total Rock / Grout Bond Strength:	4187.5	k
Total Grout / Rod Bond Strength:	4037.6	k
Total Rod Mechanical Strength:	4680.0	k
Pullout Weight / Rod:	290.9	k
Rock / Grout Bond Strength / Rod:	349.0	k
Grout / Rod Bond Strength / Rod:	336.5	k
Rod Mechanical Strength / Rod:	390.0	k

Capacities & Results		
Soil Strength Reduction Factor (ϕ_s):	0.75	
Factored Nominal Moment Capacity per Leg ($\phi_s M_n$):	4701.9	k
Factored Nominal Uplift Capacity per Leg ($\phi_s T_n$):	2740.7	k
Factored Nominal Compressive Capacity per Leg ($\phi_s P_n$):	1853.1	k
Factored Nominal Shear Capacity per Leg ($\phi_s V_n$):	2106.0	k
$T_u/\phi_s T_n + M_u/\phi_s M_n$:	90%	Result: OK
$P_u/\phi_s P_n$:	4%	Result: OK
$V_u/\phi_s V_n$:	2%	Result: OK

AMERICAN TOWER®
CORPORATION

This report was prepared for American Tower Corporation by

CLS ENGINEERING PLLC

Antenna Mount Analysis Report

ATC Site Name	:	**Brln - Berlin**
ATC Asset Number	:	**302483**
Engineering Number	:	**13682691_C8_01**
Mount Elevation	:	**151.5 ft**
Carrier	:	**AT&T Mobility**
Carrier Site Name	:	**MRCTB051296**
Carrier Site Number	:	**N/A**
Site Location	:	**268 Beckley Road** **Berlin, CT 06037-2419** **41.63172222, -72.7299**
County	:	**Hartford**
Date	:	**November 5, 2021**
Max Usage	:	**64%**
Result	:	**Contingent Pass*** ***See conclusion for requirements**

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PE # 32402 Exp. 1/31/2022
COA # PEC.001833 Exp. 8/14/2022
11/05/2021

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Calculations ..... Attached

Introduction

The proposed equipment is to be mounted to the proposed Site Pro 1 RMQLP-NP w/ HRK14-3HD and Modifications. This proposed mounting configuration was analyzed using RISA-3D, a commercially available finite element analysis software package. A selection of input and output from our analysis is attached to the end of this report.

Supporting Documents

Structural Data	Site Photos dated July 03, 2019 Spec Sheet by Site Pro 1, Part# RMQP-NP, dated July 09, 2015 Spec Sheet by Site Pro 1, Part# HRK14-3HD, dated July 08, 2016 Mount Mapping by Infinigy, Job # 1009-Z0003-H, dated August 13, 2021
Previous Analyses	Tower SA by CLS Engineering PLLC, Eng. Number 13683513_C3_02, dated September 23, 2021
Loading Data	ATC Application, Project#13682691, dated October 27, 2021 AT&T RFDS, RFDS ID: 4387644, Version 3.00, dated October 06, 2021

Analysis

Codes	TIA-222-H
Basic Wind Speed	118 mph, V_{ult} (3-Second Gust)
Basic Wind Speed w/ Ice	50 mph (3-Second Gust) w/ 1.5" Radial Ice (Escalating)
Exposure Category	B
Topographic Factor Procedure:	Method 2
Feature:	Flat
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Risk Category	II
Maintenance Live Load	L_M: 500 lb
Spectral Response	S_s: 0.20; S_1: 0.06; Site Class: D

Conclusion

Based on the analysis, the antenna mount meets the requirements per the applicable codes listed above. The mounting configuration considered in this analysis will be capable of supporting the referenced loading pursuant to referenced standards once the following scope is executed:

- **Replace existing platform mount with proposed Site Pro 1 RMQLP-NP platform mount. Install proposed mount collar 1'-6" below top flange at 150'-0" elevation.**
- **Install (5) proposed mount pipes at each sector for proposed panel configuration (15 total) as shown. Connect to platform base members using Site Pro 1 SP219 crossover plate (15 total).**
- **Install (1) proposed secondary mount pipe at each sector for proposed panel configuration (3 total). Connect to primary mount pipe at position 2 using (1) Site Pro 1 DCP12K threaded rod kit (3 total).**
- **Install Site Pro 1 HRK14-3HD (ANT.51657) support rail kit at 3'-6" above proposed low profile platform base horizontal. Connect to (12) proposed mount pipes using Site Pro 1 SCX2 crossover plates included in the support rail kit. Connect to remaining (3) mount pipes using Site Pro 1 SCX7-U (ANT.16985) crossover plates (3 total). Do not install AHCP if construction is not feasible due to outermost mount pipes.**
- **Install support rail kicker connection brackets L4x3x1/4 (6 total) at existing tower flange plate as specified. Connect proposed pipe support rail kickers to proposed support rails using (2) Site Pro 1 PUCK (6 total). Field-cut kicker pipes as required.**
- **Install (2) bracing pipes at the outermost mount pipes in each sector as shown (6 total). Connect to outermost mount pipe of adjacent sector using (2) Site Pro 1 SCX7-U (ANT.16985) crossover plate kits (6 total). Field-cut proposed brace pipes as required.**
- **Install (2) corner extension stand-off pipe in each sector as shown (6 total). Connect to outermost brace pipes using (2) Site Pro 1 SCX7-U (ANT.16985) crossover plate kits (6 total). Field-cut proposed stand-off pipes as required.**
- **Install (1) proposed mount pipe at corner extension at each sector for proposed panel configuration (3 total) as shown. Connect to stand-off member using (2) Site Pro 1 SCX7-U (ANT.16985) crossover plate (6 total).**
- **Install (1) proposed Site Pro 1 UGLM ring mount to monopole with (3) Site Pro 1 FMA-1 flush mount adapter as shown and install (1) proposed pipe at each sector for spare panel configuration (3 total) as shown.**
- **Install all antennas such that their centerlines achieve contracted carrier rad elevation.**
- **Install (2) proposed mount pipes at stand-off horizontal at each sector for proposed RRUS (3 total) as shown. Connect to stand-off member using (1) Site Pro 1 BBPM-K1 crossover plate (3 total).**
- **Replace safety climb with American tower (tower owner) approved assembly per manufacturer specifications and American tower construction and safety standards.**

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.

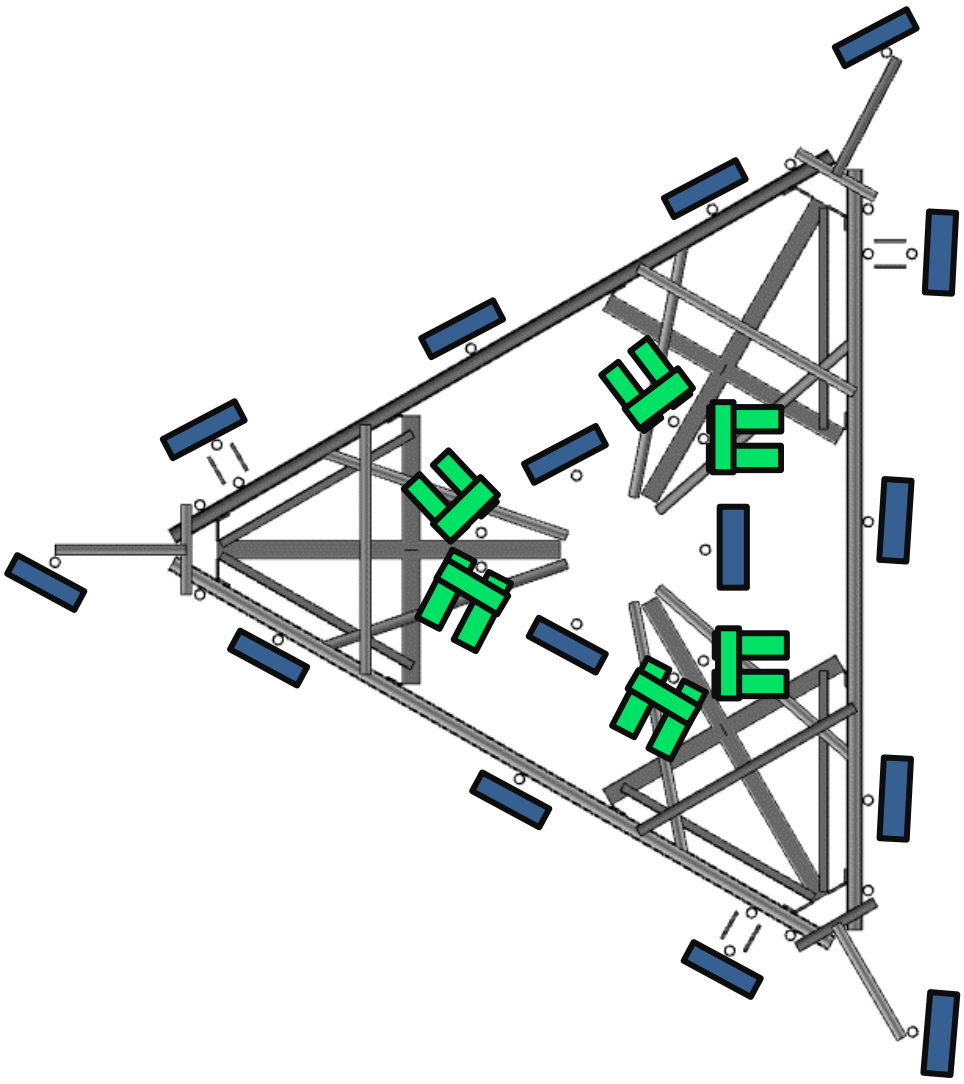
Antenna Loading

Elevation (ft)		Antennas	
Mount	Rad.	#	Name
151.5	153.0	3	Ericsson Air6449 n77D
	152.0	3	CCI OPA-65R-LCUU-H6
		3	Quintel Technology QS66512-2
		3	CCI TPA-65R-BU6DA-K
		3	CCI DMP65R-BU6DA
		1	Raycap DC9-48-60-24-8C-EV
		3	Ericsson RRUS 32 B30
		3	Ericsson RRUS E2 B29
		3	Ericsson RRUS 4449 B5/B12
		3	Ericsson RRUS 4478 B14
		3	Ericsson AIR 6419 N77G
		3	Ericsson RRUS 4415 B25
		3	Ericsson RRUS 4426 B66
		2	Raycap DC6-48-60-18-8F

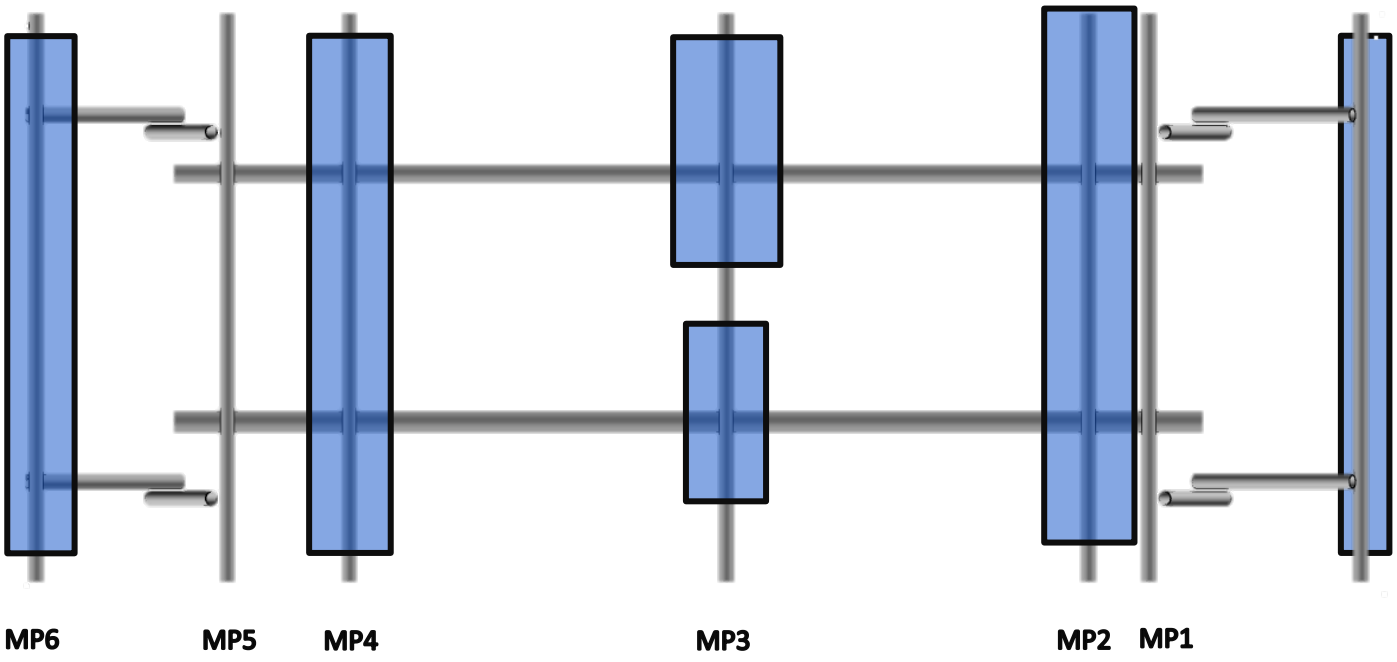
Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Stand-Off Horizontals	64%	Pass
Support Rail	64%	Pass
Tower-Mount Connections	61%	Pass
Mount Pipes	39%	Pass
Bracing Members	29%	Pass
Corner Plates	28%	Pass
Platform Base	19%	Pass
Reinforcement Members	18%	Pass

Equipment Layout Plan View



Equipment Layout Front Elevation View



Standard Conditions

This analysis is inclusive of the antenna supporting frames/mounts and all recorded connections that will support the equipment listed in this report. It considers only the theoretical capacity of structural components and it is not a condition assessment. The validity of the analysis may be dependent on the accuracy of structural information supplied by others. The client is responsible for verifying this information. If any provided information is revised after completion of this analysis, CLS Engineering, PLLC should be notified immediately to revise results.

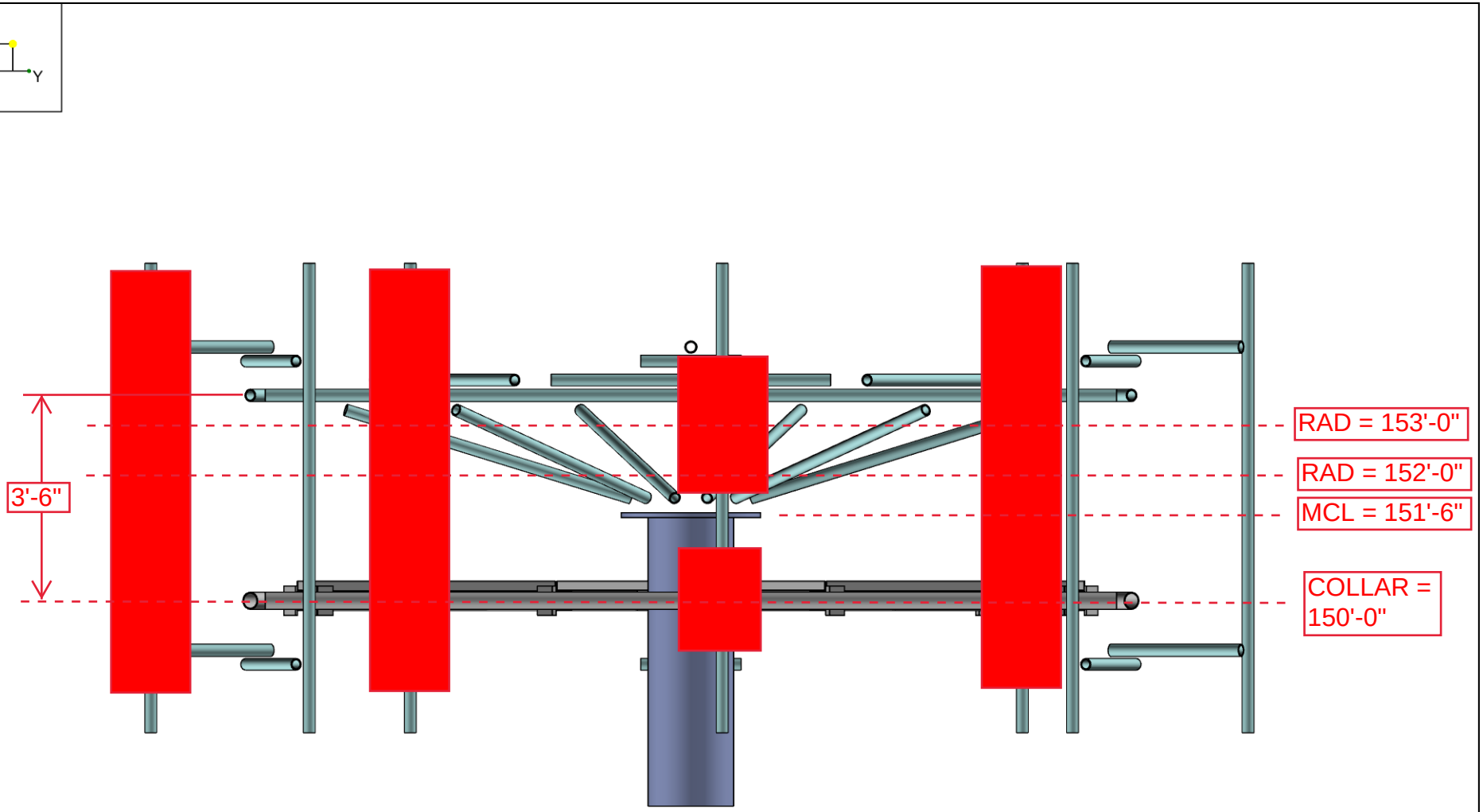
This analysis assumes the following:

1. The tower or other superstructure and mounts (if existing) were properly constructed as per the original design and have been properly maintained in accordance with applicable code standards.
2. Member sizes and strengths are accurate as supplied or are assumed as stated in the calculations.
3. In the absence of sufficient design information, all welds and connections are assumed to develop at least the capacity of the connected member, unless otherwise stated in this analysis.
4. All prior structural modifications, if any, are assumed to be correctly installed and fully effective.
5. The loading configuration is complete and accurate as supplied and/or as modeled in the previous analysis. All appurtenances are assumed to be properly installed and supported as per manufacturer requirements.
6. Some conservative assumptions may be used regarding appurtenances and their projected areas based on careful interpretation of data supplied, previous experience and standard industry practice.
7. Installation of all equipment and steel should be confirmed not to cause tower conflicts nor impede the tower climbing pegs.

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of the report. All opinions and conclusions contained herein are subject to revision based upon receipt of new or updated information. All services are provided exercising a level of care and diligence equivalent to the standard of our profession. No warranty or guarantee, either expressed or implied, is offered. All services are confidential in nature and this report will not be released to any other party without the client's consent. The use of this analysis is limited to the expressed purpose for which it was commissioned and it may not be reused, copied or disseminated for any other purpose without consent from CLS Engineering, PLLC.

All services were performed, results obtained and recommendations made in accordance with generally accepted engineering principles and practices. CLS Engineering, PLLC is not responsible for the conclusions, opinions or recommendations made by others based on the information supplied in this analysis.

It is not possible to have the fully detailed information necessary to perform a complete and thorough analysis of every structural sub-component of an existing structure. The structural analysis by CLS Engineering, PLLC verifies the adequacy of the primary members of the structure. CLS Engineering, PLLC provides a limited scope of service in that we cannot verify the adequacy of every weld, bolt, gusset, etc.



CLS	41124-13682691_C8_01-Brln - Berlin	IN-1
VH		Nov 05, 2021
41124-13682691_C8_01-01-MA	Installation Sketch - Front Elevation	41124-13682691_C8_01-01-MA - Option 1.r3d

Project & Site Information

CLS Project ID		41124-13682691_C8_01-01-MR
Client Information	Carrier Name	AT&T
	Client Name	American Tower
	Site #	302483
	Site Name	Brln - Berlin
	Application #	13682691_C8_01
Site Location	Address	260 Beckley Road, Kensington, CT 06037-2419
	County	Hartford
	GPS	41.63172222, -72.7299
	Elevation AMSL (ft)	196.87

Mount & Supporting Structure

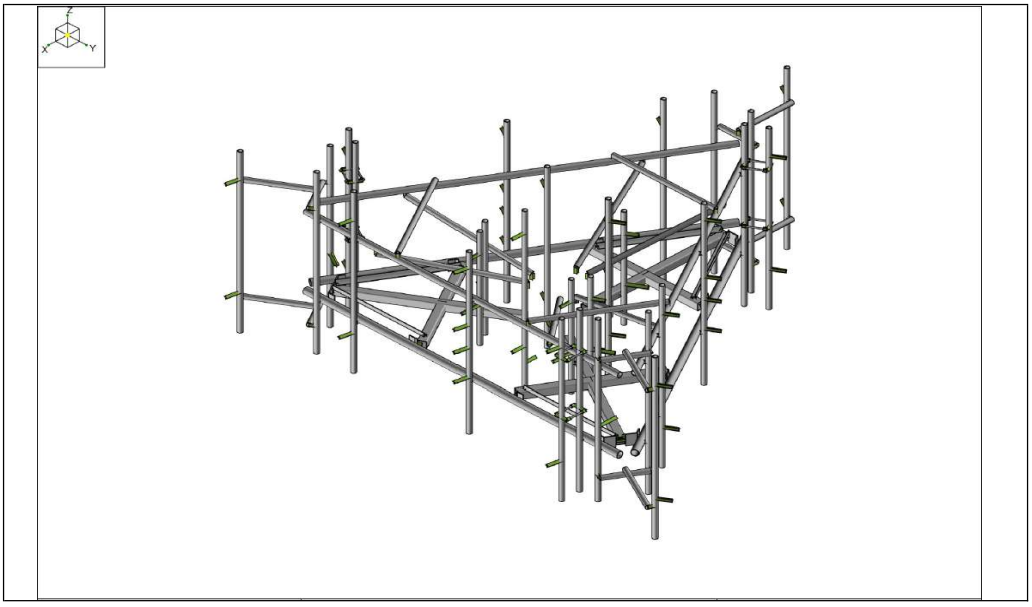
Mount Configuration	Mount Type	Site Pro 1 RMQP-NP w/ HRK14-3HD and Modifications
Nominal AGL Elevations (ft)	Mount Elevation	151.5
	Default Antenna Rad	152
Supporting Structure	Structure Type	Monopole
	Height (TOS) (ft)	151.5

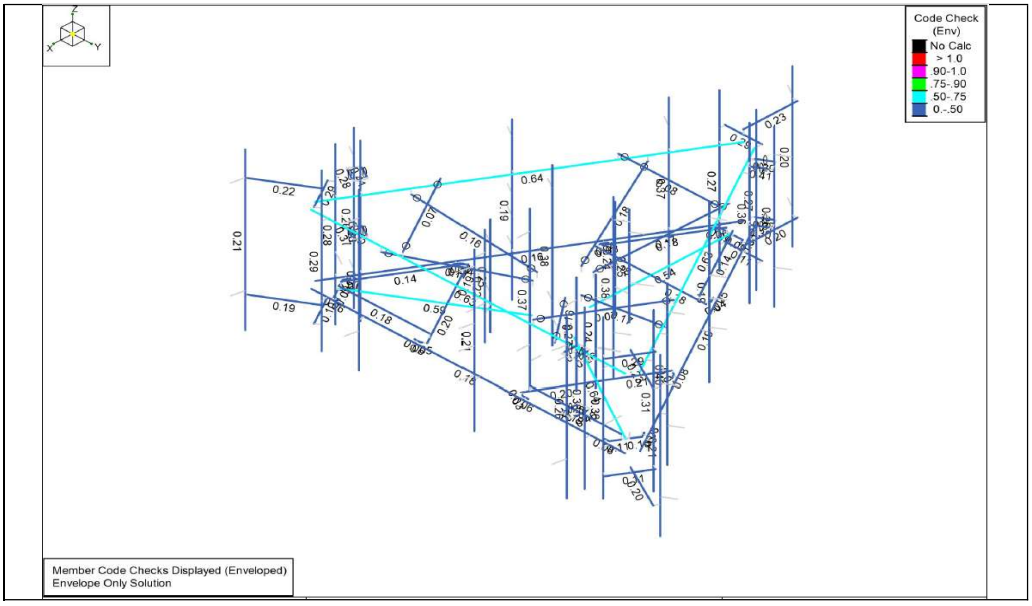
Wind & Ice Loading

TIA Standard	TIA-222-H
Building Code	
Basic Wind Speed, V (bare)	118.0 mph
Basic Wind Speed, V (ice)	50.0 mph
Design Ice Thickness, t_i	1.50 in

Replacement Summary* — Cost Estimate

Replace existing Platform mounts with (1) Site Pro 1 RMQP-NP w/ HRK14-3HD and Modifications			
Post MR Usage	**65%**	**Cost + Mobilization**	**$ 32,000**





Wind & Ice Loading

Nominal Mount Elevation (AGL), z_{mount}	152 ft	K_a	0.90
Nominal Rad Elevation (AGL), z_{rad}	152 ft	K_d	0.95
Elevation AMSL (ft)	197 ft	K_e	0.99
TIA Standard	H	K_z	1.11
Basic Wind Speed, V_{ult} (bare)	118 mph	K_{zt}	1.00
Basic Wind Speed, V (ice)	50 mph	K_s	1.00
Design Ice Thickness, t_i	1 1/2 in	t_{iz}	1.75 in
Exposure Category	B	G_h	1.00
Risk Category	II	q_z (bare)	37.4 psf
Seismic Response Coeff., C_s	0.11	q_z (ice)	6.7 psf

Live Loading

At Mount Pipes, L_M	500 lb
Joint Labels Considered	M1
	M2
	M3
	M4
	M5

Member Distributed Loading

Section Set Label	Shape Label	F_A (lb/ft) Bare	F_A (lb/ft) Ice	Ice Wt. (lb/ft)
Offset Tube	HSS4X4X4	22.45	2.41	14.60
Offset End Plate	0.5 x 6 Plate	33.67	5.75	12.56
Offset Side Plate	0.38 X 6 Plate	33.67	5.75	12.40
Grating Angle	L2x2x3	11.22	2.26	8.91
Platform Horzontal Pipe	PIPE_3.0	11.79	4.23	11.20
MOD Support Rail	PIPE_2.5	9.68	3.85	9.86
MOD SR Bracing	PIPE_2.0	8.00	3.55	8.80
Mount Pipe	PIPE_2.0	8.00	3.55	8.80
MOD kickers	PIPE_2.0	8.00	3.55	8.80
MOD Stand-off	PIPE_2.0	8.00	3.55	8.80
MOD Threaded Rods	SR 5/8"	2.10	2.49	5.06
RRU MOUNT PIPE 2.0	PIPE_2.0	8.00	3.55	8.80

Appurtenances

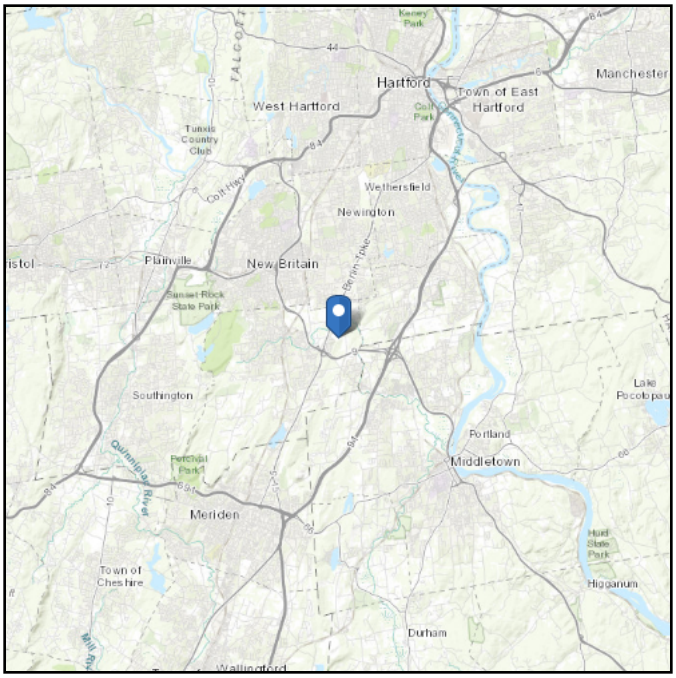
Appurtenance Model	Status	Azimuth Offset (°, ↻)	Rad Elev. Override (ft)	Swap Width & Depth	Area Factor Front	Area Factor Side	Qty. per Azimuth 40°	Qty. per Azimuth 150°	Qty. per Azimuth 270°	Total Qty. Override	40° Joints 1	40° Joints 2	150° Joints 1	150° Joints 2	270° Joints 1	270° Joints 2	Height (in)	Width (in)	Depth (in)	Weight (Bare) (lb)	Shape	Weight of Ice (lb)	EPA_A (Bare) (ft²) N	EPA_A (Bare) (ft²) T	EPA_A (Ice) (ft²) N	EPA_A (Ice) (ft²) T	F_A (Bare) (lb) N	F_A (Bare) (lb) T	F_A (Ice) (lb) N	F_A (Ice) (lb) T
TPA-65R-BU6DA-K				☐			1	1	1		A1	A2	B1	B2	C1	C2	71.2	25.5	7.6	79.6	Flat	331.56	15.29	5.56	18.10	7.99	515.47	187.32	109.53	48.34
Air6449				☐			1	1	1		A3	A4	B3	B4	C3	C4	30.4	15.9	8.1	81.6	Flat	103.50	4.03	2.15	5.48	3.33	135.76	72.37	33.15	20.13
AIR 6419 N77G				☐			1	1	1		A5	A6	B5	B6	C5	C6	15.7	30	6.7	70	Flat	110.16	3.93	0.88	5.36	1.63	132.29	29.54	32.42	9.87
DMP65R-BU6DA				☐			1	1	1		A7	A8	B7	B8	C7	C8	71.2	20.7	7.7	79.4	Flat	287.90	12.71	5.62	15.39	8.05	428.37	189.26	93.12	48.69
OPA-65R-LCUU-H6				☐			1	1	1		A9	A10	B9	B10	C9	C10	72	14.4	7.3	80	Generic	199.60	9.20	4.63	11.89	7.11	310.08	156.05	71.96	43.04
QS66512-2				☐			1	1	1	***3***	S1	S2	S3	S4	S5	S6	72	12	9.6	111	Generic	199.92	4.01	3.37	5.41	4.73	135.16	113.58	32.73	28.64
DC6-48-60-18-8F				☐			1				DC1						24	11	11	32.8	Round	73.12	1.28	1.28	1.94	1.94	43.25	43.25	11.72	11.72
DC6-48-60-18-8F				☐				1					DC2				24	11	11	32.8	Round	73.12	1.28	1.28	1.94	1.94	43.25	43.25	11.72	11.72
DC9-48-60-24-8C-EV				☐			1				DC1						31.41	10.24	18.28	26.2	Flat	129.57	2.74	4.78	4.00	6.33	92.24	161.27	24.21	38.33
RRUS 32 B30				☐			1	1	1		R3		R6		R10		26.7	12.1	6.7	60	Flat	71.30	2.69	1.57	3.92	2.61	90.74	53.01	23.75	15.79
RRUS 4415 B25				☑		0.5	1	1	1		R4		R55		R8		14.96	13.19	5.39	44	Flat	43.45	0.68	0.82	1.37	1.28	22.88	27.71	8.27	7.76
RRUS 4449 B5/B12				☐			1	1	1		R1		R7		R11		17.9	13.19	9.44	71	Flat	64.69	1.97	1.41	2.97	2.31	66.31	47.46	18.00	13.96
RRUS E2 B29				☑		0.5	1	1	1		R2		R5		R9		20.4	18.5	7.5	60	Flat	81.16	1.29	1.57	2.19	2.19	43.32	53.00	13.25	13.25
RRUS 4478 B14				☑		0.5	1	1	1		R2		R5		R9		16.5	13.4	7.7	59.9	Flat	55.49	1.06	0.92	1.87	1.41	35.68	31.05	11.29	8.52
RRUS 4426 B66				☑		0.5	1	1	1		R4		R55		R8		14.96	13.19	5.8	48.4	Flat	44.80	0.73	0.82	1.43	1.28	24.44	27.71	8.65	7.76

ASCE 7 Hazards Report

Address:
286 Beckley Rd
Berlin, Connecticut
06037

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Elevation: 196.87 ft (NAVD 88)
Latitude: 41.631673
Longitude: -72.729997



Wind

Results:

Wind Speed:	118 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	98 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed: Fri Oct 29 2021

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

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

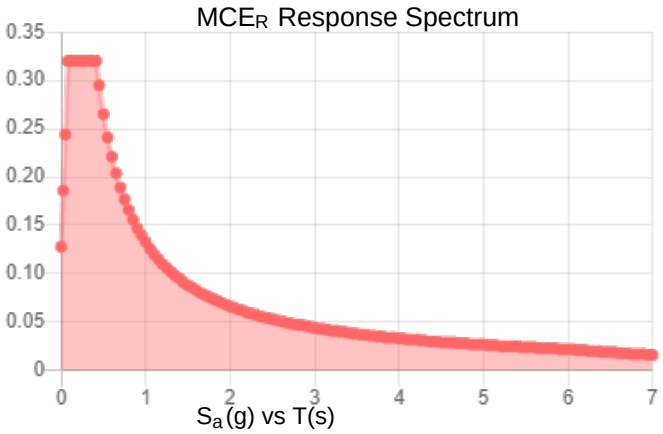
Seismic

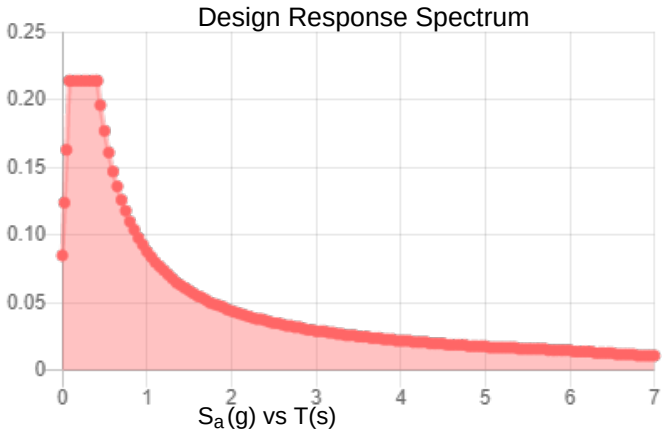
Site Soil Class: D - Default (see Section 11.4.3)

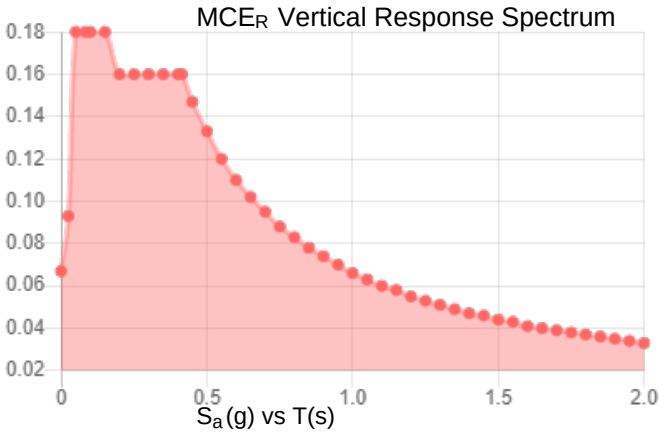
Results:

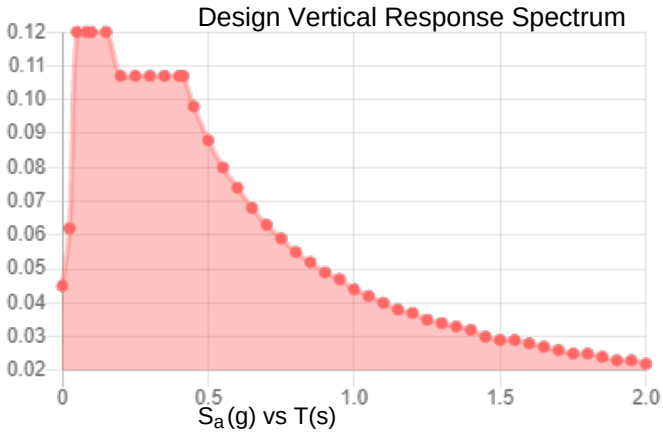
S_S :	0.2	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.11
F_v :	2.4	PGA_M :	0.174
S_{MS} :	0.32	F_{PGA} :	1.58
S_{M1} :	0.133	I_e :	1
S_{DS} :	0.214	C_v :	0.701

Seismic Design Category B









Data Accessed: Fri Oct 29 2021

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

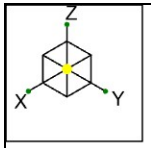
Ice

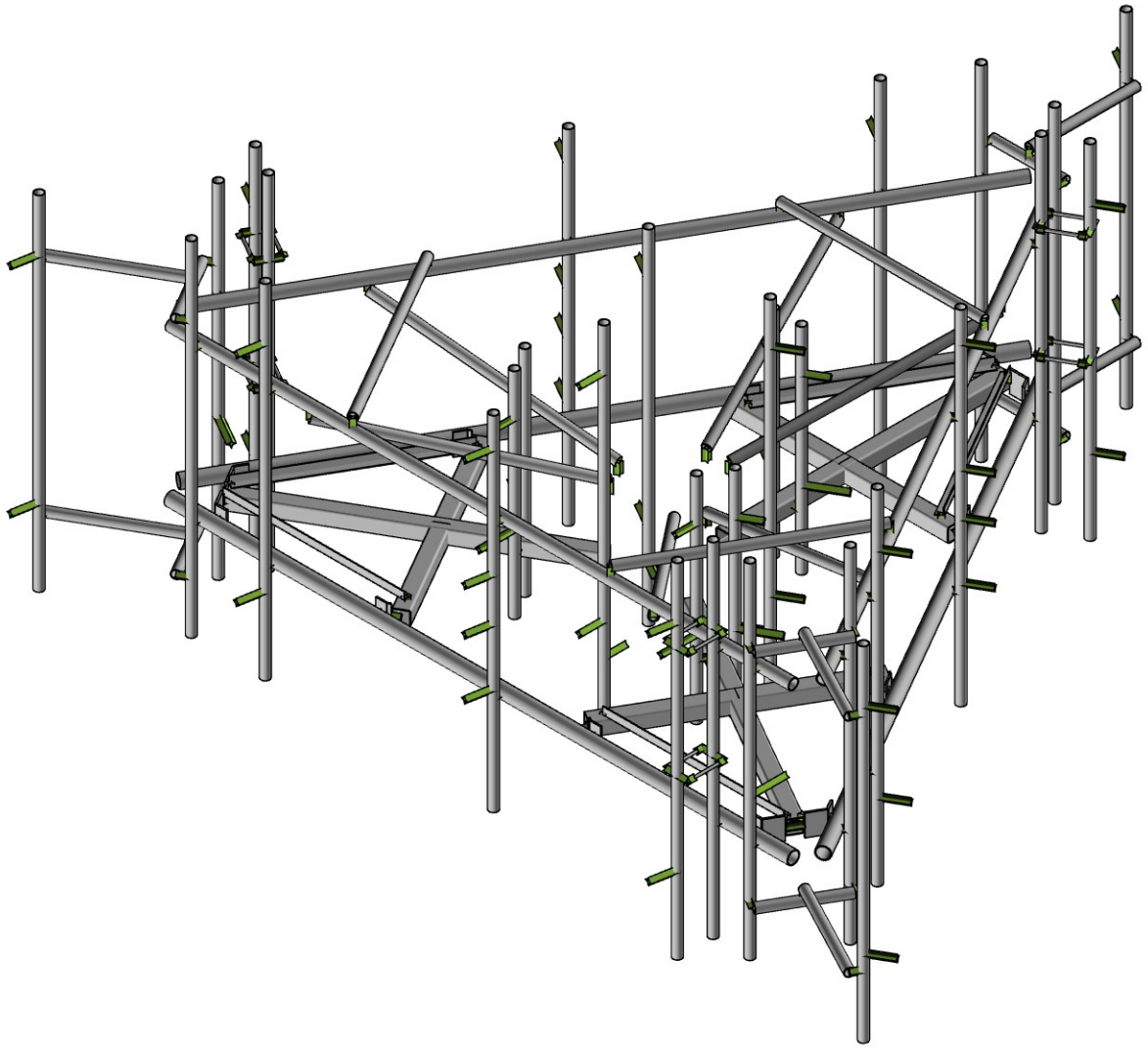
Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Fri Oct 29 2021

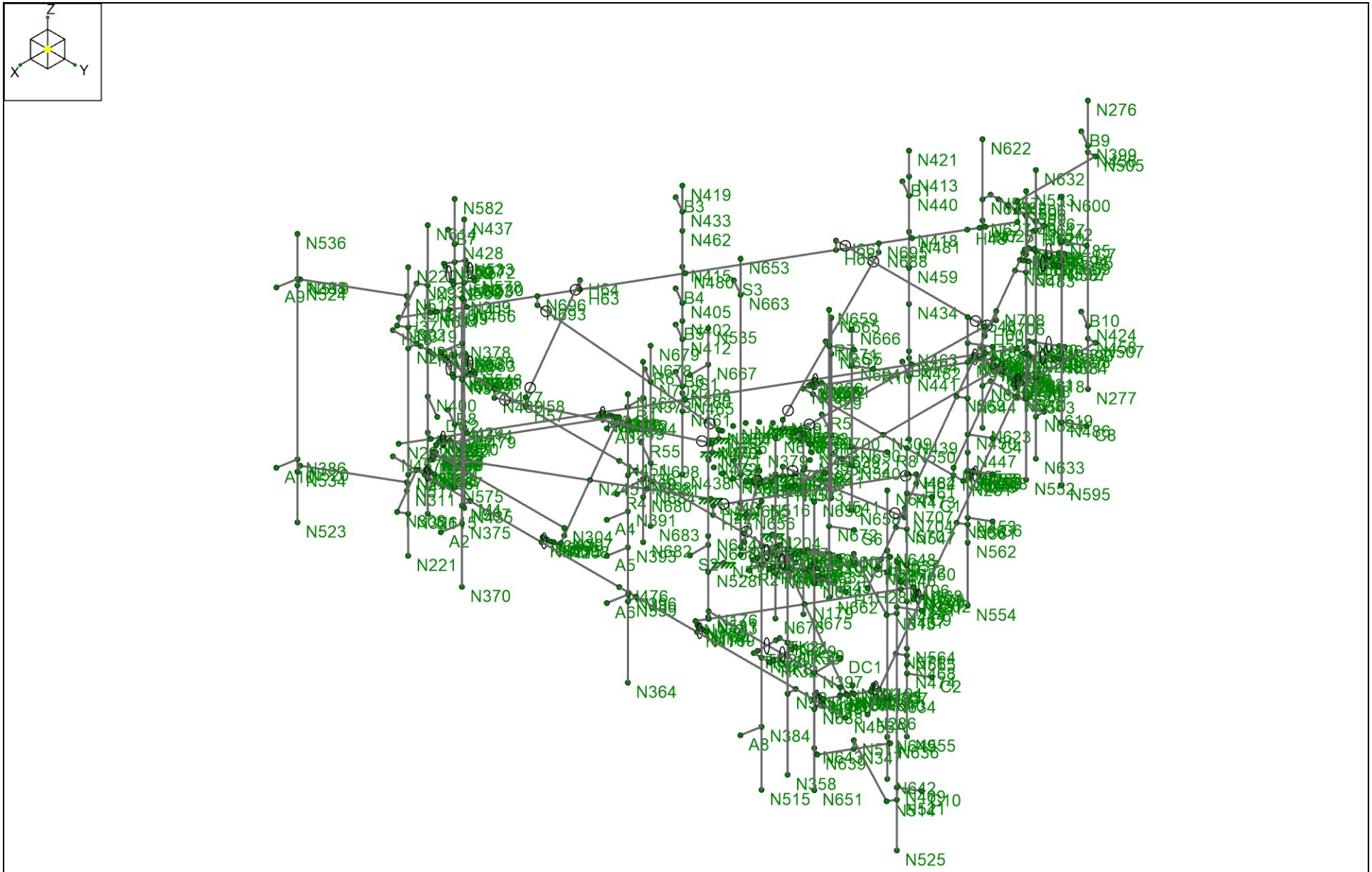
Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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

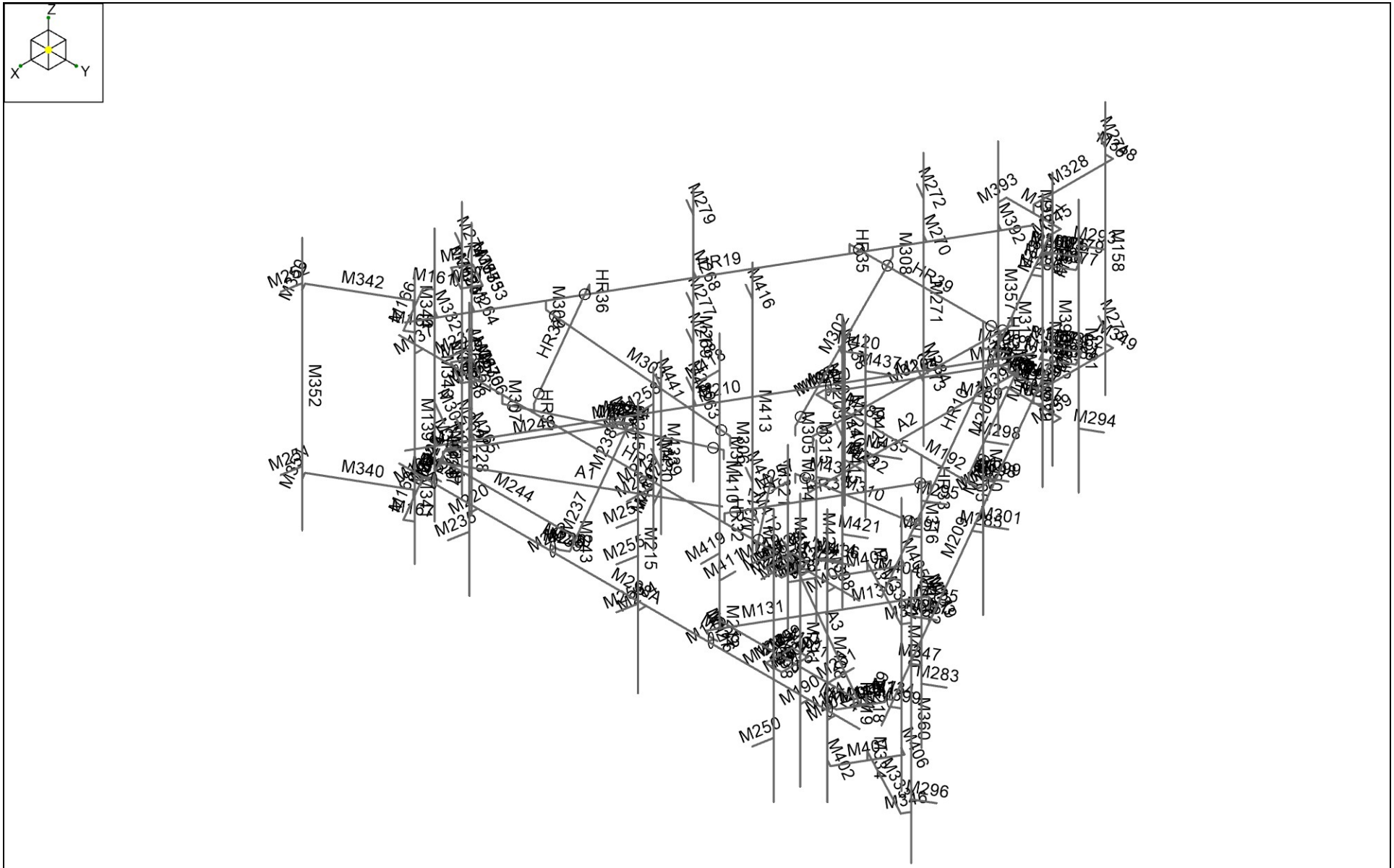




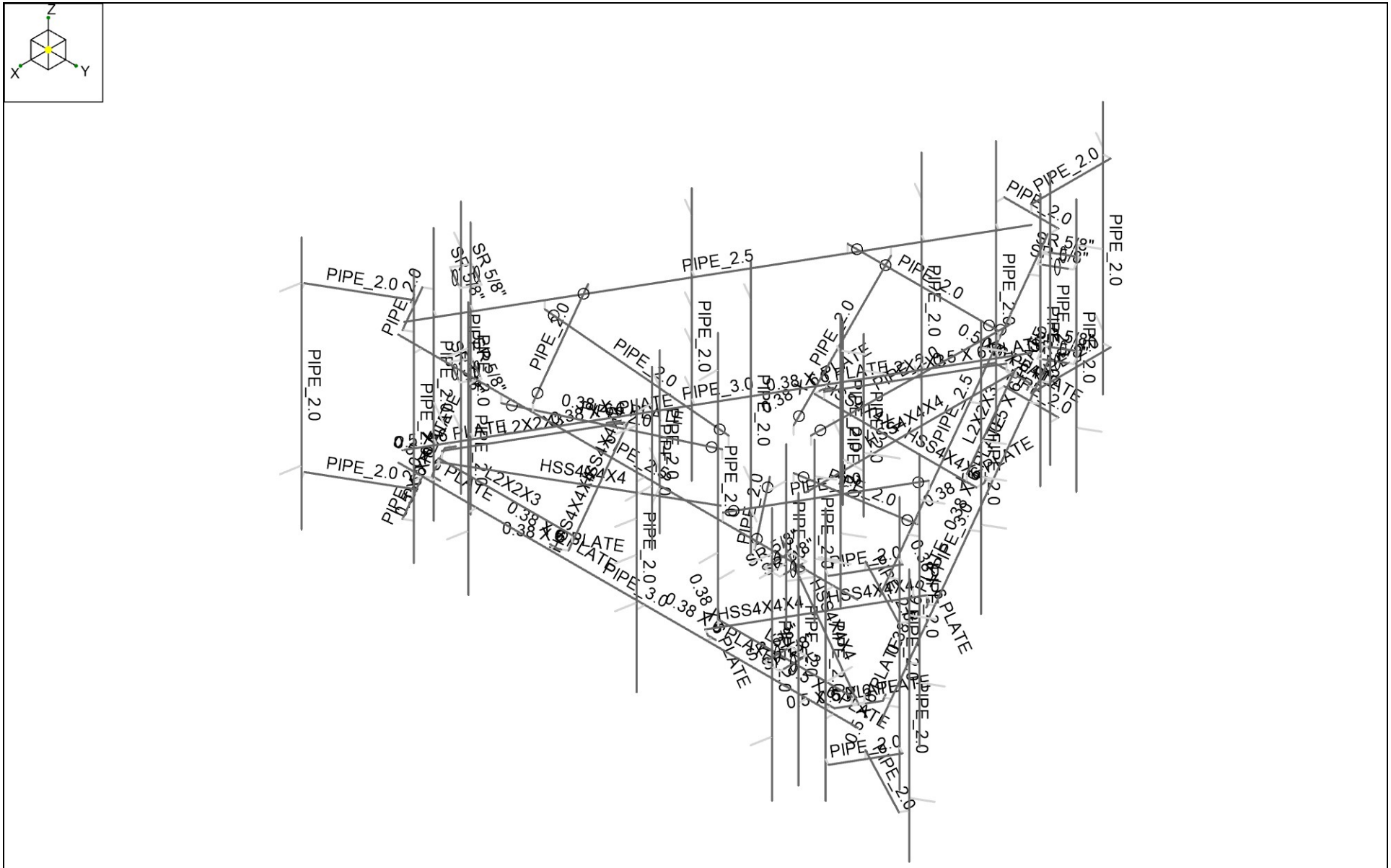
CLS	41124-13682691_C8_01-Brln - Berlin	SK-1
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Rendered	41124-13682691_C8_01-01-MR.r3d



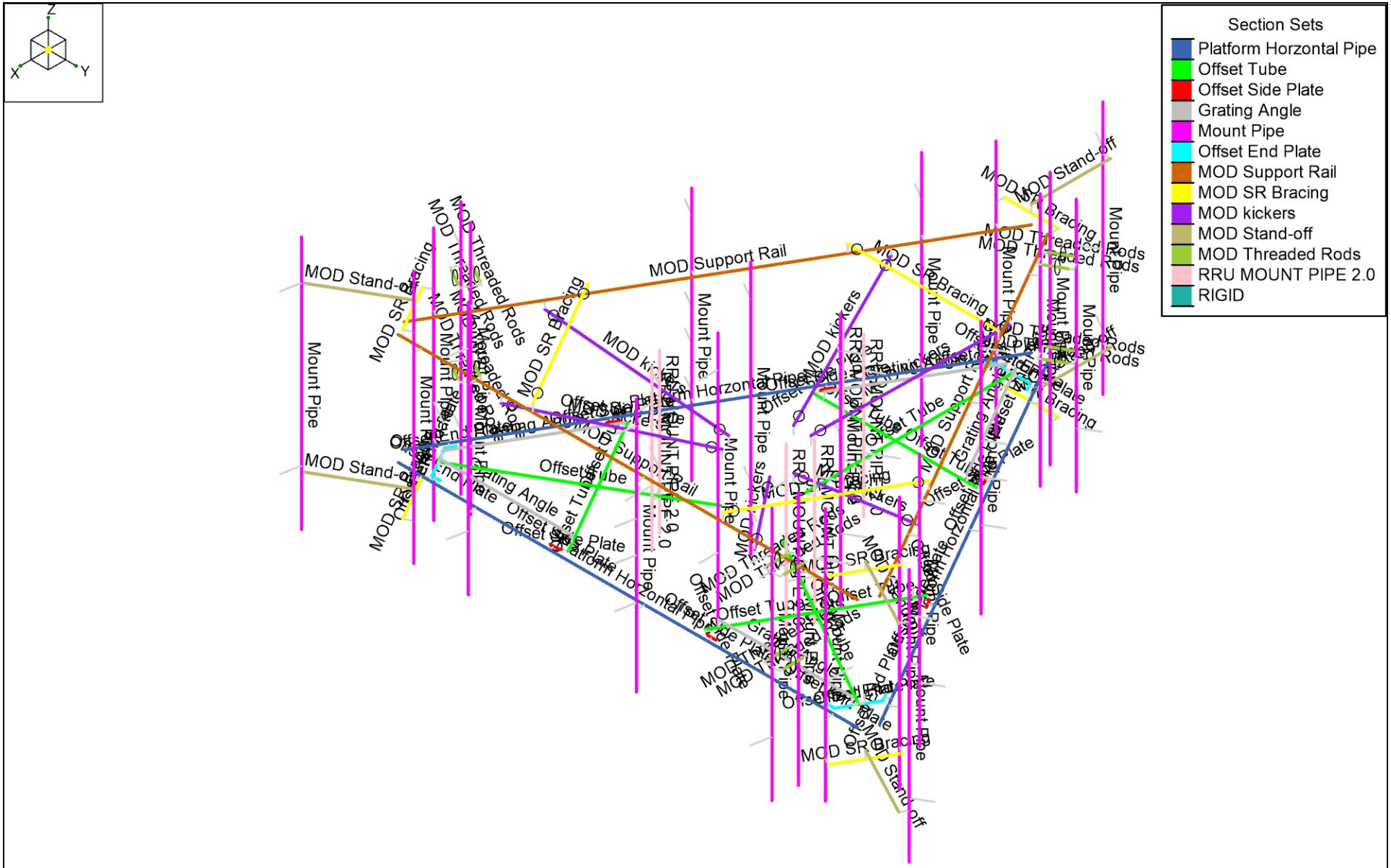
CLS	41124-13682691_C8_01-Brln - Berlin	SK-2
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Joint Labels	41124-13682691_C8_01-01-MR.r3d



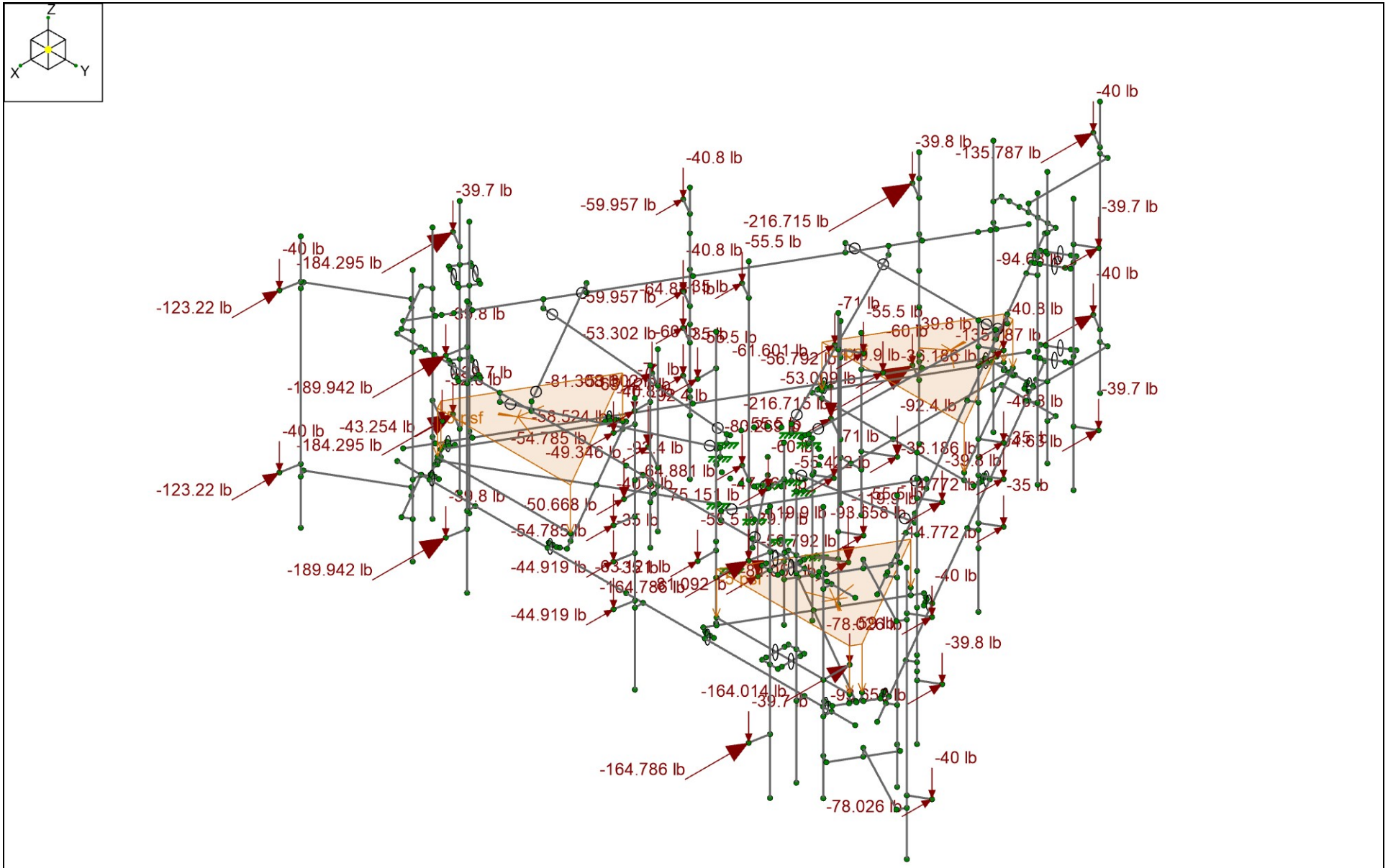
CLS	41124-13682691_C8_01-Brln - Berlin	SK-3
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Member Labels	41124-13682691_C8_01-01-MR.r3d



CLS	41124-13682691_C8_01-Brln - Berlin	SK-3.1
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Member Shapes	41124-13682691_C8_01-01-MR.r3d

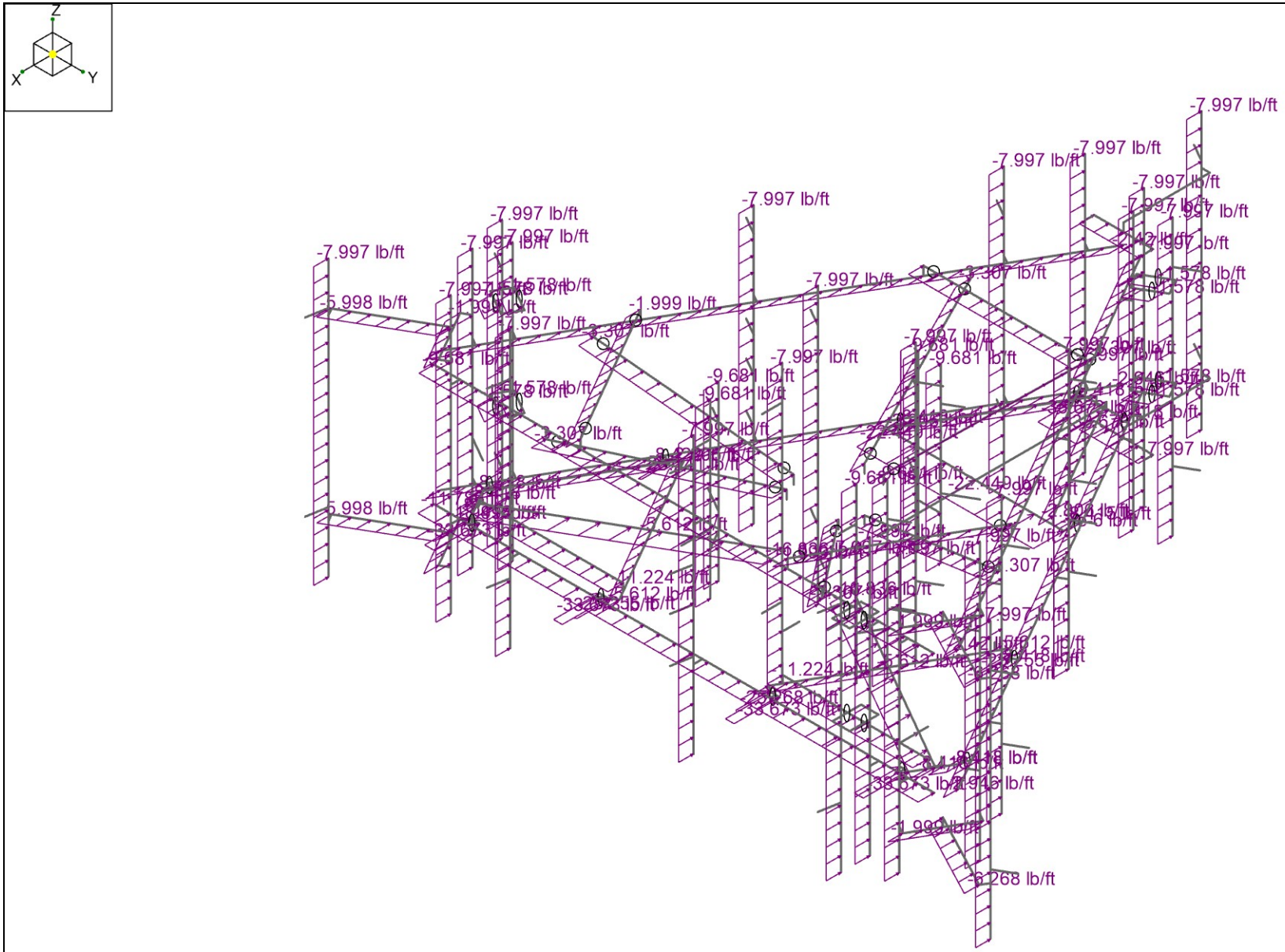


CLS	41124-13682691_C8_01-Brln - Berlin	SK-4
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Section Sets	41124-13682691_C8_01-01-MR.r3d



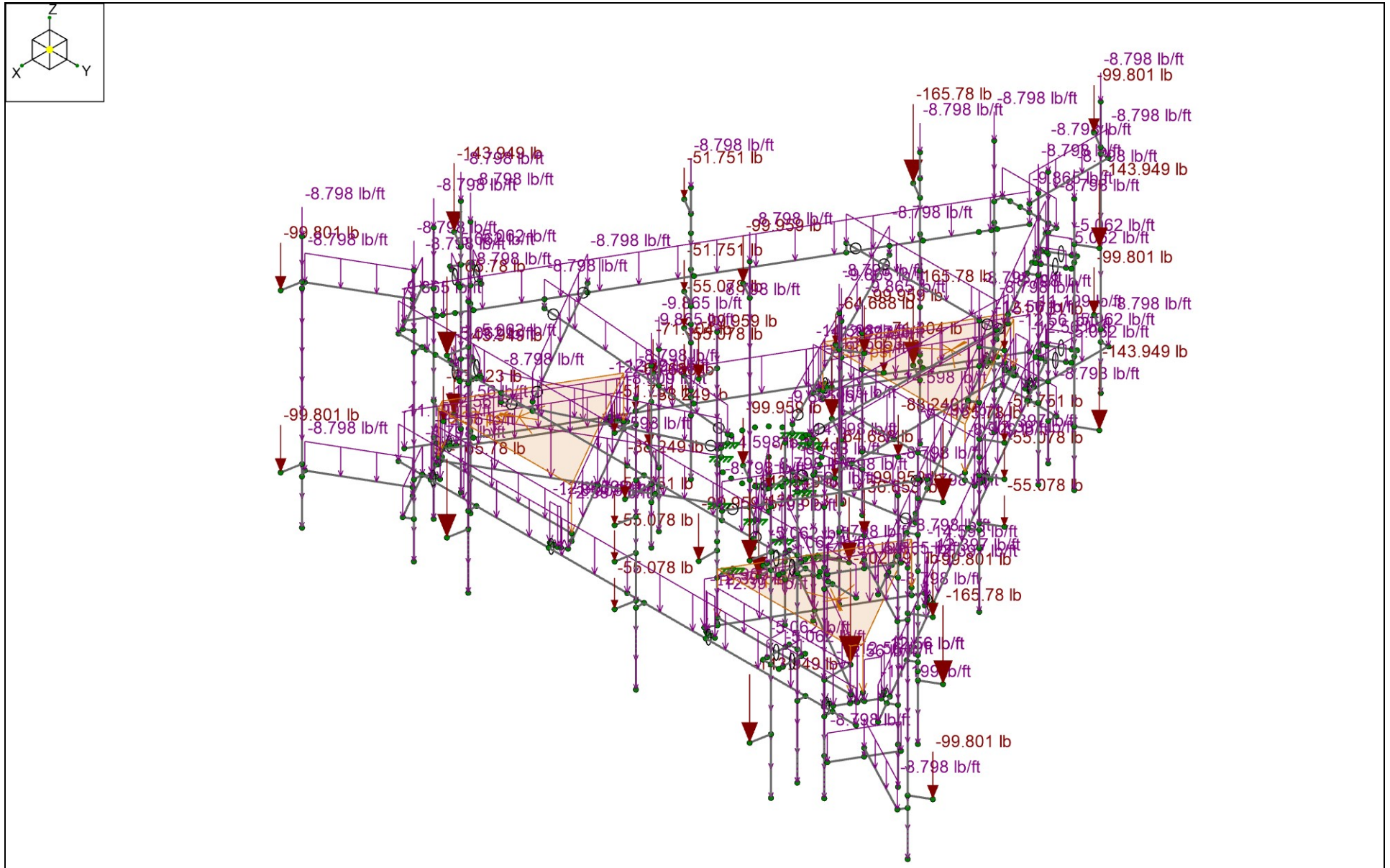
Loads: LC 1, DISPLAY (1.0D + 1.0W_0)

CLS	41124-13682691_C8_01-Brln - Berlin	SK-5
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Joint Loads – Dead and Normal Wind	41124-13682691_C8_01-01-MR.r3d



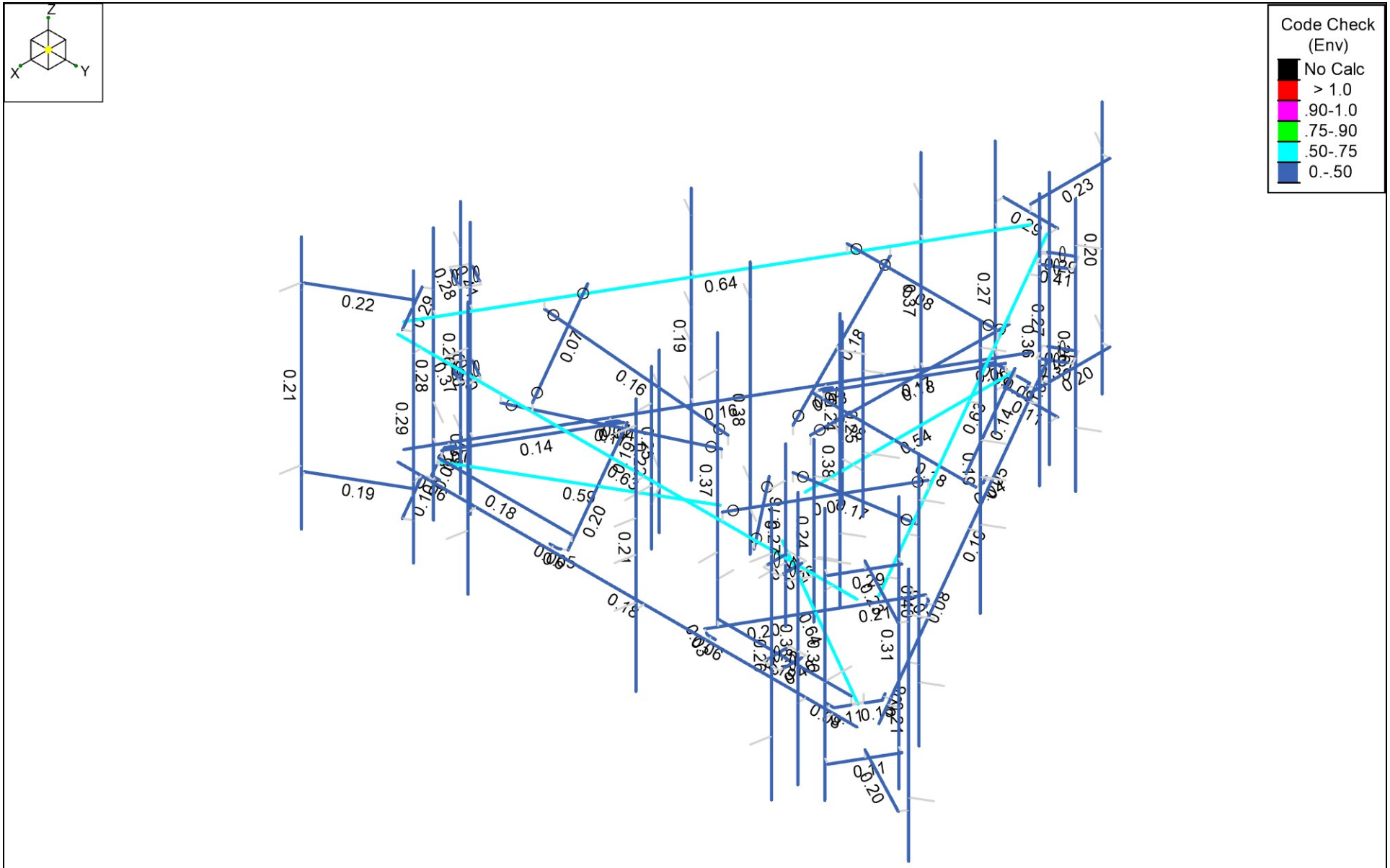
Loads: BLC 5, Structure Wind 0

CLS	41124-13682691_C8_01-Brln - Berlin	SK-6
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Distributed Load – Normal Wind	41124-13682691_C8_01-01-MR.r3d



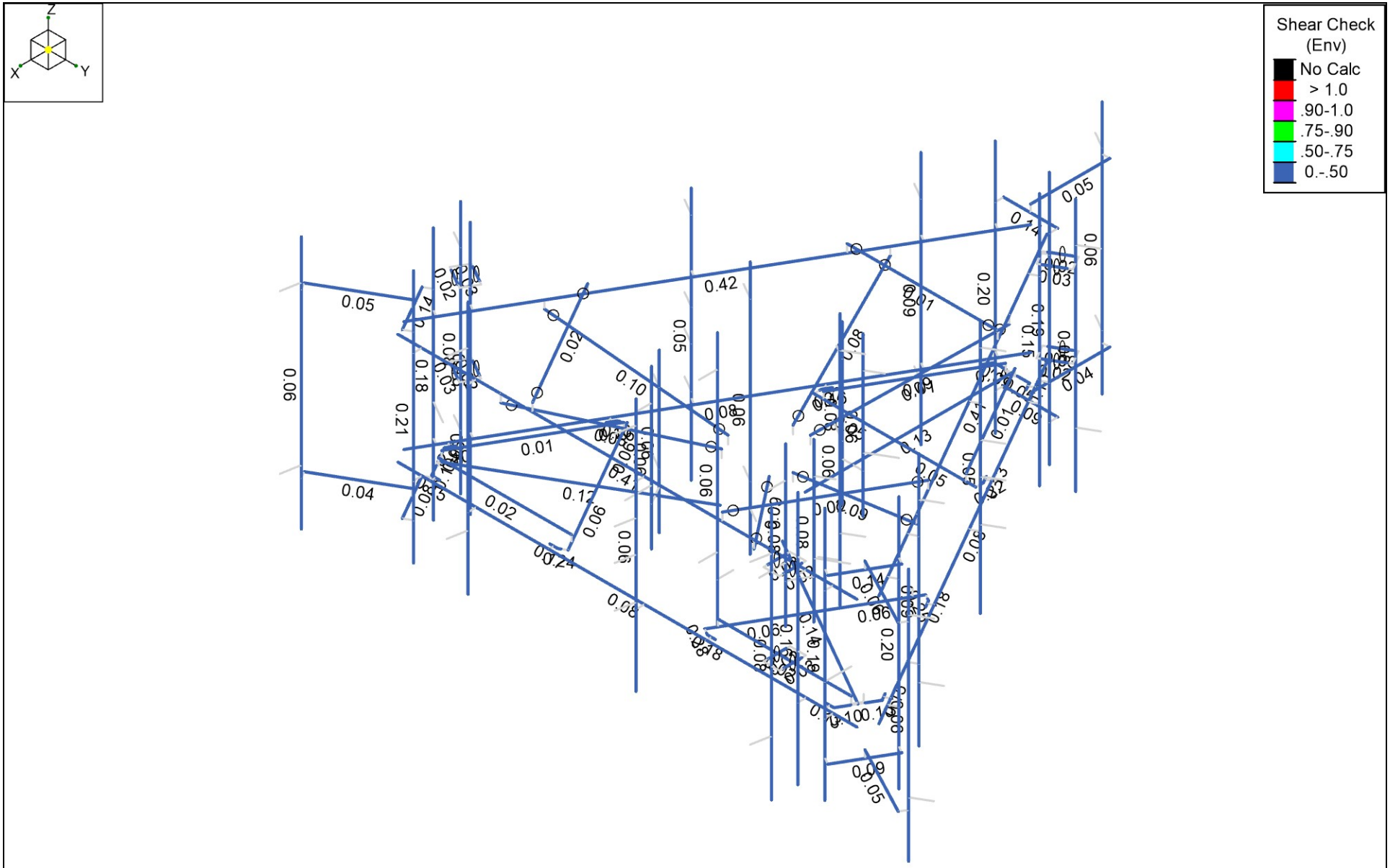
Loads: BLC 2, Ice Dead

CLS	41124-13682691_C8_01-Brln - Berlin	SK-7
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Ice Dead Loads	41124-13682691_C8_01-01-MR.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

CLS	41124-13682691_C8_01-Brln - Berlin	SK-8
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Envelope Member Unity Check Results – Bending	41124-13682691_C8_01-01-MR.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

CLS	41124-13682691_C8_01-Brln - Berlin	SK-9
VH		Nov 03, 2021
41124-13682691_C8_01-01-MR	Envelope Member Check Results – Shear	41124-13682691_C8_01-01-MR.r3d

Basic Load Cases

	BLC Description	Category	Z Gravity	Nodal	Distributed	Area(Member)
1	Dead	DL	-1	57		3
2	Ice Dead	RL		57	107	3
3	BLC 1 Transient Area Loads	None			25	
4	BLC 2 Transient Area Loads	None			25	
5	Structure Wind 0°	None			99	
6	Structure Wind 30°	None			184	
7	Structure Wind 45°	None			214	
8	Structure Wind 60°	None			198	
9	Structure Wind 90°	None			92	
10	Structure Wind 120°	None			202	
11	Structure Wind 135°	None			214	
12	Structure Wind 150°	None			186	
13	Structure Wind 180°	None			99	
14	Structure Wind 210°	None			184	
15	Structure Wind 225°	None			214	
16	Structure Wind 240°	None			198	
17	Structure Wind 270°	None			92	
18	Structure Wind 300°	None			202	
19	Structure Wind 315°	None			214	
20	Structure Wind 330°	None			186	
21	Structure Wind w/ Ice 0°	None			99	
22	Structure Wind w/ Ice 30°	None			188	
23	Structure Wind w/ Ice 45°	None			214	
24	Structure Wind w/ Ice 60°	None			198	
25	Structure Wind w/ Ice 90°	None			94	
26	Structure Wind w/ Ice 120°	None			202	
27	Structure Wind w/ Ice 135°	None			214	
28	Structure Wind w/ Ice 150°	None			190	
29	Structure Wind w/ Ice 180°	None			99	
30	Structure Wind w/ Ice 210°	None			188	
31	Structure Wind w/ Ice 225°	None			214	
32	Structure Wind w/ Ice 240°	None			198	
33	Structure Wind w/ Ice 270°	None			94	
34	Structure Wind w/ Ice 300°	None			202	
35	Structure Wind w/ Ice 315°	None			214	
36	Structure Wind w/ Ice 330°	None			190	
37	Antenna Wind 0°	None		57		
38	Antenna Wind 30°	None		114		
39	Antenna Wind 45°	None		114		
40	Antenna Wind 60°	None		114		
41	Antenna Wind 90°	None		57		
42	Antenna Wind 120°	None		114		
43	Antenna Wind 135°	None		114		
44	Antenna Wind 150°	None		114		
45	Antenna Wind 180°	None		57		
46	Antenna Wind 210°	None		114		
47	Antenna Wind 225°	None		114		
48	Antenna Wind 240°	None		114		
49	Antenna Wind 270°	None		57		
50	Antenna Wind 300°	None		114		
51	Antenna Wind 315°	None		114		
52	Antenna Wind 330°	None		114		
53	Antenna Wind w/ Ice 0°	None		57		
54	Antenna Wind w/ Ice 30°	None		114		
55	Antenna Wind w/ Ice 45°	None		114		
56	Antenna Wind w/ Ice 60°	None		114		
57	Antenna Wind w/ Ice 90°	None		57		
58	Antenna Wind w/ Ice 120°	None		114		

Basic Load Cases (Continued)

	BLC Description	Category	Z Gravity	Nodal	Distributed	Area(Member)
59	Antenna Wind w/ Ice 135°	None		114		
60	Antenna Wind w/ Ice 150°	None		114		
61	Antenna Wind w/ Ice 180°	None		57		
62	Antenna Wind w/ Ice 210°	None		114		
63	Antenna Wind w/ Ice 225°	None		114		
64	Antenna Wind w/ Ice 240°	None		114		
65	Antenna Wind w/ Ice 270°	None		57		
66	Antenna Wind w/ Ice 300°	None		114		
67	Antenna Wind w/ Ice 315°	None		114		
68	Antenna Wind w/ Ice 330°	None		114		
69	Seismic X	ELX		57	107	
70	Seismic Y	ELY		57	107	
71	Seismic Z	ELZ		57	107	
72	Maintenance Live 500 (1)	OL1		1		
73	Maintenance Live 500 (2)	OL2		1		
74	Maintenance Live 500 (3)	OL3		1		
75	Maintenance Live 500 (4)	OL4		1		
76	Maintenance Live 500 (5)	OL5		1		

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	DISPLAY (1.0D + 1.0W_0°)	Yes	Y	DL	1	37	1				
2	1.4D	Yes	Y	DL	1.4						
3	1.2D + 1.0W_0°	Yes	Y	DL	1.2	5	1	37	1		
4	1.2D + 1.0W_30°	Yes	Y	DL	1.2	6	1	38	1		
5	1.2D + 1.0W_45°	Yes	Y	DL	1.2	7	1	39	1		
6	1.2D + 1.0W_60°	Yes	Y	DL	1.2	8	1	40	1		
7	1.2D + 1.0W_90°	Yes	Y	DL	1.2	9	1	41	1		
8	1.2D + 1.0W_120°	Yes	Y	DL	1.2	10	1	42	1		
9	1.2D + 1.0W_135°	Yes	Y	DL	1.2	11	1	43	1		
10	1.2D + 1.0W_150°	Yes	Y	DL	1.2	12	1	44	1		
11	1.2D + 1.0W_180°	Yes	Y	DL	1.2	13	-1	45	-1		
12	1.2D + 1.0W_210°	Yes	Y	DL	1.2	14	-1	46	-1		
13	1.2D + 1.0W_225°	Yes	Y	DL	1.2	15	-1	47	-1		
14	1.2D + 1.0W_240°	Yes	Y	DL	1.2	16	-1	48	-1		
15	1.2D + 1.0W_270°	Yes	Y	DL	1.2	17	-1	49	-1		
16	1.2D + 1.0W_300°	Yes	Y	DL	1.2	18	-1	50	-1		
17	1.2D + 1.0W_315°	Yes	Y	DL	1.2	19	-1	51	-1		
18	1.2D + 1.0W_330°	Yes	Y	DL	1.2	20	-1	52	-1		
19	1.2D + 1.0Di + 1.0Wi_0°	Yes	Y	DL	1.2	21	1	53	1	RL	1
20	1.2D + 1.0Di + 1.0Wi_30°	Yes	Y	DL	1.2	22	1	54	1	RL	1
21	1.2D + 1.0Di + 1.0Wi_45°	Yes	Y	DL	1.2	23	1	55	1	RL	1
22	1.2D + 1.0Di + 1.0Wi_60°	Yes	Y	DL	1.2	24	1	56	1	RL	1
23	1.2D + 1.0Di + 1.0Wi_90°	Yes	Y	DL	1.2	25	1	57	1	RL	1
24	1.2D + 1.0Di + 1.0Wi_120°	Yes	Y	DL	1.2	26	1	58	1	RL	1
25	1.2D + 1.0Di + 1.0Wi_135°	Yes	Y	DL	1.2	27	1	59	1	RL	1
26	1.2D + 1.0Di + 1.0Wi_150°	Yes	Y	DL	1.2	28	1	60	1	RL	1
27	1.2D + 1.0Di + 1.0Wi_180°	Yes	Y	DL	1.2	29	-1	61	-1	RL	1
28	1.2D + 1.0Di + 1.0Wi_210°	Yes	Y	DL	1.2	30	-1	62	-1	RL	1
29	1.2D + 1.0Di + 1.0Wi_225°	Yes	Y	DL	1.2	31	-1	63	-1	RL	1
30	1.2D + 1.0Di + 1.0Wi_240°	Yes	Y	DL	1.2	32	-1	64	-1	RL	1
31	1.2D + 1.0Di + 1.0Wi_270°	Yes	Y	DL	1.2	33	-1	65	-1	RL	1
32	1.2D + 1.0Di + 1.0Wi_300°	Yes	Y	DL	1.2	34	-1	66	-1	RL	1
33	1.2D + 1.0Di + 1.0Wi_315°	Yes	Y	DL	1.2	35	-1	67	-1	RL	1
34	1.2D + 1.0Di + 1.0Wi_330°	Yes	Y	DL	1.2	36	-1	68	-1	RL	1
35	1.2D + 1.0Ev + 1.0Eh_0°	Yes	Y	DL	1.243	ELX	-1	ELY			
36	1.2D + 1.0Ev + 1.0Eh_30°	Yes	Y	DL	1.243	ELX	-0.866	ELY	0.5		
37	1.2D + 1.0Ev + 1.0Eh_45°	Yes	Y	DL	1.243	ELX	-0.707	ELY	0.707		

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
38	1.2D + 1.0Ev + 1.0Eh_60°	Yes	Y	DL	1.243	ELX	-0.5	ELY	0.866		
39	1.2D + 1.0Ev + 1.0Eh_90°	Yes	Y	DL	1.243	ELX		ELY	1		
40	1.2D + 1.0Ev + 1.0Eh_120°	Yes	Y	DL	1.243	ELX	0.5	ELY	0.866		
41	1.2D + 1.0Ev + 1.0Eh_135°	Yes	Y	DL	1.243	ELX	0.707	ELY	0.707		
42	1.2D + 1.0Ev + 1.0Eh_150°	Yes	Y	DL	1.243	ELX	0.866	ELY	0.5		
43	1.2D + 1.0Ev + 1.0Eh_180°	Yes	Y	DL	1.243	ELX	1	ELY			
44	1.2D + 1.0Ev + 1.0Eh_210°	Yes	Y	DL	1.243	ELX	0.866	ELY	-0.5		
45	1.2D + 1.0Ev + 1.0Eh_225°	Yes	Y	DL	1.243	ELX	0.707	ELY	-0.707		
46	1.2D + 1.0Ev + 1.0Eh_240°	Yes	Y	DL	1.243	ELX	0.5	ELY	-0.866		
47	1.2D + 1.0Ev + 1.0Eh_270°	Yes	Y	DL	1.243	ELX		ELY	-1		
48	1.2D + 1.0Ev + 1.0Eh_300°	Yes	Y	DL	1.243	ELX	-0.5	ELY	-0.866		
49	1.2D + 1.0Ev + 1.0Eh_315°	Yes	Y	DL	1.243	ELX	-0.707	ELY	-0.707		
50	1.2D + 1.0Ev + 1.0Eh_330°	Yes	Y	DL	1.243	ELX	-0.866	ELY	-0.5		
51	0.9D - 1.0Ev + 1.0Eh_0°	Yes	Y	DL	0.857	ELX	-1	ELY			
52	0.9D - 1.0Ev + 1.0Eh_30°	Yes	Y	DL	0.857	ELX	-0.866	ELY	0.5		
53	0.9D - 1.0Ev + 1.0Eh_45°	Yes	Y	DL	0.857	ELX	-0.707	ELY	0.707		
54	0.9D - 1.0Ev + 1.0Eh_60°	Yes	Y	DL	0.857	ELX	-0.5	ELY	0.866		
55	0.9D - 1.0Ev + 1.0Eh_90°	Yes	Y	DL	0.857	ELX		ELY	1		
56	0.9D - 1.0Ev + 1.0Eh_120°	Yes	Y	DL	0.857	ELX	0.5	ELY	0.866		
57	0.9D - 1.0Ev + 1.0Eh_135°	Yes	Y	DL	0.857	ELX	0.707	ELY	0.707		
58	0.9D - 1.0Ev + 1.0Eh_150°	Yes	Y	DL	0.857	ELX	0.866	ELY	0.5		
59	0.9D - 1.0Ev + 1.0Eh_180°	Yes	Y	DL	0.857	ELX	1	ELY			
60	0.9D - 1.0Ev + 1.0Eh_210°	Yes	Y	DL	0.857	ELX	0.866	ELY	-0.5		
61	0.9D - 1.0Ev + 1.0Eh_225°	Yes	Y	DL	0.857	ELX	0.707	ELY	-0.707		
62	0.9D - 1.0Ev + 1.0Eh_240°	Yes	Y	DL	0.857	ELX	0.5	ELY	-0.866		
63	0.9D - 1.0Ev + 1.0Eh_270°	Yes	Y	DL	0.857	ELX		ELY	-1		
64	0.9D - 1.0Ev + 1.0Eh_300°	Yes	Y	DL	0.857	ELX	-0.5	ELY	-0.866		
65	0.9D - 1.0Ev + 1.0Eh_315°	Yes	Y	DL	0.857	ELX	-0.707	ELY	-0.707		
66	0.9D - 1.0Ev + 1.0Eh_330°	Yes	Y	DL	0.857	ELX	-0.866	ELY	-0.5		
67	1.2D + 1.5Lm_1 + 1.0Wm_0°	Yes	Y	DL	1.2	5	0.068	37	0.068	OL1	1.5
68	1.2D + 1.5Lm_1 + 1.0Wm_30°	Yes	Y	DL	1.2	6	0.068	38	0.068	OL1	1.5
69	1.2D + 1.5Lm_1 + 1.0Wm_45°	Yes	Y	DL	1.2	7	0.068	39	0.068	OL1	1.5
70	1.2D + 1.5Lm_1 + 1.0Wm_60°	Yes	Y	DL	1.2	8	0.068	40	0.068	OL1	1.5
71	1.2D + 1.5Lm_1 + 1.0Wm_90°	Yes	Y	DL	1.2	9	0.068	41	0.068	OL1	1.5
72	1.2D + 1.5Lm_1 + 1.0Wm_120°	Yes	Y	DL	1.2	10	0.068	42	0.068	OL1	1.5
73	1.2D + 1.5Lm_1 + 1.0Wm_135°	Yes	Y	DL	1.2	11	0.068	43	0.068	OL1	1.5
74	1.2D + 1.5Lm_1 + 1.0Wm_150°	Yes	Y	DL	1.2	12	0.068	44	0.068	OL1	1.5
75	1.2D + 1.5Lm_1 + 1.0Wm_180°	Yes	Y	DL	1.2	13	-0.068	45	-0.068	OL1	1.5
76	1.2D + 1.5Lm_1 + 1.0Wm_210°	Yes	Y	DL	1.2	14	-0.068	46	-0.068	OL1	1.5
77	1.2D + 1.5Lm_1 + 1.0Wm_225°	Yes	Y	DL	1.2	15	-0.068	47	-0.068	OL1	1.5
78	1.2D + 1.5Lm_1 + 1.0Wm_240°	Yes	Y	DL	1.2	16	-0.068	48	-0.068	OL1	1.5
79	1.2D + 1.5Lm_1 + 1.0Wm_270°	Yes	Y	DL	1.2	17	-0.068	49	-0.068	OL1	1.5
80	1.2D + 1.5Lm_1 + 1.0Wm_300°	Yes	Y	DL	1.2	18	-0.068	50	-0.068	OL1	1.5
81	1.2D + 1.5Lm_1 + 1.0Wm_315°	Yes	Y	DL	1.2	19	-0.068	51	-0.068	OL1	1.5
82	1.2D + 1.5Lm_1 + 1.0Wm_330°	Yes	Y	DL	1.2	20	-0.068	52	-0.068	OL1	1.5
83	1.2D + 1.5Lm_2 + 1.0Wm_0°	Yes	Y	DL	1.2	5	0.068	37	0.068	OL2	1.5
84	1.2D + 1.5Lm_2 + 1.0Wm_30°	Yes	Y	DL	1.2	6	0.068	38	0.068	OL2	1.5
85	1.2D + 1.5Lm_2 + 1.0Wm_45°	Yes	Y	DL	1.2	7	0.068	39	0.068	OL2	1.5
86	1.2D + 1.5Lm_2 + 1.0Wm_60°	Yes	Y	DL	1.2	8	0.068	40	0.068	OL2	1.5
87	1.2D + 1.5Lm_2 + 1.0Wm_90°	Yes	Y	DL	1.2	9	0.068	41	0.068	OL2	1.5
88	1.2D + 1.5Lm_2 + 1.0Wm_120°	Yes	Y	DL	1.2	10	0.068	42	0.068	OL2	1.5
89	1.2D + 1.5Lm_2 + 1.0Wm_135°	Yes	Y	DL	1.2	11	0.068	43	0.068	OL2	1.5
90	1.2D + 1.5Lm_2 + 1.0Wm_150°	Yes	Y	DL	1.2	12	0.068	44	0.068	OL2	1.5
91	1.2D + 1.5Lm_2 + 1.0Wm_180°	Yes	Y	DL	1.2	13	-0.068	45	-0.068	OL2	1.5
92	1.2D + 1.5Lm_2 + 1.0Wm_210°	Yes	Y	DL	1.2	14	-0.068	46	-0.068	OL2	1.5
93	1.2D + 1.5Lm_2 + 1.0Wm_225°	Yes	Y	DL	1.2	15	-0.068	47	-0.068	OL2	1.5
94	1.2D + 1.5Lm_2 + 1.0Wm_240°	Yes	Y	DL	1.2	16	-0.068	48	-0.068	OL2	1.5
95	1.2D + 1.5Lm_2 + 1.0Wm_270°	Yes	Y	DL	1.2	17	-0.068	49	-0.068	OL2	1.5

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
96	1.2D + 1.5Lm_2 + 1.0Wm_300°	Yes	Y	DL	1.2	18	-0.068	50	-0.068	OL2	1.5
97	1.2D + 1.5Lm_2 + 1.0Wm_315°	Yes	Y	DL	1.2	19	-0.068	51	-0.068	OL2	1.5
98	1.2D + 1.5Lm_2 + 1.0Wm_330°	Yes	Y	DL	1.2	20	-0.068	52	-0.068	OL2	1.5
99	1.2D + 1.5Lm_3 + 1.0Wm_0°	Yes	Y	DL	1.2	5	0.068	37	0.068	OL3	1.5
100	1.2D + 1.5Lm_3 + 1.0Wm_30°	Yes	Y	DL	1.2	6	0.068	38	0.068	OL3	1.5
101	1.2D + 1.5Lm_3 + 1.0Wm_45°	Yes	Y	DL	1.2	7	0.068	39	0.068	OL3	1.5
102	1.2D + 1.5Lm_3 + 1.0Wm_60°	Yes	Y	DL	1.2	8	0.068	40	0.068	OL3	1.5
103	1.2D + 1.5Lm_3 + 1.0Wm_90°	Yes	Y	DL	1.2	9	0.068	41	0.068	OL3	1.5
104	1.2D + 1.5Lm_3 + 1.0Wm_120°	Yes	Y	DL	1.2	10	0.068	42	0.068	OL3	1.5
105	1.2D + 1.5Lm_3 + 1.0Wm_135°	Yes	Y	DL	1.2	11	0.068	43	0.068	OL3	1.5
106	1.2D + 1.5Lm_3 + 1.0Wm_150°	Yes	Y	DL	1.2	12	0.068	44	0.068	OL3	1.5
107	1.2D + 1.5Lm_3 + 1.0Wm_180°	Yes	Y	DL	1.2	13	-0.068	45	-0.068	OL3	1.5
108	1.2D + 1.5Lm_3 + 1.0Wm_210°	Yes	Y	DL	1.2	14	-0.068	46	-0.068	OL3	1.5
109	1.2D + 1.5Lm_3 + 1.0Wm_225°	Yes	Y	DL	1.2	15	-0.068	47	-0.068	OL3	1.5
110	1.2D + 1.5Lm_3 + 1.0Wm_240°	Yes	Y	DL	1.2	16	-0.068	48	-0.068	OL3	1.5
111	1.2D + 1.5Lm_3 + 1.0Wm_270°	Yes	Y	DL	1.2	17	-0.068	49	-0.068	OL3	1.5
112	1.2D + 1.5Lm_3 + 1.0Wm_300°	Yes	Y	DL	1.2	18	-0.068	50	-0.068	OL3	1.5
113	1.2D + 1.5Lm_3 + 1.0Wm_315°	Yes	Y	DL	1.2	19	-0.068	51	-0.068	OL3	1.5
114	1.2D + 1.5Lm_3 + 1.0Wm_330°	Yes	Y	DL	1.2	20	-0.068	52	-0.068	OL3	1.5
115	1.2D + 1.5Lm_4 + 1.0Wm_0°	Yes	Y	DL	1.2	5	0.068	37	0.068	OL4	1.5
116	1.2D + 1.5Lm_4 + 1.0Wm_30°	Yes	Y	DL	1.2	6	0.068	38	0.068	OL4	1.5
117	1.2D + 1.5Lm_4 + 1.0Wm_45°	Yes	Y	DL	1.2	7	0.068	39	0.068	OL4	1.5
118	1.2D + 1.5Lm_4 + 1.0Wm_60°	Yes	Y	DL	1.2	8	0.068	40	0.068	OL4	1.5
119	1.2D + 1.5Lm_4 + 1.0Wm_90°	Yes	Y	DL	1.2	9	0.068	41	0.068	OL4	1.5
120	1.2D + 1.5Lm_4 + 1.0Wm_120°	Yes	Y	DL	1.2	10	0.068	42	0.068	OL4	1.5
121	1.2D + 1.5Lm_4 + 1.0Wm_135°	Yes	Y	DL	1.2	11	0.068	43	0.068	OL4	1.5
122	1.2D + 1.5Lm_4 + 1.0Wm_150°	Yes	Y	DL	1.2	12	0.068	44	0.068	OL4	1.5
123	1.2D + 1.5Lm_4 + 1.0Wm_180°	Yes	Y	DL	1.2	13	-0.068	45	-0.068	OL4	1.5
124	1.2D + 1.5Lm_4 + 1.0Wm_210°	Yes	Y	DL	1.2	14	-0.068	46	-0.068	OL4	1.5
125	1.2D + 1.5Lm_4 + 1.0Wm_225°	Yes	Y	DL	1.2	15	-0.068	47	-0.068	OL4	1.5
126	1.2D + 1.5Lm_4 + 1.0Wm_240°	Yes	Y	DL	1.2	16	-0.068	48	-0.068	OL4	1.5
127	1.2D + 1.5Lm_4 + 1.0Wm_270°	Yes	Y	DL	1.2	17	-0.068	49	-0.068	OL4	1.5
128	1.2D + 1.5Lm_4 + 1.0Wm_300°	Yes	Y	DL	1.2	18	-0.068	50	-0.068	OL4	1.5
129	1.2D + 1.5Lm_4 + 1.0Wm_315°	Yes	Y	DL	1.2	19	-0.068	51	-0.068	OL4	1.5
130	1.2D + 1.5Lm_4 + 1.0Wm_330°	Yes	Y	DL	1.2	20	-0.068	52	-0.068	OL4	1.5
131	1.2D + 1.5Lm_5 + 1.0Wm_0°	Yes	Y	DL	1.2	5	0.068	37	0.068	OL5	1.5
132	1.2D + 1.5Lm_5 + 1.0Wm_30°	Yes	Y	DL	1.2	6	0.068	38	0.068	OL5	1.5
133	1.2D + 1.5Lm_5 + 1.0Wm_45°	Yes	Y	DL	1.2	7	0.068	39	0.068	OL5	1.5
134	1.2D + 1.5Lm_5 + 1.0Wm_60°	Yes	Y	DL	1.2	8	0.068	40	0.068	OL5	1.5
135	1.2D + 1.5Lm_5 + 1.0Wm_90°	Yes	Y	DL	1.2	9	0.068	41	0.068	OL5	1.5
136	1.2D + 1.5Lm_5 + 1.0Wm_120°	Yes	Y	DL	1.2	10	0.068	42	0.068	OL5	1.5
137	1.2D + 1.5Lm_5 + 1.0Wm_135°	Yes	Y	DL	1.2	11	0.068	43	0.068	OL5	1.5
138	1.2D + 1.5Lm_5 + 1.0Wm_150°	Yes	Y	DL	1.2	12	0.068	44	0.068	OL5	1.5
139	1.2D + 1.5Lm_5 + 1.0Wm_180°	Yes	Y	DL	1.2	13	-0.068	45	-0.068	OL5	1.5
140	1.2D + 1.5Lm_5 + 1.0Wm_210°	Yes	Y	DL	1.2	14	-0.068	46	-0.068	OL5	1.5
141	1.2D + 1.5Lm_5 + 1.0Wm_225°	Yes	Y	DL	1.2	15	-0.068	47	-0.068	OL5	1.5
142	1.2D + 1.5Lm_5 + 1.0Wm_240°	Yes	Y	DL	1.2	16	-0.068	48	-0.068	OL5	1.5
143	1.2D + 1.5Lm_5 + 1.0Wm_270°	Yes	Y	DL	1.2	17	-0.068	49	-0.068	OL5	1.5
144	1.2D + 1.5Lm_5 + 1.0Wm_300°	Yes	Y	DL	1.2	18	-0.068	50	-0.068	OL5	1.5
145	1.2D + 1.5Lm_5 + 1.0Wm_315°	Yes	Y	DL	1.2	19	-0.068	51	-0.068	OL5	1.5
146	1.2D + 1.5Lm_5 + 1.0Wm_330°	Yes	Y	DL	1.2	20	-0.068	52	-0.068	OL5	1.5

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e^{5}°F^{-1}]	Density [k/ft^{3}]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	0.3	0.65	0.527	42	1.4	58	1.3

Hot Rolled Steel Properties (Continued)

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
5	A500 Gr.B Rect	29000	11154	0.3	0.65	0.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.6	60	1.2
7	A1085	29000	11154	0.3	0.65	0.49	50	1.4	65	1.3
8	SAE J429 Grade 2	29000	11154	0.3	0.65	0.49	57	1.5	74	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Platform Horzontal Pipe	PIPE_3.0	Beam	None	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	Offset Tube	HSS4X4X4	Beam	None	A36 Gr.36	Typical	3.37	7.8	7.8	12.8
3	Offset Side Plate	0.38 X 6 Plate	Beam	None	A36 Gr.36	Typical	2.28	0.027	6.84	0.105
4	Grating Angle	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	0.722	0.271	0.271	0.009
5	Mount Pipe	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
6	Offset End Plate	0.5 x 6 Plate	Beam	None	A36 Gr.36	Typical	3	0.063	9	0.237
7	MOD Support Rail	PIPE_2.5	Beam	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
8	MOD SR Conn Plate	PL6x0.375	Beam	None	A36 Gr.36	Typical	2.25	0.026	6.75	0.101
9	MOD SR Conn Angle	L2.5x2.5x4	Beam	None	A36 Gr.36	Typical	1.19	0.692	0.692	0.026
10	MOD SR Bracing	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
11	MOD kickers	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
12	MOD Stand-off	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
13	MOD Threaded Rods	SR 5/8"	Beam	None	SAE J429 Grade 2	Typical	0.307	0.007	0.007	0.015
14	RRU MOUNT PIPE 2.0	PIPE_2.0	Beam	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25

Hot Rolled Steel Design Parameters

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Function
1	A2	Offset Tube	78.319			Lateral
2	M184	Offset End Plate	3.122			Lateral
3	M185	Offset End Plate	4.688			Lateral
4	M186	Offset End Plate	3.122			Lateral
5	M187	Offset Side Plate	0.875			Lateral
6	M188	Offset Side Plate	0.875			Lateral
7	M189	Offset Tube	30.688			Lateral
8	M192	Offset Tube	30.687			Lateral
9	M193	Offset End Plate	4.688			Lateral
10	M199	Offset Side Plate	3			Lateral
11	M200	Offset Side Plate	3			Lateral
12	M204	Grating Angle	50.542			Lateral
13	M206	Grating Angle	50.542			Lateral
14	M298A	Platform Horzontal Pipe	174	59.8	63.7	Lateral
15	M116	Offset Side Plate	0.875			Lateral
16	M117	Offset End Plate	4.688			Lateral
17	M119	Offset Side Plate	0.875			Lateral
18	M120	Offset End Plate	4.688			Lateral
19	A3	Offset Tube	78.319			Lateral
20	M124	Offset End Plate	3.122			Lateral
21	M126	Offset Side Plate	3			Lateral
22	M129	Offset End Plate	3.122			Lateral
23	M130	Offset Tube	30.688			Lateral
24	M131	Offset Tube	30.687			Lateral
25	M132	Offset Side Plate	3			Lateral
26	M216	Grating Angle	50.542			Lateral
27	M223	Offset Side Plate	0.875			Lateral
28	M224	Offset End Plate	4.688			Lateral
29	M226	Offset Side Plate	0.875			Lateral
30	M227	Offset End Plate	4.688			Lateral
31	A1	Offset Tube	78.319			Lateral
32	M231	Offset End Plate	3.122			Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Function
33	M233	Offset Side Plate	3			Lateral
34	M236	Offset End Plate	3.122			Lateral
35	M237	Offset Tube	30.688			Lateral
36	M238	Offset Tube	30.687			Lateral
37	M239	Offset Side Plate	3			Lateral
38	M244	Grating Angle	50.542			Lateral
39	M246	Grating Angle	50.542			Lateral
40	M209	Platform Horzontal Pipe	174	59.8	63.7	Lateral
41	M210	Platform Horzontal Pipe	174	59.8	63.7	Lateral
42	HR1	MOD Support Rail	174	72	63.7	Lateral
43	HR10	MOD Support Rail	174	72	63.7	Lateral
44	HR19	MOD Support Rail	174	72	63.7	Lateral
45	HR37	MOD SR Bracing	57.116			Lateral
46	HR38	MOD SR Bracing	57.116			Lateral
47	HR39	MOD SR Bracing	57.116			Lateral
48	M139	Mount Pipe	96			Lateral
49	M158	Mount Pipe	96			Lateral
50	M166	MOD SR Bracing	20.528			Lateral
51	M168	MOD SR Bracing	20.528			Lateral
52	M211	Mount Pipe	96			Lateral
53	M215	Mount Pipe	96			Lateral
54	M228	Mount Pipe	96			Lateral
55	M313	MOD kickers	62.015			Lateral
56	M333	MOD Stand-off	30.057			Lateral
57	M335	MOD Stand-off	30.057			Lateral
58	M340	MOD Stand-off	30			Lateral
59	M342	MOD Stand-off	30			Lateral
60	M328	MOD Stand-off	30			Lateral
61	M331	MOD Stand-off	30			Lateral
62	M267	Mount Pipe	96			Lateral
63	M269	Mount Pipe	96			Lateral
64	M271	Mount Pipe	96			Lateral
65	M288	Mount Pipe	96			Lateral
66	M290	Mount Pipe	96			Lateral
67	M292	Mount Pipe	96			Lateral
68	M352	Mount Pipe	96			Lateral
69	M360	Mount Pipe	96			Lateral
70	M317	MOD kickers	62.015			Lateral
71	M104	MOD Threaded Rods	7			Lateral
72	M105	MOD Threaded Rods	7			Lateral
73	M107	MOD Threaded Rods	7			Lateral
74	M113	MOD Threaded Rods	7			Lateral
75	M338	Mount Pipe	96			Lateral
76	M339	MOD Threaded Rods	7			Lateral
77	M354	MOD Threaded Rods	7			Lateral
78	M364	Mount Pipe	96			Lateral
79	M370	MOD Threaded Rods	7			Lateral
80	M373	MOD Threaded Rods	7			Lateral
81	M374	MOD Threaded Rods	7			Lateral
82	M376	MOD Threaded Rods	7			Lateral
83	M381	Mount Pipe	96			Lateral
84	M387	MOD Threaded Rods	7			Lateral
85	M390	MOD Threaded Rods	7			Lateral
86	M343	Mount Pipe	96			Lateral
87	M357	Mount Pipe	96			Lateral
88	M358	MOD SR Bracing	20.528			Lateral
89	M396	Mount Pipe	96			Lateral
90	M397	MOD SR Bracing	20.528			Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Function
91	M400	Mount Pipe	96			Lateral
92	M401	MOD SR Bracing	20.528			Lateral
93	M408	Mount Pipe	96			Lateral
94	M409	MOD SR Bracing	20.528			Lateral
95	M410	Mount Pipe	96			Lateral
96	M413	Mount Pipe	96			Lateral
97	M415	Mount Pipe	96			Lateral
98	M424	RRU MOUNT PIPE 2.0	60			Lateral
99	M425	RRU MOUNT PIPE 2.0	60			Lateral
100	M426	RRU MOUNT PIPE 2.0	60			Lateral
101	M429	RRU MOUNT PIPE 2.0	60			Lateral
102	M430	RRU MOUNT PIPE 2.0	60			Lateral
103	M433	RRU MOUNT PIPE 2.0	60			Lateral
104	M302	MOD kickers	62.015			Lateral
105	M303	MOD kickers	62.015			Lateral
106	M310	MOD kickers	62.015			Lateral
107	M312	MOD kickers	62.015			Lateral

Member Advanced Data

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
1	A2			Yes	Default	None
2	M184			Yes	Default	None
3	M185			Yes	Default	None
4	M186			Yes	Default	None
5	M187			Yes	Default	None
6	M188			Yes	Default	None
7	M189			Yes	Default	None
8	M191			Yes	** NA **	None
9	M192			Yes	Default	None
10	M193			Yes	Default	None
11	M194			Yes	** NA **	None
12	M195			Yes	** NA **	None
13	M196			Yes	** NA **	None
14	M197		OOOXOO	Yes	** NA **	None
15	M198		OOOXOO	Yes	** NA **	None
16	M199			Yes	Default	None
17	M200			Yes	Default	None
18	M201		OOOXOO	Yes	** NA **	None
19	M202		OOOXOO	Yes	** NA **	None
20	M203			Yes	** NA **	None
21	M204			Yes	Default	None
22	M205			Yes	** NA **	None
23	M206			Yes	Default	None
24	M207			Yes	** NA **	None
25	M208			Yes	** NA **	None
26	M298A			Yes	Default	None
27	M114		OOOXOO	Yes	** NA **	None
28	M115		OOOXOO	Yes	** NA **	None
29	M116			Yes	Default	None
30	M117			Yes	Default	None
31	M118			Yes	** NA **	None
32	M119			Yes	Default	None
33	M120			Yes	Default	None
34	M122			Yes	** NA **	None
35	A3			Yes	Default	None
36	M124			Yes	Default	None
37	M126			Yes	Default	None
38	M127			Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
39	M129			Yes	Default	None
40	M130			Yes	Default	None
41	M131			Yes	Default	None
42	M132			Yes	Default	None
43	M133			Yes	** NA **	None
44	M134		OOOXOO	Yes	** NA **	None
45	M135		OOOXOO	Yes	** NA **	None
46	M136			Yes	** NA **	None
47	M212			Yes	** NA **	None
48	M216			Yes	Default	None
49	M218			Yes	** NA **	None
50	M219			Yes	** NA **	None
51	M221		OOOXOO	Yes	** NA **	None
52	M222		OOOXOO	Yes	** NA **	None
53	M223			Yes	Default	None
54	M224			Yes	Default	None
55	M225			Yes	** NA **	None
56	M226			Yes	Default	None
57	M227			Yes	Default	None
58	M229			Yes	** NA **	None
59	A1			Yes	Default	None
60	M231			Yes	Default	None
61	M233			Yes	Default	None
62	M234			Yes	** NA **	None
63	M236			Yes	Default	None
64	M237			Yes	Default	None
65	M238			Yes	Default	None
66	M239			Yes	Default	None
67	M240			Yes	** NA **	None
68	M241		OOOXOO	Yes	** NA **	None
69	M242		OOOXOO	Yes	** NA **	None
70	M243			Yes	** NA **	None
71	M244			Yes	Default	None
72	M245			Yes	** NA **	None
73	M246			Yes	Default	None
74	M247			Yes	** NA **	None
75	M248			Yes	** NA **	None
76	M209			Yes	Default	None
77	M210			Yes	Default	None
78	HR1			Yes	Default	None
79	HR10			Yes	Default	None
80	HR19			Yes	Default	None
81	HR31			Yes	** NA **	None
82	HR32			Yes	** NA **	None
83	HR33			Yes	** NA **	None
84	HR34			Yes	** NA **	None
85	HR35			Yes	** NA **	None
86	HR36			Yes	** NA **	None
87	HR37	BenPIN	BenPIN	Yes	Default	None
88	HR38	BenPIN	BenPIN	Yes	Default	None
89	HR39	BenPIN	BenPIN	Yes	Default	None
90	M137			Yes	** NA **	None
91	M138			Yes	** NA **	None
92	M139			Yes	Default	None
93	M158			Yes	Default	None
94	M161			Yes	** NA **	None
95	M162			Yes	** NA **	None
96	M165			Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
97	M166			Yes	Default	None
98	M167			Yes	** NA **	None
99	M168			Yes	Default	None
100	M182			Yes	** NA **	None
101	M190			Yes	** NA **	None
102	M211			Yes	Default	None
103	M213			Yes	** NA **	None
104	M214			Yes	** NA **	None
105	M215			Yes	Default	None
106	M217			Yes	** NA **	None
107	M220			Yes	** NA **	None
108	M228			Yes	Default	None
109	M232			Yes	** NA **	None
110	M235			Yes	** NA **	None
111	M249			Yes	** NA **	None
112	M250			Yes	** NA **	None
113	M251			Yes	** NA **	None
114	M252			Yes	** NA **	None
115	M254			Yes	** NA **	None
116	M255			Yes	** NA **	None
117	M253			Yes	** NA **	None
118	M256			Yes	** NA **	None
119	M257			Yes	** NA **	None
120	M258			Yes	** NA **	None
121	M259			Yes	** NA **	None
122	M260			Yes	** NA **	None
123	M261			Yes	** NA **	None
124	M262			Yes	** NA **	None
125	M272			Yes	** NA **	None
126	M273			Yes	** NA **	None
127	M274			Yes	** NA **	None
128	M275			Yes	** NA **	None
129	M276			Yes	** NA **	None
130	M277			Yes	** NA **	None
131	M278			Yes	** NA **	None
132	M279			Yes	** NA **	None
133	M280			Yes	** NA **	None
134	M283			Yes	** NA **	None
135	M293			Yes	** NA **	None
136	M294			Yes	** NA **	None
137	M295			Yes	** NA **	None
138	M296			Yes	** NA **	None
139	M297			Yes	** NA **	None
140	M298			Yes	** NA **	None
141	M299			Yes	** NA **	None
142	M300			Yes	** NA **	None
143	M301			Yes	** NA **	None
144	M304			Yes	** NA **	None
145	M307			Yes	** NA **	None
146	M311			Yes	** NA **	None
147	M313	BenPIN	BenPIN	Yes	Default	None
148	M333			Yes	Default	None
149	M334			Yes	** NA **	None
150	M335			Yes	Default	None
151	M337			Yes	** NA **	None
152	M340			Yes	Default	None
153	M341			Yes	** NA **	None
154	M342			Yes	Default	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
155	M344			Yes	** NA **	None
156	M327			Yes	** NA **	None
157	M328			Yes	Default	None
158	M329			Yes	** NA **	None
159	M331			Yes	Default	None
160	M263			Yes	** NA **	None
161	M264			Yes	** NA **	None
162	M265			Yes	** NA **	None
163	M267			Yes	Default	None
164	M268			Yes	** NA **	None
165	M269			Yes	Default	None
166	M270			Yes	** NA **	None
167	M271			Yes	Default	None
168	M284			Yes	** NA **	None
169	M285			Yes	** NA **	None
170	M286			Yes	** NA **	None
171	M287			Yes	** NA **	None
172	M288			Yes	Default	None
173	M289			Yes	** NA **	None
174	M290			Yes	Default	None
175	M291			Yes	** NA **	None
176	M292			Yes	Default	None
177	M347			Yes	** NA **	None
178	M348			Yes	** NA **	None
179	M349			Yes	** NA **	None
180	M350			Yes	** NA **	None
181	M351			Yes	** NA **	None
182	M352			Yes	Default	None
183	M330			Yes	** NA **	None
184	M346			Yes	** NA **	None
185	M360			Yes	Default	None
186	M317	BenPIN	BenPIN	Yes	Default	None
187	M321			Yes	** NA **	None
188	M323			Yes	** NA **	None
189	M98			Yes	** NA **	None
190	M99			Yes	** NA **	None
191	M100			Yes	** NA **	None
192	M101			Yes	** NA **	None
193	M102			Yes	** NA **	None
194	M103			Yes	** NA **	None
195	M104	OOOXOO		Yes	Default	None
196	M105	OOOXOO		Yes	Default	None
197	M106			Yes	** NA **	None
198	M107	OOOXOO		Yes	Default	None
199	M108			Yes	** NA **	None
200	M109			Yes	** NA **	None
201	M110			Yes	** NA **	None
202	M111			Yes	** NA **	None
203	M112			Yes	** NA **	None
204	M113	OOOXOO		Yes	Default	None
205	M338			Yes	Default	None
206	M339	OOOXOO		Yes	Default	None
207	M353			Yes	** NA **	None
208	M354	OOOXOO		Yes	Default	None
209	M355			Yes	** NA **	None
210	M361			Yes	** NA **	None
211	M362			Yes	** NA **	None
212	M363			Yes	** NA **	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
213	M364			Yes	Default	None
214	M365			Yes	** NA **	None
215	M366			Yes	** NA **	None
216	M367			Yes	** NA **	None
217	M368			Yes	** NA **	None
218	M369			Yes	** NA **	None
219	M370	OOOXOO		Yes	Default	None
220	M371			Yes	** NA **	None
221	M372			Yes	** NA **	None
222	M373	OOOXOO		Yes	Default	None
223	M374	OOOXOO		Yes	Default	None
224	M375			Yes	** NA **	None
225	M376	OOOXOO		Yes	Default	None
226	M377			Yes	** NA **	None
227	M378			Yes	** NA **	None
228	M379			Yes	** NA **	None
229	M380			Yes	** NA **	None
230	M381			Yes	Default	None
231	M382			Yes	** NA **	None
232	M383			Yes	** NA **	None
233	M384			Yes	** NA **	None
234	M385			Yes	** NA **	None
235	M386			Yes	** NA **	None
236	M387	OOOXOO		Yes	Default	None
237	M388			Yes	** NA **	None
238	M389			Yes	** NA **	None
239	M390	OOOXOO		Yes	Default	None
240	M332			Yes	** NA **	None
241	M336			Yes	** NA **	None
242	M343			Yes	Default	None
243	M345			Yes	** NA **	None
244	M356			Yes	** NA **	None
245	M357			Yes	Default	None
246	M358			Yes	Default	None
247	M359			Yes	** NA **	None
248	M391			Yes	** NA **	None
249	M392			Yes	** NA **	None
250	M393			Yes	** NA **	None
251	M394			Yes	** NA **	None
252	M395			Yes	** NA **	None
253	M396			Yes	Default	None
254	M397			Yes	Default	None
255	M398			Yes	** NA **	None
256	M399			Yes	** NA **	None
257	M400			Yes	Default	None
258	M401			Yes	Default	None
259	M402			Yes	** NA **	None
260	M403			Yes	** NA **	None
261	M404			Yes	** NA **	None
262	M405			Yes	** NA **	None
263	M406			Yes	** NA **	None
264	M407			Yes	** NA **	None
265	M408			Yes	Default	None
266	M409			Yes	Default	None
267	M410			Yes	Default	None
268	M411			Yes	** NA **	None
269	M412			Yes	** NA **	None
270	M413			Yes	Default	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Physical	Deflection Ratio Options	Seismic DR
271	M414			Yes	** NA **	None
272	M415			Yes	Default	None
273	M416			Yes	** NA **	None
274	M417			Yes	** NA **	None
275	M418			Yes	** NA **	None
276	M419			Yes	** NA **	None
277	M420			Yes	** NA **	None
278	M421			Yes	** NA **	None
279	M422			Yes	** NA **	None
280	M423			Yes	** NA **	None
281	M424			Yes	Default	None
282	M425			Yes	Default	None
283	M426			Yes	Default	None
284	M427			Yes	** NA **	None
285	M428			Yes	** NA **	None
286	M429			Yes	Default	None
287	M430			Yes	Default	None
288	M431			Yes	** NA **	None
289	M432			Yes	** NA **	None
290	M433			Yes	Default	None
291	M434			Yes	** NA **	None
292	M435			Yes	** NA **	None
293	M436			Yes	** NA **	None
294	M437			Yes	** NA **	None
295	M438			Yes	** NA **	None
296	M439			Yes	** NA **	None
297	M440			Yes	** NA **	None
298	M441			Yes	** NA **	None
299	M302	BenPIN	BenPIN	Yes	Default	None
300	M303	BenPIN	BenPIN	Yes	Default	None
301	M305			Yes	** NA **	None
302	M306			Yes	** NA **	None
303	M308			Yes	** NA **	None
304	M309			Yes	** NA **	None
305	M310	BenPIN	BenPIN	Yes	Default	None
306	M312	BenPIN	BenPIN	Yes	Default	None
307	M314			Yes	** NA **	None
308	M315			Yes	** NA **	None
309	M316			Yes	** NA **	None
310	M318			Yes	** NA **	None

Node Boundary Conditions

	Node Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot [k-ft/rad]	Y Rot [k-ft/rad]	Z Rot [k-ft/rad]
1	N471	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N303	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N204	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N343	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
5	N446	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
6	N537	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
7	N656	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
8	N661	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
9	N685	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
10	N686	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
11	N699	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
12	N701	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N471	max	2905.588	21	107.028	13	1181.817	21	547.267	21	799.344	21	-0.388	9
2		min	-122.204	13	-2523.971	21	-36.928	13	-40.55	13	-18.533	13	-35.494	33
3	N303	max	1700.713	3	864.909	16	2711.502	19	969.932	7	6609.069	19	1626.351	8
4		min	-1623.981	11	-840.579	8	265.976	11	-949.164	15	-679.211	11	-1610.919	16
5	N204	max	1082.087	16	1433.44	15	3080.877	24	6701.949	24	268.954	18	2132.95	13
6		min	-1057.907	8	-1444.06	7	347.973	16	-463.763	15	-4119.546	26	-2125.111	5
7	N343	max	1147.153	3	1758.617	14	2825.835	30	527.702	6	545.563	4	1484.246	3
8		min	-1173.193	11	-1748.363	6	258.595	6	-6167.911	30	-3630.022	28	-1461.597	11
9	N446	max	2723.46	34	2363.367	33	1106.948	34	26.351	9	772.351	34	43.331	20
10		min	-9.85	10	-8.021	10	7.623	10	-487.831	33	16.703	10	5.33	12
11	N537	max	190.226	3	186.476	15	436.817	27	578.782	7	430.032	3	164.695	15
12		min	-190.227	11	-186.476	7	118.969	51	-578.782	15	-751.909	11	-164.695	7
13	N656	max	193.742	3	182.95	15	436.817	23	427.585	7	683.305	3	160.882	4
14		min	-193.743	11	-182.952	7	118.969	63	-706.713	15	-521.86	11	-160.882	12
15	N661	max	177.564	3	199.136	15	436.817	21	759.662	7	630.305	3	161.02	9
16		min	-177.565	11	-199.135	7	118.969	59	-480.725	15	-468.827	11	-161.073	17
17	N685	max	89.593	18	34.313	18	1203.29	26	428.524	26	26.327	18	0.177	15
18		min	-3702.3	26	-1275.883	26	-12.668	18	2.873	18	-887.99	26	-36.416	23
19	N686	max	696.927	23	78.107	15	1127.946	23	927.563	23	67.603	5	44.293	25
20		min	-12.499	15	-3601.39	23	-8.667	15	-14	15	-48.189	13	4.78	17
21	N699	max	730.464	31	3758.32	31	1172.68	31	40.203	7	73.861	17	-1.5	4
22		min	-31.08	7	-173.051	7	-37.479	7	-964.028	31	-41.001	9	-39.813	28
23	N701	max	40.19	4	1203.729	28	1133.867	28	-13.159	5	18.122	4	41.267	31
24		min	-3480.177	28	-17.367	4	2.916	4	-427.518	29	-827.198	28	3.584	7
25	Totals:	max	7627.152	3	7990.38	15	15402.056	33						
26		min	-7627.2	11	-7990.365	7	4142.652	57						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
1	HR19	PIPE_2.5	0.641	38.463	26	0.417	38.463		27	37773.818	50715	3596.25	3596.25	3	H3-6
2	A3	HSS4X4X4	0.635	0	24	0.14	0	y	28	94969.438	109188	12663	12663	3	H1-1b
3	HR1	PIPE_2.5	0.629	38.463	21	0.412	38.463		21	37773.818	50715	3596.25	3596.25	3	H3-6
4	HR10	PIPE_2.5	0.626	38.463	31	0.407	38.463		32	37773.818	50715	3596.25	3596.25	3	H3-6
5	A1	HSS4X4X4	0.588	0	30	0.125	0	y	11	94969.438	109188	12663	12663	3	H1-1b
6	A2	HSS4X4X4	0.537	0	19	0.127	0	y	16	94969.438	109188	12663	12663	3	H1-1b
7	M113	SR 5/8"	0.412	7	19	0.031	7		19	13314.069	15738.635	163.941	163.941	2.253	H1-1b
8	M390	SR 5/8"	0.41	7	29	0.03	7		30	13314.069	15738.635	163.941	163.941	2.249	H1-1b
9	M373	SR 5/8"	0.407	7	24	0.03	7		24	13314.069	15738.635	163.941	163.941	2.251	H1-1b
10	M292	PIPE_2.0	0.397	27.284	31	0.09	26.779		16	14916.096	32130	1871.625	1871.625	3	H1-1b
11	M104	SR 5/8"	0.396	0	14	0.029	7		14	13314.069	15738.635	163.941	163.941	2.215	H1-1b
12	M228	PIPE_2.0	0.385	27.284	21	0.091	69.221		6	14916.096	32130	1871.625	1871.625	3	H1-1b
13	M413	PIPE_2.0	0.376	80.842	17	0.06	80.842		4	14916.096	32130	1871.625	1871.625	1.798	H1-1b
14	M211	PIPE_2.0	0.376	27.284	23	0.157	26.779		14	14916.096	32130	1871.625	1871.625	3	H1-1b
15	M415	PIPE_2.0	0.375	80.842	7	0.061	80.842		17	14916.096	32130	1871.625	1871.625	1.798	H1-1b
16	M339	SR 5/8"	0.375	0	3	0.027	7		3	13314.069	15738.635	163.941	163.941	2.216	H1-1b
17	M410	PIPE_2.0	0.374	80.842	12	0.061	80.842		15	14916.096	32130	1871.625	1871.625	1.797	H1-1b
18	M374	SR 5/8"	0.374	0	8	0.027	7		8	13314.069	15738.635	163.941	163.941	2.216	H1-1b
19	M271	PIPE_2.0	0.371	27.284	26	0.09	26.779		11	14916.096	32130	1871.625	1871.625	3	H1-1b
20	M267	PIPE_2.0	0.36	27.284	25	0.151	26.779		3	14916.096	32130	1871.625	1871.625	3	H1-1b
21	M288	PIPE_2.0	0.359	27.284	30	0.152	26.779		8	14916.096	32130	1871.625	1871.625	3	H1-1b
22	M105	SR 5/8"	0.321	7	6	0.024	7		6	13314.069	15738.635	163.941	163.941	2.204	H1-1b
23	M400	PIPE_2.0	0.313	68.716	23	0.198	26.779		29	14916.096	32130	1871.625	1871.625	2.695	H1-1b
24	M408	PIPE_2.0	0.304	68.716	29	0.195	26.779		21	14916.096	32130	1871.625	1871.625	2.573	H1-1b
25	M370	SR 5/8"	0.296	7	11	0.022	7		11	13314.069	15738.635	163.941	163.941	2.206	H1-1b
26	M387	SR 5/8"	0.296	7	16	0.022	7		17	13314.069	15738.635	163.941	163.941	2.206	H1-1b
27	M139	PIPE_2.0	0.292	68.716	31	0.206	26.779		19	14916.096	32130	1871.625	1871.625	2.698	H1-1b
28	M397	PIPE_2.0	0.292	10.264	28	0.142	10.264		31	31022.159	32130	1871.625	1871.625	1.122	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
29	M409	PIPE_2.0	0.291	10.264	34	0.136	10.264		20	31022.159	32130	1871.625	1871.625	1.139	H1-1b
30	M166	PIPE_2.0	0.289	10.264	23	0.138	10.264		25	31022.159	32130	1871.625	1871.625	1.124	H1-1b
31	M376	SR 5/8"	0.287	7	30	0.02	7		30	13314.069	15738.635	163.941	163.941	2.241	H1-1b
32	M343	PIPE_2.0	0.282	68.716	30	0.182	26.779		26	14916.096	32130	1871.625	1871.625	2.483	H1-1b
33	M354	SR 5/8"	0.281	7	24	0.02	7		25	13314.069	15738.635	163.941	163.941	2.242	H1-1b
34	M396	PIPE_2.0	0.272	27.284	34	0.188	26.779		31	14916.096	32130	1871.625	1871.625	2.42	H1-1b
35	M429	PIPE_2.0	0.269	44.842	12	0.081	44.842		7	23808.54	32130	1871.625	1871.625	1.671	H1-1b
36	M357	PIPE_2.0	0.266	27.284	21	0.201	26.779		24	14916.096	32130	1871.625	1871.625	2.65	H1-1b
37	M107	SR 5/8"	0.263	7	19	0.019	7		19	13314.069	15738.635	163.941	163.941	2.241	H1-1b
38	M364	PIPE_2.0	0.262	52.042	10	0.078	52.042		11	14916.096	32130	1871.625	1871.625	1.723	H1-1b
39	M381	PIPE_2.0	0.261	52.042	15	0.078	52.042		16	14916.096	32130	1871.625	1871.625	1.723	H1-1b
40	M338	PIPE_2.0	0.26	52.042	5	0.078	52.042		6	14916.096	32130	1871.625	1871.625	1.741	H1-1b
41	M433	PIPE_2.0	0.249	44.842	17	0.061	44.842		12	23808.54	32130	1871.625	1871.625	1.635	H1-1b
42	M425	PIPE_2.0	0.248	44.842	7	0.062	44.842		17	23808.54	32130	1871.625	1871.625	1.633	H1-1b
43	M424	PIPE_2.0	0.243	44.842	17	0.075	44.842		4	23808.54	32130	1871.625	1871.625	1.677	H1-1b
44	M426	PIPE_2.0	0.24	44.842	6	0.075	44.842		10	23808.54	32130	1871.625	1871.625	1.677	H1-1b
45	M335	PIPE_2.0	0.233	30.057	5	0.059	30.057		28	29801.741	32130	1871.625	1871.625	2.172	H1-1b
46	M328	PIPE_2.0	0.23	30	15	0.051	30		23	29810.292	32130	1871.625	1871.625	2.201	H1-1b
47	M342	PIPE_2.0	0.216	30	10	0.053	30		34	29810.292	32130	1871.625	1871.625	2.201	H1-1b
48	M430	PIPE_2.0	0.216	44.842	12	0.058	44.842		15	23808.54	32130	1871.625	1871.625	1.627	H1-1b
49	M352	PIPE_2.0	0.208	17.179	29	0.058	78.821		6	14916.096	32130	1871.625	1871.625	1.76	H1-1b
50	M130	HSS4X4X4	0.207	30.688	23	0.063	30.688	y	24	106874.106	109188	12663	12663	1.734	H1-1b
51	M360	PIPE_2.0	0.207	17.179	23	0.058	78.821		16	14916.096	32130	1871.625	1871.625	1.766	H1-1b
52	M215	PIPE_2.0	0.206	66.695	25	0.062	68.716		14	14916.096	32130	1871.625	1871.625	3	H1-1b
53	M158	PIPE_2.0	0.203	17.179	34	0.06	78.821		11	14916.096	32130	1871.625	1871.625	1.768	H1-1b
54	M237	HSS4X4X4	0.201	30.688	29	0.058	3.553	y	29	106874.106	109188	12663	12663	1.715	H1-1b
55	M333	PIPE_2.0	0.2	30.057	13	0.046	30.057		27	29801.741	32130	1871.625	1871.625	2.106	H1-1b
56	M331	PIPE_2.0	0.198	30	7	0.038	30		22	29810.292	32130	1871.625	1871.625	2.121	H1-1b
57	M131	HSS4X4X4	0.197	0	24	0.063	0	y	24	106874.166	109188	12663	12663	1.748	H1-1b
58	M269	PIPE_2.0	0.19	66.695	30	0.055	27.284		13	14916.096	32130	1871.625	1871.625	3	H1-1b
59	M216	L2x2x3	0.189	50.542	26	0.018	50.542	z	23	9618.956	23392.8	557.717	1137.588	1.5	H2-1
60	M238	HSS4X4X4	0.188	0	30	0.058	0	y	30	106874.166	109188	12663	12663	1.737	H1-1b
61	M290	PIPE_2.0	0.187	66.695	20	0.053	68.716		8	14916.096	32130	1871.625	1871.625	3	H1-1b
62	M340	PIPE_2.0	0.185	30	18	0.04	30		32	29810.292	32130	1871.625	1871.625	2.12	H1-1b
63	M244	L2x2x3	0.182	50.542	29	0.015	50.542	y	30	9618.888	23392.8	557.717	1137.587	1.5	H2-1
64	M192	HSS4X4X4	0.179	0	19	0.054	0	y	19	106874.166	109188	12663	12663	1.73	H1-1b
65	M204	L2x2x3	0.178	50.542	34	0.014	50.542	y	19	9618.888	23392.8	557.717	1137.587	1.5	H2-1
66	M189	HSS4X4X4	0.178	30.688	34	0.051	3.553	y	19	106874.106	109188	12663	12663	1.712	H1-1b
67	M302	PIPE_2.0	0.176	62.015	26	0.079	62.015		23	23326.068	32130	1871.625	1871.625	1.136	H1-1b*
68	M209	PIPE_3.0	0.175	57.695	24	0.085	29.305		30	56075.227	65205	5748.75	5748.75	2.435	H1-1b
69	M313	PIPE_2.0	0.173	62.015	21	0.077	62.015		33	23326.068	32130	1871.625	1871.625	1.136	H1-1b*
70	M298A	PIPE_3.0	0.172	57.695	29	0.084	29.305		19	56075.227	65205	5748.75	5748.75	2.367	H1-1b
71	M310	PIPE_2.0	0.172	62.015	31	0.086	62.015		28	23326.068	32130	1871.625	1871.625	1.136	H1-1b*
72	M312	PIPE_2.0	0.165	62.015	28	0.089	62.015		31	23326.068	32130	1871.625	1871.625	1.136	H1-1b*
73	M303	PIPE_2.0	0.165	62.015	23	0.095	62.015		25	23326.068	32130	1871.625	1871.625	1.136	H1-1b*
74	M317	PIPE_2.0	0.162	62.015	34	0.093	62.015		21	23326.068	32130	1871.625	1871.625	1.136	H1-1b*
75	M210	PIPE_3.0	0.154	117.221	30	0.08	29.305		24	56075.227	65205	5748.75	5748.75	2.338	H1-1b
76	M117	0.5 x 6 Plate	0.149	4.688	7	0.098	0	y	16	91950.093	97200	1012.5	12150	1.093	H1-1b
77	M206	L2x2x3	0.142	50.542	21	0.013	50.542	z	19	9618.956	23392.8	557.717	1137.588	1.5	H2-1
78	M246	L2x2x3	0.137	50.542	31	0.013	50.542	z	30	9618.956	23392.8	557.717	1137.588	1.5	H2-1
79	M120	0.5 x 6 Plate	0.112	0	17	0.102	0	y	70	91950.093	97200	1012.5	12150	1.546	H1-1b
80	M227	0.5 x 6 Plate	0.107	0	6	0.047	0	y	3	91950.093	97200	1012.5	12150	1.142	H1-1b
81	M401	PIPE_2.0	0.107	10.264	4	0.087	0		6	31022.159	32130	1871.625	1871.625	1.245	H1-1b
82	M358	PIPE_2.0	0.107	10.264	8	0.085	0		16	31022.159	32130	1871.625	1871.625	1.403	H1-1b
83	M168	PIPE_2.0	0.102	10.264	3	0.083	0		11	31022.159	32130	1871.625	1871.625	1.413	H1-1b
84	M224	0.5 x 6 Plate	0.093	4.688	6	0.102	0	y	5	91950.093	97200	1012.5	12150	1.404	H1-1b
85	M193	0.5 x 6 Plate	0.091	0	11	0.052	4.688	y	8	91950.093	97200	1012.5	12150	1.266	H1-1b
86	M185	0.5 x 6 Plate	0.086	4.688	10	0.091	0	y	11	91950.093	97200	1012.5	12150	1.668	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [lb-ft]	phi*Mn z-z [lb-ft]	Cb	Eqn
87	M129	0.5 x 6 Plate	0.084	1.495	7	0.148	1.495	y	16	94834.571	97200	1012.5	12150	3	H1-1b
88	M124	0.5 x 6 Plate	0.084	1.495	3	0.131	0	y	70	94834.571	97200	1012.5	12150	3	H1-1b
89	M132	0.38 X 6 Plate	0.079	1.5	14	0.18	3	y	8	71019.885	73872	584.82	9234	3	H1-1b
90	M200	0.38 X 6 Plate	0.076	1.5	13	0.158	3	y	3	71019.885	73872	584.82	9234	2.403	H1-1b
91	HR39	PIPE_2.0	0.075	57.116	27	0.014	57.116		8	24487.657	32130	1871.625	1871.625	1.136	H1-1b*
92	HR37	PIPE_2.0	0.074	57.116	22	0.015	57.116		99	24487.657	32130	1871.625	1871.625	1.136	H1-1b*
93	HR38	PIPE_2.0	0.073	57.116	32	0.017	57.116		13	24487.657	32130	1871.625	1871.625	1.136	H1-1b*
94	M231	0.5 x 6 Plate	0.07	1.495	9	0.103	1.495	y	11	94834.571	97200	1012.5	12150	3	H1-1b
95	M233	0.38 X 6 Plate	0.069	1.5	5	0.159	3	y	28	71020.258	73872	584.82	9234	3	H1-1b
96	M119	0.38 X 6 Plate	0.067	0.875	6	0.252	0.875	y	8	73624.978	73872	584.82	9234	1.236	H1-1b
97	M126	0.38 X 6 Plate	0.064	1.5	5	0.181	3	y	22	71020.258	73872	584.82	9234	3	H1-1b
98	M239	0.38 X 6 Plate	0.059	3	13	0.172	3	y	14	71019.885	73872	584.82	9234	3	H1-1b
99	M186	0.5 x 6 Plate	0.058	0	8	0.138	1.495	y	11	94834.571	97200	1012.5	12150	3	H1-1b
100	M184	0.5 x 6 Plate	0.057	1.495	15	0.102	1.495	y	8	94834.571	97200	1012.5	12150	3	H1-1b
101	M236	0.5 x 6 Plate	0.056	0	3	0.151	1.495	y	6	94834.571	97200	1012.5	12150	3	H1-1b
102	M226	0.38 X 6 Plate	0.054	0	13	0.245	0.875	y	14	73624.978	73872	584.82	9234	1.281	H1-1b
103	M199	0.38 X 6 Plate	0.053	1.5	5	0.133	3	y	17	71020.258	73872	584.82	9234	3	H1-1b
104	M188	0.38 X 6 Plate	0.044	0	18	0.224	0.875	y	3	73624.978	73872	584.82	9234	1.27	H1-1b
105	M187	0.38 X 6 Plate	0.042	0	5	0.221	0.875	y	19	73624.978	73872	584.82	9234	1.227	H1-1b
106	M223	0.38 X 6 Plate	0.038	0.875	5	0.261	0.875	y	29	73624.978	73872	584.82	9234	1.543	H1-1b
107	M116	0.38 X 6 Plate	0.034	0	3	0.284	0.875	y	23	73624.978	73872	584.82	9234	1.439	H1-1b

TOWER-MOUNT CONNECTION ANALYSIS

v.1.0.0

telamon CLS
319 Chapanoke Road, Suite 118
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SITE INFORMATION	
Site ID	302483
Site Name	Brln - Berlin
Project ID	41124-13682691_C8_01-01-MR

ANALYSIS PARAMETERS	
TIA Revision	H

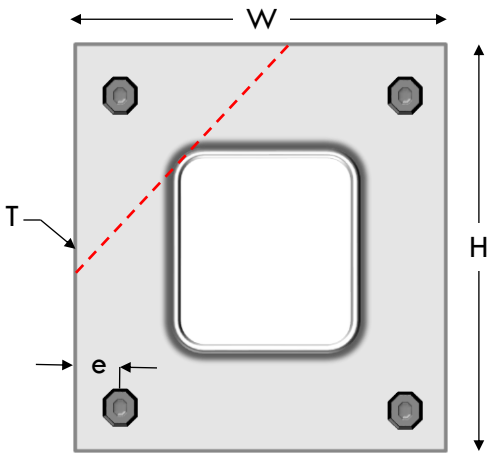
APPLIED FORCES FROM R3D		
Member Label		LC24-A3
Member End Label		I
Force-X	Fx, lbs	-389.3
Force-Y	Fy, lbs	3079.3
Force-Z	Fz, lbs	-15.6
Moment X-X	Mx, lbs-ft	-182.2
Moment Y-Y	My, lbs-ft	177.5
Moment Z-Z	Mz, lbs-ft	7844.1

STANDOFF MEMBER PROPERTIES	
Standoff Member Type	Square/Rect. HSS
Standoff Member Shape	HSS4X4X1/4
Standoff Member Grade	A36
Member to Plate Weld Size, in	3/16

BOLT & PLATE PROPERTIES	
Bolt Quantity	4
Bolt Edge Distance (e), in	1.00
Nominal Bolt Diameter (ØDb), in	0.625
Bolt Grade	A325
Plate Height (H), in	8.00
Plate Width (W), in	8.00
Plate Thickness (T), in	0.75
Plate Grade	A36

BOLT ANALYSIS		
Shear Demand (Vu), k	0.80	
Shear Capacity (ΦRnv), k	13.81	
Tension Demand (Tu), k	11.19	
Tension Capacity (ΦRnt), k	20.34	
Shear Utilization	5.8%	
Tension Utilization	55.0%	PASS
Interaction Utilization	30.6%	

PLATE ANALYSIS		
Moment Demand (Mu), k-in	22.39	
Flexural Capacity (ΦMn), k-in	36.45	
Plate Utilization	61.4%	PASS



MATERIAL PROPERTIES	
Standoff Member - Yield Strength (Fy), ksi	36
Standoff Member - Ultimate Strength (Fu), ksi	58
Bolt - Yield Strength (Fy), ksi	92
Bolt - Tensile Strength (Fu), ksi	120
Plate - Yield Strength (Fy), ksi	36
Plate - Ultimate Strength (Fu), ksi	58

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Tracking number 9505510391972103696762

Delivered
April 18, 10:45AM
Berlin, CT

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Berlin Town Manager

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Tracking number 9505510391972103696793

Town Planner/Zoning Enforcement Officer

Delivered
April 18, 10:45AM
Berlin, CT

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American Tower Corp. Tower Owner

Tracking number 9505510391972103696786

Delivered
April 16, 11:04AM
Woburn, MA

View details on USPS

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DOCKET NO. 40

ORIGINAL

AN APPLICATION SUBMITTED BY THE SOUTHERN NEW ENGLAND TELEPHONE COMPANY FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN THE HARTFORD AND MIDDLESEX COUNTIES.	:	CONNECTICUT SITING COUNCIL
	:	May 15, 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 Southern New England Telephone for the construction, operation, and maintenance of a telecommunications tower and associated equipment to provide cellular service at each of the following sites:

Shuttle Meadow Road, Southington, Connecticut;
Mountain Street, Hartford, Connecticut;
Prestige Park Road, East Hartford, Connecticut;
Beckley Road, Berlin, Connecticut;
Slicer tract, Niederwerfer Road, South Windsor, Connecticut; and
Kikapoo Road, Middlefield, 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 shall be no taller than necessary to provide the proposed service and in no event shall exceed

   a) 150 feet at the Southington site,
   b) 100 feet at the Hartford site,
   c) 150 feet at the East Hartford site,
   d) 150 feet at the Berlin site,
   e) 75 feet at the South Windsor site, and
   f) 75 feet at the Middlefield 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 seven, below, no lights shall be installed on any of these towers.
6. The facility construction shall be conducted 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 South Windsor, Southington, and Berlin 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. The applicant shall comply with the reporting requirements of section 16-50j-87 for all sites. The applicant shall consult with Mrs. Claire Aubin and the Town of South Windsor in the preparation of the South Windsor site D&M.
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(c) 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, Journal Inquirer, and the Middletown Press.

The parties to this proceeding are

Southern New England Telephone Company Room 314 227 Church Street New Haven, Connecticut 06506	(Applicant)
ATTN: Mr. Peter J. Tyrrell, Esquire	(its attorney)
Town of South Windsor 1540 Sullivan Avenue South Windsor, Connecticut 06074	represented by: Mr. Richard M. Rittenband Town Attorney 1734 Ellington Road South Windsor, Connecticut 06074
Frank Niederwerfer 260 Niederwerfer Road South Windsor, Connecticut 06074	(service waived)
Claire Aubin 407 Niederwerfer Road South Windsor, Connecticut 06074	(service waived)

Betty S. Kleiner
Chairman
Hartford Audubon Society, Inc.
5 Flintlock Ridge
Simsbury, Connecticut 06070

(service waived)

Roger Thorpe
2916 Ellington Road
South Windsor, Connecticut 06074

Intervenors in this proceeding are

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

representing:

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

CERTIFICATION

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 15th day of May, 1984.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner John Downey Designee: Commissioner Peter G. Boucher	Yes
Commissioner Stanley Pac Designee: Christopher Cooper	Yes
Owen L. Clark	Yes
Fred J. Doocy	~~Yes~~ Abstain
Mortimer A. Gelston	Yes
James G. Horsfall	Absent
Janet Sitty	Yes
Colin C. Tait	Absent

STATE OF CONNECTICUT)
: ss. New Britain, May 15, 1984
COUNTY OF HARTFORD)

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

CERTIFICATION

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:

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James G. Horsfall	Absent
Janet Sitty	Yes
Colin C. Tait	Absent

STATE OF CONNECTICUT)
: ss. New Britain, May 15, 1984
COUNTY OF HARTFORD)

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