Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

February 19, 2019

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

RE: **Notice of Exempt Modification for AT&T Crown Site BU: 881364**
AT&T Site ID: NEWINGTON SOUTH 10042331
123 Costelo Road Newington, CT 06111
Latitude: 41° 39′ 18.72″ / Longitude: -72° 43′ 17.19″

Dear Ms. Bachman:

AT&T currently maintains 9 antennas at the 105 foot level of the existing 145-foot monopole at 123 Costello Road in Newington, CT. The tower is owned by Crown Castle. The property is owned by Costello Industries Inc. AT&T intends to replace (3) antennas, (6) RRH's and add (1) DC6.

This facility was approved by Newington Town Plan and Zoning Commission in Petition 65-01 on November 28, 2001. This approval included the conditions that:

1. All ground equipment shall be located within an 8' fence enclosure, no equipment shall be placed within 10' side setback area.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Stephen Woods, Mayor, Town of Newington, Craig Minor, Town Planner, as well as the property owner, and Crown Castle is the tower owner.

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

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification 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 replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, AT&T respectfully submits that the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Nesmet Badawi.

Sincerely,

Nesmet Badawi
Real Estate Specialist
1200 MacArthur Blvd Suite 200 Mahwah NJ 07430
201-514-7374
Nesmet.Badawi.Contractor@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Stephen Woods, Mayor, Town of Newington
131 Cedar Street
Newington, CT 06111

Craig Minor
Town Planner- Town of Newington
131 Cedar Street
Newington, CT 06111

Costello Industries Inc.
123 Costello Road
Newington, CT 06111

TOWN OF NEWINGTON

Town Hall • 131 Cedar Street, Newington, Connecticut 06111
Central Telephone (860) 665-8500
Department Telephone (860) 665-8575
Department Fax No. (860) 665-8577

Certified Mail No. 7106 4575 1292 0696 5209
OFFICE OF THE TOWN PLANNER

CERTIFICATE OF ACTION

TO: Kenneth C. Baldwin
Robinson & Cole LLP
280 Trumbull Street
Harford CT 06103-3597

DATE: December 3, 2001

SUBJECT: PETITION 65-01 123 Costello Road, Costello Industries owner, Cellco Partnership d/b/a Verizon Wireless applicant, represented by Kenneth C. Baldwin, Robinson & Cole LLP, 280 Trumbull Street Hartford, CT 06103-3597 requests Special Exception Section 3.2.7 PCS antenna co location and ground base equipment, PD Zone District.

At a meeting held November 28, 2001, the Newington Town Plan and Zoning Commission voted to approve the above referenced PETITION subject to the following conditions:

1. Approval is granted for the placement of Verizon Wireless PCS platform and antenna as a co-locator on the existing monopole at the elevation of 125' as shown on plans prepared by URS Corporation AES, 795 Brook Street Rocky Hill, CT, dated 10-11-01, Sheets T-1, Z-1 and Z-2, entitled "123 Costello Road", Newington, Connecticut."

2. All ground equipment shall be located within an 8' fence enclosure, no equipment shall be placed within 10' side setback area.

3. The approval of this special exception shall be void and of no effect unless construction of the project commences within one year from the date of the Commission's approval. The term "construction" pertains to the installation of the antenna and support ground facilities by the Verizon Wireless.

4. Prior to the installation of the Verizon Wireless antenna building permits shall be obtained.

-1-(Continued on Page 2)

Certified by:

Edmund J. Meehan
Town Planner

This Special Exception will not become effective until this Certificate of Action is filed by the applicant on the Land Records of the Town of Newington.

This Site Plan Modification will not become effective until 1) a transparency of the Certificate of Action is affixed to the original site plan mylar, 2) the modification is incorporated into the site plan and noted as a revision and 3) a mylar copy of the modified signed site plan original mylar is filed in the Town Plan and Zoning Office.

An Autocad DXF File shall be provided to the Town Planner for incorporation into the Town's GIS database at the time of submission of the plan mylar.

ca1128-2/3

Badawi, Nesmet (Contractor)

From: TrackingUpdates@fedex.com
Sent: Wednesday, February 20, 2019 11:19 AM
To: Badawi, Nesmet (Contractor)
Subject: FedEx Shipment 774509269950 Delivered

Your package has been delivered

Tracking # 774509269950

Ship date:
Tue, 2/19/2019

Nesmet Badawi
Crown Castle
MAHWAH, NJ 07430
US

Delivered

Delivery date:
Wed, 2/20/2019 11:15 am

Criag Minor, Town Panner
Town of Newington
131 Cedar Street
NEWINGTON, CT 06111
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	774509269950
Status:	Delivered: 02/20/2019 11:15 AM Signed for By: J.LINGDON
Reference:	1766.6680
Signed for by:	J.LINGDON
Delivery location:	NEWINGTON, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1

Weight:	0.50 lb.
Special handling/Services:	Adult Signature Required
	Deliver Weekday
Standard transit:	2/20/2019 by 10:30 am

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 10:18 AM CST on 02/20/2019.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.

Thank you for your business.

Badawi, Nesmet (Contractor)

From: TrackingUpdates@fedex.com
Sent: Wednesday, February 20, 2019 11:17 AM
To: Badawi, Nesmet (Contractor)
Subject: FedEx Shipment 774509218488 Delivered

Your package has been delivered

Tracking # 774509218488

Ship date:
Tue, 2/19/2019

Nesmet Badawi
Crown Castle
MAHWAH, NJ 07430
US

Delivered

Delivery date:
Wed, 2/20/2019 11:14 am

Mayor Stephen Woods
Town of Newington
131 Cedar Street
NEWINGTON, CT 06111
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	774509218488
Status:	Delivered: 02/20/2019 11:14 AM Signed for By: J.SHONTY
Reference:	1766.6680
Signed for by:	J.SHONTY
Delivery location:	NEWINGTON, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	2.00 lb.

Special handling/Services:	Adult Signature Required
	Deliver Weekday
Standard transit:	2/20/2019 by 10:30 am

Please do not respond to this message. This email was sent from an unattended mailbox. This report was generated at approximately 10:16 AM CST on 02/20/2019.

All weights are estimated.

To track the latest status of your shipment, click on the tracking number above.

Standard transit is the date and time the package is scheduled to be delivered by, based on the selected service, destination and ship date. Limitations and exceptions may apply. Please see the FedEx Service Guide for terms and conditions of service, including the FedEx Money-Back Guarantee, or contact your FedEx Customer Support representative.

Thank you for your business.

Badawi, Nesmet (Contractor)

From: TrackingUpdates@fedex.com
Sent: Tuesday, February 19, 2019 5:37 PM
To: Badawi, Nesmet (Contractor)
Subject: FedEx Shipment 774509313754 Notification

This shipment is scheduled to be sent on 02/19/2019.

See "Preparing for Delivery" for helpful tips

Tracking # 774509313754

Anticipated ship date:
Tue, 2/19/2019

Nesmet Badawi
Crown Castle
MAHWAH, NJ 07430
US

Initiated

Scheduled delivery:
Wed, 2/20/2019 by 10:30 am

Costello Industries Inc.
123 Costello Road
NEWINGTON, CT 06111
US

Shipment Facts

Tracking number:	774509313754
Reference:	1766.6680
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	0.50 lb.
Special handling/Services:	Adult Signature Required
	Deliver Weekday

Preparing for Delivery

To help ensure successful delivery of your shipment, please review the below.

Won't be in?

If an adult (age and required identification vary by country) will not be available to sign for the delivery, you may be able to hold it at a convenient FedEx location for pickup.

The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2015.

Information on the Property Records for the Municipality of Newington was last updated on 2/19/2019.

Parcel Information

Location:	123 COSTELLO RD	Property Use:	Industrial	Primary Use:	Office Warehouse
Unique ID:	C0685500	Map Block Lot:	32/018/00A	Acres:	2.84
490 Acres:	0.00	Zone:	PD	Volume / Page:	1304/ 147
Developers Map / Lot:	S/E 2020 & 2815	Census:			

Value Information

	Appraised Value	Assessed Value
Land	382,500	267,750

	Appraised Value	Assessed Value
Buildings	212,671	148,870
Detached Outbuildings	287,500	201,250
Total	882,671	617,870

Owner's Information

Owner's Data
COSTELLO INDUSTRIES INC PO BOX 370125 WEST HARTFORD CT 06137--012

Building 1

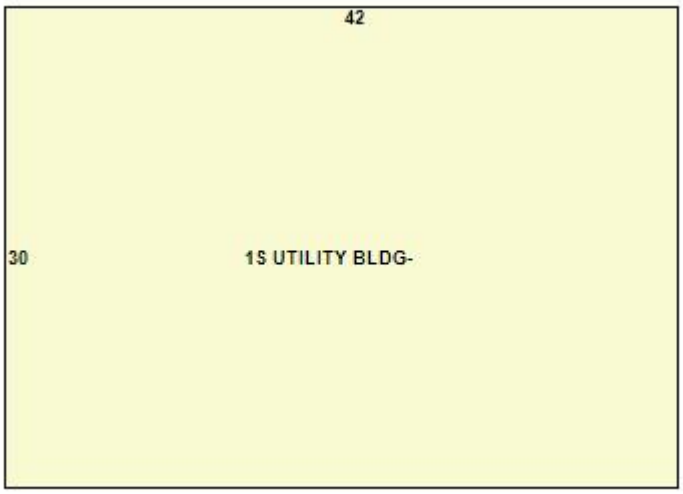
Category:	Industrial	Use:	Warehouse	GLA:	10,150
Stories:	1.00	Construction:	Steel	Year Built:	1975
Heating:	Unit Heater/AC	Fuel:	Natural Gas	Cooling Percent:	0
Siding:	Concrete Block	Roof Material:	Other	Beds/Units:	0

Special Features

Overhead Doors	2

Attached Components

Building 2



Category:	Industrial	Use:	Utility Building	GLA:	1,260

Stories:	1.00	Construction:	Steel	Year Built:	1981
Heating:	Unit Heater/AC	Fuel:	Natural Gas	Cooling Percent:	0
Siding:	Metal	Roof Material:	Other	Beds/Units:	0

Special Features

Overhead Doors	1

Attached Components

Detached Outbuildings

Type:	Year Built:	Length:	Width:	Area:
Paving	1975	1.00	25,000.00	25,000
Cell Tower	1975	0.00	0.00	1

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
COSTELLO INDUSTRIES INC	1304	147	09/03/1999	Quit Claim	No	$0
TAGATAC SANDRA	1304	144	09/03/1999	Quit Claim	No	$0
COSTELLO INDUSTRIES INC	573	98	03/31/1986		No	$0
COSTELLO INDUSTRIES INC	399	332	08/18/1980		No	$0

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
COSTELLO INDUSTRIES INC	385	280	12/18/1979		No	$0
COSTELLO INDUSTRIES INC	385	278	12/18/1979		No	$0
COSTELLO INDUSTRIES INC	314	129	06/06/1977		No	$0
COSTELLO CONSTRUCTION CORP THE	284	147	02/19/1976		No	$0
COSTELLO CONSTRUCTION CORP THE	271	180	06/17/1975		No	$0

Building Permits

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
B-16-927	Foundation	12/12/2016		Closed	Verizon Wireless is looking to replace antenna panels and Remote Radio Heads to existing Cell Tower
B-16-909	Other	12/05/2016		Closed	AT&T to replace three (3) antennas and replace six (6) Triplexors to their existing antennas equipm
E-16-425	Electrical	09/22/2016		Imported Record	INSTALL NEW OUTLETS & LIGHTING IN NEW ADDITION. INSTALL NEW 150A 3PH SUBPANEL IN ADDITION TO FEED
B-16-527	Comm Renovations	05/30/2016		Closed	REPLACE (3) NEW AIR 32 ANTENNA
B-16-531	Comm Renovations	05/30/2016		Closed	BUILD NEW ADDITION ABUTTING EXISTING BUILDING
TB-16-150	Other	03/15/2016		Closed	AT&T (3) ANTENNAS AND (3) RRU'S
B-16-23	Addition	02/19/2016		Closed	T-MOBILE (3) NEW ANTENNAS

Permit Number	Permit Type	Date Opened	Date Closed	Permit Status	Reason
TB-14-114	Remodel	03/07/2014		Closed	ANTENNAS MODIFACATION
TB-13-447	Other	07/26/2013		Closed	6 ANTENNAS CELL TOWER
TB-13-173	Remodel	04/19/2013		Closed	REPLACE (3) ANTENNAS MONOPOLE
B-13-51	Remodel	03/07/2013		Closed	CONCRETE PAD TO 9'X10'
B-12-318	Addition	07/05/2012		Closed	
	Remodel	09/16/2010		Closed	REMOVE & REPLACE 12 EXISTING VERIZON
76610	Other	12/02/2008		Closed	100 AMP TELECOMMUNICATIONS EQUIP
61582	Building	03/27/2001		Closed	FOUND FOR PRE-F
60016	Building	05/16/2000		Closed	ANTENNA'S EXIST
58584	Building	08/23/1999		Closed	REPLACE TOWER

RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of AT&T Mobility, LLC

Crown Castle Site Name: Newington
Crown Castle Site ID: 881364
AT&T Mobility, LLC FA #: 10042331
123 Costello Road
Newington, CT
1/11/2019

Report Status:

AT&T Mobility, LLC Is Compliant

Prepared By:

Sitesafe, LLC

8618 Westwood Center Drive,
Suite 315

Vienna, VA 22182

Voice 703-276-1100
Fax 703-276-1169

Engineering Statement in Re:
Electromagnetic Energy Analysis
Crown Castle
Newington, CT

My signature on the cover of this document indicates:

That I am registered as a Professional Engineer in the jurisdiction indicated; and

That I have extensive professional experience in the wireless communications engineering industry; and

That I am an employee of Sitesafe, LLC in Vienna, Virginia; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission ("the FCC" and "the FCC Rules") both in general and specifically as they apply to the FCC's Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; and

That the technical information serving as the basis for this report was supplied by Crown Castle (See attached Site Summary and Carrier documents), and that AT&T Mobility, LLC's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "Newington" ("the site"); and

That AT&T Mobility, LLC proposes to operate at the site with transmit antennas listed in the carrier summary and with a maximum effective radiated power as specified by AT&T Mobility, LLC and shown on the worksheet, and that worst-case 100% duty cycle have been assumed; and

That in addition to the emitters specified in the worksheet, there are additional collocated point-to-point microwave facilities on this structure and, the antennas used are highly directional oriented at angles at or just below the horizontal and, that the energy present at ground level is typically so low as to be considered insignificant and have not been included in this analysis; and

That this analysis has been performed with the assumption that the ground immediately surrounding the tower is primarily flat or falling; and

That at this time, the FCC requires that certain licensees address specific levels of radio-frequency energy to which workers or members of the public might possibly be exposed (at §1.1307(b) of the FCC Rules); and

That such consideration of possible exposure of humans to radio-frequency radiation must utilize the standards set by the FCC, which is the Federal Agency having jurisdiction over communications facilities; and

That the FCC rules define two tiers of permissible exposure guidelines: 1) "uncontrolled environments," defined as situations in which persons may not be aware of (the "general public"), or may not be able to control their exposure to a transmission facility; and (2) "controlled environments," which defines situations in which persons are aware of their potential for exposure (industry personnel); and

That this statement specifically addresses the uncontrolled environment (which is more conservative than the controlled environment) and the limit set forth in the FCC rules for

licensees of AT&T Mobility, LLC's operating frequency as shown on the attached antenna worksheet; and

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed AT&T Mobility, LLC operation is no more than 4.467% of the maximum in any accessible area on the ground and

That it is understood per FCC Guidelines and OET65 Appendix A, that regardless of the existent radio-frequency environment, only those licenses whose contributions exceed five percent of the exposure limit pertinent to their operation(s) bear any responsibility for bringing any non-compliant area(s) into compliance; and

That when applying the uncontrolled environment standards, the cumulative predicted energy density from the proposed operation is no more than 9.773% of the maximum in any accessible area up to two meters above the ground per OET-65; and

That the calculations provided in this report are based on data provided by the client and antenna pattern data supplied by the antenna manufacturer, in accordance with FCC guidelines listed in OET-65. Horizontal and vertical antenna patterns are combined for modeling purposes to accurately reflect the energy two meters above ground level where on-axis energy refers to maximum energy two meters above the ground along the azimuth of the antenna and where area energy refers to the maximum energy anywhere two meters above the ground regardless of the antenna azimuth, accounting for cumulative energy from multiple antennas for the carrier and frequency range indicated; and

That the Occupational Safety and Health Administration has policies in place which address worker safety in and around communications sites, thus individual companies will be responsible for their employees' training regarding Radio Frequency Safety.

In summary, it is stated here that the proposed operation at the site would not result in exposure of the Public to excessive levels of radio-frequency energy as defined in the FCC Rules and Regulations, specifically 47 CFR 1.1307 and that AT&T Mobility, LLC's proposed operation is completely compliant.

Finally, it is stated that access to the tower should be restricted to communication industry professionals, and approved contractor personnel trained in radio-frequency safety; and that the instant analysis addresses exposure levels at two meters above ground level and does not address exposure levels on the tower, or in the immediate proximity of the antennas.

Crown Castle
Newington
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC	0.708 %
AT&T Mobility, LLC	0.37 %
AT&T Mobility, LLC (Proposed)	0.619 %
AT&T Mobility, LLC (Proposed)	0.716 %
AT&T Mobility, LLC (Proposed)	0.756 %
AT&T Mobility, LLC (Proposed)	0.67 %
AT&T Mobility, LLC (Proposed)	0.628 %
Clearwire	0.133 %
MetroPCS (Decommissioned)	0 %
Sprint	0.363 %
Sprint	0.489 %
Sprint	0.094 %
T-Mobile	0.341 %
T-Mobile	0.384 %
T-Mobile	1.004 %
T-Mobile	0.458 %
Verizon Wireless	0.551 %
Verizon Wireless	0.802 %
Verizon Wireless	0.293 %
Verizon Wireless	0.395 %
Composite Site MPE:	9.773 %

AT&T Mobility, LLC
Newington
Carrier Summary

Frequency:	2300	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	7.0794	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.70794	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
CCI Antennas	OPA-65R-LCUU-H6	105	10	3206	6.278539	0.627854	6.996195	0.699619
CCI Antennas	OPA-65R-LCUU-H6	105	140	3206	6.278539	0.627854	6.996195	0.699619
CCI Antennas	OPA-65R-LCUU-H6	105	260	3206	6.308622	0.630862	6.996195	0.699619

AT&T Mobility, LLC
Newington
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	2.09685	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.37003	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Powerwave	7770	105	10	1094	0.98173	0.173246	1.531598	0.270282
Powerwave	7770	105	140	1094	0.98173	0.173246	1.531598	0.270282
Powerwave	7770	105	260	1094	0.982982	0.173467	1.531598	0.270282

AT&T Mobility, LLC (Proposed)
Newington
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	3.50607	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.61872	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Quintel	QS66512-2	105	10	1996	2.78288	0.491096	3.411766	0.602076
Quintel	QS66512-2	105	140	1996	2.77094	0.488989	3.411766	0.602076
Quintel	QS66512-2	105	260	1996	2.77094	0.488989	3.411766	0.602076

AT&T Mobility, LLC (Proposed)
Newington
Carrier Summary

Frequency:	737	MHz
Maximum Permissible Exposure (MPE):	491.33	µW/cm^2
Maximum power density at ground level:	3.51685	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.71578	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Quintel	QS66512-2	105	10	2239	2.374154	0.483206	3.427935	0.69768
Quintel	QS66512-2	105	140	2239	2.374154	0.483206	3.427935	0.69768
Quintel	QS66512-2	105	260	2239	2.37577	0.483535	3.427935	0.69768

AT&T Mobility, LLC (Proposed)
Newington
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	7.55502	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.7555	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Kathrein-Scala	800-10965	105	10	7114	2.959977	0.295998	6.926796	0.69268
Kathrein-Scala	800-10965	105	140	7114	2.887832	0.288783	6.926796	0.69268
Kathrein-Scala	800-10965	105	260	7114	2.887832	0.288783	6.926797	0.69268

AT&T Mobility, LLC (Proposed)
Newington
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	6.70388	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.67039	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Kathrein-Scala	800-10965	105	10	6168	2.422256	0.242226	5.363826	0.536383
Kathrein-Scala	800-10965	105	140	6168	2.422256	0.242226	5.363827	0.536383
Kathrein-Scala	800-10965	105	260	6168	2.420216	0.242022	5.363826	0.536383

AT&T Mobility, LLC (Proposed)
Newington
Carrier Summary

Frequency:	763	MHz
Maximum Permissible Exposure (MPE):	508.67	µW/cm^2
Maximum power density at ground level:	3.1963	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.62837	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Kathrein-Scala	800-10965	105	10	2959	2.17129	0.426859	2.794324	0.549343
Kathrein-Scala	800-10965	105	140	2959	2.18398	0.429354	2.794324	0.549343
Kathrein-Scala	800-10965	105	260	2959	2.18398	0.429354	2.794324	0.549343

Clearwire
Newington
Carrier Summary

Frequency:	2500	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.33374	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.13337	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ARGUS	LLPX310R	135	60	1542	0.672913	0.067291	1.212084	0.121208
ARGUS	LLPX310R	135	165	1542	0.672913	0.067291	1.212084	0.121208
ARGUS	LLPX310R	135	300	1542	0.667787	0.066779	1.212084	0.121208

MetroPCS (Decommissioned)
Newington
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	0	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Kathrein-Scala	742213	87	10	0	0	0	0	0
Kathrein-Scala	742213	87	150	0	0	0	0	0
Kathrein-Scala	742213	87	270	0	0	0	0	0

Sprint
Newington
Carrier Summary

Frequency:	2500	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	3.63006	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.36301	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVTM14-C-I20	124	10	6168	1.481887	0.148189	2.799938	0.279994
RFS	APXVTM14-C-I20	124	130	6168	1.481887	0.148189	2.799938	0.279994
RFS	APXVTM14-C-I20	124	250	6168	1.481091	0.148109	2.799938	0.279994

Sprint
Newington
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	4.88755	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.48876	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVSPP18-C-A20	124	10	3804	1.112839	0.111284	2.25725	0.225725
RFS	APXVSPP18-C-A20	124	10	3804	1.112839	0.111284	2.25725	0.225725
RFS	APXVSPP18-C-A20	124	130	3804	1.112839	0.111284	2.25725	0.225725
RFS	APXVSPP18-C-A20	124	130	3804	1.112839	0.111284	2.25725	0.225725
RFS	APXVSPP18-C-A20	124	250	3804	1.118657	0.111866	2.25725	0.225725
RFS	APXVSPP18-C-A20	124	250	3804	1.118657	0.111866	2.25725	0.225725

Sprint
Newington
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	0.53065	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.09364	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVSPP18-C-A20	124	10	1084	0.512131	0.090376	0.519398	0.091658
RFS	APXVSPP18-C-A20	124	130	1084	0.512131	0.090376	0.519398	0.091658
RFS	APXVSPP18-C-A20	124	250	1084	0.512131	0.090376	0.519398	0.091658

T-Mobile
Newington
Carrier Summary

Frequency:	700	MHz
Maximum Permissible Exposure (MPE):	466.67	µW/cm^2
Maximum power density at ground level:	1.59237	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.34122	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	95	60	1307	0.956468	0.204957	1.026771	0.220022
RFS	APXVAARR24_43-U-NA20	95	190	1307	0.956468	0.204957	1.026771	0.220022
RFS	APXVAARR24_43-U-NA20	95	320	1307	0.956103	0.204879	1.026771	0.220022

T-Mobile
Newington
Carrier Summary

Frequency:	600	MHz
Maximum Permissible Exposure (MPE):	400	µW/cm^2
Maximum power density at ground level:	1.53589	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.38397	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
RFS	APXVAARR24_43-U-NA20	95	60	1251	0.950094	0.237524	0.952149	0.238037
RFS	APXVAARR24_43-U-NA20	95	190	1251	0.950094	0.237524	0.952149	0.238037
RFS	APXVAARR24_43-U-NA20	95	320	1251	0.950094	0.237524	0.952149	0.238037

T-Mobile
Newington
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	10.03505	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	1.0035	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Ericsson	AIR 21 B2A B4P	95	60	2061	1.133611	0.113361	1.330021	0.133002
Ericsson	AIR 32 B2A-B66AA	95	60	2313	5.602767	0.560277	5.625356	0.562536
Ericsson	AIR 21 B2A B4P	95	190	2061	1.1339	0.11339	1.330021	0.133002
Ericsson	AIR 32 B2A-B66AA	95	190	2313	5.602767	0.560277	5.625356	0.562536
Ericsson	AIR 21 B2A B4P	95	320	2061	1.133611	0.113361	1.330021	0.133002
Ericsson	AIR 32 B2A-B66AA	95	320	2313	5.602767	0.560277	5.625356	0.562536

T-Mobile
Newington
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	4.57564	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.45756	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Ericsson	AIR 21 B2A B4P	95	60	2061	1.133611	0.113361	1.330021	0.133002
Ericsson	AIR 32 B2A-B66AA	95	60	2313	1.255126	0.125513	1.492305	0.14923
Ericsson	AIR 21 B2A B4P	95	190	2061	1.1339	0.11339	1.330021	0.133002
Ericsson	AIR 32 B2A-B66AA	95	190	2313	1.255126	0.125513	1.492305	0.14923
Ericsson	AIR 21 B2A B4P	95	320	2061	1.133611	0.113361	1.330021	0.133002
Ericsson	AIR 32 B2A-B66AA	95	320	2313	1.255126	0.125513	1.492304	0.14923

Verizon Wireless
Newington
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	5.50799	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.5508	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	SBNHH-1D65B	115	330	5154	3.509332	0.350933	5.294519	0.529452
ANDREW	SBNHH-1D65B	115	90	5154	3.505153	0.350515	5.294519	0.529452
ANDREW	SBNHH-1D65B	115	210	5154	3.505153	0.350515	5.29452	0.529452

Verizon Wireless
Newington
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	8.02332	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.80233	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	SBNHH-1D65B	115	330	4583	6.231101	0.62311	7.92798	0.792798
ANDREW	SBNHH-1D65B	115	90	4583	6.231102	0.62311	7.92798	0.792798
ANDREW	SBNHH-1D65B	115	210	4583	6.142292	0.614229	7.92798	0.792798

Verizon Wireless
Newington
Carrier Summary

Frequency:	751	MHz
Maximum Permissible Exposure (MPE):	500.67	µW/cm^2
Maximum power density at ground level:	1.46522	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.29265	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	SBNHH-1D65B	115	330	681	0.382501	0.076398	0.619192	0.123674
ANDREW	SBNHH-1D65B	115	330	681	0.382501	0.076398	0.619192	0.123674
ANDREW	SBNHH-1D65B	115	90	681	0.382997	0.076497	0.619192	0.123674
ANDREW	SBNHH-1D65B	115	90	681	0.382997	0.076497	0.619192	0.123674
ANDREW	SBNHH-1D65B	115	210	681	0.382997	0.076497	0.619192	0.123674
ANDREW	SBNHH-1D65B	115	210	681	0.382997	0.076497	0.619192	0.123674

Verizon Wireless
Newington
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	2.2403	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.39535	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-80063-4CF	115	330	798	0.83361	0.147108	1.104521	0.194915
Antel	BXA-80063-4CF	115	330	798	0.83361	0.147108	1.104521	0.194915
Antel	BXA-80063-4CF	115	90	798	0.83361	0.147108	1.104521	0.194915
Antel	BXA-80063-4CF	115	90	798	0.83361	0.147108	1.104521	0.194915
Antel	BXA-80063-4CF	115	210	798	0.834168	0.147206	1.104521	0.194915
Antel	BXA-80063-4CF	115	210	798	0.834168	0.147206	1.104521	0.194915

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING TOWER:

- INSTALL ANTENNA (800-10965) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL 8843 B2/B66A (AWS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL 4449 B5/B12 (850) (TYP. OF 1 PER SECTOR).
- INSTALL SURGE ARRESTOR (DC6-48-60-18-8F) (TOTAL OF 1).
- INSTALL (2) DC TRUNK CABLES.
- INSTALL SITEPRO1 PLATFORM MOUNT (PART #RMQP-12-H5)(TOTAL OF 1).
- RELOCATE (3) EXISTING ANTENNAS FROM POS. 4 TO POS. 3.

ITEMS TO BE MOUNTED INSIDE EXISTING SHELTER:

- ADD NEW NR BB 6630.

ITEMS TO REMAIN:

- (9) ANTENNAS, (9) RRU'S, (6) TMAS, & (2) SURGE SUPPRESSORS.

SQUID ALARMING (NOT TO BE DAISY CHAINED).

- THE 1ST SQUID INSTALLED WILL BE ALARMED TO THE LOWEST BAND (OR FIRST INSTALLED RRH/RRU ON THE ALPHA SECTOR, IN THE EVENT THE ALARM CABLE CANNOT BE CONNECTED TO ALPHA IT WILL BE ACCEPTABLE TO ALARM TO THE CLOSEST PHYSICAL SECTOR ON AN EXCEPTION BASIS.
- 2ND SQUID INSTALLED WILL BE ALARMED TO THE LOWEST BAND (OR FIRST INSTALLED) RRH/RRU ON THE BETA SECTOR.
- 3RD SQUID INSTALLED WILL BE ALARMED TO THE LOWEST BAND (OR FIRST INSTALLED)
- RRH/RRU ON THE GAMMA SECTOR.

SITE ADDRESS:	123 COSTELLO ROAD NEWINGTON, CT 06111
LATITUDE (NAD 83):	N 41° 39' 18.68"
LONGITUDE (NAD 83):	W 72° 43' 17.20"
LANDLORD:	CROWN CASTLE INTERNATIONAL 500 W. CUMMINGS PARK, STE 3600 WOBURN, MA 01801
TYPE OF SITE:	MONOPOLE/INDOOR
TOWER HEIGHT:	145'
RAD CENTER:	105'
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CT1108

FA NUMBER: 10042331

SITE NAME: NEWINGTON SOUTH

CROWN SITE NAME: NEWINGTON

PROJECT: LTE 7C/5G NR UPGRADE/4TX4RX SOFTWARE RETROFIT/4TX4RX SOFTWARE RETROFIT

PACE ID: MRCTB035010, MRCTB034953, MRCTB034937, MRCTB034941

BU#: 881364

NOTE:

ALL CONSTRUCTION ACTIVITIES ARE TO BE COMPLETED DIRECTLY THROUGH CROWN. CONTRACTOR MUST HAVE CONSTRUCTION PO AND NTP FROM CROWN DIRECT IN ORDER TO BEGIN. PRE-APPROVAL TO ENTER THE PROPERTY MUST BE OBTAINED. FOR ACCESS AUTHORIZATION, PLEASE CONTACT CROWN.

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO:	EP4TURNL
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

1	02/12/19	ISSUED FOR CONSTRUCTION
0	12/20/18	ISSUED FOR PERMITTING

FA# 10042331
SITE# CT1108
NEWINGTON SOUTH

123 COSTELLO ROAD
NEWINGTON, CT 06111

TITLE SHEET

T-1

DRAWING INDEX

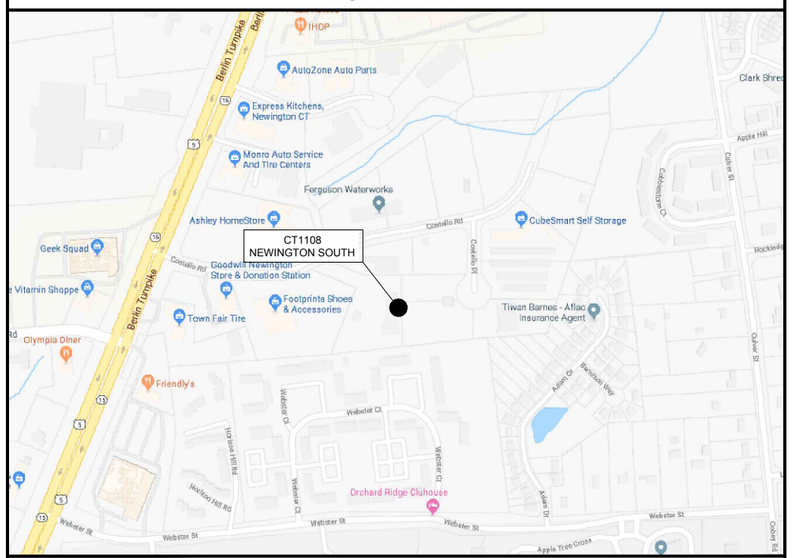
SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
GN-1	GENERAL NOTES I
GN-2	GENERAL NOTES II
C-1	SITE PLAN
C-2	EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION
C-3	EXISTING & PROPOSED ANTENNA LAYOUT
C-4	EQUIPMENT DETAILS
S-1	MOUNT MODIFICATION DETAIL 1
S-2	MOUNT MODIFICATION DETAIL 2
S-3	MOUNT MODIFICATION DETAIL 3
RF-1	ANTENNA CHART & RF EQUIPMENT SCHEMATIC
G-1	GROUNDING DETAILS

CROWN CASTLE SITE ID #: 881364
CROWN CASTLE SITE NAME: NEWINGTON

ENGINEERING

2018 CONNECTICUT STATE BUILDING CODE
2015 INTERNATIONAL BUILDING CODE
2009 ICC/ANSI A117.1 ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES
2015 INTERNATIONAL MECHANICAL CODE
2015 INTERNATIONAL ENERGY CONVERSATION CODE
2017 NFPA 70 NATIONAL ELECTRICAL CODE
ANSI/TIA-222-G

VICINITY MAP



SHELTER DOOR 0043 LEGACY ORANGEIN ROCKY HILL, TAKE EXIT 23 OFF I-91(FROM EITHER NORTH OR SOUTH), AND GO WEST TO ROUTE 3. TAKE ROUTE 3 NORTH 7/10 MILE TO ROUTE 160 WEST. FOLLOW ROUTE 160 WEST FOR 3.2 MILES TO THE BERLIN TURNPIKE (ROUTES 5/15). TAKE A RIGHT ONTO THE TURNPIKE AND GO 1 MILE AND LOOK FOR COSTELLO ROAD ON THE RIGHT (DUNKIN DONUTS IS ON THE CORNER). THE TOWER SITE ENTRANCE IS 2/10 MILE UP ON THE RIGHT BEHIND THE COSTELLO EXCAVATION COMPANY. ENTER THROUGH THE EXCAVATION COMPANYS DRIVEWAY. COMBINATION LOCK 3749 AS RECEIVED PER THE COSTELLO EXCAVATION BUILDING OWNER.T-1 INFO GSM 1 HCGS 713570 2 HCGS 713571 3 HCGS 718938 UMTS 1 HCGS 731693 2 HCGS 731694 ADDRESS:123 COSTELLO ROAD, NEWINGTON, CT.ACCESS: 24/7 LOCK COMBO AT MAIN GATE 3749, COMPOUND GATE IS 5000 OR 2500CONTACT: SPRINT SITE.SECURITY: NO ISSUES POWER COMPANY: NORTHEAST UTILITIES (800) 286-2000 FIRE: (860-667-5900)POLICE: 860-666-8445TORACLE

GENERAL NOTES

1. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CONNECTICUT ONE CALL SYSTEM, INC.
1-800-922-4455
STOP - CALL BEFORE YOU DIG!

UNDERGROUND SERVICE ALERT

CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

NOT FOR CONSTRUCTION

PART 1 - GENERAL

1.1 GENERAL CONDITIONS:

A. CONTRACTOR SHALL INSPECT THE EXISTING SITE CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.

B. THE CONTRACTOR SHALL OBTAIN PERMITS, LICENSES, MAKE ALL DEPOSITS, AND PAY ALL FEES REQUIRED FOR THE CONSTRUCTION PERFORMANCE FOR THE WORK UNDER THIS SECTION.

C. DRAWINGS SHOW THE GENERAL ARRANGEMENT OF ALL SYSTEMS AND COMPONENTS COVERED UNDER THIS SECTION. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS. DRAWING SHALL NOT BE SCALED TO DETERMINE DIMENSIONS.

1.2 LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES.

A. ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE, AND ALL APPLICABLE LOCAL LAWS, REGULATIONS, ORDINANCES, STATUTES AND CODES. CONDUIT BENDS SHALL BE THE RADIUS BEND FOR THE TRADE SIZE OF CONDUIT IN COMPLIANCE WITH THE LATEST EDITIONS OF NEC.

1.3 REFERENCES:

A. THE PUBLICATIONS LISTED BELOW ARE PART OF THIS SPECIFICATION. EACH PUBLICATION SHALL BE THE LATEST REVISION AND ADDENDUM IN EFFECT ON THE DATE. THIS SPECIFICATION IS ISSUED FOR CONSTRUCTION UNLESS OTHERWISE NOTED. EXCEPT AS MODIFIED BY THE REQUIREMENT SPECIFIED HEREIN OR THE DETAILS OF THE DRAWINGS, WORK INCLUDED IN THIS SPECIFICATION SHALL CONFORM TO THE APPLICABLE PROVISION OF THESE PUBLICATIONS.

1. ANSI/IEEE (AMERICAN NATIONAL STANDARDS INSTITUTE)
2. ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)
3. ICEA (INSULATED CABLE ENGINEERS ASSOCIATION)
4. NEMA (NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION)
5. NFPA (NATIONAL FIRE PROTECTION ASSOCIATION)
6. OSHA (OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION)
7. UL (UNDERWRITERS LABORATORIES INC.)
8. AT&T GROUNDING AND BONDING STANDARDS TP-76416

1.4 SCOPE OF WORK

A. WORK UNDER THIS SECTION SHALL CONSIST OF FURNISHING ALL LABOR, MATERIAL, AND ASSOCIATED SERVICES REQUIRED TO COMPLETE REQUIRED CONSTRUCTION AND BE OPERATIONAL.

B. ALL ELECTRICAL EQUIPMENT UNDER THIS CONTRACT SHALL BE PROPERLY TESTED, ADJUSTED, AND ALIGNED BY THE CONTRACTOR.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL EXCAVATING, DRAINING, TRENCHES, BACKFILLING, AND REMOVAL OF EXCESS DIRT.

D. THE CONTRACTOR SHALL FURNISH TO THE OWNER WITH CERTIFICATES OF A FINAL INSPECTION AND APPROVAL FROM THE INSPECTION AUTHORITIES HAVING JURISDICTION.

E. THE CONTRACTOR SHALL PREPARE A COMPLETE SET OF AS-BUILT DRAWINGS, DOCUMENT ALL WIRING EQUIPMENT CONDITIONS, AND CHANGES WHILE COMPLETING THIS CONTRACT. THE AS-BUILT DRAWINGS SHALL BE SUBMITTED AT COMPLETION OF THE PROJECT.

PART 2 - PRODUCTS

2.1 GENERAL:

A. ALL MATERIALS AND EQUIPMENT SHALL BE UL LISTED, NEW, AND FREE FROM DEFECTS.

B. ALL ITEMS OF MATERIALS AND EQUIPMENT SHALL BE ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION AS SUITABLE FOR THE USE INTENDED.

C. ALL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES LABEL OF APPROVAL, AND SHALL CONFORM TO REQUIREMENT OF THE NATIONAL ELECTRICAL CODE.

D. ALL OVERCURRENT DEVICES SHALL HAVE AN INTERRUPTING CURRENT RATING THAT SHALL BE GREATER THAN THE SHORT CIRCUIT CURRENT TO WHICH THEY ARE SUBJECTED, 10,000 AIC MINIMUM. VERIFY AVAILABLE SHORT CIRCUIT CURRENT DOES NOT EXCEED THE RATING OF ELECTRICAL EQUIPMENT IN ACCORDANCE WITH ARTICLE 110.24 NEC OR THE MOST CURRENT ADOPTED CODE PER THE GOVERNING JURISDICTION.

2.2 MATERIALS AND EQUIPMENT:

A. CONDUIT:

1. RIGID METAL CONDUIT (RMC) SHALL BE HOT-DIPPED GALVANIZED INSIDE AND OUTSIDE INCLUDING ENDS AND THREADS AND ENAMELED OR LACQUERED INSIDE IN ADDITION TO GALVANIZING.
2. LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE UL LISTED.
3. CONDUIT CLAMPS, STRAPS AND SUPPORTS SHALL BE STEEL OR MALLEABLE IRON. ALL FITTINGS SHALL BE COMPRESSION AND CONCRETE TIGHT TYPE. GROUNDING BUSHINGS WITH INSULATED THROATS SHALL BE INSTALLED ON ALL CONDUIT TERMINATIONS.
4. NONMETALLIC CONDUIT AND FITTINGS SHALL BE SCHEDULE 40 PVC. INSTALL USING SOLVENT-CEMENT-TYPE JOINTS AS RECOMMENDED BY THE MANUFACTURER.

B. CONDUCTORS AND CABLE:

1. CONDUCTORS AND CABLE SHALL BE FLAME-RETARDANT, MOISTURE AND HEAT RESISTANT THERMOPLASTIC, SINGLE CONDUCTOR, COPPER, TYPE THHN/THWN-2, 600 VOLT, SIZE AS INDICATED, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR USED.
2. #10 AWG AND SMALLER CONDUCTOR SHALL BE SOLID OR STRANDED AND #8 AWG AND LARGER CONDUCTORS SHALL BE STRANDED.
3. SOLDERLESS, COMPRESSION-TYPE CONNECTORS SHALL BE USED FOR TERMINATION OF ALL STRANDED CONDUCTORS.
4. STRAIN-RELIEF SUPPORTS GRIPS SHALL BE HUBBELL KELLEMS OR APPROVED EQUAL. CABLES SHALL BE SUPPORTED IN ACCORDANCE WITH THE NEC AND CABLE MANUFACTURER'S RECOMMENDATIONS.
5. ALL CONDUCTORS SHALL BE TAGGED AT BOTH ENDS OF THE CONDUCTOR, AT ALL PULL BOXES, J-BOXES, EQUIPMENT AND CABINETS AND SHALL BE IDENTIFIED WITH APPROVED PLASTIC TAGS (ACTION CRAFT, BRADY, OR APPROVED EQUAL).

C. DISCONNECT SWITCHES:

1. DISCONNECT SWITCHES SHALL BE HEAVY DUTY, DEAD-FRONT, QUICK-MAKE, QUICK-BREAK, EXTERNALLY OPERABLE, HANDLE LOCKABLE AND INTERLOCK WITH COVER IN CLOSED POSITION, RATING AS INDICATED, UL LABELED FURNISHED IN NEMA 3R ENCLOSURE, SQUARE-D OR ENGINEER APPROVED EQUAL.

D. CHEMICAL ELECTROLYTIC GROUNDING SYSTEM:

1. INSTALL CHEMICAL GROUNDING AS REQUIRED. THE SYSTEM SHALL BE ELECTROLYTIC MAINTENANCE FREE ELECTRODE CONSISTING OF RODS WITH A MINIMUM #2 AWG CU EXOTHERMICALLY WELDED PIGTAIL, PROTECTIVE BOXES, AND BACKFILL MATERIAL. MANUFACTURER SHALL BE LYNCOLE XIT GROUNDING ROD TYPES K2-(*)CS OR K2L-(*)CS (*) LENGTH AS REQUIRED.
2. GROUND ACCESS BOX SHALL BE A POLYPLASTIC BOX FOR NON-TRAFFIC APPLICATIONS, INCLUDING BOLT DOWN FLUSH COVER WITH "BREATHER" HOLES, XIT MODEL #XB-22. ALL DISCONNECT SWITCHES AND CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED LAMICOID NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS ID NUMBERING, AND THE ELECTRICAL POWER SOURCE.
3. BACKFILL MATERIAL SHALL BE LYNCONITE AND LYNCOLE GROUNDING GRAVEL.

E. SYSTEM GROUNDING:

1. ALL GROUNDING COMPONENTS SHALL BE TINNED AND GROUNDING CONDUCTOR SHALL BE #2 AWG BARE, SOLID, TINNED, COPPER. ABOVE GRADE GROUNDING CONDUCTORS SHALL BE INSULATED WHERE NOTED.
2. GROUNDING BUSES SHALL BE BARE, TINNED, ANNEALED COPPER BARS OF RECTANGULAR CROSS SECTION. STANDARD BUS BARS MGB, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. THEY SHALL NOT BE FABRICATED OR MODIFIED IN THE FIELD. ALL GROUNDING BUSES SHALL BE IDENTIFIED WITH MINIMUM 3/4" LETTERS BY WAY OF STENCILING OR DESIGNATION PLATE.
3. CONNECTORS SHALL BE HIGH-CONDUCTIVITY, HEAVY DUTY, LISTED AND LABELED AS GROUNDING CONNECTORS FOR THE MATERIALS USED. USE TWO-HOLE COMPRESSION LUGS WITH HEAT SHRINK FOR MECHANICAL CONNECTIONS. INTERIOR CONNECTIONS USE TWO-HOLE COMPRESSION LUGS WITH INSPECTION WINDOW AND CLEAR HEAT SHRINK.
4. EXOTHERMIC WELDED CONNECTIONS SHALL BE PROVIDED IN KIT FORM AND SELECTED FOR THE SPECIFIC TYPES, SIZES, AND COMBINATIONS OF CONDUCTORS AND OTHER ITEMS TO BE CONNECTED.
5. GROUND RODS SHALL BE COPPER-CLAD STEEL WITH HIGH-STRENGTH STEEL CORE AND ELECTROLYTIC-GRADE COPPER OUTER SHEATH, MOLTEN WELDED TO CORE, 5/8"x10'-0". ALL GROUNDING RODS SHALL BE INSTALLED WITH INSPECTION SLEEVES.
6. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS IN COMPLIANCE WITH THE AT&T SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULLBOXES, DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.

F. OTHER MATERIALS:

6. THE CONTRACTOR SHALL PROVIDE OTHER MATERIALS, THOUGH NOT SPECIFICALLY DESCRIBED, WHICH ARE REQUIRED FOR A COMPLETELY OPERATIONAL SYSTEM AND PROPER INSTALLATION OF THE WORK.
7. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.

G. PANELS AND LOAD CENTERS:

1. ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN.

PART 3 - EXECUTION

3.1 GENERAL:

A. ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. EQUIPMENT SHALL BE TIGHTLY COVERED AND PROTECTED AGAINST DIRT OR WATER, AND AGAINST CHEMICAL OR MECHANICAL INJURY DURING INSTALLATION AND CONSTRUCTION PERIODS.

3.2 LABOR AND WORKMANSHIP:

A. ALL LABOR FOR THE INSTALLATION OF MATERIALS AND EQUIPMENT FURNISHED FOR THE ELECTRICAL SYSTEM SHALL BE INSTALLED BY EXPERIENCED WIREMEN, IN A NEAT AND WORKMAN-LIKE MANNER.

B. ALL ELECTRICAL EQUIPMENT SHALL BE ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.

C. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT, REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.

3.3 COORDINATION:

A. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ELECTRICAL ITEMS WITH THE OWNER-FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

3.4 INSTALLATION:

A. CONDUIT:

1. ALL ELECTRICAL WIRING SHALL BE INSTALLED IN CONDUIT AS SPECIFIED. NO CONDUIT OR TUBING OF LESS THAN 3/4 INCH TRADE SIZE.
2. PROVIDE RIGID PVC SCHEDULE 80 CONDUITS FOR ALL RISERS, RMC OTHERWISE NOTED. EMT MAY BE INSTALLED FOR EXTERIOR CONDUITS WHERE NOT SUBJECT TO PHYSICAL DAMAGE.
3. INSTALL SCHEDULE 40 PVC CONDUIT WITH A MINIMUM COVER OF 24" UNDER ROADWAYS, PARKING LOTS, STREETS, AND ALLEYS. CONDUIT SHALL HAVE A MINIMUM COVER OF 18" IN ALL OTHER NON-TRAFFIC APPLICATIONS (REFER TO 2017 NEC, TABLE 300.5).
4. USE GALVANIZED FLEXIBLE STEEL CONDUIT WHERE DIRECT CONNECTION TO EQUIPMENT WITH MOVEMENT, VIBRATION, OR FOR EASE OF MAINTENANCE. USE LIQUID TIGHT, FLEXIBLE METAL CONDUIT FOR OUTDOOR APPLICATIONS. INSTALL GALVANIZED FLEXIBLE STEEL CONDUIT AT ALL POINTS OF CONNECTION TO EQUIPMENT MOUNTED ON SUPPORT TO ALLOW FOR EXPANSION AND CONTRACTION.
5. A RUN OF CONDUIT BETWEEN BOXES OR EQUIPMENT SHALL NOT CONTAIN MORE THAN THE EQUIVALENT OF THREE QUARTER-BENDS. CONDUIT BEND SHALL BE MADE WITH THE UL LISTED BENDER OR FACTORY 90 DEGREE ELBOWS MAY BE USED.
6. FIELD FABRICATED CONDUITS SHALL BE CUT SQUARE WITH A CONDUIT CUTTING TOOL AND REAMED TO PROVIDE A SMOOTH INSIDE SURFACE.
7. PROVIDE INSULATED GROUNDING BUSHING FOR ALL CONDUITS.
8. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL CONDUITS DURING CONSTRUCTION. TEMPORARY OPENINGS IN THE CONDUIT SYSTEM SHALL BE PLUGGED OR CAPPED TO PREVENT ENTRANCE OF MOISTURE OR FOREIGN MATTER. CONTRACTOR SHALL REPLACE ANY CONDUITS CONTAINING FOREIGN MATERIALS THAT CANNOT BE REMOVED.
9. ALL CONDUITS SHALL BE SWABBED CLEAN BY PULLING AN APPROPRIATE SIZE MANDREL THROUGH THE CONDUIT BEFORE INSTALLATION OF CONDUCTORS OR CABLES. CONDUIT SHALL BE FREE OF DIRT AND DEBRIS.
10. INSTALL PULL STRINGS IN ALL CLEAN EMPTY CONDUITS. IDENTIFY PULL STRINGS AT EACH END.
11. INSTALL 2" HIGHLY VISIBLE AND DETECTABLE TAPE 12" ABOVE ALL UNDERGROUND CONDUITS AND CONDUCTORS.
12. CONDUITS SHALL BE INSTALLED IN SUCH A MANNER AS TO INSURE AGAINST COLLECTION OF TRAPPED CONDENSATION.
13. PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS TO ALLOW FOR RACEWAYS AND CABLES TO BE ROUTED THROUGH THE BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE EFFECTIVELY SEALED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FIRE STOPS AT FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE, AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.

B. CONDUCTORS AND CABLE:

1. ALL POWER WIRING SHALL BE COLOR CODED AS FOLLOWS:

DESCRIPTION	208/240/120 VOLT SYSTEMS
PHASE A	BLACK
PHASE B	RED
PHASE C	BLUE
NEUTRAL	WHITE
GROUNDING	GREEN

2. SPLICES SHALL BE MADE ONLY AT OUTLETS, JUNCTION BOXES, OR ACCESSIBLE RACEWAY CONDUITS APPROVED FOR THIS PURPOSE.
3. PULLING LUBRICANTS SHALL BE UL APPROVED. CONTRACTOR SHALL USE NYLON OR HEMP ROPE FOR PULLING CONDUCTOR OR CABLES INTO THE CONDUIT.
4. CABLES SHALL BE NEATLY TRAINED, WITHOUT INTERLACING, AND BE OF SUFFICIENT LENGTH IN ALL BOXES & EQUIPMENT TO PERMIT MAKING A NEAT ARRANGEMENT. CABLES SHALL BE SECURED IN A MANNER TO AVOID TENSION ON CONDUCTORS OR TERMINALS. CONDUCTORS SHALL BE PROTECTED FROM MECHANICAL INJURY AND MOISTURE. SHARP BENDS OVER CONDUIT BUSHINGS IS PROHIBITED. DAMAGED CABLES SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

C. DISCONNECT SWITCHES:

1. INSTALL DISCONNECT SWITCHES LEVEL AND PLUMB. CONNECT TO WIRING SYSTEM AND GROUNDING SYSTEM AS INDICATED.

D. GROUNDING:

1. ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, AT&T GROUNDING AND BONDING STANDARDS TP-76416, ND-00135, AND THE NATIONAL ELECTRICAL CODE.
2. PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
3. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES.
4. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND WHERE THE MAIN GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUNDING RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN 2/0 AWG COPPER. ROOFTOP GROUNDING RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY). SEE STANDARD 6.3.2.2.
5. TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING.
6. CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN-POINTS TO THE EXISTING GROUNDING SYSTEM. ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
8. APPLY CORROSION-RESISTANT FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED. USE KOPR-SHIELD ANTI-OXIDATION COMPOUND ON ALL COMPRESSION GROUNDING CONNECTIONS.
9. A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
10. BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE #6 AWG GROUNDING CONDUCTOR TO A GROUND BUS.
11. DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 36" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
12. ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
13. THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
14. DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 36" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES.
15. IF COAX ON THE ICE BRIDGE IS MORE THAN 6 FT. FROM THE GROUNDING BAR AT THE BASE OF THE TOWER, A SECOND GROUNDING BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE, TO GROUND THE COAX CABLE GROUNDING KITS AND IN-LINE ARRESTORS.
16. CONTRACTOR SHALL REPAIR, AND/OR REPLACE, EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.

3.5 ACCEPTANCE TESTING:

A. CERTIFIED PERSONNEL USING CERTIFIED EQUIPMENT SHALL PERFORM REQUIRED TESTS AND SUBMIT WRITTEN TEST REPORTS UPON COMPLETION.

B. WHEN MATERIAL AND/OR WORKMANSHIP IS FOUND NOT TO COMPLY WITH THE SPECIFIED REQUIREMENTS, THE NON-COMPLYING ITEMS SHALL BE REMOVED FROM THE PROJECT SITE AND REPLACED WITH ITEMS COMPLYING WITH THE SPECIFIED REQUIREMENTS PROMPTLY AFTER RECEIPT OF NOTICE FOR NON-COMPLIANCE.

C. TEST PROCEDURES:

1. ALL FEEDERS SHALL HAVE INSULATION TESTED AFTER INSTALLATION, BEFORE CONNECTION TO DEVICES. THE CONDUCTORS SHALL TEST FREE FROM SHORT CIRCUITS AND GROUNDS. TESTING SHALL BE FOR ONE MINUTE USING 1000V DC. PROVIDE WRITTEN DOCUMENTATION FOR ALL TEST RESULTS.
2. PRIOR TO ENERGIZING CIRCUITRY, TEST WIRING DEVICES FOR ELECTRICAL CONTINUITY AND PROPER POLARITY CONNECTIONS.
3. MEASURE AND RECORD VOLTAGES BETWEEN PHASES AND BETWEEN PHASE CONDUCTORS AND NEUTRALS. SUBMIT A REPORT OF MAXIMUM AND MINIMUM VOLTAGES.
4. PERFORM GROUNDING TEST TO MEASURE GROUNDING RESISTANCE OF GROUNDING SYSTEM USING THE IEEE STANDARD 3-POINT "FALL-OF-POTENTIAL" METHOD. PROVIDE PLOTTED TEST VALUES AND LOCATION SKETCH. NOTIFY THE ENGINEER IMMEDIATELY IF MEASURED VALUE IS OVER 5 OHMS.

NOT FOR CONSTRUCTION

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: EP4TURNL

DRAWN BY: DAP

CHECKED BY: CAT

SUBMITTALS

1	02/12/19	ISSUED FOR CONSTRUCTION
0	12/20/18	ISSUED FOR PERMITTING

FA# 10042331
SITE# CT1108
NEWINGTON SOUTH

123 COSTELLO ROAD
NEWINGTON, CT 06111

GENERAL NOTES II

GN-1

ANTENNA MOUNTING

1. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA-222 OR APPLICABLE LOCAL CODES.
2. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
3. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
4. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
5. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
6. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
7. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50-OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
8. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/- 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/- 0.5% AS DEFINED BY THE RFDS. REFER TO ND-00246.
9. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
10. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
11. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

12. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
13. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
    A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
    B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.
    C. ALL 8M ANTENNA HARDWARE SHALL BE TIGHTENED TO 9 LB-FT (12 NM).
14. ALL 12M ANTENNA HARDWARE SHALL BE TIGHTENED TO 43 LB-FT (58 NM).
15. ALL GROUNDING HARDWARE SHALL BE TIGHTENED UNTIL THE LOCK WASHER COLLAPSES AND THE GROUNDING HARDWARE IS NO LONGER LOOSE.
16. ALL DIN TYPE CONNECTIONS SHALL BE TIGHTENED TO 18-22 LB-FT (24.4 - 29.8 NM).
17. ALL N TYPE CONNECTIONS SHALL BE TIGHTENED TO 15-20 LB-IN (1.7 - 2.3 NM).

FIBER & POWER CABLE MOUNTING

18. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
19. THE TYPE TC-ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC-ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
20. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC-ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

21. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
22. CONTRACTOR SHALL VERIFY THE DOWN-TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
23. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION. REFER TO "ANTENNA SYSTEM LABELING STANDARD" ND-00027 LATEST VERSION.
24. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'-0".
25. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'-0" O.C.
26. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
27. CONTRACTOR SHALL WEATHERPROOF ALL ANTENNA CONNECTORS WITH SELF AMALGAMATING TAPE. WEATHERPROOFING SHALL BE COMPLETED IN STRICT ACCORDANCE WITH AT&T STANDARDS.
28. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
29. CONTRACTOR SHALL PROVIDE STRAIN-RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN-RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
30. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

31. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
32. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
33. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
34. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE-HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
35. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
    A. TEMPERATURE SHALL BE ABOVE 50° F.
    B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
    C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
    D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS.
36. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'-0", ADDITIONAL CABLE GROUNDING REQUIRED.
    C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
    D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
    E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
37. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND
38. BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.
39. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ANTENNA AND THE COAX CONFIGURATION IS THE CORRECT MAKE AND MODELS, PRIOR TO INSTALLATION.
40. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S SPECIFICATION & RECOMMENDATIONS.
41. ANTENNA CONTRACTOR SHALL FURNISH AND INSTALL A 12'-0" T-BOOM SECTOR ANTENNA MOUNT, IF APPLICABLE, INCLUDING ALL HARDWARE.

GROUNDING NOTES

42. GROUNDING IS SHOWN DIAGRAMMATICALLY ONLY.
43. CONTRACTOR SHALL GROUND ALL EQUIPMENT AS A COMPLETE SYSTEM. GROUNDING SHALL BE IN COMPLIANCE WITH NEC SECTION 250 AND AT&T GROUNDING AND BONDING REQUIREMENTS (ATT-TP-76416) AND MANUFACTURER'S SPECIFICATIONS.
44. ALL GROUND CONDUCTORS SHALL BE COPPER; NO ALUMINUM CONDUCTORS SHALL BE USED.
45. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUNDING KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200', ADDITIONAL CABLE GROUNDING REQUIRED.
    C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
    D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
    E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
46. ALL PROPOSED GROUNDING BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUNDING BAR DOWNLEADS A MINIMUM DISTANCE OF 4'-0" BELOW GROUNDING BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

EXOTHERMIC CONNECTION
MECHANICAL CONNECTION
CHEMICAL ELECTROLYTIC GROUNDING SYSTEM
TEST CHEMICAL ELECTROLYTIC GROUNDING SYSTEM (T)
EXOTHERMIC WITH INSPECTION SLEEVE
GROUNDING BAR
SHELTER GROUNDING BAR
GROUND ROD
TEST GROUND ROD WITH INSPECTION SLEEVE (T)
SINGLE POLE SWITCH ($)
DUPLEX RECEPTACLE
DUPLEX GFCI RECEPTACLE (GFCI)
FLUORESCENT LIGHTING FIXTURE (2) TWO LAMPS 48-T8 (F)
EXISTING SMOKE DETECTION (DC) (SD)
EXISTING EMERGENCY LIGHTING (DC)
SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A400/51K-SR4-120-PE-DDBTXD
EXISTING UTILITY POLE

CALLOUT REFERENCE (X)
REVISION REFERENCE (1)
WORKPOINT (W.P.)
SECTION REFERENCE (XX / X-X)
DETAIL REFERENCE (XX / X-X)
ELEVATION REFERENCE (X / X)

EXISTING CHAIN LINK FENCE — X — X — X — X —
EXISTING WOOD/WROUGHT IRON FENCE
EXISTING WALL STRUCTURE
LEASE AREA
PROPERTY LINE (PL)
SETBACKS
PROPOSED/EXISTING ICE BRIDGE
PROPOSED/EXISTING CABLE TRAY
EXISTING WATER LINE
PROPOSED UNDERGROUND POWER — W — W — W — W — W —
PROPOSED UNDERGROUND TELCO — UGP — UGP — UGP — UGP —
PROPOSED OVERHEAD POWER — UGT — UGT — UGT — UGT —
PROPOSED OVERHEAD TELCO — OHP — OHP — OHP — OHP —
PROPOSED OVERHEAD UTILITIES — OHT — OHT — OHT — OHT — OHT —
PROPOSED ABOVE GROUND POWER — OHT — OHT — OHT — OHT — OHT —
PROPOSED ABOVE GROUND TELCO — AGP — AGP — AGP — AGP — AGP —
— AGT — AGT — AGT — AGT — AGT —

THESE DOCUMENTS ARE IN COMPLIANCE WITH AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE FOLLOW CODES AND STANDARDS AS APPLICABLE: 2018 CONNECTICUT STATE BUILDING CODE. 2017 NATIONAL ELECTRIC CODE OR LATEST EDITION.

AB	ANCHOR BOLT	COL	COLUMN	FIN	FINISH(ED)	MAS	MASONRY	QTY	QUANTITY	TOF	TOP OF FOUNDATION
ABV	ABOVE	COMM	COMMON	FLR	FLOOR	MAX	MAXIMUM	RAD	RADIUS	TOP	TOP OF PLATE (PARAPET)
AC	ALTERNATING CURRENT	CONC	CONCRETE	FDN	FOUNDATION	MB	MACHINE BOLT	RECT	RECTIFIER	TOS	TOP OF STEEL
ADDL	ADDITIONAL	CONSTR	CONSTRUCTION	FOC	FACE OF CONCRETE	MECH	MECHANICAL	REF	REFERENCE	TOW	TOP OF WALL
AFF	ABOVE FINISHED FLOOR	DBL	DOUBLE	FOM	FACE OF MASONRY	MFR	MANUFACTURER	REINF	REINFORCEMENT	TVSS	TRANSIENT VOLTAGE SUPPRESSION
AFG	ABOVE FINISHED GRADE	DC	DIRECT CURRENT	FOS	FACE OF STUD	MGB	MASTER GROUND BAR	REQ'D	REQUIRED		SYSTEM
AIC	AMPERAGE INTERRUPTION CAPACITY	DEPT	DEPARTMENT	FOW	FACE OF WALL	MIN	MINIMUM	RET	REMOTE ELECTRIC TILT	TYP	TYPICAL
ALUM	ALUMINUM	DF	DOUGLAS FIR	FS	FINISH SURFACE	MISC	MISCELLANEOUS	RMC	RIGID METALLIC CONDUIT	UG	UNDERGROUND
ALT	ALTERNATE	DIA	DIAMETER	FT	FOOT	MTL	METAL	RRH	REMOTE RADIO HEAD	UL	UNDERWRITERS LABORATORY
ANT	ANTENNA	DIAG	DIAGONAL	FTG	FOOTING	MTS	MANUAL TRANSFER SWITCH	RRU	REMOTE RADIO UNIT	UNO	UNLESS NOTED OTHERWISE
APPROX	APPROXIMATE	DIM	DIMENSION	GA	GAUGE	MW	MICROWAVE	RWY	RACEWAY	UMTS	UNIVERSAL MOBILE
ARCH	ARCHITECTURAL	DWG	DRAWING	GEN	GENERATOR	(N)	NEW	SCH	SCHEDULE		TELECOMMUNICATIONS SYSTEM
ATS	AUTOMATIC TRANSFER SWITCH	DWL	DOWEL	GFCI	GROUND FAULT CIRCUIT INTERRUPTER	NEC	NATIONAL ELECTRIC CODE	SHT	SHEET	UPS	UNINTERRUPTIBLE POWER SYSTEM
AWG	AMERICAN WIRE GAUGE	(E)	EXISTING	GLB	GLUE LAMINATED BEAM	NO.(#)	NUMBER	SIAD	SMART INTEGRATED DEVICE		(DC POWER PLANT)
BATT	BATTERY	EA	EACH	GLV	GALVANIZED	NTS	NOT TO SCALE	SIM	SIMILAR	VIF	VERIFIED IN FIELD
BLDG	BUILDING	EC	ELECTRICAL CONDUCTOR	GPS	GLOBAL POSITIONING SYSTEM	OC	ON CENTER	SPEC	SPECIFICATION	W	WIDE
BLK	BLOCK	EL	ELEVATION	GND	GROUND	OPNG	OPENING	SQ	SQUARE	W/	WITH
BLKG	BLOCKING	ELEC	ELECTRICAL	GSM	GLOBAL SYSTEM FOR MOBILE	(P)	PROPOSED	SS	STAINLESS STEEL	WD	WOOD
BM	BEAM	EMT	ELECTRICAL METALLIC TUBING	HDR	HEADER	P/C	PRECAST CONCRETE	STD	STANDARD	W.P.	WORK POINT
BTC	BARE TINNED COPPER CONDUCTOR	ENG	ENGINEER	HGR	HANGER	PCS	PERSONAL COMMUNICATION SERVICES	STL	STEEL	WP	WEATHERPROOF
BOF	BOTTOM OF FOOTING	EQ	EQUAL	HVAC	HEAT/VENTILATION/AIR CONDITIONING	PCU	PRIMARY CONTROL UNIT	STRUCT	STRUCTURAL	WT	WEIGHT
CAB	CABINET	EXP	EXPANSION	HT	HEIGHT	PRC	PRIMARY RADIO CABINET	TEMP	TEMPORARY		
CANT	CANTILEVERED	EXT	EXTERIOR	IGR	INTERIOR GROUND RING	PP	POLARIZING PRESERVING	THK	THICKNESS		
CEC	CALIFORNIA ELECTRIC CODE	FAB	FABRICATION	IN	INCH	PSF	POUNDS PER SQUARE FOOT	TMA	TOWER MOUNTED AMPLIFIER		
CHG	CHARGING	FF	FINISH FLOOR	INT	INTERIOR	PSI	POUNDS PER SQUARE INCH	TN	TOE NAIL		
CLG	CEILING	FG	FINISH GRADE	LB(S)	POUND(S)	PT	PRESSURE TREATED	TOA	TOP OF ANTENNA		
CLR	CLEAR	FIF	FACILITY INTERFACE FRAME	LF	LINEAR FEET	PWR	POWER CABINET	TOC	TOP OF CURB		

NOT FOR CONSTRUCTION

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: EP4TURNL

DRAWN BY: DAP

CHECKED BY: CAT

SUBMITTALS

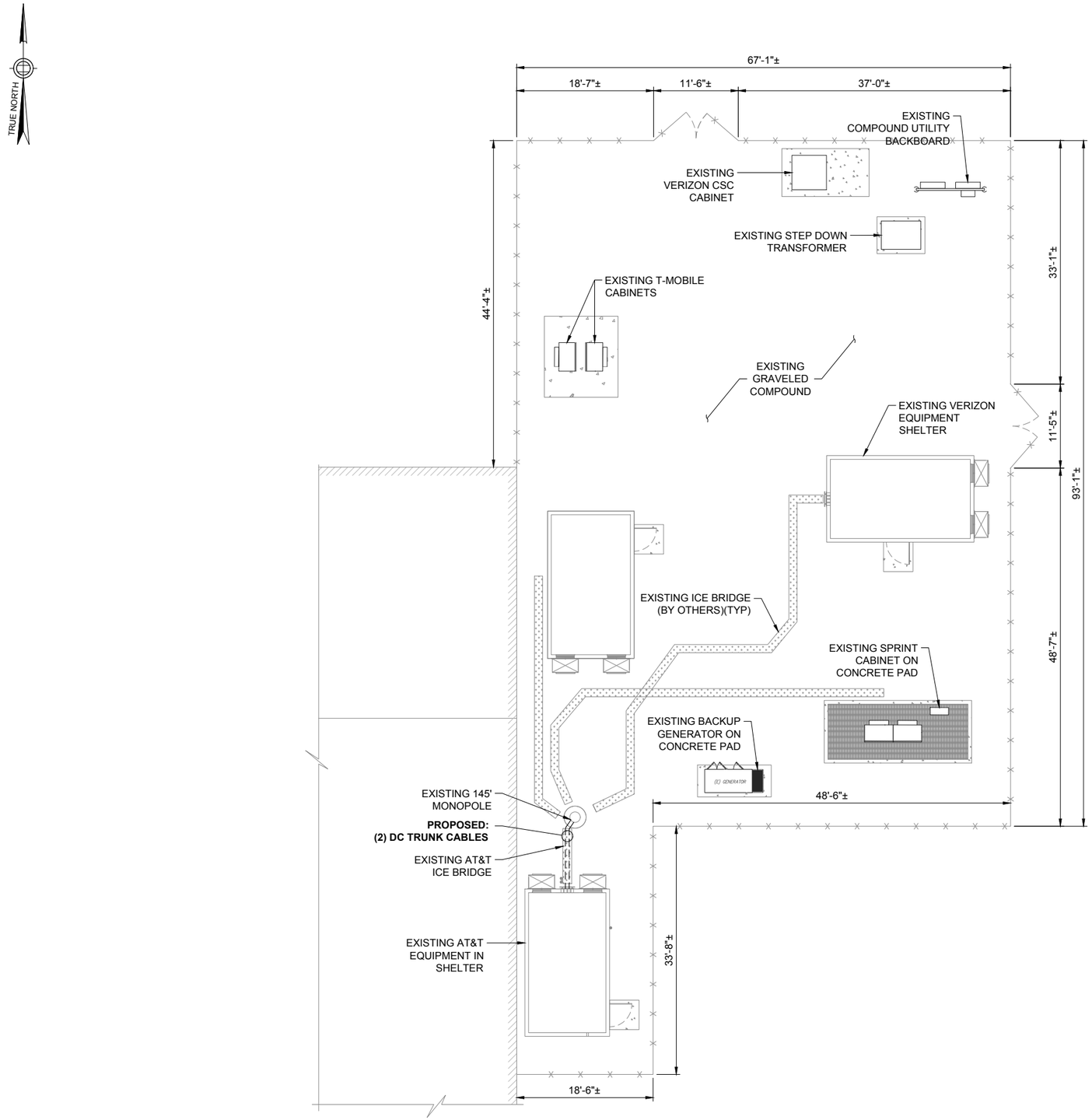
1	02/12/19	ISSUED FOR CONSTRUCTION
0	12/20/18	ISSUED FOR PERMITTING

FA# 10042331
SITE# CT1108
NEWINGTON SOUTH

123 COSTELLO ROAD
NEWINGTON, CT 06111

GENERAL NOTES III

GN-2



NOTES:

1. PLAN BASED ON AS-BUILT DRAWINGS ISSUED BY EMPIRE TELECOM ON 06/20/18. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

1 SITE PLAN

SCALE: 1/8" = 1'-0"

NOT FOR CONSTRUCTION

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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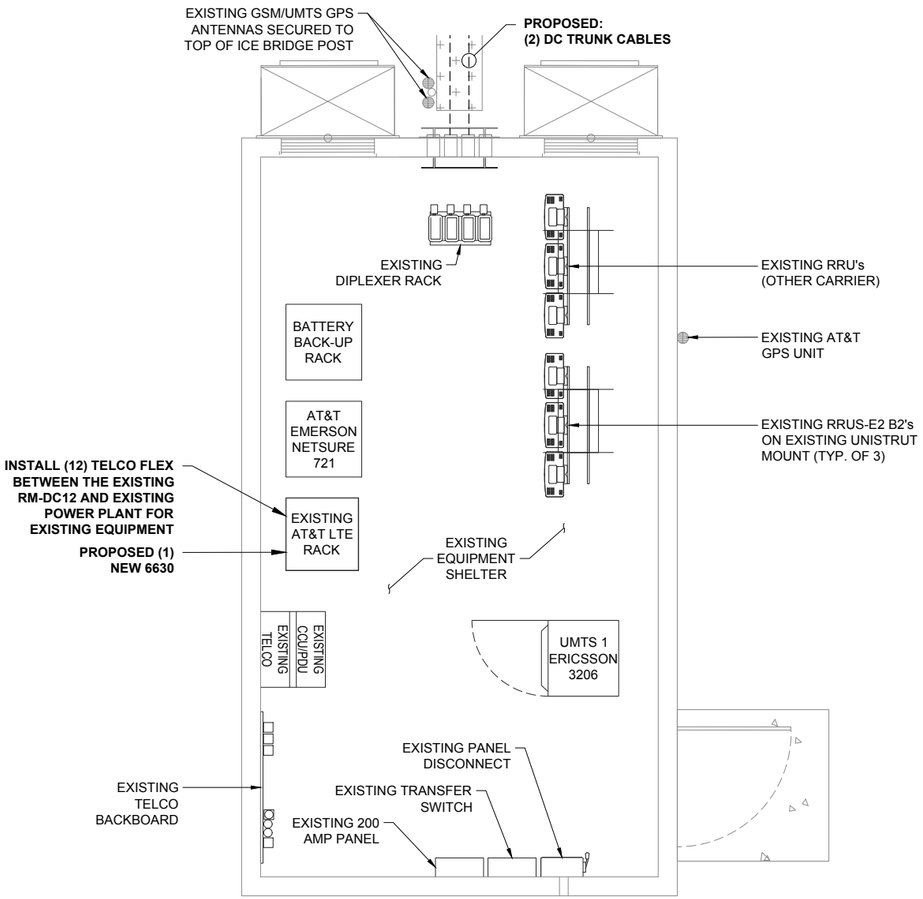
NEWINGTON, CT 06111

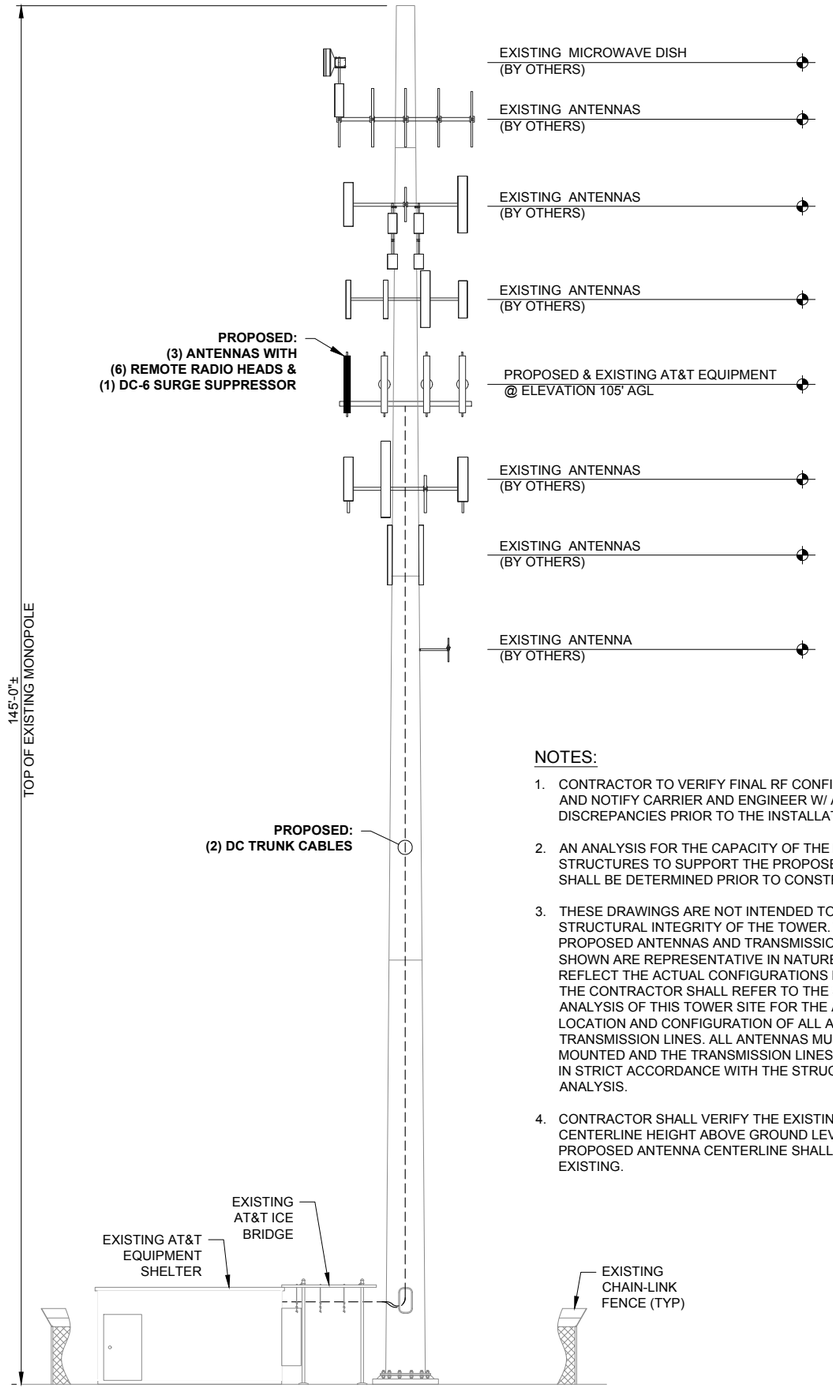
SITE PLAN

C-1

TRUE NORTH



1 EQUIPMENT LAYOUT SCALE: 1/2"=1'-0"



2 PROPOSED TOWER ELEVATION SCALE: 1/8"=1'-0"

NOTES:

1. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
2. AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.
3. THESE DRAWINGS ARE NOT INTENDED TO REFLECT THE STRUCTURAL INTEGRITY OF THE TOWER. THE PROPOSED ANTENNAS AND TRANSMISSION LINES SHOWN ARE REPRESENTATIVE IN NATURE AND DO NOT REFLECT THE ACTUAL CONFIGURATIONS REQUIRED. THE CONTRACTOR SHALL REFER TO THE STRUCTURAL ANALYSIS OF THIS TOWER SITE FOR THE APPROVED LOCATION AND CONFIGURATION OF ALL ANTENNAS AND TRANSMISSION LINES. ALL ANTENNAS MUST BE MOUNTED AND THE TRANSMISSION LINES CONFIGURED IN STRICT ACCORDANCE WITH THE STRUCTURAL ANALYSIS.
4. CONTRACTOR SHALL VERIFY THE EXISTING ANTENNA CENTERLINE HEIGHT ABOVE GROUND LEVEL. PROPOSED ANTENNA CENTERLINE SHALL MATCH EXISTING.

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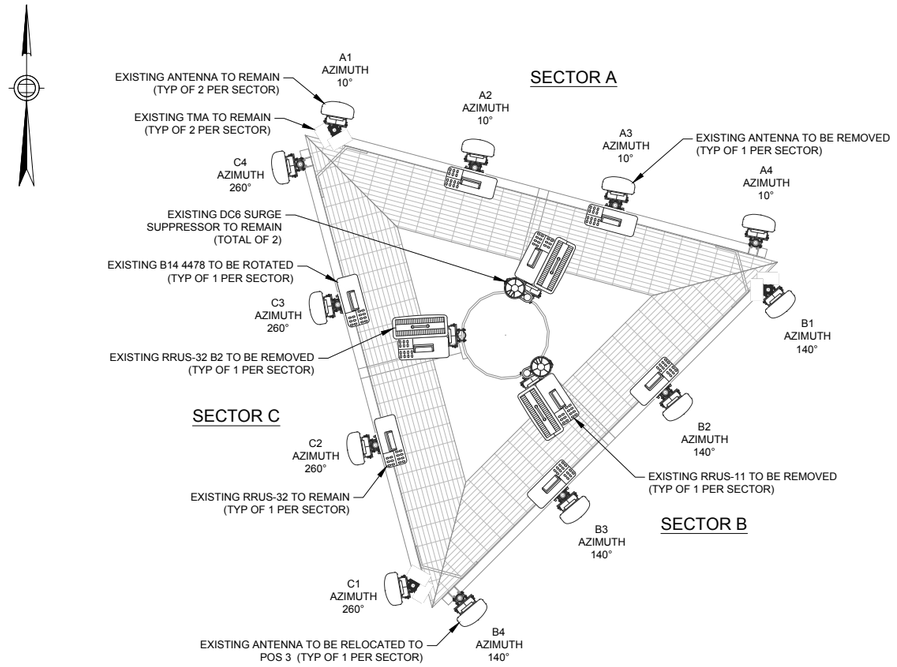
NEWINGTON SOUTH

123 COSTELLO ROAD
NEWINGTON, CT 06111

EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION

C-2



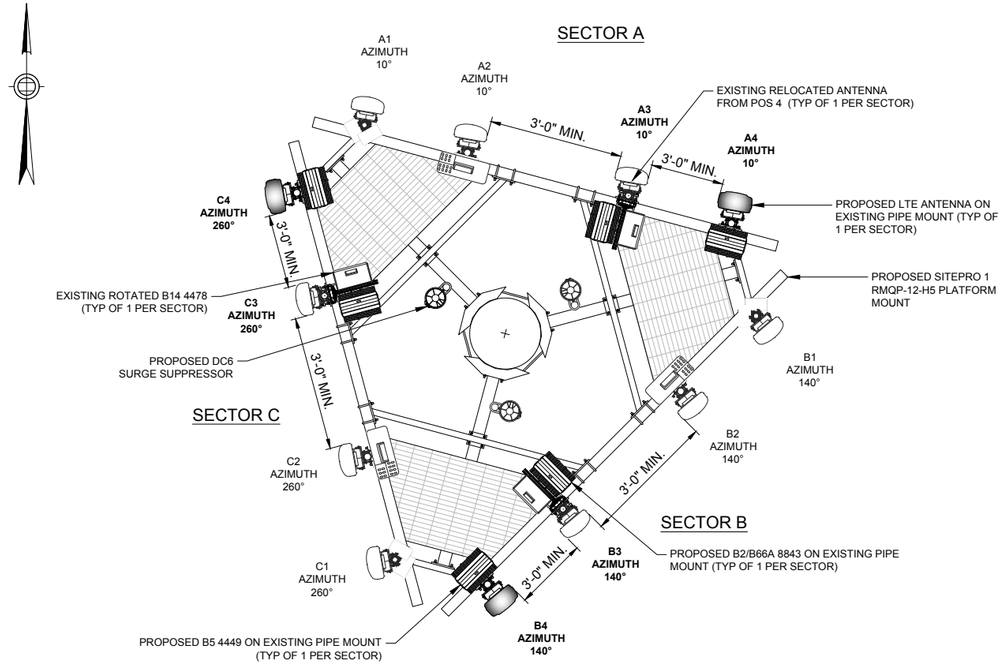
ELEVATION 105'

1 EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

NOTES:

1. CONTRACTOR SHALL REFER TO THE MOUNT MODIFICATION REPORT; SITE NUMBER: CT1108; SITE NAME: NEWINGTON SOUTH; FA LOCATION: 10042331; CROWN BU NUMBER: 881364; CROWN SITE NAME: NEWINGTON; CROWN ORDER NUMBER: ##########; ISSUED BY INFINIGI. DATED ON 02/05/19. THE MOUNT MODIFICATIONS MUST BE PERFORMED PRIOR TO THE INSTALLATION OF THE EQUIPMENT SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL VERIFY ALL EXISTING MEMBERS AND HARDWARE ARE ISNTALLED PROPERLY AS DESCRIBED IN THIS REPORT.
2. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.
3. CONTRACTOR SHALL NOT EXCEED MOUNTING MORE THAN (2) RRHS PER ANTENNA MOUNTING PIPE - RELOCATE TO AN ADJACENT ANTENNA MOUNTING PIPE AS NEEDED.
4. CONTRACTOR TO VERIFY FINAL RF CONFIGURATION AND NOTIFY CARRIER AND ENGINEER W/ ANY DISCREPANCIES PRIOR TO THE INSTALLATION.



ELEVATION 105'

1 PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

DO NOT INSTALL PROPOSED SQUID OR SURGE SUPPRESSOR ON TOWER LEG

NOT FOR CONSTRUCTION

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STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: EP4TURNL

DRAWN BY: DAP

CHECKED BY: CAT

SUBMITTALS

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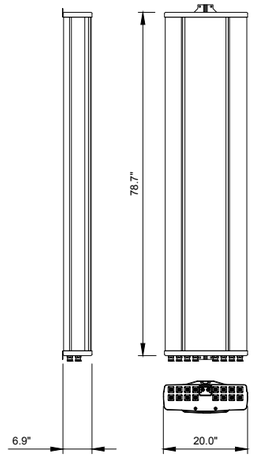
FA# 10042331
SITE# CT1108
NEWINGTON SOUTH

123 COSTELLO ROAD
NEWINGTON, CT 06111

EXISTING & PROPOSED ANTENNA LAYOUT

C-3

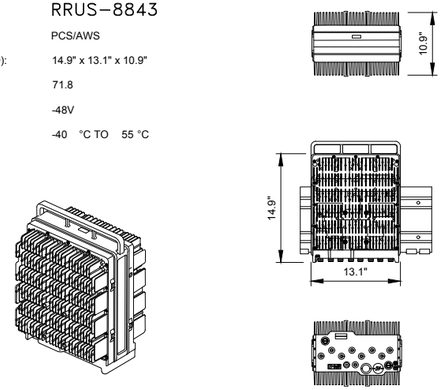
MANUFACTURER:	KATHREIN
MODEL NO.:	800–10965
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
COLOR:	LIGHT GRAY
DIMENSIONS (LxWxD):	78.7" x 20.0" x 6.9" 1999mm x 508mm x 175mm
WEIGHT (lbs):	97.6
CONNECTOR:	16 x 4.3-10 FEMALE
FRONT WIND LOAD:	254 LBF @ 93 MPH 1130 N @ 150 KM/H
SIDE WIND LOAD:	256 LBF @ 93 MPH 1140 N @ 150 KM/H
WIND SPEED MAX.:	>150 MPH (>241 KM/H)



ANTENNA SPECIFICATIONS

SCALE: N.T.S.

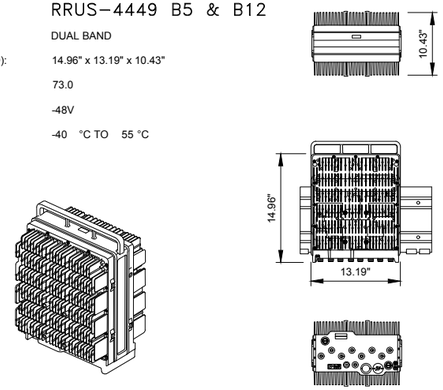
MANUFACTURER:	ERICSSON
MODEL NO.:	RRUS–8843
	PCS/AWS
DIMENSIONS (HxWxD):	14.9" x 13.1" x 10.9"
WEIGHT (lbs):	71.8
POWER SUPPLY:	-48V
TEMPERATURE:	-40 °C TO 55 °C



RRUS SPECIFICATIONS

SCALE: N.T.S.

MANUFACTURER:	ERICSSON
MODEL NO.:	RRUS–4449 B5 & B12
TECHNOLOGY:	DUAL BAND
DIMENSIONS (HxWxD):	14.96" x 13.19" x 10.43"
WEIGHT (lbs):	73.0
POWER SUPPLY:	-48V
TEMPERATURE:	-40 °C TO 55 °C

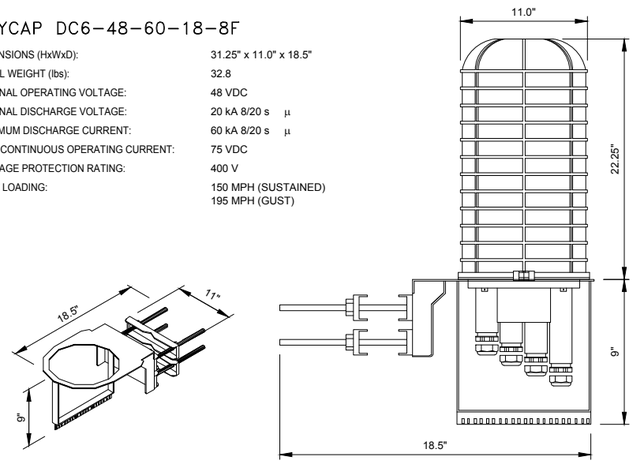


RRUS SPECIFICATIONS

SCALE: N.T.S.

RAYCAP DC6–48–60–18–8F

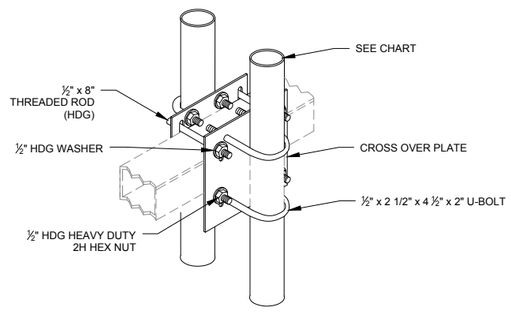
DIMENSIONS (HxWxD):	31.25" x 11.0" x 18.5"
TOTAL WEIGHT (lbs):	32.8
NOMINAL OPERATING VOLTAGE:	48 VDC
NOMINAL DISCHARGE VOLTAGE:	20 kA 8/20 s μ
MAXIMUM DISCHARGE CURRENT:	60 kA 8/20 s μ
MAX. CONTINUOUS OPERATING CURRENT:	75 VDC
VOLTAGE PROTECTION RATING:	400 V
WIND LOADING:	150 MPH (SUSTAINED) 195 MPH (GUST)



DC SURGE PROTECTION SPECIFICATIONS

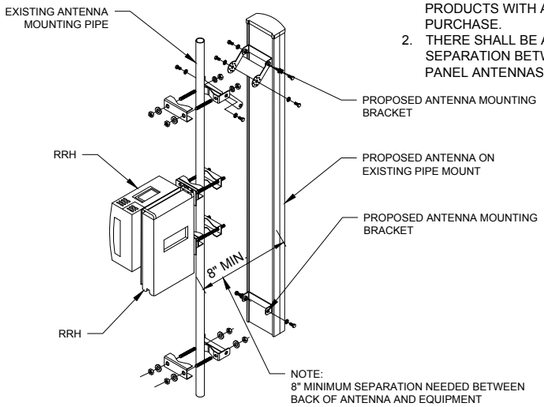
SCALE: N.T.S.

PART #	PIPE SIZE	STAND-OFF ARM
BBPM-K1	2-3/8"	3-1/2" - 4-1/2"
BBPM-K2	2-7/8"	3-1/2" - 4-1/2"
BBPM-K3	2-3/8"	3-1/2" - 6"
BBPM-U	2-3/8" - 4-1/2"	2-3/8" - 4-1/2"



DC6 MOUNTING DETAIL

SCALE: N.T.S.



NOTES:

1. MOUNTING OPTIONS ARE INCLUDED PRODUCTS WITH ANTENNA PURCHASE.
2. THERE SHALL BE A MINIMUM 3'-0" SEPARATION BETWEEN ALL LTE PANEL ANTENNAS.

ANTENNA & RRH MOUNTING DETAIL

SCALE: N.T.S.

DETAIL NOT USED

DETAIL NOT USED

DETAIL NOT USED

NOT FOR CONSTRUCTION

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

JACOBS
JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED PROFESSIONAL ENGINEER

PROJECT NO:	EP4TURNL
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

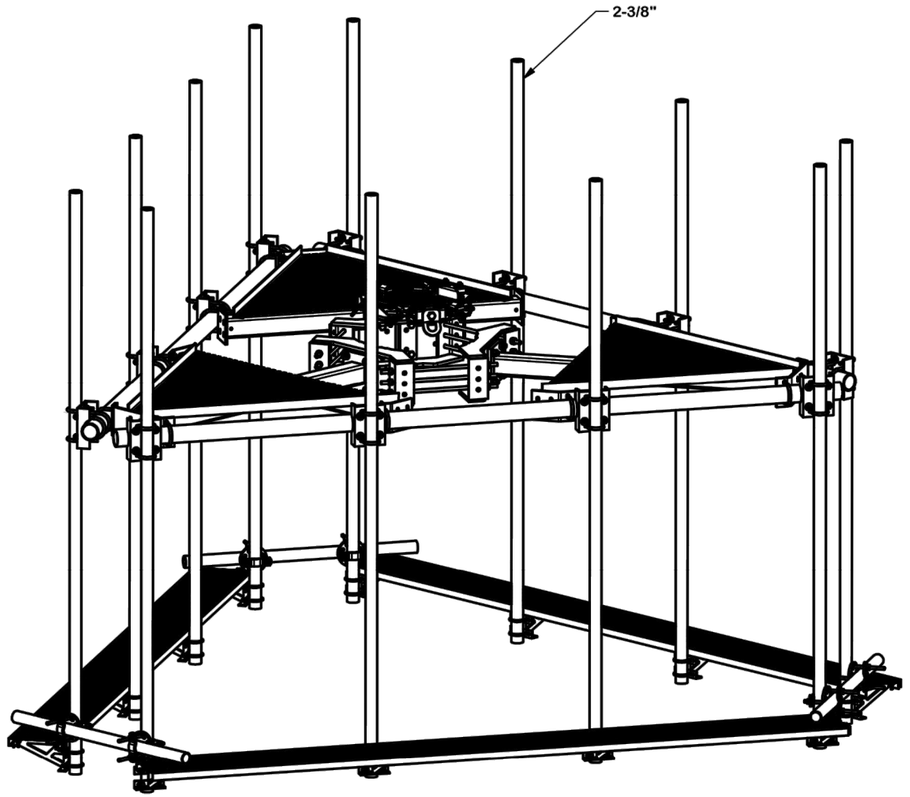
1	02/12/19	ISSUED FOR CONSTRUCTION
0	12/20/18	ISSUED FOR PERMITTING

FA# 10042331
SITE# CT1108
NEWINGTON SOUTH

123 COSTELLO ROAD
NEWINGTON, CT 06111

EXISTING & PROPOSED ANTENNA LAYOUT

C-4



PARTS LIST

ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	3	X-SV196	LOW PROFILE PLATFORM CORNER		212.10	636.31
2	3	X-LWRM	RING MOUNT WELDMENT		68.81	206.42
3	12	X-SP219	SMALL SUPPORT CROSS PLATE	8 1/4 in	8.61	103.33
4	12	X-WWSB	WALKWAY SUPPORT BRACKET		6.73	80.75
5	6	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALV.)		2.51	15.04
6	12	X-100064	CLAMP (4" V-CLAMP) GALVANIZED		0.91	10.95
7	12	P2120	2-3/8" x 120" (2" SCH. 40) GALAVANIZED PIPE	120 in	36.61	439.38
8	3	P3150	3-1/2" X 150" (3" SCH 40) GALVANIZED PIPE	150 in	94.80	284.40
9	3	P248	2-3/8" X 63"SCH 40 GALVANIZED PIPE	63 in	20.18	60.55
10	9	G58R-24	5/8" x 24" THREADED ROD (HDG.)	24 in	0.40	3.59
10	9	G58R-48	5/8" x 48" THREADED ROD (HDG.)	48 in	0.40	3.59
11	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	4.27
12	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
13	30	G58LW	5/8" HDG LOCKWASHER		0.03	0.78
14	30	A58NUT	5/8" HDG A325 HEX NUT		0.13	3.90
15	3	GRS12-12	12" WIDE GRIP STRUT	120 in	31.00	93.00
16	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.83	29.82
17	24	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.63	15.00
18	12	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	3.24
19	12	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	6 1/2 in	0.41	4.91
20	144	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	4.91
21	144	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	2.00
22	144	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	10.31
23	24	X-UB3212	3/8" X 2-1/2" X 3-5/8" X 1-3/4" U-BOLT (HDG.)		0.29	6.97
24	48	G3802	3/8" x 2" HDG HEX BOLT GR5		0.09	4.21
25	48	SQW38	3/8" SQUARE WASHER	2 in	0.29	13.89
26	96	G38FW	3/8" HDG USS FLATWASHER		0.01	1.13
27	96	G38LW	3/8" HDG LOCKWASHER		0.01	0.64
28	96	G38NUT	3/8" HDG HEAVY 2H HEX NUT		0.03	3.25
29	1	HALO	HALO		40.35	40.35
					TOTAL WT. #	2136.59

TOLERANCE NOTES

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

DESCRIPTION	RMQP-12-H5
CPD NO.	
DRAWN BY	CEK 11/1/2017
ENG. APPROVAL	
CHECKED BY	
CLASS / SUB	
DRAWING USAGE	CUSTOMER
PART NO.	RMQP-12-H5
DWG. NO.	RMQP-12-H5
PAGE	1 OF 3

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

NOT FOR CONSTRUCTION

1 MOUNT MODIFICATION DETAIL — SCALE: N.T.S.

at&t
5841 BRIDGE STREET
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CLIFTON PARK, NY 12065

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JACOBS ENGINEERING GROUP, INC.
120 ST. JAMES AVENUE, 5TH FLOOR
BOSTON, MA 02116

STATE OF CONNECTICUT
CRAIG A. THOMAS
No. 0029052
LICENSED
PROFESSIONAL ENGINEER

PROJECT NO: EP4TURNL
DRAWN BY: DAP
CHECKED BY: CAT

SUBMITTALS

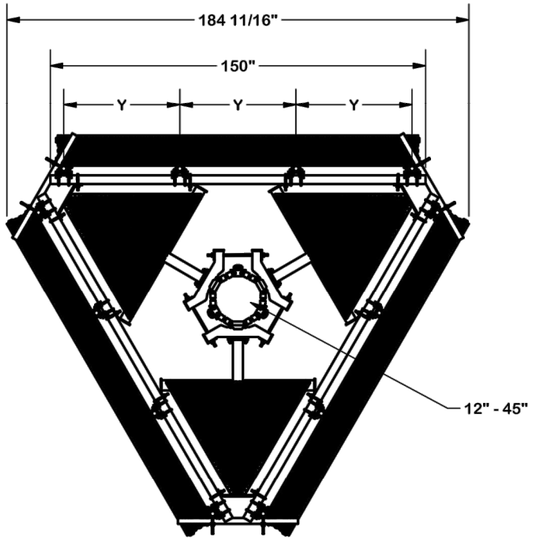
1	02/12/19	ISSUED FOR CONSTRUCTION
0	12/20/18	ISSUED FOR PERMITTING

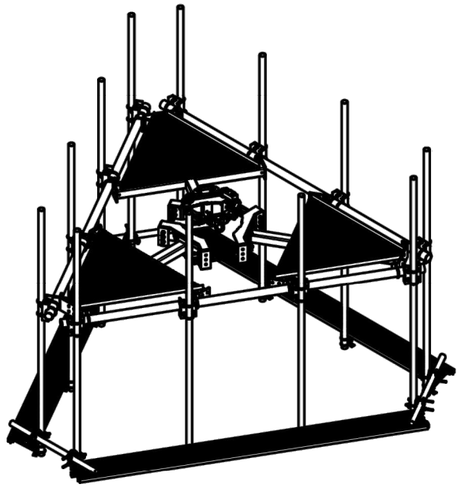
FA# 10042331
SITE# CT1108
NEWINGTON SOUTH

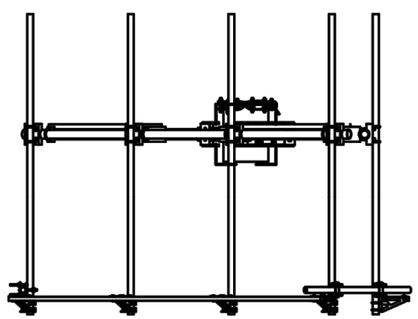
123 COSTELLO ROAD
NEWINGTON, CT 06111

MOUNT MODIFICATION DETAIL 1

S-1







TOLERANCE NOTES

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

DESCRIPTION: RMQP-12-H5			
CPD NO.	DRAWN BY: CEK 11/1/2017	ENG. APPROVAL	PART NO.: RMQP-12-H5
CLASS / SUB	DRAWING USAGE: CUSTOMER	CHECKED BY	DWG. NO.: RMQP-12-H5

SITE PRO 1 — A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

PAGE 2 OF 3

1 MOUNT MODIFICATION DETAIL

SCALE: N.T.S.

NOT FOR CONSTRUCTION

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065

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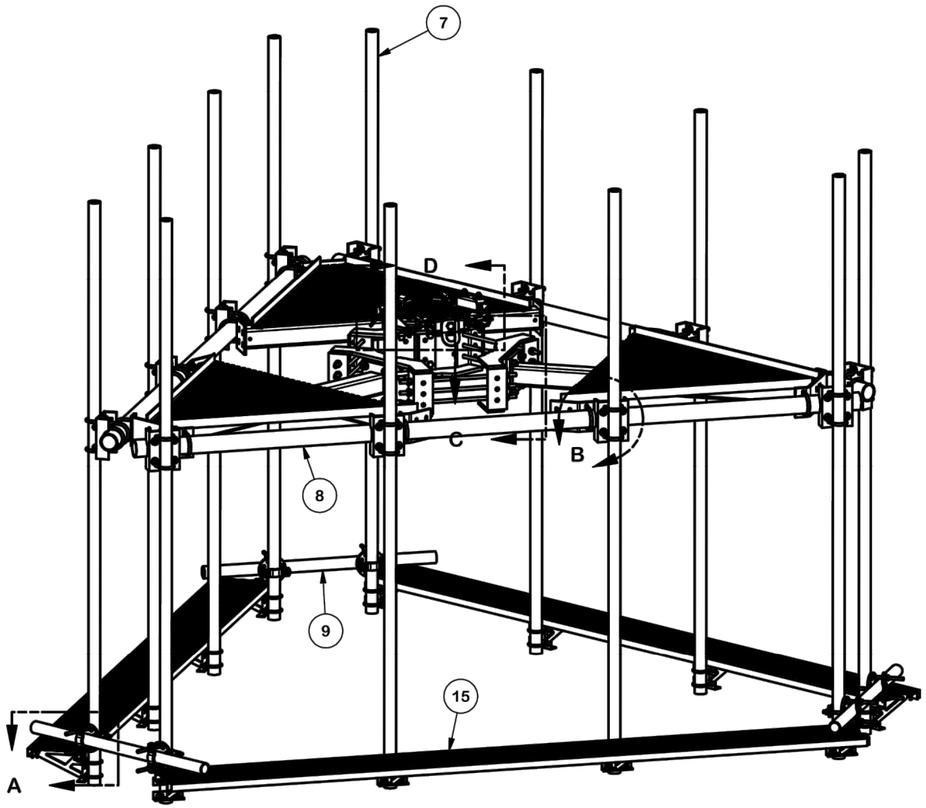
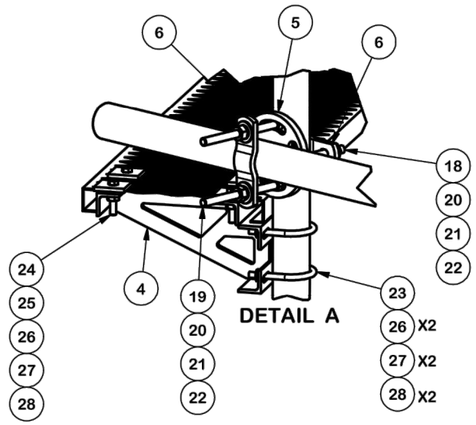
NEWINGTON, CT 06111

MOUNT MODIFICATION DETAIL 2

S-2





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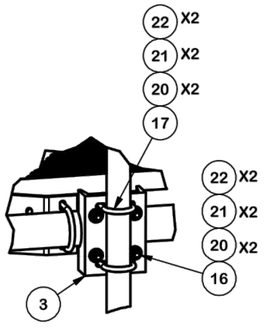

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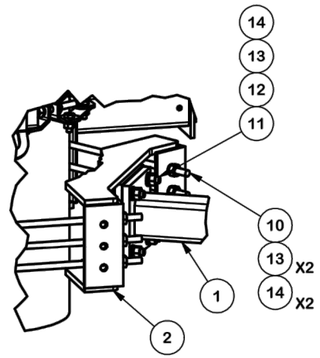

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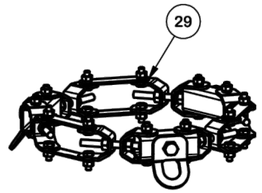

DETAIL D

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
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LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
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	CEK 11/1/2017		RMQP-12-H5
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	CUSTOMER		RMQP-12-H5

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PAGE 3 OF 3

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NEWINGTON, CT 06111

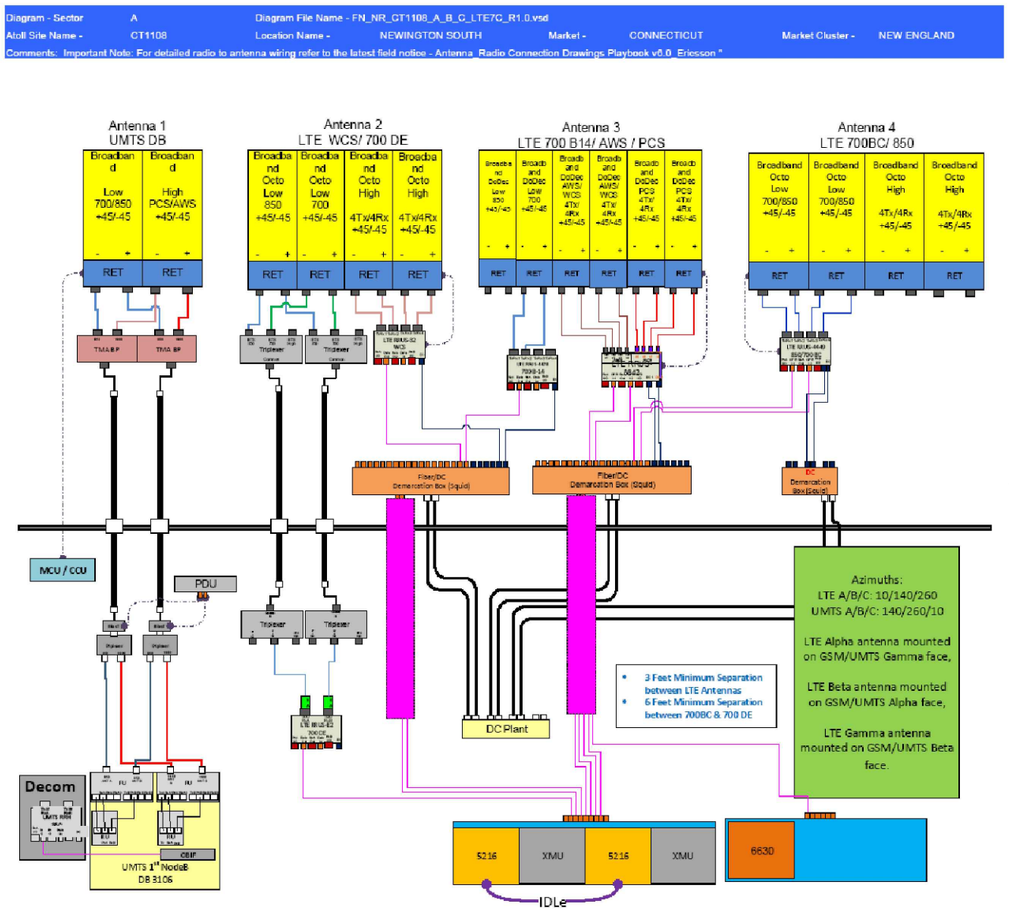
MOUNT MODIFICATION DETAIL 3

S-3

ANTENNA NUMBER	ANTENNA MODEL	ANTENNA BAND	AZIMUTH	ANTENNA CENTERLINE FROM GROUND	TMA's & DIPLEXERS	RRH's	FEEDER	RAYCAP
A1	7770 (55"x11"x5")	UMTS	10°	105'	(2) LGP21901	-	(2) 1-5/8" EXISTING (LENGTH @ 155')	(2) RAYCAP DC6-48-60-0-8F
A2	OPA-65R-LCUU-H6 (72"x14.8"x7.4")	LTE	10°	105'	(2) TPX-070821	(1) RRUS-E2 B29 (1) RRUS-32	(1) FIBER (2) COAX (LENGTH @ 155')	
A3	QS66512-2 (72"x12"x9.6")	LTE	10°	105'	-	(1) B14 4478 **(1) B2/B66A 8843**	-	
A4	**800-10965 (78.7"x20"x6.9")**	**LTE**	**10°**	**105'**	-	**B5/B12 4449**	-	**(1) RAYCAP DC6-48-60-0-8F**
B1	7770 (55"x11"x5")	UMTS	140°	105'	(2) LGP21901	-	(2) 1-5/8" EXISTING (LENGTH @ 155')	
B2	OPA-65R-LCUU-H6 (72"x14.8"x7.4")	LTE	140°	105'	(2) TPX-070821	(1) RRUS-E2 B29 (1) RRUS-32	(1) FIBER (2) COAX (LENGTH @ 155')	
B3	QS66512-2 (72"x12"x9.6")	LTE	140°	105'	-	(1) B14 4478 **(1) B2/B66A 8843**	-	
B4	**800-10965 (78.7"x20"x6.9")**	**LTE**	**140°**	**105'**	-	**B5/B12 4449**	-	
G1	7770 (55"x11"x5")	UMTS	260°	105'	(2) LGP21901	-	(2) 1-5/8" EXISTING (LENGTH @ 155')	
G2	OPA-65R-LCUU-H6 (72"x14.8"x7.4")	LTE	260°	105'	(2) TPX-070821	(1) RRUS-E2 B29 (1) RRUS-32	(1) FIBER (2) COAX (LENGTH @ 155')	
G3	QS66512-2 (72"x12"x9.6")	LTE	260°	105'	-	(1) B14 4478 **(1) B2/B66A 8843**	-	
G4	**800-10965 (78.7"x20"x6.9")**	**LTE**	**260°**	**105'**	-	**B5/B12 4449**	-	

*EQUIPMENT LISTED IN **BOLD**, DELINEATES THAT THE EQUIPMENT IS PROPOSED

1 ANTENNA INFORMATION CHART — SCALE: NONE



2 RF EQUIPMENT SCHEMATIC — SCALE: NONE

NOT FOR CONSTRUCTION

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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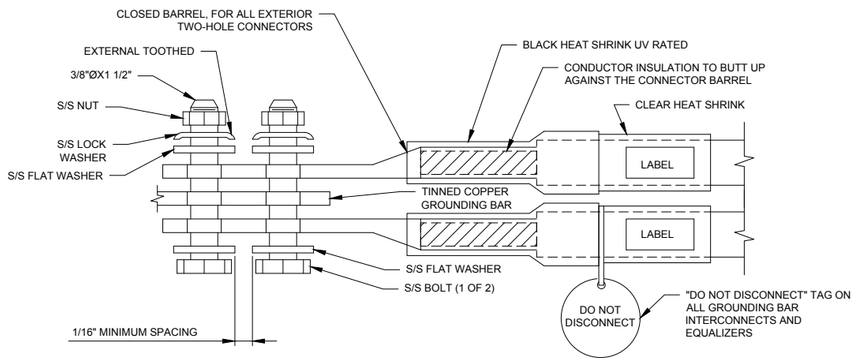
ANTENNA CHART & RF EQUIPMENT SCHEMATIC

RF-1

NOTES:

1. EXOTHERMIC WELD (2) TWO, #2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. ALL GROUNDING BARS SHALL BE STAMPED IN TO THE METAL "IF STOLEN DO NOT RECYCLE." THE CONTRACTOR SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH 1" HIGH LETTERS.
3. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8" DIAMETER OR LARGER. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
5. DO NOT INSTALL CABLE GROUNDING KIT AT A BEND AND ALWAYS DIRECT GROUNDING CONDUCTOR DOWN TO GROUNDING BUS.
6. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK HEAT-SHRINKING TUBE, 600 VOLT INSULATION, ON ALL GROUNDING TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
7. SUPPLIED AND INSTALLED BY CONTRACTOR.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUNDING BAR AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.
9. ENSURE THE WIRE INSULATION TERMINATION IS WITHIN 1/8" OF THE BARREL (NO SHINERS).



1 EXTERIOR TWO HOLE LUG DETAIL

SCALE: NONE

GENERAL NOTES:

1. CONTRACTOR SHALL HAVE A COMPLETE UNDERSTANDING OF THE CONTENTS OF AT&T STANDARD TP-76416.
2. ALL INSTALLATIONS SHALL BE FIELD VERIFIED.
3. ALL GROUND CONNECTIONS FOR ALL RELOCATED EQUIPMENT SHALL BE RE-ESTABLISHED BY THE CONTRACTOR. CONTRACTOR SHALL FURNISH ALL MATERIALS AS REQUIRED.

GROUNDING NOTES:

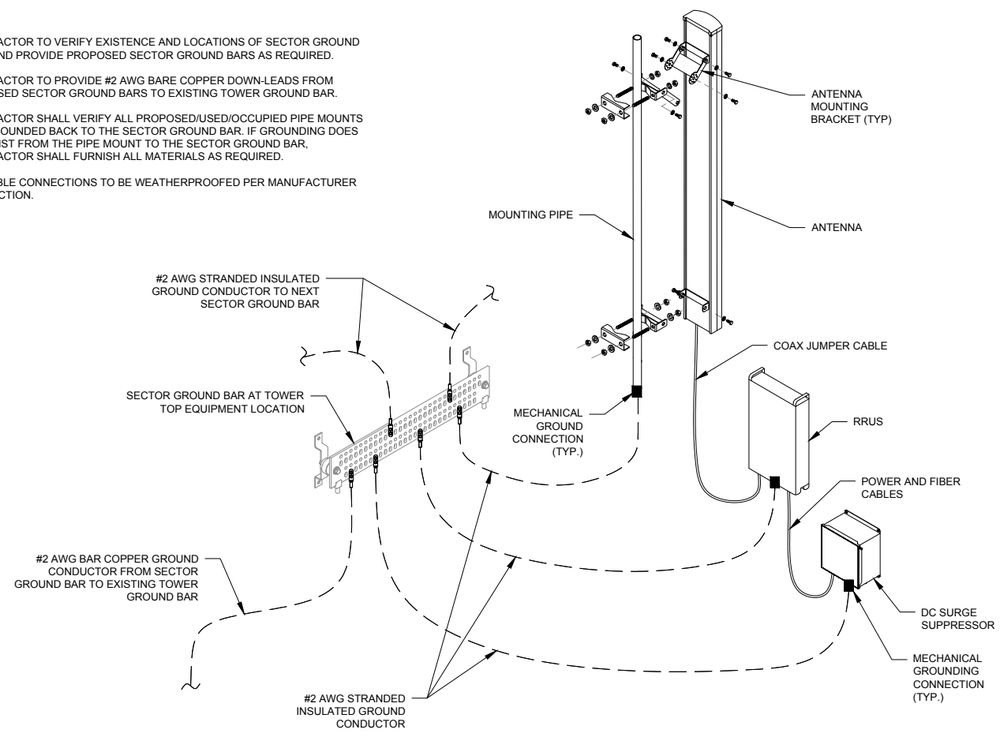
1. TOWER GROUNDING BAR: EXTEND (2) #2 AWG TINNED CU WIRE FROM BURIED GROUND RING UP TO THE TOWER GROUND BAR AND MAKE A MECHANICAL CONNECTION. SECURE GROUND BAR DIRECTLY TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
2. ANTENNA GROUNDING BAR: ANDREW CORPORATION PART #UGBKIT-0424-T MOUNT GROUND BAR DIRECTLY TO TOWER. SECURE TO TOWER WITH STAINLESS STEEL MOUNTING MATERIAL.
3. GROUNDING BAR: LOCATED CLOSE TO GRADE LOCK BOX TESSCO PART #351546: INSTALL PER MANUFACTURER GUIDELINES.
4. EXOTHERMIC OR COMPRESSION CONNECTION FOR PIPE MOUNT TO ANTENNA ROUTE CONDUCTOR TO NEAREST GROUNDING BAR SO THE GROUNDING CONDUCTORS PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND. USE #2 AWG SOLID TINNED COPPER CONDUCTOR. GROUNDING CONNECTION SHALL BE LOCATED AT THE TOP 2" OF PIPE.
5. ALL GROUNDING CONDUCTORS SHALL BE #2 AWG COPPER TINNED UNLESS NOTED OTHERWISE.
6. ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
7. KOPR-SHIELD ANTI-OXIDATION COMPOUND SHALL BE USED ON ALL COMPRESSION GROUNDING CONNECTIONS.
8. ALL EXOTHERMIC CONNECTIONS SHALL BE INSTALLED UTILIZING THE PROPER CONNECTION/MOLD AND MATERIALS FOR THE PARTICULAR APPLICATION.
9. ALL BOLTED GROUNDING CONNECTIONS SHALL BE INSTALLED WITH AN EXTERNAL TOOTHED LOCK WASHER. GROUNDING BUS BARS MAY HAVE PRE-PUNCHED HOLES OR TAPPED HOLES. ALL HARDWARE SHALL BE SECURITY TORQUE HARDWARE 3/8" STAINLESS STEEL.
10. EXTERNAL GROUNDING CONDUCTOR SHALL NOT BE INSTALLED OR ROUTED THROUGH HOLES IN ANY METAL OBJECTS, CONDUITS, OR SUPPORTS TO PRECLUDE ESTABLISHING A MAGNETIC CHOKE POINT.
11. PLASTIC CLIPS SHALL BE USED TO FASTEN AND SUPPORT GROUNDING CONDUCTORS. FERROUS METAL CLIPS WHICH COMPLETELY SURROUND THE GROUNDING CONDUCTOR SHALL NOT BE USED.
12. IF COAX ON ICE BRIDGE IS MORE THAT 6' FROM THE GROUND BAR AT THE BASE OF THE TOWER, A SECOND GROUND BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE RUN TO GROUND THE COAX GROUND KIT AND THE IN-LINE SURGE ARRESTORS (SURGE ARRESTORS INSTALLED BY LUCENT ONLY HAVE 6' GROUND TAILS).
13. CONTRACTOR SHALL REPAIR/PLACE EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.
14. DO NOT ALLOW THE COPPER CONDUCTOR TO TOUCH THE GALVANIZED GUY WIRE AT THE CONNECTION POINT OR AT ANY OTHER POINT. NO EXOTHERMICALLY WELDED CONNECTION SHALL BE MADE TO THE GUY WIRE.
15. CONTRACTOR SHALL VERIFY EXISTING SECTOR GROUNDING CONDITION AND GROUND THE PROPOSED EQUIPMENT IN THE SAME MANNER. A PROPOSED SECTOR GROUND BAR SHALL BE INSTALLED IF REQUIRED.

2 GROUNDING BAR DETAIL

SCALE: NONE

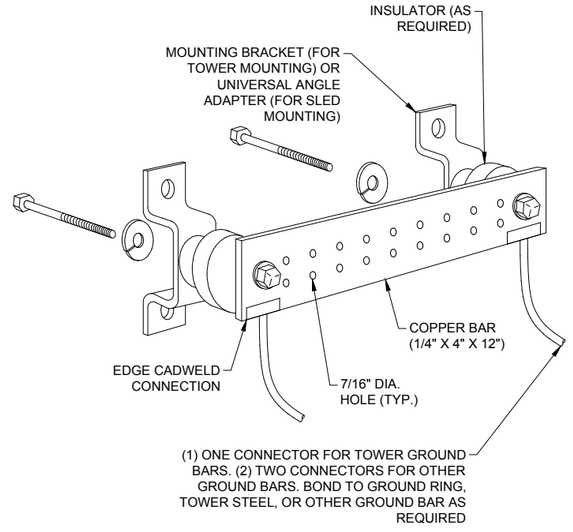
NOTES:

1. CONTRACTOR TO VERIFY EXISTENCE AND LOCATIONS OF SECTOR GROUND BARS AND PROVIDE PROPOSED SECTOR GROUND BARS AS REQUIRED.
2. CONTRACTOR TO PROVIDE #2 AWG BARE COPPER DOWN-LEADS FROM PROPOSED SECTOR GROUND BARS TO EXISTING TOWER GROUND BAR.
3. CONTRACTOR SHALL VERIFY ALL PROPOSED/USED/OCCUPIED PIPE MOUNTS ARE GROUNDED BACK TO THE SECTOR GROUND BAR. IF GROUNDING DOES NOT EXIST FROM THE PIPE MOUNT TO THE SECTOR GROUND BAR, CONTRACTOR SHALL FURNISH ALL MATERIALS AS REQUIRED.
4. ALL CABLE CONNECTIONS TO BE WEATHERPROOFED PER MANUFACTURER INSTRUCTION.



3 TYPICAL ANTENNA GROUNDING SCHEMATIC

SCALE: NONE



4 GROUND BAR DETAIL

SCALE: NONE

NOT FOR CONSTRUCTION

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5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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3 CORPORATE PARK DRIVE
SUITE 101
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NEWINGTON, CT 06111

GROUNDING DETAILS

G-1

Date: **February 5, 2019**

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

Charles McGuirt
Crown Castle
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Clifton Park, NY 12065

Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Subject:	**Mount Replacement Analysis Report**	
Carrier Designation:	**AT&T Equipment Change-Out**	
	Carrier Site Number:	10042331
	Carrier Site Name:	Newington South
Crown Castle Designation:	**Crown Castle BU Number:**	881364
	Crown Castle Site Name:	Newington
	Crown Castle JDE Job Number:	548703
	Crown Castle Order Number:	471664 Rev.0
Engineering Firm Designation:	**Infinigy Report Designation:**	1039-A0002-B
Site Data:	**123 Costelo Road, Newington, Hartford County, CT, 06111** **Latitude 41°39'18.72" Longitude -72°43'17.19"**	
Structure Information:	**Tower Height & Type:**	**145.0 ft Monopole**
	Mount Elevation:	**105.0 ft**
	Mount Type:	**12.5 ft Platform**

Dear Charles McGuirt,

Infinigy is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of AT&T's antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Platform **Sufficent**

The analysis has been performed in accordance with the TIA-222-H Standard. This analysis utilizes an ultimate 3-second gust wind speed of 125 mph from the 2015 IBC/2018 Connecticut State Building Code. Exposure Category C and Risk Category II were used in this analysis.

We at Infinigy Engineering, PLLC appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount analysis prepared by: Kevin Berger Jr.
Respectfully Submitted by:

Joe Johnston, P.E.
VP Structural Engineering / Principal

02-05-19

TABLE OF CONTENTS

1) INTRODUCTION

This mount is a proposed 12.5 ft Platform RMQP-12-H5 designed by SitePro1 and located at the 105.0 ft elevation. The existing and proposed antenna loading was obtained from the Application provided by CCI, Application Order 471664, Rev. 0.

2) ANALYSIS CRITERIA

Building Code: 2015 IBC/2018 Connecticut State Building Code
TIA-222 Revision: TIA-222-H
Risk Category: II
Ultimate Wind Speed: 125 mph
Exposure Category: C
Ice Thickness: 2.0 in
Wind Speed with Ice: 50 mph
Man Live Load at Mid/End-Points: 250 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount
105.0	105.0	3	CCI	OPA-65R-LCUU-H6	Platform
		3	Kathrein	800-10965	
		3	Powerwave	7770	
		3	Quintel	QS66512-2	
		6	CCI	TPX-070821	
		3	Ericsson	RRUS-32	
		3	Ericsson	RRUS-4449 B5/B12	
		3	Ericsson	RRUS-8843 B2/B66A	
		6	Powerwave	LGP21401	
		3	Ericsson	RRUS 4478 B14	
		3	Raycap	DC6-48-60-18-8F	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	AT&T	471664, Rev. 0	CCI Sites
Structural Analysis	Paul J. Ford & Co.	12-17-18	CCI Sites
Model	11-01-17	RMQP-12-H5	Site Pro 1

3.1) Analysis Method

RISA-3D (Version 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Wind Load Calculator (Version 3.0.2), a tool internally developed by Infinigy Engineering, was used to calculate wind loading on all appurtenances, dishes and mount members for various loading cases. In addition, Infinigy Bolt Calculator (Version 1.0.0) was used to calculate member stresses for round structural members for various loading cases, when applicable. Selected output from the analysis is included in Appendix B “Software Input Calculations”.

This analysis was performed in accordance with Crown Castle's ENG-SOW-10208 *Tower Mount Analysis* (Revision B).

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Table 1 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Infinigy should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3(a) - Mount Component Stresses vs. Capacity (Platform)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Stand-off	M11	105.0	75.6	Pass
	Horizontal	M40		19.2	Pass
	Mount Pipe	MP2		32.2	Pass
	Bolts	--		42.4	Pass

Structure Rating (max from all components) =	75.6%

Notes:
1) See additional documentation in "Appendix C - Software Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

4.1) Recommendations

The mount has sufficient capacity to support the proposed loading. No modifications are required at this time.

APPENDIX A

WIRE FRAME AND RENDERED MODELS

APPENDIX B

SOFTWARE INPUT CALCULATIONS

APPENDIX C

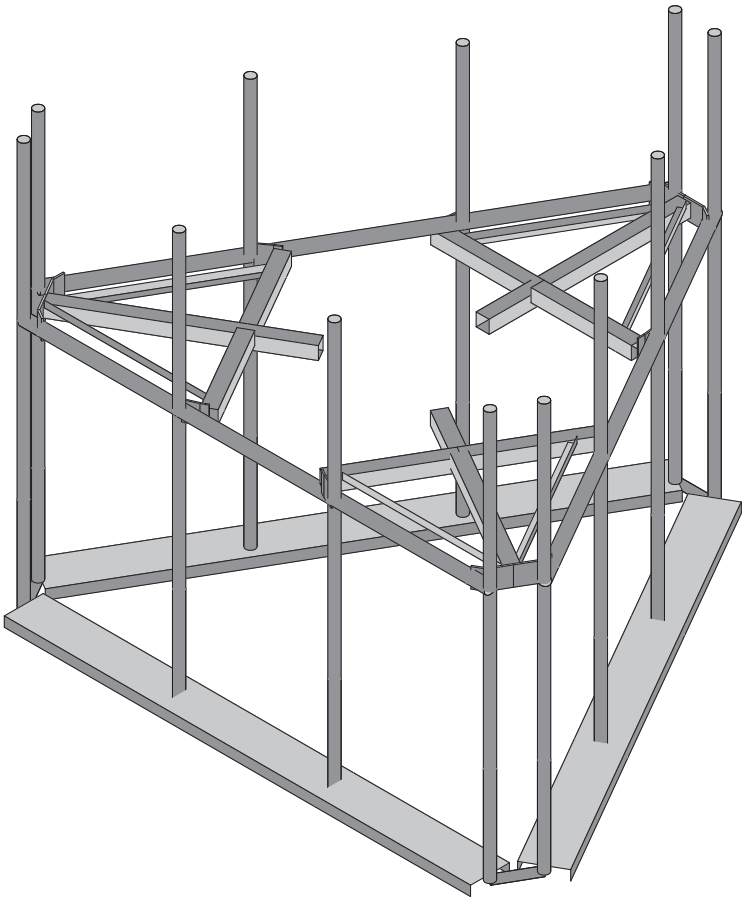
SOFTWARE ANALYSIS OUTPUT

APPENDIX D

ADDITIONAL CALCUATIONS

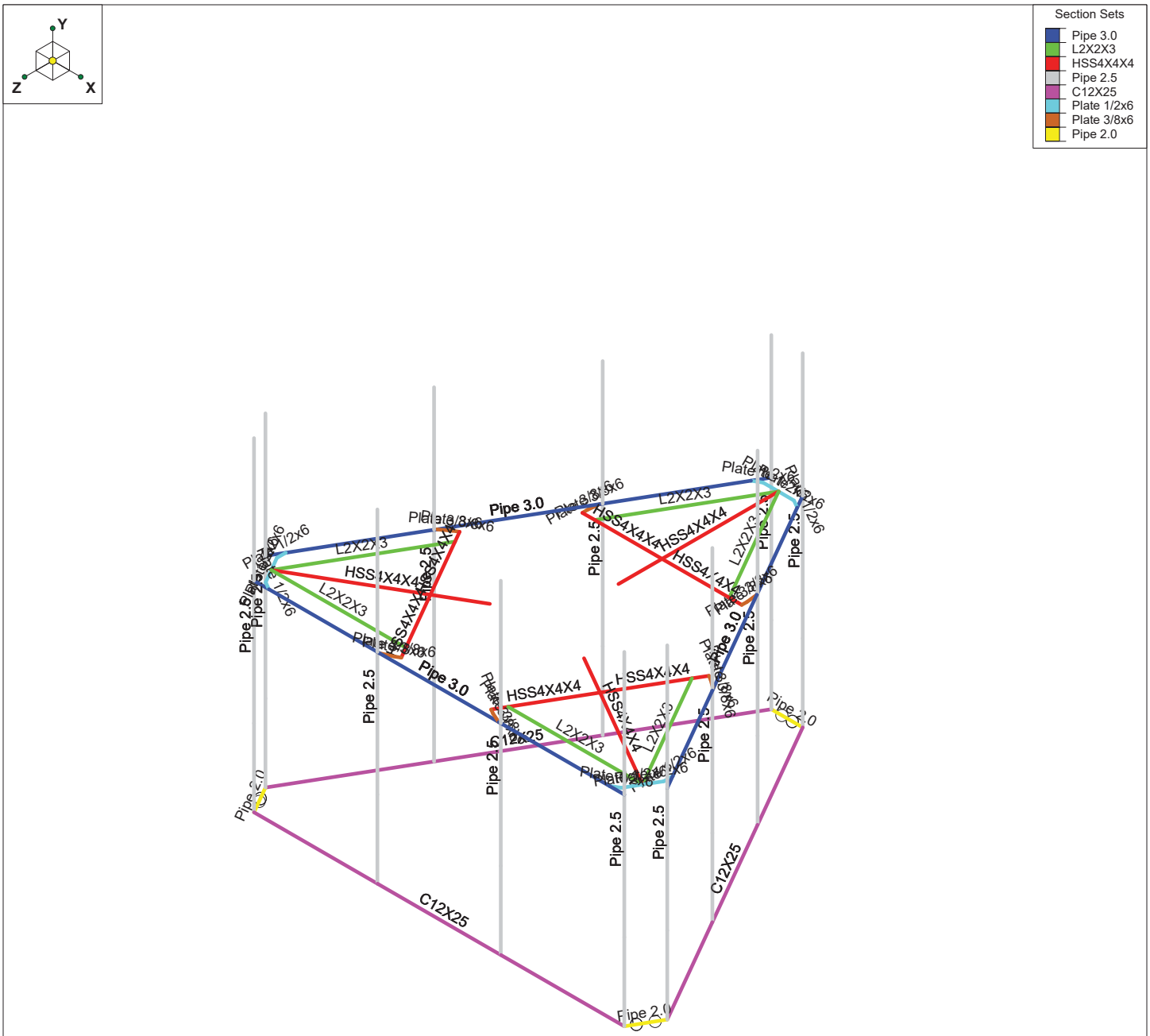
APPENDIX A

WIRE FRAME AND RENDERED MODELS



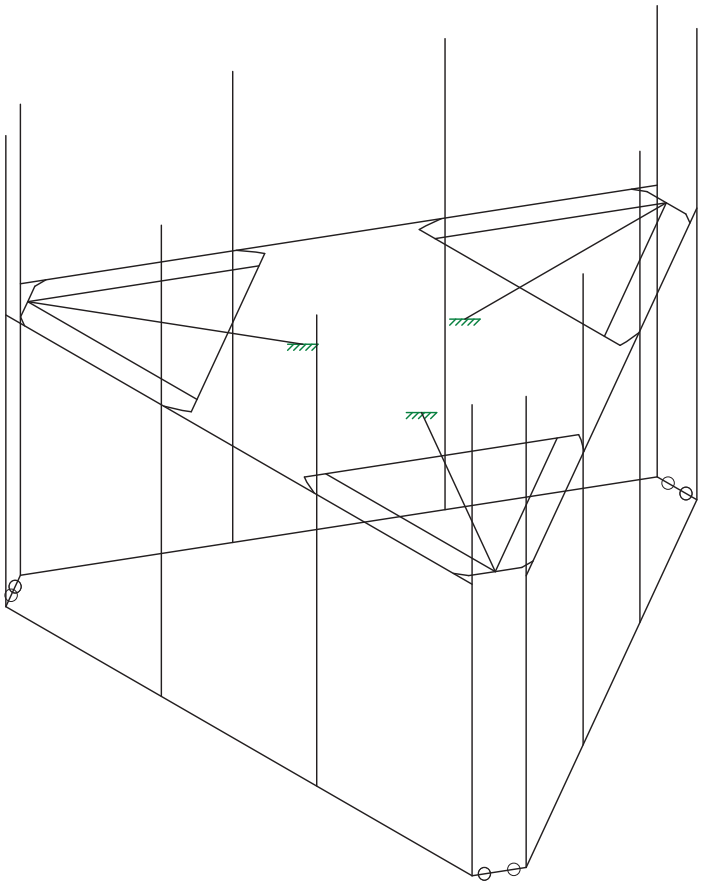
Envelope Only Solution

Infinigy Engineering, PLLC.	881364	Final Configuration
KLB		Feb 5, 2019 at 11:20 AM
1039-A0002-B		RMQP-12-H5_881364.r3d



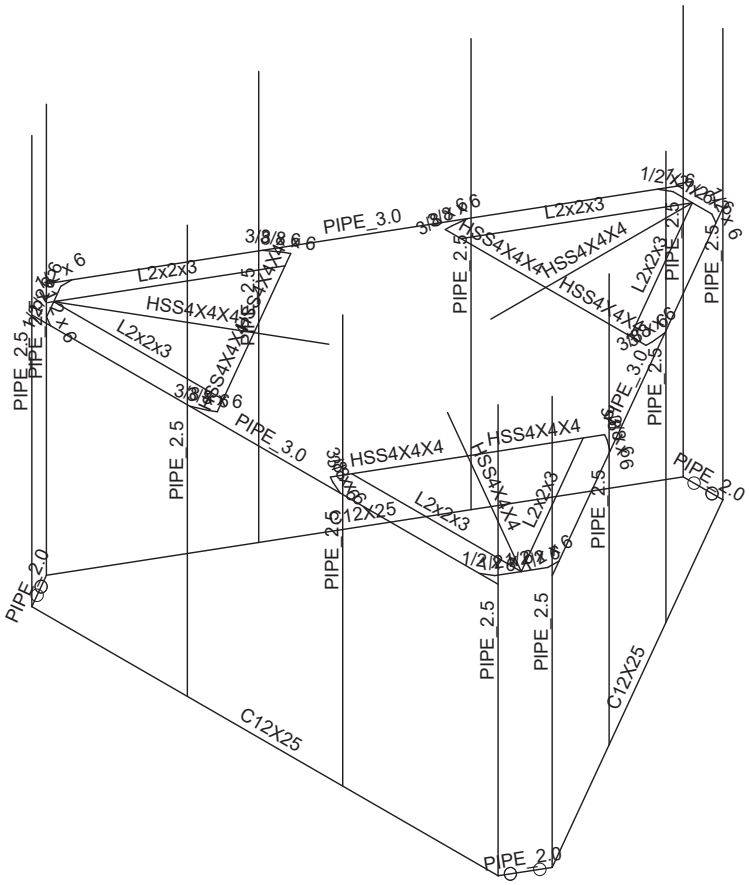
Envelope Only Solution

Infinigy Engineering, PLLC.	881364	Section Sets
KLB		Feb 5, 2019 at 11:20 AM
1039-A0002-B		RMQP-12-H5_881364.r3d



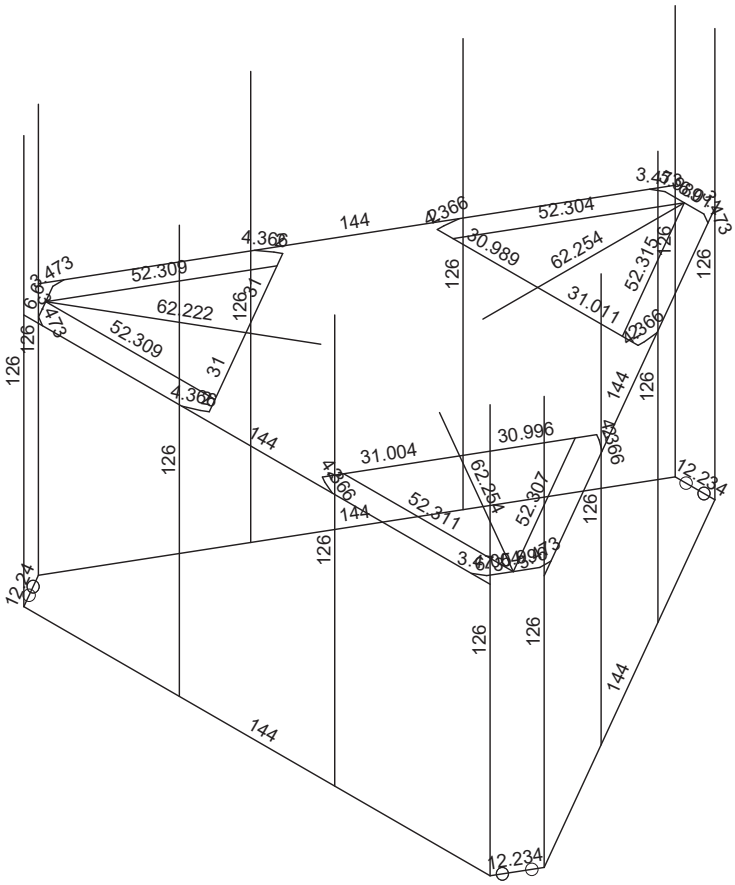
Envelope Only Solution

Infinigy Engineering, PLLC.	881364	Wire Frame
KLB		Feb 5, 2019 at 11:21 AM
1039-A0002-B		RMQP-12-H5_881364.r3d



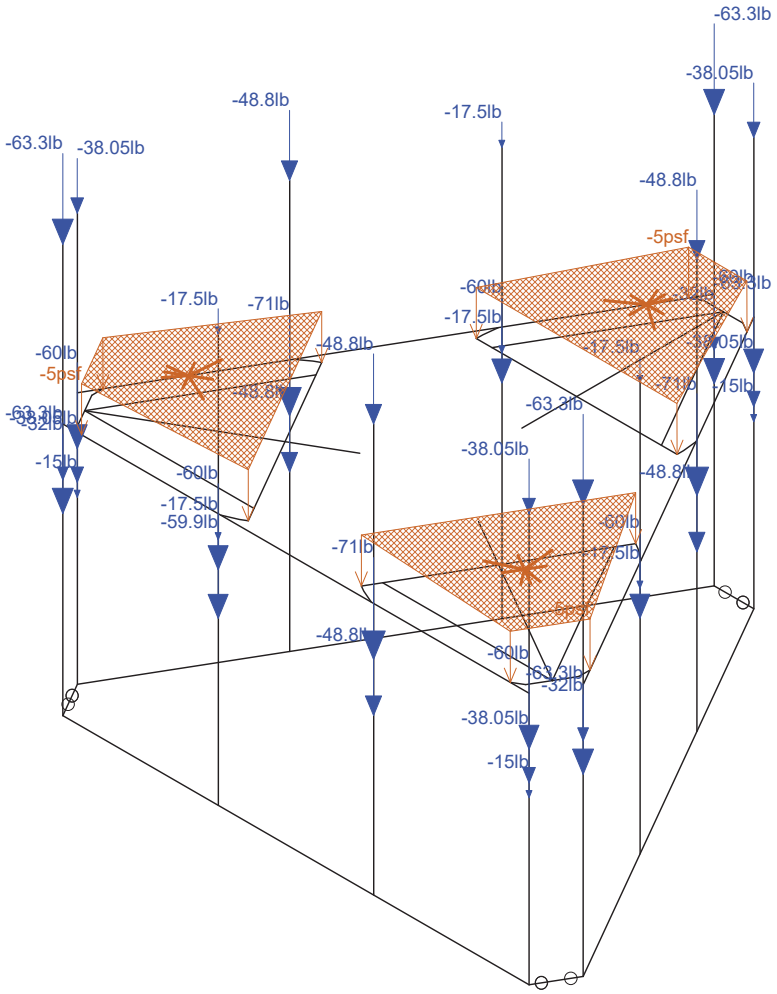
Envelope Only Solution

Infinigy Engineering, PLLC.	881364	Member Shape
KLB		Feb 5, 2019 at 11:21 AM
1039-A0002-B		RMQP-12-H5_881364.r3d



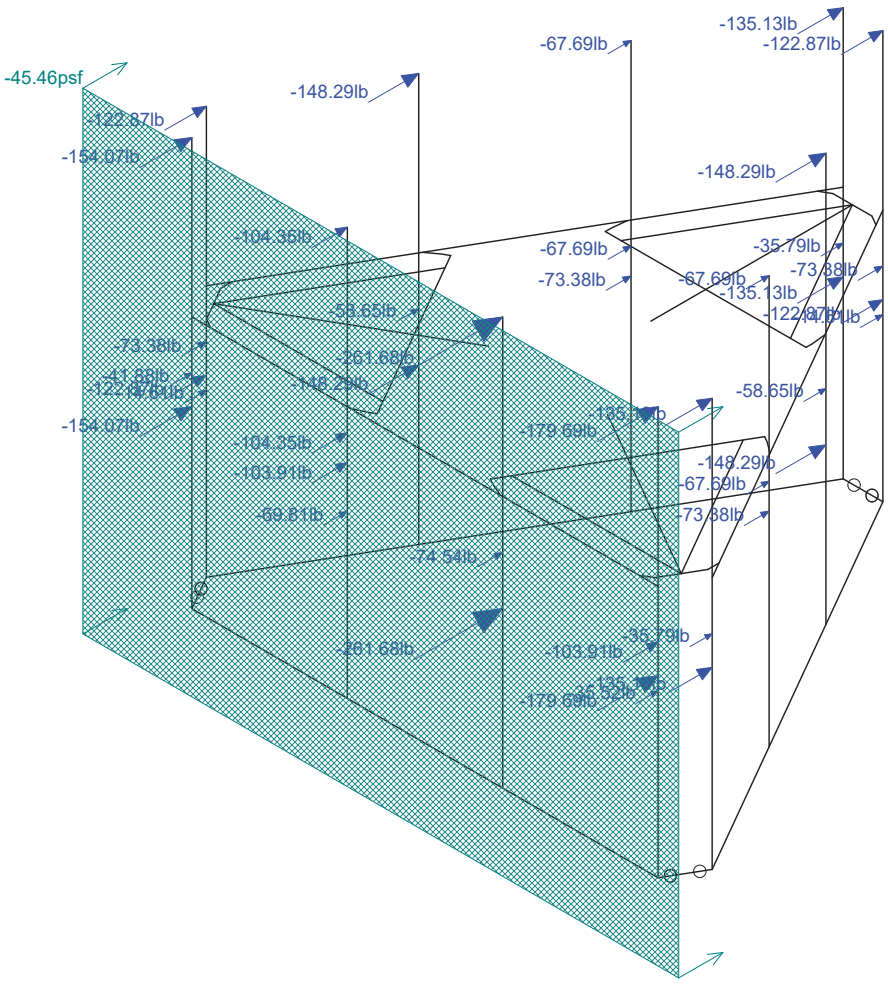
Member Length (in) Displayed
Envelope Only Solution

Infinigy Engineering, PLLC.	881364	Member Length
KLB		Feb 5, 2019 at 11:21 AM
1039-A0002-B		RMQP-12-H5_881364.r3d



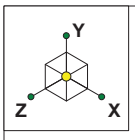
Loads: BLC 1, Self Weight
Envelope Only Solution

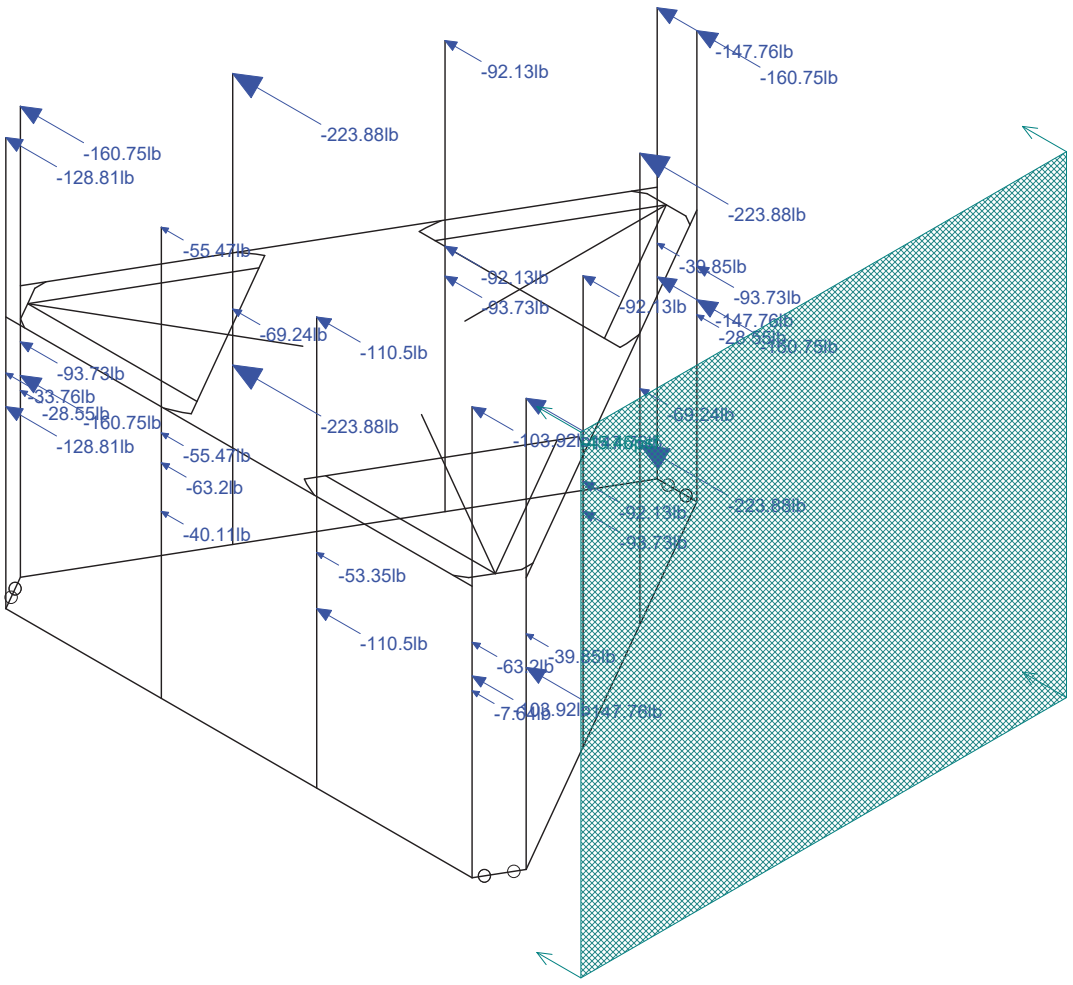
Infinigy Engineering, PLLC.	881364	Self-Weight
KLB		Feb 5, 2019 at 11:21 AM
1039-A0002-B		RMQP-12-H5_881364.r3d



Loads: BLC 2, Wind Load AZI 000
Envelope Only Solution

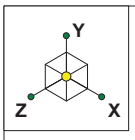
Infinigy Engineering, PLLC.	881364	Wind Load 000
KLB		Feb 5, 2019 at 11:22 AM
1039-A0002-B		RMQP-12-H5_881364.r3d

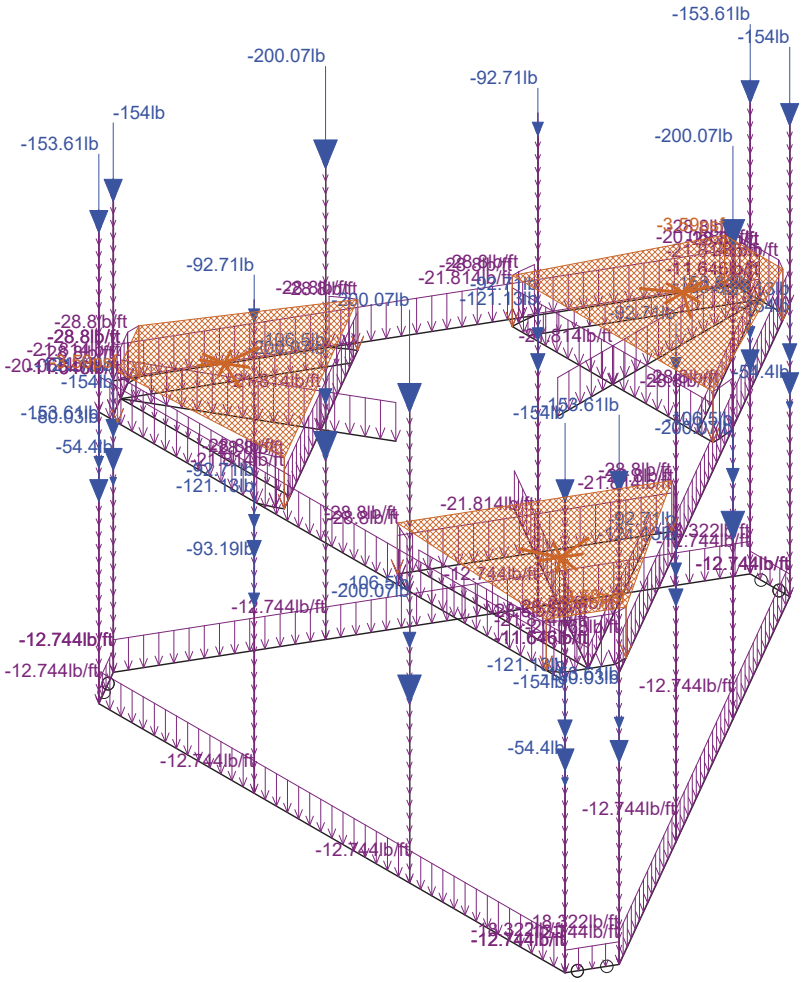




Loads: BLC 3, Wind Load AZI 090
Envelope Only Solution

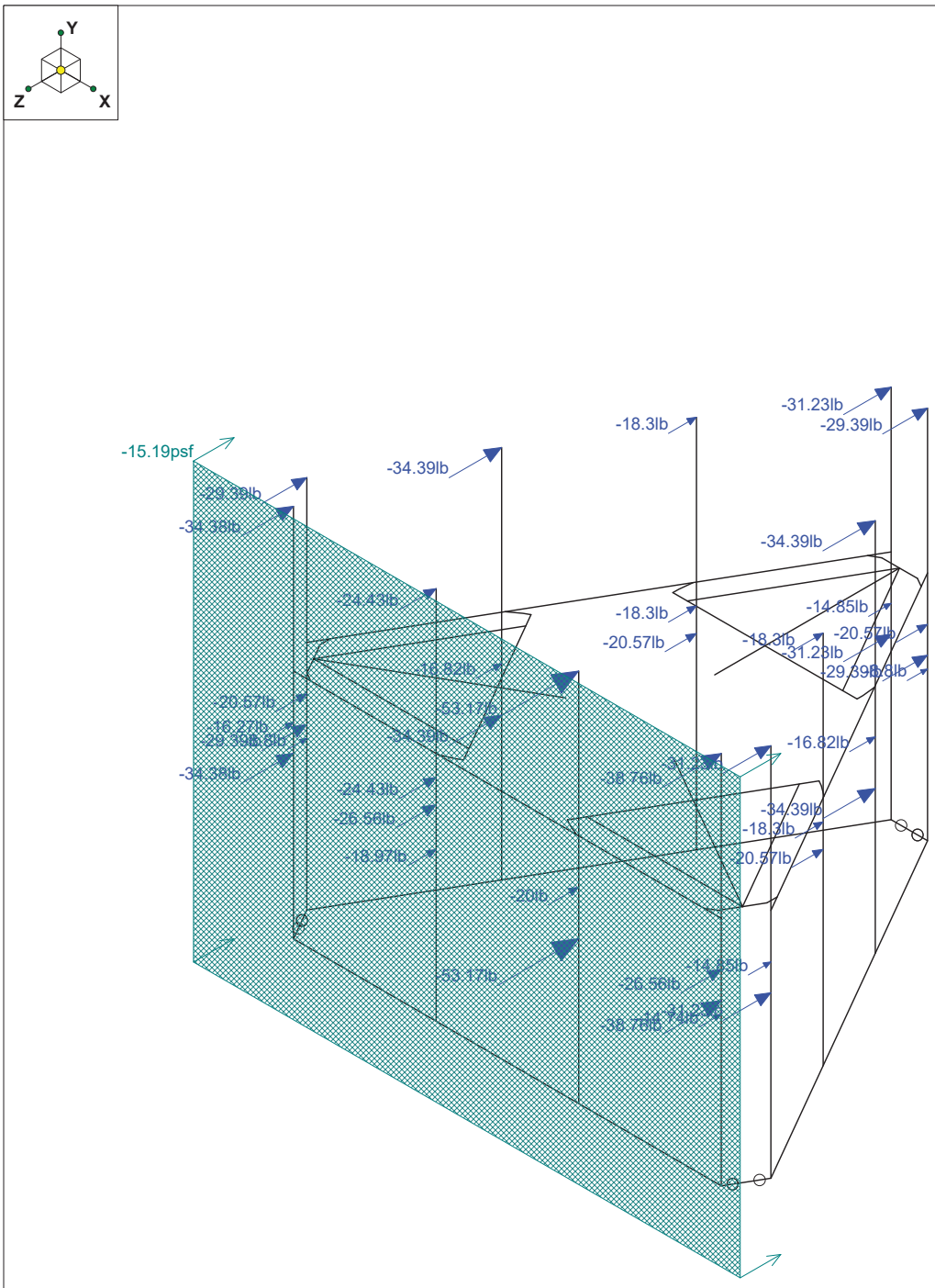
Infinigy Engineering, PLLC.	881364	Wind Load 090
KLB		Feb 5, 2019 at 11:23 AM
1039-A0002-B		RMQP-12-H5_881364.r3d





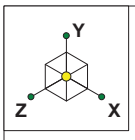
Loads: BLC 4, Ice Weight
Envelope Only Solution

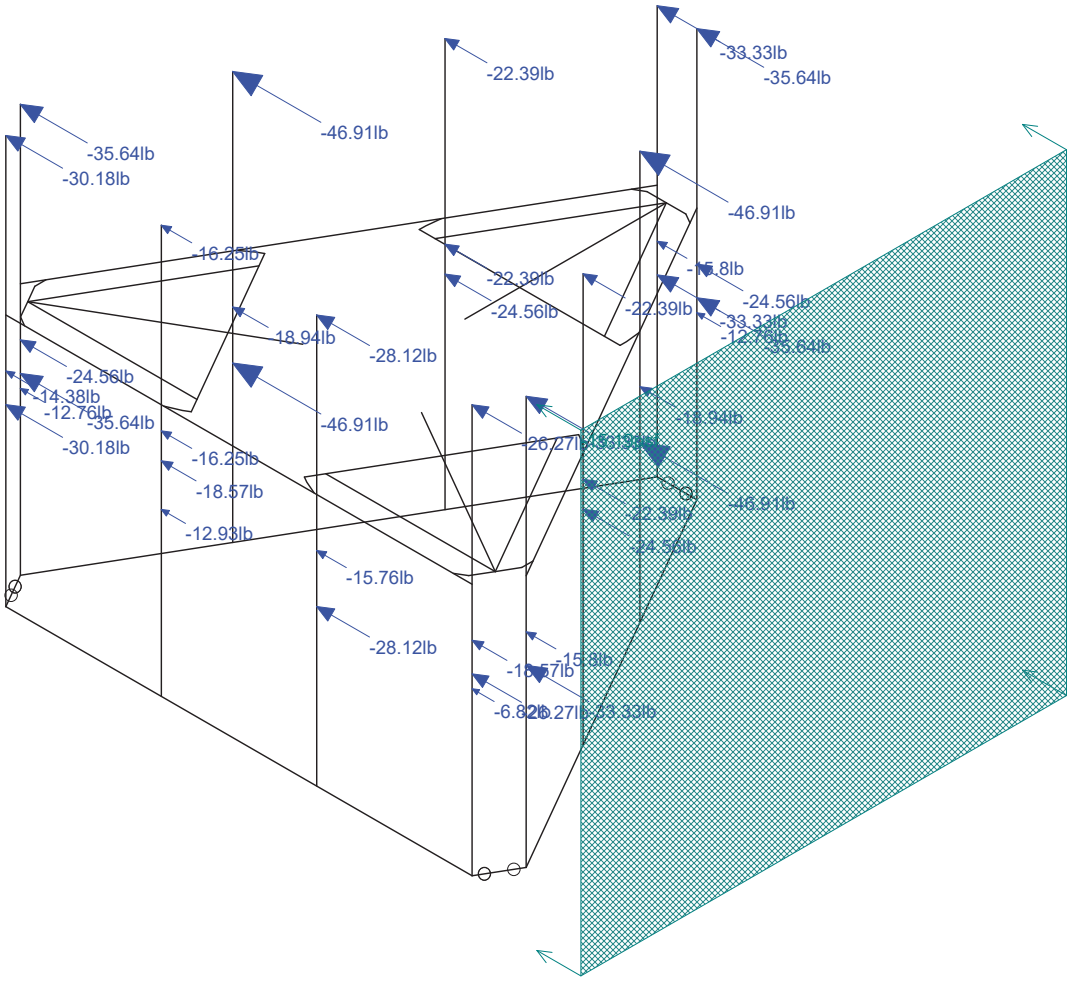
Infinigy Engineering, PLLC.	881364	Ice Weight
KLB		Feb 5, 2019 at 11:22 AM
1039-A0002-B		RMQP-12-H5_881364.r3d



Loads: BLC 5, Wind + Ice Load AZI 000
Envelope Only Solution

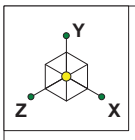
Infinigy Engineering, PLLC.	881364	Wind+Ice 000
KLB		Feb 5, 2019 at 11:23 AM
1039-A0002-B		RMQP-12-H5_881364.r3d

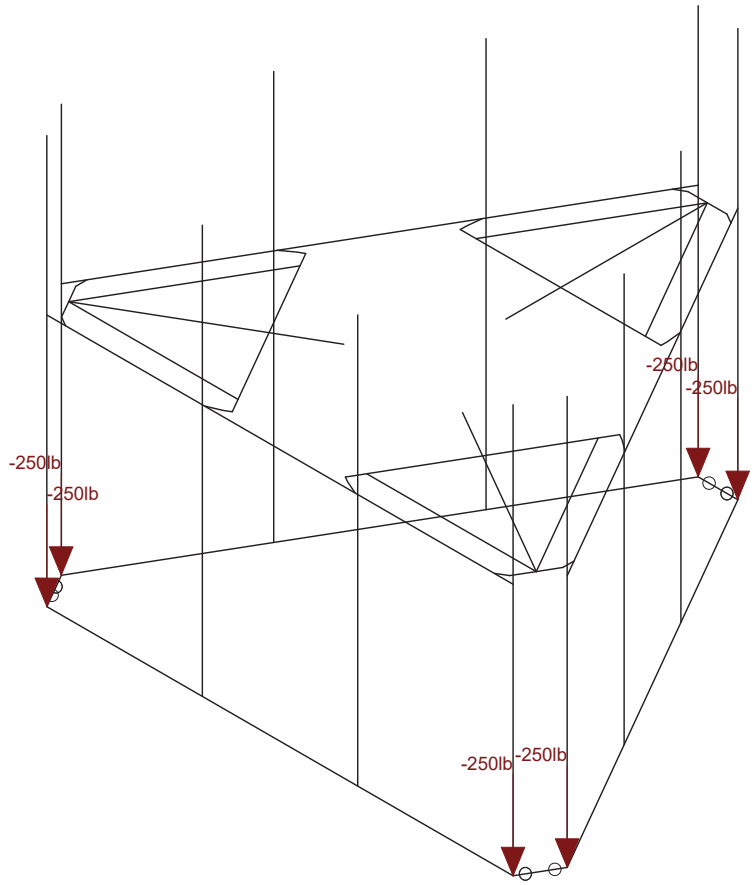




Loads: BLC 6, Wind + Ice Load AZI 090
Envelope Only Solution

Infinigy Engineering, PLLC.	881364	Wind+Ice 090
KLB		Feb 5, 2019 at 11:23 AM
1039-A0002-B		RMQP-12-H5_881364.r3d





Loads: BLC 7, Service Live 1
Envelope Only Solution

Infinigy Engineering, PLLC.	881364	Service Load
KLB		Feb 5, 2019 at 11:22 AM
1039-A0002-B		RMQP-12-H5_881364.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Site Name:	881364
Client:	CCI
Carrier:	AT&T
Engineer:	KLB
Date:	2/5/2019

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-H
Antenna Load Standard:	TIA-222-H
Structure Risk Category:	II
Structure Type:	Mount - Platform
Number of Sectors:	3
Structure Shape 1:	Round

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	125	mph (ultimate 3-second gust)
Wind Centerline 1 (z_1):	105.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
37.89	1.00	**45.46**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
6.06	1.00	**15.19**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (ultimate 3-second gust)
Base Ice Thickness:	2.00	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
CCI OPA-65R-LCUU-H6	105.0	3	1.00	Flat	Flat	37.89	9.49	359.39	207.85	245.73	321.50
Kathrein 800-10965	105.0	3	1.00	Flat	Flat	37.89	13.81	523.35	221.00	296.59	447.76
Powerwave 7770	105.0	3	1.00	Flat	Flat	37.89	5.51	208.69	110.94	135.38	184.26
Quintel QS66512-2	105.0	3	1.00	Flat	Flat	37.89	8.13	308.14	257.63	270.25	295.51
CCI TPX-070821	105.0	6	1.00	Flat	Flat	37.89	0.47	17.76	3.82	7.31	14.28
Ericsson RRUS-32	105.0	3	1.00	Flat	Flat	37.89	2.74	103.91	63.20	73.38	93.73
Ericsson RRUS-4449 B5/B12	105.0	3	1.00	Flat	Flat	37.89	1.97	74.54	53.35	58.65	69.24
Ericsson RRUS-8843 B2/B66A	105.0	3	1.00	Flat	Flat	37.89	2.74	103.91	63.20	73.38	93.73
Powerwave LGP21401	105.0	6	1.00	Flat	Flat	37.89	0.55	20.94	16.88	17.89	19.93
Raycap DC6-48-60-18-8F	105.0	3	1.00	Round	Round	37.89	1.21	45.91	45.91	45.91	45.91
Ericsson RRUS 4478 B14	105.0	3	1.00	Flat	Flat	37.89	1.84	69.81	40.11	47.54	62.38

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N7	N5		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
2	M2	N7	N6		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
3	M3	N3	N1		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
4	M4	N1	N50		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
5	M5	N4	N2		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
6	M6	N2	N43		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
7	M7	N7	N9			L2X2X3	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N7	N8		270	L2X2X3	Beam	Single Angle	A36 Gr.36	Typical
9	M9	N5	N48		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
10	M10	N6	N45		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
11	M11	N7	N57			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
12	M12	N3	N10			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
13	M13	N10	N4			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
14	M14	N17	N15		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
15	M15	N17	N16		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
16	M16	N13	N11		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
17	M17	N11	N34		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
18	M18	N14	N12		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
19	M19	N12	N51		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
20	M20	N17	N19			L2X2X3	Beam	Single Angle	A36 Gr.36	Typical
21	M21	N17	N18		270	L2X2X3	Beam	Single Angle	A36 Gr.36	Typical
22	M22	N15	N32		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
23	M23	N16	N53		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
24	M24	N17	N55			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
25	M25	N13	N20			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
26	M26	N20	N14			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
27	M27	N27	N25		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
28	M28	N27	N26		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
29	M29	N23	N21		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
30	M30	N21	N42		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
31	M31	N24	N22		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
32	M32	N22	N35		90	Plate 3/8x6	Beam	RECT	A36 Gr.36	Typical
33	M33	N27	N29			L2X2X3	Beam	Single Angle	A36 Gr.36	Typical
34	M34	N27	N28		270	L2X2X3	Beam	Single Angle	A36 Gr.36	Typical
35	M35	N25	N40		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
36	M36	N26	N37		90	Plate 1/2x6	Beam	RECT	A36 Gr.36	Typical
37	M37	N27	N56			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
38	M38	N23	N30			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
39	M39	N30	N24			HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical
40	M40	NP12	NP9			Pipe 3.0	Beam	Pipe	A53 Gr.B	Typical
41	M41	NP8	NP5			Pipe 3.0	Beam	Pipe	A53 Gr.B	Typical
42	M42	NP4	NP1			Pipe 3.0	Beam	Pipe	A53 Gr.B	Typical
43	MP4	N79	N67			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
44	MP9	N78	N66			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
45	MP3	N80	N68			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
46	MP10	N77	N65			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
47	MP2	N81	N69			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
48	MP1	N82	N70A			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
49	MP8	N71	N59			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
50	MP11	N76	N64			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
51	MP7	N72	N60			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
52	MP6	N73	N61			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
53	MP5	N74	N62			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
54	MP12	N75	N63			Pipe 2.5	Beam	Pipe	A53 Gr.B	Typical
55	M55	N82	N71			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
56	M56	N71	N74		90	C12X25	Beam	Channel	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
57	M57	N74	N75			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical
58	M58	N82	N79		90	C12X25	Beam	Channel	A36 Gr.36	Typical
59	M59	N75	N78		90	C12X25	Beam	Channel	A36 Gr.36	Typical
60	M60	N78	N79			Pipe 2.0	Beam	Pipe	A53 Gr.B	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	Hot Rolled Steel				
2	A36 Gr.36	1/2 x 6	12	56.8	48.4
3	A36 Gr.36	3/8 x 6	12	38.2	24.4
4	A36 Gr.36	C12X25	3	432	899.1
5	A36 Gr.36	L2x2x3	6	313.9	64.3
6	A53 Gr.B	HSS4X4X4	9	372.7	356.2
7	A53 Gr.B	PIPE_2.0	3	36.7	10.6
8	A53 Gr.B	PIPE_2.5	12	1512	690.3
9	A53 Gr.B	PIPE_3.0	3	432	253.6
10	Total HR Steel		60	3194.3	2346.8

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Self Weight	DL		-1			40		3	
2	Wind Load AZI 000	WLZ					40		1	
3	Wind Load AZI 090	WLX					40		1	
4	Ice Weight	OL1					40	60	3	
5	Wind + Ice Load AZI ...	OL2					40		1	
6	Wind + Ice Load AZI ...	OL3					40		1	
7	Service Live 1	LL				6				
8	BLC 1 Transient Area...	None						117		
9	BLC 2 Transient Area...	None						58		
10	BLC 3 Transient Area...	None						53		
11	BLC 4 Transient Area...	None						117		
12	BLC 5 Transient Area...	None						58		
13	BLC 6 Transient Area...	None						53		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.4D	Yes	Y		DL	1.4																				
2	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	1																		
3	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	.866	W...	.5																
4	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	.5	W...	.866																
5	1.2D + 1W...	Yes	Y		DL	1.2			W...	1																
6	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	-.5	W...	.866																
7	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	-.866	W...	.5																
8	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	-1																		
9	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	-.866	W...	-.5																
10	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	-.5	W...	-.866																
11	1.2D + 1W...	Yes	Y		DL	1.2			W...	-1																
12	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	.5	W...	-.866																
13	1.2D + 1W...	Yes	Y		DL	1.2	WLZ	.866	W...	-.5																
14	0.9D + 1W...	Yes	Y		DL	.9	WLZ	1																		
15	0.9D + 1W...	Yes	Y		DL	.9	WLZ	.866	W...	.5																
16	0.9D + 1W...	Yes	Y		DL	.9	WLZ	.5	W...	.866																

Load Combinations (Continued)

	Description	Sol..	PD..	SR..	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
17	0.9D + 1W..	Yes	Y		DL	.9			W...	1														
18	0.9D + 1W..	Yes	Y		DL	.9	WLZ	-.5	W...	.866														
19	0.9D + 1W..	Yes	Y		DL	.9	WLZ	-.866	W...	.5														
20	0.9D + 1W..	Yes	Y		DL	.9	WLZ	-1																
21	0.9D + 1W..	Yes	Y		DL	.9	WLZ	-.866	W...	-.5														
22	0.9D + 1W..	Yes	Y		DL	.9	WLZ	-.5	W...	-.866														
23	0.9D + 1W..	Yes	Y		DL	.9			W...	-1														
24	0.9D + 1W..	Yes	Y		DL	.9	WLZ	.5	W...	-.866														
25	0.9D + 1W..	Yes	Y		DL	.9	WLZ	.866	W...	-.5														
26	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1																
27	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	1														
28	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5												
29	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.866												
30	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1			OL3	1												
31	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.866												
32	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5												
33	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-1														
34	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5												
35	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-.866												
36	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1			OL3	-1												
37	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-.866												
38	1.2D + 1.0..	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5												
39	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.047														
40	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.041	W...	.024												
41	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.024	W...	.041												
42	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5			W...	.047												
43	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.024	W...	.041												
44	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.041	W...	.024												
45	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.047														
46	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.041	W...	-.024												
47	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	-.024	W...	-.041												
48	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5			W...	-.047												
49	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.024	W...	-.041												
50	1.2D + 1.5..	Yes	Y		DL	1.2	LL	1.5	WLZ	.041	W...	-.024												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N56	max	1478.72	5	4899.95	33	3116.114	2	8768.442	33	1875.173	11	156.768	30
2		min	-1479.408	11	1043.491	14	-3043.402	20	1649.106	14	-1874.654	5	-114.321	24
3	N55	max	2615.913	16	4994.484	29	2241.363	15	-846.462	21	1299.011	8	7614.797	29
4		min	-2677.733	10	1106.802	22	-2278.674	9	-4594.087	28	-1300.975	2	1575.906	22
5	N57	max	2821.333	6	5092.423	37	1962.878	25	-952.562	19	930.331	2	-1622.459	18
6		min	-2758.901	24	1141.343	18	-1999.65	7	-4591.67	38	-928.9	8	-7856.732	37
7	Totals:	max	6631.835	17	14682.421	38	6759.466	14						
8		min	-6631.835	11	3877.417	14	-6759.466	8						

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe 3.0	PIPE_3.0	Beam	Pipe	A53 Gr.B	Typical	2.07	2.85	2.85	5.69
2	L2X2X3	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
3	HSS4X4X4	HSS4X4X4	Beam	HSS Pipe	A53 Gr.B	Typical	3.37	7.8	7.8	12.8
4	Pipe 2.5	PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
5	C12X25	C12X25	Beam	Channel	A36 Gr.36	Typical	7.34	4.45	144	.538
6	Plate 1/2x6	1/2 x 6	Beam	RECT	A36 Gr.36	Typical	3	9	.063	.237

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
7	Plate 3/8x6	3/8 x 6	Beam	RECT	A36 Gr.36	Typical	2.25	6.75	.026	.101
8	Pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Joint Boundary Conditions

	Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N56	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N10						
3	N55	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N57	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M1						Yes				None
2	M2						Yes				None
3	M3						Yes				None
4	M4						Yes				None
5	M5						Yes				None
6	M6						Yes				None
7	M7						Yes				None
8	M8						Yes				None
9	M9						Yes				None
10	M10						Yes				None
11	M11						Yes				None
12	M12						Yes				None
13	M13						Yes				None
14	M14						Yes				None
15	M15						Yes				None
16	M16						Yes				None
17	M17						Yes				None
18	M18						Yes				None
19	M19						Yes				None
20	M20						Yes				None
21	M21						Yes				None
22	M22						Yes				None
23	M23						Yes				None
24	M24						Yes				None
25	M25						Yes				None
26	M26						Yes				None
27	M27						Yes				None
28	M28						Yes				None
29	M29						Yes				None
30	M30						Yes				None
31	M31						Yes				None
32	M32						Yes				None
33	M33						Yes				None
34	M34						Yes				None
35	M35						Yes				None
36	M36						Yes				None
37	M37						Yes				None
38	M38						Yes				None
39	M39						Yes				None
40	M40						Yes				None
41	M41						Yes	Default			None
42	M42						Yes	Default			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
43	MP4						Yes				None
44	MP9						Yes				None
45	MP3						Yes				None
46	MP10						Yes				None
47	MP2						Yes				None
48	MP1						Yes				None
49	MP8						Yes				None
50	MP11						Yes				None
51	MP7						Yes				None
52	MP6						Yes				None
53	MP5						Yes				None
54	MP12						Yes				None
55	M55	AllPIN	BenPIN				Yes				None
56	M56						Yes				None
57	M57	AllPIN	BenPIN				Yes				None
58	M58						Yes				None
59	M59						Yes				None
60	M60	AllPIN	BenPIN				Yes				None

Hot Rolled Steel Properties

	Label	E [psi]	G [psi]	Nu	Therm (\1E5 F)	Density[lb/ft^...	Yield[psi]	Ry	Fu[psi]	Rt
1	A36 Gr.36	2.9e+7	1.115e+7	.3	.65	490	36000	1.5	58000	1.2
2	A572 Gr.50	2.9e+7	1.115e+7	.3	.65	490	50000	1.1	58000	1.2
3	A992	2.9e+7	1.115e+7	.3	.65	490	50000	1.1	58000	1.2
4	A500 Gr.42	2.9e+7	1.115e+7	.3	.65	490	42000	1.3	58000	1.1
5	A500 Gr.46	2.9e+7	1.115e+7	.3	.65	490	46000	1.2	58000	1.1
6	A53 Gr.B	2.9e+7	1.115e+7	.3	.65	490	35000	1.5	58000	1.2
7	Q235	2.9e+7	1.115e+7	.3	.65	490	34000	1.5	58000	1.2
8	J429-Gr5	2.9e+7	1.115e+7	.3	.65	490	92000	1.5	1.2e+5	1.2

Joint Loads and Enforced Displacements (BLC 7 : Service Live 1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^...
1	N79	L	Y	-250
2	N78	L	Y	-250
3	N82	L	Y	-250
4	N71	L	Y	-250
5	N75	L	Y	-250
6	N74	L	Y	-250

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-38.05	54
2	MP2	Y	-48.8	48
3	MP3	Y	-17.5	71
4	MP4	Y	-63.3	54
5	MP1	Y	-15	50
6	MP1	Y	-60	63
7	MP2	Y	-71	63
8	MP3	Y	-60	63
9	MP4	Y	-32	63
10	MP3	Y	-59.9	50
11	MP1	Y	-38.05	126

Member Point Loads (BLC 1 : Self Weight) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
12	MP2	Y	-48.8	126
13	MP3	Y	-17.5	126
14	MP4	Y	-63.3	126
15	MP5	Y	-38.05	54
16	MP6	Y	-48.8	48
17	MP7	Y	-17.5	71
18	MP8	Y	-63.3	54
19	MP5	Y	-15	50
20	MP5	Y	-60	63
21	MP6	Y	-71	63
22	MP7	Y	-60	63
23	MP8	Y	-32	63
24	MP5	Y	-38.05	126
25	MP6	Y	-48.8	126
26	MP7	Y	-17.5	126
27	MP8	Y	-63.3	126
28	MP9	Y	-38.05	54
29	MP10	Y	-48.8	48
30	MP11	Y	-17.5	71
31	MP12	Y	-63.3	54
32	MP9	Y	-15	50
33	MP9	Y	-60	63
34	MP10	Y	-71	63
35	MP11	Y	-60	63
36	MP12	Y	-32	63
37	MP9	Y	-38.05	126
38	MP10	Y	-48.8	126
39	MP11	Y	-17.5	126
40	MP12	Y	-63.3	126

Member Point Loads (BLC 2 : Wind Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-179.69	54
2	MP2	Z	-261.68	48
3	MP3	Z	-104.35	71
4	MP4	Z	-154.07	54
5	MP1	Z	-35.52	50
6	MP1	Z	-103.91	63
7	MP2	Z	-74.54	63
8	MP3	Z	-103.91	63
9	MP4	Z	-41.88	63
10	MP3	Z	-69.81	50
11	MP1	Z	-179.69	126
12	MP2	Z	-261.68	126
13	MP3	Z	-104.35	126
14	MP4	Z	-154.07	126
15	MP5	Z	-122.87	54
16	MP6	Z	-148.29	48
17	MP7	Z	-67.69	71
18	MP8	Z	-135.13	54
19	MP5	Z	-14.61	50
20	MP5	Z	-73.38	63
21	MP6	Z	-58.65	63
22	MP7	Z	-73.38	63
23	MP8	Z	-35.79	63
24	MP5	Z	-122.87	126

Member Point Loads (BLC 2 : Wind Load AZI 000) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
25	MP6	Z	-148.29	126
26	MP7	Z	-67.69	126
27	MP8	Z	-135.13	126
28	MP9	Z	-122.87	54
29	MP10	Z	-148.29	48
30	MP11	Z	-67.69	71
31	MP12	Z	-135.13	54
32	MP9	Z	-14.61	50
33	MP9	Z	-73.38	63
34	MP10	Z	-58.65	63
35	MP11	Z	-73.38	63
36	MP12	Z	-35.79	63
37	MP9	Z	-122.87	126
38	MP10	Z	-148.29	126
39	MP11	Z	-67.69	126
40	MP12	Z	-135.13	126

Member Point Loads (BLC 3 : Wind Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-103.92	54
2	MP2	X	-110.5	48
3	MP3	X	-55.47	71
4	MP4	X	-128.81	54
5	MP1	X	-7.64	50
6	MP1	X	-63.2	63
7	MP2	X	-53.35	63
8	MP3	X	-63.2	63
9	MP4	X	-33.76	63
10	MP3	X	-40.11	50
11	MP1	X	-103.92	126
12	MP2	X	-110.5	126
13	MP3	X	-55.47	126
14	MP4	X	-128.81	126
15	MP5	X	-160.75	54
16	MP6	X	-223.88	48
17	MP7	X	-92.13	71
18	MP8	X	-147.76	54
19	MP5	X	-28.55	50
20	MP5	X	-93.73	63
21	MP6	X	-69.24	63
22	MP7	X	-93.73	63
23	MP8	X	-39.85	63
24	MP5	X	-160.75	126
25	MP6	X	-223.88	126
26	MP7	X	-92.13	126
27	MP8	X	-147.76	126
28	MP9	X	-160.75	54
29	MP10	X	-223.88	48
30	MP11	X	-92.13	71
31	MP12	X	-147.76	54
32	MP9	X	-28.55	50
33	MP9	X	-93.73	63
34	MP10	X	-69.24	63
35	MP11	X	-93.73	63
36	MP12	X	-39.85	63
37	MP9	X	-160.75	126

Member Point Loads (BLC 3 : Wind Load AZI 090) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
38	MP10	X	-223.88	126
39	MP11	X	-92.13	126
40	MP12	X	-147.76	126

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Y	-154	54
2	MP2	Y	-200.07	48
3	MP3	Y	-92.71	71
4	MP4	Y	-153.61	54
5	MP1	Y	-54.4	50
6	MP1	Y	-121.13	63
7	MP2	Y	-106.5	63
8	MP3	Y	-121.13	63
9	MP4	Y	-80.03	63
10	MP3	Y	-93.19	50
11	MP1	Y	-154	126
12	MP2	Y	-200.07	126
13	MP3	Y	-92.71	126
14	MP4	Y	-153.61	126
15	MP5	Y	-154	54
16	MP6	Y	-200.07	48
17	MP7	Y	-92.71	71
18	MP8	Y	-153.61	54
19	MP5	Y	-54.4	50
20	MP5	Y	-121.13	63
21	MP6	Y	-106.5	63
22	MP7	Y	-121.13	63
23	MP8	Y	-80.03	63
24	MP5	Y	-154	126
25	MP6	Y	-200.07	126
26	MP7	Y	-92.71	126
27	MP8	Y	-153.61	126
28	MP9	Y	-154	54
29	MP10	Y	-200.07	48
30	MP11	Y	-92.71	71
31	MP12	Y	-153.61	54
32	MP9	Y	-54.4	50
33	MP9	Y	-121.13	63
34	MP10	Y	-106.5	63
35	MP11	Y	-121.13	63
36	MP12	Y	-80.03	63
37	MP9	Y	-154	126
38	MP10	Y	-200.07	126
39	MP11	Y	-92.71	126
40	MP12	Y	-153.61	126

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	Z	-38.76	54
2	MP2	Z	-53.17	48
3	MP3	Z	-24.43	71
4	MP4	Z	-34.38	54
5	MP1	Z	-14.74	50
6	MP1	Z	-26.56	63
7	MP2	Z	-20	63

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
8	MP3	Z	-26.56	63
9	MP4	Z	-16.27	63
10	MP3	Z	-18.97	50
11	MP1	Z	-38.76	126
12	MP2	Z	-53.17	126
13	MP3	Z	-24.43	126
14	MP4	Z	-34.38	126
15	MP5	Z	-29.39	54
16	MP6	Z	-34.39	48
17	MP7	Z	-18.3	71
18	MP8	Z	-31.23	54
19	MP5	Z	-8.8	50
20	MP5	Z	-20.57	63
21	MP6	Z	-16.82	63
22	MP7	Z	-20.57	63
23	MP8	Z	-14.85	63
24	MP5	Z	-29.39	126
25	MP6	Z	-34.39	126
26	MP7	Z	-18.3	126
27	MP8	Z	-31.23	126
28	MP9	Z	-29.39	54
29	MP10	Z	-34.39	48
30	MP11	Z	-18.3	71
31	MP12	Z	-31.23	54
32	MP9	Z	-8.8	50
33	MP9	Z	-20.57	63
34	MP10	Z	-16.82	63
35	MP11	Z	-20.57	63
36	MP12	Z	-14.85	63
37	MP9	Z	-29.39	126
38	MP10	Z	-34.39	126
39	MP11	Z	-18.3	126
40	MP12	Z	-31.23	126

Member Point Loads (BLC 6 : Wind + Ice Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP1	X	-26.27	54
2	MP2	X	-28.12	48
3	MP3	X	-16.25	71
4	MP4	X	-30.18	54
5	MP1	X	-6.82	50
6	MP1	X	-18.57	63
7	MP2	X	-15.76	63
8	MP3	X	-18.57	63
9	MP4	X	-14.38	63
10	MP3	X	-12.93	50
11	MP1	X	-26.27	126
12	MP2	X	-28.12	126
13	MP3	X	-16.25	126
14	MP4	X	-30.18	126
15	MP5	X	-35.64	54
16	MP6	X	-46.91	48
17	MP7	X	-22.39	71
18	MP8	X	-33.33	54
19	MP5	X	-12.76	50
20	MP5	X	-24.56	63

Member Point Loads (BLC 6 : Wind + Ice Load AZI 090) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
21	MP6	X	-18.94	63
22	MP7	X	-24.56	63
23	MP8	X	-15.8	63
24	MP5	X	-35.64	126
25	MP6	X	-46.91	126
26	MP7	X	-22.39	126
27	MP8	X	-33.33	126
28	MP9	X	-35.64	54
29	MP10	X	-46.91	48
30	MP11	X	-22.39	71
31	MP12	X	-33.33	54
32	MP9	X	-12.76	50
33	MP9	X	-24.56	63
34	MP10	X	-18.94	63
35	MP11	X	-24.56	63
36	MP12	X	-15.8	63
37	MP9	X	-35.64	126
38	MP10	X	-46.91	126
39	MP11	X	-22.39	126
40	MP12	X	-33.33	126

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M1	Y	-28.8	-28.8	0	%100
2	M2	Y	-28.8	-28.8	0	%100
3	M3	Y	-28.8	-28.8	0	%100
4	M4	Y	-28.8	-28.8	0	%100
5	M5	Y	-28.8	-28.8	0	%100
6	M6	Y	-28.8	-28.8	0	%100
7	M7	Y	-11.646	-11.646	0	%100
8	M8	Y	-11.646	-11.646	0	%100
9	M9	Y	-28.8	-28.8	0	%100
10	M10	Y	-28.8	-28.8	0	%100
11	M11	Y	-21.814	-21.814	0	%100
12	M12	Y	-21.814	-21.814	0	%100
13	M13	Y	-21.814	-21.814	0	%100
14	M14	Y	-28.8	-28.8	0	%100
15	M15	Y	-28.8	-28.8	0	%100
16	M16	Y	-28.8	-28.8	0	%100
17	M17	Y	-28.8	-28.8	0	%100
18	M18	Y	-28.8	-28.8	0	%100
19	M19	Y	-28.8	-28.8	0	%100
20	M20	Y	-11.646	-11.646	0	%100
21	M21	Y	-11.646	-11.646	0	%100
22	M22	Y	-28.8	-28.8	0	%100
23	M23	Y	-28.8	-28.8	0	%100
24	M24	Y	-21.814	-21.814	0	%100
25	M25	Y	-21.814	-21.814	0	%100
26	M26	Y	-21.814	-21.814	0	%100
27	M27	Y	-28.8	-28.8	0	%100
28	M28	Y	-28.8	-28.8	0	%100
29	M29	Y	-28.8	-28.8	0	%100
30	M30	Y	-28.8	-28.8	0	%100
31	M31	Y	-28.8	-28.8	0	%100
32	M32	Y	-28.8	-28.8	0	%100

Member Distributed Loads (BLC 4 : Ice Weight) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
33	M33	Y	-11.646	-11.646	0	%100
34	M34	Y	-11.646	-11.646	0	%100
35	M35	Y	-28.8	-28.8	0	%100
36	M36	Y	-28.8	-28.8	0	%100
37	M37	Y	-21.814	-21.814	0	%100
38	M38	Y	-21.814	-21.814	0	%100
39	M39	Y	-21.814	-21.814	0	%100
40	M40	Y	-20.068	-20.068	0	%100
41	M41	Y	-20.068	-20.068	0	%100
42	M42	Y	-20.068	-20.068	0	%100
43	MP4	Y	-12.744	-12.744	0	%100
44	MP9	Y	-12.744	-12.744	0	%100
45	MP3	Y	-12.744	-12.744	0	%100
46	MP10	Y	-12.744	-12.744	0	%100
47	MP2	Y	-12.744	-12.744	0	%100
48	MP1	Y	-12.744	-12.744	0	%100
49	MP8	Y	-12.744	-12.744	0	%100
50	MP11	Y	-12.744	-12.744	0	%100
51	MP7	Y	-12.744	-12.744	0	%100
52	MP6	Y	-12.744	-12.744	0	%100
53	MP5	Y	-12.744	-12.744	0	%100
54	MP12	Y	-12.744	-12.744	0	%100
55	M55	Y	-12.744	-12.744	0	%100
56	M56	Y	-18.322	-18.322	0	%100
57	M57	Y	-12.744	-12.744	0	%100
58	M58	Y	-18.322	-18.322	0	%100
59	M59	Y	-18.322	-18.322	0	%100
60	M60	Y	-12.744	-12.744	0	%100

Member Distributed Loads (BLC 8 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M1	Y	-.608	-.608	3.433	5.748
2	M2	Y	-.607	-.607	3.433	5.75
3	M4	Y	-.491	-.491	0	4.366
4	M6	Y	-.491	-.491	0	4.366
5	M7	Y	-.753	-2.505	0	10.462
6	M7	Y	-2.505	-3.531	10.462	20.924
7	M7	Y	-3.531	-4.153	20.924	31.386
8	M7	Y	-4.153	-3.447	31.386	41.848
9	M7	Y	-3.447	-1.089	41.848	52.309
10	M8	Y	-.752	-2.505	0	10.462
11	M8	Y	-2.505	-3.526	10.462	20.924
12	M8	Y	-3.526	-4.148	20.924	31.386
13	M8	Y	-4.148	-3.446	31.386	41.848
14	M8	Y	-3.446	-1.089	41.848	52.309
15	M9	Y	-.342	-.342	0	3.473
16	M10	Y	-.341	-.341	0	3.473
17	M11	Y	-.196	-2.315	0	8.711
18	M11	Y	-2.315	-4.166	8.711	17.422
19	M11	Y	-4.166	-6.302	17.422	26.133
20	M11	Y	-6.302	-6.749	26.133	34.844
21	M11	Y	-6.749	-4.652	34.844	43.555
22	M12	Y	-.364	-1.344	0	7.75
23	M12	Y	-1.344	-2.658	7.75	15.5
24	M12	Y	-2.658	-2.854	15.5	23.25
25	M12	Y	-2.854	-1.598	23.25	31

Member Distributed Loads (BLC 8 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
26	M13	Y	-1.606	-2.854	0	7.75
27	M13	Y	-2.854	-2.656	7.75	15.5
28	M13	Y	-2.656	-1.344	15.5	23.25
29	M13	Y	-1.344	-.364	23.25	31
30	M41	Y	-.025	-.612	86.4	97.92
31	M41	Y	-.612	-1.221	97.92	109.44
32	M41	Y	-1.221	-1.246	109.44	120.96
33	M41	Y	-1.246	-.998	120.96	132.48
34	M41	Y	-.998	-.493	132.48	144
35	M42	Y	-.491	-.998	0	11.52
36	M42	Y	-.998	-1.247	11.52	23.04
37	M42	Y	-1.247	-1.221	23.04	34.56
38	M42	Y	-1.221	-.612	34.56	46.08
39	M42	Y	-.612	-.025	46.08	57.6
40	M14	Y	-.608	-.608	3.432	5.746
41	M15	Y	-.607	-.607	3.434	5.752
42	M17	Y	-.491	-.491	0	4.366
43	M19	Y	-.491	-.491	0	4.366
44	M20	Y	-.753	-2.506	0	10.462
45	M20	Y	-2.506	-3.531	10.462	20.925
46	M20	Y	-3.531	-4.154	20.925	31.387
47	M20	Y	-4.154	-3.447	31.387	41.849
48	M20	Y	-3.447	-1.089	41.849	52.311
49	M21	Y	-.752	-2.504	0	10.461
50	M21	Y	-2.504	-3.525	10.461	20.923
51	M21	Y	-3.525	-4.147	20.923	31.384
52	M21	Y	-4.147	-3.446	31.384	41.846
53	M21	Y	-3.446	-1.089	41.846	52.307
54	M22	Y	-.342	-.342	0	3.473
55	M23	Y	-.341	-.341	0	3.473
56	M24	Y	-.196	-2.314	0	8.716
57	M24	Y	-2.314	-4.164	8.716	17.431
58	M24	Y	-4.164	-6.299	17.431	26.147
59	M24	Y	-6.299	-6.746	26.147	34.862
60	M24	Y	-6.746	-4.65	34.862	43.578
61	M25	Y	-.365	-1.344	0	7.749
62	M25	Y	-1.344	-2.659	7.749	15.498
63	M25	Y	-2.659	-2.854	15.498	23.247
64	M25	Y	-2.854	-1.597	23.247	30.996
65	M26	Y	-1.605	-2.854	0	7.751
66	M26	Y	-2.854	-2.656	7.751	15.502
67	M26	Y	-2.656	-1.343	15.502	23.253
68	M26	Y	-1.343	-.364	23.253	31.004
69	M40	Y	-.49	-.998	0	11.52
70	M40	Y	-.998	-1.246	11.52	23.04
71	M40	Y	-1.246	-1.22	23.04	34.56
72	M40	Y	-1.22	-.612	34.56	46.08
73	M40	Y	-.612	-.025	46.08	57.6
74	M42	Y	-.025	-.612	86.4	97.92
75	M42	Y	-.612	-1.221	97.92	109.44
76	M42	Y	-1.221	-1.247	109.44	120.96
77	M42	Y	-1.247	-.998	120.96	132.48
78	M42	Y	-.998	-.493	132.48	144
79	M27	Y	-.609	-.609	3.43	5.742
80	M28	Y	-.607	-.607	3.436	5.755
81	M30	Y	-.491	-.491	0	4.366
82	M32	Y	-.491	-.491	0	4.366

Member Distributed Loads (BLC 8 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
83	M33	Y	-.753	-2.506	0	10.463
84	M33	Y	-2.506	-3.533	10.463	20.926
85	M33	Y	-3.533	-4.156	20.926	31.389
86	M33	Y	-4.156	-3.448	31.389	41.852
87	M33	Y	-3.448	-1.088	41.852	52.315
88	M34	Y	-.752	-2.504	0	10.461
89	M34	Y	-2.504	-3.523	10.461	20.921
90	M34	Y	-3.523	-4.145	20.921	31.382
91	M34	Y	-4.145	-3.445	31.382	41.843
92	M34	Y	-3.445	-1.089	41.843	52.304
93	M35	Y	-.341	-.341	0	3.473
94	M36	Y	-.341	-.341	0	3.473
95	M37	Y	-.196	-2.314	0	8.716
96	M37	Y	-2.314	-4.164	8.716	17.431
97	M37	Y	-4.164	-6.3	17.431	26.147
98	M37	Y	-6.3	-6.746	26.147	34.862
99	M37	Y	-6.746	-4.649	34.862	43.578
100	M38	Y	-.365	-1.345	0	7.747
101	M38	Y	-1.345	-2.658	7.747	15.494
102	M38	Y	-2.658	-2.854	15.494	23.241
103	M38	Y	-2.854	-1.596	23.241	30.989
104	M39	Y	-1.605	-2.854	0	7.753
105	M39	Y	-2.854	-2.656	7.753	15.506
106	M39	Y	-2.656	-1.343	15.506	23.259
107	M39	Y	-1.343	-.364	23.259	31.011
108	M40	Y	-.025	-.613	86.4	97.92
109	M40	Y	-.613	-1.222	97.92	109.44
110	M40	Y	-1.222	-1.248	109.44	120.96
111	M40	Y	-1.248	-.999	120.96	132.48
112	M40	Y	-.999	-.493	132.48	144
113	M41	Y	-.49	-.997	0	11.52
114	M41	Y	-.997	-1.245	11.52	23.04
115	M41	Y	-1.245	-1.22	23.04	34.56
116	M41	Y	-1.22	-.612	34.56	46.08
117	M41	Y	-.612	-.025	46.08	57.6

Member Distributed Loads (BLC 9 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M1	Z	-11.365	-11.365	0	6
2	M2	Z	-11.365	-11.365	0	6
3	M3	Z	-19.685	-19.685	0	2
4	M4	Z	-20.824	-20.824	0	4.366
5	M5	Z	-19.685	-19.685	0	2
6	M6	Z	-18.302	-18.302	0	4.366
7	M7	Z	-3.788	-3.788	0	52.309
8	M8	Z	-7.577	-7.577	0	52.309
9	M9	Z	-19.634	-19.634	0	3.473
10	M10	Z	-.102	-.102	0	3.473
11	M11	Z	-13.123	-13.123	0	62.222
12	M12	Z	-7.577	-7.577	0	31
13	M13	Z	-7.577	-7.577	0	31
14	M14	Z	-11.365	-11.365	0	5.996
15	M15	Z	-11.365	-11.365	0	6.004
16	M16	Z	-19.685	-19.685	0	2
17	M17	Z	-18.302	-18.302	0	4.366
18	M18	Z	-19.685	-19.685	0	2

Member Distributed Loads (BLC 9 : BLC 2 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
19	M19	Z	-20.824	-20.824	0	4.366
20	M20	Z	-7.577	-7.577	0	52.311
21	M21	Z	-3.789	-3.789	0	52.307
22	M22	Z	-.102	-.102	0	3.473
23	M23	Z	-19.634	-19.634	0	3.473
24	M24	Z	-13.123	-13.123	0	62.254
25	M25	Z	-7.577	-7.577	0	30.996
26	M26	Z	-7.577	-7.577	0	31.004
27	M27	Z	-22.73	-22.73	0	5.989
28	M28	Z	-22.73	-22.73	0	6.011
29	M30	Z	-2.522	-2.522	0	4.366
30	M32	Z	-2.522	-2.522	0	4.366
31	M33	Z	-3.79	-3.79	0	52.315
32	M34	Z	-3.787	-3.787	0	52.304
33	M35	Z	-19.735	-19.735	0	3.473
34	M36	Z	-19.735	-19.735	0	3.473
35	M37	Z	-.004	-.004	0	62.254
36	M38	Z	-15.153	-15.153	0	30.989
37	M39	Z	-15.153	-15.153	0	31.011
38	M40	Z	-6.63	-6.63	0	144
39	M41	Z	-6.63	-6.63	0	144
40	M42	Z	-13.259	-13.259	0	144
41	MP4	Z	-10.891	-10.891	0	126
42	MP9	Z	-10.891	-10.891	0	126
43	MP3	Z	-10.891	-10.891	0	126
44	MP10	Z	-10.891	-10.891	0	126
45	MP2	Z	-10.891	-10.891	0	126
46	MP1	Z	-10.891	-10.891	0	126
47	MP8	Z	-10.891	-10.891	0	126
48	MP11	Z	-10.891	-10.891	0	126
49	MP7	Z	-10.891	-10.891	0	126
50	MP6	Z	-10.891	-10.891	0	126
51	MP5	Z	-10.891	-10.891	0	126
52	MP12	Z	-10.891	-10.891	0	126
53	M55	Z	-4.496	-4.496	0	12.234
54	M56	Z	-5.777	-5.777	0	144
55	M57	Z	-8.997	-8.997	0	12.234
56	M58	Z	-11.554	-11.554	0	144
57	M59	Z	-5.777	-5.777	0	144
58	M60	Z	-4.499	-4.499	0	12.24

Member Distributed Loads (BLC 10 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M1	X	-19.685	-19.685	0	6
2	M2	X	-19.685	-19.685	0	6
3	M3	X	-11.365	-11.365	0	2
4	M4	X	-9.111	-9.111	0	4.366
5	M5	X	-11.365	-11.365	0	2
6	M6	X	-13.479	-13.479	0	4.366
7	M7	X	-6.562	-6.562	0	52.309
8	M9	X	-11.453	-11.453	0	3.473
9	M10	X	-22.73	-22.73	0	3.473
10	M11	X	-7.577	-7.577	0	62.222
11	M12	X	-13.123	-13.123	0	31
12	M13	X	-13.123	-13.123	0	31
13	M14	X	-19.685	-19.685	0	5.996

Member Distributed Loads (BLC 10 : BLC 3 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
14	M15	X	-19.685	-19.685	0	6.004
15	M16	X	-11.365	-11.365	0	2
16	M17	X	-13.479	-13.479	0	4.366
17	M18	X	-11.365	-11.365	0	2
18	M19	X	-9.111	-9.111	0	4.366
19	M20	X	-.000497	-.000497	0	52.311
20	M21	X	-6.561	-6.561	0	52.307
21	M22	X	-22.73	-22.73	0	3.473
22	M23	X	-11.453	-11.453	0	3.473
23	M24	X	-7.577	-7.577	0	62.254
24	M25	X	-13.123	-13.123	0	30.996
25	M26	X	-13.123	-13.123	0	31.004
26	M29	X	-22.73	-22.73	0	2
27	M30	X	-22.59	-22.59	0	4.366
28	M31	X	-22.73	-22.73	0	2
29	M32	X	-22.59	-22.59	0	4.366
30	M33	X	-6.561	-6.561	0	52.315
31	M34	X	-6.562	-6.562	0	52.304
32	M35	X	-11.277	-11.277	0	3.473
33	M36	X	-11.277	-11.277	0	3.473
34	M37	X	-15.153	-15.153	0	62.254
35	M40	X	-11.483	-11.483	0	144
36	M41	X	-11.483	-11.483	0	144
37	MP4	X	-10.891	-10.891	0	126
38	MP9	X	-10.891	-10.891	0	126
39	MP3	X	-10.891	-10.891	0	126
40	MP10	X	-10.891	-10.891	0	126
41	MP2	X	-10.891	-10.891	0	126
42	MP1	X	-10.891	-10.891	0	126
43	MP8	X	-10.891	-10.891	0	126
44	MP11	X	-10.891	-10.891	0	126
45	MP7	X	-10.891	-10.891	0	126
46	MP6	X	-10.891	-10.891	0	126
47	MP5	X	-10.891	-10.891	0	126
48	MP12	X	-10.891	-10.891	0	126
49	M55	X	-7.793	-7.793	0	12.234
50	M56	X	-10.006	-10.006	0	144
51	M57	X	-.003	-.003	0	12.234
52	M59	X	-10.006	-10.006	0	144
53	M60	X	-7.792	-7.792	0	12.24

Member Distributed Loads (BLC 11 : BLC 4 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M1	Y	-.437	-.437	3.433	5.748
2	M2	Y	-.436	-.436	3.433	5.75
3	M4	Y	-.353	-.353	0	4.366
4	M6	Y	-.353	-.353	0	4.366
5	M7	Y	-.541	-1.799	0	10.462
6	M7	Y	-1.799	-2.535	10.462	20.924
7	M7	Y	-2.535	-2.982	20.924	31.386
8	M7	Y	-2.982	-2.475	31.386	41.848
9	M7	Y	-2.475	-.782	41.848	52.309
10	M8	Y	-.54	-1.798	0	10.462
11	M8	Y	-1.798	-2.531	10.462	20.924
12	M8	Y	-2.531	-2.978	20.924	31.386
13	M8	Y	-2.978	-2.474	31.386	41.848

Member Distributed Loads (BLC 11 : BLC 4 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
14	M8	Y	-2.474	-.782	41.848	52.309
15	M9	Y	-.245	-.245	0	3.473
16	M10	Y	-.245	-.245	0	3.473
17	M11	Y	-.141	-1.662	0	8.711
18	M11	Y	-1.662	-2.991	8.711	17.422
19	M11	Y	-2.991	-4.525	17.422	26.133
20	M11	Y	-4.525	-4.846	26.133	34.844
21	M11	Y	-4.846	-3.34	34.844	43.555
22	M12	Y	-.262	-.965	0	7.75
23	M12	Y	-.965	-1.909	7.75	15.5
24	M12	Y	-1.909	-2.049	15.5	23.25
25	M12	Y	-2.049	-1.147	23.25	31
26	M13	Y	-1.153	-2.049	0	7.75
27	M13	Y	-2.049	-1.907	7.75	15.5
28	M13	Y	-1.907	-.965	15.5	23.25
29	M13	Y	-.965	-.262	23.25	31
30	M41	Y	-.018	-.44	86.4	97.92
31	M41	Y	-.44	-.876	97.92	109.44
32	M41	Y	-.876	-.895	109.44	120.96
33	M41	Y	-.895	-.716	120.96	132.48
34	M41	Y	-.716	-.354	132.48	144
35	M42	Y	-.352	-.717	0	11.52
36	M42	Y	-.717	-.895	11.52	23.04
37	M42	Y	-.895	-.876	23.04	34.56
38	M42	Y	-.876	-.44	34.56	46.08
39	M42	Y	-.44	-.018	46.08	57.6
40	M14	Y	-.437	-.437	3.432	5.746
41	M15	Y	-.436	-.436	3.434	5.752
42	M17	Y	-.353	-.353	0	4.366
43	M19	Y	-.353	-.353	0	4.366
44	M20	Y	-.541	-1.799	0	10.462
45	M20	Y	-1.799	-2.536	10.462	20.925
46	M20	Y	-2.536	-2.982	20.925	31.387
47	M20	Y	-2.982	-2.475	31.387	41.849
48	M20	Y	-2.475	-.782	41.849	52.311
49	M21	Y	-.54	-1.798	0	10.461
50	M21	Y	-1.798	-2.531	10.461	20.923
51	M21	Y	-2.531	-2.978	20.923	31.384
52	M21	Y	-2.978	-2.474	31.384	41.846
53	M21	Y	-2.474	-.782	41.846	52.307
54	M22	Y	-.245	-.245	0	3.473
55	M23	Y	-.245	-.245	0	3.473
56	M24	Y	-.141	-1.661	0	8.716
57	M24	Y	-1.661	-2.99	8.716	17.431
58	M24	Y	-2.99	-4.523	17.431	26.147
59	M24	Y	-4.523	-4.843	26.147	34.862
60	M24	Y	-4.843	-3.339	34.862	43.578
61	M25	Y	-.262	-.965	0	7.749
62	M25	Y	-.965	-1.909	7.749	15.498
63	M25	Y	-1.909	-2.049	15.498	23.247
64	M25	Y	-2.049	-1.147	23.247	30.996
65	M26	Y	-1.153	-2.049	0	7.751
66	M26	Y	-2.049	-1.907	7.751	15.502
67	M26	Y	-1.907	-.965	15.502	23.253
68	M26	Y	-.965	-.261	23.253	31.004
69	M40	Y	-.352	-.716	0	11.52
70	M40	Y	-.716	-.895	11.52	23.04

Member Distributed Loads (BLC 11 : BLC 4 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
71	M40	Y	-.895	-.876	23.04	34.56
72	M40	Y	-.876	-.44	34.56	46.08
73	M40	Y	-.44	-.018	46.08	57.6
74	M42	Y	-.018	-.44	86.4	97.92
75	M42	Y	-.44	-.877	97.92	109.44
76	M42	Y	-.877	-.895	109.44	120.96
77	M42	Y	-.895	-.717	120.96	132.48
78	M42	Y	-.717	-.354	132.48	144
79	M27	Y	-.437	-.437	3.43	5.742
80	M28	Y	-.436	-.436	3.436	5.755
81	M30	Y	-.353	-.353	0	4.366
82	M32	Y	-.353	-.353	0	4.366
83	M33	Y	-.541	-1.8	0	10.463
84	M33	Y	-1.8	-2.537	10.463	20.926
85	M33	Y	-2.537	-2.984	20.926	31.389
86	M33	Y	-2.984	-2.476	31.389	41.852
87	M33	Y	-2.476	-.781	41.852	52.315
88	M34	Y	-.54	-1.798	0	10.461
89	M34	Y	-1.798	-2.53	10.461	20.921
90	M34	Y	-2.53	-2.976	20.921	31.382
91	M34	Y	-2.976	-2.473	31.382	41.843
92	M34	Y	-2.473	-.782	41.843	52.304
93	M35	Y	-.245	-.245	0	3.473
94	M36	Y	-.245	-.245	0	3.473
95	M37	Y	-.141	-1.661	0	8.716
96	M37	Y	-1.661	-2.99	8.716	17.431
97	M37	Y	-2.99	-4.523	17.431	26.147
98	M37	Y	-4.523	-4.843	26.147	34.862
99	M37	Y	-4.843	-3.338	34.862	43.578
100	M38	Y	-.262	-.965	0	7.747
101	M38	Y	-.965	-1.909	7.747	15.494
102	M38	Y	-1.909	-2.049	15.494	23.241
103	M38	Y	-2.049	-1.146	23.241	30.989
104	M39	Y	-1.152	-2.049	0	7.753
105	M39	Y	-2.049	-1.907	7.753	15.506
106	M39	Y	-1.907	-.964	15.506	23.259
107	M39	Y	-.964	-.261	23.259	31.011
108	M40	Y	-.018	-.44	86.4	97.92
109	M40	Y	-.44	-.877	97.92	109.44
110	M40	Y	-.877	-.896	109.44	120.96
111	M40	Y	-.896	-.717	120.96	132.48
112	M40	Y	-.717	-.354	132.48	144
113	M41	Y	-.352	-.716	0	11.52
114	M41	Y	-.716	-.894	11.52	23.04
115	M41	Y	-.894	-.876	23.04	34.56
116	M41	Y	-.876	-.439	34.56	46.08
117	M41	Y	-.439	-.018	46.08	57.6

Member Distributed Loads (BLC 12 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M1	Z	-3.798	-3.798	0	6
2	M2	Z	-3.797	-3.797	0	6
3	M3	Z	-6.577	-6.577	0	2
4	M4	Z	-6.958	-6.958	0	4.366
5	M5	Z	-6.577	-6.577	0	2
6	M6	Z	-6.115	-6.115	0	4.366

Member Distributed Loads (BLC 12 : BLC 5 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
7	M7	Z	-1.266	-1.266	0	52.309
8	M8	Z	-2.532	-2.532	0	52.309
9	M9	Z	-6.56	-6.56	0	3.473
10	M10	Z	-.034	-.034	0	3.473
11	M11	Z	-4.385	-4.385	0	62.222
12	M12	Z	-2.532	-2.532	0	31
13	M13	Z	-2.532	-2.532	0	31
14	M14	Z	-3.797	-3.797	0	5.996
15	M15	Z	-3.798	-3.798	0	6.004
16	M16	Z	-6.577	-6.577	0	2
17	M17	Z	-6.115	-6.115	0	4.366
18	M18	Z	-6.577	-6.577	0	2
19	M19	Z	-6.958	-6.958	0	4.366
20	M20	Z	-2.532	-2.532	0	52.311
21	M21	Z	-1.266	-1.266	0	52.307
22	M22	Z	-.034	-.034	0	3.473
23	M23	Z	-6.56	-6.56	0	3.473
24	M24	Z	-4.385	-4.385	0	62.254
25	M25	Z	-2.532	-2.532	0	30.996
26	M26	Z	-2.532	-2.532	0	31.004
27	M27	Z	-7.595	-7.595	0	5.989
28	M28	Z	-7.595	-7.595	0	6.011
29	M30	Z	-.843	-.843	0	4.366
30	M32	Z	-.843	-.843	0	4.366
31	M33	Z	-1.266	-1.266	0	52.315
32	M34	Z	-1.265	-1.265	0	52.304
33	M35	Z	-6.594	-6.594	0	3.473
34	M36	Z	-6.594	-6.594	0	3.473
35	M37	Z	-.001	-.001	0	62.254
36	M38	Z	-5.063	-5.063	0	30.989
37	M39	Z	-5.063	-5.063	0	31.011
38	M40	Z	-2.215	-2.215	0	144
39	M41	Z	-2.215	-2.215	0	144
40	M42	Z	-4.43	-4.43	0	144
41	MP4	Z	-3.639	-3.639	0	126
42	MP9	Z	-3.639	-3.639	0	126
43	MP3	Z	-3.639	-3.639	0	126
44	MP10	Z	-3.639	-3.639	0	126
45	MP2	Z	-3.639	-3.639	0	126
46	MP1	Z	-3.639	-3.639	0	126
47	MP8	Z	-3.639	-3.639	0	126
48	MP11	Z	-3.639	-3.639	0	126
49	MP7	Z	-3.639	-3.639	0	126
50	MP6	Z	-3.639	-3.639	0	126
51	MP5	Z	-3.639	-3.639	0	126
52	MP12	Z	-3.639	-3.639	0	126
53	M55	Z	-1.502	-1.502	0	12.234
54	M56	Z	-1.93	-1.93	0	144
55	M57	Z	-3.006	-3.006	0	12.234
56	M58	Z	-3.861	-3.861	0	144
57	M59	Z	-1.93	-1.93	0	144
58	M60	Z	-1.503	-1.503	0	12.24

Member Distributed Loads (BLC 13 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M1	X	-6.577	-6.577	0	6

Member Distributed Loads (BLC 13 : BLC 6 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
2	M2	X	-6.577	-6.577	0	6
3	M3	X	-3.798	-3.798	0	2
4	M4	X	-3.044	-3.044	0	4.366
5	M5	X	-3.798	-3.798	0	2
6	M6	X	-4.504	-4.504	0	4.366
7	M7	X	-2.192	-2.192	0	52.309
8	M9	X	-3.827	-3.827	0	3.473
9	M10	X	-7.595	-7.595	0	3.473
10	M11	X	-2.532	-2.532	0	62.222
11	M12	X	-4.385	-4.385	0	31
12	M13	X	-4.385	-4.385	0	31
13	M14	X	-6.577	-6.577	0	5.996
14	M15	X	-6.577	-6.577	0	6.004
15	M16	X	-3.797	-3.797	0	2
16	M17	X	-4.504	-4.504	0	4.366
17	M18	X	-3.798	-3.798	0	2
18	M19	X	-3.044	-3.044	0	4.366
19	M20	X	-.0001661	-.0001661	0	52.311
20	M21	X	-2.192	-2.192	0	52.307
21	M22	X	-7.595	-7.595	0	3.473
22	M23	X	-3.827	-3.827	0	3.473
23	M24	X	-2.532	-2.532	0	62.254
24	M25	X	-4.385	-4.385	0	30.996
25	M26	X	-4.385	-4.385	0	31.004
26	M29	X	-7.595	-7.595	0	2
27	M30	X	-7.548	-7.548	0	4.366
28	M31	X	-7.595	-7.595	0	2
29	M32	X	-7.548	-7.548	0	4.366
30	M33	X	-2.192	-2.192	0	52.315
31	M34	X	-2.193	-2.193	0	52.304
32	M35	X	-3.768	-3.768	0	3.473
33	M36	X	-3.768	-3.768	0	3.473
34	M37	X	-5.063	-5.063	0	62.254
35	M40	X	-3.837	-3.837	0	144
36	M41	X	-3.837	-3.837	0	144
37	MP4	X	-3.639	-3.639	0	126
38	MP9	X	-3.639	-3.639	0	126
39	MP3	X	-3.639	-3.639	0	126
40	MP10	X	-3.639	-3.639	0	126
41	MP2	X	-3.639	-3.639	0	126
42	MP1	X	-3.639	-3.639	0	126
43	MP8	X	-3.639	-3.639	0	126
44	MP11	X	-3.639	-3.639	0	126
45	MP7	X	-3.639	-3.639	0	126
46	MP6	X	-3.639	-3.639	0	126
47	MP5	X	-3.639	-3.639	0	126
48	MP12	X	-3.639	-3.639	0	126
49	M55	X	-2.604	-2.604	0	12.234
50	M56	X	-3.344	-3.344	0	144
51	M57	X	-.0008421	-.0008421	0	12.234
52	M59	X	-3.344	-3.344	0	144
53	M60	X	-2.604	-2.604	0	12.24

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

	Member	Shape	Code Check	Loc[in]	LC	Shear ..	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M11	HSS4X4X4	.756	62.222	38	.184	62.2...	y	27	105871....	106155	12311.25	12311.25	3....	H1-1b
2	M24	HSS4X4X4	.745	62.254	28	.192	62.2...	y	27	105870....	106155	12311.25	12311.25	3....	H1-1b
3	M37	HSS4X4X4	.736	62.254	31	.181	62.2...	y	31	105870....	106155	12311.25	12311.25	3....	H1-1b
4	M12	HSS4X4X4	.448	31	38	.089	4.844	y	34	105206....	106155	12311.25	12311.25	1....	H1-1b
5	M13	HSS4X4X4	.446	0	36	.086	26.1...	y	28	105206....	106155	12311.25	12311.25	1....	H1-1b
6	M26	HSS4X4X4	.442	0	28	.083	26.16	y	32	105478....	106155	12311.25	12311.25	1....	H1-1b
7	M25	HSS4X4X4	.436	30.996	30	.089	4.843	y	38	105478....	106155	12311.25	12311.25	1....	H1-1b
8	M39	HSS4X4X4	.429	0	33	.083	26.1...	y	36	105478....	106155	12311.25	12311.25	1....	H1-1b
9	M38	HSS4X4X4	.426	30.989	34	.087	4.842	y	30	105479....	106155	12311.25	12311.25	1....	H1-1b
10	MP2	PIPE_2.5	.322	77.438	8	.040	77.4...		10	20573.2...	50715	3596.25	3596.25	2....	H1-1b
11	MP10	PIPE_2.5	.304	77.438	5	.046	77.4...		7	20573.2...	50715	3596.25	3596.25	1....	H1-1b
12	MP6	PIPE_2.5	.280	77.438	12	.047	77.4...		3	20573.2...	50715	3596.25	3596.25	1....	H1-1b
13	MP3	PIPE_2.5	.265	77.438	32	.041	77.4...		6	20573.2...	50715	3596.25	3596.25	2....	H1-1b
14	MP11	PIPE_2.5	.265	77.438	27	.043	77.4...		13	20573.2...	50715	3596.25	3596.25	2....	H1-1b
15	MP1	PIPE_2.5	.264	77.438	8	.044	77.4...		10	20573.2...	50715	3596.25	3596.25	2....	H1-1b
16	MP7	PIPE_2.5	.264	77.438	35	.043	77.4...		10	20573.2...	50715	3596.25	3596.25	2....	H1-1b
17	MP5	PIPE_2.5	.253	77.438	5	.045	77.4...		3	20573.2...	50715	3596.25	3596.25	2....	H1-1b
18	MP12	PIPE_2.5	.253	0	37	.044	77.4...		2	20573.2...	50715	3596.25	3596.25	2....	H1-1b
19	MP8	PIPE_2.5	.250	0	34	.041	77.4...		10	20573.2...	50715	3596.25	3596.25	2....	H1-1b
20	MP9	PIPE_2.5	.247	77.438	5	.045	77.4...		7	20573.2...	50715	3596.25	3596.25	2....	H1-1b
21	MP4	PIPE_2.5	.239	0	29	.043	77.4...		6	20573.2...	50715	3596.25	3596.25	2....	H1-1b
22	M56	C12X25	.207	48	33	.020	96	z	28	48481.3...	237816	8090.909	58906.2...	1....	H1-1b
23	M59	C12X25	.207	48	37	.020	48	z	27	48481.3...	237816	8090.909	58937.5...	1....	H1-1b
24	M32	3/8 x 6	.203	4.366	10	.173	0	y	37	70309.5...	72900	9112.5	569.533	1....	H1-1b
25	M58	C12X25	.199	96	28	.020	96	z	30	48481.3...	237816	8090.909	57086.0...	1....	H1-1b
26	M20	L2x2x3	.199	52.311	9	.011	52.3...	y	30	15645.7...	23392.8	557.717	1208.813	2....	H2-1
27	M7	L2x2x3	.194	52.309	5	.011	52.3...	y	38	15646.2...	23392.8	557.717	1212.801	2....	H2-1
28	M40	PIPE_3.0	.192	49.5	28	.209	48		27	30165.1...	65205	5748.75	5748.75	1....	H1-1b
29	M17	3/8 x 6	.191	4.366	4	.178	0	y	38	70309.5...	72900	9112.5	569.533	1....	H1-1b
30	M10	1/2 x 6	.188	3.473	5	.103	0	y	28	95966.0...	97200	12150	1012.5	1....	H1-1b
31	M8	L2x2x3	.187	52.309	33	.012	52.3...	z	36	15646.2...	23392.8	557.717	1117.845	1....	H2-1
32	M41	PIPE_3.0	.186	49.5	32	.208	96		27	30165.1...	65205	5748.75	5748.75	1....	H1-1b
33	M34	L2x2x3	.185	52.304	29	.011	52.3...	z	32	15647.6...	23392.8	557.717	1125.799	1....	H2-1
34	M21	L2x2x3	.185	52.307	36	.012	52.3...	z	28	15646.7...	23392.8	557.717	1124.128	1....	H2-1
35	M33	L2x2x3	.183	52.315	37	.011	52.3...	y	34	15644.8...	23392.8	557.717	1133.705	1....	H2-1
36	M42	PIPE_3.0	.182	49.5	36	.215	48		34	30165.1...	65205	5748.75	5748.75	1....	H1-1b
37	M6	3/8 x 6	.176	4.366	12	.179	0	y	28	70309.5...	72900	9112.5	569.533	1.3	H1-1b
38	M22	1/2 x 6	.176	3.473	11	.114	3.473	y	2	95966.0...	97200	12150	1012.5	1....	H1-1b
39	M30	3/8 x 6	.174	4.366	31	.176	0	y	30	70309.5...	72900	9112.5	569.533	1....	H1-1b
40	M23	1/2 x 6	.170	3.473	14	.098	0	y	32	95966.0...	97200	12150	1012.5	1....	H1-1b
41	M36	1/2 x 6	.162	3.473	19	.103	0	y	36	95966.0...	97200	12150	1012.5	1....	H1-1b
42	M2	1/2 x 6	.159	0	11	.127	0	y	30	93563.5...	97200	12150	1012.5	1....	H1-1b
43	M14	1/2 x 6	.158	0	11	.136	0	y	29	93568.2...	97200	12150	1012.5	1....	H1-1b
44	M9	1/2 x 6	.156	3.473	2	.099	0	y	10	95966.0...	97200	12150	1012.5	1....	H1-1b
45	M4	3/8 x 6	.155	4.366	35	.183	0	y	34	70309.5...	72900	9112.5	569.533	1....	H1-1b
46	M19	3/8 x 6	.154	4.366	32	.172	0	y	33	70309.5...	72900	9112.5	569.533	1....	H1-1b
47	M35	1/2 x 6	.153	3.473	9	.091	0	y	5	95966.0...	97200	12150	1012.5	1....	H1-1b
48	M31	3/8 x 6	.150	0	9	.077	0	z	37	72348.6...	72900	9112.5	569.533	1....	H1-1b
49	M16	3/8 x 6	.144	0	4	.069	0	z	38	72348.6...	72900	9112.5	569.533	1....	H1-1b
50	M28	1/2 x 6	.144	0	8	.120	0	y	33	93549.9...	97200	12150	1012.5	1....	H1-1b
51	M27	1/2 x 6	.140	0	9	.136	0	y	33	93577.13	97200	12150	1012.5	1.1	H1-1b
52	M15	1/2 x 6	.134	0	9	.123	0	y	29	93558.8...	97200	12150	1012.5	1....	H1-1b
53	M1	1/2 x 6	.134	0	7	.139	0	y	37	93563.5...	97200	12150	1012.5	1....	H1-1b
54	M5	3/8 x 6	.129	0	12	.079	0	z	28	72348.6...	72900	9112.5	569.533	1....	H1-1b
55	M29	3/8 x 6	.124	0	7	.068	0	z	30	72348.6...	72900	9112.5	569.533	1....	H1-1b
56	M18	3/8 x 6	.075	2	8	.077	0	z	33	72348.6...	72900	9112.5	569.533	1....	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear ..	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
57	M3	3/8 x 6	.073	2	33	.076	0	z	34	72348.6...	72900	9112.5	569.533	1....	H1-1b
58	M55	PIPE_2.0	.004	0	29	.001	12.2...		35	31732.0...	32130	1871.625	1871.625	1....	H1-1b*
59	M60	PIPE_2.0	.004	12.24	37	.001	0		37	31731.6...	32130	1871.625	1871.625	1....	H1-1b*
60	M57	PIPE_2.0	.003	0	33	.001	12.2...		33	31732.0...	32130	1871.625	1871.625	1....	H1-1b*

APPENDIX D

ADDITIONAL CALCUATIONS

Date:	2/5/2019
Client	Crown
Carrier	AT&T
Engineer:	KLB
Site:	881364
Job #:	1039-A0002-B

Code:	LRFD	
Axial:	3116.10	lbs
Shear:	5092.40	lbs

Bolt Capacity (5/8" A325 Bolt)				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	13106.7	9830.0	2	19660
Shear(lb)	8013.3	6010.0	2	12020

Interaction Check	
$T / \phi T_n$	15.8%
$V / \phi Vn$	42.4%
≤1.0	20.5%
	OK

PAUL J. FORD & COMPANY

Date: **December 17, 2018**

Heather Simeone
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277

Paul J Ford and Company
250 East Broad St., Suite 600
Columbus, OH 43215
(614) 221-6679

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	10042331
	Carrier Site Name:	NEWINGTON SOUTH
Crown Castle Designation:	**Crown Castle BU Number:**	881364
	Crown Castle Site Name:	Newington
	Crown Castle JDE Job Number:	548703
	Crown Castle Work Order Number:	1669544
	Crown Castle Order Number:	471664 Rev. 0
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37518-2864.004.7805
Site Data:	**123 Costelo Road, Newington, Hartford County, CT**	
	Latitude *41° 39' 18.72"*, Longitude *-72° 43' 17.19"*	
	145 Foot - Monopole Tower	

Dear Heather Simeone,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2016 Connecticut State Building Code per section 1609.3 and Appendix N. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

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Respectfully submitted by:

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C.J.P.

12-18-18

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1) INTRODUCTION

This tower is a 145 ft Monopole tower designed by SUMMIT.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
105.0	105.0	3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	12 6 2	1-5/8 3/4 3/8
		6	cci antennas	TPX-070821		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 4449 B5/B12		
		3	ericsson	RRUS 4478 B14		
		3	ericsson	RRUS 8843 B2/B66A		
		3	kathrein	80010965 w/ Mount Pipe		
		3	powerwave technologies	7770.00 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		3	quintel technology	QS66512-2 w/ Mount Pipe		
		3	raycap	DC6-48-60-18-8F		
		1	tower mounts	Platform Mount [LP 712-1]		

Table 2 – Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
133.0	139.0	2	andrew	VHLP2.5-11	2 6	1/2 5/16
		1	dragonwave	HORIZON COMPACT		
		1	samsung telecommunications	WIMAX DAP HEAD		
	135.0	3	argus technologies	LLPX310R-V1 w/ Mount Pipe		
		1	dragonwave	HORIZON COMPACT		
		1	motorola	TIMING 2000		
		2	samsung telecommunications	WIMAX DAP HEAD		
	133.0	1	tower mounts	Platform Mount [LP 712-1]		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
124.0	124.0	3	alcatel lucent	TD-RRH8x20-25	4	1-1/4
		3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe		
		3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe		
		3	rfs celwave	IBC1900BB-1		
		3	rfs celwave	IBC1900HG-2A		
		1	tower mounts	Platform Mount [LP 712-1]		
122.0	122.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	-	-
		1	tower mounts	Pipe Mount [PM 601-3]		
	118.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER		
114.0	116.0	1	lucent	KS24019-L112A	8 1	1-5/8 1/2
	115.0	6	andrew	SBNHH-1D65B w/ Mount Pipe		
		6	antel	BXA-80063/4CFx5 w/ Mount Pipe		
		2	rfs celwave	DB-T1-6Z-8AB-0Z		
		3	samsung telecommunications	RFV01U-D1A		
		3	samsung telecommunications	RFV01U-D2A		
	114.0	1	tower mounts	Platform Mount [LP 712-1]		
		1	tower mounts	Handrail Kit HRK14		
		1	tower mounts	Vertical Stabilizer Kit PV-VSK		
94.0	95.0	3	ericsson	AIR -32 B2A/B66AA w/ Mount Pipe	1 12	1-1/4 1-5/8
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe		
		3	ericsson	KRY 112 144/1		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	94.0	1	tower mounts	Platform Mount [LP 712-1]		
87.0	87.0	3	kathrein	742 213	6	1-5/8
		1	tower mounts	Pipe Mount [PM 601-3]		
80.0	80.0	2	tower mounts	Side Arm Mount [SO 701-1]	-	-
77.0	77.0	1	symmetricom	58532A	1	1/2
		1	tower mounts	Side Arm Mount [SO 701-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, 08/10/1999	1425352	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit/PJF, 5153/29299-105, 08/11/1999	1425473	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit, 5153, 08/10/1999	1425417	CCISITES
4-POST-MODIFICATION INSPECTION	ETS, 160020, 02/29/2016	6120832	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37515-0757.007.7700, 11/11/2015	5976614	CCISITES
4-STRUCTURAL ANALYSIS	PJF, 37518-2864.002.7805, 09/15/2018	7830172	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) For existing modifications: monopole was modified in conformance with the referenced modification drawings.
5) Mount modifications considered in referenced document #7830172 have been considered in this analysis.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L1	145 - 140	Pole	TP24.923x24x0.1875	Pole	0.2%	Pass
L2	140 - 135	Pole	TP25.847x24.923x0.1875	Pole	1.4%	Pass
L3	135 - 130	Pole	TP26.77x25.847x0.1875	Pole	4.7%	Pass
L4	130 - 125	Pole	TP27.709x26.77x0.25	Pole	5.8%	Pass
L5	125 - 120	Pole	TP28.648x27.709x0.25	Pole	10.2%	Pass
L6	120 - 115	Pole	TP29.588x28.648x0.25	Pole	14.9%	Pass
L7	115 - 110	Pole	TP30.527x29.588x0.25	Pole	22.2%	Pass
L8	110 - 105	Pole	TP31.466x30.527x0.25	Pole	29.1%	Pass
L9	105 - 100	Pole	TP32.405x31.466x0.25	Pole	38.4%	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
L10	100 - 95	Pole	TP33.345x32.405x0.25	Pole	46.7%	Pass
L11	95 - 90	Pole	TP34.284x33.345x0.25	Pole	56.6%	Pass
L12	90 - 89.25	Pole	TP35.27x34.284x0.25	Pole	58.1%	Pass
L13	89.25 - 84.25	Pole	TP34.851x33.925x0.3125	Pole	51.4%	Pass
L14	84.25 - 79.25	Pole	TP35.777x34.851x0.3125	Pole	58.0%	Pass
L15	79.25 - 74.25	Pole	TP36.703x35.777x0.3125	Pole	64.2%	Pass
L16	74.25 - 69.25	Pole	TP37.629x36.703x0.3125	Pole	70.0%	Pass
L17	69.25 - 64.25	Pole	TP38.555x37.629x0.3125	Pole	75.4%	Pass
L18	64.25 - 59.25	Pole	TP39.482x38.555x0.3125	Pole	80.5%	Pass
L19	59.25 - 58.08	Pole	TP39.698x39.482x0.3125	Pole	81.7%	Pass
L20	58.08 - 57.83	Pole + Reinf.	TP39.745x39.698x0.4125	Reinf. 2 Tension Rupture	81.2%	Pass
L21	57.83 - 52.83	Pole + Reinf.	TP40.671x39.745x0.4188	Reinf. 2 Tension Rupture	85.8%	Pass
L22	52.83 - 49.5	Pole + Reinf.	TP42.26x40.671x0.4125	Reinf. 2 Tension Rupture	88.7%	Pass
L23	49.5 - 43.25	Pole + Reinf.	TP41.82x40.663x0.475	Reinf. 2 Tension Rupture	84.6%	Pass
L24	43.25 - 38.25	Pole + Reinf.	TP42.746x41.82x0.475	Reinf. 2 Tension Rupture	88.0%	Pass
L25	38.25 - 33.25	Pole + Reinf.	TP43.672x42.746x0.475	Reinf. 2 Tension Rupture	91.2%	Pass
L26	33.25 - 31.25	Pole + Reinf.	TP44.042x43.672x0.475	Reinf. 2 Tension Rupture	92.4%	Pass
L27	31.25 - 31	Pole + Reinf.	TP44.089x44.042x0.5375	Reinf. 1 Compression	72.8%	Pass
L28	31 - 26	Pole + Reinf.	TP45.015x44.089x0.5375	Reinf. 1 Compression	75.3%	Pass
L29	26 - 21	Pole + Reinf.	TP45.941x45.015x0.525	Reinf. 1 Compression	77.6%	Pass
L30	21 - 16	Pole + Reinf.	TP46.867x45.941x0.525	Reinf. 1 Compression	79.8%	Pass
L31	16 - 11	Pole + Reinf.	TP47.793x46.867x0.525	Reinf. 1 Compression	81.8%	Pass
L32	11 - 6	Pole + Reinf.	TP48.719x47.793x0.5188	Reinf. 1 Compression	83.7%	Pass
L33	6 - 4.75	Pole + Reinf.	TP48.95x48.719x0.5188	Reinf. 1 Compression	84.2%	Pass
L34	4.75 - 4.5	Pole + Reinf.	TP48.997x48.95x0.5875	Reinf. 3 Tension Yield	78.9%	Pass
L35	4.5 - 0	Pole + Reinf.	TP49.83x48.997x0.575	Reinf. 3 Tension Yield	80.4%	Pass
					Summary	
				Pole	81.7%	Pass
				Reinforcement	92.4%	Pass
				Overall	92.4%	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	97.1	Pass
1	Base Plate	0	77.9	Pass
1	Base Foundation Structural Steel	0	62.5	Pass
1	Base Foundation Soil Interaction	0	61.4	Pass
1	Flange Connection	130	7.0	Pass

Structure Rating (max from all components) =	97.1%

Notes:

- Structural rating per TIA-222-H Section 15.5.

1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

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

1) Tower is located in Hartford County, Connecticut.
2) Tower base elevation above sea level: 141.0000 ft.
3) Basic wind speed of 125.0 mph.
4) Risk Category II.
5) Exposure Category C.
6) Simplified Topographic Factor Procedure for wind speed-up calculations is used.
7) Topographic Category: 1.
8) Crest Height 0.0000 ft.
9) Nominal ice thickness of 1.7000 in.
10) Ice thickness is considered to increase with height.
11) Ice density of 56 pcf.
12) A wind speed of 50.0 mph is used in combination with ice.
13) Temperature drop of 50 °F.
14) Deflections calculated using a wind speed of 60.0 mph.
15) TIA-222-H Annex S..
16) A non-linear (P-delta) analysis was used.
17) Pressures are calculated at each section.
18) Stress ratio used in pole design is 1.05.
19) 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	145.0000-140.0000	5.0000	0.00	18	24.0000	24.9233	0.1875	0.7500	A607-65 (65 ksi)
L2	140.0000-135.0000	5.0000	0.00	18	24.9233	25.8467	0.1875	0.7500	A607-65 (65 ksi)

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
L3	135.0000-130.0000	5.0000	0.00	18	25.8467	26.7700	0.1875	0.7500	A607-65 (65 ksi)
L4	130.0000-125.0000	5.0000	0.00	18	26.7700	27.7092	0.2500	1.0000	A607-65 (65 ksi)
L5	125.0000-120.0000	5.0000	0.00	18	27.7092	28.6485	0.2500	1.0000	A607-65 (65 ksi)
L6	120.0000-115.0000	5.0000	0.00	18	28.6485	29.5877	0.2500	1.0000	A607-65 (65 ksi)
L7	115.0000-110.0000	5.0000	0.00	18	29.5877	30.5269	0.2500	1.0000	A607-65 (65 ksi)
L8	110.0000-105.0000	5.0000	0.00	18	30.5269	31.4661	0.2500	1.0000	A607-65 (65 ksi)
L9	105.0000-100.0000	5.0000	0.00	18	31.4661	32.4054	0.2500	1.0000	A607-65 (65 ksi)
L10	100.0000-95.0000	5.0000	0.00	18	32.4054	33.3446	0.2500	1.0000	A607-65 (65 ksi)
L11	95.0000-90.0000	5.0000	0.00	18	33.3446	34.2838	0.2500	1.0000	A607-65 (65 ksi)
L12	90.0000-84.7500	5.2500	4.50	18	34.2838	35.2700	0.2500	1.0000	A607-65 (65 ksi)
L13	84.7500-84.2500	5.0000	0.00	18	33.9247	34.8508	0.3125	1.2500	A607-65 (65 ksi)
L14	84.2500-79.2500	5.0000	0.00	18	34.8508	35.7770	0.3125	1.2500	A607-65 (65 ksi)
L15	79.2500-74.2500	5.0000	0.00	18	35.7770	36.7031	0.3125	1.2500	A607-65 (65 ksi)
L16	74.2500-69.2500	5.0000	0.00	18	36.7031	37.6293	0.3125	1.2500	A607-65 (65 ksi)
L17	69.2500-64.2500	5.0000	0.00	18	37.6293	38.5554	0.3125	1.2500	A607-65 (65 ksi)
L18	64.2500-59.2500	5.0000	0.00	18	38.5554	39.4816	0.3125	1.2500	A607-65 (65 ksi)
L19	59.2500-58.0800	1.1700	0.00	18	39.4816	39.6983	0.3125	1.2500	A607-65 (65 ksi)
L20	58.0800-57.8300	0.2500	0.00	18	39.6983	39.7446	0.4125	1.6500	A607-65 (65 ksi)
L21	57.8300-52.8300	5.0000	0.00	18	39.7446	40.6707	0.4188	1.6750	A607-65 (65 ksi)
L22	52.8300-44.2500	8.5800	5.25	18	40.6707	42.2600	0.4125	1.6500	A607-65 (65 ksi)
L23	44.2500-43.2500	6.2500	0.00	18	40.6625	41.8200	0.4750	1.9000	A607-65 (65 ksi)
L24	43.2500-38.2500	5.0000	0.00	18	41.8200	42.7460	0.4750	1.9000	A607-65 (65 ksi)
L25	38.2500-33.2500	5.0000	0.00	18	42.7460	43.6720	0.4750	1.9000	A607-65 (65 ksi)
L26	33.2500-31.2500	2.0000	0.00	18	43.6720	44.0424	0.4750	1.9000	A607-65 (65 ksi)
L27	31.2500-31.0000	0.2500	0.00	18	44.0424	44.0887	0.5375	2.1500	A607-65 (65 ksi)
L28	31.0000-26.0000	5.0000	0.00	18	44.0887	45.0147	0.5375	2.1500	A607-65 (65 ksi)
L29	26.0000-21.0000	5.0000	0.00	18	45.0147	45.9408	0.5250	2.1000	A607-65 (65 ksi)
L30	21.0000-16.0000	5.0000	0.00	18	45.9408	46.8668	0.5250	2.1000	A607-65 (65 ksi)
L31	16.0000-11.0000	5.0000	0.00	18	46.8668	47.7928	0.5250	2.1000	A607-65 (65 ksi)
L32	11.0000-6.0000	5.0000	0.00	18	47.7928	48.7188	0.5188	2.0750	A607-65 (65 ksi)
L33	6.0000-4.7500	1.2500	0.00	18	48.7188	48.9503	0.5188	2.0750	A607-65 (65 ksi)
L34	4.7500-4.5000	0.2500	0.00	18	48.9503	48.9966	0.5875	2.3500	A607-65 (65 ksi)
L35	4.5000-0.0000	4.5000		18	48.9966	49.8300	0.5750	2.3000	A607-65 (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	24.3413	14.1714	1015.2211	8.4534	12.1920	83.2694	2031.7780	7.0871	3.8940	20.768
	25.2789	14.7209	1137.9555	8.7812	12.6611	89.8784	2277.4083	7.3619	4.0565	21.635
L2	25.2789	14.7209	1137.9555	8.7812	12.6611	89.8784	2277.4083	7.3619	4.0565	21.635
	26.2165	15.2704	1270.2035	9.1090	13.1301	96.7398	2542.0784	7.6367	4.2190	22.501
L3	26.2165	15.2704	1270.2035	9.1090	13.1301	96.7398	2542.0784	7.6367	4.2190	22.501
	27.1540	15.8199	1412.3200	9.4368	13.5992	103.8535	2826.4984	7.9115	4.3815	23.368
L4	27.1444	21.0436	1869.8421	9.4146	13.5992	137.4969	3742.1446	10.5238	4.2715	17.086
	28.0981	21.7889	2075.6270	9.7480	14.0763	147.4556	4153.9851	10.8965	4.4368	17.747
L5	28.0981	21.7889	2075.6270	9.7480	14.0763	147.4556	4153.9851	10.8965	4.4368	17.747
	29.0518	22.5342	2295.9817	10.0815	14.5534	157.7624	4594.9846	11.2692	4.6021	18.409
L6	29.0518	22.5342	2295.9817	10.0815	14.5534	157.7624	4594.9846	11.2692	4.6021	18.409
	30.0056	23.2794	2531.4053	10.4149	15.0305	168.4174	5066.1415	11.6419	4.7674	19.07
L7	30.0056	23.2794	2531.4053	10.4149	15.0305	168.4174	5066.1415	11.6419	4.7674	19.07
	30.9593	24.0247	2782.3955	10.7483	15.5077	179.4206	5568.4521	12.0146	4.9327	19.731
L8	30.9593	24.0247	2782.3955	10.7483	15.5077	179.4206	5568.4521	12.0146	4.9327	19.731
	31.9130	24.7700	3049.4512	11.0817	15.9848	190.7720	6102.9150	12.3874	5.0980	20.392
L9	31.9130	24.7700	3049.4512	11.0817	15.9848	190.7720	6102.9150	12.3874	5.0980	20.392
	32.8667	25.5153	3333.0703	11.4152	16.4619	202.4715	6670.5263	12.7601	5.2633	21.053
L10	32.8667	25.5153	3333.0703	11.4152	16.4619	202.4715	6670.5263	12.7601	5.2633	21.053
	33.8204	26.2606	3633.7516	11.7486	16.9390	214.5192	7272.2846	13.1328	5.4286	21.715
L11	33.8204	26.2606	3633.7516	11.7486	16.9390	214.5192	7272.2846	13.1328	5.4286	21.715
	34.7741	27.0058	3951.9930	12.0820	17.4162	226.9151	7909.1862	13.5055	5.5940	22.376
L12	34.7741	27.0058	3951.9930	12.0820	17.4162	226.9151	7909.1862	13.5055	5.5940	22.376
	35.7755	27.7884	4305.5913	12.4321	17.9172	240.3055	8616.8481	13.8968	5.7675	23.07
L13	35.2462	33.3391	4758.6642	11.9323	17.2337	276.1248	9523.5899	16.6727	5.4207	17.346
	35.3403	34.2577	5162.9606	12.2611	17.7042	291.6230	10332.7148	17.1321	5.5837	17.868
L14	35.3403	34.2577	5162.9606	12.2611	17.7042	291.6230	10332.7148	17.1321	5.5837	17.868
	36.2807	35.1763	5589.5314	12.5899	18.1747	307.5445	11186.4177	17.5915	5.7467	18.39
L15	36.2807	35.1763	5589.5314	12.5899	18.1747	307.5445	11186.4177	17.5915	5.7467	18.39
	37.2211	36.0950	6038.9739	12.9187	18.6452	323.8891	12085.8940	18.0509	5.9098	18.911
L16	37.2211	36.0950	6038.9739	12.9187	18.6452	323.8891	12085.8940	18.0509	5.9098	18.911
	38.1616	37.0136	6511.8853	13.2475	19.1157	340.6569	13032.3391	18.5103	6.0728	19.433
L17	38.1616	37.0136	6511.8853	13.2475	19.1157	340.6569	13032.3391	18.5103	6.0728	19.433
	39.1020	37.9322	7008.8623	13.5762	19.5862	357.8478	14026.9471	18.9697	6.2358	19.954
L18	39.1020	37.9322	7008.8623	13.5762	19.5862	357.8478	14026.9471	18.9697	6.2358	19.954
	40.0424	38.8508	7530.5034	13.9050	20.0566	375.4620	15070.9156	19.4291	6.3988	20.476
L19	40.0424	38.8508	7530.5034	13.9050	20.0566	375.4620	15070.9156	19.4291	6.3988	20.476
	40.2625	39.0658	7656.1925	13.9820	20.1667	379.6448	15322.4593	19.5366	6.4369	20.598
L20	40.2471	51.4359	10029.3911	13.9465	20.1667	497.3237	20071.9791	25.7228	6.2609	15.178
	40.2941	51.4965	10064.8992	13.9629	20.1903	498.5029	20143.0421	25.7532	6.2690	15.198
L21	40.2931	52.2685	10212.5277	13.9607	20.1903	505.8148	20438.4934	26.1392	6.2580	14.945
	41.2335	53.4994	10951.1846	14.2895	20.6607	530.0482	21916.7790	26.7548	6.4210	15.334
L22	41.2345	52.7091	10792.7599	14.2917	20.6607	522.3803	21599.7213	26.3596	6.4320	15.593
	42.8483	54.7899	12122.0726	14.8559	21.4681	564.6556	24260.0957	27.4001	6.7118	16.271
L23	42.2038	60.5887	12362.6323	14.2666	20.6565	598.4849	24741.5317	30.3001	6.3206	13.307
	42.3919	62.3338	13461.9316	14.6775	21.2446	633.6647	26941.5768	31.1728	6.5243	13.735

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
L24	42.3919	62.3338	13461.9316	14.6775	21.2446	633.6647	26941.5768	31.1728	6.5243	13.735
	43.3322	63.7299	14386.8679	15.0062	21.7150	662.5320	28792.6665	31.8710	6.6873	14.079
L25	43.3322	63.7299	14386.8679	15.0062	21.7150	662.5320	28792.6665	31.8710	6.6873	14.079
	44.2725	65.1260	15353.2293	15.3349	22.1854	692.0423	30726.6608	32.5692	6.8503	14.422
L26	44.2725	65.1260	15353.2293	15.3349	22.1854	692.0423	30726.6608	32.5692	6.8503	14.422
	44.6486	65.6844	15751.5762	15.4664	22.3736	704.0264	31523.8787	32.8485	6.9155	14.559
L27	44.6389	74.2205	17747.5527	15.4443	22.3736	793.2378	35518.4580	37.1173	6.8055	12.661
	44.6860	74.2995	17804.2763	15.4607	22.3971	794.9374	35631.9800	37.1568	6.8136	12.676
L28	44.6860	74.2995	17804.2763	15.4607	22.3971	794.9374	35631.9800	37.1568	6.8136	12.676
	45.6263	75.8793	18964.2877	15.7894	22.8675	829.3121	37953.5291	37.9469	6.9766	12.98
L29	45.6282	74.1355	18538.8796	15.7939	22.8675	810.7089	37102.1532	37.0748	6.9986	13.331
	46.5685	75.6785	19720.7477	16.1226	23.3379	845.0093	39467.4445	37.8465	7.1616	13.641
L30	46.5685	75.6785	19720.7477	16.1226	23.3379	845.0093	39467.4445	37.8465	7.1616	13.641
	47.5088	77.2216	20951.8064	16.4513	23.8083	880.0204	41931.1817	38.6181	7.3246	13.952
L31	47.5088	77.2216	20951.8064	16.4513	23.8083	880.0204	41931.1817	38.6181	7.3246	13.952
	48.4491	78.7647	22233.0599	16.7801	24.2787	915.7422	44495.3746	39.3898	7.4875	14.262
L32	48.4500	77.8373	21977.0961	16.7823	24.2787	905.1995	43983.1102	38.9260	7.4985	14.455
	49.3903	79.3620	23294.0297	17.1110	24.7491	941.2055	46618.7102	39.6885	7.6615	14.769
L33	49.3903	79.3620	23294.0297	17.1110	24.7491	941.2055	46618.7102	39.6885	7.6615	14.769
	49.6254	79.7431	23631.2839	17.1932	24.8667	950.3166	47293.6625	39.8791	7.7023	14.848
L34	49.6148	90.1833	26649.3294	17.1688	24.8667	1071.6854	53333.7246	45.1002	7.5813	12.904
	49.6618	90.2696	26725.9423	17.1852	24.8903	1073.7507	53487.0513	45.1434	7.5894	12.918
L35	49.6637	88.3718	26177.5732	17.1897	24.8903	1051.7192	52389.5915	44.1943	7.6114	13.237
	50.5100	89.8928	27552.6381	17.4855	25.3136	1088.4503	55141.5306	44.9550	7.7581	13.492

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 145.0000-140.0000				1	1	1			
L2 140.0000-135.0000				1	1	1			
L3 135.0000-130.0000				1	1	1			
L4 130.0000-125.0000				1	1	1			
L5 125.0000-120.0000				1	1	1			
L6 120.0000-115.0000				1	1	1			
L7 115.0000-110.0000				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 110.0000-105.0000				1	1	1			
L9 105.0000-100.0000				1	1	1			
L10 100.0000-95.0000				1	1	1			
L11 95.0000-90.0000				1	1	1			
L12 90.0000-84.7500				1	1	1			
L13 84.7500-84.2500				1	1	1			
L14 84.2500-79.2500				1	1	1			
L15 79.2500-74.2500				1	1	1			
L16 74.2500-69.2500				1	1	1			
L17 69.2500-64.2500				1	1	1			
L18 64.2500-59.2500				1	1	1			
L19 59.2500-58.0800				1	1	1			
L20 58.0800-57.8300				1	1	1.10905			
L21 57.8300-52.8300				1	1	1.0847			
L22 52.8300-44.2500				1	1	1.09579			
L23 44.2500-43.2500				1	1	1.08016			
L24 43.2500-38.2500				1	1	1.07379			
L25 38.2500-33.2500				1	1	1.0677			
L26 33.2500-31.2500				1	1	1.06533			
L27 31.2500-31.0000				1	1	1.1293			
L28 31.0000-26.0000				1	1	1.12031			
L29 26.0000-21.0000				1	1	1.13785			
L30 21.0000-16.0000				1	1	1.12939			
L31 16.0000-11.0000				1	1	1.12125			
L32 11.0000-6.0000				1	1	1.1267			
L33 6.0000-4.7500				1	1	1.12477			
L34 4.7500-4.5000				1	1	0.963063			
L35 4.5000-0.0000				1	1	0.978135			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
**********											

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
ATCB-B01-005(5/16")	C	No	No	Inside Pole	133.0000 - 0.0000	6	No Ice	0.0000	0.07
							1/2" Ice	0.0000	0.07
							1" Ice	0.0000	0.07
							2" Ice	0.0000	0.07
FSJ4-50B(1/2)	C	No	No	Inside Pole	133.0000 - 0.0000	2	No Ice	0.0000	0.14
							1/2" Ice	0.0000	0.14
							1" Ice	0.0000	0.14
							2" Ice	0.0000	0.14
2" (Nominal) Conduit	C	No	No	Inside Pole	133.0000 - 0.0000	2	No Ice	0.0000	0.72
							1/2" Ice	0.0000	0.72
							1" Ice	0.0000	0.72
							2" Ice	0.0000	0.72
***									
HB114-1-08U4-M5J(1 1/4")	C	No	No	Inside Pole	124.0000 - 0.0000	3	No Ice	0.0000	1.08
							1/2" Ice	0.0000	1.08
							1" Ice	0.0000	1.08
							2" Ice	0.0000	1.08
HB114-21U3M12-XXXF(1-1/4)	C	No	No	Inside Pole	124.0000 - 0.0000	1	No Ice	0.0000	1.22
							1/2" Ice	0.0000	1.22
							1" Ice	0.0000	1.22
							2" Ice	0.0000	1.22
***									
LDF4-50A(1/2)	C	No	No	Inside Pole	114.0000 - 0.0000	1	No Ice	0.0000	0.15
							1/2" Ice	0.0000	0.15
							1" Ice	0.0000	0.15
							2" Ice	0.0000	0.15
HB158-1-08U8-S8J18(1-5/8)	C	No	No	Inside Pole	114.0000 - 0.0000	1	No Ice	0.0000	1.30
							1/2" Ice	0.0000	1.30
							1" Ice	0.0000	1.30
							2" Ice	0.0000	1.30
LDF7-50A(1-5/8)	C	No	No	Inside Pole	114.0000 - 0.0000	6	No Ice	0.0000	0.82
							1/2" Ice	0.0000	0.82
							1" Ice	0.0000	0.82
							2" Ice	0.0000	0.82
HB158-1-08U8-S8J18(1-5/8)	C	No	No	CaAa (Out Of Face)	114.0000 - 0.0000	1	No Ice	0.1980	1.30
							1/2" Ice	0.2980	2.81
							1" Ice	0.3980	4.94
							2" Ice	0.5980	11.02
***									
LCF158-50A(1-5/8)	C	No	No	Inside Pole	105.0000 - 0.0000	12	No Ice	0.0000	2.31
							1/2" Ice	0.0000	2.31
							1" Ice	0.0000	2.31
							2" Ice	0.0000	2.31
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	105.0000 - 0.0000	4	No Ice	0.0000	1.38
							1/2" Ice	0.0000	1.38
							1" Ice	0.0000	1.38
							2" Ice	0.0000	1.38
FB-L98B-002-75000(3/8)	C	No	No	Inside Pole	105.0000 - 0.0000	2	No Ice	0.0000	0.60
							1/2" Ice	0.0000	0.60
							1" Ice	0.0000	0.60
							2" Ice	0.0000	0.60
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	105.0000 - 0.0000	2	No Ice	0.0000	1.38
							1/2" Ice	0.0000	1.38
							1" Ice	0.0000	1.38
							2" Ice	0.0000	1.38
2" (Nominal) Conduit	C	No	No	Inside Pole	105.0000 - 0.0000	1	No Ice	0.0000	0.72
							1/2" Ice	0.0000	0.72
							1" Ice	0.0000	0.72
							2" Ice	0.0000	0.72
2" (Nominal) Conduit	C	No	No	Inside Pole	105.0000 - 0.0000	1	No Ice	0.0000	0.72
							1/2" Ice	0.0000	0.72
							1" Ice	0.0000	0.72
							2" Ice	0.0000	0.72
***									

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
HJ7-50A(1-5/8")	C	No	No	Inside Pole	94.0000 - 0.0000	6	No Ice	0.0000	1.04
							1/2" Ice	0.0000	1.04
							1" Ice	0.0000	1.04
							2" Ice	0.0000	1.04
HJ7-50A(1-5/8")	C	No	No	CaAa (Out Of Face)	94.0000 - 0.0000	4	No Ice	0.0000	1.04
							1/2" Ice	0.0000	2.55
							1" Ice	0.0000	4.68
							2" Ice	0.0000	10.76
HJ7-50A(1-5/8")	C	No	No	CaAa (Out Of Face)	94.0000 - 0.0000	2	No Ice	0.1980	1.04
							1/2" Ice	0.2980	2.55
							1" Ice	0.3980	4.68
							2" Ice	0.5980	10.76
MLE Hybrid 3Power/6Fiber RL 2 10AWG(1-1/4")	C	No	No	CaAa (Out Of Face)	94.0000 - 0.0000	1	No Ice	0.0000	0.46
							1/2" Ice	0.0000	1.53
							1" Ice	0.0000	3.21
							2" Ice	0.0000	8.40
***									
AVA7-50(1-5/8)	C	No	No	Inside Pole	87.0000 - 0.0000	6	No Ice	0.0000	0.70
							1/2" Ice	0.0000	0.70
							1" Ice	0.0000	0.70
							2" Ice	0.0000	0.70
***									
LDF4-50A(1/2)	C	No	No	CaAa (Out Of Face)	77.0000 - 0.0000	1	No Ice	0.0000	0.15
							1/2" Ice	0.0000	0.84
							1" Ice	0.0000	2.14
							2" Ice	0.0000	6.56
***									
1 1/4" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	35.5000 - 0.0000	1	No Ice	0.2083	0.00
							1/2" Ice	0.3194	0.00
							1" Ice	0.4306	0.00
							2" Ice	0.6528	0.00
1" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	60.5800 - 35.5000	1	No Ice	0.1667	0.00
							1/2" Ice	0.2778	0.00
							1" Ice	0.3889	0.00
							2" Ice	0.6111	0.00
**********									
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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 K
L1	145.0000-140.0000	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	0.00
L2	140.0000-135.0000	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	0.00
L3	135.0000-130.0000	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	0.01
L4	130.0000-125.0000	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	0.01
L5	125.0000-120.0000	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	0.03
L6	120.0000-115.0000	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	0.03
L7	115.0000-110.0000	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	0.792	0.06
L8	110.0000-105.0000	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	0.990	0.07

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 K
L9	105.0000-100.0000	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	0.990	0.26
L10	100.0000-95.0000	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	0.990	0.26
L11	95.0000-90.0000	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	2.574	0.32
L12	90.0000-84.7500	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	3.119	0.36
L13	84.7500-84.2500	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	0.297	0.04
L14	84.2500-79.2500	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	2.970	0.35
L15	79.2500-74.2500	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	2.970	0.35
L16	74.2500-69.2500	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	2.970	0.35
L17	69.2500-64.2500	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	2.970	0.35
L18	64.2500-59.2500	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	3.192	0.35
L19	59.2500-58.0800	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	0.890	0.08
L20	58.0800-57.8300	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	0.190	0.02
L21	57.8300-52.8300	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	3.803	0.35
L22	52.8300-44.2500	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	6.527	0.60
L23	44.2500-43.2500	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	0.761	0.07
L24	43.2500-38.2500	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	3.803	0.35
L25	38.2500-33.2500	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	3.897	0.35
L26	33.2500-31.2500	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	1.605	0.14
L27	31.2500-31.0000	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	0.201	0.02
L28	31.0000-26.0000	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	4.012	0.35
L29	26.0000-21.0000	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	4.012	0.35
L30	21.0000-16.0000	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	4.012	0.35
L31	16.0000-11.0000	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	4.012	0.35

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 K
L32	11.0000-6.0000	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	4.012	0.35
L33	6.0000-4.7500	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	1.003	0.09
L34	4.7500-4.5000	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	0.201	0.02
L35	4.5000-0.0000	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	3.610	0.32

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 K
L1	145.0000-140.0000	A	1.968	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	0.00
L2	140.0000-135.0000	A	1.961	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	0.00
L3	135.0000-130.0000	A	1.954	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	0.01
L4	130.0000-125.0000	A	1.946	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	0.01
L5	125.0000-120.0000	A	1.938	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	0.03
L6	120.0000-115.0000	A	1.930	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	0.03
L7	115.0000-110.0000	A	1.922	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	2.329	0.10
L8	110.0000-105.0000	A	1.913	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	2.903	0.12
L9	105.0000-100.0000	A	1.904	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	2.894	0.31
L10	100.0000-95.0000	A	1.894	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	2.884	0.31
L11	95.0000-90.0000	A	1.885	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	7.474	0.61
L12	90.0000-84.7500	A	1.874	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	9.021	0.72
L13	84.7500-84.2500	A	1.868	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	0.859	0.07
L14	84.2500-79.2500	A	1.861	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	8.554	0.70
L15	79.2500-74.2500	A	1.850	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	8.519	0.71
L16	74.2500-69.2500	A	1.837	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	8.482	0.72
L17	69.2500-64.2500	A	1.824	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

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 K
		C		0.000	0.000	0.000	8.442	0.72
L18	64.2500-59.2500	A	1.810	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	9.156	0.71
L19	59.2500-58.0800	A	1.801	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	2.622	0.17
L20	58.0800-57.8300	A	1.798	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	0.560	0.04
L21	57.8300-52.8300	A	1.790	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	11.163	0.71
L22	52.8300-44.2500	A	1.767	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	18.991	1.21
L23	44.2500-43.2500	A	1.749	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	2.213	0.14
L24	43.2500-38.2500	A	1.736	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	10.941	0.69
L25	38.2500-33.2500	A	1.714	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	10.942	0.69
L26	33.2500-31.2500	A	1.696	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	4.394	0.27
L27	31.2500-31.0000	A	1.690	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	0.548	0.03
L28	31.0000-26.0000	A	1.675	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	10.899	0.68
L29	26.0000-21.0000	A	1.643	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	10.767	0.67
L30	21.0000-16.0000	A	1.604	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	10.607	0.66
L31	16.0000-11.0000	A	1.555	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	10.403	0.65
L32	11.0000-6.0000	A	1.484	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	10.113	0.63
L33	6.0000-4.7500	A	1.418	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	2.460	0.15
L34	4.7500-4.5000	A	1.397	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	0.488	0.03
L35	4.5000-0.0000	A	1.299	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	8.418	0.52

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	145.0000-140.0000	0.0000	0.0000	0.0000	0.0000
L2	140.0000-135.0000	0.0000	0.0000	0.0000	0.0000
L3	135.0000-130.0000	0.0000	0.0000	0.0000	0.0000

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L4	130.0000-125.0000	0.0000	0.0000	0.0000	0.0000
L5	125.0000-120.0000	0.0000	0.0000	0.0000	0.0000
L6	120.0000-115.0000	0.0000	0.0000	0.0000	0.0000
L7	115.0000-110.0000	-1.0275	0.5932	-1.5602	0.9008
L8	110.0000-105.0000	-1.2593	0.7270	-1.8975	1.0955
L9	105.0000-100.0000	-1.2627	0.7290	-1.9063	1.1006
L10	100.0000-95.0000	-1.2660	0.7309	-1.9142	1.1052
L11	95.0000-90.0000	-2.9027	1.6759	-4.1354	2.3876
L12	90.0000-84.7500	-3.2647	1.8849	-4.6037	2.6580
L13	84.7500-84.2500	-3.2660	1.8856	-4.6059	2.6592
L14	84.2500-79.2500	-3.2762	1.8915	-4.6187	2.6666
L15	79.2500-74.2500	-3.2941	1.9019	-4.6508	2.6852
L16	74.2500-69.2500	-3.3113	1.9118	-4.6803	2.7022
L17	69.2500-64.2500	-3.3279	1.9214	-4.7072	2.7177
L18	64.2500-59.2500	-3.5433	2.0457	-5.0341	2.9065
L19	59.2500-58.0800	-4.0709	2.3503	-5.8068	3.3525
L20	58.0800-57.8300	-4.0752	2.3528	-5.8130	3.3561
L21	57.8300-52.8300	-4.0870	2.3596	-5.8302	3.3661
L22	52.8300-44.2500	-4.1160	2.3764	-5.8694	3.3887
L23	44.2500-43.2500	-4.1227	2.3802	-5.8842	3.3972
L24	43.2500-38.2500	-4.1350	2.3873	-5.8731	3.3908
L25	38.2500-33.2500	-4.2348	2.4450	-5.9246	3.4206
L26	33.2500-31.2500	-4.3447	2.5084	-5.9753	3.4498
L27	31.2500-31.0000	-4.3501	2.5115	-5.9782	3.4515
L28	31.0000-26.0000	-4.3609	2.5178	-5.9812	3.4532
L29	26.0000-21.0000	-4.3808	2.5292	-5.9795	3.4523
L30	21.0000-16.0000	-4.4002	2.5404	-5.9650	3.4439
L31	16.0000-11.0000	-4.4190	2.5513	-5.9309	3.4242
L32	11.0000-6.0000	-4.4372	2.5618	-5.8607	3.3837
L33	6.0000-4.7500	-4.4483	2.5682	-5.7783	3.3361
L34	4.7500-4.5000	-4.4517	2.5702	-5.7504	3.3200
L35	4.5000-0.0000	-4.4598	2.5749	-5.6064	3.2368

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

Discrete Tower Loads

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 K
LLPX310R-V1 w/ Mount Pipe	A	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.5378 4.8914 5.2539 6.0062	2.9834 3.5263 4.0859 5.2357	0.05 0.08 0.13 0.23
LLPX310R-V1 w/ Mount Pipe	B	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.5378 4.8914 5.2539 6.0062	2.9834 3.5263 4.0859 5.2357	0.05 0.08 0.13 0.23

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 K
LLPX310R-V1 w/ Mount Pipe	C	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.5378 4.8914 5.2539 6.0062	2.9834 3.5263 4.0859 5.2357	0.05 0.08 0.13 0.23
TIMING 2000	A	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.1079 0.1518 0.2031 0.3280	0.1079 0.1518 0.2031 0.3280	0.00 0.00 0.01 0.01
WIMAX DAP HEAD	A	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.5467 1.7037 1.8681 2.2193	0.6840 0.7999 0.9228 1.1926	0.03 0.04 0.06 0.09
WIMAX DAP HEAD	B	From Leg	4.0000 0.00 6.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.5467 1.7037 1.8681 2.2193	0.6840 0.7999 0.9228 1.1926	0.03 0.04 0.06 0.09
WIMAX DAP HEAD	C	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.5467 1.7037 1.8681 2.2193	0.6840 0.7999 0.9228 1.1926	0.03 0.04 0.06 0.09
HORIZON COMPACT	A	From Leg	4.0000 0.00 6.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.7208 0.8278 0.9422 1.1933	0.3681 0.4499 0.5391 0.7396	0.01 0.02 0.03 0.05
HORIZON COMPACT	B	From Leg	4.0000 0.00 2.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.7208 0.8278 0.9422 1.1933	0.3681 0.4499 0.5391 0.7396	0.01 0.02 0.03 0.05
(3) 2.375'' OD x 5' Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1875 1.4956 1.8071 2.4580	1.1875 1.4956 1.8071 2.4580	0.02 0.03 0.04 0.08
(3) 2.375'' OD x 5' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1875 1.4956 1.8071 2.4580	1.1875 1.4956 1.8071 2.4580	0.02 0.03 0.04 0.08
(3) 2.375'' OD x 5' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1875 1.4956 1.8071 2.4580	1.1875 1.4956 1.8071 2.4580	0.02 0.03 0.04 0.08
Platform Mount [LP 712-1]	C	None		0.000	133.0000	No Ice 1/2" Ice 1" Ice 2" Ice	24.5300 29.9400 35.3500 46.1700	24.5300 29.9400 35.3500 46.1700	1.34 1.65 1.96 2.58
***									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	8.2619 8.8215 9.3462 10.4181	6.9458 8.1266 9.0212 10.8440	0.08 0.15 0.23 0.41
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice	8.2619 8.8215 9.3462 10.4181	6.9458 8.1266 9.0212 10.8440	0.08 0.15 0.23 0.41

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 K
						2" Ice			
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	8.2619 8.8215 9.3462 10.4181	6.9458 8.1266 9.0212 10.8440	0.08 0.15 0.23 0.41
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	6.5799 7.0306 7.4733 8.3846	4.9591 5.7544 6.4723 7.9407	0.08 0.13 0.19 0.34
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	6.5799 7.0306 7.4733 8.3846	4.9591 5.7544 6.4723 7.9407	0.08 0.13 0.19 0.34
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	6.5799 7.0306 7.4733 8.3846	4.9591 5.7544 6.4723 7.9407	0.08 0.13 0.19 0.34
TD-RRH8x20-25	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.0455 4.2975 4.5570 5.0981	1.5345 1.7142 1.9008 2.2951	0.07 0.10 0.13 0.20
TD-RRH8x20-25	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.0455 4.2975 4.5570 5.0981	1.5345 1.7142 1.9008 2.2951	0.07 0.10 0.13 0.20
TD-RRH8x20-25	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.0455 4.2975 4.5570 5.0981	1.5345 1.7142 1.9008 2.2951	0.07 0.10 0.13 0.20
IBC1900HG-2A	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.9660 1.0908 1.2230 1.5097	0.4635 0.5576 0.6599 0.8927	0.02 0.03 0.04 0.06
IBC1900HG-2A	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.9660 1.0908 1.2230 1.5097	0.4635 0.5576 0.6599 0.8927	0.02 0.03 0.04 0.06
IBC1900HG-2A	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.9660 1.0908 1.2230 1.5097	0.4635 0.5576 0.6599 0.8927	0.02 0.03 0.04 0.06
IBC1900BB-1	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.9660 1.0908 1.2230 1.5097	0.4635 0.5576 0.6599 0.8927	0.02 0.03 0.04 0.06
IBC1900BB-1	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.9660 1.0908 1.2230 1.5097	0.4635 0.5576 0.6599 0.8927	0.02 0.03 0.04 0.06
IBC1900BB-1	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice	0.9660 1.0908 1.2230 1.5097	0.4635 0.5576 0.6599 0.8927	0.02 0.03 0.04 0.06

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 K
						2" Ice			
2.375" OD x 5' Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1875 1.4956 1.8071 2.4580	1.1875 1.4956 1.8071 2.4580	0.02 0.03 0.04 0.08
2.375" OD x 5' Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1875 1.4956 1.8071 2.4580	1.1875 1.4956 1.8071 2.4580	0.02 0.03 0.04 0.08
2.375" OD x 5' Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1875 1.4956 1.8071 2.4580	1.1875 1.4956 1.8071 2.4580	0.02 0.03 0.04 0.08
Platform Mount [LP 712-1]	C	None		0.000	124.0000	No Ice 1/2" Ice 1" Ice 2" Ice	24.5300 29.9400 35.3500 46.1700	24.5300 29.9400 35.3500 46.1700	1.34 1.65 1.96 2.58
***									
800MHz 2X50W RRH W/FILTER	A	From Leg	1.0000 0.00 -4.00	0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.0583 2.2398 2.4287 2.8287	1.9317 2.1087 2.2931 2.6843	0.06 0.09 0.11 0.17
800MHz 2X50W RRH W/FILTER	B	From Leg	1.0000 0.00 -4.00	0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.0583 2.2398 2.4287 2.8287	1.9317 2.1087 2.2931 2.6843	0.06 0.09 0.11 0.17
800MHz 2X50W RRH W/FILTER	C	From Leg	1.0000 0.00 -4.00	0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.0583 2.2398 2.4287 2.8287	1.9317 2.1087 2.2931 2.6843	0.06 0.09 0.11 0.17
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.0000 0.00 0.00	0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.3218 2.5266 2.7388 3.1855	2.2381 2.4407 2.6507 3.0929	0.06 0.08 0.11 0.17
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.0000 0.00 0.00	0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.3218 2.5266 2.7388 3.1855	2.2381 2.4407 2.6507 3.0929	0.06 0.08 0.11 0.17
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.0000 0.00 0.00	0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.3218 2.5266 2.7388 3.1855	2.2381 2.4407 2.6507 3.0929	0.06 0.08 0.11 0.17
Pipe Mount [PM 601-3]	C	None		0.000	122.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.3900 5.4800 6.5700 8.7500	4.3900 5.4800 6.5700 8.7500	0.20 0.24 0.28 0.36
***									
BXA-80063/4CFx5 w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	114.0000	No Ice 1/2" Ice 1" Ice 2" Ice	4.9453 5.3243 5.7120 6.5142	3.6158 4.2169 4.8343 6.1053	0.03 0.07 0.12 0.23
BXA-80063/4CFx5 w/ Mount Pipe	B	From Leg	4.0000 0.00	0.000	114.0000	No Ice	4.9453 5.3243	3.6158 4.2169	0.03 0.07

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 K
			1.00					1/2" Ice	5.7120	4.8343	0.12
								1" Ice	6.5142	6.1053	0.23
								2" Ice			
BXA-80063/4CFx5 w/ Mount Pipe	C	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	4.9453	3.6158	0.03
								1/2" Ice	5.3243	4.2169	0.07
								1" Ice	5.7120	4.8343	0.12
								2" Ice	6.5142	6.1053	0.23
BXA-80063/4CFx5 w/ Mount Pipe	A	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	4.9453	3.6158	0.03
								1/2" Ice	5.3243	4.2169	0.07
								1" Ice	5.7120	4.8343	0.12
								2" Ice	6.5142	6.1053	0.23
BXA-80063/4CFx5 w/ Mount Pipe	B	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	4.9453	3.6158	0.03
								1/2" Ice	5.3243	4.2169	0.07
								1" Ice	5.7120	4.8343	0.12
								2" Ice	6.5142	6.1053	0.23
BXA-80063/4CFx5 w/ Mount Pipe	C	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	4.9453	3.6158	0.03
								1/2" Ice	5.3243	4.2169	0.07
								1" Ice	5.7120	4.8343	0.12
								2" Ice	6.5142	6.1053	0.23
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	8.4186	7.4197	0.08
								1/2" Ice	8.9558	8.4535	0.15
								1" Ice	9.4801	9.3468	0.23
								2" Ice	10.5534	11.1834	0.42
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	8.4186	7.4197	0.08
								1/2" Ice	8.9558	8.4535	0.15
								1" Ice	9.4801	9.3468	0.23
								2" Ice	10.5534	11.1834	0.42
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	8.4186	7.4197	0.08
								1/2" Ice	8.9558	8.4535	0.15
								1" Ice	9.4801	9.3468	0.23
								2" Ice	10.5534	11.1834	0.42
KS24019-L112A	B	From Leg	4.0000	0.00	2.00	0.000	114.0000	No Ice	0.1407	0.1407	0.01
								1/2" Ice	0.1979	0.1979	0.01
								1" Ice	0.2621	0.2621	0.01
								2" Ice	0.4148	0.4148	0.02
DB-T1-6Z-8AB-0Z	B	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	4.8000	2.0000	0.04
								1/2" Ice	5.0704	2.1926	0.08
								1" Ice	5.3481	2.3926	0.12
								2" Ice	5.9259	2.8148	0.21
DB-T1-6Z-8AB-0Z	A	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	4.8000	2.0000	0.04
								1/2" Ice	5.0704	2.1926	0.08
								1" Ice	5.3481	2.3926	0.12
								2" Ice	5.9259	2.8148	0.21
(2) RFV01U-D2A	A	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	1.8750	1.0125	0.07
								1/2" Ice	2.0454	1.1445	0.09
								1" Ice	2.2231	1.2840	0.11
								2" Ice	2.6009	1.5851	0.15
RFV01U-D2A	B	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	1.8750	1.0125	0.07
								1/2" Ice	2.0454	1.1445	0.09
								1" Ice	2.2231	1.2840	0.11
								2" Ice	2.6009	1.5851	0.15
RFV01U-D1A	B	From Leg	4.0000	0.00	1.00	0.000	114.0000	No Ice	1.8750	1.2500	0.08

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 K
			0.00					1/2" Ice	2.0454	1.3926	0.10
			1.00					1" Ice	2.2231	1.5426	0.12
								2" Ice	2.6009	1.8648	0.18
(2) RFV01U-D1A	C	From Leg	4.0000			0.000	114.0000	No Ice	1.8750	1.2500	0.08
			0.00					1/2" Ice	2.0454	1.3926	0.10
			1.00					1" Ice	2.2231	1.5426	0.12
								2" Ice	2.6009	1.8648	0.18
Platform Mount [LP 712-1]	C	None				0.000	114.0000	No Ice	24.5300	24.5300	1.34
								1/2" Ice	29.9400	29.9400	1.65
								1" Ice	35.3500	35.3500	1.96
								2" Ice	46.1700	46.1700	2.58
Miscellaneous [NA 509-3]	C	None				0.000	114.0000	No Ice	11.8400	11.8400	0.28
								1/2" Ice	16.9600	16.9600	0.30
								1" Ice	22.0800	22.0800	0.32
								2" Ice	32.3200	32.3200	0.36
Miscellaneous [NA 510-1]	C	None				0.000	114.0000	No Ice	6.0000	6.0000	0.26
								1/2" Ice	8.5000	8.5000	0.34
								1" Ice	11.0000	11.0000	0.42
								2" Ice	16.0000	16.0000	0.59
*** **********											
7770.00 w/ Mount Pipe	A	From Leg	4.0000			0.000	105.0000	No Ice	5.7460	4.2543	0.06
			0.00					1/2" Ice	6.1791	5.0137	0.10
			0.00					1" Ice	6.6067	5.7109	0.16
								2" Ice	7.4880	7.1553	0.29
7770.00 w/ Mount Pipe	B	From Leg	4.0000			0.000	105.0000	No Ice	5.7460	4.2543	0.06
			0.00					1/2" Ice	6.1791	5.0137	0.10
			0.00					1" Ice	6.6067	5.7109	0.16
								2" Ice	7.4880	7.1553	0.29
7770.00 w/ Mount Pipe	C	From Leg	4.0000			0.000	105.0000	No Ice	5.7460	4.2543	0.06
			0.00					1/2" Ice	6.1791	5.0137	0.10
			0.00					1" Ice	6.6067	5.7109	0.16
								2" Ice	7.4880	7.1553	0.29
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.0000			0.000	105.0000	No Ice	9.8953	7.1792	0.10
			0.00					1/2" Ice	10.4700	8.3621	0.18
			0.00					1" Ice	11.0098	9.2588	0.26
								2" Ice	12.1119	11.0860	0.46
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.0000			0.000	105.0000	No Ice	9.8953	7.1792	0.10
			0.00					1/2" Ice	10.4700	8.3621	0.18
			0.00					1" Ice	11.0098	9.2588	0.26
								2" Ice	12.1119	11.0860	0.46
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.0000			0.000	105.0000	No Ice	9.8953	7.1792	0.10
			0.00					1/2" Ice	10.4700	8.3621	0.18
			0.00					1" Ice	11.0098	9.2588	0.26
								2" Ice	12.1119	11.0860	0.46
80010965 w/ Mount Pipe	A	From Leg	4.0000			0.000	105.0000	No Ice	14.0513	7.6284	0.13
			0.00					1/2" Ice	14.6885	8.9027	0.22
			0.00					1" Ice	15.3033	9.9625	0.33
								2" Ice	16.5301	11.9248	0.57
80010965 w/ Mount Pipe	B	From Leg	4.0000			0.000	105.0000	No Ice	14.0513	7.6284	0.13
			0.00					1/2" Ice	14.6885	8.9027	0.22
			0.00					1" Ice	15.3033	9.9625	0.33
								2" Ice	16.5301	11.9248	0.57

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 K
						2" Ice			
80010965 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	14.0513 14.6885 15.3033 16.5301	7.6284 8.9027 9.9625 11.9248	0.13 0.22 0.33 0.57
QS66512-2 w/ Mount Pipe	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.6000 9.2903 9.9098 11.1763	5.0000 9.6573 10.6203 12.6104	0.14 0.21 0.30 0.49
QS66512-2 w/ Mount Pipe	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.6000 9.2903 9.9098 11.1763	5.0000 9.6573 10.6203 12.6104	0.14 0.21 0.30 0.49
QS66512-2 w/ Mount Pipe	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.6000 9.2903 9.9098 11.1763	5.0000 9.6573 10.6203 12.6104	0.14 0.21 0.30 0.49
RRUS 4478 B14	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	1.0588 1.1969 1.3425 1.6558	0.06 0.08 0.09 0.14
RRUS 4478 B14	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	1.0588 1.1969 1.3425 1.6558	0.06 0.08 0.09 0.14
RRUS 4478 B14	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.8425 2.0123 2.1895 2.5662	1.0588 1.1969 1.3425 1.6558	0.06 0.08 0.09 0.14
(2) DC6-48-60-18-8F	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.2117 1.8924 2.1051 2.5703	1.2117 1.8924 2.1051 2.5703	0.03 0.05 0.08 0.14
(2) LGP21401	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1040 1.2388 1.3810 1.6877	0.3471 0.4422 0.5444 0.7696	0.01 0.02 0.03 0.05
(2) LGP21401	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1040 1.2388 1.3810 1.6877	0.3471 0.4422 0.5444 0.7696	0.01 0.02 0.03 0.05
(2) LGP21401	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.1040 1.2388 1.3810 1.6877	0.3471 0.4422 0.5444 0.7696	0.01 0.02 0.03 0.05
(2) TPX-070821	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.4688 0.5585 0.6556 0.8721	0.1009 0.1471 0.2020 0.3340	0.01 0.01 0.02 0.03
(2) TPX-070821	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice	0.4688 0.5585 0.6556 0.8721	0.1009 0.1471 0.2020 0.3340	0.01 0.01 0.02 0.03

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 K
						2" Ice			
(2) TPX-070821	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.4688 0.5585 0.6556 0.8721	0.1009 0.1471 0.2020 0.3340	0.01 0.01 0.02 0.03
RRUS 32	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.8571 3.0830 3.3163 3.8052	1.7766 1.9677 2.1658 2.5829	0.06 0.08 0.10 0.16
RRUS 32	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.8571 3.0830 3.3163 3.8052	1.7766 1.9677 2.1658 2.5829	0.06 0.08 0.10 0.16
RRUS 32	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	2.8571 3.0830 3.3163 3.8052	1.7766 1.9677 2.1658 2.5829	0.06 0.08 0.10 0.16
DC6-48-60-18-8F	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.2117 1.8924 2.1051 2.5703	1.2117 1.8924 2.1051 2.5703	0.03 0.05 0.08 0.14
RRUS 4449 B5/B12	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9675 2.1439 2.3278 2.7177	1.4081 1.5637 1.7267 2.0749	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9675 2.1439 2.3278 2.7177	1.4081 1.5637 1.7267 2.0749	0.07 0.09 0.11 0.16
RRUS 4449 B5/B12	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.9675 2.1439 2.3278 2.7177	1.4081 1.5637 1.7267 2.0749	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	A	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.6390 1.7988 1.9660 2.3227	1.3534 1.5005 1.6549 1.9860	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	B	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.6390 1.7988 1.9660 2.3227	1.3534 1.5005 1.6549 1.9860	0.07 0.09 0.11 0.16
RRUS 8843 B2/B66A	C	From Leg	4.0000 0.00 0.00	0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	1.6390 1.7988 1.9660 2.3227	1.3534 1.5005 1.6549 1.9860	0.07 0.09 0.11 0.16
Platform Mount [LP 712-1]	C	None		0.000	105.0000	No Ice 1/2" Ice 1" Ice 2" Ice	24.5300 29.9400 35.3500 46.1700	24.5300 29.9400 35.3500 46.1700	1.34 1.65 1.96 2.58
***									
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.0000 0.00 1.00	0.000	94.0000	No Ice 1/2" Ice	6.3186 6.7646 7.2032	5.6334 6.4160 7.1208	0.11 0.17 0.23

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 K
						1" Ice	8.1062	8.5791	0.38
						2" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.0000	0.000	94.0000	No Ice	6.3186	5.6334	0.11
			0.00			1/2"	6.7646	6.4160	0.17
			1.00			Ice	7.2032	7.1208	0.23
						1" Ice	8.1062	8.5791	0.38
						2" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.0000	0.000	94.0000	No Ice	6.3186	5.6334	0.11
			0.00			1/2"	6.7646	6.4160	0.17
			1.00			Ice	7.2032	7.1208	0.23
						1" Ice	8.1062	8.5791	0.38
						2" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.0000	0.000	94.0000	No Ice	6.7474	6.0700	0.15
			0.00			1/2"	7.2017	6.8671	0.21
			1.00			Ice	7.6475	7.5828	0.28
						1" Ice	8.5651	9.0629	0.44
						2" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.0000	0.000	94.0000	No Ice	6.7474	6.0700	0.15
			0.00			1/2"	7.2017	6.8671	0.21
			1.00			Ice	7.6475	7.5828	0.28
						1" Ice	8.5651	9.0629	0.44
						2" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.0000	0.000	94.0000	No Ice	6.7474	6.0700	0.15
			0.00			1/2"	7.2017	6.8671	0.21
			1.00			Ice	7.6475	7.5828	0.28
						1" Ice	8.5651	9.0629	0.44
						2" Ice			
KRY 112 144/1	A	From Leg	4.0000	0.000	94.0000	No Ice	0.3500	0.1750	0.01
			0.00			1/2"	0.4259	0.2343	0.01
			1.00			Ice	0.5093	0.3009	0.02
						1" Ice	0.6981	0.4565	0.03
						2" Ice			
KRY 112 144/1	B	From Leg	4.0000	0.000	94.0000	No Ice	0.3500	0.1750	0.01
			0.00			1/2"	0.4259	0.2343	0.01
			1.00			Ice	0.5093	0.3009	0.02
						1" Ice	0.6981	0.4565	0.03
						2" Ice			
KRY 112 144/1	C	From Leg	4.0000	0.000	94.0000	No Ice	0.3500	0.1750	0.01
			0.00			1/2"	0.4259	0.2343	0.01
			1.00			Ice	0.5093	0.3009	0.02
						1" Ice	0.6981	0.4565	0.03
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.0000	0.000	94.0000	No Ice	20.4801	11.0240	0.16
			0.00			1/2"	21.2306	12.5496	0.30
			1.00			Ice	21.9900	14.0992	0.44
						1" Ice	23.4441	16.4509	0.78
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.0000	0.000	94.0000	No Ice	20.4801	11.0240	0.16
			0.00			1/2"	21.2306	12.5496	0.30
			1.00			Ice	21.9900	14.0992	0.44
						1" Ice	23.4441	16.4509	0.78
						2" Ice			
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.0000	0.000	94.0000	No Ice	20.4801	11.0240	0.16
			0.00			1/2"	21.2306	12.5496	0.30
			1.00			Ice	21.9900	14.0992	0.44
						1" Ice	23.4441	16.4509	0.78
						2" Ice			
RADIO 4449 B12/B71	A	From Leg	4.0000	0.000	94.0000	No Ice	1.6500	1.1625	0.07
			0.00			1/2"	1.8104	1.3012	0.09
			1.00			Ice	1.9781	1.4473	0.11
						1" Ice	2.3359	1.7618	0.16
						2" Ice			
RADIO 4449 B12/B71	B	From Leg	4.0000	0.000	94.0000	No Ice	1.6500	1.1625	0.07
			0.00			1/2"	1.8104	1.3012	0.09
			1.00			Ice	1.9781	1.4473	0.11

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 K
						1" Ice	2.3359	1.7618	0.16
						2" Ice			
RADIO 4449 B12/B71	C	From Leg	4.0000	0.000	94.0000	No Ice	1.6500	1.1625	0.07
			0.00			1/2" Ice	1.8104	1.3012	0.09
			1.00			1" Ice	1.9781	1.4473	0.11
						2" Ice	2.3359	1.7618	0.16
2.375" OD x 5' Mount Pipe	A	From Leg	4.0000	0.000	94.0000	No Ice	1.1875	1.1875	0.02
			0.00			1/2" Ice	1.4956	1.4956	0.03
			0.00			1" Ice	1.8071	1.8071	0.04
						2" Ice	2.4580	2.4580	0.08
2.375" OD x 5' Mount Pipe	B	From Leg	4.0000	0.000	94.0000	No Ice	1.1875	1.1875	0.02
			0.00			1/2" Ice	1.4956	1.4956	0.03
			0.00			1" Ice	1.8071	1.8071	0.04
						2" Ice	2.4580	2.4580	0.08
2.375" OD x 5' Mount Pipe	C	From Leg	4.0000	0.000	94.0000	No Ice	1.1875	1.1875	0.02
			0.00			1/2" Ice	1.4956	1.4956	0.03
			0.00			1" Ice	1.8071	1.8071	0.04
						2" Ice	2.4580	2.4580	0.08
Platform Mount [LP 712-1]	C	None		0.000	94.0000	No Ice	24.5300	24.5300	1.34
						1/2" Ice	29.9400	29.9400	1.65
						1" Ice	35.3500	35.3500	1.96
						2" Ice	46.1700	46.1700	2.58
***									
742 213	A	From Leg	1.0000	0.000	87.0000	No Ice	5.1354	2.8687	0.02
			0.00			1/2" Ice	5.6089	3.4832	0.05
			0.00			1" Ice	6.0897	3.9457	0.08
						2" Ice	7.0737	4.8929	0.16
742 213	B	From Leg	1.0000	0.000	87.0000	No Ice	5.1354	2.8687	0.02
			0.00			1/2" Ice	5.6089	3.4832	0.05
			0.00			1" Ice	6.0897	3.9457	0.08
						2" Ice	7.0737	4.8929	0.16
742 213	C	From Leg	1.0000	0.000	87.0000	No Ice	5.1354	2.8687	0.02
			0.00			1/2" Ice	5.6089	3.4832	0.05
			0.00			1" Ice	6.0897	3.9457	0.08
						2" Ice	7.0737	4.8929	0.16
Pipe Mount [PM 601-3]	C	None		0.000	87.0000	No Ice	4.3900	4.3900	0.20
						1/2" Ice	5.4800	5.4800	0.24
						1" Ice	6.5700	6.5700	0.28
						2" Ice	8.7500	8.7500	0.36
***									
Side Arm Mount [SO 701-1]	A	None		0.000	80.0000	No Ice	0.8500	1.6700	0.07
						1/2" Ice	1.1400	2.3400	0.08
						1" Ice	1.4300	3.0100	0.09
						2" Ice	2.0100	4.3500	0.12
Side Arm Mount [SO 701-1]	B	None		0.000	80.0000	No Ice	0.8500	1.6700	0.07
						1/2" Ice	1.1400	2.3400	0.08
						1" Ice	1.4300	3.0100	0.09
						2" Ice	2.0100	4.3500	0.12
***									
Side Arm Mount [SO 701-1]	C	None		0.000	77.0000	No Ice	0.8500	1.6700	0.07
						1/2" Ice	1.1400	2.3400	0.08
						1" Ice	1.4300	3.0100	0.09
						2" Ice	2.0100	4.3500	0.12

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 K
58532A	C	From Leg	3.0000 0.00 0.00	0.000	77.0000	No Ice 1/2" Ice 1" Ice 2" Ice	0.1893 0.2483 0.3147 0.4698	0.1893 0.2483 0.3147 0.4698	0.00 0.00 0.01 0.02
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2.5-11	A	Paraboloid w/Shroud (HP)	From Leg	4.0000 0.00 6.00	0.000		133.0000	2.9167	No Ice 1/2" Ice 1" Ice 2" Ice	6.6800 7.0700 7.4600 8.2300	0.05 0.08 0.12 0.19
VHLP2.5-11	B	Paraboloid w/Shroud (HP)	From Leg	4.0000 0.00 6.00	0.000		133.0000	2.9167	No Ice 1/2" Ice 1" Ice 2" Ice	6.6800 7.0700 7.4600 8.2300	0.05 0.08 0.12 0.19

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 145.0000-140.0000	142.4843	1.364	49	10.338	A	0.000	10.338	10.338	100.00	0.000	0.000
					B	0.000	10.338		100.00	0.000	0.000
					C	0.000	10.338		100.00	0.000	0.000
L2 140.0000-135.0000	137.4848	1.353	49	10.728	A	0.000	10.728	10.728	100.00	0.000	0.000
					B	0.000	10.728		100.00	0.000	0.000
					C	0.000	10.728		100.00	0.000	0.000
L3 135.0000-130.0000	132.4854	1.343	48	11.119	A	0.000	11.119	11.119	100.00	0.000	0.000
					B	0.000	11.119		100.00	0.000	0.000
					C	0.000	11.119		100.00	0.000	0.000
L4 130.0000-125.0000	127.4856	1.332	48	11.509	A	0.000	11.509	11.509	100.00	0.000	0.000
					B	0.000	11.509		100.00	0.000	0.000
					C	0.000	11.509		100.00	0.000	0.000
L5 125.0000-120.0000	122.4861	1.321	47	11.906	A	0.000	11.906	11.906	100.00	0.000	0.000
					B	0.000	11.906		100.00	0.000	0.000
					C	0.000	11.906		100.00	0.000	0.000
L6 120.0000-115.0000	117.4866	1.309	47	12.304	A	0.000	12.304	12.304	100.00	0.000	0.000
					B	0.000	12.304		100.00	0.000	0.000
					C	0.000	12.304		100.00	0.000	0.000
L7 115.0000-110.0000	112.4870	1.297	47	12.701	A	0.000	12.701	12.701	100.00	0.000	0.000
					B	0.000	12.701		100.00	0.000	0.000
					C	0.000	12.701		100.00	0.000	0.792
L8 110.0000-105.0000	107.4874	1.285	46	13.098	A	0.000	13.098	13.098	100.00	0.000	0.000
					B	0.000	13.098		100.00	0.000	0.000
					C	0.000	13.098		100.00	0.000	0.990
L9 105.0000-100.0000	102.4877	1.272	46	13.496	A	0.000	13.496	13.496	100.00	0.000	0.000
					B	0.000	13.496		100.00	0.000	0.000
					C	0.000	13.496		100.00	0.000	0.990
L10 100.0000-95.0000	97.4881	1.259	45	13.893	A	0.000	13.893	13.893	100.00	0.000	0.000
					B	0.000	13.893		100.00	0.000	0.000
					C	0.000	13.893		100.00	0.000	0.990

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
L11 95.0000-90.0000	92.4884	1.245	45	14.291	A	0.000	14.291	14.291	100.00	0.000	0.000
					B	0.000	14.291		100.00	0.000	0.000
					C	0.000	14.291		100.00	0.000	2.574
L12 90.0000-84.7500	87.3626	1.23	44	15.433	A	0.000	15.433	15.433	100.00	0.000	0.000
					B	0.000	15.433		100.00	0.000	0.000
					C	0.000	15.433		100.00	0.000	3.119
L13 84.7500-84.2500	84.4999	1.222	44	1.471	A	0.000	1.471	1.471	100.00	0.000	0.000
					B	0.000	1.471		100.00	0.000	0.000
					C	0.000	1.471		100.00	0.000	0.297
L14 84.2500-79.2500	81.7391	1.213	44	14.921	A	0.000	14.921	14.921	100.00	0.000	0.000
					B	0.000	14.921		100.00	0.000	0.000
					C	0.000	14.921		100.00	0.000	2.970
L15 79.2500-74.2500	76.7394	1.197	43	15.313	A	0.000	15.313	15.313	100.00	0.000	0.000
					B	0.000	15.313		100.00	0.000	0.000
					C	0.000	15.313		100.00	0.000	2.970
L16 74.2500-69.2500	71.7396	1.18	42	15.705	A	0.000	15.705	15.705	100.00	0.000	0.000
					B	0.000	15.705		100.00	0.000	0.000
					C	0.000	15.705		100.00	0.000	2.970
L17 69.2500-64.2500	66.7399	1.162	42	16.097	A	0.000	16.097	16.097	100.00	0.000	0.000
					B	0.000	16.097		100.00	0.000	0.000
					C	0.000	16.097		100.00	0.000	2.970
L18 64.2500-59.2500	61.7401	1.143	41	16.488	A	0.000	16.488	16.488	100.00	0.000	0.000
					B	0.000	16.488		100.00	0.000	0.000
					C	0.000	16.488		100.00	0.000	3.192
L19 59.2500-58.0800	58.6645	1.131	41	3.915	A	0.000	3.915	3.915	100.00	0.000	0.000
					B	0.000	3.915		100.00	0.000	0.000
					C	0.000	3.915		100.00	0.000	0.890
L20 58.0800-57.8300	57.9550	1.128	41	0.839	A	0.000	0.839	0.839	100.00	0.000	0.000
					B	0.000	0.839		100.00	0.000	0.000
					C	0.000	0.839		100.00	0.000	0.190
L21 57.8300-52.8300	55.3204	1.117	40	16.985	A	0.000	16.985	16.985	100.00	0.000	0.000
					B	0.000	16.985		100.00	0.000	0.000
					C	0.000	16.985		100.00	0.000	3.803
L22 52.8300-44.2500	48.5126	1.087	39	30.060	A	0.000	30.060	30.060	100.00	0.000	0.000
					B	0.000	30.060		100.00	0.000	0.000
					C	0.000	30.060		100.00	0.000	6.527
L23 44.2500-43.2500	43.7496	1.063	38	3.525	A	0.000	3.525	3.525	100.00	0.000	0.000
					B	0.000	3.525		100.00	0.000	0.000
					C	0.000	3.525		100.00	0.000	0.761
L24 43.2500-38.2500	40.7409	1.048	38	17.859	A	0.000	17.859	17.859	100.00	0.000	0.000
					B	0.000	17.859		100.00	0.000	0.000
					C	0.000	17.859		100.00	0.000	3.803
L25 38.2500-33.2500	35.7411	1.019	37	18.251	A	0.000	18.251	18.251	100.00	0.000	0.000
					B	0.000	18.251		100.00	0.000	0.000
					C	0.000	18.251		100.00	0.000	3.897
L26 33.2500-31.2500	32.2486	0.997	36	7.410	A	0.000	7.410	7.410	100.00	0.000	0.000
					B	0.000	7.410		100.00	0.000	0.000
					C	0.000	7.410		100.00	0.000	1.605
L27 31.2500-31.0000	31.1250	0.99	36	0.930	A	0.000	0.930	0.930	100.00	0.000	0.000
					B	0.000	0.930		100.00	0.000	0.000
					C	0.000	0.930		100.00	0.000	0.201
L28 31.0000-26.0000	28.4913	0.972	35	18.815	A	0.000	18.815	18.815	100.00	0.000	0.000
					B	0.000	18.815		100.00	0.000	0.000
					C	0.000	18.815		100.00	0.000	4.012
L29 26.0000-21.0000	23.4915	0.933	34	19.208	A	0.000	19.208	19.208	100.00	0.000	0.000
					B	0.000	19.208		100.00	0.000	0.000
					C	0.000	19.208		100.00	0.000	4.012
L30 21.0000-16.0000	18.4917	0.887	32	19.599	A	0.000	19.599	19.599	100.00	0.000	0.000
					B	0.000	19.599		100.00	0.000	0.000
					C	0.000	19.599		100.00	0.000	4.012
L31 16.0000-11.0000	13.4918	0.85	31	19.991	A	0.000	19.991	19.991	100.00	0.000	0.000
					B	0.000	19.991		100.00	0.000	0.000
					C	0.000	19.991		100.00	0.000	4.012
L32 11.0000-6.0000	8.4920	0.85	31	20.383	A	0.000	20.383	20.383	100.00	0.000	0.000
					B	0.000	20.383		100.00	0.000	0.000
					C	0.000	20.383		100.00	0.000	4.012
L33 6.0000-4.7500	5.3745	0.85	31	5.157	A	0.000	5.157	5.157	100.00	0.000	0.000
					B	0.000	5.157		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	5.157		100.00	0.000	1.003
L34 4.7500-4.5000	4.6250	0.85	31	1.034	A	0.000	1.034	1.034	100.00	0.000	0.000
					B	0.000	1.034		100.00	0.000	0.000
					C	0.000	1.034		100.00	0.000	0.201
L35 4.5000-0.0000	2.2437	0.85	31	18.783	A	0.000	18.783	18.783	100.00	0.000	0.000
					B	0.000	18.783		100.00	0.000	0.000
					C	0.000	18.783		100.00	0.000	3.610

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 145.0000-140.0000	142.4843	1.364	8	1.9678	11.977	A	0.000	11.977	11.977	100.00	0.000	0.000
						B	0.000	11.977		100.00	0.000	0.000
						C	0.000	11.977		100.00	0.000	0.000
L2 140.0000-135.0000	137.4848	1.353	8	1.9608	12.362	A	0.000	12.362	12.362	100.00	0.000	0.000
						B	0.000	12.362		100.00	0.000	0.000
						C	0.000	12.362		100.00	0.000	0.000
L3 135.0000-130.0000	132.4854	1.343	8	1.9535	12.747	A	0.000	12.747	12.747	100.00	0.000	0.000
						B	0.000	12.747		100.00	0.000	0.000
						C	0.000	12.747		100.00	0.000	0.000
L4 130.0000-125.0000	127.4856	1.332	8	1.9460	13.131	A	0.000	13.131	13.131	100.00	0.000	0.000
						B	0.000	13.131		100.00	0.000	0.000
						C	0.000	13.131		100.00	0.000	0.000
L5 125.0000-120.0000	122.4861	1.321	8	1.9382	13.521	A	0.000	13.521	13.521	100.00	0.000	0.000
						B	0.000	13.521		100.00	0.000	0.000
						C	0.000	13.521		100.00	0.000	0.000
L6 120.0000-115.0000	117.4866	1.309	8	1.9302	13.912	A	0.000	13.912	13.912	100.00	0.000	0.000
						B	0.000	13.912		100.00	0.000	0.000
						C	0.000	13.912		100.00	0.000	0.000
L7 115.0000-110.0000	112.4870	1.297	7	1.9218	14.303	A	0.000	14.303	14.303	100.00	0.000	0.000
						B	0.000	14.303		100.00	0.000	0.000
						C	0.000	14.303		100.00	0.000	2.329
L8 110.0000-105.0000	107.4874	1.285	7	1.9131	14.693	A	0.000	14.693	14.693	100.00	0.000	0.000
						B	0.000	14.693		100.00	0.000	0.000
						C	0.000	14.693		100.00	0.000	2.903
L9 105.0000-100.0000	102.4877	1.272	7	1.9040	15.082	A	0.000	15.082	15.082	100.00	0.000	0.000
						B	0.000	15.082		100.00	0.000	0.000
						C	0.000	15.082		100.00	0.000	2.894
L10 100.0000-95.0000	97.4881	1.259	7	1.8945	15.472	A	0.000	15.472	15.472	100.00	0.000	0.000
						B	0.000	15.472		100.00	0.000	0.000
						C	0.000	15.472		100.00	0.000	2.884
L11 95.0000-90.0000	92.4884	1.245	7	1.8845	15.861	A	0.000	15.861	15.861	100.00	0.000	0.000
						B	0.000	15.861		100.00	0.000	0.000
						C	0.000	15.861		100.00	0.000	7.474
L12 90.0000-84.7500	87.3626	1.23	7	1.8738	17.072	A	0.000	17.072	17.072	100.00	0.000	0.000
						B	0.000	17.072		100.00	0.000	0.000
						C	0.000	17.072		100.00	0.000	9.021
L13 84.7500-84.2500	84.4999	1.222	7	1.8676	1.627	A	0.000	1.627	1.627	100.00	0.000	0.000
						B	0.000	1.627		100.00	0.000	0.000
						C	0.000	1.627		100.00	0.000	0.859
L14 84.2500-79.2500	81.7391	1.213	7	1.8614	16.472	A	0.000	16.472	16.472	100.00	0.000	0.000
						B	0.000	16.472		100.00	0.000	0.000
						C	0.000	16.472		100.00	0.000	8.554
L15 79.2500-74.2500	76.7394	1.197	7	1.8497	16.854	A	0.000	16.854	16.854	100.00	0.000	0.000
						B	0.000	16.854		100.00	0.000	0.000
						C	0.000	16.854		100.00	0.000	8.519
L16 74.2500-69.2500	71.7396	1.18	7	1.8373	17.236	A	0.000	17.236	17.236	100.00	0.000	0.000
						B	0.000	17.236		100.00	0.000	0.000
						C	0.000	17.236		100.00	0.000	8.482
L17 69.2500-64.2500	66.7399	1.162	7	1.8240	17.617	A	0.000	17.617	17.617	100.00	0.000	0.000
						B	0.000	17.617		100.00	0.000	0.000
						C	0.000	17.617		100.00	0.000	8.442

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
L18 64.2500-59.2500	61.7401	1.143	7	1.8099	17.997	A	0.000	17.997	17.997	100.00	0.000	0.000
						B	0.000	17.997		100.00	0.000	0.000
						C	0.000	17.997		100.00	0.000	9.156
L19 59.2500-58.0800	58.6645	1.131	7	1.8007	4.266	A	0.000	4.266	4.266	100.00	0.000	0.000
						B	0.000	4.266		100.00	0.000	0.000
						C	0.000	4.266		100.00	0.000	2.622
L20 58.0800-57.8300	57.9550	1.128	6	1.7985	0.914	A	0.000	0.914	0.914	100.00	0.000	0.000
						B	0.000	0.914		100.00	0.000	0.000
						C	0.000	0.914		100.00	0.000	0.560
L21 57.8300-52.8300	55.3204	1.117	6	1.7901	18.477	A	0.000	18.477	18.477	100.00	0.000	0.000
						B	0.000	18.477		100.00	0.000	0.000
						C	0.000	18.477		100.00	0.000	11.163
L22 52.8300-44.2500	48.5126	1.087	6	1.7668	32.586	A	0.000	32.586	32.586	100.00	0.000	0.000
						B	0.000	32.586		100.00	0.000	0.000
						C	0.000	32.586		100.00	0.000	18.991
L23 44.2500-43.2500	43.7496	1.063	6	1.7486	3.819	A	0.000	3.819	3.819	100.00	0.000	0.000
						B	0.000	3.819		100.00	0.000	0.000
						C	0.000	3.819		100.00	0.000	2.213
L24 43.2500-38.2500	40.7409	1.048	6	1.7362	19.306	A	0.000	19.306	19.306	100.00	0.000	0.000
						B	0.000	19.306		100.00	0.000	0.000
						C	0.000	19.306		100.00	0.000	10.941
L25 38.2500-33.2500	35.7411	1.019	6	1.7136	19.679	A	0.000	19.679	19.679	100.00	0.000	0.000
						B	0.000	19.679		100.00	0.000	0.000
						C	0.000	19.679		100.00	0.000	10.942
L26 33.2500-31.2500	32.2486	0.997	6	1.6961	7.975	A	0.000	7.975	7.975	100.00	0.000	0.000
						B	0.000	7.975		100.00	0.000	0.000
						C	0.000	7.975		100.00	0.000	4.394
L27 31.2500-31.0000	31.1250	0.99	6	1.6901	1.001	A	0.000	1.001	1.001	100.00	0.000	0.000
						B	0.000	1.001		100.00	0.000	0.000
						C	0.000	1.001		100.00	0.000	0.548
L28 31.0000-26.0000	28.4913	0.972	6	1.6752	20.211	A	0.000	20.211	20.211	100.00	0.000	0.000
						B	0.000	20.211		100.00	0.000	0.000
						C	0.000	20.211		100.00	0.000	10.899
L29 26.0000-21.0000	23.4915	0.933	5	1.6432	20.577	A	0.000	20.577	20.577	100.00	0.000	0.000
						B	0.000	20.577		100.00	0.000	0.000
						C	0.000	20.577		100.00	0.000	10.767
L30 21.0000-16.0000	18.4917	0.887	5	1.6043	20.936	A	0.000	20.936	20.936	100.00	0.000	0.000
						B	0.000	20.936		100.00	0.000	0.000
						C	0.000	20.936		100.00	0.000	10.607
L31 16.0000-11.0000	13.4918	0.85	5	1.5545	21.287	A	0.000	21.287	21.287	100.00	0.000	0.000
						B	0.000	21.287		100.00	0.000	0.000
						C	0.000	21.287		100.00	0.000	10.403
L32 11.0000-6.0000	8.4920	0.85	5	1.4842	21.620	A	0.000	21.620	21.620	100.00	0.000	0.000
						B	0.000	21.620		100.00	0.000	0.000
						C	0.000	21.620		100.00	0.000	10.113
L33 6.0000-4.7500	5.3745	0.85	5	1.4179	5.452	A	0.000	5.452	5.452	100.00	0.000	0.000
						B	0.000	5.452		100.00	0.000	0.000
						C	0.000	5.452		100.00	0.000	2.460
L34 4.7500-4.5000	4.6250	0.85	5	1.3967	1.092	A	0.000	1.092	1.092	100.00	0.000	0.000
						B	0.000	1.092		100.00	0.000	0.000
						C	0.000	1.092		100.00	0.000	0.488
L35 4.5000-0.0000	2.2437	0.85	5	1.2993	19.757	A	0.000	19.757	19.757	100.00	0.000	0.000
						B	0.000	19.757		100.00	0.000	0.000
						C	0.000	19.757		100.00	0.000	8.418

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 145.0000-140.0000	142.4843	1.364	10	10.338	A	0.000	10.338	10.338	100.00	0.000	0.000
					B	0.000	10.338		100.00	0.000	0.000
					C	0.000	10.338		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
L2 140.0000-135.0000	137.4848	1.353	10	10.728	A	0.000	10.728	10.728	100.00	0.000	0.000
					B	0.000	10.728		100.00	0.000	0.000
					C	0.000	10.728		100.00	0.000	0.000
L3 135.0000-130.0000	132.4854	1.343	10	11.119	A	0.000	11.119	11.119	100.00	0.000	0.000
					B	0.000	11.119		100.00	0.000	0.000
					C	0.000	11.119		100.00	0.000	0.000
L4 130.0000-125.0000	127.4856	1.332	10	11.509	A	0.000	11.509	11.509	100.00	0.000	0.000
					B	0.000	11.509		100.00	0.000	0.000
					C	0.000	11.509		100.00	0.000	0.000
L5 125.0000-120.0000	122.4861	1.321	10	11.906	A	0.000	11.906	11.906	100.00	0.000	0.000
					B	0.000	11.906		100.00	0.000	0.000
					C	0.000	11.906		100.00	0.000	0.000
L6 120.0000-115.0000	117.4866	1.309	10	12.304	A	0.000	12.304	12.304	100.00	0.000	0.000
					B	0.000	12.304		100.00	0.000	0.000
					C	0.000	12.304		100.00	0.000	0.000
L7 115.0000-110.0000	112.4870	1.297	10	12.701	A	0.000	12.701	12.701	100.00	0.000	0.000
					B	0.000	12.701		100.00	0.000	0.000
					C	0.000	12.701		100.00	0.000	0.792
L8 110.0000-105.0000	107.4874	1.285	10	13.098	A	0.000	13.098	13.098	100.00	0.000	0.000
					B	0.000	13.098		100.00	0.000	0.000
					C	0.000	13.098		100.00	0.000	0.990
L9 105.0000-100.0000	102.4877	1.272	9	13.496	A	0.000	13.496	13.496	100.00	0.000	0.000
					B	0.000	13.496		100.00	0.000	0.000
					C	0.000	13.496		100.00	0.000	0.990
L10 100.0000-95.0000	97.4881	1.259	9	13.893	A	0.000	13.893	13.893	100.00	0.000	0.000
					B	0.000	13.893		100.00	0.000	0.000
					C	0.000	13.893		100.00	0.000	0.990
L11 95.0000-90.0000	92.4884	1.245	9	14.291	A	0.000	14.291	14.291	100.00	0.000	0.000
					B	0.000	14.291		100.00	0.000	0.000
					C	0.000	14.291		100.00	0.000	2.574
L12 90.0000-84.7500	87.3626	1.23	9	15.433	A	0.000	15.433	15.433	100.00	0.000	0.000
					B	0.000	15.433		100.00	0.000	0.000
					C	0.000	15.433		100.00	0.000	3.119
L13 84.7500-84.2500	84.4999	1.222	9	1.471	A	0.000	1.471	1.471	100.00	0.000	0.000
					B	0.000	1.471		100.00	0.000	0.000
					C	0.000	1.471		100.00	0.000	0.297
L14 84.2500-79.2500	81.7391	1.213	9	14.921	A	0.000	14.921	14.921	100.00	0.000	0.000
					B	0.000	14.921		100.00	0.000	0.000
					C	0.000	14.921		100.00	0.000	2.970
L15 79.2500-74.2500	76.7394	1.197	9	15.313	A	0.000	15.313	15.313	100.00	0.000	0.000
					B	0.000	15.313		100.00	0.000	0.000
					C	0.000	15.313		100.00	0.000	2.970
L16 74.2500-69.2500	71.7396	1.18	9	15.705	A	0.000	15.705	15.705	100.00	0.000	0.000
					B	0.000	15.705		100.00	0.000	0.000
					C	0.000	15.705		100.00	0.000	2.970
L17 69.2500-64.2500	66.7399	1.162	9	16.097	A	0.000	16.097	16.097	100.00	0.000	0.000
					B	0.000	16.097		100.00	0.000	0.000
					C	0.000	16.097		100.00	0.000	2.970
L18 64.2500-59.2500	61.7401	1.143	8	16.488	A	0.000	16.488	16.488	100.00	0.000	0.000
					B	0.000	16.488		100.00	0.000	0.000
					C	0.000	16.488		100.00	0.000	3.192
L19 59.2500-58.0800	58.6645	1.131	8	3.915	A	0.000	3.915	3.915	100.00	0.000	0.000
					B	0.000	3.915		100.00	0.000	0.000
					C	0.000	3.915		100.00	0.000	0.890
L20 58.0800-57.8300	57.9550	1.128	8	0.839	A	0.000	0.839	0.839	100.00	0.000	0.000
					B	0.000	0.839		100.00	0.000	0.000
					C	0.000	0.839		100.00	0.000	0.190
L21 57.8300-52.8300	55.3204	1.117	8	16.985	A	0.000	16.985	16.985	100.00	0.000	0.000
					B	0.000	16.985		100.00	0.000	0.000
					C	0.000	16.985		100.00	0.000	3.803
L22 52.8300-44.2500	48.5126	1.087	8	30.060	A	0.000	30.060	30.060	100.00	0.000	0.000
					B	0.000	30.060		100.00	0.000	0.000
					C	0.000	30.060		100.00	0.000	6.527
L23 44.2500-43.2500	43.7496	1.063	8	3.525	A	0.000	3.525	3.525	100.00	0.000	0.000
					B	0.000	3.525		100.00	0.000	0.000
					C	0.000	3.525		100.00	0.000	0.761
L24 43.2500-38.2500	40.7409	1.048	8	17.859	A	0.000	17.859	17.859	100.00	0.000	0.000
					B	0.000	17.859		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	17.859		100.00	0.000	3.803
L25 38.2500-33.2500	35.7411	1.019	8	18.251	A	0.000	18.251	18.251	100.00	0.000	0.000
					B	0.000	18.251		100.00	0.000	0.000
					C	0.000	18.251		100.00	0.000	3.897
L26 33.2500-31.2500	32.2486	0.997	7	7.410	A	0.000	7.410	7.410	100.00	0.000	0.000
					B	0.000	7.410		100.00	0.000	0.000
					C	0.000	7.410		100.00	0.000	1.605
L27 31.2500-31.0000	31.1250	0.99	7	0.930	A	0.000	0.930	0.930	100.00	0.000	0.000
					B	0.000	0.930		100.00	0.000	0.000
					C	0.000	0.930		100.00	0.000	0.201
L28 31.0000-26.0000	28.4913	0.972	7	18.815	A	0.000	18.815	18.815	100.00	0.000	0.000
					B	0.000	18.815		100.00	0.000	0.000
					C	0.000	18.815		100.00	0.000	4.012
L29 26.0000-21.0000	23.4915	0.933	7	19.208	A	0.000	19.208	19.208	100.00	0.000	0.000
					B	0.000	19.208		100.00	0.000	0.000
					C	0.000	19.208		100.00	0.000	4.012
L30 21.0000-16.0000	18.4917	0.887	7	19.599	A	0.000	19.599	19.599	100.00	0.000	0.000
					B	0.000	19.599		100.00	0.000	0.000
					C	0.000	19.599		100.00	0.000	4.012
L31 16.0000-11.0000	13.4918	0.85	6	19.991	A	0.000	19.991	19.991	100.00	0.000	0.000
					B	0.000	19.991		100.00	0.000	0.000
					C	0.000	19.991		100.00	0.000	4.012
L32 11.0000-6.0000	8.4920	0.85	6	20.383	A	0.000	20.383	20.383	100.00	0.000	0.000
					B	0.000	20.383		100.00	0.000	0.000
					C	0.000	20.383		100.00	0.000	4.012
L33 6.0000-4.7500	5.3745	0.85	6	5.157	A	0.000	5.157	5.157	100.00	0.000	0.000
					B	0.000	5.157		100.00	0.000	0.000
					C	0.000	5.157		100.00	0.000	1.003
L34 4.7500-4.5000	4.6250	0.85	6	1.034	A	0.000	1.034	1.034	100.00	0.000	0.000
					B	0.000	1.034		100.00	0.000	0.000
					C	0.000	1.034		100.00	0.000	0.201
L35 4.5000-0.0000	2.2437	0.85	6	18.783	A	0.000	18.783	18.783	100.00	0.000	0.000
					B	0.000	18.783		100.00	0.000	0.000
					C	0.000	18.783		100.00	0.000	3.610

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
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

Comb. No.	Description
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 K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	145 - 140	Pole	Max Tension	8	0.00	0.00	-0.00
			Max. Compression	26	-0.62	-0.00	0.00
			Max. Mx	20	-0.25	1.07	0.00
			Max. My	2	-0.25	0.00	1.08
			Max. Vy	20	-0.43	1.07	0.00
			Max. Vx	2	-0.43	0.00	1.08
			Max. Torque	3			-0.00
L2	140 - 135	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-1.65	-0.86	0.50
			Max. Mx	8	-0.59	-6.85	-0.24
			Max. My	2	-0.58	0.71	7.12
			Max. Vy	20	-1.53	6.68	0.81
			Max. Vx	14	1.60	-0.75	-7.09
			Max. Torque	22			-0.92
L3	135 - 130	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-6.95	-1.08	0.70
			Max. Mx	20	-2.74	25.24	1.87
			Max. My	14	-2.73	-1.61	-26.06
			Max. Vy	20	-4.72	25.24	1.87
			Max. Vx	14	4.80	-1.61	-26.06
			Max. Torque	22			-1.02
L4	130 - 125	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-7.75	-1.09	0.70
			Max. Mx	20	-3.15	50.03	2.84
			Max. My	14	-3.14	-2.38	-51.26
			Max. Vy	20	-5.20	50.03	2.84
			Max. Vx	14	5.28	-2.38	-51.26
			Max. Torque	22			-1.02
L5	125 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-16.43	-1.09	0.71
			Max. Mx	20	-6.48	93.55	3.83
			Max. My	14	-6.47	-3.15	-95.20
			Max. Vy	20	-10.43	93.55	3.83
			Max. Vx	14	10.51	-3.15	-95.20
			Max. Torque	22			-1.02
L6	120 - 115	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-17.30	-1.09	0.71
			Max. Mx	20	-6.95	146.92	4.83
			Max. My	14	-6.94	-3.93	-148.99
			Max. Vy	20	-10.93	146.92	4.83
			Max. Vx	14	11.01	-3.93	-148.99

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	22			-1.02
L7	115 - 110	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.54	-1.99	1.02
			Max. Mx	20	-10.61	230.88	6.11
			Max. My	14	-10.59	-5.14	-233.92
			Max. Vy	20	-17.60	230.88	6.11
			Max. Vx	14	17.76	-5.14	-233.92
			Max. Torque	14			1.36
L8	110 - 105	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.56	-1.93	1.00
			Max. Mx	20	-11.19	320.29	7.40
			Max. My	14	-11.16	-6.20	-324.12
			Max. Vy	20	-18.16	320.29	7.40
			Max. Vx	14	18.32	-6.20	-324.12
			Max. Torque	14			1.33
L9	105 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.99	-1.86	3.19
			Max. Mx	20	-15.82	443.77	9.21
			Max. My	14	-15.80	-7.28	-447.83
			Max. Vy	20	-24.98	443.77	9.21
			Max. Vx	14	25.15	-7.28	-447.83
			Max. Torque	22			-1.92
L10	100 - 95	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.29	-1.79	3.16
			Max. Mx	20	-16.71	570.08	10.52
			Max. My	14	-16.68	-8.35	-574.94
			Max. Vy	20	-25.55	570.08	10.52
			Max. Vx	14	25.71	-8.35	-574.94
			Max. Torque	22			-1.87
L11	95 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.35	-1.39	2.92
			Max. Mx	20	-20.77	723.71	11.81
			Max. My	14	-20.74	-9.40	-729.35
			Max. Vy	20	-31.37	723.71	11.81
			Max. Vx	14	31.53	-9.40	-729.35
			Max. Torque	22			-1.81
L12	90 - 84.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.61	-1.32	2.88
			Max. Mx	20	-20.93	747.28	12.00
			Max. My	14	-20.90	-9.55	-753.04
			Max. Vy	20	-31.46	747.28	12.00
			Max. Vx	14	31.63	-9.55	-753.04
			Max. Torque	20			-1.68
L13	84.75 - 84.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-56.21	-0.79	2.59
			Max. Mx	20	-22.81	908.39	13.30
			Max. My	14	-22.79	-10.59	-914.93
			Max. Vy	20	-32.90	908.39	13.30
			Max. Vx	14	33.06	-10.59	-914.93
			Max. Torque	20			-1.57
L14	84.25 - 79.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.37	-0.27	2.30
			Max. Mx	20	-24.18	1074.60	14.58
			Max. My	14	-24.15	-11.63	-1081.93
			Max. Vy	20	-33.71	1074.60	14.58
			Max. Vx	14	33.87	-11.63	-1081.93
			Max. Torque	20			-1.56
L15	79.25 - 74.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-60.46	0.35	1.95
			Max. Mx	20	-25.52	1244.94	15.86
			Max. My	14	-25.50	-12.66	-1253.06
			Max. Vy	20	-34.42	1244.94	15.86
			Max. Vx	14	34.58	-12.66	-1253.06
			Max. Torque	20			-1.46
L16	74.25 - 69.25	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-62.44	0.92	1.62
			Max. Mx	20	-26.82	1418.57	17.14
			Max. My	14	-26.80	-13.68	-1427.46
			Max. Vy	20	-35.03	1418.57	17.14
			Max. Vx	14	35.19	-13.68	-1427.46
			Max. Torque	20			-1.33
L17	69.25 - 64.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.44	1.48	1.29
			Max. Mx	20	-28.16	1595.18	18.40
			Max. My	14	-28.15	-14.69	-1604.86
			Max. Vy	20	-35.62	1595.18	18.40
			Max. Vx	14	35.78	-14.69	-1604.86
			Max. Torque	20			-1.22
L18	64.25 - 59.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.47	2.06	0.95
			Max. Mx	20	-29.54	1774.73	19.66
			Max. My	14	-29.52	-15.70	-1785.18
			Max. Vy	20	-36.21	1774.73	19.66
			Max. Vx	14	36.37	-15.70	-1785.18
			Max. Torque	20			-1.11
L19	59.25 - 58.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-66.95	2.19	0.87
			Max. Mx	20	-29.86	1817.17	19.96
			Max. My	14	-29.84	-15.94	-1827.80
			Max. Vy	20	-36.35	1817.17	19.96
			Max. Vx	14	36.51	-15.94	-1827.80
			Max. Torque	20			-1.00
L20	58.08 - 57.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67.07	2.23	0.86
			Max. Mx	20	-29.97	1826.26	20.02
			Max. My	14	-29.95	-15.99	-1836.93
			Max. Vy	20	-36.38	1826.26	20.02
			Max. Vx	14	36.54	-15.99	-1836.93
			Max. Torque	20			-0.96
L21	57.83 - 52.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-69.48	2.81	0.51
			Max. Mx	20	-31.68	2009.74	21.27
			Max. My	14	-31.66	-16.99	-2021.18
			Max. Vy	20	-37.02	2009.74	21.27
			Max. Vx	14	37.18	-16.99	-2021.18
			Max. Torque	20			-0.96
L22	52.83 - 44.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-71.10	3.20	0.27
			Max. Mx	20	-32.84	2133.71	22.10
			Max. My	14	-32.83	-17.65	-2145.66
			Max. Vy	20	-37.44	2133.71	22.10
			Max. Vx	14	37.60	-17.65	-2145.66
			Max. Torque	3			0.91
L23	44.25 - 43.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-76.11	3.94	-0.16
			Max. Mx	20	-36.43	2370.59	23.65
			Max. My	14	-36.41	-18.90	-2383.50
			Max. Vy	20	-38.35	2370.59	23.65
			Max. Vx	14	38.51	-18.90	-2383.50
			Max. Torque	3			1.22
L24	43.25 - 38.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-78.73	4.53	-0.52
			Max. Mx	20	-38.38	2563.79	24.89
			Max. My	14	-38.37	-19.89	-2577.47
			Max. Vy	20	-38.94	2563.79	24.89
			Max. Vx	14	39.10	-19.89	-2577.47

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	3			1.46
L25	38.25 - 33.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-81.37	5.13	-0.87
			Max. Mx	20	-40.36	2759.91	26.12
			Max. My	14	-40.35	-20.87	-2774.35
			Max. Vy	20	-39.51	2759.91	26.12
			Max. Vx	14	39.67	-20.87	-2774.35
			Max. Torque	3			1.70
L26	33.25 - 31.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.43	5.37	-1.01
			Max. Mx	20	-41.16	2839.15	26.61
			Max. My	14	-41.15	-21.26	-2853.89
			Max. Vy	20	-39.74	2839.15	26.61
			Max. Vx	14	39.89	-21.26	-2853.89
			Max. Torque	3			1.80
L27	31.25 - 31	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-82.58	5.40	-1.02
			Max. Mx	20	-41.28	2849.09	26.67
			Max. My	14	-41.27	-21.31	-2863.87
			Max. Vy	20	-39.77	2849.09	26.67
			Max. Vx	14	39.92	-21.31	-2863.87
			Max. Torque	3			1.82
L28	31 - 26	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-85.52	6.00	-1.38
			Max. Mx	20	-43.55	3049.29	27.89
			Max. My	14	-43.55	-22.28	-3064.83
			Max. Vy	20	-40.32	3049.29	27.89
			Max. Vx	14	40.48	-22.28	-3064.83
			Max. Torque	3			2.06
L29	26 - 21	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-88.48	6.60	-1.74
			Max. Mx	20	-45.87	3252.21	29.11
			Max. My	14	-45.86	-23.25	-3268.50
			Max. Vy	20	-40.85	3252.21	29.11
			Max. Vx	14	41.01	-23.25	-3268.50
			Max. Torque	3			2.31
L30	21 - 16	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.45	7.19	-2.09
			Max. Mx	20	-48.21	3457.64	30.31
			Max. My	14	-48.21	-24.21	-3474.68
			Max. Vy	20	-41.33	3457.64	30.31
			Max. Vx	14	41.49	-24.21	-3474.68
			Max. Torque	25			2.56
L31	16 - 11	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-94.42	7.77	-2.43
			Max. Mx	20	-50.58	3665.39	31.51
			Max. My	14	-50.58	-25.16	-3683.17
			Max. Vy	20	-41.78	3665.39	31.51
			Max. Vx	14	41.93	-25.16	-3683.17
			Max. Torque	25			2.83
L32	11 - 6	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-97.39	8.33	-2.77
			Max. Mx	20	-52.98	3875.35	32.69
			Max. My	14	-52.98	-26.11	-3893.87
			Max. Vy	20	-42.21	3875.35	32.69
			Max. Vx	14	42.37	-26.11	-3893.87
			Max. Torque	25			3.10
L33	6 - 4.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-98.12	8.47	-2.85
			Max. Mx	20	-53.58	3928.17	32.99
			Max. My	14	-53.58	-26.34	-3946.88
			Max. Vy	20	-42.33	3928.17	32.99
			Max. Vx	14	42.48	-26.34	-3946.88
			Max. Torque	25			3.17
L34	4.75 - 4.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-98.27	8.50	-2.86
			Max. Mx	20	-53.72	3938.76	33.05

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	14	-53.71	-26.39	-3957.50
			Max. Vy	20	-42.33	3938.76	33.05
			Max. Vx	14	42.48	-26.39	-3957.50
			Max. Torque	25			3.18
L35	4.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-100.82	8.94	-3.12
			Max. Mx	20	-55.82	4130.19	34.11
			Max. My	14	-55.82	-27.23	-4149.59
			Max. Vy	20	-42.75	4130.19	34.11
			Max. Vx	14	42.90	-27.23	-4149.59
			Max. Torque	25			3.43

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	100.82	-0.00	-0.00
	Max. H_x	21	41.88	42.72	0.24
	Max. H_z	2	55.84	0.29	42.81
	Max. M_x	2	4139.83	0.29	42.81
	Max. M_z	8	4115.24	-42.63	-0.14
	Max. Torsion	25	3.43	21.49	37.18
	Min. Vert	15	41.88	-0.20	-42.88
	Min. H_x	9	41.88	-42.63	-0.14
	Min. H_z	14	55.84	-0.20	-42.88
	Min. M_x	14	-4149.59	-0.20	-42.88
	Min. M_z	20	-4130.19	42.72	0.24
	Min. Torsion	13	-3.42	-21.44	-37.20

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	46.54	-0.00	-0.00	0.03	0.75	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	55.84	-0.29	-42.81	-4139.83	41.44	-3.28
0.9 Dead+1.0 Wind 0 deg - No Ice	41.88	-0.29	-42.81	-4100.12	40.74	-3.29
1.2 Dead+1.0 Wind 30 deg - No Ice	55.84	21.20	-37.00	-3575.32	-2041.10	-1.81
0.9 Dead+1.0 Wind 30 deg - No Ice	41.88	21.20	-37.00	-3541.07	-2021.81	-1.81
1.2 Dead+1.0 Wind 60 deg - No Ice	55.84	36.87	-21.29	-2054.74	-3557.11	-0.65
0.9 Dead+1.0 Wind 60 deg - No Ice	41.88	36.87	-21.29	-2035.07	-3523.29	-0.64
1.2 Dead+1.0 Wind 90 deg - No Ice	55.84	42.63	0.14	18.78	-4115.24	0.68
0.9 Dead+1.0 Wind 90 deg - No Ice	41.88	42.63	0.14	18.57	-4076.19	0.70
1.2 Dead+1.0 Wind 120 deg - No Ice	55.84	36.92	21.65	2105.07	-3563.19	2.62
0.9 Dead+1.0 Wind 120 deg - No Ice	41.88	36.92	21.65	2084.83	-3529.31	2.64
1.2 Dead+1.0 Wind 150 deg - No Ice	55.84	21.44	37.20	3603.40	-2074.41	3.41
0.9 Dead+1.0 Wind 150 deg - No Ice	41.88	21.44	37.20	3568.85	-2054.74	3.42
1.2 Dead+1.0 Wind 180 deg - No Ice	55.84	0.20	42.88	4149.59	-27.23	3.03
0.9 Dead+1.0 Wind 180 deg - No Ice	41.88	0.20	42.88	4109.73	-27.13	3.04

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
1.2 Dead+1.0 Wind 210 deg - No Ice	55.84	-21.15	37.13	3594.20	2036.09	1.79
0.9 Dead+1.0 Wind 210 deg - No Ice	41.88	-21.15	37.13	3559.74	2016.42	1.79
1.2 Dead+1.0 Wind 240 deg - No Ice	55.84	-36.90	21.31	2057.68	3563.99	0.66
0.9 Dead+1.0 Wind 240 deg - No Ice	41.88	-36.90	21.31	2037.99	3529.65	0.65
1.2 Dead+1.0 Wind 270 deg - No Ice	55.84	-42.72	-0.24	-34.11	4130.19	-0.65
0.9 Dead+1.0 Wind 270 deg - No Ice	41.88	-42.72	-0.24	-33.71	4090.46	-0.67
1.2 Dead+1.0 Wind 300 deg - No Ice	55.84	-37.02	-21.61	-2099.24	3579.73	-2.38
0.9 Dead+1.0 Wind 300 deg - No Ice	41.88	-37.02	-21.61	-2079.07	3545.21	-2.40
1.2 Dead+1.0 Wind 330 deg - No Ice	55.84	-21.49	-37.18	-3599.42	2083.09	-3.41
0.9 Dead+1.0 Wind 330 deg - No Ice	41.88	-21.49	-37.18	-3564.90	2062.89	-3.43
1.2 Dead+1.0 Ice+1.0 Temp	100.82	0.00	0.00	3.12	8.94	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	100.82	-0.06	-12.70	-1266.93	18.12	-1.63
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	100.82	6.30	-10.98	-1094.58	-619.35	-1.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	100.82	10.95	-6.32	-628.57	-1084.30	-0.26
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	100.82	12.66	0.03	7.18	-1255.33	0.55
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	100.82	10.96	6.40	645.54	-1085.81	1.37
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	100.82	6.36	11.02	1106.77	-626.71	1.74
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	100.82	0.04	12.71	1275.07	3.35	1.58
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	100.82	-6.30	11.01	1104.60	636.82	1.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	100.82	-10.96	6.33	635.25	1104.25	0.26
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	100.82	-12.68	-0.05	-4.30	1276.92	-0.55
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	100.82	-10.98	-6.39	-638.26	1107.78	-1.32
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	100.82	-6.37	-11.02	-1099.86	647.03	-1.74
Dead+Wind 0 deg - Service	46.54	-0.06	-8.82	-848.95	9.06	-0.68
Dead+Wind 30 deg - Service	46.54	4.37	-7.63	-733.16	-417.99	-0.37
Dead+Wind 60 deg - Service	46.54	7.60	-4.39	-421.38	-728.92	-0.13
Dead+Wind 90 deg - Service	46.54	8.79	0.03	3.86	-843.39	0.14
Dead+Wind 120 deg - Service	46.54	7.61	4.46	431.72	-730.19	0.54
Dead+Wind 150 deg - Service	46.54	4.42	7.67	739.02	-424.86	0.71
Dead+Wind 180 deg - Service	46.54	0.04	8.84	851.00	-5.01	0.63
Dead+Wind 210 deg - Service	46.54	-4.36	7.65	737.12	418.15	0.37
Dead+Wind 240 deg - Service	46.54	-7.61	4.39	421.97	731.42	0.14
Dead+Wind 270 deg - Service	46.54	-8.81	-0.05	-6.98	847.57	-0.14
Dead+Wind 300 deg - Service	46.54	-7.63	-4.46	-430.51	734.73	-0.49
Dead+Wind 330 deg - Service	46.54	-4.43	-7.66	-738.19	427.79	-0.71

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-46.54	0.00	0.00	46.54	0.00	0.000%
2	-0.29	-55.84	-42.81	0.29	55.84	42.81	0.001%
3	-0.29	-41.88	-42.81	0.29	41.88	42.81	0.002%
4	21.20	-55.84	-37.00	-21.20	55.84	37.00	0.000%
5	21.20	-41.88	-37.00	-21.20	41.88	37.00	0.000%
6	36.87	-55.84	-21.29	-36.87	55.84	21.29	0.000%
7	36.87	-41.88	-21.29	-36.87	41.88	21.29	0.000%
8	42.64	-55.84	0.14	-42.63	55.84	-0.14	0.005%
9	42.64	-41.88	0.14	-42.63	41.88	-0.14	0.004%
10	36.92	-55.84	21.65	-36.92	55.84	-21.65	0.000%
11	36.92	-41.88	21.65	-36.92	41.88	-21.65	0.000%
12	21.44	-55.84	37.20	-21.44	55.84	-37.20	0.000%
13	21.44	-41.88	37.20	-21.44	41.88	-37.20	0.000%
14	0.20	-55.84	42.88	-0.20	55.84	-42.88	0.002%
15	0.20	-41.88	42.88	-0.20	41.88	-42.88	0.004%
16	-21.15	-55.84	37.13	21.15	55.84	-37.13	0.000%
17	-21.15	-41.88	37.13	21.15	41.88	-37.13	0.000%
18	-36.90	-55.84	21.31	36.90	55.84	-21.31	0.000%
19	-36.90	-41.88	21.31	36.90	41.88	-21.31	0.000%
20	-42.72	-55.84	-0.24	42.72	55.84	0.24	0.002%
21	-42.72	-41.88	-0.24	42.72	41.88	0.24	0.002%
22	-37.02	-55.84	-21.61	37.02	55.84	21.61	0.000%
23	-37.02	-41.88	-21.61	37.02	41.88	21.61	0.000%
24	-21.49	-55.84	-37.18	21.49	55.84	37.18	0.000%
25	-21.49	-41.88	-37.18	21.49	41.88	37.18	0.000%
26	0.00	-100.82	0.00	-0.00	100.82	-0.00	0.002%
27	-0.06	-100.82	-12.70	0.06	100.82	12.70	0.000%
28	6.30	-100.82	-10.98	-6.30	100.82	10.98	0.000%
29	10.95	-100.82	-6.32	-10.95	100.82	6.32	0.000%
30	12.66	-100.82	0.03	-12.66	100.82	-0.03	0.000%
31	10.96	-100.82	6.40	-10.96	100.82	-6.40	0.000%
32	6.36	-100.82	11.02	-6.36	100.82	-11.02	0.000%
33	0.04	-100.82	12.71	-0.04	100.82	-12.71	0.000%
34	-6.30	-100.82	11.01	6.30	100.82	-11.01	0.000%
35	-10.96	-100.82	6.33	10.96	100.82	-6.33	0.000%
36	-12.68	-100.82	-0.05	12.68	100.82	0.05	0.000%
37	-10.98	-100.82	-6.39	10.98	100.82	6.39	0.000%
38	-6.37	-100.82	-11.02	6.37	100.82	11.02	0.000%
39	-0.06	-46.54	-8.83	0.06	46.54	8.82	0.002%
40	4.37	-46.54	-7.63	-4.37	46.54	7.63	0.002%
41	7.60	-46.54	-4.39	-7.60	46.54	4.39	0.001%
42	8.79	-46.54	0.03	-8.79	46.54	-0.03	0.002%
43	7.61	-46.54	4.46	-7.61	46.54	-4.46	0.001%
44	4.42	-46.54	7.67	-4.42	46.54	-7.67	0.001%
45	0.04	-46.54	8.84	-0.04	46.54	-8.84	0.002%
46	-4.36	-46.54	7.65	4.36	46.54	-7.65	0.001%
47	-7.61	-46.54	4.39	7.61	46.54	-4.39	0.002%
48	-8.81	-46.54	-0.05	8.81	46.54	0.05	0.002%
49	-7.63	-46.54	-4.46	7.63	46.54	4.46	0.001%
50	-4.43	-46.54	-7.66	4.43	46.54	7.66	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	18	0.00000001	0.00008047
3	Yes	17	0.00000001	0.00012385
4	Yes	22	0.00000001	0.00007101
5	Yes	21	0.00000001	0.00010884
6	Yes	22	0.00000001	0.00007194
7	Yes	21	0.00000001	0.00011033
8	Yes	16	0.00005591	0.00012594
9	Yes	16	0.00003795	0.00008645
10	Yes	22	0.00000001	0.00007400
11	Yes	21	0.00000001	0.00011342
12	Yes	22	0.00000001	0.00007310
13	Yes	21	0.00000001	0.00011189
14	Yes	17	0.00002679	0.00008602
15	Yes	16	0.00003790	0.00012449
16	Yes	22	0.00000001	0.00007209
17	Yes	21	0.00000001	0.00011052
18	Yes	22	0.00000001	0.00007107
19	Yes	21	0.00000001	0.00010896
20	Yes	17	0.00002681	0.00012853
21	Yes	17	0.00000001	0.00009517
22	Yes	22	0.00000001	0.00007399
23	Yes	21	0.00000001	0.00011328
24	Yes	22	0.00000001	0.00007469
25	Yes	21	0.00000001	0.00011443
26	Yes	6	0.00000001	0.00008123
27	Yes	20	0.00000001	0.00009980
28	Yes	20	0.00000001	0.00011714
29	Yes	20	0.00000001	0.00011743
30	Yes	20	0.00000001	0.00009859
31	Yes	20	0.00000001	0.00011870
32	Yes	20	0.00000001	0.00011824
33	Yes	20	0.00000001	0.00009963
34	Yes	20	0.00000001	0.00011880
35	Yes	20	0.00000001	0.00011808
36	Yes	20	0.00000001	0.00009968
37	Yes	20	0.00000001	0.00011964
38	Yes	20	0.00000001	0.00012054
39	Yes	15	0.00009505	0.00005320
40	Yes	15	0.00009494	0.00014736
41	Yes	16	0.00000001	0.00008062
42	Yes	15	0.00009504	0.00004919
43	Yes	16	0.00000001	0.00008235
44	Yes	16	0.00000001	0.00007918
45	Yes	15	0.00009504	0.00005102
46	Yes	16	0.00000001	0.00008034
47	Yes	15	0.00009493	0.00014615
48	Yes	15	0.00009504	0.00005040
49	Yes	16	0.00000001	0.00008163
50	Yes	16	0.00000001	0.00008467

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 140	20.82	50	1.130	0.002
L2	140 - 135	19.64	50	1.129	0.002
L3	135 - 130	18.46	50	1.129	0.002
L4	130 - 125	17.27	50	1.125	0.002
L5	125 - 120	16.10	50	1.120	0.002
L6	120 - 115	14.93	50	1.110	0.002
L7	115 - 110	13.78	50	1.095	0.001
L8	110 - 105	12.64	50	1.074	0.001
L9	105 - 100	11.53	50	1.046	0.001
L10	100 - 95	10.45	50	1.011	0.001
L11	95 - 90	9.42	50	0.968	0.001
L12	90 - 84.75	8.43	50	0.917	0.001

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L13	89.25 - 84.25	8.28	50	0.909	0.001
L14	84.25 - 79.25	7.35	50	0.880	0.000
L15	79.25 - 74.25	6.45	50	0.826	0.000
L16	74.25 - 69.25	5.62	50	0.767	0.000
L17	69.25 - 64.25	4.85	50	0.705	0.000
L18	64.25 - 59.25	4.14	50	0.639	0.000
L19	59.25 - 58.08	3.51	50	0.571	0.000
L20	58.08 - 57.83	3.37	50	0.555	0.000
L21	57.83 - 52.83	3.34	50	0.552	0.000
L22	52.83 - 44.25	2.79	50	0.499	0.000
L23	49.5 - 43.25	2.46	50	0.462	0.000
L24	43.25 - 38.25	1.87	50	0.424	0.000
L25	38.25 - 33.25	1.46	50	0.372	0.000
L26	33.25 - 31.25	1.10	50	0.319	0.000
L27	31.25 - 31	0.97	50	0.298	0.000
L28	31 - 26	0.95	50	0.295	0.000
L29	26 - 21	0.67	50	0.248	0.000
L30	21 - 16	0.43	50	0.200	0.000
L31	16 - 11	0.25	50	0.151	0.000
L32	11 - 6	0.12	50	0.103	0.000
L33	6 - 4.75	0.03	50	0.054	0.000
L34	4.75 - 4.5	0.02	50	0.042	0.000
L35	4.5 - 0	0.02	50	0.040	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.0000	VHLP2.5-11	50	19.40	1.129	0.002	434599
133.0000	LLPX310R-V1 w/ Mount Pipe	50	17.98	1.128	0.002	97574
124.0000	APXVSPP18-C-A20 w/ Mount Pipe	50	15.87	1.118	0.002	34567
122.0000	800MHz 2X50W RRH W/FILTER	50	15.40	1.114	0.002	28253
114.0000	BXA-80063/4CFx5 w/ Mount Pipe	50	13.55	1.092	0.001	15135
105.0000	7770.00 w/ Mount Pipe	50	11.53	1.046	0.001	9076
94.0000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	50	9.21	0.958	0.001	5962
87.0000	742 213	50	7.86	0.894	0.000	7911
80.0000	Side Arm Mount [SO 701-1]	50	6.58	0.835	0.000	5189
77.0000	Side Arm Mount [SO 701-1]	50	6.07	0.799	0.000	4847

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	145 - 140	101.40	24	5.511	0.010
L2	140 - 135	95.64	24	5.511	0.010
L3	135 - 130	89.89	24	5.506	0.009
L4	130 - 125	84.15	24	5.490	0.008
L5	125 - 120	78.42	24	5.462	0.007
L6	120 - 115	72.74	24	5.415	0.006
L7	115 - 110	67.12	24	5.343	0.006
L8	110 - 105	61.59	24	5.241	0.005
L9	105 - 100	56.18	24	5.105	0.005
L10	100 - 95	50.94	24	4.932	0.004
L11	95 - 90	45.89	24	4.722	0.003
L12	90 - 84.75	41.08	24	4.476	0.002
L13	89.25 - 84.25	40.38	24	4.436	0.002
L14	84.25 - 79.25	35.81	24	4.295	0.002
L15	79.25 - 74.25	31.46	24	4.029	0.002
L16	74.25 - 69.25	27.39	24	3.743	0.002
L17	69.25 - 64.25	23.63	24	3.438	0.002

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L18	64.25 - 59.25	20.20	24	3.118	0.002
L19	59.25 - 58.08	17.11	24	2.785	0.002
L20	58.08 - 57.83	16.44	24	2.706	0.002
L21	57.83 - 52.83	16.30	24	2.693	0.002
L22	52.83 - 44.25	13.62	24	2.433	0.002
L23	49.5 - 43.25	11.98	24	2.254	0.002
L24	43.25 - 38.25	9.14	24	2.066	0.002
L25	38.25 - 33.25	7.11	24	1.812	0.002
L26	33.25 - 31.25	5.35	24	1.556	0.001
L27	31.25 - 31	4.72	24	1.452	0.001
L28	31 - 26	4.64	24	1.441	0.001
L29	26 - 21	3.25	24	1.211	0.001
L30	21 - 16	2.11	24	0.975	0.001
L31	16 - 11	1.21	24	0.738	0.001
L32	11 - 6	0.56	24	0.502	0.001
L33	6 - 4.75	0.16	24	0.263	0.000
L34	4.75 - 4.5	0.10	24	0.204	0.000
L35	4.5 - 0	0.09	24	0.194	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
139.0000	VHLP2.5-11	24	94.49	5.510	0.012	104705
133.0000	LLPX310R-V1 w/ Mount Pipe	24	87.59	5.501	0.010	20634
124.0000	APXVSPP18-C-A20 w/ Mount Pipe	24	77.28	5.455	0.009	7230
122.0000	800MHz 2X50W RRH W/FILTER	24	75.01	5.437	0.008	5907
114.0000	BXA-80063/4CFx5 w/ Mount Pipe	24	66.01	5.325	0.007	3161
105.0000	7770.00 w/ Mount Pipe	24	56.18	5.105	0.006	1895
94.0000	ERICSSON AIR 21 B4A B2P w/ Mount Pipe	24	44.91	4.676	0.003	1242
87.0000	742 213	24	38.30	4.362	0.002	1644
80.0000	Side Arm Mount [SO 701-1]	24	32.09	4.075	0.002	1076
77.0000	Side Arm Mount [SO 701-1]	24	29.59	3.899	0.002	1004

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L1	145 - 140 (1)	TP24.9233x24x0.1875	5.0000	0.0000	0.0	14.7209	-0.25
L2	140 - 135 (2)	TP25.8467x24.9233x0.1875	5.0000	0.0000	0.0	15.2704	-0.57
L3	135 - 130 (3)	TP26.77x25.8467x0.1875	5.0000	0.0000	0.0	15.8199	-2.73
L4	130 - 125 (4)	TP27.7092x26.77x0.25	5.0000	0.0000	0.0	21.7889	-3.14
L5	125 - 120 (5)	TP28.6485x27.7092x0.25	5.0000	0.0000	0.0	22.5342	-6.46
L6	120 - 115 (6)	TP29.5877x28.6485x0.25	5.0000	0.0000	0.0	23.2794	-6.93
L7	115 - 110 (7)	TP30.5269x29.5877x0.25	5.0000	0.0000	0.0	24.0247	-10.58
L8	110 - 105 (8)	TP31.4661x30.5269x0.25	5.0000	0.0000	0.0	24.7700	-11.15
L9	105 - 100 (9)	TP32.4054x31.4661x0.25	5.0000	0.0000	0.0	25.5153	-15.78

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L10	100 - 95 (10)	TP33.3446x32.4054x0.25	5.0000	0.0000	0.0	26.2606	-16.67
L11	95 - 90 (11)	TP34.2838x33.3446x0.25	5.0000	0.0000	0.0	27.0058	-20.73
L12	90 - 84.75 (12)	TP35.27x34.2838x0.25	5.2500	0.0000	0.0	27.1176	-20.89
L13	84.75 - 84.25 (13)	TP34.8508x33.9247x0.3125	5.0000	0.0000	0.0	34.2577	-22.77
L14	84.25 - 79.25 (14)	TP35.777x34.8508x0.3125	5.0000	0.0000	0.0	35.1763	-24.14
L15	79.25 - 74.25 (15)	TP36.7031x35.777x0.3125	5.0000	0.0000	0.0	36.0950	-25.49
L16	74.25 - 69.25 (16)	TP37.6293x36.7031x0.3125	5.0000	0.0000	0.0	37.0136	-26.79
L17	69.25 - 64.25 (17)	TP38.5554x37.6293x0.3125	5.0000	0.0000	0.0	37.9322	-28.14
L18	64.25 - 59.25 (18)	TP39.4816x38.5554x0.3125	5.0000	0.0000	0.0	38.8508	-29.51
L19	59.25 - 58.08 (19)	TP39.6983x39.4816x0.3125	1.1700	0.0000	0.0	39.0658	-29.84
L20	58.08 - 57.83 (20)	TP39.7446x39.6983x0.4125	0.2500	0.0000	0.0	51.4965	-29.94
L21	57.83 - 52.83 (21)	TP40.6707x39.7446x0.4188	5.0000	0.0000	0.0	53.4994	-31.66
L22	52.83 - 44.25 (22)	TP42.26x40.6707x0.4125	8.5800	0.0000	0.0	53.5167	-32.82
L23	44.25 - 43.25 (23)	TP41.82x40.6625x0.475	6.2500	0.0000	0.0	62.3338	-36.41
L24	43.25 - 38.25 (24)	TP42.746x41.82x0.475	5.0000	0.0000	0.0	63.7299	-38.36
L25	38.25 - 33.25 (25)	TP43.672x42.746x0.475	5.0000	0.0000	0.0	65.1260	-40.34
L26	33.25 - 31.25 (26)	TP44.0424x43.672x0.475	2.0000	0.0000	0.0	65.6844	-41.14
L27	31.25 - 31 (27)	TP44.0887x44.0424x0.5375	0.2500	0.0000	0.0	74.2995	-41.27
L28	31 - 26 (28)	TP45.0147x44.0887x0.5375	5.0000	0.0000	0.0	75.8793	-43.54
L29	26 - 21 (29)	TP45.9408x45.0147x0.525	5.0000	0.0000	0.0	75.6786	-45.86
L30	21 - 16 (30)	TP46.8668x45.9408x0.525	5.0000	0.0000	0.0	77.2216	-48.20
L31	16 - 11 (31)	TP47.7928x46.8668x0.525	5.0000	0.0000	0.0	78.7647	-50.58
L32	11 - 6 (32)	TP48.7188x47.7928x0.5188	5.0000	0.0000	0.0	79.3620	-52.98
L33	6 - 4.75 (33)	TP48.9503x48.7188x0.5188	1.2500	0.0000	0.0	79.7431	-53.58
L34	4.75 - 4.5 (34)	TP48.9966x48.9503x0.5875	0.2500	0.0000	0.0	90.2696	-53.71
L35	4.5 - 0 (35)	TP49.83x48.9966x0.575	4.5000	0.0000	0.0	89.8928	-55.82

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	M_{uy} kip-ft
L1	145 - 140 (1)	TP24.9233x24x0.1875	1.08	0.00
L2	140 - 135 (2)	TP25.8467x24.9233x0.1875	7.37	0.00
L3	135 - 130 (3)	TP26.77x25.8467x0.1875	26.61	0.00
L4	130 - 125 (4)	TP27.7092x26.77x0.25	51.99	0.00
L5	125 - 120 (5)	TP28.6485x27.7092x0.25	96.12	0.00
L6	120 - 115 (6)	TP29.5877x28.6485x0.25	150.10	0.00
L7	115 - 110 (7)	TP30.5269x29.5877x0.25	235.45	0.00
L8	110 - 105 (8)	TP31.4661x30.5269x0.25	325.98	0.00
L9	105 - 100 (9)	TP32.4054x31.4661x0.25	450.95	0.00
L10	100 - 95 (10)	TP33.3446x32.4054x0.25	578.40	0.00

Section No.	Elevation ft	Size	M_{ux} kip-ft	M_{uy} kip-ft
L11	95 - 90 (11)	TP34.2838x33.3446x0.25	733.14	0.00
L12	90 - 84.75 (12)	TP35.27x34.2838x0.25	756.87	0.00
L13	84.75 - 84.25 (13)	TP34.8508x33.9247x0.3125	919.08	0.00
L14	84.25 - 79.25 (14)	TP35.777x34.8508x0.3125	1086.39	0.00
L15	79.25 - 74.25 (15)	TP36.7031x35.777x0.3125	1257.83	0.00
L16	74.25 - 69.25 (16)	TP37.6293x36.7031x0.3125	1432.54	0.00
L17	69.25 - 64.25 (17)	TP38.5554x37.6293x0.3125	1610.24	0.00
L18	64.25 - 59.25 (18)	TP39.4816x38.5554x0.3125	1790.88	0.00
L19	59.25 - 58.08 (19)	TP39.6983x39.4816x0.3125	1833.56	0.00
L20	58.08 - 57.83 (20)	TP39.7446x39.6983x0.4125	1842.71	0.00
L21	57.83 - 52.83 (21)	TP40.6707x39.7446x0.4188	2027.27	0.00
L22	52.83 - 44.25 (22)	TP42.26x40.6707x0.4125	2151.94	0.00
L23	44.25 - 43.25 (23)	TP41.82x40.6625x0.475	2390.16	0.00
L24	43.25 - 38.25 (24)	TP42.746x41.82x0.475	2584.43	0.00
L25	38.25 - 33.25 (25)	TP43.672x42.746x0.475	2781.60	0.00
L26	33.25 - 31.25 (26)	TP44.0424x43.672x0.475	2861.26	0.00
L27	31.25 - 31 (27)	TP44.0887x44.0424x0.5375	2871.25	0.00
L28	31 - 26 (28)	TP45.0147x44.0887x0.5375	3072.51	0.00
L29	26 - 21 (29)	TP45.9408x45.0147x0.525	3276.47	0.00
L30	21 - 16 (30)	TP46.8668x45.9408x0.525	3482.93	0.00
L31	16 - 11 (31)	TP47.7928x46.8668x0.525	3691.71	0.00
L32	11 - 6 (32)	TP48.7188x47.7928x0.5188	3902.69	0.00
L33	6 - 4.75 (33)	TP48.9503x48.7188x0.5188	3955.77	0.00
L34	4.75 - 4.5 (34)	TP48.9966x48.9503x0.5875	3966.40	0.00
L35	4.5 - 0 (35)	TP49.83x48.9966x0.575	4158.74	0.00

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	Actual T_u kip-ft
L1	145 - 140 (1)	TP24.9233x24x0.1875	0.43	0.00
L2	140 - 135 (2)	TP25.8467x24.9233x0.1875	1.63	0.78
L3	135 - 130 (3)	TP26.77x25.8467x0.1875	4.84	0.87
L4	130 - 125 (4)	TP27.7092x26.77x0.25	5.32	0.87
L5	125 - 120 (5)	TP28.6485x27.7092x0.25	10.55	0.87
L6	120 - 115 (6)	TP29.5877x28.6485x0.25	11.05	0.87
L7	115 - 110 (7)	TP30.5269x29.5877x0.25	17.83	1.22
L8	110 - 105 (8)	TP31.4661x30.5269x0.25	18.39	1.16
L9	105 - 100 (9)	TP32.4054x31.4661x0.25	25.22	1.50
L10	100 - 95 (10)	TP33.3446x32.4054x0.25	25.78	1.43
L11	95 - 90 (11)	TP34.2838x33.3446x0.25	31.60	1.28
L12	90 - 84.75 (12)	TP35.27x34.2838x0.25	31.70	1.24

Section No.	Elevation ft	Size	Actual V_u K	Actual T_u kip-ft
L13	84.75 - 84.25 (13)	TP34.8508x33.9247x0.3125	33.13	1.02
L14	84.25 - 79.25 (14)	TP35.777x34.8508x0.3125	33.94	0.84
L15	79.25 - 74.25 (15)	TP36.7031x35.777x0.3125	34.65	0.59
L16	74.25 - 69.25 (16)	TP37.6293x36.7031x0.3125	35.26	0.37
L17	69.25 - 64.25 (17)	TP38.5554x37.6293x0.3125	35.85	0.16
L18	64.25 - 59.25 (18)	TP39.4816x38.5554x0.3125	36.43	0.12
L19	59.25 - 58.08 (19)	TP39.6983x39.4816x0.3125	36.58	0.19
L20	58.08 - 57.83 (20)	TP39.7446x39.6983x0.4125	36.61	0.20
L21	57.83 - 52.83 (21)	TP40.6707x39.7446x0.4188	37.25	0.48
L22	52.83 - 44.25 (22)	TP42.26x40.6707x0.4125	37.66	0.67
L23	44.25 - 43.25 (23)	TP41.82x40.6625x0.475	38.57	1.02
L24	43.25 - 38.25 (24)	TP42.746x41.82x0.475	39.17	1.30
L25	38.25 - 33.25 (25)	TP43.672x42.746x0.475	39.74	1.58
L26	33.25 - 31.25 (26)	TP44.0424x43.672x0.475	39.96	1.69
L27	31.25 - 31 (27)	TP44.0887x44.0424x0.5375	39.98	1.71
L28	31 - 26 (28)	TP45.0147x44.0887x0.5375	40.55	1.99
L29	26 - 21 (29)	TP45.9408x45.0147x0.525	41.07	2.27
L30	21 - 16 (30)	TP46.8668x45.9408x0.525	41.55	2.54
L31	16 - 11 (31)	TP47.7928x46.8668x0.525	42.00	2.81
L32	11 - 6 (32)	TP48.7188x47.7928x0.5188	42.43	3.08
L33	6 - 4.75 (33)	TP48.9503x48.7188x0.5188	42.55	3.15
L34	4.75 - 4.5 (34)	TP48.9966x48.9503x0.5875	42.55	3.16
L35	4.5 - 0 (35)	TP49.83x48.9966x0.575	42.96	3.41

CCIpole

per TIA-222- H

Site BU: 881364

Work Order:

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	145	15	0	18	24	26.77	0.1875	Auto	A607-65
2	130	45.25	4.5	18	26.77	35.27	0.25	Auto	A607-65
3	89.25	45	5.25	18	33.92	42.26	0.3125	Auto	A607-65
4	49.5	49.5	0	18	40.66	49.83	0.375	Auto	A607-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	4.75	31.25	plate	I-085125; (1) (1.1875)	3			o						o				o					
2	31.25	58.08	plate	I-060100; (1) (1.1875)	3			o						o				o					
3	0	4.75	plate	FP 1.25 x 7.75_1	3		c							c					o				
4																							
5																							
6																							
7																							
8																							
9																							
10																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	8.5	1.25	10.625	0.625	51.000	51.000	17.000	9.063	1.1875	A572-65
2	6	1	6	0.5	30.000	30.000	16.000	4.750	1.1875	A572-65
3	1.25	7.75	9.6875	3.875	n/a	n/a	0.000	9.688	0.0000	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	145 - 140	5		18	24.000	24.923	0.1875	A607-65	1.000
2	140 - 135	5		18	24.923	25.847	0.1875	A607-65	1.000
3	135 - 130	5	0	18	25.847	26.770	0.1875	A607-65	1.000
4	130 - 125	5		18	26.770	27.709	0.25	A607-65	1.000
5	125 - 120	5		18	27.709	28.648	0.25	A607-65	1.000
6	120 - 115	5		18	28.648	29.588	0.25	A607-65	1.000
7	115 - 110	5		18	29.588	30.527	0.25	A607-65	1.000
8	110 - 105	5		18	30.527	31.466	0.25	A607-65	1.000
9	105 - 100	5		18	31.466	32.405	0.25	A607-65	1.000
10	100 - 95	5		18	32.405	33.345	0.25	A607-65	1.000
11	95 - 90	5		18	33.345	34.284	0.25	A607-65	1.000
12	90 - 89.25	5.25	4.5	18	34.284	35.270	0.25	A607-65	1.000
13	89.25 - 84.25	5		18	33.925	34.851	0.3125	A607-65	1.000
14	84.25 - 79.25	5		18	34.851	35.777	0.3125	A607-65	1.000
15	79.25 - 74.25	5		18	35.777	36.703	0.3125	A607-65	1.000
16	74.25 - 69.25	5		18	36.703	37.629	0.3125	A607-65	1.000
17	69.25 - 64.25	5		18	37.629	38.555	0.3125	A607-65	1.000
18	64.25 - 59.25	5		18	38.555	39.482	0.3125	A607-65	1.000
19	59.25 - 58.08	1.17		18	39.482	39.698	0.3125	A607-65	1.000
20	58.08 - 57.83	0.25		18	39.698	39.745	0.4125	A607-65	1.109
21	57.83 - 52.83	5		18	39.745	40.671	0.41875	A607-65	1.085
22	52.83 - 49.5	8.58	5.25	18	40.671	42.260	0.4125	A607-65	1.096
23	49.5 - 43.25	6.25		18	40.663	41.820	0.475	A607-65	1.080
24	43.25 - 38.25	5		18	41.820	42.746	0.475	A607-65	1.074
25	38.25 - 33.25	5		18	42.746	43.672	0.475	A607-65	1.068
26	33.25 - 31.25	2		18	43.672	44.042	0.475	A607-65	1.065
27	31.25 - 31	0.25		18	44.042	44.089	0.5375	A607-65	1.129
28	31 - 26	5		18	44.089	45.015	0.5375	A607-65	1.120
29	26 - 21	5		18	45.015	45.941	0.525	A607-65	1.138
30	21 - 16	5		18	45.941	46.867	0.525	A607-65	1.129
31	16 - 11	5		18	46.867	47.793	0.525	A607-65	1.121
32	11 - 6	5		18	47.793	48.719	0.51875	A607-65	1.127
33	6 - 4.75	1.25		18	48.719	48.950	0.51875	A607-65	1.125
34	4.75 - 4.5	0.25		18	48.950	48.997	0.5875	A607-65	0.963
35	4.5 - 0	4.5		18	48.997	49.830	0.575	A607-65	0.978

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	145 - 140	0.25	1.08	0.43
2	140 - 135	0.57	7.37	1.63
3	135 - 130	2.73	26.61	4.84
4	130 - 125	3.14	51.99	5.32
5	125 - 120	6.46	96.12	10.55
6	120 - 115	6.93	150.10	11.05
7	115 - 110	10.58	235.45	17.83
8	110 - 105	11.15	325.98	18.39
9	105 - 100	15.78	450.95	25.22
10	100 - 95	16.67	578.40	25.78
11	95 - 90	20.73	733.14	31.60
12	90 - 89.25	20.89	756.86	31.70
13	89.25 - 84.25	22.77	919.08	33.13
14	84.25 - 79.25	24.14	1086.39	33.94
15	79.25 - 74.25	25.49	1257.83	34.65
16	74.25 - 69.25	26.79	1432.54	35.26
17	69.25 - 64.25	28.14	1610.24	35.85
18	64.25 - 59.25	29.51	1790.87	36.43
19	59.25 - 58.08	29.84	1833.56	36.58
20	58.08 - 57.83	29.94	1842.70	36.61
21	57.83 - 52.83	31.66	2027.26	37.25
22	52.83 - 49.5	32.82	2151.94	37.66
23	49.5 - 43.25	36.41	2390.16	38.57
24	43.25 - 38.25	38.36	2584.43	39.17
25	38.25 - 33.25	40.34	2781.60	39.74
26	33.25 - 31.25	41.14	2861.26	39.96
27	31.25 - 31	41.27	2871.25	39.98
28	31 - 26	43.54	3072.51	40.55
29	26 - 21	45.86	3276.47	41.07
30	21 - 16	48.20	3482.93	41.55
31	16 - 11	50.58	3691.71	42.00
32	11 - 6	52.98	3902.69	42.43
33	6 - 4.75	53.58	3955.77	42.55
34	4.75 - 4.5	53.71	3966.40	42.55
35	4.5 - 0	55.82	4158.74	42.96

Analysis Results

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
145 - 140	Pole	TP24.923x24x0.1875	Pole	0.2%	Pass
140 - 135	Pole	TP25.847x24.923x0.1875	Pole	1.4%	Pass
135 - 130	Pole	TP26.77x25.847x0.1875	Pole	4.7%	Pass
130 - 125	Pole	TP27.709x26.77x0.25	Pole	5.8%	Pass
125 - 120	Pole	TP28.648x27.709x0.25	Pole	10.2%	Pass
120 - 115	Pole	TP29.588x28.648x0.25	Pole	14.9%	Pass
115 - 110	Pole	TP30.527x29.588x0.25	Pole	22.2%	Pass
110 - 105	Pole	TP31.466x30.527x0.25	Pole	29.1%	Pass
105 - 100	Pole	TP32.405x31.466x0.25	Pole	38.4%	Pass
100 - 95	Pole	TP33.345x32.405x0.25	Pole	46.7%	Pass
95 - 90	Pole	TP34.284x33.345x0.25	Pole	56.6%	Pass
90 - 89.25	Pole	TP35.27x34.284x0.25	Pole	58.1%	Pass
89.25 - 84.25	Pole	TP34.851x33.925x0.3125	Pole	51.4%	Pass
84.25 - 79.25	Pole	TP35.777x34.851x0.3125	Pole	58.0%	Pass
79.25 - 74.25	Pole	TP36.703x35.777x0.3125	Pole	64.2%	Pass
74.25 - 69.25	Pole	TP37.629x36.703x0.3125	Pole	70.0%	Pass
69.25 - 64.25	Pole	TP38.555x37.629x0.3125	Pole	75.4%	Pass
64.25 - 59.25	Pole	TP39.482x38.555x0.3125	Pole	80.5%	Pass
59.25 - 58.08	Pole	TP39.698x39.482x0.3125	Pole	81.7%	Pass
58.08 - 57.83	Pole + Reinf.	TP39.745x39.698x0.4125	Reinf. 2 Tension Rupture	81.2%	Pass
57.83 - 52.83	Pole + Reinf.	TP40.671x39.745x0.4188	Reinf. 2 Tension Rupture	85.8%	Pass
52.83 - 49.5	Pole + Reinf.	TP42.26x40.671x0.4125	Reinf. 2 Tension Rupture	88.7%	Pass
49.5 - 43.25	Pole + Reinf.	TP41.82x40.663x0.475	Reinf. 2 Tension Rupture	84.6%	Pass
43.25 - 38.25	Pole + Reinf.	TP42.746x41.82x0.475	Reinf. 2 Tension Rupture	88.0%	Pass
38.25 - 33.25	Pole + Reinf.	TP43.672x42.746x0.475	Reinf. 2 Tension Rupture	91.2%	Pass
33.25 - 31.25	Pole + Reinf.	TP44.042x43.672x0.475	Reinf. 2 Tension Rupture	92.4%	Pass
31.25 - 31	Pole + Reinf.	TP44.089x44.042x0.5375	Reinf. 1 Compression	72.8%	Pass
31 - 26	Pole + Reinf.	TP45.015x44.089x0.5375	Reinf. 1 Compression	75.3%	Pass
26 - 21	Pole + Reinf.	TP45.941x45.015x0.525	Reinf. 1 Compression	77.6%	Pass
21 - 16	Pole + Reinf.	TP46.867x45.941x0.525	Reinf. 1 Compression	79.8%	Pass
16 - 11	Pole + Reinf.	TP47.793x46.867x0.525	Reinf. 1 Compression	81.8%	Pass
11 - 6	Pole + Reinf.	TP48.719x47.793x0.5188	Reinf. 1 Compression	83.7%	Pass
6 - 4.75	Pole + Reinf.	TP48.95x48.719x0.5188	Reinf. 1 Compression	84.2%	Pass
4.75 - 4.5	Pole + Reinf.	TP48.997x48.95x0.5875	Reinf. 3 Tension Yield	78.9%	Pass
4.5 - 0	Pole + Reinf.	TP49.83x48.997x0.575	Reinf. 3 Tension Yield	80.4%	Pass
				Summary	
			Pole	81.7%	Pass
			Reinforcement	92.4%	Pass
			Overall	92.4%	Pass

Additional Calculations

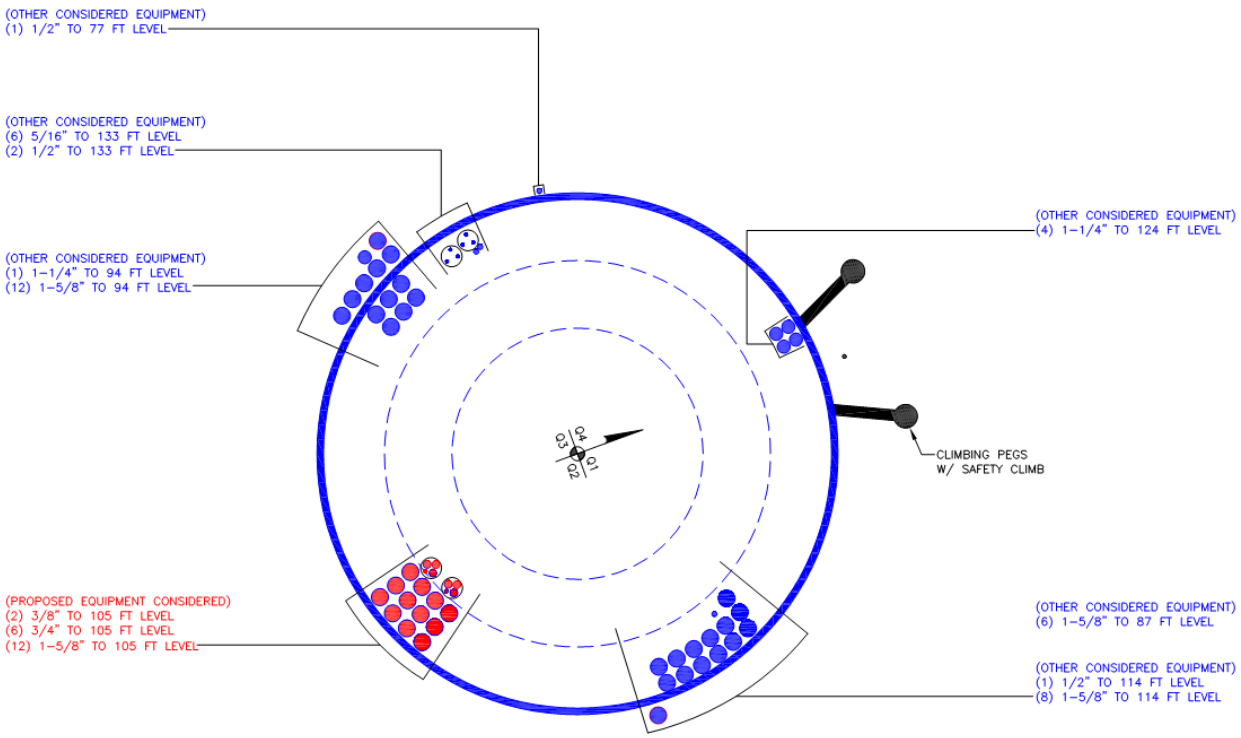
Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*			
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3
145 - 140	1138	n/a	1138	14.72	n/a	14.72	0.2%			
140 - 135	1270	n/a	1270	15.27	n/a	15.27	1.4%			
135 - 130	1412	n/a	1412	15.82	n/a	15.82	4.7%			
130 - 125	2075	n/a	2075	21.79	n/a	21.79	5.8%			
125 - 120	2295	n/a	2295	22.53	n/a	22.53	10.2%			
120 - 115	2531	n/a	2531	23.28	n/a	23.28	14.9%			
115 - 110	2781	n/a	2781	24.02	n/a	24.02	22.2%			
110 - 105	3048	n/a	3048	24.77	n/a	24.77	29.1%			
105 - 100	3332	n/a	3332	25.51	n/a	25.51	38.4%			
100 - 95	3632	n/a	3632	26.26	n/a	26.26	46.7%			
95 - 90	3951	n/a	3951	27.00	n/a	27.00	56.6%			
90 - 89.25	4000	n/a	4000	27.12	n/a	27.12	58.1%			
89.25 - 84.25	5161	n/a	5161	34.26	n/a	34.26	51.4%			
84.25 - 79.25	5588	n/a	5588	35.18	n/a	35.18	58.0%			
79.25 - 74.25	6037	n/a	6037	36.09	n/a	36.09	64.2%			
74.25 - 69.25	6510	n/a	6510	37.01	n/a	37.01	70.0%			
69.25 - 64.25	7006	n/a	7006	37.93	n/a	37.93	75.4%			
64.25 - 59.25	7528	n/a	7528	38.85	n/a	38.85	80.5%			
59.25 - 58.08	7653	n/a	7653	39.06	n/a	39.06	81.7%			
58.08 - 57.83	7749	2376	10125	39.11	18.00	57.11	65.9%		81.2%	
57.83 - 52.83	8311	2678	10989	40.03	18.00	58.03	69.3%		85.8%	
52.83 - 49.5	8696	2758	11455	40.64	18.00	58.64	72.0%		88.7%	
49.5 - 43.25	10776	2849	13624	49.33	18.00	67.33	63.9%		84.6%	
43.25 - 38.25	11511	2974	14486	50.43	18.00	68.43	66.8%		88.0%	
38.25 - 33.25	12280	3102	15383	51.53	18.00	69.53	69.5%		91.2%	
33.25 - 31.25	12597	3155	15751	51.97	18.00	69.97	70.6%		92.4%	
31.25 - 31	12721	5200	17921	52.03	31.88	83.90	63.5%	72.8%		
31 - 26	13542	5414	18956	53.13	31.88	85.01	66.0%	75.3%		
26 - 21	14398	5632	20030	54.23	31.88	86.11	68.3%	77.6%		
21 - 16	15289	5855	21143	55.33	31.88	87.21	70.6%	79.8%		
16 - 11	16215	6082	22297	56.44	31.88	88.31	72.8%	81.8%		
11 - 6	17179	6314	23493	57.54	31.88	89.41	74.9%	83.7%		
6 - 4.75	17426	6372	23798	57.81	31.88	89.69	75.4%	84.2%		
4.75 - 4.5	17322	9193	26515	57.87	29.06	86.93	66.0%			78.9%
4.5 - 0	18227	9464	27691	58.86	29.06	87.92	67.8%			80.4%

Note: Section capacity checked in 5 degree increments.

Rating per TIA-222-H Section 15.5.

APPENDIX B

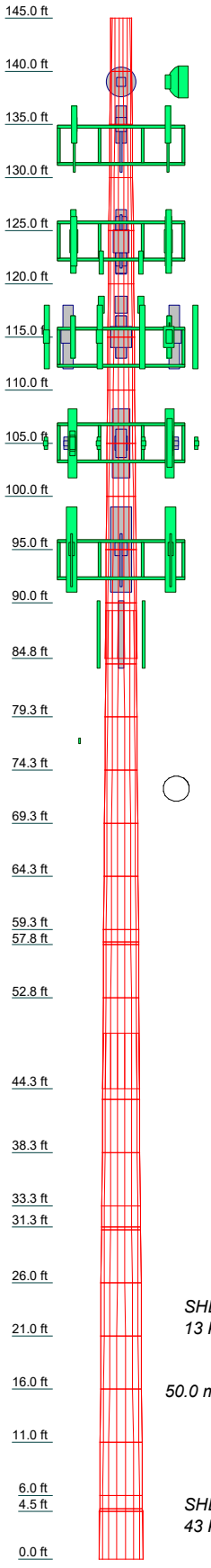
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Length (ft)	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	6.2500	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	5.0000	4.5000
Number of Sides	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Thickness (in)	0.1875	0.1875	0.1875	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.2500	0.3125	0.3125	0.3125	0.3125	0.3125	0.3125	0.4125	0.4125	0.4125	0.4125	0.4750	0.4750	0.4750	0.4750	0.4750	0.5250	0.5250	0.5250	0.5250	0.5188	0.5188	0.5188	0.5906
Socket Length (ft)																						5.2500													
Top Dia (in)	24.0000	24.9233	25.8467	26.7700	27.7092	28.6485	29.5877	30.5269	31.4661	32.4054	33.3446	34.2838	35.2230	36.1623	36.7031	37.6293	38.5554	39.4816	40.6707	42.2600	43.2200	44.1800	45.0147	45.9408	46.8668	47.7928	48.7188	49.6448	50.5708	51.4968	52.4228	53.3488	54.2748	55.2008	56.1268
Bot Dia (in)	24.9233	25.8467	26.7700	27.7092	28.6485	29.5877	30.5269	31.4661	32.4054	33.3446	34.2838	35.2230	36.1623	37.1015	37.6293	38.5554	39.4816	40.6707	42.2600	43.2200	44.1800	45.0147	45.9408	46.8668	47.7928	48.7188	49.6448	50.5708	51.4968	52.4228	53.3488	54.2748	55.2008	56.1268	57.0528
Grade	A607-65																																		
Weight (K)	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	1.0	1.7	1.4	1.2	1.2	0.5	1.4	1.5	1.5	1.5	1.4	1.3	24.5				



ALL REACTIONS ARE FACTORED

AXIAL 101 K

SHEAR 13 K *MOMENT 1278 kip-ft*

TORQUE 2 kip-ft

50.0 mph WIND - 1.7000 in ICE

AXIAL 56 K

SHEAR 43 K *MOMENT 4159 kip-ft*

TORQUE 3 kip-ft

REACTIONS - 125.0 mph WIND

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125.0 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.70 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TIA-222-H Annex S.

Paul J. Ford & Company
250 East Broad st., Suite 600
Columbus, OH 43215
Phone: (614) 221-6679
FAX:

Job: *145 ft Monopole / Newington*			
Project: *PJF 37518-2864.004.7805 / BU 881364*			
Client: Crown Castle	Drawn by: jacuna		App'd:
Code: TIA-222-H	Date: 12/17/18		Scale: NTS
Path: G:\TOWER\375_Crown_Castle\2018\37518-2864_881364_Newington\37518-2864.004.7805_SA_1669544\37518-2864.004.7805_CCIpole.eri			Dwg No. E-1

Monopole Flange Plate Connection

BU #	881364
Site Name	NEWINGTON SOUTH
Order #	

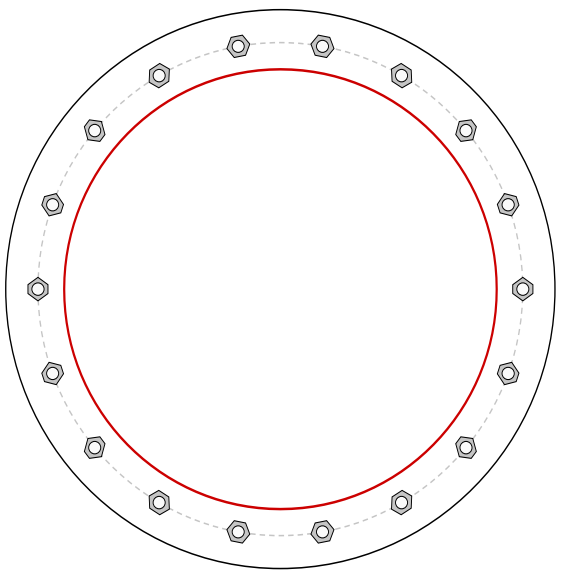
TIA-222 Revision	H

Elevation = 130 ft.

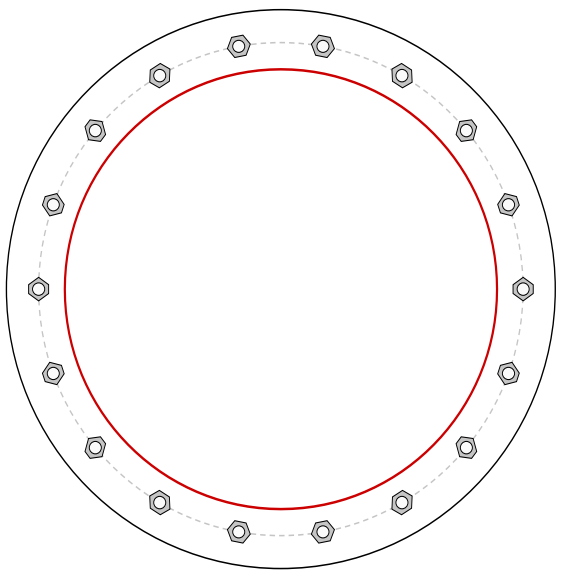
Applied Loads	
Moment (kip-ft)	26.61
Axial Force (kips)	2.73
Shear Force (kips)	4.84

**TIA-222-H Section 15.5 Applied*

Top Plate - External



Bottom Plate - External



Connection Properties

Bolt Data

(18) 3/4" ø bolts (A325 N; Fy=92 ksi, Fu=120 ksi) on 30" BC

Top Plate Data

34" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Top Stiffener Data

N/A

Top Pole Data

26.77" x 0.1875" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Bottom Plate Data

34" OD x 1.5" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Bottom Stiffener Data

N/A

Bottom Pole Data

26.77" x 0.25" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Bolt Capacity

Max Load (kips)	2.21	
Allowable (kips)	30.06	
Stress Rating:	**7.0%**	**Pass**

Top Plate Capacity

Max Stress (ksi):	0.98	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**2.1%**	**Pass**
Tension Side Stress Rating:	**0.9%**	**Pass**

Bottom Plate Capacity

Max Stress (ksi):	0.98	(Flexural)
Allowable Stress (ksi):	45.00	
Stress Rating:	**2.1%**	**Pass**
Tension Side Stress Rating:	**0.9%**	**Pass**

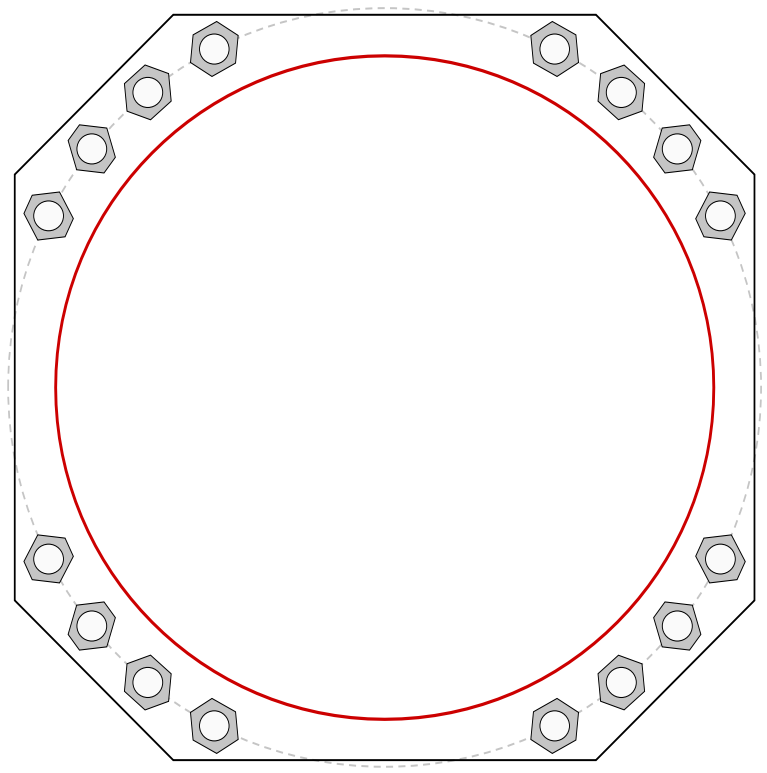
Monopole Base Plate Connection

Site Info	
BU #	881364
Site Name	NEWINGTON SOUTH
Order #	

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	5.75

Applied Loads	
Moment (kip-ft)	4158.74
Axial Force (kips)	55.82
Shear Force (kips)	42.96

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(16) 2-1/4" ø bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 57" BC

Base Plate Data

56" OD x 3" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)

Stiffener Data

N/A

Pole Data

49.83" x 0.375" 18-sided pole (A607-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_c = 222.23	ϕPn_c = 243.75	**Stress Rating**
Vu = 2.69	ϕVn = 73.13	**97.1%**
Mu = 10.04	ϕMn = 94.7	**Pass**

Base Plate Summary		
Max Stress (ksi):	36.81	(Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**77.9%**	**Pass**

Drilled Pier Foundation

BU # :	881364
Site Name:	
Order Number:	

TIA-222 Revison:	H
Tower Type:	Monopole

Applied Loads	Comp.	Uplift
Moment (kip-ft)	4159	
Axial Force (kips)	56	
Shear Force (kips)	43	

Material Properties		
Concrete Strength, f'c:	3	ksi
Rebar Strength, Fy:	60	ksi

Pier Design Data		
Depth	25	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
From 0.5' above grade to 25' below grade		
Pier Diameter	7	ft
Rebar Quantity	28	
Rebar Size	11	
Clear Cover to Ties	4	in
Tie Size	5	

Analysis Results	Compression	Uplift
Soil Lateral Capacity		
$D_{v=0}$ (ft from TOC)	6.43	-
Soil Safety Factor	2.06	-
Max Moment (kip-ft)	4397.29	-
Rating*	*61.4%*	-
Soil Vertical Capacity	*Compression*	*Uplift*
Skin Friction (kips)	184.54	-
End Bearing (kips)	173.18	-
Weight of Concrete (kips)	133.42	-
Total Capacity (kips)	357.72	-
Axial (kips)	189.42	-
Rating*	*50.4%*	-
Reinforced Concrete Capacity	*Compression*	*Uplift*
Critical Depth (ft from TOC)	6.36	-
Critical Moment (kip-ft)	4397.24	-
Critical Moment Capacity	6705.33	-
Rating*	*62.5%*	-

Soil Interaction Rating*	**61.4%**
Structural Foundation Rating*	**62.5%**

Check Limitation	
Apply TIA-222-H Section 15.5:	☑

*Rating per TIA-222-H Section 15.5

Soil Profile

Groundwater Depth	10	ft	# of Layers	4	

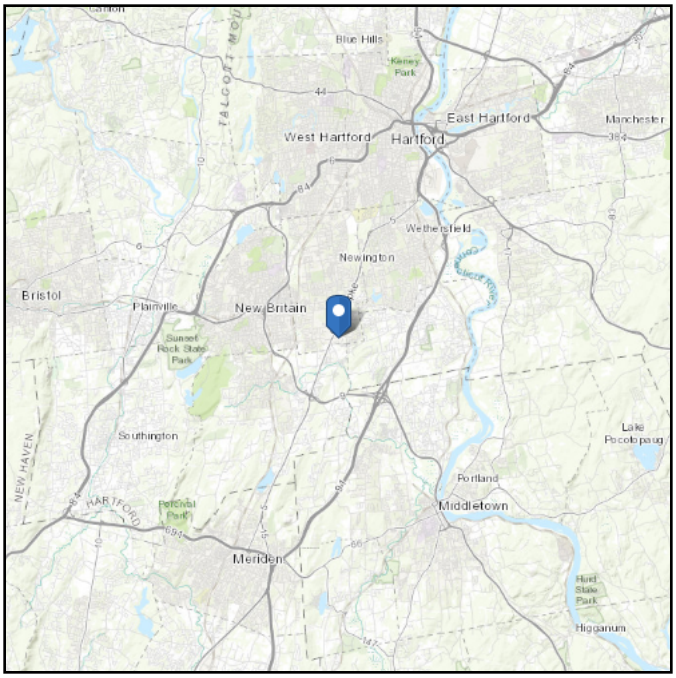
Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ_{soil} (pcf)	$\gamma_{concrete}$ (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ult. Gross Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	125	150	0	0	0.000	0.000					Cohesionless
2	4	10	6	125	150	0	34	0.467	0.467				7	Cohesionless
3	10	12	2	62.6	87.6	0	34	0.645	0.645				7	Cohesionless
4	12	25	13	62.6	87.6	0	30	0.546	0.546			6	5	Cohesionless

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 141.56 ft (NAVD 88)
Latitude: 41.6552
Longitude: -72.721442



Wind

Results:	**77 Vmph**
Wind Speed:	123 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	100 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Wed Dec 12 2018

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 7-10 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 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

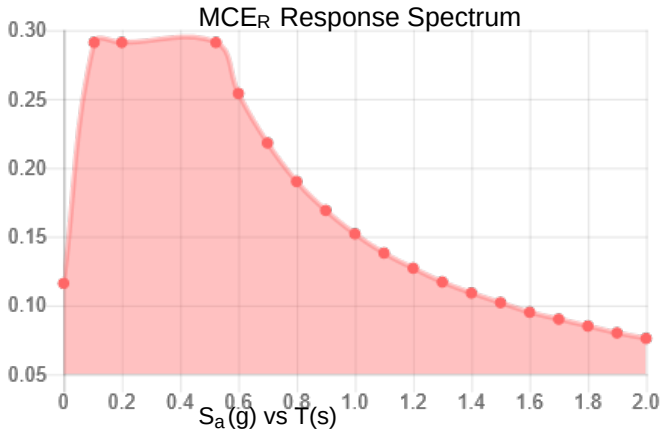
Seismic

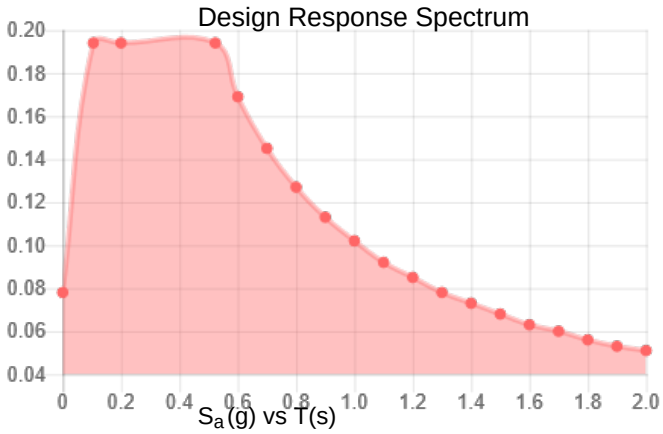
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.182	S_{DS} :	0.194
S_1 :	0.063	S_{D1} :	0.102
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.092
S_{MS} :	0.291	PGA_M :	0.148
S_{M1} :	0.152	F_{PGA} :	1.600
		I_e :	1

Seismic Design Category B





Data Accessed: Wed Dec 12 2018

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Dec 12 2018

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 50-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.

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