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

February 22, 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: 846176**
AT&T Site ID: Madison Durham Road
1749 Durham Road, Madison, CT 06443
Latitude: 41° 23' 22.3"/ Longitude: -72° 38' 56"

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 118-foot level of the existing 119-foot monopole at 1749 Durham Road, Madison, CT 06443. The tower is owned by Crown Castle. The property is owned by the South Central Connecticut Regional Water Authority. AT&T intends to replace six (6) antennas with six (6) new antennas and add six (6) RRUs. AT&T also intends to add two (2) DC cables and one (1) fiber cable.

This facility was approved by the Council on August 26, 2004, Docket No. 290, subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wireless and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level. The height at the top of the antennas shall not exceed 123 feet above ground level. The tower and tower foundation shall be of sufficient capacity to support a tower extension to 150 feet above ground level.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Madison, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:
    a. a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, relocated access road, utility line, and landscaping; and

b. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council in the event other carriers locate at this facility or if circumstances in equipment operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

7. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extension of this period shall be filed with the Council not later than sixty days prior to expiration date of this Certificate and shall be served on all parties and interveners and the Town of Madison, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

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 The Honorable Tom Banisch, First Selectman of the Town of Madison, the Town Planner David Anderson, and to the land owner the South Central Connecticut Regional Water Authority. 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: William Stone.

Sincerely,

Anne Marie Zsamba
Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
(201) 236-9224
AnneMarie.Zsamba@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:

Tom Banisch, First Selectman
Town of Madison
8 Campus Drive
Madison, CT 06443
(203) 245-5602

David Anderson, Town Planner
Town of Madison
8 Campus Drive
Madison, CT 06443
(203) 245-5632

South Central Connecticut Regional Water Authority
Attn: Dianne L. Tompkins, Senior Land Use Manager
30 Sargent Drive
New Haven, CT 06511-5966

ORIGIN ID:GFLA (518) 373-3523
ANNE MARIE ZSAMBA
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 22FEB19
ACTWGT: 3.00 LB
CAD: 104924194/INET4100

BILL SENDER

TO **MELANIE BACHMAN**
CONNECTICUT SITING COUNCIL
10 FRANKLIN SQUARE

NEW BRITAIN CT 06051
(860) 827-2951 REF: 1765.6680
INV:
PO: DEPT:

565J2/0E3D/23AD

FedEx Express

J191019010701uv

TRK# 0201 **7745 3750 0110**

MON - 25 FEB 10:30A
PRIORITY OVERNIGHT

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

ORIGIN ID:GFLA (518) 373-3523
WILL STONE
CROWN CASTLE
3 CORPORATE PARK DRIVE
SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 22FEB19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO **TOM BANISCH, FIRST SELECTMAN**
TOWN OF MADISON
8 CAMPUS DRIVE
MADISON CT 06443
(203) 245-5602 REF: 1734.7680
INV:
PO: DEPT:

565J2/0E3D/23AD

FedEx Express

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TRK# 0201 **7745 3752 7951**

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SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 22FEB19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO **DAVID ANDERSON, TOWN PLANNER**
TOWN OF MADISON
8 CAMPUS DRIVE
MADISON CT 06443
(203) 245-5632 REF: 1734.7680
INV:
PO: DEPT:

565J2/0E3D/23AD

FedEx Express

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TRK# 0201 **7745 3754 6913**

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SUITE 101
CLIFTON PARK, NY 12065
UNITED STATES US

SHIP DATE: 22FEB19
ACTWGT: 1.50 LB
CAD: 104924194/INET4100

BILL SENDER

TO **SOUTH CENTRAL CT REGIONAL WATER AUT**
DIANNE L. TOMPKINS, SR. LAND USE MG
30 SARGENT DRIVE

NEW HAVEN CT 06511
(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

565J2/0E3D/23AD

J191019010701uv

TRK# 7745 3757 1969
0201

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CT-US **BDL**

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1749 DURHAM RD

Location	1749 DURHAM RD	**Mblu**	154/ 3/ / /
Acct#	00722900	**Owner**	SOUTH CENTRAL CONNECTICUT REGIONAL WATER
Assessment	$136,200	**Appraisal**	$840,500
PID	7618	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$0	$840,500	$840,500
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$0	$136,200	$136,200

Owner of Record

Owner	SOUTH CENTRAL CONNECTICUT REGIONAL WATER	**Sale Price**	$0
Co-Owner	AUTHORITY	**Certificate**	
		Book & Page	1761/ 176
		Sale Date	01/06/2012
		Instrument	28

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
SOUTH CENTRAL CONNECTICUT REGIONAL WATER	$0		1761/ 176	28	01/06/2012
RUGE ANITA	$0		1761/ 172	01	01/06/2012
RUGE FRIEDA L/U & ANITA S REMAINDER	$0		1755/ 158	01	12/02/2011
RUGE FRIEDA L/U& FRED& ANITA S REMAINDER	$0		1504/ 164	25	04/12/2007
RUGE FRIEDA L/U &FRED& ANITA S REMAINDER	$0		466/ 239	00	06/20/1991

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	
Stories:	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Fireplace(s)	
Xtra FPL Open	

Building Photo

(http://images.vgsi.com/photos/MadisonCTPhotos//\01\01\41/63

Building Layout

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 9300
Description Pilot - Forest
Zone RU-1

Land Line Valuation

Size (Acres) 34.61
Depth 0

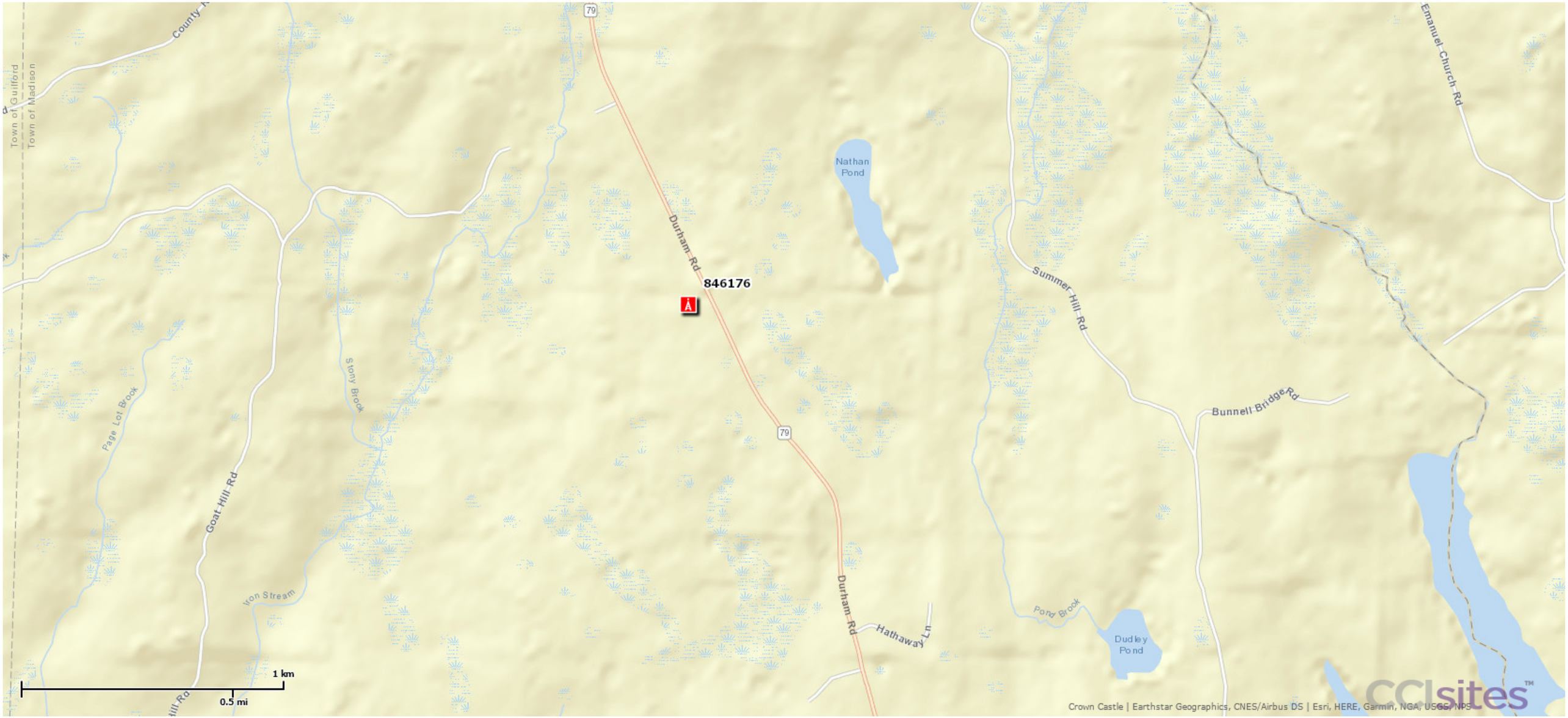
Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$0	$840,500	$840,500

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$0	$136,200	$136,200


846176
Durham Rd
79
Nathan Pond
Summer Hill Rd
Emanuel Church Rd
Bunnell Bridge Rd
Durham Rd
Hathaway Ln
Pond Brook
Dudley Pond
Goat Hill Rd
Stony Brook
Page Lot Brook
Iron Stream
Town of Guilford
Town of Madison
1 km
0.5 mi
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Connecticut Siting Council

Decisions

DOCKET NO. 290 – AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two locations on Durham Road (Route 79), Madison, Connecticut.	} } }	Connecticut Siting Council August 26, 2004

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes **§** 16-50k, be issued to AT&T Wireless PCS, LLC d/b/a AT&T Wireless at Site A, located at 1749 Durham Road, Madison, Connecticut. The Council denies certification of Site B, located on the Elka Perez Trust property, Durham Road, Madison, Connecticut.

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

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wirleless and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level. The height at the top of the antennas shall not exceed 123 feet above ground level. The tower and tower foundation shall be of sufficient capacity to support a tower extension to 150 feet above ground level.

   2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be served on the Town of Madison, and all parties and intervenors as listed in the service list, and submitted to and approved by the Council prior to the commencement of facility construction and shall include:

   a. a final site plan(s) of site development to include specifications for the tower, tower foundation, antennas, equipment building, relocated access road, utility line, and landscaping; and

   b. construction plans for site clearing, water drainage, and erosion and sedimentation control consistent with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council

worst-case

modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council in the event other carriers locate at this facility or if circumstances in equipment operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

7. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extension of this period shall be filed with the Council not later than sixty days prior to expiration date of this Certificate and shall be served on all parties and intervenors and the Town of Madison, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

Pursuant to General Statutes **§** 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the The Shoreline Times and The Source.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq.

	90 Maple Avenue White Plains, New York 10601
Intervenor Sprint Spectrum L. P. d/b/a Sprint PCS	**Its Representative** Thomas J. Regan, Esq. Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402

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Connecticut Siting Council

Decisions

DOCKET NO. 290 – AT&T Wireless PCS, LLC d/b/a AT&T Wireless application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a wireless telecommunications facility at one of two locations on Durham Road (Route 79), Madison, Connecticut.	} } }	Connecticut Siting Council August 26, 2004

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

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wirleless and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level. The height at the top of the antennas shall not exceed 123 feet above ground level. The tower and tower foundation shall be of sufficient capacity to support a tower extension to 150 feet above ground level.

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	90 Maple Avenue White Plains, New York 10601
Intervenor Sprint Spectrum L. P. d/b/a Sprint PCS	**Its Representative** Thomas J. Regan, Esq. Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402

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worst-case

modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall ensure a recalculated report of electromagnetic radio frequency power density is submitted to the Council in the event other carriers locate at this facility or if circumstances in equipment operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new State or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

6. The Certificate Holder shall provide reasonable space on the tower for no compensation for any municipal antennas, provided such antennas are compatible with the structural integrity of the tower.

7. If the facility does not initially provide wireless services within one year of completion of construction or ceases to provide wireless services for a period of one year, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

8. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and cease to function.

9. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved. Any request for extension of this period shall be filed with the Council not later than sixty days prior to expiration date of this Certificate and shall be served on all parties and intervenors and the Town of Madison, as listed in the service list. Any proposed modifications to this Decision and Order shall likewise be so served.

Pursuant to General Statutes **§** 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the The Shoreline Times and The Source.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
AT&T Wireless PCS, LLC d/b/a AT&T Wireless	Christopher B. Fisher, Esq.

	90 Maple Avenue White Plains, New York 10601
Intervenor Sprint Spectrum L. P. d/b/a Sprint PCS	**Its Representative** Thomas J. Regan, Esq. Brown Rudnick Berlack Israels LLP CityPlace I, 38th Floor 185 Asylum Street Hartford, CT 06103-3402

Content Last Modified on 8/27/2004 4:39:20 PM

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING TOWER:

- REMOVE (3) EXISTING RRH's

- INSTALL AT&T ANTENNA (OPA65R-BU6A) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T ANTENNA (800-10965) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 4449 B5/12 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 8843 B2/B66A (AWS/PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL SURGE ARRESTOR (DC6-48-60-18-8F) (TOTAL OF 1).
- INSTALL (2) DC TRUNK CABLES & (1) FIBER TRUNK CABLE.
- INSTALL NEW SITE PRO 1 HANDRAIL KIT (PART# HRK12) (TYP. OF 1 PER SECTOR, TOTAL OF 3).

ITEMS TO BE MOUNTED INSIDE EXISTING SHELTER:

- SWITCH TO 5216
- ADD (1) NEW 6601
- ADD (1) NEW XMU03
- ADD (1) NEW 6630

ITEMS TO REMAIN:

- (3) ANTENNAS, (6) TMAS, (2) DC TRUNK CABLES, (1) FIBER TRUNK CABLES (12) COAX & (1) SURGE SUPPRESSOR.

SITE ADDRESS:	1749 DURHAM ROAD MADISON, CT 06443
LATITUDE (NAD 83):	N 41° 23' 22.33"
LONGITUDE (NAD 83):	W 72° 38' 55.97"
LANDLORD:	CROWN CASTLE INTERNATIONAL 500 W. CUMMINGS PARK, STE 3600 WOBURN, MA 01801
TYPE OF SITE:	MONOPOLE /INDOOR
TOWER HEIGHT:	119'
RAD CENTER:	118'
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

SITE NUMBER: CTL02100

FA LOCATION CODE: 10091767

SITE NAME: MADISON DURHAM ROAD

CROWN SITE NAME: MADISON-DURHAM ROAD

PROJECT: LTE 2C / LTE 3C / LTE 4C / 4TX4RX SOFTWARE RETROFIT

PACE ID: MRCTB033547, MRCTB033550, MRCTB033698, MRCTB033880

BU#: 846176

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:	ERCC0004
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

1	02/01/19	ISSUED FOR CONSTRUCTION
0	12/28/18	ISSUED FOR PERMITTING

FA# 10091767
SITE# CTL02100
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443

TITLE SHEET

T-1

DRAWING INDEX

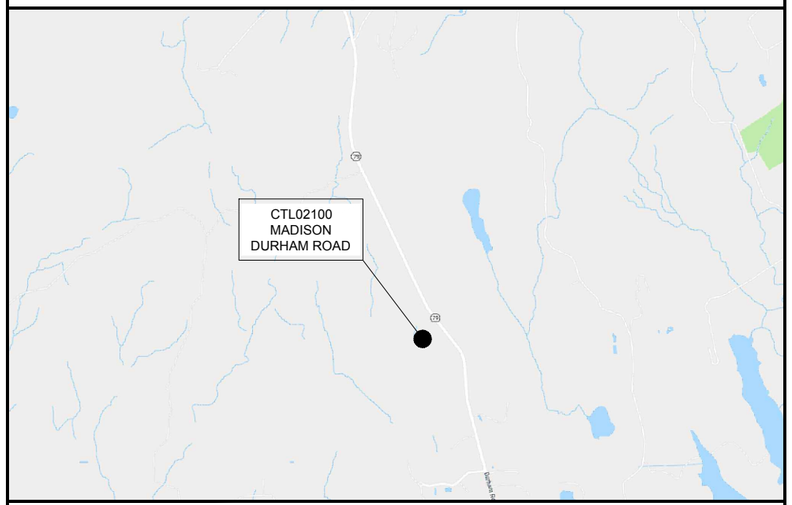
SHEET NO:	SHEET TITLE
T-1	TITLE SHEET
GN-1	GENERAL NOTES I
GN-2	GENERAL NOTES II
C-1	SITE PLAN
C-2	EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION
C-3	EXISTING & PROPOSED ANTENNA LAYOUT
C-4	EQUIPMENT DETAILS I
C-5	HANDRAIL KIT DETAIL
RF-1	ANTENNA CHART & RF EQUIPMENT SCHEMATIC
G-1	GROUNDING DETAILS

CROWN CASTLE SITE ID #: 846176
CROWN SITE NAME: MADISON-DURHAM ROAD

ENGINEERING

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

VICINITY MAP



FROM 5841 BRIDGE STREET, EAST SYRACUSE, NY 13057, HEAD SOUTHWEST ON BRIDGE ST, 240 FT. USE THE LEFT 2 LANES TO TURN LEFT ONTO WIDEWATERS PKWY, 230 FT. MAKE A U-TURN, 177 FT. USE THE MIDDLE LANE TO TURN RIGHT AT THE 1ST CROSS STREET ONTO BRIDGE ST, 0.2 MI. TURN LEFT ONTO THE INTERSTATE 690 E RAMP TO INTERSTATE 481, 0.3 MI. MERGE ONTO I-690 E, 0.5 MI. USE THE LEFT LANE TO TAKE THE INTERSTATE 481 N EXIT TOWARD INTERSTATE 90/THRUWAY, 0.6 MI. MERGE ONTO I-481 N, 2.6 MI. TAKE EXIT 6 TO MERGE ONTO I-90 E (TOLL ROAD), 129 MI. KEEP RIGHT TO CONTINUE ON GOVERNOR THOMAS E. DEWEY THRUWAY/NEW YORK STATE THRUWAY, FOLLOW SIGNS FOR I-87 S/NEW YORK/BOSTON (TOLL ROAD), 1.0 MI. CONTINUE ONTO I-87 S/GOVERNOR THOMAS E. DEWEY THRUWAY/NEW YORK STATE THRUWAY (TOLL ROAD), 13.6 MI. TAKE EXIT 21A TOWARD I-90 E/MASS TURNPIKE/BOSTON (TOLL ROAD), 1.0 MI. CONTINUE ONTO NY-912M E (TOLL ROAD), 6.4 MI. CONTINUE ONTO I-90 E (TOLL ROAD)(ENTERING MASSACHUSETTS), 63.1 MI. TAKE EXIT 4 TO MERGE ONTO I-91 S TOWARD SPRINGFIELD (PARTIAL TOLL ROAD), 6.6 MI. KEEP LEFT TO STAY ON I-91 S (ENTERING CONNECTICUT), 36.8 MI. USE THE LEFT LANE TO TAKE EXIT 22S TO MERGE ONTO CT-9 S TOWARD MIDDLETOWN/OLD SAYBROOK, 6.4 MI. TAKE EXIT 13 FOR STATE ROUTE 17 S TOWARD NEW HAVEN, 0.2 MI. CONTINUE ONTO CT-17 S, 6.7 MI. TURN LEFT ONTO CT-79 S/MADISON RD AND CONTINUE TO FOLLOW CT-79 S, 6.0 MI. SIET IS ACCESSIBLE VIA ACCESS ROAD ON THE RIGHT.

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: ERCC0004
DRAWN BY: DAP
CHECKED BY: CAT

SUBMITTALS

1	02/01/19	ISSUED FOR CONSTRUCTION
0	12/28/18	ISSUED FOR PERMITTING

FA# 10091767
SITE# CTL02100
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443

GENERAL NOTES I

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 (F)
(2) TWO LAMPS 48-T8
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
EXISTING CHAIN LINK FENCE
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)
PROPOSED UNDERGROUND TELCO (UGP)
PROPOSED OVERHEAD POWER (UGT)
PROPOSED OVERHEAD TELCO (OHP)
PROPOSED OVERHEAD UTILITIES (OHT)
PROPOSED ABOVE GROUND POWER (OHT)
PROPOSED ABOVE GROUND TELCO (AGP)
(AGT)

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

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

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SUITE 101
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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: ERCC0004

DRAWN BY: DAP

CHECKED BY: CAT

SUBMITTALS

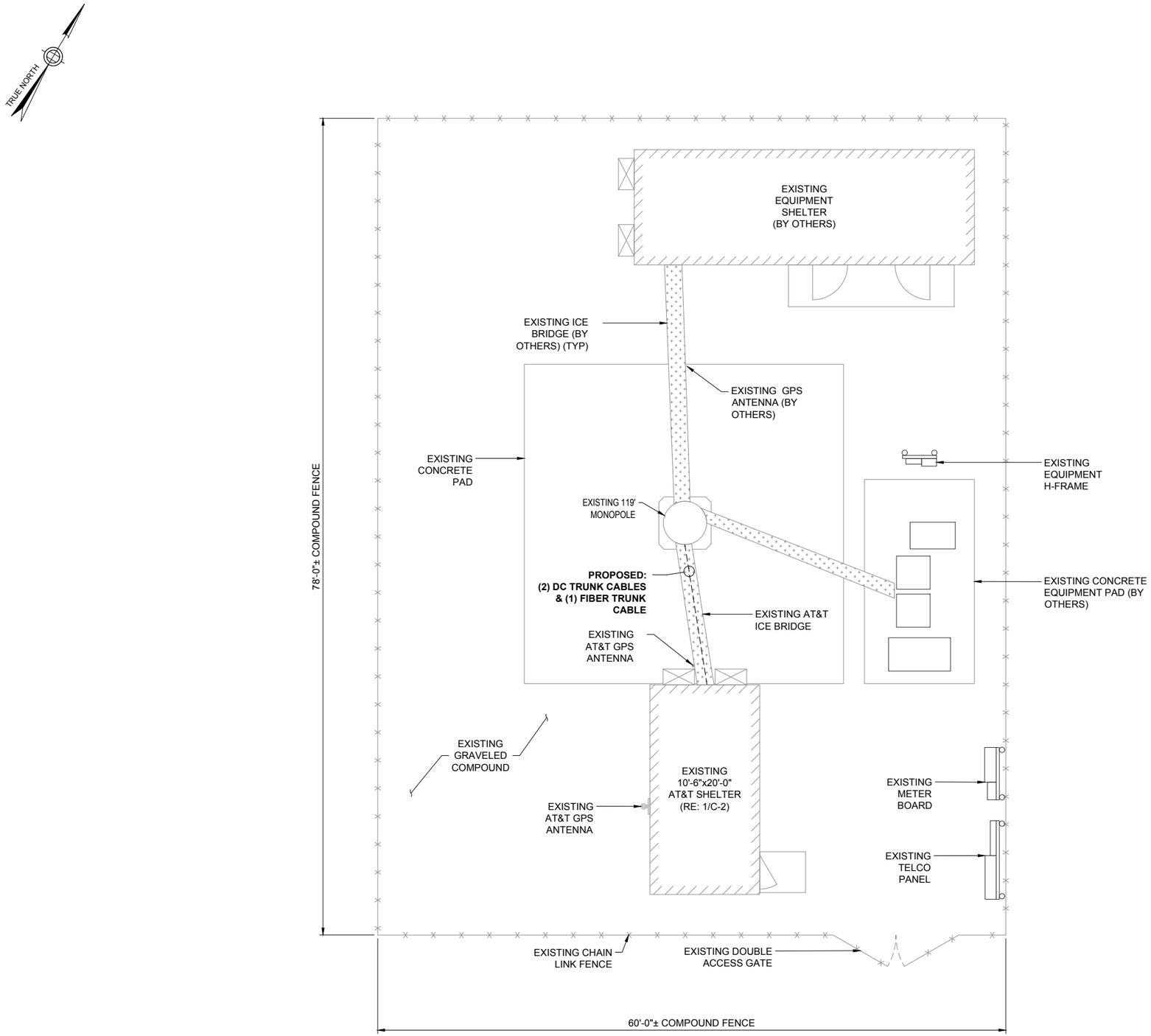
1	02/01/19	ISSUED FOR CONSTRUCTION
0	12/28/18	ISSUED FOR PERMITTING

FA# 10091767
SITE# CTL02100
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443

GENERAL NOTES II

GN-2



NOTES:

1. PLAN BASED ON AS-BUILT DRAWINGS ISSUED BY DEWBERRY ENGINEERS, INC. ON 01/07/13. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

1 SITE PLAN

SCALE: 3/16" = 1'-0"

NOT FOR CONSTRUCTION

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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SUBMITTALS

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FA# 10091767
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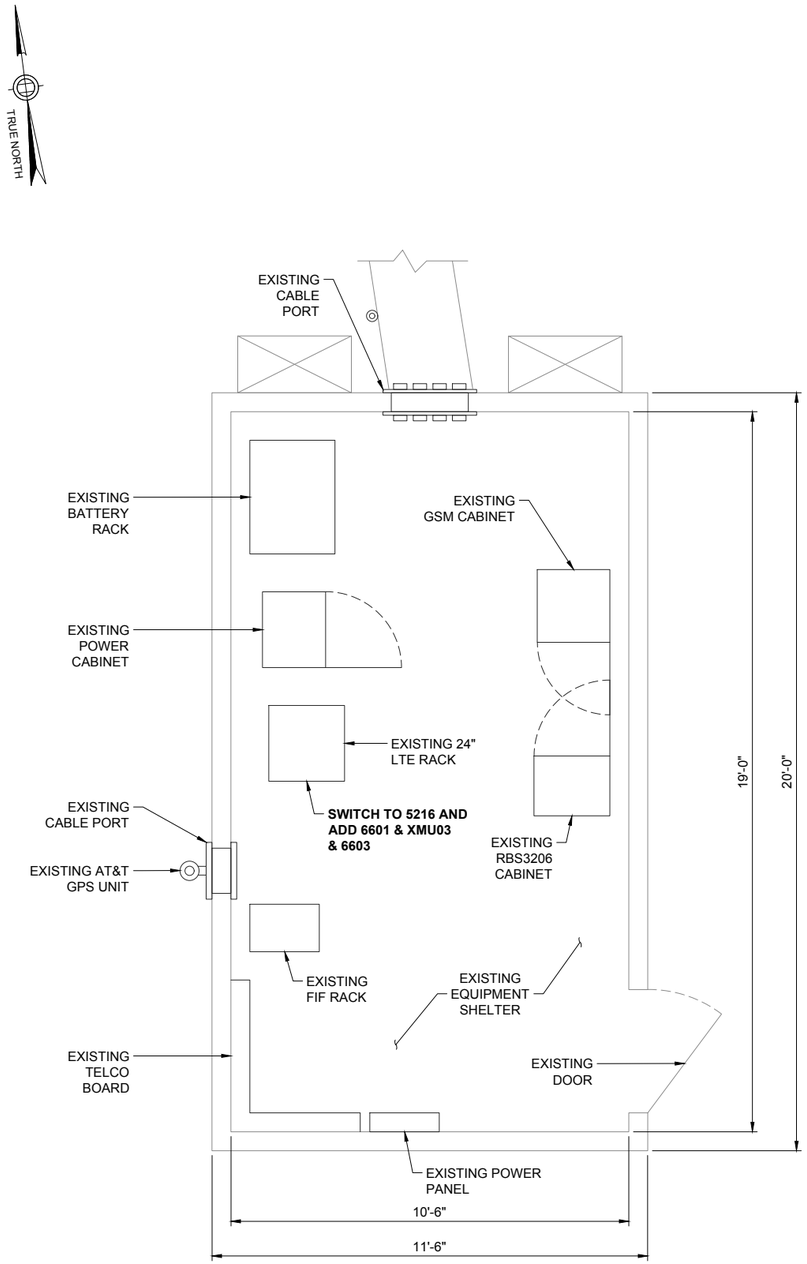
MADISON DURHAM ROAD

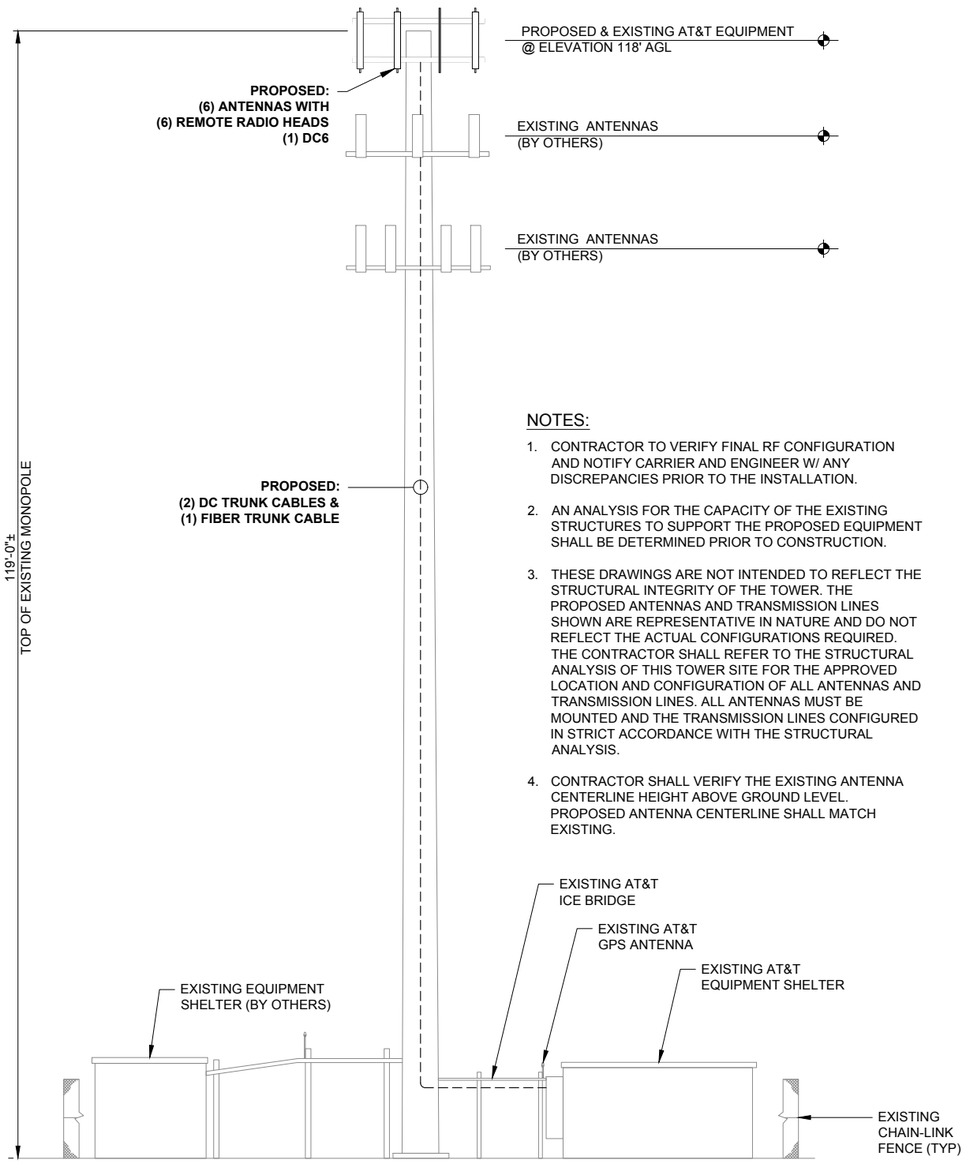
1749 DURHAM ROAD
MADISON, CT 06443

SITE PLAN

C-1



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



2 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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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: ERCC0004

DRAWN BY: DAP

CHECKED BY: CAT

SUBMITTALS

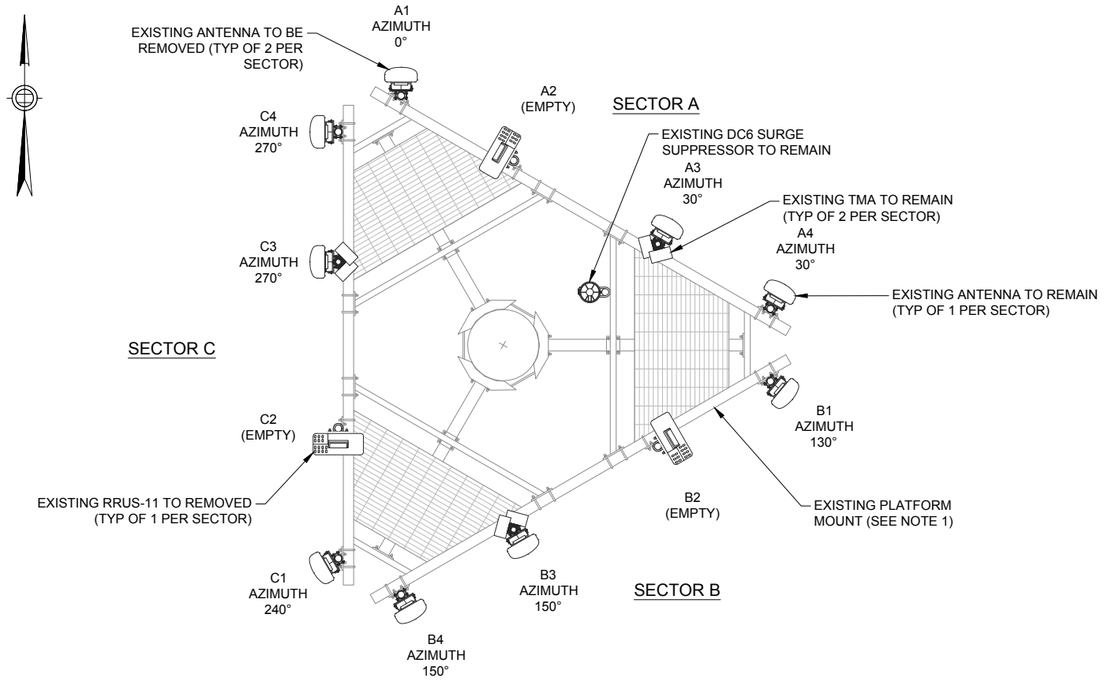
1	02/01/19	ISSUED FOR CONSTRUCTION
0	12/28/18	ISSUED FOR PERMITTING

FA# 10091767
SITE# CTL02100
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443

EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION

C-2



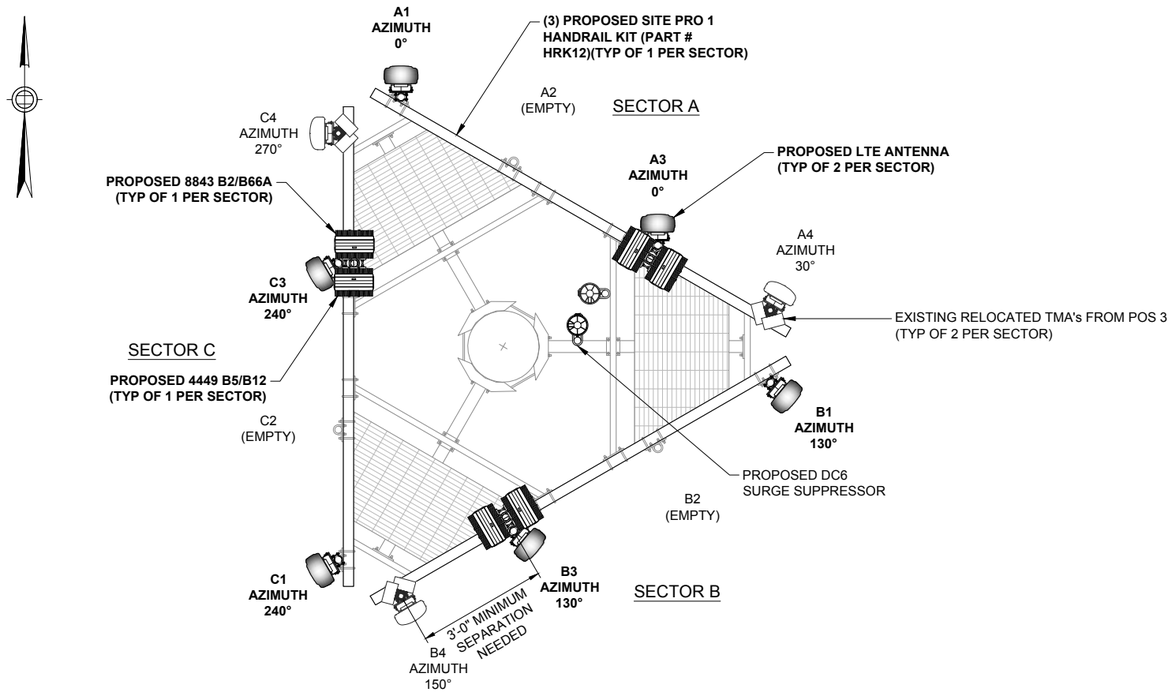
ELEVATION 118'

1 EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

NOTES:

1. CONTRACTOR SHALL REFER TO THE MOUNT MODIFICATION REPORT; SITE NUMBER: CTL02100; SITE NAME: MADISON DURHAM ROAD; FA LOCATION: 10091767; CROWN BU NUMBER: 846176; CROWN SITE NAME: MADISON-DURHAM ROAD; CROWN ORDER NUMBER: 471842; ISSUED BY INFINIGY. DATED ON 01/29/19. 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 118'

1 PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.

DO NOT INSTALL PROPOSED SQUID OR SURGE SUPPRESSOR ON TOWER LEG

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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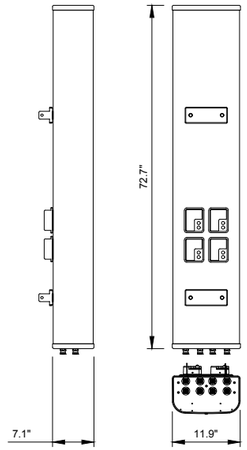
MADISON, CT 06443

EXISTING & PROPOSED ANTENNA LAYOUT

C-3

MANUFACTURER: CCI
MODEL NO.: OPA65R-BU6A

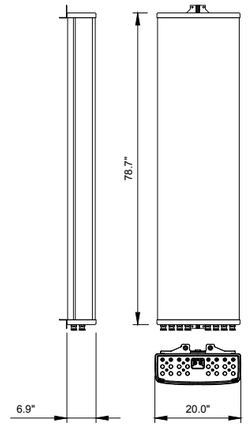
COLOR: LIGHT GRAY
DIMENSIONS (LxWxD): 72.7" x 11.9" x 7.1"
1807mm x 297mm x 214mm
WEIGHT (lbs): 57.5
CONNECTOR: 8 x 4.3-10 DIN FEMALE LONG NECK
FRONT WIND LOAD: 201 LBS @ 100 MPH
894 N @ 161 KPH
SIDE WIND LOAD: 160 LBS @ 100 MPH
714 N @ 161 KPH
WIND SPEED MAX.: >150 MPH (>241 KPH)



1 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

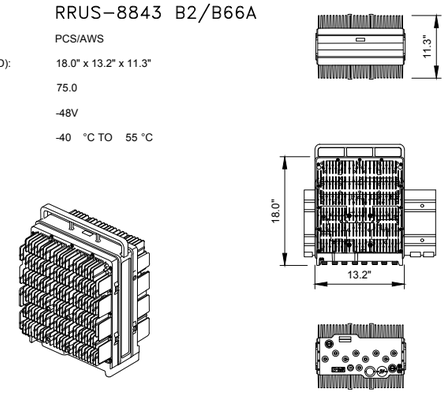
MANUFACTURER: KATHREIN
MODEL NO.: 80010965
RADOME MATERIAL: FIBERGLASS, UV RESISTANT
COLOR: LIGHT GRAY
DIMENSIONS (LxWxD): 78.7" x 20.0" x 6.9"
1999mm x 508mm x 175mm
WEIGHT (lbs): 97.6
CONNECTOR: 8 x 4.3-10 FEMALE
FRONT WIND LOAD: 254 LBF @ 93 MPH
1130 N @ 150 KM/H
SIDE WIND LOAD: 256 LBF @ 93 MPH
1140 N @ 150 KM/H
WIND SPEED MAX.: >150 MPH (>241 KM/H)



2 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

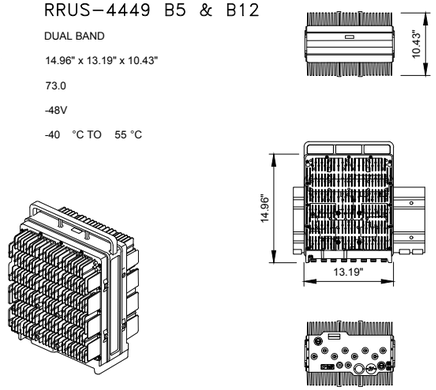
MANUFACTURER: ERICSSON
MODEL NO.: RRUS-8843 B2/B66A
PCS/AWS
DIMENSIONS (HxWxD): 18.0" x 13.2" x 11.3"
WEIGHT (lbs): 75.0
POWER SUPPLY: -48V
TEMPERATURE: -40 °C TO 55 °C



3 RRUS SPECIFICATIONS

SCALE: N.T.S.

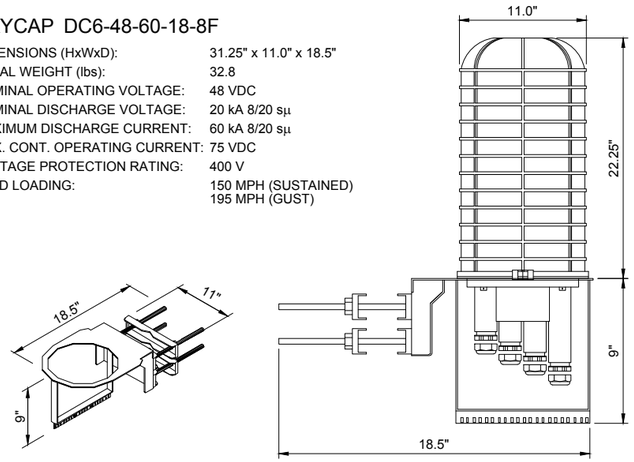
MANUFACTURER: ERICSSON
MODEL NO.: RRUS-4449 B5 & B12
TECHNOLOGY: DUAL BAND
DIMENSIONS (HxWxD): 14.96" x 13.19" x 10.43"
WEIGHT (lbs): 73.0
POWER SUPPLY: -48V
TEMPERATURE: -40 °C TO 55 °C



4 RRUS SPECIFICATIONS

SCALE: N.T.S.

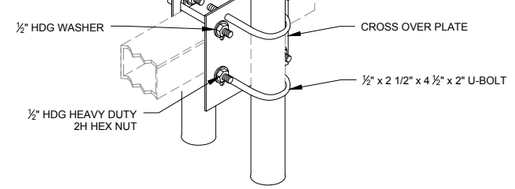
RAYCAP DC6-48-60-18-8F
DIMENSIONS (HxWxD): 31.25" x 11.0" x 18.5"
TOTAL WEIGHT (lbs): 32.8
NOMINAL OPERATING VOLTAGE: 48 VDC
NOMINAL DISCHARGE VOLTAGE: 20 kA 8/20 sμ
MAXIMUM DISCHARGE CURRENT: 60 kA 8/20 sμ
MAX. CONT. OPERATING CURRENT: 75 VDC
VOLTAGE PROTECTION RATING: 400 V
WIND LOADING: 150 MPH (SUSTAINED)
195 MPH (GUST)



5 DC SURGE PROTECTION SPECIFICATIONS

SCALE: N.T.S.

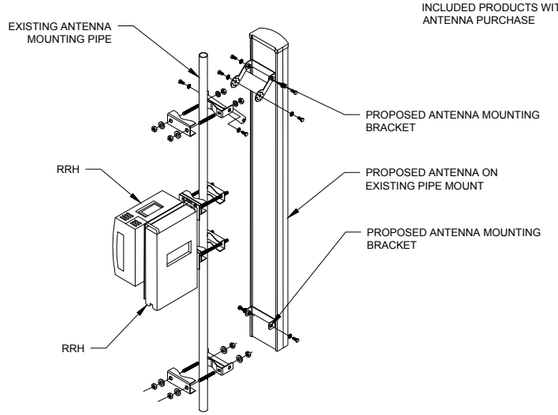
PART #	PIPE SIZE	STAND-OFF ARM
BBPM-K1	2-3/8"	3-1/2" - 4-1/2"
BBPM-K2	2-7/8"	3-1/2" - 4-1/2"
BBPM-K3	2-3/8"	3-1/2" - 6"
BBPM-U	2-3/8" - 4-1/2"	2-3/8" - 4-1/2"



6 DC6 MOUNTING DETAIL

SCALE: N.T.S.

NOTE
MOUNTING OPTIONS ARE INCLUDED PRODUCTS WITH ANTENNA PURCHASE

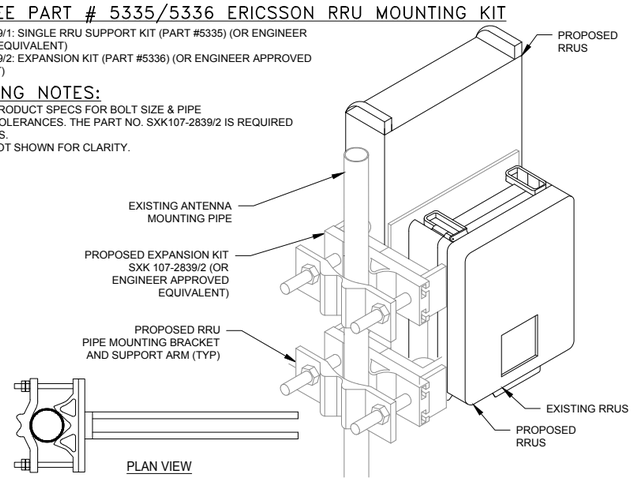


7 ANTENNA & RRH MOUNTING DETAIL

SCALE: N.T.S.

CUE DEE PART # 5335/5336 ERICSSON RRU MOUNTING KIT
SXK 107 2839/1: SINGLE RRU SUPPORT KIT (PART #5335) (OR ENGINEER APPROVED EQUIVALENT)
SXK 107 2839/2: EXPANSION KIT (PART #5336) (OR ENGINEER APPROVED EQUIVALENT)

MOUNTING NOTES:
REFER TO PRODUCT SPECS FOR BOLT SIZE & PIPE DIAMETER TOLERANCES. THE PART NO. SXK107-2839/2 IS REQUIRED FOR (2) RRUS.
ANTENNA NOT SHOWN FOR CLARITY.



8 RRU MOUNTING DETAIL

SCALE: N.T.S.

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

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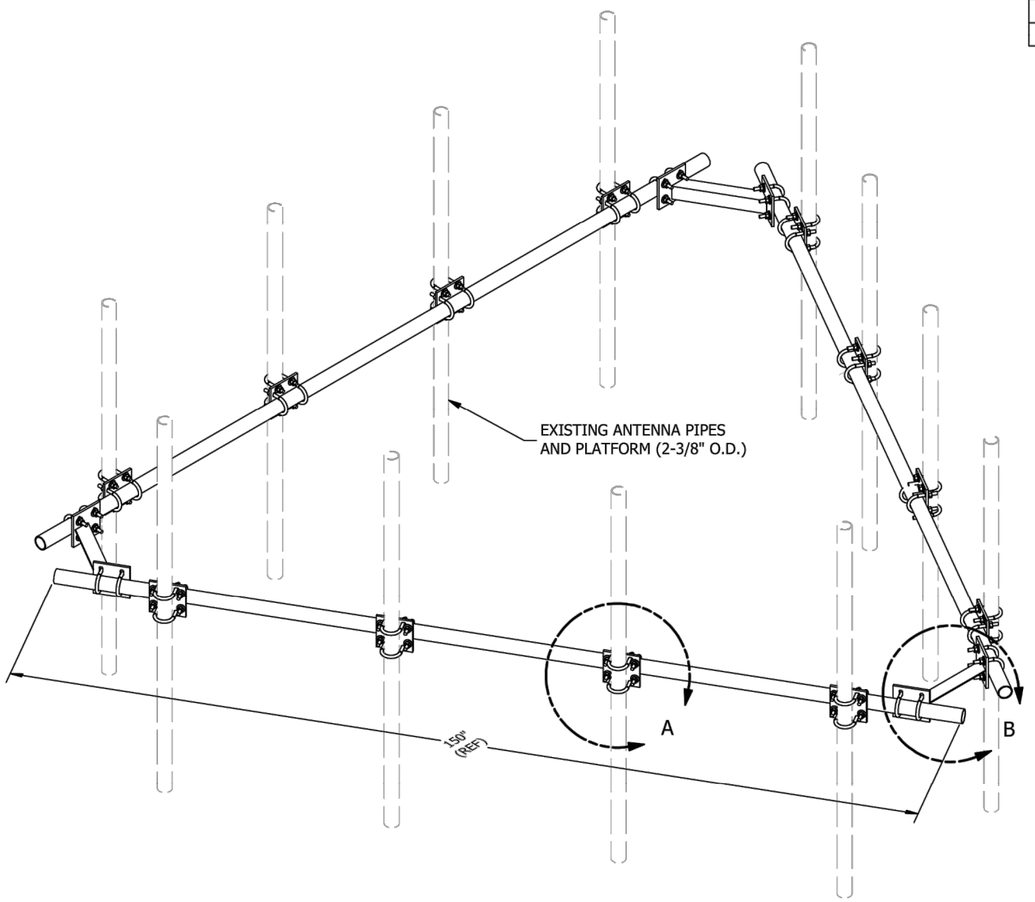
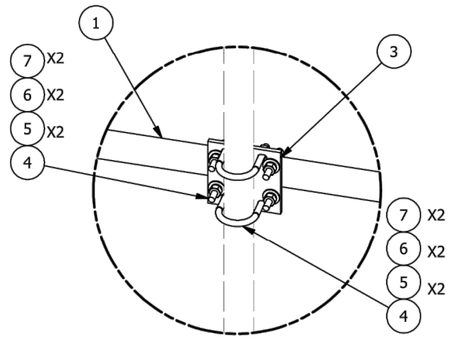
1749 DURHAM ROAD
MADISON, CT 06443

EQUIPMENT DETAILS I

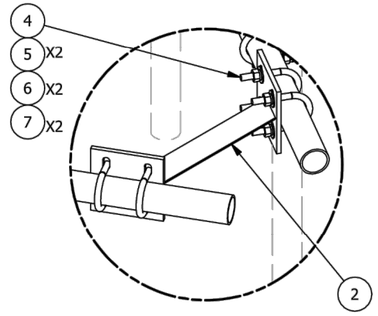
C-4

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





DETAIL A



DETAIL B

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

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 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			
HANDRAIL KIT FOR 12'-6" FACE			
CPD NO.	DRAWN BY KC8 5/30/2012	ENG. APPROVAL	PART NO. HRK12
CLASS 81	SUB 01	DRAWING USAGE CUSTOMER	CHECKED BY BMC 7/13/2014
			DWG. NO. HRK12

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 1 OF 1

NOT FOR CONSTRUCTION

7 HANDRAIL KIT DETAIL

SCALE: N.T.S.

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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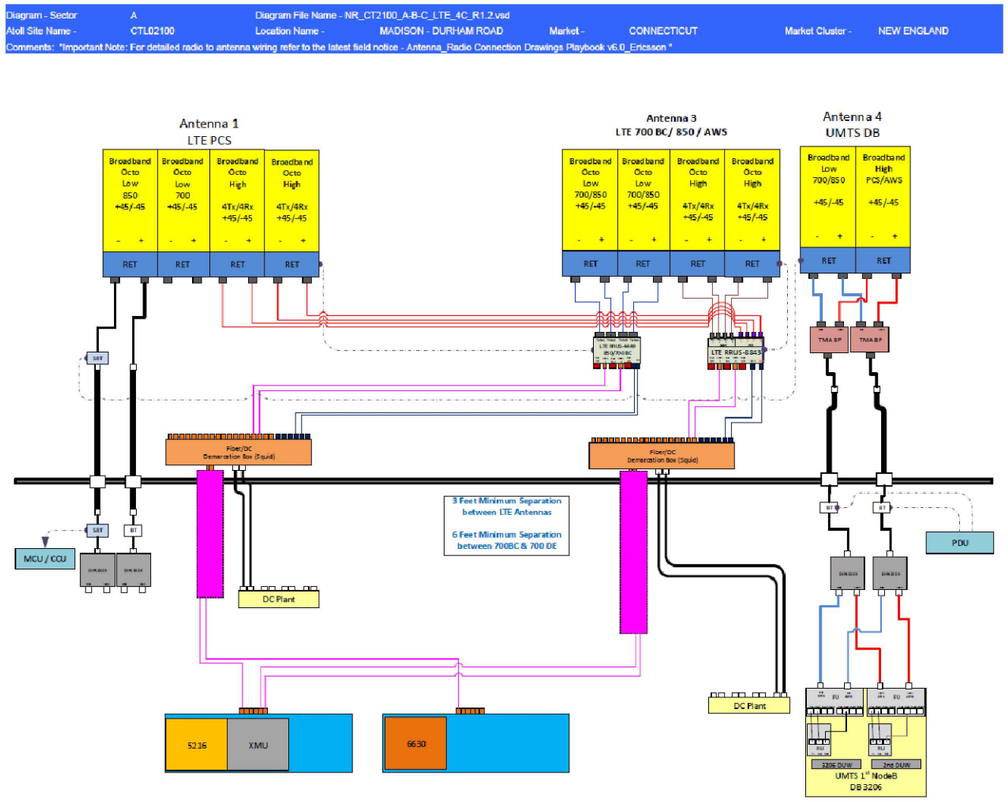
HANDRAIL KIT DETAIL

C-5

ANTENNA NUMBER	ANTENNA MODEL	ANTENNA BAND	AZIMUTH	ANTENNA CENTERLINE FROM GROUND	TMA's	RRH's	FEEDER	RAYCAP
A1	**OPA65R-BU6A (72.7"x11.9"x7.1")**	**LTE**	**0°**	**118'**	-	-	(1) FIBER (E) **(1) FIBER (P)** (2) 1-5/8" EXISTING (LENGTH @ 135')	**(1) RAYCAP DC6-48-60-18-8F**
A2	-	-	-	-	-	-	-	
A3	**800-10965 (78.7"x20"x6.9")**	**LTE**	**0°**	**118'**	-	**(1) B5/B12 4449 (850/700) (1) B2/B66A 8843 (AWS/PCS)**	-	(1) RAYCAP DC6-48-60-18-8C
A4	7770 (55"x11"x5")	UMTS	30°	118'	(2) LGP 21401	-	(2) DC (E) (2) DC (P) (2) 1-5/8" EXISTING (LENGTH @ 135')	
B1	**OPA65R-BU6A (72.7"x11.9"x7.1")**	**LTE**	**130°**	**118'**	-	-	(2) 1-5/8" EXISTING (LENGTH @ 135')	
B2	-	-	-	-	-	-	-	
B3	**800-10965 (78.7"x20"x6.9")**	**LTE**	**130°**	**118'**	-	**(1) B5/B12 4449 (850/700) (1) B2/B66A 8843 (AWS/PCS)**	-	
B4	7770 (55"x11"x5")	UMTS	150°	118'	(2) LGP 21401	-	(2) 1-5/8" EXISTING (LENGTH @ 135')	
G1	**OPA65R-BU6A (72.7"x11.9"x7.1")**	**LTE**	**240°**	**118'**	-	-	(2) 1-5/8" EXISTING (LENGTH @ 135')	
G2	-	-	-	-	-	-	-	
G3	**800-10965 (78.7"x20"x6.9")**	**LTE**	**240°**	**118'**	-	**(1) B5/B12 4449 (850/700) (1) B2/B66A 8843 (AWS/PCS)**	-	
G4	7770 (55"x11"x5")	UMTS	270°	118'	(2) LGP 21401	-	(2) 1-5/8" EXISTING (LENGTH @ 135')	

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

1 ANTENNA INFORMATION CHART — SCALE: NONE



2 RF EQUIPMENT SCHEMATIC — SCALE: NONE

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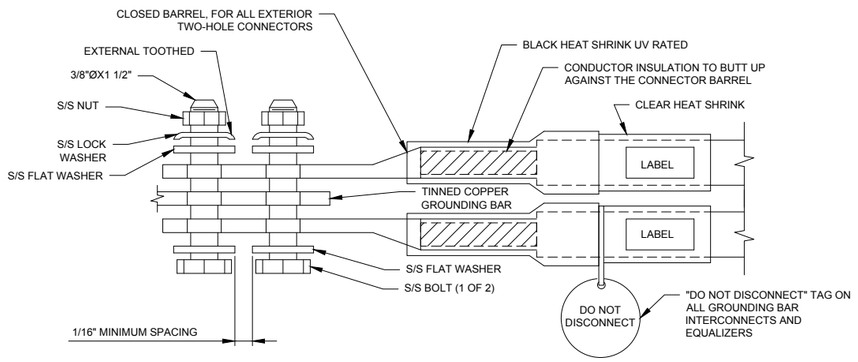
ANTENNA CHART & RF EQUIPMENT SCHEMATIC

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.

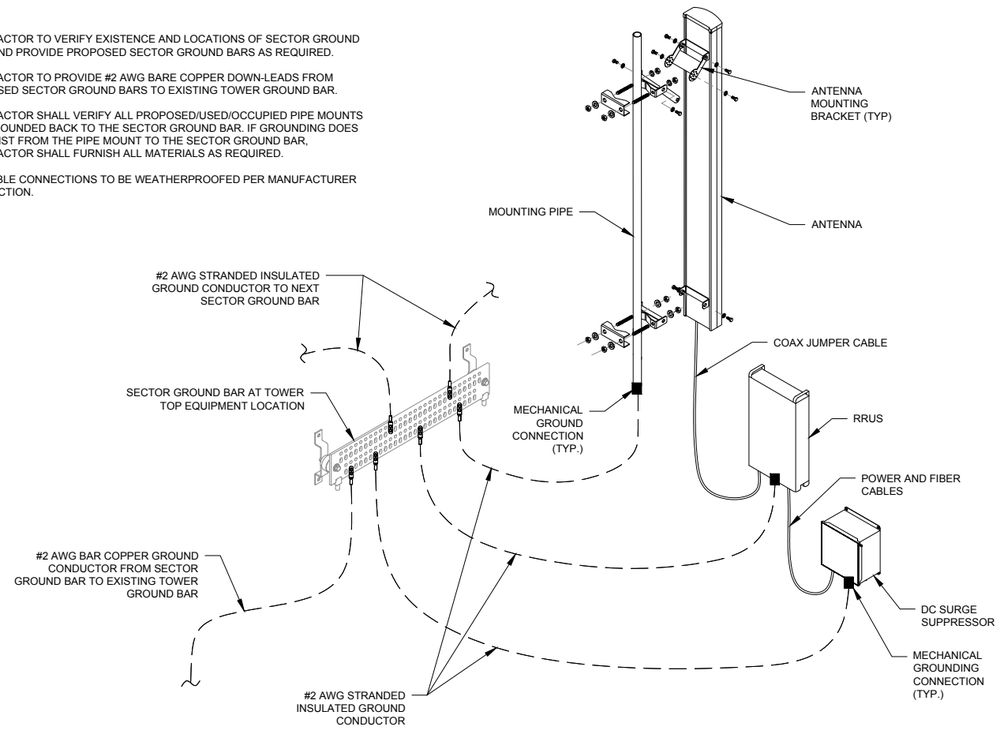
GROUNDING NOTES:

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

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: ERCC0004

DRAWN BY: DAP

CHECKED BY: CAT

SUBMITTALS

1	02/01/19	ISSUED FOR CONSTRUCTION
0	12/28/18	ISSUED FOR PERMITTING

FA# 10091767
SITE# CTL02100
MADISON DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443

GROUNDING DETAILS

G-1

Date: **February 05, 2019**

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

Engineered Tower Solutions, PLLC
3227 Wellington Court
Raleigh, NC 27615
(919) 782-2710

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	10091767
	Carrier Site Name:	MADISON - DURHAM ROAD
Crown Castle Designation:	**Crown Castle BU Number:**	846176
	Crown Castle Site Name:	MADISON DURHAM ROAD
	Crown Castle JDE Job Number:	548697
	Crown Castle Work Order Number:	1689986
	Crown Castle Order Number:	471842 Rev. 0
Engineering Firm Designation:	**Engineered Tower Solutions, PLLC Project Number:** 190688.14	
Site Data:	**1749 DURHAM ROAD, MADISON, New Haven County, CT** **Latitude *41° 23' 22.33"*, Longitude *-72° 38' 55.97"*** **119 Foot - Monopole Tower**	

Dear Heather Simeone,

Engineered Tower Solutions, PLLC 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 130 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by:

Tomas Martin Sosa
Structural Engineer I

Respectfully submitted by:

Frederic Bost, PE
President/Owner

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 119 ft. Monopole tower designed by Sabre Communications in December of 2005. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor:	1
Ice Thickness:	1.5 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)
119.0	119.0	1	SitePro	HRK12	2 4 12 1	3/8 3/4 1-5/8 2” Conduit
116.0	118.0	3	CCI Antennas	OPA65R-BU6A		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		3	Kathrein	80010965		
		3	Powerwave Technologies	7770.00		
		6	Powerwave Technologies	LGP21401		
		1	Raycap	DC6-48-60-18-8F		
	116.0	1	Crown Mounts	Platform Mount [LP 601-1]		
	115.0	1	Raycap	DC6-48-60-18-8F		

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)
108.0	108.0	3	Alcatel lucent	1900MHz RRH	-	-
		3	Alcatel lucent	800MHZ 2X50W RRH W/FILTER		
		1	Crown Mounts	Side Arm Mount [SO 102-3]		
106.0	110.0	3	Alcatel lucent	TD-RRH8x20-25	4	1-1/4
		3	RFS Celwave	APXVTM14-ALU-I20		
	108.0	3	RFS Celwave	APXVSPP18-C-A20		
	106.0	1	Crown Mounts	Platform Mount [LP 601-1]		
94.0	96.0	1	Antel	BXA-171063-12BF	13	1-5/8
		2	Antel	BXA-171063-8BF-EDIN-0		
		3	Antel	BXA-70063-6CF-EDIN-0		
		2	Decibel	DB846F65E-SX		
		3	Kathrein	742 213		
		4	RFS Celwave	APL868013		
		6	RFS Celwave	FD9R6004/2C-3L		
	94.0	3	Alcatel lucent	RRH2X40-AWS		
		1	RFS Celwave	TMA-DB-T1-6Z-8AB-0Z		
		1	Crown Mounts	Platform Mount [LP 601-1]		
55.0	55.0	1	PCTEL	GPS-TMG-HR-26NCM	1	1/2
		1	Crown Mounts	Side Arm Mount [SO 701-1]		
50.0	50.0	1	Crown Mounts	Side Arm Mount [SO 102-3]	-	-

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	SABRE COMMUNICATIONS	4552185	CCI Sites
4-TOWER MANUFACTURER DRAWINGS	SABRE COMMUNICATIONS	4516773	CCI Sites
4-GEOTECHNICAL REPORTS	TEP, INC	4301706	CCI Sites

3.1) Analysis Method

tnxTower (version 8.0.5.0), 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 and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Engineered Tower Solutions, PLLC 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	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	119 - 97.25	Pole	TP30.86x25.5x0.25	1	-7.746	1443.907	12.4	Pass
L2	97.25 - 48	Pole	TP42.47x29.374x0.313	2	-19.142	2489.823	39.4	Pass
L3	48 - 0	Pole	TP53.65x40.554x0.375	3	-34.972	3894.996	44.7	Pass
							Summary	
						Pole (L3)	44.7	Pass
						RATING =	**44.7**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	41.7	Pass
1	Base Plate	0	42.0	Pass
1	Base Foundation Soil Interaction	0	51.8	Pass
1	Base Foundation Structural	0	42.4	Pass

Structure Rating (max from all components) =	**51.8%**

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

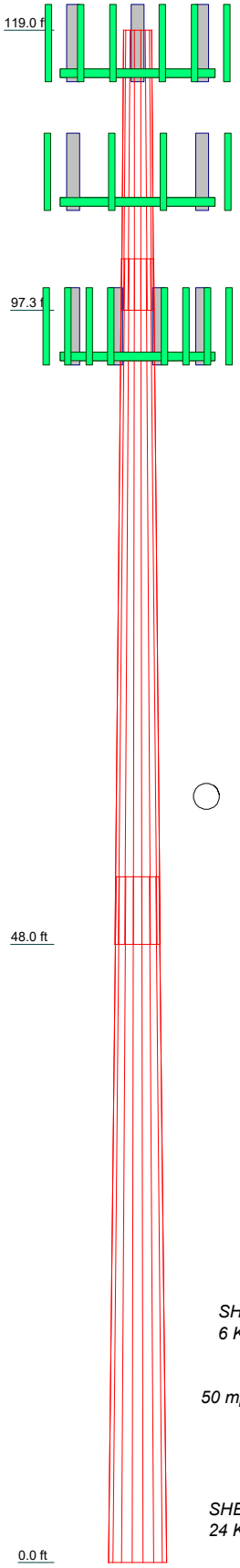
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3
Length (ft)	21.750	53.250	53.250
Number of Sides	18	18	18
Thickness (in)	0.250	0.313	0.375
Socket Length (ft)	4.000	5.250	
Top Dia (in)	25.500	29.374	40.554
Bot Dia (in)	30.860	42.470	53.650
Grade	A572-65		
Weight (K)	1.6	6.4	10.1



MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 130 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TIA-222-H Annex S
9. TOWER RATING: 44.7%

ALL REACTIONS ARE FACTORED

AXIAL 56 K

SHEAR 6 K *MOMENT 479 kip-ft*

TORQUE 0 kip-ft
50 mph WIND - 1.500 in ICE

AXIAL 35 K

SHEAR 24 K *MOMENT 2092 kip-ft*

TORQUE 1 kip-ft
REACTIONS - 130 mph WIND

Engineered Tower Solutions, PLLC
3227 Wellington Court
Raleigh, NC 27615
Phone: (919) 782-2710
FAX:

Job: ***BU# 846176***			
Project: ***ETS Proj. No. 190688.14***			
Client: Crown Castle	Drawn by: Tomas Martin Sosa	App'd:	
Code: TIA-222-H	Date: 02/05/19	Scale: NTS	
Path: C:\Users\Tomas.Sosa\Desktop\Towers\2019\0688\SA\Analysis\Tower\MADISON DURHAM ROAD_471842 Rev.0.eri		Dwg No. E-1	

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Tower base elevation above sea level: 343.000 ft.
Basic wind speed of 130 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.500 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
TIA-222-H Annex S.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.05.
Tower analysis based on target reliabilities in accordance with Annex S.
Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.
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	119.000-97.250	21.750	4.000	18	25.500	30.860	0.250	1.000	A572-65 (65 ksi)
L2	97.250-48.000	53.250	5.250	18	29.374	42.470	0.313	1.250	A572-65 (65 ksi)
L3	48.000-0.000	53.250		18	40.554	53.650	0.375	1.500	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	25.855	20.036	1613.870	8.964	12.954	124.585	3229.863	10.020	4.048	16.192
	31.297	24.289	2875.242	10.867	15.677	183.407	5754.267	12.147	4.991	19.965
L2	30.778	28.826	3075.812	10.317	14.922	206.124	6155.672	14.416	4.620	14.784
	43.077	41.815	9388.991	14.966	21.575	435.184	18790.337	20.911	6.925	22.159
L3	42.433	47.823	9753.687	14.263	20.601	473.449	19520.207	23.916	6.477	17.273
	54.420	63.411	22737.673	18.913	27.254	834.281	45505.265	31.711	8.782	23.42

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 119.000-97.250				1	1	1			
L2 97.250-48.000				1	1	1			
L3 48.000-0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight klf
*** Safety Line 3/8 ****	C	No	Surface Af (CaAa)	119.000 - 0.000	1	1	0.350 0.350	0.000	0.750	0.000

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 klf
LDF7-50A(1-5/8)	C	No	No	Inside Pole	116.000 - 0.000	12	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
FB-L98B-002-75000 (3/8)	C	No	No	Inside Pole	116.000 - 0.000	2	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	116.000 - 0.000	4	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
2" Rigid Conduit	C	No	No	Inside Pole	116.000 - 0.000	1	No Ice	0.000	0.003
							1/2" Ice	0.000	0.003
							1" Ice	0.000	0.003
							2" Ice	0.000	0.003
***									
LDF6-50A(1-1/4)	B	No	No	Inside Pole	106.000 - 0.000	3	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
HB114-21U3M12-X XXF(1-1/4)	B	No	No	Inside Pole	106.000 - 0.000	1	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
***									
561(1-5/8)	A	No	No	Inside Pole	94.000 - 0.000	13	No Ice	0.000	0.001
							1/2" Ice	0.000	0.001
							1" Ice	0.000	0.001
							2" Ice	0.000	0.001
***									
LDF4-50A(1/2)	B	No	No	Inside Pole	55.000 - 0.000	1	No Ice	0.000	0.000
							1/2" Ice	0.000	0.000
							1" Ice	0.000	0.000
							2" Ice	0.000	0.000
****									

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	119.000-97.250	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.026
		C	0.000	0.000	0.000	0.000	0.288
L2	97.250-48.000	A	0.000	0.000	0.000	0.000	0.807
		B	0.000	0.000	0.000	0.000	0.150
		C	0.000	0.000	0.000	0.000	0.754
L3	48.000-0.000	A	0.000	0.000	0.000	0.000	0.842
		B	0.000	0.000	0.000	0.000	0.152
		C	0.000	0.000	0.000	0.000	0.734

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	119.000-97.250	A	1.435	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.026
		C		0.000	0.000	6.243	0.000	0.363
L2	97.250-48.000	A	1.378	0.000	0.000	0.000	0.000	0.807
		B		0.000	0.000	0.000	0.000	0.150
		C		0.000	0.000	14.137	0.000	0.923
L3	48.000-0.000	A	1.231	0.000	0.000	0.000	0.000	0.842
		B		0.000	0.000	0.000	0.000	0.152
		C		0.000	0.000	13.231	0.000	0.888

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	119.000-97.250	0.000	0.000	-1.412	0.335
L2	97.250-48.000	0.000	0.000	-1.465	0.346
L3	48.000-0.000	0.000	0.000	-1.457	0.342

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

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	14	Safety Line 3/8	97.25 - 119.00	1.0000	1.0000
L2	14	Safety Line 3/8	48.00 - 97.25	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice	5.746 6.179 6.607	4.254 5.014 5.711	0.055 0.103 0.157

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	7.488	7.155	0.287
7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488	4.254 5.014 5.711 7.155	0.055 0.103 0.157 0.287
7770.00 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.746 6.179 6.607 7.488	4.254 5.014 5.711 7.155	0.055 0.103 0.157 0.287
OPA65R-BU6A w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.088 8.642 9.160 10.221	7.654 8.826 9.710 11.508	0.083 0.154 0.232 0.417
OPA65R-BU6A w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.088 8.642 9.160 10.221	7.654 8.826 9.710 11.508	0.083 0.154 0.232 0.417
OPA65R-BU6A w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.088 8.642 9.160 10.221	7.654 8.826 9.710 11.508	0.083 0.154 0.232 0.417
80010965 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.051 14.688 15.303 16.530	7.628 8.903 9.963 11.925	0.125 0.222 0.327 0.569
80010965 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.051 14.688 15.303 16.530	7.628 8.903 9.963 11.925	0.125 0.222 0.327 0.569
80010965 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	14.051 14.688 15.303 16.530	7.628 8.903 9.963 11.925	0.125 0.222 0.327 0.569
(2) LGP21401	A	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.104 1.239 1.381 1.688	0.347 0.442 0.544 0.770	0.014 0.021 0.030 0.055
(2) LGP21401	B	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.104 1.239 1.381 1.688	0.347 0.442 0.544 0.770	0.014 0.021 0.030 0.055
(2) LGP21401	C	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.104 1.239 1.381 1.688	0.347 0.442 0.544 0.770	0.014 0.021 0.030 0.055
DC6-48-60-18-8F	A	From Leg	4.000 0.000 -1.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.212 1.892 2.105 2.570	1.212 1.892 2.105 2.570	0.033 0.055 0.080 0.138
RRUS 4449 B5/B12	A	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718	1.408 1.564 1.727 2.075	0.071 0.090 0.111 0.163
RRUS 4449 B5/B12	B	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718	1.408 1.564 1.727 2.075	0.071 0.090 0.111 0.163

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
RRUS 4449 B5/B12	C	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.968 2.144 2.328 2.718	1.408 1.564 1.727 2.075	0.071 0.090 0.111 0.163
RRUS 8843 B2/B66A	A	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.072 0.090 0.110 0.159
RRUS 8843 B2/B66A	B	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.072 0.090 0.110 0.159
RRUS 8843 B2/B66A	C	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.639 1.799 1.966 2.323	1.353 1.500 1.655 1.986	0.072 0.090 0.110 0.159
DC6-48-60-18-8F	C	From Leg	2.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.212 1.892 2.105 2.570	1.212 1.892 2.105 2.570	0.033 0.055 0.080 0.138
6' x 2" Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
6' x 2" Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
Platform Mount [LP 601-1]	C	None		0.000	116.000	No Ice 1/2" Ice 1" Ice 2" Ice	28.470 33.590 38.710 48.950	28.470 33.590 38.710 48.950	1.122 1.514 1.905 2.689
Miscellaneous [NA 507-1]	C	None		0.000	119.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.800 6.700 8.600 12.400	4.800 6.700 8.600 12.400	0.245 0.294 0.343 0.441
***									
1900MHz RRH	A	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.492 2.695 2.906 3.351	3.258 3.484 3.718 4.206	0.044 0.075 0.110 0.192
1900MHz RRH	B	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.492 2.695 2.906 3.351	3.258 3.484 3.718 4.206	0.044 0.075 0.110 0.192
1900MHz RRH	C	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.492 2.695 2.906 3.351	3.258 3.484 3.718 4.206	0.044 0.075 0.110 0.192
800MHZ 2X50W RRH W/FILTER	A	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172

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
800MHZ 2X50W RRH W/FILTER	B	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
(2) 6' x 2" Mount Pipe	A	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
(2) 6' x 2" Mount Pipe	B	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
(2) 6' x 2" Mount Pipe	C	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
800MHZ 2X50W RRH W/FILTER	C	From Leg	1.000 0.000 0.000	0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.058 2.240 2.429 2.829	1.932 2.109 2.293 2.684	0.064 0.086 0.111 0.172
Side Arm Mount [SO 102-3]	C	None		0.000	108.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.000 3.480 3.960 4.920	3.000 3.480 3.960 4.920	0.081 0.111 0.141 0.201
***									
APXVSPP18-C-A20 w/Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.262 8.822 9.346 10.418	6.946 8.127 9.021 10.844	0.083 0.151 0.227 0.406
APXVSPP18-C-A20 w/Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.262 8.822 9.346 10.418	6.946 8.127 9.021 10.844	0.083 0.151 0.227 0.406
APXVSPP18-C-A20 w/Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	8.262 8.822 9.346 10.418	6.946 8.127 9.021 10.844	0.083 0.151 0.227 0.406
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.000 0.000 4.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.580 7.031 7.473 8.385	4.959 5.754 6.472 7.941	0.077 0.132 0.193 0.339
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.000 0.000 4.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.580 7.031 7.473 8.385	4.959 5.754 6.472 7.941	0.077 0.132 0.193 0.339
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.000 0.000 4.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	6.580 7.031 7.473 8.385	4.959 5.754 6.472 7.941	0.077 0.132 0.193 0.339
TD-RRH8x20-25	A	From Leg	4.000 0.000 4.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.704 3.946 4.196 4.717	1.294 1.465 1.642 2.019	0.066 0.090 0.117 0.183
TD-RRH8x20-25	B	From Leg	4.000 0.000 4.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.704 3.946 4.196 4.717	1.294 1.465 1.642 2.019	0.066 0.090 0.117 0.183

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
TD-RRH8x20-25	C	From Leg	4.000 0.000 4.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.704 3.946 4.196 4.717	1.294 1.465 1.642 2.019	0.066 0.090 0.117 0.183
(2) 6' x 2" Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
(2) 6' x 2" Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
(2) 6' x 2" Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090
Platform Mount [LP 601-1]	C	None		0.000	106.000	No Ice 1/2" Ice 1" Ice 2" Ice	28.470 33.590 38.710 48.950	28.470 33.590 38.710 48.950	1.122 1.514 1.905 2.689
***									
(2) APL868013 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.104 3.476 3.848 4.604	4.802 5.416 6.040 7.337	0.025 0.063 0.108 0.216
(2) APL868013 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.104 3.476 3.848 4.604	4.802 5.416 6.040 7.337	0.025 0.063 0.108 0.216
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.179 3.555 3.930 4.692	3.353 3.971 4.595 5.893	0.029 0.061 0.099 0.193
BXA-171063-8BF-EDIN-0 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	3.179 3.555 3.930 4.692	3.353 3.971 4.595 5.893	0.029 0.061 0.099 0.193
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.042 0.103 0.171 0.335
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.042 0.103 0.171 0.335
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	7.806 8.357 8.872 9.927	5.801 6.953 7.819 9.601	0.042 0.103 0.171 0.335
(2) DB846F65E-SX w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	12.999 13.602 14.171 15.330	8.113 9.304 10.209 12.014	0.040 0.136 0.241 0.482
BXA-171063-12BF w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.971 5.521 6.036 7.091	5.228 6.389 7.261 9.046	0.040 0.086 0.139 0.271

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) FD9R6004/2C-3L	A	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.314 0.386 0.466 0.647	0.076 0.119 0.169 0.294	0.003 0.005 0.009 0.020
(2) FD9R6004/2C-3L	B	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.314 0.386 0.466 0.647	0.076 0.119 0.169 0.294	0.003 0.005 0.009 0.020
(2) FD9R6004/2C-3L	C	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.314 0.386 0.466 0.647	0.076 0.119 0.169 0.294	0.003 0.005 0.009 0.020
742 213 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.373 5.950 6.501 7.611	4.620 6.000 6.982 8.852	0.049 0.094 0.146 0.277
742 213 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.373 5.950 6.501 7.611	4.620 6.000 6.982 8.852	0.049 0.094 0.146 0.277
742 213 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.373 5.950 6.501 7.611	4.620 6.000 6.982 8.852	0.049 0.094 0.146 0.277
RRH2X40-AWS	A	From Leg	4.000 0.000 0.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.161 2.360 2.565 2.999	1.420 1.590 1.768 2.143	0.044 0.061 0.082 0.132
RRH2X40-AWS	B	From Leg	4.000 0.000 0.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.161 2.360 2.565 2.999	1.420 1.590 1.768 2.143	0.044 0.061 0.082 0.132
RRH2X40-AWS	C	From Leg	4.000 0.000 0.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	2.161 2.360 2.565 2.999	1.420 1.590 1.768 2.143	0.044 0.061 0.082 0.132
TMA-DB-T1-6Z-8AB-0Z	A	From Leg	4.000 0.000 0.000	0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	4.800 5.070 5.348 5.926	2.000 2.193 2.393 2.815	0.044 0.080 0.120 0.213
Platform Mount [LP 601-1]	C	None		0.000	94.000	No Ice 1/2" Ice 1" Ice 2" Ice	28.470 33.590 38.710 48.950	28.470 33.590 38.710 48.950	1.122 1.514 1.905 2.689
***									
GPS-TMG-HR-26NCM	A	From Leg	3.000 0.000 0.000	0.000	55.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.133 0.183 0.239 0.375	0.133 0.183 0.239 0.375	0.001 0.002 0.005 0.014
Side Arm Mount [SO 701-1]	A	From Leg	1.500 0.000 0.000	0.000	55.000	No Ice 1/2" Ice 1" Ice 2" Ice	0.850 1.140 1.430 2.010	1.670 2.340 3.010 4.350	0.065 0.079 0.093 0.121
***									
Side Arm Mount [SO 102-3]	C	None		0.000	50.000	No Ice 1/2" Ice 1" Ice	3.000 3.480 3.960	3.000 3.480 3.960	0.081 0.111 0.141

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	4.920	4.920	0.201

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
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

Comb. No.	Description
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	119 - 97.25	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-17.108	0.381	0.320
			Max. Mx	20	-7.742	124.375	0.100
			Max. My	2	-7.745	0.090	124.380
			Max. Vy	20	-10.800	124.375	0.100
			Max. Vx	2	-10.798	0.090	124.380
			Max. Torque	18			-0.212
L2	97.25 - 48	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-36.024	2.658	0.176
			Max. Mx	20	-19.147	926.893	-7.734
			Max. My	2	-19.154	-7.912	921.338
			Max. Vy	20	-19.371	926.893	-7.734
			Max. Vx	2	-19.214	-7.912	921.338
			Max. Torque	3			1.424
L3	48 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	26	-55.944	2.910	-0.187
			Max. Mx	20	-34.972	2079.371	-17.905
			Max. My	2	-34.972	-18.033	2065.483
			Max. Vy	20	-23.802	2079.371	-17.905
			Max. Vx	2	-23.649	-18.033	2065.483
			Max. Torque	3			1.422

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	35	55.944	4.767	-2.755
	Max. H_x	20	34.986	23.782	-0.188
	Max. H_z	2	34.986	-0.188	23.628
	Max. M_x	2	2065.483	-0.188	23.628
	Max. M_z	8	2078.609	-23.782	0.188
	Max. Torsion	3	1.422	-0.188	23.628
	Min. Vert	13	26.240	-11.728	-20.369
	Min. H_x	8	34.986	-23.782	0.188
	Min. H_z	14	34.986	0.188	-23.628
	Min. M_x	14	-2064.471	0.188	-23.628
	Min. M_z	20	-2079.371	23.782	-0.188
	Min. Torsion	15	-1.410	0.188	-23.628

Tower Mast Reaction Summary

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead Only	29.155	0.000	0.000	-0.409	0.307	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	34.986	0.188	-23.628	-2065.483	-18.034	-1.421
0.9 Dead+1.0 Wind 0 deg - No Ice	26.240	0.188	-23.628	-2054.158	-18.032	-1.422
1.2 Dead+1.0 Wind 30 deg - No Ice	34.986	12.054	-20.557	-1798.023	-1055.059	-1.222
0.9 Dead+1.0 Wind 30 deg - No Ice	26.240	12.054	-20.557	-1788.148	-1049.437	-1.223
1.2 Dead+1.0 Wind 60 deg - No Ice	34.986	20.690	-11.977	-1048.931	-1809.277	-0.691
0.9 Dead+1.0 Wind 60 deg - No Ice	26.240	20.690	-11.977	-1043.118	-1799.566	-0.692
1.2 Dead+1.0 Wind 90 deg - No Ice	34.986	23.782	-0.188	-18.919	-2078.609	0.024
0.9 Dead+1.0 Wind 90 deg - No Ice	26.240	23.782	-0.188	-18.690	-2067.439	0.024
1.2 Dead+1.0 Wind 120 deg - No Ice	34.986	20.502	11.652	1016.038	-1790.884	0.730
0.9 Dead+1.0 Wind 120 deg - No Ice	26.240	20.502	11.652	1010.655	-1781.272	0.730
1.2 Dead+1.0 Wind 150 deg - No Ice	34.986	11.728	20.369	1778.617	-1023.180	1.235
0.9 Dead+1.0 Wind 150 deg - No Ice	26.240	11.728	20.369	1769.100	-1017.728	1.235
1.2 Dead+1.0 Wind 180 deg - No Ice	34.986	-0.188	23.628	2064.471	18.791	1.410
0.9 Dead+1.0 Wind 180 deg - No Ice	26.240	-0.188	23.628	2053.405	18.595	1.410
1.2 Dead+1.0 Wind 210 deg - No Ice	34.986	-12.054	20.557	1797.013	1055.818	1.211
0.9 Dead+1.0 Wind 210 deg - No Ice	26.240	-12.054	20.557	1787.397	1050.001	1.211
1.2 Dead+1.0 Wind 240 deg - No Ice	34.986	-20.690	11.977	1047.920	1810.038	0.692
0.9 Dead+1.0 Wind 240 deg - No Ice	26.240	-20.690	11.977	1042.366	1800.132	0.692
1.2 Dead+1.0 Wind 270 deg - No Ice	34.986	-23.782	0.188	17.905	2079.371	-0.013
0.9 Dead+1.0 Wind 270 deg - No Ice	26.240	-23.782	0.188	17.936	2068.005	-0.013
1.2 Dead+1.0 Wind 300 deg - No Ice	34.986	-20.502	-11.652	-1017.053	1791.644	-0.718
0.9 Dead+1.0 Wind 300 deg - No Ice	26.240	-20.502	-11.652	-1011.410	1781.837	-0.718
1.2 Dead+1.0 Wind 330 deg - No Ice	34.986	-11.728	-20.369	-1779.632	1023.938	-1.235
0.9 Dead+1.0 Wind 330 deg - No Ice	26.240	-11.728	-20.369	-1769.855	1018.291	-1.236
1.2 Dead+1.0 Ice+1.0 Temp	55.944	-0.000	0.000	0.187	2.910	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	55.944	0.025	-5.466	-472.593	0.566	-0.293
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	55.944	2.766	-4.746	-410.481	-236.465	-0.268
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	55.944	4.767	-2.755	-238.331	-409.325	-0.172
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	55.944	5.490	-0.025	-2.270	-471.697	-0.029

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	55.944	4.742	2.712	234.450	-406.867	0.121
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	55.944	2.724	4.722	408.400	-232.207	0.239
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	55.944	-0.025	5.466	472.970	5.483	0.293
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	55.944	-2.766	4.746	410.858	242.515	0.268
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	55.944	-4.767	2.755	238.708	415.375	0.172
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	55.944	-5.490	0.025	2.647	477.746	0.030
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	55.944	-4.742	-2.712	-234.073	412.917	-0.121
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	55.944	-2.724	-4.722	-408.023	238.257	-0.239
Dead+Wind 0 deg - Service	29.155	0.038	-4.740	-413.347	-3.366	-0.285
Dead+Wind 30 deg - Service	29.155	2.418	-4.124	-359.866	-210.738	-0.245
Dead+Wind 60 deg - Service	29.155	4.151	-2.403	-210.072	-361.558	-0.139
Dead+Wind 90 deg - Service	29.155	4.771	-0.038	-4.102	-415.415	0.004
Dead+Wind 120 deg - Service	29.155	4.113	2.338	202.855	-357.877	0.146
Dead+Wind 150 deg - Service	29.155	2.353	4.087	355.344	-204.361	0.248
Dead+Wind 180 deg - Service	29.155	-0.038	4.740	412.507	3.998	0.285
Dead+Wind 210 deg - Service	29.155	-2.418	4.124	359.026	211.370	0.244
Dead+Wind 240 deg - Service	29.155	-4.151	2.403	209.232	362.191	0.139
Dead+Wind 270 deg - Service	29.155	-4.771	0.038	3.262	416.047	-0.004
Dead+Wind 300 deg - Service	29.155	-4.113	-2.338	-203.695	358.509	-0.145
Dead+Wind 330 deg - Service	29.155	-2.353	-4.087	-356.184	204.993	-0.248

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-29.155	0.000	0.000	29.155	0.000	0.000%
2	0.188	-34.986	-23.628	-0.188	34.986	23.628	0.000%
3	0.188	-26.240	-23.628	-0.188	26.240	23.628	0.000%
4	12.054	-34.986	-20.557	-12.054	34.986	20.557	0.000%
5	12.054	-26.240	-20.557	-12.054	26.240	20.557	0.000%
6	20.690	-34.986	-11.977	-20.690	34.986	11.977	0.000%
7	20.690	-26.240	-11.977	-20.690	26.240	11.977	0.000%
8	23.782	-34.986	-0.188	-23.782	34.986	0.188	0.000%
9	23.782	-26.240	-0.188	-23.782	26.240	0.188	0.000%
10	20.502	-34.986	11.652	-20.502	34.986	-11.652	0.000%
11	20.502	-26.240	11.652	-20.502	26.240	-11.652	0.000%
12	11.728	-34.986	20.369	-11.728	34.986	-20.369	0.000%
13	11.728	-26.240	20.369	-11.728	26.240	-20.369	0.000%
14	-0.188	-34.986	23.628	0.188	34.986	-23.628	0.000%
15	-0.188	-26.240	23.628	0.188	26.240	-23.628	0.000%
16	-12.054	-34.986	20.557	12.054	34.986	-20.557	0.000%
17	-12.054	-26.240	20.557	12.054	26.240	-20.557	0.000%
18	-20.690	-34.986	11.977	20.690	34.986	-11.977	0.000%
19	-20.690	-26.240	11.977	20.690	26.240	-11.977	0.000%
20	-23.782	-34.986	0.188	23.782	34.986	-0.188	0.000%
21	-23.782	-26.240	0.188	23.782	26.240	-0.188	0.000%
22	-20.502	-34.986	-11.652	20.502	34.986	11.652	0.000%
23	-20.502	-26.240	-11.652	20.502	26.240	11.652	0.000%
24	-11.728	-34.986	-20.369	11.728	34.986	20.369	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
25	-11.728	-26.240	-20.369	11.728	26.240	20.369	0.000%
26	0.000	-55.944	0.000	0.000	55.944	0.000	0.000%
27	0.025	-55.944	-5.466	-0.025	55.944	5.466	0.000%
28	2.766	-55.944	-4.746	-2.766	55.944	4.746	0.000%
29	4.767	-55.944	-2.755	-4.767	55.944	2.755	0.000%
30	5.490	-55.944	-0.025	-5.490	55.944	0.025	0.000%
31	4.742	-55.944	2.712	-4.742	55.944	-2.712	0.000%
32	2.724	-55.944	4.722	-2.724	55.944	-4.722	0.000%
33	-0.025	-55.944	5.466	0.025	55.944	-5.466	0.000%
34	-2.766	-55.944	4.746	2.766	55.944	-4.746	0.000%
35	-4.767	-55.944	2.755	4.767	55.944	-2.755	0.000%
36	-5.490	-55.944	0.025	5.490	55.944	-0.025	0.000%
37	-4.742	-55.944	-2.712	4.742	55.944	2.712	0.000%
38	-2.724	-55.944	-4.722	2.724	55.944	4.722	0.000%
39	0.038	-29.155	-4.740	-0.038	29.155	4.740	0.000%
40	2.418	-29.155	-4.124	-2.418	29.155	4.124	0.000%
41	4.151	-29.155	-2.403	-4.151	29.155	2.403	0.000%
42	4.771	-29.155	-0.038	-4.771	29.155	0.038	0.000%
43	4.113	-29.155	2.338	-4.113	29.155	-2.338	0.000%
44	2.353	-29.155	4.087	-2.353	29.155	-4.087	0.000%
45	-0.038	-29.155	4.740	0.038	29.155	-4.740	0.000%
46	-2.418	-29.155	4.124	2.418	29.155	-4.124	0.000%
47	-4.151	-29.155	2.403	4.151	29.155	-2.403	0.000%
48	-4.771	-29.155	0.038	4.771	29.155	-0.038	0.000%
49	-4.113	-29.155	-2.338	4.113	29.155	2.338	0.000%
50	-2.353	-29.155	-4.087	2.353	29.155	4.087	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00028252
3	Yes	4	0.00000001	0.00018199
4	Yes	5	0.00000001	0.00007013
5	Yes	5	0.00000001	0.00003217
6	Yes	5	0.00000001	0.00007584
7	Yes	5	0.00000001	0.00003491
8	Yes	4	0.00000001	0.00005077
9	Yes	4	0.00000001	0.00002975
10	Yes	5	0.00000001	0.00007330
11	Yes	5	0.00000001	0.00003391
12	Yes	5	0.00000001	0.00006680
13	Yes	5	0.00000001	0.00003077
14	Yes	4	0.00000001	0.00039609
15	Yes	4	0.00000001	0.00025433
16	Yes	5	0.00000001	0.00007767
17	Yes	5	0.00000001	0.00003583
18	Yes	5	0.00000001	0.00007167
19	Yes	5	0.00000001	0.00003289
20	Yes	4	0.00000001	0.00007956
21	Yes	4	0.00000001	0.00004985
22	Yes	5	0.00000001	0.00006842
23	Yes	5	0.00000001	0.00003149
24	Yes	5	0.00000001	0.00007524
25	Yes	5	0.00000001	0.00003484

26	Yes	4	0.00000001	0.00001119
27	Yes	4	0.00000001	0.00079088
28	Yes	4	0.00000001	0.00086721
29	Yes	4	0.00000001	0.00086994
30	Yes	4	0.00000001	0.00078284
31	Yes	4	0.00000001	0.00085987
32	Yes	4	0.00000001	0.00085752
33	Yes	4	0.00000001	0.00079138
34	Yes	4	0.00000001	0.00088876
35	Yes	4	0.00000001	0.00088718
36	Yes	4	0.00000001	0.00080172
37	Yes	4	0.00000001	0.00087737
38	Yes	4	0.00000001	0.00087856
39	Yes	4	0.00000001	0.00001582
40	Yes	4	0.00000001	0.00002791
41	Yes	4	0.00000001	0.00003452
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00003380
44	Yes	4	0.00000001	0.00002635
45	Yes	4	0.00000001	0.00001674
46	Yes	4	0.00000001	0.00003815
47	Yes	4	0.00000001	0.00002856
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00002710
50	Yes	4	0.00000001	0.00003763

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 97.25	7.633	47	0.526	0.001
L2	101.25 - 48	5.703	47	0.505	0.001
L3	53.25 - 0	1.598	47	0.276	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.000	Miscellaneous [NA 507-1]	47	7.633	0.526	0.001	84223
116.000	7770.00 w/ Mount Pipe	47	7.303	0.524	0.001	84223
108.000	1900MHz RRH	47	6.427	0.516	0.001	38283
106.000	APXVSPP18-C-A20 w/Mount Pipe	47	6.210	0.513	0.001	32394
94.000	(2) APL868013 w/ Mount Pipe	47	4.950	0.484	0.001	18240
55.000	GPS-TMG-HR-26NCM	47	1.700	0.286	0.000	8124
50.000	Side Arm Mount [SO 102-3]	47	1.420	0.258	0.000	8386

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119 - 97.25	38.175	18	2.629	0.006
L2	101.25 - 48	28.523	18	2.525	0.006
L3	53.25 - 0	7.991	18	1.383	0.002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
119.000	Miscellaneous [NA 507-1]	18	38.175	2.629	0.006	17008
116.000	7770.00 w/ Mount Pipe	18	36.522	2.619	0.006	17008
108.000	1900MHz RRH	18	32.144	2.582	0.006	7730
106.000	APXVSPP18-C-A20 w/Mount Pipe	18	31.062	2.568	0.006	6541
94.000	(2) APL868013 w/ Mount Pipe	18	24.761	2.423	0.005	3666
55.000	GPS-TMG-HR-26NCM	18	8.503	1.434	0.002	1626
50.000	Side Arm Mount [SO 102-3]	18	7.103	1.292	0.002	1678

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	119 - 97.25 (1)	TP30.86x25.5x0.25	21.750	0.000	0.0	23.507	-7.746	1375.150	0.006
L2	97.25 - 48 (2)	TP42.47x29.374x0.313	53.250	0.000	0.0	40.534	-19.142	2371.260	0.008
L3	48 - 0 (3)	TP53.65x40.554x0.375	53.250	0.000	0.0	63.411	-34.972	3709.520	0.009

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	119 - 97.25 (1)	TP30.86x25.5x0.25	124.400	1000.792	0.124	0.000	1000.792	0.000
L2	97.25 - 48 (2)	TP42.47x29.374x0.313	932.300	2304.575	0.405	0.000	2304.575	0.000
L3	48 - 0 (3)	TP53.65x40.554x0.375	2091.500	4556.425	0.459	0.000	4556.425	0.000

Pole Shear Design Data

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

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	119 - 97.25 (1)	TP30.86x25.5x0.25	10.797	412.545	0.026	0.082	1070.283	0.000
L2	97.25 - 48 (2)	TP42.47x29.374x0.313	19.498	711.378	0.027	0.692	2545.925	0.000
L3	48 - 0 (3)	TP53.65x40.554x0.375	23.927	1112.860	0.022	0.692	5192.092	0.000

Pole Interaction Design Data

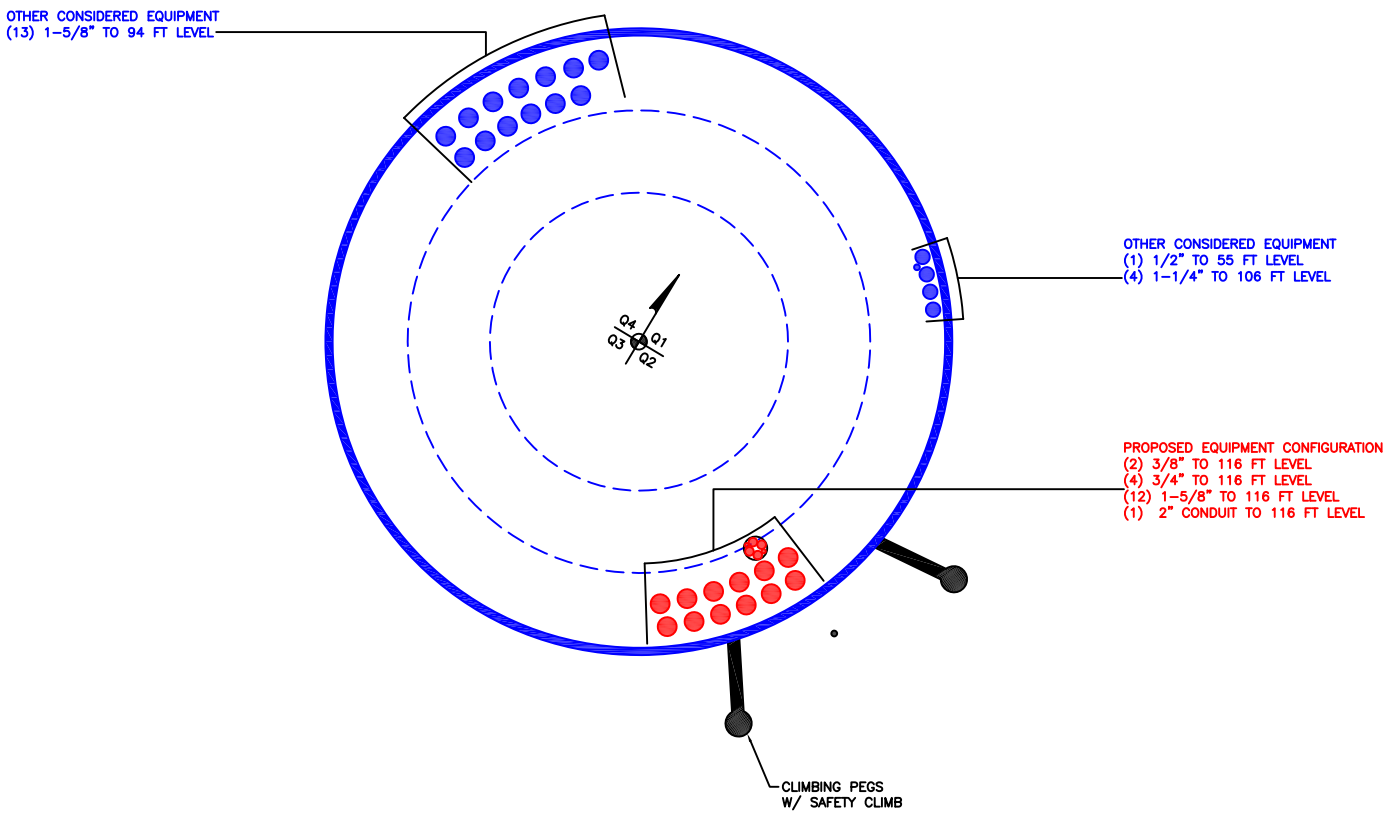
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	119 - 97.25 (1)	0.006	0.124	0.000	0.026	0.000	0.131	1.050	4.8.2
L2	97.25 - 48 (2)	0.008	0.405	0.000	0.027	0.000	0.413	1.050	4.8.2
L3	48 - 0 (3)	0.009	0.459	0.000	0.022	0.000	0.469	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	119 - 97.25	Pole	TP30.86x25.5x0.25	1	-7.746	1443.907	12.4	Pass
L2	97.25 - 48	Pole	TP42.47x29.374x0.313	2	-19.142	2489.823	39.4	Pass
L3	48 - 0	Pole	TP53.65x40.554x0.375	3	-34.972	3894.996	44.7	Pass
							Summary	
						Pole (L3)	44.7	Pass
						RATING =	**44.7**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 846176 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

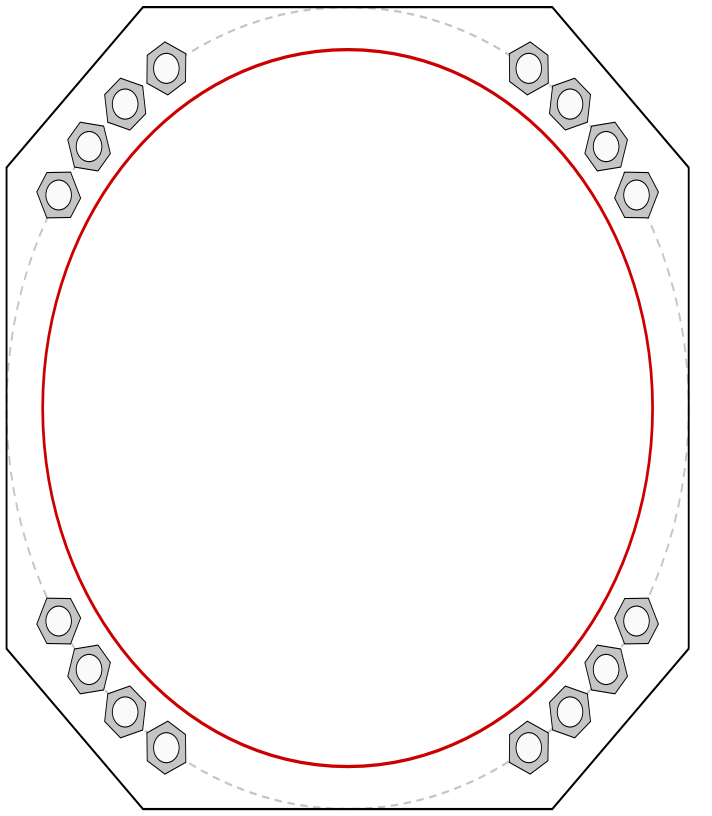
Monopole Base Plate Connection

Site Info	
BU #	846176
Site Name	ADISON DURHAM RO
Order #	471842 Rev.0

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2.25

Applied Loads	
Moment (kip-ft)	2091.50
Axial Force (kips)	34.97
Shear Force (kips)	23.93

**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 60" BC

Base Plate Data

60" OD x 2.5" Plate (A572-60; Fy=60 ksi, Fu=75 ksi)

Stiffener Data

N/A

Pole Data

53.65" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_c = 106.7	ϕPn_c = 243.75	**Stress Rating**
Vu = 1.5	ϕVn = 73.13	**41.7%**
Mu = n/a	ϕMn = n/a	**Pass**

Base Plate Summary

Max Stress (ksi):	23.81	(Flexural)
Allowable Stress (ksi):	54	
Stress Rating:	**42.0%**	**Pass**

Pier and Pad Foundation

BU # :	846176
Site Name:	MADISON DURHA
App. Number:	471842 Rev.0

TIA-222 Revision:	H
Tower Type:	Monopole

Top & Bot. Pad Rein. Different?:	☐
Block Foundation?:	☑

Superstructure Analysis Reactions

Compression, P_{comp}:	35	kips
Base Shear, Vu_comp:	24	kips
Moment, M_u:	2092	ft-kips
Tower Height, **H**:	119	ft
BP Dist. Above Fdn, bp_{dist}:	4.5	in
Bolt Circle / Bearing Plate Width, **BC**:	60	in

Foundation Analysis Checks

	Capacity	Demand	Rating*	Check
Lateral (Sliding) (kips)	62.42	24.00	**36.6%**	**Pass**
Bearing Pressure (ksf)	15.34	0.74	**4.9%**	**Pass**
*Overturning (kip*ft)*	4148.37	2149.00	**51.8%**	**Pass**
*Pad Flexure (kip*ft)*	2148.99	955.80	**42.4%**	**Pass**
Pad Shear - 1-way (kips)	677.08	114.83	**16.2%**	**Pass**
Pad Shear - 2-way (Comp) (ksi)	0.190	0.005	**2.7%**	**Pass**
*Flexural 2-way (Comp) (kip*ft)*	835.39	0.00	**0.0%**	**Pass**

**Rating per TIA-222-H Section 15.5*

Soil Rating*:	**51.8%**
Structural Rating*:	**42.4%**

Pad Properties

Depth, **D**:	1	ft
Pad Width, **W**:	30.5	ft
Pad Thickness, **T**:	2	ft
Pad Rebar Size (Bottom), **Sp**:	8	
Pad Rebar Quantity (Bottom), **mp**:	32	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties

Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	4000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	120	pcf
Ultimate Net Bearing, Qnet:	20.333	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	39	degrees
SPT Blow Count, N_{blows}:		
Base Friction, μ:	0.3	
Neglected Depth, **N**:	1.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	n/a	ft

<--Toggle between Gross and Net

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 343.31 ft (NAVD 88)
Latitude: 41.389536
Longitude: -72.648881

Wind

Results:	**78 Vmph**
Wind Speed:	128 Vmph
10-year MRI	78 Vmph
25-year MRI	88 Vmph
50-year MRI	95 Vmph
100-year MRI	104 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:	Thu Dec 13 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.

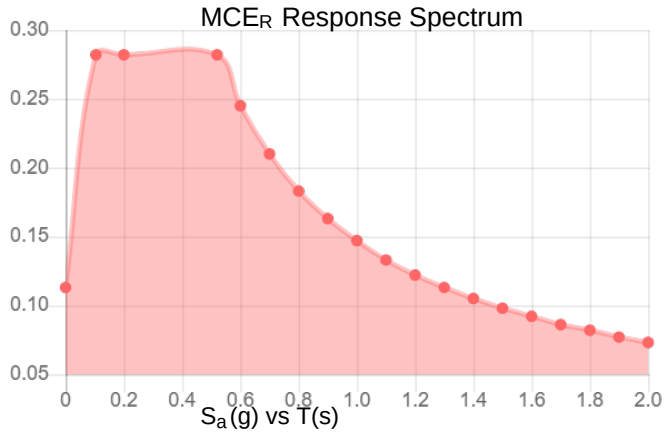
Seismic

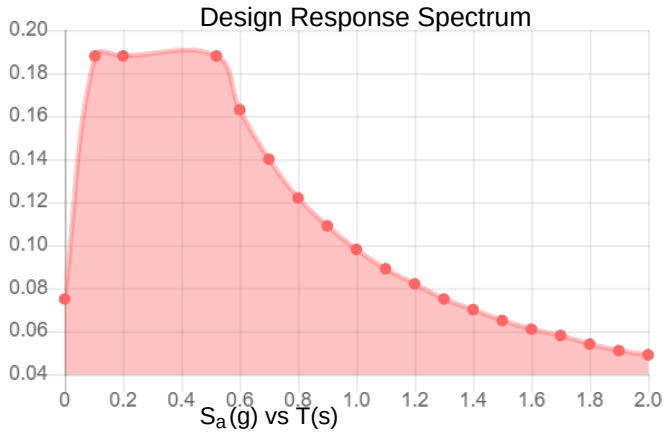
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.176	S_{DS} :	0.188
S_1 :	0.061	S_{D1} :	0.098
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.090
S_{MS} :	0.282	PGA_M :	0.144
S_{M1} :	0.147	F_{PGA} :	1.600
		I_e :	1

Seismic Design Category B





Data Accessed: Thu Dec 13 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:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Thu Dec 13 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.

BU:	846176	Structure:	A
WO:	1669503		
Order:	471842	Rev:	0

Location

	Decimal Degrees		Deg	Min	Sec
Lat:	41.389536	+	41	23	22.33
Long:	-72.648881	-	72	38	55.97

Code and Site Parameters

Seismic Design Code:	TIA-222-H*	
Site Soil:	D	Dense Soil/Soft Rock
Risk Category:	II	

USGS Seismic Reference			
	S_S:	0.1760	g
	S_1:	0.0610	g
	T_L:	6	s

Seismic Design Category Determination

Importance Factor, I_e:	1
Acceleration-based site coefficient, F_a:	1.6000
Velocity-based site coefficient, F_v:	2.4000

Design spectral response acceleration short period, S_{DS}:	0.1877	g
Design spectral response acceleration 1 s period, S_{D1}:	0.0976	g

Seismic Design Category Based on S_{DS}:	B
Seismic Design Category Based on S_{D1}:	B
Seismic Design Category Based on S_1:	N/A
Controlling Seismic Design Category:	B

*Using ASCE 7-10 Seismic Parameters

Date: **January 29, 2019**

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

Charles McGuirt
Crown Castle
3 Corporate Dr., St 101
Clifton Park, NY 12065

Subject:	**Mount Modification Report**	
Carrier Designation:	**AT&T Mount Modification**	
	Carrier Site Number:	10091767
	Carrier Site Name:	Madison-Durham Road
Crown Castle Designation:	**Crown Castle BU Number:**	846176
	Crown Castle Site Name:	Madison-Durham Road
	Crown Castle JDE Job Number:	548697
	Crown Castle Order Number:	471842, Rev. 0
Engineering Firm Designation:	**Infinigy Report Designation:**	1039-A0002-B
Site Data:	**1749 Durham Road, Madison, New Haven County, CT, 06443**	
	Latitude 41°23'22.33" Longitude -72°38'55.97"	
Structure Information:	**Tower Height & Type:**	**119.0 ft Monopole**
	Mount Elevation:	**116.0 ft**
	Mount Type:	**12.5 ft Platform**

Dear Charles McGuirt,

Infinigy is pleased to submit this **"Mount Analysis Modification 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 (typical) **Sufficient**

The analysis has been performed in accordance with the TIA-222-H Standard. This analysis utilizes an ultimate 3-second gust wind speed of 130 mph from the 2015 International Building Code and 2018 Connecticut State Building Code. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Risk Category II was/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: Christopher Kudlacik
Respectfully Submitted by:

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

TABLE OF CONTENTS

1) INTRODUCTION

This mount is an existing 12.5 ft Platform designed by Sabre, Dwg #C10116003. This mount is installed at the 116.0 ft elevation on 3 sector(s) of the 119.0 ft Monopole**.**

2) ANALYSIS CRITERIA

Building Code:	2015 IBC
TIA-222 Revision:	TIA-222-H
Risk Category:	II
Ultimate Wind Speed:	130 mph
Exposure Category:	B
Topographic Factor at Base:	1.0
Topographic Factor at Mount:	1.0
Ice Thickness:	1.28 in
Wind Speed with Ice:	**5**0 mph
Live Loading Wind Speed:	30 mph
Man Live Load at Mid/End-Points:	250 lb
Man Live Load at Mount Pipes:	500 lb

Table 1 - Proposed Equipment Configuration

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Mount / Modification Details
116.0	118.0	3	CCI	OPA65R-BU6A	Platform
		3	Kathrein	80010965	
		3	Powerwave	7770.00	
		6	Powerwave	LGP21401	
		3	Ericsson	RRUS 4449 B5/B12	
		3	Ericsson	RRUS 8843 B2/B66A	
		1	Raycap	DC6-48-60-18-8F	
	115.0	1	Raycap	DC6-48-60-18-8F	

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	AT&T Application	471842, Rev. 0	CCI Sites
Design Drawings	Sbre Mount	DWG# C10116003	Sabre
Photos	--	846176	CCI Sites

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.

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 A53 (GR 35)
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 - Mount Component Stresses vs. Capacity (Platform, Typical)

Notes	Component	Critical Member	Centerline (ft)	% Capacity	Pass / Fail
1,2	Standoff	M5	116.0	43.0	Pass
	Horizontal	M57		78.8	Pass
	Mount Pipe	M43		49.6	Pass
	Bolt Check	--		36.0	Pass

Structure Rating (max from all components) =	78.8%

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

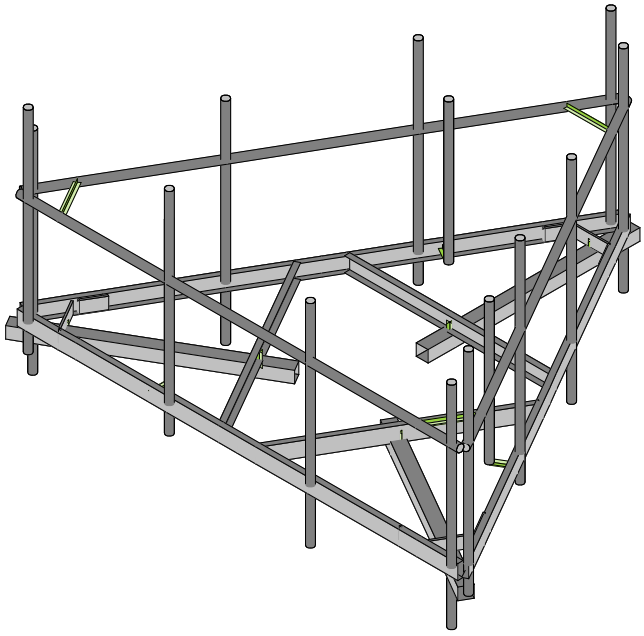
4.1) Recommendations

The Sector Frame Mount has sufficient capacity to support the proposed loading after the following is installed:

- Install (1) Sitepro1 HRK12 three feet above the existing platform

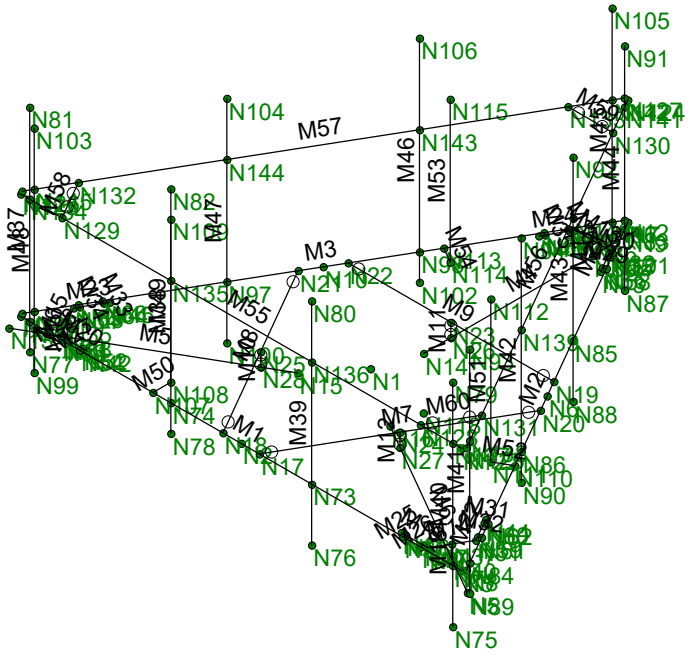
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Infinigy Engineering, PLLC	Madison Durham Road	Final Configuration
CLK		Jan 23, 2019 at 10:44 AM
1039-A0002-B		846176-Mod.R3D



Envelope Only Solution

Infinigy Engineering, PLLC	Madison Durham Road	Wireframe
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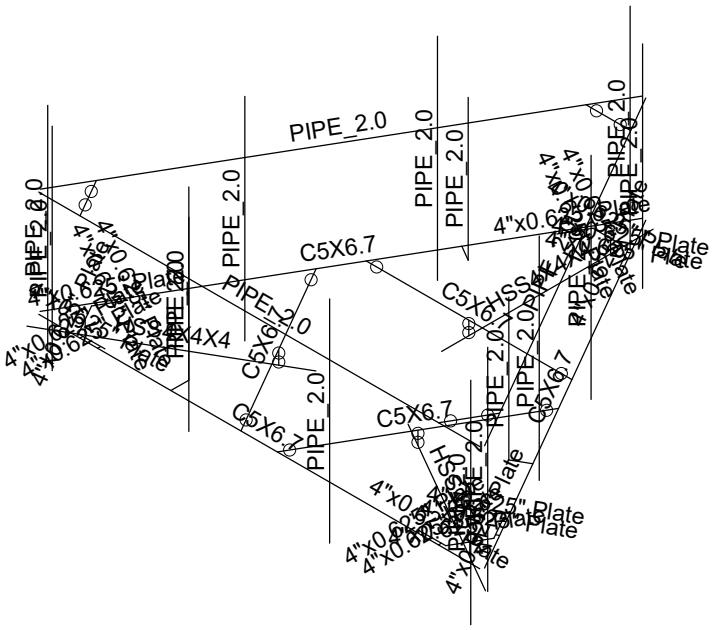

Envelope Only Solution

Infinigy Engineering, PLLC	Madison Durham Road	Member Shapes
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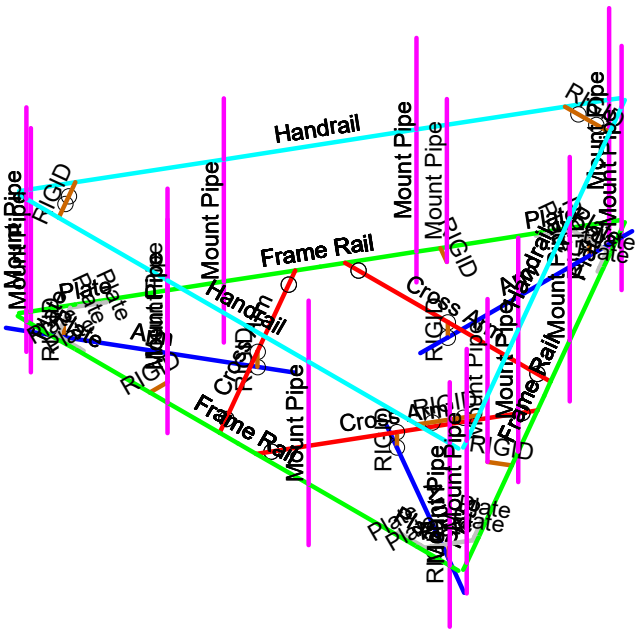
1039-A0002-B		846176-Mod.R3D



Envelope Only Solution

Infinigy Engineering, PLLC	Madison Durham Road	Section Sets
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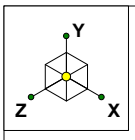
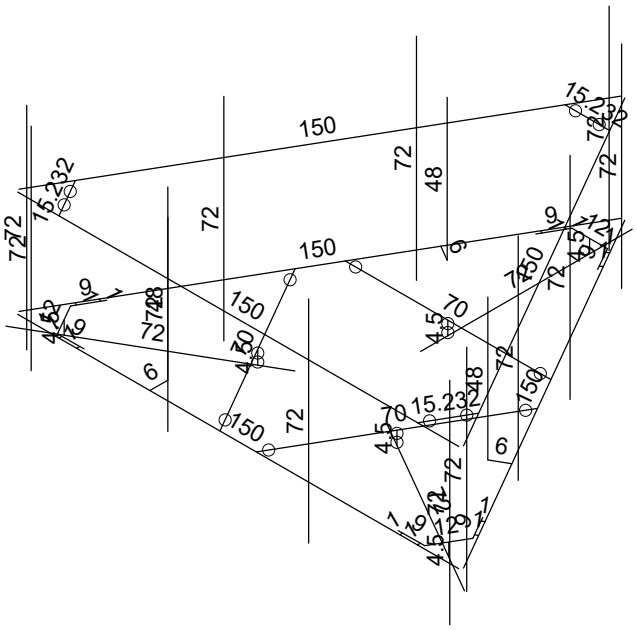
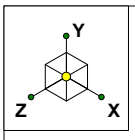
1039-A0002-B		846176-Mod.R3D

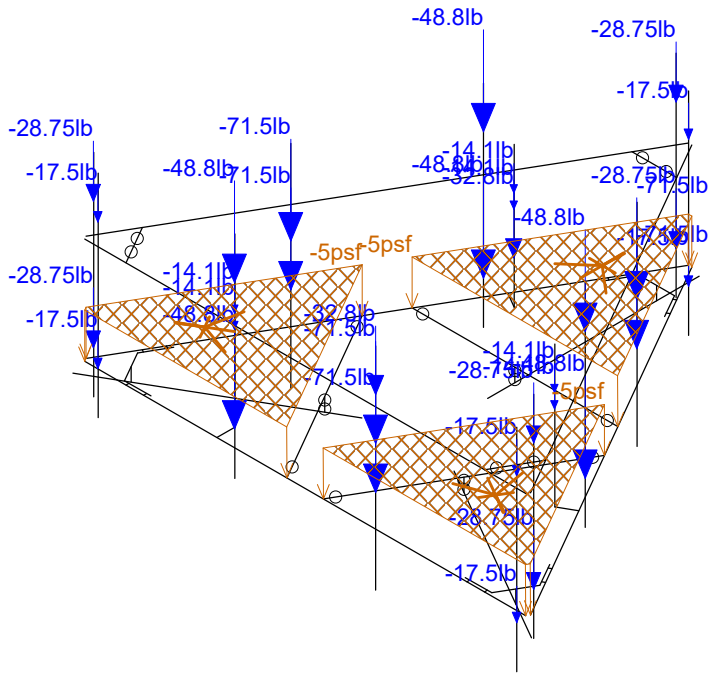




Member Length (in) Displayed
Envelope Only Solution

Infinigy Engineering, PLLC	Madison Durham Road	Member Lengths
CLK		Jan 23, 2019 at 10:45 AM
1039-A0002-B		846176-Mod.R3D





Loads: BLC 1, Self Weight
Envelope Only Solution

Infinigy Engineering, PLLC	Madison Durham Road	Dead Load
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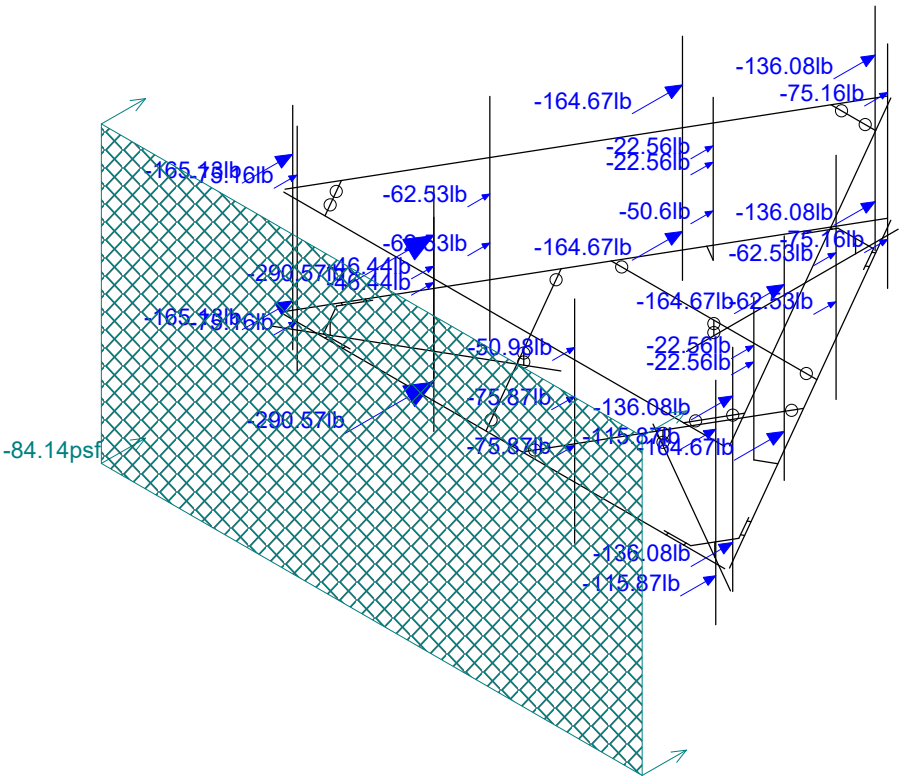
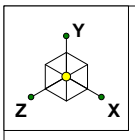
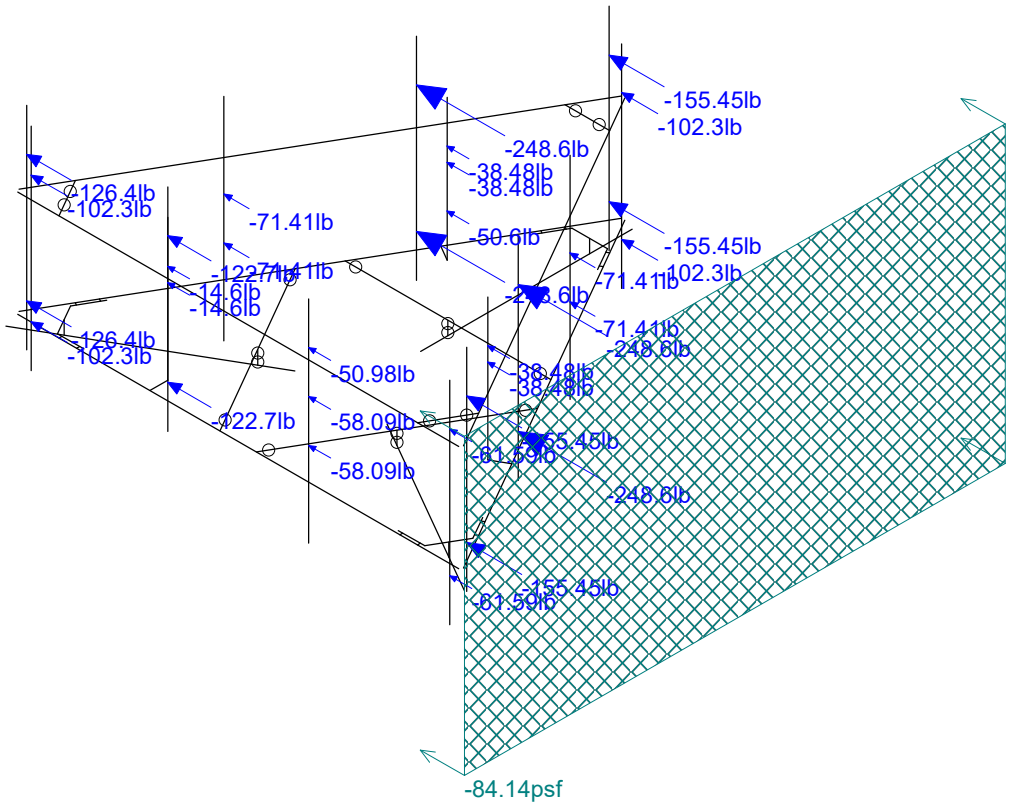
1039-A0002-B		846176-Mod.R3D



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

Infinigy Engineering, PLLC	Madison Durham Road	Wind Load 000
CLK		Jan 23, 2019 at 10:49 AM
1039-A0002-B		846176-Mod.R3D





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

Infinigy Engineering, PLLC	Madison Durham Road	Wind Load 090
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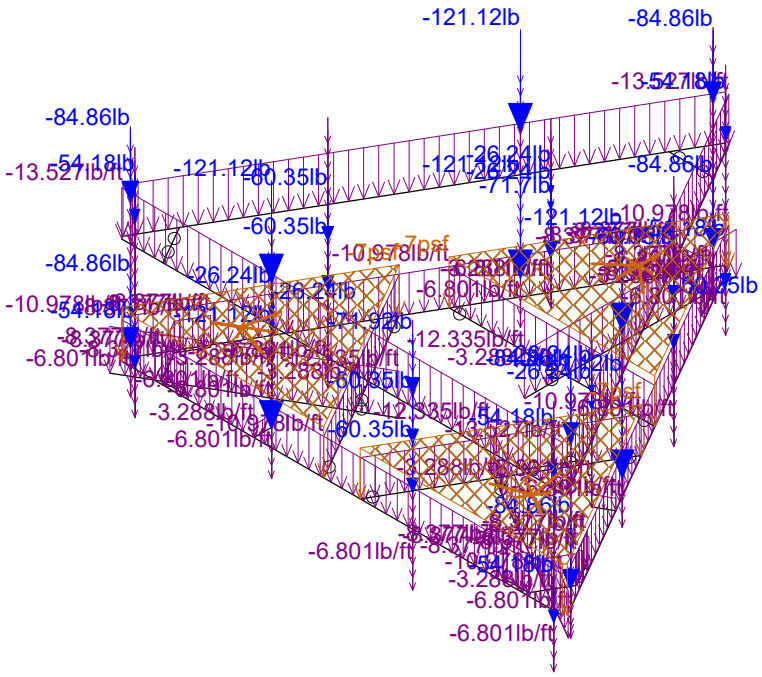
1039-A0002-B		846176-Mod.R3D



Loads: BLC 4, Ice Weight
Envelope Only Solution

Infinigy Engineering, PLLC	Madison Durham Road	Ice Load
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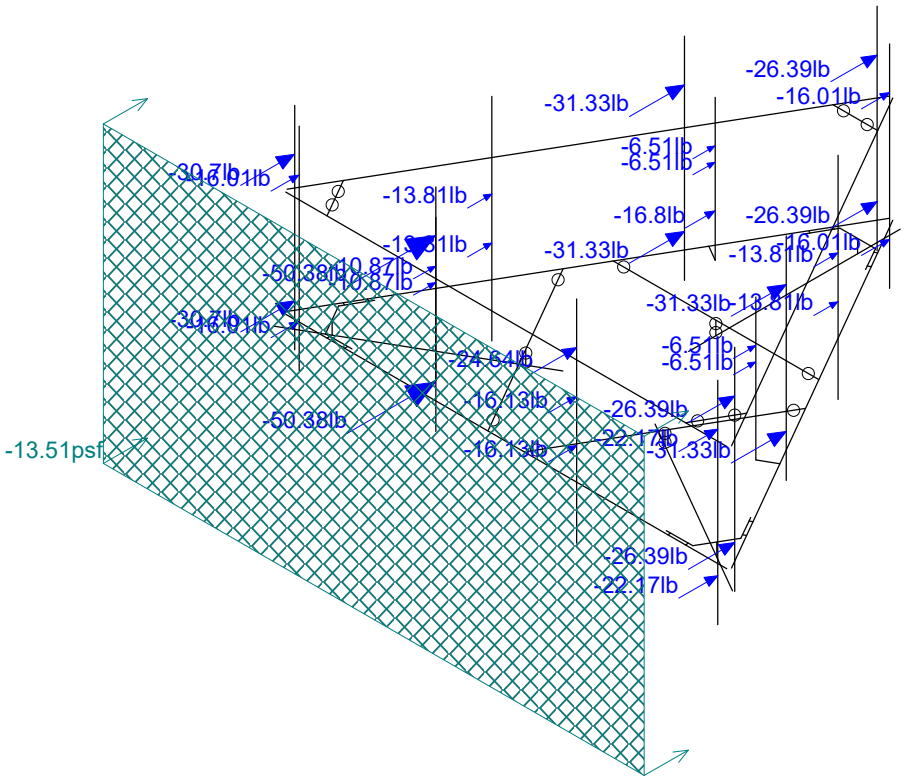
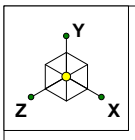
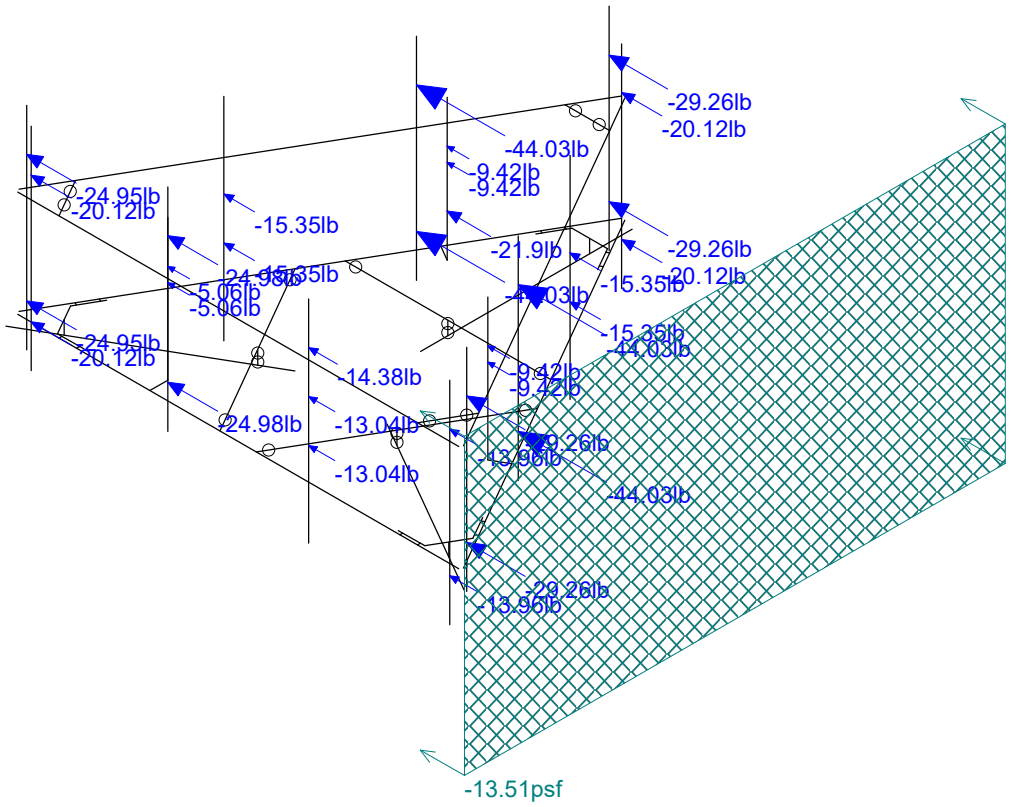
1039-A0002-B		846176-Mod.R3D



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

Infinigy Engineering, PLLC	Madison Durham Road	Wind + Ice Load 000
CLK		Jan 23, 2019 at 10:49 AM
1039-A0002-B		846176-Mod.R3D





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

Infinigy Engineering, PLLC	Madison Durham Road	Wind + Ice Load 090
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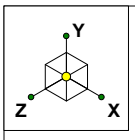
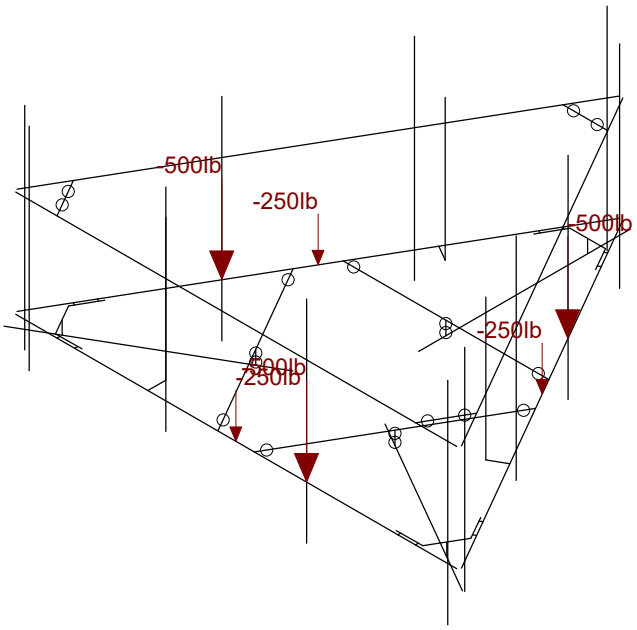
1039-A0002-B		846176-Mod.R3D





Loads: BLC 7, Service Live 1
Envelope Only Solution

Infinigy Engineering, PLLC	Madison Durham Road	Service Load
CLK		Jan 23, 2019 at 10:50 AM
1039-A0002-B		846176-Mod.R3D

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Site Name:	Madison Durham Road
Client:	Crown Castle
Carrier:	AT&T
Engineer:	CLK
Date:	1/29/2019

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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:	Flat

Rooftop Inputs:

Rooftop Wind Speed-Up?: No

Wind Loading Inputs:

Design Wind Velocity:	130	mph (ultimate 3-second gust)
Wind Centerline 1 (z_1):	118.0	ft
Side Face Angle (θ):	120	degrees
Exposure Category:	B	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
42.07	1.00	**84.14**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
6.22	1.00	**13.51**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (ultimate 3-second gust)
Base Ice Thickness:	1.28	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(120) (lbs)	Fx(-30) (lbs)
CCI OPA65R-BU6A	118.0	3	1.00	Flat	Flat	42.07	7.85	330.27	252.79	272.16	310.90
Kathrein 80010965	118.0	3	1.00	Flat	Flat	42.07	13.81	581.14	245.40	329.33	497.20
Powerwave 7770.00	118.0	3	1.00	Flat	Flat	42.07	5.51	231.74	123.19	150.33	204.60
Powerwave LGP21401	118.0	6	1.00	Flat	Flat	42.07	1.10	46.44	14.60	22.56	38.48
Ericsson RRUS 4449 B5/B12	118.0	3	1.00	Flat	Flat	42.07	1.97	82.77	59.24	65.12	76.89
Ericsson RRUS 8843 B2/B66A	118.0	3	1.00	Flat	Flat	42.07	1.64	68.95	56.94	59.94	65.95
Raycap DC6-48-60-18-8F	118.0	1	1.00	Round	Round	42.07	1.21	50.97	50.97	50.97	50.97
Raycap DC6-48-60-18-8F	115.0	1	1.00	Round	Round	41.76	1.21	50.60	50.60	50.60	50.60

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	N3	N4			Frame Rail	Beam	Channel	A36 Gr.36	Typical
2	M2	N7	N8			Frame Rail	Beam	Channel	A36 Gr.36	Typical
3	M3	N11	N12			Frame Rail	Beam	Channel	A36 Gr.36	Typical
4	M4	N14	N9			Arm	Beam	Tube	A500 Gr.B...	Typical
5	M5	N15	N13			Arm	Beam	Tube	A500 Gr.B...	Typical
6	M6	N16	N5			Arm	Beam	Tube	A500 Gr.B...	Typical
7	M7	N20	N17			Cross Arm	Beam	Channel	A36 Gr.36	Typical
8	M8	N18	N21			Cross Arm	Beam	Channel	A36 Gr.36	Typical
9	M9	N22	N19			Cross Arm	Beam	Channel	A36 Gr.36	Typical
10	M10	N25	N28			RIGID	None	None	RIGID	Typical
11	M11	N26	N23			RIGID	None	None	RIGID	Typical
12	M12	N27	N24			RIGID	None	None	RIGID	Typical
13	M13	N33	N32			Plate	Beam	BAR	A36 Gr.36	Typical
14	M14	N31	N30			Plate	Beam	BAR	A36 Gr.36	Typical
15	M15	N29	N34			Plate	Beam	BAR	A36 Gr.36	Typical
16	M16	N38	N35			RIGID	None	None	RIGID	Typical
17	M17	N39	N36			RIGID	None	None	RIGID	Typical
18	M18	N40	N37			RIGID	None	None	RIGID	Typical
19	M19	N41	N30			Plate	Beam	BAR	A36 Gr.36	Typical
20	M20	N42	N29			Plate	Beam	BAR	A36 Gr.36	Typical
21	M21	N43	N32			Plate	Beam	BAR	A36 Gr.36	Typical
22	M22	N44	N31			Plate	Beam	BAR	A36 Gr.36	Typical
23	M23	N45	N34			Plate	Beam	BAR	A36 Gr.36	Typical
24	M24	N46	N33			Plate	Beam	BAR	A36 Gr.36	Typical
25	M25	N48	N50			Plate	Beam	BAR	A36 Gr.36	Typical
26	M26	N47	N49			Plate	Beam	BAR	A36 Gr.36	Typical
27	M27	N52	N54			Plate	Beam	BAR	A36 Gr.36	Typical
28	M28	N51	N53			Plate	Beam	BAR	A36 Gr.36	Typical
29	M29	N56	N58			Plate	Beam	BAR	A36 Gr.36	Typical
30	M30	N55	N57			Plate	Beam	BAR	A36 Gr.36	Typical
31	M31	N60	N62			Plate	Beam	BAR	A36 Gr.36	Typical
32	M32	N59	N61			Plate	Beam	BAR	A36 Gr.36	Typical
33	M33	N64	N66			Plate	Beam	BAR	A36 Gr.36	Typical
34	M34	N63	N65			Plate	Beam	BAR	A36 Gr.36	Typical
35	M35	N68	N70			Plate	Beam	BAR	A36 Gr.36	Typical
36	M36	N67	N69			Plate	Beam	BAR	A36 Gr.36	Typical
37	M37	N77	N81			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
38	M38	N78	N82			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
39	M39	N76	N80			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
40	M40	N75	N79			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
41	M41	N89	N93			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
42	M42	N90	N94			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
43	M43	N88	N92			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
44	M44	N87	N91			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
45	M45	N101	N105			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
46	M46	N102	N106			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
47	M47	N100	N104			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
48	M48	N99	N103			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
49	M49	N108	N109			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
50	M50	N107	N108			RIGID	None	None	RIGID	Typical
51	M51	N111	N112			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
52	M52	N110	N111			RIGID	None	None	RIGID	Typical
53	M53	N114	N115			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
54	M54	N113	N114			RIGID	None	None	RIGID	Typical
55	M55	N122	N123			Handrail	HBrace	Pipe	A53 Gr.B	Typical
56	M56	N124	N125			Handrail	HBrace	Pipe	A53 Gr.B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
57	M57	N126	N127			Handrail	HBrace	Pipe	A53 Gr.B	Typical
58	M58	N129	N132		90	RIGID	None	None	RIGID	Typical
59	M59	N133	N130		90	RIGID	None	None	RIGID	Typical
60	M60	N131	N128		90	RIGID	None	None	RIGID	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	General				
2	RIGID		12	90.7	0
3	Total General		12	90.7	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	4"x0.625" Plate	21	102	0
7	A36 Gr.36	C5X6.7	6	660	.4
8	A500 Gr.B Rect	HSS4X4X4	3	216	.2
9	A53 Gr.B	PIPE 2.0	18	1458	.4
10	Total HR Steel		48	2436	1.1

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	57	3	
5	Wind + Ice Load AZI ...	OL2					40		1	
6	Wind + Ice Load AZI ...	OL3					40		1	
7	Service Live 1	LL				6				
8		None						57		
9	BLC 1 Transient Area...	None						102		
10	BLC 2 Transient Area...	None						51		
11	BLC 3 Transient Area...	None						51		
12	BLC 4 Transient Area...	None						102		
13	BLC 5 Transient Area...	None						51		
14	BLC 6 Transient Area...	None						51		

Load Combinations

	Description	S...	PD...	S...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	F...	B...	Fa...	...	...	...	F...	...	F...	...	F...	...	F...
1	1.4D	Yes	Y		DL	1.4																		
2	1.2D + 1W AZI 000	Yes	Y		DL	1.2	WLZ	1																
3	1.2D + 1W AZI 030	Yes	Y		DL	1.2	WLZ	.866	WLX	.5														
4	1.2D + 1W AZI 060	Yes	Y		DL	1.2	WLZ	.5	WLX	.866														
5	1.2D + 1W AZI 090	Yes	Y		DL	1.2			WLX	1														
6	1.2D + 1W AZI 120	Yes	Y		DL	1.2	WLZ	-.5	WLX	.866														
7	1.2D + 1W AZI 150	Yes	Y		DL	1.2	WLZ	-.866	WLX	.5														
8	1.2D + 1W AZI 180	Yes	Y		DL	1.2	WLZ	-1																
9	1.2D + 1W AZI 210	Yes	Y		DL	1.2	WLZ	-.866	WLX	-.5														
10	1.2D + 1W AZI 240	Yes	Y		DL	1.2	WLZ	-.5	WLX	-.866														
11	1.2D + 1W AZI 270	Yes	Y		DL	1.2			WLX	-1														
12	1.2D + 1W AZI 300	Yes	Y		DL	1.2	WLZ	.5	WLX	-.866														
13	1.2D + 1W AZI 330	Yes	Y		DL	1.2	WLZ	.866	WLX	-.5														
14	0.9D + 1W AZI 000	Yes	Y		DL	.9	WLZ	1																
15	0.9D + 1W AZI 030	Yes	Y		DL	.9	WLZ	.866	WLX	.5														

Load Combinations (Continued)

	Description	S...	PD...	S...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	F...	B...	Fa...	...	...	...	F...	F...	F...	...	...	F...
16	0.9D + 1W AZI 060	Yes	Y		DL	.9	WLZ	.5	WLX	.866													
17	0.9D + 1W AZI 090	Yes	Y		DL	.9			WLX	1													
18	0.9D + 1W AZI 120	Yes	Y		DL	.9	WLZ	-.5	WLX	.866													
19	0.9D + 1W AZI 150	Yes	Y		DL	.9	WLZ	-.866	WLX	.5													
20	0.9D + 1W AZI 180	Yes	Y		DL	.9	WLZ	-1															
21	0.9D + 1W AZI 210	Yes	Y		DL	.9	WLZ	-.866	WLX	-.5													
22	0.9D + 1W AZI 240	Yes	Y		DL	.9	WLZ	-.5	WLX	-.866													
23	0.9D + 1W AZI 270	Yes	Y		DL	.9			WLX	-1													
24	0.9D + 1W AZI 300	Yes	Y		DL	.9	WLZ	.5	WLX	-.866													
25	0.9D + 1W AZI 330	Yes	Y		DL	.9	WLZ	.866	WLX	-.5													
26	1.2D + 1.0Di	Yes	Y		DL	1.2	OL1	1															
27	1.2D + 1.0Di + 1.0Wi AZI 000	Yes	Y		DL	1.2	OL1	1	OL2	1													
28	1.2D + 1.0Di + 1.0Wi AZI 030	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	.5											
29	1.2D + 1.0Di + 1.0Wi AZI 060	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	.8...											
30	1.2D + 1.0Di + 1.0Wi AZI 090	Yes	Y		DL	1.2	OL1	1			OL3	1											
31	1.2D + 1.0Di + 1.0Wi AZI 120	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	.8...											
32	1.2D + 1.0Di + 1.0Wi AZI 150	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	.5											
33	1.2D + 1.0Di + 1.0Wi AZI 180	Yes	Y		DL	1.2	OL1	1	OL2	-1													
34	1.2D + 1.0Di + 1.0Wi AZI 210	Yes	Y		DL	1.2	OL1	1	OL2	-.866	OL3	-.5											
35	1.2D + 1.0Di + 1.0Wi AZI 240	Yes	Y		DL	1.2	OL1	1	OL2	-.5	OL3	-....											
36	1.2D + 1.0Di + 1.0Wi AZI 270	Yes	Y		DL	1.2	OL1	1			OL3	-1											
37	1.2D + 1.0Di + 1.0Wi AZI 300	Yes	Y		DL	1.2	OL1	1	OL2	.5	OL3	-....											
38	1.2D + 1.0Di + 1.0Wi AZI 330	Yes	Y		DL	1.2	OL1	1	OL2	.866	OL3	-.5											
39	1.2D + 1.5L + 1.0WL (30 mph) AZI 000	Yes	Y		DL	1.2	LL	1.5	WLZ	.054													
40	1.2D + 1.5L + 1.0WL (30 mph) AZI 030	Yes	Y		DL	1.2	LL	1.5	WLZ	.046	W...	.0...											
41	1.2D + 1.5L + 1.0WL (30 mph) AZI 060	Yes	Y		DL	1.2	LL	1.5	WLZ	.027	W...	.0...											
42	1.2D + 1.5L + 1.0WL (30 mph) AZI 090	Yes	Y		DL	1.2	LL	1.5			W...	.0...											
43	1.2D + 1.5L + 1.0WL (30 mph) AZI 120	Yes	Y		DL	1.2	LL	1.5	WLZ	-.027	W...	.0...											
44	1.2D + 1.5L + 1.0WL (30 mph) AZI 150	Yes	Y		DL	1.2	LL	1.5	WLZ	-.046	W...	.0...											
45	1.2D + 1.5L + 1.0WL (30 mph) AZI 180	Yes	Y		DL	1.2	LL	1.5	WLZ	-.054													
46	1.2D + 1.5L + 1.0WL (30 mph) AZI 210	Yes	Y		DL	1.2	LL	1.5	WLZ	-.046	W...	-....											
47	1.2D + 1.5L + 1.0WL (30 mph) AZI 240	Yes	Y		DL	1.2	LL	1.5	WLZ	-.027	W...	-....											
48	1.2D + 1.5L + 1.0WL (30 mph) AZI 270	Yes	Y		DL	1.2	LL	1.5			W...	-....											
49	1.2D + 1.5L + 1.0WL (30 mph) AZI 300	Yes	Y		DL	1.2	LL	1.5	WLZ	.027	W...	-....											
50	1.2D + 1.5L + 1.0WL (30 mph) AZI 330	Yes	Y		DL	1.2	LL	1.5	WLZ	.046	W...	-....											

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N14	max	764.755	17	3134.184	2	3311.131	14	5.977	2	2.567	11	.168	22
2		min	-763.286	23	-1412.634	20	-4186.367	8	-3.541	20	-2.578	17	-.201	4
3	N15	max	2712.174	18	3125.11	6	2225.925	13	1.863	24	1.717	2	2.989	24
4		min	-3460.001	12	-1403.171	24	-1774.247	18	-3.071	6	-1.697	20	-5.039	6
5	N16	max	3509.631	4	3125.323	10	2116.887	4	1.671	16	1.407	20	5.214	10
6		min	-2757.02	22	-1400.003	16	-1677.418	22	-2.9	10	-1.472	2	-3.103	16
7	Totals:	max	6322.075	17	7467.574	34	6465.526	14						
8		min	-6322.075	23	2209.631	15	-6465.526	20						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Ch...	Loc[in]	LC	Shear Check	Loc...	...	LC	phi*Pnc [lb]	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M1	C5X6.7	.661	68.75	9	.921	100	y	2	4719.057	63828	1.604	8.776	1...	H1-1a
2	M2	C5X6.7	.664	129.687	22	.769	100	y	6	4719.057	63828	1.604	9.012	1...	H1-1a
3	M3	C5X6.7	.664	129.687	14	1.005	100	y	10	4719.057	63828	1.604	9.084	1...	H1-1a
4	M4	HSS4X4X4	.421	0	3	.091	0	y	2	120004.784	139518	16.181	16.181	2...	H1-1b
5	M5	HSS4X4X4	.430	0	7	.092	0	y	6	120004.784	139518	16.181	16.181	2...	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Ch...	Loc[in]	LC	Shear Check	Loc...	...	LC	phi*Pnc [lb]	phi*Pn...	phi*M...	phi*M...	...	Eqn
6	M6	HSS4X4X4	.415	0	10	.089	0	y	10	120004.784	139518	16.181	16.181	2...	H1-1b
7	M7	C5X6.7	.572	35	10	.112	35	y	12	21669.137	63828	1.604	9.585	1...	H1-1b
8	M8	C5X6.7	.548	35	6	.115	35	y	8	21669.137	63828	1.604	9.585	1...	H1-1b
9	M9	C5X6.7	.594	35	2	.112	35	y	4	21669.137	63828	1.604	9.585	1...	H1-1b
10	M13	4"x0.625"...	.861	6	9	.267	12	y	13	64171.965	81000	1.055	6.75	1...	H1-1b
11	M14	4"x0.625"...	.878	6	5	.263	12	y	9	64171.965	81000	1.055	6.75	1...	H1-1b
12	M15	4"x0.625"...	.854	6	13	.262	12	y	5	64171.965	81000	1.055	6.75	1...	H1-1b
13	M19	4"x0.625"...	.313	7.5	3	.254	7.5	y	7	71054.886	81000	1.055	6.75	1...	H1-1b
14	M20	4"x0.625"...	.333	7.5	13	.369	9	y	2	71054.886	81000	1.055	6.75	1...	H1-1b
15	M21	4"x0.625"...	.324	7.5	7	.248	7.5	y	11	71054.886	81000	1.055	6.75	1...	H1-1b
16	M22	4"x0.625"...	.374	7.5	5	.346	9	y	6	71054.886	81000	1.055	6.75	1...	H1-1b
17	M23	4"x0.625"...	.349	7.5	11	.258	7.5	y	3	71054.886	81000	1.055	6.75	1...	H1-1b
18	M24	4"x0.625"...	.354	7.5	9	.361	9	y	10	71054.886	81000	1.055	6.75	1...	H1-1b
19	M25	4"x0.625"...	.234	1	4	.121	0	z	3	80869.109	81000	1.055	6.75	1...	H1-1b
20	M26	4"x0.625"...	.166	1	13	.189	1	y	7	80869.109	81000	1.055	6.75	1...	H1-1b
21	M27	4"x0.625"...	.233	1	12	.159	0	z	13	80869.109	81000	1.055	6.75	1...	H1-1b
22	M28	4"x0.625"...	.183	0	13	.231	0	y	3	80869.109	81000	1.055	6.75	1...	H1-1b
23	M29	4"x0.625"...	.243	1	8	.117	0	z	7	80869.109	81000	1.055	6.75	1...	H1-1b
24	M30	4"x0.625"...	.168	0	7	.194	1	y	11	80869.109	81000	1.055	6.75	1...	H1-1b
25	M31	4"x0.625"...	.254	1	4	.159	0	z	5	80869.109	81000	1.055	6.75	1...	H1-1b
26	M32	4"x0.625"...	.210	0	5	.214	0	y	7	80869.109	81000	1.055	6.75	1...	H1-1b
27	M33	4"x0.625"...	.255	1	12	.123	0	z	11	80869.109	81000	1.055	6.75	1...	H1-1b
28	M34	4"x0.625"...	.184	0	11	.188	1	y	3	80869.109	81000	1.055	6.75	1...	H1-1b
29	M35	4"x0.625"...	.249	1	8	.160	0	z	9	80869.109	81000	1.055	6.75	1...	H1-1b
30	M36	4"x0.625"...	.195	0	9	.240	0	y	11	80869.109	81000	1.055	6.75	1...	H1-1b
31	M37	PIPE_2.0	.378	45	3	.132	9		8	20866.733	32130	1.872	1.872	2...	H1-1b
32	M38	PIPE_2.0	.417	9	11	.220	9		12	20866.733	32130	1.872	1.872	2...	H1-1b
33	M39	PIPE_2.0	.457	54	6	.258	18		4	20866.733	32130	1.872	1.872	1...	H1-1b
34	M40	PIPE_2.0	.423	54	12	.138	18		8	20866.733	32130	1.872	1.872	1...	H1-1b
35	M41	PIPE_2.0	.407	45	7	.108	9		12	20866.733	32130	1.872	1.872	2...	H1-1b
36	M42	PIPE_2.0	.445	9	3	.230	9		4	20866.733	32130	1.872	1.872	2...	H1-1b
37	M43	PIPE_2.0	.496	18	10	.231	18		8	20866.733	32130	1.872	1.872	1...	H1-1b
38	M44	PIPE_2.0	.421	54	4	.118	18		11	20866.733	32130	1.872	1.872	1...	H1-1b
39	M45	PIPE_2.0	.377	45	11	.113	9		4	20866.733	32130	1.872	1.872	1...	H1-1b
40	M46	PIPE_2.0	.440	9	7	.212	9		8	20866.733	32130	1.872	1.872	2...	H1-1b
41	M47	PIPE_2.0	.479	18	13	.268	18		12	20866.733	32130	1.872	1.872	1...	H1-1b
42	M48	PIPE_2.0	.463	54	8	.115	18		4	20866.733	32130	1.872	1.872	1...	H1-1b
43	M49	PIPE_2.0	.205	0	2	.017	0		2	26521.424	32130	1.872	1.872	1	H1-1b
44	M51	PIPE_2.0	.182	0	5	.015	0		5	26521.424	32130	1.872	1.872	2...	H1-1b
45	M53	PIPE_2.0	.218	0	11	.020	0		11	26521.424	32130	1.872	1.872	2...	H1-1b
46	M55	PIPE_2.0	.776	14.063	7	.534	12.5		6	6295.422	32130	1.872	1.872	3...	H3-6
47	M56	PIPE_2.0	.782	14.062	11	.543	146...		7	6295.422	32130	1.872	1.872	3...	H3-6
48	M57	PIPE_2.0	.788	14.062	3	.586	12.5		2	6295.422	32130	1.872	1.872	3...	H3-6

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Arm	HSS4X4X4	Beam	Tube	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
2	Frame Rail	C5X6.7	Beam	Channel	A36 Gr.36	Typical	1.97	.47	7.48	.055
3	Cross Arm	C5X6.7	Beam	Channel	A36 Gr.36	Typical	1.97	.47	7.48	.055
4	Plate	4"x0.625"...	Beam	BAR	A36 Gr.36	Typical	2.5	.081	3.333	.293
5	Mount Pipe	PIPE_2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
6	Handrail	PIPE_2.0	HBrace	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1						
2	N2						
3	N3						
4	N4						
5	N5						
6	N6						
7	N7						
8	N8						
9	N9						
10	N10						
11	N11						
12	N12						
13	N13						
14	N14	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
15	N15	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
16	N16	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
17	N17						
18	N18						
19	N19						
20	N20						
21	N21						
22	N22						
23	N29						
24	N30						
25	N31						
26	N32						
27	N33						
28	N34						
29	N41						
30	N42						
31	N43						
32	N44						
33	N45						
34	N46						
35	N47						
36	N48						
37	N49						
38	N50						
39	N51						
40	N52						
41	N53						
42	N54						
43	N55						
44	N56						
45	N57						
46	N58						
47	N59						
48	N60						
49	N61						
50	N62						
51	N63						
52	N64						
53	N65						
54	N66						
55	N67						
56	N68						

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
57	N69						
58	N70						
59	N71						
60	N72						
61	N73						
62	N74						
63	N75						
64	N76						
65	N77						
66	N78						
67	N79						
68	N80						
69	N81						
70	N82						
71	N83						
72	N84						
73	N85						
74	N86						
75	N87						
76	N88						
77	N89						
78	N90						
79	N91						
80	N92						
81	N93						
82	N94						
83	N95						
84	N96						
85	N97						
86	N98						
87	N99						
88	N100						
89	N101						
90	N102						
91	N103						
92	N104						
93	N105						
94	N106						
95	N107						
96	N108						
97	N109						
98	N110						
99	N111						
100	N112						
101	N113						
102	N114						
103	N115						
104	N116						
105	N117						
106	N118						
107	N119						
108	N120						
109	N121						
110	N122						
111	N123						
112	N124						
113	N125						

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
114	N126						
115	N127						
116	N128						
117	N129						
118	N130						
119	N131						
120	N132						
121	N133						

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	BenPIN	BenPIN				Yes				None
8	M8	BenPIN	BenPIN				Yes				None
9	M9	BenPIN	BenPIN				Yes				None
10	M10	BenPIN	BenPIN				Yes	** NA **			None
11	M11	BenPIN	BenPIN				Yes	** NA **			None
12	M12	BenPIN	BenPIN				Yes	** NA **			None
13	M13						Yes				None
14	M14						Yes				None
15	M15						Yes				None
16	M16						Yes	** NA **			None
17	M17						Yes	** NA **			None
18	M18						Yes	** NA **			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	** NA **			None
38	M38						Yes	** NA **			None
39	M39						Yes	** NA **			None
40	M40						Yes	** NA **			None
41	M41						Yes	** NA **			None
42	M42						Yes	** NA **			None
43	M43						Yes	** NA **			None
44	M44						Yes	** NA **			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...
45	M45						Yes	** NA **			None
46	M46						Yes	** NA **			None
47	M47						Yes	** NA **			None
48	M48						Yes	** NA **			None
49	M49						Yes	** NA **			None
50	M50						Yes	** NA **			None
51	M51						Yes	** NA **			None
52	M52						Yes	** NA **			None
53	M53						Yes	** NA **			None
54	M54						Yes	** NA **			None
55	M55						Yes	** NA **			None
56	M56						Yes	** NA **			None
57	M57						Yes	** NA **			None
58	M58	BenPIN	BenPIN				Yes	** NA **			None
59	M59	BenPIN	BenPIN				Yes	** NA **			None
60	M60	BenPIN	BenPIN				Yes	** NA **			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Frame Rail	150			Lbyy						Lateral
2	M2	Frame Rail	150			Lbyy						Lateral
3	M3	Frame Rail	150			Lbyy						Lateral
4	M4	Arm	72			Lbyy						Lateral
5	M5	Arm	72			Lbyy						Lateral
6	M6	Arm	72			Lbyy						Lateral
7	M7	Cross Arm	70			Lbyy						Lateral
8	M8	Cross Arm	70			Lbyy						Lateral
9	M9	Cross Arm	70			Lbyy						Lateral
10	M13	Plate	12			Lbyy						Lateral
11	M14	Plate	12			Lbyy						Lateral
12	M15	Plate	12			Lbyy						Lateral
13	M19	Plate	9									Lateral
14	M20	Plate	9									Lateral
15	M21	Plate	9									Lateral
16	M22	Plate	9									Lateral
17	M23	Plate	9									Lateral
18	M24	Plate	9									Lateral
19	M25	Plate	1									Lateral
20	M26	Plate	1									Lateral
21	M27	Plate	1									Lateral
22	M28	Plate	1									Lateral
23	M29	Plate	1									Lateral
24	M30	Plate	1									Lateral
25	M31	Plate	1									Lateral
26	M32	Plate	1									Lateral
27	M33	Plate	1									Lateral
28	M34	Plate	1									Lateral
29	M35	Plate	1									Lateral
30	M36	Plate	1									Lateral
31	M37	Mount Pipe	72									Lateral
32	M38	Mount Pipe	72									Lateral
33	M39	Mount Pipe	72									Lateral
34	M40	Mount Pipe	72									Lateral
35	M41	Mount Pipe	72									Lateral
36	M42	Mount Pipe	72									Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torqu...	Kyy	Kzz	Cb	Function
37	M43	Mount Pipe	72									Lateral
38	M44	Mount Pipe	72									Lateral
39	M45	Mount Pipe	72									Lateral
40	M46	Mount Pipe	72									Lateral
41	M47	Mount Pipe	72									Lateral
42	M48	Mount Pipe	72									Lateral
43	M49	Mount Pipe	48									Lateral
44	M51	Mount Pipe	48									Lateral
45	M53	Mount Pipe	48									Lateral
46	M55	Handrail	150			Lbyy						Lateral
47	M56	Handrail	150			Lbyy						Lateral
48	M57	Handrail	150			Lbyy						Lateral

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

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2/...
1	N73	L	Y	-500
2	N97	L	Y	-500
3	N85	L	Y	-500
4	N2	L	Y	-250
5	N10	L	Y	-250
6	N6	L	Y	-250

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M37	Y	-28.75	%20
2	M38	Y	-48.8	%20
3	M40	Y	-17.5	%20
4	M49	Y	-14.1	%60
5	M39	Y	-35.5	%40
6	M39	Y	-36	%40
7	M39	Y	-16.4	%80
8	M37	Y	-28.75	%80
9	M38	Y	-48.8	%80
10	M40	Y	-17.5	%80
11	M49	Y	-14.1	%70
12	M39	Y	-35.5	%60
13	M39	Y	-36	%60
14	M39	Y	-16.4	%80
15	M45	Y	-28.75	%20
16	M46	Y	-48.8	%20
17	M48	Y	-17.5	%20
18	M53	Y	-14.1	%60
19	M47	Y	-35.5	%40
20	M47	Y	-36	%40
21	M53	Y	-16.4	%30
22	M45	Y	-28.75	%80
23	M46	Y	-48.8	%80
24	M48	Y	-17.5	%80
25	M53	Y	-14.1	%70
26	M47	Y	-35.5	%60
27	M47	Y	-36	%60
28	M53	Y	-16.4	%30
29	M41	Y	-28.75	%20
30	M42	Y	-48.8	%20

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
31	M44	Y	-17.5	%20
32	M51	Y	-14.1	%60
33	M43	Y	-35.5	%40
34	M43	Y	-36	%40
35	M41	Y	-28.75	%80
36	M42	Y	-48.8	%80
37	M44	Y	-17.5	%80
38	M51	Y	-14.1	%70
39	M43	Y	-35.5	%60
40	M43	Y	-36	%60

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M37	Z	-165.13	%20
2	M38	Z	-290.57	%20
3	M40	Z	-115.87	%20
4	M49	Z	-46.44	%60
5	M39	Z	-41.39	%40
6	M39	Z	-34.48	%40
7	M39	Z	-25.49	%80
8	M37	Z	-165.13	%80
9	M38	Z	-290.57	%80
10	M40	Z	-115.87	%80
11	M49	Z	-46.44	%70
12	M39	Z	-41.39	%60
13	M39	Z	-34.48	%60
14	M39	Z	-25.49	%80
15	M45	Z	-136.08	%20
16	M46	Z	-164.67	%20
17	M48	Z	-75.16	%20
18	M53	Z	-22.56	%60
19	M47	Z	-32.56	%40
20	M47	Z	-29.97	%40
21	M53	Z	-25.3	%30
22	M45	Z	-136.08	%80
23	M46	Z	-164.67	%80
24	M48	Z	-75.16	%80
25	M53	Z	-22.56	%70
26	M47	Z	-32.56	%60
27	M47	Z	-29.97	%60
28	M53	Z	-25.3	%30
29	M41	Z	-136.08	%20
30	M42	Z	-164.67	%20
31	M44	Z	-75.16	%20
32	M51	Z	-22.56	%60
33	M43	Z	-32.56	%40
34	M43	Z	-29.97	%40
35	M41	Z	-136.08	%80
36	M42	Z	-164.67	%80
37	M44	Z	-75.16	%80
38	M51	Z	-22.56	%70
39	M43	Z	-32.56	%60
40	M43	Z	-29.97	%60

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M37	X	-126.4	%20
2	M38	X	-122.7	%20
3	M40	X	-61.59	%20
4	M49	X	-14.6	%60
5	M39	X	-29.62	%40
6	M39	X	-28.47	%40
7	M39	X	-25.49	%80
8	M37	X	-126.4	%80
9	M38	X	-122.7	%80
10	M40	X	-61.59	%80
11	M49	X	-14.6	%70
12	M39	X	-29.62	%60
13	M39	X	-28.47	%60
14	M39	X	-25.49	%80
15	M45	X	-155.45	%20
16	M46	X	-248.6	%20
17	M48	X	-102.3	%20
18	M53	X	-38.48	%60
19	M47	X	-38.44	%40
20	M47	X	-32.97	%40
21	M53	X	-25.3	%30
22	M45	X	-155.45	%80
23	M46	X	-248.6	%80
24	M48	X	-102.3	%80
25	M53	X	-38.48	%70
26	M47	X	-38.44	%60
27	M47	X	-32.97	%60
28	M53	X	-25.3	%30
29	M41	X	-155.45	%20
30	M42	X	-248.6	%20
31	M44	X	-102.3	%20
32	M51	X	-38.48	%60
33	M43	X	-38.44	%40
34	M43	X	-32.97	%40
35	M41	X	-155.45	%80
36	M42	X	-248.6	%80
37	M44	X	-102.3	%80
38	M51	X	-38.48	%70
39	M43	X	-38.44	%60
40	M43	X	-32.97	%60

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M37	Y	-84.86	%20
2	M38	Y	-121.12	%20
3	M40	Y	-54.18	%20
4	M49	Y	-26.24	%60
5	M39	Y	-30.91	%40
6	M39	Y	-29.44	%40
7	M39	Y	-35.96	%80
8	M37	Y	-84.86	%80
9	M38	Y	-121.12	%80
10	M40	Y	-54.18	%80
11	M49	Y	-26.24	%70
12	M39	Y	-30.91	%60
13	M39	Y	-29.44	%60

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
14	M39	Y	-35.96	%80
15	M45	Y	-84.86	%20
16	M46	Y	-121.12	%20
17	M48	Y	-54.18	%20
18	M53	Y	-26.24	%60
19	M47	Y	-30.91	%40
20	M47	Y	-29.44	%40
21	M53	Y	-35.85	%30
22	M45	Y	-84.86	%80
23	M46	Y	-121.12	%80
24	M48	Y	-54.18	%80
25	M53	Y	-26.24	%70
26	M47	Y	-30.91	%60
27	M47	Y	-29.44	%60
28	M53	Y	-35.85	%30
29	M41	Y	-84.86	%20
30	M42	Y	-121.12	%20
31	M44	Y	-54.18	%20
32	M51	Y	-26.24	%60
33	M43	Y	-30.91	%40
34	M43	Y	-29.44	%40
35	M41	Y	-84.86	%80
36	M42	Y	-121.12	%80
37	M44	Y	-54.18	%80
38	M51	Y	-26.24	%70
39	M43	Y	-30.91	%60
40	M43	Y	-29.44	%60

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M37	Z	-30.7	%20
2	M38	Z	-50.38	%20
3	M40	Z	-22.17	%20
4	M49	Z	-10.87	%60
5	M39	Z	-8.69	%40
6	M39	Z	-7.44	%40
7	M39	Z	-12.32	%80
8	M37	Z	-30.7	%80
9	M38	Z	-50.38	%80
10	M40	Z	-22.17	%80
11	M49	Z	-10.87	%70
12	M39	Z	-8.69	%60
13	M39	Z	-7.44	%60
14	M39	Z	-12.32	%80
15	M45	Z	-26.39	%20
16	M46	Z	-31.33	%20
17	M48	Z	-16.01	%20
18	M53	Z	-6.51	%60
19	M47	Z	-7.17	%40
20	M47	Z	-6.64	%40
21	M53	Z	-8.4	%30
22	M45	Z	-26.39	%80
23	M46	Z	-31.33	%80
24	M48	Z	-16.01	%80
25	M53	Z	-6.51	%70
26	M47	Z	-7.17	%60

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
27	M47	Z	-6.64	%60
28	M53	Z	-8.4	%30
29	M41	Z	-26.39	%20
30	M42	Z	-31.33	%20
31	M44	Z	-16.01	%20
32	M51	Z	-6.51	%60
33	M43	Z	-7.17	%40
34	M43	Z	-6.64	%40
35	M41	Z	-26.39	%80
36	M42	Z	-31.33	%80
37	M44	Z	-16.01	%80
38	M51	Z	-6.51	%70
39	M43	Z	-7.17	%60
40	M43	Z	-6.64	%60

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
1	M37	X	-24.95	%20
2	M38	X	-24.98	%20
3	M40	X	-13.96	%20
4	M49	X	-5.06	%60
5	M39	X	-6.66	%40
6	M39	X	-6.38	%40
7	M39	X	-7.19	%80
8	M37	X	-24.95	%80
9	M38	X	-24.98	%80
10	M40	X	-13.96	%80
11	M49	X	-5.06	%70
12	M39	X	-6.66	%60
13	M39	X	-6.38	%60
14	M39	X	-7.19	%80
15	M45	X	-29.26	%20
16	M46	X	-44.03	%20
17	M48	X	-20.12	%20
18	M53	X	-9.42	%60
19	M47	X	-8.18	%40
20	M47	X	-7.17	%40
21	M53	X	-10.95	%30
22	M45	X	-29.26	%80
23	M46	X	-44.03	%80
24	M48	X	-20.12	%80
25	M53	X	-9.42	%70
26	M47	X	-8.18	%60
27	M47	X	-7.17	%60
28	M53	X	-10.95	%30
29	M41	X	-29.26	%20
30	M42	X	-44.03	%20
31	M44	X	-20.12	%20
32	M51	X	-9.42	%60
33	M43	X	-8.18	%40
34	M43	X	-7.17	%40
35	M41	X	-29.26	%80
36	M42	X	-44.03	%80
37	M44	X	-20.12	%80
38	M51	X	-9.42	%70
39	M43	X	-8.18	%60

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

	Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
40	M43	X	-7.17	%60

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
1	M1	Y	-10.978	-10.978	0	%100
2	M2	Y	-10.978	-10.978	0	%100
3	M3	Y	-10.978	-10.978	0	%100
4	M4	Y	-12.335	-12.335	0	%100
5	M5	Y	-12.335	-12.335	0	%100
6	M6	Y	-12.335	-12.335	0	%100
7	M7	Y	-10.978	-10.978	0	%100
8	M8	Y	-10.978	-10.978	0	%100
9	M9	Y	-10.978	-10.978	0	%100
10	M10	Y	-3.288	-3.288	0	%100
11	M11	Y	-3.288	-3.288	0	%100
12	M12	Y	-3.288	-3.288	0	%100
13	M13	Y	-8.377	-8.377	0	%100
14	M14	Y	-8.377	-8.377	0	%100
15	M15	Y	-8.377	-8.377	0	%100
16	M16	Y	-3.288	-3.288	0	%100
17	M17	Y	-3.288	-3.288	0	%100
18	M18	Y	-3.288	-3.288	0	%100
19	M19	Y	-8.377	-8.377	0	%100
20	M20	Y	-8.377	-8.377	0	%100
21	M21	Y	-8.377	-8.377	0	%100
22	M22	Y	-8.377	-8.377	0	%100
23	M23	Y	-8.377	-8.377	0	%100
24	M24	Y	-8.377	-8.377	0	%100
25	M25	Y	-8.377	-8.377	0	%100
26	M26	Y	-8.377	-8.377	0	%100
27	M27	Y	-8.377	-8.377	0	%100
28	M28	Y	-8.377	-8.377	0	%100
29	M29	Y	-8.377	-8.377	0	%100
30	M30	Y	-8.377	-8.377	0	%100
31	M31	Y	-8.377	-8.377	0	%100
32	M32	Y	-8.377	-8.377	0	%100
33	M33	Y	-8.377	-8.377	0	%100
34	M34	Y	-8.377	-8.377	0	%100
35	M35	Y	-8.377	-8.377	0	%100
36	M36	Y	-8.377	-8.377	0	%100
37	M37	Y	-6.801	-6.801	0	%100
38	M38	Y	-6.801	-6.801	0	%100
39	M39	Y	-6.801	-6.801	0	%100
40	M40	Y	-6.801	-6.801	0	%100
41	M41	Y	-6.801	-6.801	0	%100
42	M42	Y	-6.801	-6.801	0	%100
43	M43	Y	-6.801	-6.801	0	%100
44	M44	Y	-6.801	-6.801	0	%100
45	M45	Y	-6.801	-6.801	0	%100
46	M46	Y	-6.801	-6.801	0	%100
47	M47	Y	-6.801	-6.801	0	%100
48	M48	Y	-6.801	-6.801	0	%100
49	M49	Y	-6.801	-6.801	0	%100
50	M50	Y	-3.288	-3.288	0	%100
51	M51	Y	-6.801	-6.801	0	%100

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

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
52	M52	Y	-3.288	-3.288	0	%100
53	M53	Y	-6.801	-6.801	0	%100
54	M54	Y	-3.288	-3.288	0	%100
55	M55	Y	-13.527	-13.527	0	%100
56	M56	Y	-13.527	-13.527	0	%100
57	M57	Y	-13.527	-13.527	0	%100

Member Distributed Loads (BLC 8 :)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
1	M1	Y	-13.527	-13.527	0	%100
2	M2	Y	-13.527	-13.527	0	%100
3	M3	Y	-13.527	-13.527	0	%100
4	M4	Y	-15.118	-15.118	0	%100
5	M5	Y	-15.118	-15.118	0	%100
6	M6	Y	-15.118	-15.118	0	%100
7	M7	Y	-13.527	-13.527	0	%100
8	M8	Y	-13.527	-13.527	0	%100
9	M9	Y	-13.527	-13.527	0	%100
10	M10	Y	-4.516	-4.516	0	%100
11	M11	Y	-4.516	-4.516	0	%100
12	M12	Y	-4.516	-4.516	0	%100
13	M13	Y	-10.479	-10.479	0	%100
14	M14	Y	-10.479	-10.479	0	%100
15	M15	Y	-10.479	-10.479	0	%100
16	M16	Y	-4.516	-4.516	0	%100
17	M17	Y	-4.516	-4.516	0	%100
18	M18	Y	-4.516	-4.516	0	%100
19	M19	Y	-10.479	-10.479	0	%100
20	M20	Y	-10.479	-10.479	0	%100
21	M21	Y	-10.479	-10.479	0	%100
22	M22	Y	-10.479	-10.479	0	%100
23	M23	Y	-10.479	-10.479	0	%100
24	M24	Y	-10.479	-10.479	0	%100
25	M25	Y	-10.479	-10.479	0	%100
26	M26	Y	-10.479	-10.479	0	%100
27	M27	Y	-10.479	-10.479	0	%100
28	M28	Y	-10.479	-10.479	0	%100
29	M29	Y	-10.479	-10.479	0	%100
30	M30	Y	-10.479	-10.479	0	%100
31	M31	Y	-10.479	-10.479	0	%100
32	M32	Y	-10.479	-10.479	0	%100
33	M33	Y	-10.479	-10.479	0	%100
34	M34	Y	-10.479	-10.479	0	%100
35	M35	Y	-10.479	-10.479	0	%100
36	M36	Y	-10.479	-10.479	0	%100
37	M37	Y	-8.491	-8.491	0	%100
38	M38	Y	-8.491	-8.491	0	%100
39	M39	Y	-8.491	-8.491	0	%100
40	M40	Y	-8.491	-8.491	0	%100
41	M41	Y	-8.491	-8.491	0	%100
42	M42	Y	-8.491	-8.491	0	%100
43	M43	Y	-8.491	-8.491	0	%100
44	M44	Y	-8.491	-8.491	0	%100
45	M45	Y	-8.491	-8.491	0	%100
46	M46	Y	-8.491	-8.491	0	%100
47	M47	Y	-8.491	-8.491	0	%100

Member Distributed Loads (BLC 8 :) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
48	M48	Y	-8.491	-8.491	0	%100
49	M49	Y	-8.491	-8.491	0	%100
50	M50	Y	-4.516	-4.516	0	%100
51	M51	Y	-8.491	-8.491	0	%100
52	M52	Y	-4.516	-4.516	0	%100
53	M53	Y	-8.491	-8.491	0	%100
54	M54	Y	-4.516	-4.516	0	%100
55	M55	Y	-13.527	-13.527	0	%100
56	M56	Y	-13.527	-13.527	0	%100
57	M57	Y	-13.527	-13.527	0	%100

Member Distributed Loads (BLC 9 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
1	M2	Y	-.253	-1.671	0	15
2	M2	Y	-1.671	-4.697	15	30
3	M2	Y	-4.697	-5.325	30	45
4	M2	Y	-5.325	-1.854	45	60
5	M2	Y	-1.854	-.071	60	75
6	M3	Y	-.691	-1.622	75	90
7	M3	Y	-1.622	-3.06	90	105
8	M3	Y	-3.06	-3.308	105	120
9	M3	Y	-3.308	-1.772	120	135
10	M3	Y	-1.772	-.152	135	150
11	M9	Y	-.256	-3.237	0	14
12	M9	Y	-3.237	-5.542	14	28
13	M9	Y	-5.542	-5.993	28	42
14	M9	Y	-5.993	-4.556	42	56
15	M9	Y	-4.556	-1.26	56	70
16	M13	Y	-.772	-2.748	0	2.4
17	M13	Y	-2.748	-4.323	2.4	4.8
18	M13	Y	-4.323	-4.8	4.8	7.2
19	M13	Y	-4.8	-3.282	7.2	9.6
20	M13	Y	-3.282	-.466	9.6	12
21	M21	Y	-23.598	-9.683	0	1.8
22	M21	Y	-9.683	-2.636	1.8	3.6
23	M21	Y	-2.636	-1.816	3.6	5.4
24	M21	Y	-1.816	-.829	5.4	7.2
25	M21	Y	-.829	-.314	7.2	9
26	M24	Y	-20.592	-10.037	0	1.8
27	M24	Y	-10.037	-3.892	1.8	3.6
28	M24	Y	-3.892	-2.533	3.6	5.4
29	M24	Y	-2.533	-1.173	5.4	7.2
30	M24	Y	-1.173	.452	7.2	9
31	M35	Y	-.981	-.981	0	1
32	M36	Y	-.207	-.207	0	1
33	M54	Y	3.808	-14.005	0	3
34	M54	Y	-14.005	-47.05	3	6
35	M1	Y	-.219	-1.66	0	15
36	M1	Y	-1.66	-4.698	15	30
37	M1	Y	-4.698	-5.326	30	45
38	M1	Y	-5.326	-1.855	45	60
39	M1	Y	-1.855	-.072	60	75
40	M2	Y	-.691	-1.622	75	90
41	M2	Y	-1.622	-3.06	90	105
42	M2	Y	-3.06	-3.308	105	120
43	M2	Y	-3.308	-1.769	120	135

Member Distributed Loads (BLC 9 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
44	M2	Y	-1.769	-.141	135	150
45	M7	Y	-.256	-3.237	0	14
46	M7	Y	-3.237	-5.542	14	28
47	M7	Y	-5.542	-5.993	28	42
48	M7	Y	-5.993	-4.556	42	56
49	M7	Y	-4.556	-1.26	56	70
50	M14	Y	-.629	-2.671	0	2.4
51	M14	Y	-2.671	-4.572	2.4	4.8
52	M14	Y	-4.572	-4.895	4.8	7.2
53	M14	Y	-4.895	-3.136	7.2	9.6
54	M14	Y	-3.136	-.733	9.6	12
55	M19	Y	-23.598	-9.682	0	1.8
56	M19	Y	-9.682	-2.635	1.8	3.6
57	M19	Y	-2.635	-1.816	3.6	5.4
58	M19	Y	-1.816	-.836	5.4	7.2
59	M19	Y	-.836	-.337	7.2	9
60	M22	Y	-20.592	-10.037	0	1.8
61	M22	Y	-10.037	-3.892	1.8	3.6
62	M22	Y	-3.892	-2.533	3.6	5.4
63	M22	Y	-2.533	-1.171	5.4	7.2
64	M22	Y	-1.171	.452	7.2	9
65	M31	Y	-.981	-.981	0	1
66	M32	Y	-.207	-.207	0	1
67	M52	Y	3.808	-14.005	0	3
68	M52	Y	-14.005	-47.05	3	6
69	M1	Y	-.691	-1.622	75	90
70	M1	Y	-1.622	-3.06	90	105
71	M1	Y	-3.06	-3.308	105	120
72	M1	Y	-3.308	-1.772	120	135
73	M1	Y	-1.772	-.152	135	150
74	M3	Y	-.253	-1.671	0	15
75	M3	Y	-1.671	-4.697	15	30
76	M3	Y	-4.697	-5.325	30	45
77	M3	Y	-5.325	-1.854	45	60
78	M3	Y	-1.854	-.071	60	75
79	M8	Y	-.256	-3.237	0	14
80	M8	Y	-3.237	-5.542	14	28
81	M8	Y	-5.542	-5.993	28	42
82	M8	Y	-5.993	-4.556	42	56
83	M8	Y	-4.556	-1.26	56	70
84	M15	Y	-.772	-2.748	0	2.4
85	M15	Y	-2.748	-4.323	2.4	4.8
86	M15	Y	-4.323	-4.8	4.8	7.2
87	M15	Y	-4.8	-3.282	7.2	9.6
88	M15	Y	-3.282	-.466	9.6	12
89	M20	Y	-20.592	-10.037	0	1.8
90	M20	Y	-10.037	-3.892	1.8	3.6
91	M20	Y	-3.892	-2.533	3.6	5.4
92	M20	Y	-2.533	-1.173	5.4	7.2
93	M20	Y	-1.173	.452	7.2	9
94	M23	Y	-23.598	-9.683	0	1.8
95	M23	Y	-9.683	-2.636	1.8	3.6
96	M23	Y	-2.636	-1.816	3.6	5.4
97	M23	Y	-1.816	-.829	5.4	7.2
98	M23	Y	-.829	-.314	7.2	9
99	M27	Y	-.981	-.981	0	1
100	M28	Y	-.207	-.207	0	1

Member Distributed Loads (BLC 9 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
101	M50	Y	3.808	-14.005	0	3
102	M50	Y	-14.005	-47.05	3	6

Member Distributed Loads (BLC 10 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
1	M1	Z	-35.058	-35.058	0	150
2	M2	Z	-17.529	-17.529	0	150
3	M3	Z	-17.529	-17.529	0	150
4	M5	Z	-24.289	-24.289	0	72
5	M6	Z	-24.289	-24.289	0	72
6	M7	Z	-17.529	-17.529	0	70
7	M8	Z	-17.529	-17.529	0	70
8	M9	Z	-35.058	-35.058	0	70
9	M10	Z	0	0	0	4.5
10	M11	Z	0	0	0	4.5
11	M12	Z	0	0	0	4.5
12	M13	Z	-28.047	-28.047	0	12
13	M14	Z	-14.023	-14.023	0	12
14	M15	Z	-14.023	-14.023	0	12
15	M16	Z	0	0	0	4.5
16	M17	Z	0	0	0	4.5
17	M18	Z	0	0	0	4.5
18	M19	Z	-28.047	-28.047	0	9
19	M20	Z	-28.047	-28.047	0	9
20	M21	Z	-14.023	-14.023	0	9
21	M22	Z	-14.023	-14.023	0	9
22	M23	Z	-14.023	-14.023	0	9
23	M24	Z	-14.023	-14.023	0	9
24	M29	Z	-24.289	-24.289	0	1
25	M30	Z	-24.289	-24.289	0	1
26	M31	Z	-24.289	-24.289	0	1
27	M32	Z	-24.289	-24.289	0	1
28	M33	Z	-24.289	-24.289	0	1
29	M34	Z	-24.289	-24.289	0	1
30	M35	Z	-24.289	-24.289	0	1
31	M36	Z	-24.289	-24.289	0	1
32	M37	Z	-16.653	-16.653	0	72
33	M38	Z	-16.653	-16.653	0	72
34	M39	Z	-16.653	-16.653	0	72
35	M40	Z	-16.653	-16.653	0	72
36	M41	Z	-16.653	-16.653	0	72
37	M42	Z	-16.653	-16.653	0	72
38	M43	Z	-16.653	-16.653	0	72
39	M44	Z	-16.653	-16.653	0	72
40	M45	Z	-16.653	-16.653	0	72
41	M46	Z	-16.653	-16.653	0	72
42	M47	Z	-16.653	-16.653	0	72
43	M48	Z	-16.653	-16.653	0	72
44	M49	Z	-16.653	-16.653	0	48
45	M51	Z	-16.653	-16.653	0	48
46	M52	Z	0	0	0	6
47	M53	Z	-16.653	-16.653	0	48
48	M54	Z	0	0	0	6
49	M58	Z	0	0	0	15.232
50	M59	Z	0	0	0	15.232
51	M60	Z	0	0	0	15.232

Member Distributed Loads (BLC 11 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
1	M2	X	-30.361	-30.361	0	150
2	M3	X	-30.361	-30.361	0	150
3	M4	X	-28.047	-28.047	0	72
4	M5	X	-14.023	-14.023	0	72
5	M6	X	-14.023	-14.023	0	72
6	M7	X	-30.361	-30.361	0	70
7	M8	X	-30.361	-30.361	0	70
8	M10	X	0	0	0	4.5
9	M11	X	0	0	0	4.5
10	M12	X	0	0	0	4.5
11	M14	X	-24.289	-24.289	0	12
12	M15	X	-24.289	-24.289	0	12
13	M16	X	0	0	0	4.5
14	M17	X	0	0	0	4.5
15	M18	X	0	0	0	4.5
16	M21	X	-24.289	-24.289	0	9
17	M22	X	-24.289	-24.289	0	9
18	M23	X	-24.289	-24.289	0	9
19	M24	X	-24.289	-24.289	0	9
20	M25	X	-28.047	-28.047	0	1
21	M26	X	-28.047	-28.047	0	1
22	M27	X	-28.047	-28.047	0	1
23	M28	X	-28.047	-28.047	0	1
24	M29	X	-14.023	-14.023	0	1
25	M30	X	-14.023	-14.023	0	1
26	M31	X	-14.023	-14.023	0	1
27	M32	X	-14.023	-14.023	0	1
28	M33	X	-14.023	-14.023	0	1
29	M34	X	-14.023	-14.023	0	1
30	M35	X	-14.023	-14.023	0	1
31	M36	X	-14.023	-14.023	0	1
32	M37	X	-16.653	-16.653	0	72
33	M38	X	-16.653	-16.653	0	72
34	M39	X	-16.653	-16.653	0	72
35	M40	X	-16.653	-16.653	0	72
36	M41	X	-16.653	-16.653	0	72
37	M42	X	-16.653	-16.653	0	72
38	M43	X	-16.653	-16.653	0	72
39	M44	X	-16.653	-16.653	0	72
40	M45	X	-16.653	-16.653	0	72
41	M46	X	-16.653	-16.653	0	72
42	M47	X	-16.653	-16.653	0	72
43	M48	X	-16.653	-16.653	0	72
44	M49	X	-16.653	-16.653	0	48
45	M50	X	0	0	0	6
46	M51	X	-16.653	-16.653	0	48
47	M52	X	0	0	0	6
48	M53	X	-16.653	-16.653	0	48
49	M54	X	0	0	0	6
50	M58	X	0	0	0	15.232
51	M60	X	0	0	0	15.232

Member Distributed Loads (BLC 12 : BLC 4 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
1	M2	Y	-.354	-2.339	0	15
2	M2	Y	-2.339	-6.576	15	30

Member Distributed Loads (BLC 12 : BLC 4 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
3	M2	Y	-6.576	-7.455	30	45
4	M2	Y	-7.455	-2.595	45	60
5	M2	Y	-2.595	-.099	60	75
6	M3	Y	-.967	-2.271	75	90
7	M3	Y	-2.271	-4.284	90	105
8	M3	Y	-4.284	-4.631	105	120
9	M3	Y	-4.631	-2.481	120	135
10	M3	Y	-2.481	-.213	135	150
11	M9	Y	-.359	-4.531	0	14
12	M9	Y	-4.531	-7.758	14	28
13	M9	Y	-7.758	-8.39	28	42
14	M9	Y	-8.39	-6.378	42	56
15	M9	Y	-6.378	-1.763	56	70
16	M13	Y	-1.081	-3.847	0	2.4
17	M13	Y	-3.847	-6.052	2.4	4.8
18	M13	Y	-6.052	-6.72	4.8	7.2
19	M13	Y	-6.72	-4.595	7.2	9.6
20	M13	Y	-4.595	-.653	9.6	12
21	M21	Y	-33.038	-13.556	0	1.8
22	M21	Y	-13.556	-3.69	1.8	3.6
23	M21	Y	-3.69	-2.543	3.6	5.4
24	M21	Y	-2.543	-1.16	5.4	7.2
25	M21	Y	-1.16	-.44	7.2	9
26	M24	Y	-28.829	-14.052	0	1.8
27	M24	Y	-14.052	-5.449	1.8	3.6
28	M24	Y	-5.449	-3.547	3.6	5.4
29	M24	Y	-3.547	-1.642	5.4	7.2
30	M24	Y	-1.642	.633	7.2	9
31	M35	Y	-1.373	-1.373	0	1
32	M36	Y	-.29	-.29	0	1
33	M54	Y	5.332	-19.606	0	3
34	M54	Y	-19.606	-65.87	3	6
35	M1	Y	-.307	-2.324	0	15
36	M1	Y	-2.324	-6.577	15	30
37	M1	Y	-6.577	-7.457	30	45
38	M1	Y	-7.457	-2.597	45	60
39	M1	Y	-2.597	-.101	60	75
40	M2	Y	-.967	-2.271	75	90
41	M2	Y	-2.271	-4.285	90	105
42	M2	Y	-4.285	-4.631	105	120
43	M2	Y	-4.631	-2.476	120	135
44	M2	Y	-2.476	-.197	135	150
45	M7	Y	-.359	-4.531	0	14
46	M7	Y	-4.531	-7.758	14	28
47	M7	Y	-7.758	-8.39	28	42
48	M7	Y	-8.39	-6.378	42	56
49	M7	Y	-6.378	-1.763	56	70
50	M14	Y	-.881	-3.739	0	2.4
51	M14	Y	-3.739	-6.401	2.4	4.8
52	M14	Y	-6.401	-6.853	4.8	7.2
53	M14	Y	-6.853	-4.39	7.2	9.6
54	M14	Y	-4.39	-1.027	9.6	12
55	M19	Y	-33.037	-13.555	0	1.8
56	M19	Y	-13.555	-3.689	1.8	3.6
57	M19	Y	-3.689	-2.542	3.6	5.4
58	M19	Y	-2.542	-1.17	5.4	7.2
59	M19	Y	-1.17	-.471	7.2	9

Member Distributed Loads (BLC 12 : BLC 4 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
60	M22	Y	-28.829	-14.052	0	1.8
61	M22	Y	-14.052	-5.448	1.8	3.6
62	M22	Y	-5.448	-3.546	3.6	5.4
63	M22	Y	-3.546	-1.64	5.4	7.2
64	M22	Y	-1.64	.633	7.2	9
65	M31	Y	-1.373	-1.373	0	1
66	M32	Y	-.29	-.29	0	1
67	M52	Y	5.332	-19.606	0	3
68	M52	Y	-19.606	-65.87	3	6
69	M1	Y	-.967	-2.271	75	90
70	M1	Y	-2.271	-4.284	90	105
71	M1	Y	-4.284	-4.631	105	120
72	M1	Y	-4.631	-2.481	120	135
73	M1	Y	-2.481	-.213	135	150
74	M3	Y	-.354	-2.339	0	15
75	M3	Y	-2.339	-6.576	15	30
76	M3	Y	-6.576	-7.455	30	45
77	M3	Y	-7.455	-2.595	45	60
78	M3	Y	-2.595	-.099	60	75
79	M8	Y	-.359	-4.531	0	14
80	M8	Y	-4.531	-7.758	14	28
81	M8	Y	-7.758	-8.39	28	42
82	M8	Y	-8.39	-6.378	42	56
83	M8	Y	-6.378	-1.763	56	70
84	M15	Y	-1.081	-3.847	0	2.4
85	M15	Y	-3.847	-6.052	2.4	4.8
86	M15	Y	-6.052	-6.72	4.8	7.2
87	M15	Y	-6.72	-4.595	7.2	9.6
88	M15	Y	-4.595	-.653	9.6	12
89	M20	Y	-28.829	-14.052	0	1.8
90	M20	Y	-14.052	-5.449	1.8	3.6
91	M20	Y	-5.449	-3.547	3.6	5.4
92	M20	Y	-3.547	-1.642	5.4	7.2
93	M20	Y	-1.642	.633	7.2	9
94	M23	Y	-33.038	-13.556	0	1.8
95	M23	Y	-13.556	-3.69	1.8	3.6
96	M23	Y	-3.69	-2.543	3.6	5.4
97	M23	Y	-2.543	-1.16	5.4	7.2
98	M23	Y	-1.16	-.44	7.2	9
99	M27	Y	-1.373	-1.373	0	1
100	M28	Y	-.29	-.29	0	1
101	M50	Y	5.332	-19.606	0	3
102	M50	Y	-19.606	-65.87	3	6

Member Distributed Loads (BLC 13 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
1	M1	Z	-5.629	-5.629	0	150
2	M2	Z	-2.815	-2.815	0	150
3	M3	Z	-2.815	-2.815	0	150
4	M5	Z	-3.9	-3.9	0	72
5	M6	Z	-3.9	-3.9	0	72
6	M7	Z	-2.815	-2.815	0	70
7	M8	Z	-2.815	-2.815	0	70
8	M9	Z	-5.629	-5.629	0	70
9	M10	Z	0	0	0	4.5
10	M11	Z	0	0	0	4.5

Member Distributed Loads (BLC 13 : BLC 5 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
11	M12	Z	0	0	0	4.5
12	M13	Z	-4.503	-4.503	0	12
13	M14	Z	-2.252	-2.252	0	12
14	M15	Z	-2.252	-2.252	0	12
15	M16	Z	0	0	0	4.5
16	M17	Z	0	0	0	4.5
17	M18	Z	0	0	0	4.5
18	M19	Z	-4.503	-4.503	0	9
19	M20	Z	-4.503	-4.503	0	9
20	M21	Z	-2.252	-2.252	0	9
21	M22	Z	-2.252	-2.252	0	9
22	M23	Z	-2.252	-2.252	0	9
23	M24	Z	-2.252	-2.252	0	9
24	M29	Z	-3.9	-3.9	0	1
25	M30	Z	-3.9	-3.9	0	1
26	M31	Z	-3.9	-3.9	0	1
27	M32	Z	-3.9	-3.9	0	1
28	M33	Z	-3.9	-3.9	0	1
29	M34	Z	-3.9	-3.9	0	1
30	M35	Z	-3.9	-3.9	0	1
31	M36	Z	-3.9	-3.9	0	1
32	M37	Z	-2.674	-2.674	0	72
33	M38	Z	-2.674	-2.674	0	72
34	M39	Z	-2.674	-2.674	0	72
35	M40	Z	-2.674	-2.674	0	72
36	M41	Z	-2.674	-2.674	0	72
37	M42	Z	-2.674	-2.674	0	72
38	M43	Z	-2.674	-2.674	0	72
39	M44	Z	-2.674	-2.674	0	72
40	M45	Z	-2.674	-2.674	0	72
41	M46	Z	-2.674	-2.674	0	72
42	M47	Z	-2.674	-2.674	0	72
43	M48	Z	-2.674	-2.674	0	72
44	M49	Z	-2.674	-2.674	0	48
45	M51	Z	-2.674	-2.674	0	48
46	M52	Z	0	0	0	6
47	M53	Z	-2.674	-2.674	0	48
48	M54	Z	0	0	0	6
49	M58	Z	0	0	0	15.232
50	M59	Z	0	0	0	15.232
51	M60	Z	0	0	0	15.232

Member Distributed Loads (BLC 14 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
1	M2	X	-4.875	-4.875	0	150
2	M3	X	-4.875	-4.875	0	150
3	M4	X	-4.503	-4.503	0	72
4	M5	X	-2.252	-2.252	0	72
5	M6	X	-2.252	-2.252	0	72
6	M7	X	-4.875	-4.875	0	70
7	M8	X	-4.875	-4.875	0	70
8	M10	X	0	0	0	4.5
9	M11	X	0	0	0	4.5
10	M12	X	0	0	0	4.5
11	M14	X	-3.9	-3.9	0	12
12	M15	X	-3.9	-3.9	0	12

Member Distributed Loads (BLC 14 : BLC 6 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location[in..	End Location[in,...
13	M16	X	0	0	0	4.5
14	M17	X	0	0	0	4.5
15	M18	X	0	0	0	4.5
16	M21	X	-3.9	-3.9	0	9
17	M22	X	-3.9	-3.9	0	9
18	M23	X	-3.9	-3.9	0	9
19	M24	X	-3.9	-3.9	0	9
20	M25	X	-4.503	-4.503	0	1
21	M26	X	-4.503	-4.503	0	1
22	M27	X	-4.503	-4.503	0	1
23	M28	X	-4.503	-4.503	0	1
24	M29	X	-2.252	-2.252	0	1
25	M30	X	-2.252	-2.252	0	1
26	M31	X	-2.252	-2.252	0	1
27	M32	X	-2.252	-2.252	0	1
28	M33	X	-2.252	-2.252	0	1
29	M34	X	-2.252	-2.252	0	1
30	M35	X	-2.252	-2.252	0	1
31	M36	X	-2.252	-2.252	0	1
32	M37	X	-2.674	-2.674	0	72
33	M38	X	-2.674	-2.674	0	72
34	M39	X	-2.674	-2.674	0	72
35	M40	X	-2.674	-2.674	0	72
36	M41	X	-2.674	-2.674	0	72
37	M42	X	-2.674	-2.674	0	72
38	M43	X	-2.674	-2.674	0	72
39	M44	X	-2.674	-2.674	0	72
40	M45	X	-2.674	-2.674	0	72
41	M46	X	-2.674	-2.674	0	72
42	M47	X	-2.674	-2.674	0	72
43	M48	X	-2.674	-2.674	0	72
44	M49	X	-2.674	-2.674	0	48
45	M50	X	0	0	0	6
46	M51	X	-2.674	-2.674	0	48
47	M52	X	0	0	0	6
48	M53	X	-2.674	-2.674	0	48
49	M54	X	0	0	0	6
50	M58	X	0	0	0	15.232
51	M60	X	0	0	0	15.232

Member Area Loads (BLC 1 : Self Weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N22	N12	N7	N19	Y	Two Way	-5
2	N20	N8	N3	N17	Y	Two Way	-5
3	N21	N18	N4	N11	Y	Two Way	-5

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

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N117	N116	N118	N119	Z	Open Structure	-84.14

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

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N119	N118	N120	N121	X	Open Structure	-84.14

Member Area Loads (BLC 4 : Ice Weight)

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N22	N12	N7	N19	Y	Two Way	-7
2	N20	N8	N3	N17	Y	Two Way	-7
3	N21	N18	N4	N11	Y	Two Way	-7

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

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N117	N116	N118	N119	Z	Open Structure	-13.51

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

	Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[psf]
1	N119	N118	N120	N121	X	Open Structure	-13.51

APPENDIX D

ADDITIONAL CALCUATIONS

Date:	1/29/2019
Client	Crown Castle
Carrier	AT&T
Engineer:	CLK
Site:	846176
Job #:	1039-A0002-B

Code:	LRFD	
Axial:	3134.00	lbs
Shear:	4186.00	lbs

Bolt Capacity (1/2" A307 Bolt)				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	8226.7	6170.0	2	12340
Shear(lb)	5133.3	3850.0	2	7700

Interaction Check	
T /ϕT_n	25.4%
V /ϕVn	54.4%
≤1.0	36.0%
	OK

APPENDIX E

MOUNT MODIFICATION DESIGN DRAWINGS (MDD) / SUPPLEMENTAL DRAWINGS

GENERAL NOTES:

1. THESE DOCUMENTS WERE DESIGNED IN ACCORDANCE WITH THE LATEST VERSION OF APPLICABLE LOCAL/STATE/COUNTY/CITY BUILDING CODES, AS WELL AS ANSI/TIA-222 STANDARD, AWWA-D100 STANDARD, NDS, NEC, MSJC, AND/OR THE LATEST VERSION OF THE INTERNATIONAL BUILDING CODE, UNLESS NOTED OTHERWISE IN THE CORRESPONDING STRUCTURAL REPORT.
2. ALL CONSTRUCTION METHODS SHOULD FOLLOW STANDARDS OF GOOD CONSTRUCTION PRACTICE.
3. ALL WORK INDICATED ON THESE DRAWINGS SHALL BE PERFORMED BY QUALIFIED CONTRACTORS EXPERIENCED IN SIMILAR CONSTRUCTION.
4. ALL NEW WORK SHALL ACCOMMODATE EXISTING CONDITIONS. IF OBSTRUCTIONS ARE FOUND, CONTRACTOR SHALL NOTIFY ENGINEER OF RECORD PRIOR TO CONTINUING WORK.
5. ANY CHANGES OR ADDITIONS MUST CONFORM TO THE REQUIREMENTS OF THESE NOTES AND SPECIFICATIONS, AND SHOULD BE SIMILAR TO THOSE SHOWN. ALL CHANGES OR ADDITIONS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND/OR CONSTRUCTION.
6. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND EXECUTION OF ALL MISCELLANEOUS SHORING, BRACING, TEMPORARY SUPPORTS, ETC. NECESSARY TO PROVIDE A COMPLETE AND STABLE STRUCTURE DURING CONSTRUCTION. TIA-1019-A-2011 IS AN APPROPRIATE REFERENCE FOR THOSE DESIGNS MEETING TIA STANDARDS. THE ENGINEER OF RECORD MAY PROVIDE FORMAL RIGGING PLANS AT THE REQUEST AND EXPENSE OF THE CONTRACTOR.
7. INSTALLATION SHALL NOT INTERFERE NOR DENY ADEQUATE ACCESS TO OR FROM ANY EXISTING OR PROPOSED OPERATIONAL AND SAFETY EQUIPMENT.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO ANY FABRICATION. CONTACT INFINIGY ENGINEERING IF ANY DISCREPANCIES EXIST.

STEEL CONSTRUCTION NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE AISC MANUAL OF STEEL CONSTRUCTION 14TH EDITION, FOR THE DESIGN AND FABRICATION OF STEEL COMPONENTS.
2. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES, AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS' RECOMMENDATIONS.
3. ALL FIELD DRILLED HOLES TO BE USED FOR FIELD BOLTING INSTALLATION SHALL BE STANDARD HOLES, AS DEFINED BY AISC, UNLESS NOTED OTHERWISE.
4. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. ALL STEEL MEMBERS AND CONNECTIONS SHALL MEET THE FOLLOWING GRADES:
   - ANGLES, CHANNELS, PLATES AND BARS TO BE A36. Fy=36 KSI, U.N.O.
   - W SHAPES TO BE A992. Fy=50 KSI, U.N.O.
   - RECTANGULAR HSS TO BE A500, GRADE B. FY=46 KSI, U.N.O.
   - ROUND HSS TO BE A500, GRADE B. FY=42 KSI, U.N.O.
   - STEEL PIPE TO BE A53, GRADE B. Fy=35 KSI, U.N.O.
   - BOLTS TO BE A325-X. Fu=120 KSI, U.N.O.
   - U-BOLTS AND LAG SCREWS TO BE A307 GR A. Fu=60 KSI, U.N.O.
6. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES, U.N.O.
7. ALL WELDING SHALL CONFORM TO AISC AND AWS D1.1 LATEST EDITION.
8. ALL HILTI ANCHORS TO BE CARBON STEEL, U.N.O.
   - MECHANICAL ANCHORS: KWIK BOLT-TZ, U.N.O.
   - CMU BLOCK ANCHORS: ADHESIVE - HY120, U.N.O.
   - CONCRETE ANCHORS: ADHESIVE - HY150, U.N.O.
   - CONCRETE REBAR: ADHESIVE - RE500, U.N.O.
9. ALL STUDS TO BE NELSON CAPACITOR DISCHARGE 1/4"-20 LOW CARBON STEEL COPPER-FLASH AT 55 KSI ULT/50 KSI YIELD, U.N.O.
10. BOLTS SHALL BE TIGHTENED TO A "SNUG TIGHT" CONDITION AS DEFINED BY AISC.
11. MINIMUM EDGE DISTANCES SHALL CONFORM TO AISC TABLE J3.4.

CONCRETE CONSTRUCTION NOTES:

1. CONCRETE TO BE 4000 PSI @ 28 DAYS. REINFORCING BAR TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. CONCRETE INSTALLATION TO CONFORM TO ACI-318 BUILDING REQUIREMENTS FOR REINFORCED CONCRETE. ALL CONCRETE TO BE PLACED AGAINST UNDISTURBED EARTH FREE OF WATER AND ALL FOREIGN OBJECTS AND MATERIALS. A MINIMUM OF THREE INCHES OF CONCRETE SHALL COVER ALL REINFORCEMENT. WELDING OF REBAR IS NOT PERMITTED.
2. EXISTING CONCRETE SURFACES THAT ARE TO BE IN CONTACT WITH NEW PROPOSED CONCRETE SHOULD BE WIRE BRUSHED CLEAN AND TREATED WITH APPROPRIATE MECHANICAL SCRATCH COAT AND REPAIR MATERIALS OR APPROPRIATE CHEMICAL METHODS SUCH AS THE APPLICATION OF A BONDING AGENT, EX. SAKRETE OR EQUIVALENT, TO ENSURE A QUALITY BOND BETWEEN EXISTING AND PROPOSED CONCRETE SURFACES.

FIBER REINFORCED POLYMER (FRP) NOTES:

1. FRP PLATES, SHAPES, BOLTS AND NUTS (STUD/NUT ASSEMBLIES) SHALL CONFORM TO ASTM D638, 695, 790. PLATES AND SHAPES TO BE FY = 5.35 KSI LW (SAFETY FACTOR OF 8), .945 KSI CW (SAFETY FACTOR OF 8) MIN.
2. IF FIELD FABRICATION IS REQUIRED, ALL CUT EDGES AND DRILLED HOLES TO BE SEALED USING VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
3. ALL FASTENERS TO BE 1/2" DIA FRP THREADED ROD WITH FIBER REINFORCED THERMOPLASTIC NUT, SPACED AT 12 INCHES ON CENTER MAXIMUM, U.N.O., FOR PANELS AND AS DESIGNED FOR STRUCTURAL MEMBERS.
4. THE COLOR AND SURFACE PATTERN OF EXPOSED FRP PANELS SHALL MATCH THE EXTERIOR OF THE EXISTING BUILDING, U.N.O.
5. STUD/NUT ASSEMBLIES SHOULD BE LUBRICATED FOR INSTALLATION
6. ENSURE BEARING SURFACES OF THE NUTS ARE PARALLEL TO THE SURFACES BEING FASTENED.
7. TORQUE BOLTS ACCORDING TO THE FOLLOWING TABLE:

INSTALLATION TORQUE TABLE

SIZE	ULTIMATE TORQUE STRENGTH	RECOMMENDED MAXIMUM INSTALLATION TORQUE
3/8-16 UNC	8 FT-LBS	4 FT-LBS
1/2-13 UNC	18 FT-LBS	8 FT-LBS
5/8-11 UNC	35 FT-LBS	16 FT-LBS
3/4-10 UNC	50 FT-LBS	24 FT-LBS
1-8 UNC	110 FT-LBS	50 FT-LBS

8. WHEN TIGHTENING FRP STUD/NUT ASSEMBLIES, WRENCHES MUST MAKE FULL CONTACT WITH ALL NUT EDGES. A STANDARD SIX POINT SOCKET IS RECOMMENDED.
9. STUD/NUT ASSEMBLIES SHOULD BE BONDED BY APPLYING BONDING AGENT TO ENTIRE NUT AND EXPOSED STUD.
10. ALL FRP MATERIALS TO BE PROVIDED BY FIBERGRATE COMPOSITE STRUCTURES, DALLAS TX, OR APPROVED EQUAL.
11. ALL FRP SHAPES TO BE DYNAFORM PULTRUDED STRUCTURAL SHAPES.
12. ALL FRP PLATES TO BE FIBERPLATE MOLDED FRP PLATE.
13. ALL FRP PANELS TO BE FIBERPLATE CLADDING PANEL.
14. EACH FRP PANEL TO BE IDENTIFIED WITH LARR#25536 AND FIBERGRATE COMPOSITE STRUCTURAL LABEL.
15. FRP MATERIAL TO BE CLASSIFIED AS CC1 OR BETTER, AND HAVE MAXIMUM FLAME SPREAD OF 50.
16. ALL DESIGN AND CONSTRUCTION TO BE COMPLETED IN ACCORDANCE WITH LOS ANGELES RESEARCH REPORT RR25536, DATED FEBRUARY 1, 2016.
17. SPECIAL INSPECTIONS MUST BE PROVIDED FOR ALL FRP INSTALLMENTS. SEE SPECIAL INSPECTION SECTION, THIS SHEET.

RATIO OF EDGE DISTANCE TO FRP FASTENER DIAMETER

	RANGE	RECOMMENDED
EDGE DISTANCE - CL* BOLT TO END	2.0-4.0	3.0
EDGE DISTANCE - CL* BOLT TO SIDE	1.5-3.5	2.5
BOLT PITCH - CL* TO CL*	4.0-5.0	5.0

WOOD CONSTRUCTION NOTES:

1. ALL EXISTING WOOD SHAPES ARE ASSUMED TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN.
2. ALL PROPOSED WOOD SHAPES ARE TO BE DOUGLAS FIR-LARCH WITH A REFERENCE DESIGN BENDING VALUE OF 1000 PSI MIN. U.N.O.
3. ALL EXISTING AND PROPOSED GLUED LAMINATED TIMBERS ARE TO BE 24F-1.8C DOUGLAS FIR BALANCED WITH A REFERENCE DESIGN BENDING VALUE OF 2400 PSI MIN. U.N.O.

MASONRY CONSTRUCTION NOTES:

1. ALL BRICK TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 100 PSI SHALL BE USED. FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 133 PSI.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.
2. ALL CMU TO BE 1500 PSI MIN. REINFORCING BAR (IF APPLICABLE) TO CONFORM TO ASTM A615 GRADE 60 SPECIFICATIONS. ALL MORTAR TO BE 2000 PSI MIN.
   - FOR INTERIOR/ABOVE GRADE APPLICATIONS, TYPE N MORTAR HAVING MINIMUM MODULUS OF RUPTURE OF 64 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 158 PSI FOR FULLY GROUTED BLOCKS.
   - FOR EXTERIOR/BELOW GRADE APPLICATIONS TYPE M OR S MORTAR HAVING A MINIMUM MODULUS OF RUPTURE OF 84 PSI SHALL BE USED FOR UNGROUTED BLOCKS, AND 163 PSI FOR FULLY GROUTED BLOCKS.
   - BRICK AND MORTAR INSTALLATION TO CONFORM TO MSJC BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES.

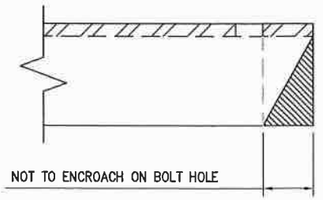
TOWER PLUMB & TENSION NOTES:

1. PLUMB AND TENSION TOWER UPON COMPLETION OF STRUCTURAL MODIFICATIONS DETAILED IN THESE DRAWINGS.
2. RETENSIONING OF EXISTING GUY WIRES SHALL BE PERFORMED AT A TIME WHEN THE WIND VELOCITY IS LESS THAN 10 MPH AT GROUND LEVEL AND WITH NO ICE ON THE STRUCTURE AND GUY WIRES.
3. PLUMB THE TOWER WHILE RETENSIONING THE EXISTING GUY WIRES. THE HORIZONTAL DISTANCE BETWEEN THE VERTICAL CENTERLINES AT ANY TWO ELEVATIONS SHALL NOT EXCEED 0.25% OF THE VERTICAL DISTANCE BETWEEN TWO ELEVATIONS FOR LATTICED STRUCTURES.
4. THE TWIST BETWEEN ANY TWO ELEVATIONS THROUGHOUT THE HEIGHT OF A LATTICE STRUCTURE SHALL NOT EXCEED 0.5 DEGREES IN 10 FEET. THE MAXIMUM TWIST OVER THE LATTICE STRUCTURE HEIGHT SHALL NOT EXCEED 5 DEGREES.

SPECIAL INSPECTIONS NOTES:

1. A QUALIFIED INDEPENDENT TESTING LABORATORY, EMPLOYED BY THE OWNER AND APPROVED BY THE JURISDICTION, SHALL PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH THE THE GOVERNING BUILDING CODE, APPLICABLE SECTION(S) AS REQUIRED BY PROJECT SPECIFICATIONS FOR THE FOLLOWING CONSTRUCTION WORK:
   a. STRUCTURAL WELDING (CONTINUOUS INSPECTION OF FIELD WELDS ONLY).
   b. HIGH STRENGTH BOLTS (PERIODIC INSPECTION OF A325 AND/OR A490 BOLTS) TO BE TIGHTENED PER "TURN-OF-THE-NUT" METHOD.
   c. MECHANICAL AND EPOXIED ANCHORAGES.
   d. FIBER REINFORCED POLYMER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE FRP MATERIAL SPECIFIED ON THE APPROVED DESIGN DOCUMENTS IS BEING INSTALLED.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT ALL CUT EDGES AND DRILLED HOLES ARE PROPERLY SEALED USING A VINYL ESTER SEALING KIT SUPPLIED BY THE MANUFACTURER.
      - THE SPECIAL INSPECTOR MUST VERIFY THAT THE STRUCTURE IS BUILT IN ACCORDANCE WITH THE APPROVED DESIGN DOCUMENTS.
2. THE INSPECTION AGENCY SHALL SUBMIT INSPECTION AND TEST REPORTS TO THE BUILDING DEPARTMENT, THE ENGINEER OF RECORD, AND THE OWNER UNLESS THE FABRICATOR IS APPROVED BY THE BUILDING OFFICIAL TO PERFORM WORK WITHOUT THE SPECIAL INSPECTIONS.

MAXIMUM ALLOWABLE ANGLE CLIP



INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOSEPH R. JOHNSTON
LICENSED PROFESSIONAL ENGINEER
Joseph R. Johnston
JAN 29 2019

CONSTRUCTION TO BE PERFORMED IN CONFORMANCE TO THIS DOCUMENT AS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

No	Submittal / Revision	App'd	Date
0	ISSUED FOR REVIEW	JRJ	01/24/19

Drawn: JA Date: 01/24/19
Designed: ATE Date: 01/24/19
Checked: NRG Date: 01/24/19

Project Number: 600-003

Project Title:
BU# 846176
FA# 10091767

MADISON-DURHAM ROAD

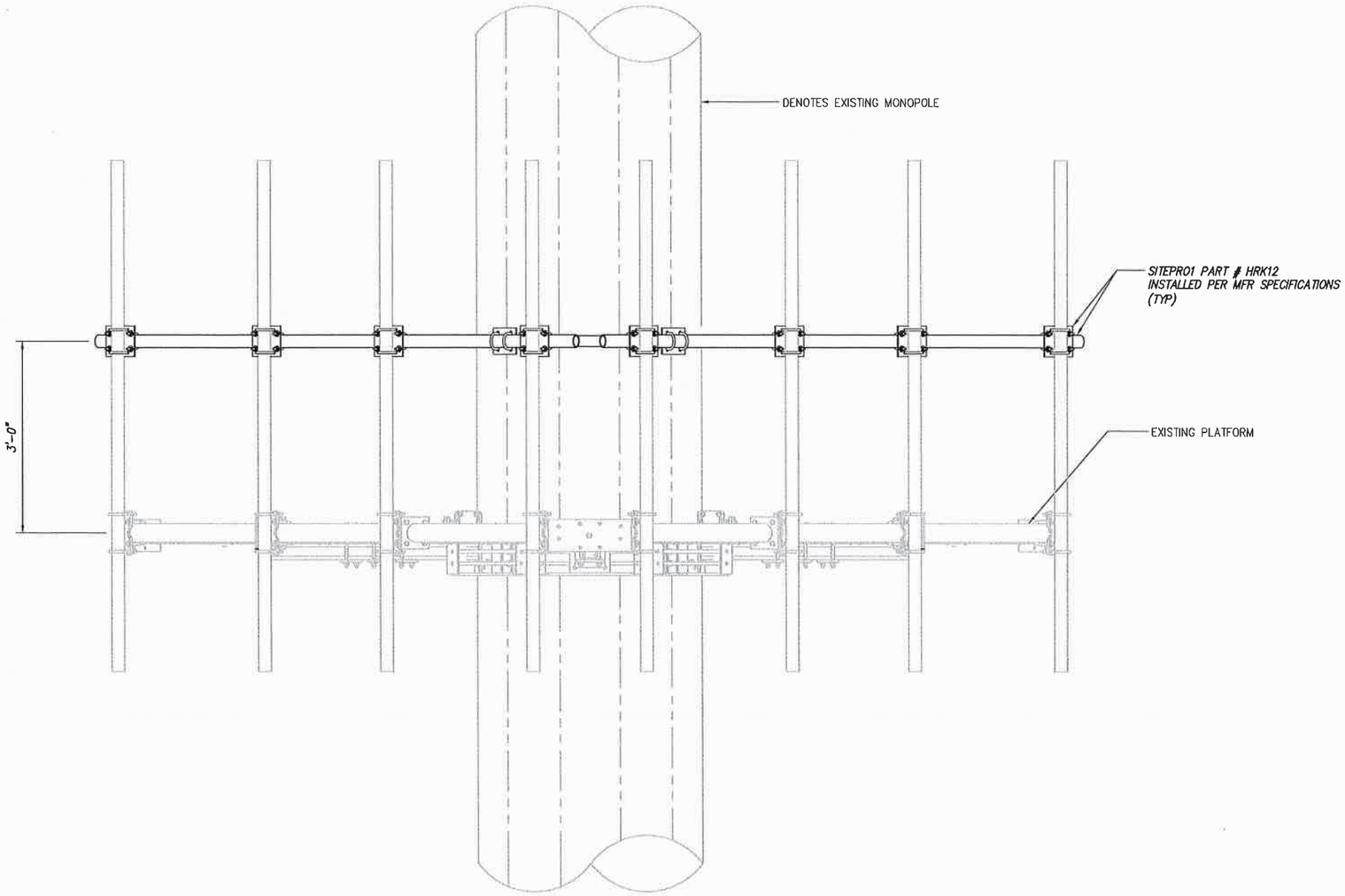
1749 DURHAM ROAD
MADISON, CT 06443

Prepared For:
CROWN CASTLE
3 Corporate Park, Suite 101
Clifton Park, NY 12065

Drawing Scale: AS NOTED
Date: 09/05/18

Drawing Title
GENERAL NOTES

Drawing Number
S1



INFINIGY
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793

at&t

STATE OF CONNECTICUT
JOSEPH R. JOHNSTON
29160
LICENSED
PROFESSIONAL ENGINEER
Joseph R. Johnston
1/29/2019

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No.	Submittal / Revision	Appd.	Date
0	ISSUED FOR REVIEW	JRJ	01/24/19

Drawn: JA Date: 01/24/18
Designed: ATE Date: 01/24/18
Checked: NRO Date: 01/24/18

Project Number:
600-003

Project Title:
BU# 846176
FA# 10091767

MADISON-DURHAM ROAD

1749 DURHAM ROAD
MADISON, CT 06443

Prepared For:

CROWN CASTLE
3 Corporate Park, Suite 101
Clifton Park, NY 12065

Drawing Scale:
AS NOTED

Date:
09/05/18

Drawing Title
MOD DESIGN

Drawing Number
S2

RF EMISSIONS COMPLIANCE REPORT

Crown Castle on behalf of AT&T Mobility, LLC

Crown Castle Site Name: MADISON DURHAM ROAD
Crown Castle Site BU: 846176
AT&T Mobility, LLC FA #: 10091767
1749 DURHAM ROAD
MADISON, CT
2/1/2019

Report Status:

AT&T Mobility, LLC Is Compliant

SEALED 5FEB2019 MIKE@H2DC.COM
H2DC PLLC CT CoA#: 0001714

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
MADISON, CT

My signature on the cover of this document indicates:

That I, Michael A McGuire, am currently and actively licensed to provide (in this state/jurisdiction as indicated within the professional electrical engineering seal on the cover of this document) professional electrical engineering services, as an employee of Hurricane Hill Development Company, PLLC , a duly authorized/registered engineering firm (in this state, as applicable) on behalf of SiteSafe, LLC; 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 "MADISON DURHAM ROAD" ("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 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 3.528% 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 7.242% 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
MADISON DURHAM ROAD
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC	0.246 %
AT&T Mobility, LLC (Proposed)	0.591 %
AT&T Mobility, LLC (Proposed)	0.536 %
AT&T Mobility, LLC (Proposed)	0.493 %
AT&T Mobility, LLC (Proposed)	0.799 %
AT&T Mobility, LLC (Proposed)	0.392 %
AT&T Mobility, LLC (Proposed)	0.471 %
Sprint	0.466 %
Sprint	0.328 %
Sprint	0.328 %
Sprint	0.251 %
Verizon Wireless	0.616 %
Verizon Wireless	0.568 %
Verizon Wireless	1.158 %
Composite Site MPE:	7.242 %

AT&T Mobility, LLC
MADISON DURHAM ROAD
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	1.39482	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.24615	%

					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	118	30	1094	0.776248	0.136985	1.195329	0.21094
Powerwave	7770	118	150	1094	0.777237	0.13716	1.195329	0.21094
Powerwave	7770	118	270	1094	0.776248	0.136985	1.195329	0.21094

AT&T Mobility, LLC (Proposed)
MADISON DURHAM ROAD
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	5.91486	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.59149	%

					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	118	0	7114	2.276238	0.227624	5.391757	0.539176
Kathrein-Scala	800-10965	118	130	7114	2.22122	0.222122	5.391757	0.539176
Kathrein-Scala	800-10965	118	240	7114	2.221221	0.222122	5.391757	0.539176

AT&T Mobility, LLC (Proposed)
MADISON DURHAM ROAD
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	5.35877	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.53588	%

					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	118	0	6168	1.961378	0.196138	4.182494	0.418249
Kathrein-Scala	800-10965	118	130	6168	1.971904	0.19719	4.182494	0.418249
Kathrein-Scala	800-10965	118	240	6168	1.961378	0.196138	4.182494	0.418249

AT&T Mobility, LLC (Proposed)
MADISON DURHAM ROAD
Carrier Summary

Frequency:	763	MHz
Maximum Permissible Exposure (MPE):	508.67	µW/cm^2
Maximum power density at ground level:	2.50604	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.49267	%

					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	118	0	2959	1.71458	0.337073	2.178472	0.428271
Kathrein-Scala	800-10965	118	130	2959	1.723342	0.338796	2.178472	0.428271
Kathrein-Scala	800-10965	118	240	2959	1.71458	0.337073	2.178472	0.428271

AT&T Mobility, LLC (Proposed)
MADISON DURHAM ROAD
Carrier Summary

Frequency:	2300	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	7.99044	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.79904	%

					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	OPA65R-BU6A	118	0	2924	7.96174	0.796174	7.961741	0.796174
CCI Antennas	OPA65R-BU6A	118	130	2924	7.96174	0.796174	7.961741	0.796174
CCI Antennas	OPA65R-BU6A	118	240	2924	7.96174	0.796174	7.96174	0.796174

AT&T Mobility, LLC (Proposed)
MADISON DURHAM ROAD
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	2.2186	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.39152	%

					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	OPA65R-BU6A	118	0	2631	1.350748	0.238367	2.008997	0.354529
CCI Antennas	OPA65R-BU6A	118	130	2631	1.353505	0.238854	2.008997	0.354529
CCI Antennas	OPA65R-BU6A	118	240	2631	1.350748	0.238367	2.008997	0.354529

AT&T Mobility, LLC (Proposed)
MADISON DURHAM ROAD
Carrier Summary

Frequency:	737	MHz
Maximum Permissible Exposure (MPE):	491.33	µW/cm^2
Maximum power density at ground level:	2.31471	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.47111	%

					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	OPA65R-BU6A	118	0	2692	1.524543	0.310287	2.074858	0.422291
CCI Antennas	OPA65R-BU6A	118	130	2692	1.519112	0.309182	2.074858	0.422291
CCI Antennas	OPA65R-BU6A	118	240	2692	1.524543	0.310287	2.074858	0.422291

Sprint
MADISON DURHAM ROAD
Carrier Summary

Frequency:	2500	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	4.65665	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.46566	%

					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	110	340	6168	1.903186	0.190319	3.610564	0.361056
RFS	APXVTM14-C-I20	110	100	6168	1.902093	0.190209	3.610564	0.361056
RFS	APXVTM14-C-I20	110	220	6168	1.902093	0.190209	3.610564	0.361056

Sprint
MADISON DURHAM ROAD
Carrier Summary

Frequency:	1990	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	3.27869	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.32787	%

					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	108	340	3804	1.349064	0.134906	3.029847	0.302985
RFS	APXVSPP18-C-A20	108	100	3804	1.349064	0.134906	3.029847	0.302985
RFS	APXVSPP18-C-A20	108	220	3804	1.349064	0.134906	3.029847	0.302985

Sprint
MADISON DURHAM ROAD
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	3.27869	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.32787	%

					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	108	340	3804	1.349064	0.134906	3.029847	0.302985
RFS	APXVSPP18-C-A20	108	100	3804	1.349064	0.134906	3.029847	0.302985
RFS	APXVSPP18-C-A20	108	220	3804	1.349064	0.134906	3.029847	0.302985

Sprint
MADISON DURHAM ROAD
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	1.42153	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.25086	%

					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	108	340	2168	1.368093	0.241428	1.390762	0.245429
RFS	APXVSPP18-C-A20	108	100	2168	1.368093	0.241428	1.390762	0.245429
RFS	APXVSPP18-C-A20	108	220	2168	1.372017	0.242121	1.390762	0.245429

Verizon Wireless
MADISON DURHAM ROAD
Carrier Summary

Frequency:	751	MHz
Maximum Permissible Exposure (MPE):	500.67	µW/cm^2
Maximum power density at ground level:	3.08191	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.61556	%

					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-70063-6CF	96	60	2010	1.893414	0.378179	2.262435	0.451885
Antel	BXA-70063-6CF	96	160	2010	1.893414	0.378179	2.262436	0.451885
Antel	BXA-70063-6CF	96	340	2010	1.893414	0.378179	2.262436	0.451885

Verizon Wireless
MADISON DURHAM ROAD
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	5.68348	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.56835	%

					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-171063-8CF	96	60	3708	2.375038	0.237504	3.388595	0.33886
Antel	BXA-171063-8CF	96	160	3708	2.375038	0.237504	3.388595	0.33886
Antel	BXA-171063-8CF	96	340	3708	2.375038	0.237504	3.388595	0.33886

Verizon Wireless
MADISON DURHAM ROAD
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	6.56293	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	1.15816	%

					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	APL868013	96	60	1560	1.929983	0.340585	2.408758	0.425075
RFS	APL868013	96	60	1560	1.929983	0.340585	2.408758	0.425075
RFS	APL868013	96	160	1560	1.929983	0.340585	2.408758	0.425075
RFS	APL868013	96	160	1560	1.929983	0.340585	2.408758	0.425075
ANDREW	DB846F65E-SX	96	340	2255	1.962191	0.346269	2.213759	0.390663
ANDREW	DB846F65E-SX	96	340	2255	1.962191	0.346269	2.213759	0.390663