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 Crown Site BU: 829013**
AT&T Site ID: CTL05258
467 South Quaker Lane, West Hartford, CT 06110
Latitude: 41° 44′ 55.59″/ Longitude: -72° 43′ 52.86″

Dear Ms. Bachman:

AT&T currently maintains (9) antennas at the 110-foot level of the existing 120-foot monopole at 467 South Quaker Lane in West Hartford, Connecticut. The tower is owned by Crown Castle. The property is owned by the Church of St. Marks the Evangelist Corporation. AT&T intends to replace (3) antennas, replace (6) RRHs, add (1) DC6 and (2) DC power cables.

The facility was approved by the Town of West Hartford on March 31, 2000. This approval came with conditions that would not be violated by this modification. Enclosed is a copy of the original approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to Shari Cantor, Mayor of the Town of West Hartford, Mark McGovern, Director of Community Development for the Town of West Hartford, as well as the property owner and Crown Castle is the tower owner.

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

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

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

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

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

For the foregoing reasons, Sprint 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: Anne Marie Zsamba.

Sincerely,

Anne Marie Zsamba, Esq.
Real Estate Specialist
3 Corporate Park Drive, Suite 101, Clifton Park, NY 12065
(201) 236-9224
annemarie.zsamba@crowncastle.com

Attachments:

Exhibit-A: Compound Plan and Elevation Depicting the Planned Changes
Exhibit-B: Structural Modification Report
Exhibit-C: General Power Density Table Report (RF Emissions Analysis Report)

cc: Mayor Shari Cantor
Town of West Hartford
50 South Main Street
West Hartford, CT 06107

Mark McGovern
Director of Community Development
Town of West Hartford
50 South Main Street
West Hartford, CT 06107

Church of St Marks the Evangelist Corp
1088 New Britain Avenue
West Hartford, CT 06110-2426

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: 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 3906 0802**

MON - 25 FEB 10:30A
PRIORITY OVERNIGHT

SE BDLA

06051
CT-US **BDL**

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
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 **MAYOR SHARI CANTOR**
TOWN OF WEST HARTFORD
50 SOUTH MAIN STREET
WEST HARTFORD CT 06107
(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

565J2/0E3D/23AD

FedEx Express

J191019010701uv

MON - 25 FEB 10:30A
PRIORITY OVERNIGHT

TRK# 0201 **7745 3908 3218**

SE KXAA

06107
CT-US **BDL**

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
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 **MARK MCGOVERN, DIRECTOR COMM DEV**
TOWN OF WEST HARTFORD
50 SOUTH MAIN STREET
WEST HARTFORD CT 06107
(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

565J2/0E3D/23AD

FedEx Express

J191019010701uv

TRK# 0201 **7745 3913 6031**

MON - 25 FEB 10:30A
PRIORITY OVERNIGHT

SE KXAA

06107
BDL
CT-US

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
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 **CHURCH OF ST. MARKS THE EVANGELIST**
1088 NEW BRITAIN AVE

WEST HARTFORD CT 06110
(201) 236-9224 REF: 1734.7680
INV:
PO: DEPT:

565J2/0E3D/23AD

FedEx Express

J191019010701uv

TRK# 0201 **7745 3915 8850**

MON - 25 FEB 10:30A
PRIORITY OVERNIGHT

SE KXAA

06110
CT-US **BDL**

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

TOWN PLAN AND ZONING COMMISSION

CERTIFIED MAIL

March 10, 2000

Dennis Brown
Ominipoint Communications, Inc.
100 Filley Street
Bloomfield, CT 06002

SUBJECT: 457 South Quaker Lane – SUP #893

Dear Mr. Brown:

At its regular meeting of March 6, 2000 the West Hartford Town Plan and Zoning Commission gave consideration to the following item:

> **457 South Quaker Lane – St. Mark's Church** – Application (SUP #893) of the Archdiocese of Hartford, R.O., Omnipoint Communications, Inc., Dennis Brown of Omnipoint and Agent for Special Use Permit application. Omnipoint Communications, Inc. proposes to erect a 120 foot tall telecommunications monopole behind St. Mark's Rectory and abutting the right-of-way for Interstate 84. The 120 foot monopole would provide location for Omnipoint antenna and co-location for two other carriers. At the base of the monopole would be an equipment box the size of two filing cabinets. The site would be surrounded by a chain link fenced area, 50' x 50', with security gate and landscape buffering. (Submitted for TPZ receipt on February 7, 2000. Suggest required public hearing be scheduled for March 6, 2000. Required TPZ public hearing scheduled for March 6, 2000.)
> **R-6 ZONE**

After a review of the application and its related exhibits and after consideration of staff technical comments and the public hearing record, the TPZ acted by **majority vote** (Motion/Kearns; Second/Kappes) (Kappes seated for Wirth) to **CONDITIONALLY APPROVE** the subject application. During its discussions and deliberations on this matter, the Commission made the following findings:

1. **The landscape plan shall be revised to substitute the proposed hemlocks with Austrian Pines. The landscape plan shall provide the number, type and size of all proposed plantings.**
2. **As required by Section 177.16.7D(4) Telecommunication towers and antennas of the West Hartford Code of Ordinances the applicant shall make payment to the "Town Abandonment Fund". The applicant shall provide to the Town of West Hartford a statement setting forth the estimated cost of construction for the approved antennas, ancillary facilities and supporting structure, together with a payment equal to 5% of the estimated cost of the**

construction. The payment shall be deposited to the Tower Abandonment Fund.

3. **The proposed Special Use Permit will comply with the finding requirements of Section 177-42A(5a & 5b) of the West Hartford Code of Ordinances.**

You should now contact the Planning Staff to discuss the submission requirements for your plans. A ten dollar ($10) filing fee is required to file a notice of approval on the West Hartford Land Records. My staff will happy to assist you in completing these requirements. The TPZ approval is not final until the legal requirements for filing are completed. The effective date of approval is March 31, 2000.

If you have questions, please feel free to call the Planning Staff at 523-3123.

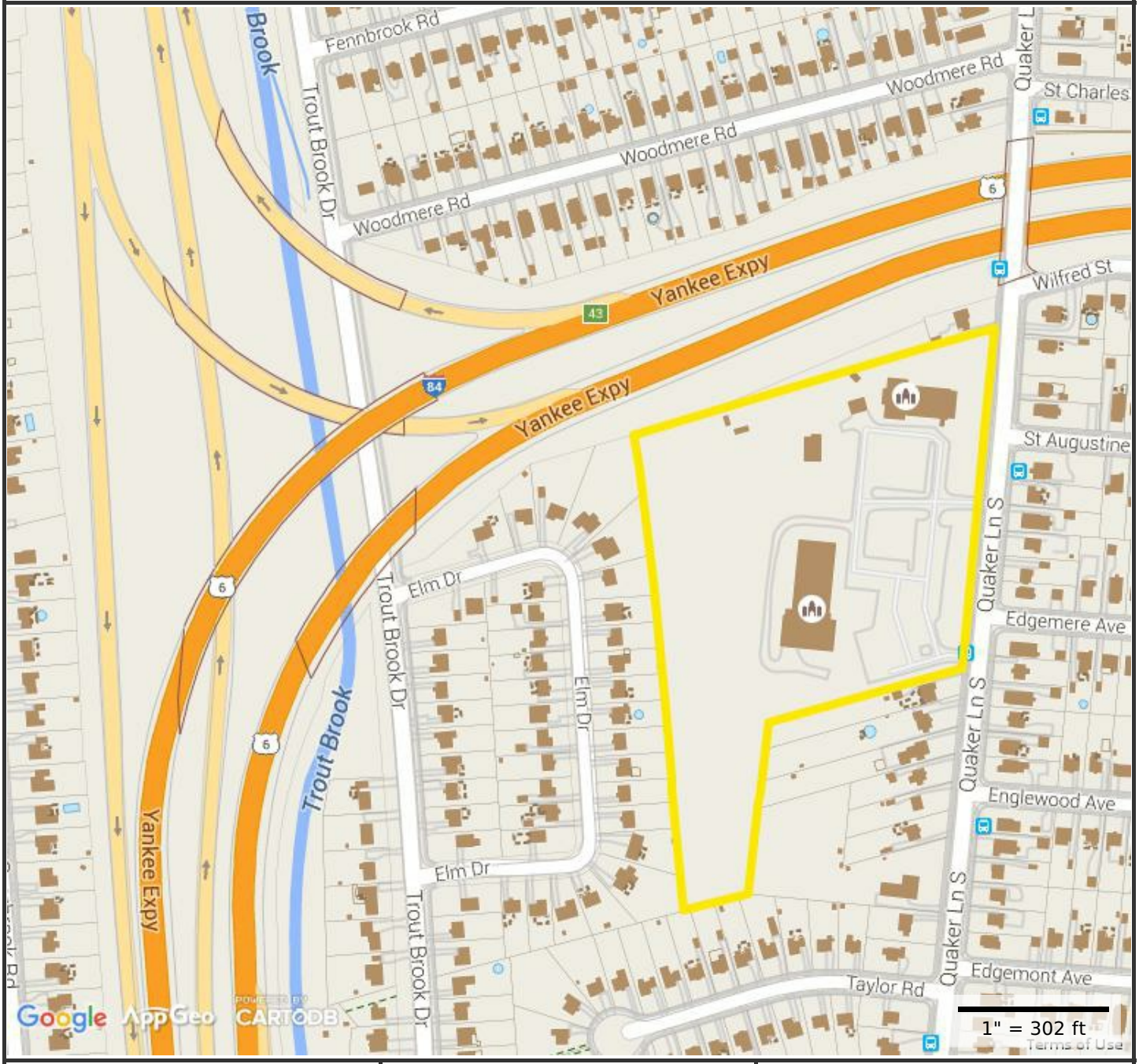
Very truly yours,

Donald R. Foster
Town Planner

C: Ronald Van Winkle, Director of Community
Kevin O'Connor, Corporation Counsel
Norma Cronin, Town Clerk
William Farrell, Town Engineer
Subject TPZ File

457Soqkr-Mar00

CT111178 parcel map



Property Information

Property ID	5096 1 471 0002
Location	471 SOUTH QUAKER LANE
Owner	CHURCH OF ST MARK THE EVANGELIST CORP

TOWN OF WEST HARTFORD

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of West Hartford, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated 5/22/2015
Properties updated Daily

Property Location: 471 SOUTH QUAKER LANE **MAP ID:** G11/ 5096/ 471/ / **Bldg Name:** **State Use:** 901

Vision ID: 18998 **Account #** 5096 1 471 0001 **Bldg #:** 1 of 3 **Sec #:** 1 of 1 **Card** 1 of 3 **Print Date:** 04/20/2016 21:41

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
CHURCH OF ST MARK THE EVANGI	4 Rolling	2 Yes	5 Not Heavy	2 Typical
	1 No	2 Yes		1 No
455 QUAKER LANE SOUTH				1 No
WEST HARTFORD, CT 06110				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:	509614710001	Tax/Exempt	Exempt
Map #	D28+29/	Nbhd	914900.00
Census #	4968	Data Mailer	
PP CANVAS	Exempt		
District	041	Lot Size	8.16
Zoning	R-6		
GIS ID:		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
EX RES LN	11	1,835,700	1,284,990
EX RS DWL	13	277,400	194,180
EX RS OTB	14	13,500	9,450
EX COM BL	22	3,776,800	2,643,760
	Total	5,903,400	4,132,380

6155
WEST HARTFORD, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
CHURCH OF ST MARK THE EVANGELIST CORP	215/ 42		U	I	0	U

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2015	11	1,284,990	2014	11	1,284,990	2013	11	1,284,990
2015	13	194,180	2014	13	194,180	2013	13	194,180
2015	14	9,450	2014	14	9,450	2013	14	9,450
2015	22	2,643,760	2014	22	2,643,760	2013	22	2,643,760
	Total:	4,132,380		Total:	4,132,380		Total:	4,132,380

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	276,000
Appraised XF (B) Value (Bldg)	1,400
Appraised OB (L) Value (Bldg)	13,500
Appraised Land Value (Bldg)	1,835,700
Special Land Value	0
Total Appraised Parcel Value	5,903,400
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	5,903,400

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
914/A				

NOTES

CHURCHSCHOOL AND AUDITORIUM.ROOF HEIGHT
ISAVERAGE. A/N 2460SURVEY 6387, FILED
9/25/00 SHOWS PADSITE AND EASEMENT AREA
FOR FUTURE TELE- COMMUNICATIONS TOWER.
10/20030002 PARCEL FOR PAD SITE

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
150004320	09/27/2015	BP	Permit	15,000		0		Replacing existing anten
0150002720	07/13/2015	BP	Permit	19,000		0		Structural modifications
140005472	12/22/2014	BP	Permit	15,000		100	10/01/2015	Remove and replace 3 an
110000479	01/01/2014	BP	Permit	5,400		100	10/01/2014	(aka 467)installation of s
130004836	12/13/2013	BP	Permit	29,800		100	10/01/2014	Conversion from oil to g
130004837	12/13/2013	BP	Permit	71,000		100	10/01/2014	Replacement of oil fired
130004835	12/13/2013	BP	Permit	14,800		100	10/01/2014	Conversion of warm air

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
10/17/2001			TJC	3B	EXTERIOR PARTIAL P

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.		C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
1	901	Exempt Res	R-6				8.16	AC	224,963.00	1.0000	0		1.00		0.00				1.00		1,835,700

Total Card Land Units:	8.16	AC	Parcel Total Land Area:	8.16 AC	Total Land Value:	1,835,700

Property Location: 471 SOUTH QUAKER LANE **MAP ID:** G11/ 5096/ 471/ / **Bldg Name:** **State Use:** 901

Vision ID: 18998 **Account #** 5096 1 471 0001 **Bldg #:** 1 of 3 **Sec #:** 1 of 1 **Card** 1 of 3 **Print Date:** 04/20/2016 21:41

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	05		Colonial
Model	01		Residential
Grade	C05		C 1.10
Stories	2.0		
Occupancy	1		
Exterior Wall 1	20		Brick
Exterior Wall 2			
Roof Structure	0		Typical
Roof Cover	0		Typical
Interior Wall 1	08		Typical
Interior Wall 2			
Interior Flr 1	25		Typical
Interior Flr 2			
Heat Fuel	03		Oil
Heat Type	03		Forced Air
AC Type	2		Yes
# of Bedrooms	3		
Full Bthrms	4		
Half Baths	0		
Extra Fixtures	0		
Total Rooms	12		
Bath Style	02		Typical
Kitchen Style	02		Typical
Extra Kitchens			
Fireplaces	1		
Prefab Fpl(s)			
Bsmt Egress			
Foundation	PF		Conc Per Piers
Bsmt Garage(s)	0		None
Fin Bsmt/RRm			
Bsmt Rec Rm			

CONSTRUCTION DETAIL (CONTINUED)

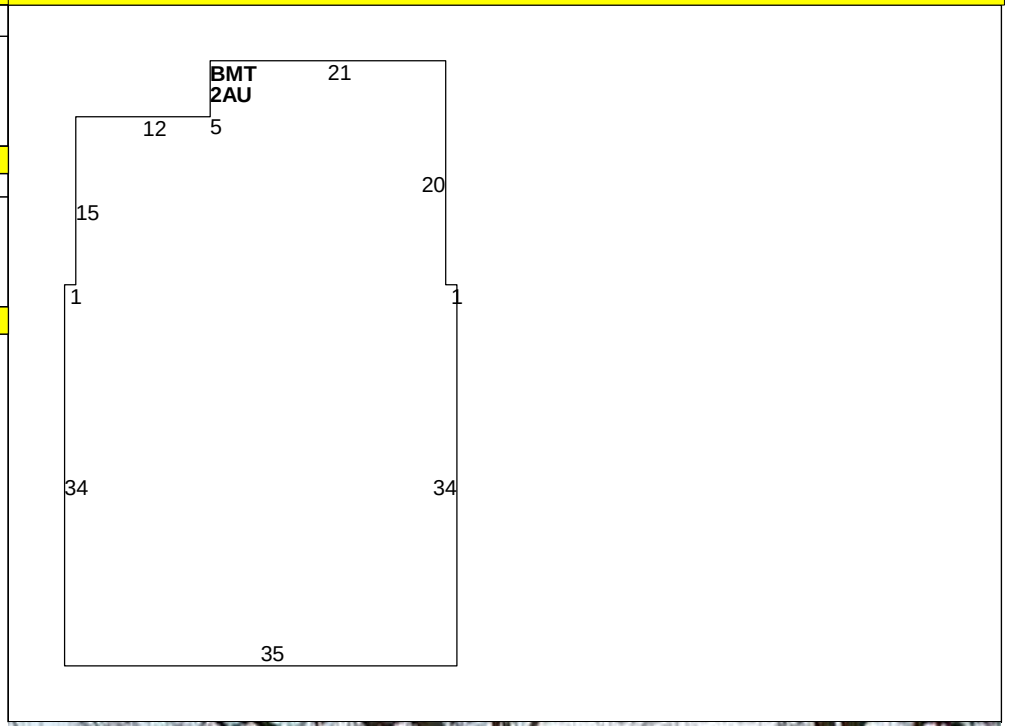
Element	Cd.	Ch.	Description
FBLA			
Int Condition	03		Typical
Attic Access	03		
Dormer LF			

MIXED USE

Code	Description	Percentage
901	Exempt Res	100

COST/MARKET VALUATION

Adj. Base Rate:	92.17
AYB	1945
Dep Code	A
Remodel Rating	
Year Remodeled	1945
Dep %	25
Functional Obslnc	
External Obslnc	
Cost Trend Factor	1
Condition	
% Complete	
Overall % Cond	75
Apprais Val	276,000
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	

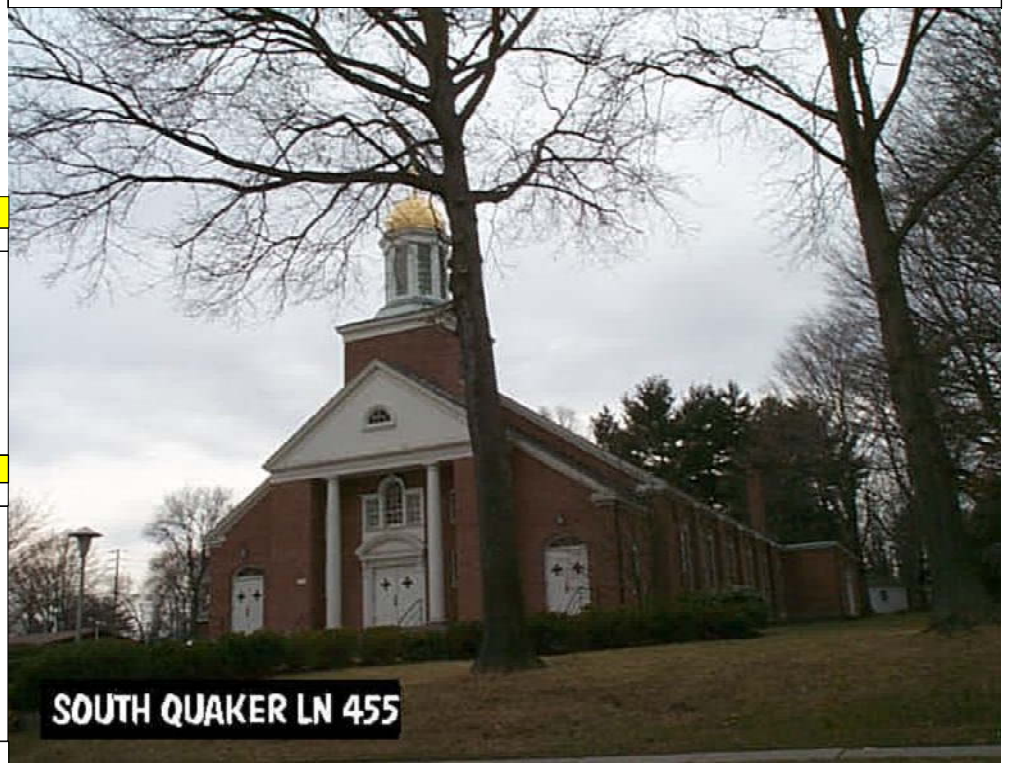


OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
CCP9	Canopy-wood			L	56	6.75	1970	C		7A	50	100
CRG4	Garage - 1.0 St			L	918	26.14	1945	C		A5	64	9,600
CRG4	Garage - 1.0 St			L	247	26.14	1945	C		A5	64	3,800
RP4	Enclosed Porch			B	30	52.87	1986	C	1		83	1,400

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
2AU	2 STORY U UNFIN ATT	3,580	1,790			
BMT	BSMT UNFIN RES	0	1,790			
	Ttl. Gross Liv/Lease Area:	3,580	3,580			



Property Location: 471 SOUTH QUAKER LANE **MAP ID:** G11/ 5096/ 471/ / **Bldg Name:** **State Use:** 901

Vision ID: 18998 **Account #** 5096 1 471 0001 **Bldg #:** 2 of 3 **Sec #:** 1 of 1 **Card** 2 **of** 3 **Print Date:** 04/20/2016 21:41

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
CHURCH OF ST MARK THE EVANGE	4 Rolling	2 Yes	5 Not Heavy	2 Typical
	1 No	2 Yes		1 No
455 QUAKER LANE SOUTH				1 No
WEST HARTFORD, CT 06110				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:	509614710001	Tax/Exempt	Exempt
Map #	D28+29/	Nbhd	914900.00
Census #	4968	Data Mailer	
PP CANVAS	Exempt		
District	041	Lot Size	8.16
Zoning	R-6		
GIS ID:		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
EX RES LN	11	1,835,700	1,284,990
EX RS DWL	13	277,400	194,180
EX RS OTB	14	13,500	9,450
EX COM BL	22	3,776,800	2,643,760
	Total	5,903,400	4,132,380

6155
WEST HARTFORD, CT

VISION

RECORD OF OWNERSHIP

	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
CHURCH OF ST MARK THE EVANGELIST CORP	215/ 42		U	I	0	U

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2015	11	1,284,990	2014	11	1,284,990	2013	11	1,284,990
2015	13	194,180	2014	13	194,180	2013	13	194,180
2015	14	9,450	2014	14	9,450	2013	14	9,450
2015	22	2,643,760	2014	22	2,643,760	2013	22	2,643,760
	Total:	4,132,380		Total:	4,132,380		Total:	4,132,380

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	2,043,400
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	0
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	5,903,400
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	5,903,400

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
914/A				

NOTES

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
10/17/2001			TJC	3B	EXTERIOR PARTIAL P

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.		C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use		Special Pricing Spec Calc		S Adj Fact	Adj. Unit Price	Land Value
2	902	Exempt Commercial	R-6				0	SF	0.00	1.0000	0		1.00		0.00				TR1	TR1	.00		0

Total Card Land Units: 0.00 AC **Parcel Total Land Area:** 8.16 AC **Total Land Value:** 0

Property Location: 471 SOUTH QUAKER LANE **MAP ID:** G11/ 5096/ 471/ / **Bldg Name:** **State Use:** 901

Vision ID: 18998 **Account #** 5096 1 471 0001 **Bldg #:** 2 of 3 **Sec #:** 1 of 1 **Card** 2 of 3 **Print Date:** 04/20/2016 21:41

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	CHUI		Church
Model	94		Comm/Ind
Grade	B06		B 0.90
Stories	2		
Occupancy			
Exterior Wall 1	PRE		Precast Panel
Exterior Wall 2			
Roof Structure	GBL		Gable
Roof Cover	CMP		Comp - Shingle
Interior Wall 1	00		Typical
Interior Wall 2			
Floor Type	WF		Wood
Floor Cover	CPT		Carpet
Heating Fuel	00		Typical
Heating Type	05		Steam Boiler
AC Type	2		Central - Zone
As Built Use	CHUI		
Bldg Use	902		Exempt Commercial
# of Bedrooms			
Total Baths			
Type	01		
Wet Sprinkler			
Frame Type	RST		Rigid Steel
Group	CTA		
Wall Height	17		
Adjustment			

CONSTRUCTION DETAIL (CONTINUED)

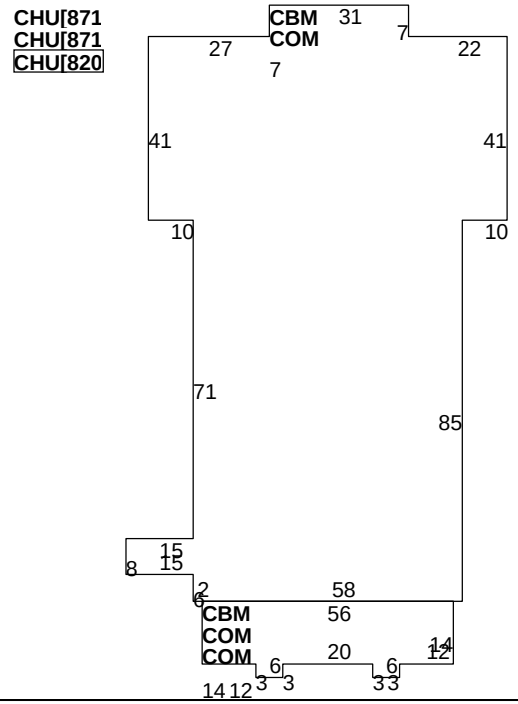
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
902	Exempt Commercial	100

COST/MARKET VALUATION

Adj. Base Rate:	143.37
AYB	1945
Dep Code	A
Remodel Rating	
Year Remodeled	
Dep %	36
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	64
Apprais Val	2,043,400
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	



No Photo On Record

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
CBM	BSMT COMM - NV	0	9,537			
CHU	CHURCH	18,254	18,254			
COM	COMMERCIAL - NV	0	10,357			
	Ttl. Gross Liv/Lease Area:	18,254	38,148			

Property Location: 471 SOUTH QUAKER LANE **MAP ID:** G11/ 5096/ 471/ / **Bldg Name:** **State Use:** 901

Vision ID: 18998 **Account #** 5096 1 471 0001 **Bldg #:** 3 of 3 **Sec #:** 1 of 1 **Card** 3 of 3 **Print Date:** 04/20/2016 21:41

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
CHURCH OF ST MARK THE EVANGE	4 Rolling	2 Yes	5 Not Heavy	2 Typical
	1 No	2 Yes		1 No
455 QUAKER LANE SOUTH				1 No
WEST HARTFORD, CT 06110				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:	509614710001	Tax/Exempt	Exempt
Map #	D28+29/	Nbhd	914900.00
Census #	4968	Data Mailer	
PP CANVAS	Exempt		
District	041	Lot Size	8.16
Zoning	R-6		
GIS ID:		ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
EX RES LN	11	1,835,700	1,284,990
EX RS DWL	13	277,400	194,180
EX RS OTB	14	13,500	9,450
EX COM BL	22	3,776,800	2,643,760
	Total	5,903,400	4,132,380

6155
WEST HARTFORD, CT

VISION

RECORD OF OWNERSHIP

	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
CHURCH OF ST MARK THE EVANGELIST CORP	215/ 42		U	I	0	U

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2015	11	1,284,990	2014	11	1,284,990	2013	11	1,284,990
2015	13	194,180	2014	13	194,180	2013	13	194,180
2015	14	9,450	2014	14	9,450	2013	14	9,450
2015	22	2,643,760	2014	22	2,643,760	2013	22	2,643,760
	Total:	4,132,380		Total:	4,132,380		Total:	4,132,380

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	1,733,400
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	0
Appraised Land Value (Bldg)	0
Special Land Value	0
Total Appraised Parcel Value	5,903,400
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	5,903,400

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
914/A				

NOTES

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
10/17/2001			TJC	3B	EXTERIOR PARTIAL P

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.		C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing	S Adj Fact	Adj. Unit Price	Land Value
3	902	Exempt Commercial	R-6				0	SF	0.00	1.0000	0		1.00		0.00		TR1	.00		0

Total Card Land Units: 0.00 AC Parcel Total Land Area: 8.16 AC Total Land Value: 0

Property Location: 471 SOUTH QUAKER LANE **MAP ID:** G11/ 5096/ 471/ / **Bldg Name:** **State Use:** 901

Vision ID: 18998 **Account #** 5096 1 471 0001 **Bldg #:** 3 of 3 **Sec #:** 1 of 1 **Card** 3 of 3 **Print Date:** 04/20/2016 21:41

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Style	RCLS		Classroom
Model	94		Comm/Ind
Grade	C10		C 1.10
Stories	1		
Occupancy			
Exterior Wall 1	PRE		Precast Panel
Exterior Wall 2			
Roof Structure	GBL		Gable
Roof Cover	CMP		Comp - Shingle
Interior Wall 1	00		Typical
Interior Wall 2			
Floor Type	CS		Concrete Slab
Floor Cover	NO		None
Heating Fuel	00		Typical
Heating Type	12		None
AC Type	8		None
As Built Use	RCLS		
Bldg Use	902		Exempt Commercial
# of Bedrooms			
Total Baths			
Type	01		
Wet Sprinkler			
Dry Sprinkler			
Class	C		Class C
Frame Type	MS		Masonry
Plumbing	01		LIGHT
Ceiling	3		Not Applicable
Group	CTA		
Wall Height	10		
Adjustment			

CONSTRUCTION DETAIL (CONTINUED)

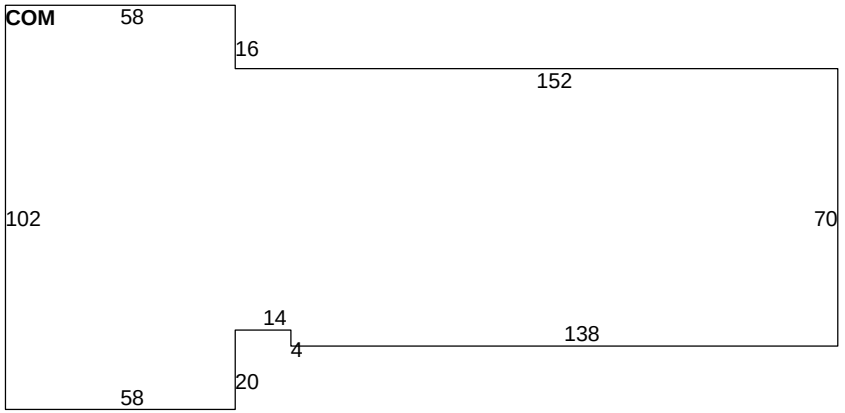
Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
902	Exempt Commercial	100

COST/MARKET VALUATION

Adj. Base Rate:	129.80
AYB	1970
Dep Code	A
Remodel Rating	
Year Remodeled	
Dep %	26
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Condition	
% Complete	
Overall % Cond	74
Apprais Val	1,733,400
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
Cost to Cure Ovr Comment	



No Photo On Record

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
CLS	CLASS ROOM BLDG	16,556	16,556			
COM	COMMERCIAL - NV	0	16,500			
	Ttl. Gross Liv/Lease Area:	16,556	33,056			

PROJECT INFORMATION

SCOPE OF WORK: ITEMS TO BE MOUNTED ON THE EXISTING TOWER:

- REMOVE (2) EXISTING ANTENNA & (2) EXISTING RRH's

- INSTALL AT&T ANTENNA (800-10966) (SECTOR A ONLY, TOTAL OF 1).
- INSTALL AT&T ANTENNA (800-10965) (SECTORS B&C ONLY, TOTAL OF 2).
- INSTALL AT&T 4449 B5/B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL AT&T 8843 B2/B66A (1900) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL SURGE ARRESTOR (DC6-48-60-18-8F) (TOTAL OF 1).
- INSTALL (2) DC TRUNKS CABLES.

ITEMS TO BE MOUNTED INSIDE EXISTING SHELTER:

- SWAP 1ST BB DUS TO 5216 AND ADD NEW XMU.
- ADD NEW NR BB 6630.

ITEMS TO REMAIN:

- (6) ANTENNAS, (3) RRU'S, (6) TMAS, (6) TRIPLEXERS, (4) DC TRUNK CABLES, (1) FIBER TRUNK CABLE, (12) COAX & (2) SURGE SUPPRESSOR.

SITE ADDRESS:	467 SOUTH QUAKER LANE WEST HARTFORD, CT 06110
LATITUDE (NAD 83):	N 41° 44' 55.59"
LONGITUDE (NAD 83):	W 72° 43' 52.86"
LANDLORD:	CROWN CASTLE INTERNATIONAL 500 W. CUMMINGS PARK, STE 3600 WOBURN, MA 01801
TYPE OF SITE:	MONOPOLE /INDOOR
TOWER HEIGHT:	120'
RAD CENTER:	110'
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

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
RF-1	ANTENNA CHART & RF EQUIPMENT SCHEMATIC
G-1	GROUNDING DETAILS

CROWN CASTLE SITE ID #: 829013
CROWN SITE NAME: WEST HARTFORD/I-84/X43

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

NOT FOR CONSTRUCTION

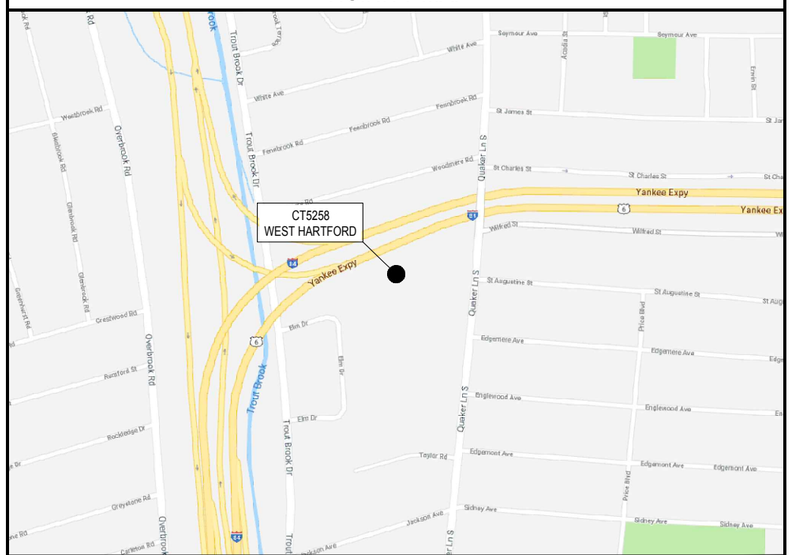
SITE NUMBER: CT5258

FA LOCATION CODE: 10071355
SITE NAME: WEST HARTFORD
CROWN SITE NAME: WEST HARTFORD/I-84/X43
PROJECT: 4C/4TX4RX SOFTWARE RETROFIT/LTE 5C
PACE ID: MRCTB033661, MRCTB033809, MRCTB033756
BU#: 829013

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.

VICINITY MAP



UPDATED 9/09CT-160 /258 WEST HARTFORDI-84 EAST TO EXIT 41. GO LEFT OFF THE EXIT FOLLOW ABOUT ONE MILE AND TAKE A LEFT ONTO SOUTH QUAKER LANE,FOLLOW THIS FOR ABOUT TWO MILES,THEN TAKE A LEFT INTO ST.MARK'S PARISH,WHICH IS 491 SOUTH QUAKER,DRIVE TO THE BACK OF THE PARKING LOT,OUR SITE IS LOCATED BEHIND THE CHURCH.ADDRESS: 491 SOUTH QUAKER ROAD,WEST HARTFORD,CT.NEMSI USES THE ADDRESS OF 467 S. QUAKER.

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.

UNDERGROUND SERVICE ALERT

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

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

0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

TITLE SHEET

T-1

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

0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

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 (2) TWO LAMPS 48-T8 (F)
EXISTING SMOKE DETECTION (DC) (SD)
EXISTING EMERGENCY LIGHTING (DC)
SECURITY LIGHT W/PHOTOCELL LITHONIA ALXW LED-1-25A400/51K-SR4-120-PE-DDBTXD
EXISTING UTILITY POLE
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

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

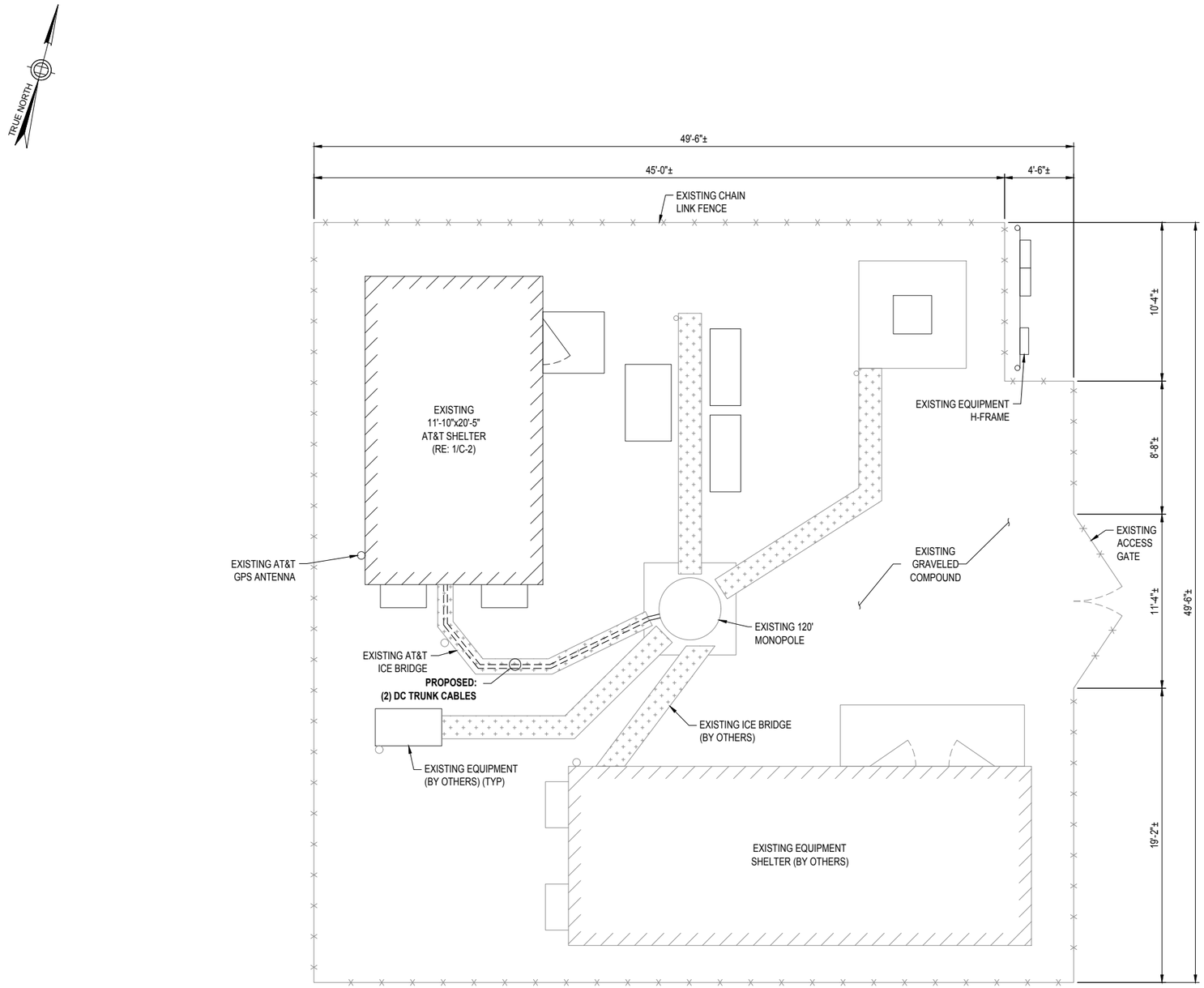
0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

GENERAL NOTES II

GN-2



NOTES:

1. PLAN BASED ON AS-BUILT DRAWINGS ISSUED BY CENTEK ENGINEERING ON 03/01/17. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND LOCATION/ORIENTATION OF EXISTING EQUIPMENT.

1 SITE PLAN

SCALE: 1/4" = 1'-0"

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

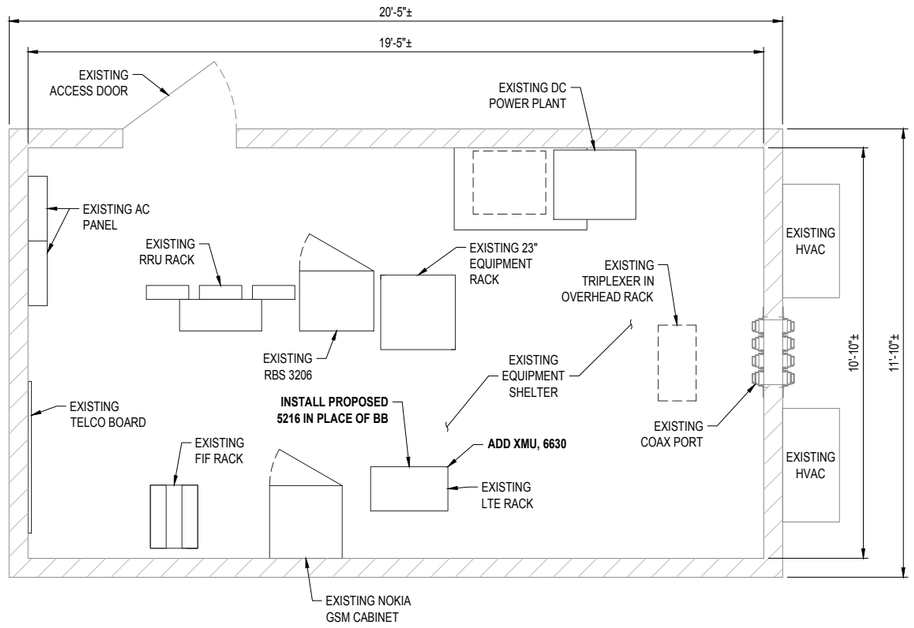
0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

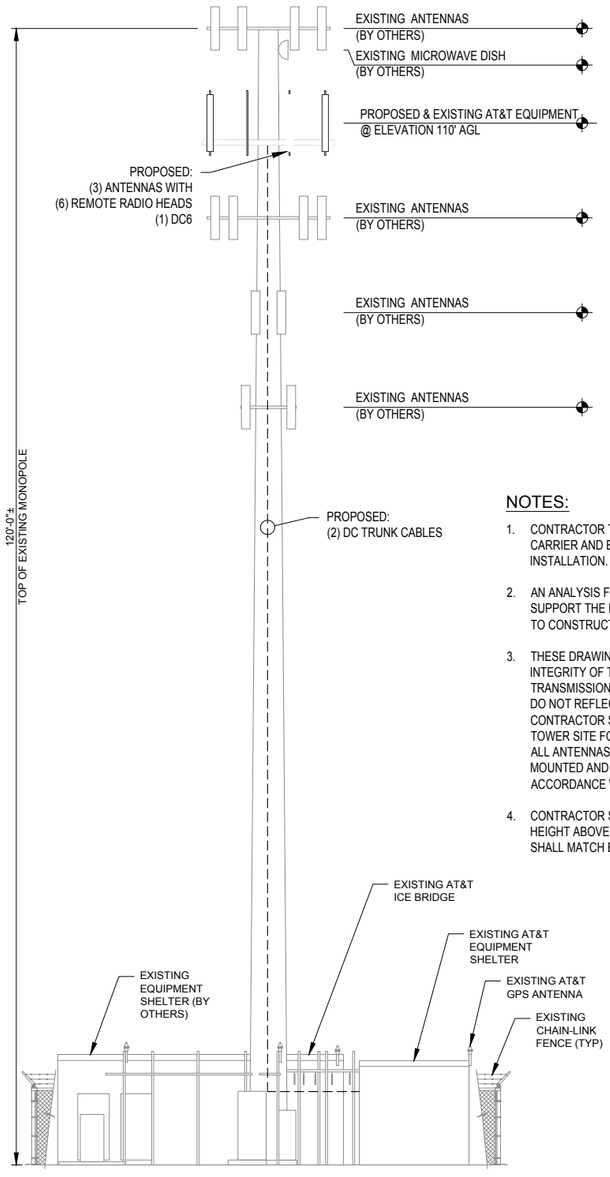
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

SITE PLAN

C-1



1 EQUIPMENT LAYOUT SCALE: 1/2" = 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.

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

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

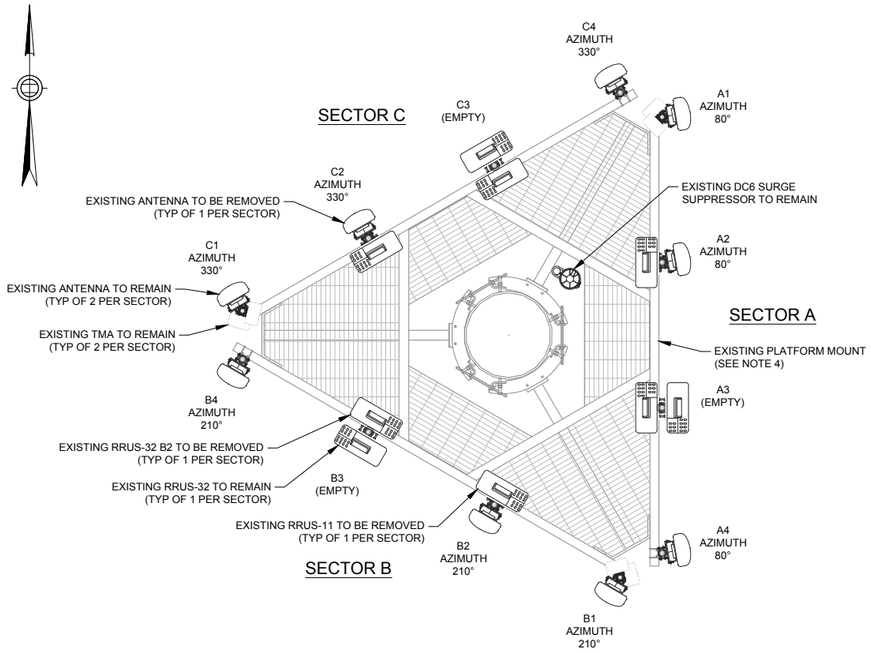
0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

EQUIPMENT LAYOUT & PROPOSED TOWER ELEVATION

C-2



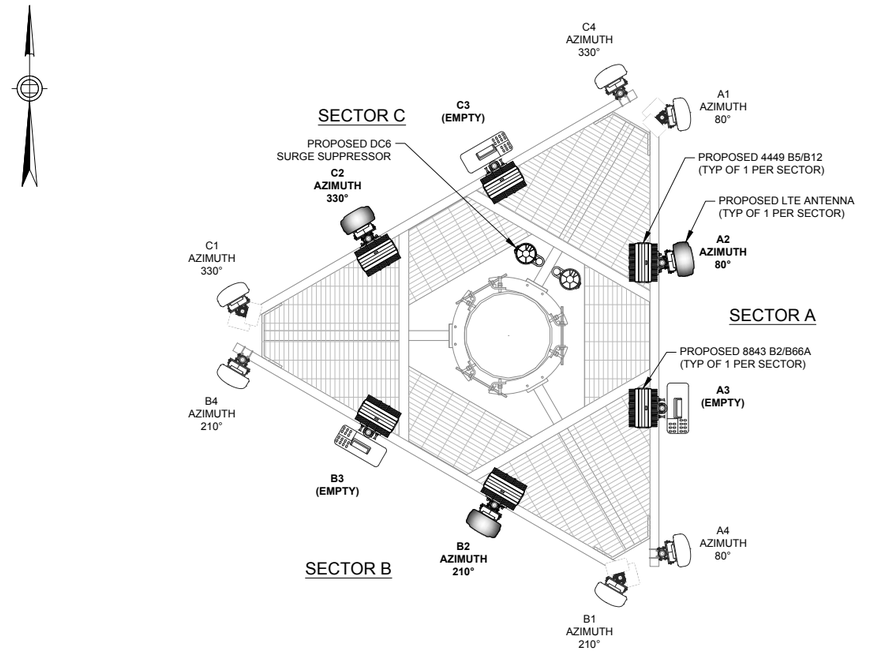
ELEVATION 110'

1 EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

NOTES:

1. THESE DRAWINGS ARE NOT INTENDED TO REFLECT THE STRUCTURAL INTEGRITY OF THE TOWER. THE PROPOSED ANTENNAS AND ASSOCIATED EQUIPMENT SHOWN ARE REPRESENTATIVE IN NATURE AND DO NOT REFLECT THE ACTUAL CONFIGURATIONS REQUIRED. THE CONTRACTOR SHALL REFER TO THE MOUNT ANALYSIS OF THIS SITE FOR THE APPROVED LOCATION AND CONFIGURATION OF ALL ANTENNAS AND EQUIPMENT. ALL ANTENNAS AND EQUIPMENT MUST BE MOUNTED IN STRICT ACCORDANCE WITH THE MOUNT ANALYSIS.



ELEVATION 110'

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

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

0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

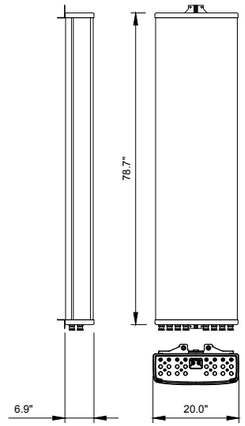
EXISTING & PROPOSED ANTENNA LAYOUT

C-3

1 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

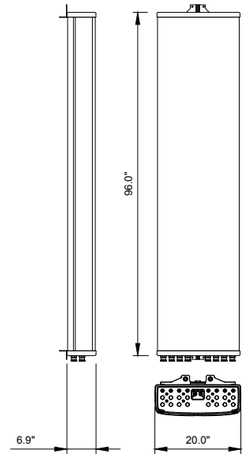
MANUFACTURER:	KATHREIN
MODEL NO.:	80010965
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
COLOR:	LIGHT GRAY
DIMENSIONS (LxWxD):	78.7" x 20.0" x 6.9" 1999mm x 508mm x 175mm
WEIGHT (lbs):	97.6
CONNECTOR:	8 x 4.3-10 FEMALE
FRONT WIND LOAD:	254 LBF @ 93 MPH 1130 N @ 150 KM/H
SIDE WIND LOAD:	256 LBF @ 93 MPH 1140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



2 ANTENNA SPECIFICATIONS

SCALE: N.T.S.

MANUFACTURER:	KATHREIN
MODEL NO.:	80010966
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
COLOR:	LIGHT GRAY
DIMENSIONS (LxWxD):	96.0" x 20.0" x 6.9" 2438mm x 508mm x 175mm
WEIGHT (lbs):	114.6
CONNECTOR:	8 x 4.3-10 FEMALE
FRONT WIND LOAD:	315 LBF @ 93 MPH 1400 N @ 150 KM/H
SIDE WIND LOAD:	316 LBF @ 93 MPH 1405 N @ 150 KM/H
WIND SPEED MAX.:	>150 MPH (>241 KM/H)

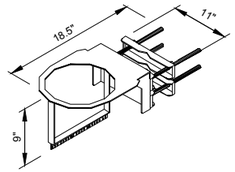


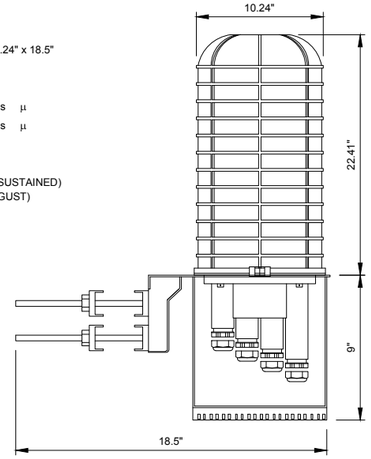
3 DC SURGE PROTECTION SPECIFICATIONS

SCALE: N.T.S.

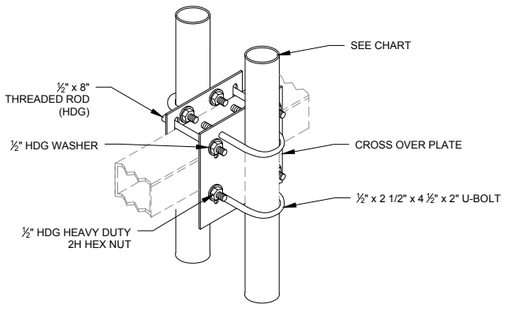
RAYCAP DC6-48-60-18-8C

DIMENSIONS (HxWxD):	31.41" x 10.24" x 18.5"
TOTAL WEIGHT (lbs):	26.2
NOMINAL OPERATING VOLTAGE:	48 VDC
NOMINAL DISCHARGE VOLTAGE:	20 kA 8/20 s μ
MAXIMUM DISCHARGE CURRENT:	60 kA 8/20 s μ
MAX. CONTINUOUS OPERATING CURRENT:	75 VDC
VOLTAGE PROTECTION RATING:	400 V
WIND LOADING:	150 MPH (SUSTAINED) 195 MPH (GUST)





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"



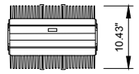
4 DC6 MOUNTING DETAIL

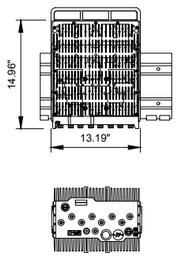
SCALE: N.T.S.

5 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

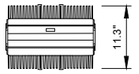


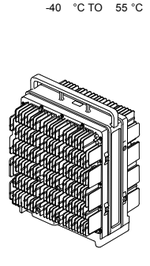


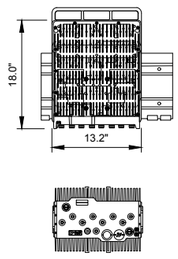
6 RRUS SPECIFICATIONS

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



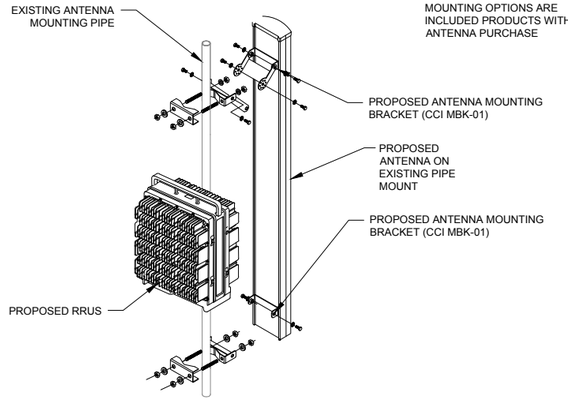




7 ANTENNA & RRH MOUNTING DETAIL

SCALE: N.T.S.

NOTE
MOUNTING OPTIONS ARE INCLUDED PRODUCTS WITH ANTENNA PURCHASE



NOT USED

NOT USED

NOT FOR CONSTRUCTION

at&t
5841 BRIDGE STREET
EAST SYRACUSE, NY 13057

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

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

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

PROJECT NO:	ERCC0004
DRAWN BY:	DAP
CHECKED BY:	CAT

SUBMITTALS

0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

EQUIPMENT DETAILS I

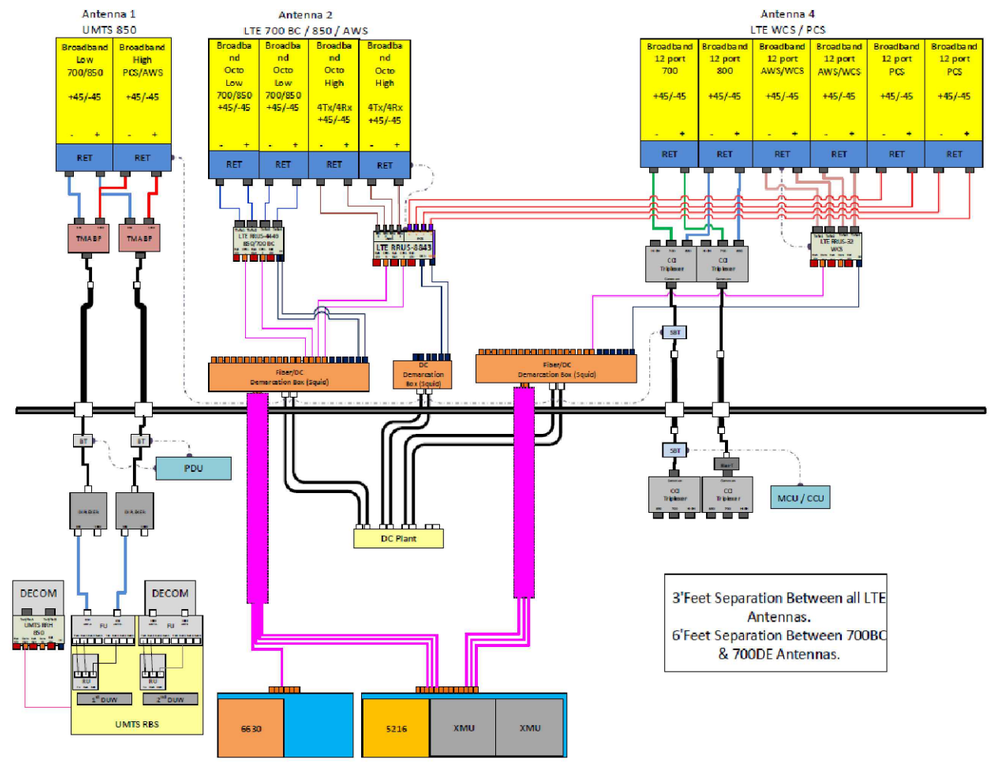
C-4

ANTENNA NUMBER	ANTENNA MODEL	ANTENNA BAND	AZIMUTH	ANTENNA CENTERLINE FROM GROUND	TMA's / DIPLEXERS	RRH's	FEEDER	RAYCAP
A1	7770 (55"x11"x5")	UMTS	80°°	110'	(2) LGP21401	-	(2) 1-5/8" EXISTING (LENGTH @ 140')	(1) RAYCAP DC6-48-60-0-8F
A2	**800-10966 (96"x20"x6.9")**	**LTE**	**80°°**	**110'**	-	**(1) B5/B12 4449 (700)**	-	
A3	-	-	80°°	110'	-	-	-	
A4	TPA-65R-LCUUUU-H8 (96"x14.4"x8.6")	LTE	80°°	110'	(2) TPX-070821	**(1) B2/B66A 8843** (1) RRUS-32	(1) FIBER (2) 1-5/8" EXISTING (LENGTH @ 140')	(1) RAYCAP DC6-48-60-18-8C
B1	7770 (55"x11"x5")	UMTS	210°°	110'	(2) LGP21401	-	(2) 1-5/8" EXISTING (LENGTH @ 140')	
B2	**800-10965 (78.7"x20"x6.9")**	**LTE**	**210°°**	**110'**	-	**(1) B5/B12 4449 (700)**	-	
B3	-	-	210°°	110'	-	-	-	
B4	QS66512-2 (72"x12"x9.6")	LTE	210°°	110'	(2) TPX-070821	**(1) B2/B66A 8843** (1) RRUS-32	(1) FIBER (2) 1-5/8" EXISTING (LENGTH @ 140')	
G1	7770 (55"x11"x5")	UMTS	330°°	110'	(2) LGP21401	-	(2) 1-5/8" EXISTING (LENGTH @ 140')	
G2	**800-10965 (78.7"x20"x6.9")**	**LTE**	**330°°**	**110'**	-	**(1) B5/B12 4449 (700)**	-	
G3	-	-	330°°	110'	-	-	-	
G4	QS66512-2 (72"x12"x9.6")	LTE	330°°	110'	(2) TPX-070821	**(1) B2/B66A 8843** (1) RRUS-32	(1) FIBER (2) 1-5/8" EXISTING (LENGTH @ 140')	

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

1 ANTENNA INFORMATION CHART — SCALE: NONE

Diagram - Sector A — Diagram File Name - CT5258_A_B_C_AWS_850_4T4R 700BC_d2.vsd
Atoll Site Name - CT5258 — Location Name - WEST HARTFORD — Market - CONNECTICUT — Market Cluster - NEW ENGLAND
Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v6.0_Ericsson



2 RF EQUIPMENT 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

0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

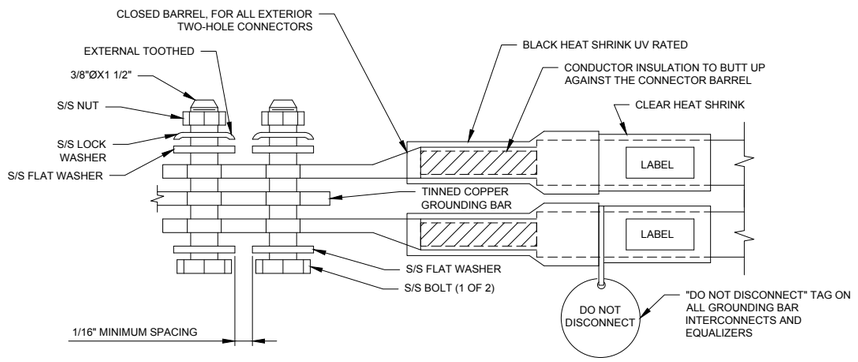
467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

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.

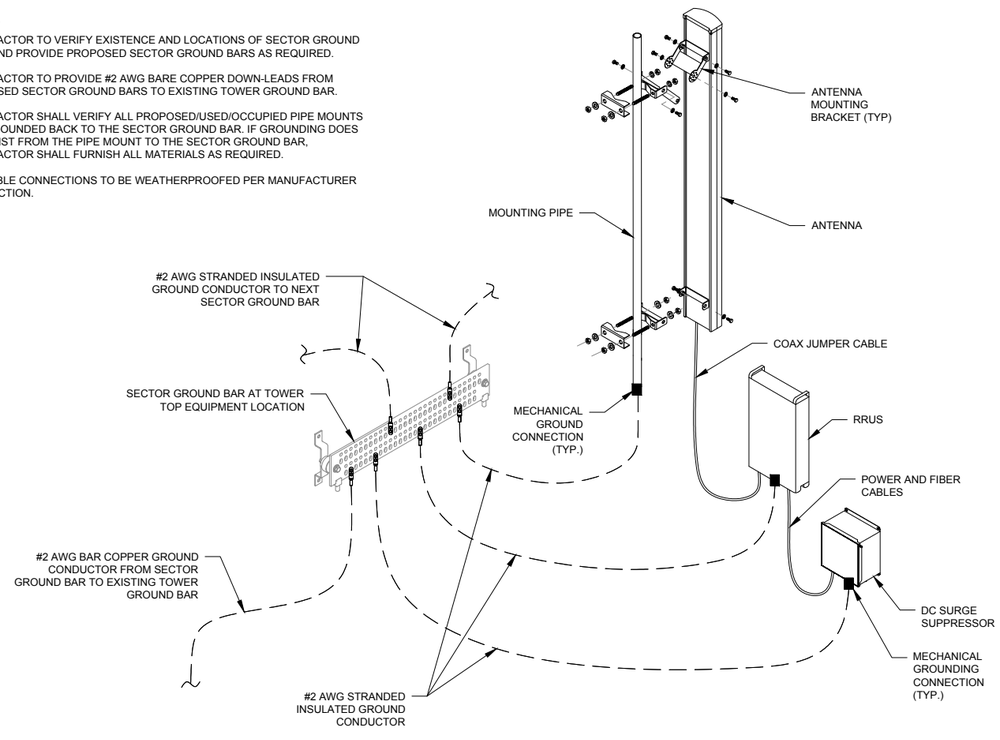
GROUNDING NOTES:

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

0	12/28/18	ISSUED FOR PERMITTING

FA# 10071355
SITE# CT5258
WEST HARTFORD

467 SOUTH QUAKER LANE
WEST HARTFORD, CT 06110

GROUNDING DETAILS

G-1

Date: **December 28, 2018**

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

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351

Subject: Structural Analysis Report

Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CTL05258
	Carrier Site Name:	West Hartford
Crown Castle Designation:	**Crown Castle BU Number:**	829013
	Crown Castle Site Name:	West Hartford/I-84/X43
	Crown Castle JDE Job Number:	549070
	Crown Castle Work Order Number:	1674606
	Crown Castle Order Number:	472226 Rev. 1
Engineering Firm Designation:	**TEP Project Number:**	25680.203458
Site Data:	**467 South Quaker Lane (Church of St. Mark), West Hartford, Hartford County, CT 06110** **Latitude *41° 44' 55.59"*, Longitude *-72° 43' 52.86"*** **119 Foot - Monopole Tower**	

Dear Denice Nicholson,

Tower Engineering Professionals is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

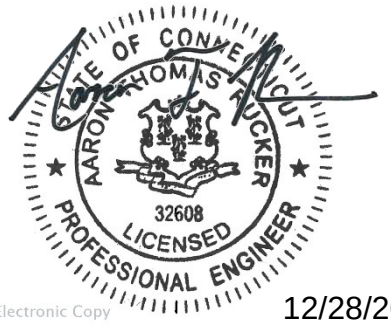
LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Alex Bramhall, E.I. / JWB

Respectfully submitted by:

Aaron T. Rucker, P.E.



Electronic Copy

12/28/2018

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 119-ft monopole tower designed by Pirod, Inc. The tower has been modified multiple times in the past to accommodate additional loading. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1.0
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
110.0	110.0	3	Powerwave Tech.	7770.00 w/ Mount Pipe	12 4 2 2	1-5/8 3/4 7/16 3/8
		2	Quintel Tech.	QS66512-2 w/ Mount Pipe		
		2	Kathrein	80010965 w/ Mount Pipe		
		1	Kathrein	80010966 w/ Mount Pipe		
		1	CCI Antennas	TPA-65R-LCUUUU-H8 w/ Mount Pipe		
		6	CCI Antennas	TPX-070821		
		3	Ericsson	RRUS 32		
		3	Ericsson	RRUS 4449 B5/B12		
		3	Ericsson	RRUS 8843 B2/B66A		
		6	Powerwave Tech.	LGP21401		
		3	Raycap	DC6-48-60-18-8F		
		1	Tower Mounts	SitePro1 RMQP-4096-HRK		

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)
120.0	120.0	3	RFS Celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe	12 2	1-5/8 1-1/2
		3	Ericsson	AIR 3246 B66 w/ Mount Pipe		
		3	Ericsson	AIR -32 B2A/B66AA w/ Mount Pipe		
		3	Ericsson	KRY 112 144/2		
		3	Ericsson	Radio 4449 B12/B71		
		3	Ericsson	KRY 112 144/1		
		1	Tower Mounts	Handrail Kit		
		1	Tower Mounts	Platform Mount [LP 403-1]		
115.0	115.0	1	Andrew	VHLP2-18	1	1/2
		1	Tower Mounts	Side Arm Mount [SO 102-3]		
100.0	100.0	6	Commscope	SBNHH-1D65B w/ Mount Pipe	14	1-5/8
		3	Amphenol	BXA-80063-4BF-EDIN-X w/ Mount Pipe		
		2	Andrew	LNX-6514DS-T4M w/ Mount Pipe		
		1	Antel	BXA-70063-6CF-EDIN-0 w/ Mount Pipe		
		3	Alcatel Lucent	RRH2X60-PCS		
		3	Alcatel Lucent	RRH2x60-700		
		3	Alcatel Lucent	RRH2x60-AWS		
		2	RFS Celwave	DB-T1-6Z-8AB-0Z		
		1	Tower Mounts	Platform Mount [LP 403-1]		
90.0	90.0	3	Comba Telecom	ODI2-065R18K-GQ w/ Mount Pipe	1	7/8
		3	Ericsson	Radio 0208		
		2	Ericsson	Radio 4415		
		1	Tower Mounts	Side Arm Mount [SO 201-3]		
80.0	83.0	1	Andrew	VHLP2-23	3 1 1	1-5/8 1-1/2 5/16
	81.0	3	Nokia	AAHC w/ Mount Pipe		
		3	Commscope	NNVV-65B-R4 w/ Mount Pipe		
		6	Alcatel Lucent	800MHZ 2X50W RRH		
		3	Alcatel Lucent	PCS 1900MHZ 4X45W-65MHZ		
	80.0	1	Clearwire	CW Junction Box		
		1	Tower Mounts	Site Pro 1 VFA10-HD3L4NP		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Supplemental Geotechnical Report	Tower Engineering Professionals	3636697	CCISites
Tower Foundation Drawings	Pirod, Inc.	3636698	CCISites
Rebar Mapping	Tower Engineering Professionals	3636698	CCISites
Tower Manufacturer Drawings	Pirod, Inc.	3525378	CCISites
Tower Reinforcement Drawings	Natcomm Consulting Engineers, Inc.	3525386	CCISites
Post-Modification Inspection	Natcomm Consulting Engineers, Inc.	3974228	CCISites
Tower Reinforcement Drawings	Tower Engineering Professionals	5650111	CCISites
Post-Modification Inspection	SGS Towers, Inc.	5852136	CCISites

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.

RISA-3D, a commercially available analysis software package, was used to model and analyze the foundation. Selected output from the analysis is included in Appendix C.

3.2) Assumptions

1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2, and the referenced drawings.
3) All tower components are in sufficient condition to carry their full design capacity.
4) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
5) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering Professionals 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 (lb)	ΦP_{allow} (lb)	% Capacity	Pass / Fail
L1	119.083 - 101.083	Pole	TP26x22.13x0.25	1	-9617.12	1224509.94	22.8	Pass
L2	101.083 - 66.5	Pole	TP34.063x24.873x0.313	2	-22449.30	1999021.41	59.8	Pass
L3	66.5 - 32.8333	Pole	TP41.75x32.498x0.375	3	-31409.50	2940797.87	67.5	Pass
L4	32.8333 - 0	Pole	TP49.063x39.849x0.375	4	-43655.30	3559594.34	79.7	Pass
							Summary	
						Pole (L4)	79.7	Pass
						Rating =	**79.7**	**Pass**

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Slip Splice Connection	101.1	24.4	Pass
1,2	Slip Splice Connection	66.5	63.8	Pass
1,2	Slip Splice Connection	32.8	72.9	Pass
1,2	Anchor Rods	-	96.8	Pass
1,2	Base Plate	-	72.5	Pass
1,2	Base Foundation Soil Interaction	-	77.9	Pass
1,2	Base Foundation Structural	-	65.7	Pass
1,2	Rock Anchors	-	84.0	Pass

Structure Rating (max from all components) =	**96.8%**

Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.
2) Rating per TIA-222-H Section 15.5.

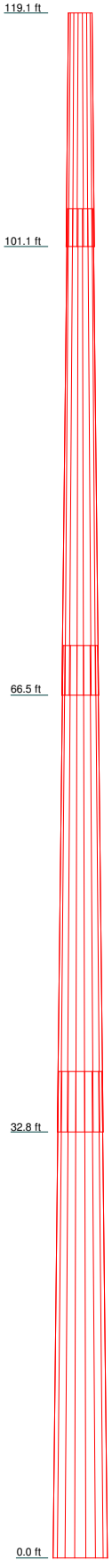
4.1) Recommendations

1) If the load differs from that described in Tables 1 and 2 of this report, the referenced drawings, or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

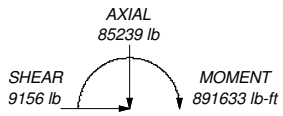
APPENDIX A

TNXTOWER OUTPUT

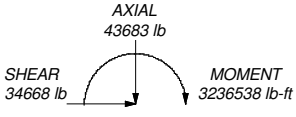
Section	1	2	3	4	
Length (ft)	18.00	37.50	37.50	37.50	
Number of Sides	18	18	18	18	
Thickness (in)	0.250	0.313	0.375	0.375	
Socket Length (ft)	2.92	3.83	4.67		
Top Dia (in)	22.130	24.873	32.498	39.849	
Bot Dia (in)	26.000	34.063	41.750	49.063	
Grade			A572-65		
Weight (lb)	1157.5	3690.1	5581.5	6695.0	17124.1



ALL REACTIONS ARE FACTORED



TORQUE 2146 lb-ft
50 mph WIND - 2.000 in ICE



TORQUE 11756 lb-ft
REACTIONS - 125 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AIR -32 B2A/B66AA w/ Mount Pipe	120	2.4" Dia x 6-ft Mount Pipe	110
AIR -32 B2A/B66AA w/ Mount Pipe	120	2.4" Dia x 6-ft Mount Pipe	110
AIR -32 B2A/B66AA w/ Mount Pipe	120	SitePro RMQP-4096-HK	110
KRY 112 144/1	120	80010965 w/ Mount Pipe	110
KRY 112 144/1	120	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
KRY 112 144/1	120	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
APXVAARR24_43-U-NA20 w/ Mount Pipe	120	BXA-70063-6CF-EDIN-0 w/ Mount Pipe	100
APXVAARR24_43-U-NA20 w/ Mount Pipe	120	LNX-6514DS-T4M w/ Mount Pipe	100
APXVAARR24_43-U-NA20 w/ Mount Pipe	120	LNX-6514DS-T4M w/ Mount Pipe	100
AIR 3246 B66 w/ Mount Pipe	120	DB-T1-6Z-8AB-0Z	100
AIR 3246 B66 w/ Mount Pipe	120	(2) SBNHH-1D65B w/ Mount Pipe	100
AIR 3246 B66 w/ Mount Pipe	120	(2) SBNHH-1D65B w/ Mount Pipe	100
RADIO 4449 B12/B71	120	(2) SBNHH-1D65B w/ Mount Pipe	100
RADIO 4449 B12/B71	120	RRH2x60-700	100
RADIO 4449 B12/B71	120	RRH2x60-700	100
KRY 112 144/2	120	RRH2x60-700	100
KRY 112 144/2	120	RRH2x60-AWS	100
KRY 112 144/2	120	RRH2x60-AWS	100
2.4" Dia x 6-ft Mount Pipe	120	RRH2x60-AWS	100
2.4" Dia x 6-ft Mount Pipe	120	RRH2X60-PCS	100
2.4" Dia x 6-ft Mount Pipe	120	RRH2X60-PCS	100
2.4" Dia x 8.5-ft Mount Pipe	120	RRH2X60-PCS	100
Platform Mount [LP 404-1]	120	DB-T1-6Z-8AB-0Z	100
2.4" Dia x 6-ft Mount Pipe	115	Platform Mount [LP 403-1]	100
Side Arm Mount [SO 102-3]	115	BXA-80063-4BF-EDIN-X w/ Mount Pipe	100
VHLP2-18	115	ODI2-065R18K-GQ w/ Mount Pipe	90
80010966 w/ Mount Pipe	110	ODI2-065R18K-GQ w/ Mount Pipe	90
80010965 w/ Mount Pipe	110	(2) RADIO 0208	90
(2) RRUS 8843 B2/B66A	110	RADIO 0208	90
RRUS 8843 B2/B66A	110	(2) RADIO 4415	90
RRUS 4449 B5/B12	110	Side Arm Mount [SO 201-3]	90
(2) RRUS 4449 B5/B12	110	ODI2-065R18K-GQ w/ Mount Pipe	90
DC6-48-60-18-8F	110	AAHC w/ Mount Pipe	80
7770.00 w/ Mount Pipe	110	AAHC w/ Mount Pipe	80
7770.00 w/ Mount Pipe	110	AAHC w/ Mount Pipe	80
7770.00 w/ Mount Pipe	110	NNVV-65B-R4 w/ Mount Pipe	80
QS66512-2 w/ Mount Pipe	110	NNVV-65B-R4 w/ Mount Pipe	80
QS66512-2 w/ Mount Pipe	110	NNVV-65B-R4 w/ Mount Pipe	80
TPA-65R-LCUUUU-H8 w/ Mount Pipe	110	PCS 1900MHZ 4X45W-65MHZ	80
(2) LGP21401	110	PCS 1900MHZ 4X45W-65MHZ	80
(2) LGP21401	110	PCS 1900MHZ 4X45W-65MHZ	80
(2) LGP21401	110	(2) 800MHZ 2X50W RRH	80
(2) TPX-070821	110	(2) 800MHZ 2X50W RRH	80
(2) TPX-070821	110	(2) 800MHZ 2X50W RRH	80
(2) TPX-070821	110	2.4" Dia x 8-ft Mount Pipe	80
RRUS 32	110	2.4" Dia x 8-ft Mount Pipe	80
RRUS 32	110	2.4" Dia x 8-ft Mount Pipe	80
RRUS 32	110	(1) Site Pro 1 VFA10-HD3L4NP	80
(2) DC6-48-60-18-8F	110	(1) Site Pro 1 VFA10-HD3L4NP	80
2.4" Dia x 6-ft Mount Pipe	110	(1) Site Pro 1 VFA10-HD3L4NP	80
2.4" Dia x 6-ft Mount Pipe	110	CW JUNCTION BOX	80
2.4" Dia x 6-ft Mount Pipe	110	VHLP2-23	80
2.4" Dia x 6-ft Mount Pipe	110		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 2.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 79.7%

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350
Tower Engineering Professionals

Job: ***West Hartford/I-84/X43 (BU 829013)***			
Project: ***TEP No. 25680.203458***			
Client: Crown Castle	Drawn by: jbalk	App'd:	
Code: TIA-222-H	Date: 12/28/18	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

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

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 119.00 ft.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 2.000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
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	119.08-101.08	18.00	2.917	18	22.130	26.000	0.250	1.000	A572-65 (65 ksi)
L2	101.08-66.50	37.50	3.833	18	24.873	34.063	0.313	1.250	A572-65 (65 ksi)
L3	66.50-32.83	37.50	4.667	18	32.498	41.750	0.375	1.500	A572-65 (65 ksi)
L4	32.83-0.00	37.50		18	39.849	49.063	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	22.433	17.362	1050.090	7.767	11.242	93.407	2101.561	8.683	3.455	13.82
	26.363	20.433	1711.654	9.141	13.208	129.592	3425.561	10.218	4.136	16.544
L2	25.934	24.361	1856.528	8.719	12.635	146.930	3715.500	12.183	3.828	12.248
	34.540	33.476	4817.433	11.981	17.304	278.404	9641.206	16.741	5.445	17.424
L3	33.902	38.235	4984.583	11.404	16.509	301.930	9975.724	19.121	5.060	13.492
	42.336	49.247	10650.982	14.688	21.209	502.192	21315.979	24.628	6.688	17.835
L4	41.570	46.984	9249.061	14.013	20.243	456.899	18510.293	23.496	6.353	16.942
	49.762	57.950	17355.138	17.284	24.924	696.329	34733.112	28.981	7.975	21.267

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 119.08-101.08				1	1	1			
L2 101.08-66.50				1	1	1			
L3 66.50-32.83				1	1	1			
L4 32.83-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	B	No	Surface Ar (CaAa)	119.00 - 0.00	1	1	0.250 0.250	0.375		0.220
LDF7-50A(1-5/8)	A	No	Surface Ar (CaAa)	119.08 - 0.00	2	2	0.500 0.500	1.980		0.820
LDF4-50A(1/2")	B	No	Surface Ar (CaAa)	115.00 - 80.00	1	1	0.250 0.250	0.625		0.150
LDF7-50A(1-5/8")	C	No	Surface Ar (CaAa)	100.00 - 0.00	3	3	0.000 0.000	1.980		0.820
*** 90' ***										
DSHYBKIT-18612-XX M(7/8)	A	No	Surface Ar (CaAa)	90.00 - 0.00	1	1	-0.250 -0.250	0.875		1.240

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
2" Flexible Conduit ***	B	No	Surface Ar (CaAa)	80.00 - 0.00	2	2	0.250 0.250	2.000		0.340

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
*** 120' ***									
LDF7-50A(1-5/8)	A	No	No	Inside Pole	119.08 - 0.00	10	No Ice	0.00	0.820
							1/2" Ice	0.00	0.820
							1" Ice	0.00	0.820
							2" Ice	0.00	0.820
MLC HYBRID 6POWER/12FIBER(1-1/2)	A	No	No	CaAa (Out Of Face)	119.08 - 0.00	2	No Ice	0.00	0.983
							1/2" Ice	0.00	2.205
							1" Ice	0.00	4.038
							2" Ice	0.00	9.536
*** 110' ***									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	110.00 - 0.00	12	No Ice	0.00	0.820
							1/2" Ice	0.00	0.820
							1" Ice	0.00	0.820
							2" Ice	0.00	0.820
WR-VG102ST-BRD A(7/16")	C	No	No	Inside Pole	110.00 - 0.00	2	No Ice	0.00	0.201
							1/2" Ice	0.00	0.201
							1" Ice	0.00	0.201
							2" Ice	0.00	0.201
FB-L98B-002-XXX(3/8)	C	No	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	0.065
							1/2" Ice	0.00	0.065
							1" Ice	0.00	0.065
							2" Ice	0.00	0.065
3" Flexible Conduit	C	No	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	1.040
							1/2" Ice	0.00	1.040
							1" Ice	0.00	1.040
							2" Ice	0.00	1.040
WR-VG86ST-BRD(3/4)	C	No	No	Inside Pole	110.00 - 0.00	4	No Ice	0.00	0.584
							1/2" Ice	0.00	0.584
							1" Ice	0.00	0.584
							2" Ice	0.00	0.584
FB-L98B-034-XXX(3/8)	C	No	No	Inside Pole	110.00 - 0.00	1	No Ice	0.00	0.057
							1/2" Ice	0.00	0.057
							1" Ice	0.00	0.057
							2" Ice	0.00	0.057
*** 115' ***									
LDF4-50A(1/2")	B	No	No	CaAa (Out Of Face)	80.00 - 0.00	1	No Ice	0.00	0.150
							1/2" Ice	0.00	0.840
							1" Ice	0.00	2.141
							2" Ice	0.00	6.576
*** 100' ***									
LDF7-50A(1-5/8")	C	No	No	Inside Pole	100.00 - 0.00	11	No Ice	0.00	0.820
							1/2" Ice	0.00	0.820
							1" Ice	0.00	0.820
							2" Ice	0.00	0.820
*** 80' ***									
9207(5/16")	B	No	No	Inside Pole	80.00 - 0.00	1	No Ice	0.00	0.600
							1/2" Ice	0.00	0.600

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
							1" Ice	0.00	0.600
							2" Ice	0.00	0.600
HB158-21U6M48-30F(1-5/8)	B	No	No	Inside Pole	80.00 - 0.00	3	No Ice	0.00	2.390
							1/2" Ice	0.00	2.390
							1" Ice	0.00	2.390
							2" Ice	0.00	2.390
MLC6C-06C-008R-008R(1-1/2)	B	No	No	Inside Pole	80.00 - 0.00	1	No Ice	0.00	1.520
							1/2" Ice	0.00	1.520
							1" Ice	0.00	1.520
							2" Ice	0.00	1.520
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	119.08-101.08	A	0.000	0.000	7.128	0.000	212.53
		B	0.000	0.000	1.542	0.000	6.03
		C	0.000	0.000	0.000	0.000	122.51
L2	101.08-66.50	A	0.000	0.000	15.751	0.000	437.47
		B	0.000	0.000	8.015	0.000	147.39
		C	0.000	0.000	19.899	0.000	859.74
L3	66.50-32.83	A	0.000	0.000	16.278	0.000	439.25
		B	0.000	0.000	14.729	0.000	348.11
		C	0.000	0.000	19.998	0.000	849.06
L4	32.83-0.00	A	0.000	0.000	15.875	0.000	428.38
		B	0.000	0.000	14.365	0.000	339.50
		C	0.000	0.000	19.503	0.000	828.04

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	119.08-101.08	A	1.917	0.000	0.000	17.538	0.000	727.37
		B		0.000	0.000	13.748	0.000	185.10
		C		0.000	0.000	0.000	0.000	122.51
L2	101.08-66.50	A	1.865	0.000	0.000	44.762	0.000	1580.33
		B		0.000	0.000	37.180	0.000	709.06
		C		0.000	0.000	40.931	0.000	1385.29
L3	66.50-32.83	A	1.770	0.000	0.000	47.860	0.000	1577.63
		B		0.000	0.000	46.345	0.000	1121.30
		C		0.000	0.000	40.691	0.000	1359.30
L4	32.83-0.00	A	1.585	0.000	0.000	45.274	0.000	1461.06
		B		0.000	0.000	43.797	0.000	1038.22
		C		0.000	0.000	38.906	0.000	1294.71

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	119.08-101.08	0.541	-2.623	1.788	-2.399
L2	101.08-66.50	0.918	0.932	1.351	0.393
L3	66.50-32.83	1.812	1.022	1.748	0.474
L4	32.83-0.00	1.921	1.084	1.921	0.534

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	1	Safety Line 3/8	101.08 - 119.00	1.0000	1.0000
L1	5	LDF7-50A(1-5/8)	101.08 - 119.08	1.0000	1.0000
L1	18	LDF4-50A(1/2")	101.08 - 115.00	1.0000	1.0000
L1	21	LDF7-50A(1-5/8")	101.08 - 100.00	1.0000	1.0000
L1	25	DSHYBKIT-18612-XXM(7/8)	101.08 - 90.00	1.0000	1.0000
L1	33	2" Flexible Conduit	101.08 - 80.00	1.0000	1.0000
L2	1	Safety Line 3/8	66.50 - 101.08	1.0000	1.0000
L2	5	LDF7-50A(1-5/8)	66.50 - 101.08	1.0000	1.0000
L2	21	LDF7-50A(1-5/8")	66.50 - 100.00	1.0000	1.0000
L2	25	DSHYBKIT-18612-XXM(7/8)	66.50 - 90.00	1.0000	1.0000
L2	33	2" Flexible Conduit	66.50 - 80.00	1.0000	1.0000
L3	1	Safety Line 3/8	32.83 - 66.50	1.0000	1.0000
L3	5	LDF7-50A(1-5/8)	32.83 - 66.50	1.0000	1.0000
L3	21	LDF7-50A(1-5/8")	32.83 - 66.50	1.0000	1.0000
L3	25	DSHYBKIT-18612-XXM(7/8)	32.83 - 66.50	1.0000	1.0000
L3	33	2" Flexible Conduit	32.83 - 66.50	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft	ft^2	ft^2	lb

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
*** 120' ***									
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	153.07 214.04 281.89 441.43
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	153.07 214.04 281.89 441.43
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	153.07 214.04 281.89 441.43
KRY 112 144/1	A	From Centroid-Face	4.00 2.500 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	11.00 14.18 18.58 31.87
KRY 112 144/1	B	From Centroid-Face	4.00 2.500 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	11.00 14.18 18.58 31.87
KRY 112 144/1	C	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	11.00 14.18 18.58 31.87
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	160.82 297.10 444.18 775.14
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	160.82 297.10 444.18 775.14
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Centroid-Face	4.00 2.500 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	160.82 297.10 444.18 775.14
AIR 3246 B66 w/ Mount Pipe	A	From Centroid-Face	4.00 2.500 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.18 8.66 9.12 10.09	6.56 7.39 8.13 9.65	201.32 271.57 349.05 528.92
AIR 3246 B66 w/ Mount Pipe	B	From Centroid-Face	4.00 2.500 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.18 8.66 9.12 10.09	6.56 7.39 8.13 9.65	201.32 271.57 349.05 528.92
AIR 3246 B66 w/ Mount Pipe	C	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.18 8.66 9.12 10.09	6.56 7.39 8.13 9.65	201.32 271.57 349.05 528.92
RADIO 4449 B12/B71	A	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.15 1.29 1.44 1.75	75.00 91.07 109.76 155.77
RADIO 4449 B12/B71	B	From Centroid-Face	4.00 7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.15 1.29 1.44 1.75	75.00 91.07 109.76 155.77

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *lb*
RADIO 4449 B12/B71	C	From Centroid-Face	4.00 2.500 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.33	1.15 1.29 1.44 1.75	75.00 91.07 109.76 155.77
KRY 112 144/2	A	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.48 0.57 0.66 0.88	0.23 0.30 0.38 0.55	9.70 13.78 19.25 35.14
KRY 112 144/2	B	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.48 0.57 0.66 0.88	0.23 0.30 0.38 0.55	9.70 13.78 19.25 35.14
KRY 112 144/2	C	From Centroid-Face	4.00 -7.000 0.000	30.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.48 0.57 0.66 0.88	0.23 0.30 0.38 0.55	9.70 13.78 19.25 35.14
2.4" Dia x 6-ft Mount Pipe	A	From Centroid-Face	4.00 -2.500 0.000	0.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	21.96 32.81 47.71 90.32
2.4" Dia x 6-ft Mount Pipe	B	From Centroid-Face	4.00 -2.500 0.000	0.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	21.96 32.81 47.71 90.32
2.4" Dia x 6-ft Mount Pipe	C	From Centroid-Face	4.00 -2.500 0.000	0.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	21.96 32.81 47.71 90.32
2.4" Dia x 8.5-ft Mount Pipe	B	From Leg	1.00 0.000 3.000	0.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.02 2.90 3.71 4.76	2.02 2.90 3.71 4.76	25.93 41.14 61.95 120.93
Platform Mount [LP 404-1]	C	None		0.000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice	32.79 44.63 56.47 80.15	32.79 44.63 56.47 80.15	2043.00 2475.48 2907.96 3772.92
*** 115' ***									
2.4" Dia x 6-ft Mount Pipe	C	From Leg	0.50 0.000 0.000	0.000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	21.96 32.81 47.71 90.32
Side Arm Mount [SO 102-3]	C	None		0.000	115.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.00 3.48 3.96 4.92	3.00 3.48 3.96 4.92	81.00 111.00 141.00 201.00
*** 110' ***									
80010965 w/ Mount Pipe	A	From Centroid-Face	4.00 2.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.05 14.69 15.30 16.53	7.63 8.90 9.96 11.92	125.19 221.67 327.18 569.14
80010966 w/ Mount Pipe	B	From Centroid-Face	4.00 2.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	17.60 18.33 19.07 20.49	9.64 11.15 12.70 15.03	147.45 263.33 389.66 677.99
80010965 w/ Mount Pipe	C	From Centroid-Face	4.00 2.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice	14.05 14.69 15.30	7.63 8.90 9.96	125.19 221.67 327.18

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	16.53	11.92	569.14
(2) RRUS 8843 B2/B66A	B	From Centroid-Face	4.00 2.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	72.00 89.60 109.91 159.50
RRUS 8843 B2/B66A	C	From Centroid-Face	4.00 2.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	1.35 1.50 1.65 1.99	72.00 89.60 109.91 159.50
RRUS 4449 B5/B12	C	From Centroid-Face	4.00 2.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	71.00 89.51 110.84 162.74
(2) RRUS 4449 B5/B12	A	From Centroid-Face	4.00 2.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.97 2.14 2.33 2.72	1.41 1.56 1.73 2.07	71.00 89.51 110.84 162.74
DC6-48-60-18-8F	A	From Centroid-Face	4.00 2.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	32.80 54.76 79.58 138.43
7770.00 w/ Mount Pipe	A	From Centroid-Face	4.00 -6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	55.38 102.81 156.64 286.58
7770.00 w/ Mount Pipe	B	From Centroid-Face	4.00 -6.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	55.38 102.81 156.64 286.58
7770.00 w/ Mount Pipe	C	From Centroid-Face	4.00 -6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	55.38 102.81 156.64 286.58
QS66512-2 w/ Mount Pipe	A	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.37 8.93 9.46 10.53	8.46 9.66 10.55 12.35	136.55 212.24 296.07 491.79
QS66512-2 w/ Mount Pipe	C	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.37 8.93 9.46 10.53	8.46 9.66 10.55 12.35	136.55 212.24 296.07 491.79
TPA-65R-LCUUUU-H8 w/ Mount Pipe	B	From Centroid-Face	4.00 6.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.54 14.24 14.95 16.31	10.96 12.49 14.04 16.39	114.45 217.61 330.97 592.60
(2) LGP21401	A	From Centroid-Face	4.00 -6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.35 0.44 0.54 0.77	14.10 21.26 30.32 54.89
(2) LGP21401	B	From Centroid-Face	4.00 -6.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.35 0.44 0.54 0.77	14.10 21.26 30.32 54.89
(2) LGP21401	C	From Centroid-Face	4.00 -6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.10 1.24 1.38 1.69	0.35 0.44 0.54 0.77	14.10 21.26 30.32 54.89

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) TPX-070821	A	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.47 0.56 0.66 0.87	0.10 0.15 0.20 0.33	7.50 10.95 15.73 30.07
(2) TPX-070821	B	From Centroid-Face	4.00 6.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.47 0.56 0.66 0.87	0.10 0.15 0.20 0.33	7.50 10.95 15.73 30.07
(2) TPX-070821	C	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.47 0.56 0.66 0.87	0.10 0.15 0.20 0.33	7.50 10.95 15.73 30.07
RRUS 32	A	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	55.12 77.39 102.93 164.59
RRUS 32	B	From Centroid-Face	4.00 6.000 0.000	20.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	55.12 77.39 102.93 164.59
RRUS 32	C	From Centroid-Face	4.00 6.000 0.000	30.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.86 3.08 3.32 3.81	1.78 1.97 2.17 2.58	55.12 77.39 102.93 164.59
(2) DC6-48-60-18-8F	B	From Centroid-Face	4.00 0.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.21 1.89 2.11 2.57	1.21 1.89 2.11 2.57	32.80 54.76 79.58 138.43
2.4" Dia x 6-ft Mount Pipe	A	From Centroid-Face	4.00 -2.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	21.96 32.81 47.71 90.32
2.4" Dia x 6-ft Mount Pipe	B	From Centroid-Face	4.00 -2.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	21.96 32.81 47.71 90.32
2.4" Dia x 6-ft Mount Pipe	C	From Centroid-Face	4.00 -2.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.93 2.30 3.06	1.43 1.93 2.30 3.06	21.96 32.81 47.71 90.32
2.4" Dia x 6-ft Mount Pipe	A	From Centroid-Face	4.00 -6.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.43 1.93 2.31 3.14	21.90 37.81 55.56 99.64
2.4" Dia x 6-ft Mount Pipe	B	From Centroid-Face	4.00 -6.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.43 1.93 2.31 3.14	21.90 37.81 55.56 99.64
2.4" Dia x 6-ft Mount Pipe	C	From Centroid-Face	4.00 -6.000 0.000	0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00	1.43 1.93 2.31 3.14	21.90 37.81 55.56 99.64
SitePro RMQP-4096-HK	C	None		0.000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice	23.14 28.17 33.23 43.26	28.17 28.17 31.60 28.17	1945.00 2335.00 2845.00 3505.00

100

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
BXA-80063-4BF-EDIN-X w/ Mount Pipe	A	From Centroid-Face	4.00 7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.62 4.99 5.36 6.13	3.47 4.04 4.63 5.83	29.82 70.14 116.05 227.38
BXA-80063-4BF-EDIN-X w/ Mount Pipe	B	From Centroid-Face	4.00 7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.62 4.99 5.36 6.13	3.47 4.04 4.63 5.83	29.82 70.14 116.05 227.38
BXA-80063-4BF-EDIN-X w/ Mount Pipe	C	From Centroid-Face	4.00 7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.62 4.99 5.36 6.13	3.47 4.04 4.63 5.83	29.82 70.14 116.05 227.38
BXA-70063-6CF-EDIN-0 w/ Mount Pipe	A	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.81 8.36 8.87 9.93	5.80 6.95 7.82 9.60	42.25 103.01 171.49 335.23
LNX-6514DS-T4M w/ Mount Pipe	B	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.44 8.98 9.51 10.58	7.42 8.45 9.34 11.18	79.33 151.64 232.88 420.19
LNX-6514DS-T4M w/ Mount Pipe	C	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.44 8.98 9.51 10.58	7.42 8.45 9.34 11.18	79.33 151.64 232.88 420.19
DB-T1-6Z-8AB-0Z	C	From Centroid-Face	4.00 2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	44.00 80.13 120.22 213.04
(2) SBNHH-1D65B w/ Mount Pipe	A	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.44 9.00 9.53 10.62	7.10 8.30 9.21 11.06	66.42 135.75 213.12 395.66
(2) SBNHH-1D65B w/ Mount Pipe	B	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.44 9.00 9.53 10.62	7.10 8.30 9.21 11.06	66.42 135.75 213.12 395.66
(2) SBNHH-1D65B w/ Mount Pipe	C	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.44 9.00 9.53 10.62	7.10 8.30 9.21 11.06	66.42 135.75 213.12 395.66
RRH2x60-700	A	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	1.82 2.05 2.29 2.79	60.00 82.72 109.06 173.43
RRH2x60-700	B	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	1.82 2.05 2.29 2.79	60.00 82.72 109.06 173.43
RRH2x60-700	C	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	1.82 2.05 2.29 2.79	60.00 82.72 109.06 173.43
RRH2x60-AWS	A	From Centroid-Face	4.00 2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	2.10 2.34 2.58 3.09	60.00 84.31 112.31 180.17
RRH2x60-AWS	B	From	4.00	0.000	100.00	No Ice	3.50	2.10	60.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
		Centroid-Face	2.500 0.000			1/2" Ice 1" Ice 2" Ice	3.76 4.03 4.58	2.34 2.58 3.09	84.31 112.31 180.17
RRH2x60-AWS	C	From Centroid-Face	4.00 2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.50 3.76 4.03 4.58	2.10 2.34 2.58 3.09	60.00 84.31 112.31 180.17
RRH2X60-PCS	A	From Centroid-Face	4.00 -7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.36 1.52 1.68 2.04	55.00 72.91 93.69 144.64
RRH2X60-PCS	B	From Centroid-Face	4.00 -7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.36 1.52 1.68 2.04	55.00 72.91 93.69 144.64
RRH2X60-PCS	C	From Centroid-Face	4.00 -7.000 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.20 2.39 2.59 3.01	1.36 1.52 1.68 2.04	55.00 72.91 93.69 144.64
DB-T1-6Z-8AB-0Z	A	From Centroid-Face	4.00 -2.500 0.000	0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	2.00 2.19 2.39 2.81	44.00 80.13 120.22 213.04
Platform Mount [LP 403-1]	C	None		0.000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.85 24.30 29.75 40.65	18.85 24.30 29.75 40.65	1500.00 1796.56 2093.12 2686.24
90									
ODI2-065R18K-GQ w/ Mount Pipe	A	From Leg	1.50 0.000 0.000	15.000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.09 5.50 5.92 6.77	3.00 3.71 4.38 5.76	45.02 83.57 128.15 238.43
ODI2-065R18K-GQ w/ Mount Pipe	B	From Leg	1.50 0.000 0.000	0.000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.09 5.50 5.92 6.77	3.00 3.71 4.38 5.76	45.02 83.57 128.15 238.43
ODI2-065R18K-GQ w/ Mount Pipe	C	From Leg	1.50 0.000 0.000	0.000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.09 5.50 5.92 6.77	3.00 3.71 4.38 5.76	45.02 83.57 128.15 238.43
(2) RADIO 0208	B	From Leg	1.50 0.000 0.000	0.000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.35 1.50 1.65 1.98	0.40 0.50 0.60 0.83	18.52 27.48 38.51 67.54
RADIO 0208	C	From Leg	1.50 0.000 0.000	0.000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.35 1.50 1.65 1.98	0.40 0.50 0.60 0.83	18.52 27.48 38.51 67.54
(2) RADIO 4415	A	From Leg	1.50 0.000 0.000	15.000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.86 2.03 2.20 2.58	0.87 1.00 1.14 1.44	49.60 64.16 81.26 123.89
Side Arm Mount [SO 201-3]	C	None		0.000	90.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.71 7.91 10.11 14.51	5.71 7.91 10.11 14.51	288.00 351.14 414.28 540.56
*** 80' ***									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
CW JUNCTION BOX	A	From Leg	4.00 0.000 0.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.20 1.34 1.48 1.79	0.60 0.70 0.81 1.06	0.00 10.34 22.81 54.96
AAHC w/ Mount Pipe	A	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.41 4.73 5.06 5.74	2.69 3.08 3.49 4.36	115.07 155.87 201.53 309.66
AAHC w/ Mount Pipe	B	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.41 4.73 5.06 5.74	2.69 3.08 3.49 4.36	115.07 155.87 201.53 309.66
AAHC w/ Mount Pipe	C	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.41 4.73 5.06 5.74	2.69 3.08 3.49 4.36	115.07 155.87 201.53 309.66
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.00 5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.51 13.11 13.67 14.82	7.41 8.60 9.50 11.33	102.95 193.58 292.74 520.22
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.00 5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.51 13.11 13.67 14.82	7.41 8.60 9.50 11.33	102.95 193.58 292.74 520.22
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.00 0.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.51 13.11 13.67 14.82	7.41 8.60 9.50 11.33	102.95 193.58 292.74 520.22
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.31 2.52 2.73 3.17	2.23 2.43 2.64 3.08	60.00 83.06 109.35 172.38
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.31 2.52 2.73 3.17	2.23 2.43 2.64 3.08	60.00 83.06 109.35 172.38
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.31 2.52 2.73 3.17	2.23 2.43 2.64 3.08	60.00 83.06 109.35 172.38
(2) 800MHZ 2X50W RRH	A	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53.00 74.19 98.39 156.61
(2) 800MHZ 2X50W RRH	B	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53.00 74.19 98.39 156.61
(2) 800MHZ 2X50W RRH	C	From Leg	4.00 -5.000 1.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.13 2.32 2.51 2.92	1.77 1.95 2.13 2.51	53.00 74.19 98.39 156.61
2.4" Dia x 8-ft Mount Pipe	A	From Leg	4.00 0.000 0.000	0.000	80.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.73 3.40 4.40	1.90 2.73 3.40 4.40	29.28 43.62 63.24 118.94
2.4" Dia x 8-ft Mount Pipe	B	From Leg	4.00	0.000	80.00	No Ice	1.90	1.90	29.28

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.000			1/2" Ice	2.73	2.73	43.62
			0.000			1" Ice	3.40	3.40	63.24
						2" Ice	4.40	4.40	118.94
2.4" Dia x 8-ft Mount Pipe	C	From Leg	4.00	0.000	80.00	No Ice	1.90	1.90	29.28
			5.000			1/2" Ice	2.73	2.73	43.62
			0.000			1" Ice	3.40	3.40	63.24
						2" Ice	4.40	4.40	118.94
(1) Site Pro 1 VFA10-HD3L4NP	A	From Leg	2.00	0.000	80.00	No Ice	11.40	7.00	553.00
			0.000			1/2" Ice	17.30	11.30	652.00
			0.000			1" Ice	22.60	15.30	801.00
						2" Ice	35.00	24.20	949.00
(1) Site Pro 1 VFA10-HD3L4NP	B	From Leg	2.00	0.000	80.00	No Ice	11.40	7.00	553.00
			0.000			1/2" Ice	17.30	11.30	652.00
			0.000			1" Ice	22.60	15.30	801.00
						2" Ice	35.00	24.20	949.00
(1) Site Pro 1 VFA10-HD3L4NP	C	From Leg	2.00	0.000	80.00	No Ice	11.40	7.00	553.00
			0.000			1/2" Ice	17.30	11.30	652.00
			0.000			1" Ice	22.60	15.30	801.00
						2" Ice	35.00	24.20	949.00
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
*** 115' ***											
VHLP2-18	C	Paraboloid w/Shroud (HP)	From Leg	1.00	0.000		115.00	2.00	No Ice	3.14	31.00
				0.000					1/2" Ice	3.41	49.00
				0.000					1" Ice	3.68	66.00
									2" Ice	4.21	101.00
*** 80' ***											
VHLP2-23	C	Paraboloid w/Shroud (HP)	From Leg	4.00	90.000		80.00	2.18	No Ice	3.73	30.00
				5.000					1/2" Ice	4.02	50.00
				3.000					1" Ice	4.31	70.00
									2" Ice	4.90	110.00
***											

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

Comb. No.	Description
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
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	119.083 - 101.083	Pole	Max Tension	26	0.00	-0.06	0.27
			Max. Compression	26	-25239.40	315.75	-5104.23
			Max. Mx	20	-9620.49	171032.92	-1490.86
			Max. My	14	-9645.79	1661.25	-170283.36
			Max. Vy	8	15542.44	-170467.46	1156.35
			Max. Vx	2	-15356.52	-1560.35	168669.60

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Torque	22			9223.57
L2	101.083 - 66.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54129.26	1292.52	-6572.23
			Max. Mx	8	-22449.34	-973495.38	3577.38
			Max. My	14	-22487.41	5574.39	-965855.09
			Max. Vy	8	29223.74	-973495.38	3577.38
			Max. Vx	14	28918.31	5574.39	-965855.09
			Max. Torque	10			-11820.60
L3	66.5 - 32.8333	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-67738.52	1259.75	-5963.61
			Max. Mx	8	-31409.52	-1981297.32	4036.25
			Max. My	14	-31433.62	7793.23	-1962206.27
			Max. Vy	8	32095.48	-1981297.32	4036.25
			Max. Vx	14	31727.08	7793.23	-1962206.27
			Max. Torque	10			-11804.14
L4	32.8333 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-85239.40	1134.34	-4885.68
			Max. Mx	8	-43655.25	-3236534.51	4773.44
			Max. My	14	-43655.82	10131.95	-3203629.49
			Max. Vy	8	34703.47	-3236534.51	4773.44
			Max. Vx	14	34340.04	10131.95	-3203629.49
			Max. Torque	10			-11769.68

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	33	85239.40	0.80	-9156.28
	Max. H_x	20	43683.19	34617.86	-46.13
	Max. H_z	2	43683.19	-108.78	34269.61
	Max. M_x	2	3198920.27	-108.78	34269.61
	Max. M_z	8	3236534.50	-34668.29	15.72
	Max. Torsion	22	11576.75	29689.71	17069.42
	Min. Vert	11	32762.40	-29748.76	-17074.81
	Min. H_x	8	43683.19	-34668.29	15.72
	Min. H_z	14	43683.19	56.57	-34305.22
	Min. M_x	14	-3203629.49	56.57	-34305.22
	Min. M_z	20	-3232903.72	34617.86	-46.13
	Min. Torsion	10	-11756.10	-29748.76	-17074.81

Tower Mast Reaction Summary

Load Combination	*Vertical*	*Shear$_x$*	*Shear$_z$*	*Overturning Moment, M$_x$*	*Overturning Moment, M$_z$*	*Torque*
	lb	*lb*	*lb*	*lb-ft*	*lb-ft*	*lb-ft*
Dead Only	36402.66	-0.00	0.00	764.66	816.84	-0.01
1.2 Dead+1.0 Wind 0 deg - No Ice	43683.19	108.78	-34269.61	-3198920.27	-13950.94	-4237.31
0.9 Dead+1.0 Wind 0 deg - No Ice	32762.40	108.78	-34269.61	-3165162.56	-14021.64	-4229.03
1.2 Dead+1.0 Wind 30 deg - No Ice	43683.19	17227.55	-29737.93	-2777021.40	-1613004.81	1504.76
0.9 Dead+1.0 Wind 30 deg - No Ice	32762.40	17227.55	-29737.93	-2747741.84	-1596082.54	1502.55
1.2 Dead+1.0 Wind 60 deg - No Ice	43683.19	29770.20	-17219.66	-1609383.43	-2783662.91	6954.13
0.9 Dead+1.0 Wind 60 deg - No Ice	32762.40	29770.20	-17219.66	-1592496.75	-2754304.76	6941.98
1.2 Dead+1.0 Wind 90 deg - No Ice	43683.19	34668.29	-15.72	-4776.17	-3236534.50	11210.62
0.9 Dead+1.0 Wind 90 deg - No Ice	32762.40	34668.28	-15.72	-4916.49	-3202404.84	11191.90
1.2 Dead+1.0 Wind 120 deg - No Ice	43683.19	29748.76	17074.81	1590834.16	-2779386.64	11756.10
0.9 Dead+1.0 Wind 120 deg - No Ice	32762.40	29748.76	17074.81	1573725.99	-2750068.15	11735.77
1.2 Dead+1.0 Wind 150 deg - No Ice	43683.19	17109.23	29685.33	2771225.20	-1595404.17	9339.13
0.9 Dead+1.0 Wind 150 deg - No Ice	32762.40	17109.23	29685.33	2741535.09	-1578691.94	9322.73
1.2 Dead+1.0 Wind 180 deg - No Ice	43683.19	-56.57	34305.22	3203629.49	10130.86	4531.25
0.9 Dead+1.0 Wind 180 deg - No Ice	32762.40	-56.57	34305.22	3169326.44	9745.30	4523.15
1.2 Dead+1.0 Wind 210 deg - No Ice	43683.19	-17164.74	29739.30	2778115.99	1608648.79	-1380.61
0.9 Dead+1.0 Wind 210 deg - No Ice	32762.40	-17164.74	29739.30	2748333.89	1591245.43	-1378.29
1.2 Dead+1.0 Wind 240 deg - No Ice	43683.19	-29755.34	17165.75	1605928.87	2783348.97	-7157.75
0.9 Dead+1.0 Wind 240 deg - No Ice	32762.40	-29755.34	17165.75	1588604.20	2753463.41	-7145.74
1.2 Dead+1.0 Wind 270 deg - No Ice	43683.19	-34617.86	46.13	8730.06	3232903.72	-10896.65
0.9 Dead+1.0 Wind 270 deg - No Ice	32762.40	-34617.86	46.13	8386.22	3198295.65	-10877.98
1.2 Dead+1.0 Wind 300 deg - No Ice	43683.19	-29689.71	-17069.42	-1589583.61	2775354.48	-11576.75
0.9 Dead+1.0 Wind 300 deg - No Ice	32762.40	-29689.71	-17069.42	-1572934.40	2745584.61	-11556.50
1.2 Dead+1.0 Wind 330 deg - No Ice	43683.19	-17117.80	-29629.38	-2763932.26	1599124.41	-9110.36
0.9 Dead+1.0 Wind 330 deg - No Ice	32762.40	-17117.80	-29629.38	-2734798.11	1581881.36	-9093.86
1.2 Dead+1.0 Ice+1.0 Temp	85239.40	-0.00	0.01	4885.68	1134.34	-0.59
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	85239.40	11.81	-9148.97	-880978.13	-878.08	-635.57
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	85239.40	4577.49	-7930.04	-763123.43	-443031.07	423.92
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	85239.40	7925.00	-4582.49	-439134.28	-767067.48	1392.61
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	85239.40	9155.00	7.64	5037.60	-886066.32	2128.17
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	85239.40	7931.76	4571.33	446899.64	-767418.08	2145.67
1.2 Dead+1.0 Wind 150	85239.40	4571.88	7930.24	772778.61	-441345.93	1628.66

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 180	85239.40	-0.80	9156.28	891630.80	1901.43	697.73
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 210	85239.40	-4564.33	7930.16	772968.51	443933.73	-397.77
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 240	85239.40	-7921.73	4571.23	448016.40	768835.27	-1436.18
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 270	85239.40	-9144.34	-1.43	5469.98	887115.30	-2064.91
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 300	85239.40	-7919.39	-4570.38	-436997.32	768408.96	-2110.98
deg+1.0 Ice+1.0 Temp 1.2 Dead+1.0 Wind 330	85239.40	-4573.83	-7918.56	-761525.36	444088.36	-1582.14
deg+1.0 Ice+1.0 Temp Dead+Wind 0 deg - Service	36402.66	23.60	-7436.41	-689617.34	-2366.01	-927.88
Dead+Wind 30 deg - Service	36402.66	3738.33	-6453.05	-598592.74	-347401.32	330.13
Dead+Wind 60 deg - Service	36402.66	6460.05	-3736.62	-346644.74	-600000.40	1523.79
Dead+Wind 90 deg - Service	36402.66	7522.92	-3.41	-407.91	-697724.77	2456.25
Dead+Wind 120 deg - Service	36402.66	6455.40	3705.19	343870.72	-599055.29	2575.25
Dead+Wind 150 deg - Service	36402.66	3712.66	6441.64	598544.25	-343585.93	2046.66
Dead+Wind 180 deg - Service	36402.66	-12.27	7444.14	691838.41	2825.25	993.79
Dead+Wind 210 deg - Service	36402.66	-3724.70	6453.35	600032.79	347724.96	-301.87
Dead+Wind 240 deg - Service	36402.66	-6456.83	3724.92	347120.79	601188.22	-1568.50
Dead+Wind 270 deg - Service	36402.66	-7511.98	10.01	2500.78	698207.09	-2388.68
Dead+Wind 300 deg - Service	36402.66	-6442.59	-3704.02	-342362.21	599469.21	-2537.41
Dead+Wind 330 deg - Service	36402.66	-3714.52	-6429.49	-595752.58	345682.72	-1996.43

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-36402.66	0.00	0.00	36402.66	-0.00	0.000%
2	108.78	-43683.19	-34269.61	-108.78	43683.19	34269.61	0.000%
3	108.78	-32762.40	-34269.61	-108.78	32762.40	34269.61	0.000%
4	17227.55	-43683.19	-29737.93	-17227.55	43683.19	29737.93	0.000%
5	17227.55	-32762.40	-29737.93	-17227.55	32762.40	29737.93	0.000%
6	29770.20	-43683.19	-17219.66	-29770.20	43683.19	17219.66	0.000%
7	29770.20	-32762.40	-17219.66	-29770.20	32762.40	17219.66	0.000%
8	34668.28	-43683.19	-15.72	-34668.29	43683.19	15.72	0.000%
9	34668.28	-32762.40	-15.72	-34668.28	32762.40	15.72	0.000%
10	29748.76	-43683.19	17074.81	-29748.76	43683.19	-17074.81	0.000%
11	29748.76	-32762.40	17074.81	-29748.76	32762.40	-17074.81	0.000%
12	17109.23	-43683.19	29685.33	-17109.23	43683.19	-29685.33	0.000%
13	17109.23	-32762.40	29685.33	-17109.23	32762.40	-29685.33	0.000%
14	-56.57	-43683.19	34305.22	56.57	43683.19	-34305.22	0.000%
15	-56.57	-32762.40	34305.22	56.57	32762.40	-34305.22	0.000%
16	-17164.74	-43683.19	29739.30	17164.74	43683.19	-29739.30	0.000%
17	-17164.74	-32762.40	29739.30	17164.74	32762.40	-29739.30	0.000%
18	-29755.34	-43683.19	17165.75	29755.34	43683.19	-17165.75	0.000%
19	-29755.34	-32762.40	17165.75	29755.34	32762.40	-17165.75	0.000%
20	-34617.86	-43683.19	46.13	34617.86	43683.19	-46.13	0.000%
21	-34617.86	-32762.40	46.13	34617.86	32762.40	-46.13	0.000%
22	-29689.71	-43683.19	-17069.42	29689.71	43683.19	17069.42	0.000%
23	-29689.71	-32762.40	-17069.42	29689.71	32762.40	17069.42	0.000%
24	-17117.80	-43683.19	-29629.38	17117.80	43683.19	29629.38	0.000%
25	-17117.80	-32762.40	-29629.38	17117.80	32762.40	29629.38	0.000%
26	0.00	-85239.40	0.00	0.00	85239.40	-0.01	0.000%
27	11.81	-85239.40	-9148.82	-11.81	85239.40	9148.97	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
28	4577.42	-85239.40	-7929.91	-4577.49	85239.40	7930.04	0.000%
29	7924.88	-85239.40	-4582.42	-7925.00	85239.40	4582.49	0.000%
30	9154.85	-85239.40	7.64	-9155.00	85239.40	-7.64	0.000%
31	7931.63	-85239.40	4571.25	-7931.76	85239.40	-4571.33	0.000%
32	4571.81	-85239.40	7930.11	-4571.88	85239.40	-7930.24	0.000%
33	-0.80	-85239.40	9156.13	0.80	85239.40	-9156.28	0.000%
34	-4564.25	-85239.40	7930.03	4564.33	85239.40	-7930.16	0.000%
35	-7921.61	-85239.40	4571.15	7921.73	85239.40	-4571.23	0.000%
36	-9144.19	-85239.40	-1.43	9144.34	85239.40	1.43	0.000%
37	-7919.27	-85239.40	-4570.30	7919.39	85239.40	4570.38	0.000%
38	-4573.76	-85239.40	-7918.44	4573.83	85239.40	7918.56	0.000%
39	23.60	-36402.66	-7436.41	-23.60	36402.66	7436.41	0.000%
40	3738.33	-36402.66	-6453.05	-3738.33	36402.66	6453.05	0.000%
41	6460.05	-36402.66	-3736.62	-6460.05	36402.66	3736.62	0.000%
42	7522.92	-36402.66	-3.41	-7522.92	36402.66	3.41	0.000%
43	6455.40	-36402.66	3705.19	-6455.40	36402.66	-3705.19	0.000%
44	3712.66	-36402.66	6441.63	-3712.66	36402.66	-6441.64	0.000%
45	-12.27	-36402.66	7444.14	12.27	36402.66	-7444.14	0.000%
46	-3724.70	-36402.66	6453.35	3724.70	36402.66	-6453.35	0.000%
47	-6456.83	-36402.66	3724.92	6456.83	36402.66	-3724.92	0.000%
48	-7511.98	-36402.66	10.01	7511.98	36402.66	-10.01	0.000%
49	-6442.59	-36402.66	-3704.02	6442.59	36402.66	3704.02	0.000%
50	-3714.52	-36402.66	-6429.49	3714.52	36402.66	6429.49	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00026976
3	Yes	5	0.00000001	0.00012247
4	Yes	6	0.00000001	0.00008742
5	Yes	5	0.00000001	0.00079615
6	Yes	6	0.00000001	0.00007547
7	Yes	5	0.00000001	0.00068540
8	Yes	5	0.00000001	0.00069507
9	Yes	5	0.00000001	0.00031443
10	Yes	6	0.00000001	0.00011126
11	Yes	6	0.00000001	0.00003523
12	Yes	6	0.00000001	0.00007253
13	Yes	5	0.00000001	0.00065974
14	Yes	5	0.00000001	0.00032422
15	Yes	5	0.00000001	0.00014664
16	Yes	6	0.00000001	0.00008300
17	Yes	5	0.00000001	0.00075360
18	Yes	6	0.00000001	0.00010013
19	Yes	5	0.00000001	0.00091552
20	Yes	5	0.00000001	0.00071146
21	Yes	5	0.00000001	0.00032156
22	Yes	6	0.00000001	0.00007141
23	Yes	5	0.00000001	0.00065135
24	Yes	6	0.00000001	0.00010456
25	Yes	5	0.00000001	0.00095938
26	Yes	4	0.00000001	0.00007357
27	Yes	5	0.00000001	0.00057166
28	Yes	5	0.00000001	0.00084506

29	Yes	5	0.00000001	0.00081362
30	Yes	5	0.00000001	0.00064835
31	Yes	5	0.00000001	0.00096728
32	Yes	5	0.00000001	0.00084447
33	Yes	5	0.00000001	0.00059070
34	Yes	5	0.00000001	0.00086263
35	Yes	5	0.00000001	0.00093551
36	Yes	5	0.00000001	0.00065005
37	Yes	5	0.00000001	0.00082330
38	Yes	5	0.00000001	0.00090214
39	Yes	4	0.00000001	0.00035561
40	Yes	4	0.00000001	0.00060770
41	Yes	4	0.00000001	0.00056754
42	Yes	4	0.00000001	0.00086660
43	Yes	5	0.00000001	0.00005669
44	Yes	4	0.00000001	0.00068943
45	Yes	4	0.00000001	0.00038400
46	Yes	4	0.00000001	0.00052799
47	Yes	4	0.00000001	0.00095664
48	Yes	4	0.00000001	0.00086280
49	Yes	4	0.00000001	0.00081371
50	Yes	5	0.00000001	0.00004875

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
L1	119.083 - 101.083	17.067	48	1.212	0.024
L2	104 - 66.5	13.296	48	1.160	0.016
L3	70.3333 - 32.8333	6.135	48	0.820	0.007
L4	37.5 - 0	1.761	48	0.431	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
120.00	AIR -32 B2A/B66AA w/ Mount Pipe	48	17.067	1.212	0.024	24729
115.00	VHLP2-18	48	16.032	1.202	0.022	24729
110.00	80010965 w/ Mount Pipe	48	14.775	1.187	0.019	13612
100.00	BXA-80063-4BF-EDIN-X w/ Mount Pipe	48	12.337	1.135	0.014	7592
90.00	ODI2-065R18K-GQ w/ Mount Pipe	48	10.054	1.048	0.011	6403
83.00	VHLP2-23	48	8.565	0.972	0.009	5772
80.00	CW JUNCTION BOX	48	7.957	0.937	0.008	5538

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	119.083 - 101.083	79.046	8	5.607	0.113
L2	104 - 66.5	61.613	8	5.377	0.074
L3	70.3333 - 32.8333	28.449	8	3.802	0.031
L4	37.5 - 0	8.164	8	2.001	0.012

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	AIR -32 B2A/B66AA w/ Mount Pipe	8	79.046	5.607	0.113	5535
115.00	VHLP2-18	8	74.264	5.563	0.101	5535
110.00	80010965 w/ Mount Pipe	8	68.452	5.497	0.088	3046
100.00	BXA-80063-4BF-EDIN-X w/ Mount Pipe	8	57.177	5.261	0.066	1691
90.00	ODI2-065R18K-GQ w/ Mount Pipe	8	46.606	4.858	0.050	1414
83.00	VHLP2-23	8	39.708	4.507	0.042	1267
80.00	CW JUNCTION BOX	8	36.892	4.345	0.039	1213

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	119.083 - 101.083 (1)	TP26x22.13x0.25	18.00	0.00	0.0	19.935	-9617.12	1166200.00	0.008
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	37.50	0.00	0.0	32.544	-22449.30	1903830.00	0.012
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	37.50	0.00	0.0	47.876	-31409.50	2800760.00	0.011
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	37.50	0.00	0.0	57.950	-43655.30	3390090.00	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	119.083 - 101.083 (1)	TP26x22.13x0.25	171914.17	753155.83	0.228	0.00	753155.83	0.000
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	973500.00	1588066.67	0.613	0.00	1588066.67	0.000
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	1981300.00	2847925.00	0.696	0.00	2847925.00	0.000

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	3236541.67	3935250.00	0.822	0.00	3935250.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	119.083 - 101.083 (1)	TP26x22.13x0.25	15578.10	349860.00	0.045	5754.61	769740.00	0.007
L2	101.083 - 66.5 (2)	TP34.063x24.873x0.313	29223.70	571148.00	0.051	11262.00	1641133.33	0.007
L3	66.5 - 32.8333 (3)	TP41.75x32.498x0.375	32095.50	840227.00	0.038	11227.25	2959775.00	0.004
L4	32.8333 - 0 (4)	TP49.063x39.849x0.375	34703.50	1017030.00	0.034	11210.67	4336408.33	0.003

Pole Interaction Design Data

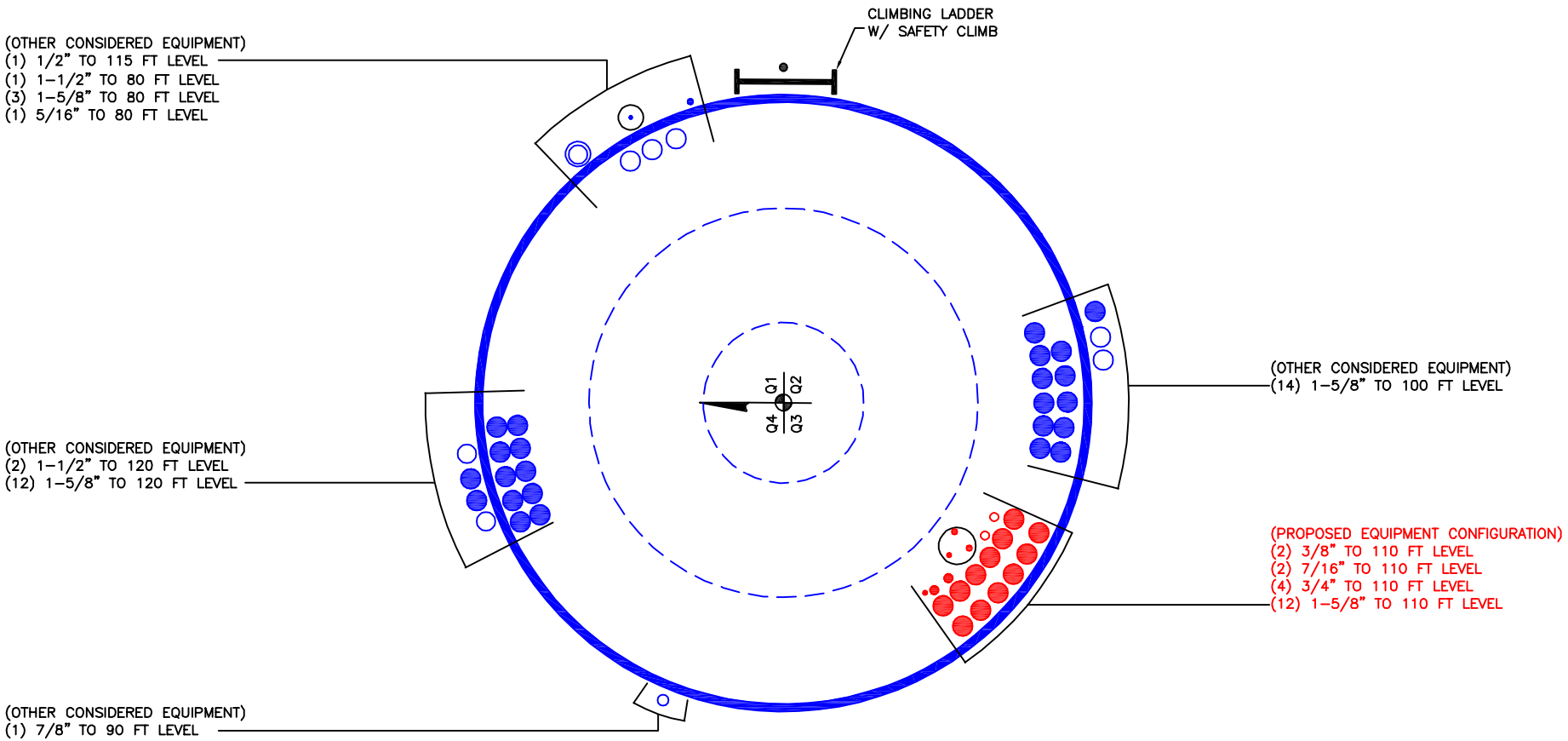
Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	119.083 - 101.083 (1)	0.008	0.228	0.000	0.045	0.007	0.239	1.050	4.8.2
L2	101.083 - 66.5 (2)	0.012	0.613	0.000	0.051	0.007	0.628	1.050	4.8.2
L3	66.5 - 32.8333 (3)	0.011	0.696	0.000	0.038	0.004	0.709	1.050	4.8.2
L4	32.8333 - 0 (4)	0.013	0.822	0.000	0.034	0.003	0.837	1.050	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	119.083 - 101.083	Pole	TP26x22.13x0.25	1	-9617.12	1224509.94	22.8	Pass
L2	101.083 - 66.5	Pole	TP34.063x24.873x0.313	2	-22449.30	1999021.41	59.8	Pass
L3	66.5 - 32.8333	Pole	TP41.75x32.498x0.375	3	-31409.50	2940797.87	67.5	Pass
L4	32.8333 - 0	Pole	TP49.063x39.849x0.375	4	-43655.30	3559594.34	79.7	Pass
							Summary	
						Pole (L4)	79.7	Pass
						Rating =	**79.7**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 829013 TOWER ID: C_BASELEVEL

APPENDIX C

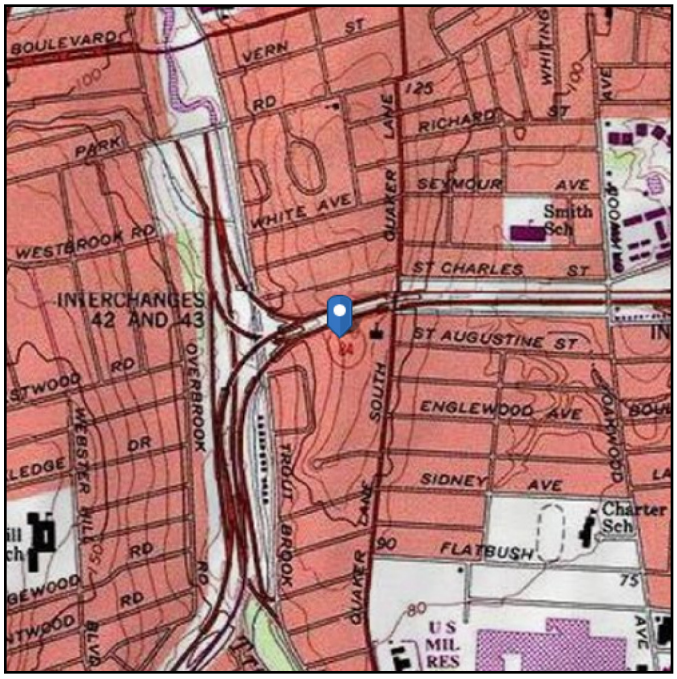
ADDITIONAL CALCULATIONS

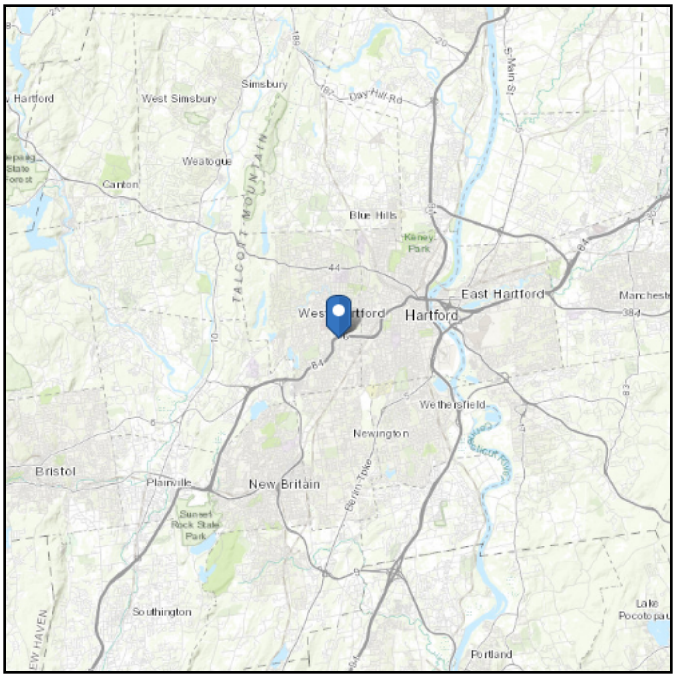
ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 118.67 ft (NAVD 88)
Latitude: 41.748775
Longitude: -72.73135





Wind

Results:

Wind Speed:	122 Vmph 125 Vmph required per jurisdiction.
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	92 Vmph
100-year MRI	99 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Wed Dec 12 2018

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

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

Ice

Results:

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

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

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

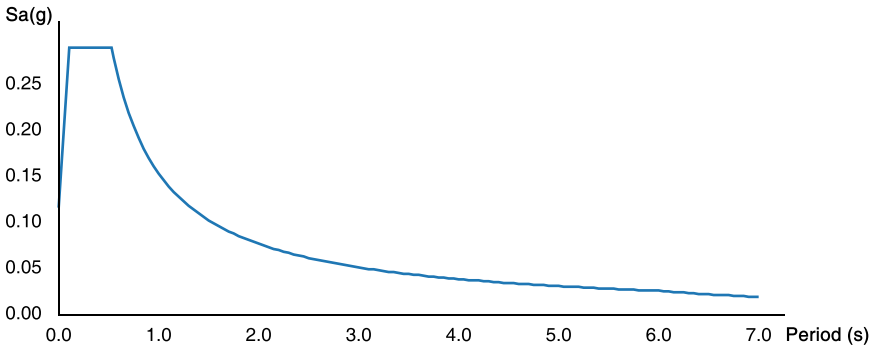
Hazards by Location

Search Information

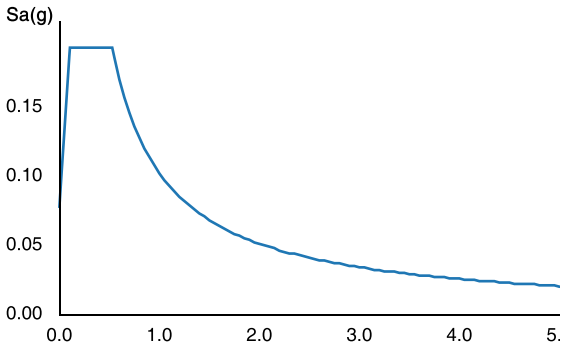
Coordinates:	41.748775, -72.73135
Timestamp:	2018-12-28T20:31:58.713Z
Hazard Type:	Seismic
Reference Document:	ASCE7-10
Risk Category:	II
Site Class:	D
Report Title:	BU 829013 - WO 1674606

Map Results

MCER Horizontal Response Spectrum



Design Horizontal Response Spectrum



Text Results

Basic Parameters

Name	Value	Description
S_S	0.181	MCE_R ground motion (period=0.2s)
S_1	0.064	MCE_R ground motion (period=1.0s)
S_{MS}	0.29	Site-modified spectral acceleration value
S_{M1}	0.153	Site-modified spectral acceleration value
S_{DS}	0.193	Numeric seismic design value at 0.2s SA
S_{D1}	0.102	Numeric seismic design value at 1.0s SA

Additional Information

Name	Value	Description

SDC	B	Seismic design category
F_a	1.6	Site amplification factor at 0.2s
F_v	2.4	Site amplification factor at 1.0s
PGA	0.091	MCE_G peak ground acceleration
F_{PGA}	1.6	Site amplification factor at PGA
PGA_M	0.146	Site modified peak ground acceleration
T_L	6	Long-period transition period (s)
SsRT	0.181	Probabilistic risk-targeted ground motion (0.2s)
SsUH	0.201	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S1RT	0.064	Probabilistic risk-targeted ground motion (1.0s)
S1UH	0.071	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
S1D	0.6	Factored deterministic acceleration value (1.0s)
PGAd	0.5	Factored deterministic acceleration value (PGA)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the United States Geological Survey Seismic Design Web Services.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

TOWER ENGINEERING PROFESSIONALS

West Hartford/I-84/X43 (BU 829013)

TEP #: 25680.203458

Analysis: ADB 12/28/2018

Check: JWB 12/28/2018

Tubular Polygonal Members Capacity Check - ANSI/TIA-222-H-2017

Reaction Input

Elevation:	101.1	ft
Moment:	171.914	kip-ft
Axial:	9.617	kip
Shear:	15.578	kip
Torsion:	5.75	kip-ft

Actual Slip-Splice Length: 35.00 in

Required Slip-Splice Length: 38.25 in (per TIA-222-H 4.9.7.1)

Section Properties

Diameter:	26.00	in
Thickness:	0.250	in
No. of Sides:	18	
Flat Width:	4.14	in
Area:	20.43	in^2

Tip Diameter: 26.33 in

Material Properties

F_y:	65	ksi
E:	29000	ksi

Filled w/ Concrete? No

***Rating per TIA-222-H Section 15.5:** 1.05

Check Bending

S: 130.02 in^3

F'$_y$: 71.47 ksi (reduced to account for actual slip-splice length per TIA-222-H 13.3.5)

ϕM_n: 696.93 kip-ft 23.5% **PASS** $0.9*F'_y*S$

Check Axial

ϕP_n: 1314.18 kip 0.7% **PASS** $0.9*F'_y*A_g$

Check Shear

ϕV_n: 358.58 kip 4.1% **PASS** $0.9*0.6*F_y*A_g/2$

Check Torsion

m: 1.58

C_t: 261.91 in^3

ϕT_n: 808.65 kip-ft 0.7% **PASS** $0.95*0.6*F_y*C_t$

Interaction*: 24.4% **PASS** $(P_u/\varphi P_n) + (M_u/\varphi M_n) + [(V_u/\varphi V_n) + T_u/\phi T_n)]^2$

TOWER ENGINEERING PROFESSIONALS

West Hartford/I-84/X43 (BU 829013)

TEP #: 25680.203458

Analysis: ADB 12/28/2018

Check: JWB 12/28/2018

Tubular Polygonal Members Capacity Check - ANSI/TIA-222-H-2017

Reaction Input

Elevation:	66.5	ft
Moment:	973.500	kip-ft
Axial:	22.449	kip
Shear:	29.224	kip
Torsion:	11.262	kip-ft

Actual Slip-Splice Length: 46.00 in

Required Slip-Splice Length: 50.16 in (per TIA-222-H 4.9.7.1)

Section Properties

Diameter:	34.0625	in
Thickness:	0.3125	in
No. of Sides:	18	
Flat Width:	5.46	in
Area:	33.47	in^2

Tip Diameter: 34.50 in

Material Properties

F_y:	65	ksi
E:	29000	ksi

Filled w/ Concrete? No

***Rating per TIA-222-H Section 15.5:** 1.05

Check Bending

S: 279.30 in^3

F'_y: 70.82 ksi (reduced to account for actual slip-splice length per TIA-222-H 13.3.5)

ϕM_n: 1483.43 kip-ft 62.5% **PASS** $0.9*F'_y*S$

Check Axial

ϕP_n: 2133.50 kip 1.0% **PASS** $0.9*F'_y*A_g$

Check Shear

ϕV_n: 587.48 kip 4.7% **PASS** $0.9*0.6*F_y*A_g/2$

Check Torsion

m: 1.58

C_t: 562.41 in^3

ϕT_n: 1736.45 kip-ft 0.6% **PASS** $0.95*0.6*F_y*C_t$

Interaction*: 63.8% **PASS** $(P_u/\varphi P_n) + (M_u/\varphi M_n) + [(V_u/\varphi V_n) + T_u/\phi T_n)]^2$

TOWER ENGINEERING PROFESSIONALS

West Hartford/I-84/X43 (BU 829013)

TEP #: 25680.203458

Analysis: ADB 12/28/2018

Check: JWB 12/28/2018

Tubular Polygonal Members Capacity Check - ANSI/TIA-222-H-2017

Reaction Input

Elevation:	32.8	ft
Moment:	1981.300	kip-ft
Axial:	31.410	kip
Shear:	32.096	kip
Torsion:	11.227	kip-ft

Actual Slip-Splice Length: 56.00 in

Required Slip-Splice Length: 61.50 in (per TIA-222-H 4.9.7.1)

Section Properties

Diameter:	41.75	in
Thickness:	0.375	in
No. of Sides:	18	
Flat Width:	6.70	in
Area:	49.24	in^2

Tip Diameter: 42.28 in

Material Properties

F_y:	65	ksi
E:	29000	ksi

Filled w/ Concrete? No

***Rating per TIA-222-H Section 15.5:** 1.05

Check Bending

S: 503.78 in^3

F'$_y$: 69.60 ksi (reduced to account for actual slip-splice length per TIA-222-H 13.3.5)

ϕM$_n$: 2629.78 kip-ft 71.8% **PASS** $0.9*F'_y*S$

Check Axial

ϕP$_n$: 3084.76 kip 1.0% **PASS** $0.9*F'_y*A_g$

Check Shear

ϕV$_n$: 864.25 kip 3.5% **PASS** $0.9*0.6*F_y*A_g/2$

Check Torsion

m: 1.58

C$_t$: 1014.30 in^3

ϕT$_n$: 3131.64 kip-ft 0.3% **PASS** $0.95*0.6*F_y*C_t$

Interaction*: 72.9% **PASS** $(P_u/\varphi P_n) + (M_u/\varphi M_n) + [(V_u/\varphi V_n) + T_u/\phi T_n)]^2$

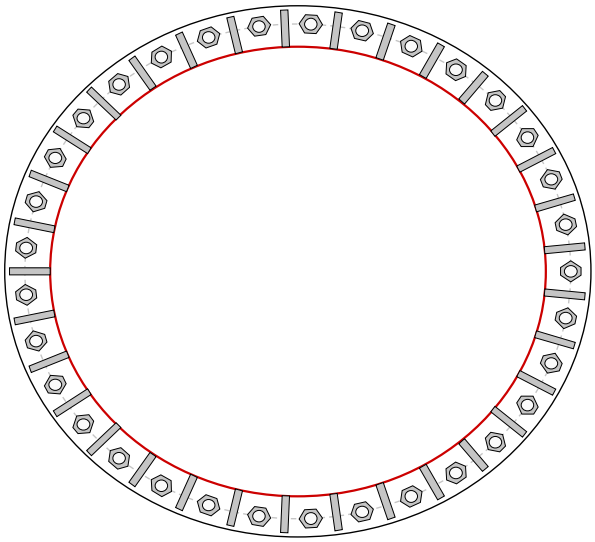
Monopole Base Plate Connection

Site Info	
BU #	829013
Site Name	West Hartford/I-84/X4
Order #	472226 Rev. 1

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	2

Applied Loads	
Moment (kip-ft)	3236.538
Axial Force (kips)	43.683
Shear Force (kips)	34.668

**TIA-222-H Section 15.5 Applied*



Connection Properties

Anchor Rod Data

(33) 1-1/4" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi) on 54" BC

Base Plate Data

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

Stiffener Data

(33) 12"H x 4"W x 0.75"T, Notch: 0.5"
plate: Fy= 36 ksi ; weld: Fy= 70 ksi
horiz. weld: 0.5" fillet
vert. weld: 0.25" fillet

Pole Data

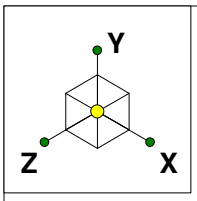
49.0625" x 0.375" 18-sided pole (A572-65; Fy=65 ksi, Fu=80 ksi)

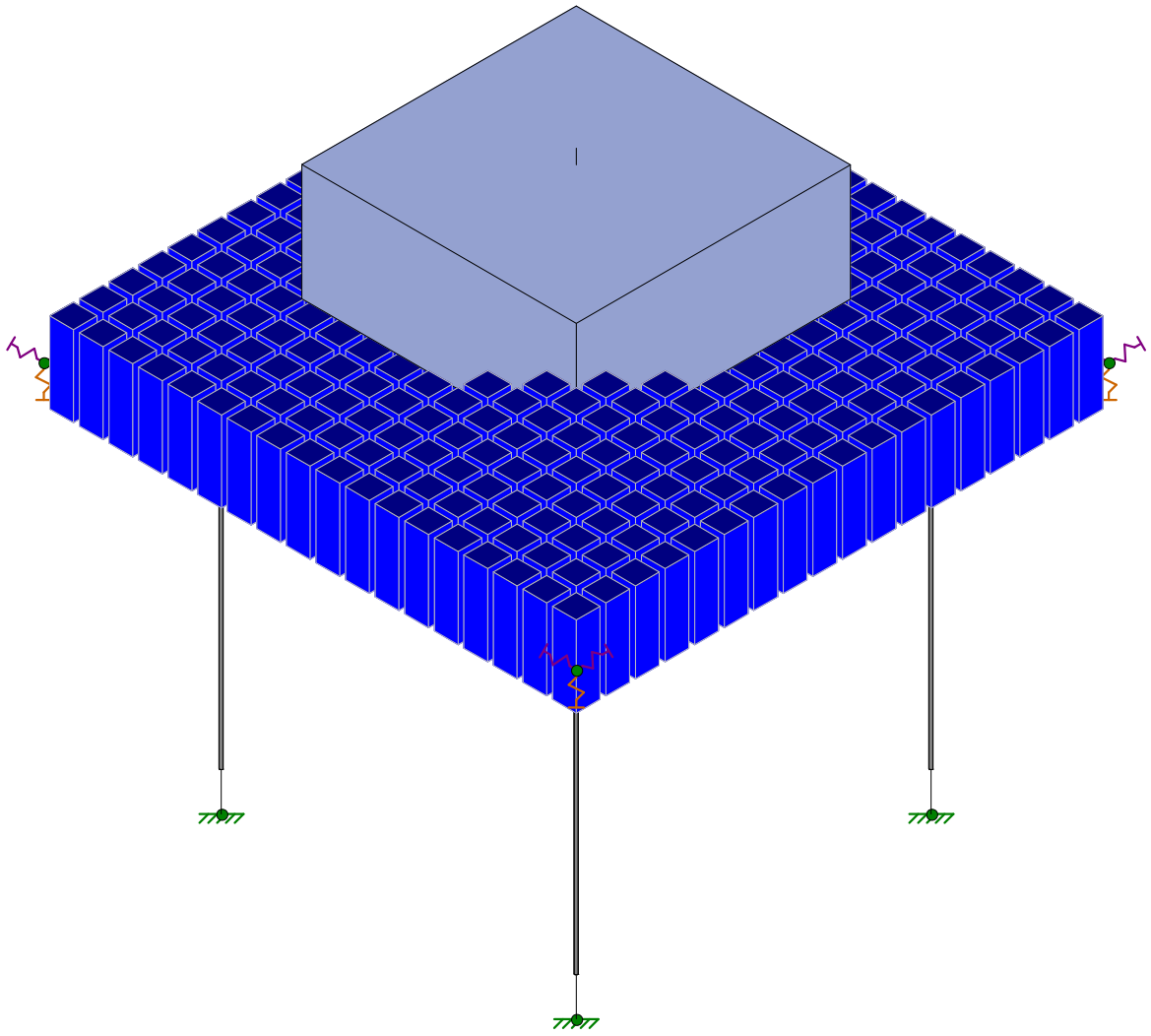
Analysis Results

Anchor Rod Summary		*(units of kips, kip-in)*
Pu_t = 85.84	ϕPn_t = 90.84	**Stress Rating**
Vu = 1.05	ϕVn = 57.52	**96.8%**
Mu = 1.37	ϕMn = 21.58	**Pass**

Base Plate Summary		
Max Stress (ksi):	30.2	(Roark's Flexural)
Allowable Stress (ksi):	45	
Stress Rating:	**63.9%**	**Pass**

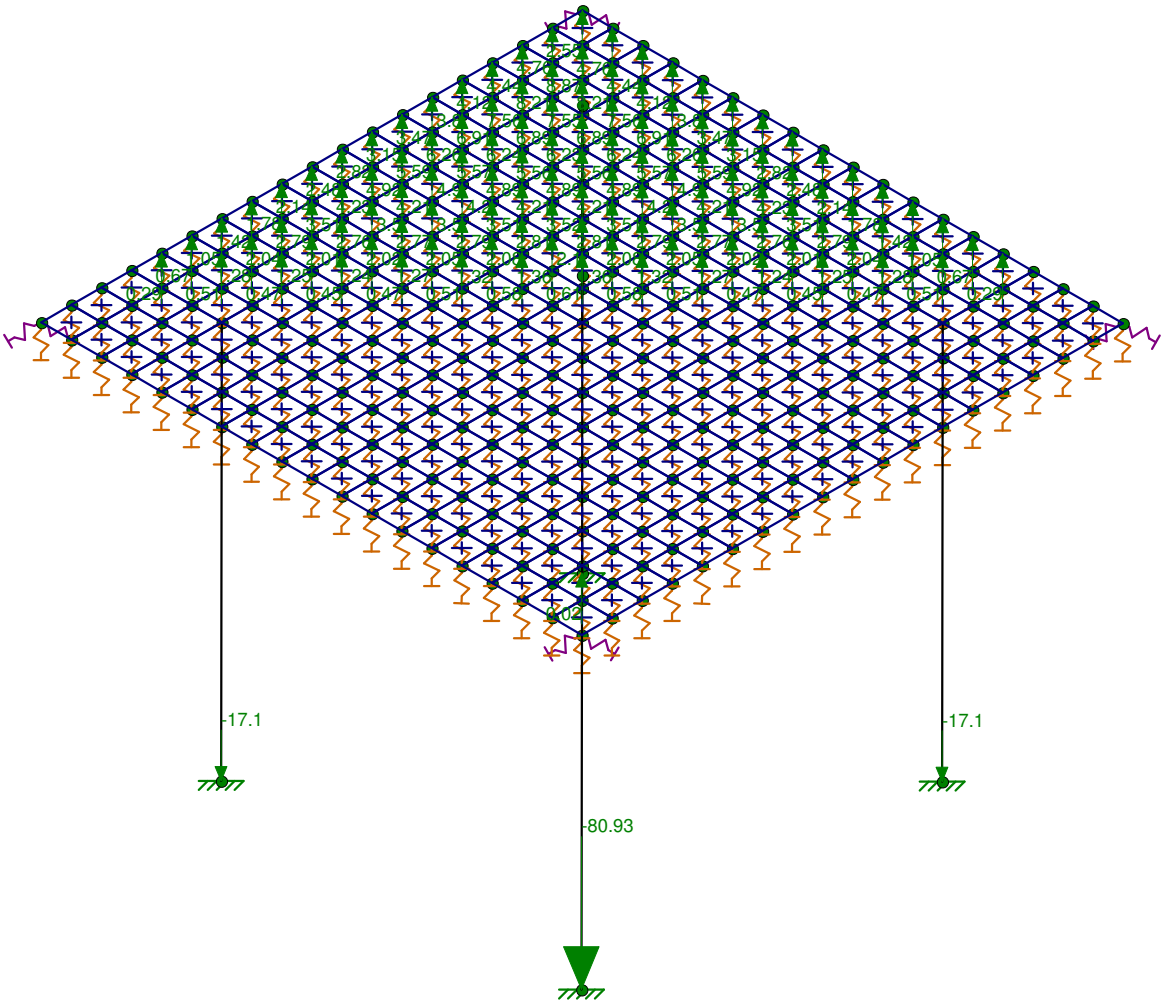
Stiffener Summary		
Horizontal Weld:	**72.5%**	**Pass**
Vertical Weld:	**48.3%**	**Pass**
Plate Flexure+Shear:	**19.5%**	**Pass**
Plate Tension+Shear:	**71.6%**	**Pass**
Plate Compression:	**71.0%**	**Pass**
Pole Summary		
Punching Shear:	**8.7%**	**Pass**





Envelope Only Solution

Crown Castle	West Hartford/I-84/X43 (BU 829013)	SK - 1
ADB		Dec 28, 2018 at 2:06 PM
TEP No. 25680.203458		829013.02S_Foundation.r3d



Y-direction Reaction Units are k and k-ft

Crown Castle	West Hartford/I-84/X43 (BU 829013)	SK - 2
ADB		Dec 28, 2018 at 2:10 PM
TEP No. 25680.203458		829013.02S_Foundation.r3d

Concrete Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1...	Density[lb/ft^3]	f'c[ksi]	Lambda	Flex Steel...	Shear Ste...
1	Conc3000NW	3156	1372	.15	.6	145	3	1	60	60
2	Conc3500NW	3409	1482	.15	.6	145	3.5	1	60	60
3	Conc4000NW	3644	1584	.15	.6	145	4	1	60	60
4	Conc3000LW	2085	907	.15	.6	109.999	3	.75	60	60
5	Conc3500LW	2252	979	.15	.6	109.999	3.5	.75	60	60
6	Conc4000LW	2408	1047	.15	.6	109.999	4	.75	60	60

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Sha...	Type	Design List	Material	Design Ru...
1	M1	N8	N12			1" WF Rock	Column	None	A722	Typical
2	M2	N7	N11			1" WF Rock	Column	None	A722	Typical
3	M3	N6	N10			1" WF Rock	Column	None	A722	Typical
4	M4	N5	N9			1" WF Rock	Column	None	A722	Typical
5	M5	TL1	N367			CRECT102...	Column	Rectangular	Conc3000NW	Typical
6	M6	N367	TOWER			6' rigid offset	Column	None	RIGID	Typical

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	TL1	L	Y	-36.403

Joint Loads and Enforced Displacements (BLC 2 : Wind 0)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	TL1	L	X	34.668
2	TL1	L	Mz	-3236.538

Joint Loads and Enforced Displacements (BLC 3 : Wind 90)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	TL1	L	Z	34.668
2	TL1	L	Mx	3236.538

Joint Loads and Enforced Displacements (BLC 4 : Wind 45)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	TL1	L	X	24.514
2	TL1	L	Mz	-2288.578
3	TL1	L	Z	24.514
4	TL1	L	Mx	2288.578

Joint Loads and Enforced Displacements (BLC 6 : Soil Strength 45)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	-.706
2	N2	L	Y	-.706
3	N31	L	Y	-.706
4	N32	L	Y	-.706
5	N33	L	Y	-.706
6	N34	L	Y	-.706
7	N35	L	Y	-.706
8	N36	L	Y	-.706
9	N37	L	Y	-.706
10	N38	L	Y	-.706
11	N39	L	Y	-.706
12	N40	L	Y	-.706

Joint Loads and Enforced Displacements (BLC 6 : Soil Strength 45) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
13	N41	L	Y	-.706
14	N42	L	Y	-.706
15	N43	L	Y	-.706
16	N44	L	Y	-.706
17	N45	L	Y	-.706
18	N46	L	Y	-.706
19	N47	L	Y	-.706
20	N3	L	Y	-.706
21	N14	L	Y	-.706
22	N15	L	Y	-.706
23	N16	L	Y	-.706
24	N17	L	Y	-.706
25	N18	L	Y	-.706
26	N19	L	Y	-.706
27	N20	L	Y	-.706
28	N21	L	Y	-.706
29	N22	L	Y	-.706
30	N23	L	Y	-.706
31	N24	L	Y	-.706
32	N25	L	Y	-.706
33	N26	L	Y	-.706
34	N27	L	Y	-.706
35	N28	L	Y	-.706
36	N29	L	Y	-.706
37	N30	L	Y	-.706

Joint Loads and Enforced Displacements (BLC 7 : Soil Strength 0)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	-.706
2	N2	L	Y	-.706
3	N31	L	Y	-.706
4	N32	L	Y	-.706
5	N33	L	Y	-.706
6	N34	L	Y	-.706
7	N35	L	Y	-.706
8	N36	L	Y	-.706
9	N37	L	Y	-.706
10	N38	L	Y	-.706
11	N39	L	Y	-.706
12	N40	L	Y	-.706
13	N41	L	Y	-.706
14	N42	L	Y	-.706
15	N43	L	Y	-.706
16	N44	L	Y	-.706
17	N45	L	Y	-.706
18	N46	L	Y	-.706
19	N47	L	Y	-.706

Joint Loads and Enforced Displacements (BLC 8 : Soil Strength 90)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
1	N1	L	Y	-.706
2	N3	L	Y	-.706
3	N14	L	Y	-.706
4	N15	L	Y	-.706
5	N16	L	Y	-.706
6	N17	L	Y	-.706

Joint Loads and Enforced Displacements (BLC 8 : Soil Strength 90) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft...
7	N18	L	Y	-.706
8	N19	L	Y	-.706
9	N20	L	Y	-.706
10	N21	L	Y	-.706
11	N22	L	Y	-.706
12	N23	L	Y	-.706
13	N24	L	Y	-.706
14	N25	L	Y	-.706
15	N26	L	Y	-.706
16	N27	L	Y	-.706
17	N28	L	Y	-.706
18	N29	L	Y	-.706
19	N30	L	Y	-.706

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	DL		-1		1				324
2	Wind 0	WL				2				
3	Wind 90	WL				2				
4	Wind 45	WL				4				
5	Prestress	None						4		
6	Soil Strength 45	None				37				
7	Soil Strength 0	None				19				
8	Soil Strength 90	None				19				

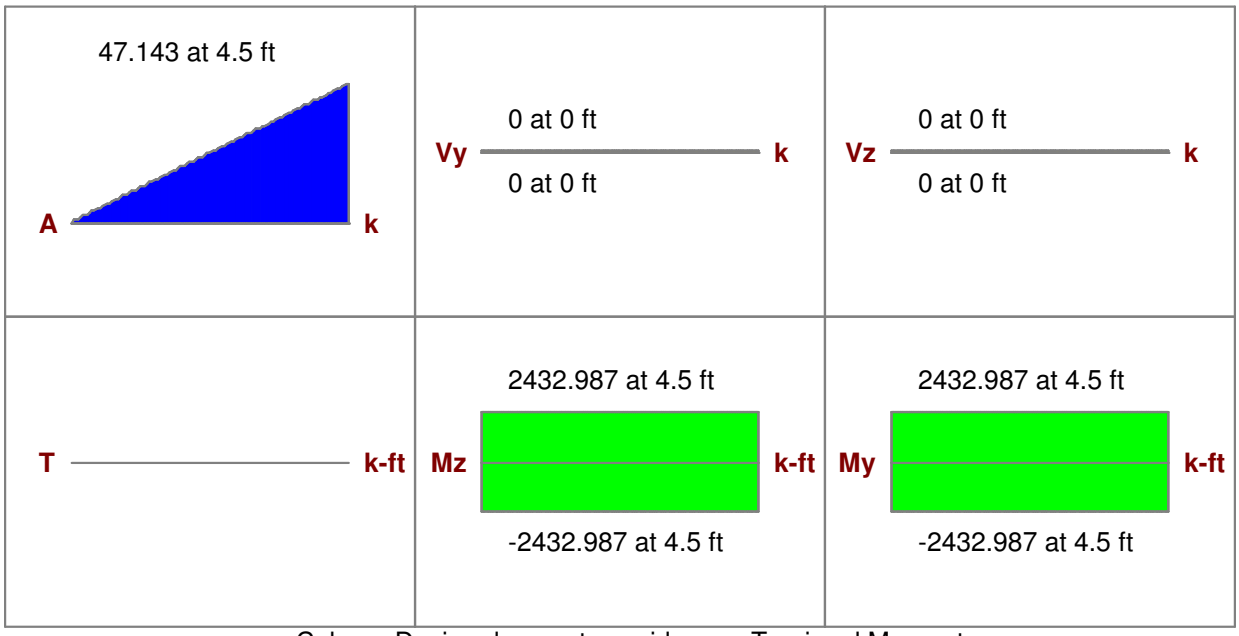
Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.2D+1.0Wind 0	Yes	Y		1	1.2	2	1	7	1																
2	1.2D+1.0Wind 90	Yes	Y		1	1.2	3	1	8	1																
3	1.2D+1.0Wind 45	Yes	Y		1	1.2	4	1	6	1																
4	0.9D+1.0Wind 0	Yes	Y		1	.9	2	1	7	1																
5	0.9D+1.0Wind 90	Yes	Y		1	.9	3	1	8	1																
6	0.9D+1.0Wind 45	Yes	Y		1	.9	4	1	6	1																
7	Prestress	Yes	Y		5	1																				

Column: ***M5***

Shape:	**CRECT102X102**	Concrete Stress Block:	**Rectangular**
Material:	**Conc3000NW**	Cracked Sections Used:	**Yes**
Length:	**4.5 ft**	Cracked 'I' Factor:	**.70**
I Joint:	**TL1**	Effective 'I':	**6.31419e+6 in^4**
J Joint:	**N367**	Biaxial Bending Solution:	**PCA Load Contour**

Code Check: **0.626 (LC 1)**
Report Based On 97 Sections



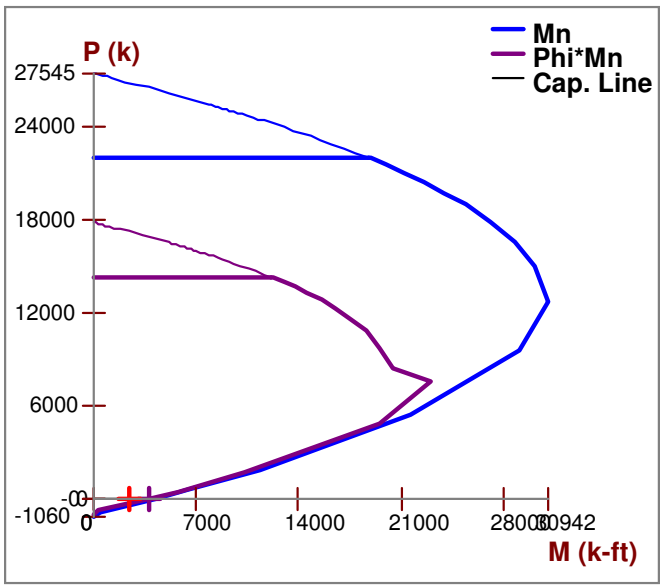
Column Design does not consider any Torsional Moments

Warning: Exact Integration selected but PCA method used
Custom rebar layout does not meet min steel (As,min) per Global Parameters

ACI 318-14 Code Check

		Bending Check	**0.626**	Shear Check	**0.000 (y)**
Gov LC	**7**	Location	**4.5 ft**	Location	**0 ft**
Gov Pu	**0 k**	Gov Muy	**2432.987 k-ft**	Gov Vuy	**0 k**
phi*Pn		Gov Muz	**0 k-ft**	Gov Vuz	**0 k**
Phi eff.	**.9**	phi*Mnoy	**-.9 k-ft**	phi*Vny	**1111.305 k**
		phi*Mnoz		phi*Vnz	**1111.305 k**
Tension Bar Fy	**60 ksi**	Concrete Weight	**145 lb/ft^3**		
Shear Bar Fy	**60 ksi**	λ	**1**	Sway yy	**No**
F'c	**3 ksi**	E_Concrete	**3156 ksi**	Sway zz	**No**
Flex. Rebar Set	**ASTM A615**	Shear Rebar Set	**ASTM A615**	Thres. Torsion	**917.543k-ft(LC:1)**
Flex. Bars	**9 #6 , 9 #6 , 11 #6 , 11 #6**				
Shear Bars	**#4 @6in**				

Column Interaction Diagram



Span Information

Span	Span Length (ft)	I-Face Dist. (in)	J-Face Dist. (in)
1	0 - 4.5	0	0

Column Steel

Span	Main Bars	UC Max	Gov LC	Loc (ft)	Pu (k)	Muy (k-ft)	Muz (k-ft)
1	40 #6	0.626	7	4.5 ft	0	2432.987	0

Axial Span Results

Span	Phi_eff	Pn (k)	Po (k)	Rho Gross	As Prvd (in^2)
1	.9		27545.425	.0017	17.671

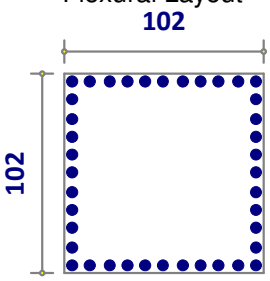
Bending Span Results

Span	ecc. y (ft)	ecc. z (ft)	NA y-y (ft)	NA z-z (ft)	Mny (k-ft)	Mnz (k-ft)	Mnoy (k-ft)	Mnoz (k-ft)
1	0	0		3.949	4319.59			

Rebar Detailing

Span	Region(ft)	Shear Steel
1	4.5 - 0 -	9 #4 @6in

Flexural Layout



Total No. of Bars - Top : 4.5 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Total No. of Bars - Middle : 2.25 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Total No. of Bars - Bottom : 0 ft
11#6 Top
9#6 Left
9#6 Right
11#6 Bottom

Monopole on Mat Foundation with Rock Anchors - TIA-222-H

Site Data	
Site Name:	West Hartford/I-84/X43
CCI Number:	BU 829013
TEP Job Number:	25680.203458

Factored Reactions from TNX		
Axial	43.683	k
Shear	34.668	k
Moment	3236.538	k-ft

Mat and Pier Properties		
Mat Width	16.5	ft
Mat Length	16.5	ft
Mat Thickness	2.5	ft
Pier Type	Square	
Pier Width/Diam.	8.5	ft
Pier Height	4.5	ft

Soil Properties		
q_{allow}	10.8	ksf
FS	2.0	
Subgrade Mod.	390	kcf
Rock Weight	160	pcf
Rock Cone Angle	30	deg

Rock Anchor Properties		
Type of Bar	WilliamsForm150	
Bar Size	1.00	in
Net Area	0.85	in^2
Ultimate Stress, Fu	150.0	ksi
Yield Stress, Fy	120.0	ksi
Bar Diameter	1.000	in
Steel/Grout Bond[1]	230	psi
Grout/Rock Allow Bond	50	psi
FS	2	
Drilled Shaft Diam.	3.75	in

[1] Ultimate Bond Values

Mat Foundation Results

Bearing Stress	11.3	ksf
Bearing Capacity, ϕq_{allow}	16.3	ksf
% Capacity	66.5%	**Pass**

Mat and Pier Structural Results

Bending Moment	793.9	kft
Flexural Capacity, ϕMn	1151.3	kft
% Capacity	65.7%	**Pass**

Rock Anchor Steel Results

Max Tension Force	80.9	k
Anchor Capacity, ϕPn	91.8	k
% Capacity	84.0%	**Pass**

Rock Anchor Pullout Results

Req. Bond Length, ld	12.4	ft
Req. Cone Height, h	12.2	ft
Total Req. Embedment	19.3	ft
Pullout Capacity, phiTn	99.0	k
% Capacity	77.9%	**Pass**

		PASS	PASS	West Hartford/I-84/X43 (BU 829013)	
	Results Summary:	LC1	LC2	TEP #:	25680.203458
	Soil Interaction:	N/A	N/A	Analysis: ADB	12/28/2018
Drilled Caisson Tool - Pier	Foundation Structural:	35.8%	9.5%	Check: JWB	12/28/2018

Code Revisions: TIA-222-H ACI 318-14

Tower Type: Monopole

	LC1	LC2	
Moment:	959.560	262.573	kip-ft
Axial (download):	43.683	85.239	kip
Shear:	34.668	9.156	kip
Axial (uplift):			kip

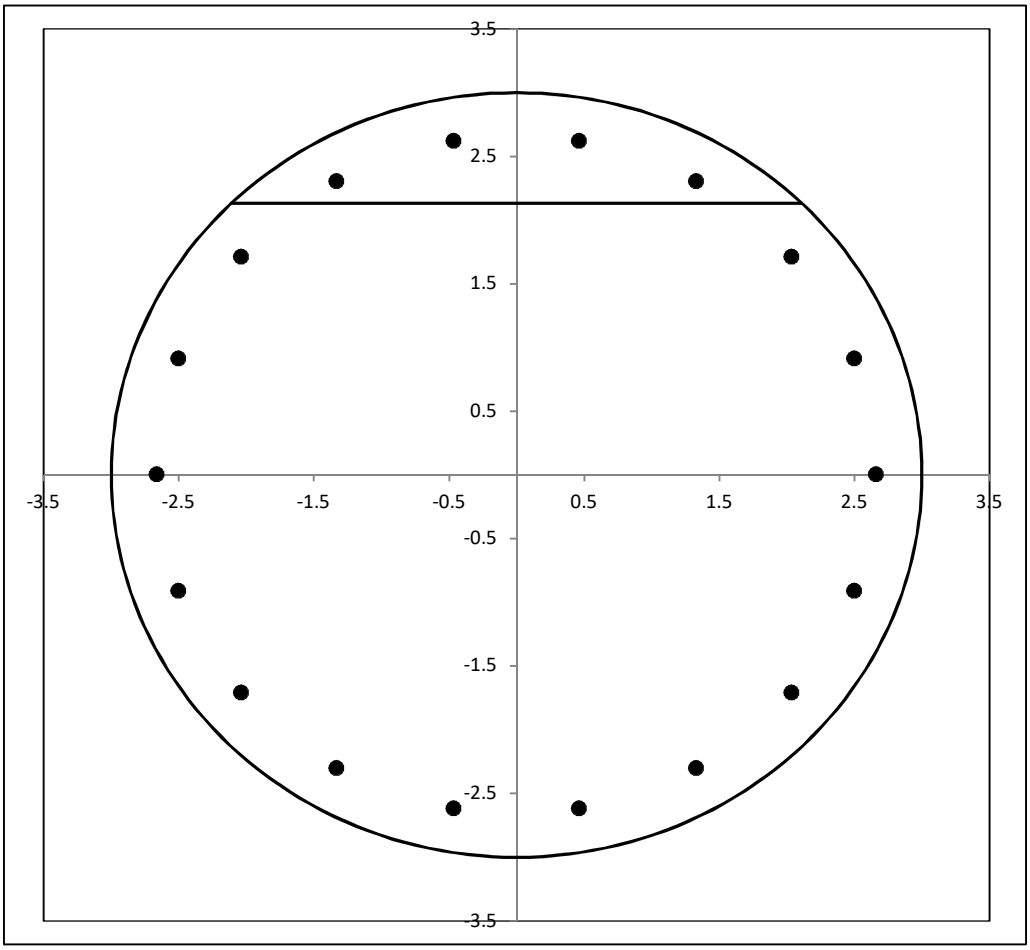
Shaft Information

Diameter:	6.00	ft
Projection:	0.50	ft
Caisson Length:	4.50	ft
f'c:	3.000	ksi
Max εc:	0.003	in/in

Cage 1 Reinforcement

Tie Bar Size:	4	*(fy = 60.0 ksi)*
Clear Cover to Tie:	3.00	*in (Cage Ø = 63.87in)*
Tie Bar Spacing:	6.00	in
Vertical Bar Size:	9	
Vertical Bar Quantity:	18	*(ρ =0.442%)*
fy:	60.0	ksi
E:	29,000	ksi

Reinforcement Capacity



		LC1	LC2	
	Vu =	34.7	9.2	kip
	Vc =	448.4	450.7	kip
fy,tie = 60.0	Vs =	269.8	269.8	kip
	ϕVn =	538.7	540.4	kip
	Capacity =	6.1%	1.6%	
		PASS	PASS	

		LC1	LC2	
	Mu =	959.6	262.6	kip-ft
	ϕMn =	2551.0	2641.8	kip-ft
	Capacity =	35.8%	9.5%	
		PASS	PASS	

RF EMISSIONS COMPLIANCE REPORT

Crown Castle on Behalf of AT&T Mobility, LLC

Site: WEST HARTFORD/I-84/X43
Crown Castle Site ID: 829013
App ID: 472226
467 South Quaker Lane
West Hartford, CT
1/14/2019

Report Status:

AT&T Mobility, LLC Is Compliant

Prepared By:

Sitesafe, LLC

8618 Westwood Center Drive, Suite 315 Vienna, VA 22182 Voice 703-276-1100
Fax 703-276-1169

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

My signature on the cover of this document indicates:

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

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

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

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

That the technical information serving as the basis for this report was supplied by Crown Castle (See attached Site Summary and Carrier documents), and that AT&T Mobility, LLC's installations involve communications equipment, antennas and associated technical equipment at a location referred to as the "WEST HARTFORD/I-84/X43" ("the site"); and

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

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

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

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

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

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

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

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

That when applying the uncontrolled environment standards, the predicted Maximum Power Density at two meters above ground level from the proposed AT&T Mobility, LLC operation is no more than 1.923% 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 5.612% 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.

AT&T Mobility, LLC
WEST HARTFORD/I-84/X43
Site Summary

Carrier	Area Maximum Percentage MPE
AT&T Mobility, LLC	0.164 %
AT&T Mobility, LLC	0.53 %
AT&T Mobility, LLC (Proposed)	0.673 %
AT&T Mobility, LLC (Proposed)	0.556 %
T-Mobile	0.23 %
T-Mobile	0.119 %
T-Mobile	0.365 %
Metro PCS	0.573 %
Verizon Wireless	1.062 %
Verizon Wireless	0.383 %
Verizon Wireless	0.616 %
Verizon Wireless	0.342 %
Composite Site MPE:	5.612 %

AT&T Mobility, LLC
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	869	MHz
Maximum Permissible Exposure (MPE):	579.33	µW/cm^2
Maximum power density at ground level:	0.95033	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.16404	%

					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	110	80	547	0.440904	0.076105	0.694667	0.119908
Powerwave	7770	110	210	547	0.440904	0.076105	0.694667	0.119908
Powerwave	7770	110	330	547	0.441449	0.076199	0.694667	0.119908

AT&T Mobility, LLC
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	2110	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	5.29603	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.5296	%

					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	TPA-65R-LCUUUU-H8	110	80	3982	2.601928	0.260193	4.505788	0.450579
Quintel	QS66512-2	110	210	4788	3.117471	0.311747	5.193352	0.519335
Quintel	QS66512-2	110	330	4788	3.073849	0.307385	5.193352	0.519335

AT&T Mobility, LLC (Proposed)
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	1930	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	6.73123	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.67312	%

					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	800-10966	110	80	6168	2.541517	0.254152	5.569831	0.556983
Kathrein-Scala	800-10965	110	210	6168	2.236801	0.22368	4.847119	0.484712
Kathrein-Scala	800-10965	110	330	6168	2.247915	0.224792	4.847118	0.484712

AT&T Mobility, LLC (Proposed)
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	734	MHz
Maximum Permissible Exposure (MPE):	489.33	µW/cm^2
Maximum power density at ground level:	2.72111	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.55608	%

					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	TPA-65R-LCUUUU-H8	110	80	3632	1.797384	0.367313	1.894267	0.387112
Kathrein-Scala	800-10965	110	210	2959	1.959552	0.400453	2.529623	0.516953
Kathrein-Scala	800-10965	110	330	2959	1.971269	0.402848	2.529623	0.516953

T-Mobile
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	700	MHz
Maximum Permissible Exposure (MPE):	466.67	µW/cm^2
Maximum power density at ground level:	1.07179	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.22967	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	LNX-6515DS-T4M	120	90	1854	1.027559	0.220191	1.027559	0.220191
ANDREW	LNX-6515DS-T4M	120	210	1854	1.027559	0.220191	1.027559	0.220191
ANDREW	LNX-6515DS-T4M	120	330	1854	1.027559	0.220191	1.027559	0.220191

T-Mobile
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	1.18507	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.11851	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Ericsson	AIR 21 B2A B4P	120	90	2061	0.707549	0.070755	0.808569	0.080857
Ericsson	AIR 21 B2A B4P	120	210	2061	0.70782	0.070782	0.808569	0.080857
Ericsson	AIR 21 B2A B4P	120	330	2061	0.707549	0.070755	0.808569	0.080857

T-Mobile
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	3.64888	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.36489	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Ericsson	AIR 32 B2A/B66AA	120	90	2313	3.425622	0.342562	3.425622	0.342562
Ericsson	AIR 32 B2A/B66AA	120	210	2313	3.406468	0.340647	3.420056	0.342006
Ericsson	AIR 32 B2A/B66AA	120	330	2313	3.425622	0.342562	3.425622	0.342562

Metro PCS
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	2500	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	5.72819	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.57282	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ARGUS	LLPX310R	81	30	2313	2.9821	0.29821	5.408939	0.540894
ARGUS	LLPX310R	81	150	2313	3.004988	0.300499	5.408939	0.540894
ARGUS	LLPX310R	81	270	2313	2.9821	0.29821	5.408939	0.540894

Verizon Wireless
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	850	MHz
Maximum Permissible Exposure (MPE):	566.67	µW/cm^2
Maximum power density at ground level:	6.01955	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	1.06227	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
Antel	BXA-80063-4CF	100	60	3192	4.515804	0.796907	5.933411	1.047073
Antel	BXA-80063-4CF	100	180	3192	4.515803	0.796906	5.93341	1.047072
Antel	BXA-80063-4CF	100	300	3192	4.521562	0.797923	5.93341	1.047072

Verizon Wireless
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	2100	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	3.8266	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.38266	%

					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-185063-8CF	100	60	5360	3.043046	0.304305	3.294768	0.329477
Antel	BXA-185063-8CF	100	180	5360	3.043046	0.304305	3.294768	0.329477
Antel	BXA-185063-8CF	100	300	5360	3.043046	0.304305	3.294769	0.329477

Verizon Wireless
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	751	MHz
Maximum Permissible Exposure (MPE):	500.67	µW/cm^2
Maximum power density at ground level:	3.08589	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.61636	%

					On Axis		Area	
Antenna Make	**Model**	**Height (feet)**	**Orientation (degrees true)**	**ERP (Watts)**	**Max Power Density (µW/cm^2)**	**Percent of MPE**	**Max Power Density (µW/cm^2)**	**Percent of MPE**
ANDREW	LNX-6514DS-T4M	100	60	1919	2.380614	0.475489	2.524241	0.504176
Antel	BXA-70063-6CF	100	180	2010	1.726232	0.344787	2.07493	0.414434
ANDREW	LNX-6514DS-T4M	100	300	1919	3.035908	0.606373	3.081311	0.615442

Verizon Wireless
WEST HARTFORD/I-84/X43
Carrier Summary

Frequency:	1900	MHz
Maximum Permissible Exposure (MPE):	1000	µW/cm^2
Maximum power density at ground level:	3.42227	µW/cm^2
Highest percentage of Maximum Permissible Exposure:	0.34223	%

					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	100	60	3708	2.158173	0.215817	3.109718	0.310972
Antel	BXA-171063-8CF	100	180	3708	2.158173	0.215817	3.109718	0.310972
Antel	BXA-171063-8CF	100	300	3708	2.15615	0.215615	3.109718	0.310972