Tim Whalen , Site Acquisition
c/o New Cingular Wireless, PCS LLC
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (781) 375 8318
twhalen@clinellc.com

March 3, 2017

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

RE: Notice of Exempt Modification // Site Number: CT2168
23 Wayne Road, Wallingford, CT 06492 (Name: MT TOM WALLINGFORD)
N 41.4627419 // W -072.941881

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains nine (9) antennas at the 78-foot level of the existing 80-foot monopole tower at 23 Wayne Road, Wallingford, CT. The tower is owned by AT&T. The property is owned by Stephen Tripp. AT&T now intends to add six (6) triplexers for its LTE upgrade. These triplexers would be installed at the 78-foot level of the tower behind existing antennas.

The current proposal involves a triplexer add only; no antennas will be added.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the office of William W. Dickinson, Jr, Mayor for the Town of Wallingford, as well as the property owner and tower owner, Stephen Tripp, Kacie Costello, the Town Planner and Zoning Enforcement Officer, and Justin Rossetti, the Building Official.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

Attached to accommodate this filing are construction drawings dated January 6, 2017 by Centek Engineering, a structural analysis dated January 5, 2017 by Centek Engineering and an Emissions Analysis Report dated January 31, 2017 by Centerline Communications.

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

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

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

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

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

6. The existing structure and its foundation can support the proposed loading as shown in the attached structural analysis dated January 5, 2017 completed by Centek.

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

Sincerely,

_____

Tim Whalen, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (781) 375-8313
twhalen@centerlincommunications.com

Attachments

cc: Office of William W. Dickinson, Jr, Mayor for the Town of Wallingford
New Cingular Wireless PCS, LLC - as tower owner
Stephen Tripp, individual - as property owner
Kacie Costello- The Town Planner and Zoning Enforcement Officer
Justin Rossetti- Building Official

Property Location: 23 WAYNE RD | MAP ID: 116/ / 116/ 1/ | Bldg Name: | State Use: 1060
Vision ID: 133733 | Account #20010026 | Bldg #: 1 of 1 | Sec #: 1 of 1 | Card 1 of 1 | Print Date: 02/24/2017 14:12

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
TRIPP STEPHEN B	2 Above Street	2 Public Water	1 Paved	2 Suburban
23 WAYNE RD	5 Steep			
WALLINGFORD, CT 06492				
Additional Owners:				

SUPPLEMENTAL DATA

Other ID:	077001008001
Census:	
Old MBLU	
TC MAP #	
TC MAP #	
Record Lot	
GIS ID: 116/116/1	
P/Z MAP #	
ENG MAP #	
Easement	
Town Line?	
IND PARKS	
ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
VAC RS LN	5-1	200,000	140,000
VAC OUTBL	5-5	19,500	13,600
	Total	219,500	153,600

6148
WALLINGFORD, CT

VISION

RECORD OF OWNERSHIP

	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
TRIPP STEPHEN B	857/ 511	03/18/1997	U	I	0	25
STEPHEN B TRIPP	/					

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2016	5-1	140,000	2015	5-1	140,000	2014	4-1	140,000
2016	5-5	13,600	2015	5-5	13,600	2014	4-2	36,300
	Total:	153,600		Total:	153,600		Total:	176,300

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

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0001/A				

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	19,500
Appraised Land Value (Bldg)	200,000
Special Land Value	0
Total Appraised Parcel Value	219,500
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	**219,500**

NOTES

CELL SITE - ATT/VERIZON/HAMM RADIO
BLDG HOUSES EQUIP FOR CELL TOWER AND
ANTENNAS. BACK-UP GENERATOR
HEAT AND A/C IN 12 X 16
REMOVED CELL TOWER FROM REAL ESTATE
FOR 04GL - DECLARED AS PERSONAL PROPERTY

SEE ALSO 116//116 FOR DWELLING
OWNER USES FOR HAMM RADIO
80 FT SELF SUPPORTING TOWER - CELL AND
MICROWAVE DISHES// ORIG BLT AS RES GAR.
PER OWNER. // (2) O/B = ATT.

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
30373	04/13/2016	CM	Commercial	15,000	09/09/2016	100		3 ANTENNAS/3 RADIO
29456	04/24/2015	CM	Commercial	4,250	07/07/2015	100		3 RADIO HEADS
29456	04/24/2015	CM	Commercial	4,250	07/07/2015	100		3 RADIO HEADS
26696	05/24/2012	CM	Commercial	15,000	10/05/2012	100		3 ANTENNAS
20959	08/31/2006	CM	Commercial	10,000	09/28/2006	100	09/28/2006	INSTALL NEW ANTEN
12553	02/22/2000	NC	New Construct	52,000	12/01/2000	100		GARAGE ADDTN
11242	01/21/2000	NC	New Construct	18,000	12/01/2000	100		FNC,GENERATOR

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
09/09/2016	02		KC	63	Permit Check - No Measu
12/17/2015			RH	41	Change
07/07/2015	02		TH	63	Permit Check - No Measu
10/05/2012	02		KC	63	Permit Check - No Measu
12/28/2010			DT	41	Change

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
1	1060	Outbulding MDL-00	R18				1.00	BL	200,000.00	1.0000	0	1.0000	1.00		0.00	CELL SITE			1.00	200,000.00	200,000

Total Card Land Units: 0.00 AC | Parcel Total Land Area: 0 AC | Total Land Value: 200,000

Property Location: 23 WAYNE RD **MAP ID:** 116/ / 116/ 1/ **Bldg Name:** **State Use:** 1060

Vision ID: 133733 **Account #**20010026 **Bldg #:** 1 of 1 **Sec #:** 1 of 1 **Card** 1 of 1 **Print Date:** 02/24/2017 14:12

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Model	00		Vacant

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
1060	Outbulding MDL-00	100

COST/MARKET VALUATION

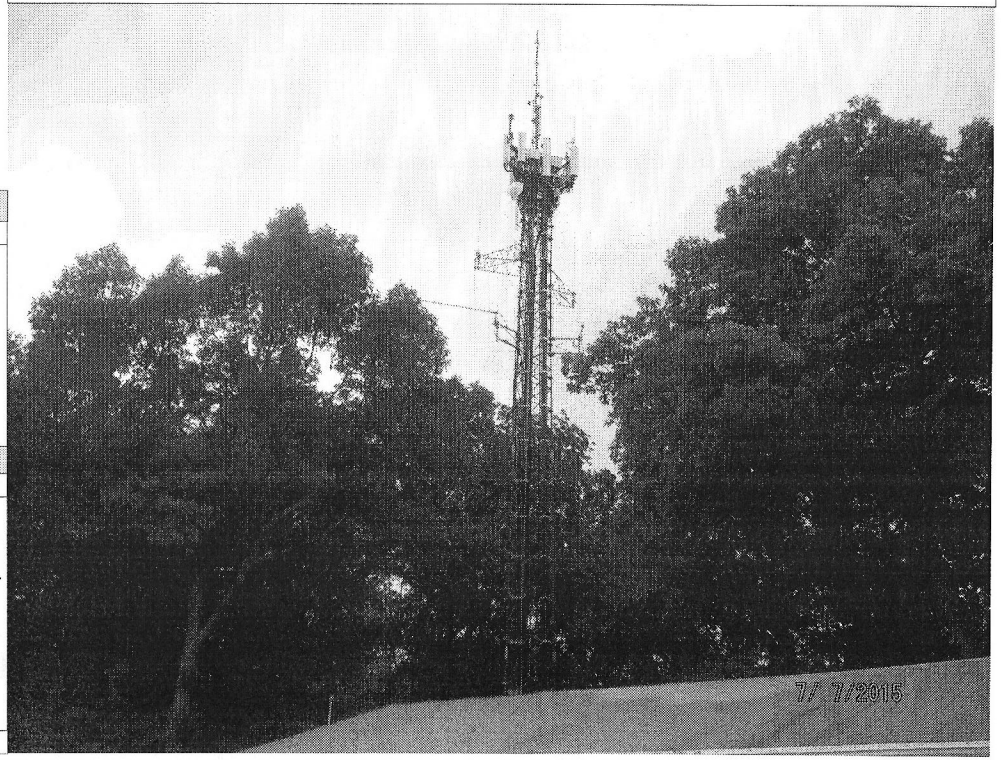
Adj. Base Rate:	0.00
	0
Net Other Adj:	0.00
Replace Cost	0
AYB	
Dep Code	
Remodel Rating	
Year Remodeled	
Dep %	
Functional Obslnc	
External Obslnc	
Cost Trend Factor	
Status	
% Complete	
Overall % Cond	
Apprais Val	
Dep % Ovr	0
Dep Ovr Comment	
Misc Imp Ovr	0
Misc Imp Ovr Comment	
Cost to Cure Ovr	0
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
FGR1	Garage-Avg			L	1,104	30.00	1976	C		A	50	16,600
FGR1	Garage-Avg			L	192	30.00	1976	C		A	50	2,900

BUILDING SUB-AREA SUMMARY SECTION

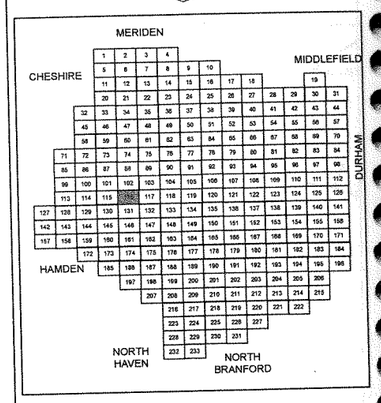
Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
	Ttl. Gross Liv/Lease Area:	0	0	0		

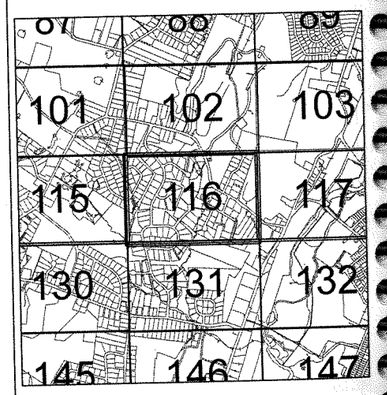


TOWN OF WALLINGFORD, CT.

PROPERTY MAP

116





LEGEND

	PARCEL LINE
41	PARCEL ID
50'	*LOT DIMENSIONS
	CURRENT TILE FRAME
	ROAD
MAIN STREET	ROAD NAME
	RIVERS & STREAMS
	HYDRO

Parcel Data 02-09-16

GIS Data 02-09-16

0 750 1,500 3,000 4,500 6,000 Feet

*Lot dimensions are projected and may not reflect actual

LEGEND

- PARCEL LINE
- 41 — PARCEL ID
- 50' — *LOT DIMENSIONS
- CURRENT TILE FRAME
- ROAD
- MAIN STREET — ROAD NAME
- RIVERS & STREAMS
- HYDRO

Parcel Data 02-09-16 GIS Data 02-09-16

0 750 1,500 3,000 4,500 6,000 Feet

* Lot dimensions are projected and may not reflect actual measurements.

THIS MAP IS PREPARED FOR THE INVENTORY OF REAL PROPERTY FOUND WITHIN THIS JURISDICTION, AND IS COMPILED FROM RECORDED DEEDS, PLATS AND OTHER RECORDS AND DATA. USERS OF THIS MAP ARE HEREBY NOTIFIED THAT THE AFORMENTIONED PUBLIC PRIMARY INFORMATION SOURCES BE CONSULTED FOR VERIFICATION OF THE INFORMATION CONTAINED ON THIS MAP. THE JURISDICTION AND MAPPING COMPANY ASSUME NO LEGAL RESPONSIBILITY FOR THE INFORMATION CONTAINED ON THIS MAP.

GRID IS BASED ON THE CONNECTICUT STATE PLANE COORDINATE SYSTEM 1983 NORTH AMERICAN DATUM.

 2/10/2016

Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT2168

Mt. Tom Wallingford
23 Wayne Road
Wallingford, CT 6492

January 31, 2017

Centerline Communications Project Number: 950006-029

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**17.79 %**

January 31, 2017

AT&T Mobility – New England
Attn: John Benedetto, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT2168 – Mt. Tom Wallingford**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **23 Wayne Road, Wallingford, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were performed for the proposed AT&T Wireless antenna facility located at **23 Wayne Road, Wallingford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

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

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
LTE	700 MHz	4	60
LTE	850 MHz	2	60
LTE	2300 MHz (WCS)	2	60
LTE	1900 MHz (PCS)	2	60

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	78
A	2	CCI OPA-65R-LCUU-H6	78
A	3	Quintel QS66512-2	78
B	1	Powerwave 7770	78
B	2	CCI OPA-65R-LCUU-H6	78
B	3	Quintel QS66512-2	78
C	1	Powerwave 7770	78
C	2	CCI OPA-65R-LCUU-H6	78
C	3	Quintel QS66512-2	78

Table 2: Antenna Data

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

RESULTS

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

Antenna ID	Antenna Make / Model		Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.01
Antenna A2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	6	360	8,073.14	8.10
Antenna A3	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	4	240	4,371.36	4.19
						Sector A Composite MPE%	**13.30**
Antenna B1	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.01
Antenna B2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	6	360	8,073.14	8.10
Antenna B3	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	4	240	4,371.36	4.19
						Sector B Composite MPE%	**13.30**
Antenna C1	Powerwave 7770	850 MHz	11.4	2	60	828.23	1.01
Antenna C2	CCI OPA-65R-LCUU-H6	700 MHz / 850 MHz / 2300 MHz (WCS)	11.65 / 12.45 / 15.45	6	360	8,073.14	8.10
Antenna C3	Quintel QS66512-2	700 MHz / 1900 MHz (PCS)	10.85 / 13.85	4	240	4,371.36	4.19
						Sector C Composite MPE%	**13.30**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**13.30 %**
PageNet	2.87 %
Land Mobile Radio	1.07 %
Amateur Radio	0.55 %
Site Total MPE %:	**17.79 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	13.30 %
AT&T Sector B Total:	13.30 %
AT&T Sector C Total:	13.30 %
Site Total:	17.79 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

AT&T _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	78	5.74	850 MHz	567	1.01%
AT&T 700 MHz LTE (Antenna 2)	2	877.31	78	12.17	700 MHz	467	2.61%
AT&T 850 MHz LTE	2	1,054.75	78	14.63	850 MHz	567	2.58%
AT&T 2300 MHz (WCS) LTE	2	2,104.51	78	29.19	2300 MHz (WCS)	1000	2.92%
AT&T 700 MHz LTE (Antenna 3)	2	729.71	78	10.12	700 MHz	467	2.17%
AT&T 1900 MHz (PCS) LTE	2	1,455.97	78	20.19	1900 MHz (PCS)	1000	2.02%
						Total:	13.30%

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	13.30 %
Sector B:	13.30 %
Sector C:	13.30 %
AT&T Maximum Total (per sector):	13.30 %
Site Total:	17.79 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **17.79 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

80' Existing Lattice Tower

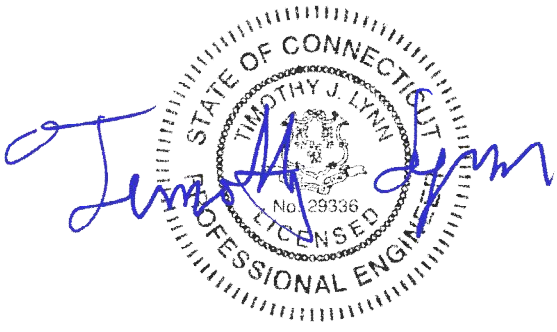
Proposed AT&T Mobility
Antenna Upgrade

AT&T Mobility Site Ref: CT2168

23 Wayne Road
Wallingford, CT

Centek Project No. 16071.92

Date: January 5, 2017



Prepared for:
AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

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- TOWER LOADING
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Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by AT&T Mobility on the existing lattice tower located in Wallingford Connecticut.

The host tower is a 80-ft, three legged, lattice tower originally designed and manufactured by PiROD Inc,. ENG. File No. A-111743 dated September 18, 1995. The tower geometry, structure member sizes and foundation information were obtained from a previous structural report prepared by Centek job no.16071.55 dated November 10, 2016.

Antenna and appurtenance inventory were taken from the aforementioned structural report, visual verification from grade by Centek personnel on November 7, 2016 and a RF data sheet.

The tower consists of four (4) vertical sections consisting of solid round pipe legs conforming to ASTM A572 Gr. 50 and solid round lateral and horizontal bracing conforming to ASTM A572 Gr. 50. The vertical tower sections are connected by bolted sleeve connections with the diagonal and horizontal bracing to pipe legs consisting of welded connections. The width of the tower face is 3-ft 6-in at the top and 5-ft 0-in at the bottom.

AT&T proposes the replacement of three (3) panel antennas and three (3) remote radio heads mounted to three (3) frames. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing and proposed loads considered in the analysis consist of the following:

- UNKNOWN (Existing):
  Antenna: Four (4) flash beacon lights pole mounted to the top of the tower.
- Unknown (Existing):
  Antenna: One (1) 20-ft dipole antenna mounted on a 4”x10-ft pipe to the top of the tower.
  Coax Cable: See note 1.
- Unknown (Existing):
  Antenna: One (1) 10-ft Omni-directional whip and one (1) 7-ft whip mounted to the AT&T frames.
  Coax Cable: See note 1.
- Unknown (Existing):
  Antenna: Two (2) 2-ft ∅ Microwave dishes leg mounted with a RAD center elevation of ±73-ft above grade level.
  Coax Cable: See note 1.
- Unknown (Existing):
  Antenna: One (1) 7-ft Omni-directional whip, one (1) 8-ft Omni-directional whip and one (1) 4-ft Omni-directional whip mounted on two (2) 6-ft bogner mounts with an elevation of ±65-ft above grade level.
  Coax Cable: See note 1.
- Unknown (Existing):
  Antenna: One (1) 10-ft yagi and one (1) 10-ft Omni-directional whip mounted on two (2) 3-ft side arms with an elevation of ±55-ft above grade level.
  Coax Cable: See note 1.

- AT&T (Existing to Remain):
  Antenna: Three (3) Powerwave 7770 panel antennas, three (3) CCI OPA-65R-LCUU-H6 panel antennas, three (3) Qunitel QS66512-2 panel antennas, three (3) Powerwave TT19-08BP111 TMAs, three (3) Ericsson RRUS-11 remote radio heads, six (6) Ericsson RRUS-32 remote radio heads and two (2) Raycap DC6-48-60-18-8F surge arrestors mounted on three (3) frames with a RAD center elevation of ±78-ft above grade level.
  Coax Cable: Twelve (12) 1-5/8" ∅ coax cables, two (2) fiber cables and four (4) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing to Remove):
  Antenna: Three (3) Powerwave TT19-08BP111 TMAs mounted on three (3) frames with a RAD center elevation of ±78-ft above grade level.
- **AT&T (Proposed):**
  Antenna: Six (6) CCI TPX-070821 triplexers mounted on three (3) frames with a RAD center elevation of ±78-ft above grade level.

  Note 1: All coax cables assumed to run to the top of the tower. Total coax cable inventory consists of twenty-eight (28) 7/8" ∅ and six (6) 1-1/4" ∅ cables.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables should be routed as specified in section 3 of this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	New Haven; v = 95-115 mph (3-second gust)	*[Annex B of TIA-222-G-2005]*
	Wallingford; v = 97 mph (3 second gust)	*[Appendix N of the 2016 CT Building Code]*
Load Cases:	Load Case 1; 97 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2016 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2012 International Building Code as amended by the 2016 Connecticut State Building Code (CSBC).

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 4-8 of the TIA code.

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **92.3%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T4)	0.00'-20.00'	92.3%	**PASS**
Diagonal (T4)	0.00'-20.00'	56.6%	**PASS**

Foundation and Anchors

The existing foundation consists of a 14-ft square x 8-ft 3-in thick reinforced concrete mat. The sub grade conditions used in the foundation analysis were derived from the aforementioned structural report. The base of the tower is connected to the foundation by means of (2) 1.75"∅, anchor bolts per leg embedded into the concrete foundation structure.

- The tower base reactions developed from the governing Load Case 1 were used in the verification of the foundation and its anchors:

Location	Vector	Proposed Reactions
Base	Shear	**14 kips**
	Compression	**13 kips**
	Moment	**746 kip-ft**
Leg	Shear	**9 kips**
	Uplift	**176 kips**
	Compression	**168 kips**

- The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Combined Compression and Shear	79.1%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[(1)]	Proposed Loading (FS)[(1)]	Result
Reinforced Concrete Mat	Overturing	1.0	1.85	**PASS**

Note 1: FS denotes Factor of Safety.

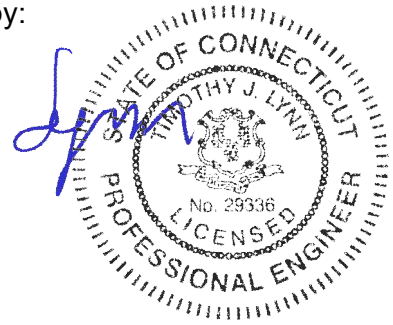
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by AT&T. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

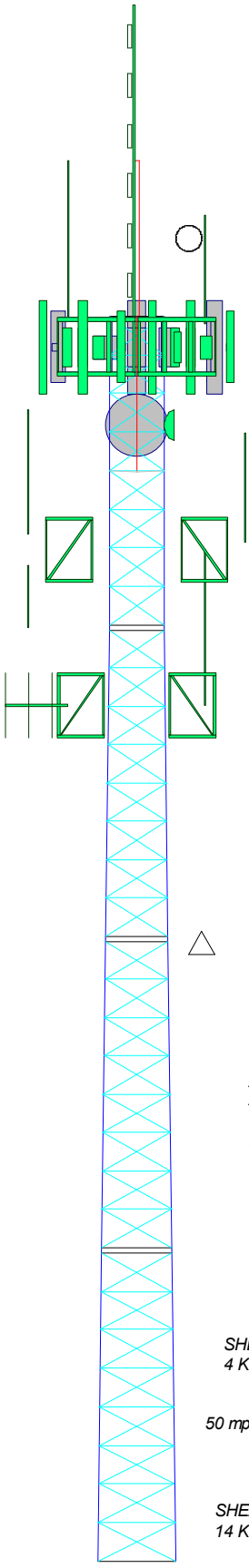
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

RISATower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, RISATower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

RISATower Features:

- RISATower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- RISATower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
L1	P4x.237	A53-B-35	N.A.	N.A.	N.A.	N.A.	N.A.	0.375	N.A.	0.1
T1	SR 1 1/2		SR 3/4		L3 1/2x3 1/2x5/16	SR 3/4	SR 3/4	3.5	8 @ 2.47917	1.0
T2	SR 2	A572-50		A572-50	SR 7/8	SR 7/8		4	16 @ 2.45833	1.3
T3	SR 2 1/4		SR 7/8		SR 1	SR 1	SR 7/8	4.5		1.5
T4	SR 2 1/2							5	8 @ 2.47917	1.8
										5.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' 8 Bay Di-Pole	90	DC6-48-60-18-8F Surge Arrestor (ATI - Existing)	78
10' x 1" Dia Omni	85	(2) TPX-070821 (ATI - Proposed)	78
7' Whip	83	(2) TPX-070821 (ATI - Proposed)	78
QS66512-2 (ATI - Existing)	78	(2) TPX-070821 (ATI - Proposed)	78
OPA-65R-LCUU-H6 (ATI - Existing)	78	Pirod 10' PCS Frame (1) (ATI - Existing)	78
7770.00 (ATI - Existing)	78	Pirod 10' PCS Frame (1) (ATI - Existing)	78
QS66512-2 (ATI - Existing)	78	Pirod 10' PCS Frame (1) (ATI - Existing)	78
OPA-65R-LCUU-H6 (ATI - Existing)	78	QS66512-2 (ATI - Existing)	78
7770.00 (ATI - Existing)	78	OPA-65R-LCUU-H6 (ATI - Existing)	78
TT19-08BP111-001 TMA (ATI - Existing)	78	7770.00 (ATI - Existing)	78
TT19-08BP111-001 TMA (ATI - Existing)	78	2-ft dish	73
TT19-08BP111-001 TMA (ATI - Existing)	78	4-ft Dish	73
RRUS-11 (ATI - Existing)	78	7' x 3" Dia Omni	65
RRUS-11 (ATI - Existing)	78	8' x 3" Dia Omni	65
RRUS-11 (ATI - Existing)	78	4' x 3" DIA Omni	65
RRUS-32 (ATI - Existing)	78	PiROD 6' Heavy Bogner Mount	65
RRUS-32 (ATI - Existing)	78	PiROD 6' Heavy Bogner Mount	65
RRUS-32 (ATI - Existing)	78	10' x 1" Dia Omni	55
RRUS-32 (ATI - Existing)	78	10-ft Yagi	55
RRUS-32 (ATI - Existing)	78	3' Side Mount Standoff	55
RRUS-32 (ATI - Existing)	78	3' Side Mount Standoff	55
DC6-48-60-18-8F Surge Arrestor (ATI - Existing)	78		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 92.3%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 176 K
SHEAR: 9 K

UPLIFT: -168 K
SHEAR: 8 K

AXIAL 34 K
SHEAR 4 K *MOMENT 232 kip-ft*

TORQUE 1 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 13 K
SHEAR 14 K *MOMENT 746 kip-ft*

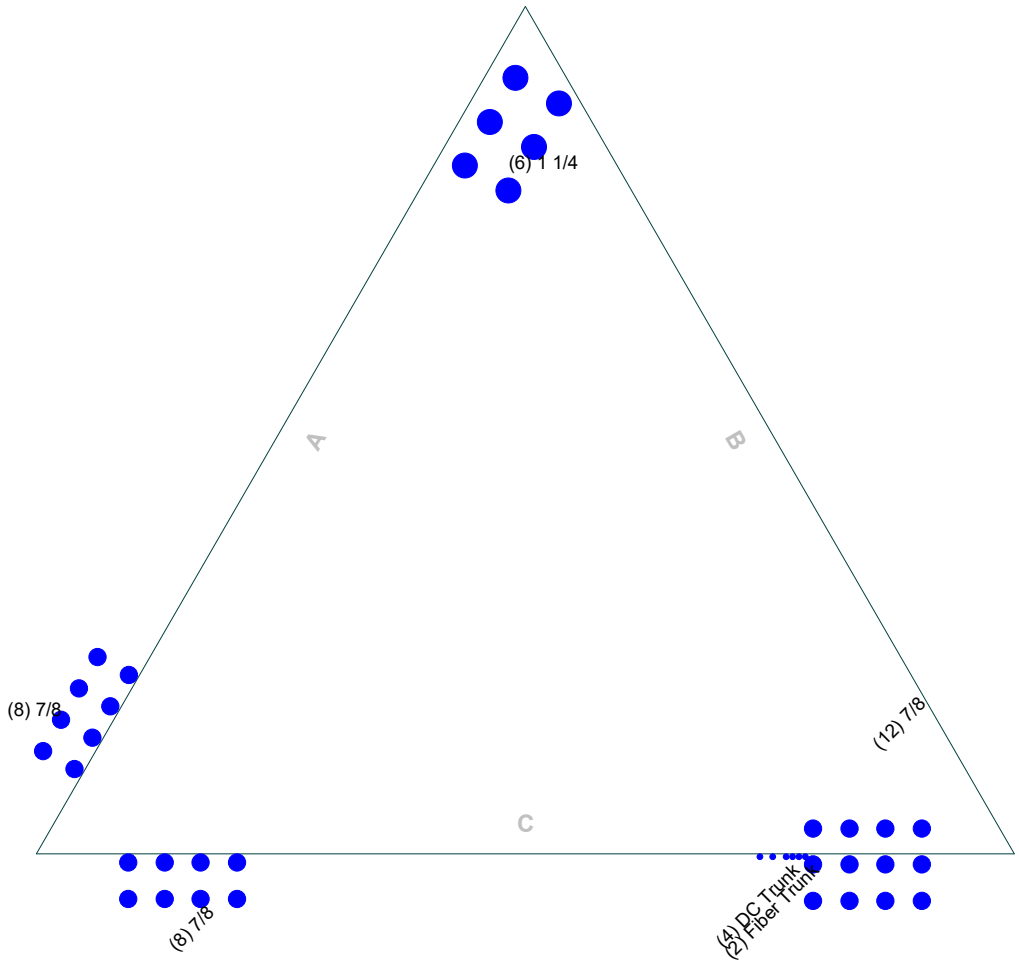
TORQUE 3 kip-ft
REACTIONS - 97 mph WIND

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: *16071.92 - CT2168*		
Project: *80-ft Lattice Tower - 23 Wayne Road Wallingford, CT*		
Client: AT&T Mobility	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 01/05/17	Scale: NTS
Path:		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face



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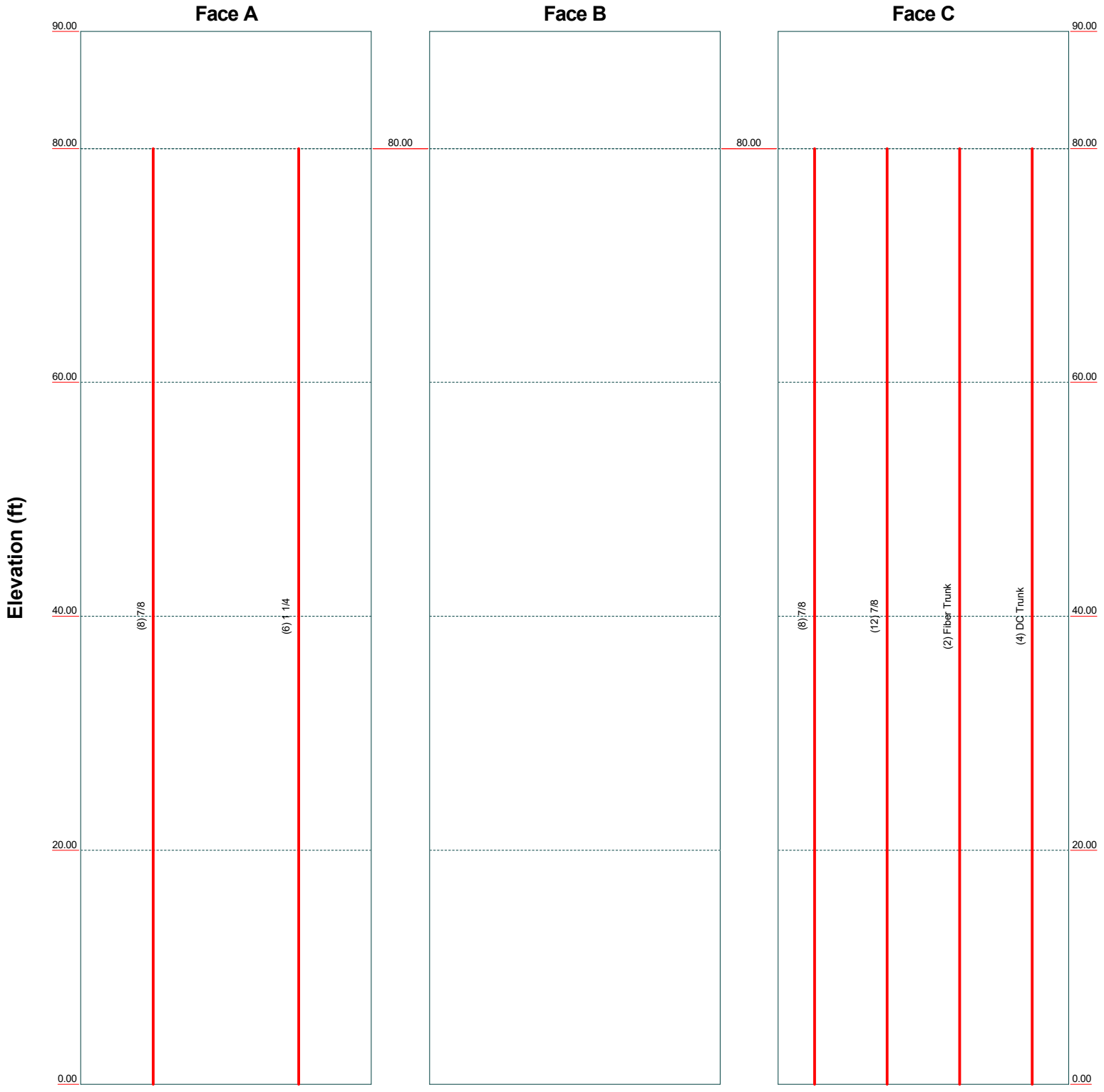
Code: TIA-222-G		Date: 01/05/17	Scale: NTS
Path:			Dwg No. E-7

Feed Line Distribution Chart
0' - 90'

Round | Flat | App In Face | App Out Face | Truss Leg



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Code: TIA-222-G	Date: 01/05/17	Scale: NTS	
Path:		Dwg No. E-7	

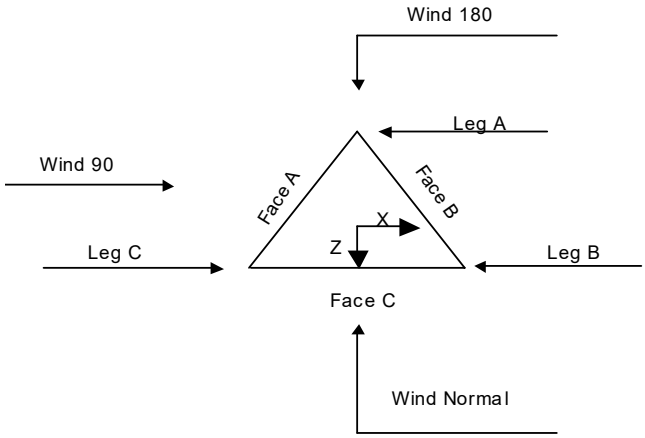
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 90.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.50 ft at the top and 5.00 ft at the base.
An index plate is provided at the 3x free standing -tower connection.
There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz		Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G 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				



Triangular Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	90.00-80.00	10.00	P4x.237	A53-B-35 (35 ksi)	10.00

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 90.00-80.00				1	1	1			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	80.00-60.00			3.50	1	20.00
T2	60.00-40.00			3.50	1	20.00
T3	40.00-20.00			4.00	1	20.00
T4	20.00-0.00			4.50	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	80.00-60.00	2.48	X Brace	No	Yes	0.0000	2.0000
T2	60.00-40.00	2.46	X Brace	No	Yes	2.0000	2.0000
T3	40.00-20.00	2.46	X Brace	No	Yes	2.0000	2.0000
T4	20.00-0.00	2.48	X Brace	No	Yes	2.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 80.00-60.00	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 40.00-20.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 20.00-0.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 80.00-60.00	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 60.00-40.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 40.00-20.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 20.00-0.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 80.00-60.00	None	Flat Bar		A36	Solid Round	3/4	A572-50

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 60.00-40.00	None	Flat Bar		(36 ksi) A36 (36 ksi)	Solid Round	7/8	(50 ksi) A572-50 (50 ksi)
T3 40.00-20.00	None	Flat Bar		(36 ksi) A36 (36 ksi)	Solid Round	7/8	(50 ksi) A572-50 (50 ksi)
T4 20.00-0.00	None	Flat Bar		(36 ksi) A36 (36 ksi)	Solid Round	7/8	(50 ksi) A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

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
T1 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
7/8	A	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.35	8	4	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	0.35	8	4	1.1100	1.1100		0.54
7/8	C	No	Ar (CaAa)	80.00 - 0.00	-1.0000	-0.35	12	4	1.1100	1.1100		0.54
1 1/4	A	No	Ar (CaAa)	80.00 - 0.00	-4.0000	0.38	6	3	1.5500	1.5500		0.66
Fiber Trunk	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.28	2	2	0.4000	0.4000		1.00
DC Trunk	C	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.26	4	4	0.4000	0.4000		0.11

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	90.00-80.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	80.00-60.00	A	0.000	0.000	36.360	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	49.200	0.000	0.26
T2	60.00-40.00	A	0.000	0.000	36.360	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	49.200	0.000	0.26
T3	40.00-20.00	A	0.000	0.000	36.360	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	49.200	0.000	0.26
T4	20.00-0.00	A	0.000	0.000	36.360	0.000	0.17
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	49.200	0.000	0.26

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	90.00-80.00	A	1.649	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	0.000	0.000	0.00
T1	80.00-60.00	A	1.617	0.000	0.000	65.836	0.000	1.18
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	99.179	0.000	1.61
T2	60.00-40.00	A	1.564	0.000	0.000	65.096	0.000	1.16
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	97.692	0.000	1.57
T3	40.00-20.00	A	1.486	0.000	0.000	64.020	0.000	1.12
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	95.531	0.000	1.51
T4	20.00-0.00	A	1.331	0.000	0.000	61.886	0.000	1.04
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	91.248	0.000	1.40

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	90.00-80.00	0.0000	0.0000	0.0000	0.0000
T1	80.00-60.00	-0.5117	0.8758	-0.2031	0.3721
T2	60.00-40.00	-0.5714	0.9588	-0.2362	0.4253
T3	40.00-20.00	-0.6426	1.0438	-0.2785	0.4873
T4	20.00-0.00	-0.7112	1.1258	-0.3347	0.5724

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	7/8	60.00 - 80.00	0.6000	0.3759
T1	2	7/8	60.00 - 80.00	0.6000	0.3759
T1	3	7/8	60.00 - 80.00	0.6000	0.3759
T1	4	1 1/4	60.00 - 80.00	0.6000	0.3759
T1	5	Fiber Trunk	60.00 - 80.00	0.6000	0.3759
T1	6	DC Trunk	60.00 - 80.00	0.6000	0.3759
T2	1	7/8	40.00 - 60.00	0.6000	0.3930
T2	2	7/8	40.00 - 60.00	0.6000	0.3930
T2	3	7/8	40.00 - 60.00	0.6000	0.3930
T2	4	1 1/4	40.00 - 60.00	0.6000	0.3930
T2	5	Fiber Trunk	40.00 - 60.00	0.6000	0.3930
T2	6	DC Trunk	40.00 - 60.00	0.6000	0.3930
T3	1	7/8	20.00 - 40.00	0.6000	0.4314
T3	2	7/8	20.00 - 40.00	0.6000	0.4314
T3	3	7/8	20.00 - 40.00	0.6000	0.4314
T3	4	1 1/4	20.00 - 40.00	0.6000	0.4314
T3	5	Fiber Trunk	20.00 - 40.00	0.6000	0.4314
T3	6	DC Trunk	20.00 - 40.00	0.6000	0.4314
T4	1	7/8	0.00 - 20.00	0.6000	0.4833
T4	2	7/8	0.00 - 20.00	0.6000	0.4833
T4	3	7/8	0.00 - 20.00	0.6000	0.4833
T4	4	1 1/4	0.00 - 20.00	0.6000	0.4833

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	5	Fiber Trunk	0.00 - 20.00	0.6000	0.4833
T4	6	DC Trunk	0.00 - 20.00	0.6000	0.4833

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
QS66512-2	A	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	0.11
(AT&T - Existing)			5.00			1/2" Ice	8.59	7.27	0.17
			0.00			1" Ice	9.05	7.72	0.23
OPA-65R-LCUU-H6	A	From Leg	2.00	0.0000	78.00	No Ice	9.66	5.52	0.07
(AT&T - Existing)			0.00			1/2" Ice	10.13	5.97	0.13
			0.00			1" Ice	10.61	6.43	0.20
7770.00	A	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	0.04
(AT&T - Existing)			-5.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
QS66512-2	B	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	0.11
(AT&T - Existing)			5.00			1/2" Ice	8.59	7.27	0.17
			0.00			1" Ice	9.05	7.72	0.23
OPA-65R-LCUU-H6	B	From Leg	2.00	0.0000	78.00	No Ice	9.66	5.52	0.07
(AT&T - Existing)			0.00			1/2" Ice	10.13	5.97	0.13
			0.00			1" Ice	10.61	6.43	0.20
7770.00	B	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	0.04
(AT&T - Existing)			-5.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
QS66512-2	C	From Leg	2.00	0.0000	78.00	No Ice	8.13	6.80	0.11
(AT&T - Existing)			5.00			1/2" Ice	8.59	7.27	0.17
			0.00			1" Ice	9.05	7.72	0.23
OPA-65R-LCUU-H6	C	From Leg	2.00	0.0000	78.00	No Ice	9.66	5.52	0.07
(AT&T - Existing)			0.00			1/2" Ice	10.13	5.97	0.13
			0.00			1" Ice	10.61	6.43	0.20
7770.00	C	From Leg	2.00	0.0000	78.00	No Ice	5.51	2.93	0.04
(AT&T - Existing)			-5.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
TT19-08BP111-001 TMA	A	From Leg	2.00	0.0000	78.00	No Ice	0.55	0.45	0.02
(AT&T - Existing)			0.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	0.03
TT19-08BP111-001 TMA	B	From Leg	2.00	0.0000	78.00	No Ice	0.55	0.45	0.02
(AT&T - Existing)			0.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	0.03
TT19-08BP111-001 TMA	C	From Leg	2.00	0.0000	78.00	No Ice	0.55	0.45	0.02
(AT&T - Existing)			0.00			1/2" Ice	0.65	0.53	0.02
			0.00			1" Ice	0.75	0.63	0.03
RRUS-11	A	From Leg	2.00	0.0000	78.00	No Ice	2.57	1.07	0.05
(AT&T - Existing)			-2.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-11	B	From Leg	2.00	0.0000	78.00	No Ice	2.57	1.07	0.05
(AT&T - Existing)			-2.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-11	C	From Leg	2.00	0.0000	78.00	No Ice	2.57	1.07	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T - Existing)			-2.00			1/2" Ice	2.76	1.21	0.07
			0.00			1" Ice	2.97	1.36	0.09
RRUS-32	A	From Leg	2.00	0.0000	78.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			2.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-32	B	From Leg	2.00	0.0000	78.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			2.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-32	C	From Leg	2.00	0.0000	78.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			2.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-32	A	From Leg	2.00	0.0000	78.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-32	B	From Leg	2.00	0.0000	78.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
RRUS-32	C	From Leg	2.00	0.0000	78.00	No Ice	3.31	2.42	0.08
(AT&T - Existing)			0.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
DC6-48-60-18-8F Surge	A	From Leg	1.00	0.0000	78.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Existing)			0.00			1" Ice	2.29	2.29	0.06
DC6-48-60-18-8F Surge	B	From Leg	1.00	0.0000	78.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T - Existing)			0.00			1" Ice	2.29	2.29	0.06
(2) TPX-070821	A	From Leg	2.00	0.0000	78.00	No Ice	0.47	0.10	0.01
(AT&T - Proposed)			0.00			1/2" Ice	0.56	0.15	0.01
			0.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	B	From Leg	2.00	0.0000	78.00	No Ice	0.47	0.10	0.01
(AT&T - Proposed)			0.00			1/2" Ice	0.56	0.15	0.01
			0.00			1" Ice	0.66	0.20	0.02
(2) TPX-070821	C	From Leg	2.00	0.0000	78.00	No Ice	0.47	0.10	0.01
(AT&T - Proposed)			0.00			1/2" Ice	0.56	0.15	0.01
			0.00			1" Ice	0.66	0.20	0.02
Pirod 10' PCS Frame (1)	A	From Leg	1.00	0.0000	78.00	No Ice	9.00	9.00	0.25
(AT&T - Existing)			0.00			1/2" Ice	13.20	13.20	0.35
			0.00			1" Ice	17.40	17.40	0.45
Pirod 10' PCS Frame (1)	B	From Leg	1.00	0.0000	78.00	No Ice	9.00	9.00	0.25
(AT&T - Existing)			0.00			1/2" Ice	13.20	13.20	0.35
			0.00			1" Ice	17.40	17.40	0.45
Pirod 10' PCS Frame (1)	C	From Leg	1.00	0.0000	78.00	No Ice	9.00	9.00	0.25
(AT&T - Existing)			0.00			1/2" Ice	13.20	13.20	0.35
			0.00			1" Ice	17.40	17.40	0.45
20' 8 Bay Di-Pole	C	From Leg	0.00	0.0000	90.00	No Ice	4.00	4.00	0.06
			0.00			1/2" Ice	6.00	6.00	0.10
			0.00			1" Ice	8.00	8.00	0.14
10' x 1" Dia Omni	C	From Leg	2.00	0.0000	85.00	No Ice	1.00	1.00	0.03
			5.00			1/2" Ice	2.02	2.02	0.04
			0.00			1" Ice	3.05	3.05	0.05
7' Whip	B	From Leg	2.00	0.0000	83.00	No Ice	1.74	1.74	0.04
			-5.00			1/2" Ice	2.60	2.60	0.05
			0.00			1" Ice	3.29	3.29	0.08
PiROD 6' Heavy Bogner	C	From Leg	3.00	0.0000	65.00	No Ice	8.20	8.20	0.25
Mount			0.00			1/2" Ice	9.90	9.90	0.33
			0.00			1" Ice	11.60	11.60	0.40
PiROD 6' Heavy Bogner	B	From Leg	3.00	0.0000	65.00	No Ice	8.20	8.20	0.25

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Mount			0.00			1/2" Ice	9.90	9.90	0.33
			0.00			1" Ice	11.60	11.60	0.40
7' x 3" Dia Omni	B	From Leg	6.00	0.0000	65.00	No Ice	2.10	2.10	0.02
			0.00			1/2" Ice	2.64	2.64	0.04
			4.00			1" Ice	3.07	3.07	0.06
8' x 3" Dia Omni	C	From Leg	6.00	0.0000	65.00	No Ice	2.40	2.40	0.03
			0.00			1/2" Ice	3.19	3.19	0.04
			5.00			1" Ice	3.67	3.67	0.07
4' x 3" DIA Omni	C	From Leg	6.00	0.0000	65.00	No Ice	1.00	1.00	0.02
			0.00			1/2" Ice	1.25	1.25	0.02
			-3.00			1" Ice	1.50	1.50	0.04
3' Side Mount Standoff	C	From Leg	2.00	0.0000	55.00	No Ice	2.64	2.64	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
3' Side Mount Standoff	B	From Leg	2.00	0.0000	55.00	No Ice	2.64	2.64	0.04
			0.00			1/2" Ice	3.69	3.69	0.05
			0.00			1" Ice	4.74	4.74	0.06
10' x 1" Dia Omni	B	From Leg	3.00	0.0000	55.00	No Ice	1.00	1.00	0.03
			0.00			1/2" Ice	2.02	2.02	0.04
			5.00			1" Ice	3.05	3.05	0.05
10-ft Yagi	C	From Leg	3.00	0.0000	55.00	No Ice	5.00	5.00	0.06
			0.00			1/2" Ice	7.50	7.50	0.08
			0.00			1" Ice	10.00	10.00	0.10

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 K
2-ft dish	B	Paraboloid w/o Radome	From Leg	0.00	Worst		73.00	2.00	No Ice	3.14	0.05
				0.00					1/2" Ice	3.41	0.08
				0.00					1" Ice	3.68	0.10
4-ft Dish	A	Paraboloid w/o Radome	From Leg	0.00	Worst		73.00	4.00	No Ice	3.14	0.10
				0.00					1/2" Ice	3.41	0.10
				0.00					1" Ice	3.68	0.12

Tower Pressures - No Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 90.00-80.00	85.00	1.223	25	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	24	72.500	A	0.984	10.823	5.000	42.34	36.360	0.000
					B	0.984	10.823		42.34	0.000	0.000
					C	0.984	10.823		42.34	49.200	0.000
T2 60.00-40.00	50.00	1.094	22	78.334	A	0.000	14.018	6.667	47.56	36.360	0.000
					B	0.000	14.018		47.56	0.000	0.000
					C	0.000	14.018		47.56	49.200	0.000
T3 40.00-20.00	30.00	0.982	20	88.750	A	0.000	15.727	7.501	47.69	36.360	0.000
					B	0.000	15.727		47.69	0.000	0.000
					C	0.000	15.727		47.69	49.200	0.000
T4 20.00-0.00	10.00	0.85	17	99.167	A	0.000	17.390	8.334	47.92	36.360	0.000
					B	0.000	17.390		47.92	0.000	0.000
					C	0.000	17.390		47.92	49.200	0.000

Tower Pressure - With Ice

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 90.00-80.00	85.00	1.223	7	1.6489	6.498	A	0.000	6.498	6.498	100.00	0.000	0.000
						B	0.000	6.498		100.00	0.000	0.000
						C	0.000	6.498		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	6	1.6171	77.890	A	0.984	47.627	15.781	32.46	65.836	0.000
						B	0.984	47.627		32.46	0.000	0.000
						C	0.984	47.627		32.46	99.179	0.000
T2 60.00-40.00	50.00	1.094	6	1.5636	83.546	A	0.000	50.717	17.093	33.70	65.096	0.000
						B	0.000	50.717		33.70	0.000	0.000
						C	0.000	50.717		33.70	97.692	0.000
T3 40.00-20.00	30.00	0.982	5	1.4858	93.703	A	0.000	53.284	17.407	32.67	64.020	0.000
						B	0.000	53.284		32.67	0.000	0.000
						C	0.000	53.284		32.67	95.531	0.000
T4 20.00-0.00	10.00	0.85	5	1.3312	103.605	A	0.000	53.533	17.210	32.15	61.886	0.000
						B	0.000	53.533		32.15	0.000	0.000
						C	0.000	53.533		32.15	91.248	0.000

Tower Pressure - Service

G_H = 0.850 (base tower), 1.350 (upper structure)

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
L1 90.00-80.00	85.00	1.223	10	3.750	A	0.000	3.750	3.750	100.00	0.000	0.000
					B	0.000	3.750		100.00	0.000	0.000
					C	0.000	3.750		100.00	0.000	0.000
T1 80.00-60.00	70.00	1.174	9	72.500	A	0.984	10.823	5.000	42.34	36.360	0.000
					B	0.984	10.823		42.34	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.984	10.823		42.34	49.200	0.000
T2 60.00-40.00	50.00	1.094	9	78.334	A	0.000	14.018	6.667	47.56	36.360	0.000
					B	0.000	14.018		47.56	0.000	0.000
					C	0.000	14.018		47.56	49.200	0.000
T3 40.00-20.00	30.00	0.982	8	88.750	A	0.000	15.727	7.501	47.69	36.360	0.000
					B	0.000	15.727		47.69	0.000	0.000
					C	0.000	15.727		47.69	49.200	0.000
T4 20.00-0.00	10.00	0.85	7	99.167	A	0.000	17.390	8.334	47.92	36.360	0.000
					B	0.000	17.390		47.92	0.000	0.000
					C	0.000	17.390		47.92	49.200	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.11	A	1	0.955	25	1	1	3.750	0.12	12.10	C
90.00-80.00			B	1	0.955		1	1	3.750			
			C	1	0.955		1	1	3.750			
T1	0.43	0.98	A	0.163	2.725	24	1	1	7.143	1.52	76.06	C
80.00-60.00			B	0.163	2.725		1	1	7.143			
			C	0.163	2.725		1	1	7.143			
T2	0.43	1.29	A	0.179	2.668	22	1	1	8.006	1.38	69.19	C
60.00-40.00			B	0.179	2.668		1	1	8.006			
			C	0.179	2.668		1	1	8.006			
T3	0.43	1.54	A	0.177	2.674	20	1	1	8.978	1.29	64.40	C
40.00-20.00			B	0.177	2.674		1	1	8.978			
			C	0.177	2.674		1	1	8.978			
T4 20.00-0.00	0.43	1.81	A	0.175	2.68	17	1	1	9.923	1.15	57.64	C
			B	0.175	2.68		1	1	9.923			
			C	0.175	2.68		1	1	9.923			
Sum Weight:	1.72	5.73						OTM	236.12 kip-ft	5.47		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.11	A	1	0.955	25	1	1	3.750	0.12	12.10	C
90.00-80.00			B	1	0.955		1	1	3.750			
			C	1	0.955		1	1	3.750			
T1	0.43	0.98	A	0.163	2.725	24	0.825	1	6.970	1.51	75.58	C
80.00-60.00			B	0.163	2.725		0.825	1	6.970			
			C	0.163	2.725		0.825	1	6.970			
T2	0.43	1.29	A	0.179	2.668	22	0.825	1	8.006	1.38	69.19	C
60.00-40.00			B	0.179	2.668		0.825	1	8.006			
			C	0.179	2.668		0.825	1	8.006			
T3	0.43	1.54	A	0.177	2.674	20	0.825	1	8.978	1.29	64.40	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
40.00-20.00			B	0.177	2.674		0.825	1	8.978			
			C	0.177	2.674		0.825	1	8.978			
T4 20.00-0.00	0.43	1.81	A	0.175	2.68	17	0.825	1	9.923	1.15	57.64	C
			B	0.175	2.68		0.825	1	9.923			
			C	0.175	2.68		0.825	1	9.923			
Sum Weight:	1.72	5.73						OTM	235.45 kip-ft	5.46		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.11	A	1	0.955	25	1	1	3.750	0.12	12.10	C
90.00-80.00			B	1	0.955		1	1	3.750			
			C	1	0.955		1	1	3.750			
T1	0.43	0.98	A	0.163	2.725	24	0.8	1	6.946	1.51	75.51	C
80.00-60.00			B	0.163	2.725		0.8	1	6.946			
			C	0.163	2.725		0.8	1	6.946			
T2	0.43	1.29	A	0.179	2.668	22	0.8	1	8.006	1.38	69.19	C
60.00-40.00			B	0.179	2.668		0.8	1	8.006			
			C	0.179	2.668		0.8	1	8.006			
T3	0.43	1.54	A	0.177	2.674	20	0.8	1	8.978	1.29	64.40	C
40.00-20.00			B	0.177	2.674		0.8	1	8.978			
			C	0.177	2.674		0.8	1	8.978			
T4 20.00-0.00	0.43	1.81	A	0.175	2.68	17	0.8	1	9.923	1.15	57.64	C
			B	0.175	2.68		0.8	1	9.923			
			C	0.175	2.68		0.8	1	9.923			
Sum Weight:	1.72	5.73						OTM	235.35 kip-ft	5.46		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.11	A	1	0.955	25	1	1	3.750	0.12	12.10	C
90.00-80.00			B	1	0.955		1	1	3.750			
			C	1	0.955		1	1	3.750			
T1	0.43	0.98	A	0.163	2.725	24	0.85	1	6.995	1.51	75.65	C
80.00-60.00			B	0.163	2.725		0.85	1	6.995			
			C	0.163	2.725		0.85	1	6.995			
T2	0.43	1.29	A	0.179	2.668	22	0.85	1	8.006	1.38	69.19	C
60.00-40.00			B	0.179	2.668		0.85	1	8.006			
			C	0.179	2.668		0.85	1	8.006			
T3	0.43	1.54	A	0.177	2.674	20	0.85	1	8.978	1.29	64.40	C
40.00-20.00			B	0.177	2.674		0.85	1	8.978			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.177	2.674		0.85	1	8.978			
T4 20.00-0.00	0.43	1.81	A	0.175	2.68	17	0.85	1	9.923	1.15	57.64	C
			B	0.175	2.68		0.85	1	9.923			
			C	0.175	2.68		0.85	1	9.923			
Sum Weight:	1.72	5.73						OTM	235.55 kip-ft	5.46		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.23	A	1	1.2	7	1	1	6.498	0.07	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	2.79	2.96	A	0.624	1.791	6	1	1	37.145	0.73	36.60	C
80.00-60.00			B	0.624	1.791		1	1	37.145			
			C	0.624	1.791		1	1	37.145			
T2	2.73	3.17	A	0.607	1.8	6	1	1	37.948	0.67	33.45	C
60.00-40.00			B	0.607	1.8		1	1	37.948			
			C	0.607	1.8		1	1	37.948			
T3	2.63	3.46	A	0.569	1.827	5	1	1	38.596	0.63	31.64	C
40.00-20.00			B	0.569	1.827		1	1	38.596			
			C	0.569	1.827		1	1	38.596			
T4 20.00-0.00	2.45	3.57	A	0.517	1.879	5	1	1	37.160	0.57	28.27	C
			B	0.517	1.879		1	1	37.160			
			C	0.517	1.879		1	1	37.160			
Sum Weight:	10.60	13.40						OTM	115.28 kip-ft	2.67		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.23	A	1	1.2	7	1	1	6.498	0.07	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	2.79	2.96	A	0.624	1.791	6	0.825	1	36.973	0.73	36.52	C
80.00-60.00			B	0.624	1.791		0.825	1	36.973			
			C	0.624	1.791		0.825	1	36.973			
T2	2.73	3.17	A	0.607	1.8	6	0.825	1	37.948	0.67	33.45	C
60.00-40.00			B	0.607	1.8		0.825	1	37.948			
			C	0.607	1.8		0.825	1	37.948			
T3	2.63	3.46	A	0.569	1.827	5	0.825	1	38.596	0.63	31.64	C
40.00-20.00			B	0.569	1.827		0.825	1	38.596			
			C	0.569	1.827		0.825	1	38.596			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T4 20.00-0.00	2.45	3.57	A	0.517	1.879	5	0.825	1	37.160	0.57	28.27	C
			B	0.517	1.879		0.825	1	37.160			
			C	0.517	1.879		0.825	1	37.160			
Sum Weight:	10.60	13.40						OTM	115.16 kip-ft	2.67		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.00	0.23	A	1	1.2	7	1	1	6.498	0.07	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	2.79	2.96	A	0.624	1.791	6	0.8	1	36.948	0.73	36.51	C
80.00-60.00			B	0.624	1.791		0.8	1	36.948			
			C	0.624	1.791		0.8	1	36.948			
T2	2.73	3.17	A	0.607	1.8	6	0.8	1	37.948	0.67	33.45	C
60.00-40.00			B	0.607	1.8		0.8	1	37.948			
			C	0.607	1.8		0.8	1	37.948			
T3	2.63	3.46	A	0.569	1.827	5	0.8	1	38.596	0.63	31.64	C
40.00-20.00			B	0.569	1.827		0.8	1	38.596			
			C	0.569	1.827		0.8	1	38.596			
T4 20.00-0.00	2.45	3.57	A	0.517	1.879	5	0.8	1	37.160	0.57	28.27	C
			B	0.517	1.879		0.8	1	37.160			
			C	0.517	1.879		0.8	1	37.160			
Sum Weight:	10.60	13.40						OTM	115.15 kip-ft	2.67		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.00	0.23	A	1	1.2	7	1	1	6.498	0.07	7.00	C
90.00-80.00			B	1	1.2		1	1	6.498			
			C	1	1.2		1	1	6.498			
T1	2.79	2.96	A	0.624	1.791	6	0.85	1	36.998	0.73	36.53	C
80.00-60.00			B	0.624	1.791		0.85	1	36.998			
			C	0.624	1.791		0.85	1	36.998			
T2	2.73	3.17	A	0.607	1.8	6	0.85	1	37.948	0.67	33.45	C
60.00-40.00			B	0.607	1.8		0.85	1	37.948			
			C	0.607	1.8		0.85	1	37.948			
T3	2.63	3.46	A	0.569	1.827	5	0.85	1	38.596	0.63	31.64	C
40.00-20.00			B	0.569	1.827		0.85	1	38.596			
			C	0.569	1.827		0.85	1	38.596			
T4 20.00-0.00	2.45	3.57	A	0.517	1.879	5	0.85	1	37.160	0.57	28.27	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			B	0.517	1.879		0.85	1	37.160			
			C	0.517	1.879		0.85	1	37.160			
Sum Weight:	10.60	13.40						OTM	115.18 kip-ft	2.67		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.11	A	1	1.2	10	1	1	3.750	0.06	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	0.43	0.98	A	0.163	2.725	9	1	1	7.143	0.58	29.10	C
80.00-60.00			B	0.163	2.725		1	1	7.143			
			C	0.163	2.725		1	1	7.143			
T2	0.43	1.29	A	0.179	2.668	9	1	1	8.006	0.53	26.47	C
60.00-40.00			B	0.179	2.668		1	1	8.006			
			C	0.179	2.668		1	1	8.006			
T3	0.43	1.54	A	0.177	2.674	8	1	1	8.978	0.49	24.64	C
40.00-20.00			B	0.177	2.674		1	1	8.978			
			C	0.177	2.674		1	1	8.978			
T4 20.00-0.00	0.43	1.81	A	0.175	2.68	7	1	1	9.923	0.44	22.05	C
			B	0.175	2.68		1	1	9.923			
			C	0.175	2.68		1	1	9.923			
Sum Weight:	1.72	5.73						OTM	91.35 kip-ft	2.10		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.11	A	1	1.2	10	1	1	3.750	0.06	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	0.43	0.98	A	0.163	2.725	9	0.825	1	6.970	0.58	28.92	C
80.00-60.00			B	0.163	2.725		0.825	1	6.970			
			C	0.163	2.725		0.825	1	6.970			
T2	0.43	1.29	A	0.179	2.668	9	0.825	1	8.006	0.53	26.47	C
60.00-40.00			B	0.179	2.668		0.825	1	8.006			
			C	0.179	2.668		0.825	1	8.006			
T3	0.43	1.54	A	0.177	2.674	8	0.825	1	8.978	0.49	24.64	C
40.00-20.00			B	0.177	2.674		0.825	1	8.978			
			C	0.177	2.674		0.825	1	8.978			
T4 20.00-0.00	0.43	1.81	A	0.175	2.68	7	0.825	1	9.923	0.44	22.05	C
			B	0.175	2.68		0.825	1	9.923			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.175	2.68		0.825	1	9.923			
Sum Weight:	1.72	5.73						OTM	91.10 kip-ft	2.10		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.11	A	1	1.2	10	1	1	3.750	0.06	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	0.43	0.98	A	0.163	2.725	9	0.8	1	6.946	0.58	28.89	C
80.00-60.00			B	0.163	2.725		0.8	1	6.946			
			C	0.163	2.725		0.8	1	6.946			
T2	0.43	1.29	A	0.179	2.668	9	0.8	1	8.006	0.53	26.47	C
60.00-40.00			B	0.179	2.668		0.8	1	8.006			
			C	0.179	2.668		0.8	1	8.006			
T3	0.43	1.54	A	0.177	2.674	8	0.8	1	8.978	0.49	24.64	C
40.00-20.00			B	0.177	2.674		0.8	1	8.978			
			C	0.177	2.674		0.8	1	8.978			
T4 20.00-0.00	0.43	1.81	A	0.175	2.68	7	0.8	1	9.923	0.44	22.05	C
			B	0.175	2.68		0.8	1	9.923			
			C	0.175	2.68		0.8	1	9.923			
Sum Weight:	1.72	5.73						OTM	91.06 kip-ft	2.10		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.00	0.11	A	1	1.2	10	1	1	3.750	0.06	5.82	C
90.00-80.00			B	1	1.2		1	1	3.750			
			C	1	1.2		1	1	3.750			
T1	0.43	0.98	A	0.163	2.725	9	0.85	1	6.995	0.58	28.94	C
80.00-60.00			B	0.163	2.725		0.85	1	6.995			
			C	0.163	2.725		0.85	1	6.995			
T2	0.43	1.29	A	0.179	2.668	9	0.85	1	8.006	0.53	26.47	C
60.00-40.00			B	0.179	2.668		0.85	1	8.006			
			C	0.179	2.668		0.85	1	8.006			
T3	0.43	1.54	A	0.177	2.674	8	0.85	1	8.978	0.49	24.64	C
40.00-20.00			B	0.177	2.674		0.85	1	8.978			
			C	0.177	2.674		0.85	1	8.978			
T4 20.00-0.00	0.43	1.81	A	0.175	2.68	7	0.85	1	9.923	0.44	22.05	C
			B	0.175	2.68		0.85	1	9.923			
			C	0.175	2.68		0.85	1	9.923			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	1.72	5.73						OTM	91.13 kip-ft	2.10		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	2.92					
Bracing Weight	2.81					
Total Member Self-Weight	5.73			2.48	0.34	
Total Weight	10.66			2.48	0.34	
Wind 0 deg - No Ice		0.00	-8.46	-457.81	0.34	-0.43
Wind 30 deg - No Ice		4.23	-7.32	-395.64	-229.51	0.52
Wind 45 deg - No Ice		5.97	-5.97	-322.52	-324.66	0.95
Wind 60 deg - No Ice		7.32	-4.22	-227.28	-397.62	1.33
Wind 90 deg - No Ice		8.45	0.00	2.48	-459.37	1.78
Wind 120 deg - No Ice		7.33	4.23	232.63	-398.28	1.76
Wind 135 deg - No Ice		5.98	5.98	327.87	-325.05	1.57
Wind 150 deg - No Ice		4.23	7.32	400.60	-229.51	1.26
Wind 180 deg - No Ice		0.00	8.45	462.00	0.34	0.43
Wind 210 deg - No Ice		-4.23	7.32	400.60	230.20	-0.52
Wind 225 deg - No Ice		-5.97	5.97	327.48	325.34	-0.95
Wind 240 deg - No Ice		-7.33	4.23	232.63	398.97	-1.33
Wind 270 deg - No Ice		-8.45	0.00	2.48	460.06	-1.78
Wind 300 deg - No Ice		-7.32	-4.22	-227.28	398.30	-1.76
Wind 315 deg - No Ice		-5.98	-5.98	-322.91	325.74	-1.57
Wind 330 deg - No Ice		-4.23	-7.32	-395.64	230.20	-1.26
Member Ice	7.67					
Total Weight Ice	32.28			7.88	1.70	
Wind 0 deg - Ice		0.00	-4.04	-209.70	1.70	-0.28
Wind 30 deg - Ice		2.02	-3.50	-180.47	-107.05	0.13
Wind 45 deg - Ice		2.85	-2.85	-145.89	-152.08	0.32
Wind 60 deg - Ice		3.50	-2.02	-100.84	-186.62	0.50
Wind 90 deg - Ice		4.04	0.00	7.88	-215.79	0.74
Wind 120 deg - Ice		3.50	2.02	116.68	-186.74	0.78
Wind 135 deg - Ice		2.86	2.86	161.73	-152.15	0.72
Wind 150 deg - Ice		2.02	3.50	196.23	-107.05	0.61
Wind 180 deg - Ice		0.00	4.04	225.34	1.70	0.28
Wind 210 deg - Ice		-2.02	3.50	196.23	110.44	-0.13
Wind 225 deg - Ice		-2.85	2.85	161.66	155.47	-0.32
Wind 240 deg - Ice		-3.50	2.02	116.68	190.13	-0.50
Wind 270 deg - Ice		-4.04	0.00	7.88	219.19	-0.74
Wind 300 deg - Ice		-3.50	-2.02	-100.84	190.02	-0.78
Wind 315 deg - Ice		-2.86	-2.86	-145.96	155.54	-0.72
Wind 330 deg - Ice		-2.02	-3.50	-180.47	110.44	-0.61
Total Weight	10.66			2.48	0.34	
Wind 0 deg - Service		0.00	-3.25	-175.60	0.17	-0.17
Wind 30 deg - Service		1.62	-2.81	-151.68	-88.29	0.20
Wind 45 deg - Service		2.29	-2.29	-123.54	-124.90	0.37
Wind 60 deg - Service		2.81	-1.62	-86.89	-152.97	0.51
Wind 90 deg - Service		3.25	0.00	1.53	-176.74	0.68
Wind 120 deg - Service		2.81	1.62	90.09	-153.23	0.67

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 135 deg - Service		2.30	2.30	126.74	-125.05	0.60
Wind 150 deg - Service		1.62	2.81	154.73	-88.29	0.48
Wind 180 deg - Service		0.00	3.24	178.36	0.17	0.17
Wind 210 deg - Service		-1.62	2.81	154.73	88.62	-0.20
Wind 225 deg - Service		-2.29	2.29	126.59	125.23	-0.37
Wind 240 deg - Service		-2.81	1.62	90.09	153.56	-0.51
Wind 270 deg - Service		-3.25	0.00	1.53	177.07	-0.68
Wind 300 deg - Service		-2.81	-1.62	-86.89	153.31	-0.67
Wind 315 deg - Service		-2.30	-2.30	-123.69	125.38	-0.60
Wind 330 deg - Service		-1.62	-2.81	-151.68	88.62	-0.48

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	90 - 80	Pole	Max Tension	6	0.00	-0.00	0.00
			Max. Compression	34	-0.69	-0.10	0.69
			Max. Mx	10	-0.26	-3.81	0.24
			Max. My	2	-0.26	-0.04	4.03
			Max. Vy	10	0.57	-3.81	0.24
			Max. Vx	2	-0.57	-0.04	4.03
			Max. Torque	12			0.48
T1	80 - 60	Leg	Max Tension	19	33.02	0.00	0.22
			Max. Compression	24	-36.18	0.26	-0.13
			Max. Mx	26	-31.62	0.27	-0.04
			Max. My	2	-35.35	0.00	0.29
			Max. Vy	26	-2.91	0.27	-0.04
			Max. Vx	2	-3.12	0.00	0.29
		Diagonal	Max Tension	27	3.24	0.00	0.00
			Max. Compression	26	-3.40	0.00	0.00
			Max. Mx	45	0.56	-0.00	0.00
			Max. My	10	-3.39	0.00	0.00
			Max. Vy	45	0.01	-0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Horizontal	Max Tension	18	0.99	0.00	0.00
			Max. Compression	16	-0.78	0.00	0.00
			Max. Mx	34	0.37	0.01	0.00
			Max. My	26	-0.75	0.00	0.00
			Max. Vy	34	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	41	0.06	0.00	0.00
			Max. Compression	4	-11.04	0.00	0.00
			Max. Mx	34	-0.00	-0.03	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	26	-10.20	0.00	-0.00
			Max. Vy	34	0.04	0.00	0.00
			Max. Vx	26	0.00	0.00	0.00
		Bottom Girt	Max Tension	18	1.19	0.00	0.00
			Max. Compression	25	-1.10	0.00	0.00
			Max. Mx	34	0.18	0.01	0.00
			Max. My	26	0.11	0.00	0.00
			Max. Vy	34	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Pole Socket	Max Tension	1	0.00	0.00	0.00
			Max. Compression	35	-0.82	0.00	0.00
			Max. Mx	10	-0.29	-2.82	0.22
			Max. My	2	-0.29	-0.04	2.99
			Max. Vy	10	-0.28	-2.82	0.22
			Max. Vx	2	0.30	-0.04	2.99
		Pole Socket Support	Max Tension	12	1.79	0.18	0.06
			Max. Compression	15	-0.90	0.00	0.00
			Max. Mx	42	0.40	0.52	0.26
			Max. My	14	-0.23	0.26	-2.66
			Max. Vy	42	0.25	0.52	0.26
			Max. Vx	14	-1.32	0.26	-2.66
T2	60 - 40	Leg	Max Tension	19	77.59	0.38	0.01
			Max. Compression	24	-82.34	0.20	0.01
			Max. Mx	24	-36.22	0.72	0.06
			Max. My	4	-2.04	-0.00	-0.48
			Max. Vy	2	-3.64	0.20	0.00
			Max. Vx	30	-2.09	0.05	0.12
		Diagonal	Max Tension	29	3.75	0.00	0.00
			Max. Compression	12	-3.91	0.00	0.00
			Max. Mx	46	0.45	-0.01	-0.00
			Max. My	26	-3.41	0.00	-0.00
			Max. Vy	46	0.01	-0.01	-0.00
			Max. Vx	26	0.00	0.00	-0.00
		Horizontal	Max Tension	18	1.59	0.00	0.00
			Max. Compression	25	-1.38	0.00	0.00
			Max. Mx	34	0.33	0.01	0.00
			Max. My	26	0.10	0.00	0.00
			Max. Vy	34	-0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	2	0.26	0.00	0.00
			Max. Compression	9	-0.16	0.00	0.00
			Max. Mx	34	0.14	0.01	0.00
			Max. My	26	-0.00	0.00	0.00
			Max. Vy	34	-0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	18	1.47	0.00	0.00
			Max. Compression	25	-1.36	0.00	0.00
			Max. Mx	34	0.18	0.01	0.00
			Max. My	26	0.10	0.00	0.00
			Max. Vy	34	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T3	40 - 20	Leg	Max Tension	19	123.21	0.41	0.01
			Max. Compression	24	-129.54	0.26	0.01
			Max. Mx	2	-81.24	0.80	0.01
			Max. My	30	-24.20	0.20	0.47
			Max. Vy	2	-4.21	0.26	0.00
			Max. Vx	30	-2.22	0.07	0.14
		Diagonal	Max Tension	29	4.06	0.00	0.00
			Max. Compression	12	-4.22	0.00	0.00
			Max. Mx	46	0.70	-0.01	0.00
			Max. My	26	-4.02	0.00	-0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	46	0.01	-0.01	0.00
			Max. Vx	26	0.00	0.00	-0.00
		Horizontal	Max Tension	18	1.73	0.00	0.00
			Max. Compression	25	-1.53	0.00	0.00
			Max. Mx	34	0.24	0.02	0.00
			Max. My	26	0.07	0.00	0.00
			Max. Vy	34	0.01	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	18	0.34	0.00	0.00
			Max. Compression	25	-0.24	0.00	0.00
			Max. Mx	34	0.17	0.02	0.00
			Max. My	26	-0.01	0.00	0.00
			Max. Vy	34	0.02	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	18	1.57	0.00	0.00
			Max. Compression	25	-1.46	0.00	0.00
			Max. Mx	34	0.14	0.02	0.00
			Max. My	26	0.08	0.00	0.00
			Max. Vy	34	0.02	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T4	20 - 0	Leg	Max Tension	19	165.01	-0.18	-0.00
			Max. Compression	24	-172.82	-0.00	-0.00
			Max. Mx	2	-128.44	0.96	0.02
			Max. My	32	-3.84	-0.00	0.51
			Max. Vy	2	-4.20	0.96	0.02
			Max. Vx	30	-2.22	0.24	0.51
		Diagonal	Max Tension	29	4.20	0.00	0.00
			Max. Compression	12	-4.40	0.00	0.00
			Max. Mx	46	0.27	-0.01	-0.00
			Max. My	26	-4.29	0.00	-0.00
			Max. Vy	43	-0.01	-0.01	-0.00
			Max. Vx	26	0.00	0.00	-0.00
		Horizontal	Max Tension	18	1.87	0.00	0.00
			Max. Compression	25	-1.64	0.00	0.00
			Max. Mx	34	-0.94	0.02	0.00
			Max. My	30	-0.37	0.00	-0.00
			Max. Vy	34	-0.01	0.00	0.00
			Max. Vx	30	0.00	0.00	0.00
		Top Girt	Max Tension	18	0.46	0.00	0.00
			Max. Compression	25	-0.36	0.00	0.00
			Max. Mx	34	0.11	0.02	0.00
			Max. My	26	-0.03	0.00	0.00
			Max. Vy	34	-0.02	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	34	7.40	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	34	7.40	0.02	0.00
			Max. Vy	34	0.02	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	176.43	7.50	-4.05
	Max. H_x	24	176.43	7.50	-4.05
	Max. H_z	37	-37.02	-15.21	8.80

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	9	-167.51	-7.45	4.01
	Min. H_x	38	-38.77	-15.32	8.79
	Min. H_z	22	170.34	7.16	-4.06
Leg B	Max. Vert	12	176.27	-7.53	-3.98
	Max. H_x	48	-39.50	15.34	8.77
	Max. H_z	48	-39.50	15.34	8.77
	Min. Vert	29	-167.64	7.49	3.94
	Min. H_x	12	176.27	-7.53	-3.98
	Min. H_z	12	176.27	-7.53	-3.98
Leg A	Max. Vert	2	175.30	-0.08	8.50
	Max. H_x	25	-82.99	0.28	-4.14
	Max. H_z	2	175.30	-0.08	8.50
	Min. Vert	19	-168.36	0.08	-8.46
	Min. H_x	11	2.67	-0.23	0.13
	Min. H_z	43	-42.13	0.03	-17.69

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	10.66	0.00	0.00	2.49	0.34	-0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	12.79	-0.00	-13.53	-740.63	0.42	-0.70
0.9 Dead+1.6 Wind 0 deg - No Ice	9.59	-0.00	-13.53	-739.57	0.32	-0.69
1.2 Dead+1.6 Wind 30 deg - No Ice	12.79	6.76	-11.71	-640.19	-370.96	0.85
0.9 Dead+1.6 Wind 30 deg - No Ice	9.59	6.76	-11.71	-639.38	-370.15	0.84
1.2 Dead+1.6 Wind 45 deg - No Ice	12.79	9.56	-9.56	-522.05	-524.67	1.56
0.9 Dead+1.6 Wind 45 deg - No Ice	9.59	9.56	-9.56	-521.52	-523.49	1.55
1.2 Dead+1.6 Wind 60 deg - No Ice	12.79	11.71	-6.76	-368.17	-642.55	2.16
0.9 Dead+1.6 Wind 60 deg - No Ice	9.59	11.71	-6.76	-368.03	-641.08	2.15
1.2 Dead+1.6 Wind 90 deg - No Ice	12.79	13.52	0.00	3.04	-742.31	2.90
0.9 Dead+1.6 Wind 90 deg - No Ice	9.59	13.52	0.00	2.28	-740.60	2.88
1.2 Dead+1.6 Wind 120 deg - No Ice	12.79	11.72	6.77	374.86	-643.59	2.86
0.9 Dead+1.6 Wind 120 deg - No Ice	9.59	11.72	6.77	373.19	-642.12	2.85
1.2 Dead+1.6 Wind 135 deg - No Ice	12.79	9.56	9.56	528.10	-524.64	2.54
0.9 Dead+1.6 Wind 135 deg - No Ice	9.59	9.56	9.56	526.06	-523.46	2.53
1.2 Dead+1.6 Wind 150 deg - No Ice	12.79	6.76	11.71	646.24	-370.93	2.05
0.9 Dead+1.6 Wind 150 deg - No Ice	9.59	6.76	11.71	643.90	-370.13	2.05
1.2 Dead+1.6 Wind 180 deg - No Ice	12.79	-0.00	13.52	745.42	0.42	0.70
0.9 Dead+1.6 Wind 180 deg -	9.59	-0.00	13.52	742.85	0.32	0.70

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice						
1.2 Dead+1.6 Wind 210 deg - No Ice	12.79	-6.76	11.71	646.23	371.77	-0.85
0.9 Dead+1.6 Wind 210 deg - No Ice	9.59	-6.76	11.71	643.90	370.75	-0.84
1.2 Dead+1.6 Wind 225 deg - No Ice	12.79	-9.56	9.56	528.10	525.48	-1.56
0.9 Dead+1.6 Wind 225 deg - No Ice	9.59	-9.56	9.56	526.05	524.09	-1.55
1.2 Dead+1.6 Wind 240 deg - No Ice	12.79	-11.72	6.77	374.85	644.43	-2.16
0.9 Dead+1.6 Wind 240 deg - No Ice	9.59	-11.72	6.77	373.19	642.75	-2.15
1.2 Dead+1.6 Wind 270 deg - No Ice	12.79	-13.52	0.00	3.04	743.14	-2.90
0.9 Dead+1.6 Wind 270 deg - No Ice	9.59	-13.52	0.00	2.28	741.22	-2.88
1.2 Dead+1.6 Wind 300 deg - No Ice	12.79	-11.71	-6.76	-368.17	643.38	-2.86
0.9 Dead+1.6 Wind 300 deg - No Ice	9.59	-11.71	-6.76	-368.02	641.70	-2.85
1.2 Dead+1.6 Wind 315 deg - No Ice	12.79	-9.56	-9.56	-522.04	525.51	-2.54
0.9 Dead+1.6 Wind 315 deg - No Ice	9.59	-9.56	-9.56	-521.52	524.12	-2.53
1.2 Dead+1.6 Wind 330 deg - No Ice	12.79	-6.76	-11.71	-640.19	371.80	-2.05
0.9 Dead+1.6 Wind 330 deg - No Ice	9.59	-6.76	-11.71	-639.38	370.78	-2.05
1.2 Dead+1.0 Ice+1.0 Temp	34.29	0.00	-0.00	8.64	1.81	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	34.29	0.00	-4.04	-214.74	1.82	-0.29
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	34.29	2.02	-3.50	-184.72	-109.84	0.14
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	34.29	2.85	-2.85	-149.22	-156.08	0.34
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	34.29	3.50	-2.02	-102.96	-191.55	0.53
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	34.29	4.04	0.00	8.67	-221.50	0.77
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	34.29	3.50	2.02	120.38	-191.67	0.81
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	34.29	2.85	2.85	166.56	-156.08	0.75
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	34.29	2.02	3.50	202.06	-109.84	0.64
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	34.29	0.00	4.04	231.95	1.81	0.29
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	34.29	-2.02	3.50	202.06	113.47	-0.14
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	34.29	-2.85	2.85	166.56	159.71	-0.34
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	34.29	-3.50	2.02	120.38	195.30	-0.53
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	34.29	-4.04	0.00	8.67	225.13	-0.77
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	34.29	-3.50	-2.02	-102.96	195.18	-0.81
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	34.29	-2.85	-2.85	-149.22	159.71	-0.75
1.2 Dead+1.0 Wind 330	34.29	-2.02	-3.50	-184.72	113.48	-0.64

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	10.66	0.00	-3.25	-176.07	0.35	-0.17
Dead+Wind 30 deg - Service	10.66	1.62	-2.81	-151.95	-88.83	0.20
Dead+Wind 45 deg - Service	10.66	2.29	-2.29	-123.58	-125.75	0.37
Dead+Wind 60 deg - Service	10.66	2.81	-1.62	-86.63	-154.05	0.52
Dead+Wind 90 deg - Service	10.66	3.25	0.00	2.51	-178.01	0.69
Dead+Wind 120 deg - Service	10.66	2.81	1.62	91.80	-154.31	0.68
Dead+Wind 135 deg - Service	10.66	2.29	2.29	128.60	-125.75	0.61
Dead+Wind 150 deg - Service	10.66	1.62	2.81	156.97	-88.83	0.49
Dead+Wind 180 deg - Service	10.66	-0.00	3.24	180.79	0.35	0.17
Dead+Wind 210 deg - Service	10.66	-1.62	2.81	156.97	89.53	-0.20
Dead+Wind 225 deg - Service	10.66	-2.29	2.29	128.60	126.44	-0.37
Dead+Wind 240 deg - Service	10.66	-2.81	1.62	91.80	155.00	-0.52
Dead+Wind 270 deg - Service	10.66	-3.25	0.00	2.51	178.71	-0.69
Dead+Wind 300 deg - Service	10.66	-2.81	-1.62	-86.63	154.75	-0.68
Dead+Wind 315 deg - Service	10.66	-2.29	-2.29	-123.58	126.44	-0.61
Dead+Wind 330 deg - Service	10.66	-1.62	-2.81	-151.95	89.53	-0.49

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-10.66	0.00	0.00	10.66	0.00	0.000%
2	0.00	-12.79	-13.53	0.00	12.79	13.53	0.000%
3	0.00	-9.59	-13.53	0.00	9.59	13.53	0.000%
4	6.76	-12.79	-11.71	-6.76	12.79	11.71	0.000%
5	6.76	-9.59	-11.71	-6.76	9.59	11.71	0.000%
6	9.56	-12.79	-9.56	-9.56	12.79	9.56	0.000%
7	9.56	-9.59	-9.56	-9.56	9.59	9.56	0.000%
8	11.71	-12.79	-6.76	-11.71	12.79	6.76	0.000%
9	11.71	-9.59	-6.76	-11.71	9.59	6.76	0.000%
10	13.52	-12.79	0.00	-13.52	12.79	-0.00	0.000%
11	13.52	-9.59	0.00	-13.52	9.59	-0.00	0.000%
12	11.72	-12.79	6.77	-11.72	12.79	-6.77	0.000%
13	11.72	-9.59	6.77	-11.72	9.59	-6.77	0.000%
14	9.56	-12.79	9.56	-9.56	12.79	-9.56	0.000%
15	9.56	-9.59	9.56	-9.56	9.59	-9.56	0.000%
16	6.76	-12.79	11.71	-6.76	12.79	-11.71	0.000%
17	6.76	-9.59	11.71	-6.76	9.59	-11.71	0.000%
18	0.00	-12.79	13.52	0.00	12.79	-13.52	0.000%
19	0.00	-9.59	13.52	0.00	9.59	-13.52	0.000%
20	-6.76	-12.79	11.71	6.76	12.79	-11.71	0.000%
21	-6.76	-9.59	11.71	6.76	9.59	-11.71	0.000%
22	-9.56	-12.79	9.56	9.56	12.79	-9.56	0.000%
23	-9.56	-9.59	9.56	9.56	9.59	-9.56	0.000%
24	-11.72	-12.79	6.77	11.72	12.79	-6.77	0.000%
25	-11.72	-9.59	6.77	11.72	9.59	-6.77	0.000%
26	-13.52	-12.79	0.00	13.52	12.79	-0.00	0.000%
27	-13.52	-9.59	0.00	13.52	9.59	-0.00	0.000%
28	-11.71	-12.79	-6.76	11.71	12.79	6.76	0.000%
29	-11.71	-9.59	-6.76	11.71	9.59	6.76	0.000%
30	-9.56	-12.79	-9.56	9.56	12.79	9.56	0.000%
31	-9.56	-9.59	-9.56	9.56	9.59	9.56	0.000%
32	-6.76	-12.79	-11.71	6.76	12.79	11.71	0.000%
33	-6.76	-9.59	-11.71	6.76	9.59	11.71	0.000%
34	0.00	-34.29	0.00	-0.00	34.29	0.00	0.000%
35	0.00	-34.29	-4.04	-0.00	34.29	4.04	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
36	2.02	-34.29	-3.50	-2.02	34.29	3.50	0.000%
37	2.85	-34.29	-2.85	-2.85	34.29	2.85	0.001%
38	3.50	-34.29	-2.02	-3.50	34.29	2.02	0.000%
39	4.04	-34.29	0.00	-4.04	34.29	-0.00	0.000%
40	3.50	-34.29	2.02	-3.50	34.29	-2.02	0.000%
41	2.85	-34.29	2.85	-2.85	34.29	-2.85	0.000%
42	2.02	-34.29	3.50	-2.02	34.29	-3.50	0.000%
43	0.00	-34.29	4.04	-0.00	34.29	-4.04	0.000%
44	-2.02	-34.29	3.50	2.02	34.29	-3.50	0.000%
45	-2.85	-34.29	2.85	2.85	34.29	-2.85	0.000%
46	-3.50	-34.29	2.02	3.50	34.29	-2.02	0.000%
47	-4.04	-34.29	0.00	4.04	34.29	-0.00	0.000%
48	-3.50	-34.29	-2.02	3.50	34.29	2.02	0.000%
49	-2.85	-34.29	-2.85	2.85	34.29	2.85	0.000%
50	-2.02	-34.29	-3.50	2.02	34.29	3.50	0.000%
51	0.00	-10.66	-3.25	0.00	10.66	3.25	0.000%
52	1.62	-10.66	-2.81	-1.62	10.66	2.81	0.000%
53	2.29	-10.66	-2.29	-2.29	10.66	2.29	0.000%
54	2.81	-10.66	-1.62	-2.81	10.66	1.62	0.000%
55	3.25	-10.66	0.00	-3.25	10.66	-0.00	0.000%
56	2.81	-10.66	1.62	-2.81	10.66	-1.62	0.000%
57	2.29	-10.66	2.29	-2.29	10.66	-2.29	0.000%
58	1.62	-10.66	2.81	-1.62	10.66	-2.81	0.001%
59	0.00	-10.66	3.24	0.00	10.66	-3.24	0.000%
60	-1.62	-10.66	2.81	1.62	10.66	-2.81	0.000%
61	-2.29	-10.66	2.29	2.29	10.66	-2.29	0.000%
62	-2.81	-10.66	1.62	2.81	10.66	-1.62	0.000%
63	-3.25	-10.66	0.00	3.25	10.66	-0.00	0.000%
64	-2.81	-10.66	-1.62	2.81	10.66	1.62	0.000%
65	-2.29	-10.66	-2.29	2.29	10.66	2.29	0.000%
66	-1.62	-10.66	-2.81	1.62	10.66	2.81	0.001%

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	0.00010959
3	Yes	5	0.00000001	0.00010652
4	Yes	5	0.00000001	0.00015730
5	Yes	5	0.00000001	0.00015412
6	Yes	5	0.00000001	0.00016919
7	Yes	5	0.00000001	0.00016641
8	Yes	5	0.00000001	0.00015510
9	Yes	5	0.00000001	0.00015311
10	Yes	5	0.00000001	0.00011181
11	Yes	5	0.00000001	0.00011231
12	Yes	5	0.00000001	0.00014498
13	Yes	5	0.00000001	0.00014751
14	Yes	5	0.00000001	0.00014757
15	Yes	5	0.00000001	0.00015074
16	Yes	5	0.00000001	0.00012888
17	Yes	5	0.00000001	0.00013243
18	Yes	5	0.00000001	0.00007770
19	Yes	5	0.00000001	0.00008212
20	Yes	5	0.00000001	0.00012363

21	Yes	5	0.00000001	0.00012812
22	Yes	5	0.00000001	0.00013986
23	Yes	5	0.00000001	0.00014413
24	Yes	5	0.00000001	0.00013627
25	Yes	5	0.00000001	0.00013999
26	Yes	5	0.00000001	0.00010650
27	Yes	5	0.00000001	0.00010830
28	Yes	5	0.00000001	0.00015244
29	Yes	5	0.00000001	0.00015188
30	Yes	5	0.00000001	0.00016823
31	Yes	5	0.00000001	0.00016678
32	Yes	5	0.00000001	0.00015854
33	Yes	5	0.00000001	0.00015644
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00009108
36	Yes	4	0.00000001	0.00010828
37	Yes	4	0.00000001	0.00011084
38	Yes	4	0.00000001	0.00010027
39	Yes	4	0.00000001	0.00006571
40	Yes	4	0.00000001	0.00007129
41	Yes	4	0.00000001	0.00007316
42	Yes	4	0.00000001	0.00006677
43	Yes	4	0.00000001	0.00005036
44	Yes	4	0.00000001	0.00006403
45	Yes	4	0.00000001	0.00006868
46	Yes	4	0.00000001	0.00006611
47	Yes	4	0.00000001	0.00005986
48	Yes	4	0.00000001	0.00009129
49	Yes	4	0.00000001	0.00010313
50	Yes	4	0.00000001	0.00010354
51	Yes	4	0.00000001	0.00001922
52	Yes	4	0.00000001	0.00003137
53	Yes	4	0.00000001	0.00003445
54	Yes	4	0.00000001	0.00003156
55	Yes	4	0.00000001	0.00001966
56	Yes	4	0.00000001	0.00002623
57	Yes	4	0.00000001	0.00002739
58	Yes	4	0.00000001	0.00002378
59	Yes	4	0.00000001	0.00001155
60	Yes	4	0.00000001	0.00002204
61	Yes	4	0.00000001	0.00002537
62	Yes	4	0.00000001	0.00002417
63	Yes	4	0.00000001	0.00001820
64	Yes	4	0.00000001	0.00003048
65	Yes	4	0.00000001	0.00003352
66	Yes	4	0.00000001	0.00003070

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	90 - 80	4.466	51	0.6492	0.0186
T1	80 - 60	3.352	59	0.3248	0.0374
T2	60 - 40	2.017	59	0.2858	0.0374
T3	40 - 20	0.946	59	0.2057	0.0237
T4	20 - 0	0.257	59	0.1052	0.0110

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.00	20' 8 Bay Di-Pole	51	4.466	0.6492	0.0200	3696
85.00	10' x 1" Dia Omni	60	3.855	0.4571	0.0289	3696
83.00	7' Whip	59	3.644	0.3903	0.0328	2672
78.00	QS66512-2	59	3.176	0.3005	0.0397	2159
73.00	2-ft dish	59	2.792	0.2707	0.0423	3108
65.00	PiROD 6' Heavy Bogner Mount	59	2.296	0.2771	0.0405	14114
55.00	3' Side Mount Standoff	59	1.738	0.2804	0.0340	26701

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	90 - 80	18.121	2	2.3582	0.0760
T1	80 - 60	13.735	18	1.3280	0.1573
T2	60 - 40	8.284	18	1.1681	0.1571
T3	40 - 20	3.895	18	0.8445	0.0995
T4	20 - 0	1.059	18	0.4331	0.0460

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.00	20' 8 Bay Di-Pole	2	18.121	2.3582	0.0915	1254
85.00	10' x 1" Dia Omni	24	15.806	1.7663	0.1217	1254
83.00	7' Whip	20	14.936	1.5600	0.1377	906
78.00	QS66512-2	18	13.011	1.2255	0.1666	728
73.00	2-ft dish	18	11.443	1.1006	0.1778	1024
65.00	PiROD 6' Heavy Bogner Mount	18	9.419	1.1290	0.1702	3750
55.00	3' Side Mount Standoff	20	7.141	1.1476	0.1429	7821

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	90 - 80 (1)	P4x.237	10.00	10.00	79.5	3.1741	-0.26	72.35	0.004
T1	80 - 60 (314)	P4x.237	10.00	10.00	79.5	3.1741	-0.35	72.35	0.005

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	90 - 80 (1)	P4x.237	4.03	11.32	0.356	0.00	11.32	0.000
T1	80 - 60 (314)	P4x.237	2.99	11.32	0.264	0.00	11.32	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	90 - 80 (1)	P4x.237	0.57	49.99	0.011	0.14	16.88	0.008
T1	80 - 60 (314)	P4x.237	0.30	49.99	0.006	0.01	16.88	0.001

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	90 - 80 (1)	0.004	0.356	0.000	0.011	0.008	0.360 ✔	1.000	4.8.2 ✔
T1	80 - 60 (314)	0.005	0.264	0.000	0.006	0.001	0.269 ✔	1.000	4.8.2 ✔

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	1 1/2	20.00	2.48	79.3 K=1.00	1.7672	-32.72	50.19	0.652 [1]
T2	60 - 40	2	20.00	2.46	59.0 K=1.00	3.1416	-78.63	109.60	0.717 [1]
T3	40 - 20	2 1/4	20.00	2.46	52.4 K=1.00	3.9761	-125.79	146.32	0.860 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	20 - 0	2 1/2	20.00	2.48	47.6 K=1.00	4.9087	-172.82	187.16	0.923 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	80 - 60	1 1/2	0.00	2.11	0.000	0.00	2.11	0.000
T2	60 - 40	2	0.00	5.00	0.000	0.00	5.00	0.000
T3	40 - 20	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T4	20 - 0	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	80 - 60	1 1/2	0.652	0.000	0.000	0.652 [1] ✔	1.000	4.8.1 ✔
T2	60 - 40	2	0.717	0.000	0.000	0.717 [1] ✔	1.000	4.8.1 ✔
T3	40 - 20	2 1/4	0.860	0.000	0.000	0.860 [1] ✔	1.000	4.8.1 ✔
T4	20 - 0	2 1/2	0.923	0.000	0.000	0.923 [1] ✔	1.000	4.8.1 ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	4.29	2.07	119.1 K=0.90	0.4418	-3.40	7.03	0.484 [1] ✔
T2	60 - 40	7/8	4.67	2.25	111.2 K=0.90	0.6013	-3.91	10.95	0.357 [1] ✔
T3	40 - 20	7/8	5.10	2.46	121.4 K=0.90	0.6013	-4.22	9.22	0.458 [1] ✔
T4	20 - 0	7/8	5.55	2.68	132.2 K=0.90	0.6013	-4.40	7.77	0.566 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.38	151.2 K=0.70	0.4418	-0.78	4.37	0.179 [1] ✔
T2	60 - 40	7/8	3.93	3.77	144.7 K=0.70	0.6013	-1.38	6.49	0.212 [1] ✔
T3	40 - 20	7/8	4.43	4.25	163.1 K=0.70	0.6013	-1.53	5.11	0.299 [1] ✔
T4	20 - 0	7/8	4.94	4.73	181.6 K=0.70	0.6013	-1.64	4.12	0.399 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	L3 1/2x3 1/2x5/16	3.50	3.38	89.3 K=1.52	2.0900	-11.04	44.48	0.248 [1] ✔
T2	60 - 40	7/8	3.50	3.34	128.2 K=0.70	0.6013	-0.16	8.27	0.019 [1] ✔
T3	40 - 20	1	4.00	3.82	128.2 K=0.70	0.7854	-0.24	10.79	0.022 [1] ✔
T4	20 - 0	1	4.50	4.30	144.3 K=0.70	0.7854	-0.36	8.52	0.042 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.38	151.2 K=0.70	0.4418	-1.10	4.37	0.251 [1] ✔
T2	60 - 40	7/8	4.00	3.83	147.0 K=0.70	0.6013	-1.36	6.28	0.217 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	40 - 20	1	4.50	4.31	144.8 K=0.70	0.7854	-1.46	8.47	0.172 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	1 1/2	20.00	0.17	5.3	1.7672	33.02	79.52	0.415 [1]
T2	60 - 40	2	20.00	0.17	4.0	3.1416	77.59	141.37	0.549 [1]
T3	40 - 20	2 1/4	20.00	0.17	3.6	3.9761	123.21	178.92	0.689 [1]
T4	20 - 0	2 1/2	20.00	2.48	47.6	4.9087	165.01	220.89	0.747 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	80 - 60	1 1/2	0.00	2.11	0.000	0.00	2.11	0.000
T2	60 - 40	2	0.00	5.00	0.000	0.00	5.00	0.000
T3	40 - 20	2 1/4	0.00	7.12	0.000	0.00	7.12	0.000
T4	20 - 0	2 1/2	0.00	9.77	0.000	0.00	9.77	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	80 - 60	1 1/2	0.415	0.000	0.000	0.415 [1]	1.000	4.8.1
T2	60 - 40	2	0.549	0.000	0.000	0.549 [1]	1.000	4.8.1
T3	40 - 20	2 1/4	0.689	0.000	0.000	0.689 [1]	1.000	4.8.1
T4	20 - 0	2 1/2	0.747	0.000	0.000	0.747 [1]	1.000	4.8.1

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	4.29	2.07	132.3	0.4418	3.24	19.88	0.163 [1] ✔
T2	60 - 40	7/8	4.67	2.25	123.6	0.6013	3.75	27.06	0.138 [1] ✔
T3	40 - 20	7/8	5.10	2.46	134.9	0.6013	4.06	27.06	0.150 [1] ✔
T4	20 - 0	7/8	5.55	2.68	146.9	0.6013	4.20	27.06	0.155 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.38	216.0	0.4418	0.99	19.88	0.050 [1] ✔
T2	60 - 40	7/8	3.93	3.77	206.7	0.6013	1.59	27.06	0.059 [1] ✔
T3	40 - 20	7/8	4.43	4.25	233.0	0.6013	1.73	27.06	0.064 [1] ✔
T4	20 - 0	7/8	4.94	4.73	259.5	0.6013	1.87	27.06	0.069 [1] ✔

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	L3 1/2x3 1/2x5/16	3.50	3.38	37.5	2.0900	0.06	67.72	0.001 [1] ✔
T2	60 - 40	7/8	3.50	3.34	183.1	0.6013	0.26	27.06	0.010 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	40 - 20	1	4.00	3.82	183.2	0.7854	0.34	35.34	0.010 [1]
T4	20 - 0	1	4.50	4.30	206.2	0.7854	0.46	35.34	0.013 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	80 - 60	3/4	3.50	3.38	216.0	0.4418	1.19	19.88	0.060 [1]
T2	60 - 40	7/8	4.00	3.83	210.1	0.6013	1.47	27.06	0.054 [1]
T3	40 - 20	1	4.50	4.31	206.8	0.7854	1.57	35.34	0.044 [1]
T4	20 - 0	1	5.00	4.79	230.0	0.7854	7.40	35.34	0.209 [*1]

[*] DL controls
[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	90 - 80	Pole	P4x.237	1	-0.26	72.35	36.0	Pass
T1	80 - 60	Leg	1 1/2	2	-32.72	50.19	65.2	Pass
T2	60 - 40	Leg	2	80	-78.63	109.60	71.7	Pass
T3	40 - 20	Leg	2 1/4	158	-125.79	146.32	86.0	Pass
T4	20 - 0	Leg	2 1/2	236	-172.82	187.16	92.3	Pass
T1	80 - 60	Diagonal	3/4	11	-3.40	7.03	48.4	Pass
T2	60 - 40	Diagonal	7/8	90	-3.91	10.95	35.7	Pass
T3	40 - 20	Diagonal	7/8	168	-4.22	9.22	45.8	Pass
T4	20 - 0	Diagonal	7/8	246	-4.40	7.77	56.6	Pass
T1	80 - 60	Horizontal	3/4	45	-0.78	4.37	17.9	Pass
T2	60 - 40	Horizontal	7/8	96	-1.38	6.49	21.2	Pass
T3	40 - 20	Horizontal	7/8	174	-1.53	5.11	29.9	Pass
T4	20 - 0	Horizontal	7/8	252	-1.64	4.12	39.9	Pass
T1	80 - 60	Top Girt	L3 1/2x3 1/2x5/16	7	-11.04	44.48	24.8	Pass
T2	60 - 40	Top Girt	7/8	84	-0.16	8.27	1.9	Pass
T3	40 - 20	Top Girt	1	162	-0.24	10.79	2.2	Pass
T4	20 - 0	Top Girt	1	240	-0.36	8.52	4.2	Pass
T1	80 - 60	Bottom Girt	3/4	9	-1.10	4.37	25.1	Pass
T2	60 - 40	Bottom Girt	7/8	87	-1.36	6.28	21.7	Pass
T3	40 - 20	Bottom Girt	1	165	-1.46	8.47	17.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T4	20 - 0	Bottom Girt	1	243	7.40	35.34	20.9	Pass
T1	80 - 60	Pole Socket	P4x.237	314	-0.35	72.35	26.9	Pass
							Summary	
						Pole (L1)	36.0	Pass
						Leg (T4)	92.3	Pass
						Diagonal (T4)	56.6	Pass
						Horizontal (T4)	39.9	Pass
						Top Girt (T1)	24.8	Pass
						Bottom Girt (T1)	25.1	Pass
						Pole Socket (T1)	26.9	Pass
						RATING =	**92.3**	**Pass**

Element Map

Section No.	Section Elevation ft	Component Type	Element List
L1	90.00-80.00	Pole	1
T1	80.00-60.00	Leg	2-4
		Diagonal	11-16,20-25,29-34,38-43,47-52,56-61,65-70,74-79
		Horizontal	17-19,26-28,35-37,44-46,53-55,62-64,71-73
		Top Girt	5-7
		Bottom Girt	8-10
		Pole Socket	314
		Pole Socket	315-317
		Support	
T2	60.00-40.00	Leg	80-82
		Diagonal	89-94,98-103,107-112,116-121,125-130,134-139,143-148,152-157
		Horizontal	95-97,104-106,113-115,122-124,131-133,140-142,149-151
		Top Girt	83-85
		Bottom Girt	86-88
T3	40.00-20.00	Leg	158-160
		Diagonal	167-172,176-181,185-190,194-199,203-208,212-217,221-226,230-235
		Horizontal	173-175,182-184,191-193,200-202,209-211,218-220,227-229
		Top Girt	161-163
		Bottom Girt	164-166
T4	20.00-0.00	Leg	236-238
		Diagonal	245-250,254-259,263-268,272-277,281-286,290-295,299-304,308-313
		Horizontal	251-253,260-262,269-271,278-280,287-289,296-298,305-307
		Top Girt	239-241
		Bottom Girt	242-244
			Total number of elements: 317

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Subject:	Anchor Bolt and Baseplate Analysis
Location:	80-ft Pirod Lattice Tower Wallingford, CT
Rev. 0: 1/5/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16071.92

Anchor Bolt Analysis:

Input Data:

Tower Reactions:

Tension Force =	Tension := 168·kips	(Input From tnxTower)
Compression Force =	Compression := 176·kips	(Input From tnxTower)
Shear Force =	Shear := 9·kips	(Input From tnxTower)

Anchor Bolt Data:

ASTM A36

Number of Anchor Bolts =	N := 2	(User Input)
Bolt Ultimate Strength =	F_u := 80·ksi	(User Input)
Bolt Yield Strength =	F_y := 36·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Anchor Bolts =	D := 1.75·in	(User Input)
Threads per Inch =	n := 5	(User Input)
	η := 0.55	For grouted Base Plate per TIA-222-G Section 4.9.9

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 2.405 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n} \right)^2 = 1.899 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 1.555 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.389 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.369 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := \frac{Tension}{N} = 84 \cdot kips$

Maximum Compressive Force = $C_{Max} := \frac{Compression}{N} = 88 \cdot kips$

Maximum Shear Force = $V_{Max} := \frac{Shear}{N} = 4.5 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := 0.8 \cdot F_u \cdot A_n = 121.565 \cdot k$

Bolt % of Capacity = $\frac{\left(C_{Max} + \frac{V_{Max}}{\eta} \right)}{\Phi R_{nt}} \cdot 100 = 79.1$

Condition1 = $Condition1 := if\left[\frac{\left(C_{Max} + \frac{V_{Max}}{\eta} \right)}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed" \right]$

Condition1 = "OK"

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Subject:	FOUNDATION ANALYSIS
Location:	Wallingford, CT
Rev. 0: 1/5/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16071.92

Pier and Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 746 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 14 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 13 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 176 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 168 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 80 \cdot ft$	(User Input)	
Tower Width =	$W_t := 5 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 4.5 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 0 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 8.25 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 14 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Soil Bearing Capacity =	$q_s := 10000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 100 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 2.25 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	
Coefficient of Lateral Soil Pressure =	$K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$		

Pier Reinforcement:

Bar Size =	$BS_{pier} := 0$	(User Input)	
Bar Diameter =	$d_{bpier} := 0 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 0$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 3 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 8$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.00 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 15$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 8$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.00 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 15$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area = $A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0 \cdot in^2$

Pad Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.785 \cdot in^2$

Pad Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.785 \cdot in^2$

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Load Factor = $LF := 1$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 100 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0.675 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = -1.125 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0.675 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 1.35 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.012 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 2.25$

$A_p := W_f \cdot T_p = 31.5$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 31.894 \cdot kip$

Weight of Concrete Pad = $WT_{pad} := \left(W_f^2 \cdot T_f\right) \cdot \gamma_c = 242.55 \cdot kip$

Weight of Concrete Piers = $WT_{pier} := 3 \cdot \left[\left(L_p \cdot \frac{d_p^2 \cdot \pi}{4}\right) \cdot \gamma_c\right] = 0 \cdot kip$

Total Weight of Concrete = $WT_c := WT_{pad} + WT_{pier} = 243 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left(W_f^2 - 3 \cdot \frac{d_p^2 \cdot \pi}{4}\right) \cdot (L_p - L_{pag}) \cdot \gamma_s = 0 \cdot kip$

Weight of Soil Above Footing = $WT_{s2} := \left[\frac{\tan(\Phi_s) \cdot (L_p - L_{pag})^2}{2} \cdot W_f\right] \cdot \gamma_s = 0 \cdot kip$

Tower Offset = $X_{t1} := \left[\frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{2}\right]$ $X_{t2} := \frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{3}$

$X_t := if(Pos_t, X_{t1}, X_{t2}) = 4.835$

$X_{off} := \frac{W_f}{2} - \left[\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t\right] = 0.722$

Resisting Moment = $M_r := (0.9WT_c + 0.75WT_{s1}) \cdot \frac{W_f}{2} + 0.75S_u \cdot \frac{T_f}{3} + 0.75WT_{s2} \cdot \left[W_f + \frac{\tan(\Phi_s) \cdot (L_p - L_{pag})}{3}\right] = 1594 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + S_t \cdot (L_p + T_f) = 861.5 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.85$

Factor of Safety Required = $FS_{req} := 1$

$OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

$OverTurning\_Moment\_Check = "Okay"$

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 256 \cdot kip$

Area of the Mat = $A_{mat} := W_f^{\,2} = 196$

Section Modulus of Mat = $S := \frac{W_f^{\,3}}{6} = 457.33 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 3.188 \cdot ksf$

$Max\_Pressure\_Check := if\left(P_{max} < 0.75 q_s, "Okay", "No Good"\right)$

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.58 \cdot ksf$

$Min\_Pressure\_Check := if\left[\left(P_{min} \geq 0\right) \cdot \left(P_{min} < 0.75 q_s\right), "Okay", "No Good"\right]$

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 3.948$

Distance to Kern = $X_k := \frac{W_f}{6} = 2.333$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 3.371$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 3.353 \cdot ksf$

$q_{adj} := if\left(P_{min} < 0, P_a, P_{max}\right) = 3.353 \cdot ksf$

$Pressure\_Check := if\left(q_{adj} < 0.75 q_s, "Okay", "No Good"\right)$

Pressure_Check = "Okay"

Shear Strength of Concrete:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - d_{bbot} = 95 \cdot in$

$d_1 := \frac{W_f}{2} - \frac{d_p}{2}$

$d_2 := d_1 - d$

$L := \left(\frac{W_f}{2} - e\right) \cdot 3$

$Slope := if\left(L > W_f, \frac{P_{max} - P_{min}}{W_f}, \frac{q_{adj}}{L}\right)$

$V_{req} := LF \cdot \left[\left(q_{adj} - Slope \cdot d_1\right) + \left(\frac{Slope \cdot d_1}{2}\right)\right] \cdot W_f \cdot d_1 = 222.98 \cdot kip$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d = 1486 \cdot kip$ (ACI-2008 11.2.1.1)

$Beam\_Shear\_Check := if\left(V_{req} < V_{Avail}, "Okay", "No Good"\right)$

Beam_Shear_Check = "Okay"

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.11.1.2)

Critical Perimeter of Punching Shear = $b_o := \left(d_p + d\right) \cdot \pi = 24.9$

Area Included Inside Perimeter = $A_{bo} := \frac{\pi \cdot \left(d_p + d\right)^2}{4} = 49.2$

Area Outside of Perimeter = $A_{out} := A_{mat} - A_{bo} = 146.8$

Guess Value = $v_u := 1ksf$

(From "Foundation Analysis and design", By Joseph Bowles, Eq. 8-9)

Given $d^2 + d_p \cdot d = \frac{Load_{tot}}{\pi \cdot v_u}$

$v_u := Find\left(v_u\right) = 1.3 \times 10^3 lbf$

$V_u := v_u \cdot d \cdot W_f = 143.9 \cdot kips$

Required Shear Strength = $V_{req} := LF \cdot V_u = 143.9 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 5280 \cdot kip$ (ACI-2008 11.11.2.1)

$Punching\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

$$M_{nT} := LF \cdot \left[U_t \cdot \left(W_t \cdot \sin(60 \cdot deg) - \frac{d_p}{2} \right) + S_t \cdot (D_f + L_{pag}) \right] - WT_t \cdot X_{off} = 781 \cdot ft \cdot k$$

$$M_{nS} := -1 \cdot \left[\frac{1}{2} \cdot \left(\frac{W_f}{2} + \frac{W_t}{3} \cdot \cos(30 \cdot deg) - \frac{d_p}{2} \right)^2 \cdot W_t \cdot \left[\gamma_s \cdot (T_f - T_f) \right] \right]$$

$$M_{nC} := -1 \cdot \left[\frac{1}{2} \cdot \left(\frac{W_f}{2} + \frac{W_t}{3} \cdot \cos(30 \cdot deg) - \frac{d_p}{2} \right)^2 \cdot W_t \cdot (\gamma_c \cdot T_f) \right]$$

Design Moment = $M_n := \frac{M_{nT} + M_{nS} + M_{nC}}{\phi_m} = 622.805 \cdot kips \cdot ft$

$$\beta := \begin{cases} 0.85 & \text{if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 & \text{if } f_c > 8000 \cdot psi \\ \left[0.85 - \left[\left(\frac{f_c}{psi} - 4000 \right) \cdot 0.5 \right] \right] & \text{otherwise} \end{cases} = 0.85$$ (ACI-200810.2.7.3)

$b_{eff} := W_t \cdot \cos(30 \cdot deg) + d_p = 51.962 \cdot in$

$d := T_f - Cvr_{pad} - d_{bbot} = 95 \cdot in$

$A_s := \frac{M_n}{(f_y \cdot d)} = 1.311 \cdot in^2$

$a := \frac{A_s \cdot f_y}{\beta \cdot f_c \cdot b_{eff}} = 0.594 \cdot in$

$A_s := \frac{M_n}{f_y \cdot \left(d - \frac{a}{2} \right)} = 1.315 \cdot in^2$

$\rho := \frac{A_s}{b_{eff} d} = 0.00027$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \geq 60000\cdot psi \\ .0020 & \text{otherwise} \end{cases} = 0.0018 \qquad \text{(ACI -2008 7.12.2.1)}$$

Check Bottom Bars:

$$As := \begin{cases} \left(\rho\cdot b_{eff}\, d\right) & \text{if } \left(\rho\cdot b_{eff}\, d\right) > \rho_{sh}\cdot\frac{b_{eff}}{2}\cdot d \\ \rho_{sh}\cdot\frac{b_{eff}}{2}\cdot d & \text{otherwise} \end{cases} = 4.443\cdot in^2$$

$As_{prov} := A_{bbot}\cdot NB_{bot} = 11.8\cdot in^2$

$Pad\_Reinforcement\_Bot := if\left(As_{prov} > As, "Okay", "No\ Good"\right)$

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh}\cdot\frac{b_{eff}}{2}\cdot d\right) = 4.4\cdot in^2$$

$As_{prov} := A_{btop}\cdot NB_{top} = 11.8\cdot in^2$

$Pad\_Reinforcement\_Top := if\left(As_{prov} > As, "Okay", "No\ Good"\right)$

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2\cdot Cvr_{pad} - NB_{bot}\cdot d_{bbot}}{NB_{bot} - 1} = 10.5\cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3\cdot in$$

Transverse Reinforcement Index =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$$L_{dbt} := \frac{3\cdot f_y\,\alpha_{pad}\cdot\beta_{pad}\cdot\gamma_{pad}\cdot\lambda_{pad}}{40\cdot\sqrt{f_c\cdot psi}\cdot\frac{c + k_{tr}}{d_{bbot}}}\cdot d_{bbot} = 27.4\cdot in$$

Minimum Development Length =

$L_{dbmin} := 12\cdot in$ (ACI-2008 12.2.1)

$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, "Use\ L.dbt", "Use\ L.dbmin"\right) = "Use\ L.dbt"$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr_{pad} = 51\cdot in$$

$Lpad\_Check := if\left(L_{Pad} > L_{dbt}, "Okay", "No\ Good"\right)$

Lpad_Check = "Okay"

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTU2168	DATE:	09/22/2016	RF DESIGN ENG:	Mateen MD
ISSUE:	Bronze RRH Add	Approved? (Y/N):	Yes	RF DESIGN PHONE:	8602586382
REVISION:	Final	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	mm093q@att.com
INITIATIVE /PROJECT:	LTE 850 will be 4C at the site Add RRUS-11. LTE 700 DE will be 5C at the site with RRUS-E2. Add 2nd XMU. **KEEP 6' Separation between Antenna 2 and Antenna4 for 700 carriers. **GSM 850 IS DECOM FOR ADDING LTE 850 CARRIER.				

RF PERF ENG:		RFDS PROGRAM TYPE:	2017 LTE Next Carrier		
RF PERF PHONE:		RFDS TECHNOLOGY:	LTE		
RF PERF EMAIL:		STATE/STATUS:	Final/Approved		
RFDS VERSION:	2.00	RFDS ID:	1405257		
GSM FREQUENCY:		Created By:	mm093q	Updated By:	mh705r
UMTS FREQUENCY:	850	Date Created:	9/22/2016 5:05:18 PM	Date Updated:	12/12/2016 3:50:35 PM
LTE FREQUENCY:	700, 850, 1900, WCS				
I-PLAN JOB # 1:	NER-RCTB-16-03251	IPLAN PRD GRP || SUB GRP #1:	LTE Next Carrier || LTE 4C		
I-PLAN JOB # 2:	NER-RCTB-16-03295	IPLAN PRD GRP || SUB GRP #2:	LTE Next Carrier || LTE 5C		
I-PLAN JOB # 3:		IPLAN PRD GRP || SUB GRP #3:			
I-PLAN JOB # 4:		IPLAN PRD GRP || SUB GRP #4:			
I-PLAN JOB # 5:		IPLAN PRD GRP || SUB GRP #5:			
I-PLAN JOB # 6:		IPLAN PRD GRP || SUB GRP #6:			
I-PLAN JOB # 7:		IPLAN PRD GRP || SUB GRP #7:			
I-PLAN JOB # 8:		IPLAN PRD GRP || SUB GRP #8:			

Section 2 - LOCATION INFORMATION

USID:	4563	FA LOCATION CODE:	10035084	LOCATION NAME:	MT TOM WALLINGFORD
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT
ADDRESS:	23 WAYNE ROAD	CITY:	WALLINGFORD	STATE:	CT
ZIP CODE:	06492	COUNTY:	NEW HAVEN	LONG (DEC. DEG.):	-72.8418881
LATITUDE (D-M-S):	41d 27m 45.87084s	LONGITUDE (D-M-S):	-72d -50m -30.79716s	LAT (DEC. DEG.):	41.4627419
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	2168 - WALLINGFORD 23 WAYNE RD. WALLINGFORD, CT ON WAYNE ROAD TO END. TRIPP`S DRIVEWAY AT END. LAST DRIVEWAY ON LEFT TO TOP OF HILL. WE ARE IN COMPOUND BEHIND GARAGE IN WOODEN FENCE AREA.ACCESS: 24/7 TRACCESS CONTACT: STEVE TRIPP (203) 786-0052SECURITY: NONEPOWER COMPANY: WALLINGFORD ELECTRIC (203) 294-2020FIRE: (203) 265-0333POLICE: (203) 294-2800TELCO: AT&T (800)247-20202GET-244 HCGS718321SNET-051 HCGS238700SNET-177 HCGS238701SNET-235 HCGS713988SN3GCBUIMA 1-1PP1 HCGS731190SNPP2 HCGS731191SNPP3 HCGS747939SNPP4 HCGS747940SNET-MC1IMA 1-2PP1 HCGS751503SNPP2 HCGS751504SNPP3 HCGS751505SNPP4 HCGS751506SNPP5 HCGS761672SNPP6 HCGS761673SNPP7 HCGS763601SNPP8 HCGS763602SNTRAC - 7082168				

ORACLE PTN # 1:		PACE JOB # 1:	MRCTB019857		
ORACLE PTN # 2:		PACE JOB # 2:	MRCTB019926		
ORACLE PTN # 3:		PACE JOB # 3:			
ORACLE PTN # 4:		PACE JOB # 4:			
ORACLE PTN # 5:		PACE JOB # 5:			
ORACLE PTN # 6:		PACE JOB # 6:			
ORACLE PTN # 7:		PACE JOB # 7:			
ORACLE PTN # 8:		PACE JOB # 8:			
BORDER CELL WITH CONTOUR COORD:		SEARCH RING NAME:			
AM STUDY REQ'D (Y/N):	No	SEARCH_RING_ID:			
FREQ COORD:		BTA:		MSA / RSA:	
OPS DISTRICT:	CT-South	LAC(GSM):	05008		
OPS ZONE:	NE_CT_S_NHVN_NE_CS	LAC(UMTS):	05988		
RF DISTRICT:	NPO Triage	BSC(GSM):	BCT08		
RF ZONE:	Hotseat	RNC(UMTS):	BRPTCT04CRBR07		
PARENT NAME(GSM):	MIDDLETOWN-GSM MTSO-BSC-8	MME POOL ID(LTE):	FF01		
PARENT NAME(UMTS):	BRIDGEPORT RNC07 ERICSSON 3820				

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		PCS REDUCED - UPS ZIP:	
CGSA - MINOR FILING NEEDED (Yes/No):	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:	
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:			

CGSA CALL SIGNS:	

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):		STRUCTURE TYPE:	SELF SUPPORT
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:	NR
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	0.00		
LIGHTING TYPE:	RED LIGHT ONLY				

MARKET LOCATION 700 MHz Band:			
MARKET LOCATION 850 MHz Band:			
MARKET LOCATION 1900 MHz Band:			
MARKET LOCATION AWS Band:			
MARKET LOCATION WCS Band:			
MARKET LOCATION Future Band:			

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911				INTRADO_MIAMI		0				
SECTOR B				INTRADO_MIAMI		0				
SECTOR C				INTRADO_MIAMI		0				
SECTOR D	WALLINGFORD PD	1408				0				
SECTOR E	WALLINGFORD PD	1408				0				
SECTOR F	WALLINGFORD PD	1408				0				
OMNI										

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911				INTRADO_MIAMI		0				
SECTOR B				INTRADO_MIAMI		0				
SECTOR C				INTRADO_MIAMI		0				
SECTOR D	WALLINGFORD PD	1408				0				
SECTOR E	WALLINGFORD PD	1408				0				
SECTOR F	WALLINGFORD PD	1408				0				
OMNI										

Section 6 - RBS GENERAL INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RBS ID:	128710	128711	172432	229594	366829							
CTS COMMON ID:	049D2168	318D2168	CTU2168	CTV2168	CTL02168							
CELL ID / BCF:	049D2168		CTU2168	CTU2168	CTL02168							
BTA/TID:	049G	049P	318V	318U	318L							
4-9 DIGIT SITE ID:	2168	2168	2168	2168	2168							
COW OR TOY?:	No	No	No	No	No							
CELL SITE TYPE:												
SITE TYPE:												
BTS LOCATION ID:												
BASE STATION TYPE:												
EQUIPMENT NAME:	MT TOM WALLINGFORD	WALLINGFORD- WAYNE RD	MT TOM WALLINGFORD	MT TOM WALLINGFORD	MT TOM WALLINGFORD							
DISASTER PRIORITY:												

Section 6 - RBS GENERAL INFORMATION - final

	GSM 1ST RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS								
RBS ID:		229594		366829								
CTS COMMON ID:		CTV2168		CTL02168								
CELL ID / BCF:		CTU2168		CTL02168								
BTA/TID:		318U		318L								
4-9 DIGIT SITE ID:		2168		2168								
COW OR TOY?:		No		No								
CELL SITE TYPE:		SECTORIZED		SECTORIZED								
SITE TYPE:		MACRO-CONVENTIONAL		MACRO-CONVENTIONAL								
BTS LOCATION ID:		INTERNAL		INTERNAL								
BASE STATION TYPE:		OVERLAY		BASE								
EQUIPMENT NAME:		MT TOM WALLINGFORD		MT TOM WALLINGFORD								
DISASTER PRIORITY:		0		3								

Section 7 - RBS SPECIFIC INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RAC:												
EQUIPMENT VENDOR:												
EQUIPMENT TYPE:	ULTRASITE	ULTRASITE										
BASEBAND CONFIGURATION:												
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:												
AGPS:	Yes	Yes	Yes	Yes	Yes							
NODE B NUMBER:	0	0	0	0	2168							

Section 7 - RBS SPECIFIC INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RAC:												
EQUIPMENT VENDOR:			ERICSSON		ERICSSON							
EQUIPMENT TYPE:			3206 INDOOR		6601 INDOOR MU							
BASEBAND CONFIGURATION:					2x6601 / 2xDUS41(IDL) / 2xXMU03							
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:					CT							
AGPS:			Yes		Yes							
NODE B NUMBER:			0		2168							

Section 8 - RBS/SECTOR ASSOCIATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS														
CTS Common ID	049D2168	318D2168	CTU2168	CTV2168	CTL02168														
Soft Sector IDs	318G21681		CTU21684	CTV21681	CTL02168_3A_1														
	318G21682		CTU21685	CTV21682	CTL02168_3B_1														
	318G21683		CTU21686	CTV21683	CTL02168_3C_1														
			CTU21687	CTV2168A	CTL02168_7A_1														
			CTU21688	CTV2168B	CTL02168_7B_1														
			CTU21689	CTV2168C	CTL02168_7C_1														
					CTL02168_9A_1														
					CTL02168_9B_1														
					CTL02168_9C_1														

Section 8 - RBS/SECTOR ASSOCIATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS														
CTS Common ID			CTV2168		CTL02168														
Soft Sector IDs			CTV21681		CTL02168_3A_1														
			CTV21682		CTL02168_3B_1														
			CTV21683		CTL02168_3C_1														
					CTL02168_7A_1														
					CTL02168_7A_2_E														
					CTL02168_7B_1														
					CTL02168_7B_2_E														
					CTL02168_7C_1														
					CTL02168_7C_2_E														
					CTL02168_8A_1														
					CTL02168_8B_1														
					CTL02168_8C_1														
					CTL02168_9A_1														
					CTL02168_9A_2														
					CTL02168_9B_1														
					CTL02168_9B_2														
					CTL02168_9C_1														
					CTL02168_9C_2														

Section 9 - SOFT SECTOR ID - existing

	GSM 1ST 850	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900														
USEID (excluding Hard Sector)	4563.850.25G.1	4563.850.3G.1	4563.1900.3G.1	4563.850.3G.2	4563.1900.3G.2																				
SECTOR A **SOFT SECTOR ID**	318G21681	CTV21681	CTU21687	CTV2168A	CTU21684	CTL02168_7A_1		CTL02168_9A_1	CTL02168_3A_1																
SECTOR B	318G21682	CTV21682	CTU21688	CTV2168B	CTU21685	CTL02168_7B_1		CTL02168_9B_1	CTL02168_3B_1																
SECTOR C	318G21683	CTV21683	CTU21689	CTV2168C	CTU21686	CTL02168_7C_1		CTL02168_9C_1	CTL02168_3C_1																
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - SOFT SECTOR ID - final

	GSM 1ST 850	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900														
USEID (excluding Hard Sector)		4563.850.3G.1																							
SECTOR A **SOFT SECTOR ID**		CTV21681				CTL02168_7A_1	CTL02168_8A_1	CTL02168_9A_1	CTL02168_3A_1	CTL02168_7A_2_E	CTL02168_9A_2																
SECTOR B		CTV21682				CTL02168_7B_1	CTL02168_8B_1	CTL02168_9B_1	CTL02168_3B_1	CTL02168_7B_2_E	CTL02168_9B_2																
SECTOR C		CTV21683				CTL02168_7C_1	CTL02168_8C_1	CTL02168_9C_1	CTL02168_3C_1	CTL02168_7C_2_E	CTL02168_9C_2																
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - Cell Number - existing

	GSM 1ST 850	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900														
USEID (excluding Hard Sector)	4563.850.25G.1	4563.850.3G.1	4563.1900.3G.1	4563.850.3G.2	4563.1900.3G.2																				
SECTOR A **CELL NUMBER**	0	0	0	0	0	15		8	149																
SECTOR B	0	0	0	0	0	16		9	150																
SECTOR C	0	0	0	0	0	17		10	151																
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 9 - Cell Number - final

	GSM 1ST 850	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900														
USEID (excluding Hard Sector)		4563.850.3G.1																							
SECTOR A **CELL NUMBER**		0				15	1	8	149	185	178														
SECTOR B		0				16	2	9	150	186	179														
SECTOR C		0				17	3	10	151	187	180														
SECTOR D																									
SECTOR E																									
SECTOR F																									
OMNI																									

Section 10 - CID/SAC - existing

	GSM 1ST 850	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900																
SECTOR A CID/SAC	21681	21681	21687	61681	21684																						
SECTOR B	21682	21682	21688	61682	21685																						
SECTOR C	21683	21683	21689	61683	21686																						
SECTOR D																											
SECTOR E																											
SECTOR F																											
OMNI																											

Section 10 - CID/SAC - final

	GSM 1ST 850	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900																
SECTOR A CID/SAC		21681																									
SECTOR B		21682																									
SECTOR C		21683																									
SECTOR D																											
SECTOR E																											
SECTOR F																											
OMNI																											

Section 15A - CURRENT SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770		OPA-65R-LCUU-H6				QS66512-2							
ANTENNA VENDOR	POWERWAVE		CCI Products				Quintel							
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X7.4				72X12X9.6							
ANTENNA WEIGHT	35		73				111							
AZIMUTH	150		20				20							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	78		78				78							
ANTENNA TIP HEIGHT	80		81				81							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT	2		Fiber + 2 Coax											
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Built-in				Built-in						
SURGE ARRESTOR (QTY/MODEL)			2	DC/ Fiber Squid (1) + Andrew ABT-DFDM-ADBH (1)			1	DC/ Fiber Squid						
DIPLEXER (QTY/MODEL)	2	Kathrein 782-10250	2	Kathrein 782-10250										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Powerwave 7070		LTE RRH				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH	1	Polyphaser DAS-HY-NMNF-01S										
PDU FOR TMAS (QTY/MODEL)	1	Powerwave LGP 12104												
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)	1	RRUW												
RRH - 1900 band (QTY/MODEL)	1	RRUW					1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)			1	RRUS-32										
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4563.A.850.3G.1	4563.A.850.3G.1	CTV21681	CTV21681		UMTS 850	7770.00.850.10	13.5	150	10	None	Andrew 7/8 (850)	115				NO		308.32		1	
	PORT 2		4563.A.850.3G.2	CTV21681	CTV2168A		UMTS 850	7770.00.850.10	13.5	150	10	Bottom	Andrew 7/8 (850)	115				NO		308.32		1	
	PORT 4		4563.A.1900.3G.2	CTU21687	CTU21684		UMTS 1900	7770.00.1900.04	15.5	150	4	Bottom	Andrew 7/8 (850)	115				NO		574.12		2	
ANTENNA POSITION 2	PORT 1		4563.A.850.25G.1	318G21681	318G21681		GSM 850	OPA-65R-LCUU-H6_849MHz_10DT	14.3	20	10	None	Andrew 7/8 (850)	115				YES		308.32		3	
	PORT 3	4563.A.WCS.4G.1	4563.A.WCS.4G.1	CTL02168_3A_1	CTL02168_3A_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	20	3	TOP	Andrew 7/8 (850)	115						1227.4392		3	

ANTENNA POSITION 4	**PORT 1**	4563.A.700.4G.1	4563.A.700.4G.1	CTL02168_7A_1	CTL02168_7A_1		LTE 700	QS66512-2_722MHz_13DT	13	20	13	Top	FIBER	0						1475.7065		7	
	PORT 3	4563.A.1900.4G.1	4563.A.1900.4G.1	CTL02168_9A_1	CTL02168_9A_1		LTE 1900	QS66512-2_1930MHz_04DT	16	20	4	Top	FIBER	0						3664.3757		7	
	PORT 4	4563.A.1900.4G.1	4563.A.1900.4G.1	CTL02168_9A_2	CTL02168_9A_2		LTE 1900	QS66512-2_1930MHz_04DT	16	20	4	Top	FIBER	0						3664.3757		7	

Section 15B - CURRENT SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770		OPA-65R-LCUU-H6				QS66512-2							
ANTENNA VENDOR	POWERWAVE		CCI Products				Quintel							
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X7.4				72X12X9.6							
ANTENNA WEIGHT	35		73				111							
AZIMUTH	270		150				150							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	78		78				78							
ANTENNA TIP HEIGHT	80		81				81							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT	2		Fiber + 2 Coax											
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Built-in				Built-in						
SURGE ARRESTOR (QTY/MODEL)			2	DC/ Fiber Squid (1) + Andrew ABT-DFDM-ADBH (1)			1	DC/ Fiber Squid						
DIPLEXER (QTY/MODEL)	2	Kathrein 782-10250	2	Kathrein 782-10250										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH	1	Polyphaser DAS-HY-NMNF-01S										
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)	1	RRUW												
RRH - 1900 band (QTY/MODEL)	1	RRUW					1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)			1	RRUS-32										
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4563.B.850.3G.1	4563.B.850.3G.1	CTV21682	CTV21682		UMTS 850	7770.00.850.04	13.5	270	4	None	Andrew 7/8 (850)	115				NO		308.32		9	
	PORT 2		4563.B.850.3G.2	CTV21682	CTV2168B		UMTS 850	7770.00.850.04	13.5	270	4	Bottom	Andrew 7/8 (850)	115				NO		308.32		9	
	PORT 4		4563.B.1900.3G.2	CTU21688	CTU21685		UMTS 1900	7770.00.1900.04	15.5	270	4	Bottom	Andrew 7/8 (850)	115				NO		574.12		10	
ANTENNA POSITION 2	PORT 1		4563.B.850.25G.1	318G21682	318G21682		GSM 850	OPA-65R-LCUU-H6_849MHz_04DT	14.5	150	4	None	Andrew 7/8 (850)	115				YES		308.32		11	
	PORT 3	4563.B.WCS.4G.1	4563.B.WCS.4G.1	CTL02168_3B_1	CTL02168_3B_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	150	3	TOP	Andrew 7/8 (850)	115						1227.4392		11	

ANTENNA POSITION 4	**PORT 1**	4563.B.700.4G.1	4563.B.700.4G.1	CTL02168_7B_1	CTL02168_7B_1		LTE 700	QS66512-2_722MHz_04DT	13	150	4	Top	FIBER	0						1475.7065		15	
	PORT 3	4563.B.1900.4G.1	4563.B.1900.4G.1	CTL02168_9B_1	CTL02168_9B_1		LTE 1900	QS66512-2_1930MHz_06DT	16	150	6	Top	FIBER	0						3664.3757		15	
	PORT 4	4563.B.1900.4G.1	4563.B.1900.4G.1	CTL02168_9B_2	CTL02168_9B_2		LTE 1900	QS66512-2_1930MHz_06DT	16	150	6	Top	FIBER	0						3664.3757		15	

Section 15C - CURRENT SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770		OPA-65R-LCUU-H6				QS66512-2							
ANTENNA VENDOR	POWERWAVE		CCI Products				Quintel							
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X7.4				72X12X9.6							
ANTENNA WEIGHT	35		73				111							
AZIMUTH	20		270				270							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	78		78				78							
ANTENNA TIP HEIGHT	80		81				81							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT	2		Fiber + 2 Coax											
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Built-in				Built-in						
SURGE ARRESTOR (QTY/MODEL)			2	DC/ Fiber Squid (1) + Andrew ABT-DFDM-ADBH (1)			1	DC/ Fiber Squid						
DIPLEXER (QTY/MODEL)	2	Kathrein 782-10250	2	Kathrein 782-10250										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)										
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH	1	Polyphaser DAS-HY-NMNF-01S										
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)	1	RRUW												
RRH - 1900 band (QTY/MODEL)	1	RRUW					1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)			1	RRUS-32										
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4563.C.850.3G.1	4563.C.850.3G.1	CTV21683	CTV21683		UMTS 850	7770.00.850.10	13.5	20	10	None	Andrew 7/8 (850)	115				NO		308.32		17	
	PORT 2		4563.C.850.3G.2	CTV21683	CTV2168C		UMTS 850	7770.00.850.10	13.5	20	10	Bottom	Andrew 7/8 (850)	115				NO		308.32		17	
	PORT 3		4563.C.1900.3G.1	CTU21689	CTU21689		UMTS 1900	7770.00.1900.04	15.5	20	4	None	Andrew 7/8 (850)	115				NO		330.37		18	
ANTENNA POSITION 2	PORT 1		4563.C.850.25G.1	318G21683	318G21683		GSM 850	OPA-65R-LCUU-H6_849MHz_10DT	14.3	270	10	None	Andrew 7/8 (850)	115				YES		308.32		19	
	PORT 3	4563.C.WCS.4G.1	4563.C.WCS.4G.1	CTL02168_3C_1	CTL02168_3C_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	270	3	TOP	Andrew 7/8 (850)	115						1227.4392		19	

ANTENNA POSITION 4	**PORT 1**	4563.C.700.4G.1	4563.C.700.4G.1	CTL02168_7C_1	CTL02168_7C_1		LTE 700	QS66512-2_722MHz_03DT	13	270	3	Top	FIBER	0						1475.7065		23	
	PORT 3	4563.C.1900.4G.1	4563.C.1900.4G.1	CTL02168_9C_1	CTL02168_9C_1		LTE 1900	QS66512-2_1930MHz_04DT	16	270	4	Top	FIBER	0						3664.3757		23	
	PORT 4	4563.C.1900.4G.1	4563.C.1900.4G.1	CTL02168_9C_2	CTL02168_9C_2		LTE 1900	QS66512-2_1930MHz_04DT	16	270	4	Top	FIBER	0						3664.3757		23	

Section 16A - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?		Yes					
ANTENNA MAKE - MODEL							
ANTENNA VENDOR							
ANTENNA SIZE (H x W x D)							
ANTENNA WEIGHT							
AZIMUTH							
MAGNETIC DECLINATION							
RADIATION CENTER (feet)							
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT							
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)		4 Andrew ABT-DFDM-ADBH					
DIPLEXER (QTY/MODEL)		4 CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 RRUS-E2					
RRH - 850 band (QTY/MODEL)		1 RRUS-11					
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)		2 Kathrein 782-11055 & 782-10254					
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 850 will be 4C at the site, Add RRUS-11 to existing Octo port Antenna // LTE 700 D/E will be 5C at the site, Add RRUS-E2 to existing Octo port Antenna at Bottom // Replace the diplexers with 4 Triplexers (2 top, 2 bottom) , Add 2nd XMU // GSM 850 will be Decom for this carrier ADD.						
Local Market Note 2							
Local Market Note 3	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 2	PORT 1		4563.A.850.4G.1	CTL02168_8A_1	CTL02168_8A_1		LTE 850	OPA-65R-LCUU-H6_849MHz_10DT	14.3	20	10	Bottom	Andrew 7/8 (850)	115									
	PORT 5		4563.A.700.4G.1	CTL02168_7A_2_E	CTL02168_7A_2_E		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	13.9	20	3	Bottom	Andrew 7/8 (700)	115									

Section 16B - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?		Yes					
ANTENNA MAKE - MODEL							
ANTENNA VENDOR							
ANTENNA SIZE (H x W x D)							
ANTENNA WEIGHT							
AZIMUTH							
MAGNETIC DECLINATION							
RADIATION CENTER (feet)							
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT							
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)		4 Andrew ABT-DFDM-ADBH					
DIPLEXER (QTY/MODEL)		4 CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 RRUS-E2					
RRH - 850 band (QTY/MODEL)		1 RRUS-11					
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)		2 Kathrein 782-11055 & 782-10254					
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 850 will be 4C at the site, Add RRUS-11 to existing Octo port Antenna // LTE 700 D/E will be 5C at the site, Add RRUS-E2 to existing Octo port Antenna at Bottom // Replace the diplexers with 4 Triplexers (2 top, 2 bottom) , Add 2nd XMU // GSM 850 will be Decom for this carrier ADD.						
Local Market Note 2							
Local Market Note 3	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 2	PORT 1		4563.B.850.4G.1	CTL02168_8B_1	CTL02168_8B_1		LTE 850	OPA-65R-LCUU-H6_849MHz_04DT	14.5	150	4	Bottom	Andrew 7/8 (850)	115									
	PORT 5		4563.B.700.4G.1	CTL02168_7B_2_E	CTL02168_7B_2_E		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	13.9	150	3	Bottom	Andrew 7/8 (700)	115									

Section 16C - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?		Yes					
ANTENNA MAKE - MODEL							
ANTENNA VENDOR							
ANTENNA SIZE (H x W x D)							
ANTENNA WEIGHT							
AZIMUTH							
MAGNETIC DECLINATION							
RADIATION CENTER (feet)							
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT							
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)							
SURGE ARRESTOR (QTY/MODEL)		4 Andrew ABT-DFDM-ADBH					
DIPLEXER (QTY/MODEL)		4 CCI Triplexer -TPX-070821					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 RRUS-E2					
RRH - 850 band (QTY/MODEL)		1 RRUS-11					
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)		2 Kathrein 782-11055 & 782-10254					
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 850 will be 4C at the site, Add RRUS-11 to existing Octo port Antenna // LTE 700 D/E will be 5C at the site, Add RRUS-E2 to existing Octo port Antenna at Bottom // Replace the diplexers with 4 Triplexers (2 top, 2 bottom) , Add 2nd XMU // GSM 850 will be Decom for this carrier ADD.						
Local Market Note 2							
Local Market Note 3	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 2	PORT 1		4563.C.850.4G.1	CTL02168_8C_1	CTL02168_8C_1		LTE 850	OPA-65R-LCUU-H6_849MHz_10DT	14.3	270	10	Bottom	Andrew 7/8 (850)	115									
	PORT 5		4563.C.700.4G.1	CTL02168_7C_2_E	CTL02168_7C_2_E		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	13.9	270	3	Bottom	Andrew 7/8 (700)	115									

Section 17A - FINAL SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770		OPA-65R-LCUU-H6				QS66512-2							
ANTENNA VENDOR	POWERWAVE		CCI Products				Quintel							
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X7.4				72X12X9.6							
ANTENNA WEIGHT	35		73				111							
AZIMUTH	150		20				20							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	78		78				78							
ANTENNA TIP HEIGHT	80		81				81							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT	2		Fiber + 2 Coax											
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Built-in				Built-in						
SURGE ARRESTOR (QTY/MODEL)			4	Andrew ABT-DFDM-ADBH			2	DC/ Fiber Squid						
DIPLEXER (QTY/MODEL)	2	Kathrein 782-10250	4	CCI Triplexer -TPX-070821										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Powerwave 7070		LTE RRH				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH												
PDU FOR TMAS (QTY/MODEL)	1	Powerwave LGP 12104												
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-E2			1	RRUS-11						
RRH - 850 band (QTY/MODEL)	1	RRUW	1	RRUS-11										
RRH - 1900 band (QTY/MODEL)	1	RRUW					1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)			1	RRUS-32										
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)			2	Kathrein 782-11055 & 782-10254										
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 850 will be 4C at the site, Add RRUS-11 to existing Octo port Antenna // LTE 700 D/E will be 5C at the site, Add RRUS-E2 to existing Octo port Antenna at Bottom // Replace the diplexers with 4 Triplexers (2 top, 2 bottom) , Add 2nd XMU // GSM 850 will be Decom for this carrier ADD.													
Local Market Note 2														
Local Market Note 3	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face													

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4563.A.850.3G.1	4563.A.850.3G.1	CTV21681	CTV21681		UMTS 850	7770.00.850.10	13.5	150	10	None	Andrew 7/8 (850)	115				NO		308.32		1	
ANTENNA POSITION 2	PORT 1	4563.A.700.4G.1,4563.A.700.4G.tmp2	4563.A.700.4G.1	CTL02168_7A_2_E	CTL02168_7A_2_E		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	13.9	20	3	Bottom	Andrew 7/8 (700)	115						1475.7065		3	
	PORT 2	4563.A.850.4G.tmp1	4563.A.850.4G.1	CTL02168_8A_1	CTL02168_8A_1		LTE 850	OPA-65R-LCUU-H6_849MHz_10DT	14.3	20	10	Bottom	Andrew 7/8 (700)	115						1000		3	
	PORT 3	4563.A.WCS.4G.1	4563.A.WCS.4G.1	CTL02168_3A_1	CTL02168_3A_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	20	3	TOP	Fiber	0						1227.4392		4	
ANTENNA POSITION 4	PORT 1	4563.A.700.4G.1	4563.A.700.4G.1	CTL02168_7A_1	CTL02168_7A_1		LTE 700	QS66512-2_722MHz_13DT	13	20	13	Top	FIBER	0						1475.7065		7	

	PORT 3	4563.A.1900.4G.1	4563.A.1900.4G.1	CTL02168_9A_1	CTL02168_9A_1		LTE 1900	QS66512-2_1930MHz_04DT	16	20	4	Top	FIBER	0						3664.3757		7	
	PORT 4	4563.A.1900.4G.1,4563.A.1900.4G.tmp2	4563.A.1900.4G.1	CTL02168_9A_2	CTL02168_9A_2		LTE 1900	QS66512-2_1930MHz_04DT	16	20	4	Top	FIBER	0						3664.3757		7	

Section 17B - FINAL SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770		OPA-65R-LCUU-H6				QS66512-2							
ANTENNA VENDOR	POWERWAVE		CCI Products				Quintel							
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X7.4				72X12X9.6							
ANTENNA WEIGHT	35		73				111							
AZIMUTH	270		150				150							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	78		78				78							
ANTENNA TIP HEIGHT	80		81				81							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT	2		Fiber + 2 Coax											
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Built-in				Built-in						
SURGE ARRESTOR (QTY/MODEL)			4	Andrew ABT-DFDM-ADBH										
DIPLEXER (QTY/MODEL)	2	Kathrein 782-10250	4	CCI Triplexer -TPX-070821										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-E2			1	RRUS-11						
RRH - 850 band (QTY/MODEL)	1	RRUW	1	RRUS-11										
RRH - 1900 band (QTY/MODEL)	1	RRUW					1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)			1	RRUS-32										
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)			2	Kathrein 782-11055 & 782-10254										
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 850 will be 4C at the site, Add RRUS-11 to existing Octo port Antenna // LTE 700 D/E will be 5C at the site, Add RRUS-E2 to existing Octo port Antenna at Bottom // Replace the diplexers with 4 Triplexers (2 top, 2 bottom) , Add 2nd XMU // GSM 850 will be Decom for this carrier ADD.													
Local Market Note 2														
Local Market Note 3	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face													

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4563.B.850.3G.1	4563.B.850.3G.1	CTV21682	CTV21682		UMTS 850	7770.00.850.04	13.5	270	4	None	Andrew 7/8 (850)	115				NO		308.32		9	
ANTENNA POSITION 2	PORT 1	4563.B.700.4G.1,4563.B.700.4G.tmp2	4563.B.700.4G.1	CTL02168_7B_2_E	CTL02168_7B_2_E		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	13.9	150	3	Bottom	Andrew 7/8 (700)	115						1475.7065		11	
	PORT 2	4563.B.850.4G.tmp1	4563.B.850.4G.1	CTL02168_8B_1	CTL02168_8B_1		LTE 850	OPA-65R-LCUU-H6_849MHz_04DT	14.5	150	4	Bottom	Andrew 7/8 (700)	115						1000		11	
	PORT 3	4563.B.WCS.4G.1	4563.B.WCS.4G.1	CTL02168_3B_1	CTL02168_3B_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	150	3	TOP	Fiber	0						1227.4392		12	
ANTENNA POSITION 4	PORT 1	4563.B.700.4G.1	4563.B.700.4G.1	CTL02168_7B_1	CTL02168_7B_1		LTE 700	QS66512-2_722MHz_04DT	13	150	4	Top	FIBER	0						1475.7065		15	

	PORT 3	4563.B.1900.4G.1	4563.B.1900.4G.1	CTL02168_9B_1	CTL02168_9B_1		LTE 1900	QS66512-2_1930MHz_06DT	16	150	6	Top	FIBER	0						3664.3757		15	
	PORT 4	4563.B.1900.4G.1,4563.B.1900.4G.tmp2	4563.B.1900.4G.1	CTL02168_9B_2	CTL02168_9B_2		LTE 1900	QS66512-2_1930MHz_06DT	16	150	6	Top	FIBER	0						3664.3757		15	

Section 17C - FINAL SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770		OPA-65R-LCUU-H6				QS66512-2							
ANTENNA VENDOR	POWERWAVE		CCI Products				Quintel							
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X7.4				72X12X9.6							
ANTENNA WEIGHT	35		73				111							
AZIMUTH	20		270				270							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	78		78				78							
ANTENNA TIP HEIGHT	80		81				81							
MECHANICAL DOWNTILT	0		0				0							
FEEDER AMOUNT	2		Fiber + 2 Coax											
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020		Built-in				Built-in						
SURGE ARRESTOR (QTY/MODEL)			4	Andrew ABT-DFDM-ADBH										
DIPLEXER (QTY/MODEL)	2	Kathrein 782-10250	4	CCI Triplexer -TPX-070821										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH				RRH Controlled						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Andrew ABT-DFDM-ADBH												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)			1	RRUS-E2			1	RRUS-11						
RRH - 850 band (QTY/MODEL)	1	RRUW	1	RRUS-11										
RRH - 1900 band (QTY/MODEL)	1	RRUW					1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)			1	RRUS-32										
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)			2	Kathrein 782-11055 & 782-10254										
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 850 will be 4C at the site, Add RRUS-11 to existing Octo port Antenna // LTE 700 D/E will be 5C at the site, Add RRUS-E2 to existing Octo port Antenna at Bottom // Replace the diplexers with 4 Triplexers (2 top, 2 bottom) , Add 2nd XMU // GSM 850 will be Decom for this carrier ADD.													
Local Market Note 2														
Local Market Note 3	LTE alpha is with UMTS Gamma Face // LTE Beta is with UMTS Alpha Face // LTE Gamma is with UMTS Beta Face													

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	4563.C.850.3G.1	4563.C.850.3G.1	CTV21683	CTV21683		UMTS 850	7770.00.850.10	13.5	20	10	None	Andrew 7/8 (850)	115				NO		308.32		17	
ANTENNA POSITION 2	PORT 1	4563.C.700.4G.1,4563.C.700.4G.tmp2	4563.C.700.4G.1	CTL02168_7C_2_E	CTL02168_7C_2_E		LTE 700	OPA-65R-LCUU-H6_719MHz_03DT	13.9	270	3	Bottom	Andrew 7/8 (700)	115						1475.7065		19	
	PORT 2	4563.C.850.4G.tmp1	4563.C.850.4G.1	CTL02168_8C_1	CTL02168_8C_1		LTE 850	OPA-65R-LCUU-H6_849MHz_10DT	14.3	270	10	Bottom	Andrew 7/8 (700)	115						1000		19	
	PORT 3	4563.C.WCS.4G.1	4563.C.WCS.4G.1	CTL02168_3C_1	CTL02168_3C_1		LTE WCS	OPA-65R-LCUU-H6_2350MHz_03DT	17.8	270	3	TOP	Fiber	0						1227.4392		20	
ANTENNA POSITION 4	PORT 1	4563.C.700.4G.1	4563.C.700.4G.1	CTL02168_7C_1	CTL02168_7C_1		LTE 700	QS66512-2_722MHz_03DT	13	270	3	Top	FIBER	0						1475.7065		23	

	PORT 3	4563.C.1900.4G.1	4563.C.1900.4G.1	CTL02168_9C_1	CTL02168_9C_1		LTE 1900	QS66512-2_1930MHz_04DT	16	270	4	Top	FIBER	0						3664.3757		23	
	PORT 4	4563.C.1900.4G.1,4563.C.1900.4G.tmp2	4563.C.1900.4G.1	CTL02168_9C_2	CTL02168_9C_2		LTE 1900	QS66512-2_1930MHz_04DT	16	270	4	Top	FIBER	0						3664.3757		23	

Diagram - Sector	A	Diagram File Name - CT2168_A_B_C_BrnRRH_4C_5C_Rev1.vsd					
Atoll Site Name -	CTU2168	Location Name -	MT TOM WALLINGFORD	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

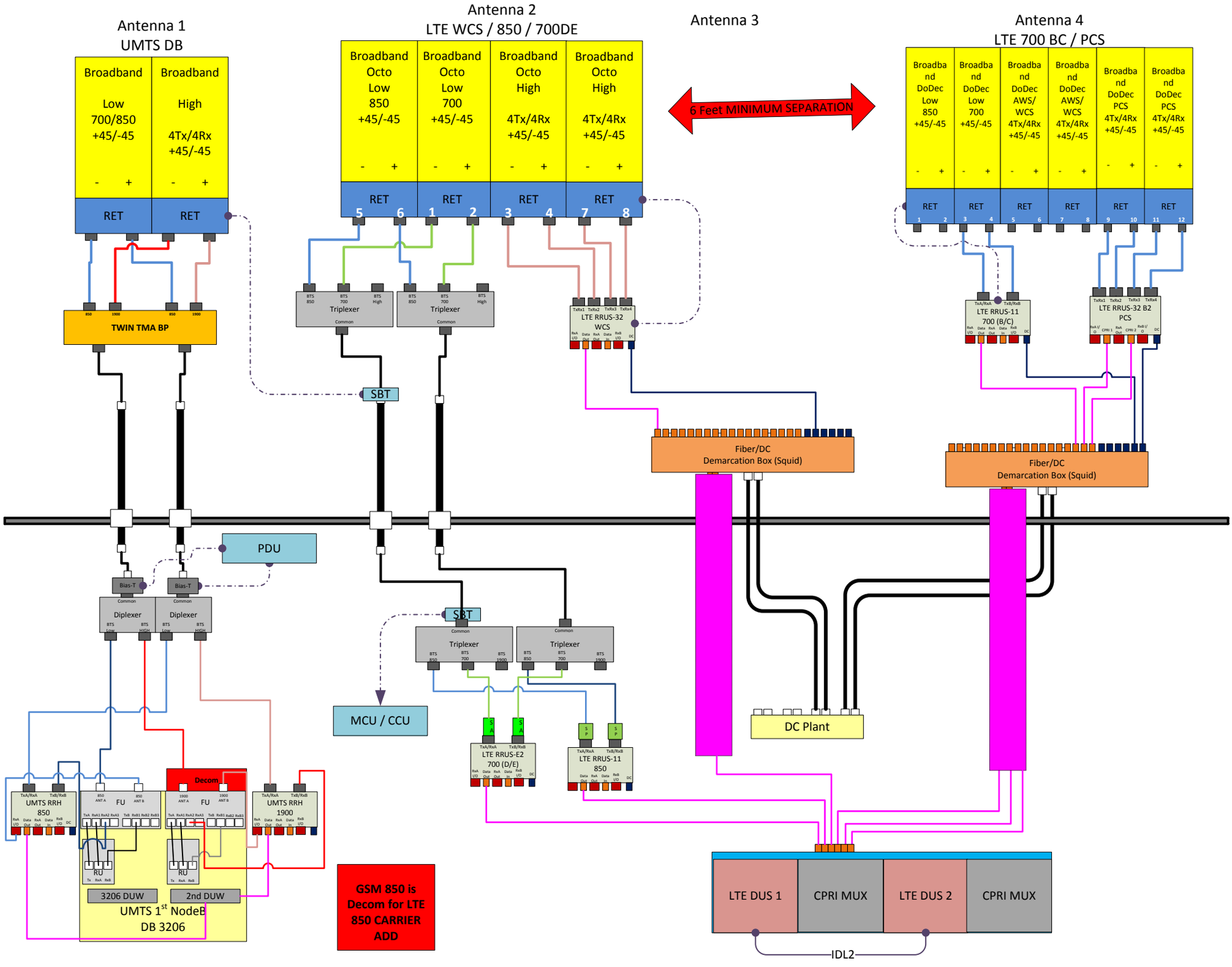


Diagram - Sector	B	Diagram File Name - CT2168_A_B_C_BrnRRH_4C_5C_Rev1.vsd					
Atoll Site Name -	CTU2168	Location Name -	MT TOM WALLINGFORD	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

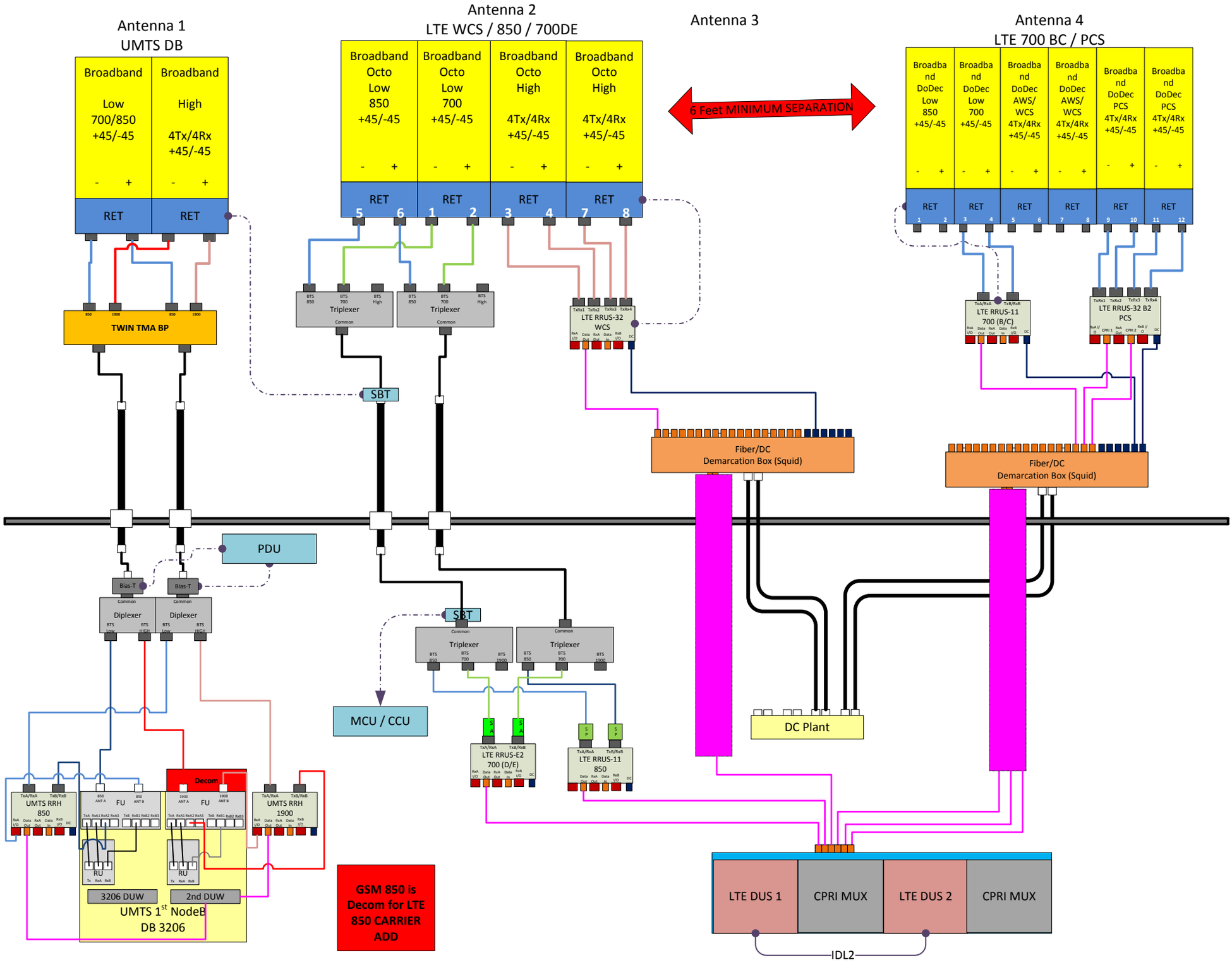
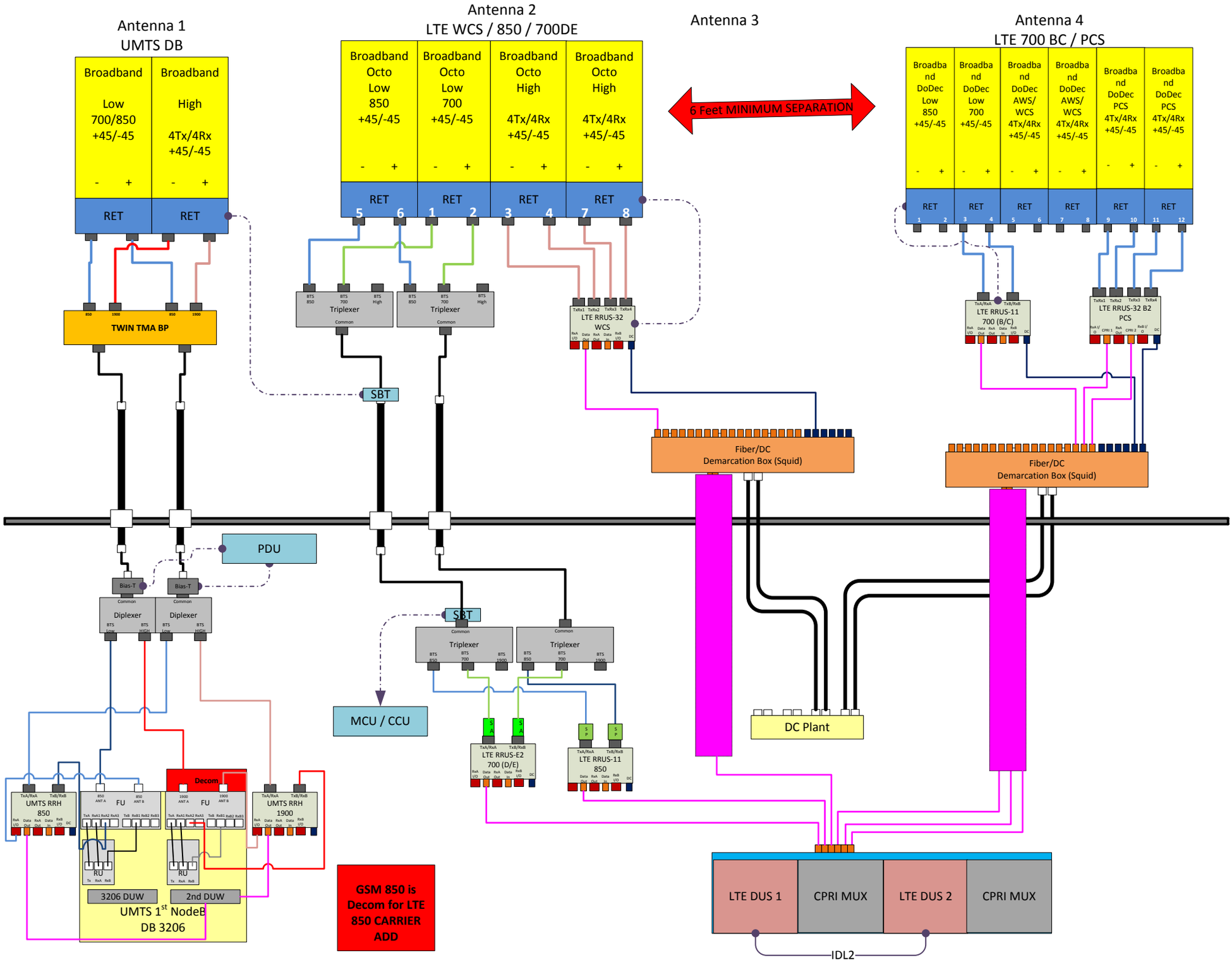


Diagram - Sector	C	Diagram File Name - CT2168_A_B_C_BrnRRH_4C_5C_Rev1.vsd					
Atoll Site Name -	CTU2168	Location Name -	MT TOM WALLINGFORD	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

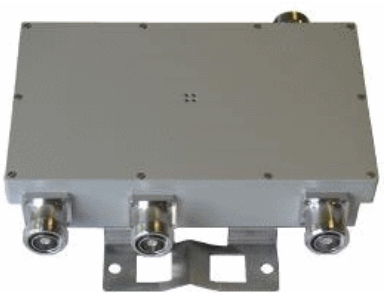


WORKFLOW SUMMARY							
Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments	PACE Status
09/22/2016	Preliminary In Progress	mm093q	Preliminary Submitted for Approval	RC475S	Promote	LTE Preliminary RFDS	
09/28/2016	Preliminary Submitted for Approval	RC475S	Preliminary Approved	BG144B	Promote		
12/07/2016	Preliminary Approved	BG144B	Final RF Approval	OM636A	Promote		
12/12/2016	Final RF Approval	MH705R	Final Approved	BG144B	Promote	LTE 4C/5C Final RFDS	NER-RCTB-16-03251 MRCTB019857 SUCCESS 12/12/2016 3:54:27 PM NER-RCTB-16-03295 MRCTB019926 SUCCESS 12/12/2016 3:54:27 PM

DATA SHEET

Outdoor Broadband Triplexer

TPX-070821



- Low Loss
- Small, lightweight
- AISG 2.0 compliant from PCS/AWS port to Common port
- Good Isolation
- Good IM
- Lightning protected
- High reliability
- Full 700, 850 MHz, and PCS/AWS (pre-combined) bands

Overview

Communication Components, Inc. Outdoor Broadband Triplexer combines 700 MHz, 850 MHz, and PCS/AWS band Basestation Tx/Rx signals onto a common port. Specifically intended for use in multi-band systems with limited feeder lines, the CCI Triplexer model TPX-070821 facilitates the addition of new technologies including LTE to existing sites while providing a high degree of isolation between systems. By reducing the number of feeder lines, the cost to upgrade a site (tower loading, leasing and installation costs) is reduced.
The CCI Outdoor Broadband Triplexer provides full band performance for each band with low insertion loss, low Intermodulation, and high power handling. Excellent return loss delivers the best match to the antennas and base station, saving precious transmit power. DC and AISG pass-through retains full RET and TMA capability utilizing CCI's AISG suite of products.

Technical Description:

The Outdoor Broadband Triplexer consists of multiple filters to combine (or divide) full band 700 MHz, 850 MHz and PCS/AWS signals. This tower mount unit can be used as either a splitter or combiner to aggregate multiple bands on a common feeder line. All RF ports are DIN 7-16 connectors. The fully weatherproof tower mount unit incorporates a unique intelligent Bias-T architecture which passes the DC and AISG carrier frequency from any of the input ports to the common port while blocking the DC and AISG signals from being re-injected into the other input ports. The unit has internal lightning strike protection using a multi-stage surge protection circuit.
The filters have been designed to minimize insertion loss while maximizing isolation. Particular attention has been given to the intermodulation performance of the Broadband Diplexer to minimize any passive intermodulation products from occurring. All DIN Connectors are fully IP68 rated and the unit body is rated for IP66.

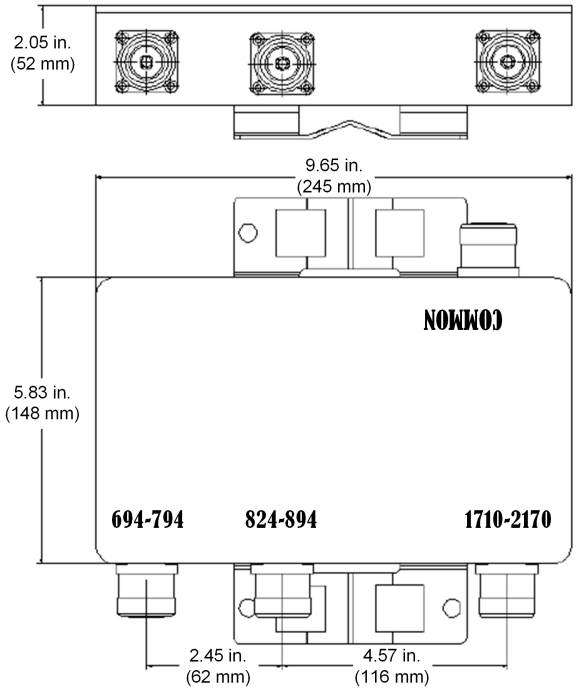
SPECIFICATIONS

Outdoor Broadband Triplexer

TPX-070821

Mechanical

Connectors	4 x 7-16 DIN female long neck
Dimensions (w/o connectors or brackets)(HxWxD)	5.83 x 9.65 x 2.05 in. (148 x 245 x 52 mm)
Weight	7.5 lbs (3.45 kg)
Mounting	Pole/Wall mounting bracket



Outdoor Broadband Triplexer Outline Drawing

WIRELESS COMMUNICATIONS FACILITY
CT2168 - LTE 4C/5C
MT. TOM WALLINGFORD
23 WAYNE ROAD
WALLINGFORD, CT 06492

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA-222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2016 CONNECTICUT FIRE SAFETY CODE AND, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO "EXTRA" WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

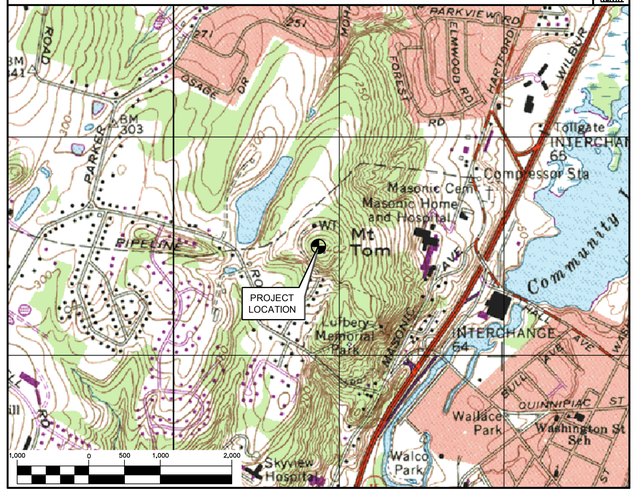
SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT
TO: 23 WAYNE ROAD, WALLINGFORD, CONNECTICUT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.31 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.27 MI
3.	TURN LEFT ONTO WEST ST	0.30 MI
4.	TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN	9.59 MI
5.	MERGE ONTO CT-15 S/WILBUR CROSS PKWY S via EXIT 17 TOWARD E MAIN ST.	6.42 MI
6.	TAKE EXIT 64 TOWARD WALLINGFORD	0.17 MI
7.	TURN LEFT ONTO QUINNIPIAC ST	0.17 MI
8.	QUINNIPIAC ST BECOMES S TURNPIKE RD	0.04 MI
9.	TURN RIGHT ONTO CHESHIRE RD	0.31 MI
10.	TAKE THE 3RD RIGHT ONTO WAYNE RD	0.19 MI
11.	23 WAYNE RD IS ON THE LEFT	

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   A. INSTALL (3) NEW RRUS-11s (LTE 850 MHz) AND (3) NEW RRUS-E2s (LTE 700 D/E MHz) ON NEW EQUIPMENT RACK/FAME INSTALLED WITHIN EXISTING EQUIPMENT ROOM.
   B. INSTALL (2) NEW TRIPLEXERS BEHIND POSITION 2 ANTENNA, (2) PER SECTOR/(6) TOTAL.
   C. INSTALL (6) NEW TRIPLEXERS WITHIN EXISTING EQUIPMENT ROOM.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT2168
AT&T SITE NAME:	MT. TOM WALLINGFORD
SITE ADDRESS:	23 WAYNE ROAD WALLINGFORD, CT 06492
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-27'-45.84" N LONGITUDE: 72°-50'-30.84" W GROUND ELEVATION: ±400' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES AND SPECIFICATIONS	0
C-1	PLANS AND ELEVATION	0
C-2	LTE 4C/5C EQUIPMENT DETAILS	0
C-3	LTE 4C/5C EQUIPMENT DETAILS	0
E-1	LTE SCHEMATIC DIAGRAM AND NOTES	0
E-2	LTE WIRING DIAGRAM	0
E-3	TYPICAL ELECTRICAL DETAILS & NOTES	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/06/17	KAW/JR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

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Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY

MT. TOM WALLINGFORD
CT2168 - LTE 4C/5C
23 WAYNE ROAD
WALLINGFORD, CT 06492

DATE: 12/20/16
SCALE: AS NOTED
JOB NO. 16071.92

TITLE SHEET

T-1

Sheet No. 1 of 8

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 95–115 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 97 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF–SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325–N
   G. U–BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PAINT NOTES

PAINTING SCHEDULE:

1. <u>ANTENNA PANELS:</u>

   A. SHERWIN WILLIAMS POLANE–B
   B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.

2. <u>COAXIAL CABLES:</u>

   A. ONE COAT OF DTM BONDING PRIMER (2–5 MILS. DRY FINISH)
   B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5–5 MILS. DRY FINISH)
   C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI–SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH–PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON–PETROLEUM–BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE. DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

1. COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.

APPLICATION:

1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
3. APPLY EACH COAT TO UNIFORM FINISH.
4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
6. VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
7. ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.

COMPLETED WORK:

1. SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
2. MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	01/06/17	KAWJR	CAG	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · CAMILO A. GAVIRIA · 27517 · LICENSED · PROFESSIONAL ENGINEER

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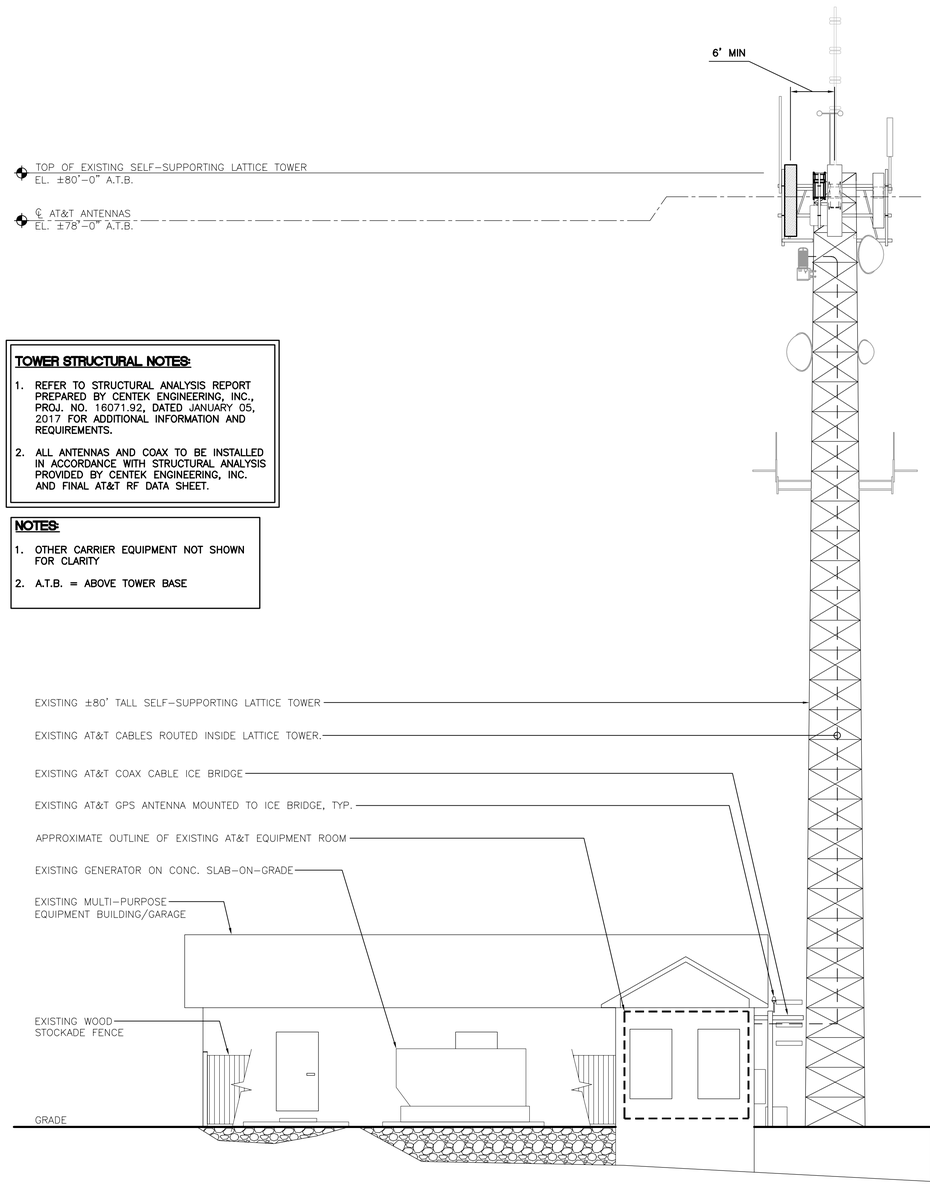
WALLINGFORD, CT 06492

DATE: 12/20/16
SCALE: AS NOTED
JOB NO. 16071.92

NOTES AND SPECIFICATIONS

N–1



TOWER STRUCTURAL NOTES:

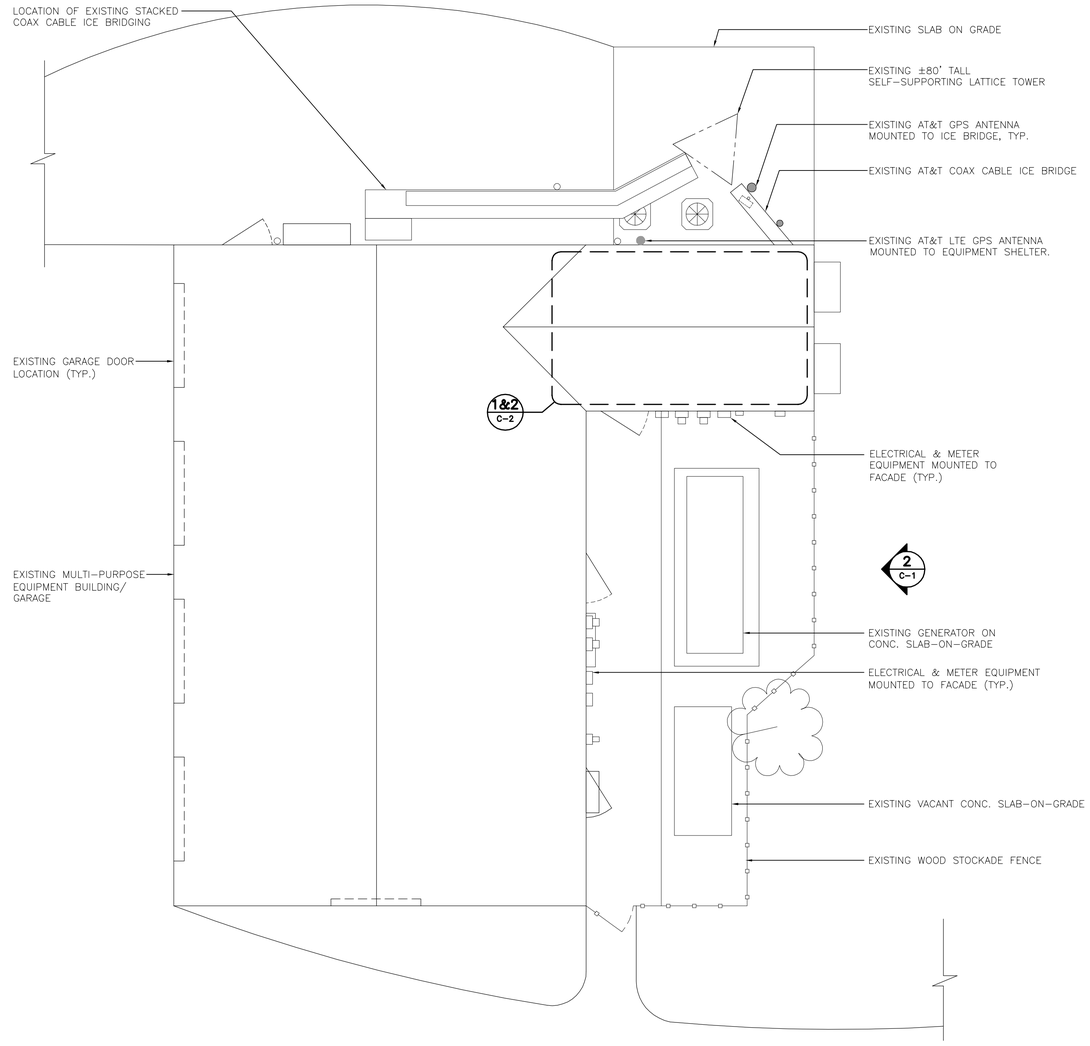
1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 16071.92, DATED JANUARY 05, 2017 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, INC. AND FINAL AT&T RF DATA SHEET.

NOTES:

1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
2. A.T.B. = ABOVE TOWER BASE

2 / C-1 **NORTH ELEVATION**
SCALE: 1" = 6'-0"

GRAPHIC SCALE
6 0 3 6 12 24
(IN FEET)
1 inch = 6 ft.



1 / C-1 **COMPOUND PLAN**
SCALE: 1" = 5'-0"

APPROX. NORTH

GRAPHIC SCALE
5 0 2.5 5 10 20
(IN FEET)
1 inch = 5 ft.

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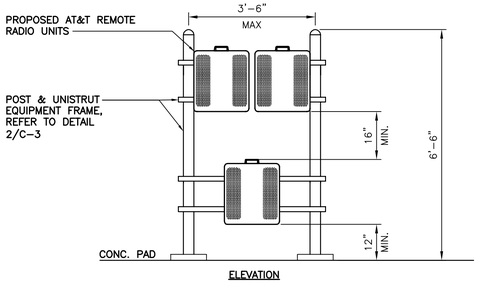
PLANS & ELEVATION

C-1

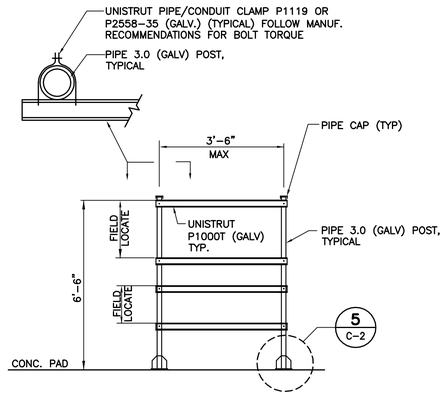
Sheet No. 3 of 8



ELEVATION

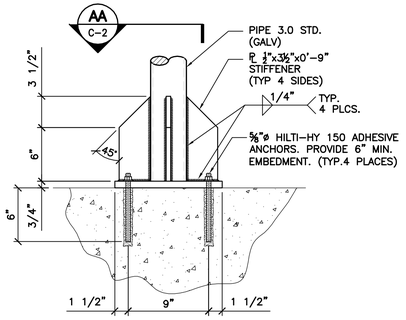
3/C-2 EQUIPMENT MOUNTING FRAME DETAIL

NOT TO SCALE



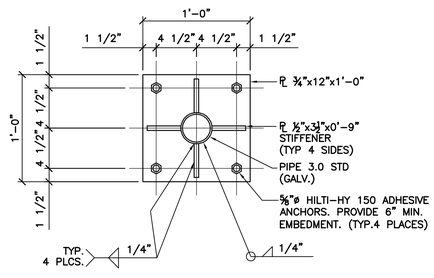
4/C-2 EQUIPMENT MOUNTING FRAME DETAIL

NOT TO SCALE



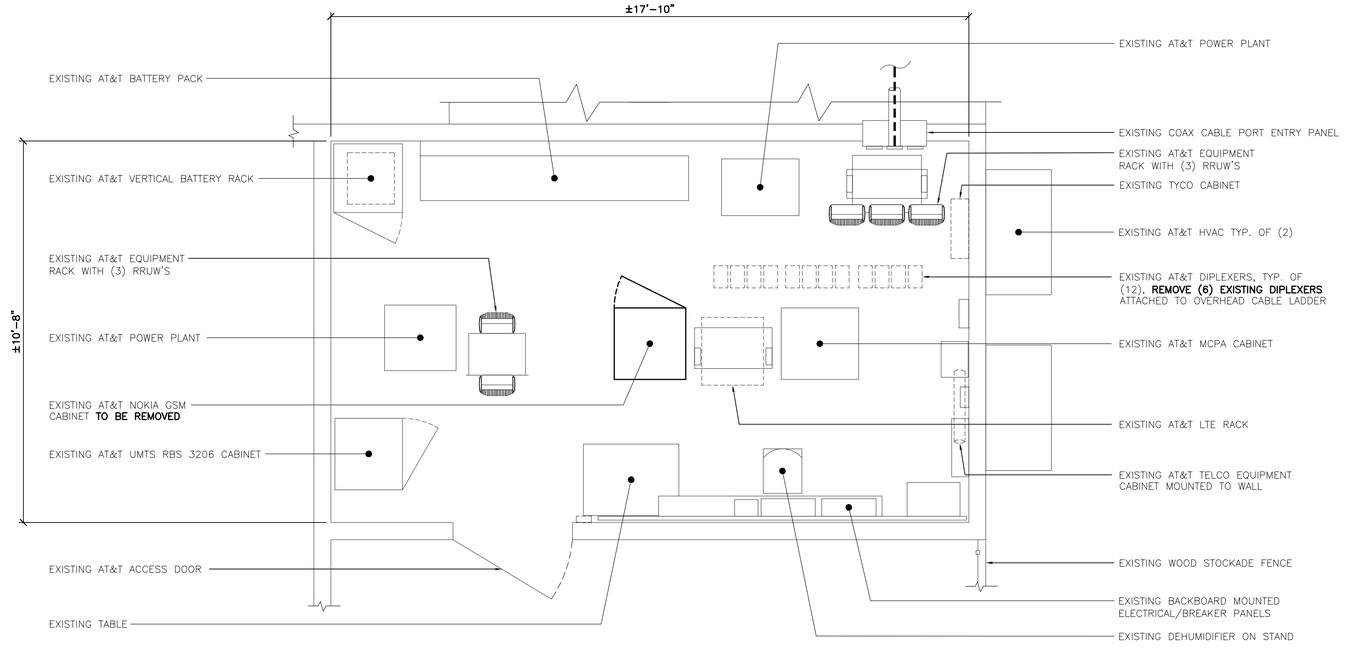
5/C-2 FRAME TO CONCRETE CONNECTION DETAIL

NOT TO SCALE



AA/C-2 FRAME BASE PLATE PLAN DETAIL

NOT TO SCALE



1/C-2 EXISTING EQUIPMENT ROOM FLOOR PLAN

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

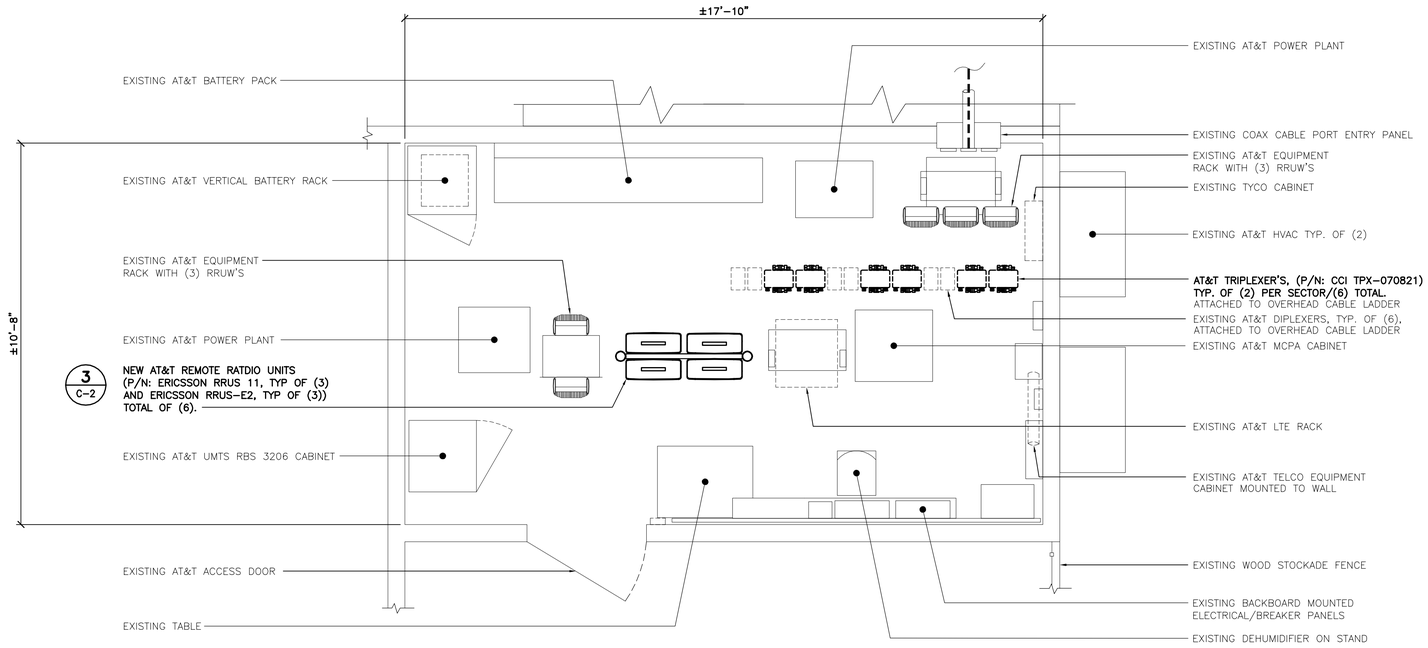
APPROX. NORTH

GRAPHIC SCALE

2 0 1 2 4 8

(IN FEET)

1 inch = 4 ft.



2/C-2 PROPOSED EQUIPMENT ROOM FLOOR PLAN

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

APPROX. NORTH

GRAPHIC SCALE

2 0 1 2 4 8

(IN FEET)

1 inch = 4 ft.

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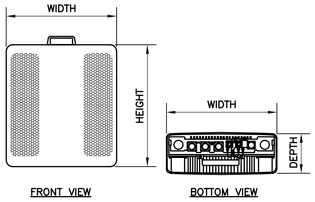
LTE 4C/5C EQUIPMENT DETAILS

C-2

Sheet No. 4 of 8

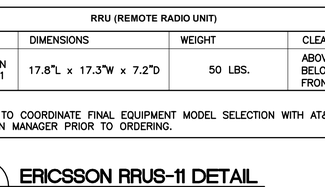


RRUS-E2

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS-E2	20.4"L x 18.5"W x 7.5"D	59.5 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 / C-3 ERICSSON RRUS-E2 DETAIL
SCALE: 1" = 1'-0"

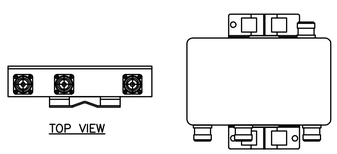


RRUS-11

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS-11	17.8"L x 17.3"W x 7.2"D	50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

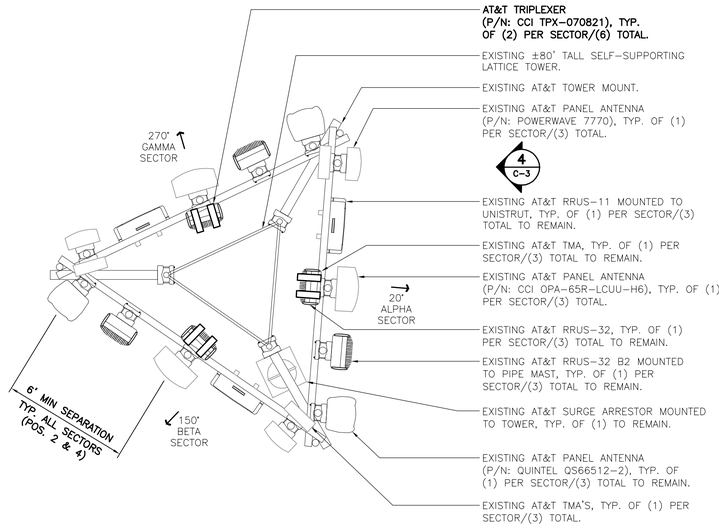
6 / C-3 ERICSSON RRUS-11 DETAIL
SCALE: 1" = 1'-0"



TRIPLEXER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: TPX-070821	5.83"H x 9.65"W x 2.05"D	7.5 LBS.

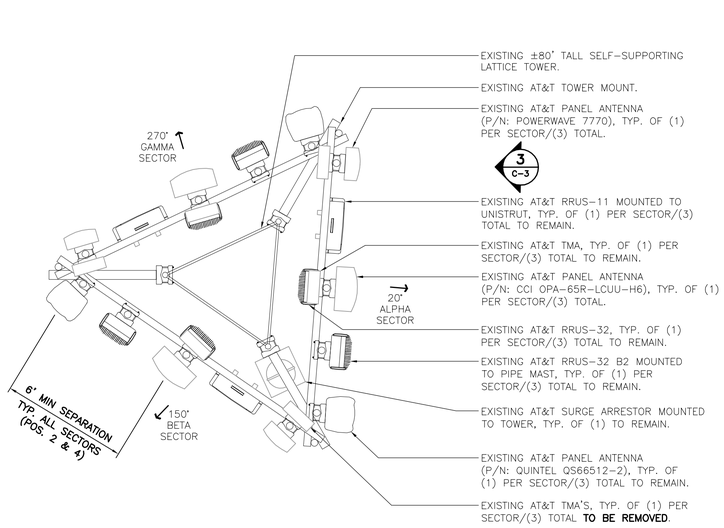
NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

7 / C-3 TRIPLEXER DETAIL
SCALE: NONE



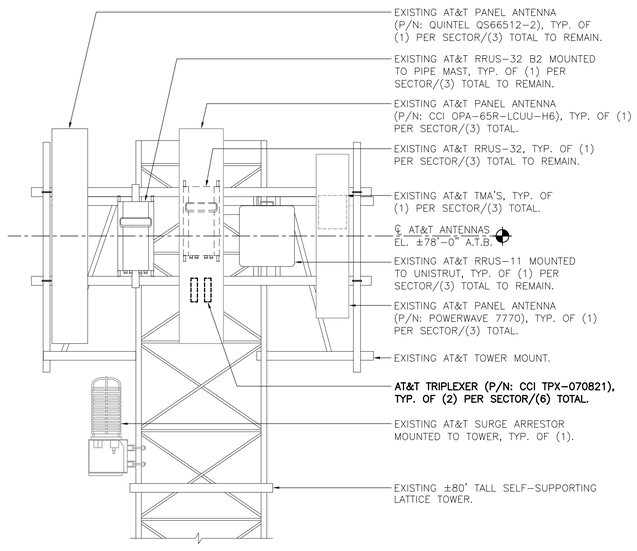
2 / C-3 PROPOSED ANTENNA PLAN
SCALE: 1/2" = 1'-0"

APPROXIMATE NORTH

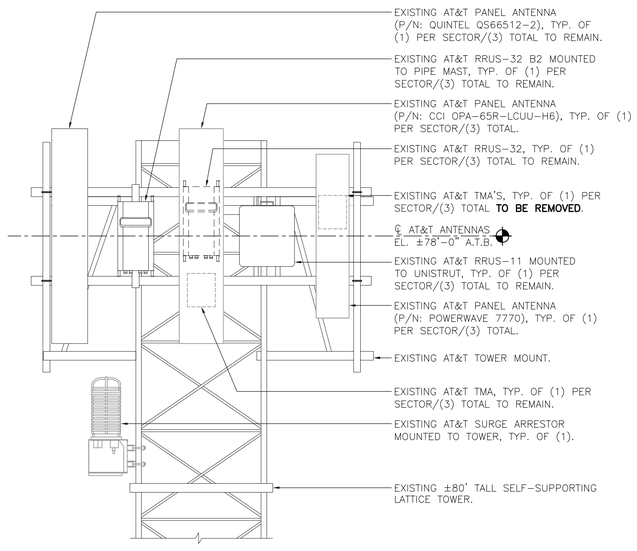


1 / C-3 EXISTING ANTENNA PLAN
SCALE: 1/2" = 1'-0"

APPROXIMATE NORTH



4 / C-3 PROPOSED ANTENNA ELEVATION
SCALE: 1/2" = 1'-0"



3 / C-3 EXISTING ANTENNA ELEVATION
SCALE: 1/2" = 1'-0"

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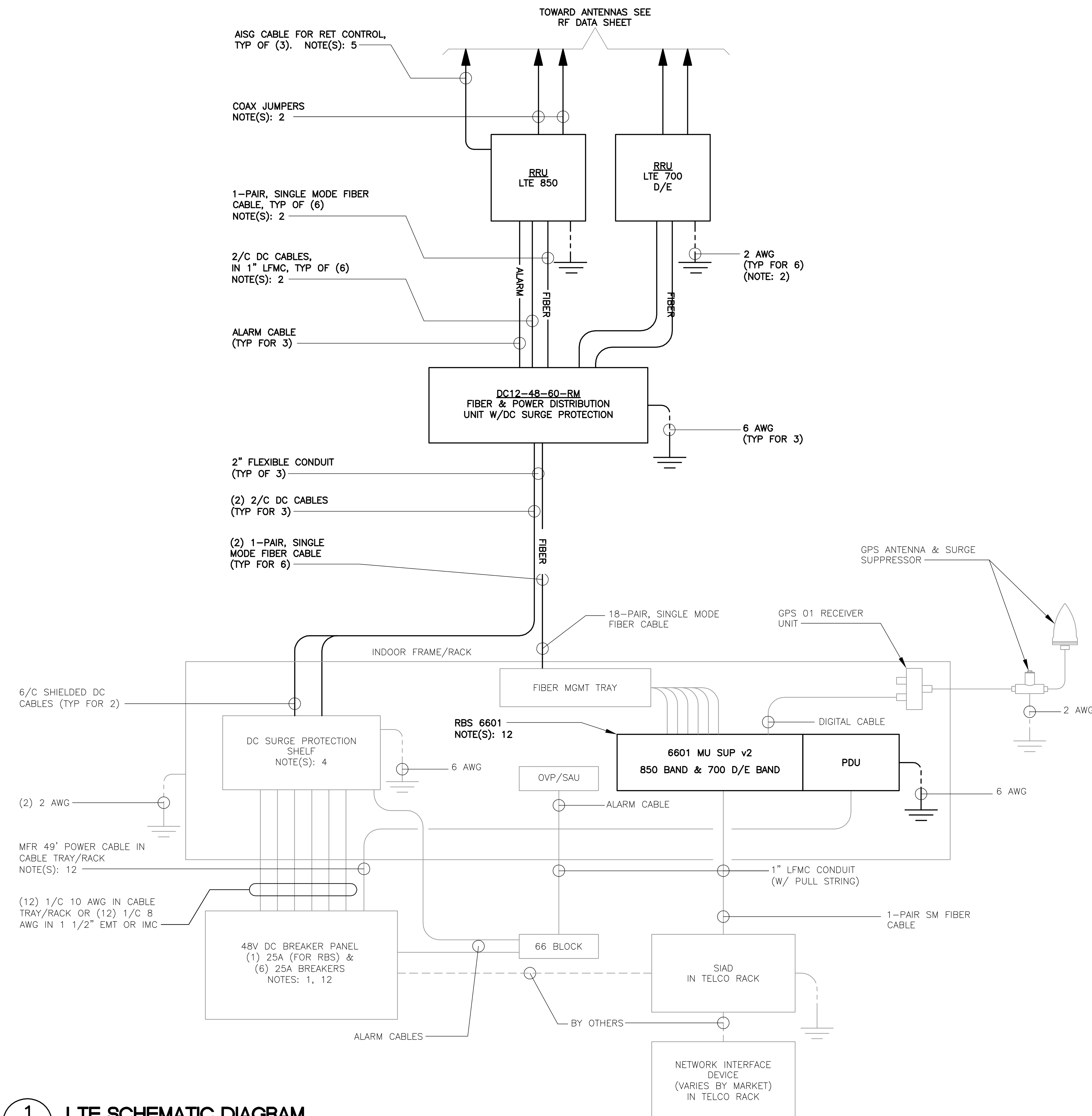
LTE 4C/5C EQUIPMENT DETAILS

C-3

Sheet No. 5 of 8



1 E-1 **LTE SCHEMATIC DIAGRAM**

NOT TO SCALE

LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx-48-60-RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6-48-60-18-8F.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP-IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
10. FIBER OPTIC CABLES SHALL BE INSTALLED IN FLEXIBLE CONDUIT AS SCOPED BY MARKET.
11. RET CONTROL FROM THE RRU IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
12. RBS 6601 VARIANT 2 REQUIRES A 25A BREAKER AND 10 AWG (MIN.) CONDUCTORS. REPLACE EXISTING 15A OR 20A BREAKERS AND 12 AWG CONDUCTORS WHEN UPGRADING AN EXISTING RBS 6601 VARIANT 1.

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION.
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

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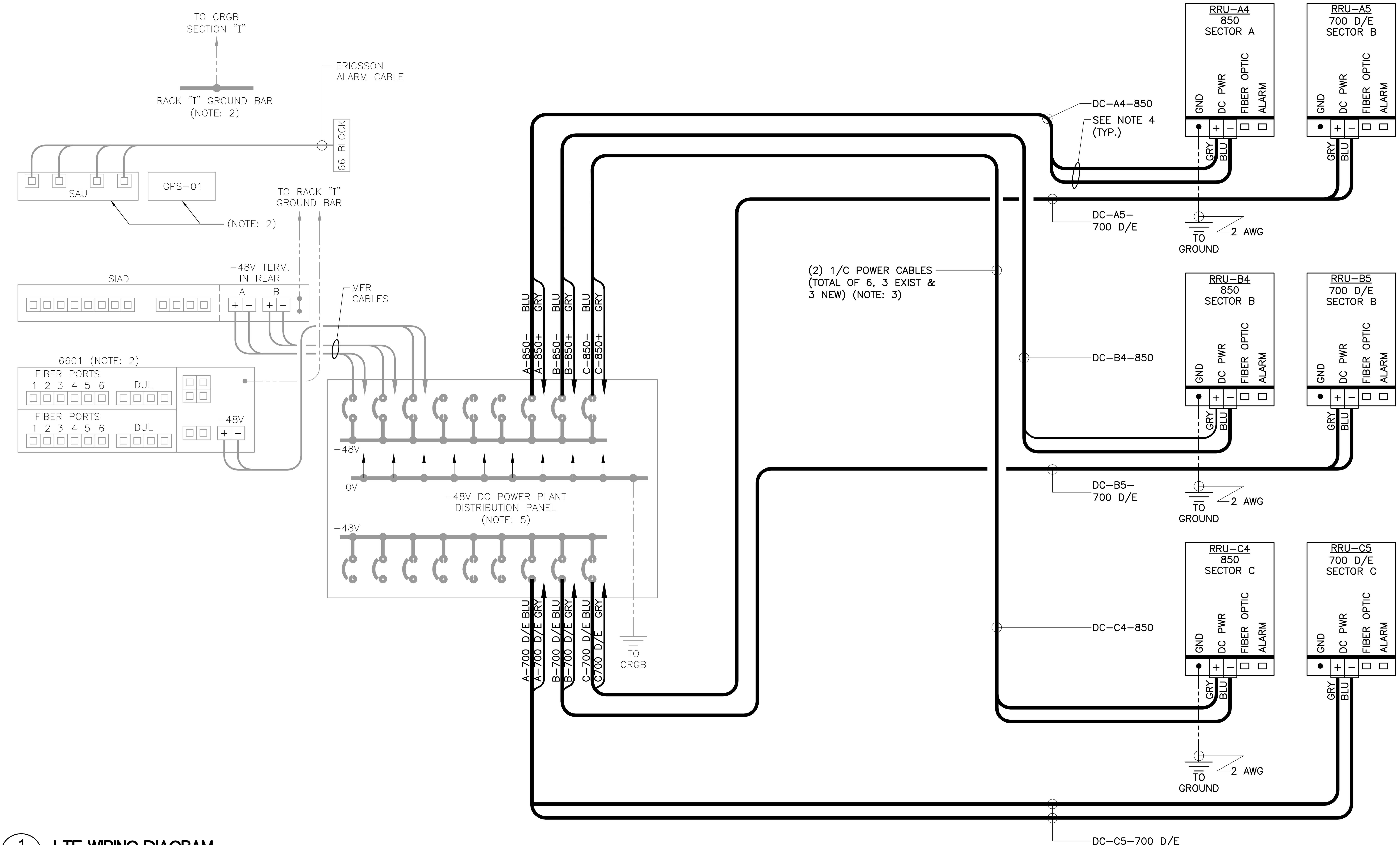
LTE SCHEMATIC DIAGRAM AND NOTES

E-1



1 E-2 **LTE WIRING DIAGRAM**

NOT TO SCALE

LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A–1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI–CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN–TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E–1 FOR BREAKER RATING.

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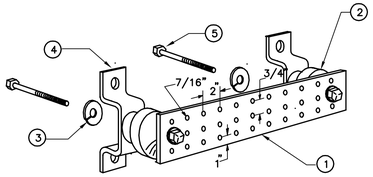
LTE WIRING DIAGRAM

E-2

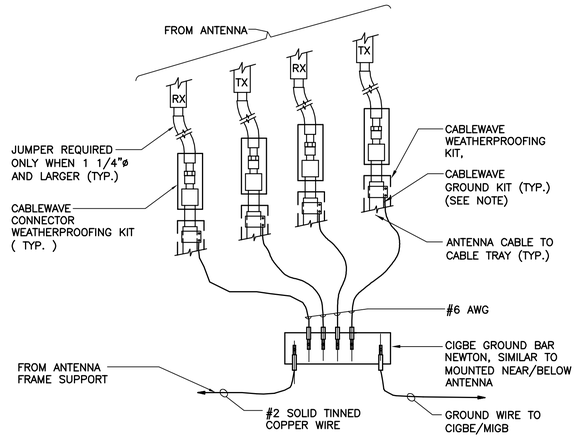
Sheet No. 7 of 8



LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061–4.
3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015–8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A–6056.
5. STAINLESS STEEL SECURITY SCREWS.

3 / E-3 **GROUND BAR DETAIL**
NOT TO SCALE



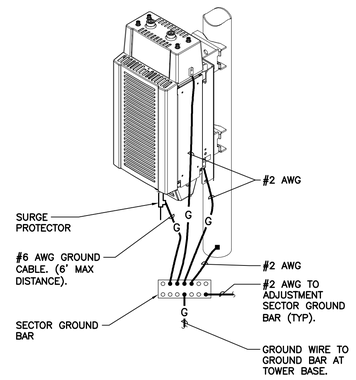
NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

2 / E-3 **CONNECTION OF GROUND WIRES TO GROUND BAR**
NOT TO SCALE

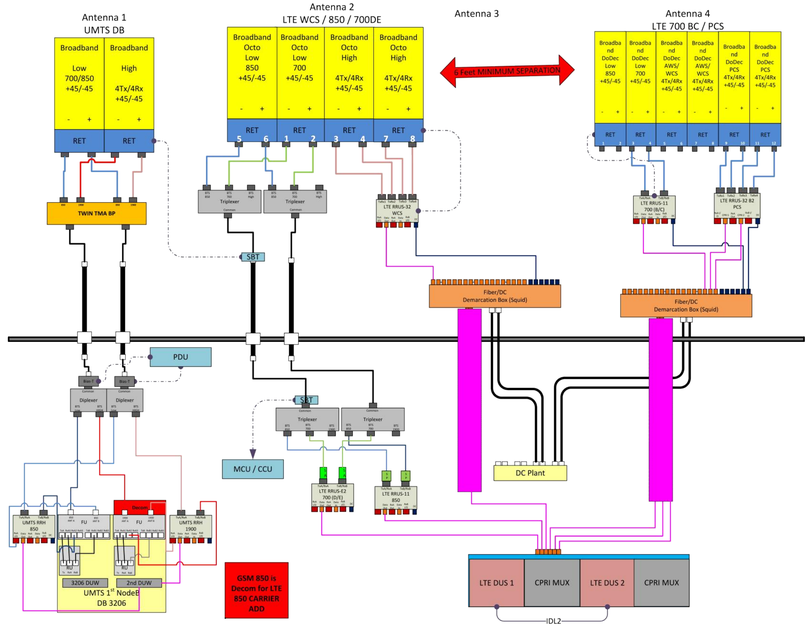
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



1 / E-3 **RRU POLE MOUNT GROUNDING**
NOT TO SCALE

Diagram - Sector	A	Diagram File Name - CT2168_A_B_C_BmRRH_4C_5C_Rev1.vsd					
Atoll Site Name -	CTU2168	Location Name -	MT TOM WALLINGFORD	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							



4 / E-3 **RF PLUMBING DIAGRAM**
NOT TO SCALE

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MT. TOM WALLINGFORD
CT2168 - LTE 4C/5C
23 WAYNE ROAD
WALLINGFORD, CT 06492

DATE:	12/20/16
SCALE:	AS NOTED
JOB NO.	16071.92

TYPICAL ELECTRICAL DETAILS & NOTES

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