



January 24, 2019

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

Regarding: Notice of Exempt Modification – Antenna Modification  
Property Address: 975 Mix Avenue, Hamden, CT 06514 (the “Property”)  
Applicant: AT&T Mobility (“AT&T”, Site # CT2035)

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 65-foot Steel Platform at the above-referenced address, latitude 41° 22’ 42.78”, longitude -72° 55’ 4.32”. Said Steel Platform is owned by Chestnut Hill North LLC.

AT&T desires to modify its existing telecommunications facility by adding (3) antennas and their associated cabling and ancillary equipment, add (6) remote-radio heads (“RRHs”), add (6) diplexers, and add (1) surge arrester (squid). The centerline height of the existing antennas is and will remain at 61 feet.

Please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72 (b)(2). In accordance with R.C.S.A. §16-50j-73, a copy of this letter is being sent to The Honorable Curt B. Leng as Mayor, Town of Hamden, Dan Kops as Town Planner and Zoning of Town of Hamden and Chestnut Hill North LLC the Tower/Property Owner.

The planned modifications to AT&T’s facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72 (b)(2). Specifically:

1. The planned modification will not result in an increase in the height of the existing structure. The added antennas and accessory equipment along with equipment to be swapped will be installed at the existing height of 61 feet on the 65-foot Steel Platform.
2. The proposed modifications will not involve any changes to ground-mounted equipment, and therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above Federal Communications Commission (FCC) safety standard. An RF emissions calculation (enclosed) for AT&T's modified facility is herein provided.
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 AT&T's proposed modifications (please see enclosed structural analysis completed by Centek Engineering, dated November 2, 2018).

For the foregoing reasons, AT&T respectfully requests that the proposed antennas and remote-radio head installation be allowed within the exempt modifications under R.C.S.A. §16-50j-72 (b)(2).

Sincerely,

*Nora Oliver*

Nora Oliver  
Site Acquisition Manager

Enclosures: Exhibit 1 – Field Card and GIS Map  
Exhibit 2 – Construction Drawings  
Exhibit 3 – Structural Analysis  
Exhibit 4 – RF Emissions Analysis Report Evaluation

cc:  
The Honorable Curt B. Leng, Mayor, Town of Hamden  
Dan Kops, Town Planner and Zoning, Town of Hamden  
Chestnut Hill North LLC the Tower/Property Owner.



# TOWN OF HAMDEN, CONNECTICUT

GEOGRAPHIC & PROPERTY INFORMATION NETWORK



2750 DIXWELL AVENUE  
HAMDEN, CT 06518  
203-287-2500  
E-MAIL: GENERAL INFORMATION

## ❖ MAIN MENU

[GIS HOME](#)

**>** [GIS PROPERTY MAP SEARCH](#)

[TOWN WIDE MAP GALLERY](#)

[TOWN GRID MAPS](#)

[INTERACTIVE MAPPING](#)

[HELP](#)

## ❖ SUMMARY PARCEL INFORMATION & MAP DOCUMENTS

### Detailed Parcel Information

**Parcel No**  
2628-101-00-0000

**Unique ID**  
100226

**Account**  
100226

**Owner**  
CHESTNUT HILL NORTH LLC

**Location**  
905 MIX AVE

**MAILING ADDRESS**  
1621 STATE STREET  
NEW HAVEN CT 06511



#### PROPERTY INFO DATA UPDATED

Nightly

#### CURRENT PARCEL COUNT

16,754 +/-

[Scroll Down For Complete Property Detail](#)

*Click on the Google logo to go to Google Maps*

### Parcel Documents

[Create Parcel Map](#)

[Property Summary Card](#)

## Full Size Assessor Maps

[Full Assessor Map](#)

## Interactive GIS Maps of Property

[GO TO VIRTUAL EARTH BIRDS EYE!](#)

[GO TO INTERACTIVE MAP!](#)

Once in Interactive Map, Select Parcel and enter Abutters distance.

## PARCEL VALUATIONS

	Appraised Value	Assessed Value
Buildings	9033700	6323590
Outbuildings	406600	284620
Improvements	9551100	6685770
Extra Features	110800	77560
Land	5845500	4091850
TOTAL:	15396600	10777620

## PROPERTY INFORMATION

Land Acres	8.6
Land Use	APT Over 8
Land Class	C
Zoning	R5
Neighborhood	100
Lot Description	Rolling
Lot Setting	Urban
Lot Utilities	All Public
Street Description	Paved

## SALE INFORMATION

Sale Date	10/29/2015
Sale Price	0
Book / Page	4265/ 086

## BUILDING AREA

Gross Building Area	
Total Living Area	0

## CONSTRUCTION DETAILS

Building Style	Apartments
Building Use	Comm/Ind
Number of Rooms	

Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	3
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Brick Veneer
Secondary Exterior Wall Type	
Primary Interior Wall Type	Drywall
Secondary Interior Wall Type	
Primary Floor Type	Carpet
Secondary Floor Type	
Heating Type	Hot Water
Heating Fuel	Gas
Air Conditioning Type	Central
Building Style	Apartments
Building Use	Comm/Ind
Number of Rooms	
Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	3
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Brick Veneer
Secondary Exterior Wall Type	
Primary Interior Wall Type	Drywall
Secondary Interior Wall Type	
Primary Floor Type	Carpet
Secondary Floor Type	
Heating Type	Hot Water
Heating Fuel	Gas
Air Conditioning Type	None
Building Style	Apartments
Building Use	Comm/Ind
Number of Rooms	
Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	3
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Brick Masonry
Secondary Exterior Wall Type	
Primary Interior Wall Type	Drywall
Secondary Interior Wall Type	
Primary Floor Type	Carpet
Secondary Floor Type	
Heating Type	Hot Water
Heating Fuel	Gas
Air Conditioning Type	None

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Building Use  
All information is intended for your general knowledge only and is not a substitute for contacting the Town Hall or other  
Number of Rooms  
Number of Bedrooms  
Number of Bathrooms  
Number of Half Bathrooms

You should promptly consult the specific office or department with any questions.  
Use of this web site and any information you find through it is subject to the Disclaimer.

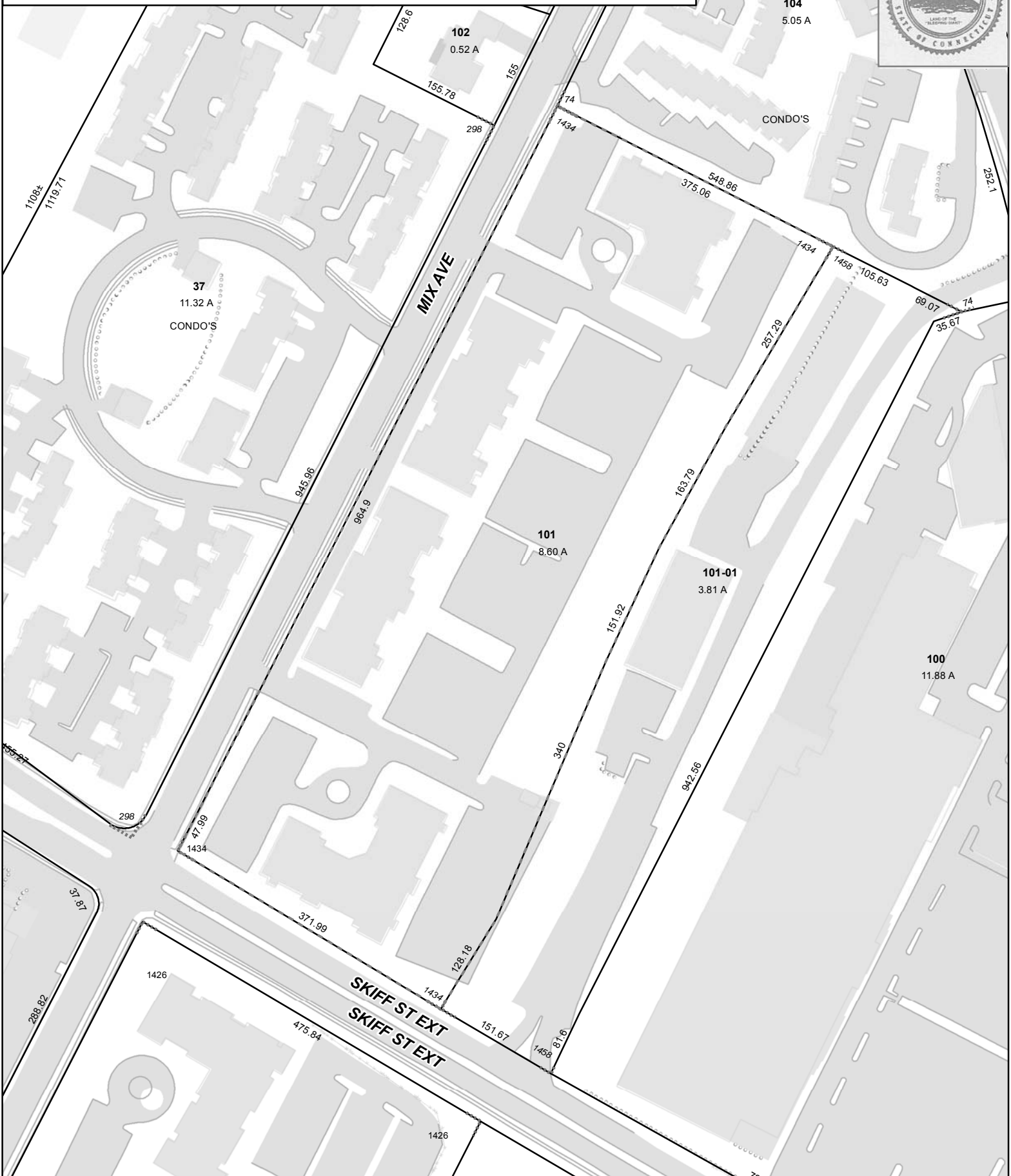
Number of Rooms	0
Number of Bedrooms	
Number of Bathrooms	
Number of Half Bathrooms	
Kitchen Style	
Stories	3
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Brick Veneer
Secondary Exterior Wall Type	
Primary Interior Wall Type	Drywall
Secondary Interior Wall Type	
Primary Floor Type	Carpet
Secondary Floor Type	
Heating Type	Hot Water
Heating Fuel	Gas
Air Conditioning Type	Central

[Back](#) | [New Search](#) | [Town of Hamden](#)

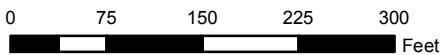
# Town of Hamden, Connecticut - Assessment Parcel Map

Parcel: 2628-101-00-0000

Address: 905 MIX AVE



Approximate Scale: 1 inch = 150 feet



Map Produced: March 2018

Disclaimer: This map is for informational purposes only. All information is subject to verification by any user. The Town of Hamden and its mapping contractors assume no legal responsibility for the information contained herein.



# WIRELESS COMMUNICATIONS FACILITY CT2035 - LTE 6C AWS/7C UPPER D/5G 850 HAMDEN 975 MIX AVENUE HAMDEN, CT 06514

### GENERAL NOTES

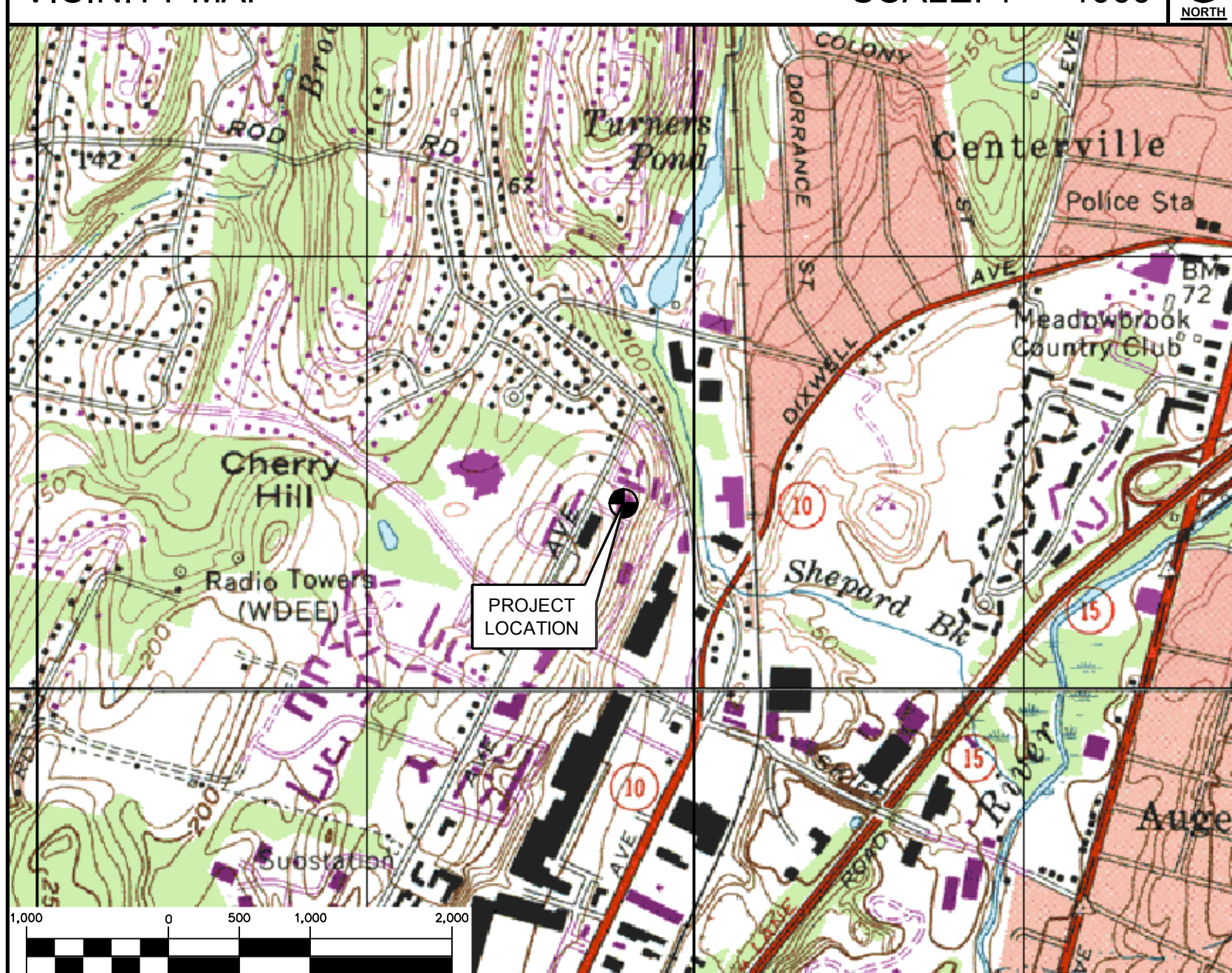
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA-222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2016 CONNECTICUT FIRE SAFETY CODE AND, NATIONAL ELECTRICAL 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

<b>FROM:</b> 500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT	<b>TO:</b> 975 MIX AVENUE HAMDEN, CONNECTICUT
1. TAKE RAMP LEFT FOR I-91 SOUTH	9.7 MI
2. AT EXIT 17, TAKE RAMP RIGHT FOR CT-15 SOUTH TOWARD W. CROSS PKWY / E. MAIN ST	14.6 MI
3. AT EXIT 60, TAKE RAMP RIGHT FOR CT-10 TOWARD NEW HAVEN / HAMDEN	0.2 MI
4. TURN LEFT ONTO CT-10 / DIXWELL AVE	0.7 MI
5. TURN LEFT ONTO SKIFF ST	0.3 MI
6. TURN RIGHT ONTO MIX AVE	0.2 MI
7. ARRIVE AT 975 MIX AVE, HAMDEN, CT 06514	

### 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. **AT ANTENNA SECTORS:**
    - INSTALL (1) NEW 8-PORT ANTENNA AT POS.3 (1 PER SECTOR)
    - REMOVE (3) EXISTING RRUS-12'S (1 PER SECTOR)
    - INSTALL (3) NEW B14 4478 (1 PER SECTOR)
    - INSTALL (3) NEW 4478 B5 (1 PER SECTOR)
    - INSTALL (3) NEW 4426 B66 (1 PER SECTOR)
    - INSTALL (6) NEW LOW-BAND COMBINERS (2 PER SECTOR)
    - INSTALL (1) NEW DC FIBER SQUID
    - REPLACE EXISTING ANTENNA MOUNT FOR A NEW TRI-PLATFORM MOUNT TO ACHIEVE REQUIRED LTE CLEARANCES
    - INSTALL (9) NEW DUAL SWIVEL MOUNTS TO ACCOMMODATE (E/P) RRU'S (RADIO REMOTE UNITS)
    - RELOCATE EXISTING RRUS (RADIO REMOTE UNITS) FROM EXISTING POSITION ONTO PROPOSED ANTENNA MOUNT
    - RELOCATE EXISTING SURGE ARRESTORS
  - B. **AT THE EQUIPMENT AREA**
    - REMOVE AND REPLACE (2) EXISTING DUL DUS
    - INSTALL (2) 5216 UNITS
    - INSTALL (1) NEW IDLE
    - INSTALL (1) NEW RBS 6630
    - REMOVE (1) EXISTING DC6 RAYCAP
    - INSTALL (1) DC12 RAYCAP
    - INSTALL (2) DC TRUNKS

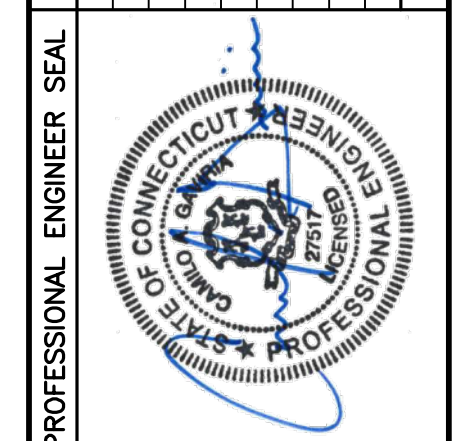
### PROJECT INFORMATION

AT&T SITE NUMBER:	CT2035
AT&T SITE NAME:	HAMDEN
SITE ADDRESS:	975 MIX AVENUE HAMDEN, CT 06514
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
AT&T PACE ID NUMBER:	PACE JOB 1 - MRCTB032299 PACE JOB 2 - MRCTB032288 PACE JOB 3 - MRCTB032250
AT&T FA LOCATION CODE:	10035036
ENGINEER:	CEN TEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-22'-42.81" N LONGITUDE: 72°-55'-05.40" W GROUND ELEVATION: ±177' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

### SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES, SPECIFICATIONS AND ANTENNA SCHEDULE	0
C-1	PLANS AND ELEVATION	0
C-2	ANTENNA CONFIGURATION DETAILS	0
C-3	DETAILS	0
S-1	ANTENNA MAST DETAILS	0
E-1	SCHEMATIC DIAGRAM AND NOTES	0
E-2	WIRING DIAGRAM	0
E-3	TYPICAL ELECTRICAL DETAILS	0

0	REV.	DATE	11/29/18	DMD	TUL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
						DRAWN BY/CHKD BY/DESCRIPTION



**CEN TEK engineering**  
Centek Solutions  
(203) 488-0380  
(203) 488-3337 Fax  
632 North Branford Road  
Branford, CT 06405  
www.CentekEng.com

**AT&T MOBILITY**  
 WIRELESS COMMUNICATIONS FACILITY  
**HAMDEN**  
 CT2035 - LTE 6C AWS/7C 700 UPPER D/5G 850  
 975 MIX AVENUE  
 HAMDEN, CT 06514

DATE:	08/23/18
SCALE:	AS NOTED
JOB NO.	18000.36

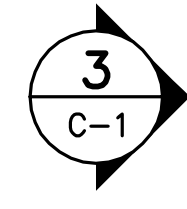
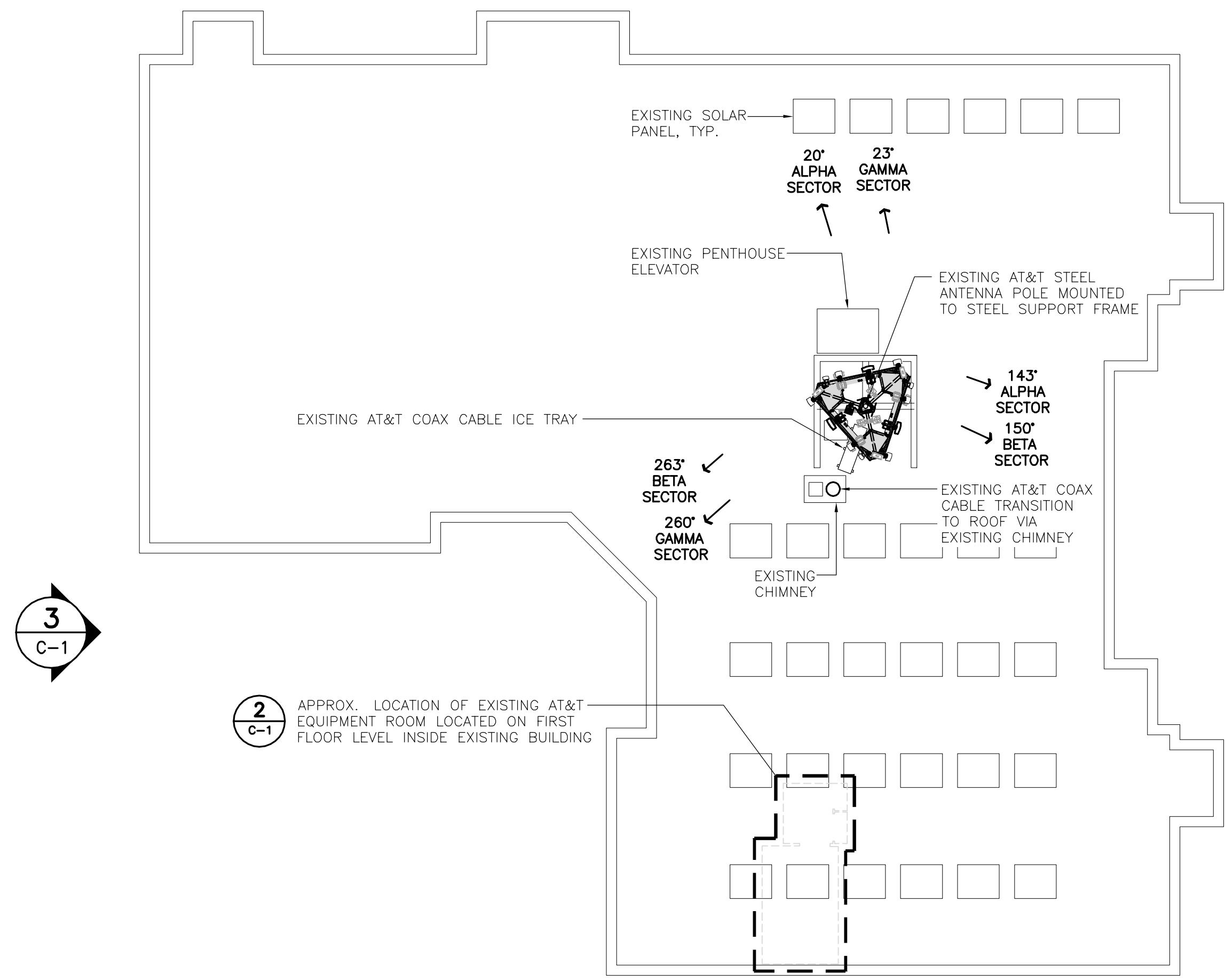
TITLE SHEET

# T-1

Sheet No. 1 of 9

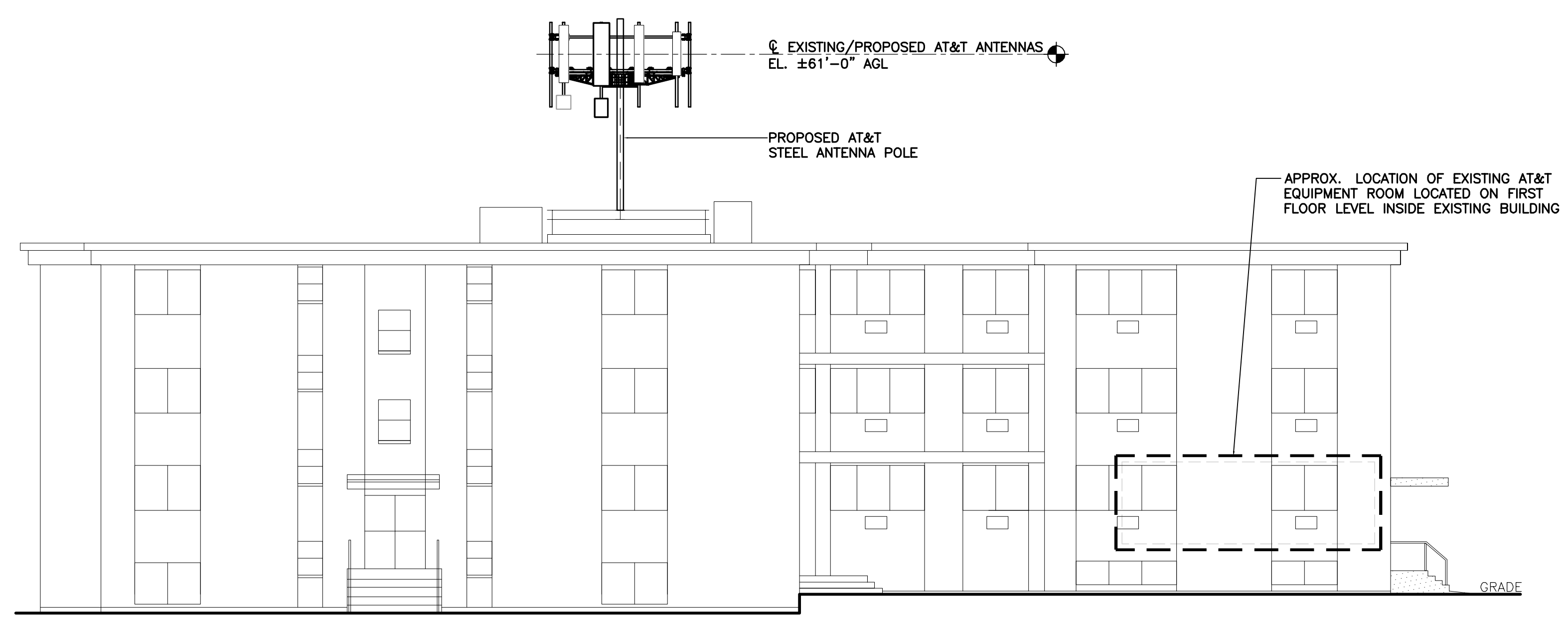
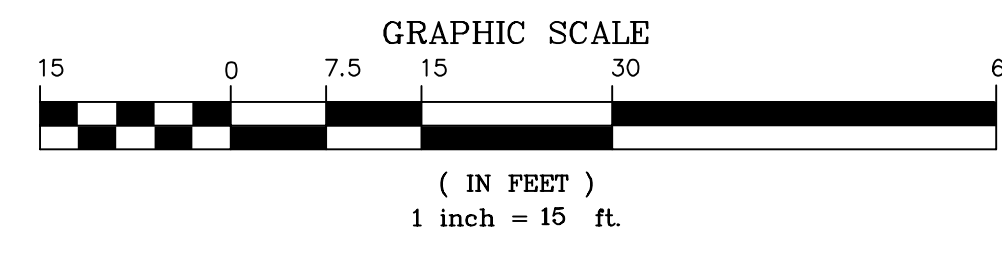




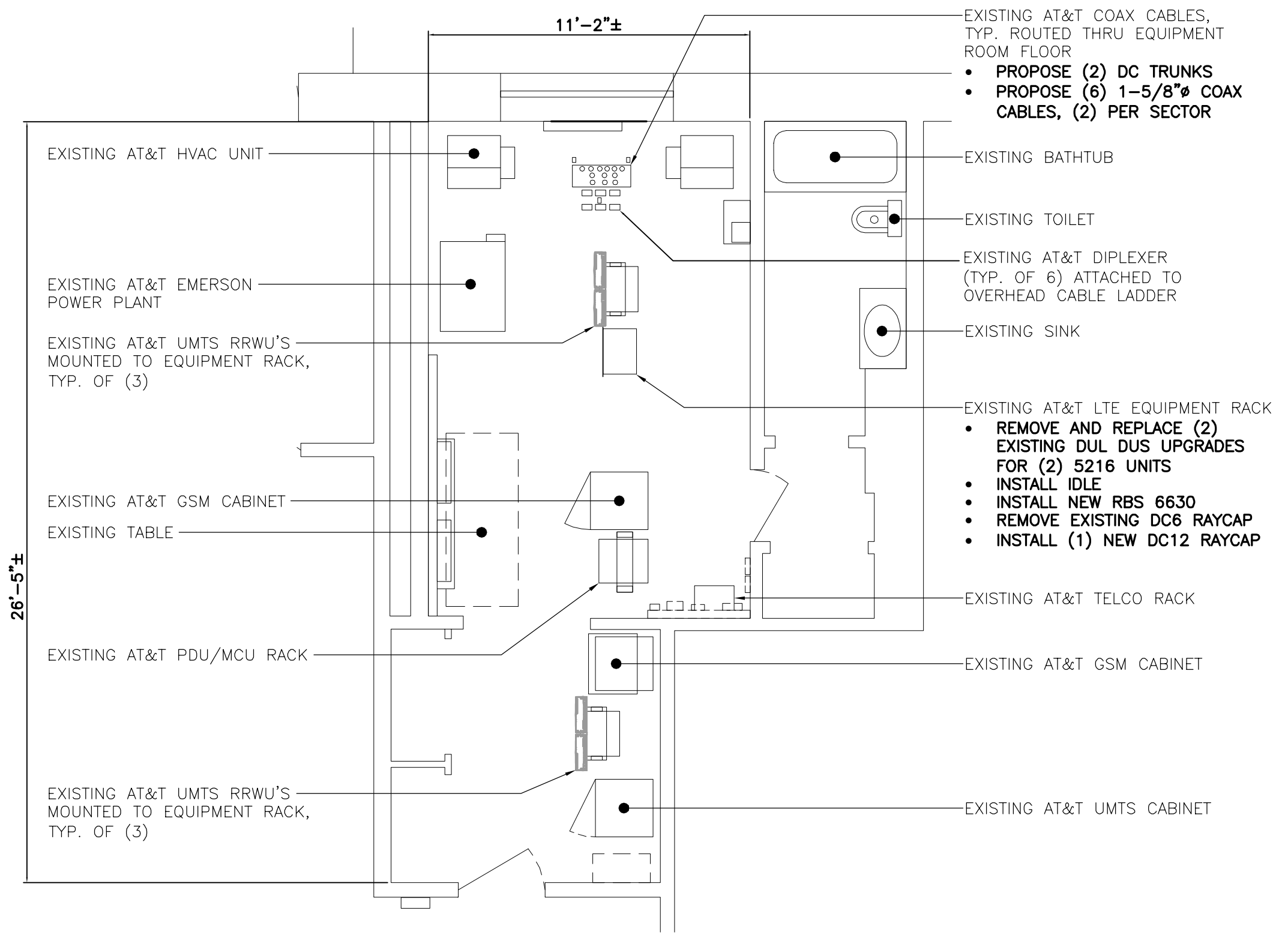
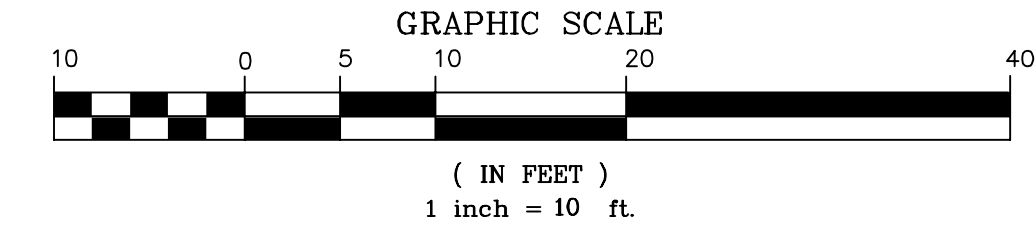


2 APPROX. LOCATION OF EXISTING AT&T EQUIPMENT ROOM LOCATED ON FIRST FLOOR LEVEL INSIDE EXISTING BUILDING

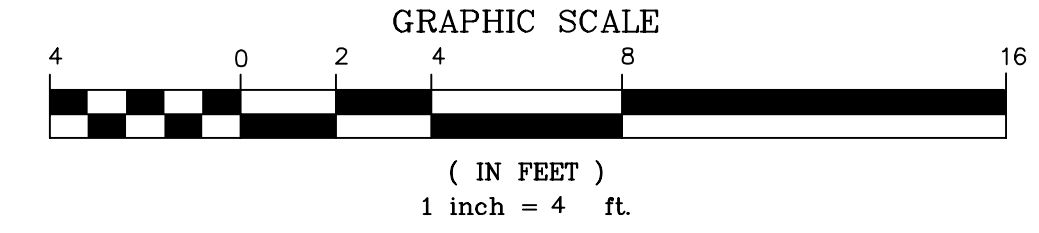
1 ROOF PLAN - PROPOSED  
SCALE: 1" = 15'-0"



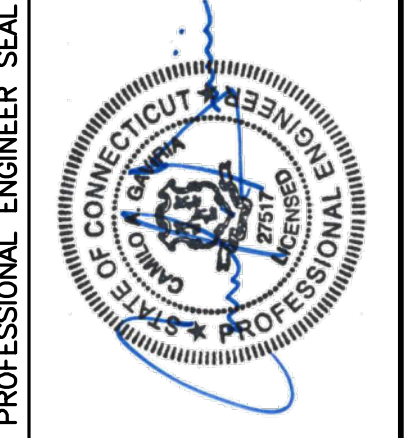
3 NORTHWEST ELEVATION - PROPOSED  
SCALE: 1" = 10'-0"



2 EQUIPMENT ROOM PLAN - PROPOSED  
SCALE: 1/4" = 1'-0"



REV.	DATE	DMD	TJL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	11/28/18			DRAWN BY/CHKD BY/DESCRIPTION



**CENTEK** engineering  
Centered on Solutions  
(203) 488-0380  
(203) 488-3387 Fax  
632 North Branford Road  
Branford, CT 06405  
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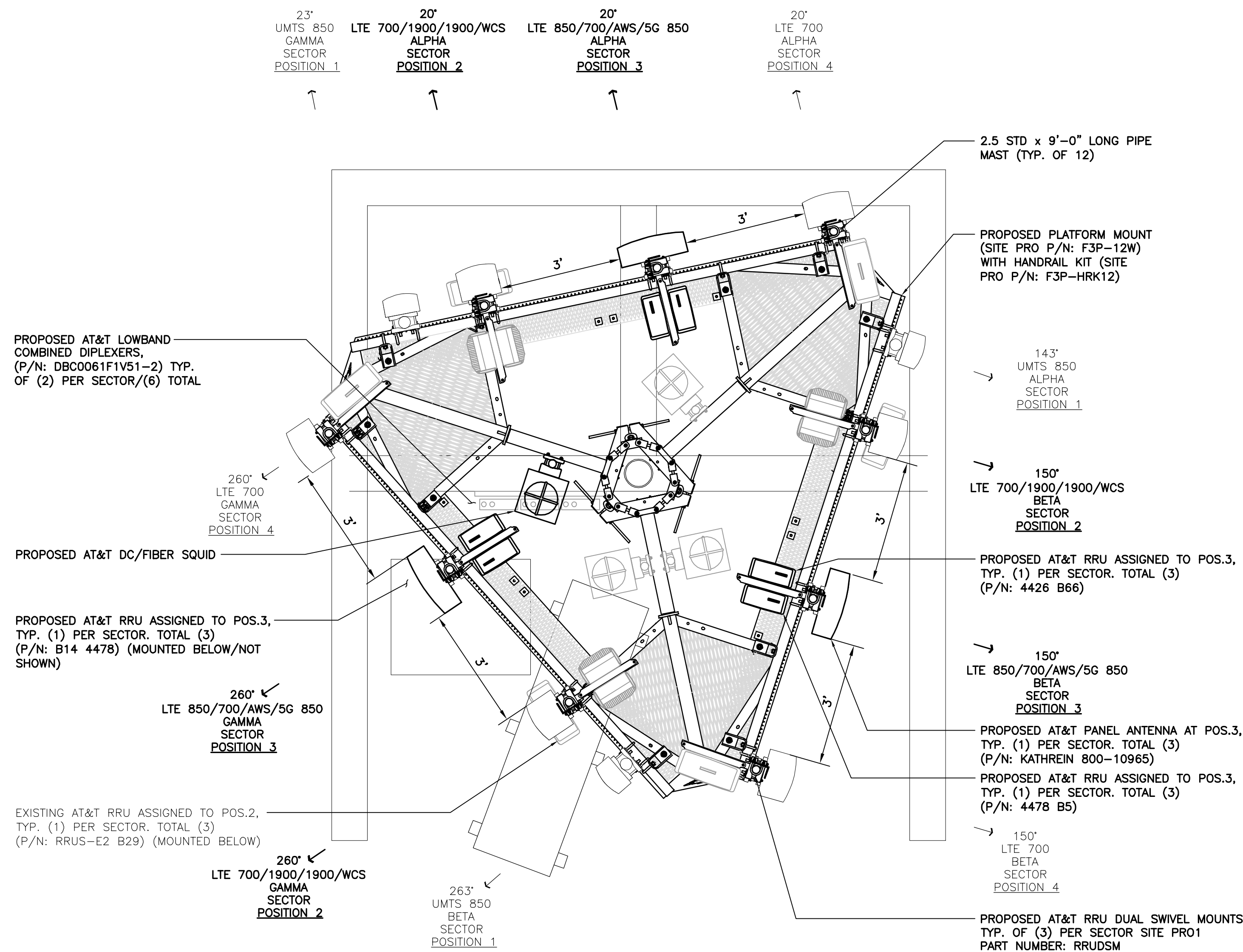
AT&T MOBILITY  
WIRELESS COMMUNICATIONS FACILITY  
**HAMDEN**  
CT2035 - LTE 6C AWS/7C 700 UPPER D/5G 850  
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DATE: 08/23/18  
SCALE: AS NOTED  
JOB NO. 18000.36

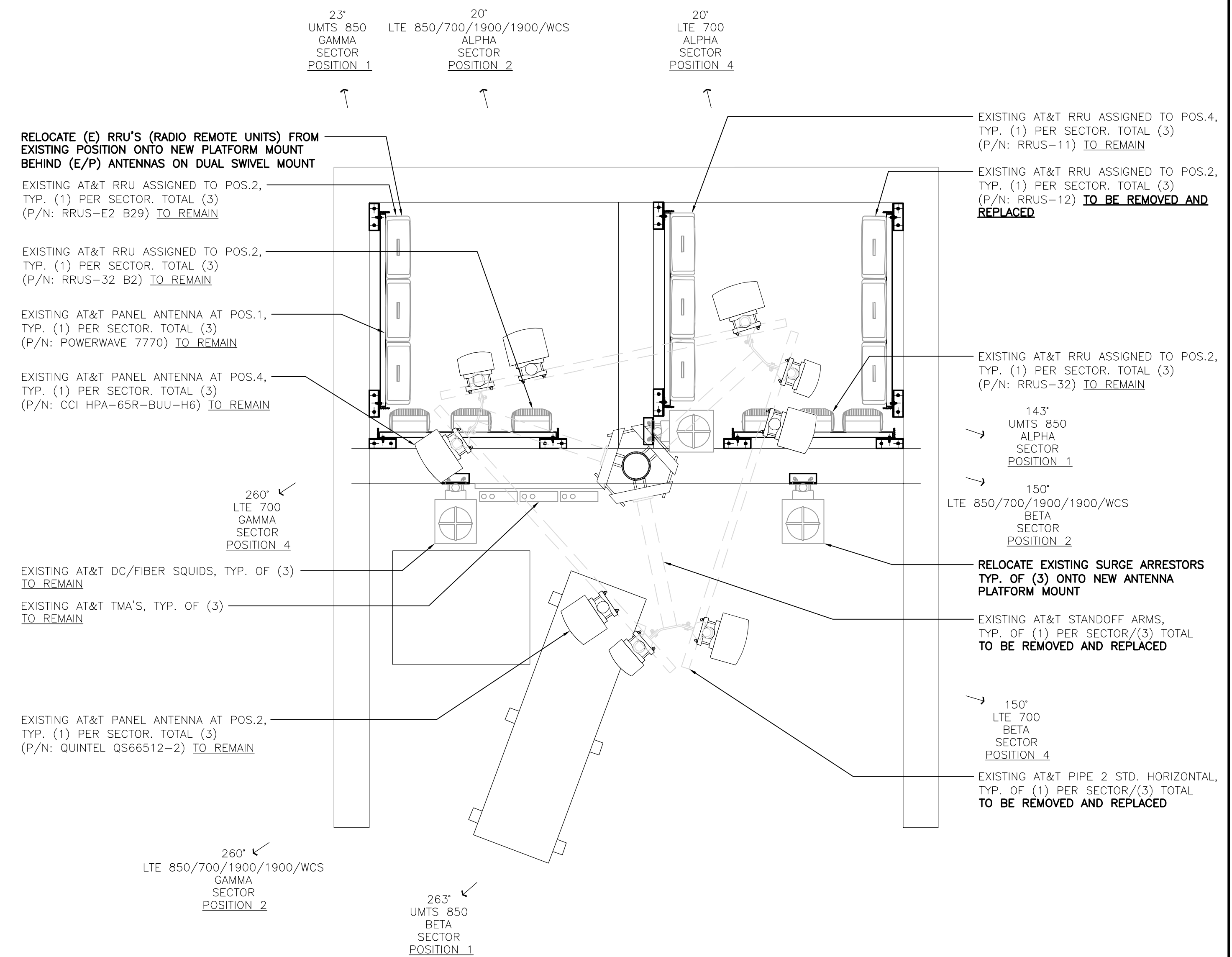
PLANS AND ELEVATION

C-1  
Sheet No. 3 of 9

**NOTE:**  
ALL EXISTING AND/OR PROPOSED RRU'S SHALL BE MOUNTED A MINIMUM OF 8" FROM THE BACK OF ADJACENT AT&T ANTENNA.

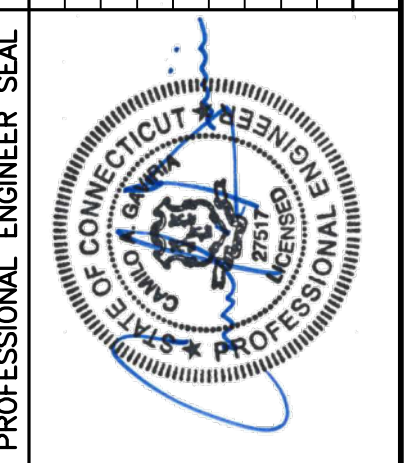


**2 PROPOSED ANTENNA PLAN**  
C-2 SCALE: 1/2" = 1'-0" TRUE NORTH



**1 EXISTING ANTENNA PLAN**  
C-2 SCALE: 1/2" = 1'-0" TRUE NORTH

CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION	TUL	DATE	11/29/18
DRAWN BY/CHKD BY/DESCRIPTION	DMD	REV	0

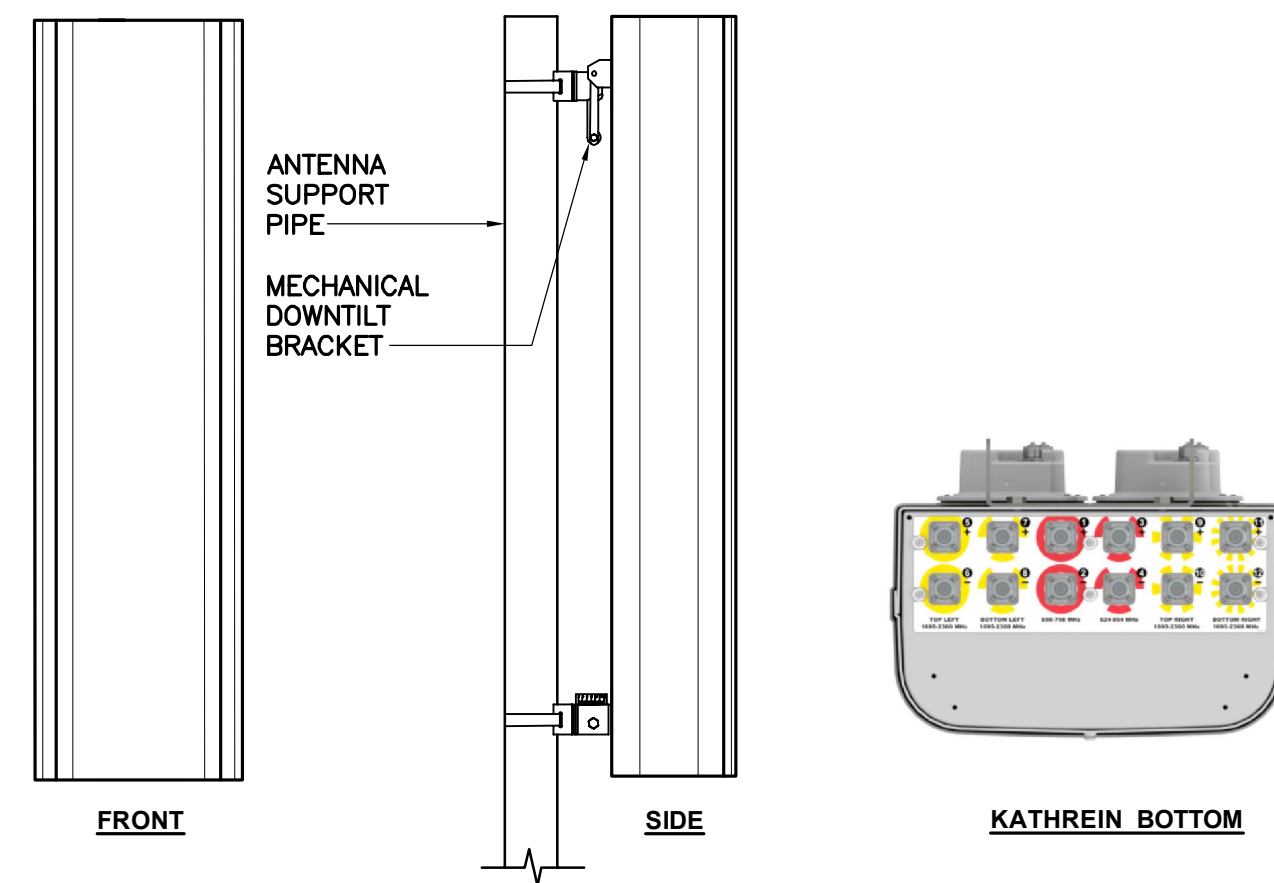


**CENTEK engineering**  
Centered on Solutions  
203-488-0380  
203-488-3387 Fax  
652 North Branford Road  
Branford, CT 06405  
www.CentekEng.com

**AT&T MOBILITY**  
WIRELESS COMMUNICATIONS FACILITY  
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CT2035 - LTE 6C AWS/7C 700 UPPER D/5G 850  
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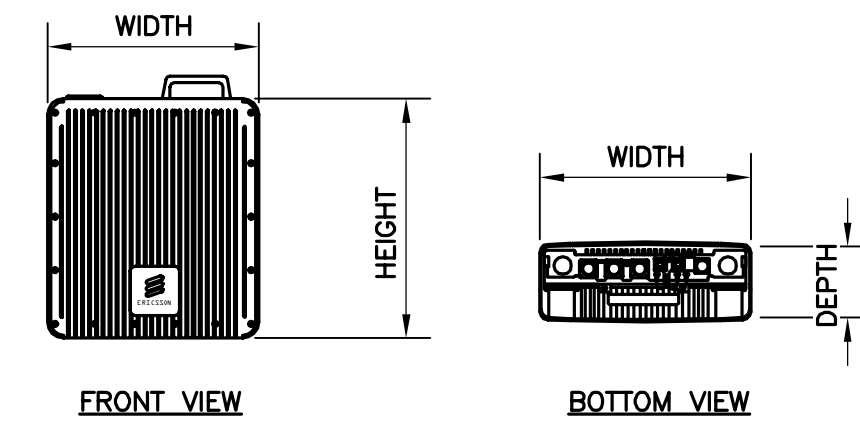
DATE: 08/23/18  
SCALE: AS NOTED  
JOB NO. 18000.36

ANTENNA CONFIGURATION DETAILS



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: KATHREIN MODEL: 800-10965	78.7"L x 20"W x 6.9"D	108.6 LBS.

**1 PROPOSED ANTENNA DETAIL**  
C-3 SCALE: NTS



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: 4426 B66	15.0"L x 13.2"W x 5.8"D	48.5 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.

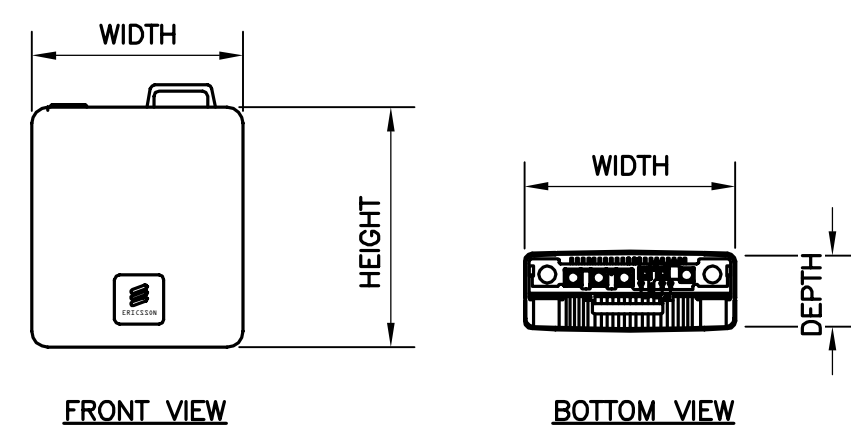
**2 ERICSSON 4426 B66 DETAIL**  
C-3 SCALE: 1" = 1'-0"



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: 4478 B5	16.5"L x 13.4"W x 7.7"D	59.9 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.

**3 ERICSSON 4478 B5 DETAIL**  
C-3 NOT TO SCALE



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: B14 4478	14.9"L x 13.1"W x 7.3"D	60 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.

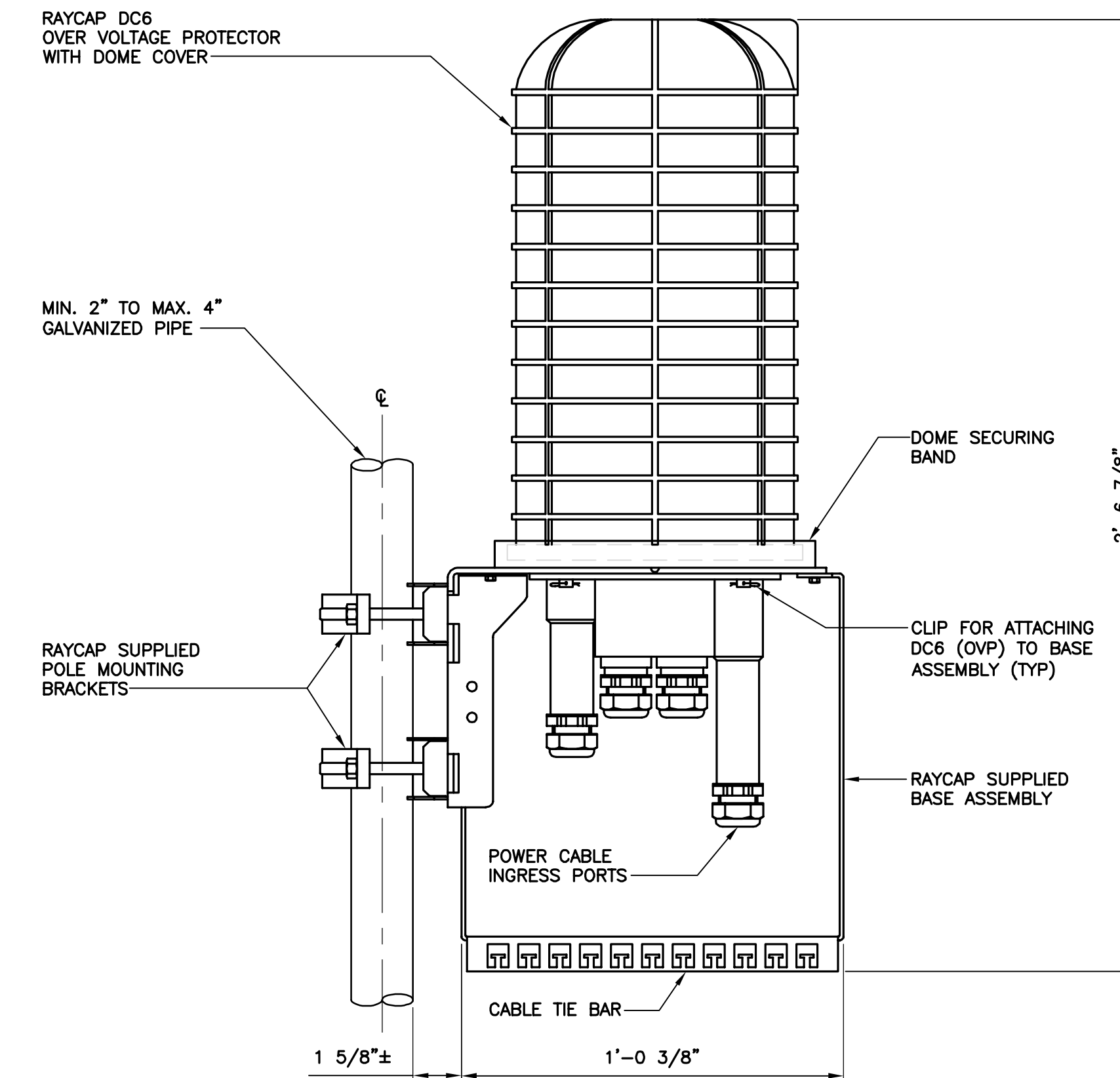
**4 ERICSSON B14 4478 DETAIL**  
C-3 SCALE: 1" = 1'-0"



LOW BAND COMBINER		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: KAEUS MODEL: DBC0061FV51-2	8"H x 1.45"W x 6.2"D	18.3 LBS.

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

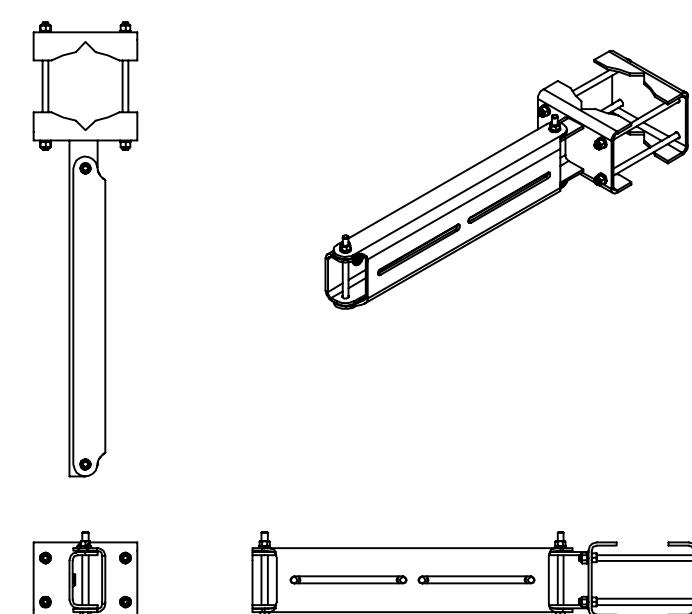
**5 KAEUS DBC0061FV51-2 DETAIL**  
C-3 SCALE: NOT TO SCALE



SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
	MAKE: RAYCAP (SQUID) MODEL: DC6-48-60-18-8F	(1) PER SITE	ANTENNA PLATFORM	20 LBS. (WITHOUT MOUNT)

**NOTES:**  
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.  
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.  
3. RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

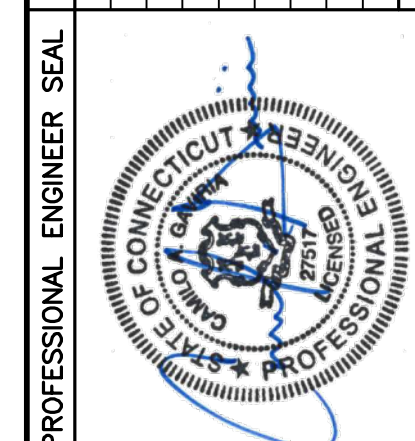
**7 TYPICAL DC FIBER SQUID DETAIL**  
C-3 NOT TO SCALE



RRU DUAL SWIVEL MOUNT		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: SITE PRO 1 PART NO.: RRUDSM	27.75"L x 6.5"W x 4.7"D	39.4 LBS.

**6 RRU DUAL SWIVEL MOUNT DETAIL**  
C-3 NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	TITLE	ISSUED FOR
0	11/29/18	DMD	TUL	CONSTRUCTION DRAWINGS	- ISSUED FOR CONSTRUCTION



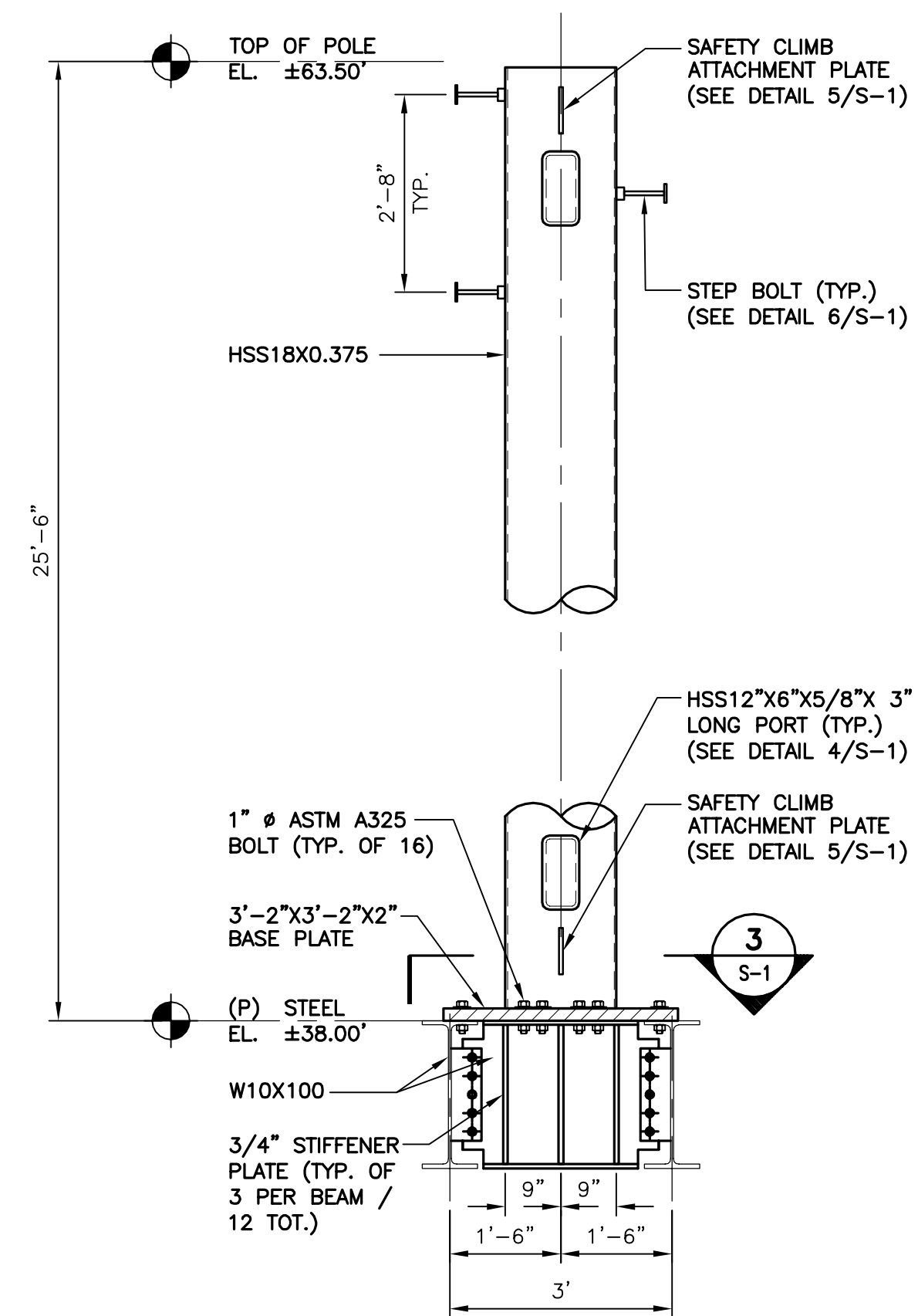
**CENTEX** engineering  
Centered on Solutions  
203 488-0380  
203 488-8387 Fax  
63-2 North Branford Road  
Branford, CT 06405  
www.CentexEng.com

**AT&T MOBILITY**  
WIRELESS COMMUNICATIONS FACILITY  
**HAMDEN**  
CT2035 - LTE 6C AWS/7C 700 UPPER D/5G 850  
975 MIX AVENUE  
HAMDEN, CT 06514

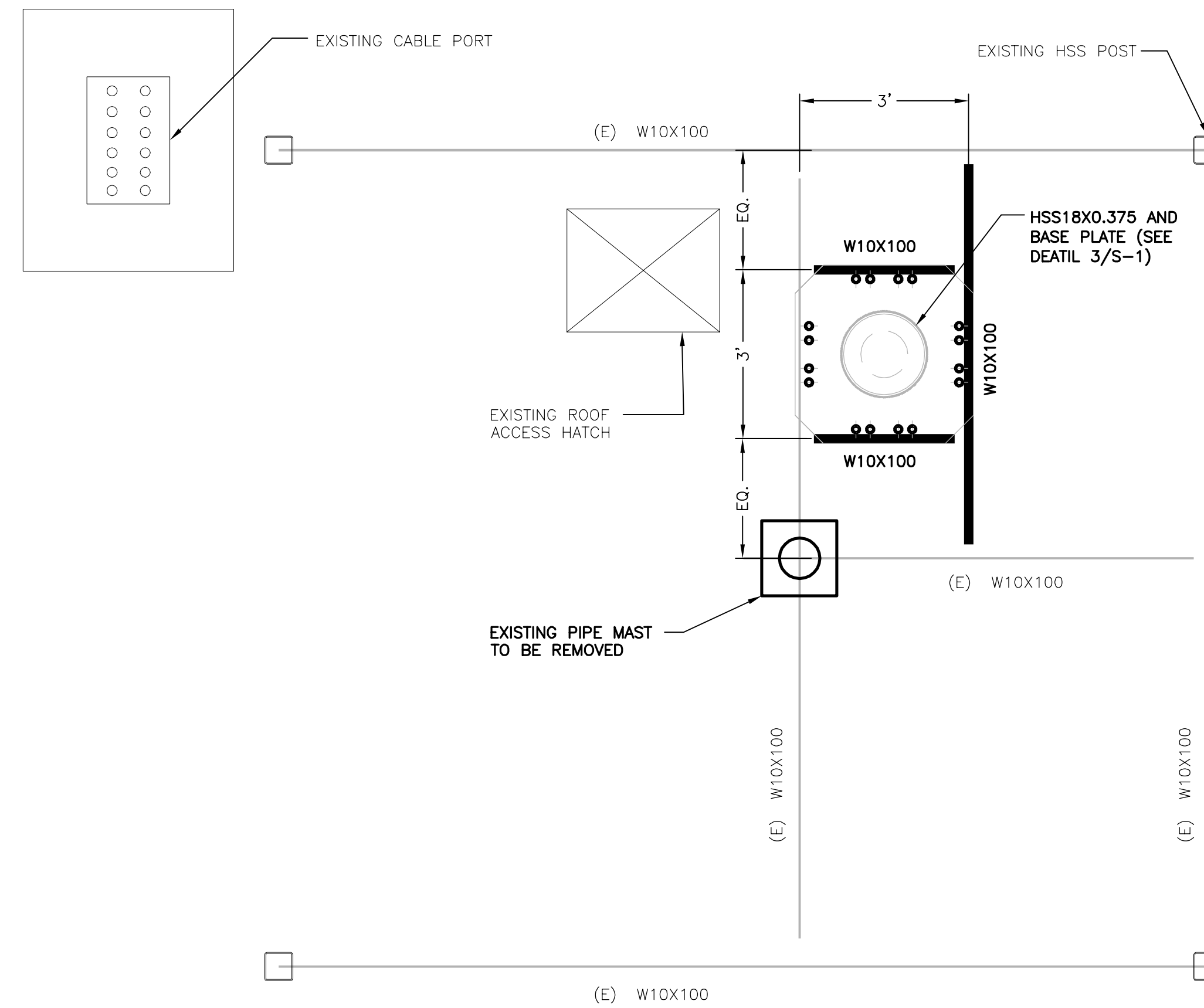
DATE: 08/23/18  
SCALE: AS NOTED  
JOB NO. 18000.36

DETAILS

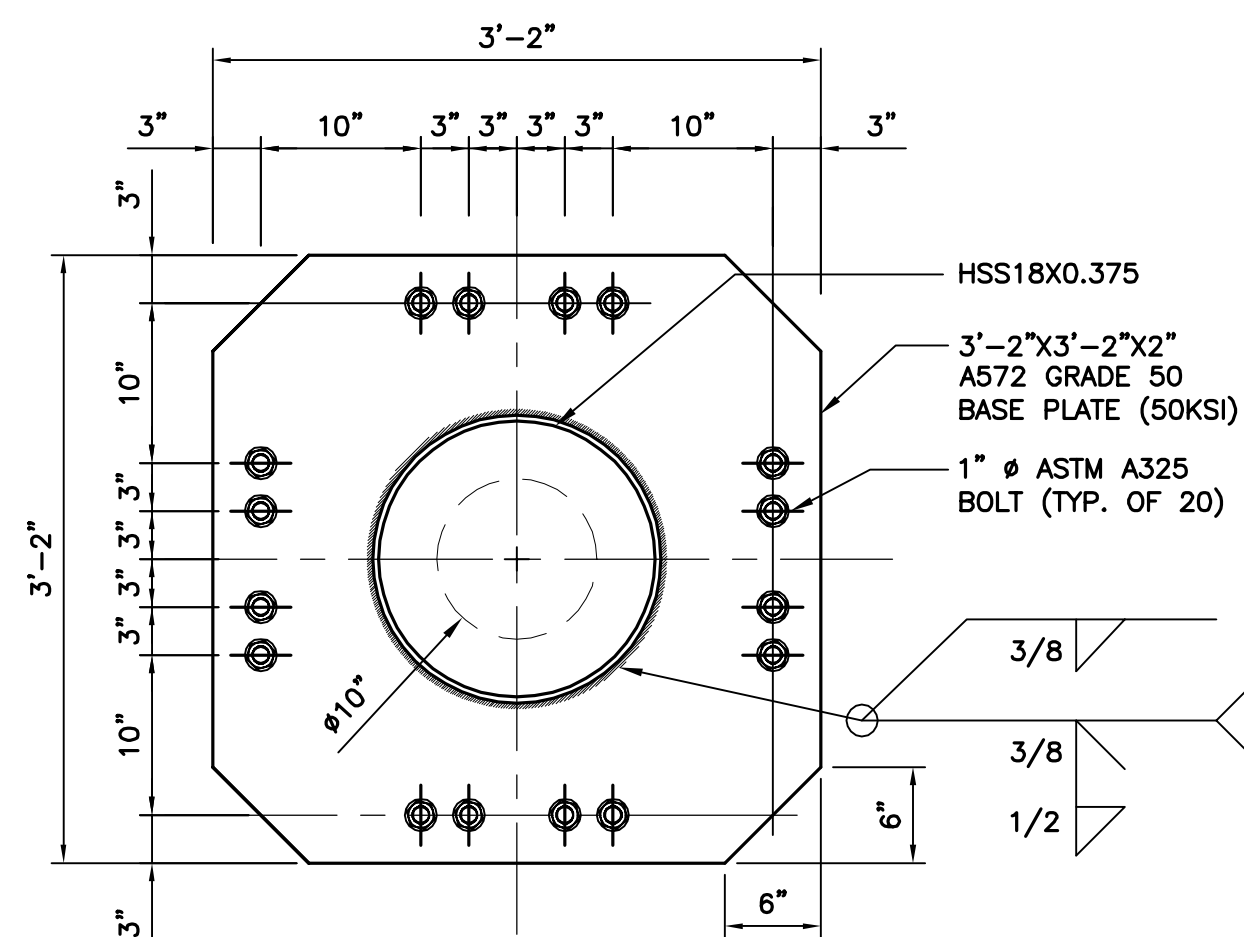
**C-3**  
Sheet No. 5 of 9



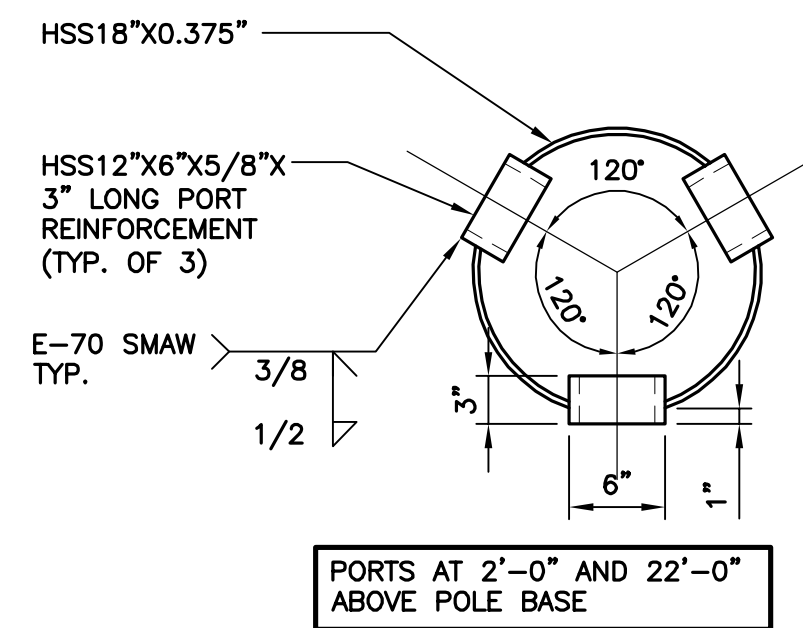
**2 POLE DETAIL**  
S-1 SCALE: 1/2" = 1'-0"



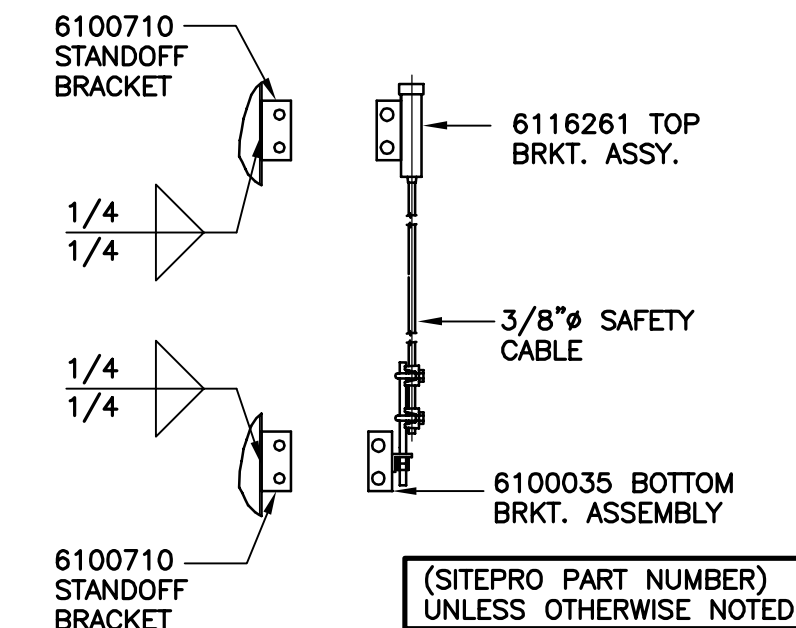
**1 FRAMING PLAN**  
S-1 SCALE: 1/2" = 1'-0"



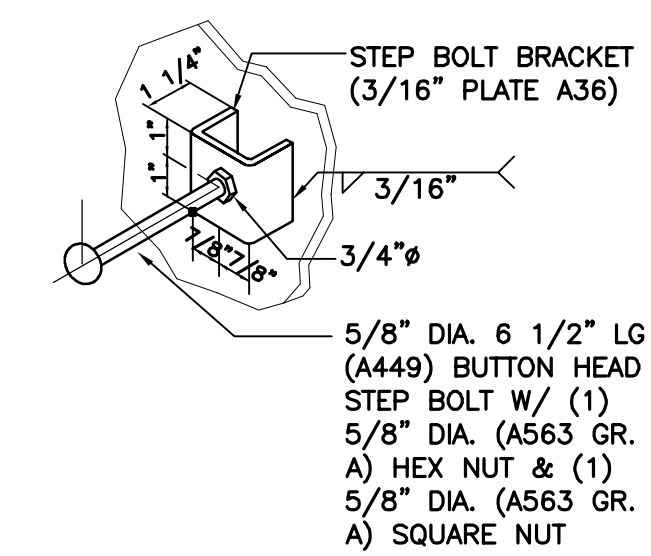
**3 POLE BASE PLATE DETAIL**  
S-1 SCALE: 1" = 1'-0"



**4 PORT DETAIL**  
S-1 SCALE: 1" = 1'-0"

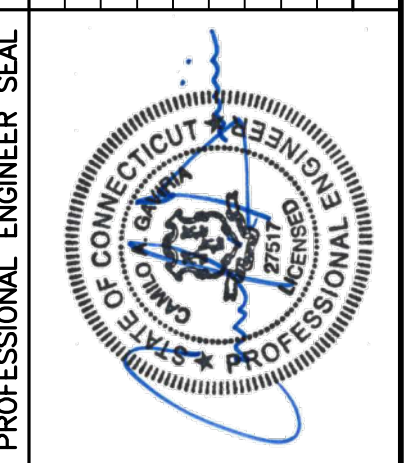


**5 SAFETY CLIMB DETAIL**  
S-1 SCALE: 1/2" = 1'-0"



**6 STEP BOLT DETAIL**  
S-1 SCALE: 3/4" = 1'-0"

REV	DATE	DMD	TUL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
0	11/28/18			
				DRAWN BY:CHKD BY:DESCRIPTION



**CENTEK engineering**  
Centered on Solutions  
203-488-0380  
203-488-3387 Fax  
652 North Branford Road  
Branford, CT 06405  
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CT2035 - LTE 6C AWS/7C 700 UPPER D/5G 850  
975 MIX AVENUE  
HAMDEN, CT 06514

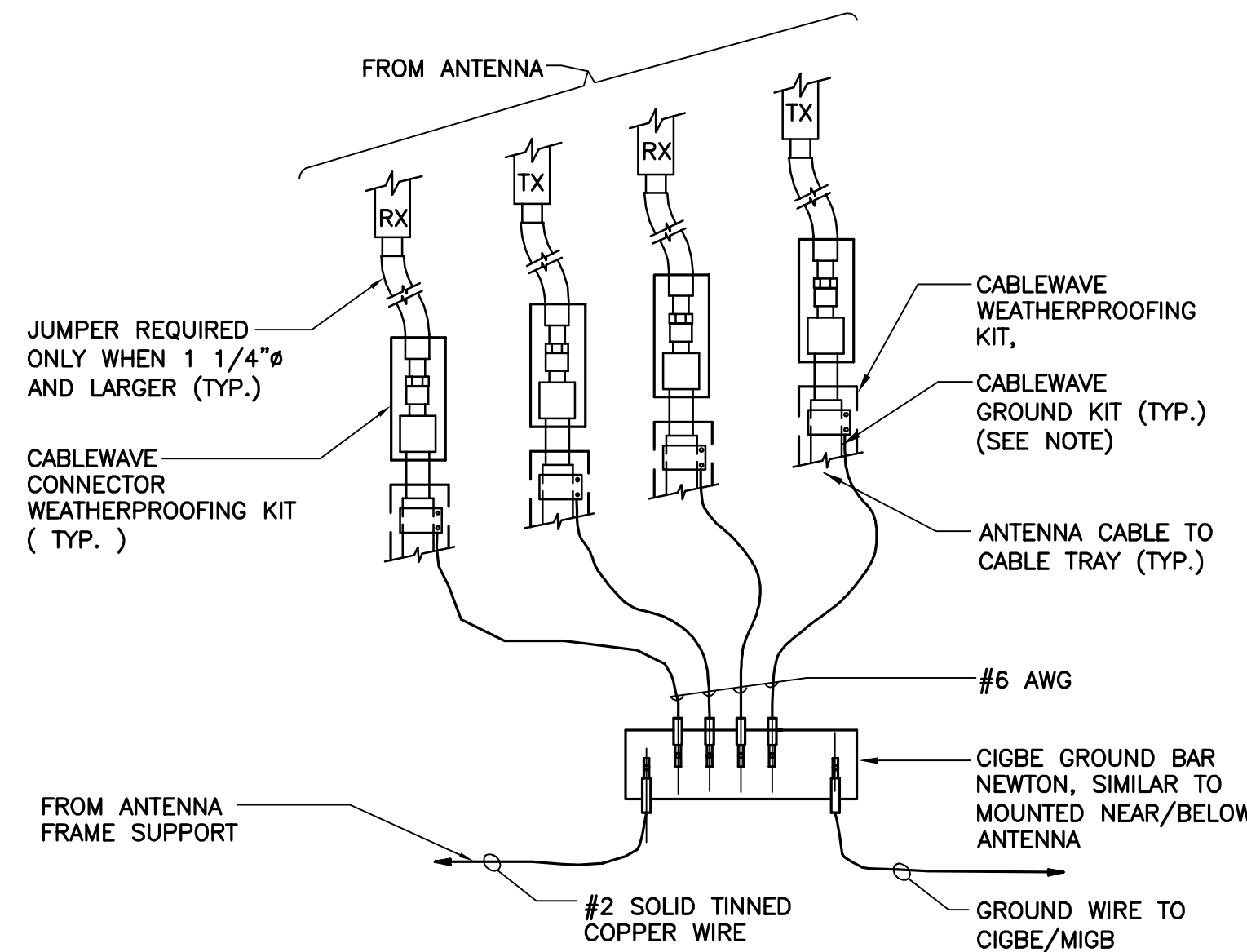
DATE: 08/23/18  
SCALE: AS NOTED  
JOB NO. 18000.36

ANTENNA MAST  
DETAILS

**S-1**  
Sheet No. 6 of 9



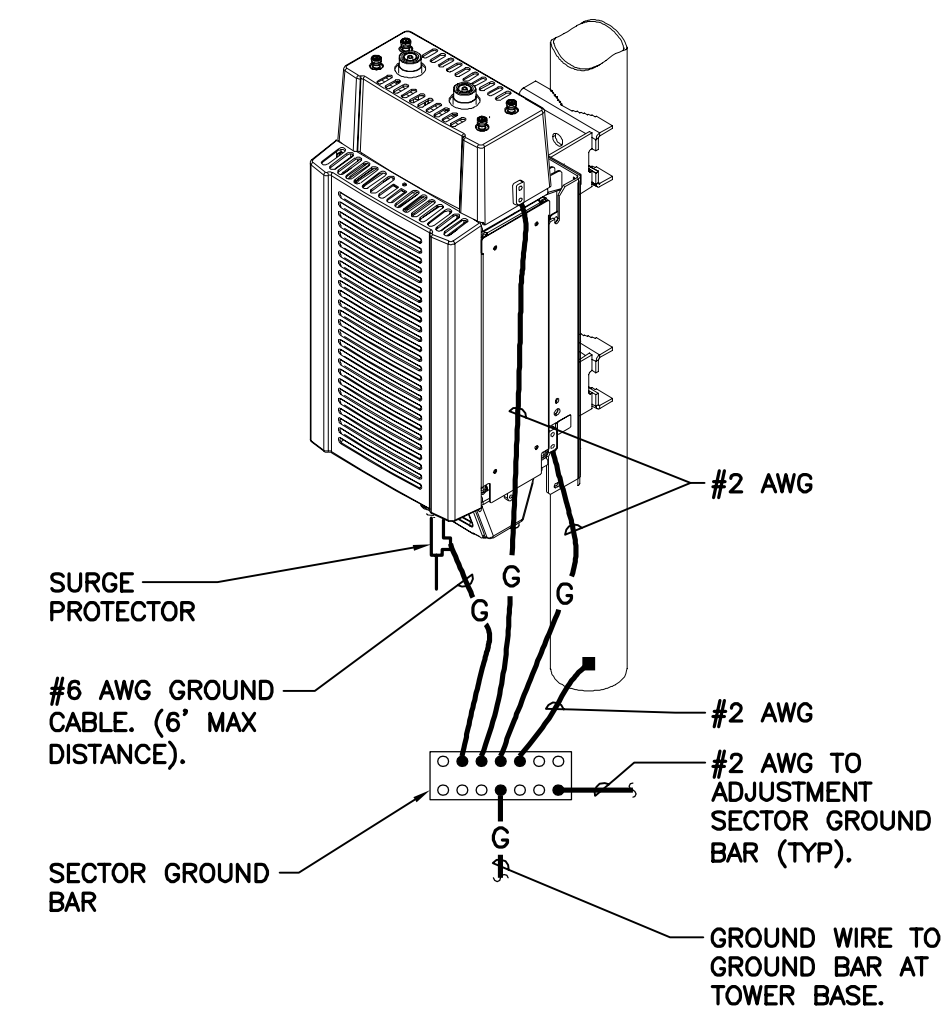




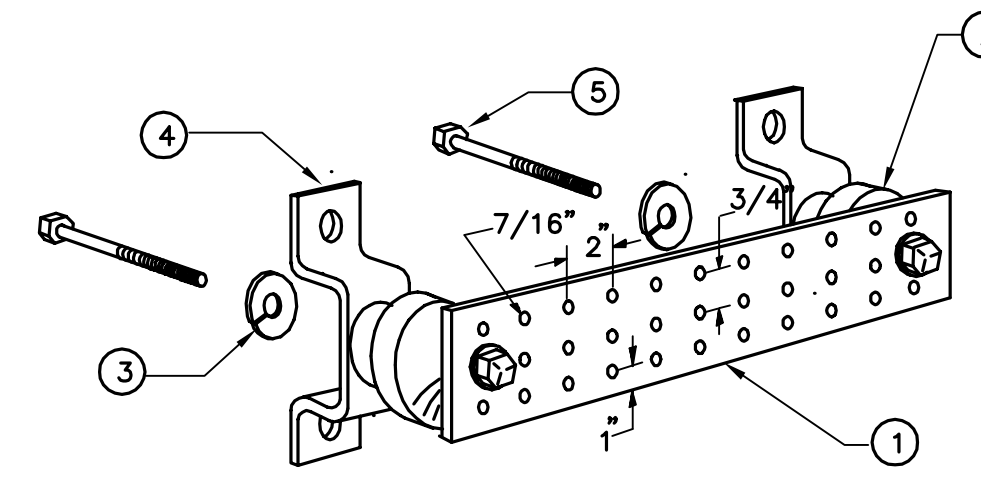
**NOTE:**  
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

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

EACH RRU CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:  
1. AT TOP OF THE CABINET  
2. AT RIGHT SIDE OF THE CABINET.



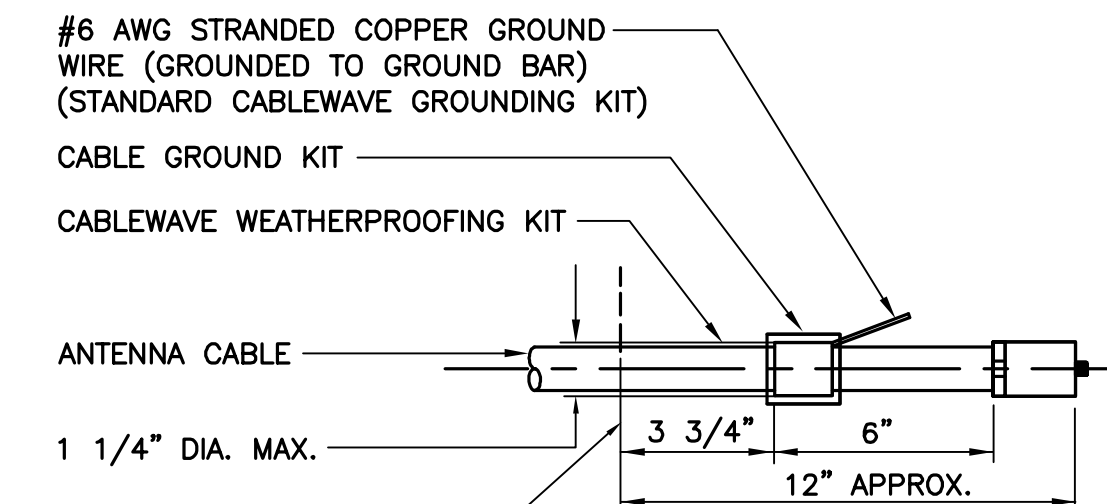
**2 RRU POLE MOUNT GROUNDING**  
E-3 NOT TO SCALE



**LEGEND**

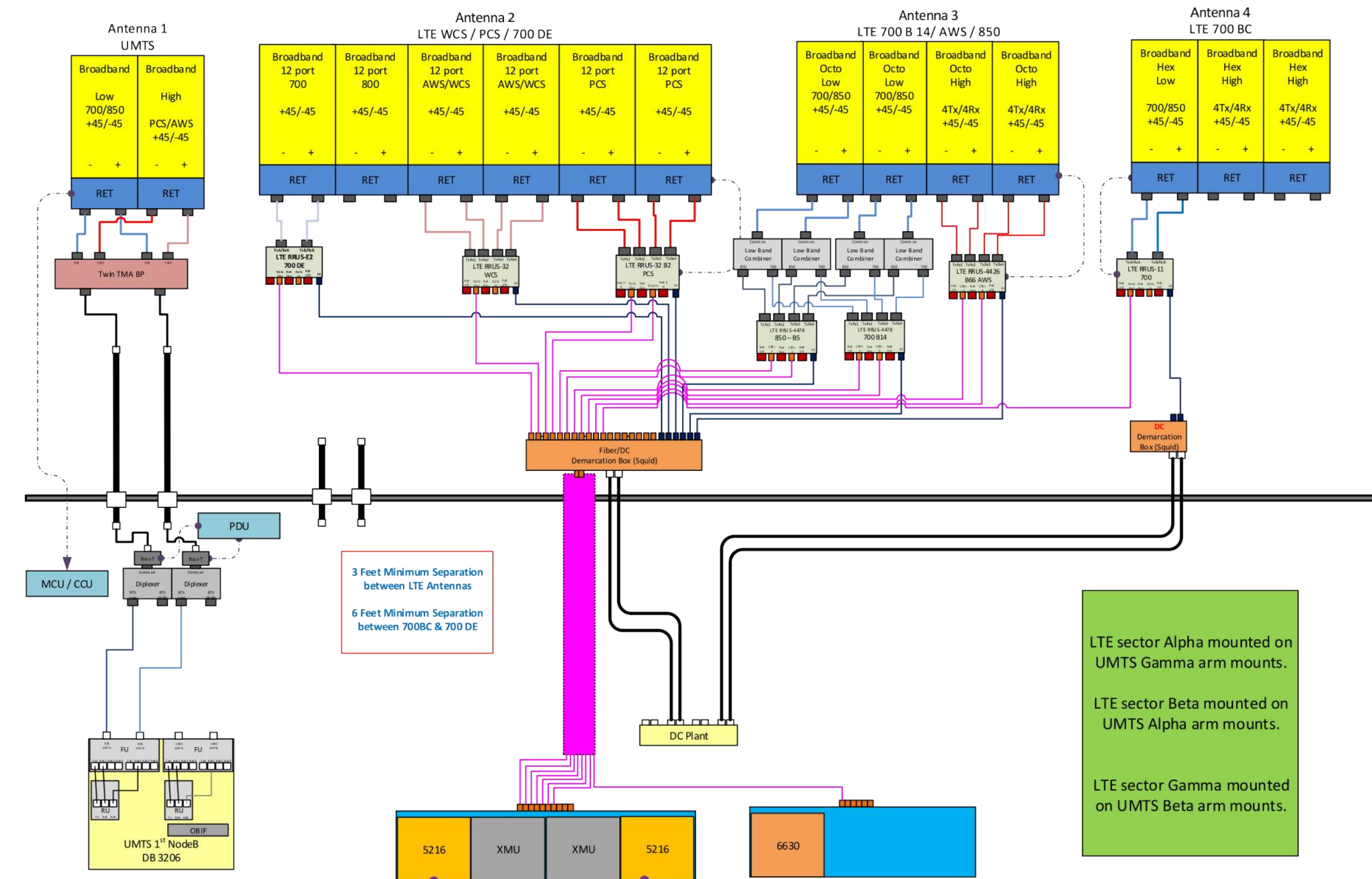
1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-B.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT. NO. A-6056.
5. STAINLESS STEEL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

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

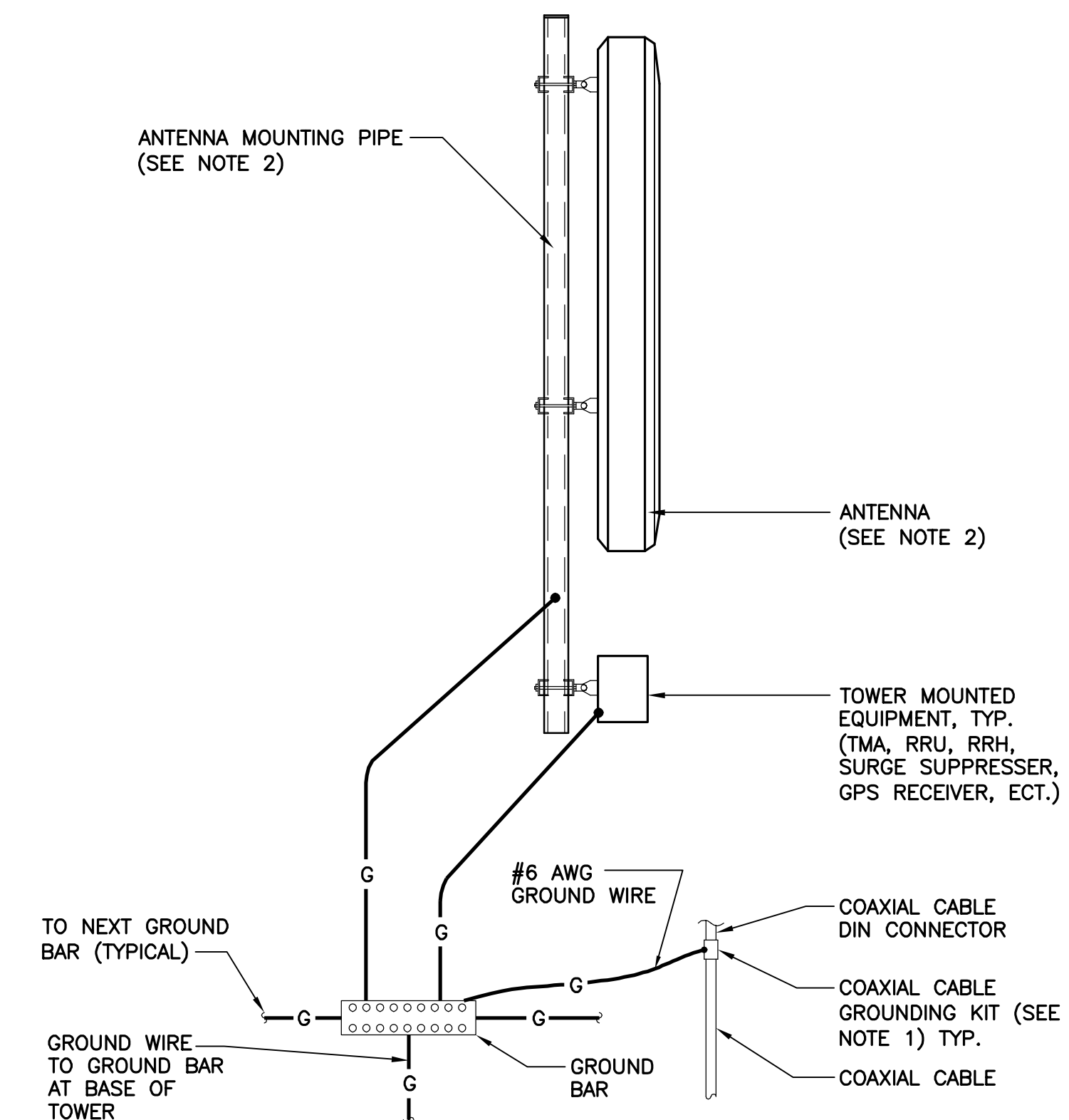


**NOTE:**  
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

**4 ANTENNA CABLE GROUNDING DETAIL**  
E-3 NOT TO SCALE



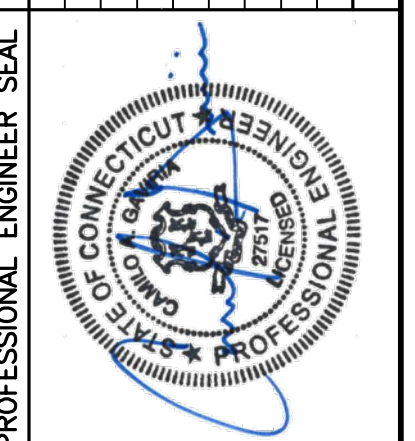
**5 RF PLUMBING DIAGRAM**  
E-3 NOT TO SCALE



- NOTES:**
1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
  2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
  3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

**6 TYPICAL ANTENNA GROUNDING DETAIL**  
E-3 NOT TO SCALE

REV	0	DATE	11/29/18	DMD	TJL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
DATE	11/29/18	DMD	TJL	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION	DRAWN BY/CHKD BY/DESCRIPTION	



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CT2035 - LTE 6C AWS/7C 700 UPPER D/5G 850  
975 MIX AVENUE  
HAMDEN, CT 06514

DATE: 08/23/18  
SCALE: AS NOTED  
JOB NO. 18000.36

TYPICAL ELECTRICAL DETAILS



**Structural Analysis Report**

*Antenna Pipe Mast & Support Platform*

AT&T Site #: CT2035

AT&T Site Name: Hamden

Project: LTE 6C/7C

PACE #: MRCTB032299/ MRCTB032288/  
MRCTB032250

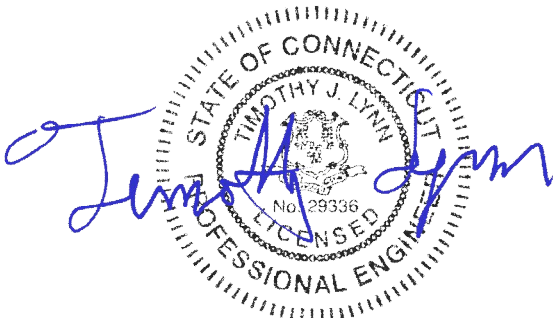
PT #: 2051A0GWFL/ 2051A0GWEG/  
2051A0GWFN

FA #: 10035036

975 Mix Avenue  
Hamden, CT 06514

Centek Project No. 18000.36

Date: November 2, 2018



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

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- TOWER LOADING
- TOWER CAPACITY
- FOUNDATION AND ANCHORS
- CONCLUSION

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- STANDARD ENGINEERING CONDITIONS
- GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

## **SECTION 3 – CALCULATIONS**

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## Introduction

The purpose of this report is to summarize the results of the non-linear, P- $\Delta$  structural analysis of the antenna upgrade proposed by AT&T on the existing roof mounted platform located in Hamden, Connecticut.

The host structure is a roof mounted steel equipment platform with an existing 8" diameter antenna pipe mast.

## Antenna and Appurtenance Summary

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

- **AT&T (EXISTING TO REMOVED):**  
Antennas: Three (3) Ericsson RRUS-12 mounted on the existing support platform.
- **AT&T (EXISTING TO RELOCATE):**  
Antennas: Three (3) Kathrein 800-10121 panel antennas, three (3) Qunitel QS66512-2 panel antennas, three (3) CCI HPA-65R-BUU-H6 panel antennas, three (3) Powerwave TT19-08BP111-001 TMAs, three (3) Ericsson RRUS-11, three (3) Ericsson RRUS-E2, three (3) Ericsson RRUS-32, three (3) Ericsson RRUS-32 B2 and three (3) Raycap DC6-48-60-18-8F surge arrestors relocated to the proposed antenna mast on a proposed 13-ft platform with handrails with a RAD center elevation of 61-ft above grade level.
- **AT&T (PROPOSED):**  
Antennas: Three (3) Kathrein 800-10965 panel antenna, six (6) Kaelus DBC0061F1V51-2 diplexers, six (6) Ericsson 4478 remote radio heads, three (3) Ericsson 4426 B66 remote radio heads and three (3) DC squids mounted on the proposed antenna mast on a proposed 13-ft platform with handrails with a RAD center elevation of 61-ft above grade level.  
Coax Cables: Six (6) 1-5/8"  $\varnothing$  coax cables, three (3) fiber cables and twelve (12) dc control cables running on the exterior of the pipe mast.

### 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 or reinforcement drawings.
- 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 to be installed as indicated in this report.

## Analysis

The proposed antenna mast 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<sup>1</sup> and the wind speed data available in the TIA-222-G-2005 Standard.

The existing/modified antenna mast support platform was analyzed using a comprehensive computer program titled Risa3D. The program analyzes the antenna mounts, considering the worst case loading condition. The antenna support mounts were considered to be loaded by concentric forces along the pipe masts, and the model assumes that the members are subjected to bending, axial, and shear forces.

## 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 County; $v = 95-115$ mph	[Annex B of TIA-222-G-2005]
	Hamden; $v = 97$ mph (Nominal)	[Appendix N of the 2016 CT Building Code]
Load Cases:	<u>Load Case 1</u> ; 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]
	<u>Load Case 2</u> ; 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]

---

<sup>1</sup> The 2012 International Building Code as amended by the 2016 Connecticut State Building Code (CSBC).

Results

- Calculated stresses were found to be within allowable limits.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Proposed P18x0.375	0.00'	43.6%	<b>PASS</b>

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

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	24.4%	<b>PASS</b>
Base Plate	Bending	31.0%	<b>PASS</b>

- Calculated stresses were found to be within allowable limits.

Support Frame Component	Stress Ratio (percentage of capacity)	Result
W10x100	27.8%	<b>PASS</b>
HSS4x4x5/16	32.8%	<b>PASS</b>

Conclusion

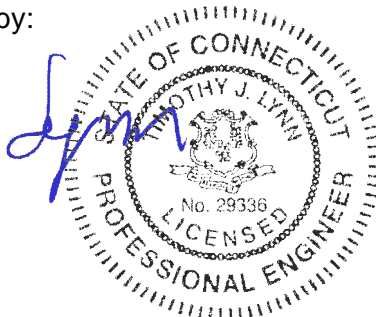
This analysis shows that the antenna mast and equipment frame **with the proposed modifications is adequate** to support the proposed modified antenna configuration.

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 uncorroded 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

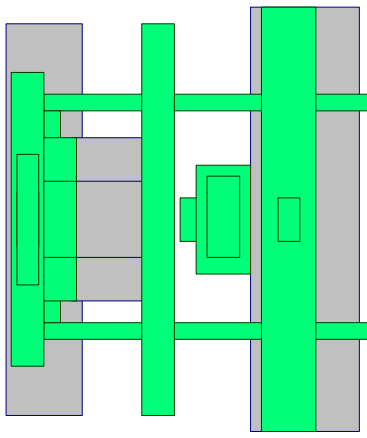
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

### tnxTower Features:

- tnxTower 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.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.



Section	1
Size	P 18x.375
Length (ft)	25.500
Grade	A500-42
Weight (K)	1.8
	63.5 ft
	38.0 ft



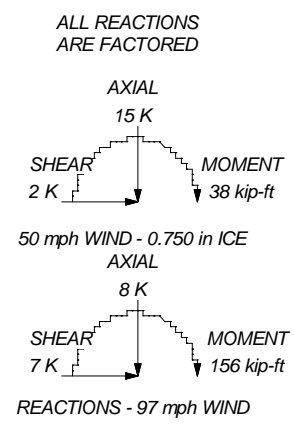
**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
800-10121	61	(2) RRUS-32	61
QS66512-2	61	RRUS-E2	61
80010965	61	4426 B66	61
HPA-65R-BUU-H6	61	(2) B14 4478	61
800-10121	61	RRUS-11	61
QS66512-2	61	(2) RRUS-32	61
80010965	61	RRUS-E2	61
HPA-65R-BUU-H6	61	4426 B66	61
800-10121	61	(2) B14 4478	61
QS66512-2	61	RRUS-11	61
80010965	61	(2) RRUS-32	61
HPA-65R-BUU-H6	61	RRUS-E2	61
TT19-08BP111-001 TMA	61	4426 B66	61
TT19-08BP111-001 TMA	61	(2) B14 4478	61
TT19-08BP111-001 TMA	61	13' Platform w/rails	61
(2) DBC0061F1V51-2	61	DC6-48-60-18-8F Surge Arrestor	61
(2) DBC0061F1V51-2	61	DC6-48-60-18-8F Surge Arrestor	61
(2) DBC0061F1V51-2	61	DC6-48-60-18-8F Surge Arrestor	61
RRUS-11	61		

**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi			

- TOWER DESIGN NOTES**
1. Tower designed for Exposure C to the TIA-222-G Standard.
  2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
  3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
  4. Deflections are based upon a 60 mph wind.
  5. Tower Structure Class II.
  6. Topographic Category 1 with Crest Height of 0.000 ft
  7. TOWER RATING: 43.6%



<b>Centek Engineering Inc.</b>		Job: <b>18000.36 - CT2035</b>	
63-2 North Branford Rd. Branford, CT 06405		Project: <b>25.5-ft Monopole - 975 Mix Ave Hamden, CT</b>	
Phone: (203) 488-0580	FAX: (203) 488-8587	Client: AT&T	Drawn by: T.J.L.
		Code: TIA-222-G	Date: 11/02/18
		Path:	App'd:
			Scale: NTS
			Dwg No. E-1

<b>tnxTower</b>  <b>Centek Engineering Inc.</b> 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	<b>Job</b> 18000.36 - CT2035	<b>Page</b> 1 of 20
	<b>Project</b> 25.5-ft Monopole - 975 Mix Ave Hamden, CT	<b>Date</b> 10:38:31 11/02/18
	<b>Client</b> AT&T	<b>Designed by</b> TJJ

## Tower Input Data

There is a pole section.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Basic wind speed of 97 mph.

Structure Class II.

Exposure Category C.

Topographic Category 1.

Crest Height 0.000 ft.

Nominal ice thickness of 0.750 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.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>√ Assume Rigid Index Plate</li> <li>Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retension Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>√ Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-G Bracing Resist. Exemption</li> <li>Use TIA-222-G Tension Splice Exemption</li> <li style="text-align: center;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> </ul> |
|--|--|---|

## Pole Section Geometry

Section	Elevation	Section Length	Pole Size	Pole Grade	Socket Length
	ft	ft			ft
L1	63.500-38.000	25.500	P18x.375	A500-42 (42 ksi)	

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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft <sup>2</sup>	in					in	in	in
L1 63.500-38.000				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number		$C_A A_A$	Weight
				ft			ft <sup>2</sup> /ft	klf
1 5/8	C	No	Inside Pole	60.000 - 38.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
Fiber Trunk	C	No	Inside Pole	60.000 - 38.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
DC Trunk	C	No	Inside Pole	60.000 - 38.000	12	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000

### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation	Face	$A_R$	$A_F$	$C_A A_A$ In Face	$C_A A_A$ Out Face	Weight
	ft		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L1	63.500-38.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.232

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation	Face or Leg	Ice Thickness	$A_R$	$A_F$	$C_A A_A$ In Face	$C_A A_A$ Out Face	Weight
	ft		in	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	K
L1	63.500-38.000	A	1.566	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.232

### Feed Line Center of Pressure

Section	Elevation	$CP_x$	$CP_z$	$CP_x$ Ice	$CP_z$ Ice
	ft	in	in	in	in
L1	63.500-38.000	0.000	0.000	0.000	0.000

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## Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
---------------	----------------------	-------------	-------------------------	-----------------------	--------------------

## Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight
			Horz	Lateral					
800-10121	A	From Leg	3.000	0.000	61.000	No Ice	5.162	3.293	0.046
			6.000			1/2" Ice	5.514	3.639	0.079
			0.000			1" Ice	5.874	3.994	0.117
QS66512-2	A	From Leg	3.000	0.000	61.000	No Ice	8.133	6.800	0.112
			2.000			1/2" Ice	8.590	7.267	0.169
			0.000			1" Ice	9.053	7.723	0.233
80010965	A	From Leg	3.000	0.000	61.000	No Ice	13.814	5.833	0.109
			-2.000			1/2" Ice	14.347	6.324	0.186
			0.000			1" Ice	14.888	6.821	0.269
HPA-65R-BUU-H6	A	From Leg	3.000	0.000	61.000	No Ice	9.658	6.450	0.051
			-6.000			1/2" Ice	10.128	6.913	0.114
			0.000			1" Ice	10.606	7.384	0.183
800-10121	B	From Leg	3.000	0.000	61.000	No Ice	5.162	3.293	0.046
			6.000			1/2" Ice	5.514	3.639	0.079
			0.000			1" Ice	5.874	3.994	0.117
QS66512-2	B	From Leg	3.000	0.000	61.000	No Ice	8.133	6.800	0.112
			2.000			1/2" Ice	8.590	7.267	0.169
			0.000			1" Ice	9.053	7.723	0.233
80010965	B	From Leg	3.000	0.000	61.000	No Ice	13.814	5.833	0.109
			-2.000			1/2" Ice	14.347	6.324	0.186
			0.000			1" Ice	14.888	6.821	0.269
HPA-65R-BUU-H6	B	From Leg	3.000	0.000	61.000	No Ice	9.658	6.450	0.051
			-6.000			1/2" Ice	10.128	6.913	0.114
			0.000			1" Ice	10.606	7.384	0.183
800-10121	C	From Leg	3.000	0.000	61.000	No Ice	5.162	3.293	0.046
			6.000			1/2" Ice	5.514	3.639	0.079
			0.000			1" Ice	5.874	3.994	0.117
QS66512-2	C	From Leg	3.000	0.000	61.000	No Ice	8.133	6.800	0.112
			2.000			1/2" Ice	8.590	7.267	0.169
			0.000			1" Ice	9.053	7.723	0.233
80010965	C	From Leg	3.000	0.000	61.000	No Ice	13.814	5.833	0.109
			-2.000			1/2" Ice	14.347	6.324	0.186
			0.000			1" Ice	14.888	6.821	0.269
HPA-65R-BUU-H6	C	From Leg	3.000	0.000	61.000	No Ice	9.658	6.450	0.051
			-6.000			1/2" Ice	10.128	6.913	0.114
			0.000			1" Ice	10.606	7.384	0.183
TT19-08BP111-001 TMA	A	From Leg	3.000	0.000	61.000	No Ice	0.553	0.446	0.016
			6.000			1/2" Ice	0.649	0.534	0.022
			0.000			1" Ice	0.752	0.630	0.029
TT19-08BP111-001 TMA	B	From Leg	3.000	0.000	61.000	No Ice	0.553	0.446	0.016
			6.000			1/2" Ice	0.649	0.534	0.022
			0.000			1" Ice	0.752	0.630	0.029
TT19-08BP111-001 TMA	C	From Leg	3.000	0.000	61.000	No Ice	0.553	0.446	0.016
			6.000			1/2" Ice	0.649	0.534	0.022
			0.000			1" Ice	0.752	0.630	0.029

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
(2) DBC0061F1V51-2	A	From Leg	3.000	0.000	0.000	61.000	No Ice	0.413	0.430	0.019
			6.000				1/2" Ice	0.496	0.514	0.024
			0.000				1" Ice	0.586	0.605	0.031
(2) DBC0061F1V51-2	B	From Leg	3.000	0.000	0.000	61.000	No Ice	0.413	0.430	0.019
			6.000				1/2" Ice	0.496	0.514	0.024
			0.000				1" Ice	0.586	0.605	0.031
(2) DBC0061F1V51-2	C	From Leg	3.000	0.000	0.000	61.000	No Ice	0.413	0.430	0.019
			6.000				1/2" Ice	0.496	0.514	0.024
			0.000				1" Ice	0.586	0.605	0.031
RRUS-11	A	From Leg	3.000	0.000	0.000	61.000	No Ice	2.566	1.068	0.050
			0.000				1/2" Ice	2.765	1.211	0.070
			0.000				1" Ice	2.971	1.361	0.092
(2) RRUS-32	A	From Leg	3.000	0.000	0.000	61.000	No Ice	3.314	2.424	0.077
			0.000				1/2" Ice	3.558	2.638	0.105
			0.000				1" Ice	3.809	2.860	0.136
RRUS-E2	A	From Leg	3.000	0.000	0.000	61.000	No Ice	3.145	1.285	0.058
			0.000				1/2" Ice	3.365	1.438	0.081
			0.000				1" Ice	3.592	1.600	0.108
4426 B66	A	From Leg	3.000	0.000	0.000	61.000	No Ice	1.650	0.727	0.049
			0.000				1/2" Ice	1.810	0.844	0.062
			0.000				1" Ice	1.978	0.971	0.077
(2) B14 4478	A	From Leg	3.000	0.000	0.000	61.000	No Ice	1.627	0.906	0.060
			0.000				1/2" Ice	1.786	1.033	0.074
			0.000				1" Ice	1.953	1.168	0.091
RRUS-11	B	From Leg	3.000	0.000	0.000	61.000	No Ice	2.566	1.068	0.050
			0.000				1/2" Ice	2.765	1.211	0.070
			0.000				1" Ice	2.971	1.361	0.092
(2) RRUS-32	B	From Leg	3.000	0.000	0.000	61.000	No Ice	3.314	2.424	0.077
			0.000				1/2" Ice	3.558	2.638	0.105
			0.000				1" Ice	3.809	2.860	0.136
RRUS-E2	B	From Leg	3.000	0.000	0.000	61.000	No Ice	3.145	1.285	0.058
			0.000				1/2" Ice	3.365	1.438	0.081
			0.000				1" Ice	3.592	1.600	0.108
4426 B66	B	From Leg	3.000	0.000	0.000	61.000	No Ice	1.650	0.727	0.049
			0.000				1/2" Ice	1.810	0.844	0.062
			0.000				1" Ice	1.978	0.971	0.077
(2) B14 4478	B	From Leg	3.000	0.000	0.000	61.000	No Ice	1.627	0.906	0.060
			0.000				1/2" Ice	1.786	1.033	0.074
			0.000				1" Ice	1.953	1.168	0.091
RRUS-11	C	From Leg	3.000	0.000	0.000	61.000	No Ice	2.566	1.068	0.050
			0.000				1/2" Ice	2.765	1.211	0.070
			0.000				1" Ice	2.971	1.361	0.092
(2) RRUS-32	C	From Leg	3.000	0.000	0.000	61.000	No Ice	3.314	2.424	0.077
			0.000				1/2" Ice	3.558	2.638	0.105
			0.000				1" Ice	3.809	2.860	0.136
RRUS-E2	C	From Leg	3.000	0.000	0.000	61.000	No Ice	3.145	1.285	0.058
			0.000				1/2" Ice	3.365	1.438	0.081
			0.000				1" Ice	3.592	1.600	0.108
4426 B66	C	From Leg	3.000	0.000	0.000	61.000	No Ice	1.650	0.727	0.049
			0.000				1/2" Ice	1.810	0.844	0.062
			0.000				1" Ice	1.978	0.971	0.077
(2) B14 4478	C	From Leg	3.000	0.000	0.000	61.000	No Ice	1.627	0.906	0.060
			0.000				1/2" Ice	1.786	1.033	0.074
			0.000				1" Ice	1.953	1.168	0.091
13' Platform w/rails	A	None		0.000	0.000	61.000	No Ice	31.300	31.300	1.822
							1/2" Ice	40.200	40.200	2.452
							1" Ice	49.100	49.100	3.082

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
DC6-48-60-18-8F Surge Arrestor	A	From Leg	3.000	0.000	0.000	61.000	No Ice	1.909	1.909	0.020
			6.000				1/2" Ice	2.098	2.098	0.039
			0.000				1" Ice	2.294	2.294	0.062
DC6-48-60-18-8F Surge Arrestor	B	From Leg	3.000	0.000	0.000	61.000	No Ice	1.909	1.909	0.020
			6.000				1/2" Ice	2.098	2.098	0.039
			0.000				1" Ice	2.294	2.294	0.062
DC6-48-60-18-8F Surge Arrestor	C	From Leg	3.000	0.000	0.000	61.000	No Ice	1.909	1.909	0.020
			6.000				1/2" Ice	2.098	2.098	0.039
			0.000				1" Ice	2.294	2.294	0.062

**Tower Pressures - No Ice**

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		ksf	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 63.500-38.000	50.750	1.097	0.025	38.250	A	0.000	38.250	38.250	100.00	0.000	0.000
					B	0.000	38.250		100.00	0.000	0.000
					C	0.000	38.250		100.00	0.000	0.000

**Tower Pressure - With Ice**

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	t <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		ksf	in	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 63.500-38.000	50.750	1.097	0.007	1.566	44.905	A	0.000	44.905	44.905	100.00	0.000	0.000
						B	0.000	44.905		100.00	0.000	0.000
						C	0.000	44.905		100.00	0.000	0.000

**Tower Pressure - Service**

$G_H = 1.100$

Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		ksf	ft <sup>2</sup>	e	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>

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Section Elevation	z	K <sub>Z</sub>	q <sub>z</sub>	A <sub>G</sub>	F a c e	A <sub>F</sub>	A <sub>R</sub>	A <sub>leg</sub>	Leg %	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face
ft	ft		ksf	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>		ft <sup>2</sup>	ft <sup>2</sup>
L1 63.500-38.000	50.750	1.097	0.009	38.250	A	0.000	38.250	38.250	100.00	0.000	0.000
					B	0.000	38.250		100.00	0.000	0.000
					C	0.000	38.250		100.00	0.000	0.000

### Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K				ksf			ft <sup>2</sup>	K	klf	
L1 63.500-38.000	0.232	1.802	A	1	0.6	0.025	1	1	38.250	0.634	0.025	C
			B	1	0.6		1	1	38.250			
			C	1	0.6		1	1	38.250			
Sum Weight:	0.232	1.802						OTM	8.081 kip-ft	0.634		

### Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K				ksf			ft <sup>2</sup>	K	klf	
L1 63.500-38.000	0.232	1.802	A	1	0.6	0.025	1	1	38.250	0.634	0.025	C
			B	1	0.6		1	1	38.250			
			C	1	0.6		1	1	38.250			
Sum Weight:	0.232	1.802						OTM	8.081 kip-ft	0.634		

### Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K				ksf			ft <sup>2</sup>	K	klf	
L1 63.500-38.000	0.232	1.802	A	1	0.6	0.025	1	1	38.250	0.634	0.025	C
			B	1	0.6		1	1	38.250			
			C	1	0.6		1	1	38.250			
Sum Weight:	0.232	1.802						OTM	8.081 kip-ft	0.634		

### Tower Forces - No Ice - Wind 90 To Face

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	<b>Client</b> AT&T	<b>Designed by</b> TJL

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K	e			ksf			ft <sup>2</sup>	K	klf	
L1 63.500-38.000	0.232	1.802	A	1	0.6	0.025	1	1	38.250	0.634	0.025	C
			B	1	0.6		1	1	38.250			
			C	1	0.6		1	1	38.250			
Sum Weight:	0.232	1.802						OTM	8.081 kip-ft	0.634		

### Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K	e			ksf			ft <sup>2</sup>	K	klf	
L1 63.500-38.000	0.232	2.756	A	1	1.2	0.007	1	1	44.905	0.395	0.016	C
			B	1	1.2		1	1	44.905			
			C	1	1.2		1	1	44.905			
Sum Weight:	0.232	2.756						OTM	5.042 kip-ft	0.395		

### Tower Forces - With Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K	e			ksf			ft <sup>2</sup>	K	klf	
L1 63.500-38.000	0.232	2.756	A	1	1.2	0.007	1	1	44.905	0.395	0.016	C
			B	1	1.2		1	1	44.905			
			C	1	1.2		1	1	44.905			
Sum Weight:	0.232	2.756						OTM	5.042 kip-ft	0.395		

### Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K	e			ksf			ft <sup>2</sup>	K	klf	
L1 63.500-38.000	0.232	2.756	A	1	1.2	0.007	1	1	44.905	0.395	0.016	C
			B	1	1.2		1	1	44.905			
			C	1	1.2		1	1	44.905			
Sum Weight:	0.232	2.756						OTM	5.042 kip-ft	0.395		



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**Tower Forces - With Ice - Wind 90 To Face**

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K	e			ksf			ft <sup>2</sup>	K	klf	
L1	0.232	2.756	A	1	1.2	0.007	1	1	44.905	0.395	0.016	C
63.500-38.000			B	1	1.2		1	1	44.905			
			C	1	1.2		1	1	44.905			
Sum Weight:	0.232	2.756						OTM	5.042 kip-ft	0.395		

**Tower Forces - Service - Wind Normal To Face**

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K	e			ksf			ft <sup>2</sup>	K	klf	
L1	0.232	1.802	A	1	0.6	0.009	1	1	38.250	0.217	0.009	C
63.500-38.000			B	1	0.6		1	1	38.250			
			C	1	0.6		1	1	38.250			
Sum Weight:	0.232	1.802						OTM	2.767 kip-ft	0.217		

**Tower Forces - Service - Wind 45 To Face**

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K	e			ksf			ft <sup>2</sup>	K	klf	
L1	0.232	1.802	A	1	0.6	0.009	1	1	38.250	0.217	0.009	C
63.500-38.000			B	1	0.6		1	1	38.250			
			C	1	0.6		1	1	38.250			
Sum Weight:	0.232	1.802						OTM	2.767 kip-ft	0.217		

**Tower Forces - Service - Wind 60 To Face**

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K	e			ksf			ft <sup>2</sup>	K	klf	
L1	0.232	1.802	A	1	0.6	0.009	1	1	38.250	0.217	0.009	C

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Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K				ksf			ft <sup>2</sup>	K	klf	
63.500-38.000			B	1	0.6		1	1	38.250			
			C	1	0.6		1	1	38.250			
Sum Weight:	0.232	1.802						OTM	2.767	0.217		
									kip-ft			

### Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C <sub>F</sub>	q <sub>z</sub>	D <sub>F</sub>	D <sub>R</sub>	A <sub>E</sub>	F	w	Ctrl. Face
ft	K	K				ksf			ft <sup>2</sup>	K	klf	
L1	0.232	1.802	A	1	0.6	0.009	1	1	38.250	0.217	0.009	C
63.500-38.000			B	1	0.6		1	1	38.250			
			C	1	0.6		1	1	38.250			
Sum Weight:	0.232	1.802						OTM	2.767	0.217		
									kip-ft			

### Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M <sub>x</sub>	Sum of Overturning Moments, M <sub>z</sub>	Sum of Torques
	K	K	K	kip-ft	kip-ft	kip-ft
Leg Weight	1.802					
Bracing Weight	0.000					
Total Member Self-Weight	1.802			0.000	0.000	
Total Weight	6.325			0.000	0.000	
Wind 0 deg - No Ice		0.000	-4.499	-96.977	0.000	0.000
Wind 30 deg - No Ice		2.249	-3.896	-83.984	-48.488	0.000
Wind 45 deg - No Ice		3.181	-3.181	-68.573	-68.573	0.000
Wind 60 deg - No Ice		3.896	-2.249	-48.488	-83.984	0.000
Wind 90 deg - No Ice		4.499	0.000	0.000	-96.977	0.000
Wind 120 deg - No Ice		3.896	2.249	48.488	-83.984	0.000
Wind 135 deg - No Ice		3.181	3.181	68.573	-68.573	0.000
Wind 150 deg - No Ice		2.249	3.896	83.984	-48.488	0.000
Wind 180 deg - No Ice		0.000	4.499	96.977	0.000	0.000
Wind 210 deg - No Ice		-2.249	3.896	83.984	48.488	0.000
Wind 225 deg - No Ice		-3.181	3.181	68.573	68.573	0.000
Wind 240 deg - No Ice		-3.896	2.249	48.488	83.984	0.000
Wind 270 deg - No Ice		-4.499	0.000	0.000	96.977	0.000
Wind 300 deg - No Ice		-3.896	-2.249	-48.488	83.984	0.000
Wind 315 deg - No Ice		-3.181	-3.181	-68.573	68.573	0.000
Wind 330 deg - No Ice		-2.249	-3.896	-83.984	48.488	0.000
Member Ice	0.955					
Total Weight Ice	13.818			0.000	0.000	
Wind 0 deg - Ice		0.000	-1.795	-37.239	0.000	0.000
Wind 30 deg - Ice		0.898	-1.555	-32.250	-18.620	0.000
Wind 45 deg - Ice		1.269	-1.269	-26.332	-26.332	0.000
Wind 60 deg - Ice		1.555	-0.898	-18.620	-32.250	0.000

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Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M <sub>x</sub> kip-ft	Sum of Overturning Moments, M <sub>z</sub> kip-ft	Sum of Torques kip-ft
Wind 90 deg - Ice		1.795	0.000	0.000	-37.239	0.000
Wind 120 deg - Ice		1.555	0.898	18.620	-32.250	0.000
Wind 135 deg - Ice		1.269	1.269	26.332	-26.332	0.000
Wind 150 deg - Ice		0.898	1.555	32.250	-18.620	0.000
Wind 180 deg - Ice		0.000	1.795	37.239	0.000	0.000
Wind 210 deg - Ice		-0.898	1.555	32.250	18.620	0.000
Wind 225 deg - Ice		-1.269	1.269	26.332	26.332	0.000
Wind 240 deg - Ice		-1.555	0.898	18.620	32.250	0.000
Wind 270 deg - Ice		-1.795	0.000	0.000	37.239	0.000
Wind 300 deg - Ice		-1.555	-0.898	-18.620	32.250	0.000
Wind 315 deg - Ice		-1.269	-1.269	-26.332	26.332	0.000
Wind 330 deg - Ice		-0.898	-1.555	-32.250	18.620	0.000
Total Weight	6.325			0.000	0.000	
Wind 0 deg - Service		0.000	-1.540	-33.199	0.000	0.000
Wind 30 deg - Service		0.770	-1.334	-28.751	-16.599	0.000
Wind 45 deg - Service		1.089	-1.089	-23.475	-23.475	0.000
Wind 60 deg - Service		1.334	-0.770	-16.599	-28.751	0.000
Wind 90 deg - Service		1.540	0.000	0.000	-33.199	0.000
Wind 120 deg - Service		1.334	0.770	16.599	-28.751	0.000
Wind 135 deg - Service		1.089	1.089	23.475	-23.475	0.000
Wind 150 deg - Service		0.770	1.334	28.751	-16.599	0.000
Wind 180 deg - Service		0.000	1.540	33.199	0.000	0.000
Wind 210 deg - Service		-0.770	1.334	28.751	16.599	0.000
Wind 225 deg - Service		-1.089	1.089	23.475	23.475	0.000
Wind 240 deg - Service		-1.334	0.770	16.599	28.751	0.000
Wind 270 deg - Service		-1.540	0.000	0.000	33.199	0.000
Wind 300 deg - Service		-1.334	-0.770	-16.599	28.751	0.000
Wind 315 deg - Service		-1.089	-1.089	-23.475	23.475	0.000
Wind 330 deg - Service		-0.770	-1.334	-28.751	16.599	0.000

## 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

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Comb. No.	Description
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
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	63.5 - 38	Pole	Max Tension	34	0.000	0.000	0.000
			Max. Compression	34	-15.083	0.000	0.000
			Max. Mx	10	-7.586	-156.199	0.000
			Max. My	2	-7.586	0.000	156.199
			Max. Vy	10	7.203	-156.199	0.000
			Max. Vx	2	-7.203	0.000	156.199

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### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	35	15.083	0.000	1.795
	Max. H <sub>x</sub>	27	5.693	7.198	0.000
	Max. H <sub>z</sub>	2	7.590	0.000	7.198
	Max. M <sub>x</sub>	2	156.199	0.000	7.198
	Max. M <sub>z</sub>	10	156.199	-7.198	0.000
	Max. Torsion	16	0.000	-3.599	-6.234
	Min. Vert	7	5.693	-5.090	5.090
	Min. H <sub>x</sub>	10	7.590	-7.198	0.000
	Min. H <sub>z</sub>	18	7.590	0.000	-7.198
	Min. M <sub>x</sub>	18	-156.199	0.000	-7.198
	Min. M <sub>z</sub>	26	-156.199	7.198	0.000
	Min. Torsion	20	0.000	3.599	-6.234

### Tower Mast Reaction Summary

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
Dead Only	6.325	0.000	0.000	0.000	0.000	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	7.590	0.000	-7.198	-156.199	0.000	0.000
0.9 Dead+1.6 Wind 0 deg - No Ice	5.693	0.000	-7.198	-155.938	0.000	0.000
1.2 Dead+1.6 Wind 30 deg - No Ice	7.590	3.599	-6.234	-135.273	-78.100	0.000
0.9 Dead+1.6 Wind 30 deg - No Ice	5.693	3.599	-6.234	-135.046	-77.969	0.000
1.2 Dead+1.6 Wind 45 deg - No Ice	7.590	5.090	-5.090	-110.450	-110.450	0.000
0.9 Dead+1.6 Wind 45 deg - No Ice	5.693	5.090	-5.090	-110.265	-110.265	0.000
1.2 Dead+1.6 Wind 60 deg - No Ice	7.590	6.234	-3.599	-78.100	-135.273	0.000
0.9 Dead+1.6 Wind 60 deg - No Ice	5.693	6.234	-3.599	-77.969	-135.046	0.000
1.2 Dead+1.6 Wind 90 deg - No Ice	7.590	7.198	0.000	0.000	-156.199	0.000
0.9 Dead+1.6 Wind 90 deg - No Ice	5.693	7.198	0.000	0.000	-155.938	0.000
1.2 Dead+1.6 Wind 120 deg - No Ice	7.590	6.234	3.599	78.100	-135.273	0.000
0.9 Dead+1.6 Wind 120 deg - No Ice	5.693	6.234	3.599	77.969	-135.046	0.000
1.2 Dead+1.6 Wind 135 deg - No Ice	7.590	5.090	5.090	110.450	-110.450	0.000
0.9 Dead+1.6 Wind 135 deg - No Ice	5.693	5.090	5.090	110.265	-110.265	0.000
1.2 Dead+1.6 Wind 150 deg - No Ice	7.590	3.599	6.234	135.273	-78.100	0.000
0.9 Dead+1.6 Wind 150 deg - No Ice	5.693	3.599	6.234	135.046	-77.969	0.000
1.2 Dead+1.6 Wind 180 deg - No Ice	7.590	0.000	7.198	156.199	0.000	0.000

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	<p style="text-align: center;"><b>Project</b></p> <p style="text-align: center;">25.5-ft Monopole - 975 Mix Ave Hamden, CT</p>	<p style="text-align: center;"><b>Date</b></p> <p style="text-align: center;">10:38:31 11/02/18</p>
	<p style="text-align: center;"><b>Client</b></p> <p style="text-align: center;">AT&amp;T</p>	<p style="text-align: center;"><b>Designed by</b></p> <p style="text-align: center;">TJL</p>

Load Combination	Vertical K	Shear <sub>x</sub> K	Shear <sub>z</sub> K	Overturning Moment, M <sub>x</sub> kip-ft	Overturning Moment, M <sub>z</sub> kip-ft	Torque kip-ft
0.9 Dead+1.6 Wind 180 deg - No Ice	5.693	0.000	7.198	155.938	0.000	0.000
1.2 Dead+1.6 Wind 210 deg - No Ice	7.590	-3.599	6.234	135.273	78.100	0.000
0.9 Dead+1.6 Wind 210 deg - No Ice	5.693	-3.599	6.234	135.046	77.969	0.000
1.2 Dead+1.6 Wind 225 deg - No Ice	7.590	-5.090	5.090	110.450	110.450	0.000
0.9 Dead+1.6 Wind 225 deg - No Ice	5.693	-5.090	5.090	110.265	110.265	0.000
1.2 Dead+1.6 Wind 240 deg - No Ice	7.590	-6.234	3.599	78.100	135.273	0.000
0.9 Dead+1.6 Wind 240 deg - No Ice	5.693	-6.234	3.599	77.969	135.046	0.000
1.2 Dead+1.6 Wind 270 deg - No Ice	7.590	-7.198	0.000	0.000	156.199	0.000
0.9 Dead+1.6 Wind 270 deg - No Ice	5.693	-7.198	0.000	0.000	155.938	0.000
1.2 Dead+1.6 Wind 300 deg - No Ice	7.590	-6.234	-3.599	-78.100	135.273	0.000
0.9 Dead+1.6 Wind 300 deg - No Ice	5.693	-6.234	-3.599	-77.969	135.046	0.000
1.2 Dead+1.6 Wind 315 deg - No Ice	7.590	-5.090	-5.090	-110.450	110.450	0.000
0.9 Dead+1.6 Wind 315 deg - No Ice	5.693	-5.090	-5.090	-110.265	110.265	0.000
1.2 Dead+1.6 Wind 330 deg - No Ice	7.590	-3.599	-6.234	-135.273	78.100	0.000
0.9 Dead+1.6 Wind 330 deg - No Ice	5.693	-3.599	-6.234	-135.046	77.969	0.000
1.2 Dead+1.0 Ice+1.0 Temp	15.083	0.000	0.000	0.000	0.000	0.000
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	15.083	0.000	-1.795	-37.767	0.000	0.000
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	15.083	0.898	-1.555	-32.707	-18.884	0.000
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	15.083	1.269	-1.269	-26.705	-26.705	0.000
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	15.083	1.555	-0.898	-18.884	-32.707	0.000
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	15.083	1.795	0.000	0.000	-37.767	0.000
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	15.083	1.555	0.898	18.884	-32.707	0.000
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	15.083	1.269	1.269	26.705	-26.705	0.000
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	15.083	0.898	1.555	32.707	-18.884	0.000
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	15.083	0.000	1.795	37.767	0.000	0.000
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	15.083	-0.898	1.555	32.707	18.884	0.000
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	15.083	-1.269	1.269	26.705	26.705	0.000
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	15.083	-1.555	0.898	18.884	32.707	0.000
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	15.083	-1.795	0.000	0.000	37.767	0.000
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	15.083	-1.555	-0.898	-18.884	32.707	0.000
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	15.083	-1.269	-1.269	-26.705	26.705	0.000

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Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturning Moment, M <sub>x</sub>	Overturning Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	15.083	-0.898	-1.555	-32.707	18.884	0.000
Dead+Wind 0 deg - Service	6.325	0.000	-1.540	-33.384	0.000	0.000
Dead+Wind 30 deg - Service	6.325	0.770	-1.334	-28.912	-16.692	0.000
Dead+Wind 45 deg - Service	6.325	1.089	-1.089	-23.606	-23.606	0.000
Dead+Wind 60 deg - Service	6.325	1.334	-0.770	-16.692	-28.912	0.000
Dead+Wind 90 deg - Service	6.325	1.540	0.000	0.000	-33.384	0.000
Dead+Wind 120 deg - Service	6.325	1.334	0.770	16.692	-28.912	0.000
Dead+Wind 135 deg - Service	6.325	1.089	1.089	23.606	-23.606	0.000
Dead+Wind 150 deg - Service	6.325	0.770	1.334	28.912	-16.692	0.000
Dead+Wind 180 deg - Service	6.325	0.000	1.540	33.384	0.000	0.000
Dead+Wind 210 deg - Service	6.325	-0.770	1.334	28.912	16.692	0.000
Dead+Wind 225 deg - Service	6.325	-1.089	1.089	23.606	23.606	0.000
Dead+Wind 240 deg - Service	6.325	-1.334	0.770	16.692	28.912	0.000
Dead+Wind 270 deg - Service	6.325	-1.540	0.000	0.000	33.384	0.000
Dead+Wind 300 deg - Service	6.325	-1.334	-0.770	-16.692	28.912	0.000
Dead+Wind 315 deg - Service	6.325	-1.089	-1.089	-23.606	23.606	0.000
Dead+Wind 330 deg - Service	6.325	-0.770	-1.334	-28.912	16.692	0.000

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-6.325	0.000	0.000	6.325	0.000	0.000%
2	0.000	-7.590	-7.198	0.000	7.590	7.198	0.000%
3	0.000	-5.693	-7.198	0.000	5.693	7.198	0.000%
4	3.599	-7.590	-6.234	-3.599	7.590	6.234	0.000%
5	3.599	-5.693	-6.234	-3.599	5.693	6.234	0.000%
6	5.090	-7.590	-5.090	-5.090	7.590	5.090	0.000%
7	5.090	-5.693	-5.090	-5.090	5.693	5.090	0.000%
8	6.234	-7.590	-3.599	-6.234	7.590	3.599	0.000%
9	6.234	-5.693	-3.599	-6.234	5.693	3.599	0.000%
10	7.198	-7.590	0.000	-7.198	7.590	0.000	0.000%
11	7.198	-5.693	0.000	-7.198	5.693	0.000	0.000%
12	6.234	-7.590	3.599	-6.234	7.590	-3.599	0.000%
13	6.234	-5.693	3.599	-6.234	5.693	-3.599	0.000%
14	5.090	-7.590	5.090	-5.090	7.590	-5.090	0.000%
15	5.090	-5.693	5.090	-5.090	5.693	-5.090	0.000%
16	3.599	-7.590	6.234	-3.599	7.590	-6.234	0.000%
17	3.599	-5.693	6.234	-3.599	5.693	-6.234	0.000%
18	0.000	-7.590	7.198	0.000	7.590	-7.198	0.000%
19	0.000	-5.693	7.198	0.000	5.693	-7.198	0.000%
20	-3.599	-7.590	6.234	3.599	7.590	-6.234	0.000%
21	-3.599	-5.693	6.234	3.599	5.693	-6.234	0.000%
22	-5.090	-7.590	5.090	5.090	7.590	-5.090	0.000%
23	-5.090	-5.693	5.090	5.090	5.693	-5.090	0.000%
24	-6.234	-7.590	3.599	6.234	7.590	-3.599	0.000%
25	-6.234	-5.693	3.599	6.234	5.693	-3.599	0.000%
26	-7.198	-7.590	0.000	7.198	7.590	0.000	0.000%
27	-7.198	-5.693	0.000	7.198	5.693	0.000	0.000%
28	-6.234	-7.590	-3.599	6.234	7.590	3.599	0.000%
29	-6.234	-5.693	-3.599	6.234	5.693	3.599	0.000%
30	-5.090	-7.590	-5.090	5.090	7.590	5.090	0.000%
31	-5.090	-5.693	-5.090	5.090	5.693	5.090	0.000%
32	-3.599	-7.590	-6.234	3.599	7.590	6.234	0.000%
33	-3.599	-5.693	-6.234	3.599	5.693	6.234	0.000%
34	0.000	-15.083	0.000	0.000	15.083	0.000	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
35	0.000	-15.083	-1.795	0.000	15.083	1.795	0.000%
36	0.898	-15.083	-1.555	-0.898	15.083	1.555	0.000%
37	1.269	-15.083	-1.269	-1.269	15.083	1.269	0.000%
38	1.555	-15.083	-0.898	-1.555	15.083	0.898	0.000%
39	1.795	-15.083	0.000	-1.795	15.083	0.000	0.000%
40	1.555	-15.083	0.898	-1.555	15.083	-0.898	0.000%
41	1.269	-15.083	1.269	-1.269	15.083	-1.269	0.000%
42	0.898	-15.083	1.555	-0.898	15.083	-1.555	0.000%
43	0.000	-15.083	1.795	0.000	15.083	-1.795	0.000%
44	-0.898	-15.083	1.555	0.898	15.083	-1.555	0.000%
45	-1.269	-15.083	1.269	1.269	15.083	-1.269	0.000%
46	-1.555	-15.083	0.898	1.555	15.083	-0.898	0.000%
47	-1.795	-15.083	0.000	1.795	15.083	0.000	0.000%
48	-1.555	-15.083	-0.898	1.555	15.083	0.898	0.000%
49	-1.269	-15.083	-1.269	1.269	15.083	1.269	0.000%
50	-0.898	-15.083	-1.555	0.898	15.083	1.555	0.000%
51	0.000	-6.325	-1.540	0.000	6.325	1.540	0.000%
52	0.770	-6.325	-1.334	-0.770	6.325	1.334	0.000%
53	1.089	-6.325	-1.089	-1.089	6.325	1.089	0.000%
54	1.334	-6.325	-0.770	-1.334	6.325	0.770	0.000%
55	1.540	-6.325	0.000	-1.540	6.325	0.000	0.000%
56	1.334	-6.325	0.770	-1.334	6.325	-0.770	0.000%
57	1.089	-6.325	1.089	-1.089	6.325	-1.089	0.000%
58	0.770	-6.325	1.334	-0.770	6.325	-1.334	0.000%
59	0.000	-6.325	1.540	0.000	6.325	-1.540	0.000%
60	-0.770	-6.325	1.334	0.770	6.325	-1.334	0.000%
61	-1.089	-6.325	1.089	1.089	6.325	-1.089	0.000%
62	-1.334	-6.325	0.770	1.334	6.325	-0.770	0.000%
63	-1.540	-6.325	0.000	1.540	6.325	0.000	0.000%
64	-1.334	-6.325	-0.770	1.334	6.325	0.770	0.000%
65	-1.089	-6.325	-1.089	1.089	6.325	1.089	0.000%
66	-0.770	-6.325	-1.334	0.770	6.325	1.334	0.000%

## Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001



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20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000001
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00001652
36	Yes	4	0.00000001	0.00001661
37	Yes	4	0.00000001	0.00001665
38	Yes	4	0.00000001	0.00001661
39	Yes	4	0.00000001	0.00001652
40	Yes	4	0.00000001	0.00001661
41	Yes	4	0.00000001	0.00001665
42	Yes	4	0.00000001	0.00001661
43	Yes	4	0.00000001	0.00001652
44	Yes	4	0.00000001	0.00001661
45	Yes	4	0.00000001	0.00001665
46	Yes	4	0.00000001	0.00001661
47	Yes	4	0.00000001	0.00001652
48	Yes	4	0.00000001	0.00001661
49	Yes	4	0.00000001	0.00001665
50	Yes	4	0.00000001	0.00001661
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	63.5 - 38	0.498	63	0.133	0.000

### Critical Deflections and Radius of Curvature - Service Wind

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
61.000	800-10121	63	0.449	0.120	0.000	Inf

### Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	63.5 - 38	2.328	26	0.621	0.000

### Critical Deflections and Radius of Curvature - Design Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
61.000	800-10121	26	2.100	0.560	0.000	Inf

### Compression Checks

### Pole Design Data

Section No.	Elevation	Size	L	L <sub>u</sub>	Kl/r	A	P <sub>u</sub>	φP <sub>n</sub>	Ratio P <sub>u</sub> / φP <sub>n</sub>
	ft		ft	ft		in <sup>2</sup>	K	K	
L1	63.5 - 62.225	P18x.375	25.500	0.000	0.0	20.764	-0.170	784.878	0.000 <sup>1</sup>
	62.225 - 60.95					20.764	-12.024	784.878	0.015
	60.95 - 59.675					20.764	-5.446	784.878	0.007
	59.675 - 58.4					20.764	-5.568	784.878	0.007
	58.4 - 57.125					20.764	-5.691	784.878	0.007
	57.125 - 55.85					20.764	-5.813	784.878	0.007
	55.85 - 54.575					20.764	-5.937	784.878	0.008
	54.575 - 53.3					20.764	-6.060	784.878	0.008
	53.3 - 52.025					20.764	-6.185	784.878	0.008
	52.025 - 50.75					20.764	-6.309	784.878	0.008
	50.75 - 49.475					20.764	-6.434	784.878	0.008
	49.475 - 48.2					20.764	-6.560	784.878	0.008
	48.2 - 46.925					20.764	-6.686	784.878	0.009
	46.925 - 45.65					20.764	-6.813	784.878	0.009
	45.65 - 44.375					20.764	-6.940	784.878	0.009
	44.375 - 43.1					20.764	-7.068	784.878	0.009
	43.1 - 41.825					20.764	-7.197	784.878	0.009
	41.825 - 40.55					20.764	-7.326	784.878	0.009
	40.55 - 39.275					20.764	-7.455	784.878	0.009
	39.275 - 38					20.764	-7.586	784.878	0.010

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<sup>1</sup>  $P_u / \phi P_n$  controls

### Pole Bending Design Data

Section No.	Elevation ft	Size	$M_{ux}$	$\phi M_{nx}$	Ratio	$M_{uy}$	$\phi M_{ny}$	Ratio
			kip-ft	kip-ft	$\frac{M_{ux}}{\phi M_{nx}}$	kip-ft	kip-ft	$\frac{M_{uy}}{\phi M_{ny}}$
L1	63.5 - 62.225	P18x.375	0.013	367.000	0.000	0.000	367.000	0.000
	62.225 - 60.95		0.123	367.000	0.000	0.000	367.000	0.000
	60.95 - 59.675		8.566	367.000	0.023	0.000	367.000	0.000
	59.675 - 58.4		16.753	367.000	0.046	0.000	367.000	0.000
	58.4 - 57.125		25.005	367.000	0.068	0.000	367.000	0.000
	57.125 - 55.85		33.322	367.000	0.091	0.000	367.000	0.000
	55.85 - 54.575		41.703	367.000	0.114	0.000	367.000	0.000
	54.575 - 53.3		50.149	367.000	0.137	0.000	367.000	0.000
	53.3 - 52.025		58.657	367.000	0.160	0.000	367.000	0.000
	52.025 - 50.75		67.228	367.000	0.183	0.000	367.000	0.000
	50.75 - 49.475		75.860	367.000	0.207	0.000	367.000	0.000
	49.475 - 48.2		84.553	367.000	0.230	0.000	367.000	0.000
	48.2 - 46.925		93.308	367.000	0.254	0.000	367.000	0.000
	46.925 - 45.65		102.121	367.000	0.278	0.000	367.000	0.000
	45.65 - 44.375		110.993	367.000	0.302	0.000	367.000	0.000
	44.375 - 43.1		119.923	367.000	0.327	0.000	367.000	0.000
	43.1 - 41.825		128.908	367.000	0.351	0.000	367.000	0.000
	41.825 - 40.55		137.951	367.000	0.376	0.000	367.000	0.000
	40.55 - 39.275		147.048	367.000	0.401	0.000	367.000	0.000
	39.275 - 38		156.199	367.000	0.426	0.000	367.000	0.000

### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$	$\phi V_n$	Ratio	Actual $T_u$	$\phi T_n$	Ratio
			K	K	$\frac{V_u}{\phi V_n}$	kip-ft	kip-ft	$\frac{T_u}{\phi T_n}$
L1	63.5 - 62.225	P18x.375	0.020	392.439	0.000	0.000	564.642	0.000
	62.225 - 60.95		1.471	392.439	0.004	0.000	564.642	0.000
	60.95 - 59.675		6.395	392.439	0.016	0.000	564.642	0.000
	59.675 - 58.4		6.447	392.439	0.016	0.000	564.642	0.000
	58.4 - 57.125		6.498	392.439	0.017	0.000	564.642	0.000
	57.125 - 55.85		6.549	392.439	0.017	0.000	564.642	0.000
	55.85 - 54.575		6.600	392.439	0.017	0.000	564.642	0.000
	54.575 - 53.3		6.650	392.439	0.017	0.000	564.642	0.000
	53.3 - 52.025		6.699	392.439	0.017	0.000	564.642	0.000
	52.025 - 50.75		6.748	392.439	0.017	0.000	564.642	0.000
	50.75 - 49.475		6.796	392.439	0.017	0.000	564.642	0.000
	49.475 - 48.2		6.844	392.439	0.017	0.000	564.642	0.000
	48.2 - 46.925		6.892	392.439	0.018	0.000	564.642	0.000
	46.925 - 45.65		6.938	392.439	0.018	0.000	564.642	0.000
	45.65 - 44.375		6.984	392.439	0.018	0.000	564.642	0.000
	44.375 - 43.1		7.029	392.439	0.018	0.000	564.642	0.000
	43.1 - 41.825		7.074	392.439	0.018	0.000	564.642	0.000
	41.825 - 40.55		7.118	392.439	0.018	0.000	564.642	0.000
	40.55 - 39.275		7.161	392.439	0.018	0.000	564.642	0.000
	39.275 - 38		7.203	392.439	0.018	0.000	564.642	0.000

<b>tnxTower</b>  <b>Centek Engineering Inc.</b> 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	<b>Job</b> 18000.36 - CT2035	<b>Page</b> 19 of 20
	<b>Project</b> 25.5-ft Monopole - 975 Mix Ave Hamden, CT	<b>Date</b> 10:38:31 11/02/18
	<b>Client</b> AT&T	<b>Designed by</b> TJJ

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio	Ratio	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		$P_u / \phi P_n$	$M_{ux} / \phi M_{nx}$	$M_{uy} / \phi M_{ny}$	$V_u / \phi V_n$	$T_u / \phi T_n$			
L1	63.5 - 62.225	0.000	0.000	0.000	0.000	0.000	0.000 <sup>1</sup>	1.000	4.8.2 ✓
	62.225 - 60.95	0.015	0.000	0.000	0.004	0.000	0.016	1.000	4.8.2 ✓
	60.95 - 59.675	0.007	0.023	0.000	0.016	0.000	0.031	1.000	4.8.2 ✓
	59.675 - 58.4	0.007	0.046	0.000	0.016	0.000	0.053	1.000	4.8.2 ✓
	58.4 - 57.125	0.007	0.068	0.000	0.017	0.000	0.076	1.000	4.8.2 ✓
	57.125 - 55.85	0.007	0.091	0.000	0.017	0.000	0.098	1.000	4.8.2 ✓
	55.85 - 54.575	0.008	0.114	0.000	0.017	0.000	0.121	1.000	4.8.2 ✓
	54.575 - 53.3	0.008	0.137	0.000	0.017	0.000	0.145	1.000	4.8.2 ✓
	53.3 - 52.025	0.008	0.160	0.000	0.017	0.000	0.168	1.000	4.8.2 ✓
	52.025 - 50.75	0.008	0.183	0.000	0.017	0.000	0.192	1.000	4.8.2 ✓
	50.75 - 49.475	0.008	0.207	0.000	0.017	0.000	0.215	1.000	4.8.2 ✓
	49.475 - 48.2	0.008	0.230	0.000	0.017	0.000	0.239	1.000	4.8.2 ✓
	48.2 - 46.925	0.009	0.254	0.000	0.018	0.000	0.263	1.000	4.8.2 ✓
	46.925 - 45.65	0.009	0.278	0.000	0.018	0.000	0.287	1.000	4.8.2 ✓
	45.65 - 44.375	0.009	0.302	0.000	0.018	0.000	0.312	1.000	4.8.2 ✓
	44.375 - 43.1	0.009	0.327	0.000	0.018	0.000	0.336	1.000	4.8.2 ✓
	43.1 - 41.825	0.009	0.351	0.000	0.018	0.000	0.361	1.000	4.8.2 ✓
	41.825 - 40.55	0.009	0.376	0.000	0.018	0.000	0.386	1.000	4.8.2 ✓
	40.55 - 39.275	0.009	0.401	0.000	0.018	0.000	0.411	1.000	4.8.2 ✓
	39.275 - 38	0.010	0.426	0.000	0.018	0.000	0.436	1.000	4.8.2 ✓

<sup>1</sup>  $P_u / \phi P_n$  controls

<b>tnxTower</b>  <b>Centek Engineering Inc.</b> 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	<b>Job</b> 18000.36 - CT2035	<b>Page</b> 20 of 20
	<b>Project</b> 25.5-ft Monopole - 975 Mix Ave Hamden, CT	<b>Date</b> 10:38:31 11/02/18
	<b>Client</b> AT&T	<b>Designed by</b> TJL

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail	
L1	63.5 - 38	Pole	P18x.375	1	-7.586	784.878	43.6	Pass	
							Summary		
							Pole (L1)	43.6	Pass
							<b>RATING =</b>	<b>43.6</b>	<b>Pass</b>

**Anchor Bolt and Base Plate Analysis:****Input Data:**Tower Reactions:

Overturing Moment =	$M_U := 156\text{-ft-kips}$	(Input From RisaTower)
Shear Force =	Shear := 7-kips	(Input From RisaTower)
Axial Force =	Axial := 8-kips	(Input From RisaTower)

Anchor Bolt Data:

ASTMA325

Number of Anchor Bolts =	$N := 16$	(User Input)
Nominal Tensile Stress =	$F_{nt} := 90\text{-ksi}$	(User Input)
Nominal Shear Stress =	$F_{nv} := 54\text{-ksi}$	(User Input)
Bolt Modulus =	$E := 29000\text{-ksi}$	(User Input)
Diameter of Anchor Bolts =	$D := 1\text{-in}$	(User Input)
Threads per Inch =	$n := 8$	(User Input)
Distance to Bolts 1 =	$D_1 := 3\text{-in}$	(User Input)
Distance to Bolts 2 =	$D_2 := 6\text{-in}$	(User Input)
Distance to Bolts 3 =	$D_3 := 16\text{-in}$	(User Input)
Number of Bolts 1 =	$N_1 := 4$	(User Input)
Number of Bolts 2 =	$N_2 := 4$	(User Input)
Number of Bolts 3 =	$N_3 := 8$	(User Input)

Base Plate Data:

UseASTMA572 Grade 50

Plate Yield Strength =	$F_{ybp} := 50\text{-ksi}$	(User Input)
Base Plate Thickness =	$t_{BP} := 2\text{-in}$	(User Input)
Base Plate Effective Bend Width =	$B_{eff} := 26\text{-in}$	(User Input)
Outer Pole Diameter =	$D_T := 18\text{-in}$	(User Input)

**Anchor Bolt Analysis:**

GrossArea of Bolt =  $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot \text{in}^2$

NetArea of Bolt =  $A_n := \frac{\pi}{4} \cdot \left( D - \frac{0.9743 \cdot \text{in}}{n} \right)^2 = 0.606 \cdot \text{in}^2$

Bolt Polar Moment of Inertia =  $I_p := D_1^2 \cdot N_1 + D_2^2 \cdot N_2 + D_3^2 \cdot N_3 = 2228 \cdot \text{in}^2$

Maximum Tension Force =  $T_u := M_u \cdot \frac{D_3}{I_p} - \frac{\text{Axial}}{N} = 12.9 \cdot \text{kips}$

Maximum Shear Force =  $V_u := \frac{\text{Shear}}{N} = 0.4 \cdot \text{kips}$

Strength Resistance Factor =  $\phi := 0.75$

Design Shear Strength =  $\Phi R_{nv} := \phi \cdot F_{nv} \cdot A_g = 31.8 \cdot \text{k}$

$$\frac{V_u}{\Phi R_{nv}} = 1.38\%$$

Check Bolt Shear =  $\text{Bolt\_Shear} := \text{if} \left( \frac{V_u}{\Phi R_{nv}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$

**Bolt\_Shear = "OK"**

Design Tensile Strength =  $\Phi R_{nt} := \phi \cdot F_{nt} \cdot A_g = 53.0 \cdot \text{k}$

Required Shear Stress =  $f_{rv} := \frac{V_u}{A_g} = 0.6 \cdot \text{ksi}$

Nominal Tensile Stress Modified to Include Shear Stress =  $F'_{nt} := \min \left[ \left( 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_{rv} \right), F_{nt} \right] = 90.0 \cdot \text{ksi}$

Design Tensile Strength Reduced for Shear Effects =  $\Phi R'_{nt} := \phi \cdot F'_{nt} \cdot A_g = 53.0 \cdot \text{k}$

$$\frac{T_u}{\Phi R'_{nt}} = 24.41\%$$

Check Bolt Tension =  $\text{Bolt\_Tension} := \text{if} \left( \frac{T_u}{\Phi R'_{nt}} \leq 1.00, \text{"OK"}, \text{"Overstressed"} \right)$

**Bolt\_Tension = "OK"**

**Base Plate Analysis:**

Strength Resistance Factor Yielding due to Bending =

$$\phi_b := 0.9$$

Bending Moment in Plate =

$$M_{pl} := T_u \left( D_3 - \frac{D_T}{2} \right) \cdot \frac{N_3}{2} = 30.201 \text{ ft-kips}$$

Plate Plastic Section Modulus =

$$Z_{bp} := B_{eff} \frac{t_{BP}^2}{4} = 26 \text{ in}^3$$

Applied Bending Stress in Plate =

$$f_{bp} := \frac{M_{pl}}{Z_{bp}} = 13.94 \text{ ksi}$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot F_{ybp} = 45 \text{ ksi}$$

Plate Bending Stress % of Capacity =

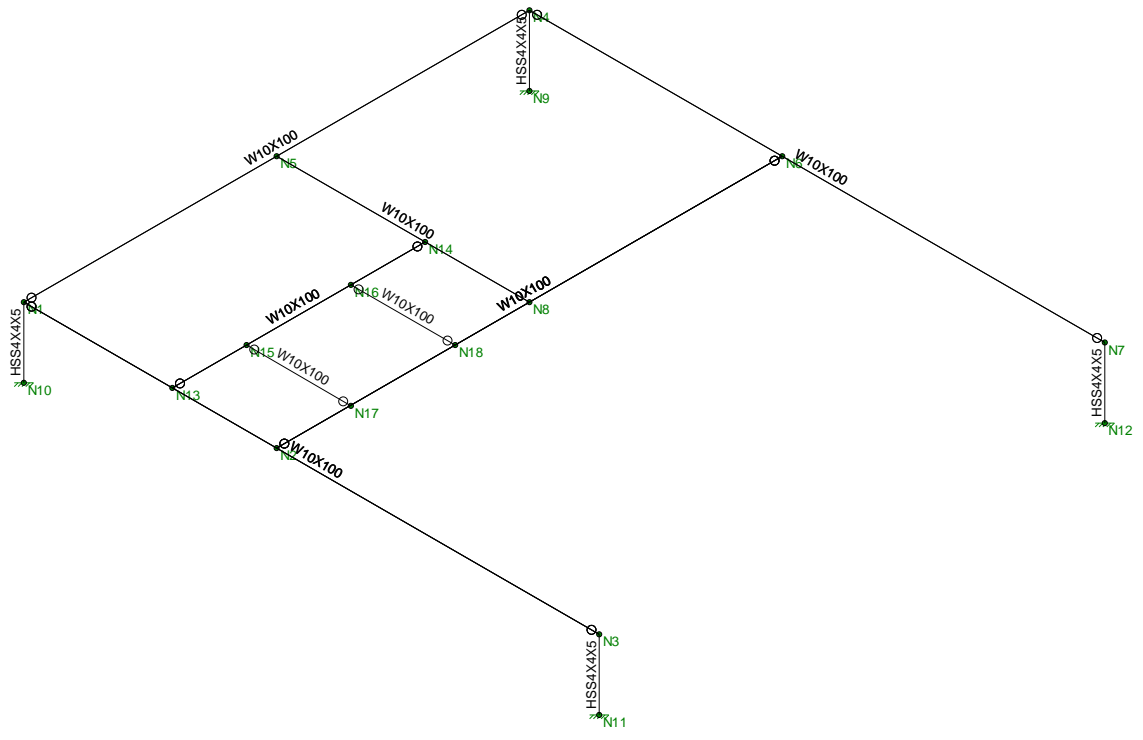
$$\frac{f_{bp}}{F_{bp}} = 31.0\%$$

Base Plate Bending =

$$\text{Plate\_Bending} := \text{if} \left( \frac{f_{bp}}{F_{bp}} < 1.00, \text{"Ok"}, \text{"Overstressed"} \right)$$

Plate\_Bending = "Ok"





Envelope Only Solution

Centek Engineering, Inc.	CT2035 Member Framing	Nov 2, 2018 at 11:28 AM
TJL		18000.36_CT2035_Hamden_Steel ...
18000.36		

**(Global) Model Settings**

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-12: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

**(Global) Model Settings, Continued**

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	.145
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#6
Footing Top Bar Cover (in)	1.5
Footing Bottom Bar	#6
Footing Bottom Bar Cover (in)	3
Pedestal Bar	#6
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#4

**Hot Rolled Steel Properties**

	Label	E [ksi]	G [ksi]	Nu	Therm (\1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3

### Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in <sup>2</sup> ]	I <sub>yy</sub> [in <sup>4</sup> ]	I <sub>zz</sub> [in <sup>4</sup> ]	J [in <sup>4</sup> ]
1	W10X100	W10X100	Beam	Wide Flange	A992	Typical	29.3	207	623	10.9
2	HSS4X4X5/16	HSS4X4X5	Column	Tube	A500 Gr.B R...	Typical	4.1	9.14	9.14	15.3

### Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	L <sub>byy</sub> [ft]	L <sub>bzz</sub> [ft]	L <sub>comp top</sub> [ft]	L <sub>comp bot</sub> [ft]	L-torqu...	K <sub>yy</sub>	K <sub>zz</sub>	C <sub>b</sub>	Function
1	M1	W10X100	16.5			Segment	Segment					Lateral
2	M2	W10X100	16.5			Segment	Segment					Lateral
3	M3	W10X100	14.5			Segment	Segment					Lateral
4	M4	W10X100	14.5			Segment	Segment					Lateral
5	M5	W10X100	7.25			Segment	Segment					Lateral
6	M6	HSS4X4X5/...	2									Lateral
7	M7	HSS4X4X5/...	2									Lateral
8	M8	HSS4X4X5/...	2									Lateral
9	M9	HSS4X4X5/...	2									Lateral
10	M10	W10X100	7.25			Segment	Segment					Lateral
11	M11	W10X100	3			L <sub>byy</sub>						Lateral
12	M12	W10X100	3			L <sub>byy</sub>						Lateral

### Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...)	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N3			W10X100	Beam	Wide Flange	A992	Typical
2	M2	N4	N7			W10X100	Beam	Wide Flange	A992	Typical
3	M3	N2	N6			W10X100	Beam	Wide Flange	A992	Typical
4	M4	N1	N4			W10X100	Beam	Wide Flange	A992	Typical
5	M5	N5	N8			W10X100	Beam	Wide Flange	A992	Typical
6	M6	N12	N7		90	HSS4X4X5/16	Column	Tube	A500 Gr...	Typical
7	M7	N11	N3		90	HSS4X4X5/16	Column	Tube	A500 Gr...	Typical
8	M8	N10	N1		90	HSS4X4X5/16	Column	Tube	A500 Gr...	Typical
9	M9	N9	N4		90	HSS4X4X5/16	Column	Tube	A500 Gr...	Typical
10	M10	N13	N14			W10X100	Beam	Wide Flange	A992	Typical
11	M11	N16	N18			W10X100	Beam	Wide Flange	A992	Typical
12	M12	N15	N17			W10X100	Beam	Wide Flange	A992	Typical

### Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	-7.25	3	7.25	0	
2	N2	0.	3	7.25	0	
3	N3	9.25	3	7.25	0	
4	N4	-7.25	3	-7.25	0	
5	N5	-7.25	3	0.	0	
6	N6	-0.	3	-7.25	0	
7	N7	9.25	3	-7.25	0	
8	N8	0	3	0	0	
9	N9	-7.25	1	-7.25	0	Yes
10	N10	-7.25	1	7.25	0	
11	N11	9.25	1	7.25	0	

**Joint Coordinates and Temperatures (Continued)**

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
12	N12	9.25	1	-7.25	0	
13	N13	-3.	3	7.25	0	
14	N14	-3	3	0	0	
15	N15	-3.	3	5.125	0	
16	N16	-3.	3	2.125	0	
17	N17	0.	3	5.125	0	
18	N18	0.	3	2.125	0	

**Joint Boundary Conditions**

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N9	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N10	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	N11	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
4	N12	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

**Member Point Loads (BLC 2 : Dead Load)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	Y	-2	%50
2	M11	Y	-2	%50
3	M12	Y	-2	%50
4	M3	Y	-2	%25

**Member Point Loads (BLC 3 : Wind X)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M10	X	1.75	%50
2	M11	X	1.75	%50
3	M12	X	1.75	%50
4	M3	X	1.75	%25
5	M10	Y	52	%50
6	M3	Y	-52	%25

**Member Point Loads (BLC 4 : Wind Z)**

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M12	Z	1.75	%50
2	M10	Z	1.75	%50
3	M11	Z	1.75	%50
4	M3	Z	1.75	%25
5	M11	Y	52	%50
6	M12	Y	-52	%50

**Member Distributed Loads**

Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
No Data to Print ...					

### Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self	DL		-1						
2	Dead Load	DL					4			
3	Wind X	WLX					6			
4	Wind Z	WLZ					6			

### Load Combinations

	Description	So...	P...	S...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...	BLC Fac...
1	IBC 16-8	Yes	Y		DL	1								
2	IBC 16-9	Yes	Y		DL	1	LL	1	LLS	1				
3	IBC 16-12 (a) (a)	Yes	Y		DL	1	W...	.6						
4	IBC 16-12 (a) (b)	Yes	Y		DL	1	W...	.6						
5	IBC 16-12 (a) (c)	Yes	Y		DL	1	W...	-.6						
6	IBC 16-12 (a) (d)	Yes	Y		DL	1	W...	-.6						
7	IBC 16-13 (a) (a)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75		
8	IBC 16-13 (a) (b)	Yes	Y		DL	1	W...	.45	LL	.75	LLS	.75		
9	IBC 16-13 (a) (c)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75		
10	IBC 16-13 (a) (d)	Yes	Y		DL	1	W...	-.45	LL	.75	LLS	.75		
11	IBC 16-15 (a)	Yes	Y		DL	.6	W...	.6						
12	IBC 16-15 (b)	Yes	Y		DL	.6	W...	.6						
13	IBC 16-15 (c)	Yes	Y		DL	.6	W...	-.6						
14	IBC 16-15 (d)	Yes	Y		DL	.6	W...	-.6						

### Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N9	max	.603	5	8.028	6	1.571	6	3.113	6	0	14	1.285	3
2		min	-.537	11	-1.944	12	-1.591	4	-3.113	4	0	1	-1.226	13
3	N10	max	1.535	5	11.128	5	1.582	14	3.11	6	0	14	3.06	3
4		min	-1.488	11	-.122	11	-1.562	12	-3.11	4	0	1	-2.994	13
5	N11	max	1.476	13	7.875	3	.544	6	1.154	6	0	14	3.09	3
6		min	-1.526	3	-2.077	13	-.544	4	-1.161	4	0	1	-2.943	13
7	N12	max	.618	13	4.269	6	.505	6	1.083	6	0	14	1.376	3
8		min	-.684	3	-1.004	12	-.505	4	-1.077	4	0	1	-1.237	13
9	Totals:	max	4.2	13	16.345	10	4.2	14						
10		min	-4.2	3	9.807	11	-4.2	4						

### Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...]	LC	Y Rotation [...]	LC	Z Rotation [...]	LC
1	N1	max	.035	3	0	11	.035	4	2.069e-03	4	0	14	1.978e-03	13
2		min	-.034	13	-.003	5	-.035	6	-2.068e-03	6	0	1	-2.152e-03	3
3	N2	max	.036	3	.032	13	.063	4	1.525e-03	4	4.592e-05	3	4.076e-04	13
4		min	-.034	13	-.176	3	-.063	6	-1.523e-03	6	-4.59e-05	5	-6.714e-04	3
5	N3	max	.035	3	0	13	.014	4	8.314e-04	4	0	14	1.999e-03	13
6		min	-.034	13	-.002	3	-.013	6	-8.266e-04	6	0	1	-2.098e-03	3
7	N4	max	.016	3	0	12	.035	4	2.069e-03	4	0	14	8.644e-04	13
8		min	-.014	13	-.002	6	-.035	6	-2.069e-03	6	0	1	-1.035e-03	3
9	N5	max	.052	3	.04	11	.035	4	2.143e-05	4	2.486e-04	14	1.27e-03	13

**Envelope Joint Displacements (Continued)**

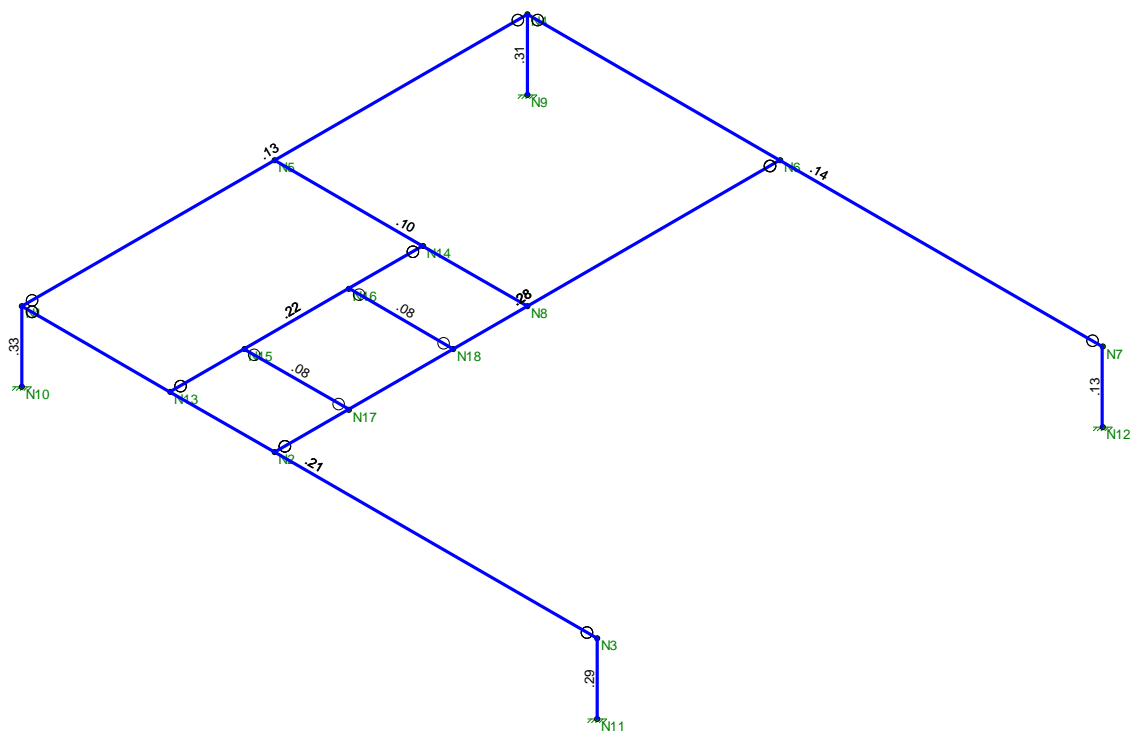
Joint	X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...]	LC	Y Rotation [...]	LC	Z Rotation [...]	LC		
10	min	13	-.051	13	-.073	5	-.035	6	-1.184e-05	14	-2.487e-04	12	-3.091e-03	3
11	N6	max	.016	3	.033	12	.063	4	1.501e-03	4	2.383e-05	3	7.132e-05	12
12	min	13	-.014	13	-.103	6	-.063	6	-1.503e-03	6	-2.386e-05	5	-2.407e-04	6
13	N7	max	.016	3	0	12	.013	4	7.76e-04	4	0	14	8.397e-04	13
14	min	13	-.014	13	-.001	6	-.013	6	-7.806e-04	6	0	1	-9.346e-04	3
15	N8	max	.053	3	.09	13	.063	4	1.114e-03	3	1.177e-04	3	2.352e-03	13
16	min	13	-.051	13	-.27	3	-.063	6	-5.887e-04	13	-1.177e-04	5	-3.869e-03	3
17	N9	max	0	14	0	14	0	14	0	14	0	14	0	14
18	min	1	0	1	0	1	0	1	0	1	0	1	0	1
19	N10	max	0	14	0	14	0	14	0	14	0	14	0	14
20	min	1	0	1	0	1	0	1	0	1	0	1	0	1
21	N11	max	0	14	0	14	0	14	0	14	0	14	0	14
22	min	1	0	1	0	1	0	1	0	1	0	1	0	1
23	N12	max	0	14	0	14	0	14	0	14	0	14	0	14
24	min	1	0	1	0	1	0	1	0	1	0	1	0	1
25	N13	max	.036	3	.017	14	.056	4	1.75e-03	4	3.279e-04	14	4.651e-04	13
26	min	13	-.034	13	-.127	4	-.056	6	-1.749e-03	6	-3.279e-04	12	-1.949e-03	3
27	N14	max	.053	3	.019	12	.056	4	6.556e-04	3	3.469e-04	14	1.908e-03	13
28	min	13	-.051	13	-.144	6	-.056	6	-3.434e-04	13	-3.47e-04	12	-3.554e-03	3
29	N15	max	.046	3	-.02	14	.056	4	1.338e-03	12	3.494e-04	13	8.88e-04	13
30	min	13	-.044	13	-.102	4	-.056	6	-1.649e-03	6	-3.494e-04	11	-2.42e-03	3
31	N16	max	.053	3	-.014	12	.056	4	1.442e-03	12	7.522e-05	6	1.485e-03	13
32	min	13	-.052	13	-.113	6	-.056	6	-1.468e-03	6	-7.531e-05	4	-3.084e-03	3
33	N17	max	.046	3	.079	13	.063	4	1.776e-03	12	3.48e-04	13	9.776e-04	13
34	min	13	-.044	13	-.248	3	-.063	6	-2.505e-03	6	-3.48e-04	11	-1.609e-03	3
35	N18	max	.053	3	.104	13	.063	4	1.482e-03	12	7.12e-05	6	1.782e-03	13
36	min	13	-.052	13	-.29	3	-.063	6	-1.528e-03	6	-7.127e-05	4	-2.932e-03	3

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

Member	Shape	Code Check	Loc...	LC	Shea..	Loc.....	L..Pnc/o...	Pnt/o...	Mnyy/...	Mnzz/.....	Eqn		
1	M1	W10X100	.214	7.3...	3	.113	4.2...	y 3	584.67	877.246	152.196	324.351	1..H1-1b
2	M2	W10X100	.137	7.2...	6	.038	0	y 6	584.67	877.246	152.196	324.351	1..H1-1b
3	M3	W10X100	.278	3.6...	3	.179	0	y 3	641.268	877.246	152.196	324.351	1..H1-1b
4	M4	W10X100	.125	7.25	5	.039	0	y 5	641.268	877.246	152.196	324.351	1..H1-1b
5	M5	W10X100	.100	4.2...	5	.076	4.6...	y 5	811.149	877.246	152.196	324.351	1..H1-1b
6	M6	HSS4X4X5	.131	0	3	.023	0	z 3	110.988	112.934	12.831	12.831	1..H1-1b
7	M7	HSS4X4X5	.288	0	3	.051	0	z 3	110.988	112.934	12.831	12.831	1..H1-1b
8	M8	HSS4X4X5	.328	0	4	.053	0	y 6	110.988	112.934	12.831	12.831	1..H1-1b
9	M9	HSS4X4X5	.310	0	6	.053	0	y 4	110.988	112.934	12.831	12.831	1..H1-1b
10	M10	W10X100	.219	3.6...	5	.130	0	y 5	811.149	877.246	152.196	324.351	1..H1-1b
11	M11	W10X100	.082	1.5	6	.112	0	y 6	865.558	877.246	152.196	324.351	1..H1-1b
12	M12	W10X100	.082	1.5	4	.117	0	y 4	865.558	877.246	152.196	324.351	1..H1-1b



Code Check ( Env )	
No Calc	
> 1.0	
.90-1.0	
.75-.90	
.50-.75	
0-.50	



Member Code Checks Displayed (Enveloped)  
Envelope Only Solution

Centek Engineering, Inc.	CT2035 Unity Check	Nov 2, 2018 at 11:28 AM
TJL		18000.36_CT2035_Hamden_Steel ...
18000.36		



Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTV2035	DATE:	04/24/2018	RF DESIGN ENG:	Parminder Singh	RF PERF ENG:	Folarin Ayo	RFDS PROGRAM TYPE:	2018 LTE Next Carrier		
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	8602586382	RF PERF PHONE:		RFDS TECHNOLOGY:	LTE		
REVISION:	Final	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	SP656B@ATT.COM	RF PERF EMAIL:		STATE/STATUS:	Final/Approved		
INITIATIVE /PROJECT:	LTE 6C AWS J, LTE 7C 700 UPPER D & LTE 850 5G NR Upgrade					RFDS VERSION:	2.00	RFDS ID:	2346785		
						GSM FREQUENCY:		Created By:	sp656b	Updated By:	om636a
						UMTS FREQUENCY:	850	Date Created:	4/24/2018 12:00:55 PM	Date Updated:	7/23/2018 2:58:03 PM
						LTE FREQUENCY:	700, 850, 1900, WCS				
						5G FREQUENCY:	850				
						I-PLAN JOB # 1:	NER-RCTB-18-03302	IPLAN PRD GRP    SUB GRP #1:	LTE Next Carrier    LTE 6C		
						I-PLAN JOB # 2:	NER-RCTB-18-03368	IPLAN PRD GRP    SUB GRP #2:	LTE Next Carrier    LTE 7C		
						I-PLAN JOB # 3:	NER-RCTB-18-02465	IPLAN PRD GRP    SUB GRP #3:	Cell Site RF Modifications    5G NR Upgrade		
						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:	61166	FA LOCATION CODE:	10035036	LOCATION NAME:	HAMDEN	ORACLE PTN # 1:	2051A0GWFL	PACE JOB # 1:	MRCTB032299
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PTN # 2:	2051A0GWEG	PACE JOB # 2:	MRCTB032288
ADDRESS:	975 MIX AVENUE	CITY:	HAMDEN	STATE:	CT	ORACLE PTN # 3:	2051A0GWFN	PACE JOB # 3:	MRCTB032250
ZIP CODE:	06514	COUNTY:	NEW HAVEN	LONG (DEC. DEG.):	-72.9179161	ORACLE PTN # 4:		PACE JOB # 4:	
LATITUDE (D-M-S):	41d 22m 42.672s	LONGITUDE (D-M-S):	-72d -55m -4.49796s	LAT (DEC. DEG.):	41.3785200	ORACLE PTN # 5:		PACE JOB # 5:	
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	2035 - HAMDEN - APARTMENTS. RT. 15 TO EXIT 60. TURN NORTH ONTO DIXWELL AVE. & PROCEED APPROX. 1/2 MILE. TURN LEFT ONTO SKIFF STREET. GO TO THE TOP OF THE HILL & TURN RIGHT AT LIGHT ONTO MIX AVE. GO TO 975 MIX AVE ON RIGHT. SITE IS IN APT. 1-KE. YOU NEED A BUILDING KEY FOR ACCESS LOCKBOX WITH KEY IS NEXT TO SIDE DOOR 0043... NOTE IF KEY IS MISSING YOU NEED TO GO THRU FRONT DOORS AND GO DOWN THE STAIRS AND AROUND BACK UP TO MAIN LEVEL CONTACT: BUILDING MNGR PAT MARCHITTO 203-410-2042/DEMARC LOCATED INSIDE SHELTERCID'S: GSM- ET45/DHXV238876 ET120/DHXV238877 ET183/HCGS714899UMTS- SITE ON FIBER					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:	
						OPS DISTRICT:	CT-South	LAC(GSM):	
						OPS ZONE:	NE_CT_S_NHVN_SW_CS	LAC(UMTS):	05988
						RF DISTRICT:	NPO Triage	BSC(GSM):	
						RF ZONE:	Hotseat	RNC(UMTS):	BRPTCT04CRBR07
						PARENT NAME(GSM):		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 CALL SIGNS:
CGSA - MINOR FILING NEEDED (Yes/No):	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:		
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:				

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):		STRUCTURE TYPE:	ROOFTOP	MARKET LOCATION 700 MHz Band:	
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:	NR	MARKET LOCATION 850 MHz Band:	
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):				MARKET LOCATION 1900 MHz Band:	
LIGHTING TYPE:	NOT REQUIRED					MARKET LOCATION AWS Band:	
						MARKET LOCATION WCS Band:	
						MARKET LOCATION Future Band:	



Section 6 - RBS GENERAL INFORMATION - existing

	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS	LTE 2ND RBS	5G 1ST RBS						
<b>RBS ID:</b>	210601	250427	366807								
<b>CTS COMMON ID:</b>	CTV2035	CTU2035	CTL02035								
<b>CELL ID / BCF:</b>	CTV2035	CTV2035	CTL02035								
<b>BTA/TID:</b>	318U	318V	318L								
<b>4-9 DIGIT SITE ID:</b>	2035	2035	2035								
<b>COW OR TOY?:</b>	No	No	No								
<b>CELL SITE TYPE:</b>	SECTORIZED	SECTORIZED	SECTORIZED								
<b>SITE TYPE:</b>	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL								
<b>BTS LOCATION ID:</b>	INTERNAL	INTERNAL	INTERNAL								
<b>BASE STATION TYPE:</b>	BASE	OVERLAY	BASE								
<b>EQUIPMENT NAME:</b>	HAMDEN	HAMDEN	HAMDEN								
<b>DISASTER PRIORITY:</b>	0	0	3								

Section 6 - RBS GENERAL INFORMATION - final

	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS	LTE 2ND RBS	5G 1ST RBS						
<b>RBS ID:</b>	210601		366807	RFDS_35887491	RFDS_35980018						
<b>CTS COMMON ID:</b>	CTV2035		CTL02035	CTL06035R	CTN0002035						
<b>CELL ID / BCF:</b>	CTV2035		CTL02035	CTL06035R	CTN0002035						
<b>BTA/TID:</b>	318U		318L	318L	318L						
<b>4-9 DIGIT SITE ID:</b>	2035		2035	6035	02035						
<b>COW OR TOY?:</b>	No		No	No	No						
<b>CELL SITE TYPE:</b>	SECTORIZED		SECTORIZED	SECTORIZED	SECTORIZED						
<b>SITE TYPE:</b>	MACRO-CONVENTIONAL		MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL						
<b>BTS LOCATION ID:</b>	INTERNAL		INTERNAL	INTERNAL	INTERNAL						
<b>BASE STATION TYPE:</b>	BASE		BASE	BASE	BASE						
<b>EQUIPMENT NAME:</b>	HAMDEN		HAMDEN	HAMDEN	HAMDEN						
<b>DISASTER PRIORITY:</b>	0		3	3	3						

Section 7 - RBS SPECIFIC INFORMATION - existing

	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS	LTE 2ND RBS	5G 1ST RBS							
<b>RAC:</b>												
<b>EQUIPMENT VENDOR:</b>	ERICSSON	ERICSSON	ERICSSON									
<b>EQUIPMENT TYPE:</b>	3206 INDOOR	3206 INDOOR	6601 INDOOR MU									
<b>BASEBAND CONFIGURATION:</b>												
<b>LOCATION:</b>												
<b>CABINET LOCATION:</b>												
<b>MARKET STATE CODE:</b>			CT									
<b>AGPS:</b>	Yes	Yes	Yes									
<b>NODE B NUMBER:</b>	0	0	2035									

Section 7 - RBS SPECIFIC INFORMATION - final

	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS	LTE 2ND RBS	5G 1ST RBS							
<b>RAC:</b>												
<b>EQUIPMENT VENDOR:</b>	ERICSSON		ERICSSON	ERICSSON	ERICSSON							
<b>EQUIPMENT TYPE:</b>	3206 INDOOR		6601 INDOOR MU	6601 INDOOR MU	6601 INDOOR MU							
<b>BASEBAND CONFIGURATION:</b>			2x6601 / 2x5216 / 2xXMMU03 + IDLe		xxxxx / 1x6630 / xxxxxx							
<b>LOCATION:</b>												
<b>CABINET LOCATION:</b>												
<b>MARKET STATE CODE:</b>			CT	CT	CT							
<b>AGPS:</b>	Yes		Yes	Yes	Yes							
<b>NODE B NUMBER:</b>	0		2035	6035	2035							











Section 15A - CURRENT TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	800-10121	QS66512-2		HPA-65R-BUU-H6			
ANTENNA VENDOR	Kathrein	Quintel		CCI Products			
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9	72X12X9.6		72X14.8X9			
ANTENNA WEIGHT	44.1	111		51			
AZIMUTH	143	20		20			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	61	61		61			
ANTENNA TIP HEIGHT	63	64		64			
MECHANICAL DOWNTILT	1	0		0			
FEEDER AMOUNT	2	Fiber+ 2Coax					
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	Kathrein / 860-10025	Internal	Internal			
SURGE ARRESTOR (QTY/MODEL)		1	DC Fiber Squid				
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006	LTE RRH	LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Powerwave / TT19-08BP111-001					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser / 100860					
PDU FOR TMA (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)					
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-E2 B29	1	RRUS-11 (REUSE ONLY)		
RRH - 850 band (QTY/MODEL)		1	RRUS-12				
RRH - 1900 band (QTY/MODEL)		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		61166.A.850.3G.1	CTV20351	CTV20351		UMTS 850	800 10121 @850_Xpol_6dt	13.42	143	6	None	Andrew 1-5/8 (850)	120.030726					293.76				
ANTENNA POSITION 2	PORT 1		61166.A.850.4G.1	CTL02035_8A_1	CTL02035_8A_1		LTE 850	QS66512-2_850MHz_06DT	13.26	20	6	TOP	FIBER	0					1000				
	PORT 2		61166.A.700.4G.1	CTL02035_7A_2_E	CTL02035_7A_2_E		LTE 700	QS66512-2_722MHz_03DT	13.5	20	3	TOP	FIBER	0					2182.7299				
	PORT 3		61166.A.1900.4G.1	CTL02035_9A_1	CTL02035_9A_1		LTE 1900	QS66512-2_1930MHz_00DT	17.29	20	0	TOP	FIBER	0					2182.7299				

	PORT 4		61166.A.1900.4G.1	CTL02035_9A_2	CTL02035_9A_2		LTE 1900	QS66512-2_1930MHz_00DT	17.29	20	0	TOP	FIBER	0						2182.7299			
	PORT 7		61166.A.WCS.4G.111	CTL02035_3A_1	CTL02035_3A_1		LTE WCS	QS66512-2_2360MHz_03DT	17.45	20	3	TOP	FIBER	0						1227.4392			
ANTENNA POSITION 4	PORT 1		61166.A.700.4G.1	CTL02035_7A_1	CTL02035_7A_1		LTE 700	HPA-65R-BUU-H6_719MHz_05DT	14.11	20	5	TOP	FIBER	0						1119.4378			

Section 15B - CURRENT TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	800-10121	QS66512-2		HPA-65R-BUU-H6			
ANTENNA VENDOR	Kathrein	Quintel		CCI Products			
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9	72X12X9.6		72X14.8X9			
ANTENNA WEIGHT	44.1	111		51			
AZIMUTH	263	150		150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	61	61		61			
ANTENNA TIP HEIGHT	63	64		64			
MECHANICAL DOWNTILT	1	0		0			
FEEDER AMOUNT	2	Fiber+ 2Coax					
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	Kathrein / 860-10025	Internal		Internal		
SURGE ARRESTOR (QTY/MODEL)		1	DC Fiber Squid				
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			LTE RRH		LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Powerwave / TT19-08BP111-001					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser / 100860					
PDU FOR TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-E2 B29	1	RRUS-11 (REUSE ONLY)		
RRH - 850 band (QTY/MODEL)		1	RRUS-12				
RRH - 1900 band (QTY/MODEL)		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		61166.B.850.3G.1	CTV20352	CTV20352		UMTS 850	800 10121 @850_Xpol_6dt	13.42	263	6	None	Andrew 1-5/8 (850)	120.030726						293.76			
ANTENNA POSITION 2	PORT 1		61166.B.850.4G.1	CTL02035_8B_1	CTL02035_8B_1		LTE 850	QS66512-2_850MHz_06DT	13.26	150	6	TOP	FIBER	0						1000			
	PORT 2		61166.B.700.4G.1	CTL02035_7B_2_E	CTL02035_7B_2_E		LTE 700	QS66512-2_722MHz_03DT	13.5	150	3	TOP	FIBER	0						2182.7299			
	PORT 3		61166.B.1900.4G.1	CTL02035_9B_1	CTL02035_9B_1		LTE 1900	QS66512-2_1930MHz_00DT	17.29	150	0	TOP	FIBER	0						2182.7299			

	PORT 4		61166.B.1900.4G.1	CTL02035_9B_2	CTL02035_9B_2		LTE 1900	QS66512-2_1930MHz_00DT	17.29	150	0	TOP	FIBER	0						2182.7299			
	PORT 7		61166.B.WCS.4G.111	CTL02035_3B_1	CTL02035_3B_1		LTE WCS	QS66512-2_2360MHz_03DT	17.45	150	3	TOP	FIBER	0						1227.4392			
ANTENNA POSITION 4	PORT 1		61166.B.700.4G.1	CTL02035_7B_1	CTL02035_7B_1		LTE 700	HPA-65R-BUU-H6_719MHz_02DT	14.28	150	2	TOP	FIBER	0						1119.4378			

Section 15C - CURRENT TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	800-10121	QS66512-2		HPA-65R-BUU-H6			
ANTENNA VENDOR	Kathrein	Quintel		CCI Products			
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9	72X12X9.6		72X14.8X9			
ANTENNA WEIGHT	44.1	111		51			
AZIMUTH	23	260		260			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	61	61		61			
ANTENNA TIP HEIGHT	63	64		64			
MECHANICAL DOWNTILT	1	0		0			
FEEDER AMOUNT	2	Fiber+ 2Coax					
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	Kathrein / 860-10025	Internal		Internal		
SURGE ARRESTOR (QTY/MODEL)			1	DC Fiber Squid			
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH		LTE RRH	
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Powerwave / TT19-08BP111-001					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser / 100860					
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-E2 B29		1	RRUS-11 (REUSE ONLY)	
RRH - 850 band (QTY/MODEL)		1	RRUS-12				
RRH - 1900 band (QTY/MODEL)		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		61166.C.850.3G.1	CTV20353	CTV20353		UMTS 850	800 10121 @850_Xpol_6dt	13.42	23	6	None	Andrew 1-5/8 (850)	120.030726						293.76			
ANTENNA POSITION 2	PORT 1		61166.C.850.4G.1	CTL02035_8C_1	CTL02035_8C_1		LTE 850	QS66512-2_850MHz_06DT	13.26	260	6	TOP	FIBER	0						1000			
	PORT 2		61166.C.700.4G.1	CTL02035_7C_2_E	CTL02035_7C_2_E		LTE 700	QS66512-2_722MHz_03DT	13.5	260	3	TOP	FIBER	0						2182.7299			
	PORT 3		61166.C.1900.4G.1	CTL02035_9C_1	CTL02035_9C_1		LTE 1900	QS66512-2_1930MHz_00DT	17.29	260	0	TOP	FIBER	0						2182.7299			

	PORT 4		61166.C.1900.4G.1	CTL02035_9C_2	CTL02035_9C_2		LTE 1900	QS66512-2_1930MHz_00DT	17.29	260	0	TOP	FIBER	0						2182.7299			
	PORT 7		61166.C.WCS.4G.111	CTL02035_3C_1	CTL02035_3C_1		LTE WCS	QS66512-2_2360MHz_03DT	17.45	260	3	TOP	FIBER	0						1227.4392			
ANTENNA POSITION 4	PORT 1		61166.C.700.4G.1	CTL02035_7C_1	CTL02035_7C_1		LTE 700	HPA-65R-BUU-H6_719MHz_10DT	13.9	260	10	TOP	FIBER	0						1119.4378			

Section 16A - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL			800-10965				
ANTENNA VENDOR			Kathrein				
ANTENNA SIZE (H x W x D)			78.7X20X6.9				
ANTENNA WEIGHT			108.6				
AZIMUTH			20				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)			61				
ANTENNA TIP HEIGHT			64				
MECHANICAL DOWNTILT			0				
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)				Internal			
SURGE ARRESTOR (QTY/MODEL)			1	DC Squid			
DIPLEXER (QTY/MODEL)			2	Kaelus DBC0061F1V51-2			
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 TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1	B14 4478			
RRH - 850 band (QTY/MODEL)			1	4478 B5			
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)			1	4426 B66			
RRH - WCS band (QTY/MODEL)							
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: Arrange antenna positions as per PD. Remove existing 850 RRH. Install 8 port antenna. Install LTE 700 B14 RRUS-4478 , LTE 850 RRUS-4478 & LTE AWS RRUS-4426 B66. Add low band combiners. Add 1 DC Fiber Squid. Swap 2x DUS with 2x 5216. Add Idle. Add 6630.

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)	RXKIT 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 3	PORT 1		61166.A.850.4G.1	CTL06035_8A_1	CTL06035_8A_1		LTE 850	80010965_849MHz_05DT	15.4	20	5	TOP	FIBER	0						1000		5		
	PORT 2		61166.A.700.4G.5	CTL06035_7A_3_F	CTL06035_7A_3_F		LTE 700	80010965_777MHz_05DT	15.4	20	5	TOP	FIBER	0							2951.413		5	
	PORT 3		61166.A.AWS.4G.4	CTL06035_2A_2	CTL06035_2A_2		LTE AWS	80010965_2133MHz_03DT	15.4	20	3	TOP	FIBER	0							5070.2572		6	
	PORT 5		61166.A.850.5G.1	CTN0002035_8A_1	CTN0002035_8A_1		5G 850	80010965_849MHz_05DT	15.4	20	5	TOP	FIBER	0							1000		5	

Section 16B - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL			800-10965				
ANTENNA VENDOR			Kathrein				
ANTENNA SIZE (H x W x D)			78.7X20X6.9				
ANTENNA WEIGHT			108.6				
AZIMUTH			150				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)			61				
ANTENNA TIP HEIGHT			64				
MECHANICAL DOWNTILT			0				
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)				Internal			
SURGE ARRESTOR (QTY/MODEL)			1	DC Squid			
DIPLEXER (QTY/MODEL)			2	Kaelus DBC0061F1V51-2			
DIPLEXER (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)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1	B14 4478			
RRH - 850 band (QTY/MODEL)			1	4478 B5			
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)			1	4426 B66			
RRH - WCS band (QTY/MODEL)							
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	Arrange antenna positions as per PD. Remove existing 850 RRH. Install 8 port antenna. Install LTE 700 B14 RRUS-4478 , LTE 850 RRUS-4478 & LTE AWS RRUS-4426 B66. Add low band combiners. Add 1 DC Fiber Squid. Swap 2x DUS with 2x 5216. Add Idle. Add 6630.						
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 3	PORT 1		61166.B.850.4G.1	CTL06035_BB_1	CTL06035_BB_1		LTE 850	80010965_849MHz_02DT	15.4	150	2	TOP	FIBER	0					1000			13	
	PORT 2		61166.B.700.4G.5	CTL06035_7B_3_F	CTL06035_7B_3_F		LTE 700	80010965_777MHz_02DT	15.3	150	2	TOP	FIBER	0					2951.413			13	
	PORT 3		61166.B.AWS.4G.4	CTL06035_2B_2	CTL06035_2B_2		LTE AWS	80010965_2133MHz_03DT	15.4	150	3	TOP	FIBER	0					5070.2572			14	
	PORT 5		61166.B.850.5G.1	CTN0002035_BB_1	CTN0002035_BB_1		5G 850	80010965_849MHz_02DT	15.4	150	2	TOP	FIBER	0					1000			13	



Section 16C - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL			800-10965				
ANTENNA VENDOR			Kathrein				
ANTENNA SIZE (H x W x D)			78.7X20X6.9				
ANTENNA WEIGHT			108.6				
AZIMUTH			260				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)			61				
ANTENNA TIP HEIGHT			64				
MECHANICAL DOWNTILT			0				
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)				Internal			
SURGE ARRESTOR (QTY/MODEL)			1	DC Squid			
DIPLEXER (QTY/MODEL)			2	Kaelus DBC0061F1V51-2			
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 TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1	B14 4478			
RRH - 850 band (QTY/MODEL)			1	4478 B5			
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)			1	4426 B66			
RRH - WCS band (QTY/MODEL)							
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 Arrange antenna positions as per PD. Remove existing 850 RRH. Install 8 port antenna. Install LTE 700 B14 RRUS-4478 , LTE 850 RRUS-4478 & LTE AWS RRUS-4426 B66. Add low band combiners. Add 1 DC Fiber Squid. Swap 2x DUS with 2x 5216. Add Idle. Add 6630.

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 3	PORT 1		61166.C.850.4G.1	CTL06035_8C_1	CTL06035_8C_1		LTE 850	80010965_849MHz_1 ODT	15.4	260	10	TOP	FIBER	0						1000		21	
	PORT 2		61166.C.700.4G.5	CTL06035_7C_3_F	CTL06035_7C_3_F		LTE 700	80010965_777MHz_1 ODT	15.2	260	10	TOP	FIBER	0						2951.413		21	
	PORT 3		61166.C.AWS.4G.4	CTL06035_2C_2	CTL06035_2C_2		LTE AWS	80010965_2170MHz_06DT	18.5	260	6	TOP	FIBER	0						5070.2572		22	
	PORT 5		61166.C.850.5G.1	CTN0002035_8C_1	CTN0002035_8C_1		5G 850	80010965_849MHz_1 ODT	15.4	260	10	TOP	FIBER	0						1000		21	

Section 17A - FINAL TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	800-10121	QS66512-2	800-10965	HPA-65R-BUU-H6			
ANTENNA VENDOR	Kathrein	Quintel	Kathrein	CCI Products			
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9	72X12X9.6	78.7X20X6.9	72X14.8X9			
ANTENNA WEIGHT	44.1	111	108.6	51			
AZIMUTH	143	20	20	20			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	61	61	61	61			
ANTENNA TIP HEIGHT	63	64	64	64			
MECHANICAL DOWNTILT	1	0	0	0			
FEEDER AMOUNT	2	Fiber+ 2Coax					
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	Kathrein / 860-10025	Internal	Internal	Internal		
SURGE ARRESTOR (QTY/MODEL)	1	DC Fiber Squid	1	DC Squid			
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901	2	Kaelus DBC0061F1V51-2			
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Kathrein / 860-10006	LTE RRH	LTE RRH	LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Powerwave / TT19-08BP111-001					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser / 100860					
PDU FOR TMA (QTY/MODEL)	1	LGP 12104 (1900 AND 850 Bypass TMA)					
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-E2 B29	1	B14 4478	1	RRUS-11 (REUSE ONLY)
RRH - 850 band (QTY/MODEL)				1	4478 B5		
RRH - 1900 band (QTY/MODEL)		1	RRUS-32 B2				
RRH - AWS band (QTY/MODEL)				1	4426 B66		
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	Arrange antenna positions as per PD. Remove existing 850 RRH. Install 8 port antenna. Install LTE 700 B14 RRUS-4478 , LTE 850 RRUS-4478 & LTE AWS RRUS-4426 B66. Add low band combiners. Add 1 DC Fiber Squid. Swap 2x DUS with 2x 5216. Add Idle. Add 6630.						
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)	RX/IT 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	61166.A.850.3G.1	61166.A.850.3G.1	CTV20351	CTV20351		UMTS 850	800 10121 @850_Xpol_6dt	13.42	143	6	None	Andrew 1-5/8 (850)	120.030726						293.76		1	
ANTENNA POSITION 2	PORT 2	61166.A.700.4G.tmp2	61166.A.700.4G.4	CTL06035_7A_2_E	CTL06035_7A_2_E		LTE 700	QS66512-2_722MHz_03DT	13.5	20	3	TOP	FIBER	0						1475.7065		3	
	PORT 3	61166.A.1900.4G.1	61166.A.1900.4G.1	CTL02035_9A_1	CTL02035_9A_1		LTE 1900	QS66512-2_1930MHz_03DT	15.9	20	3	TOP	FIBER	0						4842.058		4	
	PORT 4	61166.A.1900.4G.4	61166.A.1900.4G.4	CTL02035_9A_2	CTL02035_9A_2		LTE 1900	QS66512-2_1930MHz_03DT	15.9	20	3	TOP	FIBER	0						4842.058		4	

	PORT 7	61166.A.WCS.4G.1	61166.A.WCS.4G.1	CTL02035_3A_1	CTL02035_3A_1		LTE WCS	QS66512-2_2355MHz_03DT	16.7	20	3	TOP	FIBER	0						1285.2866		4	
ANTENNA POSITION 3	PORT 1	61166.A.850.4G.tmp1	61166.A.850.4G.1	CTL06035_8A_1	CTL06035_8A_1		LTE 850	80010965_849MHz_05DT	15.4	20	5	TOP	FIBER	0						1000		5	
	PORT 2	61166.A.700.4G.tmp5	61166.A.700.4G.5	CTL06035_7A_3_F	CTL06035_7A_3_F		LTE 700	80010965_777MHz_05DT	15.4	20	5	TOP	FIBER	0						2951.413		5	
	PORT 3	61166.A.AWS.4G.tmp4	61166.A.AWS.4G.4	CTL06035_2A_2	CTL06035_2A_2		LTE AWS	80010965_2133MHz_03DT	15.4	20	3	TOP	FIBER	0						5070.2572		6	
	PORT 5	61166.A.850.5G.tmp1	61166.A.850.5G.1	CTN0002035_8A_1	CTN0002035_8A_1		5G 850	80010965_849MHz_05DT	15.4	20	5	TOP	FIBER	0						1000		5	
ANTENNA POSITION 4	PORT 1	61166.A.700.4G.1	61166.A.700.4G.1	CTL02035_7A_1	CTL02035_7A_1		LTE 700	HPA-65R-BUU-H6_719MHz_05DT	14.11	20	5	TOP	FIBER	0						1475.7065		7	

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	800-10121	QS66512-2	800-10965	HPA-65R-BUU-H6			
ANTENNA VENDOR	Kathrein	Quintel	Kathrein	CCI Products			
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9	72X12X9.6	78.7X20X6.9	72X14.8X9			
ANTENNA WEIGHT	44.1	111	108.6	51			
AZIMUTH	263	150	150	150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	61	61	61	61			
ANTENNA TIP HEIGHT	63	64	64	64			
MECHANICAL DOWNTILT	1	0	0	0			
FEEDER AMOUNT	2	Fiber+ 2Coax					
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	Kathrein / 860-10025	Internal	Internal	Internal		
SURGE ARRESTOR (QTY/MODEL)		1	DC Fiber Squid	1	DC Squid		
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901		2	Kaelus DBC0061F1V51-2		
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			LTE RRH	LTE RRH	LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Powerwave / TT19-08BP111-001					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser / 100860					
PDU FOR TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-E2 B29	1	B14 4478	1	RRUS-11 (REUSE ONLY)
RRH - 850 band (QTY/MODEL)				1	4478 B5		
RRH - 1900 band (QTY/MODEL)		1	RRUS-32 B2				
RRH - AWS band (QTY/MODEL)				1	4426 B66		
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	Arrange antenna positions as per PD. Remove existing 850 RRH. Install 8 port antenna. Install LTE 700 B14 RRUS-4478 , LTE 850 RRUS-4478 & LTE AWS RRUS-4426 B66. Add low band combiners. Add 1 DC Fiber Squid. Swap 2x DUS with 2x 5216. Add Idle. Add 6630.						
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	61166.B.850.3G.1	61166.B.850.3G.1	CTV20352	CTV20352		UMTS 850	800 10121 @850_Xpol_6dt	13.42	263	6	None	Andrew 1-5/8 (850)	120.030726						293.76		9	
ANTENNA POSITION 2	PORT 2	61166.B.700.4G.tmp2	61166.B.700.4G.4	CTL06035_7B_2_E	CTL06035_7B_2_E		LTE 700	QS66512-2_722MHz_03DT	13.5	150	3	TOP	FIBER	0						1475.7065		11	
	PORT 3	61166.B.1900.4G.1	61166.B.1900.4G.1	CTL02035_9B_1	CTL02035_9B_1		LTE 1900	QS66512-2_1930MHz_02DT	16	150	2	TOP	FIBER	0						4842.058		12	
	PORT 4	61166.B.1900.4G.4	61166.B.1900.4G.4	CTL02035_9B_2	CTL02035_9B_2		LTE 1900	QS66512-2_1930MHz_02DT	16	150	2	TOP	FIBER	0						4842.058		12	

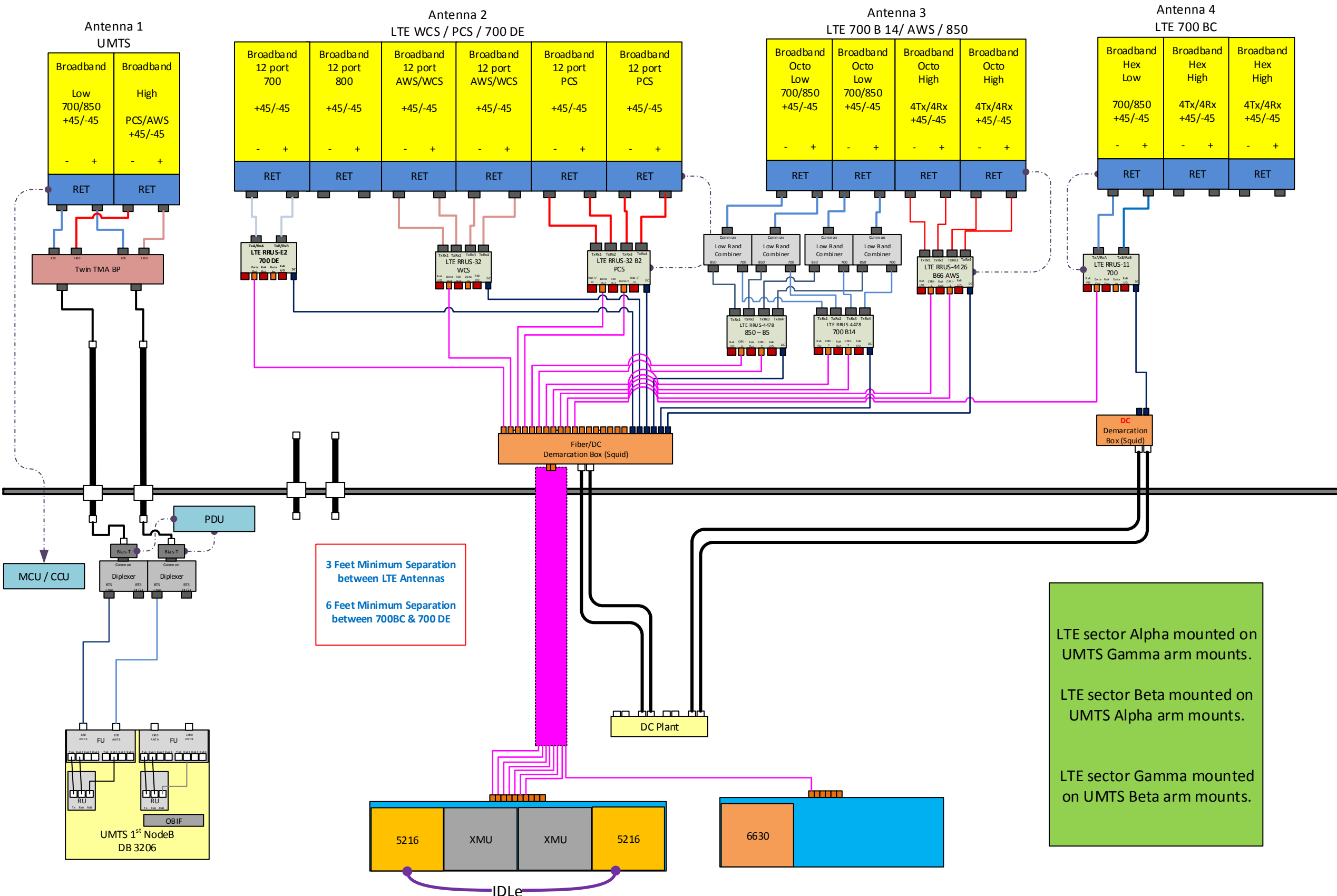
	PORT 7	61166.B.WCS.4G.1	61166.B.WCS.4G.1	CTL02035_3B_1	CTL02035_3B_1		LTE WCS	QS66512-2_2355MHz_03DT	16.7	150	3	TOP	FIBER	0						1285.2866		12	
ANTENNA POSITION 3	PORT 1	61166.B.850.4G.tmp1	61166.B.850.4G.1	CTL06035_8B_1	CTL06035_8B_1		LTE 850	80010965_849MHz_02DT	15.4	150	2	TOP	FIBER	0						1000		13	
	PORT 2	61166.B.700.4G.tmp5	61166.B.700.4G.5	CTL06035_7B_3_F	CTL06035_7B_3_F		LTE 700	80010965_777MHz_02DT	15.3	150	2	TOP	FIBER	0						2951.413		13	
	PORT 3	61166.B.AWS.4G.tmp4	61166.B.AWS.4G.4	CTL06035_2B_2	CTL06035_2B_2		LTE AWS	80010965_2133MHz_03DT	15.4	150	3	TOP	FIBER	0						5070.2572		14	
	PORT 5	61166.B.850.5G.tmp1	61166.B.850.5G.1	CTN0002035_8B_1	CTN0002035_8B_1		5G 850	80010965_849MHz_02DT	15.4	150	2	TOP	FIBER	0						1000		13	
ANTENNA POSITION 4	PORT 1	61166.B.700.4G.1	61166.B.700.4G.1	CTL02035_7B_1	CTL02035_7B_1		LTE 700	HPA-65R-BUU-H6_719MHz_02DT	14.28	150	2	TOP	FIBER	0						1475.7065		15	

Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

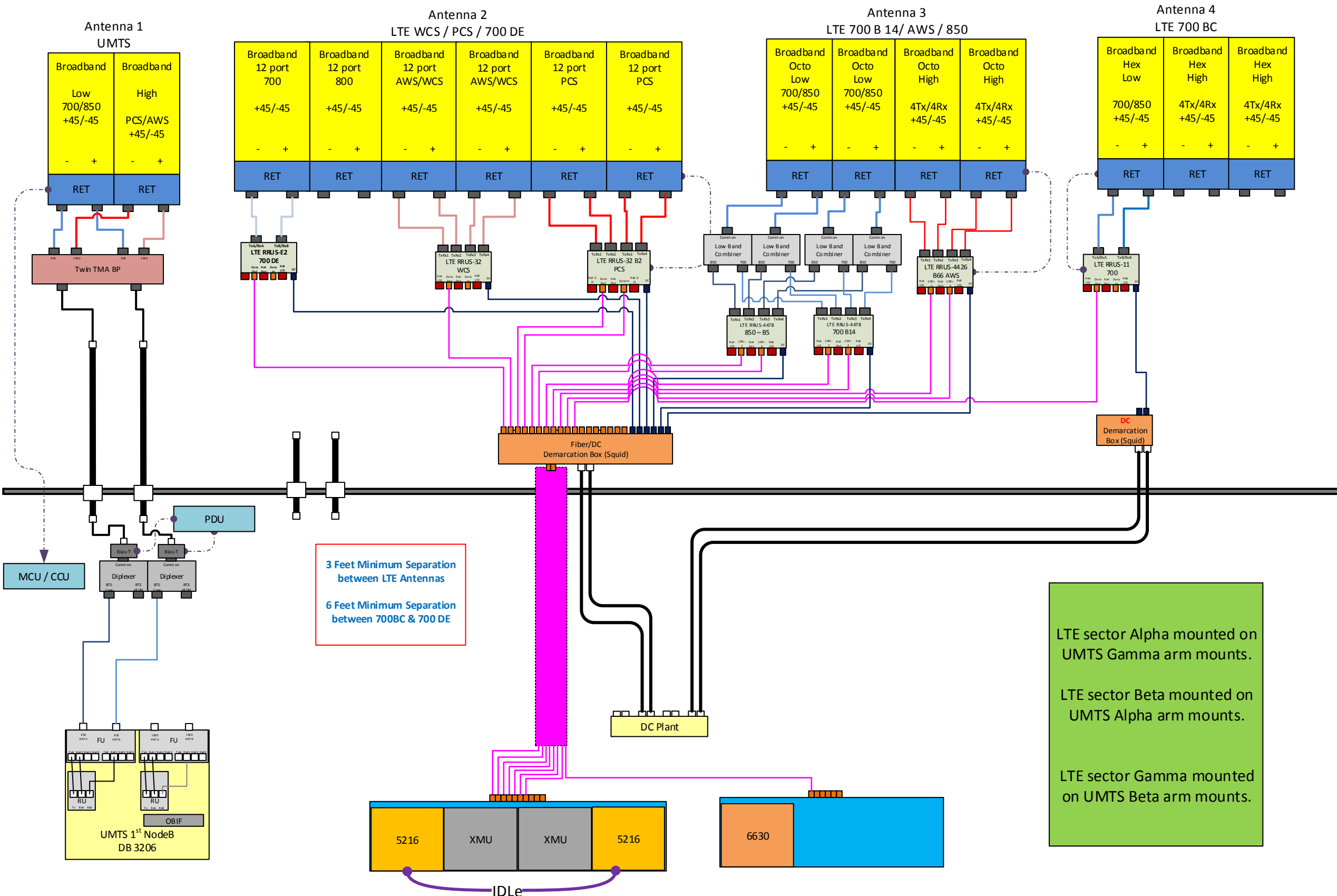
ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	800-10121	QS66512-2	800-10965	HPA-65R-BUU-H6			
ANTENNA VENDOR	Kathrein	Quintel	Kathrein	CCI Products			
ANTENNA SIZE (H x W x D)	54.5X10.3X5.9	72X12X9.6	78.7X20X6.9	72X14.8X9			
ANTENNA WEIGHT	44.1	111	108.6	51			
AZIMUTH	23	260	260	260			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	61	61	61	61			
ANTENNA TIP HEIGHT	63	64	64	64			
MECHANICAL DOWNTILT	1	0	0	0			
FEEDER AMOUNT	2	Fiber+ 2Coax					
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	Kathrein / 860-10025	Internal	Internal	Internal		
SURGE ARRESTOR (QTY/MODEL)		1	DC Fiber Squid	1	DC Squid		
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901		2	Kaelus DBC0061F1V51-2		
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			LTE RRH	LTE RRH	LTE RRH		
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1	Powerwave / TT19-08BP111-001					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser / 100860					
PDU FOR TMA (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1	RRUS-E2 B29	1	B14 4478	1	RRUS-11 (REUSE ONLY)
RRH - 850 band (QTY/MODEL)				1	4478 B5		
RRH - 1900 band (QTY/MODEL)		1	RRUS-32 B2				
RRH - AWS band (QTY/MODEL)				1	4426 B66		
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	Arrange antenna positions as per PD. Remove existing 850 RRH. Install 8 port antenna. Install LTE 700 B14 RRUS-4478 , LTE 850 RRUS-4478 & LTE AWS RRUS-4426 B66. Add low band combiners. Add 1 DC Fiber Squid. Swap 2x DUS with 2x 5216. Add Idle. Add 6630.						
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	61166.C.850.3G.1	61166.C.850.3G.1	CTV20353	CTV20353		UMTS 850	800 10121 @850_Xpot_6dt	13.42	23	6	None	Andrew 1-5/8 (850)	120.030726						293.76		17	
ANTENNA POSITION 2	PORT 2	61166.C.700.4G.tmp2	61166.C.700.4G.4	CTL06035_7C_2_E	CTL06035_7C_2_E		LTE 700	QS66512-2_722MHz_03DT	13.5	260	3	TOP	FIBER	0						1475.7065		19	
	PORT 3	61166.C.1900.4G.1	61166.C.1900.4G.1	CTL02035_9C_1	CTL02035_9C_1		LTE 1900	QS66512-2_1930MHz_02DT	16	260	2	TOP	FIBER	0						4842.058		20	
	PORT 4	61166.C.1900.4G.4	61166.C.1900.4G.4	CTL02035_9C_2	CTL02035_9C_2		LTE 1900	QS66512-2_1930MHz_02DT	16	260	2	TOP	FIBER	0						4842.058		20	

	PORT 7	61166.C.WCS.4G.1	61166.C.WCS.4G.1	CTL02035_3C_1	CTL02035_3C_1		LTE WCS	QS66512-2_2355MHz_02DT	16.8	260	2	TOP	FIBER	0						1285.2866		20	
ANTENNA POSITION 3	PORT 1	61166.C.850.4G.tmp1	61166.C.850.4G.1	CTL06035_8C_1	CTL06035_8C_1		LTE 850	80010965_849MHz_1_0DT	15.4	260	10	TOP	FIBER	0						1000		21	
	PORT 2	61166.C.700.4G.tmp5	61166.C.700.4G.5	CTL06035_7C_3_F	CTL06035_7C_3_F		LTE 700	80010965_777MHz_1_0DT	15.2	260	10	TOP	FIBER	0						2951.413		21	
	PORT 3	61166.C.AWS.4G.tmp4	61166.C.AWS.4G.4	CTL06035_2C_2	CTL06035_2C_2		LTE AWS	80010965_2170MHz_06DT	18.5	260	6	TOP	FIBER	0						5070.2572		22	
	PORT 5	61166.C.850.5G.tmp1	61166.C.850.5G.1	CTN0002035_8C_1	CTN0002035_8C_1		5G 850	80010965_849MHz_1_0DT	15.4	260	10	TOP	FIBER	0						1000		21	
ANTENNA POSITION 4	PORT 1	61166.C.700.4G.1	61166.C.700.4G.1	CTL02035_7C_1	CTL02035_7C_1		LTE 700	HPA-65R-BUU-H6_719MHz_10DT	13.9	260	10	TOP	FIBER	0						1475.7065		23	

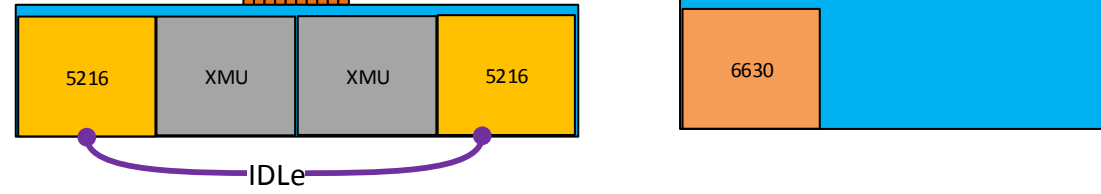






3 Feet Minimum Separation  
between LTE Antennas  
6 Feet Minimum Separation  
between 700BC & 700 DE

LTE sector Alpha mounted on  
UMTS Gamma arm mounts.  
LTE sector Beta mounted on  
UMTS Alpha arm mounts.  
LTE sector Gamma mounted on  
UMTS Beta arm mounts.



UMTS 1<sup>st</sup> NodeB  
DB 3206

MCU / CCU

PDU

DC Plant

DC  
Demarcation  
Box (Squid)

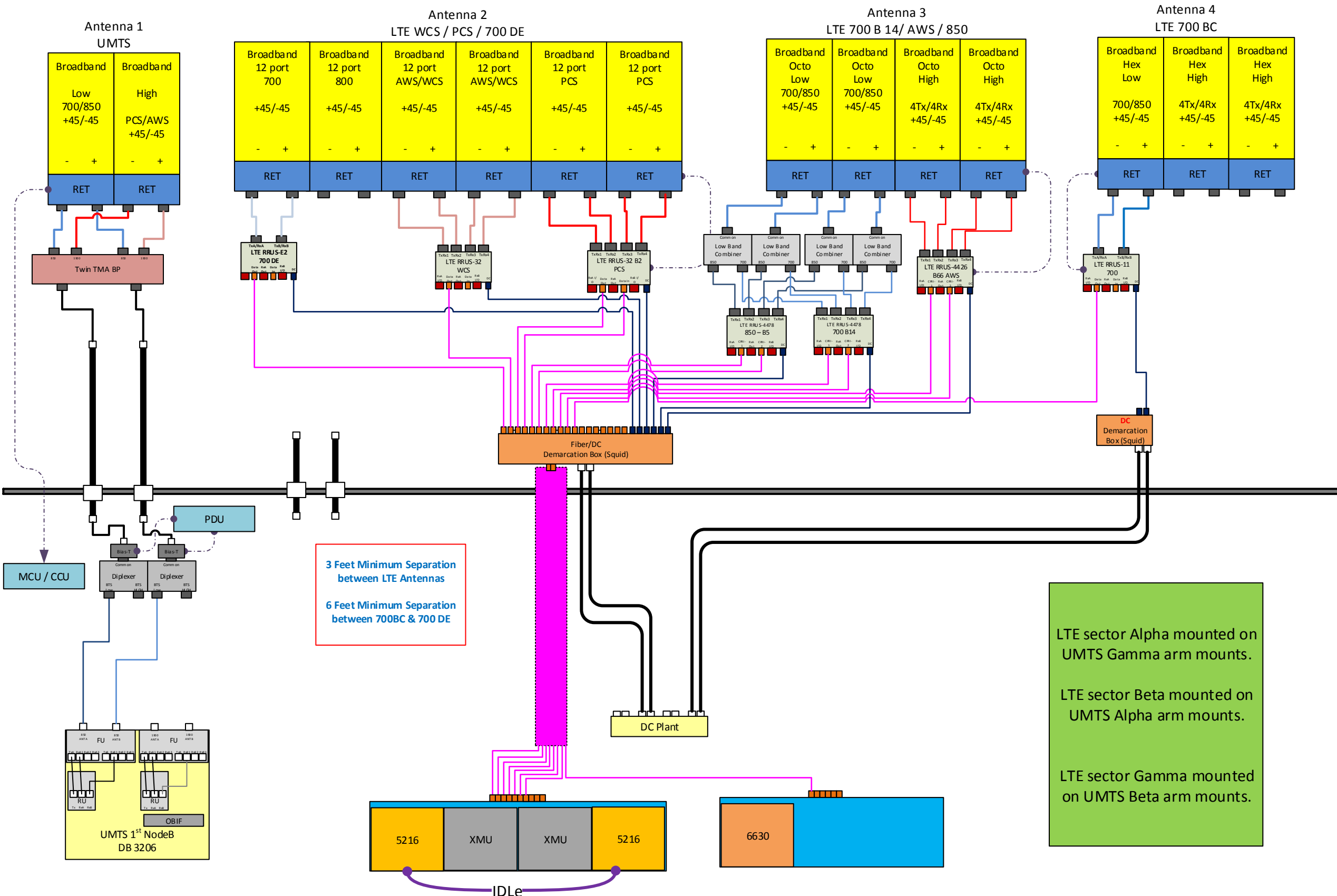
Fiber/DC  
Demarcation Box (Squid)

Twin TMA BP

Broadband 12 port 700 +45/-45	Broadband 12 port 800 +45/-45	Broadband 12 port AWS/WCS +45/-45	Broadband 12 port AWS/WCS +45/-45	Broadband 12 port PCS +45/-45	Broadband 12 port PCS +45/-45
- +	- +	- +	- +	- +	- +
RET	RET	RET	RET	RET	RET

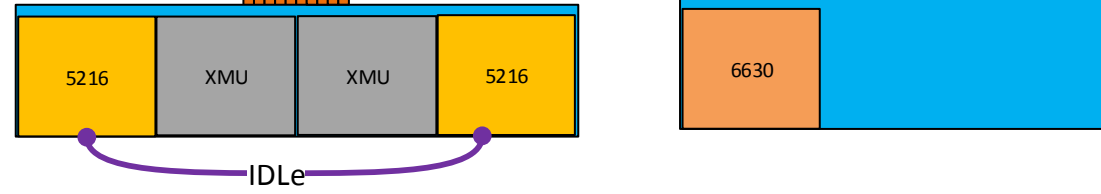
Broadband Octo Low 700/850 +45/-45	Broadband Octo Low 700/850 +45/-45	Broadband Octo High 4Tx/4Rx +45/-45	Broadband Octo High 4Tx/4Rx +45/-45
- +	- +	- +	- +
RET	RET	RET	RET

Broadband Hex Low 700/850 +45/-45	Broadband Hex High 4Tx/4Rx +45/-45	Broadband Hex High 4Tx/4Rx +45/-45
- +	- +	- +
RET	RET	RET



3 Feet Minimum Separation between LTE Antennas  
 6 Feet Minimum Separation between 700BC & 700 DE

LTE sector Alpha mounted on UMTS Gamma arm mounts.  
 LTE sector Beta mounted on UMTS Alpha arm mounts.  
 LTE sector Gamma mounted on UMTS Beta arm mounts.



## NOTES

Date Time (Eastern)	Version	ATTUID	Note
7/23/2018 2:57:51 PM	2.00	om636a	RFDS VERSION incremented.
7/23/2018 2:58:04 PM	2.00	om636a	Final RF Approved. Possible CIQ erros resolved

WORKFLOW SUMMARY

Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments	PACE Status
04/30/2018	Preliminary In Progress	sp656b	Preliminary Submitted for Approval	RC475S	Promote	Prelim RFDS	NER-RCTB-18-03302 MRCTB032299 SUCCESS 04/30/2018 12:36:32 PM NER-RCTB-18-03368 MRCTB032288 SUCCESS 04/30/2018 12:36:32 PM NER-RCTB-18-02465 MRCTB032250 SUCCESS 04/30/2018 12:36:32 PM
05/04/2018	Preliminary Submitted for Approval	RC475S	Preliminary Approved	DC5778	Promote		
07/09/2018	Preliminary Approved	DC5778	Final RF Approval	OM636A	Promote	Please promote to final	
07/23/2018	Final RF Approval	OM636A	Final Approved	DC5778	Promote	Final RF Approval. Possible CIQ issues are resolved	NER-RCTB-18-03302 MRCTB032299 SUCCESS 07/23/2018 3:20:35 PM NER-RCTB-18-03368 MRCTB032288 SUCCESS 07/23/2018 3:20:35 PM NER-RCTB-18-02465 MRCTB032250 SUCCESS 07/23/2018 3:20:35 PM



## Radio Frequency Safety Survey Report Prediction (RFSSRP)

### AT&T Wireless Rooftop Facility

**Pace ID:** MRCTB032288

**PTN:** 2051A0GWEG

**Site ID:** CT2035

**Site Name:** Hamden

**Address:** 975 Mix Avenue,  
Hamden, CT 06514

**Latitude:** 41.378520

**Longitude:** -72.917916

**USID:** 61166

**FA:** 10035036

**Prepared for:**

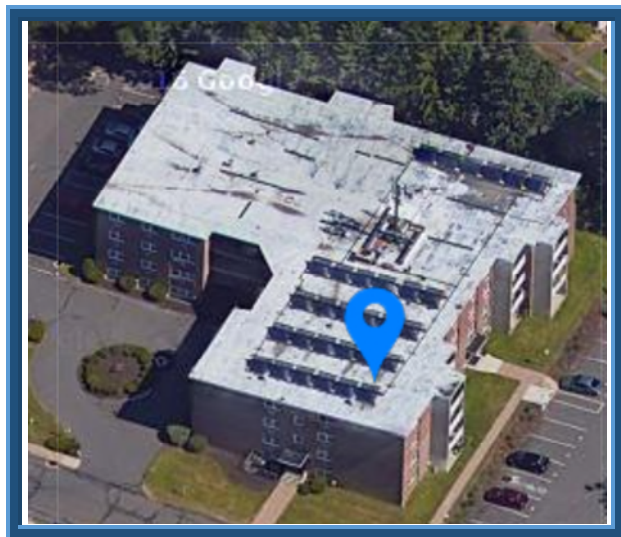
AT&T Mobility, LLC

c/o Empire Telecom

16 Esquire Road

Billerica, MA 01862

**Centerline PN:** 950006-167



### **Additional Site Information:**

CDs:10035036.AE201.FINALCDS.LT  
E 6C\_7C\_5G 850 - Rev0 CDs 18.11.29  
(S&S)

RFDS:10035036.PM;201.RFDS.2018-  
LTE-Next-Carrier.CT2035

### **Report Information:**

Report Writer: Michelle Stone

Date: January 8, 2019

Report Reviewer: Ryan McManus

### **Statement of Compliance**

AT&T is compliant with FCC Regulations.

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## 1.0 GENERAL SUMMARY

Centerline Communications, LLC (“Centerline”) has been contracted to provide a Radio Frequency (RF) Analysis for the following AT&T Mobility wireless rooftop facility to determine whether the facility is in compliance with federal standards and regulations regarding RF emissions. This analysis includes theoretical emissions calculations, for all equipment for AT&T Mobility.

### 1.1 SITE SUMMARY

Analysis Site Data	
<b>Site ID:</b>	CT2035
<b>Site USID:</b>	61166
<b>Site FA#:</b>	10035036
<b>Site Name:</b>	Hamden
<b>Site Address:</b>	975 Mix Avenue, Hamden CT 06514
<b>Site Latitude:</b>	41.378520 N
<b>Site Longitude:</b>	-72.917916 W
<b>Facility Type:</b>	Rooftop
Compliance Summary	
<b>Compliance Status:</b>	Compliant
Maximum Modeled MPE% on Walking Surface AT&T (General Public Limit):	71.10 %
Maximum Modeled MPE% at Ground Level AT&T (General Public Limit):	11.20 %
Maximum Modeled MPE% on Walking Surface Composite (General Public Limit):	71.20 %
Maximum Modeled MPE% at Ground Level Composite (General Public Limit):	11.20 %
Site Survey Data	
<b>Is Access Locked or Controlled? :</b>	Uncontrolled*
<b>Lock or Control Measures if Present:</b>	N/A
<b>Parapet Height:</b>	3”

There are no additional system operators located on this facility or considered as part of this analysis.

\*To be conservative, all rooftop sites are considered uncontrolled for modeling purposes.

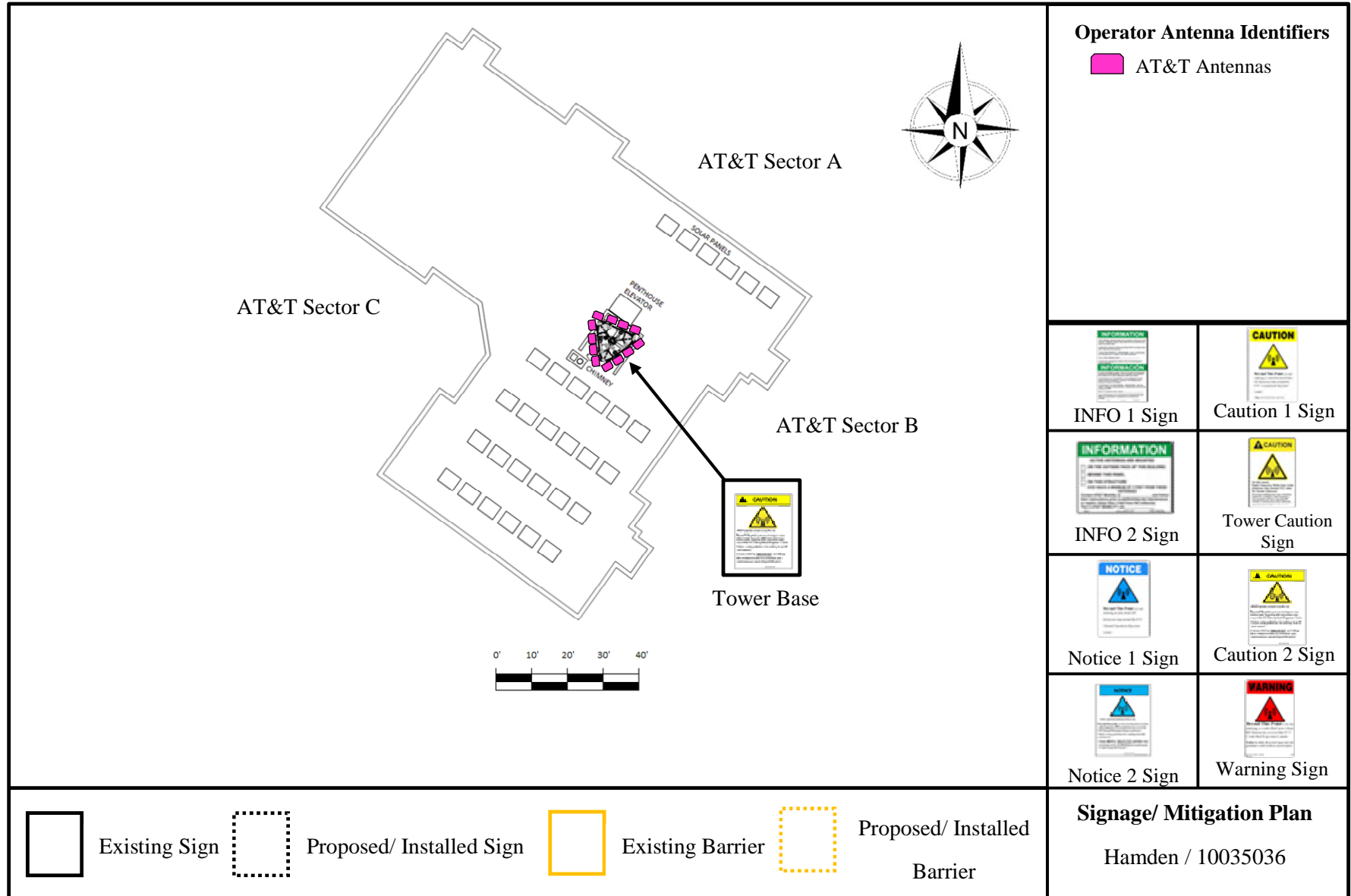
Signage and barriers are the primary means of mitigating access to accessible areas of exposure. Below is a summary of existing and recommended signage at this AT&T facility.

<b>Existing Signage and Barriers (AT&amp;T Sectors)</b>		
<b>Location</b>	<b>Signage</b>	<b>Barriers</b>
Sector A	None	None
Sector B	None	None
Sector C	None	None
Access Point (s)	Yellow Caution 2 sign	N/A
<b>Recommended Signage and Barriers (AT&amp;T Sectors)</b>		
<b>Location</b>	<b>Signage</b>	<b>Barriers</b>
Sector A	No action required	No action required
Sector B	No action required	No action required
Sector C	No action required	No action required
Access Point (s)	No action required	No action required

Per OSHA, barriers should only be installed when the parapet height is greater than 36 inches. Any barriers required for non-OSHA compliant parapets can only be installed up to 6 feet from the parapet.



**2.0 SITE SCALE MAP**





**3.0 ANTENNA INVENTORY**

ANT ID	Operator	Antenna Make	Antenna Model	Type	Freq (MHz)	# of TX	Azimuth (°)	BW (°)	Gain (dBd)	ERP (Watts)	Length (ft)	x	y	Antenna Z Value (ft)**	Ant Z Value Ground (ft)
ATT A1	AT&T	Kathrein	800-10121	Panel	UMTS 850	1	143	88	11.25	293.77	4.5	65	63	23.7	58.7
ATT A2	AT&T	Quintel	QS66512-2	Panel	LTE 737	1	20	67	11.05	1475.74	6.0	59	70.5	23.0	58.0
ATT A2	AT&T	Quintel	QS66512-2	Panel	LTE 1900	1	20	69	13.85	4842.06	6.0	59	70.5	23.0	58.0
ATT A2	AT&T	Quintel	QS66512-2	Panel	LTE 1900	1	20	69	13.85	4842.06	6.0	59	70.5	23.0	58.0
ATT A2	AT&T	Quintel	QS66512-2	Panel	LTE 2300	1	20	58	14.85	1285.21	6.0	59	70.5	23.0	58.0
ATT A3	AT&T	Kathrein	800-10965	Panel	LTE 850	1	20	61	13.25	1000.10	6.0	61	69.5	23.0	58.0
ATT A3	AT&T	Kathrein	800-10965	Panel	LTE 737	1	20	65	12.65	2951.31	6.0	61	69.5	23.0	58.0
ATT A3	AT&T	Kathrein	800-10965	Panel	LTE 2100	1	20	62	16.15	5070.26	6.0	61	69.5	23.0	58.0
ATT A3	AT&T	Kathrein	800-10965	Panel	LTE 5000	1	20	59	15.75	1000.00	6.0	61	69.5	23.0	58.0
ATT A4	AT&T	CCI	HPA-65R-BUU-H6	Panel	LTE 737	1	20	66	11.95	1475.71	6.0	64	68	23.0	58.0
ATT B1	AT&T	Kathrein	800-10121	Panel	UMTS 850	1	263	88	11.25	293.77	4.5	54	59	23.7	58.7
ATT B2	AT&T	Quintel	QS66512-2	Panel	LTE 737	1	150	67	11.05	1475.74	6.0	63	61	23.0	58.0
ATT B2	AT&T	Quintel	QS66512-2	Panel	LTE 1900	1	150	69	13.85	4842.06	6.0	63	61	23.0	58.0
ATT B2	AT&T	Quintel	QS66512-2	Panel	LTE 1900	1	150	69	13.85	4842.06	6.0	63	61	23.0	58.0
ATT B2	AT&T	Quintel	QS66512-2	Panel	LTE 2300	1	150	58	14.85	1285.21	6.0	63	61	23.0	58.0
ATT B3	AT&T	Kathrein	800-10965	Panel	LTE 850	1	150	61	13.25	1000.10	6.0	60	59	23.0	58.0
ATT B3	AT&T	Kathrein	800-10965	Panel	LTE 737	1	150	65	12.65	2951.31	6.0	60	59	23.0	58.0
ATT B3	AT&T	Kathrein	800-10965	Panel	LTE 2100	1	150	62	16.15	5070.26	6.0	60	59	23.0	58.0
ATT B3	AT&T	Kathrein	800-10965	Panel	LTE 5000	1	150	59	15.75	1000.00	6.0	60	59	23.0	58.0
ATT B4	AT&T	CCI	HPA-65R-BUU-H6	Panel	LTE 737	1	150	66	11.95	1475.71	6.0	57	57	23.0	58.0
ATT C1	AT&T	Kathrein	800-10121	Panel	UMTS 850	1	23	88	11.25	293.77	4.5	54	72	23.7	58.7
ATT C2	AT&T	Quintel	QS66512-2	Panel	LTE 737	1	260	67	11.05	1475.74	6.0	53	61	23.0	58.0
ATT C2	AT&T	Quintel	QS66512-2	Panel	LTE 1900	1	260	69	13.85	4842.06	6.0	53	61	23.0	58.0
ATT C2	AT&T	Quintel	QS66512-2	Panel	LTE 1900	1	260	69	13.85	4842.06	6.0	53	61	23.0	58.0
ATT C2	AT&T	Quintel	QS66512-2	Panel	LTE 2300	1	260	58	14.85	1285.21	6.0	53	61	23.0	58.0
ATT C3	AT&T	Kathrein	800-10965	Panel	LTE 850	1	260	61	13.25	1000.10	6.0	53	65	23.0	58.0
ATT C3	AT&T	Kathrein	800-10965	Panel	LTE 737	1	260	65	12.65	2951.31	6.0	53	65	23.0	58.0
ATT C3	AT&T	Kathrein	800-10965	Panel	LTE 2100	1	260	62	16.15	5070.26	6.0	53	65	23.0	58.0
ATT C3	AT&T	Kathrein	800-10965	Panel	LTE 5000	1	260	59	15.75	1000.00	6.0	53	65	23.0	58.0
ATT C4	AT&T	CCI	HPA-65R-BUU-H6	Panel	LTE 737	1	260	66	11.95	1475.71	6.0	53	69	23.0	58.0

Table 1: Total Site data table *\*\* (Z Value is distance from bottom of antenna to walking surface)*



**3.1 ROOFVIEW® EXPORT FILE**

Ant Num	ID	Name	(MHz) Freq	Trans Power	Trans Count	Coax Len	Coax Type	Other Loss	Input Power	Calc Power	Mfg	Model	(ft) X	(ft) Y	(ft) Z	(ft) Type	dBd Aper	BWdth Gain Pt Dir
1	ATT A1	AT&T	850.00000	22.0	1			0.0	22.0	22.0	Kathrein	800-10121	65.0	63.0	23.7	4.5	11.25	88,143
2	ATT A2	AT&T	737.00000	115.9	1			0.0	115.9	115.9	Quintel	QS66512-2	59.0	70.5	23.0	6.0	11.05	67,20
3	ATT A2	AT&T	1900.00000	199.5	1			0.0	199.5	199.5	Quintel	QS66512-2	59.0	70.5	23.0	6.0	13.85	69,20
4	ATT A2	AT&T	1900.00000	199.5	1			0.0	199.5	199.5	Quintel	QS66512-2	59.0	70.5	23.0	6.0	13.85	69,20
5	ATT A2	AT&T	2300.00000	42.1	1			0.0	42.1	42.1	Quintel	QS66512-2	59.0	70.5	23.0	6.0	14.85	58,20
6	ATT A3	AT&T	850.00000	47.3	1			0.0	47.3	47.3	Kathrein	800-10965	61.0	69.5	23.0	6.0	13.25	61,20
7	ATT A3	AT&T	737.00000	160.3	1			0.0	160.3	160.3	Kathrein	800-10965	61.0	69.5	23.0	6.0	12.65	65,20
8	ATT A3	AT&T	2100.00000	123.0	1			0.0	123.0	123.0	Kathrein	800-10965	61.0	69.5	23.0	6.0	16.15	62,20
9	ATT A3	AT&T	5000.00000	26.6	1			0.0	26.6	26.6	Kathrein	800-10965	61.0	69.5	23.0	6.0	15.75	59,20
10	ATT A4	AT&T	737.00000	94.2	1			0.0	94.2	94.2	CCI	HPA-65R-BUU-H6	64.0	68.0	23.0	6.0	11.95	66,20
11	ATT B1	AT&T	850.00000	22.0	1			0.0	22.0	22.0	Kathrein	800-10121	54.0	59.0	23.7	4.5	11.25	88,263
12	ATT B2	AT&T	737.00000	115.9	1			0.0	115.9	115.9	Quintel	QS66512-2	63.0	61.0	23.0	6.0	11.05	67,150
13	ATT B2	AT&T	1900.00000	199.5	1			0.0	199.5	199.5	Quintel	QS66512-2	63.0	61.0	23.0	6.0	13.85	69,150
14	ATT B2	AT&T	1900.00000	199.5	1			0.0	199.5	199.5	Quintel	QS66512-2	63.0	61.0	23.0	6.0	13.85	69,150
15	ATT B2	AT&T	2300.00000	42.1	1			0.0	42.1	42.1	Quintel	QS66512-2	63.0	61.0	23.0	6.0	14.85	58,150
16	ATT B3	AT&T	850.00000	47.3	1			0.0	47.3	47.3	Kathrein	800-10965	60.0	59.0	23.0	6.0	13.25	61,150
17	ATT B3	AT&T	737.00000	160.3	1			0.0	160.3	160.3	Kathrein	800-10965	60.0	59.0	23.0	6.0	12.65	65,150
18	ATT B3	AT&T	2100.00000	123.0	1			0.0	123.0	123.0	Kathrein	800-10965	60.0	59.0	23.0	6.0	16.15	62,150
19	ATT B3	AT&T	5000.00000	26.6	1			0.0	26.6	26.6	Kathrein	800-10965	60.0	59.0	23.0	6.0	15.75	59,150
20	ATT B4	AT&T	737.00000	94.2	1			0.0	94.2	94.2	CCI	HPA-65R-BUU-H6	57.0	57.0	23.0	6.0	11.95	66,150
21	ATT C1	AT&T	850.00000	22.0	1			0.0	22.0	22.0	Kathrein	800-10121	54.0	72.0	23.7	4.5	11.25	88,23
22	ATT C2	AT&T	737.00000	115.9	1			0.0	115.9	115.9	Quintel	QS66512-2	53.0	61.0	23.0	6.0	11.05	67,260
23	ATT C2	AT&T	1900.00000	199.5	1			0.0	199.5	199.5	Quintel	QS66512-2	53.0	61.0	23.0	6.0	13.85	69,260
24	ATT C2	AT&T	1900.00000	199.5	1			0.0	199.5	199.5	Quintel	QS66512-2	53.0	61.0	23.0	6.0	13.85	69,260
25	ATT C2	AT&T	2300.00000	42.1	1			0.0	42.1	42.1	Quintel	QS66512-2	53.0	61.0	23.0	6.0	14.85	58,260
26	ATT C3	AT&T	850.00000	47.3	1			0.0	47.3	47.3	Kathrein	800-10965	53.0	65.0	23.0	6.0	13.25	61,260
27	ATT C3	AT&T	737.00000	160.3	1			0.0	160.3	160.3	Kathrein	800-10965	53.0	65.0	23.0	6.0	12.65	65,260
28	ATT C3	AT&T	2100.00000	123.0	1			0.0	123.0	123.0	Kathrein	800-10965	53.0	65.0	23.0	6.0	16.15	62,260
29	ATT C3	AT&T	5000.00000	26.6	1			0.0	26.6	26.6	Kathrein	800-10965	53.0	65.0	23.0	6.0	15.75	59,260
30	ATT C4	AT&T	737.00000	94.2	1			0.0	94.2	94.2	CCI	HPA-65R-BUU-H6	53.0	69.0	23.0	6.0	11.95	66,260

Table 2: Roofview® Export File

#### 4.0 PREDICTED EMISSION LEVELS AND DISCUSSION

All calculations performed based upon the data listed for this facility have produced results that are within allowable limits for General Population for exposure to RF emissions as specified by federal standards. AT&T can ensure compliance on this facility by following the signage and barrier recommendations presented in this report

The anticipated maximum power density value (% MPE) calculated in front of any of the AT&T sectors is **71.10 %** of the FCC's allowable limit for General Population exposure to radio frequency emissions (**14.22 %** of the FCC's allowable Occupational limit). This was determined based upon worst-case theoretical modeling as described in this report for all walking surfaces in close proximity to the antenna arrays. The following is a summary for each AT&T Sector.

**Sector A:** There are no areas that exceed the **FCC's General Population or Occupational limit** for exposure to radio frequency emissions. The maximum power density value (% MPE) calculated for AT&T's Sector A antennas is **71.10 %** of the FCC's allowable limit for General Population exposure to radio frequency emissions (**14.22 %** of the FCC's allowable Occupational limit). The Sector A antennas are transmitting over the main roof level.

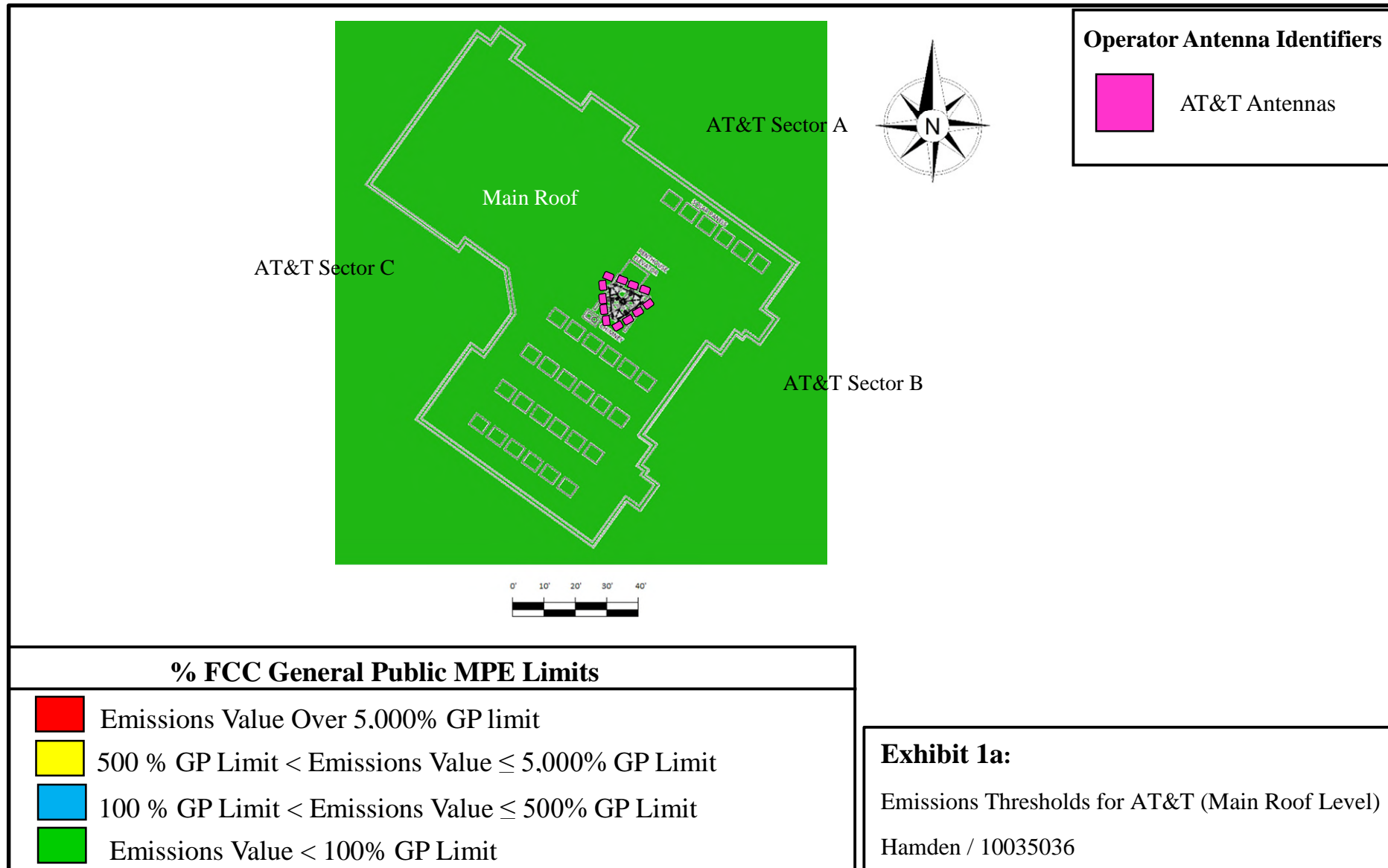
**Sector B:** There are no areas that exceed the **FCC's General Population or Occupational limit** for exposure to radio frequency emissions. The maximum power density value (% MPE) calculated for AT&T's Sector B antennas is **71.10 %** of the FCC's allowable limit for General Population exposure to radio frequency emissions (**14.22 %** of the FCC's allowable Occupational limit). The Sector B antennas are transmitting over the main roof level.

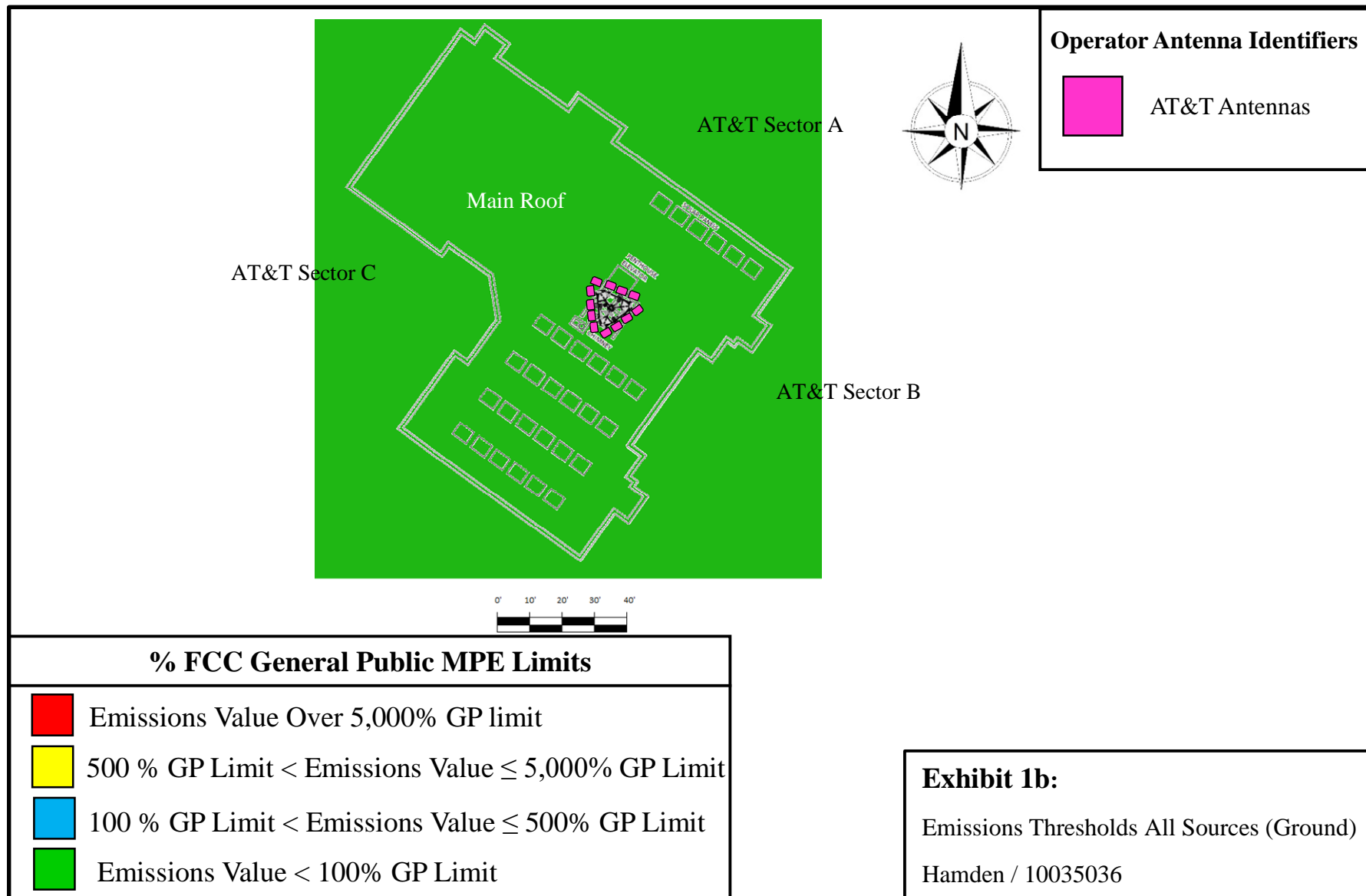
**Sector C:** There are no areas that exceed the **FCC's General Population or Occupational limit** for exposure to radio frequency emissions. The maximum power density value (% MPE) calculated for AT&T's Sector C antennas is **71.10 %** of the FCC's allowable limit for General Population exposure to radio frequency emissions (**14.22%** of the FCC's allowable Occupational limit). The Sector C antennas are transmitting over the main roof level.

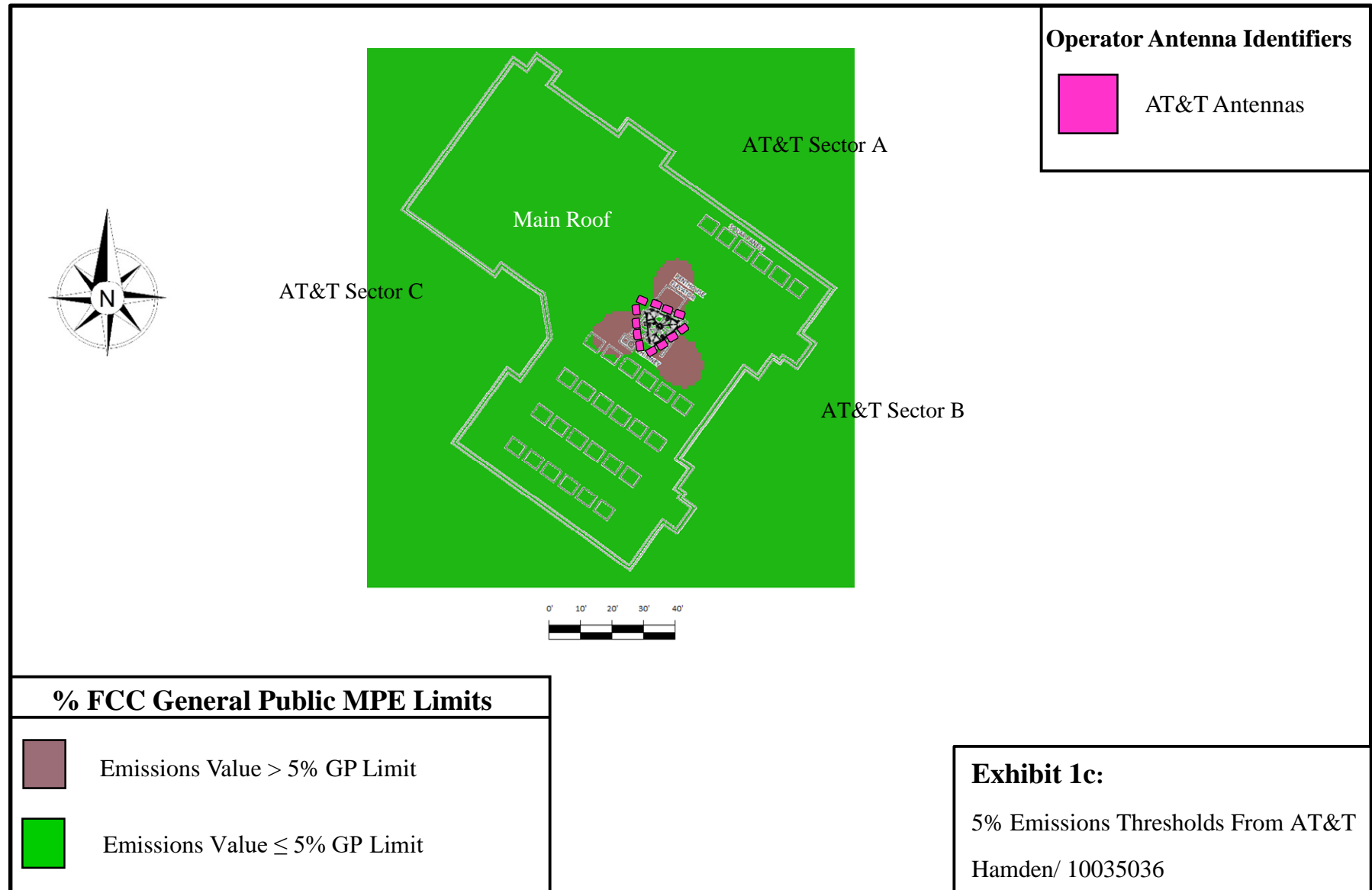
At the ground level the maximum power density value calculated from the AT&T radio equipment is **11.20 %** of the **FCC's General Population limit** for exposure to radio frequency emissions. At ground level the maximum composite power density for all system operators on this facility is **2.24 %** of the **FCC's Occupational limit** for exposure to radio frequency emissions.

AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document states that microwave dishes are compliant if they are mounted 20 feet or greater above any accessible walking or working surface. There are no microwaves identified on site.

Emissions threshold plots which graphically show power density values is shown following in **Exhibits 1a-1c**.







**5.0 STATEMENT OF COMPLIANCE**

Centerline conducted worst case modeling to determine whether the rooftop facility located at 975 Mix Avenue in Hamden, Connecticut is in compliance with FCC Regulations.

**5.1 STATEMENT OF AT&T MOBILITY COMPLIANCE**

Based on the information analyzed, AT&T is in compliance with FCC Regulations. No additional action is required by AT&T.

**5.2 RECOMMENDATIONS**

<b>AT&amp;T Mitigation Recommendations</b>		
<b>Location</b>	<b>Signage</b>	<b>Barriers</b>
Sector A	No action required	No action required
Sector B	No action required	No action required
Sector C	No action required	No action required
Access Point (s)	No action required	No action required


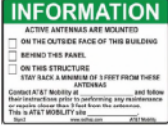
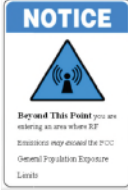





**6.0 FALL ARREST AND PARAPET INFORMATION**

As per AT&T barrier policy, rooftop edges that are protected with a 36-inch parapet wall or guardrail are safe for work activity within six (6) feet of the edge. OSHA has stated that an existing 36-inch guardrail or parapet provides sufficient protection for employees. The height of the top rail or equivalent component of guardrail systems in new construction shall be at least 42 inches above the walking or working surface. It should also be noted that the height of the parapet or guardrail may be reduced to no less than 30 inches at any point provided the sum of the depth (horizontal distance) of the top edge, and the height of the top edge (vertical distance from the work surface to the top edge of the top member, is at least 48 inches. If there is no reason for working atop the roof, then edge protection is not required. In addition, workers may use personnel lifts or temporary fall protection measures to perform work within 6 feet of the roof edge in place of permanent edge protection. Reference: 29 CFR 1910.28, 29 CFR 1910.23 (NPRM-1990); OSHA Letters of Interpretation 2/9/83 and 3/8/9



**APPENDIX A: RF SIGNAGE**

**AT&T RF Signage**

Sign	Description	Sign	Description
	<p><b>Information 1 Sign</b>                  Gives guidelines on how to proceed and who to contact regarding areas that may exceed either the FCC’s General Population or Occupational emissions limits.</p>		<p><b>Information 2 Sign</b>                  Gives specific information on how to proceed and who to contact regarding antennas that are façade mounted, concealed or on stand-alone structures.</p>
	<p><b>Blue Notice 1 Sign</b>                  Used to alert individuals that they are entering an area that may exceed the FCC’s General Population emissions limit. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.</p>		<p><b>Blue Notice 2 Sign</b>                  Used to alert individuals that they are entering an area that may exceed either the FCC’s General Population emissions limits. To be used on barriers or antenna sectors as a hybrid of the Information 1 and Blue Notice 1 signs.</p>
	<p><b>Yellow Caution 1 Sign-Rooftop</b>                  Used to inform individuals that they are entering an area that may exceed the FCC’s Occupational emissions limit. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.</p>		<p><b>Yellow Caution 2 Sign-Rooftop</b>                  Used to alert individuals that they are entering an area that may exceed the FCC’s Occupational emissions limit. To be used on barriers or antenna sectors as a hybrid of the Information 1 and Yellow Caution 1 signs.</p>
	<p><b>Yellow Caution 1 Sign-Tower</b>                  Used to inform individuals that they are entering an area that may exceed the FCC’s Occupational emissions limits. Must be placed at the base of the tower to warn tower climbers of potential for exposure.</p>		<p><b>Red Warning Sign</b>                  Used to inform individuals that they are entering an area that may exceed the FCC’s Occupational emissions limit by a factor of 10 or greater. Must be positioned such that persons approaching from any angle have ample warning to avoid the marked areas.</p>

## APPENDIX B: FCC GUIDELINES AND EMISSIONS THRESHOLD LIMITS

All power density values used in this report were analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The number of  $\mu\text{W}/\text{cm}^2$  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 public 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 public 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.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu\text{W}/\text{cm}^2$ ). The general population exposure limit for the 700 and 800 MHz Bands is approximately 467  $\mu\text{W}/\text{cm}^2$  and 567  $\mu\text{W}/\text{cm}^2$  respectively, and the general population exposure limit for the 1900 MHz PCS and 2100 MHz AWS bands is 1000  $\mu\text{W}/\text{cm}^2$ . 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.

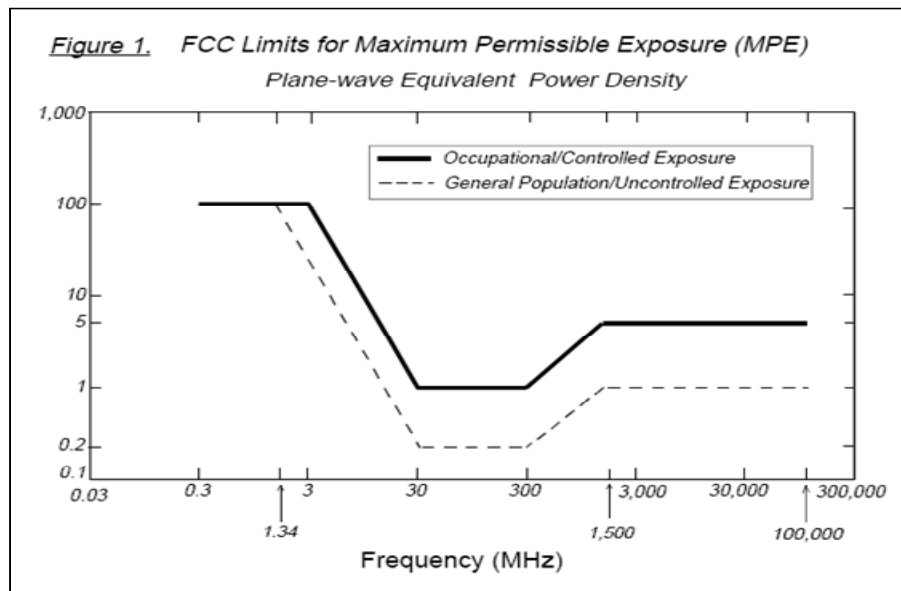
Occupational/Controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure, have been properly trained in RF safety and can exercise control over their 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, have been trained in RF safety and can exercise control over his or her exposure by leaving the area or by some other appropriate means. The Occupational/Controlled exposure limits all utilized frequency bands is five (5) times the FCC's General Public / Uncontrolled exposure limit.

Additional details can be found in FCC OET 65.

Table 1: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time [E] <sup>2</sup> , [H] <sup>2</sup> , or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f <sup>2</sup> )*	6
30-300	61.4	0.163	1.0	6
300-1,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/Uncontrolled Exposure				
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm <sup>2</sup> )	Averaging Time [E] <sup>2</sup> , [H] <sup>2</sup> , or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

f = Frequency in (MHz)

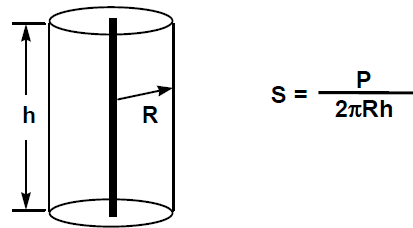
\* Plane-wave equivalent power density



**APPENDIX C: CALCULATION METHODOLOGY**

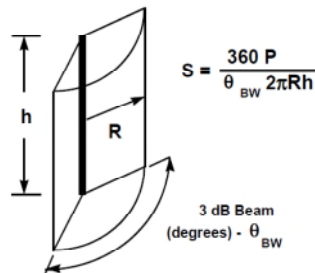
Centerline has performed theoretical calculations on all transmission equipment located on this facility. All calculations have been performed using the RoofView® software from Richard Tell Associates. This software performs calculations using a cylindrical model for very conservative power density predictions within the near-field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations the power decreases inversely with the square of the distance. This modeling technique is very accurate with very low antenna centerlines, such as rooftops, where persons can get very close to the antennas and pass through fields in close proximity.

The below calculation in Figure 1 shows the theoretical distribution of power over an imaginary cylinder with equal power distribution in all directions.



*Figure 1: Distribution of power over an imaginary cylinder in all directions*

This model can be modified for directional antennas to show directionality of power distribution. This formula will tend to be conservative as it assumes that all power is focused between the 3 dB power roll off points as shown in Figure 2.



*Figure 2: Distribution of power over an imaginary cylinder between the half power (3dB) roll off points (HBW) for directional antennas*

**APPENDIX D: CERTIFICATIONS**

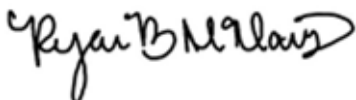
I, Michelle Stone, preparer of this report certify that I am fully trained and aware of the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document.

A handwritten signature in black ink that reads 'Michelle Stone'.

---

1/8/2019

I, Ryan McManus, reviewer and approver of this report certify that I am fully trained and aware of the Rules and Regulations of both the Federal Communications Commissions (FCC) and the Occupational Safety and Health Administration (OSHA) with regard to Human Exposure to Radio Frequency Radiation. I have been trained in the procedures and requirements outlined in AT&T's RF Exposure: Responsibilities, Procedures & Guidelines document.

A handwritten signature in black ink that reads 'Ryan McManus'.

---

1/8/2019

## **APPENDIX E: PROPRIETARY STATEMENT**

This report was prepared for the use of AT&T Mobility, LLC to meet requirements specified in AT&T's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by Centerline Communications, LLC are based solely on the information provided by AT&T Mobility and all observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to Centerline Communications, LLC so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

## Nora Oliver

---

**From:** UPS Quantum View <pkginfo@ups.com>  
**Sent:** Monday, January 28, 2019 9:38 AM  
**To:** Nora Oliver  
**Subject:** UPS Delivery Notification, Tracking Number 1Z87026W0295012094



### Your package has been delivered.

**Delivery Date:** Monday, 01/28/2019  
**Delivery Time:** 09:32 AM

At the request of QUALTEK USA,LLC this notice alerts you that the status of the shipment listed below has changed.

## Shipment Detail

---

**Tracking Number:** [1Z87026W0295012094](#)  
Honorable Curt B. Leng  
Town of Hamden  
2750 DIXWELL AVE  
FLOOR 1  
HAMDEN, CT 06518  
US

**Ship To:**

**UPS Service:** UPS 2ND DAY AIR

**Number of Packages:** 1

**Weight:** 1.0 LBS

**Delivery Location:** OFFICE  
BARBARA

**Reference Number 1:** CT2035CSCNotices



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## Nora Oliver

---

**From:** UPS Quantum View <pkginfo@ups.com>  
**Sent:** Monday, January 28, 2019 9:38 AM  
**To:** Nora Oliver  
**Subject:** UPS Delivery Notification, Tracking Number 1Z87026W0298811902



### Your package has been delivered.

**Delivery Date:** Monday, 01/28/2019  
**Delivery Time:** 09:33 AM

At the request of QUALTEK USA,LLC this notice alerts you that the status of the shipment listed below has changed.

## Shipment Detail

---

<b>Tracking Number:</b>	<a href="#"><u>1Z87026W0298811902</u></a>
<b>Ship To:</b>	Dan Kops- Town Planner and Zoning Town of Hamden 2750 DIXWELL AVE FLOOR 3 HAMDEN, CT 06518 US
<b>UPS Service:</b>	UPS 2ND DAY AIR
<b>Number of Packages:</b>	1
<b>Weight:</b>	1.0 LBS
<b>Delivery Location:</b>	OFFICE TRIPP
<b>Reference Number 1:</b>	CT2035CSCNotice



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## Nora Oliver

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**From:** UPS Quantum View <pkginfo@ups.com>  
**Sent:** Monday, January 28, 2019 12:48 PM  
**To:** Nora Oliver  
**Subject:** UPS Delivery Notification, Tracking Number 1Z87026W0299855739

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged



### Your package has been delivered.

**Delivery Date:** Monday, 01/28/2019  
**Delivery Time:** 12:44 PM

At the request of QUALTEK USA,LLC this notice alerts you that the status of the shipment listed below has changed.

## Shipment Detail

---

**Tracking Number:** [1Z87026W0299855739](#)

**Ship To:** Chestnut Hill North, LLC  
1621 STATE ST  
NEW HAVEN, CT 06511  
US

**UPS Service:** UPS 2ND DAY AIR

**Number of Packages:** 1

**Weight:** 1.0 LBS

**Delivery Location:** FRONT DESK  
FOLLEY

**Reference Number 1:** CT2035CSC Notices



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