

July 19, 2018

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

Regarding: Notice of Exempt Modification – Swap of 6 Antennas and Addition of 3

Antennas and 6 Remote Radio Units

Property Address: 555 Main Street, Stamford, CT (the "Property")

Applicant: AT&T Mobility ("AT&T", Site # CT2118)

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 228 foot self-support tower ("tower") at the above-referenced address, latitude 41.05338889, longitude -73.5356472. AT&T's facility consists of nine (9) wireless telecommunications antennas at 235 feet. The tower is controlled and owned by Frontier Communications. Assessor's information is attached hereto.

AT&T desires to modify its existing telecommunications facility by swapping (6) antennas for newer models and adding (3) antennas and (6) remote radio units. The centerline height of said antennas is and will remain at 235 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 Mayor of the City of Stamford, The Chief Building Official of the City of Stamford and the Principal Planner of the City of Stamford. A copy of this letter is also being sent to Frontier Communications, the owner of the structure that AT&T is located.

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).

- 1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's antennas and associated lines will be installed at 235 foot level of the 228 foot self-support tower.
- 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 decibel 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 the Federal Communications Commission (FCC) safety standard. An RF emissions calculation is attached.
- 5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
- 6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached structural analysis completed by Malouf Engineering Intl., Inc. dated July 9, 2018).

For the foregoing reasons AT&T respectfully requests that the proposed swap of antennas and addition of antennas and radios be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Nicole Caplan Site Acquisition Specialist Empire Telecom

CC: The Honorable David Martin, Mayor, City of Stamford Bharat Gami, Chief Building Official, City of Stamford David W. Woods, PhD, AICP, Principal Planner, City of Stamford Frontier Communications, c/o Kelley Stewart

Email: ncaplan@empiretelecomm.com

< Legend No legend

Click on Tax Map Number to view tax map or tax map with topography (2' contours).

About

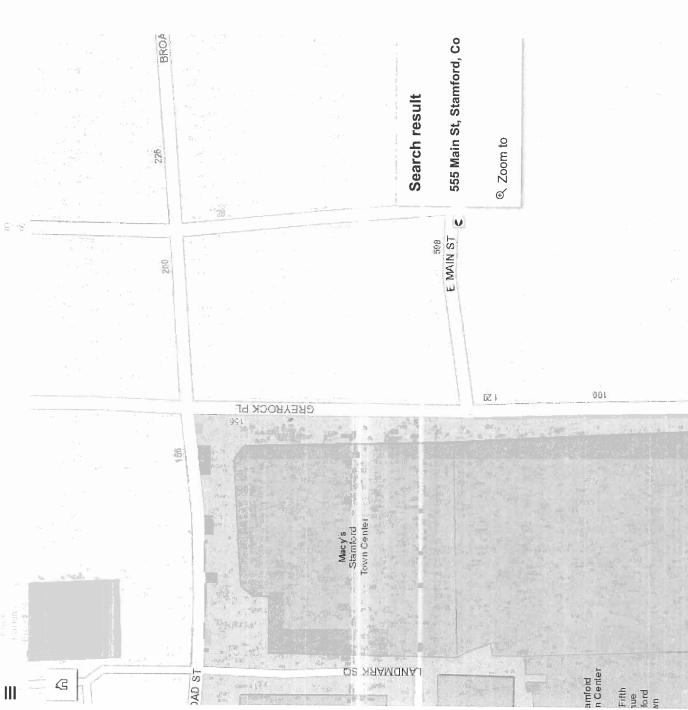
7/19/2018

City of Stamford, CT 2016 tax maps in .pdf format. http://www.stamfordct.gov/property-assessment For additional information contact the City of Stamford's Assessor's office at

size. The tax maps with topography are from 3 MB to 12 MB in file size. Printing these maps on other paper size and are approximately 1 to 3 MB in file These .pdf tax maps are formatted for 42" x 36" paper sizes will render the map scale (1"=100') inaccurate.

Maps produced July 2017.

must be obtained from surveys or deeds. The GIS survey or deed information. Maps with topography herein. This tax map is not to be used for property parcel data has been compiled from many sources accuracy. All information is subject to verification and deeds. The tax maps are not a substitute for determination of legal title. Property descriptions legal responsibility for the information contained by user. The City of Stamford, CT assumes no including assessor records, tax maps, surveys, This map is not intended to represent survey are based on NAVD88 horizontal datum. boundary description, conveyance, or



http://stamfordct.maps.arcgis.com/apps/SimpleViewer/index.html?appid=8bd89187b7324a57b263d51bd020cc40

#### **555 EAST MAIN STREET**

Location 555 EAST MAIN STREET

**Mblu** 002/ 1817///

Acct# 002-1817

Owner SOUTHERN NEW ENGLAND

TELE CO

**Assessment** \$2,526,830

Appraisal \$3,609,750

**PID** 7840

**Building Count** 1

#### **Current Value**

Appraisal								
Valuation Year Improvements Land Total								
2017	\$2,299,340	\$2,299,340 \$1,310,410						
	Assessment	A145 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	december 200-200-200-200-200-200-200-200-200-200					
Valuation Year Improvements Land Total								
2017	\$1,609,540	\$917,290	\$2,526,830					

#### **Owner of Record**

Owner

SOUTHERN NEW ENGLAND TELE CO

**Co-Owner** C/O FRONTIER COMMINICATIONS

Address

401 MERRIT 7

TAX DEPT

NORWALK, CT 06851

Sale Price

\$0

Book & Page 1251/ 285

Sale Date

02/28/1972

Instrument

25

#### **Ownership History**

Ownership History									
Owner Sale Price Book & Page Instrument Sale Date									
SOUTHERN NEW ENGLAND TELE CO	\$0	1251/ 285	25	02/28/1972					

#### **Building Information**

#### **Building 1: Section 1**

Year Built:

1971

Living Area:

30,436

Building Attributes							
Field	Description						
STYLE	Telephone Bldg						
Stories:	2						
Occupancy	1						

Exterior Wall 1 Exterior Wall 2 Roof Structure Flat Roof Cover T&G/Rubber Interior Wall 1 Drywall/Plaste Interior Wall 2 Interior Floor 1 Interior Floor 2 Heating Fuel Heating Type Forced Air-Duc AC Type Central Bldg Use Industrial MDL-94 Total Rooms Total Bedrms 0 1st Floor Use: 300C Heat/AC Heat/AC Heat/AC Frame Type Baths/Plumbing Average Ceiling/Wall Rooms/Prtns Average Wall Height 18 % Comn Wall		
Roof Structure  Roof Cover  T&G/Rubber  Interior Wall 1  Drywall/Plaste  Interior Wall 2  Interior Floor 1  Carpet  Interior Floor 2  Heating Fuel  Heating Type  Central  Bldg Use  Industrial MDL-94  Total Rooms  Total Bedrms  0  1st Floor Use:  Baths/Plumbing  Average  Ceiling/Wall  Rooms/Prtns  Flat  Drywall/Plaste  Industrial MDL-94  Forced Air-Duc  Contral  Bldg Use  Industrial MDL-94  FireProofSteel  Baths/Plumbing  Average  Wall Height  18	Exterior Wall 1	Brick/Masonry
Roof Cover Interior Wall 1 Interior Wall 2 Interior Floor 1 Interior Floor 2 Heating Fuel Heating Type AC Type Central Bldg Use Industrial MDL-94 Total Rooms Total Bedrms O 1st Floor Use: Heat/AC Heat/AC Heat/AC Frame Type Baths/Plumbing Ceiling/Wall Rooms/Prtns Average Wall Height Interior Floor 1 Carpet Carpet Industrial Carpet Industrial Industria	Exterior Wall 2	
Interior Wall 1  Interior Wall 2  Interior Floor 1  Interior Floor 2  Heating Fuel  Heating Type  AC Type  Bldg Use  Industrial MDL-94  Total Rooms  Total Baths  0  1st Floor Use:  Heat/AC  Heat/AC  Heat/AC  Frame Type  Baths/Plumbing  Ceiling/Wall  Rooms/Prtns  Average  Wall Height  Interior Wall 2  Carpet  Carpet  Carpet  Industrial  Carpet  Industrial  Carpet  Industrial  Carpet  Industrial  Air-Duc  Central  Industrial MDL-94  Industrial MDL-	Roof Structure	Flat
Interior Wall 2  Interior Floor 1  Interior Floor 2  Heating Fuel  Heating Type  AC Type  Central  Bldg Use  Industrial MDL-94  Total Rooms  Total Baths  0  1st Floor Use:  Heat/AC  Heat/AC  Heat/AC  Heat/AC  Frame Type  Baths/Plumbing  Average  Ceiling/Wall  Rooms/Prtns  Average  Wall Height  Carpet  Carpet  Carpet  Carpet  Industrial MDL-94  Forced Air-Duc  Ac Type  Forced Air-Duc  Ac Type  Forced Air-Duc  Alie Type  Forced Air-Duc  Ac Pkgs  Frame Type  FireProofSteel  Baths/Plumbing  Average  Wall Height  18	Roof Cover	T&G/Rubber
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Interior Floor 2  Heating Fuel Gas/LP  Heating Type Forced Air-Duc  AC Type Central  Bldg Use Industrial MDL-94  Total Rooms  Total Bedrms 00  Total Baths 0  1st Floor Use: 300C  Heat/AC Heat/AC Pkgs  Frame Type FireProofSteel  Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Interior Wall 2	
Heating Fuel  Heating Type  Forced Air-Duc  AC Type  Central  Bldg Use  Industrial MDL-94  Total Rooms  Total Bedrms  00  Total Baths  0  1st Floor Use:  Heat/AC  Heat/AC  Heat/AC  Frame Type  Baths/Plumbing  Average  Ceiling/Wall  Rooms/Prtns  Wall Height  Forced Air-Duc  Forced Air-Duc  Alir-Duc  Heat/AC  Heat/AC  Forced Air-Duc  Average  Findustrial MDL-94  Industrial Molecules  Industrial Molecules  Industrial Molecules  Industrial Molecules  Industrial Molecul	Interior Floor 1	Carpet
Heating Type  Central  Central  Bldg Use  Industrial MDL-94  Total Rooms  Total Bedrms  00  Total Baths  0  1st Floor Use:  Heat/AC  Heat/AC  Frame Type  FireProofSteel  Baths/Plumbing  Average  Ceiling/Wall  Rooms/Prtns  Average  Wall Height  Forced Air-Duc  Forced Air-Duc  Forced Air-Duc  Air-Duc  Forced Air-Duc  Average  Industrial MDL-94  Industrial Mole Mole Mole Mole Mole Mole Mole Mol	Interior Floor 2	
AC Type Central  Bldg Use Industrial MDL-94  Total Rooms  Total Bedrms 00  Total Baths 0  1st Floor Use: 300C  Heat/AC Heat/AC Pkgs  Frame Type FireProofSteel  Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Heating Fuel	Gas/LP
Bldg Use Industrial MDL-94  Total Rooms  Total Bedrms 00  Total Baths 0  1st Floor Use: 300C  Heat/AC Pkgs  Frame Type FireProofSteel  Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Heating Type	Forced Air-Duc
Total Rooms  Total Bedrms  00  Total Baths  0  1st Floor Use:  Heat/AC Pkgs  Frame Type  FireProofSteel  Baths/Plumbing  Average  Ceiling/Wall  Rooms/Prtns  Average  Wall Height  18	AC Type	Central
Total Bedrms 00  Total Baths 0  1st Floor Use: 300C  Heat/AC Heat/AC Pkgs  Frame Type FireProofSteel  Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Bldg Use	Industrial MDL-94
Total Baths 0  1st Floor Use: 300C  Heat/AC Heat/AC Pkgs  Frame Type FireProofSteel  Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Total Rooms	
1st Floor Use: 300C  Heat/AC Heat/AC Pkgs  Frame Type FireProofSteel  Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Total Bedrms	00
Heat/AC Heat/AC Pkgs  Frame Type FireProofSteel  Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Total Baths	0
Frame Type FireProofSteel  Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	1st Floor Use:	300C
Baths/Plumbing Average  Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Heat/AC	Heat/AC Pkgs
Ceiling/Wall Sus-Ceil&Wall  Rooms/Prtns Average  Wall Height 18	Frame Type	FireProofSteel
Rooms/Prtns Average Wall Height 18	Baths/Plumbing	Average
Wall Height 18	Ceiling/Wall	Sus-Ceil&Wall
	Rooms/Prtns	Average
% Comn Wall 13	Wall Height	18
	% Comn Wall	13

#### **Building Photo**



(http://images.vgsi.com/photos/StamfordCTPhotos//\00\13\04/2

#### **Building Layout**

BAS[15218]

FUS[15218]

UBM[15218]

(http://images.vgsi.com/photos/StarhfordCTPhotos//Sketches/78

	Building Sub-Areas (sq ft)								
Code	de Description Gross Area		Living Area						
BAS	First Floor	15,218	15,218						
FUS	Upper Story, Finished	15,218	15,218						
UBM	Basement, Unfinished 15,218		0						
	AND	45,654	30,436						

#### **Extra Features**

Extra Features	Legend
No Data for Extra Features	

#### Land

Land Use		Land Line Valuation			
Use Code	300C	Size (Acres)	0.36		

Description

Industrial MDL-94

Zone

CCN

Neighborhood 1000

Alt Land Appr No

Category

Depth

Assessed Value \$917,290

Appraised Value \$1,310,410

#### Outbuildings

Outbuildings	<u>Legend</u>
No Data for Outbuildings	

#### **Valuation History**

Appraisal							
Valuation Year	Improvements	Land	Total				
2017	\$2,299,340	\$1,310,410	\$3,609,750				
2016	\$2,263,190	\$1,191,340	\$3,454,530				
2015	\$2,263,190	\$1,191,340	\$3,454,530				

Assessment								
Valuation Year Improvements Land								
2017	\$1,609,540	\$917,290	\$2,526,830					
2016	\$1,584,230	\$833,940	\$2,418,170					
2015	\$1,584,230	\$833,940	\$2,418,170					

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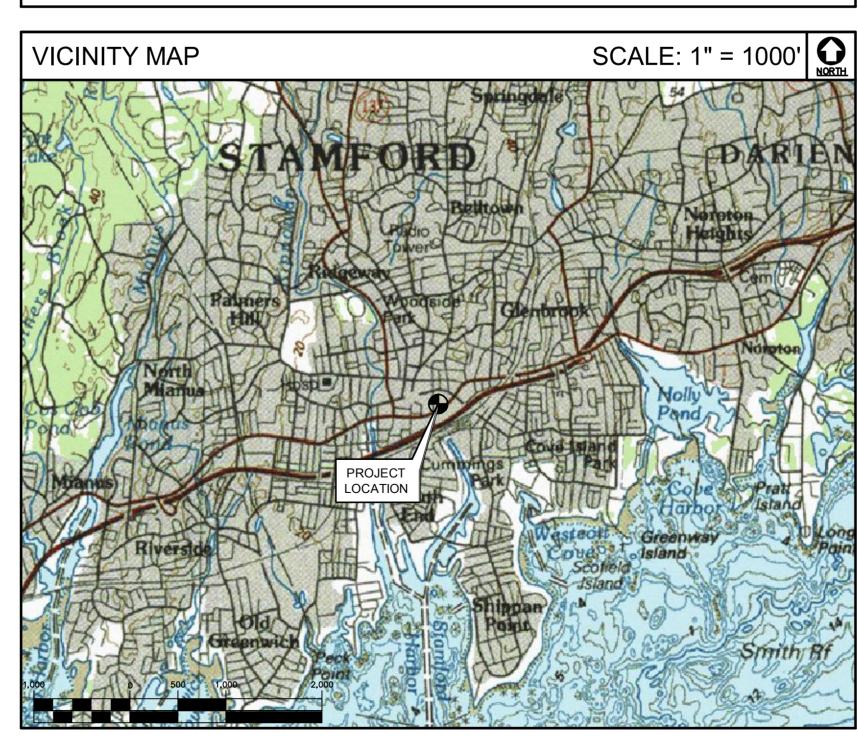
# WIRELESS COMMUNICATIONS FACILITY CT2118 - LTE 5C/6C/7C FIRSTNET STAMFORD CENTRAL 555 MAIN STREET STAMFORD, CT 06901

## **GENERAL NOTES**

- 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
- 17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- 18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
- 19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
- 20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
- 21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

#### SITE DIRECTIONS FROM: 500 ENTERPRISE DRIVE ROCKY HILL, CONNECTICUT TO: 555 MAIN STREET STAMFORD, CONNECTICUT 0.36 MI TURN LEFT ONTO CAPITAL BLVD. 0.27 MI TURN LEFT ONTO WEST ST. TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN. 0.30 MI 4. TAKE EXIT 17 FOR CT-15 S/W CROSS PKWY. 9.59 MI TAKE EXIT 52 FOR CT- 8 S. 30.24 MI MERGE ONTO I-95 S TOWARD NY CITY. 5.93 MI TAKE THE WEST AVE EXIT. EXIT 6 22.30 MI MERGE ONTO GRENHART RD. 0.18 MI TAKE THE 2ND RIGHT ONTO HARVARD AVE 0.14 MI 10. TURN RIGHT ONTO W MAIN ST/US-1 N. 0.23 MI 11. 555 MAIN ST, STANFORD, CT 06901, 555 MAIN ST IS ON THE LEFT.



## PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

#### A. AT ALPHA/BETA SECTORS:

- REMOVE AND REPLACE EXISTING ANTENNAS WITH CCI (HPA-45R-BUU-H6) ANTENNAS AT POS. 1,2,4. (TOTAL OF 6) • INSTALL KATHREIN (80010965) ANTENNAS AT POS. 3. (TOTAL OF 2)
- INSTALL (1) QUAD WCS FILTER ON EXISTING ALPHA RRUS-32. (ALPHA SECTOR ONLY)

- AT GAMMA SECTOR:

   REMOVE POS. 1 ANTENNA AND REPLACE WITH EXISTING POS. 4 POWERWAVE (P65-15-XLH-RR) ANTENNA. (TOTAL OF 1) • PREVIOUSLY REMOVED ALPHA/BETA POS. 3 CCI (OPA-65R-LCUU-H4) ANTENNA, TO BE INSTALLED AT POS. 4
- OF GAMMA SECTOR. (TOTAL OF 1) • RE-LOCATE EXISTING POS. 3 CCI (OPA-65R-LCUU-H4)
- ANTENNA TO POS. 2. (TOTAL OF 1) • INSTALL KATHREIN (80010964) ANTENNA AT POS. 3. (TOTAL OF 1)

## AT ALL ANTENNA SECTORS:

- REMOVE RRUS-11 (1900 BAND) AND REPLACE WITH RRUS-12 A2 AT POS. 4. (TOTAL OF 3)
- INSTALL RRUS-32 B66 AT POS. 3. (TOTAL OF 3) • INSTALL B14-4478 RRH AT POS. 3. (TOTAL OF 3)

## D. AT THE EQUIPMENT SHELTER

- INSTALL (3) RRUS-E2 ON EXISTING RRU RACK, WITH (6)
- SURGE ARRESTORS. (APTDC-BDFDM-DB) DECOMMISSION GSM LINE COMPONENTS.
- DECOMMISSION UMTS 1900 RRH. (TOTAL OF 3)
- DECOMMISSION UMTS 850 RRH. (TOTAL OF 3) • IN LTE RACK, ADD (2) XMUs. REPLACE IDL2 WITH IDLe. • REPLACE (2) DUSs WITH (2) 5216s.

PROJECT INFORMATION

AT&T SITE NUMBER: CT2118 STAMFORD CENTRAL AT&T SITE NAME: SITE ADDRESS: 555 MAIN STREET

LESSEE/APPLICANT:

AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067

STAMFORD, CT 06901

AT&T PACE ID NUMBER: PACE JOB 1 - MRCTB022535 PACE JOB 2 - MRCTB026719

AT&T FA LOCATION CODE: 10034983

**ENGINEER:** CENTEK ENGINEERING, INC.

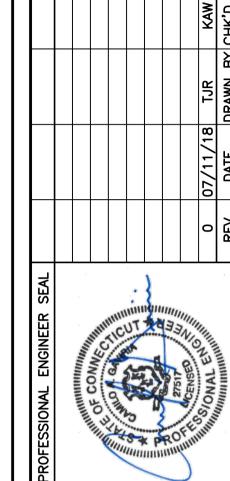
63-2 NORTH BRANFORD RD. BRANFORD, CT 06405

PROJECT COORDINATES: LATITUDE: 41°-03'-12.48" N LONGITUDE: 73'-32'-08.38" W

> SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

GROUND ELEVATION: ±20' AMSL

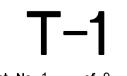
SHEET	INDEX							
SHT. NO.	SHT. NO. DESCRIPTION							
T-1	T-1 TITLE SHEET							
N-1	NOTES, SPECIFICATIONS AND ANTENNA SCHEDULE	0						
C-1	PLANS AND ELEVATION	0						
C-2	ANTENNA CONFIGURATION DETAILS	0						
C-3	DETAILS	0						
C-4	DETAILS	0						
E-1	SCHEMATIC DIAGRAM AND NOTES	0						
E-2	WIRING DIAGRAM	0						
E-3	TYPICAL ELECTRICAL DETAILS	0						





07/02/18 AS NOTED JOB NO. 18000.32

TITLE SHEET



## NOTES AND SPECIFICATIONS

## **DESIGN BASIS:**

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

- 1. DESIGN CRITERIA:
- WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 90-110 MPH (3 SECOND GUST)
- RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 93 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

## **GENERAL NOTES:**

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

## STRUCTURAL STEEL

- 1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
- A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
- B. STRUCTURAL STEEL (OTHER SHAPES)——ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)——ASTM A500 GRADE B,
   (FY = 46 KSI)
- D. STRUCTURAL HSS (ROUND SHAPES) --- ASTM A500 GRADE B, (FY = 42 KSI)
- E. PIPE---ASTM A53 (FY = 35 KSI)
- F. CONNECTION BOLTS——ASTM A325—N G. U—BOLTS——ASTM A36
- H. ANCHOR RODS---ASTM F 1554
- I. WELDING ELECTRODE——ASTM E 70XX
- 2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
- 3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
- 4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
- 5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
- INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
- 7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
- 8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
- 10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER
- 11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
- 12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
- 13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
- 14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
- 15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
- 16. FABRICATE BEAMS WITH MILL CAMBER UP.
- 17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
- 18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
- 19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
- 20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

## **PAINT NOTES**

#### PAINTING SCHEDULE:

- 1. ANTENNA PANELS:
  - A. SHERWIN WILLIAMS POLANE—B
    B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.
- 2. <u>COAXIAL CABLES:</u>
- A. ONE COAT OF DTM BONDING PRIMER (2-5 MILS. DRY FINISH)
  B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5-5 MILS. DRY FINISH)
- C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

#### **EXAMINATION AND PREPARATION:**

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

## CLEANING:

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

## APPLICATION:

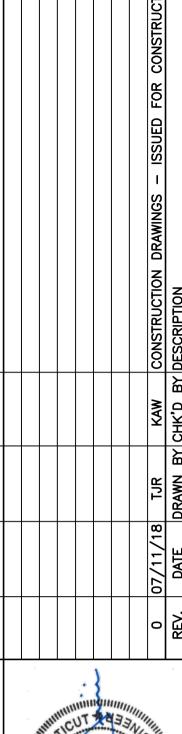
- 1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
- 3. APPLY EACH COAT TO UNIFORM FINISH.
- 4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
- 5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE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

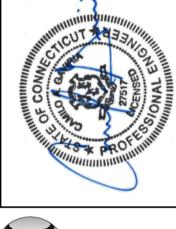
## COMPLETED WORK:

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

	ANTENNA SCHEDULE										
SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA © HEIGHT	AZIMUTH	TMA/DIPLEXER/TRIP	LEXER (QTY)	(E/P) RRU (QTY)	FEEDER	(E/P) RAYCAP (QTY)
A1	EXISTING	UMTS 850	CCI (HPA-45R-BUU-H6)	72 x 18.9 x 8.3	235'	110°	TMA: POWERWAVE: LGP21401 SINGLE 1900 (1)	DIPLEXER: POWERWAVE: LGP 13519 (2)		18ø COAX (1)	(E) BAYOAR ROO 48 00 48 00 (
A2	EXISTING	LTE 850/700DE/WCS	CCI (HPA-45R-BUU-H6)	72 x 18.9 x 8.3	235'	76°	TRIPLEXER: CCI: TPX-070821 (2)		(P) RRUS-E2 (1), (E) RRUS-11 (1), (E) RRUS-32 (1)	180 COAX (2), FEEDER AND DC POWER	(E) RAYCAP DC6-48-60-18-8C (
A3	PROPOSED	LTE 700UD/AWS J	KATHREIN (80010965)	78.7 x 20 x 6.9	235'	76°			(P) B14 4478 (1), (P) RRUS-32 B66	FEEDER AND DC POWER	
A4	EXISTING	LTE 700BC/PCS	CCI (HPA-45R-BUU-H6)	72 x 18.9 x 8.3	235'	76°			(E) RRUS-11 (1), (P) RRUS-12 A2 (1)	FEEDER AND DC POWER	
	•		•	•		•	•		•		
B1	EXISTING	UMTS 850	CCI (HPA-45R-BUU-H6)	72 x 18.9 x 8.3	235'	280°	TMA: POWERWAVE: LGP21401 SINGLE 1900 (1)	DIPLEXER: POWERWAVE: LGP 13519 (2)		18ø COAX (1)	
B2	EXISTING	LTE 850/700DE/WCS	CCI (HPA-45R-BUU-H6)	72 x 18.9 x 8.3	235'	266*	TRIPLEXER: CCI: TPX-070821 (2)		(P) RRUS-E2 (1), (E) RRUS-11 (1), (E) RRUS-32 (1)	180 COAX (2), FEEDER AND DC POWER	
В3	PROPOSED	LTE 700UD/AWS J	KATHREIN (80010965)	78.7 x 20 x 6.9	235'	266*			(P) B14 4478 (1), (P) RRUS-32 B66	FEEDER AND DC POWER	
B4	EXISTING	LTE 700BC/PCS	CCI (HPA-45R-BUU-H6)	72 x 18.9 x 8.3	235'	266*			(E) RRUS-11 (1), (P) RRUS-12 A2 (1)	FEEDER AND DC POWER	
	•		•	•		•	•		•		
C1	EXISTING	UMTS 850	PWAVE (P65-15-XLH-RR)	51 x 12 x 6	235'	0,	TMA: POWERWAVE: LGP21401 SINGLE 1900 (1)	DIPLEXER: POWERWAVE: LGP 13519 (2)		18ø COAX (1)	
C2	EXISTING	LTE 850/700DE/WCS	CCI (OPA-65R-LCUU-H4)	48 x 14.4 x 7.3	235'	351°	TRIPLEXER: CCI: TPX-070821 (2)		(P) RRUS-E2 (1), (E) RRUS-11 (1), (E) RRUS-32 (1)	180 COAX (2), FEEDER AND DC POWER	
С3	PROPOSED	LTE 700UD/AWS J	KATHREIN (80010964)	59 x 20 x 6.9	235'	351°			(P) B14 4478 (1), (P) RRUS-32 B66	FEEDER AND DC POWER	
C4	EXISTING	LTE 700BC/PCS	CCI (OPA-654-LCUU-H4)	48 x 14.4 x 7.3	235'	351°			(E) RRUS-11 (1), (P) RRUS-12 A2 (1)	FEEDER AND DC POWER	

RRU	SIZE (INCHES) (L × W × D)
RRUS-11	19.7 x 17 x 7.2
RRUS-32	27.2 x 12.1 x 7
RRUS-12	20.4 x 18.5 x 7.5
RRUS-A2	16.4 x 15.2 x 3.4
314-4478	14.9 x 13.1 x 7.3
RRUS-32 B66	27.2 x 12.1 x 7
RRUS-E2	20.4 x 18.5 x 7.5







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TTRAL (2000) SECTION (2000) SECTION

WIRELESS COMMUNICATIONS FACILITY

AMFORD CENT

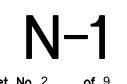
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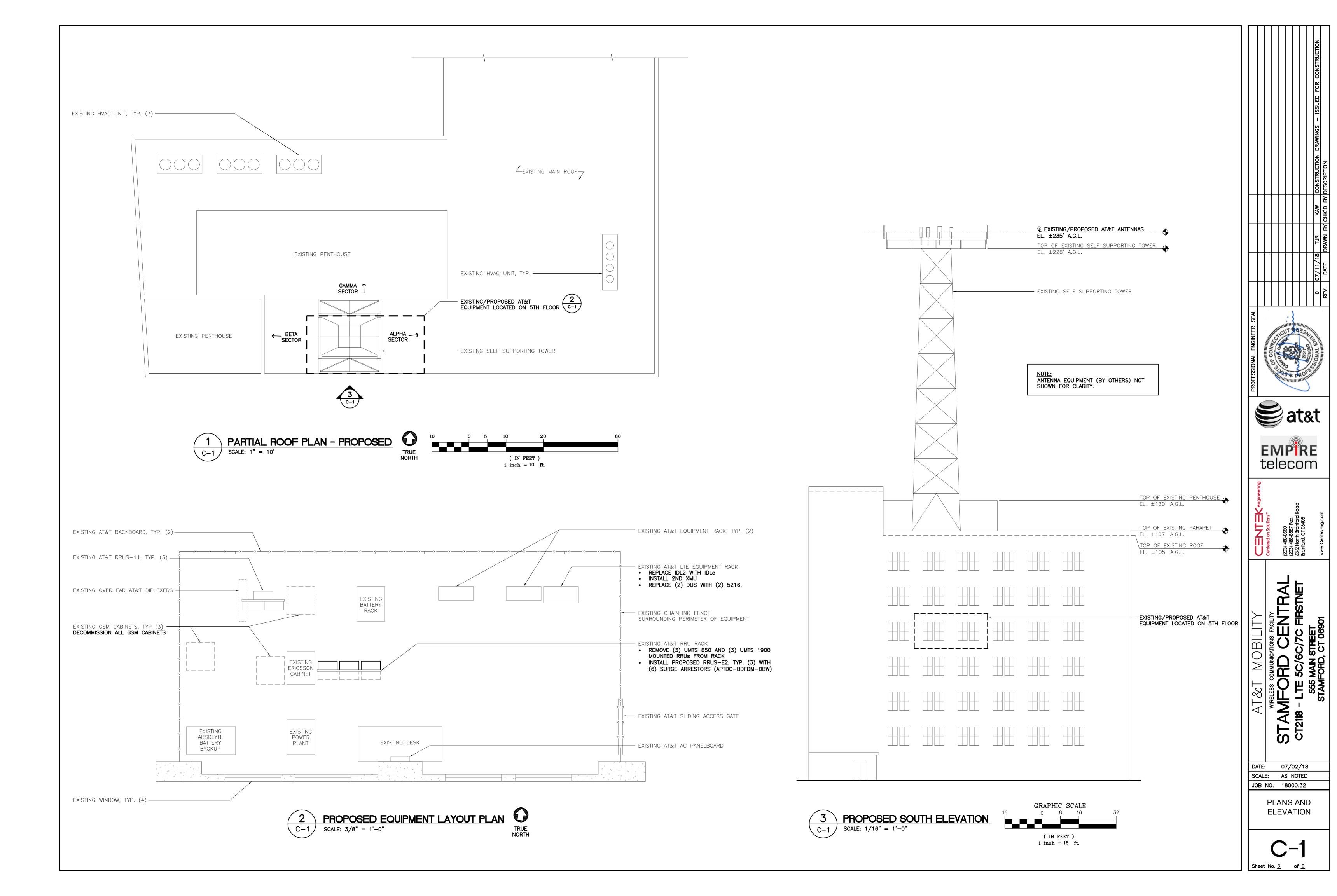
555 MAIN STREET

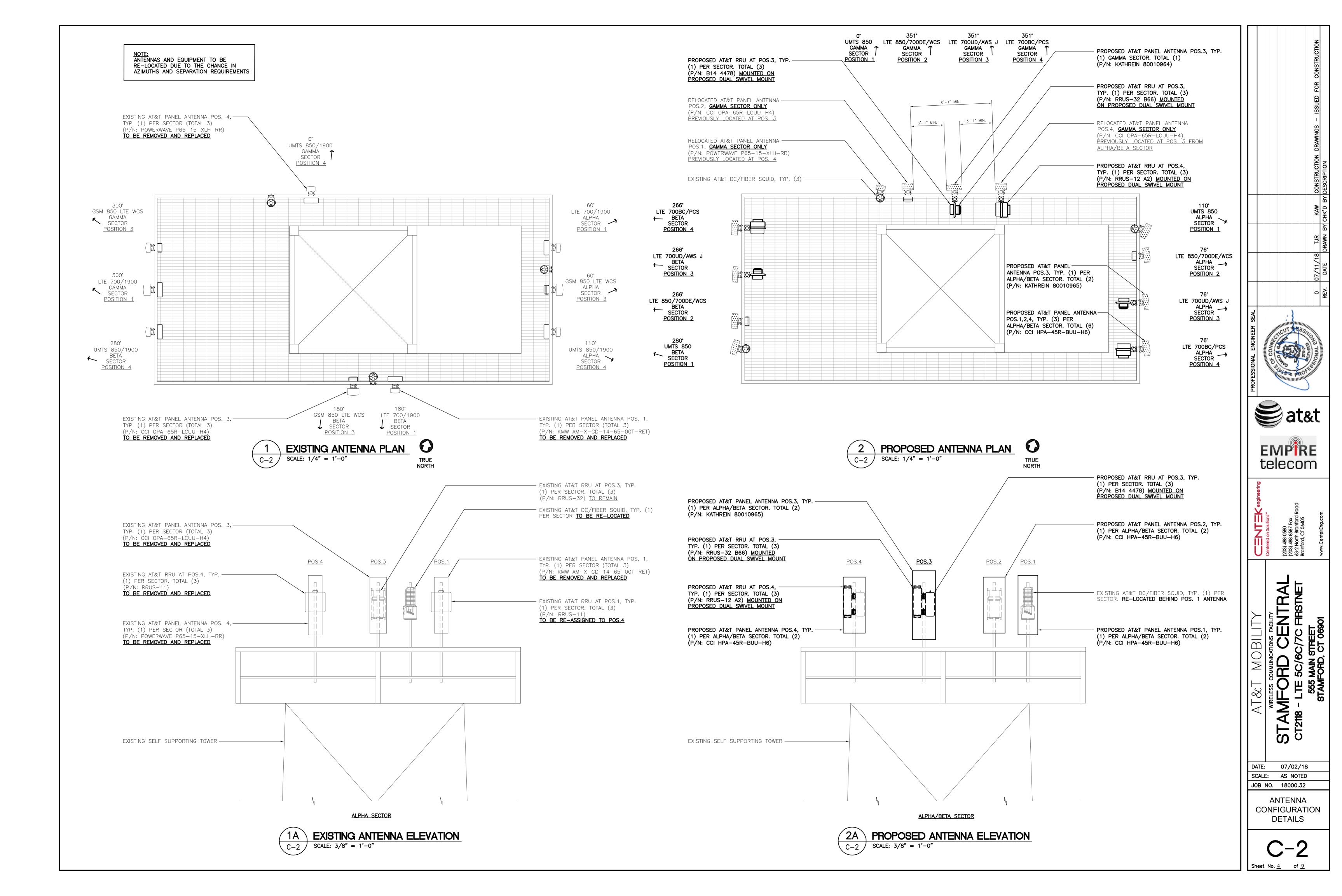
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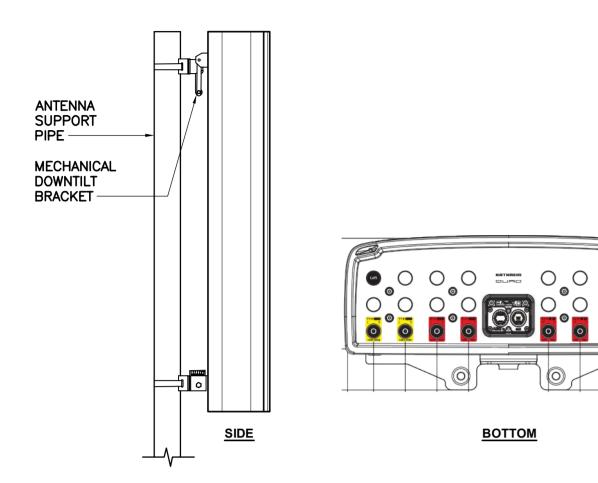
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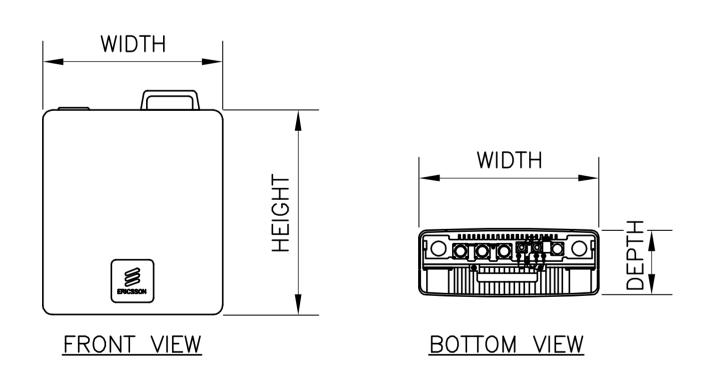




AL		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: KATHREIN MODEL: 80010964	59"L × 20"W × 6.9"D	83.8 LBS.

1 PROPOSED ANTENNA DETAIL

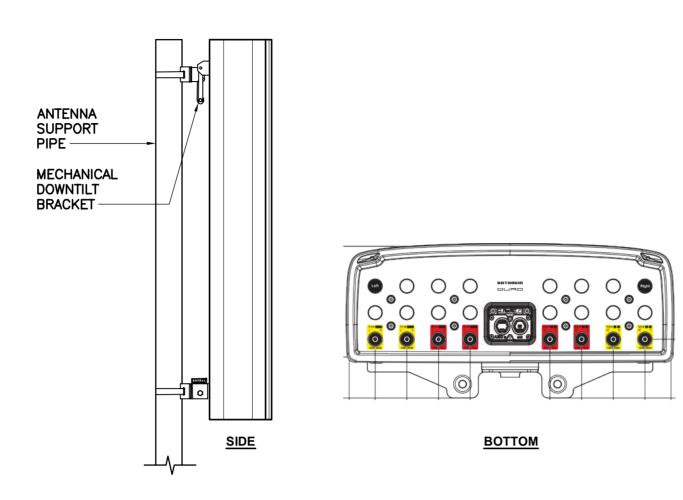
NOT TO SCALE



	RRU (REMOTE R	ADIO 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.
	COORDINATE FINAL EQUIPMEN IANAGER PRIOR TO ORDERING		/ITH AT&T

4 ERICSSON - B14 4478 DETAIL

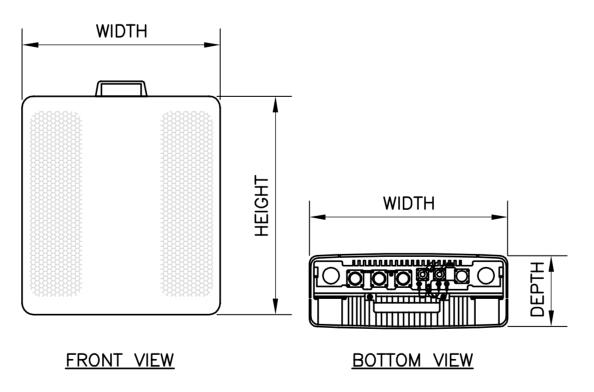
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ALPHA/BETA/GAMMA ANTENNA			
EQUIPMENT	DIMENSIONS	WEIGHT	
MAKE: KATHREIN MODEL: 80010965	78.7"L × 20"W × 6.9"D	180.6 LBS.	

PROPOSED ANTENNA DETAIL

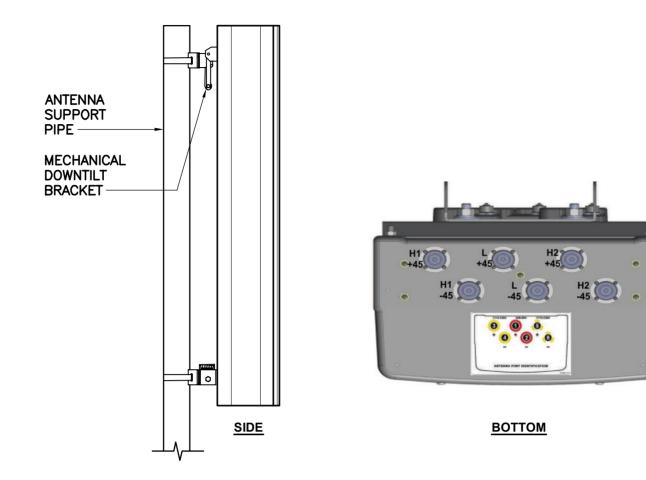
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RRU (REMOTE RADIO UNIT)				
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES	
MAKE: ERICSSON MODEL: RRUS-E2	20.4"L x 18.5"W x 7.5"D	59.52 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.	
NOTES:  1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.				

5 ERICSSON - RRUS-32 B66 DETAIL

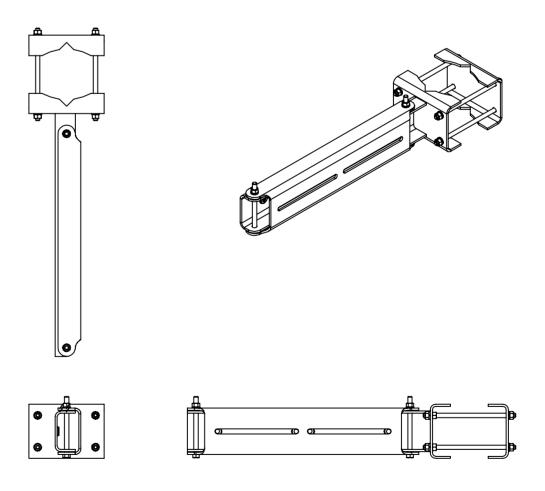
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	ALPI	IA/BETA/GAMMA ANTENNA	
EQUIPME	NT	DIMENSIONS	WEIGHT
MAKE: MODEL:	CCI HPA-45R-BUU-H6	72"L x 18.9"W x 8.3"D	180.6 LBS.

3 PROPOSED ANTENNA DETAIL

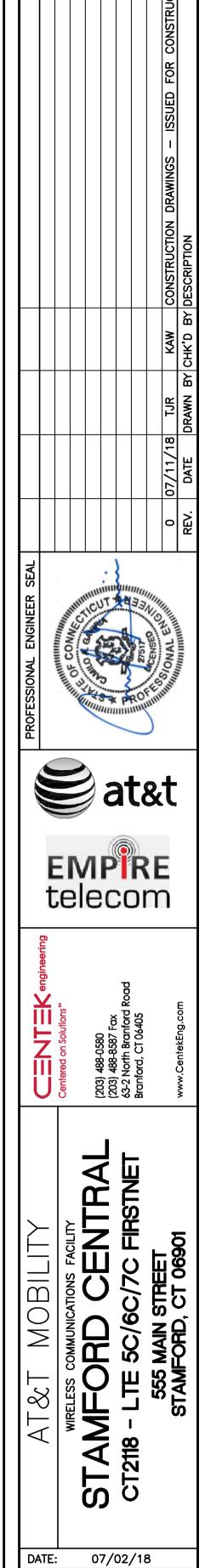
NOT TO SCALE



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

6 RRH DUAL SWIVEL MOUNT DETAIL

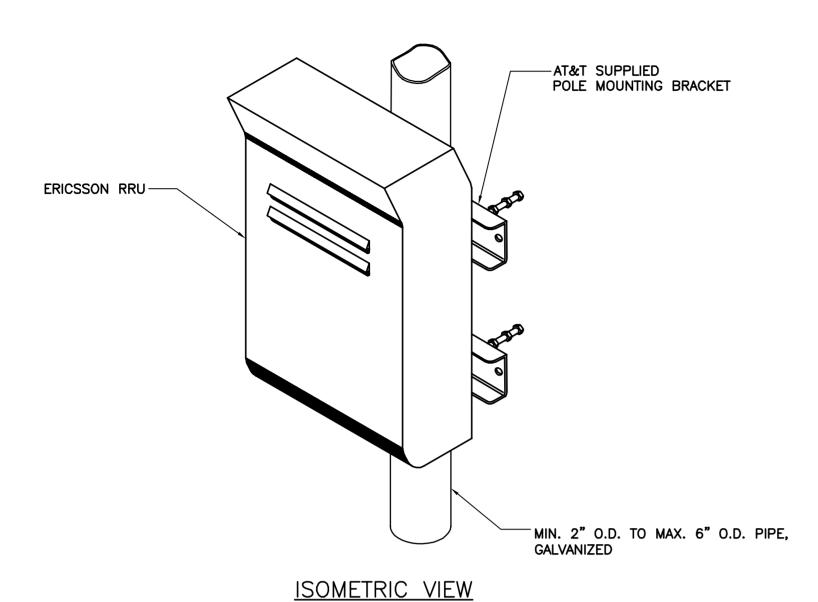
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SCALE: AS NOTED

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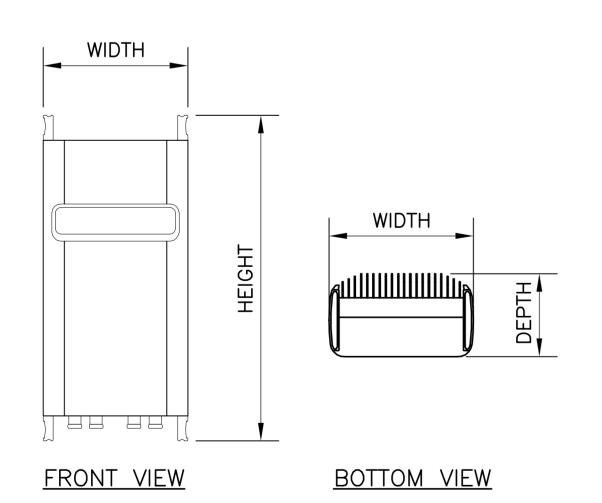
**DETAILS** 



NOTES:

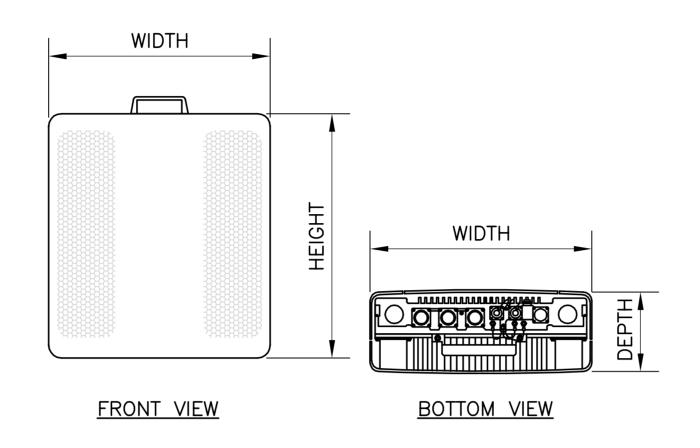
- 1. AT&T SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
- 2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.





		RRU (REMOTE RAD	DIO UNIT)		
EQUIPM	MENT	DIMENSIONS	WEIGHT	CLEARANCES	
MAKE: MODEL:	ERICSSON RRUS-32 B66	27.17"L × 12.05"W × 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.	
1. (	NOTES:  1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.				





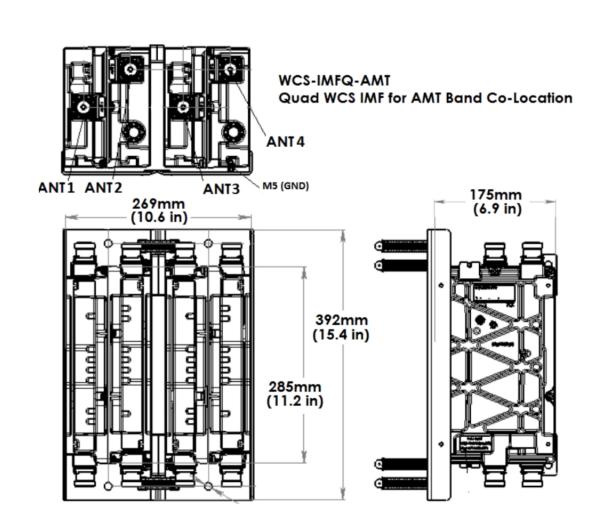
	RRU (REMOTE RAI	DIO UNIT)	
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS-12	20.4"L x 18.5"W x 7.5"D	50.00 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.
	COORDINATE FINAL EQUIPMENT MANAGER PRIOR TO ORDERING.	MODEL SELECTION W	VITH AT&T





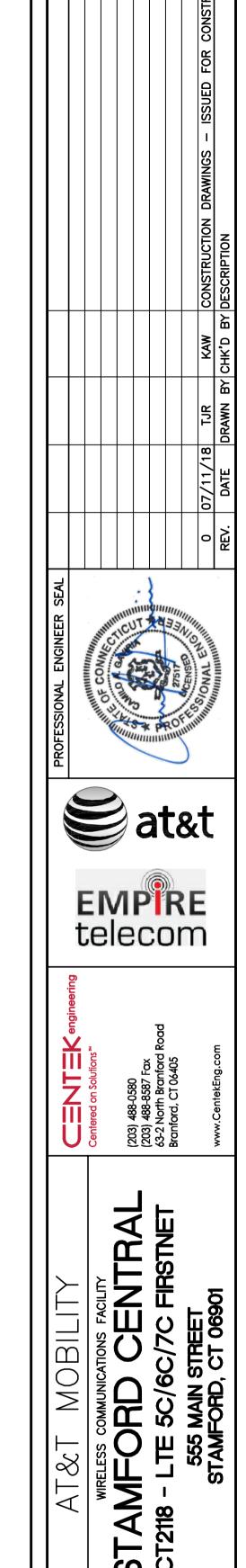
	EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: MODEL:	ANDREW APTDC-BDFDM-DB	3.46"H x 3.46"W x 1.65"D	1.32 LBS.





		WCS FILTER	
	EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: MODEL:	COMMSCOPE WCS-IMFQ-AMT	11.2"H × 6.96"W × 10.6"D	29.5 LBS.
	TRACTOR TO COORDINA	TE FINAL EQUIPMENT MODEL SEL	ECTION WITH AT&T



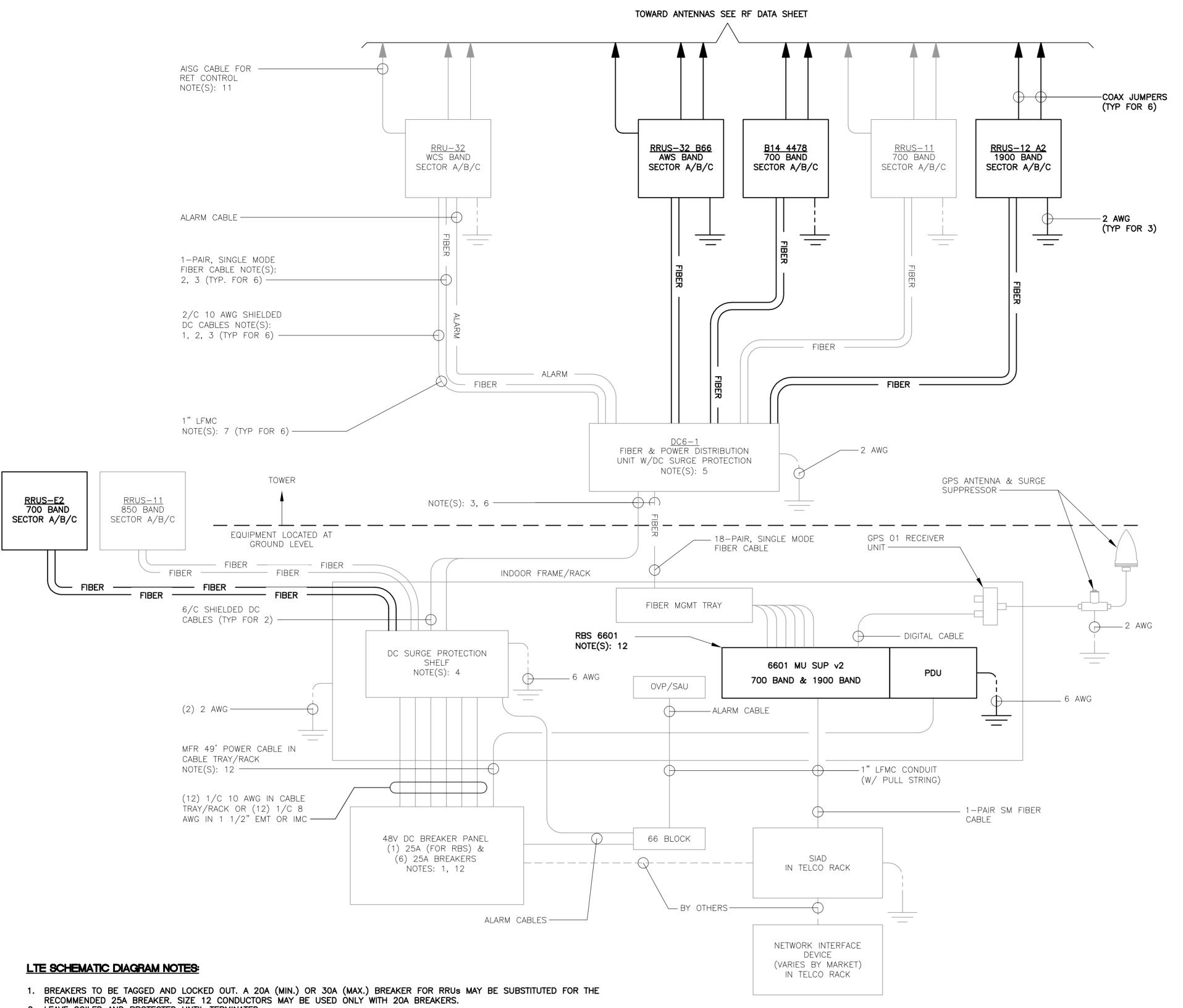


DATE: 07/02/18

SCALE: AS NOTED

JOB NO. 18000.32

**DETAILS** 



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

## SCHEMATIC DIAGRAM E-1NOT TO SCALE

## **ELECTRICAL NOTES**

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

## TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

TELEPHONE NUMBER.

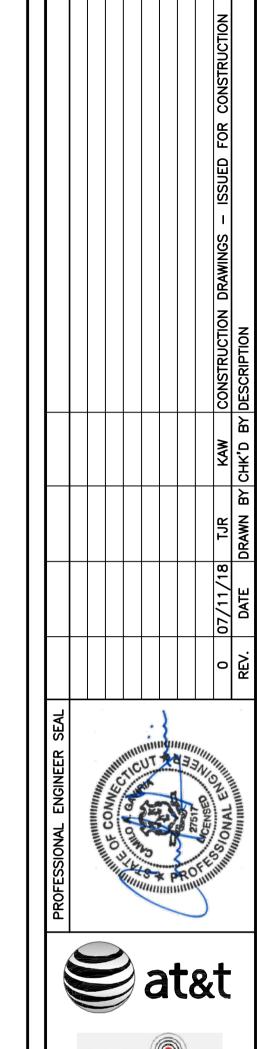
A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

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

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

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST

- EQUIPMENT. 2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND
- 3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.
- B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.
- C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.
- D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.



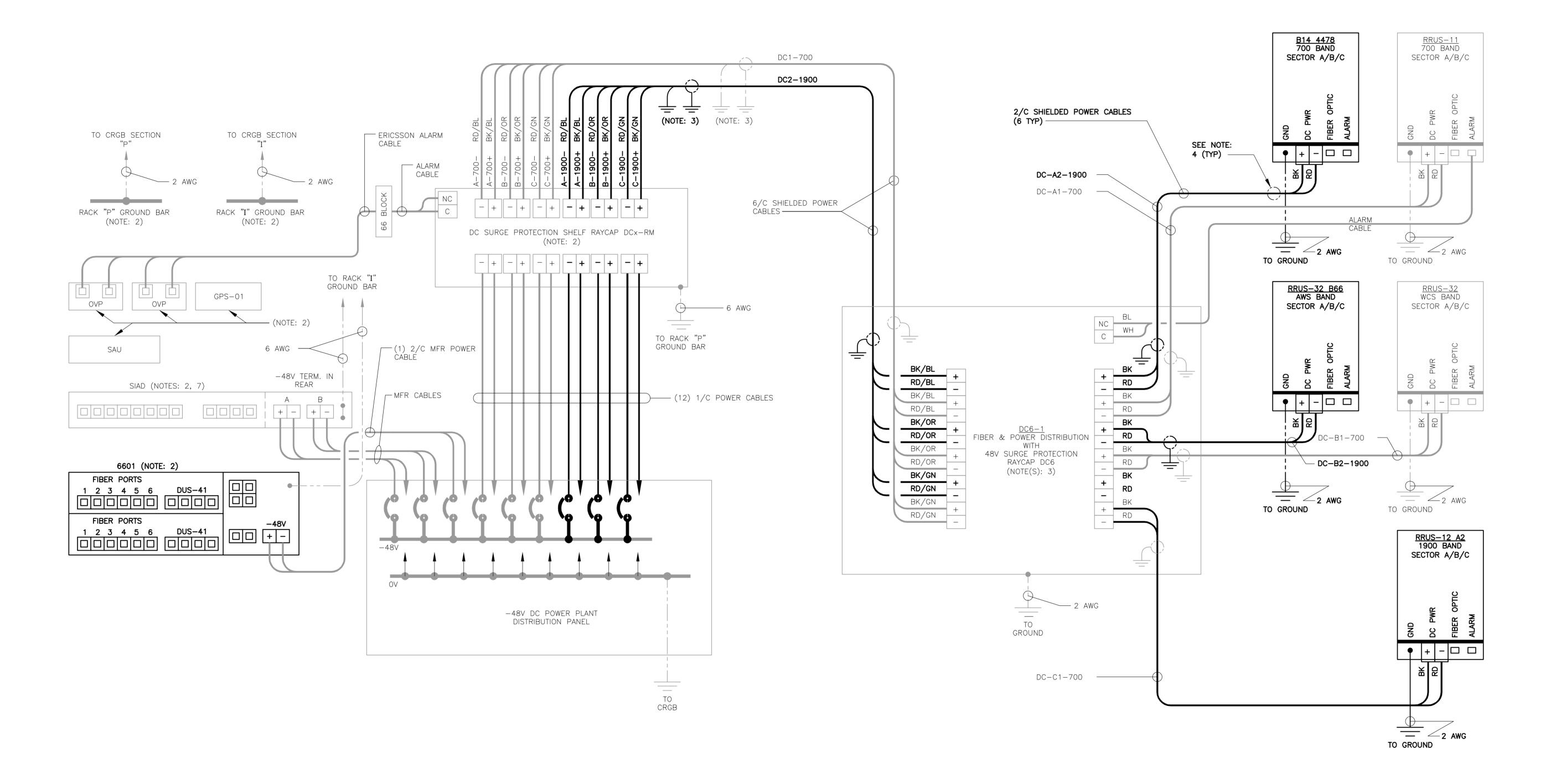


7

07/02/18 SCALE: AS NOTED JOB NO. 18000.32

> SCHEMATIC DIAGRAM AND NOTES

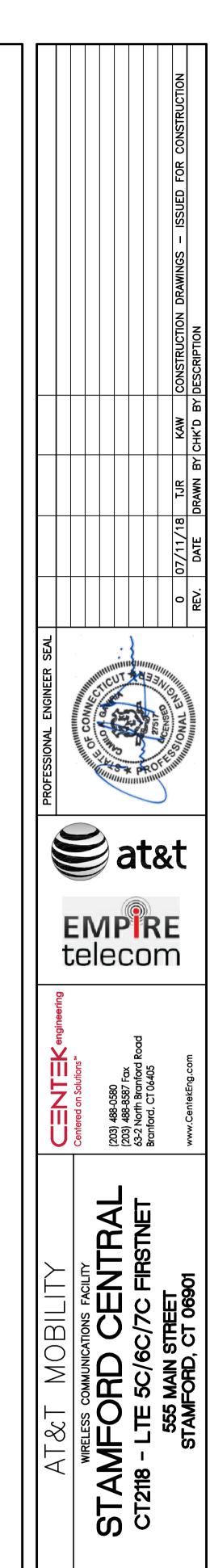




## LTE WIRING DIAGRAM NOTES:

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



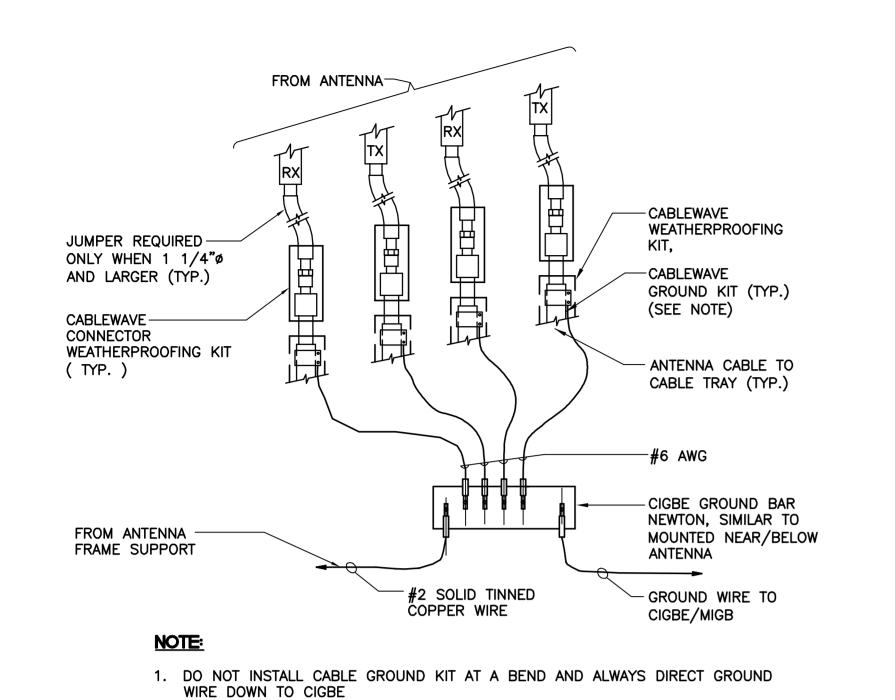


DATE: 07/02/18

SCALE: AS NOTED

JOB NO. 18000.32

WIRING DIAGRAM

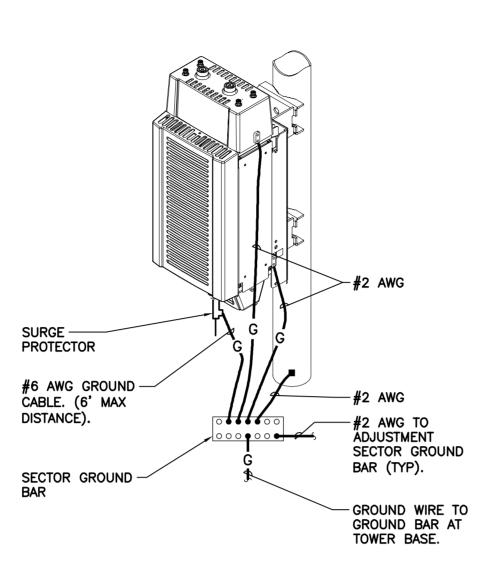


CONNECTION OF GROUND WIRES TO GROUND BAR

E-3 NOT TO SCALE

E-3 NOT TO SCALE

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



NOT TO SCALE

**RRU POLE MOUNT GROUNDING** 

2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH

4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.

3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO.

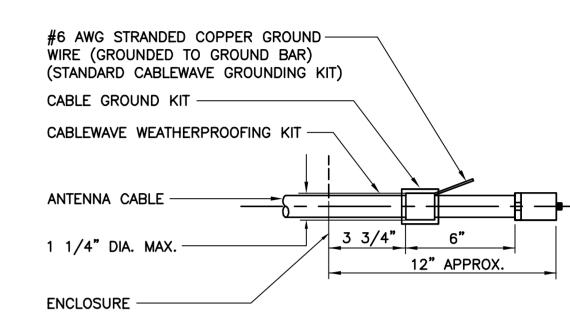
5. STAINLESS STEEL SECURITY SCREWS.

**LEGEND** 

NEMA DOUBLE LUG .

CAT. NO. 3015-8.

GROUND BAR DETAIL NOT TO SCALE



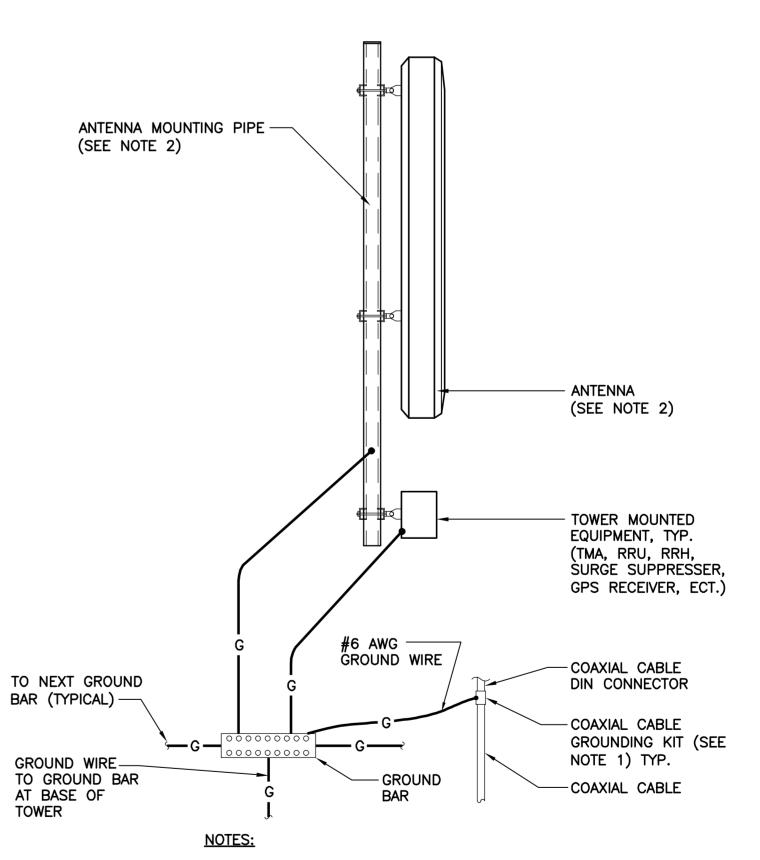
NOTE:

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

ANTENNA CABLE GROUNDING DETAIL NOT TO SCALE

Antenna 1 Antenna 3 Antenna 4 Antenna 2 UMTS 850 LTE 700 BC / PCS LTE 850 / 700 DE / WCS 700 UD/AWS J Broadband Broadband Broadband Broadband Broadband Broadband Octo Octo Octo Low Low High High Broadband Broadband Broadband Broadband Broadband Broadband Hex High 700/850 +45/-45 4Tx/4Rx Hex Low 700/850 +45/-45 Octo Low 700/850 +45/-45 Octo Low 700/850 +45/-45 Hex Low 700 Hex High Hex High High 4Tx/4Rx 4Tx/4Rx +45/-45 4Tx/4Rx +45/-45 4Tx/4Rx +45/-45 +45/-45 4Tx/4Rx 4Tx/4Rx 4Tx/4Rx +45/-45 +45/-45 +45/-45 +45/-45 +45/-45 RET RET RET RET TMA BP TxRxL TxRx2 TxRx3 TxRx4 LTE RRUS-32 B66 AWSJ Tx8s1 Tx8s2 Tx8s3 Tx8s4 LTE 4478 UPPER 700-0 (814) TAA/RAA TAB/RHB LTE RRUS-11 700 RAA Data RAA Data RAD TMABP Traffica Trafficial Red LTE RRUS-12 LTE A2 1900 Talkd Talks Talks Talks4 LTE RRUS-32 WCS Fiber/DC-1 Demarcation Box (Squid) 3 Feet Separation B/W BC-B14-DE 3 Feet Minimum Separation between LTE Antennas 6 Feet Minimum Separation MCU / CCU between 700BC & 700 DE DC Plant PDU 7:A/9AA 7:6/90-0 LTE RRUS-11 7:80 0 146 (249 Red 1999 764 GSM 850 -REQUEST TO 3206 DUW 2nd DUW UMTS 1<sup>st</sup> NodeB DECOM FOR LTE 5216 XMU LTE 5216 XMU CARRIER ADD TO HAPPEN

RF PLUMBING DIAGRAM

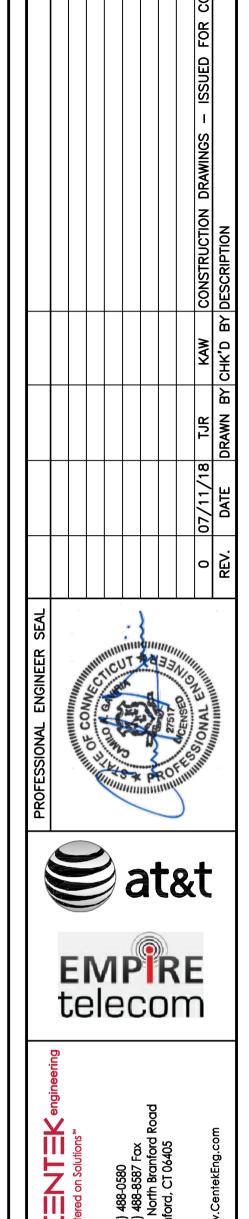


1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.

BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.

DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.





A STAMF(CT2118 - LT

07/02/18 SCALE: AS NOTED JOB NO. 18000.32

**TYPICAL** ELECTRICAL **DETAILS** 

# Structural Analysis Report



# AT&T - Stamford Central SBC CO #CT2118 / FA #10034983 Owner: Frontier Communications - Stamford #1 Co Site Stamford, Connecticut

July 09, 2018

MEI PROJECT ID: CT02768S-18V0



17950 Preston Road, Suite 720 Dallas, Texas 75252 Tel. 972 -783-2578 Fax 972-783-2583 **www.maloufengineering.com** 





July 09, 2018

Ms. Nicole Caplan Empire Telecom Billerica, MA 01862

#### STRUCTURAL ANALYSIS

npire Telecom / AT&T	Champional Conduction Co.	
	Stamford Central SBC CO #CT2118 / FA #10034983	
ontier Communications		
02768S-18V0		
5 Main Street amford, Connecticut 06901	Fairfield County FCC #1046319	
5	2768S-18V0 Main Street	2768S-18V0           Main Street         Fairfield County           mford, Connecticut 06901         FCC #1046319

#### **EXECUTIVE SUMMARY:**

Malouf Engineering Int'l (MEI), as requested, has performed a structural analysis of the above-mentioned structure to assess the impact of the changed condition as noted in Table 1.

Based on the stress analysis performed, the existing structure **is in conformance** with the Int'l Building Code (IBC) / ANSI/TIA-**222-G** Standard for the loading considered under the criteria listed and referenced in the report sections – tower rated at 96.8% - Legs.

The installation of the proposed changed condition as noted in Table 1 is structurally acceptable. Please refer to Appendix 1 for Schematic Lines Layout.

MEI appreciates the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or other projects please contact us.

Respectfully submitted.

MALOUF ENGINEERING INT'L, INC.

Analysis performed by:

Luan Nguyen, PE Sr. Project Engineer Reviewed & Approved by:

E. Mark Malouf, PE Connecticut #17715

972-783-2578 ext. 106

mmalouf@maloufengineering.com

7/9/2018

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#### 1. INTRODUCTION & SCOPE

A structural analysis was performed by Malouf Engineering Int'l (MEI), as requested and authorized by Ms. Nicole Caplan, Empire Telecom, on behalf of AT&T, to determine the acceptance of the proposed changed conditions in conformance with the IBC / ANSI/TIA-222-G Standard, "Structural Standard for Antenna Supporting Structures and Antennas".

The scope of this independent analysis is to determine the overall stability and the adequacy of structural members, foundations, and member connections, as available and stated. This analysis considers the structure to have been properly installed and maintained with no structural defects. Installation procedures and related loading are not within the scope of this analysis and should be performed and evaluated by a competent person of the erection contractor.

The different report sections detail the applicable information used in this evaluation, relating to the tower data, the appurtenances configuration and the wind and ice loading considered.

#### 2. SOURCE OF DATA

The following information has been used in this evaluation as source data that accurately represent the existing structure and the related appurtenances:

	Source	Information	Reference		
STRUCTURE					
Tower	MEI Records	Previous Structural Analysis	ID CT02768S-17V0 Dated 05/22/2017		
Foundation	Tower is on a building rooftop – building members to be reviewed by others.				
Material Grade	Not available from supplied documents-Assumed based on typical towers of this type-refer to Appendix				
CURRENT APPURTENANCES					
	Empire Telecom / Ms. Nicole Caplan	Frontier PDQ Data Sheet	Dated 06/11/2018		
CHANGED CONDITION					
	Empire Telecom / Ms. Nicole Caplan	Frontier PDQ Data Sheet	Dated 06/11/2018		

#### **Background Information:**

Based on available information, the following is known regarding this structure:

ORIGINAL DESIGN CRITERIA TIA/EIA 222-Unkr	2014/0
	IOWII
	I CT02768S-11V1; CT02768S-15V2 15 – considered properly installed.



#### 3. ANALYSIS CRITERIA

The structural analysis performed used the following criteria:

CODE / STANDARD	2016 CT St Bldg. Code / 2012 Int'l Building Code / ANSI/TIA-222-G Standard			
LOADING CASES	Full Wind: 140 Mph ultimate gust [equiv. 110 Mph (3-sec gust)] w/No Radial Ice**			
	Iced Case: 50 Mph + 0.75" Radial Ice			
	Service: 60 Mph			
	Seismic:	c: $S_s = 0.248 / S_1 = 0.069 / Site Class: D - Stiff Soil$		
STRUCTURE CRITERIA	Risk Category (Structural Class): 2			
	Exposure Ca	tegory: 'B' – Topographic Category: 1		

#### **Appurtenances Configuration**

The following appurtenances configuration is denoted by the <u>summation of Tables 1 & 2</u>:

Table 1: Tenant with Changed Condition Appurtenances Configuration

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size &
235	AT&T	6	HPA-45R-BUU-H6 Panel Antennas	[Existing Mount]		[Existing Lines]
		1	800-10964 Panel Antennas	<b>T</b> · · · ·		[EXCOUNTED ENTROS]
		2	800-10965 Panel Antennas			
		3	RRUS-32 B66 Boxes			
		3	RRUS-4478 B14 Boxes		Ì	
			Appurtenance	es to Remain		
235	AT&T	1	P65-15-XLH-RR Panel Antennas	Top Square Platform Mount	12	1-5/8"
		2	OPA-65R-LCUU-H4 Panel Antennas		-	' ' ' '
		3	RRUS-11 Boxes		4	0.75" DC Powe
		3	RRUS-32 Boxes			Trunk Cable
		6	LGP21401 TMA'S		1	
		3	RRUS-12 Boxes w/ A2 Backpack		2	0.625" Fiber
232		2	DC6-48-60-18-8F DC Surge Boxes			Cable -(FZ)
229		1	1.5'x2-Element Yagi Antenna	[Onto Platform]	1	1/2"-(FZ)
132		1	4'x7-Element Yagi Antenna	2ft Sidearm Mount	1	1/2"-(FZ)
			Appurtenances t	o be Removed		1,72 (12)
235	AT&T	4	OPA-65R-LCUU-H4 Panel Antennas			
		2	P65-15-XLH-RR Panel Antennas			<b> </b>

Table 2: Remaining Tenants Current and Reserved/Future Appurtenances

Elev (ft)	Tenant	Ants Qty	Appurtenance Model / Description	Mount Description	Lines Qty	Line size &
245.17		2	Top Small Beacons	13' T Beam Mount	1	1 1/4" R.C(FZ)
244.5		1	Top Lightning Rod			1 1/1 1/10/1/2/
231.5				Unused I-Beam Mount		
223.5		1	10ft Dia. HP Dish (Az. 210°±)	Dish Pipe Mount-DA Face	2	EW90-(FZ)
221.5	(Unused)			·	2	3/8"-(FZ)
221		J	1ft Dia. HP Dish (Windstar 43029) (Az. 210°±)	Dish Pipe Mount-BC Face	1	3/8"-(FZ)
216.5				(2) 4'Lx6'W Rest Platforms		
210	T-Mobile	3	AIR21 B2A B4P Panel Antennas	(3) Sector Frame Mounts	29	1 5/8"
		3	AIR-32 B4A/B2P Panel Antennas	7 , , , , , , , , , , , , , , , , , , ,	1	1 5/8 Hybrid
		3	KRY 112 71/2 TMA's		l i	Fiber Cable
		3	RRUS-11 B12 Boxes			1 1/4 Hybrid
		3	RRUS-32 B2 Boxes			Fiber Cable-
203		3	LNX-6515DS-VTM Panel Antennas	(3) Sector Frame Mounts		(FZ)



MEI PROJECT ID CT02768S-18V0-R1-07/10/18 - Pg. 5

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#### Notes:

- 1. \*Tower Base elevation is at 106.5ft Above Ground Level All above elevations are measured from AGL.
- 2. \*\*As per 2012 IBC for ultimate 3-sec gust wind speed converted to nominal 3-sec gust wind speed as per Sect. 1609.3.1 as required to be used in ANSI/TIA-222-G Standard per exception 5 of Sect. 1609.1.1.
- 3. Please note appurtenances not listed above are to be removed/not present as per data supplied.
- 4. (I) = Internal; (E) = External; (FZ) = Within Face Zone; (OFZ) = Outside Face Zone as per TIA-222-G.
- 5. The above appurtenances represent MEI's understanding of the appurtenances configuration. If different than above, the analysis is invalid. Please contact MEI if any discrepancies are found.



#### 4. ANALYSIS PROCEDURE

The subject structure is analyzed for feasibility of the installation of the proposed changed condition previously noted. The data records furnished were reviewed and a computer stress analysis was performed in accordance with the TIA-222 Standard provisions and with the agreed scope of work terms and the results of this analysis are reported.

#### **Analysis Program**

The computer program used to model the structure is a rigorous Finite Element Analysis program, tnxTower (ver. 8.02), a commercially available program by Tower Numerics Inc. The latticed structures members are modeled using beam/truss and cable members and the pole members using tubular beam elements. The structural parameters and geometry of the members are included in the model. The dead and temperature loads and the wind loads are internally calculated by the program for the different wind directions and then applied as external loads on the structure. Any applicable exemptions, as per Section 15.6 of the TIA-222-G Standard for existing structures originally designed in accordance with a previous revision of the TIA-222 Standard, have been taken.

#### **Assumptions**

This engineering study is based on the theoretical capacity of the members and is not a condition assessment of the structure. This analysis is based on information supplied, and therefore, its results are based on and as accurate as that supplied data. MEI has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural stress analysis:

- This existing tower is assumed, for the purpose of this analysis, to have been properly maintained and to be in good condition with no structural defects and with no deterioration to its member capacities ('asnew' condition).
- The tower member sizes and configuration are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated.
- The appurtenances configuration is as supplied and/or as stated in the report. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
- Some assumptions are made regarding antennas and mounts sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type & industry practice.
- Mounts/Platforms are considered adequate to support the loading. No actual analysis of the platform/mount itself is performed, with the analysis being limited to analyzing the structure.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per data supplied/available, and to have been properly installed and to be fully effective.

If any of the above assumptions are not valid or have been made in error, this analysis results may be invalided, MEI should be contacted to review any contradictory information to determine its effect.



#### 5. ANALYSIS RESULTS

The results of the structural stress analysis based on data available and with the previous listed criteria, indicated the following:

Note: The Wind loading controls over the Seismic loading as per TIA Section 2.7.

Table 3: Stress Analysis Results

Component Type	Maximum Stress Ratio	Controlling Elev. (ff) / Component	Pass/Fail	Comment
LEGS	96.8%	131.5 - 119	Pass	
DIAGONALS	93.0%	151.5 - 141.5	Pass	
HORIZONTALS	32.6%	141.5 - 131.5	Pass	
GIRTS	50.5%	161.5 - 151.5	Pass	
BRACING	70.8%	131.5 - 119	Pass	
INNER BRACING	5.2%	151.5 - 141.5	Pass	
BASE SUPPORT	N/A	-	-	Tower is on top of building. Scope is limited to tower. Building members to be reviewed by others. Refer to Appendix 1 for reactions

Table 4: Serviceability Requirements

	100 - 100 -			
	Maximum Value	TIA Requirement (10dB)	Pass/Fail	Comment
TWIST/SWAY	0.1158 Deg.	4.425 Deg.	Pass	1ft HP Dish (Windstar 43029) Elev. 221.00ft
	0.1173 Deg.	0.2957 Deg.	Pass	10ft HP Dish Elev. 223.50ft
	0.12 Deg.	4 Deg. from Vert. or Horiz. Axis	Pass	
HORIZONTAL DISPLACEMENT	1.819 ln./ 0.12% of Ht.	3.0% of Height	Pass	

#### Notes:



<sup>1.</sup> The Maximum Stress Ratio is the percentage that the maximum load in the member is relative to the allowable load as determined by Code requirements.

<sup>2.</sup> Refer to the Appendix 1 for more details on the member loads.

<sup>3.</sup> A maximum stress ratio between 100% and 105% may be considered as Acceptable according to industry standard practice.

#### 6. FINDINGS & RECOMMENDATIONS

- Based on the stress analysis results, the subject structure is **rated at 96.8**% of its support capacity (controlling component: Legs) with the proposed changed condition considered. Please refer to Table 3 and to Appendix 1 for more details of the analysis results.
- Based on the stress analysis performed, the existing structure is in conformance with the IBC / ANSI/TIA 222-G Standard for the loading considered under the criteria listed and referenced in the report sections.
- Please note that the tower is mounted on top of a building rooftop. Building rooftop is to be evaluated by others to determine its adequacy for the new base loads (not within scope). Refer to Appendix for tower base reactions.
- The installation of the proposed changed condition as noted in Table 1 is structurally acceptable. Please refer to Appendix 1 for Schematic Lines Layout.
- This superstructure (above tower base) is near its support capacity for the appurtenances and loading criteria considered. Therefore, no changes to the configuration considered should be made without performing a new proper evaluation.

Rigging and temporary supports required for the erection/modification shall be determined, documented, furnished and installed by the erector/contractor accounting for the loads imposed on the structure due to the proposed construction method.



#### 7. REPORT DISCLAIMER

The engineering services rendered by **M**alouf **E**ngineering International, Inc. ('MEI') in connection with this Structural Analysis are limited to a computer analysis of the tower structure, size and capacity of its members. MEI does not analyze the fabrication, including welding and connection capacities, except as included in this Report.

The analysis performed and the conclusions contained herein are based on the assumption that the tower has been properly installed and maintained, including, but not limited to the following:

- 1. Proper alignment and plumbness.
- 2. Correct guy tensions, as applicable.
- 3. Correct bolt tightness or slip jacking of sleeved connections.
- 4. No significant deterioration or damage to any structural component.

Furthermore, the information and conclusions contained in this Report were determined by application of the current "state-of-the-art" engineering and analysis procedures and formulae. MALOUF ENGINEERING INTERNATIONAL, INC. assumes no obligation to revise any of the information or conclusions contained in this Report in the event that such engineering and analysis procedures and formulae are hereafter modified or revised. In addition, under no circumstances will MALOUF ENGINEERING INTERNATIONAL, INC. have any obligation or responsibility whatsoever for or on account of consequential or incidental damages sustained by any person, firm or organization as a result of any information or conclusions contained in the Report, and the maximum liability of MALOUF ENGINEERING INTERNATIONAL, INC., if any, pursuant to this Report shall be limited to the total funds actually received by MALOUF ENGINEERING INTERNATIONAL, INC., for preparation of this Report.

Customer has requested MALOUF ENGINEERING INTERNATIONAL, INC. to prepare and submit to Customer an engineering analysis with respect to the Subject Tower and has further requested MALOUF ENGINEERING INTERNATIONAL, INC. to make appropriate recommendations regarding suggested structural modifications and changes to the Subject Tower. In making such request of MALOUF ENGINEERING INTERNATIONAL, INC., Customer has informed MALOUF ENGINEERING INTERNATIONAL, INC. that Customer will make a determination as to whether or not to implement any of the changes or modifications which may be suggested by MALOUF ENGINEERING INTERNATIONAL, INC. and that Customer will have any such changes or modifications made by riggers, erectors and other subcontractors of Customer's choice. MALOUF ENGINEERING INTERNATIONAL, INC. shall have the right to rely upon the accuracy of the information supplied by the customer and shall not be held responsible for the Customer's misrepresentation or omission of relevant fact whether intentional or otherwise.

Customer hereby agrees and acknowledges that MALOUF ENGINEERING INTERNATIONAL, INC. shall have no liability whatsoever to Customer or to others for any work or services performed by any persons other than MALOUF ENGINEERING INTERNATIONAL, INC. in connection with the implementation of services including but not limited to any services rendered for Customer or for others by riggers, erectors or other subcontractors. Customer acknowledges and agrees that any riggers, erectors or subcontractors retained or employed by Customer shall be solely responsible to Customer and to others for the quality of work performed by them and that MALOUF ENGINEERING INTERNATIONAL, INc. shall have no liability or responsibility whatsoever as a result of any negligence or breach of contract by any such rigger, erector or subcontractor and that Customer and rigger, erector, or subcontractor will provide MALOUF ENGINEERING INTERNATIONAL, INC. with a Certificate of Insurance naming MALOUF ENGINEERING INTERNATIONAL, INC. as additional insured.



## **APPENDIX 1 - ANALYSIS PRINTOUT & GRAPHICS**



	TYPE	ELEVATION	TYPE	ELEVATION
	BEACONS (E)	245.17	1.5x2-ELEMENT YAGI AND MOUNT (ATI / E)	229
TOP LIGHTNIN		244.5	PIPE DISH MOUNT (E)	223.5
	R w/ Pipe Mount (ATI / E)	235	10 FT HP DISH (E)	223.5
	J-H4 w/ Pipe Mounts (ATI / E)	235	PIPE DISH MOUNT (E)	221
OPA-65R-LCUU	J-H4 w/ Pipe Mounts (ATI / E)	235	1 FT HP DISH (WINDSTAR 43029) (E)	221
	JU-H6 w/ Pipe Mounts (ATI / P)	235	4Lx6W REST PLATFORM (E)	216.5
	JU-H6 w/ Pipe Mounts (ATI / P)	235	4Lx6W REST PLATFORM (E)	216.5
HPA-45R-BUU-	H6 w/ Pipe Mounts (ATI / P)	235	AIR21 B2A B4P w/ pipe Mount (T-MOBILE / E)	210
800-10964 w/ P	ipe Mount (ATI / P)	235	AIR-32 B4A/B2P Panel w/ Pipe Mount (T-MOBILE	210
800-10965 w/ P	pe Mount (ATI / P)	235	/N)	210
800-10965 w/ P	pe Mount (ATI / P)	235	AIR-32 B4A/B2P Panel w/ Pipe Mount (T-MOBILE	210
RRUS-11 (ATI	/ E)	235	/ N)	
RRUS-11 (ATI	/E)	235	AIR-32 B4A/B2P Panel w/ Pipe Mount (T-MOBILE	210
RRUS-11 (ATI	/E)	235	/N)	
RRUS-32 (ATT	/ E)	235	KRY 112 71/2 (T-MOBILE / E)	210
RRUS-32 (ATI	/E)	235	KRY 112 71/2 (T-MOBILE / E)	210
RRUS-32 (ATT	/ E)	235	KRY 112 71/2 (T-MOBILE / E)	210
RRUS-32 B66 (		235	RRUS-11 B12 (T-MOBILE / E)	210
RRUS-32 B66 (	ATI /P)	235	RRUS-11 B12 (T-MOBILE / E)	210
RRUS-32 B66 (		235	RRUS-11 B12 (T-MOBILE / E)	210
RRUS-4478 B1-		235	RRUS-32 B2 (T-MOBILE / N)	210
RRUS-4478 B1-		235	RRUS-32 B2 (T-MOBILE / N)	210
RRUS-4478 B1-		235	RRUS-32 B2 (T-MOBILE / N)	210
	Backpack (ATI / E)	232	SECTOR FRAME MOUNT (T-MOBILE / E)	210
	Backpack (ATI / E)	232	SECTOR FRAME MOUNT (T-MOBILE / E)	210
	8-60-18-8F DC SURGE BOX (ATT		SECTOR FRAME MOUNT (T-MOBILE / E)	210
/E)	- 00 10 01 DO CONGE BOX (ALT	202	AIR21 B2A B4P w/ pipe Mount (T-MOBILE / E)	210
RAYCAP DC6-4	8-60-18-8F DC SURGE BOX (ATT	232	AIR21 B2A B4P w/ pipe Mount (T-MOBILE / E)	210
/E)			LNX-6515DS-VTM w/ Pipe Mnt. (T-MOBILE / E)	203
(2) LGP21401 T	MA'S (ATI./E)	232	SECTOR FRAME MOUNT (T-MOBILE / E)	203
(2) LGP21401 T	MA'S (ATI/E)	232	SECTOR FRAME MOUNT (T-MOBILE / E)	203
LGP21401 TMA	S(ATI/E)	232	SECTOR FRAME MOUNT (T-MOBILE / E)	203
LGP21401 TMA	S (ATI/E)	232	LNX-6515DS-VTM w/ Pipe Mrit (T-MOBILE / E)	203
RRUS-12 w/ A2	Backpack (ATI / E)	232	LNX-6515DS-VTM w/ Pipe Mnt (T-MOBILE / E)	203
13' T BEAM MC	IUNT (E)	231 5	4x7-ELEMENT YAGI (ATT / E)	132
	M MOUNT (ATI / E)	231 5	2FT SIDEARM MOUNT (ATT / E)	132
TOP SQUARE F	PLATFORM MOUNT (ATI / E)	231.5		

#### TOWER DESIGN NOTES

1. Tower is located in Fairfield County Connecticut
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 110 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 150 mph basic wind with 0.75 in ice, lice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class 1.
7. Topographic Category 1 with Crest Height of 0.00 ft.
8. TOWER RATING. 96.8%

ALL REACTIONS ARE FACTORED

UPLIFT. -286 K SHEAR: 27 K

AXIAL 164 K

TORQUE 11 kip-ft 50 mph WIND - 0.7500 in ICE AXIAL 59 K

TORQUE 57 kip-ft REACTIONS - 110 mph WIND

SHEAR 78 K

MAX. CORNER REACTIONS AT BASE DOWN: 311 K SHEAR 28 K

MOMENT 5706 kip-ft

1

2<u>115ft</u>

201 5 ft

196.5 ft

191,5 ft

181 5 ft

171 5 ft

161.5 ft

151.5 ft

141.5 ft

131.5 ft

119.0 ft

106 5 ft

£ 5 224.8 ft 220 7 ft

= 216.5 ft

Zi.

2 206 5 ft

22

Ę,

112

2

21

116

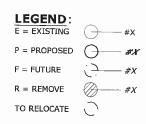
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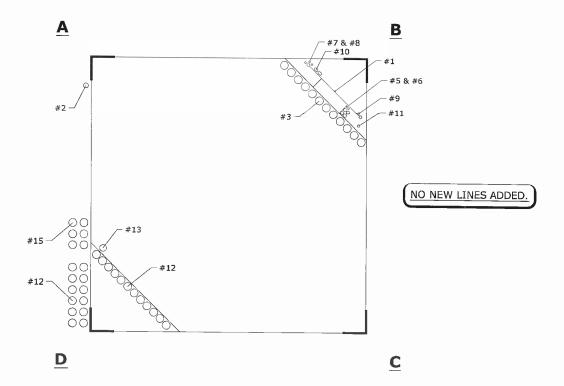
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Section

	Malouf Engineering Int'l, Inc.	lob 1	25 FT SST, ST	TAMFORD CEN	TRAL SBC CO SITE #CT211	
	17950 Preston Road, Suite #720	Project CT02768S-18V0				
	Dallas, TX 75252	Ctent	EMPIRE / AT&T	Drawn by LNguyen	Appd	
malouf engineering com	Phone (972) 783-2578	Code	TIA-222-G	Date 07/09/18	Scale NTS	
	FAX (972) 783-2583	Path ,	DWF Brown 18 DAT 6/50/C	T02768%-18\OKCT02768%-19\O	Dwg No F. 1	

No.	QTY.	DESCRIPTION	ELEV.	TENANT
1	1	Safety Climb & Climbing Ladder	125'	E
2	1	1 1/4" Rigid Conduit	125'	Е
3	12	1 5/8"	125'	AT&T / E
4	-	-	-	-
5	4	0.75" DC POWER TRUNK CABLES	125'	AT&T / E
6	2	0.625" FIBER TRUNK CABLE	125'	AT&T / E
7	2	3/8" (UNUSED)	115'	E
8	1	3/8"	114.5'	Е
9	1	1/2"	122.5'	Е
10	2	EW90	117'	E
11	1	1/2"	25.5'	Е
12	29	1 5/8"	103.5'	T-MOBILE / E
13	1	1 5/8" HYBRID FIBER CABLE	103.5'	T-MOBILE / E
14		-	-	T-MOBILE / R
15	1	1 1/4" HYBRID FIBER CABLE	103.5	T-MOBILE / E





PLAN: SCHEMATIC Tx-LINE LAYOUT 101 SCALE: NOT TO SCALE

- NOTE:

  1. TX LINE LAYOUT IS SCHEMATIC ONLY, BASED UPON MEI
- 2. ELEVATIONS SHOWN ARE ABOVE ROOF LINE.

JUL 09, 2018

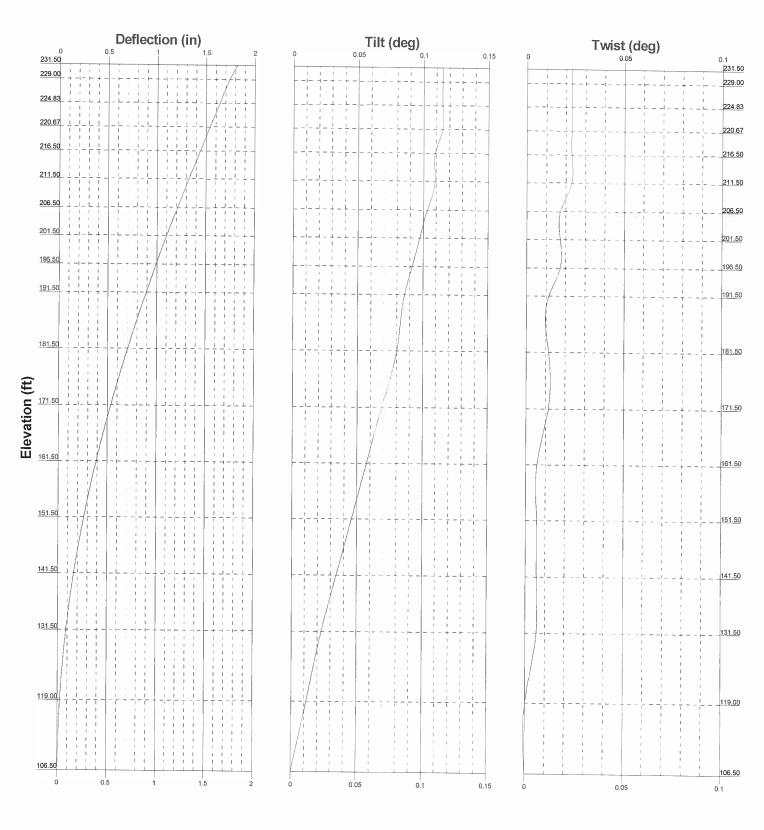


17950 PRESTON ROAD SUITE 720 DALLAS, TEXAS 75252-5635 972-783-2578 (fax: 2583) www.maloufengineering.com © MEI, INC. 2018

AT&T

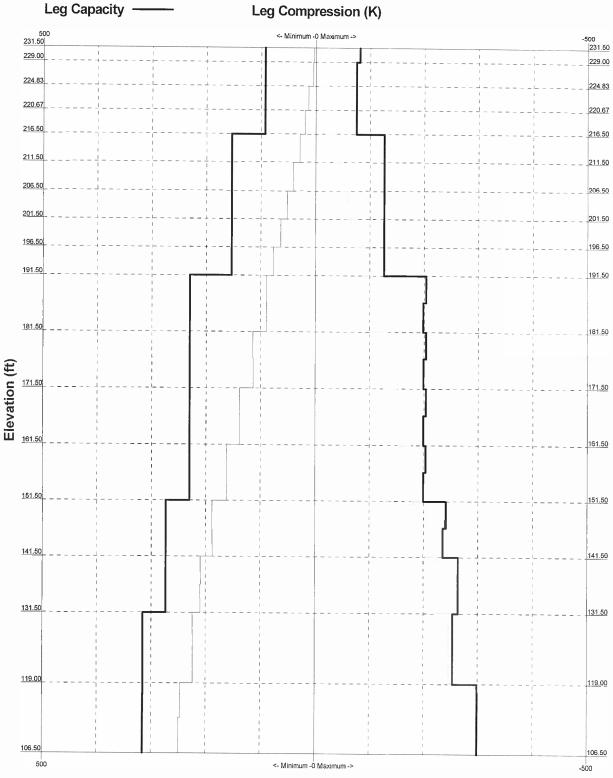
STAMFORD CENTRAL SB	C CO SITE #CT2118
TOWER TXLII	NE LAYOUT
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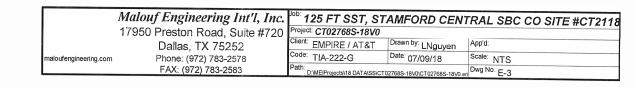
HEET NUMBER REV. CT02768S-18V0 L01 0





TIA-222-G - 110 mph/50 mph 0.7500 in Ice Exposure B
Leg Compression (K)





Malouf Engineering Int'l, Inc.
17950 Preston Road, Suite #720

Dallas, TX 75252

Phone: (972) 783-2578

FAX: (972) 783-2583

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Project	Date
CT02768S-18V0	13:54:04 07/09/18
Client EMPIRE / AT&T	Designed by LNguyen

#### **Tower Input Data**

The main tower is a 4x free standing tower with an overall height of 231.50 ft above the ground line.

The base of the tower is set at an elevation of 106.50 ft above the ground line.

The face width of the tower is 5.60 ft at the top and 13.58 ft at the base.

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

The following design criteria apply:

Tower is located in Fairfield County, Connecticut.

Basic wind speed of 110 mph.

Structure Class II.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in tower member design is 1.

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

## Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Placement	#	Description Placement	#
	ft		ft	
Safety Line	231.50 - 106.50	1	(E)	
3/8			EW90 223.50 - 106.50	2
(E)			(E)	
Climbing	231.50 - 106.50	1	3/8 221.50 - 106.50	2
Ladder			(E	
(E)			(UNUSED))	
W/G	212.50 - 106.50	1	3/8 221.00 - 106.50	1
LADDER "A"			(E)	
(E)			1 5/8 210.00 - 106.50	12
W/G	206.50 - 106.50	1	(T-MOBILE /	
LADDER "B"			E)	
(E)			1 1/4 Hybrid 210.00 - 106.50	1
W/G	200.50 - 106.50	1	Fiber Cable	•
LADDER "C"			(T-MOBILE /	
(E)			N)	
1 1/4" Rigid	231.50 - 106.50	1	1 5/8 210.00 - 106.50	5
Conduit			(T-MOBILE /	-
(E)			E)	
0.625" Fiber	231.50 - 106.50	2	1 5/8 210.00 - 106.50	11
Trunk Cable			(T-MOBILE /	• •
(AT&T / E)			E)	
0.75" DC	231.50 - 106.50	4	1 5/8 Hybrid 210,00 - 106.50	1
Power Trunk			Fiber Cable	1
Cable			(T-MOBILE /	
(AT&T / E)			E)	
1 5/8	231.50 - 106.50	12	1/2 132.00 - 106.50	1
(AT&T / E)			(E)	1
1/2	229.00 - 106.50	1	(1-1)	

Malouf Engineering Int'l, Inc. 17950 Preston Road, Suite #720 Dallas, TX 75252 Phone: (972) 783-2578 FAX: (972) 783-2583

1 -	ob 125 FT SST, STAMFORD CENTRAL SBC CO SITE #CT2118	Page 2 of 7
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(	Client EMPIRE / AT&T	Designed by LNguyen

# Feed Line/Linear Appurtenances - Entered As Area

Description	Placement ft	Total Number
MISCELLANEOUS (E)	231.50 - 106.50	2
MISCELLANEOUS WEIGHT (E)	231.50 - 106.50	1

### **Discrete Tower Loads**

Description	Placement	Weight	Description	Placement	Weight	
	ft	K		ft	K	
(2) TOP SMALL BEACONS	245.17	0.06	(AT&T / E)	Ji	0.03	
(E)		0.09	(/11 &1 / L)		0.03	
, ,		0.12	LGP21401 TMA'S	232.00	0.04	
TOP LIGHTNING ROD	244.50	0.05	(AT&T / E)	232.00	0.02	
(E)		0.07	(/// (// // // // // // // // // // // /		0.03	
` ,		0.10	RRUS-11	235.00	0.04	
13' T BEAM MOUNT	231.50	0.10	(AT&T / E)	255.00	0.03	
(E)		0.15	(AI&I/L)		0.07	
` ,		0.20	RRUS-11	235.00	0.10	
P65-15-XLH-RR w/ Pipe	235.00	0.07	(AT&T / E)	255.00	0.03	
Mount		0.12	(AI&I/L)		0.07	
(AT&T / E)		0.18	RRUS-11	235.00	0.10	
OPA-65R-LCUU-H4 w/ Pipe	235.00	0.08	(AT&T / E)	233.00		
Mounts	200.00	0.13	(AI&I/E)		0.07	
(AT&T / E)		0.20	RRUS-32	235.00	0.10	
OPA-65R-LCUU-H4 w/ Pipe	235.00	0.08	(AT&T / E)	233.00	0.08	
Mounts	233.00	0.13	(AI&I/E)		0.10	
(AT&T/E)		0.20	RRUS-32	225.00	0.14	
(3) HPA-45R-BUU-H6 w/	235,00	0.08	(AT&T / E)	235,00	0.08	
Pipe Mounts	233.00	0.17	(AI&I/E)		0.10	
(AT&T/P)		0.27	RRUS-32	235,00	0.14	
(2) HPA-45R-BUU-H6 w/	235.00	0.08	(AT&T / E)	233,00	0.08	
Pipe Mounts	233.00	0.17	(AI&I/E)		0.10	
(AT&T/P)		0.27	RRUS-12 w/ A2 Backpack	222.00	0.14	
HPA-45R-BUU-H6 w/ Pipe	235,00	0.08	(AT&T / E)	232.00	0.08	
Mounts	233,00	0.17	(AI&I/E)		0.11	
(AT&T / P)		0.27	RRUS-12 w/ A2 Backpack	222.00	0.14	
800-10964 w/ Pipe Mount	235.00	0.12	•	232.00	0.08	
(AT&T/P)	233.00	0.20	(AT&T / E)		0.11	
(11162171)		0.28	RRUS-12 w/ A2 Backpack	232.00	0.14	
800-10965 w/ Pipe Mount	235.00	0.15	(AT&T / E)	232.00	0.08	
(AT&T / P)	233.00	0.15	(AI&I/E)		0.11	
(11166171)		0.36	RAYCAP DC6-48-60-18-8F	222.00	0.14	
800-10965 w/ Pipe Mount	235.00	0.15		232.00	0.03	
(AT&T / P)	233.00	0.15	DC SURGE BOX		0.06	
(11111111)		0.23	(AT&T / E)	222.00	0.09	
(2) LGP21401 TMA'S	232.00	0.36	RAYCAP DC6-48-60-18-8F	232.00	0.03	
(AT&T / E)	434.00	0.02	DC SURGE BOX		0.06	
(AI&I/E)		0.03	(AT&T/E)	025.00	0.09	
(2) LGP21401 TMA'S	232.00		RRUS-32 B66	235.00	0.06	
(AT&T / E)	232.00	0.02	(AT&T / P)		0.08	
(AIXI/E)		0.03	DD110 00 D44		0.11	
LGP21401 TMA'S	232.00	0.04 0.02	RRUS-32 B66	235.00	0.06	
LGF21401 TIVIA S	232.00	0.02	(AT&T / P)		0.08	

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ı	Job	Page
	125 FT SST, STAMFORD CENTRAL SBC CO SITE #CT2118	3 of 7
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	Client EMPIRE / AT&T	Designed by LNguyen

					Weigh
	ft	<u>K</u>		ft	K
RRUS-32 B66	225.00	0.11	(T-MOBILE / E)		0.02
	235.00	0.06			0.03
(AT&T / P)		0.08	KRY 112 71/2	210.00	0.01
RRUS-4478 B14	225.00	0.11	(T-MOBILE / E)		0.02
(AT&T / P)	235.00	0.06			0.03
(AI&I/F)		0.07	RRUS-11 B12	210.00	0.05
RRUS-4478 B14	235.00	0.09 0.06	(T-MOBILE / E)		0.07
(AT&T / P)	233.00	0.07	DIVID 11 DIG		0.10
(1116171)		0.07	RRUS-11 B12	210.00	0.05
RRUS-4478 B14	235.00	0.06	(T-MOBILE / E)		0.07
(AT&T / P)	255.00	0.07	DD110 11 D10	240.00	0.10
()		0.09	RRUS-11 B12	210.00	0.05
JNUSED I-BEAM MOUNT	231.50	0.10	(T-MOBILE / E)		0.07
(AT&T / E)	231.50	0.15	DDLIC 22 D2	210.00	0.10
(**************************************		0.20	RRUS-32 B2	210.00	0.05
1.5'x2-ELEMENT YAGI	229.00	0.07	(T-MOBILE / N)		0.07
AND MOUNT	223.00	0.13	RRUS-32 B2	210.00	0.10
(AT&T / E)		0.17	(T-MOBILE / N)	210.00	0.05
TOP SQUARE PLATFORM	231.50	5.50	(1-MOBILE/N)		0.07
MOUNT		7.50	RRUS-32 B2	210.00	0.10
(AT&T / E)		9.50	(T-MOBILE / N)	210.00	0.05
PIPE DISH MOUNT	223.50	0.15	(1-MOBILE / N)		0.07
(E)		0.23	SECTOR FRAME MOUNT	210.00	0.10 0.40
		0.30	(T-MOBILE / E)	210.00	0.40
PIPE DISH MOUNT	221.00	0.07	(TimeBille, B)		0.80
(E)		0.10	SECTOR FRAME MOUNT	210.00	0.40
		0.13	(T-MOBILE / E)	210.00	0.60
L'Lx6'W REST PLATFORM	216.50	0.75	, , , , , , , , , , , , , , , , , , , ,		0.80
(E)		1.25	SECTOR FRAME MOUNT	210.00	0.40
		1.75	(T-MOBILE / E)		0.60
Lx6'W REST PLATFORM	216.50	0.75	,		0.80
(E)		1.25	LNX-6515DS-VTM w/ Pipe	203.00	0.08
		1.75	Mnt.		0.17
AIR21 B2A B4P w/ pipe	210.00	0.13	(T-MOBILE / E)		0.26
Mount		0.18	LNX-6515DS-VTM w/ Pipe	203.00	0.08
(T-MOBILE / E)		0.25	Mnt.		0.17
AIR21 B2A B4P w/ pipe	210.00	0.13	(T-MOBILE / E)		0.26
Mount		0.18	LNX-6515DS-VTM w/ Pipe	203.00	0.08
(T-MOBILE / E)	21000	0.25	Mnt.		0.17
AIR21 B2A B4P w/ pipe	210.00	0.13	(T-MOBILE / E)		0.26
Mount		0.18	SECTOR FRAME MOUNT	203.00	0.40
(T-MOBILE / E)	210.00	0.25	(T-MOBILE / E)		0.60
AIR-32 B4A/B2P Panel w/	210.00	0.13	GT GT 6 T TT		0.80
Pipe Mount (T-MOBILE / N)		0.19	SECTOR FRAME MOUNT	203.00	0.40
AIR-32 B4A/B2P Panel w/	210.00	0.26	(T-MOBILE / E)		0.60
Pipe Mount	210.00	0.13	GEGTOR ER LAGINATION		0.80
(T-MOBILE / N)		0.19	SECTOR FRAME MOUNT	203.00	0.40
AIR-32 B4A/B2P Panel w/	210.00	0.26	(T-MOBILE / E)		0.60
Pipe Mount	210.00	0.13	41-7 FLEXIBLE VIA	100	0.80
(T-MOBILE / N)		0.19 0.26	4'x7-ELEMENT YAGI	132.00	0.03
KRY 112 71/2	210.00	0.26	(AT&T / E)		0.04
(T-MOBILE / E)	210.00	0.01	SET CIDE ADMANDED	120 00	0.06
( INOBIDE / L)		0.02	2FT SIDEARM MOUNT	132.00	0.10
KRY 112 71/2	210.00	0.03	(AT&T / E)		0.15 0.20

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				Dis	shes				
Description	Dish Type	Elevation	Outside Diameter	Weight	Description	Dish Type	Elevation	Outside Diameter	Weight
		ft	ft	K			ft	ft	K
10 FT HP DISH	Paraboloid	223.50	10.00	0.40	(WINDSTAR 43029)	w/Shroud (HP)			0.04
(E)	w/Shroud (HP)			0.81	(E)	, ,			0.06
				1.22					0.00
1 FT HP DISH	Paraboloid	221.00	1.00	0.03					

	are subsection.	¥.	Maxim	num Reaction	ns
Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, 2 K
Leg D	Max. Vert	12	306.60	18.74	-20.74
	Max. H <sub>x</sub>	12	306.60	18.74	-20.74
	Max. Hz	5	-286.35	-18.06	20.26
	Min. Vert	5	-286.35	-18.06	20.26
	Min. H <sub>x</sub>	5	-286.35	-18.06	20.26
	Min. Hz	12	306.60	18.74	-20.74
Leg C	Max. Vert	8	294.02	-19.89	-18.47
	Max. H <sub>x</sub>	17	-270.88	18.99	17.71
	Max. H <sub>z</sub>	17	-270.88	18.99	17.71
	Min. Vert	17	-270.88	18.99	17.71
	Min. H <sub>x</sub>	8	294.02	-19.89	-18.47
	Min. Hz	8	294.02	-19.89	-18.47
Leg B	Max. Vert	4	310.99	-20.99	18.98
	Max. H <sub>x</sub>	13	-281.61	19.78	-18.02
	Max. H <sub>z</sub>	4	310.99	-20.99	18.98
	Min. Vert	13	-281.61	19.78	-18.02
	Min. $H_x$	4	310.99	-20.99	18.98
	Min. Hz	13	-281.61	19.78	-18.02
Leg A	Max. Vert	16	296.12	18.39	20.02
	$Max. H_x$	16	296.12	18.39	20.02
	Max. H <sub>z</sub>	16	296.12	18.39	20.02
	Min. Vert	9	-269.42	-17.48	-19.20
	Min. H <sub>x</sub>	9	-269.42	-17.48	-19.20
	Min. H <sub>z</sub>	9	-269.42	-17.48	-19.20

## **Maximum Tower Deflections - Service Wind**

Section	Elevation	Horz.	Gov.	Tilt	Twist
No.		Deflection	Load		
	ft	in	Comb.	o	0
T1	231.5 - 229	1.819	28	0.1172	0.0256
T2	229 - 224.833	1.739	28	0.1168	0.0230
T3	224.833 - 220.667	1.639	28	0.1157	0.0228
T4	220.667 - 216.5	1.539	28	0.1134	0.0223
T5	216.5 - 211.5	1.441	28	0.1101	0.0216
T6	211.5 - 206.5	1.324	28	0.1071	0.0201
T7	206.5 - 201.5	1.210	28	0.1033	0.0186
T8	201.5 - 196.5	1.100	28	0.0990	0.0170
T9	196.5 - 191.5	0.994	28	0.0937	0.0155
T10	191.5 - 181.5	0.894	28	0.0879	0.0141
T11	181.5 - 171.5	0.706	28	0.0796	0.0116

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Section	Elevation	Horz.	Gov.	Tilt	Twist
No.		Deflection	Load		
	ft	in	Comb.	0	0
T12	171.5 - 161.5	0.536	28	0.0700	0.0096
T13	161.5 - 151.5	0.389	28	0.0591	0.0079
T14	151.5 - 141.5	0.264	28	0.0472	0.0063
T15	141.5 - 131.5	0.163	28	0.0365	0.0050
T16	131.5 - 119	0.086	28	0.0253	0.0038
T17	119 - 106.5	0.025	28	0.0129	0.0038

## Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov.	Deflection	Tilt	Twist	Radius of
		Load				Curvature
ft		Comb.	in	0	0	ft
245.17	(2) TOP SMALL BEACONS	28	1.819	0.1172	0.0256	10822
244.50	TOP LIGHTNING ROD	28	1.819	0.1172	0.0256	10822
235.00	P65-15-XLH-RR w/ Pipe Mount	28	1.819	0.1172	0.0256	10822
232.00	(2) LGP21401 TMA'S	28	1.819	0.1172	0.0256	10822
231.50	13' T BEAM MOUNT	28	1.819	0.1172	0.0256	10822
229.00	1.5'x2-ELEMENT YAGI AND MOUNT	28	1.739	0.1168	0.0230	10822
223.50	10 FT HP DISH	28	1.607	0.1151	0.0228	146254
				(3 dB) 0.2957	(3 dB) 0.2957	
221.00	1 FT HP DISH (WINDSTAR 43029)	28	1.547	0.1136	0.0224	290803
216.50	4'Lx6'W REST PLATFORM	28	1.441	0.1101	0.0216	184521
210.00	AIR21 B2A B4P w/ pipe Mount	28	1.290	0.1061	0.0216	77033
203.00	LNX-6515DS-VTM w/ Pipe Mnt.	28	1.133	0.1003	0.0175	63780
132.00	4'x7-ELEMENT YAGI	28	0.089	0.0258	0.0039	45295

## **Section Capacity Table**

Elevation ft	Component Type	Size	Critical Element	P K	øP <sub>allow</sub> K	% Capacity	Pass Fail
231.5 - 229	Leg	I.4x4x3/8				<u> </u>	
229 - 224.833							Pass
224.833 -	-						Pass
220.667	8	2 III II.270	247	-17.01	14.51	23.4	Pass
220.667 - 216.5	Leg	L4x4x3/8	37	-26.08	74.97	3/1.9	Pass
216.5 - 211.5	Leg	L5x5x1/2					Pass
211.5 - 206.5	_						Pass
206.5 - 201.5	-						Pass
201.5 - 196.5	_						Pass
196.5 - 191.5							Pass
191.5 - 181.5	-						Pass
181.5 - 171.5							Pass
171.5 - 161.5	•						Pass
161.5 - 151.5							Pass
151.5 - 141.5							Pass
141.5 - 131.5	-						
131.5 - 119	-						Pass
119 - 106.5							Pass Pass
229 - 224.833							
			20	4.52	33.22		Pass
224.833 -	Diagonal	2L2 1/2x2x1/4x3/8	36	5.29	55.22		Door
220.667	<b>5</b>		50	5,27	33.22		Pass
220.667 - 216.5	Diagonal	2L2 1/2x2x1/4x3/8	47	-6.88	52.51		D =
		1.2.2.1177.010	47	-0.00	23.31	12.9	Pass
	ft  231.5 - 229 229 - 224.833 224.833 - 220.667 220.667 - 216.5 216.5 - 211.5 211.5 - 206.5 206.5 - 201.5 201.5 - 196.5 196.5 - 191.5 191.5 - 181.5 181.5 - 171.5 171.5 - 161.5 161.5 - 151.5 151.5 - 141.5 141.5 - 131.5 131.5 - 119 119 - 106.5 229 - 224.833 224.833 - 220.667	ft         Type           231.5 - 229         Leg           229 - 224.833         Leg           224.833 -         Leg           220.667         Leg           220.667 - 216.5         Leg           216.5 - 211.5         Leg           206.5 - 201.5         Leg           201.5 - 196.5         Leg           196.5 - 191.5         Leg           191.5 - 181.5         Leg           181.5 - 171.5         Leg           161.5 - 151.5         Leg           151.5 - 141.5         Leg           131.5 - 119         Leg           119 - 106.5         Leg           229 - 224.833         Diagonal           224.833 -         Diagonal	ft         Type           231.5 - 229         Leg         L4x4x3/8           229 - 224.833         Leg         L4x4x3/8           220.667         Leg         L4x4x3/8           220.667 - 216.5         Leg         L5x5x1/2           216.5 - 211.5         Leg         L5x5x1/2           211.5 - 206.5         Leg         L5x5x1/2           206.5 - 201.5         Leg         L5x5x1/2           201.5 - 196.5         Leg         L5x5x1/2           196.5 - 191.5         Leg         L5x5x1/2           191.5 - 181.5         Leg         L5x5x1/2           191.5 - 181.5         Leg         L6x6x5/8           171.5 - 161.5         Leg         L6x6x5/8           161.5 - 151.5         Leg         L6x6x5/8           161.5 - 151.5         Leg         L6x6x5/8           151.5 - 141.5         Leg         L6x6x3/4           141.5 - 131.5         Leg         L6x6x3/4           131.5 - 119         Leg         L6x6x7/8           119 - 106.5         Leg         L6x6x7/8           229 - 224.833         Diagonal         2L2 1/2x2x1/4x3/8           224.833 -         Diagonal         2L2 1/2x2x1/4x3/8	ft         Type         Element           231.5 - 229         Leg         L4x4x3/8         4           229 - 224.833         Leg         L4x4x3/8         12           224.833 -         Leg         L4x4x3/8         24           220.667         220.667         220.667         220.667         220.667         220.667           220.667 - 216.5         Leg         L5x5x1/2         51         211.5 - 206.5         Leg         L5x5x1/2         67           206.5 - 201.5         Leg         L5x5x1/2         83         201.5 - 196.5         Leg         L5x5x1/2         95           196.5 - 191.5         Leg         L5x5x1/2         95         111         191.5 - 181.5         Leg         L5x5x1/2         111         111         191.5 - 181.5         Leg         L6x6x5/8         123         181.5 - 171.5         Leg         L6x6x5/8         123         181.5 - 171.5         Leg         L6x6x5/8         148         171.5 - 161.5         Leg         L6x6x5/8         193         151.5 - 141.5         Leg         L6x6x5/8         193         151.5 - 141.5         Leg         L6x6x5/8         193         151.5 - 141.5         Leg         L6x6x3/4         213         141.5 - 131.5         Leg         L6x6x7/8	ft         Type         Element         K           231.5 - 229         Leg         L4x4x3/8         4         -6.40           229 - 224.833         Leg         L4x4x3/8         12         -9.58           224.833 -         Leg         L4x4x3/8         24         -19.01           220.667         -20.667         -26.08           220.667 - 216.5         Leg         L5x5x1/2         51         -35.30           211.5 - 206.5         Leg         L5x5x1/2         67         -49.03           206.5 - 201.5         Leg         L5x5x1/2         83         -61.24           201.5 - 196.5         Leg         L5x5x1/2         95         -74.16           196.5 - 191.5         Leg         L5x5x1/2         111         -87.92           191.5 - 181.5         Leg         L6x6x5/8         123         -99.77           181.5 - 171.5         Leg         L6x6x5/8         148         -126.00           171.5 - 161.5         Leg         L6x6x5/8         148         -151.77           161.5 - 151.5         Leg         L6x6x5/8         193         -177.24           151.5 - 141.5         Leg         L6x6x5/8         193         -177.24	ft         Type         Element         K         K           231.5 - 229         Leg         L4x4x3/8         4         -6.40         80.91           229 - 224.833         Leg         L4x4x3/8         12         -9.58         74.97           220.667         220.667         -26.08         74.97           220.667 - 216.5         Leg         L4x4x3/8         37         -26.08         74.97           216.5 - 211.5         Leg         L5x5x1/2         51         -35.30         126.43           211.5 - 206.5         Leg         L5x5x1/2         67         -49.03         126.43           206.5 - 201.5         Leg         L5x5x1/2         83         -61.24         126.43           201.5 - 196.5         Leg         L5x5x1/2         95         -74.16         126.43           196.5 - 191.5         Leg         L5x5x1/2         111         -87.92         126.43           191.5 - 181.5         Leg         L6x6x5/8         123         -99.77         198.38           181.5 - 171.5         Leg         L6x6x5/8         148         -126.00         198.60           171.5 - 161.5         Leg         L6x6x5/8         168         -151.77         198.79	ft         Type         Element         K         K         Capacity           231.5 - 229         Leg         L4x4x3/8         4         -6,40         80.91         76.8           229 - 224.833         Leg         L4x4x3/8         12         -9.58         74.97         12.8           224.833 -         Leg         L4x4x3/8         24         -19.01         74.97         25.4           220.667 -         220.667         Leg         L5x5x1/2         51         -35.30         126.43         27.9           211.5 - 206.5         Leg         L5x5x1/2         51         -35.30         126.43         27.9           211.5 - 206.5         Leg         L5x5x1/2         67         -49.03         126.43         38.8           206.5 - 201.5         Leg         L5x5x1/2         83         -61.24         126.43         38.8           206.5 - 201.5         Leg         L5x5x1/2         95         -74.16         126.43         38.8           201.5 - 191.5         Leg         L5x5x1/2         111         -87.92         126.43         69.5           191.5 - 181.5         Leg         L6x6x5/8         123         -99.77         198.38         50.3

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Section	Elevation	Component	Size	Critical	Р	$øP_{allow}$	%	Pass
No.	ft	Туре		Element	K	K	Capacity	Fail
				* .**			16.3 (b)	
T5	216.5 - 211.5	Diagonal	L2 1/2x2x1/4	63	-6.74	18.95	35.6	Dogg
T6	211.5 - 206.5	Diagonal	L2 1/2x2x1/4	79	-7.35	18.34	40.1	Pass Pass
T7	206.5 - 201.5	Diagonal	L2 1/2x2x1/4	91	-8.23	17.71	46.5	
T8	201.5 - 196.5	Diagonal	L2 1/2x2x1/4	107	-8.69	17.71	50.9	Pass
T9	196.5 - 191.5	Diagonal	L2 1/2x2x1/4	119	-8.91	16.43	54.2	Pass
T10	191.5 - 181.5	Diagonal	L3x3x1/4	138	-15.10	20.33	74.3	Pass
T11	181.5 - 171.5	Diagonal	L3x3x1/4	158	-15.22	19.45		Pass
T12	171.5 - 161.5	Diagonal	L3x3x1/4	183	-15.22		78.2	Pass
T13	161.5 - 151.5	Diagonal	L3x3x1/4	203	-16.18	18.53	84.7	Pass
T14	151.5 - 141.5	Diagonal	L3x3x1/4	203		17.55	92.2	Pass
T15	141.5 - 131.5	Diagonal	L3x3x1/4	260	-15.42 -17.70	16.58	93.0	Pass
	121.0	Віадопат	LJAJA1/4	200	-17.70	26.01	68.1 74.6 (b)	Pass
T16	131.5 - 119	Diagonal	2L2 1/2x2 1/2x1/4x3/8	337	-24.36	26.68	91.3	Dono
T17	119 - 106.5	Diagonal	2L2 1/2x2 1/2x1/4x3/8	404	-24.09	55.95		Pass
			DEE TIERE TIERTITASTO	707	-24.09	33.93	43.0 59.9 (b)	Pass
T15	141.5 - 131.5	Horizontal	L2 1/2x2x1/4	251	-3.42	10.40		D
T10	191.5 - 181.5	Secondary Horizontal	L2 1/2x2x1/4 L2 1/2x2x1/4	143	-3.42 -1.50	10.48 19.40	32.6	Pass
T11	181.5 - 171.5	Secondary Horizontal	L2 1/2x2x1/4	163	-1.30 -1.89		7.7	Pass
T12	171.5 - 161.5	Secondary Horizontal	L2 1/2x2x1/4 L2 1/2x2x3/16	188	-2.28	18.47	10.2	Pass
T13	161.5 - 151.5	Secondary Horizontal	L2 1/2x2x3/16 L2 1/2x2 1/2x1/4	209		13.49	16.9	Pass
		Secondary Horizontal	L2 1/4A2 1/2X1/4	209	-2.66	21.77	12.2	Pass
T14	151.5 - 141.5	Secondary Horizontal	L2 1/2x2x1/4	222	2.07	15.64	12.3 (b)	
T1	231.5 - 229	Top Girt	C8x11.5	233	-3.07	15.64	19.6	Pass
T3	224.833 -	Top Girt		8	-0.71	63.87	20.2	Pass
	220.667	•	L2 1/2x2 1/2x1/4	25	-1.34	18.34	7.3	Pass
T5	216.5 - 211.5	Top Girt	C7x9.8	53	-1.39	49.83	2.8	Pass
Т6	211.5 - 206.5	Top Girt	1.2.1/221/4	60			3.5 (b)	
T8	201.5 - 196.5	Top Girt	L2 1/2x2x1/4	69	-1.18	13.17	8.9	Pass
T10	191.5 - 181.5		L2 1/2x2 1/2x1/4	97	-0.98	15.06	6.5	Pass
110	171.3 - 101.3	Top Girt	L2 1/2x2 1/2x1/4	125	-3.63	26.23	13.9	Pass
TII	181.5 - 171.5	Ton Cint	121/221/21/				20.0 (b)	
111	101.3 - 1/1.3	Top Girt	L2 1/2x2 1/2x1/4	150	-6.73	18.97	35.4	Pass
T12	171 5 161 5	T Ci-	10100010				37.6 (b)	
112	171.5 - 161.5	Top Girt	L2 1/2x2 1/2x1/4	170	-7.32	24.97	29.3	Pass
T12	1615 1515	T 0:					40.4 (b)	
T13	161.5 - 151.5	Top Girt	L2 1/2x2 1/2x1/4	195	-8.10	16.04	50.5	Pass
T14	151.5 - 141.5	Top Girt	L2 1/2x2 1/2x1/4	215	-7.56	23.61	32.0	Pass
m							41.7 (b)	
T15	141.5 - 131.5	Top Girt	L2 1/2x2 1/2x1/4	240	-7.93	16.84	47.1	Pass
T16	131.5 - 119	Top Girt	2L2 1/2x2 1/2x1/4x3/8	311	-12.17	53.02	23.0	Pass
m							29.5 (b)	
T17	119 - 106.5	Top Girt	2L2 1/2x2 1/2x1/4x3/8	352	-11.68	40.69	28.7	Pass
T15	141.5 - 131.5	Redund Horz I	L2 1/2x2x3/16	261	-3.42	16.04	21.3	Pass
		Bracing						
T16	131.5 - 119	Redund Horz 1	L2 1/2x2x3/16	331	-3.69	15.84	23.3	Pass
		Bracing						
T17	119 - 106.5	Redund Horz 1	L2 1/2x2x3/16	376	-4.16	15.20	27.4	Pass
		Bracing						
T15	141.5 - 131.5	Redund Diag 1	L2 1/2x2x3/16	287	-2.31	13.94	16.6	Pass
		Bracing						
T16	131.5 - 119	Redund Diag 1	L2 1/2x2x3/16	328	-4.27	6.03	70.8	Pass
		Bracing					7 0.0	1 435
T17	119 - 106.5	Redund Diag 1	L2 1/2x2x3/16	360	6.62	26.21	25.2	Pass
		Bracing		200	0.02	20.21	23.2	1 455
T15	141.5 - 131.5	Redund Hip 1	L2x2x1/4	258	-0.03	13.57	0.3	Dogs
		Bracing		230	-0.03	13.31	0.3	Pass
T16	131.5 - 119	Redund Hip 1	L2x2x1/4	344	-0.18	12.88	1.4	De
		Bracing	DEALAIT	544	-0.10	12.88	1.4	Pass
		DIMPING.						
T17	119 - 106,5	Redund Hip 1	L2x2x1/4	402	-0.25	11.20	2.2	Pass

# tnxTower

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	øP <sub>allow</sub> K	% Capacity	Pass Fail
T17	119 - 106.5	Redund Hip Diagonal 1 Bracing	L2x2x1/4	419	-0.15	2.48	5.9	Pass
T17	119 - 106.5	Redund Sub Horz Bracing	L2 1/2x2x3/16	365	-4.82	24.34	19.8	Pass
T17	119 - 106.5	Redund Sub Diagonal Bracing	L2 1/2x2x3/16	394	-5.52	17.87	30.9	Pass
T10	191.5 - 181.5	Inner Bracing	L2 1/2x2 1/2x3/16	131	-0.11	12.48	0.9	D
T12	171.5 - 161.5	Inner Bracing	L2 1/2x2 1/2x3/16	178	-0.11	4.41	2.5	Pass
T14	151.5 - 141.5	Inner Bracing	L2x2 1/2x3/16	223	-0.11	2.17	5.2	Pass Pass
T16	131.5 - 119	Inner Bracing	L3x3x3/16	316	-0.11	4.38	4.1	Pass
T17	119 - 106.5	Inner Bracing	L3x3x3/16	355	-0.30	7.56	3.9	
		2		333	0.50	7.50	Summary	Pass
						Leg (T16)	96.8	Pass
						Diagonal	93.0	
						(T14)		Pass
						Horizontal (T15)	32.6	Pass
						Secondary Horizontal (T14)	19.6	Pass
						Top Girt (T13)	50.5	Pass
						Redund Horz 1 Bracing (T17)	27.4	Pass
						Redund Diag 1 Bracing (T16)	70.8	Pass
						Redund Hip	2.2	Pass
						I Bracing (T17)	2.2	1 433
						Redund Hip Diagonal I Bracing (T17)	5.9	Pass
						Redund Sub Horz Bracing (T17)	19.8	Pass
						Redund Sub Diagonal Bracing (T17)	30.9	Pass
						Inner Bracing (T14)	5.2	Pass
						Bolt Checks	74.6	Pass
						RATING =	96.8	Pass

## APPENDIX 2 - SOURCE / CHANGED CONDITION



	Droliminant Date	Overting (DDO)	
Application Date:	6/11/2018	a Questionnaire (PDQ)	Frontier
(Street, City, State, Zip Co New Cingular Wireless		Requested Site: Frontier Site Name: 555 Main Street, Stami	Stamford #1 CO
500 Enterprise Drive		and the state of the state of	
Rocky Hill, CT 06067		Applicant Site Name:	CT2118 Stamford Central SBC CO
Telephone Number:	617-639-4908	1,	T. Z. T. Callinora Contral OBC CC
Name: David Coo Phone #: 617-639-49	i: (if different from applicant) per 908 empiretelecomm.com		
Project Description:	Swapping out (6) antennas for newer mod	dels, adding (3) antennas,	and adding (6) new remote radio units
Are copies of all neo	essary permits attached?		
USFS, BLM, Municipal           Yes         x           FCC License:         Yes           No         x           If no, have they been any Yes         Yes	- - -		
No x	<del></del>		
Additional Notes on Permits:			

Tower / Radio Information - Call Sign Information needs to be tied to a specific antenna(s). Adjust letters as needed.

Coax / Waveg	Type: andre	Size: 1 5/8'	Length: 235'	.s		Type: DC Tr	Size. 3/4"	Length 235'	# of runs: 4 (E)		Tvoe' Fiber T	1	Length: 235'	# of runs; 2(E)		Type:	Size	Lenath:	# of curs.							ŀ	1	
KNLB297 WS	5M00W7D	2345-2350	398	56	2345-2350		KNLB312	WS	5M00W7D	2350-2355 MHz	398 per sector	28	2305-2310 MHz	POC 1147	KINL BZ04	ws	5M00W7D	2310-2315 MHz	398 per sector	56	2355-2360 MHz	KNKA256	17	5M00W7D	880-890, 891,5-894	316	55	835-845, 846.5-849
A Call Sign Radio Service	Emission Designator	Transmit Frequency	Output Power (watts)	Transmitter ERP (dBm)	Receive Frequency		A Call Sign	Radio Service	Emission Designator	Transmit Frequency	Output Power (watts)	Transmitter ERP (dBm)	Receive Frequency	0000	A Call Sign	Radio Service	Emission Designator	Transmit Frequency	Output Power (watts)	Transmitter ERP (dBm)	Receive Frequency	A Call Sign	Radio Service	Emission Designator	Transmit Frequency	Output Power (watts)	Transmitter ERP (dBm)	Receive Frequency
WPWV368 WZ-700 MHz lower band	5M00W7D	740-746 MHz	398	56	710-716		KNLG502	CW-PCS	5M00G7W	1965-1970 MHz	796 per sector	56	1885-1890 MHz	MO II 1459	600000	WY 700 MHz	5M00W7D	734-740	501 per sector	57	704-710	WPSL626	CW-PCS	10M0G7W	1930-1940	1000 per sector	57	1850-1860
A Call Sign Radio Service	Emission Designator	Transmit Frequency	Output Power (watts)	Transmitter ERP (dBm)	Receive Frequency	30	A Call Sign	Radio Service	Emission Designator	Transmit Frequency	Output Power (watts)	Transmitter ERP (dBm)	Receive Frequency	A Call Sign		Kadio Service	Emission Designator	Transmit Frequency	Output Power (watts)	Transmitter ERP (dBm)	Receive Frequency	A Call Sign	Radio Service	Emission Designator	Transmit Frequency	Output Power (watts)	Transmitter ERP (dBm)	Receive Frequency 1850-1860

	Allecting & Allection	Antenna & Ancillary Equipment Information	5	Check one				Heights - A	hove Ground	pypl (fapt)	Note: finchigher removale in a shields
NA         OPA-686A-CUU-H4         k         46° 118° x 5g°         57 bs         60         235°         235°         237°           NA         OPA-686A-CUU-H4         x         46° 118° x 5g°         57 bs         180         235°         237°         237°           NA         OPA-686A-CUU-H4         x         46° 118° x 5g°         57 bs         351         235°         237°         237°           COPA-685A-CUU-H4         x         46° 118° x 5g°         57 bs         351         235°         237°         237°           COPA-685A-CUU-H4         x         46° 118° x 5g°         57 bs         351         235°         237°         237°           COPA-685A-CUU-H4         x         46° 118° x 5g°         57 bs         351         235°         237°         237°           COPA-685A-CUU-H4         x         46° 118° x 5g°         57 bs         351         235°         237°         237°           COPA-685A-CUU-H4         x         46° 118° x 5g°         57 bs         351         235°         237°         237°           COPA-685A-CUU-H4         x         47 call x 118° x 5g°         57 bs         351         235°         235°         237°         237°         237°         237° <th>@ Make</th> <th>. Model</th> <th>Existing</th> <th>Proposed</th> <th>Size / Dimensions</th> <th>Weight</th> <th>Azimuth</th> <th>RAD Center</th> <th>Attachment</th> <th>Tio</th> <th>etc.)</th>	@ Make	. Model	Existing	Proposed	Size / Dimensions	Weight	Azimuth	RAD Center	Attachment	Tio	etc.)
W         OPA-686A-LOUGHHAID         x         46° 118° x 6g°         57 bs.         180         235°         235°         237°           V         OPA-686A-LOUGHHAID         x         46° 118° x 6g°         57 bs.         510         226°         235°         237° </td <td>A KMW</td> <td>OPA-65R-LCUU-H4</td> <td>×</td> <td></td> <td>48" x 14.4" x 7.3"</td> <td>57 lbs</td> <td>09</td> <td>235</td> <td>235'</td> <td>237</td> <td>To be removed</td>	A KMW	OPA-65R-LCUU-H4	×		48" x 14.4" x 7.3"	57 lbs	09	235	235'	237	To be removed
V         OPA-6850-LCUU-H4         x         46° 14.4 x 7 g /r 15 ms         57 bs         300         235°         235°         237°           CPA-6850-LCUU-H4         x         46° 14.4 x 7 g /r 16.4 x 7 g /r 15 ms         51 bs         51 c /r 25°         235°         237°	A KMW	OPA-65R-LCUU-H4	×		48" x 11.8" x 5.9"	57 lbs	180	235'	235'	237	To be removed
OPA-68FA, CUULHIA         x         40° x 144 x 7 2°         57 lbs         60°         235°         235°         237°           OPA-68FA, CUULHIA         x         40° x 144 x 7 2°         57 lbs         351         235°         237°         237°           vervaee         P65-15 XLH-RR         x         17 x 12 x 6°         51 lbs         110         235°         237°         237°         237°           evane         P65-15 XLH-RR         x         17 x 12 x 6°         51 lbs         110         235°         237°         237°           evane         P65-15 XLH-RR         x         17 x 12 x 6°         51 lbs         100         235°         237°         237°           evane         P65-15 XLH-RR         x         17 x 12 x 6°         51 lbs         100         235°         237°         237°           HPA-45 RB ULH6         x         17 x 18 x 6°         50 lbs         76         235°         237°         237°           HPA-45 RB ULH6         x         17 x 18 x 6°         50 lbs         76         235°         237°         237°           evan         80.1065         x         17 x 18 x 6°         50 lbs         260         235°         235°         237°      <	A KMW	OPA-65R-LCUU-H4	×		48" x 11.8" x 5.9"	57 lbs	300	235'	235'	237	To be removed
OPA-68FLCUULH4         X         46° Y 144 "X" 7"         57 lbs         351         235°         235°         237°           evenue         P65:15XLH4RR         X         17 lbs         110         225°         235°         237°           evenue         P65:15XLH4RR         X         17 lbs         100         235°         237°         237°           evenue         P65:15XLH4RR         X         17 lbs         0         235°         237°         237°           evenue         P65:15XLH4RR         X         17 lbs         0         235°         235°         237°           evenue         P65:15XLH4RR         X         17 lbs         0         235°         235°         237°           HPA45REBULH6         X         17 lbs         0         235°         235°         237°           HPA45REBULH6         X         17 lbs y 8 m²         0         0         235°         235°         237°           HPA45REBULH6         X         17 lbs y 8 m²         0         0         235°         235°         237°           Info M445REBULH6         X         17 lbs y 8 m²         0         0         235°         235°         237°           Info M44	A CCI	OPA-65R-LCUU-H4	×		48" x 14.4" x 7.3"	57 lbs	09	235'	235'	237	To be removed
PRESIDENCIULH4         X         40° x 2x x 4x x 7 x 3 r 5 r 5 r 5 r 5 r 5 r 5 r 5 r 5 r 5 r	A CCI	OPA-65R-LCUU-H4	×		48"×14.4"×7.3"	57 lbs	351	235'	235'	237	
PRESTSACHHER         X         STYLEYE         51 bbs         110         235         237         237           ENVENAME         PRESTSACHHER         X         STYLEYE         51 bbs         110         235         235         237           ENVENAME         PRESTSACHHER         X         TZYLEYE         51 bbs         10         235         235         237           HPAGREBULHE         X         TZYLEYE         50 bbs         76         235         235         237           HPAGREBULHE         X         TZYLEYE         50 bbs         76         235         235         237           HPAGREBULHE         X         TZYLEYE         50 bbs         260         235         235         237           HPAGREBULHE         X         TZYLEYE         50 bbs         260         235         235         237           HPAGREBULHE         X         TZYLEYE         50 bbs         260         235         235         237           HERAGREBULHE         X         TZYLEYE         50 bbs         260         235         235         237           HERAGREBULHE         X         TZYLEYE         50 bbs         260         235         235         235	A CCI	OPA-65R-LCUU-H4	×		48" x 14.4" x 7.3"	57 lbs	351	235'	235'	237	
PRESTRACHER         X         51° x 2° x 6°         51° S         235°         235°         237°           ENVANE         PRESTSALHER         X         72° x 18° x 8°         51° x 2° x 6°         51° x 2°         235°         235°         237	A Powerwave	P65-15-XLH-RR	×		51" x 12" x 6"	51 lbs	110	235'	235	237	To be removed
PRESIDENT   PRESIDENT   X   51° x 67°   51° bis   0   235°   235°   237°     HPA-45K-BULH6	A Powerwave	P65-15-XLH-RR	×		51" x 12" x 6"	51 lbs	280	235'	235'	237	To be removed
HPA-45K-BULH6	A Powerwave	P65-15-XLH-RR	×		51" x 12" x 6"	51 lbs	0	235'	235'	237'	
HPA-45K-BU1-H6	A CCI	HPA-45R-BUU-H6		×	72" x 18.9" x 8.3"	50 lbs	110	235'	235	237	
HPA-45R-BUU-H6	A CCI	HPA-45R-BUU-H6		×	72" x 18.9" x 8.3"	50 lbs	76	235'	235'	237'	
HPA-45R-BUU-H6	A CCI	HPA-45R-BUU-H6		×	72" x 18.9" x 8.3"	50 lbs	76	235'	235'	237'	
HPA-45R-BUU-H6	A CCI	HPA-45R-BUU-H6		×	72" x 18.9" x 8.3"	50 lbs	280	235'	235'	237	
HPA-65R-BUU-H6	A CCI	HPA-45R-BUU-H6		×	72" x 18.9" x 8.3"	50 lbs	266	235'	235	237'	
800-10964   X   50° x 20° x 6° x 70° x 7	A CCI	HPA-45R-BUU-H6		×	72" x 18.9" x 8.3"	50 lbs	266	235	235'	237'	
March   Marc	A Kathrien	800-10964		×	59" x 20" x 6.9"	83.8 lbs.	351	235'	235'	237'	
web         LOP 2 (1005)         X         78 7" x 20" x 6" y"         9 (9 6 ks.         255"         235"         237"           RRUS-11         X         14"x 1"x 6" x" 2""         10 ks ea.         76,2665,51         222         222           RRUS-12         X         17"x 1"x 6"         50 ks ea.         76,2665,51         232         235           RRUS-12         X         17"x 1"x 6"         50 ks ea.         76,2665,51         235         235           RRUS-12         X         17"x 1"x 6"         50 ks ea.         76,2665,51         235         235           RRUS-12         X         10"x 1"x 1"x 6"         7 ks ea.         76,2665,51         232         232           RRUS-22         X         10"x 1"x 1"x 6"         7 ks ea.         76,2665,51         232         232           RRUS-22         X         10"x 1"x 1"x 6"         25 ks         25 ks         232         232           Squid         X         31"4"x 10 24"         25 ks         25 ks         232         232           Squid         X         31"4"x 10 24"         25 ks         252         232         232	A Kathrien	800-10965		×	78.7" x 20" x 6.9"	97.6 lbs	9/	235'	235'	237	
Control   Cont	A Kathrien	800-10965		×	78.7" x 20" x 6.9"	97.6 lbs	266	235'	235'	237'	
RRUB-5-1	Powerwave	LGP21401	×		14.4" x 9" x 2.7"	19 lbs ea.	76/266/351	232'	232'		6 TMAs, 2 per sector
RRUS-3.2	Ericsson	RRUS-11	×		17"x 17"x 6"	50 lbs ea.	76/266/351	235'	235'		3 radio heads, 1 per sector
RRUG-12	Ericsson	RRUS-32	×		17"×17"×6"	77 lbs ea.	76/266/351	235'	235'		3 radio heads, 1 per sector
A.A. Module	Ericsson	RRUS-12	×		20.4" x 18.5" x 7.5"	50 lbs ea.	76/266/351	232'	232'		3 radio heads, 1 per sector
RRU6_32 B66	Ericsson	A-2 Module	×		16.4" x 15.1" x 3.4"	22 lbs ea.	76/266/351	232'	232'		3 modules, 1 per sector
B14.478	Ericsson	RRUS-32 B66		×	17"×17"×6"	77 lbs ea.	76/266/351	235'	235'		3 radio heads, 1 per sector
Squid   X   31.41" x 10.24"   23   232"   232"     Squid   X   31.41" x 10.24"   25 lbs   232"   232"     Squid   X   31.41" x 10.24"   25 lbs   232"   232"     Squid   X   31.41" x 10.24"   25 lbs   232"     Squid   X   31.41" x 10.24"   232"   232"     Squid   X   31.41" x 10.24"   232"   232"     Squid   X   31.41" x 10.24"   232"     Squid   X   31.41" x 10.24"   232"   232"   232"     Squid   X   31.41" x 10.24"   232"   232"   232"     Squid   X   31.41" x 10.24"   232"   232"   232"   232"     Squid   X   31.41" x 10.24"   232"   232"   232"   232"   232	Ericsson	B14 4478		×	27.2" x 12.1" x 7"	59.52 lbs ea.	76/266/351	235'	235'		3 radio heads, 1 per sector
Squid x 31.41"x.10.24" 25 lbs. 232" 232"	RAYCAP	Squid	×		31.41" x 10.24"	25 lbs.		232'	232'		Fiber and DC junction box
	RAYCAP	Squid	×		31.41" x 10.24"	25 lbs.		232,	232'		Fiber and DC junction box
					2						



# Radio Frequency Emissions Analysis Report

AT&T Existing Facility

**Site ID: CT2118** 

FA#: 10034983

Stamford Central SBC CO 555 Main Street Fairfield, CT 06901

**July 18, 2018** 

**Centerline Communications Project Number: 950006-135** 

Site Complian	ce Summary
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	4.39 %



July 18, 2018

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

Emissions Analysis for Site: CT2118 – Stamford Central SBC CO

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **555 Main Street, Fairfield, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ( $\mu$ W/cm²). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467  $\mu$ W/cm² and 567  $\mu$ W/cm² respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000  $\mu$ W/cm². Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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

Additional details can be found in FCC OET 65.



#### **CALCULATIONS**

Calculations were performed for the proposed AT&T Wireless antenna facility located at **555 Main Street, Fairfield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
LTE	850 MHz	2	40
LTE	700 MHz	4	40
LTE	2300 MHz (WCS)	4	30
LTE	700 MHz (BAND 14)	4	40
LTE	2100 MHz (AWS)	4	30
LTE	1900 MHz (PCS)	4	40

Table 1: Channel Data Table



The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

	Antenna		Antenna Centerline
<b>G</b> .		A . N. 1 /N. 1.1	
Sector	Number	Antenna Make / Model	(ft)
A	1	CCI HPA-45R-BUU-H6	235
A	2	CCI HPA-45R-BUU-H6	235
A	3	Kathrein 800-10965	235
A	4	CCI HPA-45R-BUU-H6	235
В	1	CCI HPA-45R-BUU-H6	235
В	2	CCI HPA-45R-BUU-H6	235
В	3	Kathrein 800-10965	235
В	4	CCI HPA-45R-BUU-H6	235
С	1	CCI OPA-65R-LCUU-H4	235
C	2	CCI OPA-65R-LCUU-H4	235
C	3	Kathrein 800-10964	235
C	4	CCI OPA-65R-LCUU-H4	235

Table 2: Antenna Data

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



## **RESULTS**

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

			Antenna Gain		Total TX		
Antenna	Antenna Make /		(dBd)	Channel	Power		
ID	Model	Frequency Bands		Count	(W)	ERP (W)	MPE %
Antenna	CCI						
A1	HPA-45R-BUU-H6	850 MHz	13.35	2	60	1,297.63	0.16
		850 MHz /					
Antenna	CCI	700 MHz /	13.35 / 13.15 /				
A2	HPA-45R-BUU-H6	2300 MHz (WCS)	16.15	8	280	8,327.65	0.79
Antenna	Kathrein	700 MHz /					
A3	800-10965	2100 MHz (AWS)	12.65 / 15.95	8	280	7,667.84	0.76
Antenna	CCI	700 MHz /					
A4	HPA-45R-BUU-H6	1900 MHz (PCS)	13.15 / 15.85	6	240	7,805.77	0.66
				Se	ector A Comp	osite MPE%	2.37
Antenna	CCI						
B1	HPA-45R-BUU-H6	850 MHz	13.35	2	60	1,297.63	0.16
		850 MHz /					
Antenna	CCI	700 MHz /	13.35 / 13.15 /				
B2	HPA-45R-BUU-H6	2300 MHz (WCS)	16.15	8	280	8,327.65	0.79
Antenna	Kathrein	700 MHz /					
В3	800-10965	2100 MHz (AWS)	12.65 / 15.95	8	280	7,667.84	0.76
Antenna	CCI	700 MHz /					
B4	HPA-45R-BUU-H6	1900 MHz (PCS)	13.15 / 15.85	6	240	7,805.77	0.66
				Se	ector B Comp	osite MPE%	2.37
Antenna	CCI						
C1	OPA-65R-LCUU-H4	850 MHz	11.5	2	60	781.90	0.09
		850 MHz /					
Antenna	CCI	700 MHz /	11.5 / 10.55 /				
C2	OPA-65R-LCUU-H4	2300 MHz (WCS)	14.65	8	280	5,451.45	0.50
Antenna	Kathrein	700 MHz /					
C3	800-10964	2100 MHz (AWS)	11.45 / 15.25	8	280	6,253.77	0.60
Antenna	CCI	700 MHz /					
C4	OPA-65R-LCUU-H4	1900 MHz (PCS)	10.55 / 13.55	6	240	4,531.44	0.38
				Se	ector C Comp	osite MPE%	1.58

Table 3: AT&T Emissions Levels



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

Site Composite MPE%	
Carrier	MPE%
AT&T – Max Value (Sectors A & B)	2.37 %
T-Mobile	1.38 %
WinStar Wireless	0.07 %
PageNet	0.14 %
Broadcast Video	0.43 %
Site Total MPE %:	4.39 %

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	2.37 %
AT&T Sector B Total:	2.37 %
AT&T Sector C Total:	1.58 %
Site Total:	4.39 %

Table 5: Site MPE Summary



FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, the sectors with the largest calculated MPE% are Sectors A & B.

AT&T _ Frequency Band / Technology  Max Power Values  (Sectors A & B)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (µW/cm²)	Frequency (MHz)	Allowable MPE (µW/cm²)	Calculated % MPE
AT&T 850 MHz UMTS – Antenna 1	2	648.82	235	0.89	850 MHz	567	0.16%
AT&T 850 MHz LTE – Antenna 2	2	865.09	235	1.19	850 MHz	567	0.21%
AT&T 700 MHz LTE – Antenna 2	2	826.15	235	1.13	700 MHz	467	0.24%
AT&T 2300 MHz (WCS) LTE – Antenna 2	4	1,236.29	235	3.39	2300 MHz (WCS)	1000	0.34%
AT&T 700 MHz LTE (BAND 14) – Antenna 3	4	736.31	235	2.02	700 MHz (BAND 14)	467	0.43%
AT&T 2100 MHz (AWS) LTE – Antenna 3	4	1,180.65	235	3.24	2100 MHz (AWS)	1000	0.32%
AT&T 700 MHz LTE – Antenna 4	2	826.15	235	1.13	700 MHz	467	0.24%
AT&T 1900 MHz (PCS) LTE – Antenna 4	4	1,538.37	235	4.22	1900 MHz (PCS)	1000	0.42%
						Total:	2.37%

Table 6: AT&T Maximum Sector MPE Power Values



### **Summary**

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

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

AT&T Sector	Power Density Value (%)
Sector A:	2.37 %
Sector B:	2.37 %
Sector C:	1.58 %
AT&T Maximum Total	2.37 %
(per sector):	2.31 %
Site Total:	4.39 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **4.39** % of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan

RF Engineering Director

**Centerline Communications, LLC** 

95 Ryan Drive, Suite 1 Raynham, MA 02767

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