Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

October 15, 2021

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

T-Mobile Northeast LLC – CTHA376A
Tower Share Application
131 Little City Road, Killingworth, CT 06419
Latitude- 41.42877778
Longitude- -72.60380556

Dear Ms. Bachman,

This letter and attachments are submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile plans to install antennas and related equipment at the tower site located at 131 Little City Road, Killingworth, Connecticut.

T-Mobile will install six (6) 600/700/1900/2100/2500 MHz antennas and six (6) RRHs at the 245' level of the existing 280' self-support tower. Three (3) hybrid cables will also be installed. T-Mobile's equipment cabinets will be placed on a 10' X 20' concrete pad within the existing ground facility. Included are plans by American Tower, dated August 31, 2021, depicting the planned changes and attached as **Exhibit A**. Also included is a structural analysis prepared by American Tower, dated July 27, 2021, confirming that the existing tower is structurally capable of supporting the proposed. This is attached and detailed in **Exhibit B**.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of T-Mobile's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Catherin Iino, First Selectwoman of the Town of Killingworth, as well as the tower and property owner, American Tower and Anthony Anderson. Please see the attached letter from American Tower authorizing the proposed shared use of this facility attached as **Exhibit C**.

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modification will not result in an increase in the height of the existing structure. The top of the self-support tower is 280'; T-Mobile's proposed antennas will be located at a center line height of 245'.

2. The proposed modifications will not result in the increase of the site boundary as depicted on the attached site plan.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed local and state criteria. T-Mobile's plans include the installation of an emergency back-up generator; noise associated with this installation is exempt from State and local noise standards. The incremental effect of the proposed changes will be negligible.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 8.69%, as evidenced by **Exhibit D**.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, T-Mobile respectfully submits that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting T-Mobile's proposed loading, with the tower modifications/reinforcements as detailed in the structural analysis. The structural analysis is included as **Exhibit B**.
B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this monopole in Killingworth. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation. Further, a Letter of Authorization is included as **Exhibit C**, authorizing T-Mobile to file this application for shared use.
C. Environmental Feasibility. The proposed shared use of this facility would have minimal environmental impact. The installation of T-Mobile equipment at the 245' level of the existing 280' tower would have an insignificant visual impact on the area around the tower. T-Mobile's ground equipment would be installed within the existing facility compound. T-Mobile's shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by **Exhibit D**, the proposed antennas would not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.
D. Economic Feasibility. T-Mobile will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist T-Mobile with this tower sharing application.
E. Public Safety Concerns. As discussed above, the monopole is structurally capable of supporting T-Mobile's proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing monopole. T-Mobile's intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Killingworth and nearby the facility.

Sincerely,

Eric Breun

Eric Breun
Transcend Wireless
10 Industrial Ave., Suite 3
Mahwah, New Jersey
ebreun@transcendwireless.com
201-658-7728

CC: Catherine Iino - First Selectwoman
American Tower – Tower Owner
Anthony Anderson – Property Owner
Cathie Jefferson – Zoning Enforcement Officer

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
CATHIE JEFFERSON
323 CONNECTICUT 81
KILLINGWORTH CT 06419

CT 063 5-02

UPS GROUND
TRACKING #: 1Z V25 742 03 9059 8911

BILLING: P/P

Reference #1: CTHA376A

XOL 21.09.12 NV45 42.0A 10/2021*

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
AMERICAN TOWER CORPORATION
10 PRESIDENTIAL WAY
WOBURN MA 01801

MA 018 9-04

UPS GROUND
TRACKING #: 1Z V25 742 03 9243 2907

BILLING: P/P

Reference #1: CTHA376A

XOL 21.09.12 NV45 42.0A 10/2021*

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
ANTHONY ANDERSON
131 LITTLE CITY ROAD
KILLINGWORTH CT 06419

CT 063 5-02

UPS GROUND
TRACKING #: 1Z V25 742 03 9909 6018

BILLING: P/P

Reference #1: CTHA376A

XOL 21.09.12 NV45 42.0A 10/2021*

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
CATHIE JEFFERSON
323 CONNECTICUT 81
KILLINGWORTH CT 06419

CT 063 5-02

UPS GROUND
TRACKING #: 1Z V25 742 03 9059 8911

BILLING: P/P

Reference #1: CTHA376A

XOL 21.09.12 NV45 42.0A 10/2021*

131 LITTLE CITY ROAD

ANDERSON ANTHONY J

131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

Parcel ID: 06-12F
Lot Size (ac): 7.4
Sale Price: $440000

Links | Abutters

- Parcel Details
- Bing Bird's Eye
- Photo
- Property Map

Google Map

Parcel_ID	06-12F
StreetAddr	131 LITTLE CITY ROAD
CAMA_match	YES
Owner	ANDERSON ANTHONY J
Mailing Address	131 LITTLE CITY ROAD
City	KILLINGWORTH
State	CT
Zipcode	06419
Acres	7.4
Sale Date	1164672000000
Sale Price	440000
Vol / Page	0221/0711
Source Category	ASSESSOR
SaleYear	11/28/2006
UNIQUEID	42700

Hello, your package has been delivered.

Delivery Date: Wednesday, 10/13/2021

Delivery Time: 11:53 AM

Left At: FRONT DESK

Signed by: ANCRI

TRANSCEND WIRELESS

Tracking Number:	1ZV257420392432907
Ship To:	AMERICAN TOWER CORPORATION 10 PRESIDENTIAL WAY WOBURN, MA 01801 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA376A

Hello, your package has been delivered.

Delivery Date: Wednesday, 10/13/2021

Delivery Time: 12:19 PM

Left At: OFFICE

Signed by: MOONEY

TRANSCEND WIRELESS

Tracking Number:	1ZV257420390598911
Ship To:	CATHIE JEFFERSON 323 CONNECTICUT 81 KILLINGWORTH, CT 06419 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA376A

Hello, your package has been delivered.

Delivery Date: Wednesday, 10/13/2021

Delivery Time: 11:19 AM

Left At: REAR DOOR

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TRANSCEND WIRELESS

Tracking Number:	1ZV257420399096018
Ship To:	ANTHONY ANDERSON 131 LITTLE CITY ROAD KILLINGWORTH, CT 06419 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA376A

Hello, your package has been delivered.

Delivery Date: Wednesday, 10/13/2021

Delivery Time: 12:19 PM

Left At: OFFICE

Signed by: MOONEY

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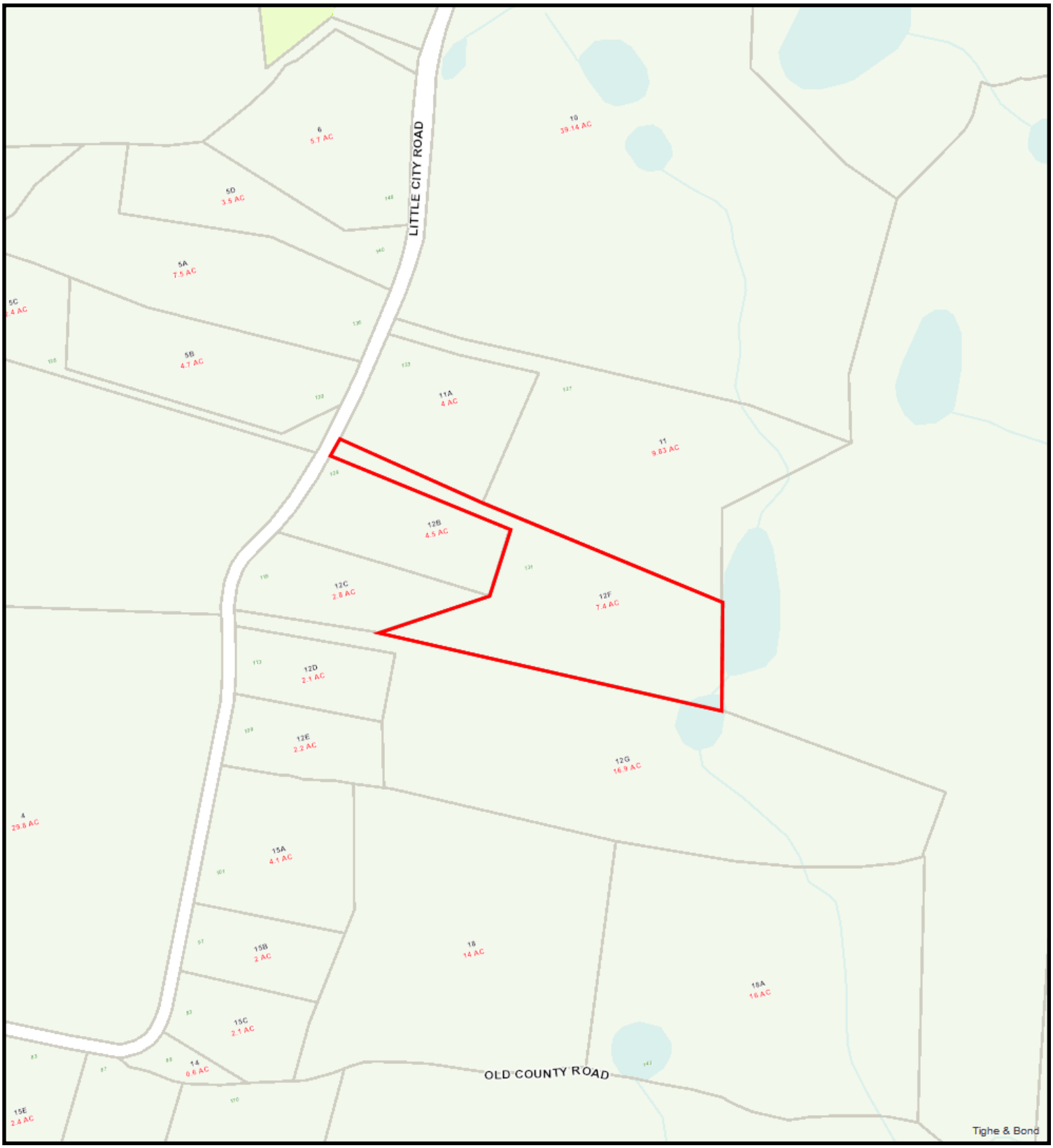
TRANSCEND WIRELESS

Tracking Number:	1ZV257420397066009
Ship To:	CATHERINE IINO 323 CONNECTICUT 81 KILLINGWORTH, CT 06419 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA376A



10/12/2021 1:56:21 PM

Scale: 1"=400'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

VICINITY MAP

AMERICAN TOWER®

ATC SITE NAME: KILLINGWORTH
ATC SITE NUMBER: 88013
T-MOBILE SITE NAME: CTHA376A
T-MOBILE SITE NUMBER:CTHA376A
SITE ADDRESS: 131 LITTLE CITY ROAD KILLINGWORTH, CT 06419

LOCATION MAP

T-MOBILE COVERAGE STRATEGY COLOCATION PLAN
67E5A998E 6160 CONFIGURATION

COMPLIANCE CODE

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNMENT AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. 2018 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2015 IBC.
2. 2017 NATIONAL ELECTRICAL CODE - NFPA 70
3. 2015 NFPA 101
4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION 360-10
5. AMERICAN CONCRETE INSTITUTE
6. 2017 NATIONAL ELECTRICAL SAFETY CODE (NESC)
7. TIA 607 FOR GROUNDING
8. INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81 IEEE C2
9. TELCORDIA GR-1275
10. ANSI T1.311

UTILITY COMPANIES

POWER COMPANY: EVERSOURCE
PHONE: (877) 659-6326

TELEPHONE COMPANY: FRONTIER COMMUNICATIONS
PHONE: (800) 376-6843

811 Know what's below. Call before you dig.

PROJECT SUMMARY

SITE ADDRESS:

131 LITTLE CITY ROAD

KILLINGWORTH, CT 06419

COUNTY: MIDDLESEX

GEOGRAPHIC COORDINATES:

LATITUDE: 41.42877778

LONGITUDE: -72.60380556

GROUND ELEVATION: 615' AMSL

PROJECT TEAM

TOWER OWNER:

AMERICAN TOWER
10 PRESIDENTIAL WAY
WOBURN, MA 01801

APPLICANT:

T-MOBILE

ENGINEER:

COLLIERS
ENGINEERING & DESIGN CT,P.C.
135 NEW ROAD
MADISON, CT 06443

PROJECT #:
21904244A

PROPERTY OWNER:

N/A
131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

PROJECT DESCRIPTION

THE PROPOSED PROJECT INCLUDES INSTALLING EQUIPMENT CABINETS AND A GENERATOR ON A PROPOSED CONCRETE PAD INSIDE A 10' X 20' GROUND SPACE WITHIN THE EXISTING COMPOUND, AND INSTALLING NEW EQUIPMENT AND MOUNTS ON THE EXISTING TOWER.

PROJECT NOTES

1. THE FACILITY IS UNMANNED.
2. A TECHNICIAN WILL VISIT THE SITE APPROXIMATELY ONCE A MONTH FOR ROUTINE INSPECTION AND MAINTENANCE.
3. THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT LAND DISTURBANCE OR EFFECT OF STORM WATER DRAINAGE.
4. NO SANITARY SEWER, POTABLE WATER OR TRASH DISPOSAL IS REQUIRED.
5. HANDICAP ACCESS IS NOT REQUIRED.
6. THE PROJECT DEPICTED IN THESE PLANS QUALIFIES AS AN ELIGIBLE FACILITIES REQUEST ENTITLED TO EXPEDITED REVIEW UNDER 47 U.S.C. § 1455(A) AS A MODIFICATION OF AN EXISTING WIRELESS TOWER THAT INVOLVES THE COLLOCATION, REMOVAL, AND/OR REPLACEMENT OF TRANSMISSION EQUIPMENT THAT IS NOT A SUBSTANTIAL CHANGE UNDER CFR § 1.61000 (B)(7).

PROJECT LOCATION DIRECTIONS

I-91 SOUTH TO 9 SOUTH TO EXIT 11 (ROUTE 148). FOLLOW ROUTE 148 UNTIL 2.3 MILES AFTER JUNCTION 79 TO LITTLE CITY ROAD. NOTE THE SIGN FOR LITTLE CITY ROAD IS NOT A NORMAL STREET SIGN, BUT A WOODEN ENGRAVED POLE. TURN LEFT ON LITTLE CITY AND FOLLOW 1.2 MILES

SHEET INDEX

SHEET NO:	DESCRIPTION:	REV:	DATE:	BY:
G-001	TITLE SHEET	0	08/31/21	MJB
G-002	GENERAL NOTES	0	08/31/21	MJB
C-001	OVERALL SITE PLAN	0	08/31/21	MJB
C-101	DETAILED SITE PLAN	0	08/31/21	MJB
C-201	TOWER ELEVATION	0	08/31/21	MJB
C-401	ANTENNA INFORMATION & SCHEDULE	0	08/31/21	MJB
C-501	CONSTRUCTION DETAILS	0	08/31/21	MJB
C-502	CONSTRUCTION DETAILS	0	08/31/21	MJB
C-503	CONSTRUCTION DETAILS	0	08/31/21	MJB
E-101	GROUNDING DETAILS & ELECTRICAL SCHEMATIC	0	08/31/21	MJB
E-501	GROUNDING DETAILS	0	08/31/21	MJB
E-601	PANEL SCHEDULE	0	08/31/21	MJB
R-601	SUPPLEMENTAL			
R-602	SUPPLEMENTAL			
R-603	SUPPLEMENTAL			
R-604	SUPPLEMENTAL			
R-605	SUPPLEMENTAL			
R-606	SUPPLEMENTAL			
R-607	SUPPLEMENTAL			

AMERICAN TOWER®

Colliers Engineering & Design
www.colliersengineering.com
Doing Business as MASER CONSULTING
MADISON
135 New Road
Madison, CT 06443
Phone: 860.395.0055
COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	MJB	08/05/21
0	FOR CONSTRUCTION	RMD	08/31/21

ATC SITE NUMBER:
88013

ATC SITE NAME:
KILLINGWORTH

T-MOBILE SITE NAME:
CTHA376A

SITE ADDRESS:
131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

SEAL

STATE OF CONNECTICUT ALEC S. NORRIS 32588 LICENSED PROFESSIONAL ENGINEER

Digitally signed by Alec Norris
Date: 2021.08.31 11:36:50-04'00'

Alec S. Norris
CONNECTICUT LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 32588
COLLIERS ENGINEERING & DESIGN CT, P.C.
C.T. JPC.0000131

T-Mobile

DATE DRAWN:	08/05/21
ATC JOB NO:	13701109_D3
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

TITLE SHEET

SHEET NUMBER:	REVISION:
G-001	0

GENERAL CONSTRUCTION NOTES:

1. OWNER FURNISHED MATERIALS, T-MOBILE "THE COMPANY" WILL PROVIDE AND THE CONTRACTOR WILL INSTALL
   - A. BTS EQUIPMENT FRAME (PLATFORM) AND ICEBRIDGE SHELTER (GROUND BUILD/CO-LOCATE ONLY)
   - B. AC/TELCO INTERFACE BOX (PPC)
   - C. ICE BRIDGE (CABLE TRAY WITH COVER) (GROUND BUILD/CO-LOCATE ONLY, GC TO FURNISH AND INSTALL FOR ROOFTOP INSTALLATION)
   - D. TOWERS, MONOPOLES
   - E. TOWER LIGHTING
   - F. GENERATORS & LIQUID PROPANE TANK
   - G. ANTENNA STANDARD BRACKETS, FRAMES AND PIPES FOR MOUNTING
   - H. ANTENNAS (INSTALLED BY OTHERS)
   - I. TRANSMISSION LINE
   - J. TRANSMISSION LINE JUMPERS
   - K. TRANSMISSION LINE CONNECTORS WITH WEATHERPROOFING KITS
   - L. TRANSMISSION LINE GROUND KITS
   - M. HANGERS
   - N. HOISTING GRIPS
   - O. BTS EQUIPMENT
2. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL OTHER MATERIALS FOR THE COMPLETE INSTALLATION OF THE SITE INCLUDING, BUT NOT LIMITED TO, SUCH MATERIALS AS FENCING, STRUCTURAL STEEL SUPPORTING SUB-FRAME FOR PLATFORM, ROOFING LABOR AND MATERIALS, GROUNDING RINGS, GROUNDING WIRES, COPPER-CLAD OR XIT CHEMICAL GROUND ROD(S), BUSS BARS, TRANSFORMERS AND DISCONNECT SWITCHES WHERE APPLICABLE, TEMPORARY ELECTRICAL POWER, CONDUIT, LANDSCAPING COMPOUND STONE, CRANES, CORE DRILLING, SLEEPERS AND RUBBER MATTING, REBAR, CONCRETE CAISSONS, PADS AND/OR AUGER MOUNTS, MISCELLANEOUS FASTENERS, CABLE TRAYS, NON-STANDARD ANTENNA FRAMES AND ALL OTHER MATERIAL AND LABOR REQUIRED TO COMPLETE THE JOB ACCORDING TO THE DRAWINGS AND SPECIFICATIONS. IT IS THE POSITION OF T-MOBILE TO APPLY FOR PERMITTING AND CONTRACTOR RESPONSIBLE FOR PICKUP AND PAYMENT OF REQUIRED PERMITS.
3. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, INCLUDING ANSI/EIA/TIA-222, AND COMPLY WITH ATC CONSTRUCTION SPECIFICATIONS.
4. CONTRACTOR SHALL CONTACT LOCAL 811 FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
6. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
7. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
8. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
9. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
10. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
11. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, GROUNDS DRAINS, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
12. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE T-MOBILE REP PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE T-MOBILE REP PRIOR TO PROCEEDING.
13. EACH CONTRACTOR SHALL COOPERATE WITH THE T-MOBILE REP, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
14. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE T-MOBILE CONSTRUCTION MANAGER.
15. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
16. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR SHALL NOTIFY THE T-MOBILE REP AND ENGINEER OF RECORD IMMEDIATELY.
17. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A COMPLETE AND CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
18. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
19. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH AMERICAN TOWER CORPORATION (ATC) AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
20. CONTRACTOR SHALL FURNISH T-MOBILE AND AMERICAN TOWER CORPORATION (ATC) WITH A PDF MARKED UP AS-BUILT SET OF DRAWINGS UPON COMPLETION OF WORK.
21. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE REP TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED. ALL ITEMS NOT PROVIDED SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED.
22. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH T-MOBILE REP TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY CONTRACTOR. ALL REQUIRED PERMITS NOT OBTAINED BY T-MOBILE MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
23. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH T-MOBILE SPECIFICATIONS AND REQUIREMENTS.
24. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO T-MOBILE FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
25. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO T-MOBILE SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
26. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
27. CONTRACTOR SHALL NOTIFY T-MOBILE REP A MINIMUM OF 48 HOURS IN ADVANCE OF POURING CONCRETE OR BACKFILLING ANY UNDERGROUND UTILITIES, FOUNDATIONS OR SEALING ANY WALL, FLOOR OR ROOF PENETRATIONS FOR ENGINEERING REVIEW AND APPROVAL.
28. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS AND RECOMMENDATIONS AND SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE AND PPM AND CONSTRUCTION DEVICES SUCH AS WELDING AND FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.
29. THE CONTRACTOR SHALL PROTECT AT HIS OWN EXPENSE, ALL EXISTING FACILITIES AND SUCH OF HIS NEW WORK LIABLE TO INJURY DURING THE CONSTRUCTION PERIOD. ANY DAMAGE CAUSED BY NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, OR BY THE ELEMENTS DUE TO NEGLECT ON THE PART OF THIS CONTRACTOR OR HIS REPRESENTATIVES, EITHER TO THE EXISTING WORK, OR TO HIS WORK OR THE WORK OF ANY OTHER CONTRACTOR, SHALL BE REPAIRED AT HIS EXPENSE TO THE OWNER'S SATISFACTION.
30. ALL WORK SHALL BE INSTALLED IN A FIRST CLASS, NEAT AND WORKMANLIKE MANNER BY MECHANICS SKILLED IN THE TRADE INVOLVED. THE QUALITY OF WORKMANSHIP SHALL BE SUBJECT TO THE APPROVAL OF THE T-MOBILE REP. ANY WORK FOUND BY THE T-MOBILE REP TO BE OF INFERIOR QUALITY AND/OR WORKMANSHIP SHALL BE REPLACED AND/OR REWORKED AT CONTRACTOR EXPENSE UNTIL APPROVAL IS OBTAINED.
31. IN ORDER TO ESTABLISH STANDARDS OF QUALITY AND PERFORMANCE, ALL TYPES OF MATERIALS LISTED HEREINAFTER BY MANUFACTURER'S NAMES AND/OR MANUFACTURER'S CATALOG NUMBER SHALL BE PROVIDED BY THESE MANUFACTURERS AS SPECIFIED.
32. T-MOBILE FURNISHED EQUIPMENT SHALL BE PICKED-UP AT THE T-MOBILE WAREHOUSE, NO LATER THAN 48HR AFTER BEING NOTIFIED INSURED, STORED, UNCRATE, PROTECTED AND INSTALLED BY THE CONTRACTOR WITH ALL APPURTENANCES REQUIRED TO PLACE THE EQUIPMENT IN OPERATION, READY FOR USE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE EQUIPMENT AFTER PICKING IT UP.
33. T-MOBILE OR HIS ARCHITECT/ENGINEER RESERVES THE RIGHT TO REJECT ANY EQUIPMENT OR MATERIALS WHICH, IN HIS OWN OPINION ARE NOT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS, EITHER BEFORE OR AFTER INSTALLATION AND THE EQUIPMENT SHALL BE REPLACED WITH EQUIPMENT CONFORMING TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS BY THE CONTRACTOR AT NO COST TO T-MOBILE OR THEIR ARCHITECT/ENGINEER.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:
   - A. ASTM A-572, GRADE 50 - ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE
   - B. ASTM A-36 - ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
   - C. ASTM A-500, GRADE B - HSS SECTION (SQUARE, RECTANGULAR, AND ROUND)
   - D. ASTM A-325, TYPE SC OR N - ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS
   - E. ASTM F-1554 07 - ALL ANCHOR BOLTS, UNLESS NOTED OTHERWISE
3. ALL EXPOSED STRUCTURAL STEEL MEMBERS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123. EXPOSED STEEL HARDWARE AND ANCHOR BOLTS SHALL BE GALVANIZED PER ASTM A153 OR B695.
4. ALL FIELD CUT SURFACES, FIELD DRILLED HOLES AND GROUND SURFACES WHERE EXISTING PAINT OR GALVANIZATION REMOVAL WAS REQUIRED SHALL BE REPAIRED WITH (2) BRUSHED COATS OF ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURER'S RECOMMENDATIONS.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. CONNECTIONS:
   - A. ALL WELDING TO BE PERFORMED BY AWS CERTIFIED WELDERS AND CONDUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE AWS WELDING CODE D1.1.
   - B. ALL WELDS SHALL BE INSPECTED VISUALLY. 25% OF WELDS SHALL BE INSPECTED WITH DYE PENETRANT OR MAGNETIC PARTICLE TO MEET THE ACCEPTANCE CRITERIA OF AWS D1.1. REPAIR ALL WELDS AS NECESSARY.
   - C. INSPECTION SHALL BE PERFORMED BY AN AWS CERTIFIED WELD INSPECTOR.
   - D. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE BURNING/WELDING PERMITS AS REQUIRED BY LOCAL GOVERNING AUTHORITY AND IF REQUIRED SHALL HAVE FIRE DEPARTMENT DETAIL FOR ANY WELDING ACTIVITY.
   - E. ALL ELECTRODES TO BE LOW HYDROGEN, MATCHING FILLER METAL, PER AWS D1.1, UNLESS NOTED OTHERWISE.
   - F. MINIMUM WELD SIZE TO BE 0.1875 INCH FILLET WELDS, UNLESS NOTED OTHERWISE.
   - G. PRIOR TO FIELD WELDING GALVANIZING MATERIAL, CONTRACTOR SHALL GRIND OFF GALVANIZING ½" BEYOND ALL FIELD WELD SURFACES. AFTER WELD AND WELD INSPECTION IS COMPLETE, REPAIR ALL GROUND AND WELDED SURFACES WITH ZRC GALVILITE COLD GALVANIZING COMPOUND PER ASTM A780 AND MANUFACTURERS RECOMMENDATIONS.
   - H. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING AND/OR BRACING WHERE REQUIRED DURING CONSTRUCTION UNTIL ALL CONNECTIONS ARE COMPLETE.
   - I. ANY FIELD CHANGES OR SUBSTITUTIONS SHALL HAVE PRIOR APPROVAL FROM THE ENGINEER, AND T- MOBILE PROJECT MANAGER IN WRITING

SPECIAL CONSTRUCTION ANTENNA INSTALLATION NOTES:

1. WORK INCLUDED:
   - A. ANTENNA AND COAXIAL CABLES ARE FURNISHED BY T-MOBILE UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL ASSIST ANTENNA INSTALLATION CONTRACTOR IN TERMS OD COORDINATION AND SITE ACCESS. ERECTION SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PERSONNEL AND
   - B. INSTALL ANTENNA AS INDICATE ON DRAWINGS AND T-MOBILE SPECIFICATIONS.
   - C. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS
   - D. INSTALL FURNISHED GALVANIZED STEEL OR ALUMINUM WAVEGUIDE AND PROVIDE PRINTOUT OF THAT TEST.
   - E. CONTRACTOR SHALL PROVIDE FOUR (4) SETS OF SWEEP TESTS USING ANRITZU-PACKARD 8713B RF SCALAR NETWORK ANALYZER. SUBMIT FREQUENCY DOMAIN REFLECTOMETER(FDR) TESTS RESULTS TO THE PROJECT MANAGER. SWEEP TESTS SHALL BE AS PER ATTACHED RFS "MINIMUM FIELD TESTING RECOMMENDED FOR ANTENNA AND HELIAX COAXIAL CABLE SYSTEMS" DATED 10/5/93. TESTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING SERVICE AND BE BOUND AND SUBMITTED WITHIN ONE WEEK OF WORK COMPLETION.
   - F. INSTALL COAXIAL CABLES AND TERMINATING BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTIONS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS. TERMINATE ALL COAXIAL CABLE THREE (3) FEET IN EXCESS OF ENTRY PORT LOCATION UNLESS OTHERWISE STATED.
   - G. ANTENNA AND COAXIAL CABLE GROUNDING:
2. ALL EXTERIOR #6 GREED GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH RFS CONNECTORS/SPLICE WEATHERPROOFING KIT #221213 OR EQUAL.
3. ALL COAXIAL CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL CABLE (NOT WITHIN BENDS)

CONCRETE AND REINFORCING STEEL NOTES:

1. DESIGN AND CONSTRUCTION OF ALL CONCRETE ELEMENTS SHALL CONFORM TO THE LATEST EDITIONS OF ALL APPLICABLE CODES INCLUDING: ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS", ACI 117 "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS", AND ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE."
2. MIX DESIGN SHALL BE APPROVED BY T-MOBILE REP PRIOR TO PLACING CONCRETE.
3. CONCRETE SHALL BE NORMAL WEIGHT, 6 % AIR ENTRAINED (+/- 1.5%) WITH A SLUMP RANGE OF 3-6" AND HAVE A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI UNLESS OTHERWISE NOTED.
4. THE FOLLOWING MATERIALS SHALL BE USED:

PORTLAND CEMENT:	ASTM C150, TYPE 2
REINFORCEMENT:	ASTM A185, PLAIN STEEL WELDED WIRE FABRIC
REINFORCEMENT BARS:	ASTM A615, GRADE 60, DEFORMED
NORMAL WEIGHT AGGREGATE:	ASTM C33
WATER:	ASTM C 94/C 94M
WELDED WIRE FABRIC:	ASTM A185
ADMIXTURES:	
-WATER-REDUCING AGENT:	ASTM C 494/C 494M, TYPE A
-AIR-ENTERING AGENT:	ASTM C 260/C 260M
-SUPERPLASTICIZER:	ASTM C494, TYPE F OR TYPE G
-RETARDING:	ASTM C 494/C 494M, TYPE B

5. MINIMUM CONCRETE COVER FOR REINFORCING STEEL SHALL BE NO LESS THAN 3".
6. A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE IN ACCORDANCE WITH ACI 301 SECTION 4.2.4, UNLESS NOTED OTHERWISE.
7. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL, OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR APPROVAL FROM AN ATC ENGINEER WHEN DRILLING HOLES IN CONCRETE.
8. ADMIXTURES SHALL CONFORM TO THE APPROPRIATE ASTM STANDARD AS REFERENCED IN "METHOD 1" OF ACI 301.
9. DO NOT WELD OR TACK WELD REINFORCING STEEL.
10. ALL DOWELS, ANCHOR BOLTS, EMBEDDED STEEL, ELECTRICAL CONDUITS, PIPE SLEEVES, GROUNDS AND ALL OTHER EMBEDDED ITEMS AND FORMED DETAILS SHALL BE IN PLACE BEFORE START OF CONCRETE PLACEMENT.
11. REINFORCEMENT SHALL BE COLD BENT WHENEVER BENDING IS REQUIRED.
12. DO NOT PLACE CONCRETE IN WATER, ICE, OR ON FROZEN GROUND.
13. FOR COLD-WEATHER (ACI 306) AND HOT-WEATHER (ACI 301M) CONCRETE PLACEMENT, CONFORM TO APPLICABLE ACI CODES AND RECOMMENDATIONS. IN EITHER CASE, MATERIALS CONTAINING CHLORIDE, CALCIUM, SALTS, ETC. SHALL NOT BE USED. PROTECT FRESH CONCRETE FROM WEATHER FOR 7 DAYS, MINIMUM.
14. ALL CONCRETE SHALL HAVE A "SMOOTH FORM FINISH."
15. SPLICING OF REINFORCEMENT IS PERMITTED ONLY AT LOCATIONS SHOWN IN THE CONTRACT DRAWINGS OR AS ACCEPTED BY THE ENGINEER. UNLESS OTHERWISE SHOWN OR NOTED REINFORCING STEEL SHALL BE SPLICED TO DEVELOP ITS FULL TENSILE CAPACITY (CLASS A) IN ACCORDANCE WITH ACI 318.
16. DETAILING OF REINFORCING STEEL SHALL CONFORM TO "ACI MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI 315).
17. ALL SLAB CONSTRUCTION SHALL BE CAST MONOLITHICALLY WITHOUT HORIZONTAL CONSTRUCTION JOINTS, UNLESS SHOWN IN THE CONTRACT DRAWINGS.
18. LOCATION OF ALL CONSTRUCTION JOINTS ARE SUBJECT TO THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, CONFORMANCE WITH ACI 318, AND ACCEPTANCE OF THE ENGINEER. DRAWINGS SHOWING LOCATION OF DETAILS OF THE PROPOSED CONSTRUCTION JOINTS SHALL BE SUBMITTED WITH REINFORCING STEEL PLACEMENT DRAWINGS.
19. SPLICES OF WWF, AT ALL SPLICED EDGES, SHALL BE SUCH THAT THE OVERLAP MEASURED BETWEEN OUTERMOST CROSS WIRES OF EACH FABRIC SHEET IS NOT LESS THAN THE SPACING OF THE CROSS WIRE PLUS 2 INCHES, NOR LESS THAN 6".
20. BAR SUPPORTS SHALL BE ALL-GALVANIZED METAL WITH PLASTIC TIPS.
21. ALL REINFORCEMENT SHALL BE SECURELY TIED IN PLACE TO PREVENT DISPLACEMENT BY CONSTRUCTION TRAFFIC OR CONCRETE. TIE WIRE SHALL BE OF SUFFICIENT STRENGTH FOR INTENDED PURPOSE, BUT NOT LESS THAN NO. 18 GAUGE.
22. SLAB ON GROUND: COMPACT STRUCTURAL FILL TO 95% DENSITY AND THEN PLACE 6" GRAVEL BENEATH SLAB.

ELECTRICAL NOTES:

1. ELECTRICAL DESIGN SHALL BE PERFORMED BY ELECTRICAL CONTRACTOR. STRUCTURAL DESIGN SHALL BE PERFORMED BY GENERAL CONTRACTOR. ELECTRICAL CONTRACTOR SHALL ENSURE THAT ALL WORK COMPLIES WITH ALL APPLICABLE LOCAL AND STATE CODES AND NATIONAL ELECTRICAL CODE.
2. ALL SUGGESTED ELECTRICAL ELEMENTS (SUCH AS BREAKER SIZES, WIRE SIZES, CONDUITS SIZES ARE FOR ZONING PURPOSES ONLY. IT IS THE RESPONSIBILITY TO OF THE ELECTRICAL CONTRACTOR TO CONFIRM COMPLIANCE WITH LOCAL ELECTRICAL CODES AND PASS ALL APPLICABLE AND NECESSARY INSPECTIONS. IN SOME EVENTS, IT MAY BE NECESSARY TO PERFORM AN ELECTRICAL LOAD STUDY TO VERIFY THE CAPACITY OF THE EXISTING SERVICE. THIS IS NOT THE RESPONSIBILITY OF CONCORDIA. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
3. CONTRACTOR SHALL FIELD LOCATE ALL BELOW GRADE GROUND LINES AND UTILITY LINES PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR RELOCATION OF ALL UTILITIES AND GROUND LINES THAT MAY BECOME DISTURBED OR CONFLICTING IN THE COURSE OF CONSTRUCTION.

ALL DISCREPANCIES FROM WHAT IS SHOWN ON THESE CONSTRUCTION DRAWINGS SHALL BE COMMUNICATED TO ATC ENGINEERING IMMEDIATELY FOR CORRECTION OR RE-DESIGN. FAILURE TO COMMUNICATE DIRECTLY WITH ATC ENGINEERING OR ANY CHANGES FROM THE DESIGN CONDUCTED WITHOUT PRIOR APPROVAL FROM ATC ENGINEERING SHALL BE THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

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DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	MJB	08/05/21
0	FOR CONSTRUCTION	RMD	08/31/21

ATC SITE NUMBER:
88013

ATC SITE NAME:
KILLINGWORTH

T-MOBILE SITE NAME:
CTHA376A

SITE ADDRESS:
131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

SEAL

STATE OF CONNECTICUT · ALEC S. NORRIS · 32588 · LICENSED PROFESSIONAL ENGINEER

Digitally signed by Alec Norris
Date: 2021.08.31 11:36:52-04'00'

Alec S. Norris
CONNECTICUT LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 32588
COLLIERS ENGINEERING & DESIGN CT, P.C.
C.T. JPC.0000131

T-Mobile

DATE DRAWN:	08/05/21
ATC JOB NO:	13701109_D3
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

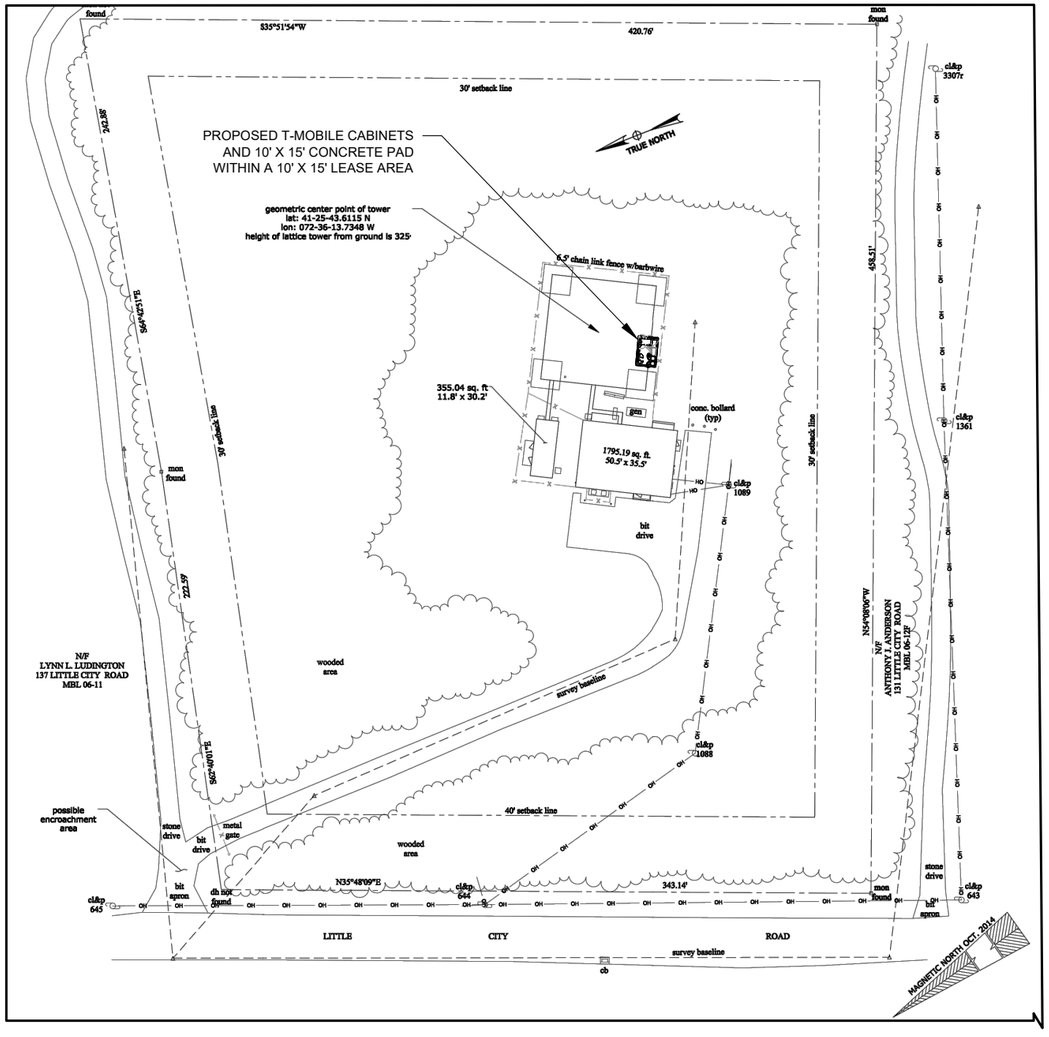
GENERAL NOTES

SHEET NUMBER: G-002

REVISION: 0

NOTES:

1. SURVEY COMPLETED BY CARDINAL ENGINEERING ASSOCIATES DATED 10/13/14.



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DATE DRAWN:	08/05/21
ATC JOB NO:	13701109_D3
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

OVERALL SITE PLAN

SHEET NUMBER:	REVISION:
C-001	0

SITE PLAN NOTES:

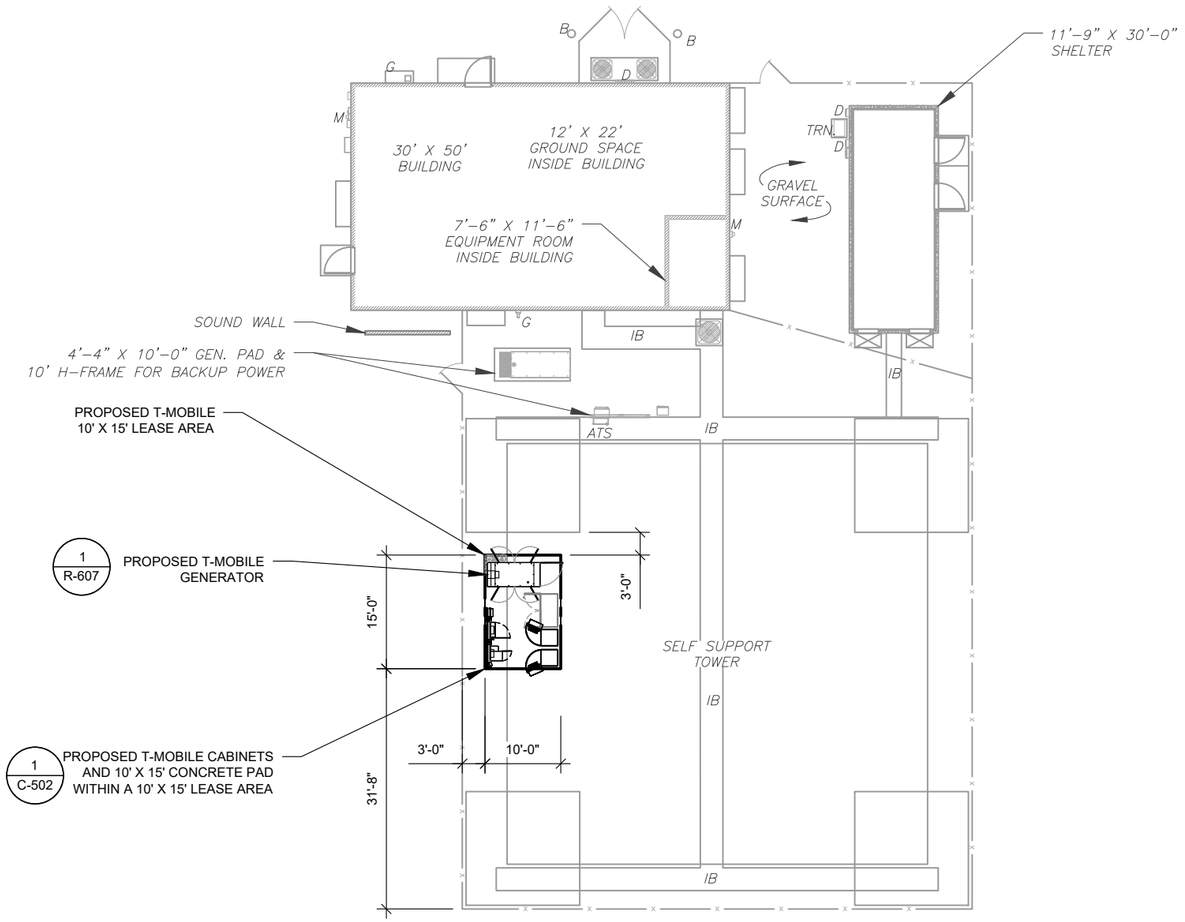
1. THIS SITE PLAN REPRESENTS THE BEST PRESENT KNOWLEDGE AVAILABLE TO THE ENGINEER AT THE TIME OF THIS DESIGN. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO CONSTRUCTION AND VERIFY ALL EXISTING CONDITIONS RELATED TO THE SCOPE OF WORK FOR THIS PROJECT.

2. ICE BRIDGE, CABLE LADDER, COAX PORT, AND COAX CABLE ARE SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL CONFIRM THE EXACT LOCATION OF ALL PROPOSED AND EXISTING EQUIPMENT AND STRUCTURES DEPICTED ON THIS PLAN. BEFORE UTILIZING EXISTING CABLE SUPPORTS, COAX PORTS, INSTALLING NEW PORTS OR ANY OTHER EQUIPMENT, CONTRACTOR SHALL VERIFY ALL ASPECTS OF THE COMPONENTS MEET THE ATC SPECIFICATIONS.

3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE T-MOBILE REPRESENTATIVE AND LOCAL UTILITY COMPANY FOR THE INSTALLATION OF CONDUITS, CONDUCTORS, BREAKERS, DISCONNECTS, OR ANY OTHER EQUIPMENT REQUIRED FOR ELECTRICAL SERVICE. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LATEST EDITION OF THE STATE AND NATIONAL CODES, ORDINANCES AND REGULATIONS APPLICABLE TO THIS PROJECT.

LEGEND

⊗	GROUNDING TEST WELL
ATS	AUTOMATIC TRANSFER SWITCH
B	BOLLARD
CSC	CELL SITE CABINET
D	DISCONNECT
E	ELECTRICAL
F	FIBER
GEN	GENERATOR
G	GENERATOR RECEPTACAL
HH, V	HAND HOLE, VAULT
IB	ICE BRIDGE
K	KENTROX BOX
LC	LIGHTING CONTROL
M	METER
PB	PULL BOX
PP	POWER POLE
T	TELCO
TRN	TRANSFORMER
—x—	CHAINLINK FENCE



1 DETAILED SITE PLAN

GRAPHIC SCALE

20 0 10 20

(IN FEET)
1 UNIT = 20 FEET

PROPOSED CABLE LENGTH:

1. ESTIMATED LENGTH OF PROPOSED CABLE IS **285'**. ESTIMATED LENGTH OF CABLE WAS PROVIDED BY CUSTOMER OR CALCULATED BY ADDING THE RAD CENTER AND THE DISTANCE FROM THE SHELTER ENTRY PLATE TO THE TOWER (ALONG THE ICE BRIDGE) AND A SAFETY FACTOR MEASUREMENT OF 15% (OF THE TWO PREVIOUS VALUES), CDS DEFER TO GREATEST CABLE LENGTH.
2. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. WHERE POSSIBLE UTILIZE EXISTING CABLE SUPPORT STRUCTURES AS PROVIDED FOR CARRIER TO ADEQUATELY SECURE CABLES, USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER. OTHERWISE, ATTACH CABLES TO HORIZONTAL OR DIAGONAL TOWER MEMBERS USING PROPOSED STAINLESS STEEL ADAPTERS (DO NOT ATTACH TO TOWER LEG).

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A	PRELIM	MJB	08/05/21
0	FOR CONSTRUCTION	RMD	08/31/21

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88013

ATC SITE NAME:
KILLINGWORTH

T-MOBILE SITE NAME:
CTHA376A

SITE ADDRESS:
131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

SCALE: AS SHOWN

STATE OF CONNECTICUT · ALEC S. NORRIS · 32588 · LICENSED PROFESSIONAL ENGINEER

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Date: 2021.08.31 11:36:56-04'00'

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T-Mobile

DATE DRAWN:	08/05/21
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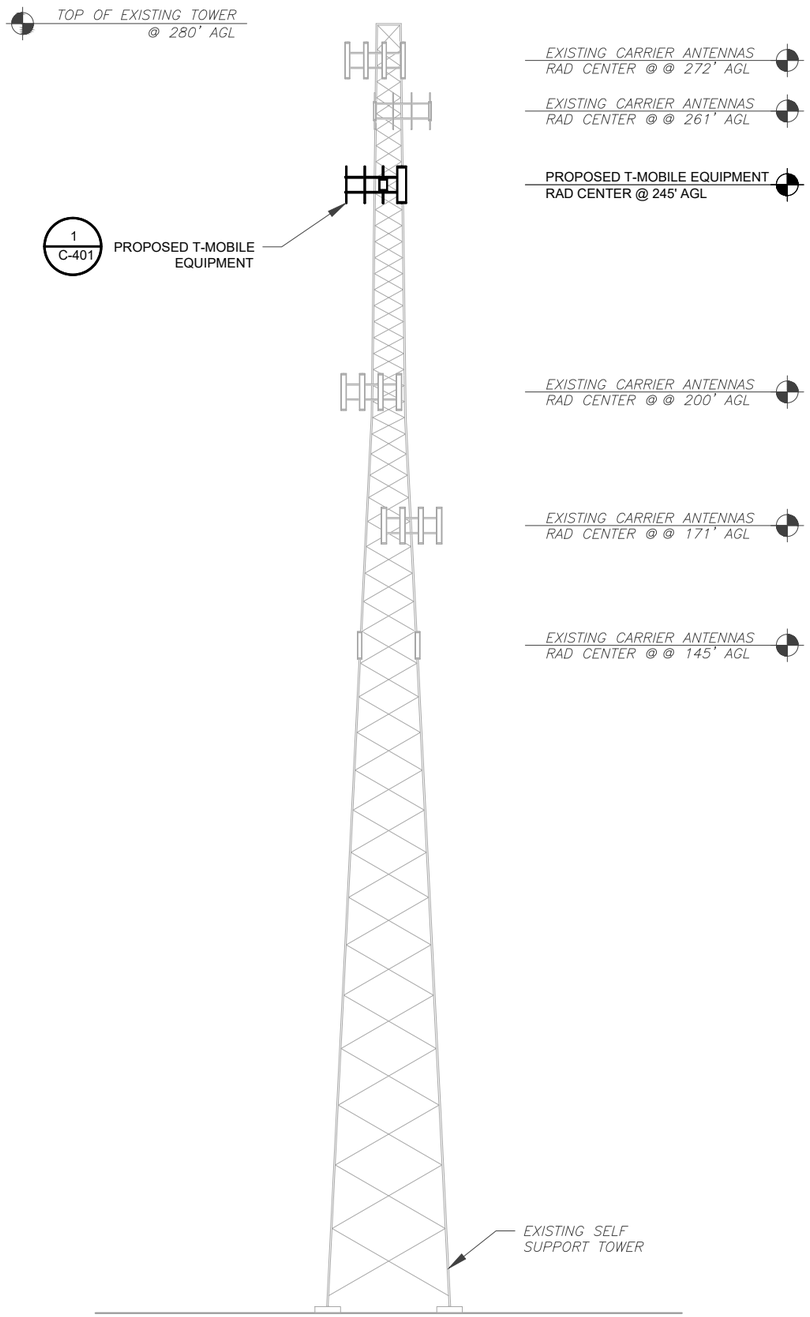
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

DETAILED SITE PLAN

SHEET NUMBER:	REVISION:
C-101	0



1 TOWER ELEVATION
SCALE: N.T.S.

PER MOUNT ANALYSIS COMPLETED BY CENTEK ENGINEERING, DATED 07/15/21, THE PROPOSED MOUNT CAN ADEQUATELY SUPPORT THE PROPOSED LOADING.

TOWER NOTE:

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM WITH THE PROJECT MANAGER THAT THEY HAVE THE MOST RECENT VERSION OF THE STRUCTURAL ANALYSIS BEFORE COMMENCING WORK. EXISTING AND PROPOSED TOWER APPURTENANCES, MOUNTS, AND ANTENNAS ARE SHOWN BASED ON THE STRUCTURAL ANALYSIS.
2. WHERE APPLICABLE, ALL NEW ANTENNAS, EQUIPMENT, MOUNTS, CABLING, ETC. SHALL BE PAINTED/SOCKED TO MATCH EXISTING EQUIPMENT IN ACCORDANCE WITH FAA, JURISDICTION, AND/OR OTHER LOCAL REQUIREMENTS.
3. ROUTE PROPOSED CABLES ALONG SAME PATH AS EXISTING CABLES AND IN ACCORDANCE WITH STRUCTURAL ANALYSIS. WHERE POSSIBLE UTILIZE EXISTING CABLE SUPPORT STRUCTURES AS PROVIDED FOR CARRIER TO ADEQUATELY SECURE CABLES, USING EITHER APPROPRIATELY SIZED STAINLESS STEEL SNAP-INS OR MOUNTING HARDWARE AND BRACKETS AS SPECIFIED BY CABLE MANUFACTURER. OTHERWISE, ATTACH CABLES TO HORIZONTAL OR DIAGONAL TOWER MEMBERS USING PROPOSED STAINLESS STEEL ADAPTERS (DO NOT ATTACH TO TOWER LEG).
4. TOWER ELEVATIONS ARE MEASURED FROM TOP OF BASE PLATE TO MATCH STRUCTURAL ANALYSIS. ELEVATIONS DO NOT REFLECT TRUE ABOVE GROUND LEVEL (A.G.L.)

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REV.	DESCRIPTION	BY	DATE
A	PRELIM	MJB	08/05/21
0	FOR CONSTRUCTION	RMD	08/31/21

ATC SITE NUMBER:
88013

ATC SITE NAME:
KILLINGWORTH

T-MOBILE SITE NAME:
CTHA376A

SITE ADDRESS:
131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

SCALE:

STATE OF CONNECTICUT · ALEC S. NORRIS · 32588 · LICENSED PROFESSIONAL ENGINEER

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Date: 2021.08.31 11:36:58-04'00'

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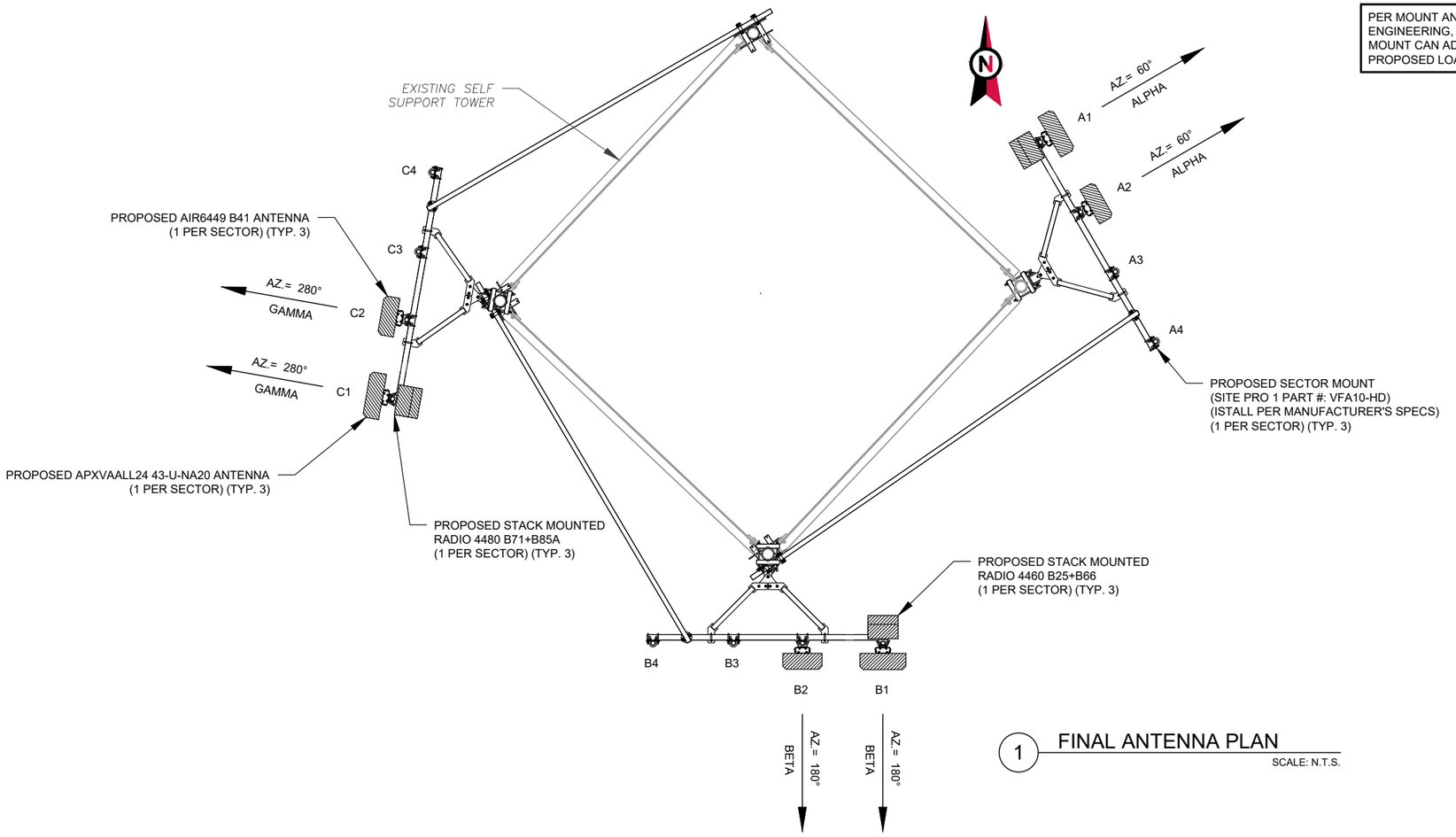
T-Mobile

DATE DRAWN:	08/05/21
ATC JOB NO:	13701109_D3
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

TOWER ELEVATION

SHEET NUMBER:	REVISION:
C-201	0

PER MOUNT ANALYSIS COMPLETED BY CENTEK ENGINEERING, DATED 07/15/21, THE PROPOSED MOUNT CAN ADEQUATELY SUPPORT THE PROPOSED LOADING.



1 FINAL ANTENNA PLAN

SCALE: N.T.S.

FINAL ANTENNA SCHEDULE								
LOCATION			ANTENNA SUMMARY				NON ANTENNA SUMMARY	
SECTOR	RAD	AZ	POS	ANTENNA	BAND	MECH/ELEC D-TILT	ADDITIONAL TOWER MOUNTED EQUIPMENT	DISTRIBUTION BOX / CABLING
ALPHA	245'	60°	A1	APXVALL24 43-U-NA20	L600/L700/L1900/L2100/ N600/U1900/U2100/G1900	0/5/5/3/3	RADIO 4460 B25+B66 RADIO 4480 B71+B85	(3) 1.99" 6/24 4AWG 100M HYBRID CABLES W/ PENDANT
			A2	AIR6449 B41	L2500/N2500	0/2/2	-	
			A3	-	-	-	-	
			A4	-	-	-	-	
BETA	245'	180°	B1	APXVALL24 43-U-NA20	L600/L700/L1900/L2100/ N600/U1900/U2100/G1900	0/5/5/3/3	RADIO 4460 B25+B66 RADIO 4480 B71+B85	
			B2	AIR6449 B41	L2500/N2500	0/2/2	-	
			B3	-	-	-	-	
			B4	-	-	-	-	
GAMMA	245'	280°	C1	APXVALL24 43-U-NA20	L600/L700/L1900/L2100/ N600/U1900/U2100/G1900	0/5/5/3/3	RADIO 4460 B25+B66 RADIO 4480 B71+B85	
			C2	AIR6449 B41	L2500/N2500	0/2/2	-	
			C3	-	-	-	-	
			C4	-	-	-	-	
1. CONFIRM WITH T-MOBILE REP FOR APPLICABLE UPDATES/REVISIONS AND MOST RECENT RFDS FOR NSN CONFIGURATION (CONFIG). GC TO CAP ALL UNUSED PORTS. 2. CONFIRM SPACING OF PROPOSED EQUIP DOES NOT CAUSE TOWER CONFLICTS NOR IMPEDE TOWER CLIMBING PEGS.								

2 ANTENNA SCHEDULE

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0	FOR CONSTRUCTION	RMD	08/31/21

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88013

ATC SITE NAME:
KILLINGWORTH

T-MOBILE SITE NAME:
CTHA376A

SITE ADDRESS:
131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

SCALE:

STATE OF CONNECTICUT · ALEC S. NORRIS · 32588 · LICENSED PROFESSIONAL ENGINEER

Digitally signed by Alec Norris
Date: 2021.08.31 11:37:00-04'00'

Alec S. Norris
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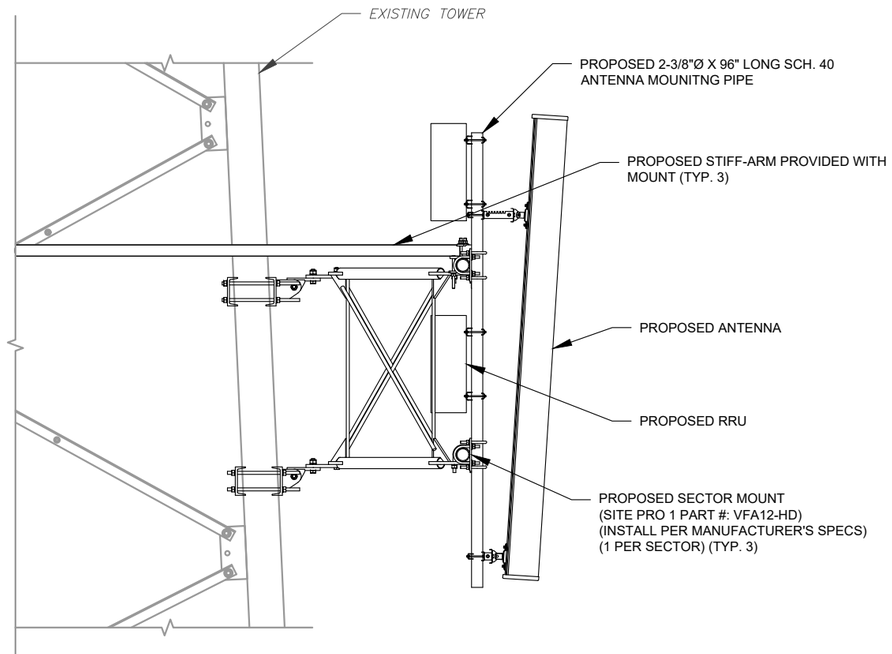
LICENSE NUMBER: 32588
COLLIERS ENGINEERING & DESIGN CT, P.C.
C.T. JPC.0000131

T-Mobile

DATE DRAWN:	08/05/21
ATC JOB NO:	13701109_D3
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

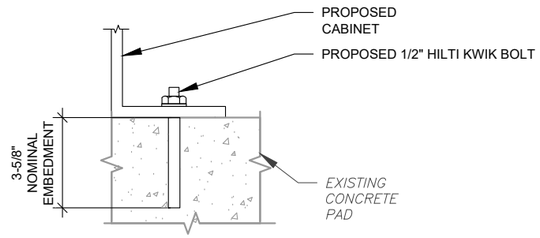
ANTENNA INFORMATION & SCHEDULE

SHEET NUMBER:	REVISION:
C-401	0



1 PROPOSED ANTENNA MOUNTING DETAIL (ELEVATION)

SCALE: NOT TO SCALE



NOTE:

INSTALL HILTI KWIK BOLT ANCHORS STRICTLY PER INSTALLATION INSTRUCTIONS INCLUDED WITH PRODUCT OR FOUND ONLINE AT WWW.US.HILTI.COM. PROPER INSTALLATION IS CRITICAL FOR FULL PERFORMANCE.

2 CABINET ATTACHMENT DETAIL

SCALE: NOT TO SCALE

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Doing Business as MASER CONSULTING

MADISON
135 New Road

Madison, CT 06443
Phone: 860.395.0055

COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	MJB	08/05/21
0	FOR CONSTRUCTION	RMD	08/31/21

ATC SITE NUMBER:
88013

ATC SITE NAME:
KILLINGWORTH

T-MOBILE SITE NAME:
CTHA376A

SITE ADDRESS:
131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

SCALE:

STATE OF CONNECTICUT · ALEC S. NORRIS · 32588 · LICENSED PROFESSIONAL ENGINEER

Digitally signed by Alec Norris
Date: 2021.08.31 11:37:02-04'00'

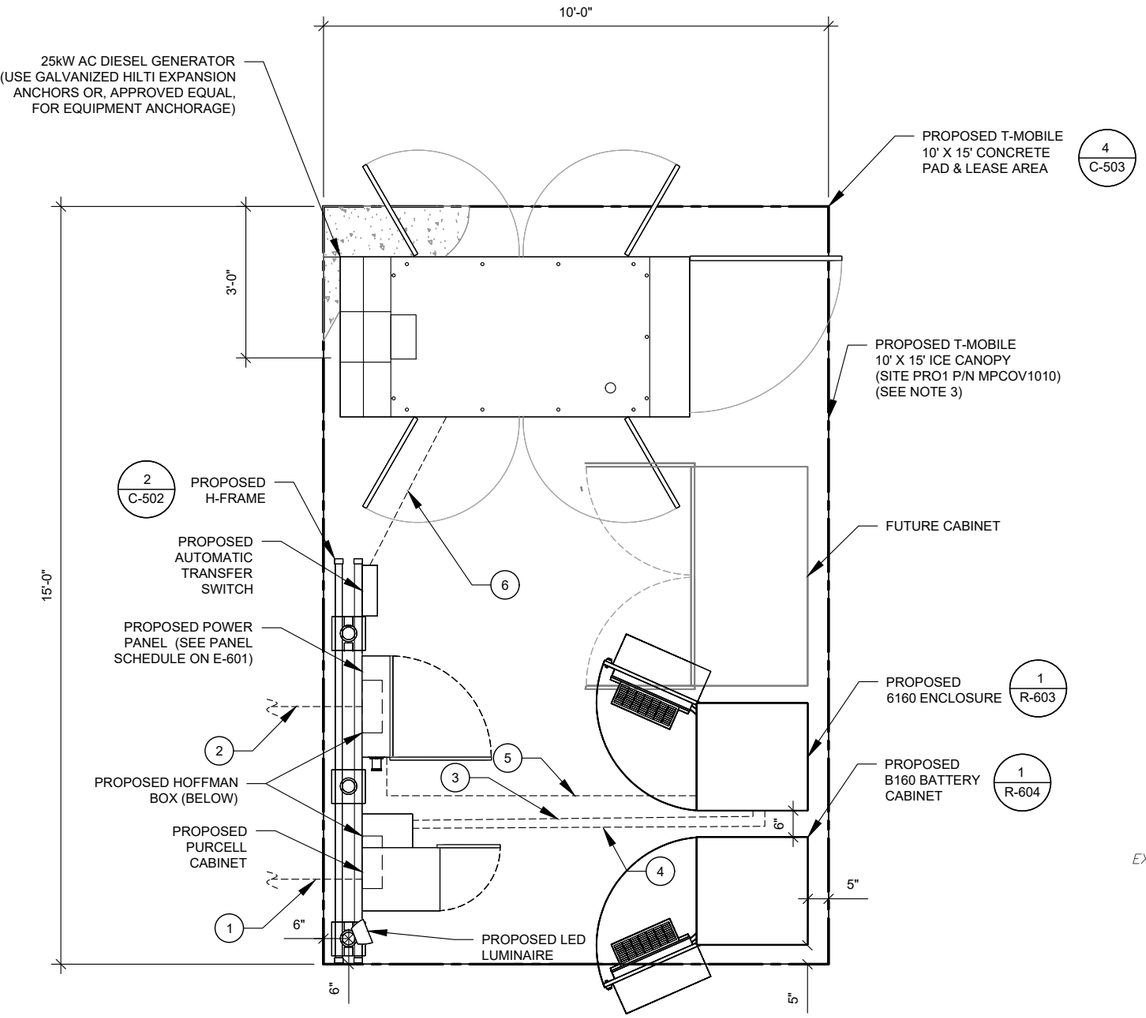
Alec S. Norris
CONNECTICUT LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 32588
COLLIERS ENGINEERING & DESIGN CT, P.C.
C.T. JPC.0000131

T-Mobile

DATE DRAWN:	08/05/21
ATC JOB NO:	13701109_D3
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

CONSTRUCTION DETAILS

SHEET NUMBER:	REVISION:
C-501	0



EQUIPMENT POWER NOTES:

2" CONDUIT W/ 3-#3/0 CU, (1) #6 AWG G, PPC POWER

2" CONDUIT FOR TELCO FEEDER SERVICE TO TELCO SOURCE PER UTILITY

2-#12, 1 #12G IN 3/4" CONDUIT FROM TELCO CAB TO 6160

3-#1, 1-#8 IN 2" CONDUIT

2" CONDUIT, FOR CAT6

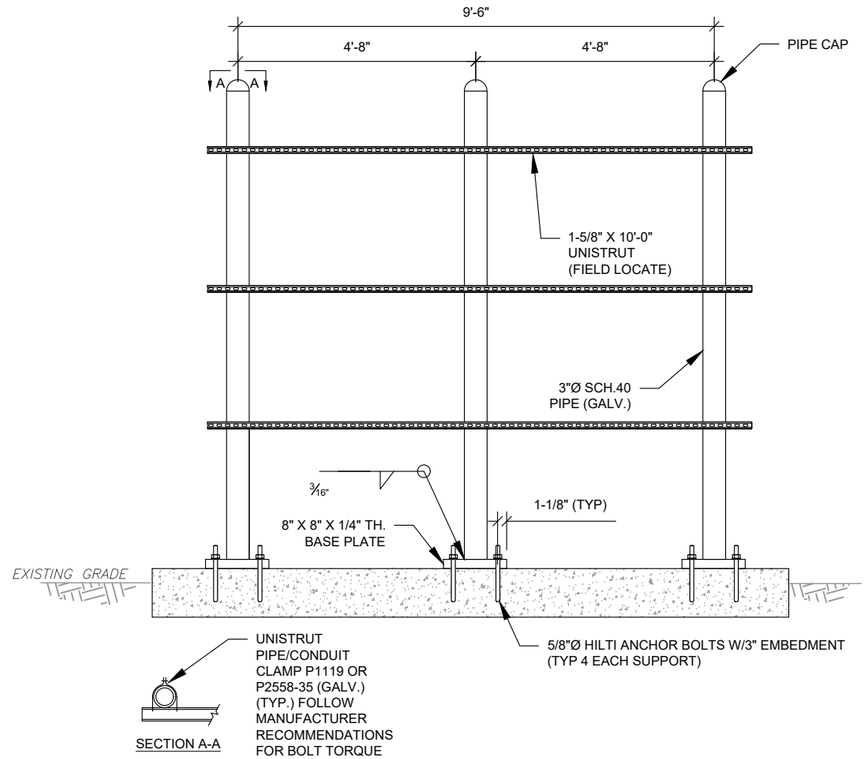
(2) CONDUITS CONNECTING FROM AC GENERATOR TO ATS PER MANUFACTURER SPECIFICATION

NOTE:
1. CABINETS SHALL BE ORIENTED AND INSTALLED EXACTLY AS SHOWN
2. WEIGHT OF BTS UNIT IS 615 LBS (WEIGHT IS WITHOUT EQUIPMENT)

1 DETAILED EQUIPMENT LAYOUT
SCALE: NOT TO SCALE

H-FRAME NOTES:

1. IF IT IS NECESSARY TO EXTEND THE H-FRAME, AN ADDITIONAL POST WILL ALWAYS BE REQUIRED.
2. PROPOSED UNISTRUTS TO BE FIELD CUT AND SHOULD NOT EXTEND MORE THAN 6 INCHES BEYOND THE LAST POST.
3. SPRAY ENDS OF UNISTRUT WITH COLD GALVANIZING SPRAY PAINT, ALLOW TO DRY, THEN COVER WITH RUBBER PROTECTIVE CAPS FOR SAFETY.
4. UNISTRUT TO BE CUT FLUSH WITH NO SHARP OR JAGGED EDGES.
5. ALL PROPOSED HARDWARE TO BE MOUNTED PER MANUFACTURERS SPECS.



2 TYPICAL H-FRAME DETAIL
SCALE: NOT TO SCALE

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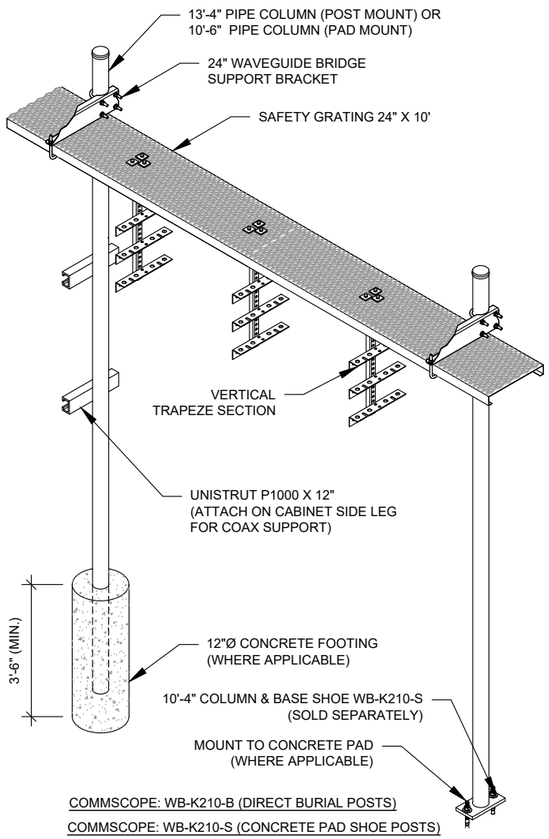
CONSTRUCTION DETAILS

SHEET NUMBER:	REVISION:
C-502	0



COMMSCOPE: WB-K210-B (DIRECT BURIAL POSTS)

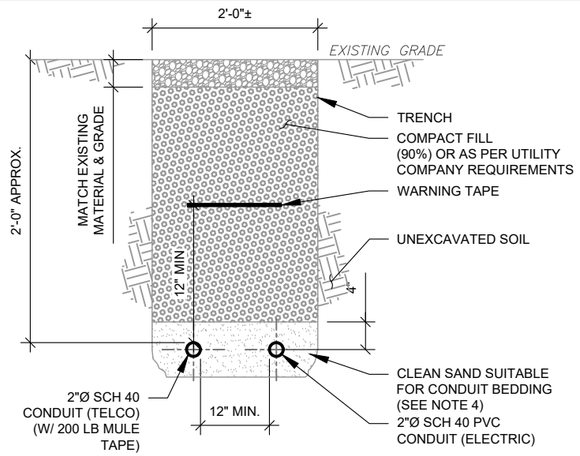
COMMSCOPE: WB-K210-S (CONCRETE PAD SHOE POSTS)

CONSTRUCTION NOTE:

1. INSTALL ICE BRIDGE TO ALLOW 7 FEET CLEARANCE ABOVE GRADE TO LOWEST APPURTENANCE.
2. INSTALL PER MANUFACTURES SPECIFICATION.

1 WAVEGUIDE BRIDGE KIT

SCALE: NOT TO SCALE

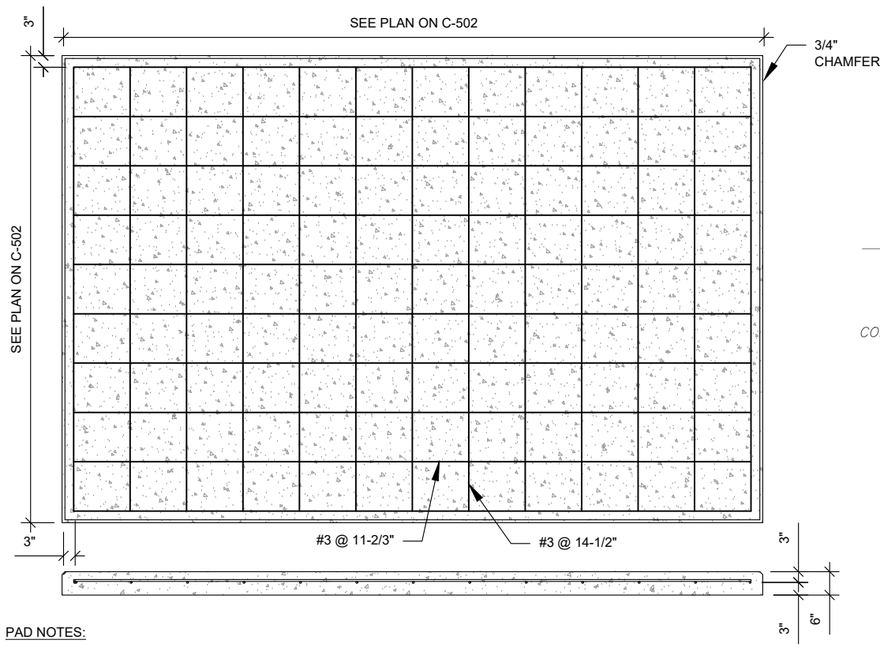


TRENCH NOTES:

1. IF FREE OF ORGANIC OR OTHER DELETERIOUS MATERIAL, EXCAVATED MATERIAL MAY BE USED FOR BACKFILL.
2. IF NOT, PROVIDE CLEAN, COMPACTIBLE MATERIAL. COMPACT IN 8" LIFTS. REMOVE ANY LARGE ROCKS PRIOR TO BACKFILLING. CONTRACTOR TO VERIFY LOCATION OF EXISTING U/G UTILITIES PRIOR TO DIGGING.
3. IF CURRENT AS-BUILT DRAWINGS ARE NOT AVAILABLE CONTRACTOR SHALL HAND DIG U/G TRENCHING.
4. CONCRETE ENCASE CONDUIT WHEN TRENCHING UNDER SITE ACCESS ROAD.

2 TELCO AND POWER CONDUIT JOINT TRENCH

SCALE: N.T.S.

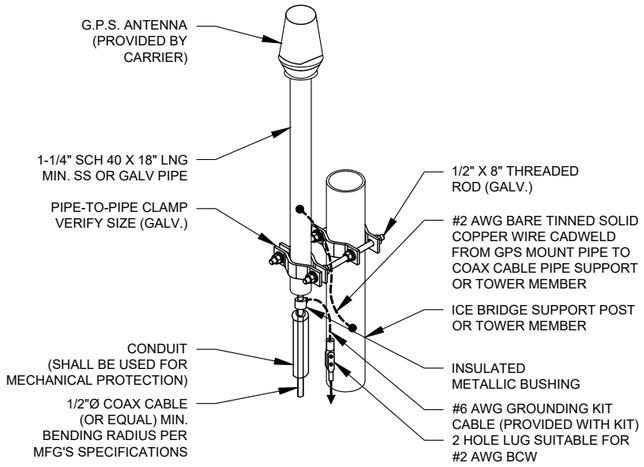


PAD NOTES:

1. PADS SHALL BE PRE-CAST MATCHING THIS DESIGN WHERE ALLOWED BY LOCAL JURISDICTION.
2. REFER TO CONCRETE & REINFORCED STEEL NOTES ON SHEET G-002 & ATC SPEC 033000 FOR CAST-IN-PLACE PADS.

4 REINFORCED PAD LAYOUT

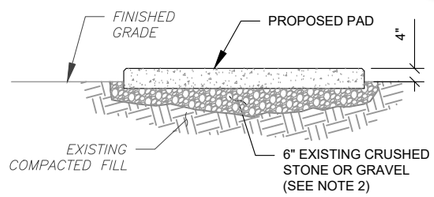
SCALE: NOT TO SCALE



NOTE:
1. GPS SHALL BE PLACED WITH CLEAR SIGHT LINE TO THE SOUTHERN SKY.
2. CONTRACTOR TO SUPPLY COAX FOR GPS UNIT.

3 GPS ANTENNA ATTACHMENT DETAIL

SCALE: NOT TO SCALE



PAD NOTES:

1. SUBGRADE AND FILL SHALL CONSIST OF CLEAN SOIL. DELETRIOUS MATERIAL AND ORGANICS SHALL BE REMOVED.
2. MECHANICALLY COMPACT FOOTPRINT OF PAD PLUS 2' PERIMETER.
3. USE GALVANIZED HILTI EXPANSION ANCHORS OR, APPROVED EQUAL, FOR EQUIPMENT ANCHORAGE.
4. FOR SIZE AND LOCATION OF ANCHORS AND OTHER REQUIREMENT, SEE EQUIPMENT VENDOR DRAWINGS.

5 GRAVEL PREPARATION

SCALE: NOT TO SCALE

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CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

CONSTRUCTION DETAILS

SHEET NUMBER:	REVISION:
C-503	0

GROUNDING NOTES:

1. ALL EQUIPMENT ENCLOSURES, DEVICES AND CONDUITS SHALL BE GROUNDED TO CONFORM WITH THE LATEST REQUIREMENTS OF THE NEC BY THE INSTALLATION OF A SEPARATE, GREEN, INSULATED GROUND CONDUCTOR FOR ALL FEEDER AND BRANCH CIRCUITS. GROUND CONDUCTORS SHALL BE OF THE SIZE INDICATED ON THE DRAWINGS. GROUND CONDUCTORS SHALL BE CONTINUOUS IN LENGTH AND SHALL BE BONDED TO EACH ENCLOSURE THEY PASS THROUGH. CONDUIT SHALL NOT BE USED AS A GROUNDING CONDUCTOR.

2. GROUNDING CONDUCTORS SHALL:
   - A. BE #2 AWG SOLID BARE TINNED COPPER (SBTC) FOR ALL GROUNDING SYSTEM WIRE UNLESS OTHERWISE NOTED, OR OTHERWISE REQUIRED BY CODE.
   - B. BE MINIMUM 12" BEND RADIUS. KEEP NUMBER OF BENDS TO A MINIMUM.
   - C. AVOID LONG BONDING CONNECTION RUNS. MAKE DIRECT AS POSSIBLE.
   - D. NOT HAVE ANY U-SHAPED RUNS.
   - E. BE IN NON-METALLIC CONDUIT ONLY, IF IN CONDUIT.
   - F. BE PLACED THROUGH NON-METALLIC SLEEVES IN FLOORS, WALLS, CEILINGS, ETC.
   - G. PROTECTED IN NON-METALLIC CONDUIT WHERE EXPOSED ABOVE GRADE.

2. INSTALL ALL GROUNDING RINGS AND RADIALS WITH CONDUCTIVE CEMENT, SANKOSHA AS DISTRIBUTED BY ELECTRIC MOTION COMPANY, INC., WINSTED, CT 06098, OR AS SPECIFICALLY INDICATED. INSTALL PER MANUFACTURER'S SPECIFICATIONS.

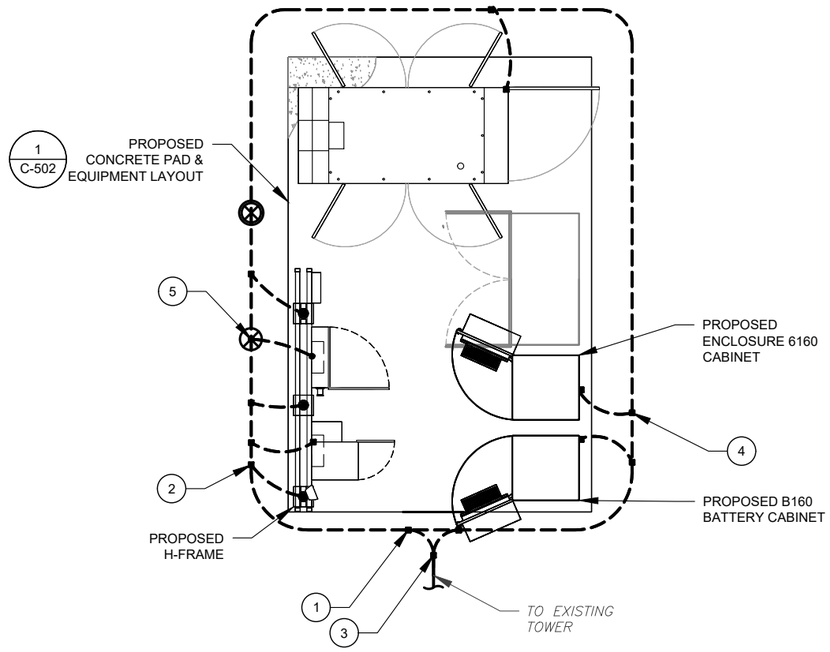
3. GROUND RINGS SHALL BE:
   - A. MINIMUM 30" BELOW GRADE, OR BELOW FROST LINE WHICHEVER IS DEEPER.
   - B. MINIMUM 2' FROM FOUNDATIONS, FOOTINGS, OTHER GROUNDING SYSTEMS AND ALL CONDUCTIVE OBJECTS.
   - C. WITH MINIMUM 12" BEND RADII.
   - D. WITH ALL CONNECTIONS IN CONTACT WITH EARTH, BONDED BY EXOTHERMIC WELDING.
   - E. BONDED TO A SINGLE POINT GROUND (SPG) WITH A SINGLE WIRE AS INDICATED ON DRAWINGS.

4. GROUND RODS SHALL BE:
   - A. MINIMUM 5/8" DIAMETER.
   - B. MINIMUM 10' LONG.
   - C. COPPER-CLAD GALVANIZED STEEL OR STAINLESS STEEL.
   - D. PLACED IN UNDISTURBED SOIL AND BELOW THE FROST LINE.
   - E. INSTALLED WITH MINIMUM SEPARATION DISTANCE OF TWICE THE DEPTH OF THE ROD(S), OR AS INDICATED ON DRAWINGS.
   - F. MINIMUM TWO (2) RODS ON THE TOWER RING OR ONE (1) PER LEG WHICHEVER IS LARGER, MINIMUM FOUR (4) RODS ON EVERY EQUIPMENT BUILDING RING WITH ONE AT EACH CORNER OR AS INDICATED, MINIMUM ONE (1) ROD FOR POWER SERVICE GROUNDING ELECTRODE, AND MINIMUM ONE (1) ROD AT END OF EACH RADIAL.

5. CONDUCTIVE OBJECTS, SUCH AS FENCES, SHALL BE BONDED TO THE GROUNDING SYSTEM IF WITHIN 20' OF THE TOWER GROUNDING SYSTEM, OR 5' OF ANY OTHER GROUNDED COMPONENT.

EQUIPMENT POWER NOTES:

1. 2" CONDUIT W/ 3-#3/0 CU, (1) #6 AWG G, PPC POWER
2. 2" CONDUIT W/ MULE TAPE FOR TELCO FEEDER SERVICE TO TELCO SOURCE PER UTILITY
3. 2-#12, 1 #12G IN 3/4" CONDUIT FROM TELCO CAB TO 6160
4. 3-#1/0, 1-#6 IN 2" CONDUIT
5. 2" CONDUIT, FOR CAT6



1 DETAILED GROUNDING PLAN

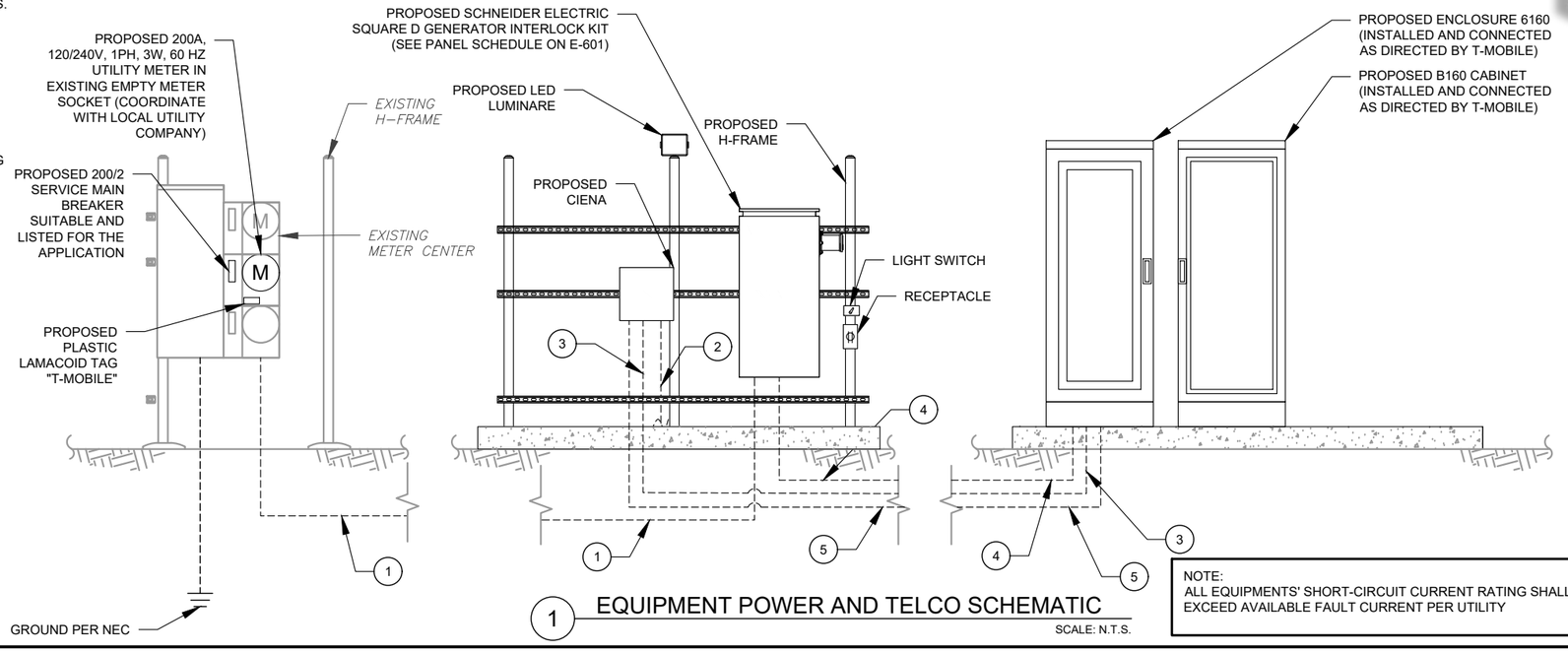
SCALE: NOT TO SCALE

GROUNDING PLAN LEGEND:

- EXISTING GROUND WIRE
- GROUND WIRE
- EXOTHERMIC WELD
- MECHANICAL WELD
- COPPER GROUND ROD
- TEST WELL

GROUNDING KEYED NOTES:

1. BOND TO TOWER GROUND RING
2. #2 AWG BOND FROM VERTICAL H-FRAME AND ICE BRIDGE POST TO EXTERNAL GROUND RING (TYP. EVERY POST).
3. #2 AWG SBTC BOND FROM TOWER GROUND RING TO EQUIPMENT.
4. EQUIPMENT BOND TO GROUND RING (TYP.)
5. 5/8Ø" X 10 FT GROUND ROD.



1 EQUIPMENT POWER AND TELCO SCHEMATIC

SCALE: N.T.S.

NOTE:
ALL EQUIPMENTS' SHORT-CIRCUIT CURRENT RATING SHALL EXCEED AVAILABLE FAULT CURRENT PER UTILITY

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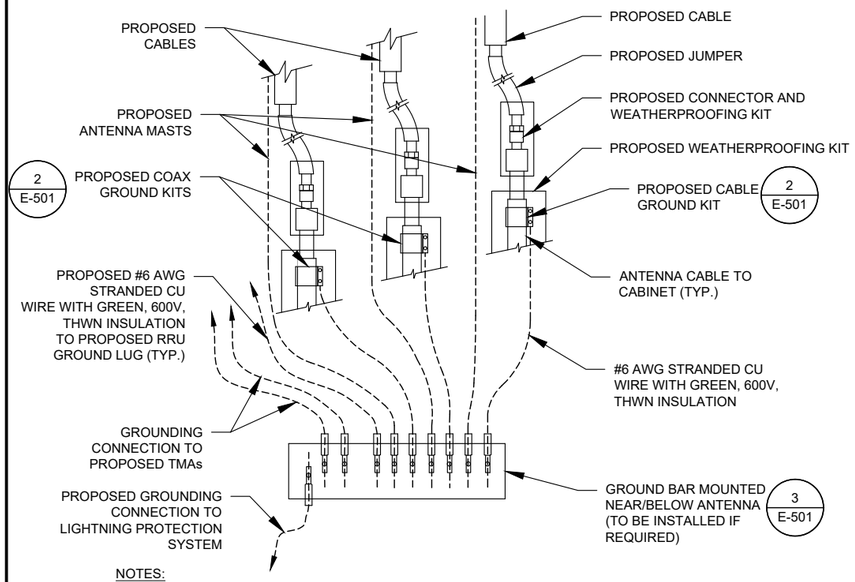
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

GROUNDING DETAILS & ELECTRICAL SCHEMATIC

SHEET NUMBER:	REVISION:
E-101	0

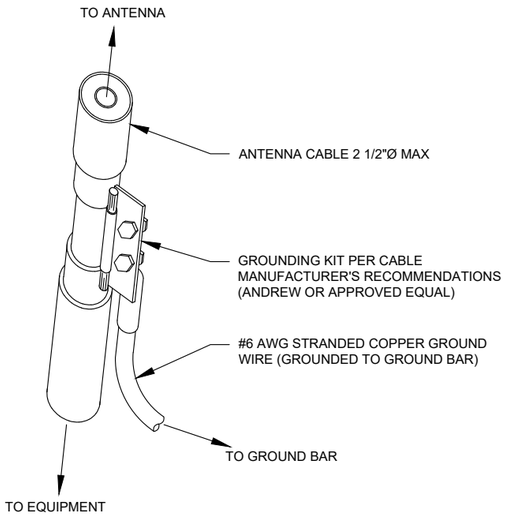


NOTES:

1. THIS DETAIL IS INTENDED TO SHOW THE GENERAL GROUNDING REQUIREMENTS. SLIGHT ADJUSTMENTS MAY BE REQUIRED BASED ON EXISTING SITE CONDITIONS. THE CONTRACTOR SHALL MAKE FIELD ADJUSTMENTS AS NEEDED AND INFORM THE CONSTRUCTION MANAGER OF ANY CONFLICTS.
2. SITE GROUNDING SHALL COMPLY WITH T-MOBILE GROUNDING STANDARDS, LATEST EDITION, AND COMPLY WITH T-MOBILE GROUNDING CHECKLIST, LATEST VERSION. WHEN NATIONAL AND LOCAL GROUNDING CODES ARE MORE STRINGENT THEY SHALL GOVERN.

1 TYPICAL ANTENNA GROUNDING DIAGRAM

SCALE: N.T.S.

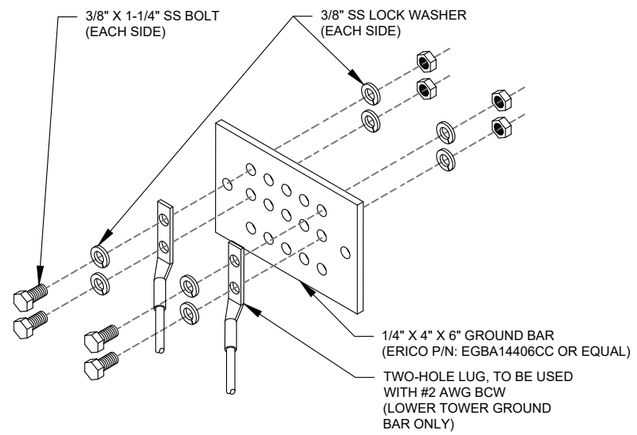


GROUND KIT NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. CONTRACTOR SHALL PROVIDE WEATHERPROOFING KIT (ANDREW PART NUMBER 221213) AND INSTALL/TAPE PER MANUFACTURER'S SPECIFICATIONS.

2 CABLE GROUND KIT CONNECTION DETAIL

SCALE: N.T.S.

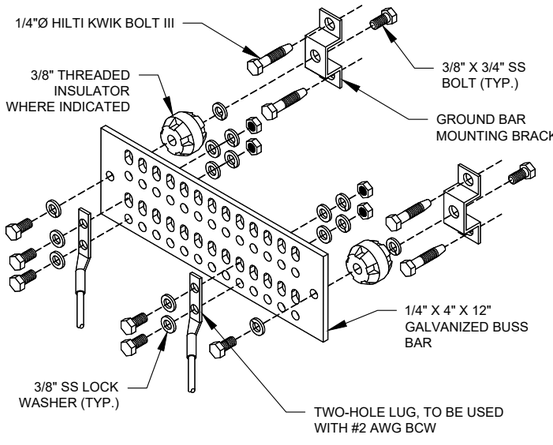


GROUND BAR NOTES:

1. GROUND BAR KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR TO BE BONDED DIRECTLY TO TOWER.

3 TOWER GROUND BAR DETAIL

SCALE: N.T.S.

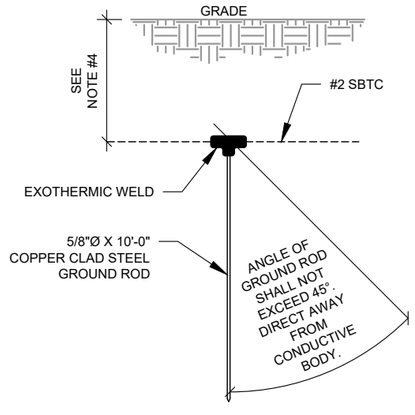


GROUND BAR NOTES

1. GROUND KITS COME WITH ALL HARDWARE, NUTS, BOLTS, WASHERS, ETC. EXCEPT THE STRUCTURAL MOUNTING MEMBER(S).
2. GROUND BAR SHALL BE BOLTED TO STRUCTURAL MEMBER OR ANCHORED TO CONCRETE SLAB W/ HILTI KWIK BOLT III.

4 MAIN GROUND BAR DETAIL

SCALE: N.T.S.

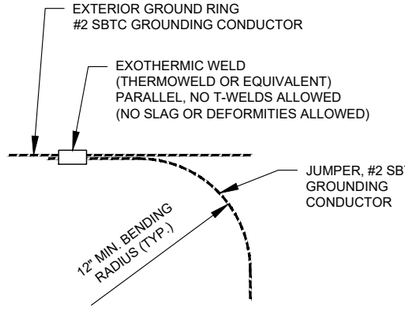


NOTES:

1. SEPARATION DIMENSION TO BE VERIFIED WITH LOCAL UTILITY COMPANY REQUIREMENTS.
2. COORDINATE UTILITY, LOCATE BEFORE DIGGING.
3. CONDUIT TRENCHING DEPTHS AT 36" OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.
4. ALL RING AND RADIAL DEPTHS AT 30" OR 6" BELOW FROST LINE, WHICHEVER IS GREATER.

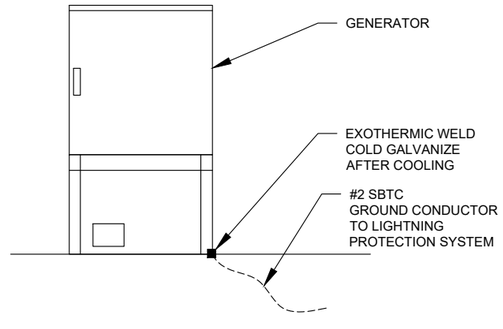
5 GROUND ROD DETAIL

SCALE: N.T.S.



6 TIE CONNECTION DETAIL

SCALE: N.T.S.



GENERATOR INSTALLATION NOTE:

INSTALL GENERATOR AND TRANSFER SWITCH WITH ALL SUPPLIED ACCESSORIES PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND SPECIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, ACCESSORIES FOR THE EXHAUST SYSTEM, FUEL SYSTEM, ENCLOSURE INTEGRITY (CAPS, PLUGS, COVERS, ETC.), ELECTRICAL CONNECTIONS, AND GROUNDING CONNECTIONS.

7 GENERATOR GROUNDING

SCALE: N.T.S.

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GROUNDING DETAILS

SHEET NUMBER:	REVISION:
E-501	0

PANEL DESIGNATION: ***TMO***

TYPE: LIGHTING & APPLIANCE
MOUNTING: SURFACE
ENCLOSURE: NEMA 3R

SYSTEM: 120/240V, 1Ø, 3W, 20 CKT
MAIN BREAKER (MB): 200A
MAIN BUS RATING: 200A
MIN. A.I.C. RATING: N/A

LOCATION: TMO LEASE EQUIPMENT AREA
PANEL NOTES: PROPOSED

CONNECTED LOAD (kVA)		BRIEF DESCRIPTION	FEEDER OR BRANCH CIRCUIT								FEEDER OR BRANCH CIRCUIT							BRIEF DESCRIPTION	CONNECTED LOAD (kVA)	
			BREAKER		CIRCUIT			POLE	CIRC.		CIRC.	POLE	CIRCUIT			BREAKER				
A	**B**		AMPS	POLES	WIRE	GND	COND.	NO.	NOTES		NOTES	NO.	COND.	GND	WIRE	POLES	AMPS		**A**	**B**
7.50		ENCLOSURE 6160	150	2	3-#1/0	#6	2"	1				2	1/2"	#12	2-#12	1	20	RECEPTACLE	0.18	
	7.50							3				4	1/2"	#12	2-#12	1	20	LIGHT		0.50
0.01		SURGE	60	2	3-#6	#10	1"	5				6	1/2"	#12	2-#12	1	20	AAV GFCI RECEPTACLE	0.18	
	0.01							7				8								0.00
0.00								9				10							0.00	
	0.00							11				12								0.00
0.00								13				14							0.00	
	0.00							15				16								0.00
0.00								17				18							0.00	
	0.00							19				20								0.00
7.5	7.5								**A**	**B**	**TOTAL**								0.4	0.5
									7.9	8.0	15.9	CONNECTED LOAD (kVA)								
									7.9	8.0	15.9	DEMAND LOAD (kVA)								

DERATING FACTOR (80%)
DEMANDLOAD SIZING: *83 AMPS*

1 PANEL SCHEDULE

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Madison, CT 06443
Phone: 860.395.0055
COLLIERS ENGINEERING & DESIGN CT, P.C.
DOING BUSINESS AS MASER CONSULTING

REV.	DESCRIPTION	BY	DATE
A	PRELIM	MJB	08/05/21
0	FOR CONSTRUCTION	RMD	08/31/21

ATC SITE NUMBER:
88013

ATC SITE NAME:
KILLINGWORTH

T-MOBILE SITE NAME:
CTHA376A

SITE ADDRESS:
131 LITTLE CITY ROAD
KILLINGWORTH, CT 06419

SCALE:

STATE OF CONNECTICUT · ALEC S. NORRIS · 32588 · LICENSED PROFESSIONAL ENGINEER

Digitally signed by Alec Norris
Date: 2021.08.31 11:37:14-04'00'

Alec S. Norris
CONNECTICUT LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 32588
COLLIERS ENGINEERING & DESIGN CT, P.C.
C.T. JPC.0000131

T-Mobile

DATE DRAWN:	08/05/21
ATC JOB NO:	13701109_D3
CUSTOMER ID:	CTHA376A
CUSTOMER #:	CTHA376A

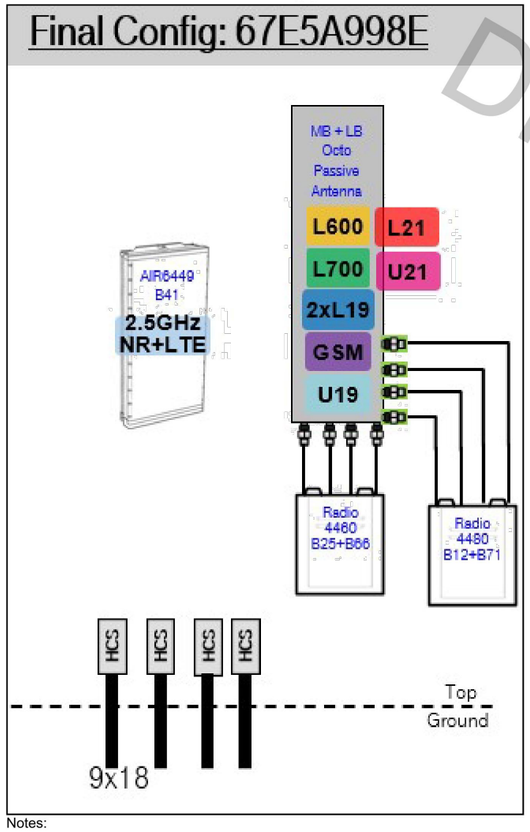
PANEL SCHEDULE

SHEET NUMBER:	REVISION:
E-601	0

Proposed RAN Equipment			
Template: 67E5A998E 6160			
Enclosure	**1**	**2**	**3**
Enclosure Type	Enclosure 6160	RBS 6601	B160
Baseband	BB 6648 (L700, L600, N600); BB 6648 (L2500, N2500); BB 6648 (L2100, L1900)	DUG20 (G1900)	
Hybrid Cable System	Ericsson Hybrid Trunk 6/24 4AWG 100m **(x 3)**		
Transport System	CSR IXRe V2 (Gen2)		
RAN Scope of Work:			

1 CABINET CONFIGURATION
SCALE: NOT TO SCALE

67E5A998E.jpg



Notes:

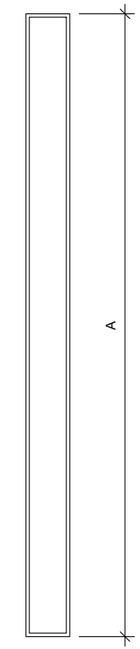
2 ANTENNA CONFIGURATION
SCALE: NOT TO SCALE

NOTE: THIS SHEET CREATED BY OTHERS AND PROVIDED BY REQUEST OF CUSTOMER WITHOUT EDIT.

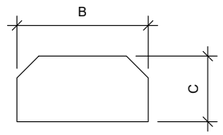
SUPPLEMENTAL

SHEET NUMBER: R-601

REVISION: A



FRONT VIEW

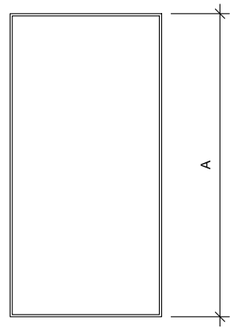


TOP VIEW

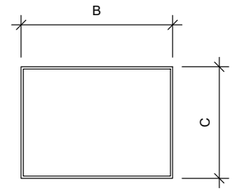
1 ANTENNA SPECIFICATIONS

FOR ILLUSTRATIVE PURPOSES ONLY - NOT TO SCALE

ANTENNA SPECIFICATIONS				
ANTENNA MODEL	A	B	C	WEIGHT (LBS)
AIR6449 B41	33.1"	20.6"	8.6"	104.0
APXVAALL24 43-U-NA20	95.9"	24.0"	8.5"	122.8



FRONT VIEW



TOP VIEW

2 RRU SPECIFICATIONS

FOR ILLUSTRATIVE PURPOSES ONLY - NOT TO SCALE

RRU SPECIFICATIONS				
RRU MODEL	A	B	C	WEIGHT (LBS)
4460	19.6"	15.7"	12.1"	109.0
4480	21.8"	15.7"	7.5"	84.0

SUPPLEMENTAL

SHEET NUMBER: R-602

REVISION: A

Enclosure 6160 AC

The Enclosure 6160 is a multi-purpose site cabinet designed to support a multitude of equipment such as ERS Baseband, Transport, Li-Ion battery and 3PP vendor equipment. It also provides a highly capable power system and battery back-up - all in a streamlined design and minimized footprint to support cost efficient expansion of mobile broadband.

Being an all-in-one enclosure, the Enclosure 6160 is a very fitting choice for all types of sites where the capacity need is large or room for future expansion is needed. It is ideally used for modernizing existing sites or in greenfield scenarios to match both current and future needs.

With a robust design, IP65 compliance and a sealed Heat Exchanger (HEX) climate system the Enclosure 6160 ensures optimal environmental protection of the active equipment - enabling them for a long-lasting service. The complete system is also integrated and verified for the entire Ericsson Radio System and ensures best-in-class service.

The power system offers 31,5kW of power in total and provides 24kW of -48V DC power for both internal and external consumers.

The equipment space allows 19U of rack space ensuring well enough capacity for existing need and future expansion.

One of the main advantages of the Enclosure 6160 is its default integration with ENM - allowing for advanced remote monitoring and control such a fault management (alarms), inventory management and performance measurements. The cabinet also provides an open O&M interface for integration to 3PP O&M systems.

Preliminary technical specification for Enclosure 6160 AC

CAPACITY	
Rack space user equipment	19U (19" rack)
Hardware capabilities	Power and CPRI support for multi-standard remote radios (RRU or AIR) ERS Baseband and Transport units Li-Ion batteries 3PP equipment Additional power feed available as option
MECHANICAL SPECIFICATION	
Weight	145 kg (excluding active equipment) 320 lbs (excluding active equipment)
Dimension (H x W x D)	1600 x 650 x 650 mm (incl. Base frame) 63 x 26 x 26 in. (incl. Base frame)
Base frame height	150 mm 6 in.
Mounting position	Ground
Enclosure material	Aluminum
Color	Power paint NCS 2002-B
Door	Front access
Rack type	19" (IEC 60297-3-100)
Locking type	Pad lock or Cylinder
POWER SYSTEM	
Input voltage	3P+N+PE: 346/200-415/240 VAC 2P+N+PE: 208/120-220/127 VAC 1P+N+PE: 200-250 VAC
Input power	<33kW
Output load (-48VDC)	24kW
Total capacity (-48VDC)	31.5kW
AC SPD	Class 2/Type 2
DC SPD	Class 2/Type 2
PSU Slots	9x
Service outlet	Optional
Priority load	8x Circuit Breaker
LLVD 1	6x Circuit Breaker
LLVD 2	6x Circuit Breaker
CB ratings	3A / 5A / 10A / 15A / 20A / 25A / 30A / 40A / 50A / 60A / 80A / 100A
Battery Interface	2x Circuit Breaker
Battery Circuit Breaker rating	125A 2pol (200A)
PSU capacity	3500W

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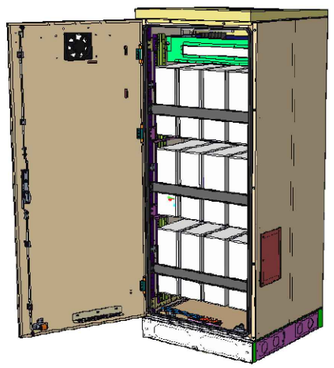
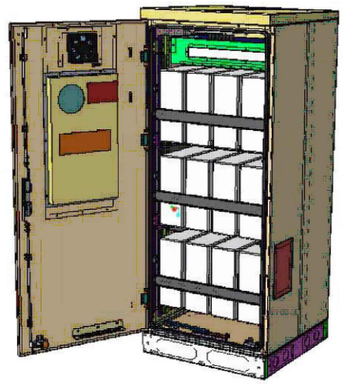
SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-603	A

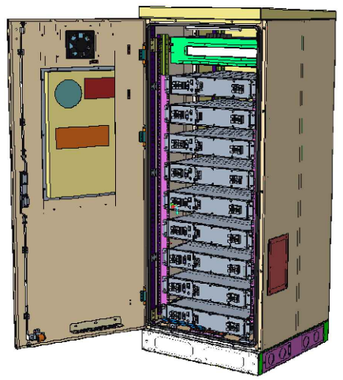
Enclosure B160



Enclosure B160
AirCon + VRLA



Enclosure B160
AirCon + Li-Ion



Enclosure B160
Convection Cooling
+ VRLA

Enclosure B160

Capacity
- VRLA 12V: 100Ah / 150Ah / 170Ah / 190Ah / 210Ah
- Li-Ion: 24U 19" / 23"
- Sodium-Nickel: 3x FIAMM

Electrical specification
- DC Output: -48VDC/200A
- Battery breakers: 2x 125/2p
- Alarms: Door open, Climate failure, MCB Connection

Mechanical specification
- Weight: 134kg
- Dimensions: 63 x 26 x 26 in. (incl. Base frame)
- Base frame height: 6 in.
- Material: Galvanized steel (180g/m^2)
- Color: Powder paint NCS 2002-B
- Door: Front access
- Locking type: Pad lock / cylinder

Environmental specification
- Ingress protection: VRLA/Sodium IP44
Li-Ion IP55
- Relative humidity: 15-100%

Climate system
- Air Conditioner
  - Fan type: DC
  - Cooling capacity: 500W @L35/L35
- Convection cooling
  - Emergency fan

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT.

SUPPLEMENTAL

SHEET NUMBER: R-604

REVISION: A

CENTEK engineering
Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

Proposed T-Mobile Upgrade

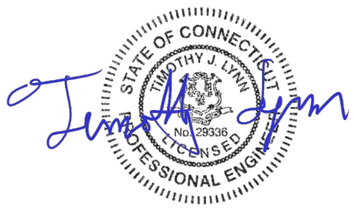
T-Mobile Site #: CTHA376A

133 Little City Road
Killingworth, CT

Centek Project No. 21085.02

Date: July 15, 2021

Max Stress Ratio = 82.9%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

CENTEK engineering
Centered on Solutions℠

July 15, 2021

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTHA376A
133 Little City Road
Killingworth, CT 06419

Centek Project No. 21085.02

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above-referenced site. The purpose of the review is to determine the structural adequacy of the three (3) proposed antenna mounts (SitePro P/N:VFA10-HD). The review considered the effects of wind load, dead load, and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC), including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

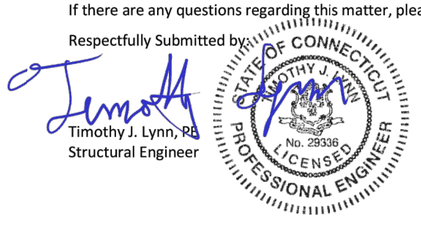
- **T-Mobile:**
  Sector Frames: Three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) Ericsson AIR6449 b41 panel antennas, three (3) Ericsson 4480 B71+B85 remote radio heads and three (3) Ericsson 4460 B25+B66 remote radio heads on the proposed mount with a RAD center elevation of 245-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 101 mph for Killingworth as required in Appendix N of the 2018 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the **subject antenna mount has sufficient capacity** to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Prepared by:

Fernando J. Palacios
Engineer

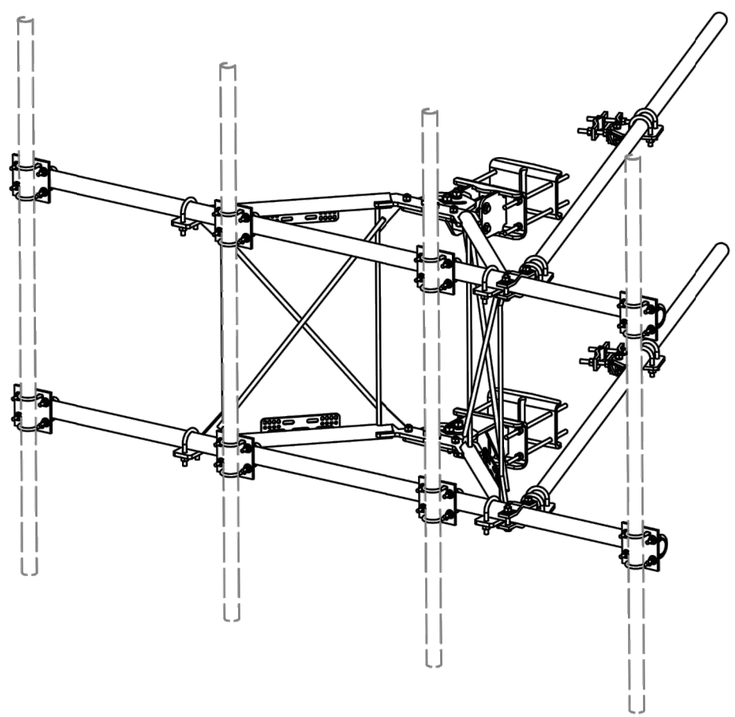
63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

1 MOUNT ANALYSIS

NOTE: THIS SHEET WAS CREATED BY OTHERS AND PROVIDED AT THE REQUEST OF THE CUSTOMER WITHOUT EDIT. PLEASE REFERENCE THE MOUNT ANALYSIS REPORT FOR COMPLETE MOUNT ANALYSIS CALCULATIONS AND DETAILS. SUPPLEMENTAL PAGES INCLUDED IN THE CONSTRUCTION DRAWINGS ARE FOR REFERENCE ONLY. GENERAL CONTRACTOR IS TO VERIFY THEY HAVE THE MOST RECENT MOUNT ANALYSIS PRIOR TO CONSTRUCTION.

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-605	A



PARTS LIST						
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-VFAW	SUPPORT ARM		71.41	142.81
2	1	X-HDCAMTBW	CLAMP WELDMENT FOR BCAM-HD		33.86	33.86
3	1	X-MHTPHD	MULTI-HOLE TAPER PLATE WELDMENT		36.24	36.24
4	2	X-VFAPL4	VFA-HD PIVOT PLATE	12 in	15.88	31.77
5	2	X-LCBP4	BENT BACKING PLATE	13 in	20.04	40.09
6	1	X-HDCAMSS	ANGLE ADJUSTMENT WELDMENT FOR BCAM-HD		16.39	16.39
7	4	X-SPTB	SLIDING PIPE TIE BACK PLATE	5 1/2 in	5.87	23.49
8	1	X-HDCAMSP	POSITIONING PLATE WELDMENT FOR BCAM-HD		2.58	2.58
9	4	X-TBCA	TIE BACK CLIP ANGLE		2.01	8.02
10	8	SCX2	CROSSOVER PLATE	7 in	4.80	38.37
11	4	MCP	CLAMP HALF 1/2" THICK, 11-5/8" LONG	12 1/16 in	3.59	14.37
12	8	DCP	1/2" THICK, 5-3/4" CNTER TO CENTER CLAMP HALF	8 1/8 in	2.36	18.90
13	2	P2126	2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	81.50
14	2	P30126	2-7/8" O.D. X 126" SCH. 40 PIPE	126 in	64.63	129.25
15	4	A34212	3/4" x 2-1/2" UNC HEX BOLT (A325)	2 1/2 in	0.48	1.92
16	4	G34FW	3/4" HDG USS FLATWASHER		0.06	0.24
17	4	G34LW	3/4" HDG LOCKWASHER		0.04	0.17
18	4	G34NUT	3/4" HDG HEAVY 2H HEX NUT		0.21	0.85
19	8	G58R-18	5/8" x 18" THREADED ROD (HDG.)		1.57	12.54
20	4	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	4.18
21	4	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	2.79
22	4	X-UB5300	5/8" X 3" X 5-1/4" X 2-1/2" U-BOLT (HDG.)		1.15	4.60
23	8	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	8.00
24	2	G5807	5/8" x 7" HDG HEX BOLT GR5 FULL THREAD	7 in	0.70	1.41
25	1	G5806	5/8" x 6" HDG HEX BOLT GR5 FULL THREAD	6 in	0.62	0.62
26	8	G5804	5/8" x 4" HDG HEX BOLT GR5		0.44	3.55
27	4	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.08
28	8	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	2.50
29	25	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	1.76
30	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
31	71	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.22
32	32	X-UB1300	1/2" X 3" X 5" X 2" GALV U-BOLT		0.74	23.64
33	16	X-UB1212	1/2" X 2-1/2" X 4-1/2" X 2" U-BOLT (HDG.)		0.60	9.56
34	64	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	2.18
35	64	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.89
36	64	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	4.58
					TOTAL WT. #	713.44

REVISION HISTORY				
REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION T0 BCAM CONNECTION		CEK	12/14/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/28/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
10' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.	PAGE
	CEK 1/25/2017		VFA10-HD	1 OF 5
CLASS / SUB	DRAWING USAGE	CHECKED BY	DWG. NO.	
81 / 02	CUSTOMER	BMC 6/29/2018	VFA10-HD	

SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

SUPPLEMENTAL

SHEET NUMBER:	REVISION:
R-606	A

APPLICATION AND ENGINEERING DATA

ENGINE SPECIFICATIONS

General

Make	Perkins
EPA Emission Compliance	Stationary Emergency
Cylinder #	4
Type	In-Line
Displacement - in³ (L)	135.2 (2.216)
Bore - in (mm)	3.30 (84.0)
Stroke - in (mm)	3.94 (100.0)
Compression Ratio	23.3:1
Intake Air Method	Turbocharged/Aftercooled
Piston Type	Aluminum Alloy
Crankshaft Type	Cast Iron OHV
Engine Block Type	Aluminum

Engine Governing

Governor	Electronic
Frequency Regulation (Steady State)	±0.25%

Lubrication System

Oil Pump Type	Gear
Oil Filter Type	Full Flow Spin-On Canister
Crankcase Capacity - L (qts)	10.6 (11.2)

Cooling System

Cooling System Type	Pre-Lubed, Self-Sealing
Fan Type	Pusher
Fan Speed (RPM)	1,980
Fan Diameter - mm (in)	18.0 (457.2)

Fuel System

Fuel Type	Ultra Low Sulfur Diesel Fuel
Fuel Specification	ASTM
Fuel Pump Type	Mechanical Engine Driven Gear
Injector Type	Mechanical
Fuel Supply Line mm (in)	7.94 (0.31) ID
Fuel Return Line mm (in)	4.76 (0.19) ID
Fuel Filtering (microns)	25

Engine Electrical System

System Voltage	12 VDC
Battery Charger Alternator	Standard
Battery Size	Group 27F
Battery Voltage	12 VDC
Ground Polarity	Negative

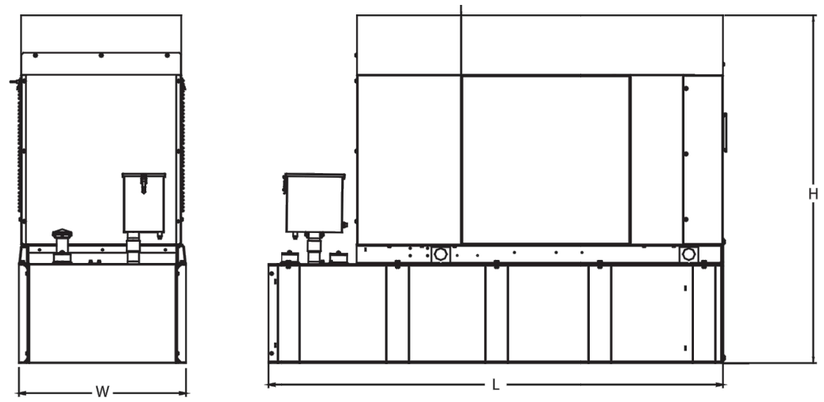
ALTERNATOR SPECIFICATIONS

Standard Model	Generac
Poles	4
Field Type	Rotating
Insulation Class - Rotor	F
Insulation Class - Stator	H
Total Harmonic Distortion	<5%
Telephone Interference Factor (TIF)	<50

Standard Excitation	Direct
Bearings	Sealed Ball
Coupling	Flexible Disc
Prototype Short Circuit Test	Yes
Voltage Regulator Type	Full Digital
Regulation Accuracy (Steady State)	±1.0%

RD025 | 2.2L | 25kW
INDUSTRIAL DIESEL GENERATOR SET
EPA Certified Stationary Emergency

DIMENSIONS AND WEIGHTS*



Weights and Dimensions

Unit Weight - lbs	Unit Weight with Skid - lbs	Dimensions (L x W x H) - in
2,946	2,984	103.4 x 35.0 x 91.7

25kW Fuel Consumption	
Fuel Tank Gross Total Capacity	240
Fuel Tank Gross Usable Capacity	229
Fuel Tank Net Usable Capacity (Run Hours Based on Net Usable Capacity)	206
Run Hours 100% Load	98
Run Hours 75% Load	125
Run Hours 50% Load	161

Sound Emission Data	
Rated Load Sound Output at 23ft - dB(A)	65

* All measurements are approximate and for estimation purposes only.
Drawing is for illustration purposes only, not to scale.

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specification characteristics may change without notice. Dimensions and weights are for preliminary purposes only. Please consult a Generac Power Systems Industrial Dealer for detailed installation drawings.

Generac Power Systems, Inc. | P.O. Box 8 | Waukesha, WI 53189
P: (262) 544-4811

Part No 10000035933
Rev. 8 07/16/18

SUPPLEMENTAL

SHEET NUMBER: R-607

REVISION: A

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**302.5 ft Self Supported Tower**
ATC Site Name	:	**Killingworth, CT**
ATC Asset Number	:	**88013**
Engineering Number	:	**13701109_C3_03**
Proposed Carrier	:	**T-MOBILE**
Carrier Site Name	:	**CTHA376A**
Carrier Site Number	:	**CTHA376A**
Site Location	:	**131 Little City Road** **Killingworth, CT 06419-1014** **41.428800, -72.603800**
County	:	**Middlesex**
Date	:	**July 27, 2021**
Max Usage	:	**74%**
Result	:	**Pass**

Prepared By:
Isaac P. Dodson
Structural Engineer III

Isaac P. Dodson

Reviewed By:

Authorized by "EOR"
27 Jul 2021 04:37:50 cosign

COA: PEC.0001553

AMERICAN TOWER®
CORPORATION

Table of Contents

Introduction 1

Supporting Documents 1

Analysis 1

Conclusion 1

Existing and Reserved Equipment 2

Equipment to be Removed 2

Proposed Equipment 2

Structure Usages 3

Foundations 3

Standard Conditions 4

Calculations ..... Attached

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 302.5 ft self supported tower to reflect the change in loading by T-MOBILE.

Supporting Documents

Tower Drawings	Mapping by TEP Job #080167, dated February 1, 2008
Foundation Drawing	Mapping by Geotel Report #E08-150-F, dated February 20, 2008
Geotechnical Report	Geotel Report #E08-150-G, dated February 20, 2008
Modifications	ATC Project #50481632, dated November 12, 2012
Mount Analysis	CENTEK Project #21085.02, dated July, 15, 2021

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	121 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/1" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
272.0	3	Ericsson RRUS 32 B2	Sector Frame	(2) 0.39" Fiber Trunk (4) 0.92" Cable (6) 1 5/8" Coax (1) 1.16" SOOW	AT&T MOBILITY
	3	Ericsson RRUS-32 B30 (77 lbs)			
	3	Ericsson RRUS 4478 B14			
	3	Ericsson RRUS 4449 B5, B12			
	6	Powerwave Allgon LGP17201			
	3	Ericsson RRUS 4426 B66			
	2	Raycap DC6-48-60-18-8F ("Squid")			
	1	Raycap DC6-48-60-18-8F			
	3	Kaelus DBC0061F1V51-2			
	1	CCI OPA65R-BU8D			
	1	CCI DMP65R-BU8D			
	1	CCI TPA-65R-LCUUUU-H8			
	2	CCI OPA65R-BU6D			
	2	CCI DMP65R-BU6DA			
	2	Quintel QS66512-2			
	3	Powerwave Allgon 7770.00			
261.0	6	Swedcom ALP 9011-DIN	Sector Frame	(6) 1 5/8" Coax	SPRINT NEXTEL
200.0	1	Commscope RDIDC-9181-PF-48	Sector Frame	(1) 1.60" Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B604			
	3	Fujitsu TA08025-B605			
	3	JMA Wireless MX08FRO665-21			
171.0	3	Samsung B2/B66A RRH-BR049	Sector Frame	(10) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
	3	Samsung B5/B13 RRH-BR04C			
	2	Raycap RC3DC-3315-PF-48			
	3	Samsung MT6407-77A			
	6	Antel LPA-80080/6CF ___			
	6	Commscope JAHH-65B-R3B			
	3	Commscope CBC78T-DS-43-2X			
145.0	6	Generic TTA	Leg	(6) 1 5/8" Coax	OTHER
	3	Generic 36" x 6" Panel			

Equipment to be Removed

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
No loading was considered as removed as part of this analysis.					

Proposed Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
245.0	3	Ericsson Radio 4460 B25+B66	Sector Frame	(3) 1.99" Hybrid	T-MOBILE
	3	Ericsson Radio 4480 B71+B85A			
	3	Ericsson Air6449 B41			
	3	RFS APXVAALL24 43-U-NA20			

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed coax on the tower face with the least amount of existing coax.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Legs	72%	Pass
Diagonals	73%	Pass
Truss Diagonals	62%	Pass
Horizontals	74%	Pass
Truss Horizontals	41%	Pass
Anchor Bolts	57%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Uplift (Kips)	262.6	63%
Axial (Kips)	408.9	21%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

AMERICAN TOWER®
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Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

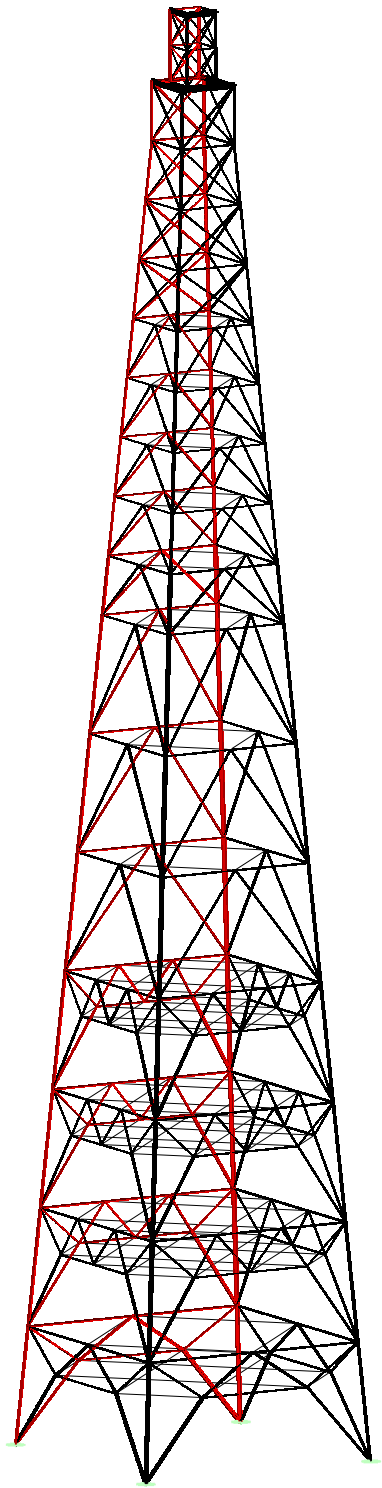
It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

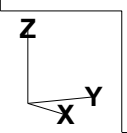
All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

American Tower Corp., Project: "88013 - Killingworth, CT"
Tower Version 16.01, 11:45:49 AM Tuesday, July 27, 2021
Undeformed geometry displayed





Project Name : 88013 - Killingworth, CT
Project Notes: OAA720121
Project File : X:\J-M\Killingworth, CT (88013)\Structural Info\88013 - Killingworth, CT.tow
Date run : 11:40:15 AM Tuesday, July 27, 2021
by : Tower Version 16.01
Licensed to : American Tower Corp.

Successfully performed nonlinear analysis

Member check option: ANSI/TIA 222-G-1
Connection rupture check: Not Checked
Crossing diagonal check: Fixed
Included angle check: None
Climbing load check: None
Redundant members checked with: Actual Force
Loads from file: X:\J-M\Killingworth, CT (88013)\Structural Info\88013 - Killingworth, CT.eia

*** Analysis Results:

Maximum element usage is 74.31% for Angle "H 3P" in load case "W -90"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
W 0	0P	303.86	57.19	2.75	0.00
W 0	0X	292.78	54.98	2.70	0.00
W 0	0XY	-146.50	31.59	3.68	0.00
W 0	0Y	-150.28	33.12	3.77	0.00
W 180	0P	-145.02	32.87	3.83	0.00
W 180	0X	-141.36	31.39	3.74	0.00
W 180	0XY	287.64	54.74	2.77	0.00
W 180	0Y	298.60	56.88	2.82	0.00
W 45	0P	408.91	75.12	2.27	0.00
W 45	0X	77.53	22.14	3.39	0.00
W 45	0XY	-262.59	52.33	4.20	0.00
W 45	0Y	76.00	21.75	3.35	0.00
W -45	0P	83.46	23.41	3.50	0.00
W -45	0X	402.98	74.46	2.30	0.00
W -45	0XY	74.58	21.43	3.30	0.00
W -45	0Y	-261.17	52.46	4.24	0.00
W 90	0P	304.76	57.42	2.79	0.00
W 90	0X	-149.66	33.24	3.80	0.00
W 90	0XY	-145.60	31.41	3.67	0.00
W 90	0Y	290.35	54.68	2.69	0.00
W -90	0P	-145.94	33.05	3.84	0.00
W -90	0X	301.05	57.20	2.83	0.00
W -90	0XY	286.71	54.52	2.73	0.00
W -90	0Y	-141.97	31.28	3.72	0.00
W 0 Ice	0P	161.78	23.27	2.62	0.00
W 0 Ice	0X	155.03	22.34	2.73	0.00
W 0 Ice	0XY	47.54	3.51	3.47	0.00
W 0 Ice	0Y	49.90	3.32	3.48	0.00
W 180 Ice	0P	56.52	4.04	3.54	0.00
W 180 Ice	0X	53.96	4.14	3.54	0.00
W 180 Ice	0XY	148.60	22.00	2.68	0.00
W 180 Ice	0Y	155.16	22.82	2.59	0.00
W 45 Ice	0P	187.00	27.75	2.52	0.00
W 45 Ice	0X	105.08	13.43	3.07	0.00
W 45 Ice	0XY	19.00	2.90	3.66	0.00
W 45 Ice	0Y	103.15	13.26	3.05	0.00
W -45 Ice	0P	110.02	13.98	3.12	0.00
W -45 Ice	0X	182.07	27.35	2.48	0.00
W -45 Ice	0XY	98.92	13.07	3.02	0.00
W -45 Ice	0Y	23.23	2.64	3.70	0.00
W 90 Ice	0P	161.94	23.32	2.63	0.00
W 90 Ice	0X	51.67	3.46	3.50	0.00
W 90 Ice	0XY	47.71	3.58	3.47	0.00
W 90 Ice	0Y	152.92	22.18	2.71	0.00
W -90 Ice	0P	56.29	3.96	3.53	0.00
W -90 Ice	0X	157.32	23.00	2.61	0.00
W -90 Ice	0XY	148.37	21.94	2.67	0.00
W -90 Ice	0Y	52.25	4.02	3.53	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
W 0	0P	-48.55	-30.22	-303.86	57.19	-0.57	-2.69	2.75	-3.35	0.00
W 0	0X	-46.19	29.82	-292.78	54.98	0.78	-2.59	2.70	3.37	0.00
W 0	0XY	-28.72	-13.15	146.50	31.59	0.58	-3.63	3.68	3.12	0.00
W 0	0Y	-30.23	13.55	150.28	33.12	-0.57	-3.73	3.77	-3.07	0.00
W 180	0P	30.19	13.00	145.02	32.87	-0.56	3.79	3.83	3.09	0.00
W 180	0X	28.73	-12.66	141.36	31.39	0.58	3.70	3.74	-3.14	0.00
W 180	0XY	46.23	29.32	-287.64	54.74	0.78	2.66	2.77	-3.39	0.00
W 180	0Y	48.54	-29.66	-298.60	56.88	-0.58	2.76	2.82	3.37	0.00
W 45	0P	-52.93	-53.31	-408.91	75.12	1.62	-1.58	2.27	0.00	0.00
W 45	0X	-21.95	-2.92	-77.53	22.14	2.81	-1.89	3.39	4.75	0.00
W 45	0XY	-37.10	-36.90	262.59	52.33	2.96	-2.98	4.20	-0.00	0.00
W 45	0Y	-2.73	-21.58	-76.00	21.75	1.87	-2.77	3.35	-4.74	0.00
W -45	0P	-23.19	3.15	-83.46	23.41	-2.91	-1.95	3.50	-4.76	0.00
W -45	0X	-51.69	53.60	-402.98	74.46	-1.72	-1.53	2.30	-0.01	0.00
W -45	0XY	-2.29	21.31	-74.58	21.43	-1.87	-2.72	3.30	4.76	0.00
W -45	0Y	-37.53	36.65	261.17	52.46	-2.96	-3.03	4.24	0.02	0.00
W 90	0P	-30.04	-48.93	-304.76	57.42	2.72	0.60	2.79	3.35	0.00
W 90	0X	13.36	-30.43	149.66	33.24	3.75	0.56	3.80	3.07	0.00
W 90	0XY	-13.18	-28.51	145.60	31.41	3.62	-0.59	3.67	-3.12	0.00
W 90	0Y	29.86	-45.81	-290.35	54.68	2.58	-0.75	2.69	-3.37	0.00
W -90	0P	12.97	30.40	145.94	33.05	-3.80	0.55	3.84	-3.08	0.00
W -90	0X	-29.64	48.92	-301.05	57.20	-2.77	0.61	2.83	-3.37	0.00
W -90	0XY	29.51	45.84	-286.71	54.52	-2.63	-0.75	2.73	3.38	0.00
W -90	0Y	-12.84	28.52	141.97	31.28	-3.67	-0.59	3.72	3.14	0.00
W 0 Ice	0P	-18.36	-14.29	-161.78	23.27	-2.11	1.56	2.62	-0.67	0.00
W 0 Ice	0X	-17.33	14.10	-155.03	22.34	2.21	1.59	2.73	0.67	0.00
W 0 Ice	0XY	0.14	3.51	-47.54	3.51	2.16	-2.72	3.47	0.66	0.00
W 0 Ice	0Y	0.08	-3.32	-49.90	3.32	-2.15	-2.74	3.48	-0.63	0.00
W 180 Ice	0P	-0.14	-4.03	-56.52	4.04	-2.13	2.82	3.54	0.66	0.00
W 180 Ice	0X	-0.12	4.14	-53.96	4.14	2.16	2.81	3.54	-0.69	0.00
W 180 Ice	0XY	17.39	13.47	-148.60	22.00	2.21	-1.51	2.68	-0.69	0.00
W 180 Ice	0Y	18.34	-13.58	-155.16	22.82	-2.12	-1.48	2.59	0.69	0.00
W 45 Ice	0P	-19.54	-19.71	-187.00	27.75	-1.77	1.79	2.52	0.00	0.00
W 45 Ice	0X	-11.74	6.51	-105.08	13.43	2.54	1.72	3.07	0.97	0.00
W 45 Ice	0XY	-2.03	-2.07	-19.00	2.90	2.59	-2.59	3.66	-0.00	0.00
W 45 Ice	0Y	6.47	-11.58	-103.15	13.26	-1.72	-2.53	3.05	-0.97	0.00
W -45 Ice	0P	-12.40	-6.46	-110.02	13.98	-2.61	1.71	3.12	-0.99	0.00
W -45 Ice	0X	-18.88	19.80	-182.07	27.35	1.70	1.80	2.48	-0.02	0.00
W -45 Ice	0XY	6.17	11.52	-98.92	13.07	1.67	-2.52	3.02	0.99	0.00
W -45 Ice	0Y	-1.73	1.99	-23.23	2.64	-2.64	-2.59	3.70	0.02	0.00
W 90 Ice	0P	-14.16	-18.53	-161.94	23.32	-1.55	2.13	2.63	0.67	0.00
W 90 Ice	0X	-3.45	0.13	-51.67	3.46	2.75	2.16	3.50	0.63	0.00
W 90 Ice	0XY	3.58	0.10	-47.71	3.58	2.73	-2.15	3.47	-0.67	0.00
W 90 Ice	0Y	14.03	-17.17	-152.92	22.18	-1.59	-2.20	2.71	-0.67	0.00
W -90 Ice	0P	-3.96	-0.17	-56.29	3.96	-2.81	2.14	3.53	-0.65	0.00
W -90 Ice	0X	-13.66	18.51	-157.32	23.00	1.49	2.14	2.61	-0.69	0.00
W -90 Ice	0XY	13.59	17.22	-148.37	21.94	1.52	-2.19	2.67	0.68	0.00
W -90 Ice	0Y	4.02	-0.08	-52.25	4.02	-2.79	-2.15	3.53	0.69	0.00

Summary of Joint Support Reactions For All Load Cases in Direction of Leg:

Load Case	Support Joint	Origin Joint	Leg Member	Force In Leg Dir. (kips)	Residual Shear Perpendicular To Leg (kips)	Residual Shear Horizontal To Leg - Res. (kips)	Residual Shear Horizontal To Leg - Long. (kips)	Residual Shear Horizontal To Leg - Tran. (kips)	Total Long. Force (kips)	Total Tran. Force (kips)	Total Vert. Force (kips)
W 0	0P	1P	L 1P	308.030	26.752	26.867	25.806	7.474	-48.55	-30.22	-303.86
W 0	0X	1X	L 1X	296.814	25.414	25.527	24.271	-7.909	-46.19	29.82	-292.78
W 0	0XY	1XY	L 1XY	-148.806	17.824	17.885	17.751	2.187	-28.72	-13.15	146.50
W 0	0Y	1Y	L 1Y	-152.703	19.053	19.118	18.980	-2.298	-30.23	13.55	150.28
W 180	0P	1P	L 1P	-147.424	19.385	19.451	-19.332	-2.144	30.19	13.00	145.02
W 180	0X	1X	L 1X	-143.656	18.203	18.265	-18.146	2.079	28.73	-12.66	141.36
W 180	0XY	1XY	L 1XY	291.660	25.784	25.897	-24.698	-7.787	46.23	29.32	-287.64
W 180	0Y	1Y	L 1Y	302.757	27.074	27.189	-26.189	7.306	48.54	-29.66	-298.60
W 45	0P	1P	L 1P	414.547	31.663	31.840	22.326	22.701	-52.93	-53.31	-408.91
W 45	0X	1X	L 1X	78.518	18.342	18.350	16.146	8.721	-21.95	-2.92	-77.53
W 45	0XY	1XY	L 1XY	-266.640	24.396	24.532	17.444	17.249	-37.10	-36.90	262.59
W 45	0Y	1Y	L 1Y	76.984	17.973	17.982	8.416	15.890	-2.73	-21.58	-76.00
W -45	0P	1P	L 1P	84.492	19.369	19.377	16.945	-9.397	-23.19	3.15	-83.46
W -45	0X	1X	L 1X	408.582	31.645	31.822	21.524	-23.438	-51.69	53.60	-402.98
W -45	0XY	1XY	L 1XY	75.577	17.579	17.589	7.875	-15.727	-2.29	21.31	-74.58
W -45	0Y	1Y	L 1Y	-265.240	24.680	24.817	17.986	-17.100	-37.53	36.65	261.17
W 90	0P	1P	L 1P	308.948	26.991	27.105	7.232	26.122	-30.04	-48.93	-304.76
W 90	0X	1X	L 1X	-152.085	19.287	19.352	-2.163	19.231	13.36	-30.43	149.66
W 90	0XY	1XY	L 1XY	-147.896	17.695	17.757	2.284	17.610	-13.18	-28.51	145.60
W 90	0Y	1Y	L 1Y	294.369	25.296	25.409	-8.129	24.074	29.86	-45.81	-290.35
W -90	0P	1P	L 1P	-148.360	19.518	19.583	-2.050	-19.476	12.97	30.40	145.94
W -90	0X	1X	L 1X	305.227	27.215	27.329	7.109	-26.388	-29.64	48.92	-301.05

W -90	0XY	1XY	L 1XY	290.725	25.560	25.674	-8.047	-24.380	29.51	45.84	-286.71
W -90	0Y	1Y	L 1Y	-144.255	17.967	18.029	2.212	-17.893	-12.84	28.52	141.97
W 0 Ice	0P	1P	L 1P	163.307	6.592	6.622	6.253	2.180	-18.36	-14.29	-161.78
W 0 Ice	0X	1X	L 1X	156.504	6.218	6.248	5.728	-2.495	-17.33	14.10	-155.03
W 0 Ice	0XY	1XY	L 1XY	47.545	3.411	3.421	3.421	0.047	0.14	3.51	-47.54
W 0 Ice	0Y	1Y	L 1Y	49.875	3.663	3.675	3.652	-0.413	0.08	-3.32	-49.90
W 180 Ice	0P	1P	L 1P	56.517	4.080	4.092	-4.088	-0.197	-0.14	-4.03	-56.52
W 180 Ice	0X	1X	L 1X	53.976	3.910	3.921	-3.919	-0.103	-0.12	4.14	-53.96
W 180 Ice	0XY	1XY	L 1XY	150.074	6.664	6.695	-6.272	-2.344	17.39	13.47	-148.60
W 180 Ice	0Y	1Y	L 1Y	156.670	6.978	7.008	-6.728	1.962	18.34	-13.58	-155.16
W 45 Ice	0P	1P	L 1P	188.886	7.910	7.954	5.538	5.709	-19.54	-19.71	-187.00
W 45 Ice	0X	1X	L 1X	105.859	4.101	4.106	3.877	1.352	-11.74	6.51	-105.08
W 45 Ice	0XY	1XY	L 1XY	18.593	4.883	4.910	3.454	3.489	-2.03	-2.07	-19.00
W 45 Ice	0Y	1Y	L 1Y	103.916	4.050	4.054	1.248	3.858	6.47	-11.58	-103.15
W -45 Ice	0P	1P	L 1P	110.816	4.525	4.528	4.166	-1.774	-12.40	-6.46	-110.02
W -45 Ice	0X	1X	L 1X	183.932	8.055	8.099	5.248	-6.169	-18.88	19.80	-182.07
W -45 Ice	0XY	1XY	L 1XY	99.686	4.288	4.294	1.232	-4.113	6.17	11.52	-98.92
W -45 Ice	0Y	1Y	L 1Y	22.824	5.063	5.091	3.471	-3.724	-1.73	1.99	-23.23
W 90 Ice	0P	1P	L 1P	163.478	6.693	6.723	2.041	6.405	-14.16	-18.53	-161.94
W 90 Ice	0X	1X	L 1X	51.649	3.750	3.762	-0.414	3.739	-3.45	0.13	-51.67
W 90 Ice	0XY	1XY	L 1XY	47.714	3.463	3.472	-0.010	3.472	3.58	0.10	-47.71
W 90 Ice	0Y	1Y	L 1Y	154.392	6.254	6.285	-2.589	5.727	14.03	-17.17	-152.92
W -90 Ice	0P	1P	L 1P	56.286	4.036	4.049	-0.257	-4.041	-3.96	-0.17	-56.29
W -90 Ice	0X	1X	L 1X	158.844	6.963	6.993	1.883	-6.734	-13.66	18.51	-157.32
W -90 Ice	0XY	1XY	L 1XY	149.844	6.569	6.600	-2.488	-6.113	13.59	17.22	-148.37
W -90 Ice	0Y	1Y	L 1Y	52.263	3.819	3.829	-0.111	-3.827	4.02	-0.08	-52.25

Overturning Moment Summary For All Load Cases:

Load Case	Transverse Moment (ft-k)	Longitudinal Moment (ft-k)	Torsional Moment (ft-k)	Resultant Moment (ft-k)	Transverse Force (kips)	Longitudinal Force (kips)	Vertical Force (kips)
W 0	195.774	-23973.640	82.869	23974.439	-0.000	153.680	299.855
W 180	196.021	23415.081	-82.987	23415.901	-0.000	-153.680	299.855
W 45	17977.707	-18059.783	-30.310	25482.419	114.708	114.708	299.855
W -45	-17583.041	-18060.032	148.664	25205.716	-114.708	114.708	299.855
W 90	23891.733	-277.945	-125.770	23893.350	153.680	-0.000	299.855
W -90	-23497.259	-278.141	125.858	23498.906	-153.680	-0.000	299.855
W 0 Ice	244.491	-5886.304	18.912	5891.380	-0.000	35.473	414.238
W 180 Ice	244.589	5186.384	-18.926	5192.148	-0.000	-35.473	414.238
W 45 Ice	4456.020	-4560.048	-6.944	6375.747	26.838	26.838	414.238
W -45 Ice	-3964.156	-4560.078	33.893	6042.255	-26.838	26.838	414.238
W 90 Ice	5782.318	-348.554	-28.733	5792.813	35.473	-0.000	414.238
W -90 Ice	-5290.472	-348.657	28.745	5301.949	-35.473	-0.000	414.238

EIA Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Top Width (ft)	Bottom Width (ft)	Gross Area (ft^2)	Face Af Adjust Factor	Face Ar Adjust Factor	Dead Load Factor
295.1-302.6	302.600	295.100	8	20	7.00	7.00	52.50	1.0000	1.0000	1.200
287.6-295.1	295.100	287.600	8	16	7.00	7.00	52.50	1.0000	1.0000	1.200
287.5-287.6	287.600	287.500	8	16	7.00	12.50	0.98	1.0000	1.0000	1.200
275.0-287.5	287.500	275.000	8	16	12.50	12.50	156.25	1.1150	1.1150	1.338
262.5-275.0	275.000	262.500	8	16	12.50	14.37	167.95	1.1840	1.1840	1.421
250.0-262.5	262.500	250.000	8	16	14.37	16.24	191.34	1.1970	1.1970	1.437
237.5-250.0	250.000	237.500	12	24	16.24	18.11	214.73	1.2060	1.2060	1.447
225.0-237.5	237.500	225.000	16	24	18.11	19.98	238.12	1.2650	1.2650	1.518
212.5-225.0	225.000	212.500	16	24	19.98	21.86	261.51	1.2790	1.2790	1.535
200.0-212.5	212.500	200.000	16	24	21.86	23.73	284.90	1.2850	1.2850	1.542
187.5-200.0	200.000	187.500	16	24	23.73	25.60	308.29	1.2900	1.2900	1.548
175.0-187.5	187.500	175.000	16	24	25.60	27.47	331.68	1.2780	1.2780	1.533
150.0-175.0	175.000	150.000	16	24	27.47	31.21	733.53	1.3590	1.3590	1.631
125.0-150.0	150.000	125.000	16	24	31.21	34.95	827.09	1.3640	1.3640	1.637
100.0-125.0	125.000	100.000	20	32	34.95	38.70	920.65	1.3320	1.3320	1.599
75.00-100.0	100.000	75.000	36	76	38.70	42.44	1014.21	1.3010	1.3010	1.561
50.00-75.00	75.000	50.000	36	76	42.44	46.18	1107.77	1.3640	1.3640	1.637
25.00-50.00	50.000	25.000	32	68	46.18	49.92	1201.33	1.1750	1.1750	1.410
0.000-25.00	25.000	0.000	20	40	49.92	53.67	1294.89	1.2340	1.2340	1.481

Printed capacities do not include the strength factor entered for each load case.
The Group Summary reports on the member and load case that resulted in maximum usage which may not necessarily be the same as that which produces maximum force.

Group Summary (Compression Portion):

Group Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Use In Comp. %	Comp. Control Member	Comp. Force (kips)	Comp. Control Load Case	L/r Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/r	KL/r	Length Comp. Member (ft)	Curve No.	No. Of Bolts Comp.
Leg S1	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	72.45	Comp	72.45	L 1P	-352.508	W 45	486.535	0.000	0.000	0.333	0.333	0.333	64.45	64.45	25.140	1	0
Leg S2	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	68.61	Comp	68.61	L 2P	-333.830	W 45	486.535	0.000	0.000	0.333	0.333	0.333	64.45	64.45	25.140	1	0
Leg S3	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	55.03	Comp	55.03	L 3P	-294.845	W 45	535.809	0.000	0.000	0.167	0.167	0.167	32.24	32.24	25.140	1	0
Leg S4	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	48.92	Comp	48.92	L 4P	-255.854	W 45	523.034	0.000	0.000	0.222	0.222	0.222	42.97	42.97	25.140	1	0
Leg S5	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	45.21	Comp	45.21	L 5P	-219.961	W 45	486.537	0.000	0.000	0.333	0.333	0.333	64.45	64.45	25.140	1	0
Leg S6	L 8" x 8" x 1"	SAE	8X8X1	33.0	42.10	Comp	42.10	L 6P	-183.731	W 45	436.384	0.000	0.000	0.333	0.333	0.333	64.45	64.45	25.140	1	0
Leg S7	L 8" x 8" x 0.875"	SAE	8X8X0.88	33.0	38.27	Comp	38.27	L 7P	-147.462	W 45	385.330	0.000	0.000	0.333	0.333	0.333	64.04	64.04	25.140	1	0
Leg S8	L 8" x 8" x 0.75"	SAE	8X8X0.75	33.0	36.16	Comp	36.16	L 8P	-127.517	W 45	352.634	0.000	0.000	0.500	0.500	0.500	47.73	47.73	12.570	1	0
Leg S9	L 6" x 6" x 0.875"	SAE	6X6X0.88	33.0	38.74	Comp	38.74	L 9P	-109.631	W 45	282.972	0.000	0.000	0.500	0.500	0.500	64.46	64.46	12.570	1	0
Leg S10	L 6" x 6" x 0.875"	SAE	6X6X0.88	33.0	33.07	Comp	33.07	L 10P	-93.589	W 45	282.972	0.000	0.000	0.500	0.500	0.500	64.46	64.46	12.570	1	0
Leg S11	L 6" x 6" x 0.75"	SAE	6X6X0.75	33.0	30.33	Comp	30.33	L 11P	-74.442	W 45	245.466	0.000	0.000	0.500	0.500	0.500	64.46	64.46	12.570	1	0
Leg S12	L 6" x 6" x 0.75"	SAE	6X6X0.75	33.0	24.20	Comp	24.20	L 12P	-59.393	W 45	245.466	0.000	0.000	0.500	0.500	0.500	64.46	64.46	12.570	1	0
Leg S13	L 6" x 6" x 0.625"	SAE	6X6X0.63	33.0	28.16	Comp	28.16	L 13X	-58.316	W -45	207.060	0.000	0.000	0.500	0.500	0.500	63.91	63.91	12.570	1	0
Leg S14	L 6" x 6" x 0.625"	SAE	6X6X0.63	33.0	21.00	Comp	21.00	L 14X	-43.476	W -45	207.060	0.000	0.000	0.500	0.500	0.500	63.91	63.91	12.570	1	0
Leg S15	L 6" x 6" x 0.5625"	SAE	6X6X0.56	33.0	16.08	Comp	16.08	L 15X	-30.152	W -45	187.505	0.000	0.000	0.500	0.500	0.500	63.91	63.91	12.570	1	0
Leg S16	L 6" x 6" x 0.5625"	SAE	6X6X0.56	33.0	8.24	Comp	8.24	L 16X	-15.464	W -45	187.643	0.000	0.000	0.500	0.500	0.500	63.56	63.56	12.500	1	0
Leg S17	L 6" x 6" x 0.5625"	SAE	6X6X0.56	33.0	3.96	Comp	3.96	L 17P	-8.210	W 45	207.527	0.000	0.000	1.000	1.000	1.000	39.56	39.56	3.890	1	0
Leg S18	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	4.56	Comp	4.56	L 18P	-7.213	W 45	158.188	0.000	0.000	1.000	1.000	1.000	76.27	76.27	7.500	1	0
Leg S19	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	3.03	Comp	3.03	L 19P	-4.796	W 45	158.188	0.000	0.000	1.000	1.000	1.000	76.27	76.27	7.500	1	0
Diag S1	B/B L3.5"x5"x0.4375"	DAS	5X3.5X0.44	33.0	34.63	Comp	34.63	D 2X	-43.581	W -90	125.862	0.000	0.000	0.500	1.000	0.500	130.87	126.69	22.030	6	0
Diag S2	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	48.29	Comp	48.29	D 4X	-31.229	W -90	64.665	0.000	0.000	0.500	1.000	0.500	137.27	130.62	20.294	6	0
Diag S3	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	45.57	Comp	45.57	D 6X	-30.415	W -90	66.745	0.000	0.000	0.250	1.000	0.250	123.32	122.04	19.834	6	0
Diag S4	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	44.01	Comp	44.01	D 8X	-30.285	W -90	68.806	0.000	0.000	0.333	1.000	0.333	120.61	120.38	19.399	6	0
Diag S5	B/B L3"x4"x0.25"	DAS	4X3X0.25	33.0	72.65	Comp	72.65	D 9X	-29.402	W -90	40.472	0.000	0.000	0.333	1.000	0.333	197.93	167.92	31.668	6	0
Diag S6	B/B L3"x4"x0.25"	DAS	4X3X0.25	33.0	68.85	Comp	68.85	D 11X	-29.397	W -90	42.698	0.000	0.000	0.333	1.000	0.333	191.00	163.67	30.561	6	0
Diag S7	B/B L3"x4"x0.25"	DAS	4X3X0.25	33.0	63.03	Comp	63.03	D 13X	-28.323	W -90	44.935	0.000	0.000	0.333	1.000	0.333	184.57	159.71	29.531	6	0
Diag S8	B/B L2.5"x3"x0.3125"	DAS	3X2.5X0.31	33.0	42.67	Comp	42.67	D 15X	-16.732	W -90	39.210	0.000	0.000	0.500	1.000	0.500	152.84	140.19	18.595	6	0
Diag S9	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	62.75	Comp	62.75	D 18Y	-14.679	W 180	23.392	0.000	0.000	0.500	1.000	0.500	180.66	157.30	17.915	6	0
Diag S10	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	52.69	Comp	52.69	D 19X	-13.032	W -90	24.735	0.000	0.000	0.500	1.000	0.500	174.04	153.23	17.259	6	0
Diag S11	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	47.07	Comp	47.07	D 21X	-12.302	W -90	26.134	0.000	0.000	0.500	1.000	0.500	167.69	149.33	16.630	6	0
Diag S12	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	45.38	Comp	45.38	D 23X	-12.514	W -90	27.579	0.000	0.000	0.500	1.000	0.500	161.65	145.62	16.030	6	0
Diag S13	L 3" x 4" x 0.25"	SAU	4X3X0.25	33.0	30.55	Tens	0.00	D 26Y	0.000		0.001	0.000	0.000	0.520	0.500	0.520	203.83	171.56	21.265	6	0
Diag S14	L 3" x 4" x 0.25"	SAU	4X3X0.25	33.0	26.03	Tens	0.00	D 28Y	0.000		0.001	0.000	0.000	0.520	0.500	0.520	189.64	162.83	19.784	6	0
Diag S15	L 3" x 3.5" x 0.25"	SAU	3.5X3X0.25	33.0	24.72	Tens	0.00	D 30Y	0.000		0.001	0.000	0.000	0.520	0.500	0.520	181.71	157.95	18.375	6	0
Diag S16	L 3.5" x 3.5" x 0.25"	SAE	3.5X3.5X0.25	33.0	14.88	Tens	0.00	D 32Y	0.000		0.001	0.000	0.000	0.520	0.500	0.520	158.95	143.95	17.678	6	0
Diag S17	L 3.5" x 3.5" x 0.25"	SAE	3.5X3.5X0.25	33.0	3.37	Tens	0.00	D 34Y	0.000		0.004	0.000	0.000	0.520	0.500	0.520	91.09	91.09	10.131	1	0
Diag S18	L 3" x 2" x 0.25"	SAU	3X2X0.25	33.0	4.83	Tens	0.00	D 36Y	0.000		0.001	0.000	0.000	0.520	0.500	0.520	147.17	136.71	10.259	6	0
Diag S19	L 3" x 2" x 0.25"	SAU	3X2X0.25	33.0	8.35	Comp	8.35	D 37X	-0.000W	-90 Ic	0.001	0.000	0.000	0.520	0.500	0.520	147.17	136.71	10.259	6	0
Horiz 1	B/B L4"x3.5"x0.375"	DAL	4X3.5X0.38	33.0	33.54	Comp	33.54	H 1P	-34.675	W -90	103.374	0.000	0.000	1.000	1.000	1.000	119.82	119.82	24.962	1	0
Horiz 2	B/B L4"x3"x0.375"	DAL	4X3X0.38	33.0	74.31	Comp	74.31	H 3P	-54.071	W -90	72.764	0.000	0.000	1.000	1.000	1.000	146.61	136.37	15.394	6	0
Horiz 3	B/B L4"x3"x0.3125"	DAL	4X3X0.31	33.0	73.00	Comp	73.00	H 5P	-49.644	W -90	68.007	0.000	0.000	1.000	1.000	1.000	133.67	128.41	14.147	6	0
Horiz 4	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	64.57	Comp	64.57	H 7P	-40.450	W -90	62.650	0.000	0.000	1.000	1.000	1.000	140.72	132.74	12.899	6	0
Horiz 5	B/B L3.5"x3"x0.25"	DAL	3.5X3X0.25	33.0	45.40	Comp	45.40	H 9P	-15.330	W -90	33.766	0.000	0.000	1.000	1.000	1.000	188.94	162.40	17.477	6	0
Horiz 6	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	45.94	Comp	45.94	H 11P	-14.653	W -90	31.895	0.000	0.000	1.000	1.000	1.000	171.81	151.86	15.606	6	0
Horiz 7	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	41.72	Comp	41.72	H 13P	-13.317	W -90	31.922	0.000	0.000	1.000	1.000	1.000	174.41	153.46	13.735	6	0
Horiz 8	B/B L3.5"x2.5"x0.3125"	DAL	3.5X2.5X0.31	33.0	21.07	Comp	21.07	H 16P	-11.121	W 180	52.770	0.000	0.000	1.000	1.000	1.000	139.63	132.07	12.799	6	0
Horiz 9	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	35.32	Comp	35.32	H 18P	-9.381	W 180	26.560	0.000	0.000	1.000	1.000	1.000	185.13	160.05	11.864	6	0
Horiz 10	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	27.86	Comp	27.86	H 19P	-8.305	W -90	29.810	0.000	0.000	1.000	1.000	1.000	170.53	151.08	10.928	6	0
Horiz 11	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	21.11	Comp	21.11	H 21P	-7.111	W -90	33.695	0.000	0.000	1.000	1.000	1.000	155.93	142.10	9.992	6	0
Horiz 12	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	24.59	Comp	24.59	H 23P	-13.189	W -90	53.628	0.000	0.000	1.000	1.000	1.000	115.01	115.01	9.057	1	0
Horiz 13	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	30.70	Comp	30.70	H 25P	-11.436	W -90	37.252	0.000	0.000	0.500	0.800	0.500	137.99	131.06	16.242	6	0
Horiz 14	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	14.29	Comp	14.29	H 27P	-9.412	W -90	65.855	0.000	0.000	0.500	0.500	0.500	91.25	91.25	14.371	1	0
Horiz 15	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	8.15	Comp	8.15	H 30P	-7.632	W 180	93.612	0.000	0.000	0.500	0.800	0.500	88.89	88.89	12.500	1	0
Horiz 16	C15x33.9	CHN	C15x33.9	33.0	2.15	Comp	2.15	H 32X	-2.197	W 45	102.383	0.000	0.000	1.000	1.000	1.000	165.93	148.25	12.500	6	0
Horiz 17	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	16.29	Comp	16.29	H 34P	-3.691	W 45	22.662	0.000	0.000	1.000	1.000	1.000	107.14	107.14	7.000	1	0
Horiz 18	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	10.62	Comp	10.62	H 35P	-2.407	W -45	22.662	0.000	0.000	1.000	1.000	1.000	107.14	107.14	7.000	1	0
Horiz 19	C15x33.9	CHN	C15x33.9	33.0	0.36	Comp	0.36	H 38X	-0.710	W 180	195.012	0.000	0.000	1.000	1.000	1.000	92.92	92.92	7.000	1	0
LD 1	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	60.05	Comp	60.05	LD 1X	-19.405	W -45	32.314	0.000	0.000	1.000	1.000	1.000	165.36	147.90	15.020	6	0
LD 2	B/B L5"x3.5"x0.4375"	DAL	5X3.5X0.44	33.0	34.29	Comp	34.29	LD 3X	-41.766	W -90	121.805	0.000	0.000	1.000	1.000	1.000	122.61	121.61	15.020	6	0
LD 4	B/B L3"x2"x0.25"	DAL	3X2X0.25	33.0	50.06	Tens	0.57	LD 7Y	-0.156	W 90	27.358	0.000	0.000	0.930	0.930	0.930	159.78	144.47	12.757	6	0
LD 5	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	53.47	Comp	53.47	LD 9X	-30.005	W -90	56.112	0.000	0.000	0.860	0.860	0.860	110.80	110.80	10.146	1	0
LD 6	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	62.15	Comp	62.15	LD 11P	-29.588	W -90	47.605	0.000	0.000	0.890	0.890	0.890	128.40	125.16	11.361	6	0
LD 7	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	53.34	Tens	0.46	LD 14Y	-0.229	W 180	50.187	0.000	0.000	0.500	0.500	0.500	92.91	92.91	12.141	1	0
LD 8	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	51.45	Comp	51.45	LD 15X	-29.226	W -90	56.803	0.000	0.000	0.870	0.870	0.870	109.55	109.55	9.916	1	0
LD 9	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	56.10	Comp	56.10	LD 17P	-28.656	W -90	51.081	0.000	0.000	0.860	0.860	0.860	119.56	119.56	10.948	1	0
LD 10	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	51.47	Tens	0.74	LD 20Y	-0.383	W 180	52.080	0.000	0.000	0.500	0.500	0.500	88.41	88.41	11.552	1	0
LD 11	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	50.63	Comp	50.63	LD 21X	-29.083	W -90	57.443	0.000	0.000	0.880	0.880	0.880	108.38	108.38	9.699	1	0
LD 12	B/B L3.5"x3.5"x0.25"	DAE	3.5X3.5X0.25	33.0	40.94	Comp	40.94	LD 23P	-27.957	W -90	68.280	0.000	0.000	1.000	1.000	1.000	116.21	116.21	10.556	1	0
LH 1	B/B L3"x3.5"x0.5"	DAS	3.5X3X0.5	33.0	31.01	Comp	31.01	LH 1P	-16.891	W 0	54.468	0.000	0.000	0.500	1.000	0.500	176.20	154.57	24.962	6	0
LH 2	B/B L3"x4"x0.25"	DAS	4X3X0.25	33.0	41.47	Tens	0.00	LH 4Y	0.000		0.008	0.000	0.000	1.000	2.000	1.000	180.16	157.00	13.452	6	0
LH 3	B/B L3"x3.5"x0.3125"	DAS	3.5X3X0.31	33.0	33.41	Tens	0.00	LH 6Y	0.000		0.011	0.000	0.000	1.000	2.000	1.000	179.46	156.56	12.412	6	0
LH 4	B/B L3"x3.5"x0.25"	DAS	3.5X3X0.25	33.0	38.14	Tens	0.00	LH 8Y	0.000		0.010	0.000	0.000	1.000	2.000	1.000	165.42	147.93	11.373	6	0
DUM 1	Dummy Bracing Member	DUM	0.1X0.1X1	36.0	0.00		0.00	BR 11XY	-1.200	W 45	0.324	0.000	0.000	1.000	1.000	1.000	2.65	2.65	22.070	1	0

Group Summary (Tension Portion):

Group Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Use In Tens. %	Tension Control Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. Member (ft)	No. Of Bolts Tens.	No. Of Holes	Hole Diameter (in)
Leg S1	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	72.45	Comp	45.03	L 1XY	223.742	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S2	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	68.61	Comp	36.74	L 2XY	182.537	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S3	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	55.03	Comp	31.83	L 3XY	158.139	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S4	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	48.92	Comp	27.08	L 4XY	134.559	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S5	L 8" x 8" x 1.125"	SAE	8X8X1.13	33.0	45.21	Comp	28.67	L 5XY	142.451	W 45	496.880	0.000	0.000	0.000	25.140	0	0.000	0
Leg S6	L 8" x 8" x 1"	SAE	8X8X1	33.0	42.10	Comp	26.31	L 6XY	117.195	W 45	445.499	0.000	0.000	0.000	25.140	0	0.000	0
Leg S7	L 8" x 8" x 0.875"	SAE	8X8X0.88	33.0	38.27	Comp	23.33	L 7XY	91.663	W 45	392.930	0.000	0.000	0.000	25.140	0	0.000	0
Leg S8	L 8" x 8" x 0.75"	SAE	8X8X0.75	33.0	36.16	Comp	23.65	L 8XY	80.352	W 45	339.767	0.000	0.000	0.000	12.570	0	0.000	0
Leg S9	L 6" x 6" x 0.875"	SAE	6X6X0.88	33.0	38.74	Comp	23.88	L 9XY	69.021	W 45	288.981	0.000	0.000	0.000	12.570	0	0.000	0
Leg S10	L 6" x 6" x 0.875"	SAE	6X6X0.88	33.0	33.07	Comp	20.09	L 10XY	58.069	W 45	288.981	0.000	0.000	0.000	12.570	0	0.000	0
Leg S11	L 6" x 6" x 0.75"	SAE	6X6X0.75	33.0	30.33	Comp	18.77	L 11XY	47.046	W 45	250.668	0.000	0.000	0.000	12.570	0	0.000	0
Leg S12	L 6" x 6" x 0.75"	SAE	6X6X0.75	33.0	24.20	Comp	14.37	L 12XY	36.023	W 45	250.668	0.000	0.000	0.000	12.570	0	0.000	0
Leg S13	L 6" x 6" x 0.625"	SAE	6X6X0.63	33.0	28.16	Comp	11.91	L 13XY	25.156	W 45	211.167	0.000	0.000	0.000	12.570	0	0.000	0
Leg S14	L 6" x 6" x 0.625"	SAE	6X6X0.63	33.0	21.00	Comp	7.11	L 14XY	15.009	W 45	211.167	0.000	0.000	0.000	12.570	0	0.000	0
Leg S15	L 6" x 6" x 0.5625"	SAE	6X6X0.56	33.0	16.08	Comp	2.90	L 15XY	5.535	W 45	190.971	0.000	0.000	0.000	12.570	0	0.000	0
Leg S16	L 6" x 6" x 0.5625"	SAE	6X6X0.56	33.0	8.24	Comp	0.00	L 16Y	0.000		190.971	0.000	0.000	0.000	12.500	0	0.000	0
Leg S17	L 6" x 6" x 0.5625"	SAE	6X6X0.56	33.0	3.96	Comp	0.15	L 17Y	0.292	W -45	190.971	0.000	0.000	0.000	3.890	0	0.000	0
Leg S18	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	4.56	Comp	0.28	L 18Y	0.473	W -45	170.775	0.000	0.000	0.000	7.500	0	0.000	0
Leg S19	L 6" x 6" x 0.5"	SAE	6X6X0.5	33.0	3.03	Comp	0.00	L 19Y	0.000		170.775	0.000	0.000	0.000	7.500	0	0.000	0
Diag S1	B/B L3.5"x5"x0.4375"	DAS	5X3.5X0.44	33.0	34.63	Comp	14.79	D 2P	30.960	W -90	209.385	0.000	0.000	0.000	22.030	0	0.000	0
Diag S2	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	48.29	Comp	41.55	D 4P	51.579	W -90	124.146	0.000	0.000	0.000	20.294	0	0.000	0
Diag S3	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	45.57	Comp	40.96	D 6P	50.844	W -90	124.146	0.000	0.000	0.000	19.834	0	0.000	0
Diag S4	B/B L3"x4"x0.3125"	DAS	4X3X0.31	33.0	44.01	Comp	40.41	D 8P	50.173	W -90	124.146	0.000	0.000	0.000	19.399	0	0.000	0
Diag S5	B/B L3"x4"x0.25"	DAS	4X3X0.25	33.0	72.65	Comp	26.26	D 9P	26.357	W -90	100.386	0.000	0.000	0.000	31.668	0	0.000	0
Diag S6	B/B L3"x4"x0.25"	DAS	4X3X0.25	33.0	68.85	Comp	26.34	D 11P	26.445	W -90	100.386	0.000	0.000	0.000	30.561	0	0.000	0
Diag S7	B/B L3"x4"x0.25"	DAS	4X3X0.25	33.0	63.03	Comp	26.21	D 13P	26.307	W -90	100.386	0.000	0.000	0.000	29.531	0	0.000	0
Diag S8	B/B L2.5"x3"x0.3125"	DAS	3X2.5X0.31	33.0	42.67	Comp	15.71	D 15P	15.116	W -90	96.228	0.000	0.000	0.000	18.595	0	0.000	0
Diag S9	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	62.75	Comp	18.81	D 18P	13.299	W 180	70.686	0.000	0.000	0.000	17.915	0	0.000	0
Diag S10	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	52.69	Comp	16.76	D 19P	11.844	W -90	70.686	0.000	0.000	0.000	17.259	0	0.000	0
Diag S11	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	47.07	Comp	15.88	D 21P	11.227	W -90	70.686	0.000	0.000	0.000	16.630	0	0.000	0
Diag S12	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	45.38	Comp	16.14	D 23P	11.409	W -90	70.686	0.000	0.000	0.000	16.030	0	0.000	0
Diag S13	L 3" x 4" x 0.25"	SAU	4X3X0.25	33.0	30.55	Tens	30.55	D 26P	15.333	W -90	50.193	0.000	0.000	0.000	21.265	0	0.000	0
Diag S14	L 3" x 4" x 0.25"	SAU	4X3X0.25	33.0	26.03	Tens	26.03	D 28P	13.066	W -90	50.193	0.000	0.000	0.000	19.784	0	0.000	0
Diag S15	L 3" x 3.5" x 0.25"	SAU	3.5X3X0.25	33.0	24.72	Tens	24.72	D 30P	11.453	W -90	46.332	0.000	0.000	0.000	18.375	0	0.000	0
Diag S16	L 3.5" x 3.5" x 0.25"	SAE	3.5X3.5X0.25	33.0	14.88	Tens	14.88	D 32Y	7.467	W -90	50.193	0.000	0.000	0.000	17.678	0	0.000	0
Diag S17	L 3.5" x 3.5" x 0.25"	SAE	3.5X3.5X0.25	33.0	3.37	Tens	3.37	D 33XY	1.691	W 90	50.193	0.000	0.000	0.000	10.131	0	0.000	0
Diag S18	L 3" x 2" x 0.25"	SAU	3X2X0.25	33.0	4.83	Tens	4.83	D 36XY	1.705	W 90	35.343	0.000	0.000	0.000	10.259	0	0.000	0
Diag S19	L 3" x 2" x 0.25"	SAU	3X2X0.25	33.0	8.35	Comp	7.46	D 38Y	2.635	W -90	35.343	0.000	0.000	0.000	10.259	0	0.000	0
Horiz 1	B/B L4"x3.5"x0.375"	DAL	4X3.5X0.38	33.0	33.54	Comp	18.49	H 1X	29.327	W -45	158.598	0.000	0.000	0.000	24.962	0	0.000	0
Horiz 2	B/B L4"x3"x0.375"	DAL	4X3X0.38	33.0	74.31	Comp	10.35	H 3P	15.278	W 90	147.609	0.000	0.000	0.000	15.394	0	0.000	0
Horiz 3	B/B L4"x3"x0.3125"	DAL	4X3X0.31	33.0	73.00	Comp	11.57	H 5X	14.361	W -90	124.146	0.000	0.000	0.000	14.147	0	0.000	0
Horiz 4	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	64.57	Comp	15.46	H 7X	17.775	W -90	114.939	0.000	0.000	0.000	12.899	0	0.000	0
Horiz 5	B/B L3.5"x3"x0.25"	DAL	3.5X3X0.25	33.0	45.40	Comp	17.61	H 9X	16.374	W -90	92.961	0.000	0.000	0.000	17.477	0	0.000	0
Horiz 6	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	45.94	Comp	17.27	H 11P	14.768	W 90	85.536	0.000	0.000	0.000	15.606	0	0.000	0
Horiz 7	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	41.72	Comp	17.60	H 13X	13.748	W -90	78.111	0.000	0.000	0.000	13.735	0	0.000	0
Horiz 8	B/B L3.5"x2.5"x0.3125"	DAL	3.5X2.5X0.31	33.0	21.07	Comp	10.84	H 15X	11.429	W -90	105.435	0.000	0.000	0.000	12.799	0	0.000	0
Horiz 9	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	35.32	Comp	13.65	H 18Y	9.647	W 180	70.686	0.000	0.000	0.000	11.864	0	0.000	0
Horiz 10	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	27.86	Comp	11.34	H 19P	8.018	W 90	70.686	0.000	0.000	0.000	10.928	0	0.000	0
Horiz 11	B/B L2.5"x2.5"x0.25"	DAE	2.5X2.5X0.25	33.0	21.11	Comp	10.70	H 21X	7.563	W -90	70.686	0.000	0.000	0.000	9.992	0	0.000	0
Horiz 12	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	24.59	Comp	1.58	H 24P	1.232	W 0	78.111	0.000	0.000	0.000	9.057	0	0.000	0
Horiz 13	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	30.70	Comp	0.00	H 26X	0.000		78.111	0.000	0.000	0.000	16.242	0	0.000	0
Horiz 14	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	14.29	Comp	0.00	H 28X	0.000		78.111	0.000	0.000	0.000	14.371	0	0.000	0
Horiz 15	B/B L3.5"x3"x0.3125"	DAL	3.5X3X0.31	33.0	8.15	Comp	0.00	H 30X	0.000		114.939	0.000	0.000	0.000	12.500	0	0.000	0
Horiz 16	C15x33.9	CHN	C15x33.9	33.0	2.15	Comp	1.23	H 31Y	3.628	W 180 Ic	295.812	0.000	0.000	0.000	12.500	0	0.000	0
Horiz 17	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	16.29	Comp	0.00	H 34X	0.000		63.261	0.000	0.000	0.000	7.000	0	0.000	0
Horiz 18	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	10.62	Comp	0.00	H 36X	0.000		63.261	0.000	0.000	0.000	7.000	0	0.000	0
Horiz 19	C15x33.9	CHN	C15x33.9	33.0	0.36	Comp	0.11	H 38P	0.335	W 90	295.812	0.000	0.000	0.000	7.000	0	0.000	0
LD 1	B/B L3.5"x2.5"x0.25"	DAL	3.5X2.5X0.25	33.0	60.05	Comp	16.62	LD 2Y	14.215	W -45	85.536	0.000	0.000	0.000	15.020	0	0.000	0
LD 2	B/B L5"x3.5"x0.4375"	DAL	5X3.5X0.44	33.0	34.29	Comp	17.71	LD 3P	37.085	W -90	209.385	0.000	0.000	0.000	15.020	0	0.000	0
LD 4	B/B L3"x2"x0.25"	DAL	3X2X0.25	33.0	50.06	Tens	50.06	LD 7P	35.385	W -90	70.686	0.000	0.000	0.000	12.757	0	0.000	0
LD 5	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	53.47	Comp	31.16	LD 9P	24.340	W -90	78.111	0.000	0.000	0.000	10.146	0	0.000	0
LD 6	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	62.15	Comp	39.46	LD 11X	30.826	W -90	78.111	0.000	0.000	0.000	11.361	0	0.000	0
LD 7	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	53.34	Tens	53.34	LD 13P	33.742	W -90	63.261	0.000	0.000	0.000	12.141	0	0.000	0
LD 8	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	51.45	Comp	30.85	LD 15P	24.100	W -90	78.111	0.000	0.000	0.000	9.916	0	0.000	0
LD 9	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	56.10	Comp	38.12	LD 17X	29.774	W -90	78.111	0.000	0.000	0.000	10.948	0	0.000	0
LD 10	B/B L2.5"x2"x0.25"	DAL	2.5X2X0.25	33.0	51.47	Tens	51.47	LD 19P	32.558	W -90	63.261	0.000	0.000	0.000	11.552	0	0.000	0
LD 11	B/B L3"x2.5"x0.25"	DAL	3X2.5X0.25	33.0	50.63	Comp	30.16	LD 21P	23.561	W -90	78.111	0.000	0.000	0.000	9.699	0	0.000	0
LD 12	B/B L3.5"x3.5"x0.25"	DAE	3.5X3.5X0.25	33.0	40.94	Comp	28.82	LD 23X	28.929	W -90	100.386	0.000	0.000	0.000	10.556	0	0.000	0
LH 1	B/B L3"x3.5"x0.5"	DAS	3.5X3X0.5	33.0	31.01	Comp	6.70	LH 1Y	11.943	W 0	178.200	0.000	0.000	0.000	24.962	0	0.000	0
LH 2	B/B L3"x4"x0.25"	DAS	4X3X0.25	33.0	41.47	Tens	41.47	LH 3P	41.633	W -90	100.386	0.000	0.000	0.000	13.452	0	0.000	0
LH 3	B/B L3"x3.5"x0.3125"	DAS	3.5X3X0.31	33.0	33.41	Tens	33.41	LH 5P	38.397	W -90	114.939	0.000	0.000	0.000	12.412	0	0.000	0
LH 4	B/B L3"x3.5"x0.25"	DAS	3.5X3X0.25	33.0	38.14	Tens	38.14	LH 7P	35.456	W -90	92.961	0.000	0.000	0.000	11.373	0	0.000	0
DUM 1	Dummy Bracing Member	DUM	0.1X0.1X1	36.0	0.00		0.00	BR 11X	0.829	W -45	0.324	0.000	0.000	0.000	22.070	0	0.000	0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
W 0	71.70	H 4Y	Angle
W 180	73.60	H 4P	Angle
W 45	72.45	L 1P	Angle
W -45	71.25	L 1X	Angle
W 90	72.86	H 3X	Angle
W -90	74.31	H 3P	Angle
W 0 Ice	30.70	L 1P	Angle
W 180 Ice	29.27	L 1Y	Angle
W 45 Ice	35.19	L 1P	Angle
W -45 Ice	34.13	L 1X	Angle
W 90 Ice	30.73	L 1P	Angle
W -90 Ice	29.73	L 1X	Angle

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 187722.3
Total: 187722.3

*** End of Report

Site #:	88013		Engineer:	I. Dodson	Windspeed:	No Ice:	121 mph	Ice:	50 mph		Taper:	-0.149698		Taper Change:	275 ft					
Name:	Killingworth, CT		Date:	07/27/21	Carrier	-					FW @ Base:	53.67 ft		FW @ Top:	12.5 ft					

Spreadsheet Version Last Updated: 11/12/2014

Joint Label	Symmetry Code	X Coord. (ft)	Y Coord. (ft)	Z Coord. (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.	Drop Sub-Brace (Y or Blank)	# Vert	Drop (ft)	Height (ft)	Type	Count	Z-Elev. (ft)	FW (ft)	# Sub-Brace
0	XY-Symmetry	26.8335	26.8335	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed		3	8.333	25	1	1	0	53.667	2
1	XY-Symmetry	24.96227273	24.96227273	25	Free	Free	Free	Free	Free	Free		1	8.333	25	2	2	25	49.92454545	2
2	XY-Symmetry	23.09104545	23.09104545	50	Free	Free	Free	Free	Free	Free	Y	1	8.333	25	2	3	50	46.18209091	5
3	XY-Symmetry	21.21981818	21.21981818	75	Free	Free	Free	Free	Free	Free	Y	1	8.333	25	2	4	75	42.43963636	4
4	XY-Symmetry	19.34859091	19.34859091	100	Free	Free	Free	Free	Free	Free		1		25	A	5	100	38.69718182	2
5	XY-Symmetry	17.47736364	17.47736364	125	Free	Free	Free	Free	Free	Free		2		25	A	6	125	34.95472727	2
6	XY-Symmetry	15.60613636	15.60613636	150	Free	Free	Free	Free	Free	Free		2		25	A	7	150	31.21227273	2
7	XY-Symmetry	13.73490909	13.73490909	175	Free	Free	Free	Free	Free	Free		2		12.5	A	8	175	27.46981818	1
8	XY-Symmetry	12.79929545	12.79929545	187.5	Free	Free	Free	Free	Free	Free		1		12.5	A	9	187.5	25.59859091	1
9	XY-Symmetry	11.86368182	11.86368182	200	Free	Free	Free	Free	Free	Free		1		12.5	A	10	200	23.72736364	1
10	XY-Symmetry	10.92806818	10.92806818	212.5	Free	Free	Free	Free	Free	Free		1		12.5	A	11	212.5	21.85613636	1
11	XY-Symmetry	9.992454545	9.992454545	225	Free	Free	Free	Free	Free	Free		1		12.5	A	12	225	19.98490909	1
12	XY-Symmetry	9.056840909	9.056840909	237.5	Free	Free	Free	Free	Free	Free		1		12.5	X	13	237.5	18.11368182	1
13	XY-Symmetry	8.121227273	8.121227273	250	Free	Free	Free	Free	Free	Free		1		12.5	X	14	250	16.24245455	1
14	XY-Symmetry	7.185613636	7.185613636	262.5	Free	Free	Free	Free	Free	Free		1		12.5	X	15	262.5	14.37122727	1
15	XY-Symmetry	6.25	6.25	275	Free	Free	Free	Free	Free	Free		1		12.5	X	16	275	12.5	1
16	XY-Symmetry	6.25	6.25	287.5	Free	Free	Free	Free	Free	Free				0.1	X	17	287.5	12.5	
17	XY-Symmetry	3.5	3.5	287.6	Free	Free	Free	Free	Free	Free				7.5	X	18	287.6	7	
18	XY-Symmetry	3.5	3.5	295.1	Free	Free	Free	Free	Free	Free				7.5	X	19	295.1	7	
19	XY-Symmetry	3.5	3.5	302.6	Free	Free	Free	Free	Free	Free						20	302.6	7	
A1	Y-Symmetry	24.96227273	0	25	Free	Free	Free	Free	Free	Free									
A2	X-Symmetry	0	24.96227273	25	Free	Free	Free	Free	Free	Free									
A3	XY-Symmetry	23.09104545	7.697015152	50	Free	Free	Free	Free	Free	Free									
A4	XY-Symmetry	7.697015152	23.09104545	50	Free	Free	Free	Free	Free	Free									
A5	XY-Symmetry	21.21981818	7.073272727	75	Free	Free	Free	Free	Free	Free									
A6	XY-Symmetry	7.073272727	21.21981818	75	Free	Free	Free	Free	Free	Free									
A7	XY-Symmetry	19.34859091	6.449530303	100	Free	Free	Free	Free	Free	Free									
A8	XY-Symmetry	6.449530303	19.34859091	100	Free	Free	Free	Free	Free	Free									
A9	Y-Symmetry	17.47736364	0	125	Free	Free	Free	Free	Free	Free									
A10	X-Symmetry	0	17.47736364	125	Free	Free	Free	Free	Free	Free									
A11	Y-Symmetry	15.60613636	0	150	Free	Free	Free	Free	Free	Free									
A12	X-Symmetry	0	15.60613636	150	Free	Free	Free	Free	Free	Free									
A13	Y-Symmetry	13.73490909	0	175	Free	Free	Free	Free	Free	Free									
A14	X-Symmetry	0	13.73490909	175	Free	Free	Free	Free	Free	Free									
A15	Y-Symmetry	12.79929545	0	187.5	Free	Free	Free	Free	Free	Free									
A16	X-Symmetry	0	12.79929545	187.5	Free	Free	Free	Free	Free	Free									
A17	Y-Symmetry	11.86368182	0	200	Free	Free	Free	Free	Free	Free									
A18	X-Symmetry	0	11.86368182	200	Free	Free	Free	Free	Free	Free									
A19	Y-Symmetry	10.92806818	0	212.5	Free	Free	Free	Free	Free	Free									
A20	X-Symmetry	0	10.92806818	212.5	Free	Free	Free	Free	Free	Free									
A21	Y-Symmetry	9.992454545	0	225	Free	Free	Free	Free	Free	Free									
A22	X-Symmetry	0	9.992454545	225	Free	Free	Free	Free	Free	Free									
A23	Y-Symmetry	9.056840909	0	237.5	Free	Free	Free	Free	Free	Free									
A24	X-Symmetry	0	9.056840909	237.5	Free	Free	Free	Free	Free	Free									
H1	XY-Symmetry	25.5859902	12.48113636	16.667	Free	Free	Free	Free	Free	Free									
H2	XY-Symmetry	12.48113636	25.5859902	16.667	Free	Free	Free	Free	Free	Free									
H5	XY-Symmetry	23.71476293	13.45187081	41.667	Free	Free	Free	Free	Free	Free									
H6	XY-Symmetry	13.45187081	23.71476293	41.667	Free	Free	Free	Free	Free	Free									
H7	Y-Symmetry	23.71476293	0	41.667	Free	Free	Free	Free	Free	Free									
H8	X-Symmetry	0	23.71476293	41.667	Free	Free	Free	Free	Free	Free									
H9	XY-Symmetry	21.84353566	12.41231673	66.667	Free	Free	Free	Free	Free	Free									
H10	XY-Symmetry	12.41231673	21.84353566	66.667	Free	Free	Free	Free	Free	Free									
H11	Y-Symmetry	21.84353566	0	66.667	Free	Free	Free	Free	Free	Free									
H12	X-Symmetry	0	21.84353566	66.667	Free	Free	Free	Free	Free	Free									
H13	XY-Symmetry	19.97230838	11.37276266	91.667	Free	Free	Free	Free	Free	Free									
H14	XY-Symmetry	11.37276266	19.97230838	91.667	Free	Free	Free	Free	Free	Free									
H15	Y-Symmetry	19.97230838	0	91.667	Free	Free	Free	Free	Free	Free									
H16	X-Symmetry	0	19.97230838	91.667	Free	Free	Free	Free	Free	Free									

NOTES	
Types:	
1:	Built up Horizs. w/ A
2:	Built up Horizs. w/ M
A:	Typical A brace
X:	Typical X brace
Drop:	Use only for types 1 & 2

# Sections:	19

Legs

Site No.:	88013
Engineer:	I. Dodson
Date:	07/27/2021
Carrier:	-

When inputting thickness values, include all decimal places.

Tower Section #	Section Elevations *(ft)*	Type of Shape [1]	Diameter or Length *(in)*	Thickness [2] *(in)*	F_Y *(ksi)*
1	0.000-25.00	L	8	1.125	33
2	25.00-50.00	L	8	1.125	33
3	50.00-75.00	L	8	1.125	33
4	75.00-100.0	L	8	1.125	33
5	100.0-125.0	L	8	1.125	33
6	125.0-150.0	L	8	1	33
7	150.0-175.0	L	8	0.875	33
8	175.0-187.5	L	8	0.75	33
9	187.5-200.0	L	6	0.875	33
10	200.0-212.5	L	6	0.875	33
11	212.5-225.0	L	6	0.75	33
12	225.0-237.5	L	6	0.75	33
13	237.5-250.0	L	6	0.625	33
14	250.0-262.5	L	6	0.625	33
15	262.5-275.0	L	6	0.5625	33
16	275.0-287.5	L	6	0.5625	33
17	287.5-287.6	L	6	0.5625	33
18	287.6-295.1	L	6	0.5	33
19	295.1-302.6	L	6	0.5	33

Notes:

[1] Type of Leg Shape: **R** = Round or **P** = Bent Plate or **S** = Schifflerized Angle. **L** = Even Leg

[2] For Solid Round Leg Shapes Thickness Equals Zero.

[3] Adjust for Bent Plate Leg Shapes.

Diagonals

Site No.:	88013
Engineer:	I. Dodson
Date:	07/27/2021
Carrier:	-

When inputting thickness values, include all decimal places.

Tower Section #	Section Elevations (ft)	Type of Shape [1]	Diameter [2] (in)	Web Length [3] (in)	Flange Length [3] (in)	Thickness (in)	F_y (ksi)	Is Diag. Tension Only? (Y/N)
1	0.000-25.00	2L		3.5	5	0.4375	33	
2	25.00-50.00	2L		3	4	0.3125	33	
3	50.00-75.00	2L		3	4	0.3125	33	
4	75.00-100.0	2L		3	4	0.3125	33	
5	100.0-125.0	2L		3	4	0.25	33	
6	125.0-150.0	2L		3	4	0.25	33	
7	150.0-175.0	2L		3	4	0.25	33	
8	175.0-187.5	2L		2.5	3	0.3125	33	
9	187.5-200.0	2L		2.5	2.5	0.25	33	
10	200.0-212.5	2L		2.5	2.5	0.25	33	
11	212.5-225.0	2L		2.5	2.5	0.25	33	
12	225.0-237.5	2L		2.5	2.5	0.25	33	
13	237.5-250.0	L		3	4	0.25	33	Y
14	250.0-262.5	L		3	4	0.25	33	Y
15	262.5-275.0	L		3	3.5	0.25	33	Y
16	275.0-287.5	L		3.5	3.5	0.25	33	Y
17	287.5-287.6	L		3.5	3.5	0.25	33	Y
18	287.6-295.1	L		3	2	0.25	33	Y
19	295.1-302.6	L		3	2	0.25	33	Y

Notes:

[1] Type of Diagonal Shape: **R** = Round, **L** = Single-Angle or **2L** = Double-Angle.

[2] Applies to Pipes and Solid Round Shapes only. For Solid Round Shapes Thickness Equals Zero.

[3] Applies to Single-Angle and Double-Angle Shapes only.

[4] Applies to Double-Angle Shapes only.

[5] Applies to Single-Angle Shapes only.

Horizontals

Site No.:	88013
Engineer:	I. Dodson
Date:	07/27/2021
Carrier:	-

When inputting thickness values, include all decimal places.

Tower Section #	Section Elevations *(ft)*	Type of Shape [1]	Diameter [2] *(in)*	Web Length [3] *(in)*	Flange Length [3] *(in)*	Thickness *(in)*	F_y *(ksi)*	B/B Spacing (in.)
1	0.000-25.00	2L		4	3.5	0.375	33	0.375
2	25.00-50.00	2L		4	3	0.375	33	0.375
3	50.00-75.00	2L		4	3	0.3125	33	0.375
4	75.00-100.0	2L		3.5	3	0.3125	33	0.375
5	100.0-125.0	2L		3.5	3	0.25	33	0.375
6	125.0-150.0	2L		3.5	2.5	0.25	33	0.375
7	150.0-175.0	2L		3	2.5	0.25	33	0.375
8	175.0-187.5	2L		3.5	2.5	0.3125	33	0.375
9	187.5-200.0	2L		2.5	2.5	0.25	33	0.375
10	200.0-212.5	2L		2.5	2.5	0.25	33	0.375
11	212.5-225.0	2L		2.5	2.5	0.25	33	0.375
12	225.0-237.5	2L		3	2.5	0.25	33	0.375
13	237.5-250.0	2L		3	2.5	0.25	33	0.375
14	250.0-262.5	2L		3	2.5	0.25	33	0.375
15	262.5-275.0	2L		3.5	3	0.3125	33	0.375
16	275.0-287.5	C		15	33.9		33	
17	287.5-287.6	2L		2.5	2	0.25	33	0.375
18	287.6-295.1	2L		2.5	2	0.25	33	0.375
19	295.1-302.6	C		15	33.9		33	

Notes:

[1] Type of Horizontal Shape: **R** = Round, **L** = Single-Angle, **2L** = Double-Angle, **C** = Channel, **W** = W Shape

[2] Applies to Pipes and Solid Round Shapes only. For Solid Round Shapes Thickness Equals Zero.

[3] Applies to Single-Angle and Double-Angle Shapes only.

[4] Applies to Double-Angle Shapes only.

[5] Applies to Single-Angle Shapes only.

Built-up Diagonals

Site No.:	88013
Engineer:	I. Dodson
Date:	07/27/2021
Carrier:	-

When inputting thickness values, include all decimal places.
Input diags. from left to center & from base section upward.

Tower Built-up Diag. #	Section Elevations *(ft)*	Type of Shape [1]	Diameter [2] *(in)*	Web Length [3] *(in)*	Flange Length [3] *(in)*	Thickness *(in)*	F_y *(ksi)*
1	0.000-25.00	2L		3.5	2.5	0.25	33
2	0.000-25.00	2L		5	3.5	0.4375	33
3	25.00-50.00	2L		3	2	0.25	33
4	25.00-50.00	2L		3	2.5	0.25	33
5	25.00-50.00	2L		3	2.5	0.25	33
6	50.00-75.00	2L		2.5	2	0.25	33
7	50.00-75.00	2L		3	2.5	0.25	33
8	50.00-75.00	2L		3	2.5	0.25	33
9	75.00-100.0	2L		2.5	2	0.25	33
10	75.00-100.0	2L		3	2.5	0.25	33
11	75.00-100.0	2L		3.5	3.5	0.25	33

Notes:

[1] Type of Diagonal Shape: **R** = Round, **L** = Single-Angle or **2L** = Double-Angle.

[2] Applies to Pipes and Solid Round Shapes only. For Solid Round Shapes Thickness Equals Zero.

[3] Applies to Single-Angle and Double-Angle Shapes only.

[4] Applies to Double-Angle Shapes only.

[5] Applies to Single-Angle Shapes only.

Built-up Horizontals

Site No.:	88013
Engineer:	I. Dodson
Date:	07/27/2021
Carrier:	-

When inputting thickness values, include all decimal places.

Tower Section #	Section Elevations *(ft)*	Type of Shape [1]	Diameter [2] *(in)*	Web Length [3] *(in)*	Flange Length [3] *(in)*	Thickness *(in)*	F_y *(ksi)*	Is Horiz. Tension Only? *(Y/N)*
1	0.000-25.00	2L		3	3.5	0.5	33	
2	25.00-50.00	2L		3	4	0.25	33	Y
3	50.00-75.00	2L		3	3.5	0.3125	33	Y
4	75.00-100.0	2L		3	3.5	0.25	33	Y

Notes:

[1] Type of Horizontal Shape: **R** = Round, **L** = Single-Angle or **2L** = Double-Angle.

[2] Applies to Pipes and Solid Round Shapes only. For Solid Round Shapes Thickness Equals Zero.

[3] Applies to Single-Angle and Double-Angle Shapes only.

[4] Applies to Double-Angle Shapes only.

[5] Applies to Single-Angle Shapes only.

Coax (p. 1 of 2)

Orig by MED, Improved by ABL. Last update 6/25/13 MED

Site No.:	88013
Engineer:	I. Dodson
Date:	07/27/21
Carrier:	-

Description	From (ft)	To (ft)	Quantity	Shape	Width or Diameter** (in)	Perimeter (in)	Unit Weight (lb/ft)	In Face Zone? (Yes/No)	Include in Wind Load (Yes/No)
1 Ladder	0	271	1	Flat	2	8.0	6	No	Yes
2 COAX CAGE1	8.3333	33.3333	1	Flat	12	48.0	25	Yes	Yes
3 COAX CAGE2	8.3333	33.3333	1	Flat	12	48.0	25	Yes	Yes
4 COAX CAGE3	8.3333	33.3333	4	Flat	12	48.0	25	Yes	Yes
6 WG-1	15	272	1	Flat	1.5	6.0	6	Yes	Yes
7 AT&T-1	15	272	2	Round	0.39	1.2	0.17	Yes	Yes
8 AT&T-2	15	272	4	Round	0.92	2.9	0.89	Yes	Yes
9 AT&T-3	15	272	6	Round	1.98	6.2	0.82	Yes	Yes
10 AT&T-4	15	272	1	Round	1.16	3.6	0.96	Yes	Yes
12 Sprint	17.5	259	6	Round	1.98	6.2	0.82	Yes	Yes
14 WG-2	17.5	250	1	Flat	1.5	6.0	6	Yes	Yes
15 WG-3	15	171	1	Flat	1.5	6.0	6	Yes	Yes
16 VZW	15	171	2	Round	1.98	6.2	0.82	Yes	Yes
17 VZW	15	171	1	Flat	7.0725	37.7	8.2	Yes	Yes
19 Other	15	145	6	Round	1.98	6.2	0.82	Yes	Yes
21 TMO	0	245	3	Round	1.99	6.3	1.9	Yes	Yes
23 DISH	0	200	1	Round	1.6	5.0	2.34	Yes	Yes

Coax (p. 2 of 2)

Site No.:	88013
Engineer:	I. Dodson
Date:	07/27/21
Carrier:	-

Exposure	B	Ke	0.977806
		α	7
Tia Code: TIA-222-H	**Topo Cat:** 1	z_g	1200
f		K_c	0.9

$k_{z\,max}$ 2.01

$k_{z\,min}$ 0.7

K_t

Description	From (ft)	To (ft)	Quantity	Face # (1-4, A-D)	Coax Width (in)	Coax Shape (Block / Flat / Ind)	% Exposed	Spacing (in)	Shape (Round/Flat)	Block Width (# coax)	Block Depth (# coax)	Perimeter (in)	Unit Weight (lb/ft)	In Face Zone (Yes/No)	Include in Wind Load (Yes/No)
Ladder	0	271	1	B	2.00	Flat	100	1	Flat	1	1	8.0	6	No	Yes
COAX CAGE1	8.3333	33.3333	1	1	12.00	Flat	100	0	Flat	1	1	48.0	25	Yes	Yes
COAX CAGE2	8.3333	33.3333	1	2	12.00	Flat	100	0	Flat	1	1	48.0	25	Yes	Yes
COAX CAGE3	8.3333	33.3333	4	3	12.00	Flat	100	0	Flat	4	1	48.0	25	Yes	Yes
								1						No	No
WG-1	15	272	1	4	1.50	Flat	100	0	Flat	1	1	6.0	6	Yes	Yes
AT&T-1	15	272	2	4	0.39	Ind	100	0	Round	2	1	1.2	0.17	Yes	Yes
AT&T-2	15	272	4	4	0.92	Ind	100	1	Round	4	1	2.9	0.89	Yes	Yes
AT&T-3	15	272	6	4	1.98	Ind	100	0	Round	6	1	6.2	0.82	Yes	Yes
AT&T-4	15	272	1	4	1.16	Ind	100	0	Round	1	1	3.6	0.96	Yes	Yes
								1						No	No
Sprint	17.5	259	6	2	1.98	Ind	100	1	Round	6	1	6.2	0.82	Yes	Yes
								1						No	No
WG-2	17.5	250	1	2	1.50	Flat	100	0	Flat	1	1	6.0	6	Yes	Yes
WG-3	15	171	1	3	1.50	Flat	100	0	Flat	1	1	6.0	6	Yes	Yes
VZW	15	171	2	3	1.98	Ind	100	1	Round	2	1	6.2	0.82	Yes	Yes
VZW	15	171	10	3	1.98	Block	50	1	Flat	5	2	37.7	8.2	Yes	Yes
								1						No	No
Other	15	145	6	3	1.98	Ind	100	1	Round	6	1	6.2	0.82	Yes	Yes
								1						No	No
TMO	0	245	3	4	1.99	Ind	100	1	Round	3	1	6.3	1.9	Yes	Yes
								1						No	No
DISH	0	200	1	4	1.60	Ind	100	1	Round	1	1	5.0	2.34	Yes	Yes
								1						No	No
								1						No	No
								1						No	No
								1						No	No
								1						No	No
								1						No	No
								1						No	No
								1						No	No
								1						No	No
								1						No	No
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								1						No	No
								1						No	No
								1						No	No
								1						No	No
								1						No	No
								1						No	No

Fac

Task:	Determine Point Loads	
Tower Height:	303	ft
Gh:	0.85	
Wind Speed:	121	mph,Vult
Ice Wind Speed:	50	
Ice Density:	56	
Tower Type:	S	

Ice Thick:	1	in
Topographic Category (1-4):	1	
Exposure Category (B-D):	B	
Risk Category (1-4):	2	
Height of Crest (H) if Topo Cat. >1:	0	ft
Load Factor; Wind:	1	
Load Factor; Dead:	1.2	

Rooftop Speed Up Factor (Ks)	1	
Ground Elevation (AMSL)	620	ft
Topographic Factor Procedure	Method 1	

Site No.:	
Engineer:	
Date:	
Carrier:	

No.	Carrier	Elevation (ft)	Quantity	# of Azimuths	Proposed?	Manufacturer	Model	Height (in)	Width (in)	Depth (in)	Weight (lbs/ea)	Flat/Round (F/R)	Reduction	C_AA_C (ft^2)	Weight (k)	Ka
1	--	302.5	1	4			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	302.5	1	4			Platform						1.000	60.00	4.00	1
2	--	287.5	1	4			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	287.5	1	4			Platform						1.000	60.00	4.00	1
3	--	268.75	1	4			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	268.75	1	4			Catwallk						1.000	45.00	2.50	1
4	--	237.5	1	1			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	237.5	1	1			Rest Platform						1.000	15.00	0.50	1
5	--	212.5	1	1			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	212.5	1	1			Platform						1.000	15.00	4.00	1
6	--	200	1	2			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	200	1	3			Platform						1.000	45.00	2.50	1
7	--	187.5	1	2			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	187.5	1	3			Platform						1.000	45.00	2.50	1
8	--	187.5	2	2			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	187.5	2	2			Horn Platform						1.000	25.00	1.25	1
9	--	175	2	2			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	175	2	2			Horn Platform						1.000	15.00	1.00	1
10	--	150	1	1			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	150	1	1			Rest Platform						1.000	15.00	0.50	1
11	--	100	1	2			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	100	1	3			Platform						1.000	45.00	4.00	1
12	--	50	1	1			--	0.001	0.001	0.001	0.001	R	0.001			1
	--	50	1	1			Rest Platform						1.000	15.00	0.50	1
13	AT&T MOBILITY	272	1	1	Proposed	Raycap	DC6-48-60-18-8F	23.5	9.7	9.7	20	R	1.000			0.8
	AT&T MOBILITY	272	1	1			-						0.001	0.00	0.00	1
14	AT&T MOBILITY	272	2	2	Proposed	Raycap	DC6-48-60-18-8F ("Squid")	24	11	11	31.8	R	1.000			0.8
	AT&T MOBILITY	272	2	2			-						0.001	0.00	0.00	1
15	AT&T MOBILITY	272	6	3		Powerwave Allgon	LGP17201	13.9	14.4	3.7	31	F	0.500			0.8
	AT&T MOBILITY	272	3	3			Flat Sector Frames						0.750	17.90	0.40	0.75
16	AT&T MOBILITY	272	3	3	Proposed	Ericsson	RRUS 4426 B66	15	13.2	5.8	48.4	F	0.670			0.8
	AT&T MOBILITY	272	3	3			-						0.001	0.00	0.00	1
17	AT&T MOBILITY	272	3	3		Powerwave Allgon	7770	55	11	5	35	F	0.650			0.8
	AT&T MOBILITY	272	3	3			-						0.001	0.00	0.00	1
18	AT&T MOBILITY	272	3	3	Proposed	Ericsson	RRUS 4449 B5, B12	17.9	13.2	9.4	71	F	0.670			0.8
	AT&T MOBILITY	272	3	3			-						0.001	0.00	0.00	1
19	AT&T MOBILITY	272	3	3	Proposed	Ericsson	RRUS 4478 B14	18.1	13.4	8.3	59.4	F	0.670			0.8
	AT&T MOBILITY	272	3	3			-						0.001	0.00	0.00	1
20	AT&T MOBILITY	272	3	3		Kaelus	DBC0061F1V51-2	8	6.5	6.2	25.5	F	0.500			0.8
	AT&T MOBILITY	272	3	3			-						0.001	0.00	0.00	1
21	AT&T MOBILITY	272	3	3	Proposed	Ericsson	RRUS-32 B30 (77 lbs)	29.9	13.3	9.5	77	F	0.710			0.8
	AT&T MOBILITY	272	3	3			-						0.001	0.00	0.00	1
22	AT&T MOBILITY	272	3	3		Ericsson	RRUS 32 B2	27.2	12.1	7	53	F	0.670			0.8
	AT&T MOBILITY	272	3	3			-						0.001	0.00	0.00	1
23	AT&T MOBILITY	272	2	2	Proposed	CCI	DMP65R-BU6DA	71.2	20.7	7.7	79.4	F	0.720			0.8
	AT&T MOBILITY	272	2	2	Proposed	CCI	OAP65R-BU6D						0.720	12.87	0.06	0.8
24	AT&T MOBILITY	272	2	2		Quintel	QS66512-2	72	12	9.6	111	F	0.740			0.8
	AT&T MOBILITY	272	1	1			-						0.001	0.00	0.00	1
25	AT&T MOBILITY	272	1	1	Proposed	CCI	DMP65R-BU8D	96	20.7	7.7	95.7	F	0.720			0.8
	AT&T MOBILITY	272	1	1	Proposed	CCI	OAP65R-BU8D						0.720	18.09	0.08	0.8
26	AT&T MOBILITY	272	1	1		CCI	TPA-65R-LCUUUU-H8	96	14.4	8.6	81.6	F	0.690			0.8
	AT&T MOBILITY	272	1	1			-						0.001	0.00	0.00	1
27	SPRINT NEXTEL	259	6	3			Swedcom ALP 9011-DIN	43	6.5	8	10	F	0.740			0.8
	SPRINT NEXTEL	259	3	3			Flat Sector Frames						0.750	17.90	0.40	0.75
28	VERIZON WIRELESS	171	3	3		Samsung	MT6407-77A	35.1	16.1	5.5	81.6	F	0.500			0.8
	VERIZON WIRELESS	171	3	3			Flat Sector Frames						0.750	17.90	0.40	0.75
29	VERIZON WIRELESS	171	3	3		Commscope	CBC78T-DS-43-2X	9.6	6.9	6.4	20.7	F	0.500			0.8
	VERIZON WIRELESS	171	3	3			-						0.001	0.00	0.00	1
30	VERIZON WIRELESS	171	3	3		Samsung	B5/B13 RRH-BR04C	15	15	8.1	70.3	F	0.500			0.8
	VERIZON WIRELESS	171	3	3			-						0.001	0.00	0.00	1
31	VERIZON WIRELESS	171	3	3		Samsung	B2/B66A RRH-BR049	15	15	10	84.4	F	0.500			0.8
	VERIZON WIRELESS	171	3	3			-						0.001	0.00	0.00	1
32	VERIZON WIRELESS	171	3	3		Alcatel-Lucent	RRH2x60 700	21.5	12	9	56.7	F	0.670			0.8
	VERIZON WIRELESS	171	3	3			-						0.001	0.00	0.00	1
33	VERIZON WIRELESS	171	2	2		Raycap	RC3DC-3315-PF-48	28.9	15.7	10.3	32	F	0.650			0.8
	VERIZON WIRELESS	171	2	2			-						0.001	0.00	0.00	1
34	VERIZON WIRELESS	171	6	3		Antel	LPA-80080/6CF ___	70.9	5.5	13.2	21	F	0.690			0.8
	VERIZON WIRELESS	171	3	3			-						0.001	0.00	0.00	1
35	VERIZON WIRELESS	171	6	3		Commscope	JAHH-65B-R3B	72	13.8	8.2	60.6	F	0.500			0.8
	VERIZON WIRELESS	171	3	3			-						0.001	0.00	0.00	1
36	OTHER	145	6	3		Generic	TTA	12	12	6	10	F	0.670			0.8
	OTHER	145	3	3			-						0.001	0.00	0.00	1
37	OTHER	145	3	3		Generic	36" x 6" Panel	36	6	3	20	F	0.789			0.8
	OTHER	145	3	3			-						0.001	0.00	0.00	1
38	T-MOBILE	245	3	3	Proposed	Ericsson	Radio 4460 B25+B66	19.6	15.7	12.1	109	F	0.670			0.8
	T-MOBILE	245	3	3			Flat Sector Frames						0.750	17.90	0.40	0.75
39	T-MOBILE	245	3	3	Proposed	Ericsson	Radio 4480 B71+B85A	21.8	15.7	7.5	84	F	0.670			0.8
	T-MOBILE	245	3	3			-						0.001	0.00	0.00	1
40	T-MOBILE	245	3	3	Proposed	Ericsson	Air6449 B41	33.1	20.6	8.6	104	F	0.744			0.8
	T-MOBILE	245	3	3			-						0.001	0.00	0.00	1
41	T-MOBILE	245	3	3	Proposed	RFS	APXVAALL24 43-U-NA20	95.9	24	8.5	122.8	F	0.716			0.8
	T-MOBILE	245	3	3			-						0.001	0.00	0.00	1
42	DISH WIRELESS L.L.C.	200	1	1	Proposed	Commscope	RDIDC-9181-PF-48	16	14	8	21.9	F	0.500			0.8
	DISH WIRELESS L.L.C.	200	1	1			-						0.001	0.00	0.00	1
43	DISH WIRELESS L.L.C.	200	3	3	Proposed	Fujitsu	TA08025-B604	15.7	15	7.9	63.9	F	0.500			0.8
	DISH WIRELESS L.L.C.	200	3	3			Flat Sector Frames						0.750	17.90	0.40	0.75
44	DISH WIRELESS L.L.C.	200	3	3	Proposed	Fujitsu	TA08025-B605	15.7	15	9.1	75	F	0.500			0.8
	DISH WIRELESS L.L.C.	200	3	3			-						0.001	0.00	0.00	1
45	DISH WIRELESS L.L.C.	200	3	3	Proposed	JMA Wireless	MX08FRO665-21	72	20	8	64.5	F	0.735			0.8
	DISH WIRELESS L.L.C.	200	3	3			-						0.001	0.00	0.00	1
46																1
																1
47																1
																1
48																1
																1
49																1
																1
50																1
																1

No.	Elevation	C_AA_C	C_AA_C (Ice)	Force	Force (Ice)	Weight	Weight (Ice)	60 Azi	Force	F (Ice)	Height	Sum of Forces (No I	
	(ft)	(ft^2)	(ft^2)	(lb)	(lb)	(lb)	(lb)	Mult.	mean	mean	Flag	60 Azi.	180 Azi.
1	302.5	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**			
	302.5	60.00	81.00	2154.077	496.551	4800	6240	**1.00**	**1184.74**	**273.10**	1.5033058	2154.07673	
2	287.5	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5033068		
	287.5	60.00	81.00	2123.002	489.388	4800	6240	**1.00**	**1167.65**	**269.16**	1.5034783	2123.002211	
3	268.75	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5034793		
	268.75	45.00	60.75	1561.864	360.036	3000	3900	**1.00**	**859.03**	**198.02**	1.5037209	1561.864366	
4	237.5	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5037219		
	237.5	15.00	20.25	502.555	115.847	600	780	**1.00**	**276.41**	**63.72**	1.5042105	502.5549219	
5	212.5	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5042115		
	212.5	15.00	20.25	486.835	112.224	4800	6240	**1.00**	**267.76**	**61.72**	1.5047059	486.8354488	
6	200	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5047069		
	200	45.00	60.75	1435.426	330.890	3000	3900	**1.00**	**789.48**	**181.99**	1.5050000	1435.426285	
7	187.5	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5050010		
	187.5	45.00	60.75	1409.200	324.845	3000	3900	**1.00**	**775.06**	**178.66**	1.5050010	1409.200173	
8	187.5	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5050020		
	187.5	50.00	67.50	1565.778	360.939	3000	3900	**1.00**	**861.18**	**198.52**	1.5053333	2974.978143	
9	175	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5053343		
	175	30.00	40.50	921.129	212.336	2400	3120	**1.00**	**506.62**	**116.78**	1.5057143	921.129111	
10	150	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5057153		
	150	15.00	20.25	440.720	101.593	600	780	**1.00**	**242.40**	**55.88**	1.5066667	440.7201	
11	100	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5066677		
	100	45.00	60.75	1177.531	271.441	4800	6240	**1.00**	**647.64**	**149.29**	1.5100000	1177.530932	
12	50	0.00	0.00	0.000	0.000	0	0	**1.00**	**0.00**	**0.00**	1.5100010		
	50	15.00	20.25	321.990	74.224	600	780	**1.00**	**177.09**	**40.82**	1.5200000	321.9900855	
13	272	1.01	1.33	35.284	7.886	24	82	**1.00**	**19.41**	**4.34**	1.5200010		
	272	0.00	0.00	0.000	0.000	1	2	**1.00**	**0.00**	**0.00**	1.5200010	35.28416641	
14	272	2.35	3.00	81.729	17.867	76	152	**1.00**	**44.95**	**9.83**	1.5200020		
	272	0.00	0.00	0.000	0.000	2	3	**1.00**	**0.00**	**0.00**	1.5036765	117.0127795	
15	272	4.00	6.08	139.421	36.183	223	302	**1.00**	**76.68**	**19.90**	1.5036775		
	272	30.21	40.78	789.006	181.879	1440	1872	**1.00**	**433.95**	**100.03**	1.5036765	1045.440471	
16	272	2.65	4.04	92.404	24.023	174	245	**1.00**	**50.82**	**13.21**	1.5036775		
	272	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5036765	1137.84491	
17	272	8.59	11.24	299.281	66.834	126	262	**1.00**	**164.60**	**36.76**	1.5036775		
	272	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5036765	1437.126143	
18	272	3.17	4.73	110.269	28.122	256	354	**1.00**	**60.65**	**15.47**	1.5036775		
	272	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5036765	1547.39542	
19	272	3.25	4.84	113.191	28.778	214	303	**1.00**	**62.25**	**15.83**	1.5036775		
	272	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5036765	1660.586168	
20	272	0.58	0.99	20.154	5.897	92	122	**1.00**	**11.08**	**3.24**	1.5036775		
	272	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5036765	1680.739788	
21	272	5.65	8.09	196.668	48.085	277	412	**1.00**	**108.17**	**26.45**	1.5036775		
	272	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5036765	1877.407814	
22	272	4.41	6.44	153.597	38.278	191	291	**1.00**	**84.48**	**21.05**	1.5036775		
	272	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5036765	2031.004457	
23	272	14.64	18.61	509.918	110.674	191	479	**1.00**	**280.46**	**60.87**	1.5036775		
	272	14.83	20.02	413.089	95.224	152	197	**1.00**	**227.20**	**52.37**	1.5036765	2954.011458	
24	272	9.63	11.93	335.384	70.920	266	500	**1.00**	**184.46**	**39.01**	1.5036775		
	272	0.00	0.00	0.000	0.000	1	2	**1.00**	**0.00**	**0.00**	1.5036765	3289.395716	
25	272	10.29	12.46	358.506	74.085	115	476	**1.00**	**197.18**	**40.75**	1.5036775		
	272	10.42	14.07	290.302	66.919	92	119	**1.00**	**159.67**	**36.81**	1.5036765	3938.203256	
26	272	7.34	8.63	255.647	51.294	98	378	**1.00**	**140.61**	**28.21**	1.5036775		
	272	0.00	0.00	0.000	0.000	1	2	**1.00**	**0.00**	**0.00**	1.5036765	4193.850175	
27	259	11.88	15.54	407.983	91.131	72	161	**1.00**	**224.39**	**50.12**	1.5036775		
	259	30.21	40.78	778.043	179.352	1440	1872	**1.00**	**427.92**	**98.64**	1.5038610	1186.026194	
28	171	5.65	7.83	172.371	40.804	294	444	**1.00**	**94.80**	**22.44**	1.5038620		
	171	30.21	40.78	691.016	159.291	1440	1872	**1.00**	**380.06**	**87.61**	1.5058480	863.3867308	
29	171	0.72	1.20	21.864	6.273	75	104	**1.00**	**12.03**	**3.45**	1.5058490		
	171	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5058480	885.2507471	
30	171	2.25	3.37	68.630	17.561	253	343	**1.00**	**37.75**	**9.66**	1.5058490		
	171	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5058480	953.8806248	
31	171	2.25	3.37	68.630	17.561	304	406	**1.00**	**37.75**	**9.66**	1.5058490		
	171	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5058480	1022.510502	
32	171	3.46	5.14	105.452	26.788	204	295	**1.00**	**58.00**	**14.73**	1.5058490		
	171	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5058480	1127.962548	
33	171	3.93	5.53	119.944	28.802	77	175	**1.00**	**65.97**	**15.84**	1.5058490		
	171	0.00	0.00	0.000	0.000	2	3	**1.00**	**0.00**	**0.00**	1.5058480	1247.906937	
34	171	30.14	35.68	919.192	185.835	151	339	**1.00**	**505.56**	**102.21**	1.5058490		
	171	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5058480	2167.098881	
35	171	21.87	27.28	667.143	142.090	436	702	**1.00**	**366.93**	**78.15**	1.5058490		
	171	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5058480	2834.241498	
36	145	3.86	6.13	112.295	30.449	72	111	**1.00**	**61.76**	**16.75**	1.5058490		
	145	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5068966	112.2955581	
37	145	3.85	5.60	112.028	27.805	72	127	**1.00**	**61.62**	**15.29**	1.5068976		
	145	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5068966	224.3234134	
38	245	4.12	5.98	139.383	34.498	392	532	**1.00**	**76.66**	**18.97**	1.5068976		
	245	30.21	40.78	765.787	176.527	1440	1872	**1.00**	**421.18**	**97.09**	1.5040816	905.1706325	
39	245	4.59	6.59	155.028	38.012	302	423	**1.00**	**85.27**	**20.91**	1.5040826		
	245	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5040816	1060.199062	
40	245	10.14	13.76	342.746	79.434	374	566	**1.00**	**188.51**	**43.69**	1.5040826		
	245	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5040816	1402.945145	
41	245	34.77	42.51	1175.345	245.352	442	913	**1.00**	**646.44**	**134.94**	1.5040826		
	245	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5040816	2578.290544	
42	200	0.75	1.12	23.817	6.100	26	72	**1.00**	**13.10**	**3.36**	1.5040826		
	200	0.00	0.00	0.000	0.000	1	2	**1.00**	**0.00**	**0.00**	1.5050000	23.81747544	
43	200	2.36	3.51	75.121	19.121	230	318	**1.00**	**41.32**	**10.52**	1.5050010		
	200	30.21	40.78	722.647	166.583	1440	1872	**1.00**	**397.46**	**91.62**	1.5050000	821.5855379	
44	200	2.36	3.51	75.121	19.121	270	367	**1.00**	**41.32**	**10.52**	1.5050010		
	200	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5050000	896.7062758	
45	200	22.03	27.92	702.615	152.049	232	518	**1.00**	**386.44**	**83.63**	1.5050010		
	200	0.00	0.00	0.000	0.000	4	5	**1.00**	**0.00**	**0.00**	1.5050000	1599.320956	
46					#VALUE!			**1.00**	**#VALUE!**	**#VALUE!**	1.5050010		
								1.00	**#VALUE!**	**#VALUE!**	1.5050010	#VALUE!	
47					#VALUE!			**1.00**	**#VALUE!**	**#VALUE!**	1.5050020		
								1.00	**#VALUE!**	**#VALUE!**	1.5050020	#VALUE!	
48					#VALUE!			**1.00**	**#VALUE!**	**#VALUE!**	1.5050030		
								1.00	**#VALUE!**	**#VALUE!**	1.5050030	#VALUE!	
49					#VALUE!			**1.00**	**#VALUE!**	**#VALUE!**	1.5050040		
								1.00	**#VALUE!**	**#VALUE!**	1.5050040	#VALUE!	
50					#VALUE!			**1.00**	**#VALUE!**	**#VALUE!**	1.5050050		
								1.00	**#VALUE!**	**#VALUE!**	1.5050050	#VALUE!	

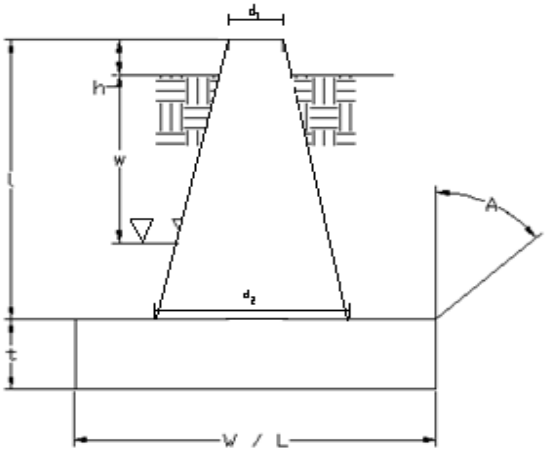
Foundation

Site No.:	88013
Engineer:	I. Dodson
Date:	07/27/21
Carrier:	-

Design Loads (Factored)

Compression/Leg:	408.91	k
Uplift/Leg:	262.59	k
Shear/Leg	75.12	k

Face Width @ Top of Pier (d_1):	4.00	ft
Face Width @ Bottom of Pier (d_2):	7.00	ft
Total Length of Pier (l):	9.00	ft
Height of Pedestal Above Ground (h):	0.67	ft
Width of Pad (W):	11.00	ft
Length of Pad (L):	11.00	ft
Thickness of Pad (t):	2.00	ft
Water Table Depth (w):	30.00	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil (Above Water Table):	120.0	pcf
Unit Weight of Soil (Below Water Table):	57.6	pcf
Friction Angle of Uplift (A):	35	°
Ultimate Compressive Bearing Pressure:	21534	psf
Ultimate Skin Friction:	886	psf



Volume Pier (Total):	279.00	ft³
Volume Pad (Total):	242.00	ft³
Volume Soil (Total):	2105.93	ft³
Volume Pier (Buoyant):	0.00	ft³
Volume Pad (Buoyant):	0.00	ft³
Volume Soil (Buoyant):	0.00	ft³
Weight Pier:	41.85	k
Weight Pad:	205.05	k
Weight Soil:	252.71	k
Uplift Skin Friction:	58.48	k

Berms/Leg:

Volume 1125 ft³

Uplift Check

ϕs Uplift Resistance (k)	Ratio	Result
418.57	0.63	**OK**

Axial Check

ϕs Axial Resistance (k)	Ratio	Result
1954.21	0.21	**OK**

Anchor Bolt Check

Bolt Diameter (in)	2
# of Bolts	6
Steel Grade	A36
Steel Fy	36
Steel Fu	58
Detail Type	C

Usage Ratio	Result
0.57	**OK**

CENTEK engineering
Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

Proposed T-Mobile
Upgrade

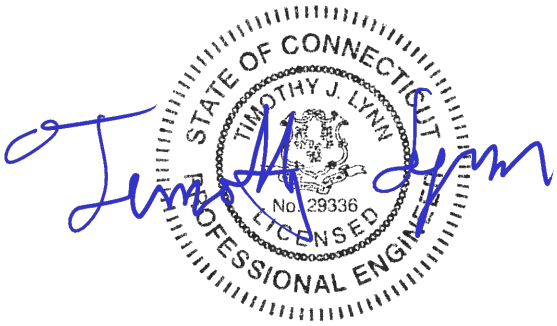
T-Mobile Site #: CTHA376A

133 Little City Road
Killingworth, CT

Centek Project No. 21085.02

Date: July 15, 2021

Max Stress Ratio = 82.9%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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- STRUCTURE LOADING
- CONCLUSION

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- WIND LOAD ON APPURTENANCES
- RISA3D OUTPUT REPORT

SECTION 3 – REFERENCE MATERIALS (NOT INCLUDED WITHIN REPORT)

- RF DATA SHEET, DATED 06/04/2021

CENTEK engineering

Centered on Solutions℠

July 15, 2021

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTHA376A
133 Little City Road
Killingworth, CT 06419

Centek Project No. 21085.02

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above-referenced site. The purpose of the review is to determine the structural adequacy of the three (3) proposed antenna mounts (SitePro P/N:VFA10-HD). The review considered the effects of wind load, dead load, and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC), including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- **T-Mobile:**
  Sector Frames: Three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) Ericsson AIR6449 b41 panel antennas, three (3) Ericsson 4480 B71+B85 remote radio heads and three (3) Ericsson 4460 B25+B66 remote radio heads on the proposed mount with a RAD center elevation of 245-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 101 mph for Killingworth as required in Appendix N of the 2018 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the **subject antenna mount has sufficient capacity** to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Fernando J. Palacios
Engineer

Section 2 - Calculations

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Loads on Equipment

Location: Killingworth,CT

Rev. 0: 07/15/2021

Prepared by: F.J.P.. Checked by: T.J.L.
Job No. 21085.02

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed	$V := 101$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)

Input

Structure Type =	$Structure\_Type := Lattice$		(User Input)
Structure Category =	$SC := II$		(User Input)
Exposure Category =	$Exp := B$		(User Input)
Structure Height =	$h := 302.5$	ft	(User Input)
Height to Center of Antennas =	$z := 245$	ft	(User Input)
Radial Ice Thickness =	$t_i := .75$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topographic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H = 0.998$		(User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if } Structure\_Type = Pole \\ 0.85 & \text{if } Structure\_Type = Lattice \end{cases} = 0.85$$

(Per Table 2-2 of TIA-222-G)

(Per Table 2-3 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.222$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.833$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\overline{\alpha}} = 1.277$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 28$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 7$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAALL24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24.0$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 150$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 572$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 203$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19.1$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 168$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.4$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 74$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 150$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 452$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 452$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson - AIR6449 B41		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 160$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 65$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.2$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 51$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.1$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 25$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 103$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5000$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 162$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 162$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4480 B71+B85		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 21.8$	in	(User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 7.5$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 84$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.4$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 81$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 39$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 28$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 16$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 84$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2567$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2940$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 95$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 95$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4460 B25+B66		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 19.6$	in	(User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 12.1$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 109$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 72$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 56$	lbs

Wind Load (with ice)

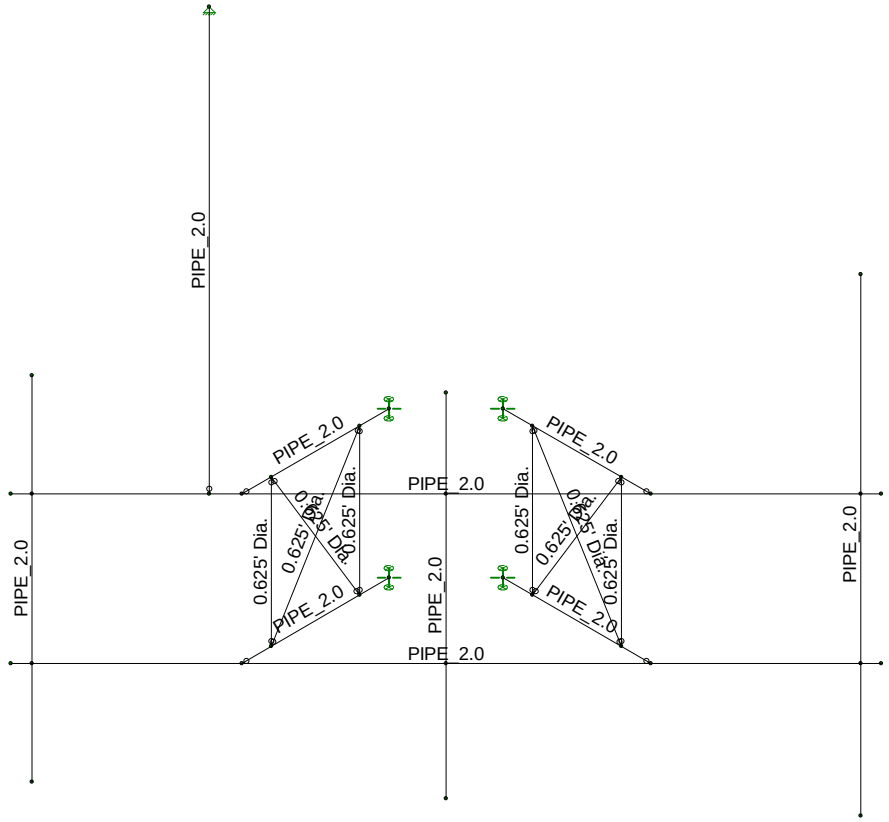
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.1$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 26$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.5$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 21$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 109$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 3723$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3380$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 110$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 110$	lbs



Envelope Only Solution

Centek Engineering Inc.		
FJP	CTHA376A - Mount	July 15, 2021 at 1:52 PM
21085.02	Member Framing	CTHA376A_AMA.r3d

(Global) Model Settings

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

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mast_2.0 STD Pipe	PIPE_2.0	Column	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
2	Horizontal_2.0 STD Pipe	PIPE_2.0	Beam	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
3	Outrigger_2.0 STD Pipe	PIPE_2.0	Beam	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
4	Stabilizer_2.0 STD Pipe	PIPE_2.0	Beam	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
5	0.625" Dia. Bar	0.625' Dia.	Column	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
6	0.75"Dia. Bar	SR 3/4	Column	BAR	A36 Gr.36	Typical	.442	.016	.016	.031

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	HB	N1	N33			Horizontal_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
2	HH	N2	N34			Horizontal_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
3	PSA.4	N5	N6			Antenna Mast_2.0 STD Pipe	Colu...	Pipe	A53 Gr...	Typical
4	PSA.1	N31	N32			Antenna Mast_2.0 STD Pipe	Colu...	Pipe	A53 Gr...	Typical
5	M5	N7	N8			Stabilizer_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
6	M6	N10	N20			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
7	M7	N9	N19			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
8	M16	N15	N16			Antenna Mast_2.0 STD Pipe	Colu...	Pipe	A53 Gr...	Typical
9	M17A	N12	N11			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
10	M18A	N18	N17			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
11	M19	N12	N17			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
12	M20	N18	N11			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
13	M15	N28	N22			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
14	M16A	N27	N21			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
15	M19A	N26	N25			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
16	M20A	N24	N23			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
17	M21	N26	N23			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
18	M22	N24	N25			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	HB	Horizontal_...	10.5	Segment	Segment	Lbyy			2.1	2.1		Lateral
2	HH	Horizontal_...	10.5	Segment	Segment	Lbyy			2.1	2.1		Lateral
3	PSA.4	Antenna M...	6			Lbyy			2.1	2.1		Lateral
4	PSA.1	Antenna M...	8	Segment	Segment	Lbyy			2.1	2.1		Lateral
5	M5	Stabilizer_...	10.18			Lbyy			1	1		Lateral
6	M6	Outrigger_...	2.521	Segment	Segment	Lbyy			.8	.8		Lateral
7	M7	Outrigger_...	2.521	Segment	Segment	Lbyy			.8	.8		Lateral
8	M16	Antenna M...	6			Lbyy			2.1	2.1		Lateral
9	M17A	0.625" Dia....	2.5						1	1		Lateral
10	M18A	0.625" Dia....	2.5						1	1		Lateral
11	M19	0.625" Dia....	2.921	1.458	1.458				1	1		Lateral
12	M20	0.625" Dia....	2.921	1.458	1.458				1	1		Lateral
13	M15	Outrigger_...	2.521	Segment	Segment	Lbyy			.8	.8		Lateral
14	M16A	Outrigger_...	2.521	Segment	Segment	Lbyy			.8	.8		Lateral
15	M19A	0.625" Dia....	2.5						1	1		Lateral
16	M20A	0.625" Dia....	2.5						1	1		Lateral
17	M21	0.625" Dia....	2.921	1.458	1.458				1	1		Lateral
18	M22	0.625" Dia....	2.921	1.458	1.458				1	1		Lateral

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N8	Reaction	Reaction	Reaction			
2	N19	Reaction	Reaction	Reaction		Reaction	
3	N20	Reaction	Reaction	Reaction		Reaction	
4	N17						
5	N18						
6	N21	Reaction	Reaction	Reaction		Reaction	
7	N22	Reaction	Reaction	Reaction		Reaction	
8	N23						
9	N24						

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	Y	-.075	1.083
2	PSA.1	Y	-.075	5.917
3	PSA.4	Y	-.052	1.667
4	PSA.4	Y	-.052	4.417
5	PSA.1	Y	-.084	1
6	PSA.1	Y	-.109	7

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	Y	-.226	1.083
2	PSA.1	Y	-.226	5.917
3	PSA.4	Y	-.081	1.667
4	PSA.4	Y	-.081	4.417
5	PSA.1	Y	-.095	1
6	PSA.1	Y	-.11	7

Member Point Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	X	.037	1.083
2	PSA.1	X	.037	5.917
3	PSA.4	X	.013	1.667
4	PSA.4	X	.013	4.417
5	PSA.1	X	.016	1
6	PSA.1	X	.027	7

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	X	.102	1.083
2	PSA.1	X	.102	5.917
3	PSA.4	X	.033	1.667
4	PSA.4	X	.033	4.417
5	PSA.1	X	.039	1
6	PSA.1	X	.056	7

Member Point Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	Z	.084	1.083
2	PSA.1	Z	.084	5.917
3	PSA.4	Z	.026	1.667
4	PSA.4	Z	.026	4.417
5	PSA.1	Z	.028	1
6	PSA.1	Z	.026	7

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	Z	.286	1.083
2	PSA.1	Z	.286	5.917
3	PSA.4	Z	.08	1.667
4	PSA.4	Z	.08	4.417
5	PSA.1	Z	.081	1
6	PSA.1	Z	.072	7

Member Distributed Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M6	X	.001	.001	0	0
2	M7	X	.001	.001	0	0
3	PSA.4	X	.001	.001	0	0

Member Distributed Loads (BLC 4 : Wind with Ice X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
4	PSA.1	X	.001	.001	0	0
5	M16	X	.001	.001	0	0
6	M5	X	.001	.001	0	0
7	M15	X	.001	.001	0	0
8	M16A	X	.001	.001	0	0
9	M17A	X	.0004	.0004	0	0
10	M18A	X	.0004	.0004	0	0
11	M19	X	.0004	.0004	0	0
12	M20	X	.0004	.0004	0	0
13	M19A	X	.0004	.0004	0	0
14	M20A	X	.0004	.0004	0	0
15	M21	X	.0004	.0004	0	0
16	M22	X	.0004	.0004	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M6	X	.006	.006	0	0
2	M7	X	.006	.006	0	0
3	PSA.4	X	.006	.006	0	0
4	PSA.1	X	.006	.006	0	0
5	M16	X	.006	.006	0	0
6	M5	X	.006	.006	0	0
7	M15	X	.006	.006	0	0
8	M16A	X	.006	.006	0	0
9	M17A	X	.002	.002	0	0
10	M18A	X	.002	.002	0	0
11	M19	X	.002	.002	0	0
12	M20	X	.002	.002	0	0
13	M19A	X	.002	.002	0	0
14	M20A	X	.002	.002	0	0
15	M21	X	.002	.002	0	0
16	M22	X	.002	.002	0	0

Member Distributed Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	HB	Z	.001	.001	1.375	9.5
2	HH	Z	.001	.001	1.375	9.5
3	M6	Z	.001	.001	0	0
4	M7	Z	.001	.001	0	0
5	M15	Z	.001	.001	0	0
6	M16A	Z	.001	.001	0	0
7	M17A	Z	.0004	.0004	0	0
8	M18A	Z	.0004	.0004	0	0
9	M19	Z	.0004	.0004	0	0
10	M20	Z	.0004	.0004	0	0
11	M19A	Z	.0004	.0004	0	0
12	M20A	Z	.0004	.0004	0	0
13	M21	Z	.0004	.0004	0	0
14	M22	Z	.0004	.0004	0	0
15	M16	Z	.001	.001	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	HB	Z	.006	.006	1.375	9.5
2	HH	Z	.006	.006	1.375	9.5
3	M6	Z	.006	.006	0	0
4	M7	Z	.006	.006	0	0
5	M15	Z	.006	.006	0	0
6	M16A	Z	.006	.006	0	0
7	M17A	Z	.002	.002	0	0
8	M18A	Z	.002	.002	0	0
9	M19	Z	.002	.002	0	0
10	M20	Z	.002	.002	0	0
11	M19A	Z	.002	.002	0	0
12	M20A	Z	.002	.002	0	0
13	M21	Z	.002	.002	0	0
14	M22	Z	.002	.002	0	0
15	M16	Z	.006	.006	0	0

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
No Data to Print ...						

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	J...	Point	Distribu...	Area(M...	Surface...
1	Self Weight	DL		-1						
2	Dead Load	None					6			
3	Ice Load	None					6			
4	Wind with Ice X	None					6	16		
5	Wind X	None					6	16		
6	Wind with Ice Z	None					6	15		
7	Wind Z	None					6	15		

Load Combinations

	Description	Solve	PDelta	...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-directi...	Yes	Y		1	1.2	2	1.2	5	1.6																
2	0.9D + 1.6W (X-directi...	Yes	Y		1	.9	2	.9	5	1.6																
3	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	4	1														
4	1.2D + 1.6W (Z-directi...	Yes	Y		1	1.2	2	1.2	7	1.6																
5	0.9D + 1.6W (Z-directi...	Yes	Y		1	.9	2	.9	7	1.6																
6	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N8	max	0	6	.021	1	.495	5	0	6	0	6	0	6
2		min	-.045	1	.016	5	-.555	1	0	1	0	1	0	1
3	N19	max	.336	5	.1	1	.149	1	0	6	.654	4	0	6
4		min	-.232	1	.026	5	.008	5	0	1	-.131	2	0	1
5	N20	max	.741	4	.101	1	.46	2	0	6	.451	5	0	6

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
6		min	-.523	2	.032	5	-.504	4	0	1	-.084	1	0	1
7	N21	max	1.126	3	.736	6	1.06	3	0	6	.68	4	0	6
8		min	-.046	5	.242	2	-.442	5	0	1	-.131	2	0	1
9	N22	max	-.394	2	.744	6	-.324	2	0	6	.484	5	0	6
10		min	-1.226	6	.195	2	-1.435	4	0	1	-.095	1	0	1
11	Totals:	max	0	6	1.638	6	0	3						
12		min	-.99	1	.614	2	-1.753	4						

Envelope Joint Displacements

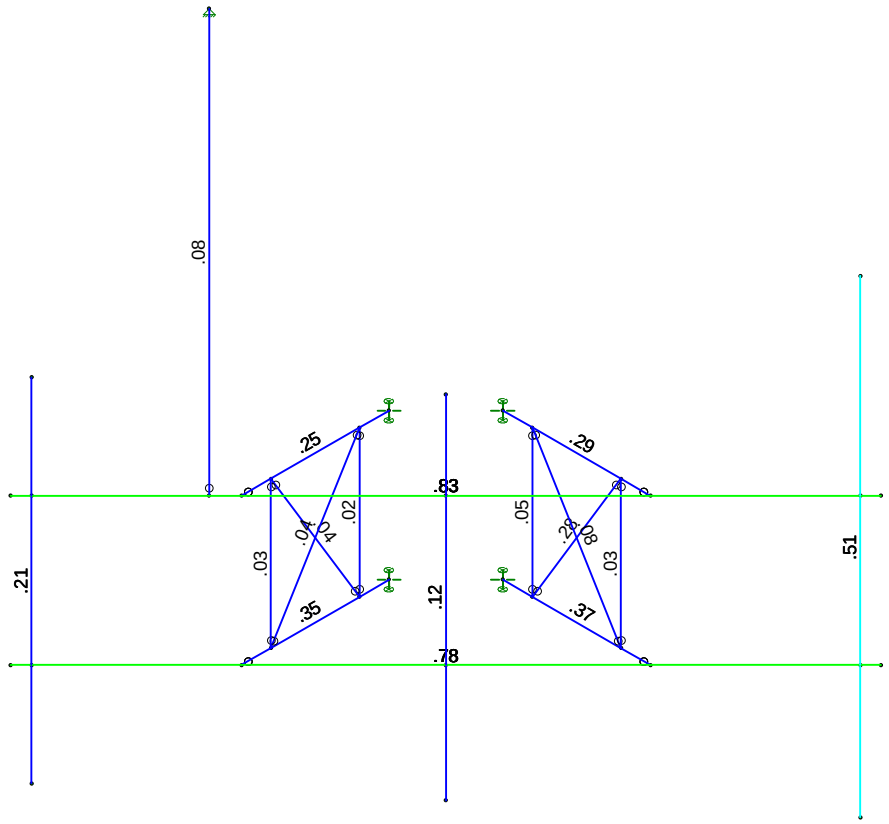
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	.022	2	-.026	5	.474	5	1.532e-3	4	1.921e-2	5	9.137e-4	1
2		min	-.118	4	-.111	3	-.054	3	-1.048e-3	2	-1.283e-3	1	-4.379e-4	5
3	N2	max	.014	1	-.026	5	.535	5	2.379e-3	4	1.935e-2	5	7.365e-4	1
4		min	-.083	5	-.111	3	-.047	1	-1.047e-3	2	-1.525e-3	1	-4.631e-4	5
5	N3	max	.022	2	-.027	5	.416	5	1.532e-3	4	1.921e-2	5	9.136e-4	1
6		min	-.118	4	-.109	3	-.051	3	-1.048e-3	2	-1.283e-3	1	-4.379e-4	5
7	N4	max	.014	1	-.027	5	.477	5	2.379e-3	4	1.935e-2	5	7.364e-4	1
8		min	-.083	5	-.109	3	-.042	1	-1.047e-3	2	-1.525e-3	1	-4.632e-4	5
9	N5	max	.041	2	-.027	5	.385	5	1.527e-3	4	1.921e-2	5	9.927e-4	1
10		min	-.126	4	-.109	3	-.064	3	-1.047e-3	2	-1.283e-3	1	-4.378e-4	5
11	N6	max	.002	2	-.027	5	.526	5	2.398e-3	4	1.935e-2	5	6.516e-4	1
12		min	-.074	4	-.109	3	-.062	1	-1.048e-3	2	-1.525e-3	1	-4.633e-4	5
13	N7	max	.014	1	-.009	5	.003	1	1.89e-3	4	1.721e-2	5	4.695e-3	3
14		min	-.083	5	-.025	3	-.003	5	-5.363e-4	2	-2.116e-3	1	1.447e-3	5
15	N8	max	0	6	0	6	0	6	2.021e-3	3	3.949e-3	1	4.695e-3	3
16		min	0	1	0	1	0	1	1.431e-3	5	-6.76e-4	5	1.447e-3	5
17	N9	max	.022	2	-.001	5	.022	2	4.224e-4	6	1.405e-2	5	4.599e-3	3
18		min	-.118	4	-.004	1	-.118	4	-4.475e-4	2	-1.019e-3	3	1.461e-3	5
19	N10	max	.014	1	-.002	5	.013	1	1.8e-3	4	1.594e-2	5	4.636e-3	3
20		min	-.083	5	-.004	1	-.081	5	-4.431e-4	2	-1.888e-3	1	1.489e-3	5
21	N11	max	.016	2	-.001	5	.016	2	-7.289e-4	5	1.454e-3	2	2.179e-3	3
22		min	-.083	4	-.003	1	-.083	4	-2.075e-3	3	-7.907e-3	4	7.527e-4	5
23	N12	max	.01	1	-.001	5	.009	1	1.613e-4	5	8.905e-4	1	2.232e-3	3
24		min	-.058	5	-.003	1	-.057	5	-2.065e-3	3	-5.48e-3	5	-9.657e-5	5
25	N13	max	.022	2	.08	3	.015	1	1.465e-4	1	8.524e-4	2	2.337e-4	2
26		min	-.119	4	.023	5	-.327	5	-1.526e-3	5	-1.829e-3	4	-4.821e-4	4
27	N14	max	.015	1	.08	3	.022	1	1.267e-3	4	8.056e-4	1	1.25e-4	2
28		min	-.083	5	.023	5	-.336	5	6.553e-5	3	-8.024e-4	5	-4.818e-4	4
29	N15	max	.03	2	.08	3	.012	1	1.464e-4	1	8.524e-4	2	3.499e-4	2
30		min	-.131	4	.023	5	-.289	4	-1.642e-3	5	-1.829e-3	4	-4.82e-4	4
31	N16	max	.014	1	.08	3	.025	1	1.316e-3	4	8.056e-4	1	7.596e-5	2
32		min	-.075	5	.023	5	-.312	5	6.553e-5	3	-8.024e-4	5	-4.818e-4	4
33	N17	max	.001	2	0	5	.001	2	-6.771e-4	5	5.764e-4	2	2.25e-3	3
34		min	-.007	4	-.002	1	-.007	4	-2.009e-3	3	-2.954e-3	4	7.915e-4	5
35	N18	max	0	1	0	5	0	1	1.767e-4	5	3.637e-4	1	2.264e-3	3
36		min	-.005	5	-.002	1	-.004	5	-2.039e-3	3	-2.042e-3	5	-5.618e-5	5
37	N19	max	0	6	0	6	0	6	-6.547e-4	5	0	6	2.318e-3	3
38		min	0	1	0	1	0	1	-1.941e-3	3	0	1	8.14e-4	5
39	N20	max	0	6	0	6	0	6	2.047e-4	5	0	6	2.334e-3	3
40		min	0	1	0	1	0	1	-1.969e-3	3	0	1	-2.821e-5	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
41	N21	max	0	6	0	6	0	6	-1.03e-3	2	0	6	-2.035e-3	2
42		min	0	1	0	1	0	1	-3.477e-3	6	0	1	-6.97e-3	6
43	N22	max	0	6	0	6	0	6	1.404e-3	5	0	6	9.726e-5	5
44		min	0	1	0	1	0	1	-2.968e-3	3	0	1	-6.426e-3	3
45	N23	max	.001	2	-.004	2	.007	4	-1.247e-3	2	5.774e-4	2	-1.818e-3	2
46		min	-.007	4	-.014	6	-.001	2	-4.137e-3	6	-3.045e-3	4	-6.311e-3	6
47	N24	max	.001	1	-.004	2	.005	4	1.16e-3	5	4.111e-4	1	3.406e-4	5
48		min	-.005	5	-.014	6	0	2	-3.616e-3	3	-2.161e-3	5	-5.779e-3	3
49	N25	max	.016	2	-.007	2	.085	4	-1.026e-3	2	1.455e-3	2	-2.042e-3	2
50		min	-.085	4	-.023	6	-.016	2	-4.192e-3	6	-8.011e-3	4	-6.26e-3	6
51	N26	max	.011	1	-.006	2	.061	5	1.111e-3	5	1.012e-3	1	3.831e-4	5
52		min	-.059	5	-.023	6	-.011	1	-3.726e-3	3	-5.658e-3	5	-5.675e-3	3
53	N27	max	.022	2	-.013	5	.121	4	1.824e-4	2	1.436e-3	2	-2.801e-3	5
54		min	-.12	4	-.036	3	-.022	2	-4.796e-3	4	-3.054e-2	4	-9.171e-3	3
55	N28	max	.016	1	-.008	2	.086	5	4.294e-3	5	1.468e-3	1	-2.374e-3	2
56		min	-.084	5	-.036	6	-.015	1	-4.535e-4	3	-3.035e-2	5	-9.051e-3	6
57	N29	max	.022	2	-.101	2	1.415	4	2.163e-4	2	1.423e-3	2	4.697e-4	2
58		min	-.12	4	-.343	6	-.066	2	-8.161e-3	4	-4.863e-2	4	-5.03e-3	6
59	N30	max	.017	1	-.101	2	1.395	5	7.411e-3	5	1.444e-3	2	-2.158e-3	5
60		min	-.084	5	-.343	6	-.059	2	-9.87e-4	3	-4.917e-2	5	-5.37e-3	3
61	N31	max	.074	2	-.101	2	1.728	4	2.159e-4	2	1.423e-3	2	2.214e-3	2
62		min	-.192	4	-.343	6	-.071	2	-1.222e-2	4	-4.863e-2	4	-4.997e-3	6
63	N32	max	.277	1	-.101	2	1.88	5	1.344e-2	5	1.444e-3	2	-2.168e-3	5
64		min	0	5	-.343	6	-.054	1	-1.002e-3	3	-4.917e-2	5	-7.43e-3	1
65	N33	max	.022	2	-.1	2	1.561	4	2.163e-4	2	1.423e-3	2	4.696e-4	2
66		min	-.12	4	-.358	6	-.07	2	-8.161e-3	4	-4.863e-2	4	-5.03e-3	6
67	N34	max	.017	1	-.11	2	1.543	5	7.411e-3	5	1.444e-3	2	-2.158e-3	5
68		min	-.084	5	-.358	6	-.063	2	-9.87e-4	3	-4.917e-2	5	-5.37e-3	3

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

	Me...	Sha...	Code Ch...	Lo...	LC	Shear...	Loc...	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn ...	Cb	Eqn
1	HB	PIP...	.783	7.6...	4	.141	7.7...		4	23.279	32.13	1.872	1.872	1.788	H1-1b
2	HH	PIP...	.829	7.6...	4	.139	7.7...		5	23.279	32.13	1.872	1.872	1.78	H1-1b
3	PS...	PIP...	.210	4.25	6	.036	1.75		3	6.196	32.13	1.872	1.872	4.976	H1-1b
4	PS...	PIP...	.509	4.75	3	.077	4.75		3	23.088	32.13	1.872	1.872	2.792	H1-1b
5	M5	PIP...	.076	5.09	1	.005	0		1	9.492	32.13	1.872	1.872	1.136	H1-1b
6	M6	PIP...	.254	2.5...	5	.021	0		4	32.067	32.13	1.872	1.872	1.599	H1-1b
7	M7	PIP...	.352	2.5...	4	.029	0		4	32.067	32.13	1.872	1.872	1.6	H1-1b
8	M16	PIP...	.121	4.5	4	.045	4.5		6	6.196	32.13	1.872	1.872	1.984	H1-1b
9	M1...	0.6...	.027	1.2...	4	.015	0		4	1.88	9.94	.104	.104	1	H1-1b
10	M1...	0.6...	.022	1.25	5	.006	0		4	1.88	9.94	.104	.104	1	H1-1b
11	M19	0.6...	.040	2.9...	1	.015	0		5	5.136	9.94	.104	.104	1.136	H1-1b*
12	M20	0.6...	.036	1.46	1	.030	0		4	5.136	9.94	.104	.104	1.136	H1-1b
13	M15	PIP...	.286	2.5...	4	.077	2.5...		6	32.067	32.13	1.872	1.872	1.609	H1-1b
14	M1...	PIP...	.366	2.5...	4	.078	2.5...		6	32.067	32.13	1.872	1.872	1.609	H1-1b
15	M1...	0.6...	.029	1.2...	4	.015	0		6	1.88	9.94	.104	.104	1	H1-1b
16	M2...	0.6...	.050	2.5	1	.006	0		4	1.88	9.94	.104	.104	1.136	H1-1b*
17	M21	0.6...	.285	1.4...	6	.006	2.9...		4	5.136	9.94	.104	.104	1.136	H1-1a
18	M22	0.6...	.077	1.46	6	.010	2.9...		6	5.136	9.94	.104	.104	1.136	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering Inc.		
FJP	CTHA376A - Mount	July 15, 2021 at 1:52 PM
21085.02	Member Unity Check	CTHA376A_AMA.r3d

AMERICAN TOWER®
CORPORATION

LETTER OF AUTHORIZATION

SITE NO/PROJECT NO: 88013/ 13701109 **SITE NAME: Killingworth**

ADDRESS: 133 LITTLE CITY RD
KILLINGWORTH, CT 06419-1015 **APN: KILL-000006-000000-000011A**

I, Margaret Robinson, Senior Counsel, US Tower Division on behalf of American Tower*, owner of the tower facility located at the address identified above (the "Tower Facility"), do hereby authorize **Transcend Wireless** its successors and assigns, to act as American Tower's non-exclusive agent for the purpose of filing and securing any zoning, land-use, building permit and/or electrical permit application(s) and approvals of the applicable jurisdiction for and to conduct the construction of the installation of antennas and related telecommunications equipment on the Tower Facility located at the above address. This installation shall not affect adjoining lands and will occur only within the area leased by American Tower.

American Tower understands that the application may be denied, modified or approved with conditions. The above authorization is limited to the acceptance by American Tower of conditions related to American Tower's installation. Any such conditions of approval or modifications will not be effective unless approved in writing by American Tower.

The above authorization does not permit **Transcend Wireless** to modify or alter any existing permit(s) and/or zoning or land-use conditions or impose any additional conditions unrelated to American Tower's installation of telecommunications equipment without the prior written approval of American Tower.

Signature: _____

Margaret Robinson, Senior Counsel
US Tower Division

NOTARY BLOCK

COMMONWEALTH OF MASSACHUSETTS
County of Middlesex

This instrument was acknowledged before me by Margaret Robinson, Senior Counsel of American Tower (Tower Facility owner and/or operator), personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to the within instrument and acknowledged to me that he/she executed the same.

WITNESS my hand and official seal, this 5th day of October 2021.

NOTARY SEAL

Catrine Galhana Vaz
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
February 24, 2028

Notary Public _____
My Commission Expires: February 24, 2028

* American Tower as used herein is defined as American Tower Corporation and any of its affiliates or subsidiaries.

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CTHA376A

133 Little City Road
Killingworth, Connecticut 06419

August 20, 2021

EBI Project Number: 6221004547

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**8.69%**

August 20, 2021

T-Mobile
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, Connecticut 06002

Emissions Analysis for Site: CTHA376A

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **133 Little City Road** in **Killingworth, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile 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 ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 133 Little City Road in Killingworth, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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. For power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

7) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

8) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

9) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

10) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

11) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

12) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

13) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. 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. This is rarely the case, and if so, is never continuous.

14) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

15) The antennas used in this modeling are the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS

APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

16) The antenna mounting height centerline of the proposed antennas is 245 feet above ground level (AGL).

17) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 15.45 dBd / 15.45 dBd / 16.45 dBd / 16.45 dBd
Height (AGL):	245 feet	Height (AGL):	245 feet	Height (AGL):	245 feet
Channel Count:	17	Channel Count:	17	Channel Count:	17
Total TX Power (W):	680 Watts	Total TX Power (W):	680 Watts	Total TX Power (W):	680 Watts
ERP (W):	22,622.65	ERP (W):	22,622.65	ERP (W):	22,622.65
Antenna A1 MPE %:	**1.78%**	Antenna B1 MPE %:	**1.78%**	Antenna C1 MPE %:	**1.78%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	245 feet	Height (AGL):	245 feet	Height (AGL):	245 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A2 MPE %:	**2.29%**	Antenna B2 MPE %:	**2.29%**	Antenna C2 MPE %:	**2.29%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	4.07%
Nextel	0.1%
AT&T	0.5%
Verizon	4.02%
Site Total MPE % :	8.69%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	4.07%
T-Mobile Sector B Total:	4.07%
T-Mobile Sector C Total:	4.07%
Site Total MPE % :	8.69%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 600 MHz LTE	2	591.73	245.0	0.74	600 MHz LTE	400	0.19%
T-Mobile 600 MHz NR	1	1577.94	245.0	0.99	600 MHz NR	400	0.25%
T-Mobile 700 MHz LTE	2	695.22	245.0	0.88	700 MHz LTE	467	0.19%
T-Mobile 1900 MHz GSM	4	1052.26	245.0	2.65	1900 MHz GSM	1000	0.26%
T-Mobile 1900 MHz UMTS	2	1052.26	245.0	1.32	1900 MHz UMTS	1000	0.13%
T-Mobile 1900 MHz LTE	2	2104.51	245.0	2.65	1900 MHz LTE	1000	0.26%
T-Mobile 2100 MHz UMTS	2	1324.71	245.0	1.67	2100 MHz UMTS	1000	0.17%
T-Mobile 2100 MHz LTE	2	2649.42	245.0	3.34	2100 MHz LTE	1000	0.33%
T-Mobile 2500 MHz LTE 1C & 2C Traffic	1	11044.63	245.0	6.95	2500 MHz LTE 1C & 2C Traffic	1000	0.70%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	245.0	0.68	2500 MHz LTE 1C & 2C Broadcast	1000	0.07%
T-Mobile 2500 MHz NR Traffic	1	22089.26	245.0	13.90	2500 MHz NR Traffic	1000	1.39%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	245.0	1.35	2500 MHz NR Broadcast	1000	0.14%
						Total:	**4.07%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

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 T-Mobile 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:

T-Mobile Sector	Power Density Value (%)
Sector A:	4.07%
Sector B:	4.07%
Sector C:	4.07%
T-Mobile Maximum MPE % (Sector A):	4.07%
Site Total:	8.69%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **8.69%** 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.

CENTEK engineering
Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

Proposed T-Mobile
Upgrade

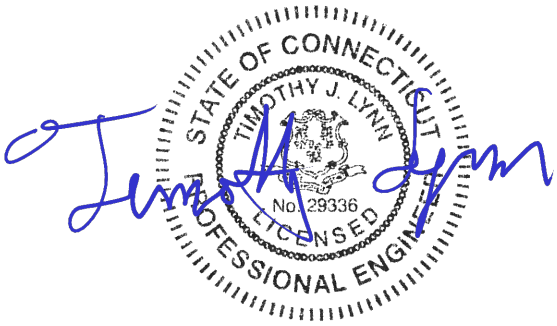
T-Mobile Site #: CTHA376A

133 Little City Road
Killingworth, CT

Centek Project No. 21085.02

Date: July 15, 2021

Max Stress Ratio = 82.9%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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- STRUCTURE LOADING
- CONCLUSION

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- RISA3D OUTPUT REPORT

SECTION 3 – REFERENCE MATERIALS (NOT INCLUDED WITHIN REPORT)

- RF DATA SHEET, DATED 06/04/2021

CENTEK engineering

Centered on Solutions℠

July 15, 2021

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTHA376A
133 Little City Road
Killingworth, CT 06419

Centek Project No. 21085.02

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above-referenced site. The purpose of the review is to determine the structural adequacy of the three (3) proposed antenna mounts (SitePro P/N:VFA10-HD). The review considered the effects of wind load, dead load, and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC), including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- **T-Mobile:**
  Sector Frames: Three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) Ericsson AIR6449 b41 panel antennas, three (3) Ericsson 4480 B71+B85 remote radio heads and three (3) Ericsson 4460 B25+B66 remote radio heads on the proposed mount with a RAD center elevation of 245-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 101 mph for Killingworth as required in Appendix N of the 2018 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the **subject antenna mount has sufficient capacity** to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Fernando J. Palacios
Engineer

Section 2 - Calculations

CENTEK engineering
Centered on Solutions℠ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Loads on Equipment

Location: Killingworth,CT

Rev. 0: 07/15/2021

Prepared by: F.J.P.. Checked by: T.J.L.
Job No. 21085.02

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed	$V := 101$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)

Input

Structure Type =	$Structure\_Type := Lattice$		(User Input)
Structure Category =	$SC := II$		(User Input)
Exposure Category =	$Exp := B$		(User Input)
Structure Height =	$h := 302.5$	ft	(User Input)
Height to Center of Antennas =	$z := 245$	ft	(User Input)
Radial Ice Thickness =	$t_i := .75$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topographic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H = 0.998$		(User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if } Structure\_Type = Pole \\ 0.85 & \text{if } Structure\_Type = Lattice \end{cases} = 0.85$$

(Per Table 2-2 of TIA-222-G)

(Per Table 2-3 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.222$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.833$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\overline{\alpha}} = 1.277$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 28$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 7$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAALL24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24.0$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 150$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 572$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 203$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19.1$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 168$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.4$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 74$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 150$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 452$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 452$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson - AIR6449 B41		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 160$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 65$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.2$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 51$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.1$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 25$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 103$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5000$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 162$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 162$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4480 B71+B85		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 21.8$	in	(User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 7.5$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 84$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.4$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 81$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 39$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 28$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 16$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 84$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2567$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2940$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 95$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 95$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4460 B25+B66		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 19.6$	in	(User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 12.1$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 109$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 72$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 56$	lbs

Wind Load (with ice)

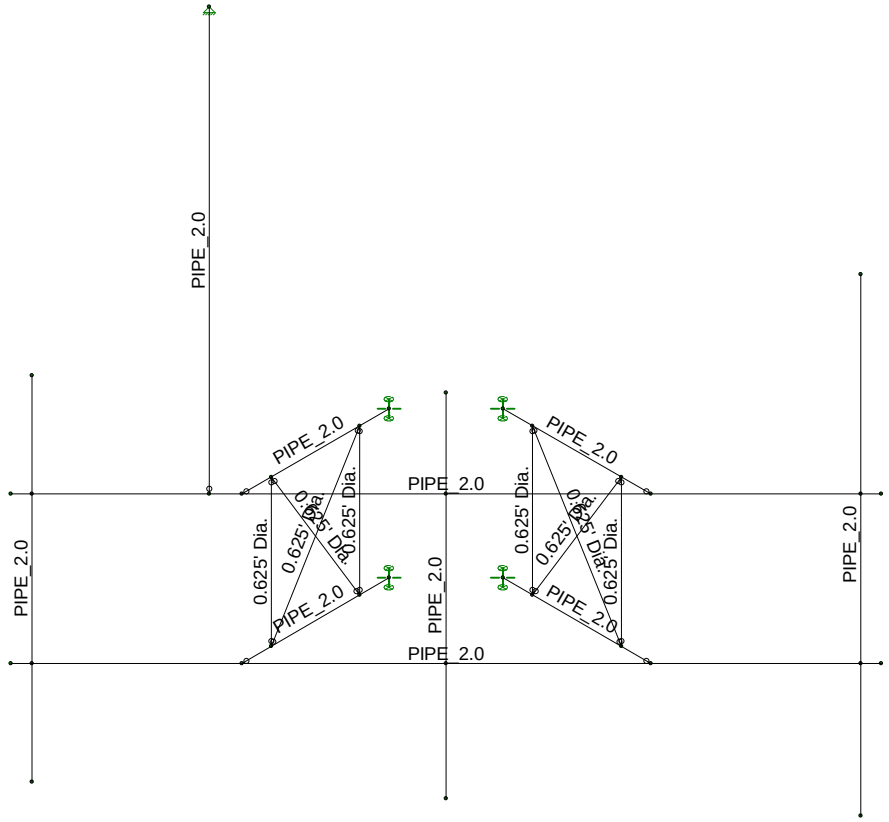
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.1$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 26$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.5$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 21$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 109$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 3723$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3380$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 110$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 110$	lbs



Envelope Only Solution

Centek Engineering Inc.		
FJP	CTHA376A - Mount	July 15, 2021 at 1:52 PM
21085.02	Member Framing	CTHA376A_AMA.r3d

(Global) Model Settings

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

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mast_2.0 STD Pipe	PIPE_2.0	Column	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
2	Horizontal_2.0 STD Pipe	PIPE_2.0	Beam	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
3	Outrigger_2.0 STD Pipe	PIPE_2.0	Beam	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
4	Stabilizer_2.0 STD Pipe	PIPE_2.0	Beam	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
5	0.625" Dia. Bar	0.625' Dia.	Column	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
6	0.75"Dia. Bar	SR 3/4	Column	BAR	A36 Gr.36	Typical	.442	.016	.016	.031

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	HB	N1	N33			Horizontal_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
2	HH	N2	N34			Horizontal_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
3	PSA.4	N5	N6			Antenna Mast_2.0 STD Pipe	Colu...	Pipe	A53 Gr...	Typical
4	PSA.1	N31	N32			Antenna Mast_2.0 STD Pipe	Colu...	Pipe	A53 Gr...	Typical
5	M5	N7	N8			Stabilizer_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
6	M6	N10	N20			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
7	M7	N9	N19			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
8	M16	N15	N16			Antenna Mast_2.0 STD Pipe	Colu...	Pipe	A53 Gr...	Typical
9	M17A	N12	N11			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
10	M18A	N18	N17			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
11	M19	N12	N17			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
12	M20	N18	N11			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
13	M15	N28	N22			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
14	M16A	N27	N21			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Gr...	Typical
15	M19A	N26	N25			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
16	M20A	N24	N23			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
17	M21	N26	N23			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical
18	M22	N24	N25			0.625" Dia. Bar	Colu...	BAR	A36 Gr...	Typical

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	HB	Horizontal_...	10.5	Segment	Segment	Lbyy			2.1	2.1		Lateral
2	HH	Horizontal_...	10.5	Segment	Segment	Lbyy			2.1	2.1		Lateral
3	PSA.4	Antenna M...	6			Lbyy			2.1	2.1		Lateral
4	PSA.1	Antenna M...	8	Segment	Segment	Lbyy			2.1	2.1		Lateral
5	M5	Stabilizer_...	10.18			Lbyy			1	1		Lateral
6	M6	Outrigger_...	2.521	Segment	Segment	Lbyy			.8	.8		Lateral
7	M7	Outrigger_...	2.521	Segment	Segment	Lbyy			.8	.8		Lateral
8	M16	Antenna M...	6			Lbyy			2.1	2.1		Lateral
9	M17A	0.625" Dia....	2.5						1	1		Lateral
10	M18A	0.625" Dia....	2.5						1	1		Lateral
11	M19	0.625" Dia....	2.921	1.458	1.458				1	1		Lateral
12	M20	0.625" Dia....	2.921	1.458	1.458				1	1		Lateral
13	M15	Outrigger_...	2.521	Segment	Segment	Lbyy			.8	.8		Lateral
14	M16A	Outrigger_...	2.521	Segment	Segment	Lbyy			.8	.8		Lateral
15	M19A	0.625" Dia....	2.5						1	1		Lateral
16	M20A	0.625" Dia....	2.5						1	1		Lateral
17	M21	0.625" Dia....	2.921	1.458	1.458				1	1		Lateral
18	M22	0.625" Dia....	2.921	1.458	1.458				1	1		Lateral

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N8	Reaction	Reaction	Reaction			
2	N19	Reaction	Reaction	Reaction		Reaction	
3	N20	Reaction	Reaction	Reaction		Reaction	
4	N17						
5	N18						
6	N21	Reaction	Reaction	Reaction		Reaction	
7	N22	Reaction	Reaction	Reaction		Reaction	
8	N23						
9	N24						

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	Y	-.075	1.083
2	PSA.1	Y	-.075	5.917
3	PSA.4	Y	-.052	1.667
4	PSA.4	Y	-.052	4.417
5	PSA.1	Y	-.084	1
6	PSA.1	Y	-.109	7

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	Y	-.226	1.083
2	PSA.1	Y	-.226	5.917
3	PSA.4	Y	-.081	1.667
4	PSA.4	Y	-.081	4.417
5	PSA.1	Y	-.095	1
6	PSA.1	Y	-.11	7

Member Point Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	X	.037	1.083
2	PSA.1	X	.037	5.917
3	PSA.4	X	.013	1.667
4	PSA.4	X	.013	4.417
5	PSA.1	X	.016	1
6	PSA.1	X	.027	7

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	X	.102	1.083
2	PSA.1	X	.102	5.917
3	PSA.4	X	.033	1.667
4	PSA.4	X	.033	4.417
5	PSA.1	X	.039	1
6	PSA.1	X	.056	7

Member Point Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	Z	.084	1.083
2	PSA.1	Z	.084	5.917
3	PSA.4	Z	.026	1.667
4	PSA.4	Z	.026	4.417
5	PSA.1	Z	.028	1
6	PSA.1	Z	.026	7

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PSA.1	Z	.286	1.083
2	PSA.1	Z	.286	5.917
3	PSA.4	Z	.08	1.667
4	PSA.4	Z	.08	4.417
5	PSA.1	Z	.081	1
6	PSA.1	Z	.072	7

Member Distributed Loads (BLC 4 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M6	X	.001	.001	0	0
2	M7	X	.001	.001	0	0
3	PSA.4	X	.001	.001	0	0

Member Distributed Loads (BLC 4 : Wind with Ice X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
4	PSA.1	X	.001	.001	0	0
5	M16	X	.001	.001	0	0
6	M5	X	.001	.001	0	0
7	M15	X	.001	.001	0	0
8	M16A	X	.001	.001	0	0
9	M17A	X	.0004	.0004	0	0
10	M18A	X	.0004	.0004	0	0
11	M19	X	.0004	.0004	0	0
12	M20	X	.0004	.0004	0	0
13	M19A	X	.0004	.0004	0	0
14	M20A	X	.0004	.0004	0	0
15	M21	X	.0004	.0004	0	0
16	M22	X	.0004	.0004	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M6	X	.006	.006	0	0
2	M7	X	.006	.006	0	0
3	PSA.4	X	.006	.006	0	0
4	PSA.1	X	.006	.006	0	0
5	M16	X	.006	.006	0	0
6	M5	X	.006	.006	0	0
7	M15	X	.006	.006	0	0
8	M16A	X	.006	.006	0	0
9	M17A	X	.002	.002	0	0
10	M18A	X	.002	.002	0	0
11	M19	X	.002	.002	0	0
12	M20	X	.002	.002	0	0
13	M19A	X	.002	.002	0	0
14	M20A	X	.002	.002	0	0
15	M21	X	.002	.002	0	0
16	M22	X	.002	.002	0	0

Member Distributed Loads (BLC 6 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	HB	Z	.001	.001	1.375	9.5
2	HH	Z	.001	.001	1.375	9.5
3	M6	Z	.001	.001	0	0
4	M7	Z	.001	.001	0	0
5	M15	Z	.001	.001	0	0
6	M16A	Z	.001	.001	0	0
7	M17A	Z	.0004	.0004	0	0
8	M18A	Z	.0004	.0004	0	0
9	M19	Z	.0004	.0004	0	0
10	M20	Z	.0004	.0004	0	0
11	M19A	Z	.0004	.0004	0	0
12	M20A	Z	.0004	.0004	0	0
13	M21	Z	.0004	.0004	0	0
14	M22	Z	.0004	.0004	0	0
15	M16	Z	.001	.001	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	HB	Z	.006	.006	1.375	9.5
2	HH	Z	.006	.006	1.375	9.5
3	M6	Z	.006	.006	0	0
4	M7	Z	.006	.006	0	0
5	M15	Z	.006	.006	0	0
6	M16A	Z	.006	.006	0	0
7	M17A	Z	.002	.002	0	0
8	M18A	Z	.002	.002	0	0
9	M19	Z	.002	.002	0	0
10	M20	Z	.002	.002	0	0
11	M19A	Z	.002	.002	0	0
12	M20A	Z	.002	.002	0	0
13	M21	Z	.002	.002	0	0
14	M22	Z	.002	.002	0	0
15	M16	Z	.006	.006	0	0

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
No Data to Print ...						

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	J...	Point	Distribu...	Area(M...	Surface...
1	Self Weight	DL		-1						
2	Dead Load	None					6			
3	Ice Load	None					6			
4	Wind with Ice X	None					6	16		
5	Wind X	None					6	16		
6	Wind with Ice Z	None					6	15		
7	Wind Z	None					6	15		

Load Combinations

	Description	Solve	PDelta	...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-directi...	Yes	Y		1	1.2	2	1.2	5	1.6																
2	0.9D + 1.6W (X-directi...	Yes	Y		1	.9	2	.9	5	1.6																
3	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	4	1														
4	1.2D + 1.6W (Z-directi...	Yes	Y		1	1.2	2	1.2	7	1.6																
5	0.9D + 1.6W (Z-directi...	Yes	Y		1	.9	2	.9	7	1.6																
6	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N8	max	0	6	.021	1	.495	5	0	6	0	6	0	6
2		min	-.045	1	.016	5	-.555	1	0	1	0	1	0	1
3	N19	max	.336	5	.1	1	.149	1	0	6	.654	4	0	6
4		min	-.232	1	.026	5	.008	5	0	1	-.131	2	0	1
5	N20	max	.741	4	.101	1	.46	2	0	6	.451	5	0	6

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
6		min	-.523	2	.032	5	-.504	4	0	1	-.084	1	0	1
7	N21	max	1.126	3	.736	6	1.06	3	0	6	.68	4	0	6
8		min	-.046	5	.242	2	-.442	5	0	1	-.131	2	0	1
9	N22	max	-.394	2	.744	6	-.324	2	0	6	.484	5	0	6
10		min	-1.226	6	.195	2	-1.435	4	0	1	-.095	1	0	1
11	Totals:	max	0	6	1.638	6	0	3						
12		min	-.99	1	.614	2	-1.753	4						

Envelope Joint Displacements

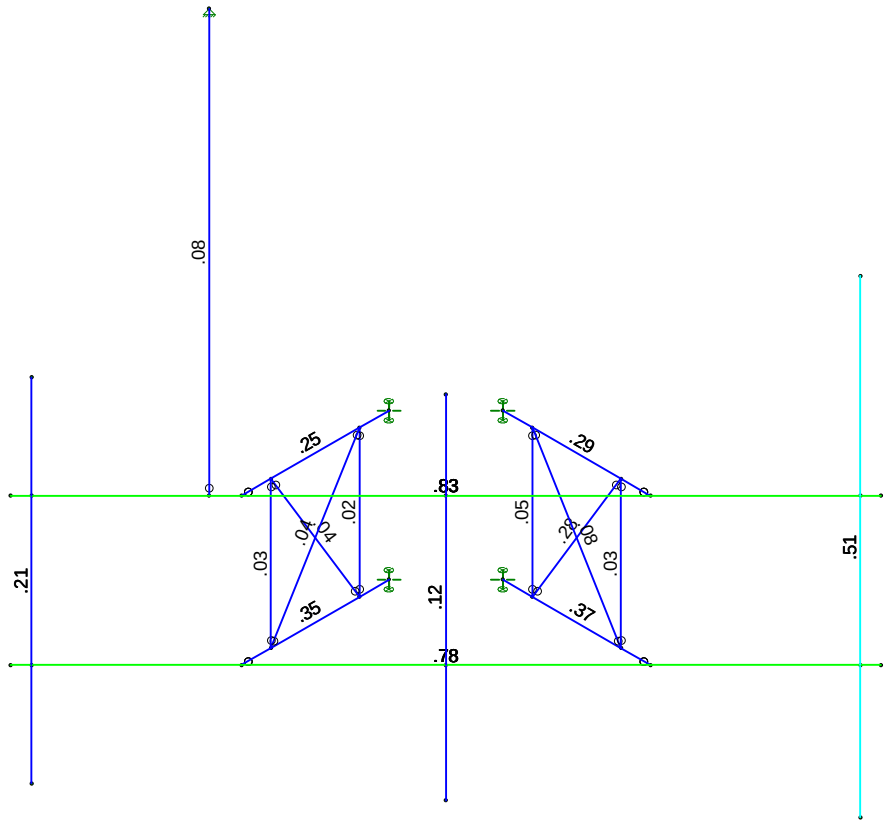
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	.022	2	-.026	5	.474	5	1.532e-3	4	1.921e-2	5	9.137e-4	1
2		min	-.118	4	-.111	3	-.054	3	-1.048e-3	2	-1.283e-3	1	-4.379e-4	5
3	N2	max	.014	1	-.026	5	.535	5	2.379e-3	4	1.935e-2	5	7.365e-4	1
4		min	-.083	5	-.111	3	-.047	1	-1.047e-3	2	-1.525e-3	1	-4.631e-4	5
5	N3	max	.022	2	-.027	5	.416	5	1.532e-3	4	1.921e-2	5	9.136e-4	1
6		min	-.118	4	-.109	3	-.051	3	-1.048e-3	2	-1.283e-3	1	-4.379e-4	5
7	N4	max	.014	1	-.027	5	.477	5	2.379e-3	4	1.935e-2	5	7.364e-4	1
8		min	-.083	5	-.109	3	-.042	1	-1.047e-3	2	-1.525e-3	1	-4.632e-4	5
9	N5	max	.041	2	-.027	5	.385	5	1.527e-3	4	1.921e-2	5	9.927e-4	1
10		min	-.126	4	-.109	3	-.064	3	-1.047e-3	2	-1.283e-3	1	-4.378e-4	5
11	N6	max	.002	2	-.027	5	.526	5	2.398e-3	4	1.935e-2	5	6.516e-4	1
12		min	-.074	4	-.109	3	-.062	1	-1.048e-3	2	-1.525e-3	1	-4.633e-4	5
13	N7	max	.014	1	-.009	5	.003	1	1.89e-3	4	1.721e-2	5	4.695e-3	3
14		min	-.083	5	-.025	3	-.003	5	-5.363e-4	2	-2.116e-3	1	1.447e-3	5
15	N8	max	0	6	0	6	0	6	2.021e-3	3	3.949e-3	1	4.695e-3	3
16		min	0	1	0	1	0	1	1.431e-3	5	-6.76e-4	5	1.447e-3	5
17	N9	max	.022	2	-.001	5	.022	2	4.224e-4	6	1.405e-2	5	4.599e-3	3
18		min	-.118	4	-.004	1	-.118	4	-4.475e-4	2	-1.019e-3	3	1.461e-3	5
19	N10	max	.014	1	-.002	5	.013	1	1.8e-3	4	1.594e-2	5	4.636e-3	3
20		min	-.083	5	-.004	1	-.081	5	-4.431e-4	2	-1.888e-3	1	1.489e-3	5
21	N11	max	.016	2	-.001	5	.016	2	-7.289e-4	5	1.454e-3	2	2.179e-3	3
22		min	-.083	4	-.003	1	-.083	4	-2.075e-3	3	-7.907e-3	4	7.527e-4	5
23	N12	max	.01	1	-.001	5	.009	1	1.613e-4	5	8.905e-4	1	2.232e-3	3
24		min	-.058	5	-.003	1	-.057	5	-2.065e-3	3	-5.48e-3	5	-9.657e-5	5
25	N13	max	.022	2	.08	3	.015	1	1.465e-4	1	8.524e-4	2	2.337e-4	2
26		min	-.119	4	.023	5	-.327	5	-1.526e-3	5	-1.829e-3	4	-4.821e-4	4
27	N14	max	.015	1	.08	3	.022	1	1.267e-3	4	8.056e-4	1	1.25e-4	2
28		min	-.083	5	.023	5	-.336	5	6.553e-5	3	-8.024e-4	5	-4.818e-4	4
29	N15	max	.03	2	.08	3	.012	1	1.464e-4	1	8.524e-4	2	3.499e-4	2
30		min	-.131	4	.023	5	-.289	4	-1.642e-3	5	-1.829e-3	4	-4.82e-4	4
31	N16	max	.014	1	.08	3	.025	1	1.316e-3	4	8.056e-4	1	7.596e-5	2
32		min	-.075	5	.023	5	-.312	5	6.553e-5	3	-8.024e-4	5	-4.818e-4	4
33	N17	max	.001	2	0	5	.001	2	-6.771e-4	5	5.764e-4	2	2.25e-3	3
34		min	-.007	4	-.002	1	-.007	4	-2.009e-3	3	-2.954e-3	4	7.915e-4	5
35	N18	max	0	1	0	5	0	1	1.767e-4	5	3.637e-4	1	2.264e-3	3
36		min	-.005	5	-.002	1	-.004	5	-2.039e-3	3	-2.042e-3	5	-5.618e-5	5
37	N19	max	0	6	0	6	0	6	-6.547e-4	5	0	6	2.318e-3	3
38		min	0	1	0	1	0	1	-1.941e-3	3	0	1	8.14e-4	5
39	N20	max	0	6	0	6	0	6	2.047e-4	5	0	6	2.334e-3	3
40		min	0	1	0	1	0	1	-1.969e-3	3	0	1	-2.821e-5	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
41	N21	max	0	6	0	6	0	6	-1.03e-3	2	0	6	-2.035e-3	2
42		min	0	1	0	1	0	1	-3.477e-3	6	0	1	-6.97e-3	6
43	N22	max	0	6	0	6	0	6	1.404e-3	5	0	6	9.726e-5	5
44		min	0	1	0	1	0	1	-2.968e-3	3	0	1	-6.426e-3	3
45	N23	max	.001	2	-.004	2	.007	4	-1.247e-3	2	5.774e-4	2	-1.818e-3	2
46		min	-.007	4	-.014	6	-.001	2	-4.137e-3	6	-3.045e-3	4	-6.311e-3	6
47	N24	max	.001	1	-.004	2	.005	4	1.16e-3	5	4.111e-4	1	3.406e-4	5
48		min	-.005	5	-.014	6	0	2	-3.616e-3	3	-2.161e-3	5	-5.779e-3	3
49	N25	max	.016	2	-.007	2	.085	4	-1.026e-3	2	1.455e-3	2	-2.042e-3	2
50		min	-.085	4	-.023	6	-.016	2	-4.192e-3	6	-8.011e-3	4	-6.26e-3	6
51	N26	max	.011	1	-.006	2	.061	5	1.111e-3	5	1.012e-3	1	3.831e-4	5
52		min	-.059	5	-.023	6	-.011	1	-3.726e-3	3	-5.658e-3	5	-5.675e-3	3
53	N27	max	.022	2	-.013	5	.121	4	1.824e-4	2	1.436e-3	2	-2.801e-3	5
54		min	-.12	4	-.036	3	-.022	2	-4.796e-3	4	-3.054e-2	4	-9.171e-3	3
55	N28	max	.016	1	-.008	2	.086	5	4.294e-3	5	1.468e-3	1	-2.374e-3	2
56		min	-.084	5	-.036	6	-.015	1	-4.535e-4	3	-3.035e-2	5	-9.051e-3	6
57	N29	max	.022	2	-.101	2	1.415	4	2.163e-4	2	1.423e-3	2	4.697e-4	2
58		min	-.12	4	-.343	6	-.066	2	-8.161e-3	4	-4.863e-2	4	-5.03e-3	6
59	N30	max	.017	1	-.101	2	1.395	5	7.411e-3	5	1.444e-3	2	-2.158e-3	5
60		min	-.084	5	-.343	6	-.059	2	-9.87e-4	3	-4.917e-2	5	-5.37e-3	3
61	N31	max	.074	2	-.101	2	1.728	4	2.159e-4	2	1.423e-3	2	2.214e-3	2
62		min	-.192	4	-.343	6	-.071	2	-1.222e-2	4	-4.863e-2	4	-4.997e-3	6
63	N32	max	.277	1	-.101	2	1.88	5	1.344e-2	5	1.444e-3	2	-2.168e-3	5
64		min	0	5	-.343	6	-.054	1	-1.002e-3	3	-4.917e-2	5	-7.43e-3	1
65	N33	max	.022	2	-.1	2	1.561	4	2.163e-4	2	1.423e-3	2	4.696e-4	2
66		min	-.12	4	-.358	6	-.07	2	-8.161e-3	4	-4.863e-2	4	-5.03e-3	6
67	N34	max	.017	1	-.11	2	1.543	5	7.411e-3	5	1.444e-3	2	-2.158e-3	5
68		min	-.084	5	-.358	6	-.063	2	-9.87e-4	3	-4.917e-2	5	-5.37e-3	3

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

	Me...	Sha...	Code Ch...	Lo...	LC	Shear...	Loc...	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn ...	Cb	Eqn
1	HB	PIP...	.783	7.6...	4	.141	7.7...		4	23.279	32.13	1.872	1.872	1.788	H1-1b
2	HH	PIP...	.829	7.6...	4	.139	7.7...		5	23.279	32.13	1.872	1.872	1.78	H1-1b
3	PS...	PIP...	.210	4.25	6	.036	1.75		3	6.196	32.13	1.872	1.872	4.976	H1-1b
4	PS...	PIP...	.509	4.75	3	.077	4.75		3	23.088	32.13	1.872	1.872	2.792	H1-1b
5	M5	PIP...	.076	5.09	1	.005	0		1	9.492	32.13	1.872	1.872	1.136	H1-1b
6	M6	PIP...	.254	2.5...	5	.021	0		4	32.067	32.13	1.872	1.872	1.599	H1-1b
7	M7	PIP...	.352	2.5...	4	.029	0		4	32.067	32.13	1.872	1.872	1.6	H1-1b
8	M16	PIP...	.121	4.5	4	.045	4.5		6	6.196	32.13	1.872	1.872	1.984	H1-1b
9	M1...	0.6...	.027	1.2...	4	.015	0		4	1.88	9.94	.104	.104	1	H1-1b
10	M1...	0.6...	.022	1.25	5	.006	0		4	1.88	9.94	.104	.104	1	H1-1b
11	M19	0.6...	.040	2.9...	1	.015	0		5	5.136	9.94	.104	.104	1.136	H1-1b*
12	M20	0.6...	.036	1.46	1	.030	0		4	5.136	9.94	.104	.104	1.136	H1-1b
13	M15	PIP...	.286	2.5...	4	.077	2.5...		6	32.067	32.13	1.872	1.872	1.609	H1-1b
14	M1...	PIP...	.366	2.5...	4	.078	2.5...		6	32.067	32.13	1.872	1.872	1.609	H1-1b
15	M1...	0.6...	.029	1.2...	4	.015	0		6	1.88	9.94	.104	.104	1	H1-1b
16	M2...	0.6...	.050	2.5	1	.006	0		4	1.88	9.94	.104	.104	1.136	H1-1b*
17	M21	0.6...	.285	1.4...	6	.006	2.9...		4	5.136	9.94	.104	.104	1.136	H1-1a
18	M22	0.6...	.077	1.46	6	.010	2.9...		6	5.136	9.94	.104	.104	1.136	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering Inc.		
FJP	CTHA376A - Mount	July 15, 2021 at 1:52 PM
21085.02	Member Unity Check	CTHA376A_AMA.r3d

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP

CTHA376A_Coverage Strategy_1_draft

Print Name: Standard

Section 1 - Site Information

Site ID: CTHA376A
Status: Draft
Version: 1
Project Type: Coverage Strategy
Approved: Not Approved
Approved By: Not Approved
Last Modified: 6/4/2021 4:33:23 PM
Last Modified By: Richard.Kane@sprint.com

Site Name: CTHA376A
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Not Specified

Latitude: 41.42874000
Longitude: -72.60382000
Address: 133 Little City Rd
City, State: Killingworth, CT
Region: NORTHEAST

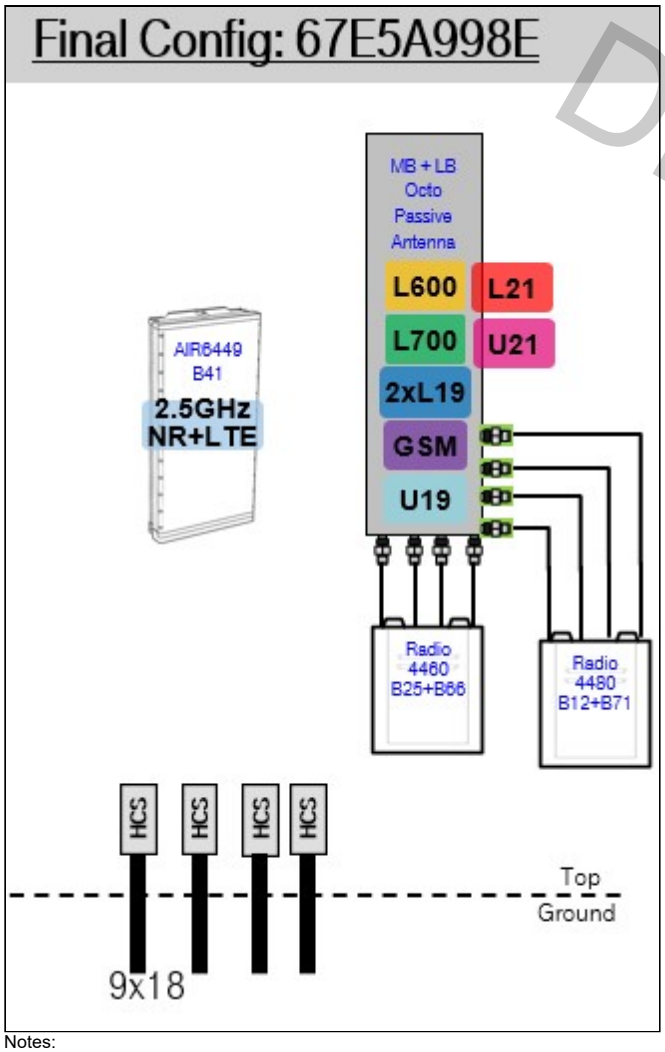
RAN Template: 67E5A998E 6160			**AL Template:** 67E5998E_1xAIR+1OP	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

----- This section is intentionally blank. -----

Section 3 - Proposed Template Images

67E5A998E.jpg



Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP

CTHA376A_Coverage Strategy_1_draft

Print Name: Standard

Section 5 - RAN Equipment

Existing RAN Equipment

----- This section is intentionally blank. -----

Proposed RAN Equipment

Template: 67E5A998E 6160

Enclosure	1	2	3
Enclosure Type	Enclosure 6160	RBS 6601	B160
Baseband	BB 6648 (L700, L600, N600); BB 6648 (L2500, N2500); BB 6648 (L2100, L1900)	DUG20 (G1900)	
Hybrid Cable System	Ericsson Hybrid Trunk 6/24 4AWG 100m **(x 3)**		
Transport System	CSR IXRe V2 (Gen2)		

RAN Scope of Work:

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP

CTHA376A_Coverage Strategy_1_draft

Print Name: Standard

Section 6 - A&L Equipment

Existing Template: Custom
Proposed Template: 67E5998E_1xAIR+1OP

Sector 1 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	60				60	
M. Tilt						
Height	245				245	
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L700 L600 N600	L700 L600 N600	U2100 L2100 L1900 G1900 U1900	U2100 L2100 L1900 G1900 U1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5	3	3	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP

CTHA376A_Coverage Strategy_1_draft

Print Name: Standard

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	180				180	
M. Tilt						
Height	245				245	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	U2100 L2100 L1900 G1900 U1900	U2100 L2100 L1900 G1900 U1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5	3	3	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP

CTHA376A_Coverage Strategy_1_draft

Print Name: Standard

Sector 3 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	280				280	
M. Tilt						
Height	245				245	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L700 L600 N600	L700 L600 N600	U2100 L2100 L1900 G1900 U1900	U2100 L2100 L1900 G1900 U1900	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	5	5	3	3	2	2
Cables	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**	Coax Jumper **(x2)**		
TMAs						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67E5A998E 6160	67E5998E_1xAIR+1OP

CTHA376A_Coverage Strategy_1_draft

Print Name: Standard

Section 7 - Power Systems Equipment

Existing Power Systems Equipment
----- This section is intentionally blank. -----

	Proposed Power Systems Equipment
Enclosure	1
Enclosure Type	Enclosure 6160