Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

July 30, 2021

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
50 Maple Street, Branford, CT 06405
Latitude: 41.2742440000
Longitude: -72.8136560000
T-Mobile Site#: CT11328F – Anchor

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 96-foot level of the existing 100-foot smokestack at 50 Maple Street, CT. The 100-foot smokestack and property are owned by Marine Systems Incorporated. T-Mobile now intends to replace six (6) existing antennas with six (6) new 1900/2100/2500 MHz antennas. The new antennas will support 5G services and will be installed at the same 96-foot level of the tower.

Planned Modifications:
Tower:
Remove
(3) TMA

Remove and Replace:
(3) AIR 21 for (3) RFS APX16DWV-16DWV-S-E-A20 1900/2100 MHz antennas
(3) AIR 21 for (3) Ericsson AIR 6449 2500 MHz antennas

Install New:
(3) Radio 4460 B25+B66
(3) 1-5/8" Hybrid

Existing to Remain:
(3) APXVAALL24_43-U-NA20
(3) Radio 4449 B75+B85
(3) 1-5/8" Hybrid
(6) 1-5/8" coax

The original approval of this facility was by the Town of Branford Planning and Zoning Commission. The Commission approved the facility on January 7, 2010. A copy of this approval is enclosed. T-Mobile was subsequently approved for tower-sharing by the Connecticut Siting Council on March 3, 2017.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman -James Cosgrove, Elected Official, and Harry Smith, Town Planner, as well as the owner.

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

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

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

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

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

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

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

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

Sincerely,

Kyle Richers
Transcend Wireless
Cell: 908-447-4716
Email: krichers@transcendwireless.com

Attachments
cc: James Cosgrove – First Selectman – Town of Branford
Harry Smith– Town Planner – Town of Branford
Marine Systems Inc – Owner

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Wednesday, August 4, 2021 10:09 AM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424297944826

Hello, your package has been delivered.

Delivery Date: Wednesday, 08/04/2021
Delivery Time: 10:07 AM
Left At: RECEPTION
Signed by: TRISTA M

TRANSCEND WIRELESS

Tracking Number:	1ZV257424297944826
Ship To:	TOWN OF BRANFORD 1019 MAIN STREET BRANFORD, CT 06405 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11328F CSC EO

Download the UPS mobile app

Kyle Richers

From: UPS <pkginfo@ups.com>
Sent: Wednesday, August 4, 2021 10:09 AM
To: KRICHERS@TRANSCENDWIRELESS.COM
Subject: UPS Delivery Notification, Tracking Number 1ZV257424297614834

Hello, your package has been delivered.

Delivery Date: Wednesday, 08/04/2021
Delivery Time: 10:07 AM
Left At: RECEPTION
Signed by: TRISTA M

TRANSCEND WIRELESS

Tracking Number:	1ZV257424297614834
Ship To:	TOWN OF BRANFORD 1019 MAIN STREET BRANFORD, CT 06405 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CT11328F UPS 3

Download the UPS mobile app

Kyle Richers

From: UPS <auto-notify@ups.com>
Sent: Tuesday, August 3, 2021 10:02 PM
To: krichers@transcendwireless.com
Subject: UPS Exception Notification, Tracking Number 1ZV257424294431582

The status of your package has changed.

Exception Reason:	Due to operating conditions, your delivery may be delayed.
Exception Resolution:	The package will be forwarded to a UPS facility in the destination city.

At the request of TRANSCEND WIRELESS, this notice alerts you that the status of the shipment listed below has changed.

Signature Required: A signature is required for package delivery

Shipment Details

Tracking Number:	1ZV257424294431582
Ship To:	Marine Systems Inc. 50 Maple Street BRANFORD, CT 06405 US
UPS Service:	UPS GROUND
Package Weight:	1.0 LBS
Reference Number 1:	CT11328F CSC 1

50 MAPLE ST

Location	50 MAPLE ST	**Mblu**	D08/000 012/ 00003/ /
Acct#	000592	**Owner**	MARINE SYSTEMS INCORPORATED
Assessment	$964,500	**Appraisal**	$1,378,100
PID	801	**Building Count**	2

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$412,300	$965,800	$1,378,100

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$288,400	$676,100	$964,500

Owner of Record

Owner	MARINE SYSTEMS INCORPORATED	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	PO BOX 447 BRANFORD, CT 06405	**Book & Page**	0555/1008
		Sale Date	09/07/1993

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
MARINE SYSTEMS INCORPORATED	$0		0555/1008	09/07/1993

Building Information

Building 1 : Section 1

Year Built:	1900
Living Area:	82,765
Replacement Cost:	$3,139,276
Building Percent Good:	3
Replacement Cost Less Depreciation:	$94,200

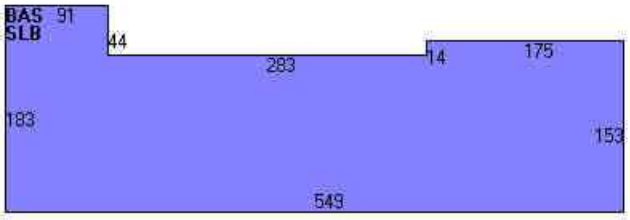
Building Attributes

Field	Description
STYLE	Warehouse
MODEL	Ind/Comm
Grade	C
Stories:	1
Occupancy	3
Exterior Wall 1	Brick
Exterior Wall 2	Concr/Cinder
Roof Structure	Flat
Roof Cover	T&G/Rubber
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	None/Coal/Wd
Heating Type	None
AC Type	None
Bldg Use	BOATYARD MDL96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	384I
Heat/AC	NONE
Frame Type	MASONRY
Baths/Plumbing	LIGHT
Ceiling/Wall	NONE
Rooms/Prtns	AVERAGE
Wall Height	22
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos/BranfordCTPhotos/\00\01\54/82.jpg)

Building Layout



(http://images.vgsi.com/photos/BranfordCTPhotos//Sketches/801_801.jpg)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	82,765	82,765
SLB	Slab	82,765	0
		165,530	82,765

Building 2 : Section 1

Year Built: 1920
Living Area: 2,304
Replacement Cost: $277,502
Building Percent Good: 30
Replacement Cost Less Depreciation: $83,300

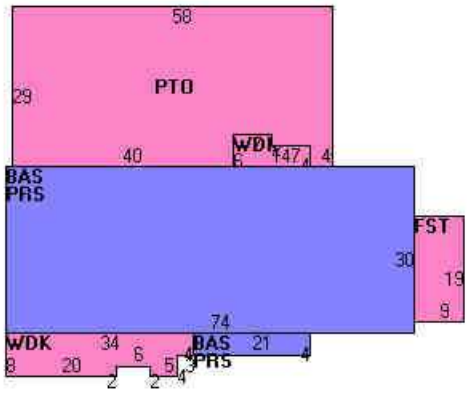
Building Attributes : Bldg 2 of 2	
Field	Description
STYLE	Restaurant
MODEL	Comm/Ind
Grade	C

Stories:	1
Occupancy	1
Exterior Wall 1	Wood Shingle
Exterior Wall 2	
Roof Structure	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Hardwood
Interior Floor 2	Ceram Clay Til
Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Central
Bldg Use	REST/CLUBS MDL94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	3840
Heat/AC	HEAT/AC SPLIT
Frame Type	WOOD FRAME
Baths/Plumbing	AVERAGE
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	8
% Comn Wall	

Building Photo

(http://images.vgsi.com/photos/BranfordCTPhotos//\00\02\16/71.jpg)

Building Layout



(http://images.vgsi.com/photos/BranfordCTPhotos//Sketches/801_14082.jp

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	2,304	2,304
FST	Utility, Finished	171	0
PRS	Pier Fndtn	2,304	0
PTO	Patio	1,612	0
WDK	Deck, Wood	318	0
		6,709	2,304

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
MEZ1	MEZZANINE-UNF	784 S.F.	$200	1
GIR3	GIRDERS 19"-24	80 L.F.	$200	1
HT2	ELECTRIC	1248 S.F.	$200	1

HT3	FORCED AIR	840 S.F.	$200	1
A/C	AIR CONDITION	0 S.F.	$0	1

Land

Land Use

Use Code	3150
Description	BOATYARD MDL96
Zone	IG-1
Neighborhood	350
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	4.59
Frontage	
Depth	
Assessed Value	$676,100
Appraised Value	$965,800

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	PAVING-ASPHALT			36978 S.F.	$18,300	1
SHD5	SHED COM WOOD			168 S.F.	$1,400	2
PAV2	PAVING-CONC			3204 S.F.	$3,200	1
LT1	LIGHTS-IN W/PL			1 UNITS	$200	1
LT1	LIGHTS-IN W/PL			1 UNITS	$200	1
LT2	W/DOUBLE LIGHT			2 UNITS	$700	1
FN3	FENCE-6' CHAIN			510 L.F.	$1,500	1
WDK	WOOD DECK			230 S.F.	$700	1
DCK3	FLOATING			4507 S.F.	$114,900	1
DCK3	FLOATING			2804 S.F.	$71,500	1
STK1	CHIMNEY STK BR			100 UNITS	$20,000	1
SHD5	SHED COM WOOD			160 S.F.	$1,400	1

Valuation History

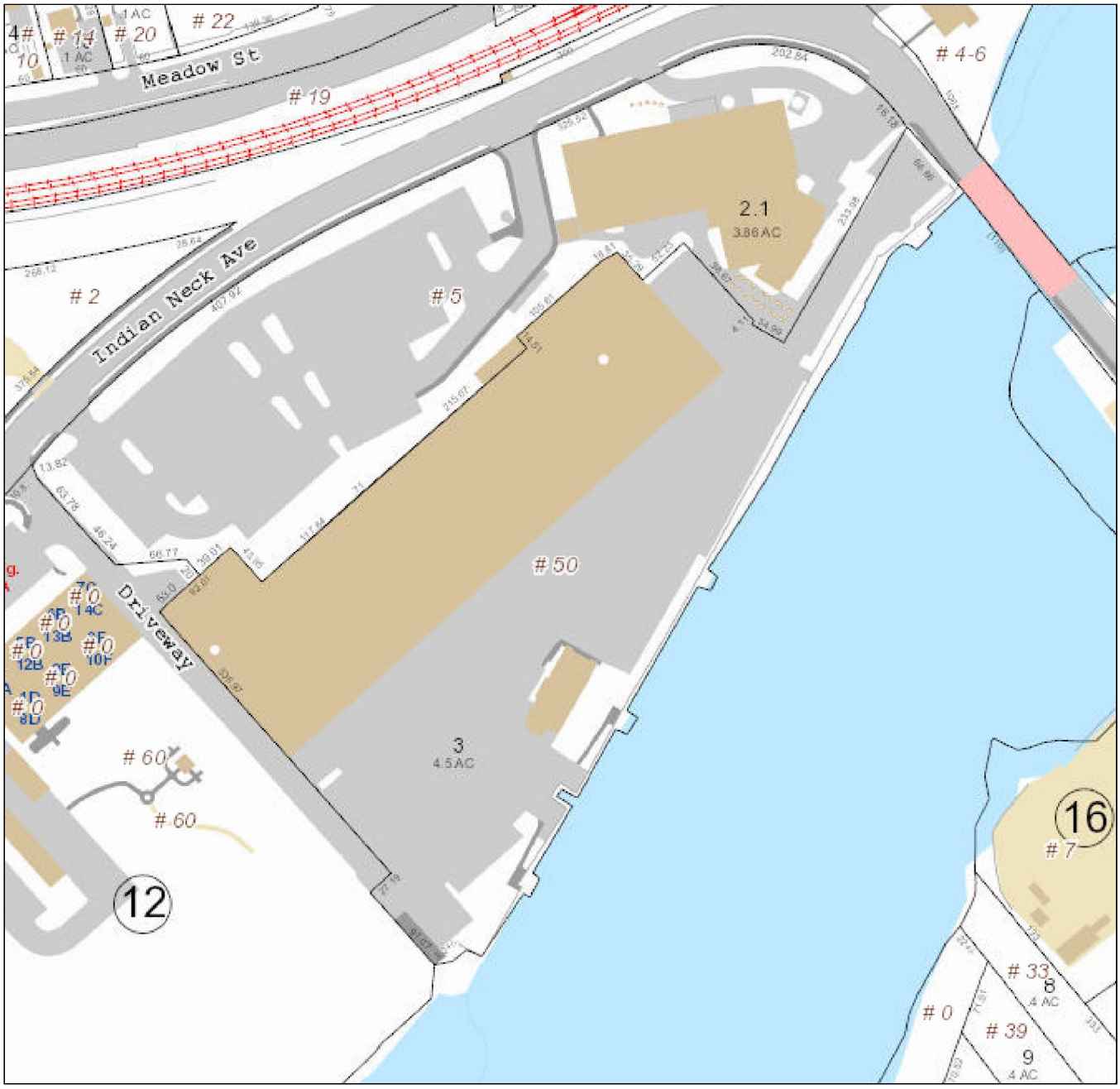
Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$412,300	$965,800	$1,378,100
2019	$412,300	$965,800	$1,378,100
2018	$401,900	$937,400	$1,339,300

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$288,400	$676,100	$964,500
2019	$288,400	$676,100	$964,500
2018	$281,300	$656,200	$937,500

Town of Branford

Geographic Information System (GIS)

Date Printed: 4/16/2021



MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Branford and its mapping contractors assume no legal responsibility for the information contained herein.

0 150 Feet

N W E S

PLANNING AND ZONING COMMISSION
TOWN OF BRANFORD TOWN HALL DRIVE P.O. BOX 150
Branford, Connecticut 06405
Telephone: (203) 488-1255 Fax: (203) 315-2188

NOTICE OF DECISION

January 11, 2010

Clearwire by Maxton Technology
Attention: Thomas F. Flynn III
1296 Blue Hills Avenue
Bloomfield, Connecticut 06002

SUBJECT: Site Plan

APPLICATION: #09-12.4 ADDRESS: 50 Maple Street

APPLICANT: Clearwire Wireless LLC d/b/a Clearwire

OWNER OF RECORD: Marine Systems, Inc.

Dear. Sir:

At a meeting of the Branford Planning & Zoning Commission held on Thursday, January 7, 2010 the Commission voted to:

X Approve your above subject application.

Very truly yours,

Shirley Rasmussen

Shirley Rasmussen
Town Planner

NOTE: Site Plan shall become null and void in the event the applicant fails to obtain a building permit within one (1) year of date of approval.
(Per Section 31.7 of the Branford Zoning Regulations)

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TOWN OF BRANFORD TOWN HALL DRIVE P.O. BOX 150
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(Per Section 31.7 of the Branford Zoning Regulations)

MARINE SYS. SMOKE STACK
SITE ID: CT11328F
50 MAPLE ST
BRANFORD, CT 06405

T-MOBILE A&L TEMPLATE (PROVIDED BY RFDS)
67D5998E_1xAIR+1OP+1QP

RAN TEMPLATE (PROVIDED BY RFDS)
67D5A998E HYBRID

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTON, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

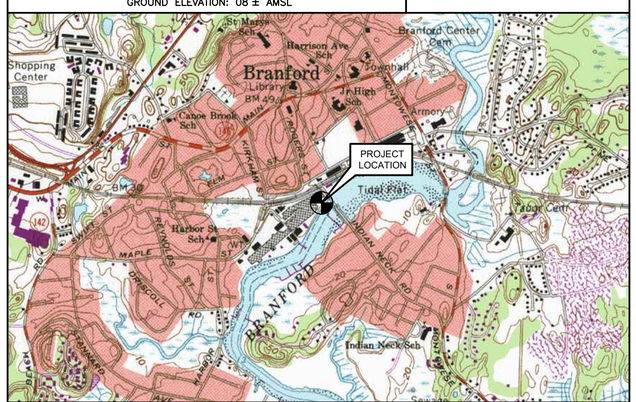
FROM: 35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

TO: 50 MAPLE STREET
BRANFORD, CT 06405

1.	HEAD NORTH ON GRIFFIN ROAD S. TOWARD HARTMAN RD.	0.30 MI.
2.	TAKE THE 2ND RIGHT ONTO DAY HILL RD.	3.64 MI.
3.	MERGE ONTO I-91 S TOWARD HARTFORD	14.42 MI.
4.	TAKE CT-99 EXIT, EXIT 24 TOWARD WETHERSFIELD/ROCKY HILL	0.28 MI.
5.	TURN LEFT ONTO SILAS DEANE HWY/CT-99	0.00 MI.
6.	MERGE ONTO I-91 S via THE RAMP ON THE LEFT TOWARD NEW HAVEN	31.32 MI.
7.	MERGE ONTO I-95 N via THE EXIT ON THE LEFT TOWARD NEW LONDON	4.55 MI.
8.	TAKE THE US-1 EXIT, EXIT 53, TOWARD SHORT BEACH/CT-142/CT-146	0.43 MI.
9.	MERGE ONTO BRANFORD CONN.	0.62 MI.
10.	TAKE THE 1ST RIGHT ONTO W MAIN ST/US-1 S	0.10 MI.
11.	TAKE THE 1ST LEFT ONTO SHORT BEACH RD/CT-142	0.22 MI.
12.	TURN LEFT ONTO MAPLE ST	0.72 MI.
13.	TURN RIGHT ONTO INDIAN NECK AVE.	0.17 MI.
14.	50 MAPLE ST BRANFORD, CT 06405-3511, 50 MAPLE ST	

SITE COORDINATES: LATITUDE: 41°-16'-27.57" N
LONGITUDE: 72°-48'-48.99" W
GROUND ELEVATION: 08'± AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

NORTH

PROJECT SUMMARY

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

1. REMOVE (1) EXISTING RBS 3106 CABINET, MOVE AAV TO (1) NEW EMERSON CABINET.
2. REMOVE (2) EXISTING AIR21 B2P/B4A ANTENNA PER SECTOR, TOTAL OF (6).
3. REMOVE (1) EXISTING AWS TMA PER SECTOR, TOTAL OF (3).
4. REMOVE ALL COAXIAL LINES.
5. INSTALL (1) NEW ENCLOSURE CABINET 6160.
6. INSTALL (1) NEW BATTERY CABINET B160.
7. INSTALL (1) NEW 6X24 HYBRID CABLE PER SECTOR, TOTAL OF (3).
8. INSTALL (1) NEW AIR6449 B41 ANTENNA PER SECTOR, TOTAL OF (3).
9. INSTALL (1) NEW APX16DWV-16DWV-S-E-A20 ANTENNA PER SECTOR, TOTAL OF (3).
10. INSTALL (1) NEW RADIO 4460 B25+B66 PER SECTOR, TOTAL OF (3).

PROJECT SUMMARY (STRUCTURAL)

SEE SHEET(S) S-1 FOR ADDITIONAL DETAILS ON PROPOSED INSTALLATION OF NEW EMERSON CABINET.

PROJECT INFORMATION

SITE NAME:	MARINE SYS. SMOKE STACK
SITE ID:	CT11328F
SITE ADDRESS:	50 MAPLE STREET BRANFORD, CT 06405
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592-8291
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41°-16'-27.57" N LONGITUDE: 72°-48'-48.99" W GROUND ELEVATION: 08'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	GENERAL NOTES AND SPECIFICATIONS	0
C-1	SITE LOCATION PLAN	0
C-2	PARTIAL COMPOUND PLAN AND ELEVATION	0
C-3	EQUIPMENT PLANS	0
C-4	ANTENNA PLANS AND ELEVATIONS	0
C-5	TYPICAL EQUIPMENT DETAILS	0
S-1	EQUIPMENT MOUNTING DETAILS	0
E-1	CONDUIT ROUTING AND ELECTRICAL RISER DIAGRAM	0
E-2	TYPICAL ELECTRICAL DETAILS	0
E-3	ELECTRICAL SPECIFICATIONS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/23/21	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile
Transcend Wireless

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

T-MOBILE NORTHEAST LLC

MARINE SYS SMOKE STACK
SITE ID: CT11328F
50 MAPLE STREET,
BRANFORD, CT 06405

DATE: 06/30/21
SCALE: AS NOTED
JOB NO. 21022.22

TITLE SHEET

T-1

Sheet No. 1 of 11

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 101 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND IT'S COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS, ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
18. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
19. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
20. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

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MARINE SYS SMOKE STACK
SITE ID: CT11328F
50 MAPLE STREET,
BRANFORD, CT 06405

DATE: 06/30/21
SCALE: AS NOTED
JOB NO. 21022.22

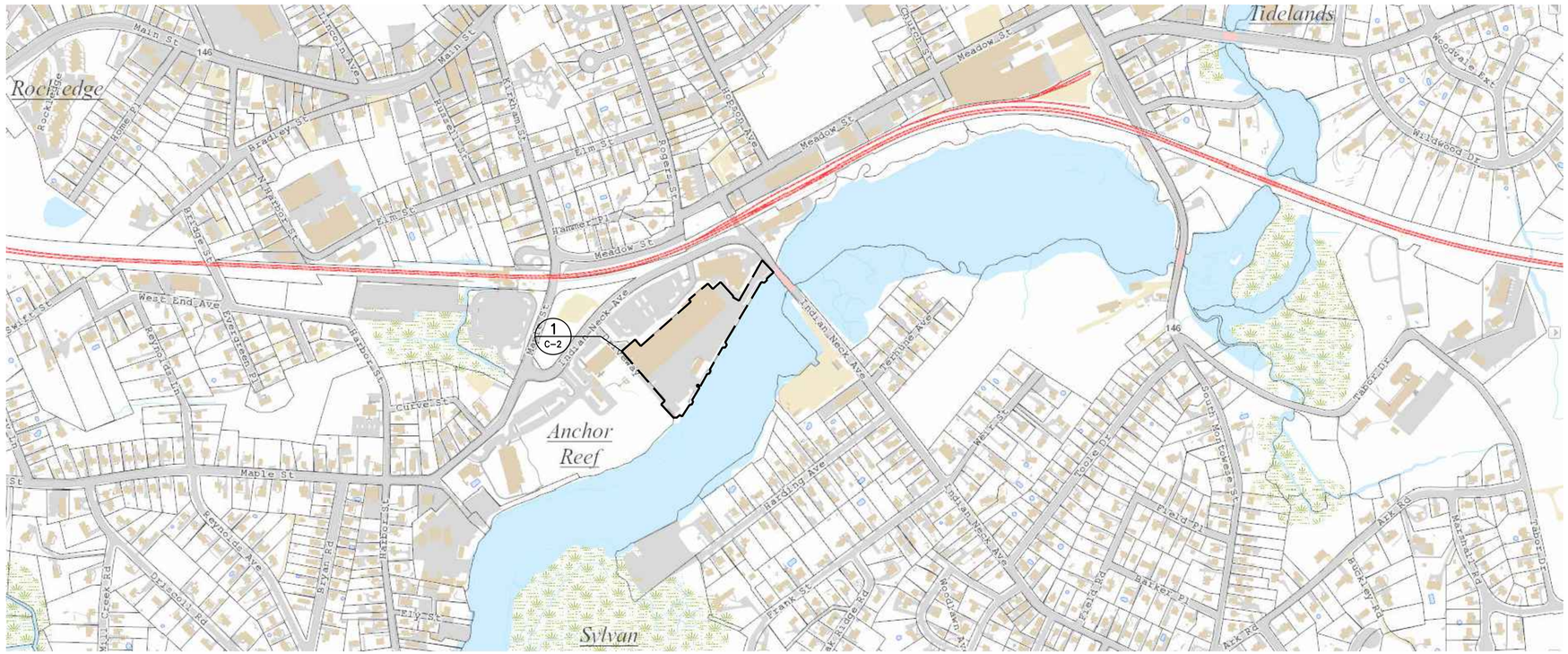
GENERAL NOTES AND SPECIFICATIONS

N-1

NOTE:
ALL HCS LENGTHS TO BE MEASURED AND VERIFIED IN FIELD BEFORE ORDERING

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) EXISTING COAX
A1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	96'	60°			(1) 6x24 HYBRID CABLE
A2	EXISTING	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	96'	60°	(E) RADIO 4449 B71+B85 (1)		
A3	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	96'	60°	(P) RADIO 4460 B25+B66 (1)		
B1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	96'	180°			(1) 6x24 HYBRID CABLE
B2	EXISTING	RFS-APXVAALL24_43-U-NA20	95.9 x 24 x 8.5	96'	180°	(E) RADIO 4449 B71+B85 (1)		
B3	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	96'	180°	(P) RADIO 4460 B25+B66 (1)		
C1	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	96'	300°			(1) 6x24 HYBRID CABLE
C2	EXISTING	RFS-APXVAALL24_43-U-NA20	95.9 x 24 x 8.5	96'	300°	(E) RADIO 4449 B71+B85 (1)		
C3	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	96'	300°	(P) RADIO 4460 B25+B66 (1)		



1 / C-1 **SITE LOCATION PLAN** — SCALE: NOT TO SCALE — TRUE NORTH

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SITE LOCATION PLAN

C-1

Sheet No. 3 of 11

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING..

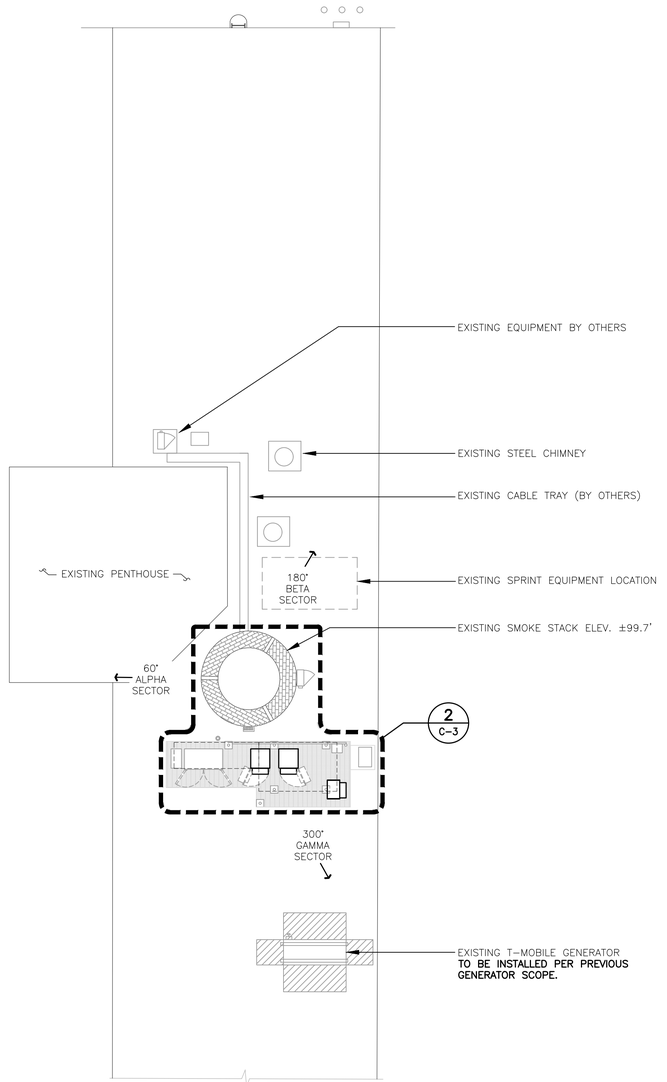
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.22) DATED 07/06/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

MASONRY SMOKESTACK AND HOST BUILDING

A STRUCTURAL ANALYSIS OF THE MASONRY SMOKESTACK AND HOST BUILDING WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.22) DATED 07/06/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

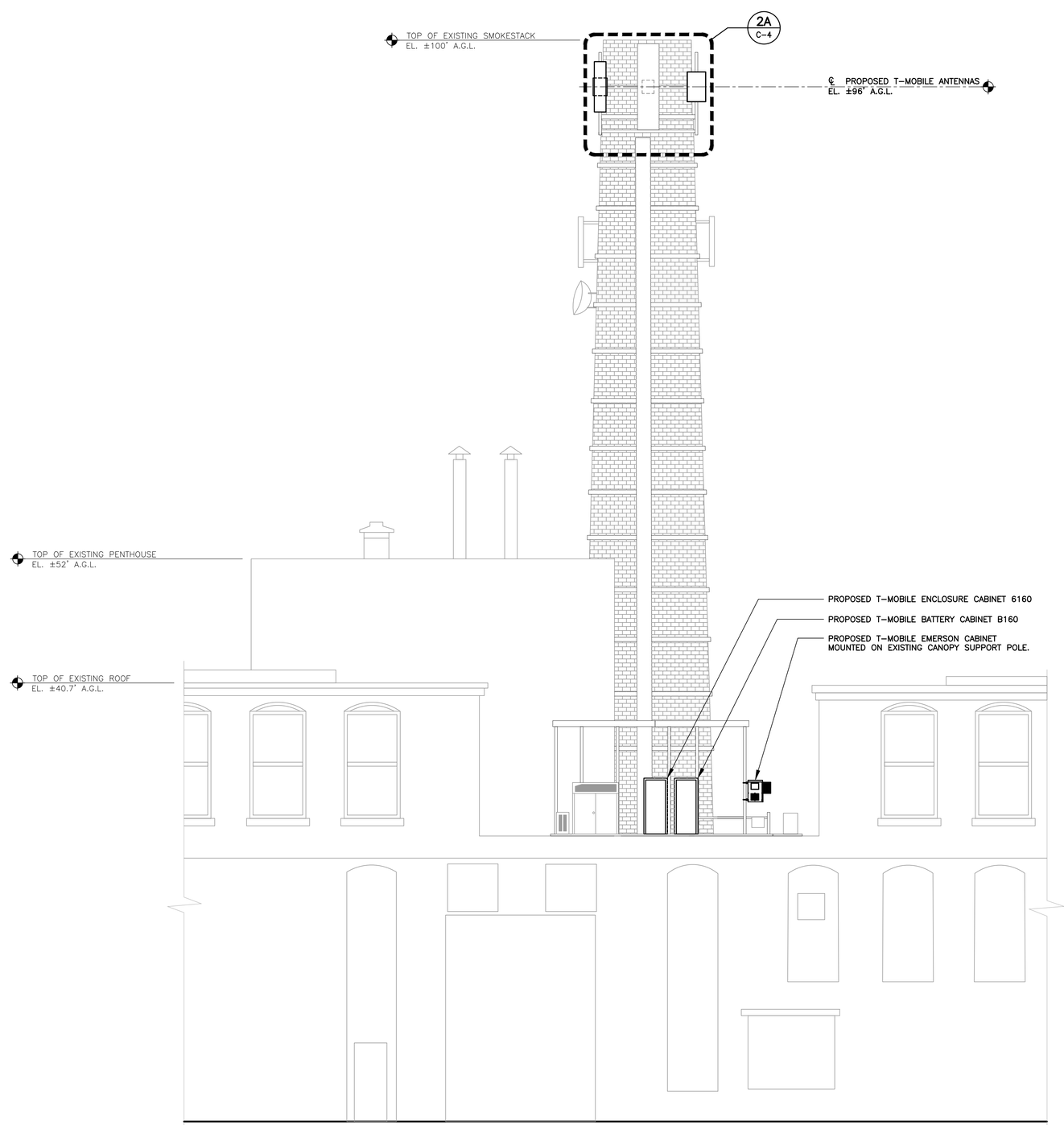
NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



1 C-2 **PARTIAL COMPOUND PLAN**
SCALE: 1" = 8'

TRUE NORTH

GRAPHIC SCALE
8 0 4 8 16 32
1 inch = 8 ft.



2 C-2 **NORTH ELEVATION**
SCALE: 1" = 8'

8 0 4 8 16 32
1 inch = 8 ft.

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PARTIAL COMPOUND PLAN AND ELEVATION

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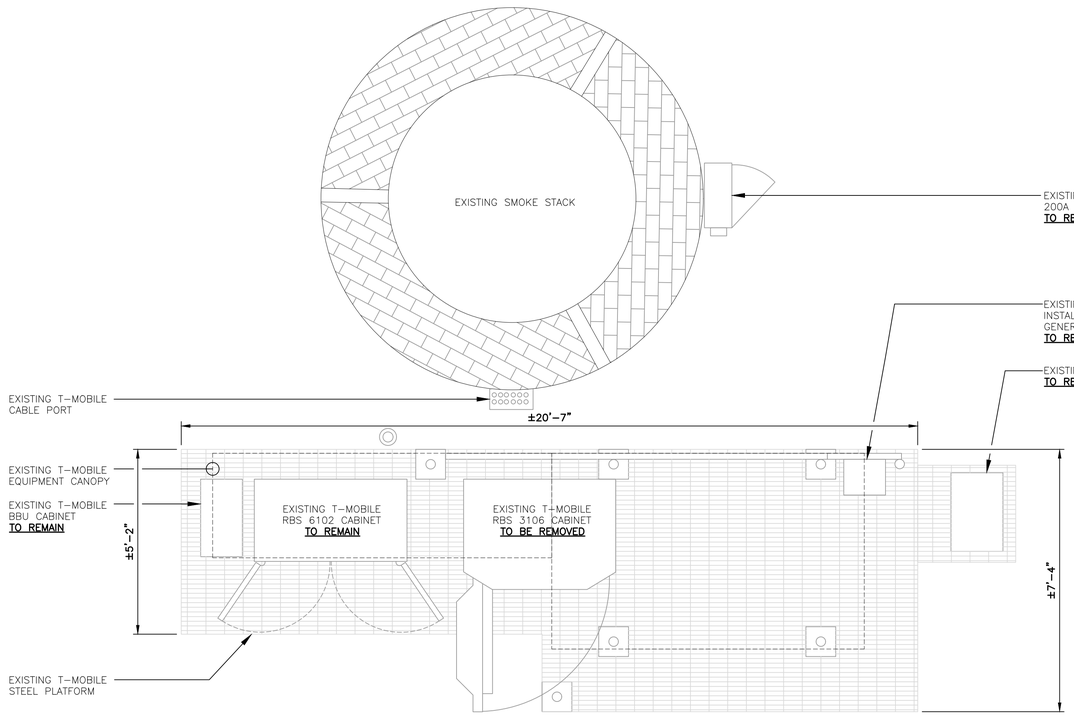
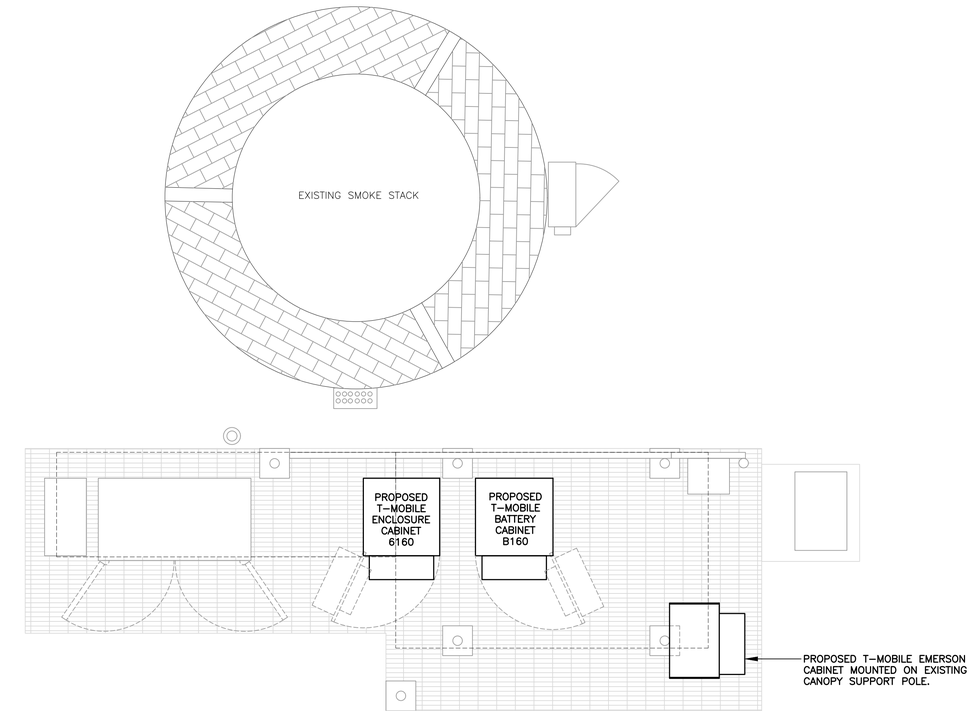
Sheet No. 4 of 11



1 C-3 **EXISTING EQUIPMENT PLAN**
SCALE: 1/2" = 1'

TRUE NORTH



2 C-3 **PROPOSED EQUIPMENT PLAN**
SCALE: 1/2" = 1'

TRUE NORTH

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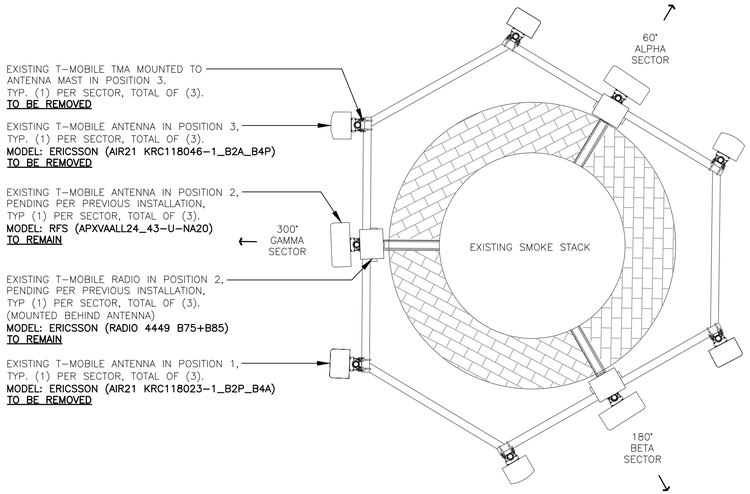
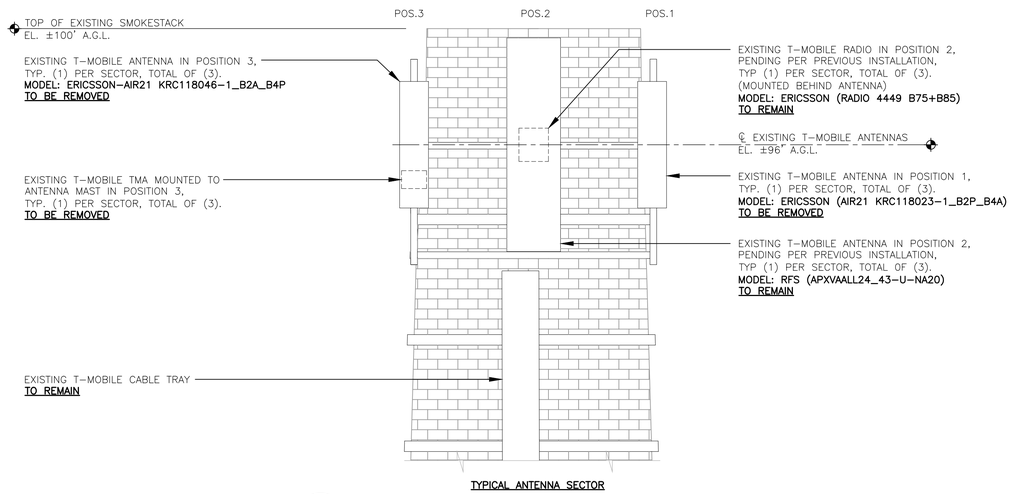
EQUIPMENT PLANS

C-3

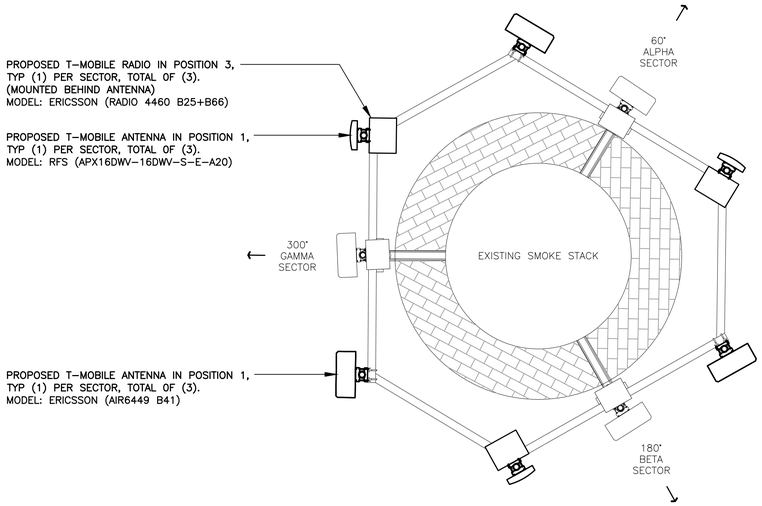
Sheet No. 5 of 11



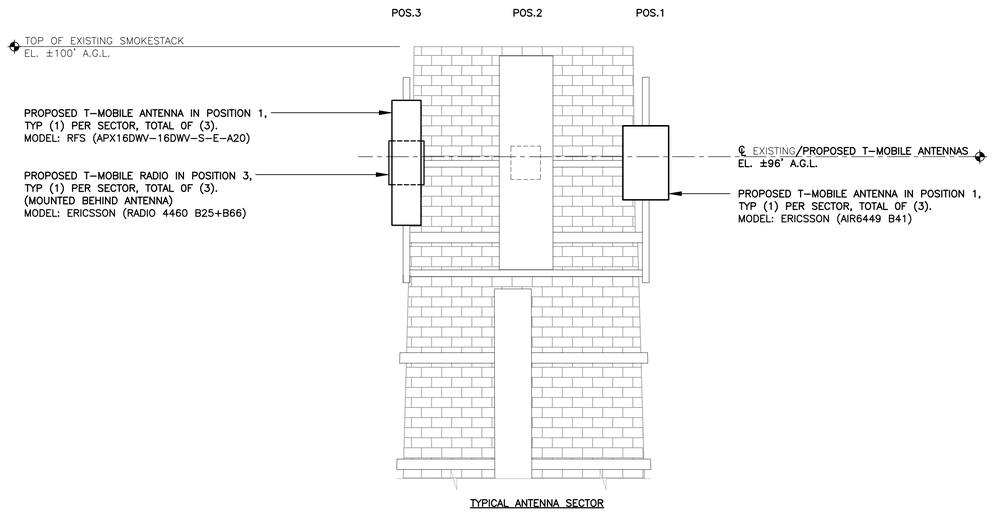
1 C-4 **EXISTING ANTENNA CONFIGURATION PLAN**
SCALE: 3/8" = 1'
TRUE NORTH



2 C-4 **EXISTING ANTENNA ELEVATION PLAN**
SCALE: 3/8" = 1'



1A C-4 **PROPOSED ANTENNA CONFIGURATION PLAN**
SCALE: 3/8" = 1'
TRUE NORTH



2A C-4 **PROPOSED ANTENNA ELEVATION PLAN**
SCALE: 3/8" = 1'

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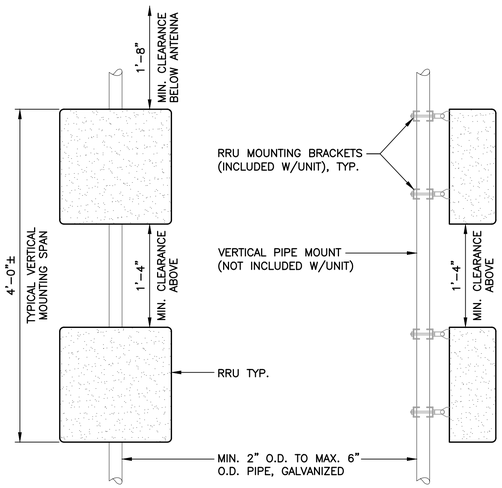
ANTENNA PLANS AND ELEVATIONS

C-4

Sheet No. 6 of 11



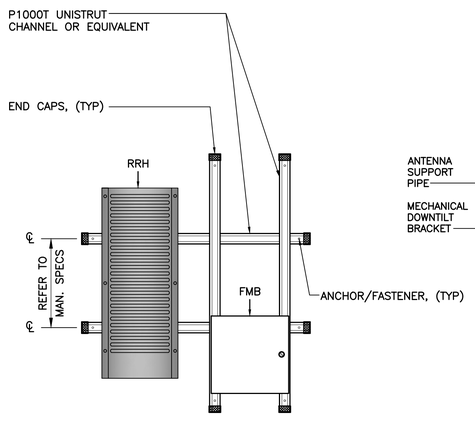
FRONT ELEVATION SIDE ELEVATION

NOTES: (PIPE MOUNTING)

1. T–MOBILE SHALL SUPPLY RRU, AND RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE–MOUNTING BRACKET.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 C–5 TYPICAL RRU MOUNTING DETAILS

SCALE: NOT TO SCALE



FRONT ELEVATION

NOTES: (UNISTRUT MOUNTING)

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT (± 16"o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

SIDE AIR6449 B41 APX16DWV-16DWV-S-E-A20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
MAKE: RFS MODEL: APX16DWV–16DWV–S–E–A20	55.9"L x 13"W x 3.15"D	±40.7 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 C–5 PROPOSED ANTENNA DETAIL

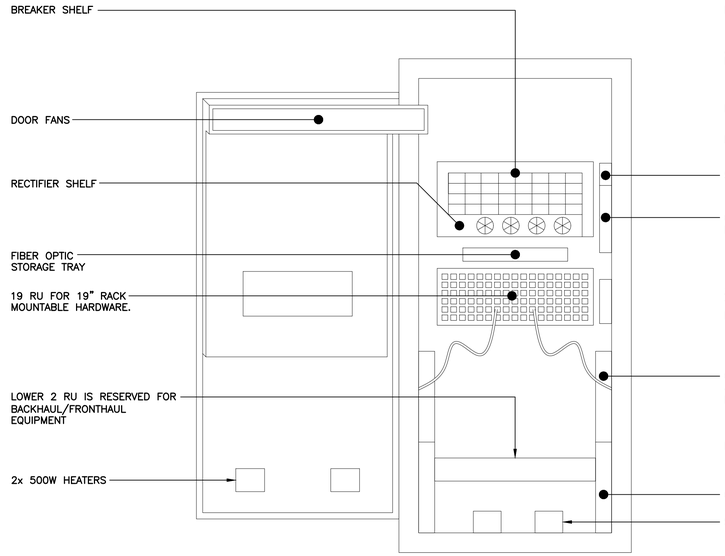
SCALE: NOT TO SCALE

RADIO 4460 B25+B66

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6"L x 15.7"W x 12.1"D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.			

3 C–5 PROPOSED RRU DETAIL

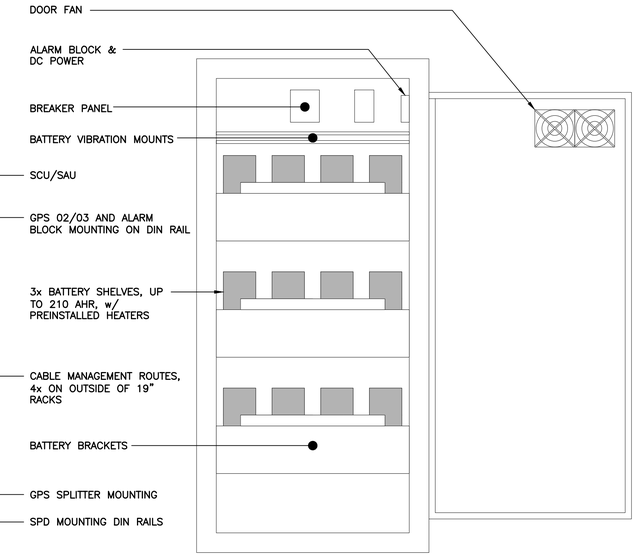
SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: ENCLOSURE 6160 CABINET	62.0"H x 26.0"W x 26.0"D	±1200 LBS

4 C–5 ENCLOSURE 6160 CABINET DETAIL

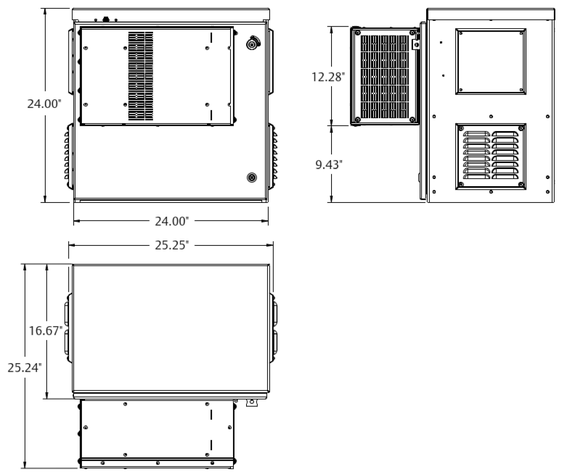
SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: BATTERY B160 CABINET	62.0"H x 26.0"W x 26.0"D	±1883 LBS

5 C–5 BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE



EMERSON CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: EMERSON MODEL: COMPACT 2416	24"L x 24"W x 16"D	±64 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

6 C–5 PROPOSED EMERSON CABINET DETAIL

SCALE: NOT TO SCALE

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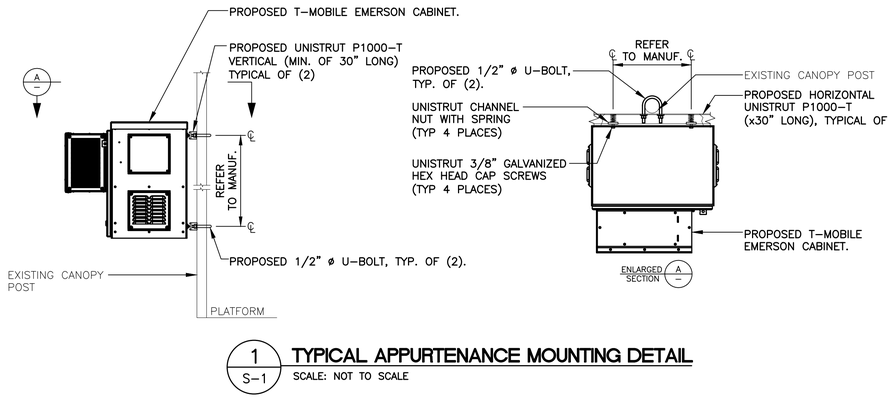
TYPICAL EQUIPMENT DETAILS

C-5

Sheet No. 7 of 11



1 / S-1 **TYPICAL APPURTENANCE MOUNTING DETAIL**

SCALE: NOT TO SCALE

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EQUIPMENT MOUNTING DETAILS

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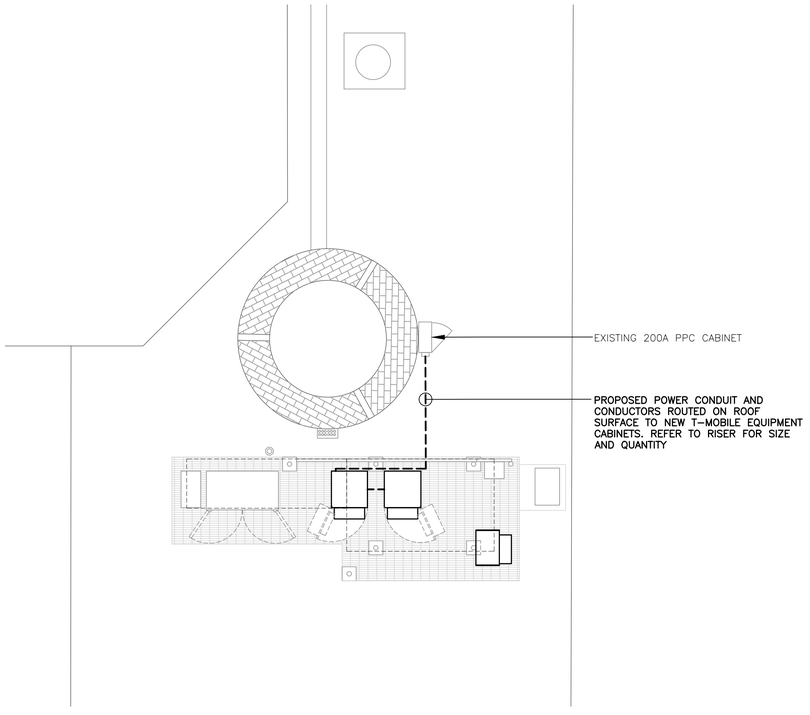
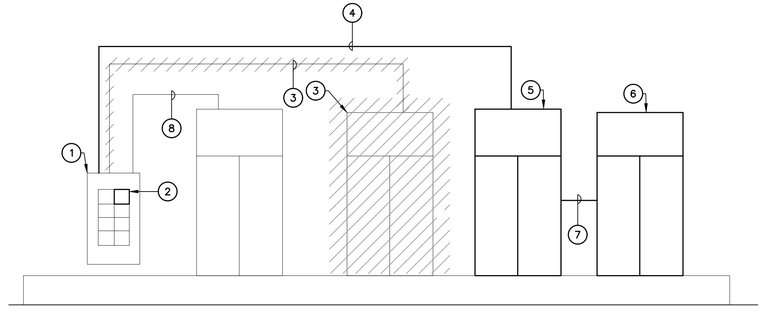


1 / E–1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: NOT TO SCALE

RISER DIAGRAM NOTES

1. EXISTING 200A, PPC CABINET TO REMAIN.
2. NEW 150A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT
3. EXISTING CABINETS AND ASSOCIATED CONDUITS AND CONDUCTORS TO BE REMOVED.
4. (3) 1/0 AWG, (1) #6 AWG GROUND, 2" CONDUIT.
5. NEW T–MOBILE EQUIPMENT CABINET
6. NEW T–MOBILE BATTERY CABINET
7. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
8. EXISTING CABINET AND ASSOCIATED CONDUIT AND CONDUCTORS TO REMAIN



2 / E–1 **ELECTRICAL POWER RISER DIAGRAM**
SCALE: NOT TO SCALE

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SITE ID: CT11328F
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CONDUIT ROUTING AND ELECTRICAL RISER DIAGRAM

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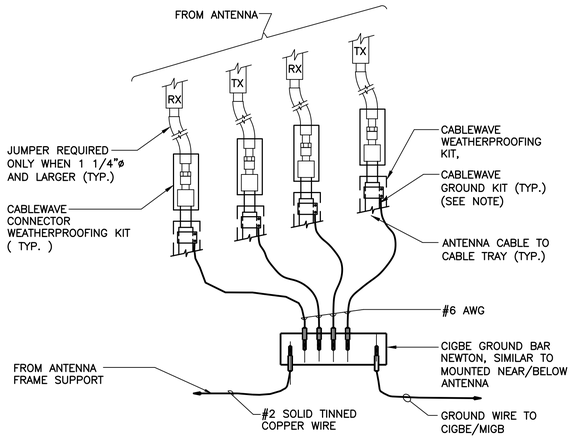
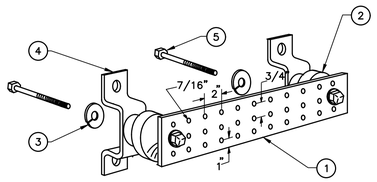


NOTES:

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

1 E-2 CONNECTION OF GROUND WIRES TO GROUND BAR

SCALE: NOT TO SCALE

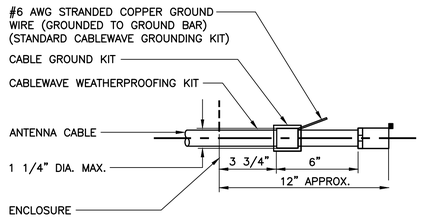


NOTES

1. TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5. 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

2 E-2 GROUND BAR DETAIL

SCALE: NOT TO SCALE

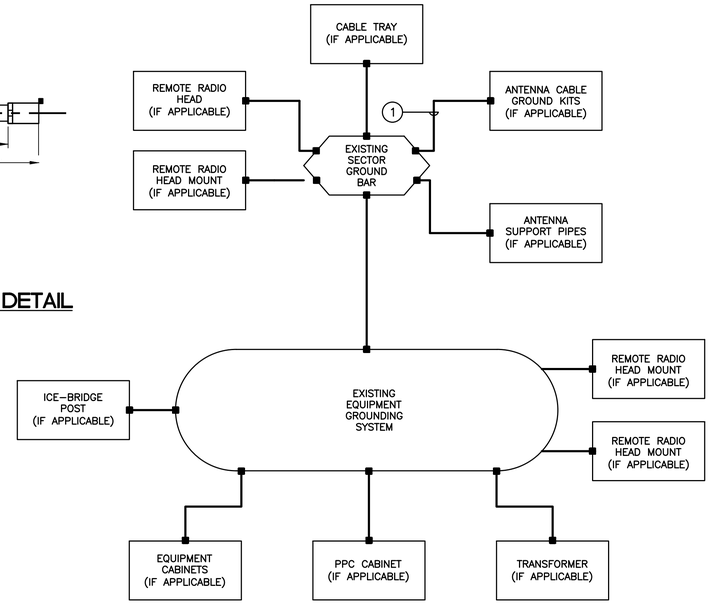


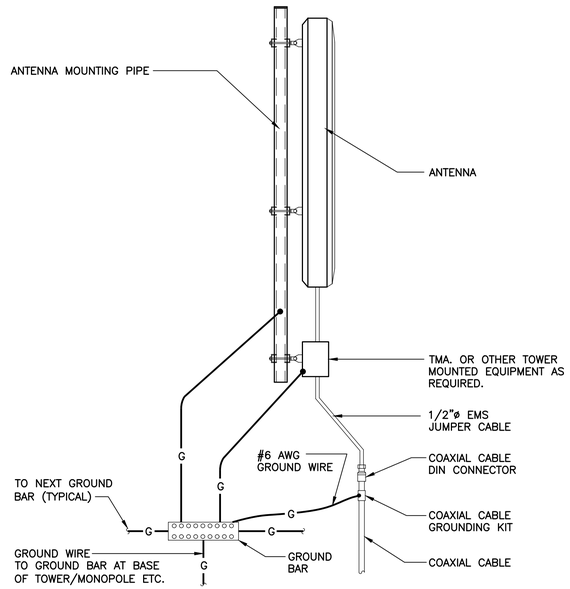
NOTES:

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

3 E-2 ANTENNA CABLE GROUNDING DETAIL

SCALE: NOT TO SCALE

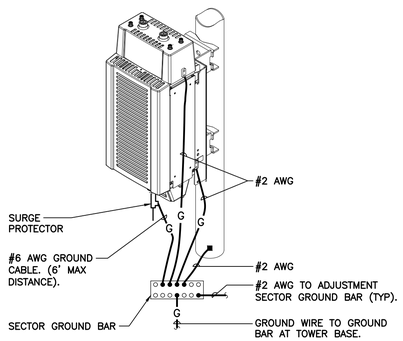




4 E-2 TYPICAL ANTENNA GROUNDING DETAIL

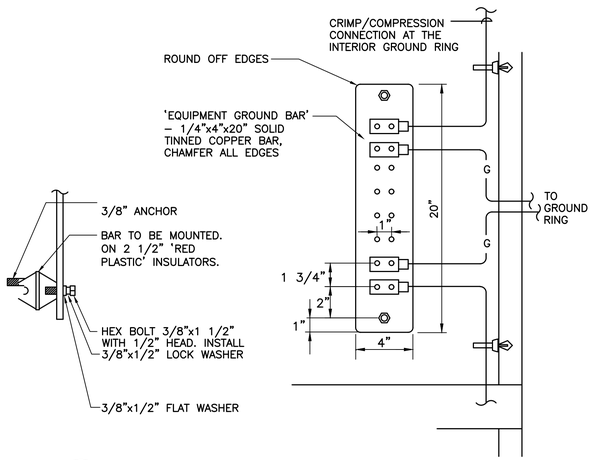
SCALE: NOT TO SCALE

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



5 E-2 RRH POLE MOUNT GROUNDING

SCALE: NOT TO SCALE



6 E-2 EQUIPMENT GROUND BAR DETAIL

SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

(1) #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. BOND CABLE TRAY SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
7. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
8. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
9. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

7 E-2 ELECTRICAL SCHEMATIC DIAGRAM

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TYPICAL ELECTRICAL DETAILS

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ELECTRICAL SPECIFICATIONS

SECTION 16010

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) [2,3]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	SECTION 16450
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)

2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE

3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE

4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES – ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS

2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).

3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

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

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

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

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.

2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.

3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

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

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

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

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

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ELECTRICAL SPECIFICATIONS

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Sheet No. 11 of 11

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

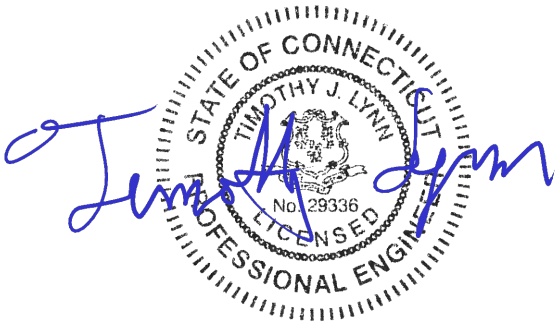
±100-ft Existing Masonry Smokestack
& Host Building

T-Mobile Site Ref: CT11328F

50 Maple Street
Branford, CT 06405

Centek Project No. 21022.22

Date: July 6, 2021



Prepared for:
T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

Introduction

The purpose of this report is to summarize the results of the structural analysis of the equipment installation proposed by T-Mobile on the existing host masonry smokestack and building located in Branford, CT.

The antennas are mounted on the host ±100-ft tall masonry smokestack. The smokestack geometry and structural information was obtained from a field investigation and inspection report prepared by International Chimney Corporation dated August 8, 2016. The equipment cabinets are mounted on the building roof.

Primary Assumptions Used in the Analysis

- The host structure's theoretical capacity not including any assessment of the condition of the host structure.
- The existing elevated steel antenna frames carry the horizontal and vertical loads due to the weight of equipment, and wind and transfers into host structure.
- Proposed reinforcement and support steel will be properly installed and maintained.
- Structure is in plumb condition.
- Loading for equipment and enclosure as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as observed during roof framing mapping.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.

Antenna and Equipment Summary

Location	Appurtenance / Equipment		Rad Center Elevation (AGL)	Mount Type
Alpha Sector	~~(2) Ericsson AIR21 antennas~~ (1) RFS-APXVAALL24_43 antenna **(1) RFS APX16DWV-16DWVS antenna** **(1) Ericsson AIR6449 B41 antenna** (1) Ericsson 4449 RRU **(1) Ericsson 4460 RRU** ~~(1) TMA~~		±96-ft	Antenna mount on smokestack
Beta Sector	~~(2) Ericsson AIR21 antennas~~ (1) RFS-APXVAALL24_43 antenna **(1) RFS APX16DWV-16DWVS antenna** **(1) Ericsson AIR6449 B41 antenna** (1) Ericsson 4449 RRU **(1) Ericsson 4460 RRU** ~~(1) TMA~~		±96-ft	Antenna mount on smokestack
Gamma Sector	~~(2) Ericsson AIR21 antennas~~ (1) RFS-APXVAALL24_43 antenna **(1) RFS APX16DWV-16DWVS antenna** **(1) Ericsson AIR6449 B41 antenna** (1) Ericsson 4449 RRU **(1) Ericsson 4460 RRU** ~~(1) TMA~~		±96-ft	Antenna mount on smokestack
Equipment Dunnage	~~(1) Ericsson RBS3106~~	~~±1200 lbs.~~	-	Steel grating on building roof
	(1) Ericsson RBS6102	900 lbs.	-	
	(1) Ericsson B160	1883 lbs.	-	
	(1) Ericsson 6160	1200 lbs.	-	

Equipment – Indicates equipment to be installed.
~~Equipment~~ – Indicates equipment to be removed.

Analysis

The roof framing was analyzed using a comprehensive computer program titled Risa3D. The program analyzes the equipment platform and antenna mounts considering the worst case code prescribed loading condition. The structures were considered to be loaded by concentric forces, and the model assumes that the members are subjected to bending, axial, and shear forces.

Design Loading

Loading was determined per the requirements of the 2015 International Building Code amended by the 2018 CSBC and ASCE 7-10 "Minimum Design Loads for Buildings and Other Structures".

Wind Speed:	V_{ult} = 130 mph	*Appendix N of the 2018 CT State Building Code*
Risk Category:	II	*2015 IBC; Table 1604.05*
Exposure Category:	Surface Roughness C	*ASCE 7-10; Section 26.7.2*
Ground Snow Load	30 psf	*Appendix N of the 2018 CT State Building Code*
Dead Load	50psf + equipment and framing self-weight	*Identified within SAR design calculations*
Live Load	20 psf	*ASCE 7-10; Table 4-1 "Roofs – All Other Construction"*

Results

Roof Framing:

Component	Stress Ratio (percentage of capacity)	Result
W24 Girder	83%	**PASS**

Smokestack:

Component	Stress Ratio (percentage of capacity)	Result
Compression	24%	**PASS**
Tension of Mortar	39%	**PASS**

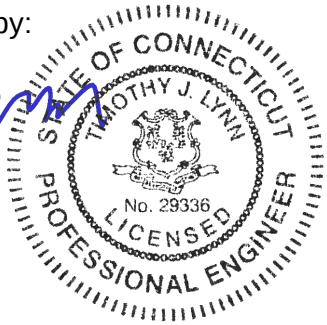
Conclusion

This analysis shows that the subject smokestack and host building **are adequate** to support the proposed T-Mobile equipment installation.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

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: Wind Load on Equipment per ASCE 7-10

Location: Branford, CT

Rev. 0: 7/6/21

Prepared by: T.J.L; Checked by: C.F.C
Job No. 21022.22

Design Wind Load on Other Structures: (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed =	$V := 130$ mph	(User Input)	(CSBC Appendix-N)
Risk Category =	$BC := II$	(User Input)	(IBC Table 1604.5)
Exposure Category =	$Exp := C$	(User Input)	
Structure Type =	$Structuretype :=$ Round_Chimney	(User Input)	
Structure Height =	$Height := 100$ ft	(User Input)	
Horizontal Dimension of Structure =	$Width := 9.5$ ft	(User Input)	

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = (Table 26.9-1)

$$zg := \begin{cases} 1200 & \text{if } Exp = B \\ 900 & \text{if } Exp = C \\ 700 & \text{if } Exp = D \end{cases} = 900$$

3-Sec Gust Speed Power Law Exponent = (Table 26.9-1)

$$\alpha := \begin{cases} 7 & \text{if } Exp = B \\ 9.5 & \text{if } Exp = C \\ 11.5 & \text{if } Exp = D \end{cases} = 9.5$$

Integral Length Scale Factor = (Table 26.9-1)

$$l := \begin{cases} 320 & \text{if } Exp = B \\ 500 & \text{if } Exp = C \\ 650 & \text{if } Exp = D \end{cases} = 500$$

Integral Length Scale Power Law Exponent = (Table 26.9-1)

$$E := \begin{cases} \frac{1}{3} & \text{if } Exp = B \\ \frac{1}{5} & \text{if } Exp = C \\ \frac{1}{8} & \text{if } Exp = D \end{cases} = 0.2$$

Turbulence Intensity Factor = (Table 26.9-1)

$$c := \begin{cases} 0.3 & \text{if } Exp = B \\ 0.2 & \text{if } Exp = C \\ 0.15 & \text{if } Exp = D \end{cases} = 0.2$$

Exposure Constant = (Table 26.9-1)

$$Z_{min} := \begin{cases} 30 & \text{if } Exp = B \\ 15 & \text{if } Exp = C \\ 7 & \text{if } Exp = D \end{cases} = 15$$

Topographic Factor =	$K_{zt} := 1$	(Eq. 26.8-2)
Wind Directionality Factor =	$K_d = 0.95$	(Table 26.6-1)
Peak Factor for Background Response =	$g_Q := 3.4$	(Sec 26.9.4)
Peak Factor for Wind Response =	$g_v := 3.4$	(Sec 26.9.4)

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Equivalent Height of Structure =

$$z := \begin{cases} Z_{min} & \text{if } Z_{min} > 0.6 \cdot Height \\ 0.6 \cdot Height & \text{otherwise} \end{cases} = 60$$

(Sec 26.9.4)

Intensity of Turbulence =

$$I_z := c \cdot \left(\frac{33}{z}\right)^{\left(\frac{1}{6}\right)} = 0.181$$

(Eq. 26.9-7)

Integral Length Scale of Turbulence =

$$L_z := l \cdot \left(\frac{z}{33}\right)^{E} = 563.505$$

(Eq. 26.9-9)

Background Response Factor =

$$Q := \sqrt{\frac{1}{1 + 0.63\left(\frac{Width + Height}{L_z}\right)^{0.63}}} = 0.904$$

(Eq. 26.9-8)

Gust Response Factor =

$$G := 0.925 \cdot \left[\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right] = 0.879$$

(Eq. 26.9-6)

Velocity Pressure =

$$q_z := 0.00256 \cdot K_{zt} \cdot K_d \cdot V^2 = 41.1$$

(Eq. 29.3-1)

Force Coefficient =

$$C_f = 0.82$$

(Fig 29.5-1 - 29.5-3)

Ultimate Wind Pressure =

$$F := q_z \cdot G \cdot C_f = 29.6 \text{ psf}$$

Height Above Grade =

$$Z := 85 \text{ ft}$$

(User Input)

Exposure Coefficient =

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg = 1.22 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$$

(Table 29.3-1)

$$K_z = 1.223$$

Height Above Grade =

$$Z := 55 \text{ ft}$$

(User Input)

Exposure Coefficient =

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg = 1.12 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$$

(Table 29.3-1)

$$K_z = 1.116$$

Height Above Grade = $Z := 35$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 1.01$ (Table 29.3-1)

$K_z = 1.015$

Height Above Grade = $Z := 27$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 0.96$ (Table 29.3-1)

$K_z = 0.961$

Height Above Grade = $Z := 20$ ft (User Input)

Exposure Coefficient = $K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases} = 0.9$ (Table 29.3-1)

$K_z = 0.902$

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Job :	CT11328F	Project No.	21022.22	Sheet	1 of 2
Address:	50 Maple Street Branford, CT 06405	Computed by	TJL	Date	7/6/21
Description:	Smokestack Evaluation	Checked by	LAA	Date	

	Wind Force (lb)	Weight (lb)	Height Above Base (ft)	Height (in)
T-Mobile	2500	1500	96	1152
Sprint	1883	936	88	1056

Section	Top Dia (in)	Bot Dia (in)	Wall Thk (in)	Sect Height (in)	Area At Base (in^2)	Tot. Vol (ft^3)	Unit Weight (pcf)	Weight of Section (lb)	Total Weight (lb)	Axial Stress fa (psi)
1	114	135.67	8	356.4	3207.0704	604.97204	127	76831.4485	79267.4485	24.7
2	135.67	161.4	8.5	360	4080.901	778.2026	125	97275.3249	176542.7734	43.3
3	161.4	169.92	9.5	120	4785.3286	323.30268	125	40412.83516	216955.6086	45.3
4	169.92	175.68	10.5	80	5445.9846	247.58964	125	30948.70445	247904.313	45.5
5	175.68	177.96	13	76	6733.6672	293.93989	125	36742.48571	284646.7987	42.3

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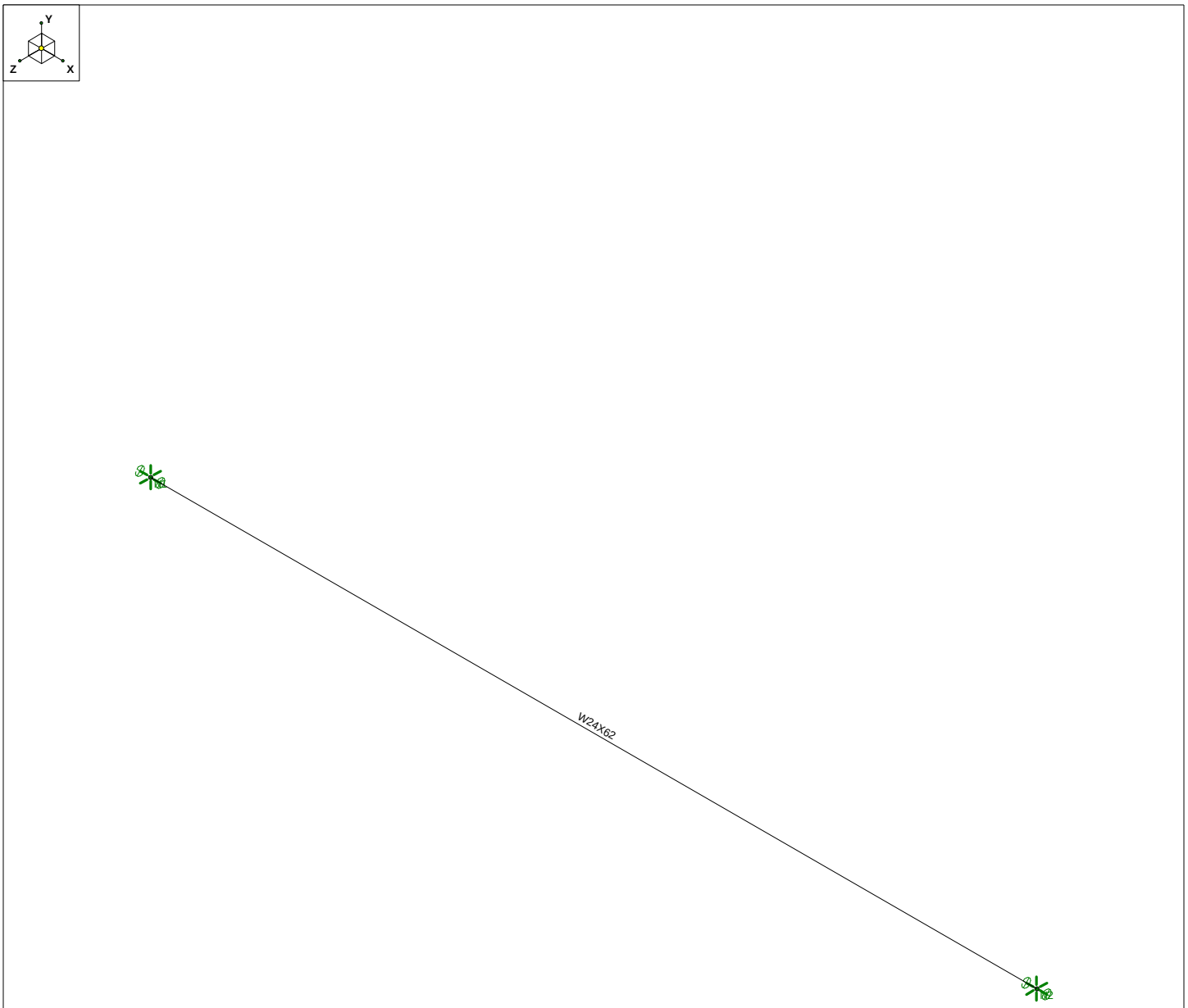
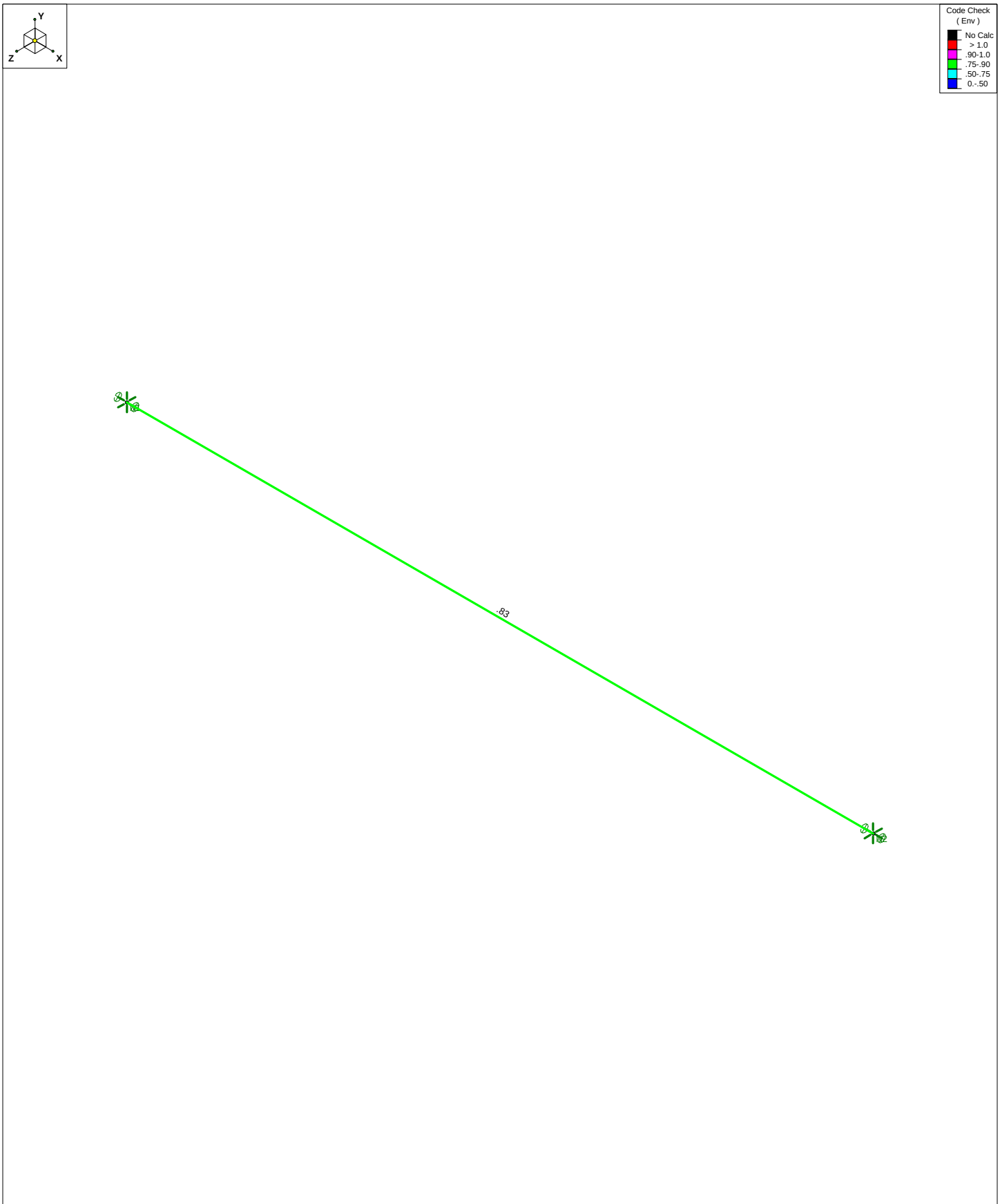
Job :	CT11328F	Project No.	21022.22	Sheet	2 of 2
Address:	50 Maple Street Branford, CT 06405	Computed by	TJL	Date	7/6/21
Description:	Smokestack Evaluation	Checked by	LAA	Date	

Ultimate Wind Pressure (psf)	ASD Wind Pressure (psf)	KZ	Wind Area (sf)	Wind Force (lb)	Moment @ Base	Section Modulus @ Base	Bending Stress fb (psi)	Allowable Fa (psi)	Allowable Fb (psi)	fa/Fa+fb/Fb		ft	Ft	ft/Ft	
30	18	1.23	309.0	6840.5	3299840.856	96703.96897	34.1	375	500	0.13	OK	9.4	40	0.24	OK
30	18	1.12	371.3	7486.2	8687817.964	148233.9248	58.6	375	500	0.23	OK	15.3	40	0.38	OK
30	18	1.02	138.1	2534.6	11085056.05	181821.2694	61.0	375	500	0.24	OK	15.6	40	0.39	OK
30	18	0.096	96.0	165.9	12791234.22	212305.0695	60.2	375	500	0.24	OK	14.7	40	0.37	OK
0	0	0	93.3	0.0	14418407.22	259009.3359	55.7	375	500	0.22	OK	13.4	40	0.33	OK



Envelope Only Solution

Centek Engineering		
TJL	CT11328 Roof Member Analysis	July 6, 2021 at 3:27 PM
21022.22	Member Framing	Existing W24 Analysis.r3d



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering		
TJL	CT11328 Roof Member Analysis	July 6, 2021 at 3:27 PM
21022.22	Unity Check	Existing W24 Analysis.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): ASD
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?	Yes
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	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	W24x62	W24X62	Column	Wide Flange	A36 Gr.36	Typical	18.2	34.5	1550	1.71

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	W24x62	32			4						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N2			W24x62	Column	Wide Flange	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	32	0	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N2	Reaction	Reaction	Reaction	Reaction		
2	N1	Reaction	Reaction	Reaction	Reaction		

Member Point Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-1	7
2	M1	Y	-1	11
3	M1	Y	-1.2	16
4	M1	Y	-1.9	20

Member Distributed Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.06	-.06	5.5	26.5

Member Distributed Loads (BLC 3 : Dead Load)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-1.1	-1.1	0	9
2	M1	Y	-.8	-.8	9	23
3	M1	Y	-1.1	-1.1	23	32

Member Distributed Loads (BLC 4 : Snow Load)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.66	-.66	0	9
2	M1	Y	-.48	-.48	9	23

Member Distributed Loads (BLC 4 : Snow Load) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
3	M1	Y	-.66	-.66	23	32

Member Distributed Loads (BLC 5 : Roof Live Load)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.44	-.44	0	9
2	M1	Y	-.32	-.32	9	23
3	M1	Y	-.44	-.44	23	32

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Weight of Equipment	DL					4	1		
3	Dead Load	DL						3		
4	Snow Load	SL						3		
5	Roof Live Load	RLL						3		

Load Combinations

	Description	Solve	P...	S...	B...	Fa...	BLC	Fact...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	IBC 16-8	Yes	Y		DL	1																		
2	IBC 16-9	Yes	Y		DL	1	LL	1	LLS	1														
3	IBC 16-10 (a)	Yes	Y		DL	1	RLL	1																
4	IBC 16-10 (b)	Yes	Y		DL	1	SL	1	SLN	1														
5	IBC 16-10 (c)	Yes	Y		DL	1	RL	1																
6	IBC 16-11 (a)	Yes	Y		DL	1	LL	.75	LLS	.75	RLL	.75												
7	IBC 16-11 (b)	Yes	Y		DL	1	LL	.75	LLS	.75	SL	.75	SLN	.75										
8	IBC 16-11 (c)	Yes	Y		DL	1	LL	.75	LLS	.75	RL	.75												
9	IBC 16-12 (a) (a)	Yes	Y		DL	1	WLX	.6																
10	IBC 16-12 (a) (b)	Yes	Y		DL	1	WLZ	.6																
11	IBC 16-12 (a) (c)	Yes	Y		DL	1	WLX	-.6																
12	IBC 16-12 (a) (d)	Yes	Y		DL	1	WLZ	-.6																
13	IBC 16-13 (a) (a)	Yes	Y		DL	1	WLX	.45	LL	.75	LLS	.75	RLL	.75										
14	IBC 16-13 (a) (b)	Yes	Y		DL	1	WLZ	.45	LL	.75	LLS	.75	RLL	.75										
15	IBC 16-13 (a) (c)	Yes	Y		DL	1	WLX	-.45	LL	.75	LLS	.75	RLL	.75										
16	IBC 16-13 (a) (d)	Yes	Y		DL	1	WLZ	-.45	LL	.75	LLS	.75	RLL	.75										
17	IBC 16-13 (b) (a)	Yes	Y		DL	1	WLX	.45	LL	.75	LLS	.75	SL	.75	S...	.75								
18	IBC 16-13 (b) (b)	Yes	Y		DL	1	WLZ	.45	LL	.75	LLS	.75	SL	.75	S...	.75								
19	IBC 16-13 (b) (c)	Yes	Y		DL	1	WLX	-.45	LL	.75	LLS	.75	SL	.75	S...	.75								
20	IBC 16-13 (b) (d)	Yes	Y		DL	1	WLZ	-.45	LL	.75	LLS	.75	SL	.75	S...	.75								
21	IBC 16-13 (c) (a)	Yes	Y		DL	1	WLX	.45	LL	.75	LLS	.75	RL	.75										
22	IBC 16-13 (c) (b)	Yes	Y		DL	1	WLZ	.45	LL	.75	LLS	.75	RL	.75										
23	IBC 16-13 (c) (c)	Yes	Y		DL	1	WLX	-.45	LL	.75	LLS	.75	RL	.75										
24	IBC 16-13 (c) (d)	Yes	Y		DL	1	WLZ	-.45	LL	.75	LLS	.75	RL	.75										
25	IBC 16-15 (a)	Yes	Y		DL	.6	WLX	.6																
26	IBC 16-15 (b)	Yes	Y		DL	.6	WLZ	.6																
27	IBC 16-15 (c)	Yes	Y		DL	.6	WLX	-.6																
28	IBC 16-15 (d)	Yes	Y		DL	.6	WLZ	-.6																

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N2	max	0	28	28.771	4	0	28	0	28	0	28	0	28
2		min	0	1	11.683	25	0	1	0	1	0	1	0	1
3	N1	max	0	28	29.171	4	0	28	0	28	0	28	0	28
4		min	0	1	11.923	25	0	1	0	1	0	1	0	1
5	Totals:	max	0	28	57.942	4	0	28						
6		min	0	1	23.605	25	0	1						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
1	N1	max	0	28	0	28	0	28	0	28	0	28	-4.087e-03	28
2		min	0	1	0	1	0	1	0	1	0	1	-9.815e-03	4
3	N2	max	0	28	0	28	0	28	0	28	0	28	9.777e-03	4
4		min	0	1	0	1	0	1	0	1	0	1	4.064e-03	25

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	Dir	...	Pnc/...	Pnt/o...	Mny...	Mnz...	Cb	Eqn
1	M1	W24X62	.829	16	4	.199	0	y	4	35.167	392....	28.171	274.85	1	H1-...

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

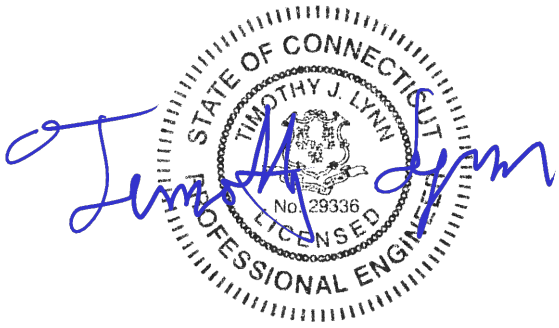
Antenna Mount Analysis

T-Mobile Site #: CT11328F

50 Maple Street
Branford, CT

Centek Project No. 21022.22

Date: July 6, 2021



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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CENTEK engineering

Centered on Solutions℠

July 6, 2021

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

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11328F
50 Maple Street
Branford, CT 06405

Centek Project No. 21022.22

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 existing mount, consisting three (3) sector mounts with stiff arms to support the proposed/existing equipment configuration. 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) and ASCE 7-10.

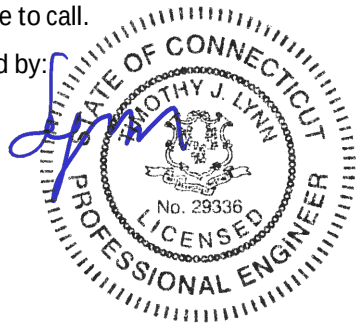
The loads considered in this analysis consist of the following:

- T-Mobile:
  Sector Frames: Three (3) RFS APXVAALL24_43 panel antennas, three (3) Ericsson AIR6449 panel antennas, three (3) RFS APX16DWV-16DWVS panel antennas, three (3) Ericsson 4449 remote radio units and three (3) Ericsson 4460 remote radio units mounted on three (3) sector frames with a RAD center elevation of 96-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 an ultimate design wind speed of 130 mph for Branford 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

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: Wind Load on Equipment per ASCE 7-10

Location: Branford, CT

Rev. 0: 7/6/21

Prepared by: T.J.L; Checked by: C.F.C.
Job No. 21022.22

Design Wind Load on Other Structures: (Based on IBC 2015, CSBC 2018 and ASCE 7-10)

Wind Speed = $V := 130$ mph (User Input) (CSBC Appendix-N)

Risk Category = $BC := II$ (User Input) (IBC Table 1604.5)

Exposure Category = $Exp := C$ (User Input)

Height Above Grade = $Z := 96$ ft (User Input)

Structure Type = $Structuretype := Square\_Chimney$ (User Input)

Structure Height = $Height := 8$ ft (User Input)

Horizontal Dimension of Structure = $Width := 2$ ft (User Input)

Terrain Exposure Constants:

Nominal Height of the Atmospheric Boundary Layer = (Table 26.9-1)

$$zg := \begin{cases} 1200 & \text{if } Exp = B = 900 \\ 900 & \text{if } Exp = C \\ 700 & \text{if } Exp = D \end{cases}$$

3-Sec Gust Speed Power Law Exponent = (Table 26.9-1)

$$\alpha := \begin{cases} 7 & \text{if } Exp = B = 9.5 \\ 9.5 & \text{if } Exp = C \\ 11.5 & \text{if } Exp = D \end{cases}$$

Integral Length Scale Factor = (Table 26.9-1)

$$l := \begin{cases} 320 & \text{if } Exp = B = 500 \\ 500 & \text{if } Exp = C \\ 650 & \text{if } Exp = D \end{cases}$$

Integral Length Scale Power Law Exponent = (Table 26.9-1)

$$E := \begin{cases} \frac{1}{3} & \text{if } Exp = B = 0.2 \\ \frac{1}{5} & \text{if } Exp = C \\ \frac{1}{8} & \text{if } Exp = D \end{cases}$$

Turbulence Intensity Factor = (Table 26.9-1)

$$c := \begin{cases} 0.3 & \text{if } Exp = B = 0.2 \\ 0.2 & \text{if } Exp = C \\ 0.15 & \text{if } Exp = D \end{cases}$$

Exposure Constant = (Table 26.9-1)

$$Z_{min} := \begin{cases} 30 & \text{if } Exp = B = 15 \\ 15 & \text{if } Exp = C \\ 7 & \text{if } Exp = D \end{cases}$$

Exposure Coefficient = (Table 29.3-1)

$$K_z := \begin{cases} 2.01\left(\frac{Z}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } 15 \le Z \le zg = 1.25 \\ 2.01\left(\frac{15}{zg}\right)^{\left(\frac{2}{\alpha}\right)} & \text{if } Z < 15 \end{cases}$$

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Wind Load on Equipment per ASCE 7-10
Location:	Branford, CT
Rev. 0: 7/6/21	Prepared by: T.J.L; Checked by: C.F.C. Job No. 21022.22

Topographic Factor =	$K_{zt} := 1$	(Eq. 26.8-2)
Wind Directionality Factor =	$K_d = 0.9$	(Table 26.6-1)
Velocity Pressure =	$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 = 48.86$	(Eq. 29.3-1)
Peak Factor for Background Response =	$g_Q := 3.4$	(Sec 26.9.4)
Peak Factor for Wind Response =	$g_v := 3.4$	(Sec 26.9.4)
Equivalent Height of Structure =	$z := \begin{cases} Z_{min} & \text{if } Z_{min} > 0.6 \cdot Height \\ 0.6 \cdot Height & \text{otherwise} \end{cases} = 15$	(Sec 26.9.4)
Intensity of Turbulence =	$I_z := c \cdot \left(\frac{33}{z}\right)^{\left(\frac{1}{6}\right)} = 0.228$	(Eq. 26.9-7)
Integral Length Scale of Turbulence =	$L_Z := l \cdot \left(\frac{z}{33}\right)^{E} = 427.057$	(Eq. 26.9-9)
Background Response Factor =	$Q := \sqrt{\frac{1}{1 + 0.63\left(\frac{Width + Height}{L_Z}\right)^{0.63}}} = 0.972$	(Eq. 26.9-8)
Gust Response Factor =	$G := 0.925 \cdot \left[\frac{\left(1 + 1.7 \cdot g_Q \cdot I_z \cdot Q\right)}{1 + 1.7 \cdot g_v \cdot I_z}\right] = 0.91$	(Eq. 26.9-6)
Force Coefficient =	$C_f = 1.35$	(Fig 29.5-1 - 29.5-3)
Wind Force =	$F := q_z \cdot G \cdot C_f = 60$	psf

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: Wind Load on Equipment per ASCE 7-10

Location: Branford, CT

Rev. 0: 7/6/21

Prepared by: T.J.L; Checked by: C.F.C.
Job No. 21022.22

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPX16DWV-16DWVS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 45$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 5$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 303$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1.2$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 73$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 45$	lbs

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject: Wind Load on Equipment per ASCE 7-10

Location: Branford, CT

Rev. 0: 7/6/21

Prepared by: T.J.L; Checked by: C.F.C.
Job No. 21022.22

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFSAPXVAALL24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	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)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 16$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 959$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 5.7$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 340$	lbs

Gravity Load (without ice)

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

Development of Wind & Ice Load on Antennas

Antenna Model =	Ericsson AIR6449		
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)

Wind Load (Front)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 4.7$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 283$	lbs

Wind Load (Side)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1.9$	sf
Total Antenna Wind Force =	$F_{ant} := F \cdot A_{ant} = 115$	lbs

Gravity Load (without ice)

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

Development of Wind & Ice Load on RRHs

RRUS Data:

RRUS Model =	Ericsson 4449		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRH} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRH} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRH} := 10.4$	in	(User Input)
RRUS Weight =	$WT_{RRH} := 74$	lbs	(User Input)
Number of RRUS's =	$N_{RRH} := 1$		(User Input)

Wind Load (Front)

Surface Area for One RRH =	$SA_{RRH} := \frac{L_{RRH} \cdot W_{RRH}}{144} = 1.4$	sf
RRH Projected Surface Area =	$A_{RRH} := SA_{RRH} \cdot N_{RRH} = 1.4$	sf
Total RRH Wind Force =	$F_{RRH} := F \cdot A_{RRH} = 82$	lbs

Wind Load (Side)

Surface Area for One RRH =	$SA_{RRH} := \frac{L_{RRH} \cdot T_{RRH}}{144} = 1.1$	sf
RRH Projected Surface Area =	$A_{RRH} := SA_{RRH} \cdot N_{RRH} = 1.1$	sf
Total RRH Wind Force =	$F_{RRH} := F \cdot A_{RRH} = 65$	lbs

Gravity Load (without ice)

Weight of All RRHs =	$WT_{RRH} \cdot N_{RRH} = 74$	lbs

Development of Wind & Ice Load on RRHs

RRUS Data:

RRUS Model =	Ericsson 4460		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRH} := 19.6$	in	(User Input)
RRUS Width =	$W_{RRH} := 15.7$	in	(User Input)
RRUS Thickness =	$T_{RRH} := 12.1$	in	(User Input)
RRUS Weight =	$WT_{RRH} := 109$	lbs	(User Input)
Number of RRUS's =	$N_{RRH} := 1$		(User Input)

Wind Load (Front)

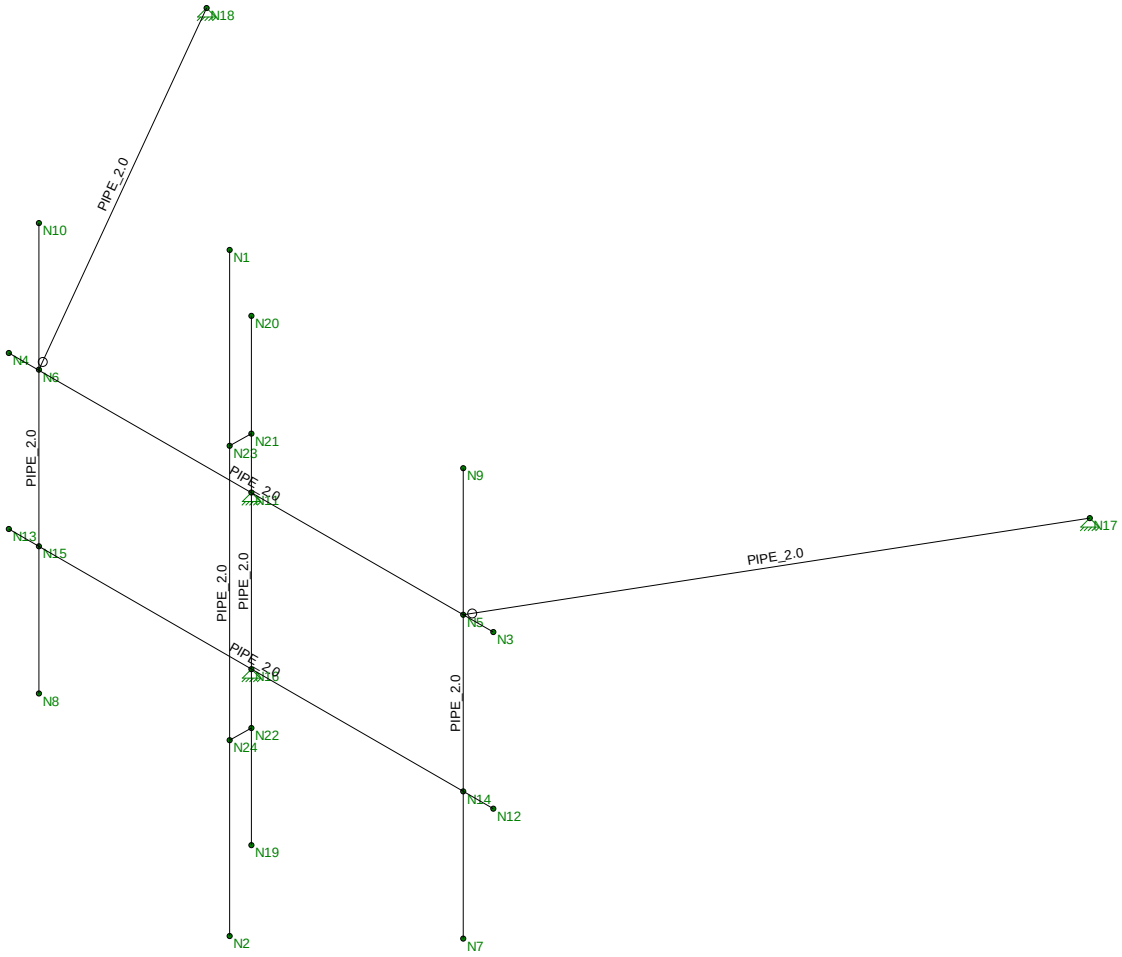
Surface Area for One RRH =	$SA_{RRH} := \frac{L_{RRH} \cdot W_{RRH}}{144} = 2.1$	sf
RRH Projected Surface Area =	$A_{RRH} := SA_{RRH} \cdot N_{RRH} = 2.1$	sf
Total RRH Wind Force =	$F_{RRH} := F \cdot A_{RRH} = 128$	lbs

Wind Load (Side)

Surface Area for One RRH =	$SA_{RRH} := \frac{L_{RRH} \cdot T_{RRH}}{144} = 1.6$	sf
RRH Projected Surface Area =	$A_{RRH} := SA_{RRH} \cdot N_{RRH} = 1.6$	sf
Total RRH Wind Force =	$F_{RRH} := F \cdot A_{RRH} = 99$	lbs

Gravity Load (without ice)

Weight of All RRHs =	$WT_{RRH} \cdot N_{RRH} = 109$	lbs



Envelope Only Solution

Centek		
TJL	CT11328F - Mount	July 6, 2021 at 11:21 AM
21022.22	Member Framing	CT11328F_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): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-12: ASD
Wood Code	AWC NDS-15: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-14
Masonry Code	ACI 530-13: ASD
Aluminum Code	AA ADM1-15: 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	4
Cd X	4
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Pipe 2.0	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
2	Antenna Mast	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
3	Horizontal	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Antenna Mast	11.667			Lbyy		Segm...				Lateral
2	M2	Horizontal	9.5			Lbyy		6				Lateral
3	M3	Antenna Mast	8			Lbyy						Lateral
4	M4	Antenna Mast	8			Lbyy						Lateral
5	M5	Horizontal	9.5			Lbyy		6				Lateral
6	M6	Pipe 2.0	8.998			Lbyy						Lateral
7	M7	Pipe 2.0	8.998			Lbyy						Lateral
8	M8	Antenna Mast	9			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N2			Antenna Mast	Column	Pipe	A53 Grade B	Typical
2	M2	N4	N3			Horizontal	Beam	Pipe	A53 Grade B	Typical
3	M3	N8	N10			Antenna Mast	Column	Pipe	A53 Grade B	Typical
4	M4	N7	N9			Antenna Mast	Column	Pipe	A53 Grade B	Typical
5	M5	N13	N12			Horizontal	Beam	Pipe	A53 Grade B	Typical
6	M6	N6	N18			Pipe 2.0	Beam	Pipe	A53 Grade B	Typical
7	M7	N5	N17			Pipe 2.0	Beam	Pipe	A53 Grade B	Typical
8	M8	N19	N20			Antenna Mast	Column	Pipe	A53 Grade B	Typical
9	M9	N21	N23			RIGID	None	None	RIGID	Typical
10	M10	N22	N24			RIGID	None	None	RIGID	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	5.833333	3.416667	0	
2	N2	0	-5.833333	3.416667	0	
3	N3	4.75	1.5	3	0	
4	N4	-4.75	1.5	3	0	
5	N5	4.166667	1.5	3	0	
6	N6	-4.166667	1.5	3	0	
7	N7	4.166667	-4	3	0	
8	N8	-4.166667	-4	3	0	
9	N9	4.166667	4	3	0	
10	N10	-4.166667	4	3	0	
11	N11	0	1.5	3	0	
12	N12	4.75	-1.5	3	0	
13	N13	-4.75	-1.5	3	0	
14	N14	4.166667	-1.5	3	0	
15	N15	-4.166667	-1.5	3	0	
16	N16	0	-1.5	3	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
17	N17	8.666667	1.5	-4.791667	0	
18	N18	-8.666667	1.5	-4.791667	0	
19	N19	0.	-4.5	3	0	
20	N20	0.	4.5	3	0	
21	N21	0	2.5	3	0	
22	N22	0	-2.5	3	0	
23	N23	0	2.5	3.416667	0	
24	N24	0	-2.5	3.416667	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N11	Reaction	Reaction	Reaction			
2	N16	Reaction	Reaction	Reaction			
3	N18	Reaction	Reaction	Reaction			
4	N17	Reaction	Reaction	Reaction			
5	N21						
6	N22						
7	N23						
8	N24						

Member Point Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Y	-.052	7.5
2	M4	Y	-.052	3.5
3	M3	Y	-.023	7.5
4	M3	Y	-.023	3.5
5	M3	Y	-.109	1
6	M1	Y	-.075	.5
7	M1	Y	-.075	7.5
8	M1	Y	-.074	5

Member Point Loads (BLC 3 : Wind Load X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	X	.058	7.5
2	M4	X	.058	3.5
3	M3	X	.037	7.5
4	M3	X	.037	3.5
5	M3	X	.099	1
6	M1	X	.17	.5
7	M1	X	.17	7.5
8	M1	X	.065	4

Member Point Loads (BLC 4 : Wind Load Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M4	Z	.142	7.5
2	M4	Z	.142	3.5
3	M3	Z	.152	7.5
4	M3	Z	.152	3.5

Member Point Loads (BLC 4 : Wind Load Z) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
5	M3	Z	.128	1
6	M1	Z	.48	.5
7	M1	Z	.48	7.5
8	M1	Z	.082	4

Member Distributed Loads (BLC 3 : Wind Load X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M6	X	.007	.007	0	0
2	M7	X	.007	.007	0	0
3	M1	X	.007	.007	0	0
4	M3	X	.007	.007	0	0
5	M4	X	.007	.007	0	0
6	M8	X	.007	.007	0	0

Member Distributed Loads (BLC 4 : Wind Load Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/f..	Start Location[ft,%]	End Location[ft,%]
1	M2	Z	.007	.007	0	0
2	M5	Z	.007	.007	0	0
3	M3	Z	.007	.007	0	3.308
4	M4	Z	.007	.007	0	3.308
5	M1	Z	.007	.007	8	11.667

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	DL		-1						
2	Weight of Equipment	DL					8			
3	Wind Load X	WLX					8	6		
4	Wind Load Z	WLZ					8	5		

Load Combinations

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

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N11	max	.523	5	1.632	6	.571	14	0	14	0	14	0	14
2		min	-.41	11	-1.052	12	-.628	4	0	1	0	1	0	1
3	N16	max	.097	13	1.618	4	.184	6	0	14	0	14	0	14
4		min	-.21	3	-1.063	14	-.127	12	0	1	0	1	0	1
5	N18	max	.152	6	.016	4	.263	6	0	14	0	14	0	14
6		min	-.153	4	.009	14	-.264	4	0	1	0	1	0	1
7	N17	max	.101	4	.016	4	.174	14	0	14	0	14	0	14
8		min	-.1	14	.009	14	-.175	4	0	1	0	1	0	1
9	Totals:	max	.646	13	.739	10	1.178	14						
10		min	-.646	3	.443	11	-1.178	4						

Envelope Joint Displacements

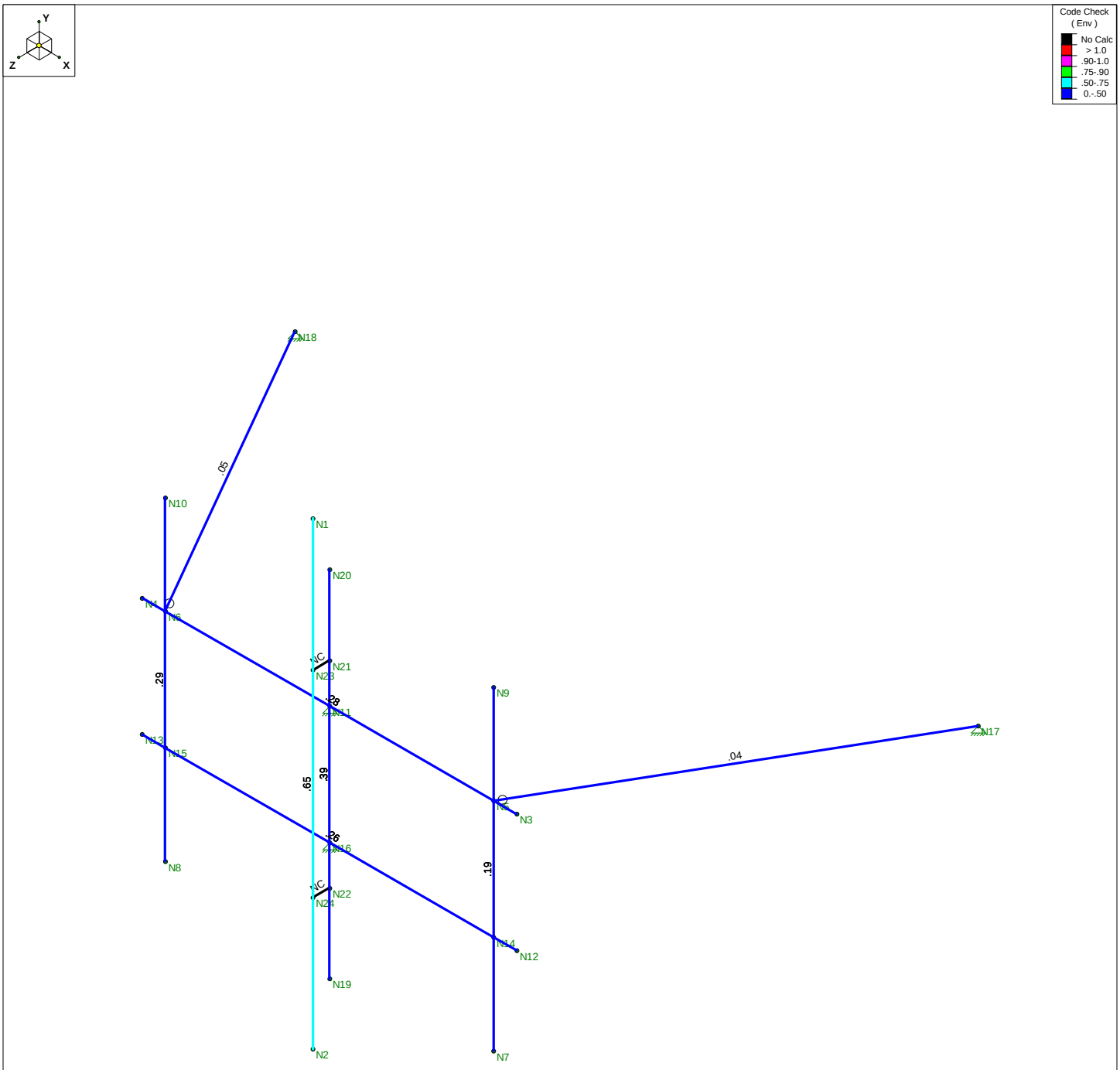
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
1	N1	max	.287	11	.017	14	.544	4	1.569e-02	4	1.351e-03	11	7.764e-03	5
2		min	-.301	5	-.021	4	-.513	14	-1.504e-02	14	-1.371e-03	5	-7.503e-03	11
3	N2	max	.05	3	.014	14	.111	14	3.032e-03	4	1.533e-03	4	9.868e-04	3
4		min	-.036	13	-.017	4	-.141	4	-2.413e-03	14	-1.509e-03	14	-7.415e-04	13
5	N3	max	0	3	-.027	13	.002	4	2.032e-03	4	2.126e-04	5	-2.208e-04	13
6		min	0	13	-.098	3	-.002	14	-1.917e-03	14	-1.937e-04	11	-9.721e-04	3
7	N4	max	0	14	-.058	11	.008	4	2.494e-03	6	8.003e-04	12	1.212e-03	5
8		min	0	4	-.13	5	-.007	14	-2.393e-03	12	-8.088e-04	6	4.465e-04	11
9	N5	max	0	3	-.025	13	.001	4	2.032e-03	4	2.126e-04	5	-2.202e-04	13
10		min	0	13	-.091	3	-.001	14	-1.917e-03	14	-1.937e-04	11	-9.71e-04	3
11	N6	max	0	14	-.054	11	.002	4	2.494e-03	6	7.99e-04	12	1.211e-03	5
12		min	0	4	-.121	5	-.002	14	-2.393e-03	12	-8.074e-04	6	4.458e-04	11
13	N7	max	-.009	13	-.025	13	.013	13	3.108e-04	3	3.18e-04	6	-3.143e-04	13
14		min	-.027	3	-.091	3	-.021	3	-1.863e-04	13	-2.443e-04	12	-8.754e-04	3
15	N8	max	.058	3	-.055	11	.374	12	6.811e-03	6	3.487e-03	12	2.052e-03	3
16		min	-.007	13	-.122	5	-.379	6	-6.721e-03	12	-3.556e-03	6	-3.998e-04	13
17	N9	max	.047	3	-.025	13	.1	4	3.723e-03	4	2.126e-04	5	5.774e-04	13
18		min	-.011	13	-.092	3	-.096	14	-3.606e-03	14	-1.937e-04	11	-1.771e-03	3
19	N10	max	-.001	11	-.054	11	.033	6	6.893e-04	6	7.99e-04	12	1.76e-03	5
20		min	-.049	5	-.121	5	-.03	12	-5.88e-04	12	-8.074e-04	6	-1.02e-04	11
21	N11	max	0	14	0	14	0	14	2.376e-03	4	5.173e-04	11	1.449e-03	5
22		min	0	1	0	1	0	1	-2.163e-03	14	-5.226e-04	5	-1.092e-03	11
23	N12	max	0	11	-.027	13	.013	14	3.109e-04	3	3.194e-04	6	-2.067e-04	13
24		min	0	5	-.098	3	-.017	4	-1.864e-04	13	-2.457e-04	12	-9.85e-04	3
25	N13	max	0	3	-.061	11	.202	12	5.866e-03	6	3.488e-03	12	1.289e-03	3
26		min	0	13	-.127	5	-.205	6	-5.768e-03	12	-3.557e-03	6	3.703e-04	13
27	N14	max	0	11	-.025	13	.015	14	3.109e-04	3	3.18e-04	6	-2.06e-04	13
28		min	0	5	-.091	3	-.019	4	-1.864e-04	13	-2.443e-04	12	-9.839e-04	3
29	N15	max	0	3	-.054	11	.177	12	5.866e-03	6	3.487e-03	12	1.288e-03	3
30		min	0	13	-.121	5	-.18	6	-5.768e-03	12	-3.556e-03	6	3.696e-04	13
31	N16	max	0	14	0	14	0	14	4.069e-04	6	1.75e-03	4	4.416e-04	3
32		min	0	1	0	1	0	1	-1.799e-04	12	-1.738e-03	14	-8.308e-05	13
33	N17	max	0	14	0	14	0	14	2.319e-03	4	1.098e-03	3	1.124e-03	6
34		min	0	1	0	1	0	1	6.098e-04	14	-1.094e-03	13	-6.863e-04	12
35	N18	max	0	14	0	14	0	14	2.857e-03	6	1.092e-03	11	9.107e-04	14
36		min	0	1	0	1	0	1	7.47e-04	12	-1.097e-03	5	-1.276e-03	4

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotation [rad]	LC
37	N19	max	.027	3	0	14	.076	14	3.29e-03	4	1.533e-03	4	7.86e-04	3
38		min	-.017	13	0	4	-.096	4	-2.67e-03	14	-1.509e-03	14	-5.404e-04	13
39	N20	max	.106	11	0	12	.146	4	4.202e-03	4	1.351e-03	11	3.485e-03	5
40		min	-.115	5	0	6	-.126	14	-3.568e-03	14	-1.371e-03	5	-3.235e-03	11
41	N21	max	.028	11	0	12	.045	4	4.202e-03	4	1.351e-03	11	3.429e-03	5
42		min	-.032	5	0	6	-.04	14	-3.568e-03	14	-1.371e-03	5	-3.179e-03	11
43	N22	max	.008	3	0	14	.012	14	3.291e-03	4	1.533e-03	4	7.306e-04	3
44		min	-.004	13	0	4	-.017	4	-2.67e-03	14	-1.509e-03	14	-4.85e-04	13
45	N23	max	.035	11	.017	14	.045	4	4.202e-03	4	1.351e-03	11	3.429e-03	5
46		min	-.039	5	-.02	4	-.04	14	-3.568e-03	14	-1.371e-03	5	-3.179e-03	11
47	N24	max	.013	3	.014	14	.012	14	3.291e-03	4	1.533e-03	4	7.306e-04	3
48		min	-.009	13	-.017	4	-.017	4	-2.67e-03	14	-1.509e-03	14	-4.85e-04	13

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	Dir	...	Pnc/...	Pnt/o...	Mny...	Mnz...	Cb	Eqn
1	M1	PIPE_2.0	.654	3....	4	.050	3....		4	4.808	21.377	1.245	1.245	4.89	H1-...
2	M8	PIPE_2.0	.388	6	14	.120	6		4	8.08	21.377	1.245	1.245	2.5...	H1-...
3	M3	PIPE_2.0	.286	5.5	4	.109	3.5		6	9.924	21.377	1.245	1.245	4.9...	H1-...
4	M2	PIPE_2.0	.283	4.75	3	.118	4.75		4	7.252	21.377	1.245	1.245	1.8...	H1-...
5	M5	PIPE_2.0	.262	4.75	5	.139	4.75		4	7.252	21.377	1.245	1.245	1.8...	H1-...
6	M4	PIPE_2.0	.188	5.5	4	.028	5.5		3	9.924	21.377	1.245	1.245	4.9...	H1-...
7	M6	PIPE_2.0	.047	4....	6	.004	8....		5	8.084	21.377	1.245	1.245	1.1...	H1-...
8	M7	PIPE_2.0	.042	4....	3	.004	8....		5	8.084	21.377	1.245	1.245	1.1...	H1-...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
TJL	CT11328F - Mount	July 6, 2021 at 11:21 AM
21022.22	Unity Check	CT11328F_AMA.r3d

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: CT11328F

Marine Sys. Smoke Stack
50 Maple Street
Branford, Connecticut 06405

July 19, 2021

EBI Project Number: 6221003830

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**35.13%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

July 19, 2021

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

Emissions Analysis for Site: CT11328F - Marine Sys. Smoke Stack

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **50 Maple Street** in **Branford, 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 50 Maple Street in Branford, 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 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.

6) 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.

7) 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.

8) 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.

9) 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.

10) 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.

11) 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.

12) 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.

13) 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.

14) The antennas used in this modeling are the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s) in Sector A, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz channel(s) in Sector B, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the RFS

APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 1900 MHz / 2100 MHz / 2100 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.

15) The antenna mounting height centerline of the proposed antennas is 96 feet above ground level (AGL).

16) 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.

17) 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:	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):	96 feet	Height (AGL):	96 feet	Height (AGL):	96 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 A1 MPE %:	**16.14%**	Antenna B1 MPE %:	**16.14%**	Antenna C1 MPE %:	**16.14%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	96 feet	Height (AGL):	96 feet	Height (AGL):	96 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts
ERP (W):	4,151.83	ERP (W):	4,151.83	ERP (W):	4,151.83
Antenna A2 MPE %:	**4.39%**	Antenna B2 MPE %:	**4.39%**	Antenna C2 MPE %:	**4.39%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz / 2100 MHz
Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd / 15.9 dBd
Height (AGL):	96 feet	Height (AGL):	96 feet	Height (AGL):	96 feet
Channel Count:	10	Channel Count:	10	Channel Count:	10
Total TX Power (W):	420 Watts	Total TX Power (W):	420 Watts	Total TX Power (W):	420 Watts
ERP (W):	16,339.90	ERP (W):	16,339.90	ERP (W):	16,339.90
Antenna A3 MPE %:	**7.25%**	Antenna B3 MPE %:	**7.25%**	Antenna C3 MPE %:	**7.25%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	27.77%
Sprint	7.36%
Site Total MPE % :	35.13%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	27.77%
T-Mobile Sector B Total:	27.77%
T-Mobile Sector C Total:	27.77%
Site Total MPE % :	35.13%

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 2500 MHz LTE 1C & 2C Traffic	1	11044.63	96.0	49.02	2500 MHz LTE 1C & 2C Traffic	1000	4.90%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	96.0	4.77	2500 MHz LTE 1C & 2C Broadcast	1000	0.48%
T-Mobile 2500 MHz NR Traffic	1	22089.26	96.0	98.04	2500 MHz NR Traffic	1000	9.80%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	96.0	9.53	2500 MHz NR Broadcast	1000	0.95%
T-Mobile 600 MHz LTE	2	591.73	96.0	5.25	600 MHz LTE	400	1.31%
T-Mobile 600 MHz NR	1	1577.94	96.0	7.00	600 MHz NR	400	1.75%
T-Mobile 700 MHz LTE	2	695.22	96.0	6.17	700 MHz LTE	467	1.32%
T-Mobile 1900 MHz GSM	4	1167.14	96.0	20.72	1900 MHz GSM	1000	2.07%
T-Mobile 1900 MHz LTE	2	2334.27	96.0	20.72	1900 MHz LTE	1000	2.07%
T-Mobile 2100 MHz UMTS	2	1167.14	96.0	10.36	2100 MHz UMTS	1000	1.04%
T-Mobile 2100 MHz LTE	2	2334.27	96.0	20.72	2100 MHz LTE	1000	2.07%
						Total:	**27.77%**

• 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:	27.77%
Sector B:	27.77%
Sector C:	27.77%
T-Mobile Maximum MPE % (Sector A):	27.77%
Site Total:	35.13%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **35.13%** 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.