NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Victoria Masse
420 Main Street #2, Sturbridge, MA 01566
860-306-2326
victoria@northeastsitesolutions.com

July 18, 2021

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

RE: Exempt Modification Application
1030 New Britain Avenue, West Hartford CT 06110
Latitude: 41.73130
Longitude: -72.72380
T-Mobile Site#: CT11170C_Anchor

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 165-foot level of the existing 180-foot lattice tower at 1030 New Britain Avenue, West Hartford CT 06110. The tower is owned by Ten Thirty Building Co LLC. The property is owned by Ten Thirty Building Co LLC c/o Hirschfeld MGMT Inc. T-Mobile now intends to replace three (3) of its existing antennas with three (3) new 2100 MHz antenna. The new antennas would be installed at the 165-foot level of the tower. T-Mobile is also proposing mount modifications. As shown on the enclosed mount analysis.

Planned Modifications

Remove:
(6) 1-5/8" Coax
(1) Hybrid Line
(1) Nortel Cabinet
(3) Twin Style TMAs

Remove and Replace:
(3) Air21 B2A B4P (Remove) - (3) Air6449 B41 2100 MHz Antenna (Replace)

Install New:
(1) Hybrid Cable
(3) RRU 4415 B25
(3) SitePro 1 Reinforcement Kits

Existing to Remain:
(3) AIR32 B66A/B2A 1900/2100MHz Antenna

NORTHEAST SITE SOLUTIONS
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(3) RFS-APXAARR24_43-U-NA20 600/700/1900 MHz Antenna
(3) RRU 4449 B71+B85
(2) Hybrid Cable

Ground:
(1) 6160 Site Support Cabinet
(1) B160 Battery Cabinet
(1) BBU Cabinet

This facility was approved by Town of West Hartford PZC. Site plan approval was granted in 1997 for the construction of a 199 foot communication tower. Please see attached.

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 Mayor Shari Cantor, Elected Official and Todd Dumais, Town Planner for the Town of West Hartford, as well as the property owner and the tower 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,

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 2, Sturbridge MA 01566
Email: victoria@northeastsitesolutions.com

Attachments

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

cc: Honorable Shari Cantor- Mayor of West Hartford (Mayor@WestHartfordCT.gov)
50 S Main Street
West Hartford CT 06107

Todd Dumais– West Hartford Town Planner
Town of West Hartford (Todd.Dumais@WestHartfordCT.gov)
50 S Main Street
West Hartford CT 06107

Ten Thirty Building Co LLC c/o Hirschfeld MGMT Inc – as tower and property owner (Buildingofficial@townofnorthbranfordct.com)
c/o Hirschfeld Management Inc
1030 New Britain Avenue
West Hartford CT 06110

Exhibit A

DEPARTMENT OF
COMMUNITY SERVICES

TOWN OF WEST HARTFORD
PERMIT APPLICATION FOR:

__Zone Change __Special Development District __Special Use Permit
__Lot Line Revision __Subdivision __Lot Split __ Site Plan
__Building Line

File # SP 812 Application Fee #100 Surcharge #10 Date Received 5/13/97

StreetAddress 1030 NEW BRITAIN AVE.

Parcel No. _____ Acreage/Lot Area 2.92 acres

Zoning IG Zone Map No. _____

Applicant's Interest in Property Management Co.

RECEIVED
MAY 13 1997
PLANNING & ZONING DIVISION

Brief Description of Proposed Activity Construct Rohn SSV Tower 199'

The undersigned warrants the truth of all statements contained herein and in all supporting documents to the best of his/her knowledge and belief. Furthermore, the applicant agress that submission of this document ocnstitutes permission and consent to Commission and staff inspections of the site.

TEN THIRTY BUILDING COMPANY LLC
Record Owner's Name

1030 NEW BRITAIN AVE.
Street

WEST HARTFORD, CT 06110
City State Zip

860-953.7000
Telephone #

T.DONALD HIRSCHFELD
Applicant's Name

1030 NEW BRITAIN AVE.
Street

WEST HARTFORD,CT 06110
City State Zip

860-953-7000
Telephone #

Contact Person:

T. Donald Hirschfeld
Name

1030 NEW BRITAIN AVE.
Street

WEST HARTFORD,CT 06110
City State Zip

860-953-7000
Telephone Number

T. Donald Hirschfeld
Applicant's Signature

T. Donald Hirschfeld
Signature of Owner/Authorized Agent

Exhibit B

1030 NEW BRITAIN AVENUE

Location	1030 NEW BRITAIN AVENUE	Mblu	H15/ 3771/ 1030/ /
Parcel ID	3771 2 1030 0001	Owner	TEN THIRTY BUILDING COMPANY LLC
Assessment	$1,088,220	Appraisal	$1,554,600
Vision Id #	18633	**Building Count**	2

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2013	$865,700	$688,900	$1,554,600
Assessment			
Valuation Year	Improvements	Land	Total
2013	$605,990	$482,230	$1,088,220

Owner of Record

Owner	TEN THIRTY BUILDING COMPANY LLC	Sale Price	$1
Co-Owner		Certificate	1
Address	C/O HIRSCHFELD MGMT INC #106 1030 NEW BRITAIN AVENUE W HARTFORD, CT 06110	Book & Page	2004/ 148
		Sale Date	04/21/1995
		Instrument	U

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
TEN THIRTY BUILDING COMPANY LLC	$1	1	2004/ 148	U	04/21/1995
HIRSCHFELD HELENE FERN TR	$0	1	911/ 85	U	04/18/1984
RUBIN LUCILLE AND	$650,000	1	685/ 183	U	05/17/1979
LINCOLN ICE CREAM CO INC	$0	1	627/ 47	U	10/09/1978
	$0	1	534/ 67	U	

Building Information

Building 1 : Section 1

Year Built:	1957
Living Area:	11,520
Replacement Cost:	$425,877

Building Percent Good:	33
Replacement Cost Less Depreciation:	$140,500

Building Attributes	
Field	Description
STYLE	Distribution Whse
MODEL	Comm/Ind
Grade	D 0.75
Stories:	1
Occupancy	
Exterior Wall 1	Concrete Block
Exterior Wall 2	
Roof Structure	Curved Roof
Roof Cover	Metal Ribbed
Interior Wall 1	Typical
Interior Wall 2	
Floor Type	Concrete Slab
Floor Cover	Carpet
Heating Fuel	Typical
Heating Type	Forced Hot Air
AC Type	Central - Zone
As Built Use	TSGR
Bldg Use	Commercial
# of Bedrooms	
Total Baths	
Type	01
Wet Sprinkler	100
Dry Sprinkler	
1st Floor Use:	
Class	Class C
Frame Type	Rigid Steel
Plumbing	LIGHT
Ceiling	Acoustic Panel
Group	IND
Wall Height	15
Adjustment	

Building Photo

(http://images.vgsi.com/photos/WestHartfordCTPhotos//\00\01

Building Layout

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
DST	DISTRIBUTION WHSE	11,520	11,520
COM	COMMERCIAL - NV	11,520	0
		23,040	11,520

Building 2 : Section 1

Year Built:	1960
Living Area:	24,386
Replacement Cost:	$1,988,911
Building Percent	34

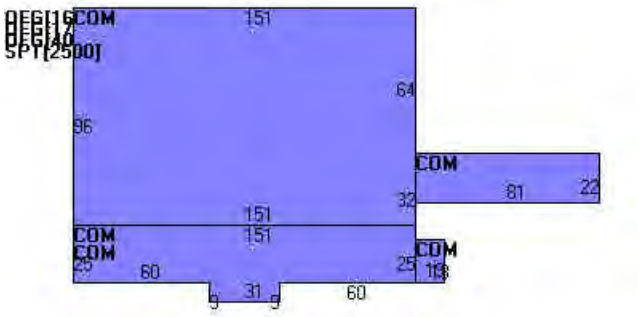
Good:
Replacement Cost
Less Depreciation: $676,200

Building Attributes : Bldg 2 of 2	
Field	Description
STYLE	Office Gen Lowrise
MODEL	Comm/Ind
Grade	D 0.75
Stories:	2
Occupancy	
Exterior Wall 1	Precast Panel
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Built Up
Interior Wall 1	Typical
Interior Wall 2	
Floor Type	Concrete Slab
Floor Cover	None
Heating Fuel	Typical
Heating Type	None
AC Type	None
As Built Use	LNDP
Bldg Use	Commercial
# of Bedrooms	
Total Baths	
Type	01
Wet Sprinkler	
Dry Sprinkler	
1st Floor Use:	
Class	Class C
Frame Type	Rigid Steel
Plumbing	LIGHT
Ceiling	Not Applicable
Group	OFF
Wall Height	8
Adjustment	

Building Photo

(http://images.vgsi.com/photos/WestHartfordCTPhotos//default

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
OFG	OFFICE GENERAL LOWRISE	21,886	21,886
SPT	MISC SPORT FACILITY	2,500	2,500
COM	COMMERCIAL - NV	24,633	0
		49,019	24,386

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	201
Description	Commercial
Zone	BG
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	2.82
Frontage	
Depth	
Assessed Value	$482,230
Appraised Value	$688,900

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CLP4	Paving, Asphalt			5700 SF	$5,300	1
COH1	Overhead Door Commercial			100 UNIT	$400	1
COH3	Overhead Metal Door			330 UNIT	$2,000	1
CLP4	Paving, Asphalt			39375 SF	$36,800	1
CLD2	Loading Dock - Stl/Conc			330 SF	$1,100	1
CCP5	Canopy-roof only			594 SF	$3,000	1
CFC5	Shed - Concrete Block			169 SF	$400	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2014	$865,700	$688,900	$1,554,600
2013	$865,700	$688,900	$1,554,600
2012	$865,700	$688,900	$1,554,600

Assessment			
Valuation Year	Improvements	Land	Total
2014	$605,990	$482,230	$1,088,220
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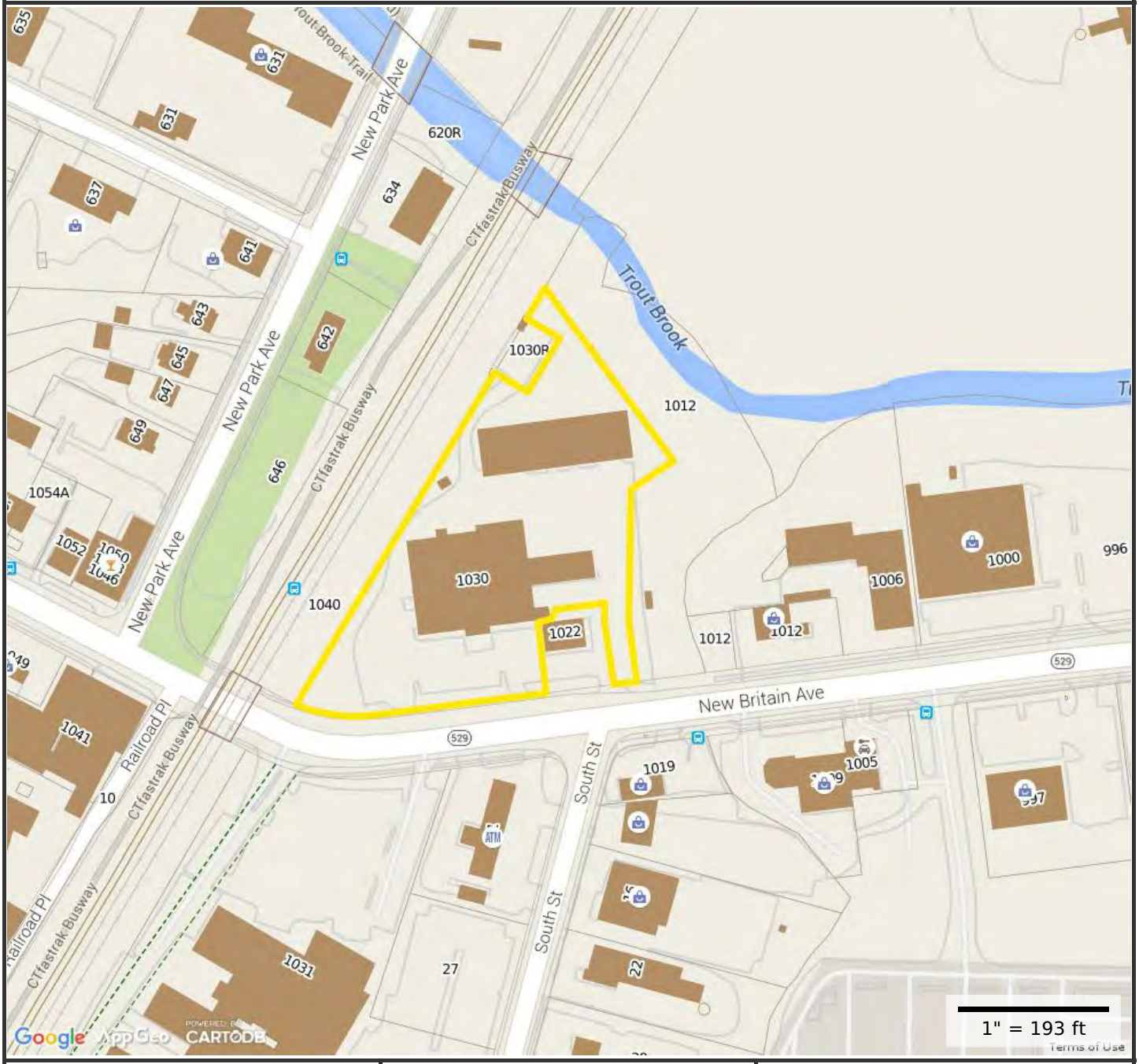


Property Information

Property ID	3771 2 1030 0001
Location	1030 NEW BRITAIN AVENUE
Owner	TEN THIRTY BUILDING COMPANY LLC

TOWN OF WEST HARTFORD

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of West Hartford, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

Parcels updated 5/22/2015
Properties updated Daily

Exhibit C

MODIFICATION OF EXISTING WIRELESS FACILITY BY

T··Mobile·

T-MOBILE NORTHEAST LLC

PROJECT TITLE: ANCHOR

SITE NUMBER: CT11170C

SITE NAME: HARTFORD/ N. BRITAIN AVE_1

SITE ADDRESS: 1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

RF CONFIGURATION 67D5997DB_2XAIR+1OP (GSM ONLY)

PROJECT NOTES:

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
   HANDICAPPED ACCESS IS NOT REQUIRED.
   POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES, ORDINANCES AND SPECIFICATIONS.

STRUCTURAL NOTES:

PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT CONTRACTOR SHOULD REVIEW THE STRUCTURAL ANALYSIS REPORT DATED JUNE 14, 2021 PREPARED BY PAUL J. FORD & COMPANY AND THE MOUNT EVALUATION REPORT DATED JANUARY 1, 2021 PREPARED BY EFI GLOBAL INC. AND ADHERE TO THE REPORTS FULLY AND ALL THE RECOMMENDATIONS THEREIN, INCLUDING BUT NOT LIMITED TO ANTENNA PLACEMENT, COAX ROUTING, STRUCTURAL IMPROVEMENTS, ETC.

CODE COMPLIANCE:

ALL WORK SHALL COMPLY WITH THE CURRENT NATIONAL AND CONNECTICUT STATE BUILDING AND LIFE SAFETY CODES, SUPPLEMENTS AND AMENDMENTS INCLUDING BUT NOT LIMITED TO THE LATEST EDITION OF:

CONNECTICUT STATE BUILDING CODE (CSBC).

ANSI/TIA-222-G STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

NATIONAL ELECTRICAL CODE (NEC) FOR POWER AND GROUNDING REQUIREMENTS.

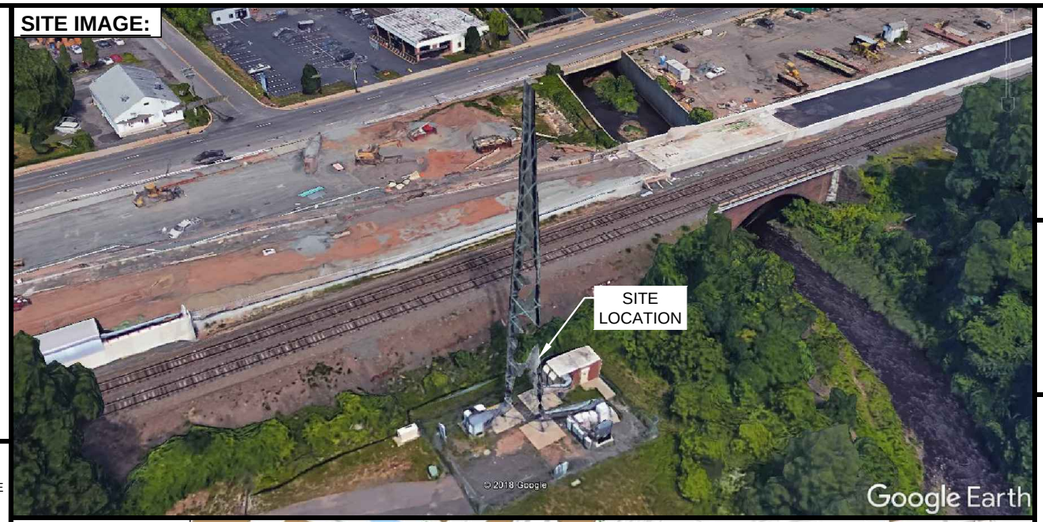
OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).

NFPA - NATIONAL FIRE PROTECTION ASSOCIATION.

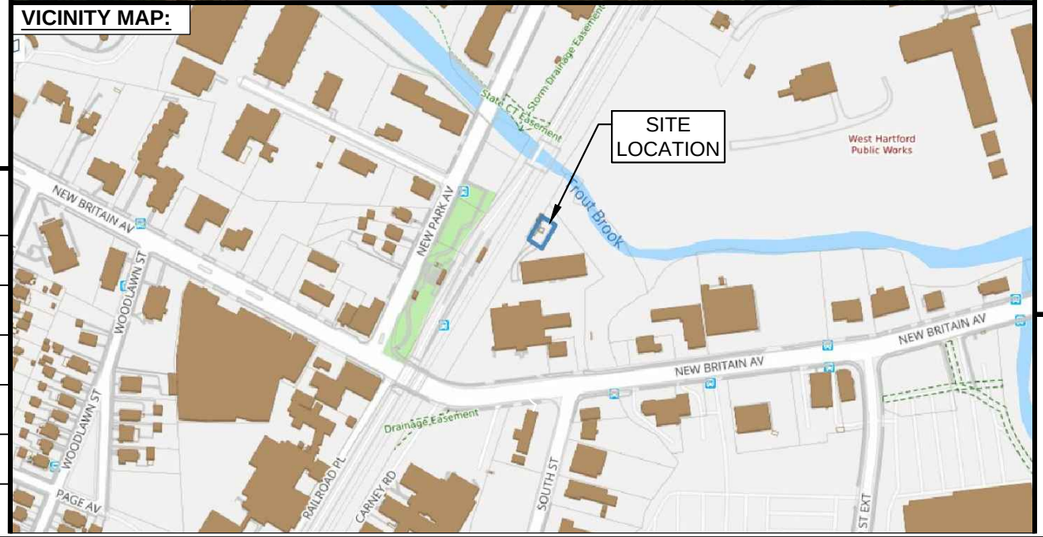
APPROVALS:

FSA CM	DATE
RF ENGINEER	DATE
FOPS	DATE
T-MOBILE ENGINEERING AND DEVELOPMENT	DATE
	DATE
	DATE

SITE IMAGE:



VICINITY MAP:



PROJECT SCOPE:

UPGRADE OF EXISTING WIRELESS FACILITY AS FOLLOWS:

UPGRADE EXISTING RBS 6131 CABINET INTERNALLY.
ADD (1) 6160 AND (1) B160 CABINETS.
UPGRADE EXISTING ANTENNA MOUNTS.
REPLACE (3) OF (9) EXISTING ANTENNAS.
ADD (3) REMOTE RADIO UNITS AT ANTENNAS FOR A TOTAL OF (6).
REMOVE (3) TOWER MOUNTED AMPLIFIERS (TMA) AT ANTENNAS.
ANTENNA FEED LINES: REMOVE ALL COAXIAL LINES, REMOVE 9X18 HCS,
ADD (1) 6X24 HCS FOR TOTAL OF (2) 6X12 AND (1) 6X24 HCS LINES.

PROJECT INFORMATION:

ADDRESS:	1030 NEW BRITAIN AVE WEST HARTFORD, CT 06110
STRUCTURE TYPE:	LATTICE TOWER
COORDINATES:	41.73130 N -72.72380 W

PROJECT TEAM:

APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860-692-7100
LANDLORD:	HIRSCHFELD COMMUNICATIONS LLC 1030 NEW BRITAIN AVENUE WEST HARTFORD, CONNECTICUT 06110 860.953.7000 FAX 860.953.9300
PROJECT MANAGER:	NORTHEAST SITE SOLUTIONS 420 MAIN STREET, BLDG 4 STURBRIDGE, MA 01566 SHELDON FREINCLE SHELDON@NORTHEASTSITESOLUTIONS.COM 201-776-8521
CONSULTANTS:	FORESITE LLC 462 WALNUT ST NEWTON, MA 02460 SAEED MOSSAVAT SMOSSAVAT@FORESITELLC.COM 617-212-3123

SHEET INDEX:

APPLICANT:

T··Mobile·

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
www.northeastsitesolutions.com

420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors

462 WALNUT STREET, SUITE 1
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL

STATE OF CONNECTICUT · MOSSEN M. SAEED · NO. ARI. 11162 · LICENSED ARCHITECT

REV	DESCRIPTION	DATE
A	PRELIMINARY	06/24/21

SITE NUMBER: CT11170C
SITE NAME: HARTFORD/ N. BRITAIN AVE_1

SITE ADDRESS: 1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

SHEET TITLE:

T-1: TITLE SHEET

GENERAL NOTES:

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE CLIENT'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.

6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

7. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS DURING CONSTRUCTION.

8. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJEC

9. THE CONTRACTOR SHALL NOTIFY THE CLIENT'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE CLIENT'S REPRESENTATIVE.

10. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

A. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS, AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS BUILDING CODES" OR LATEST EDITION.

B. AWS: AMERICAN WELDING SOCIETY INC. AS PUBLISHED IN "STANDARD D1.1-08, STRUCTURAL WELDING CODE" OR LATEST EDITION.

C. AISC: AMERICAN INSTITUTE FOR STEEL CONSTRUCTION AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

11. BOLTING:

A. BOLTS SHALL BE CONFORMING TO ASTM A325 HIGH STRENGTH, HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.

B. BOLTS SHALL BE 3/4"Ø MINIMUM (UNLESS OTHERWISE NOTED)

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

12. FABRICATION:

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES (LATEST EDITION).

B. ALL STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 (LATEST EDITION), UNLESS OTHERWISE NOTED.

13. ERECTION OF STEEL:

A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED LINES AND ELEVATIONS AND RIGIDLY FASTENED IN PLACE WITH SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.

C. TEMPORARY BRACING, GUYING AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SAFE AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

14. RELATED WORK, FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

A. FLASHING OF OPENING INTO OUTSIDE WALLS

B. SEALING AND CAULKING ALL OPENINGS

C. PAINTING

D. CUTTING AND PATCHING

15. REQUIREMENTS OF REGULATORY AGENCIES:

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, AND SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

C. TIA-EIA - 222 (LATEST EDITION). STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

D. FAA - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460-IH, OBSTRUCTION MARKING AND LIGHTING.

E. FCC - FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

F. AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS (LATEST EDITION).

G. NEC - NATIONAL ELECTRICAL CODE - ON TOWER LIGHTING KITS.

H. UL - UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

I. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

J. 2018 LIFE SAFETY CODE NFPA - 101.

APPLICANT:

T-Mobile

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

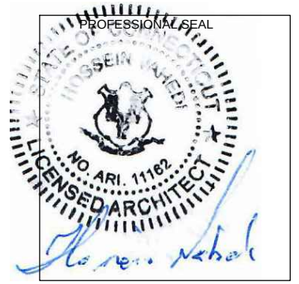
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors

462 WALNUT STREET, SUITE 1
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
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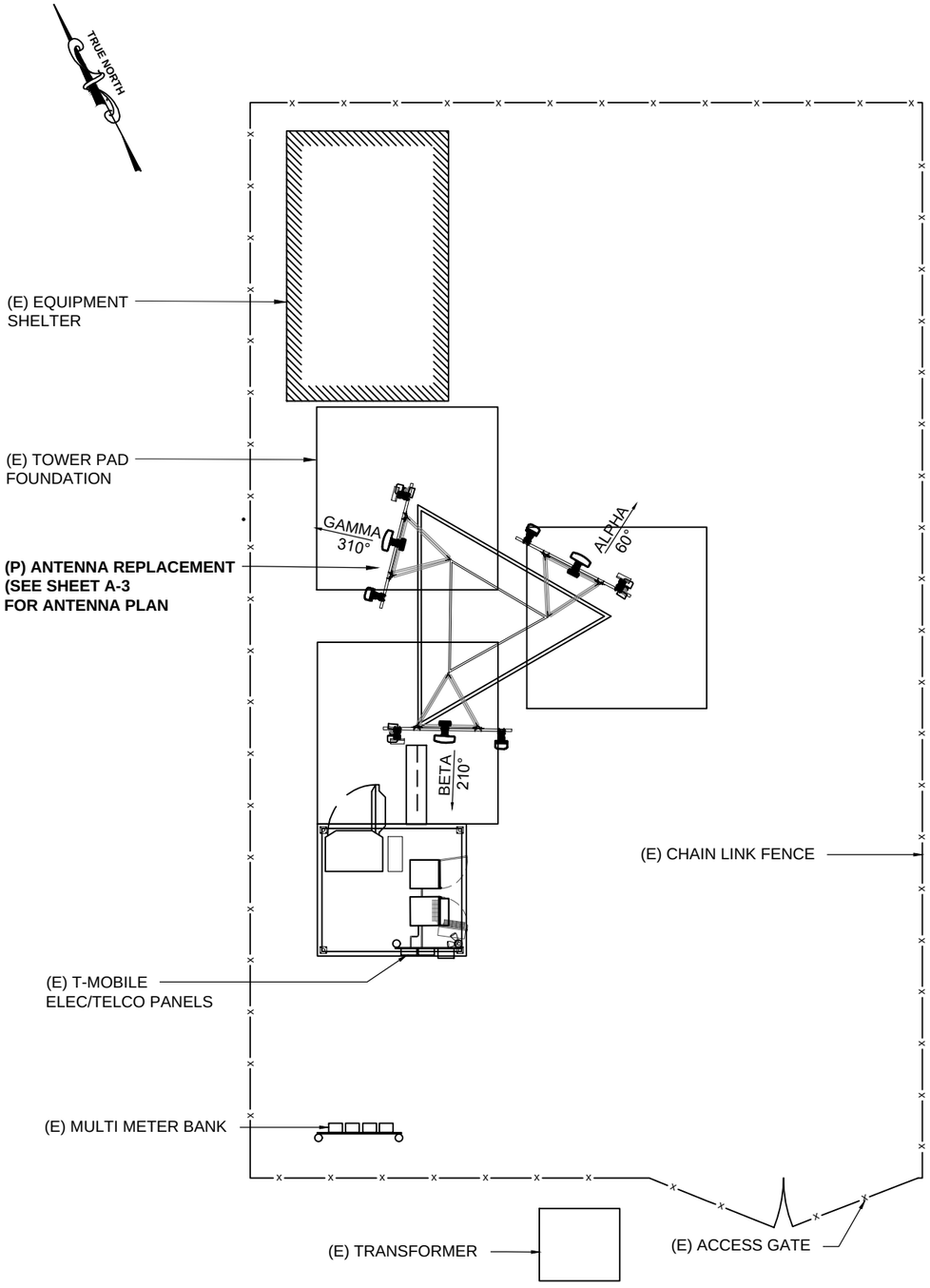
SITE NUMBER: CT11170C
SITE NAME: HARTFORD/ N. BRITAIN AVE_1

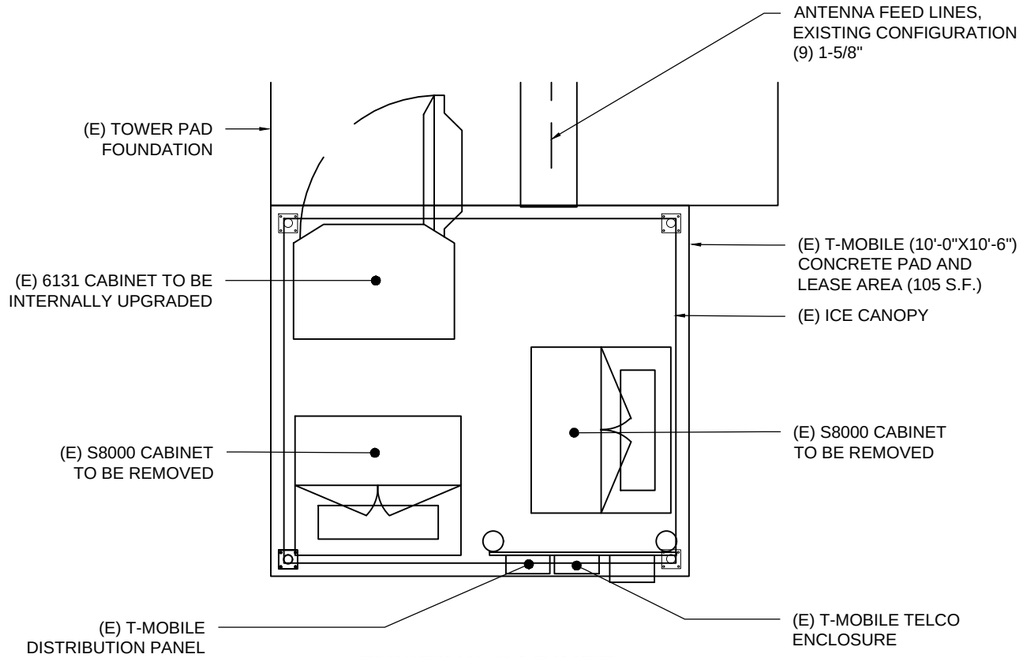
SITE ADDRESS: 1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

SHEET TITLE:

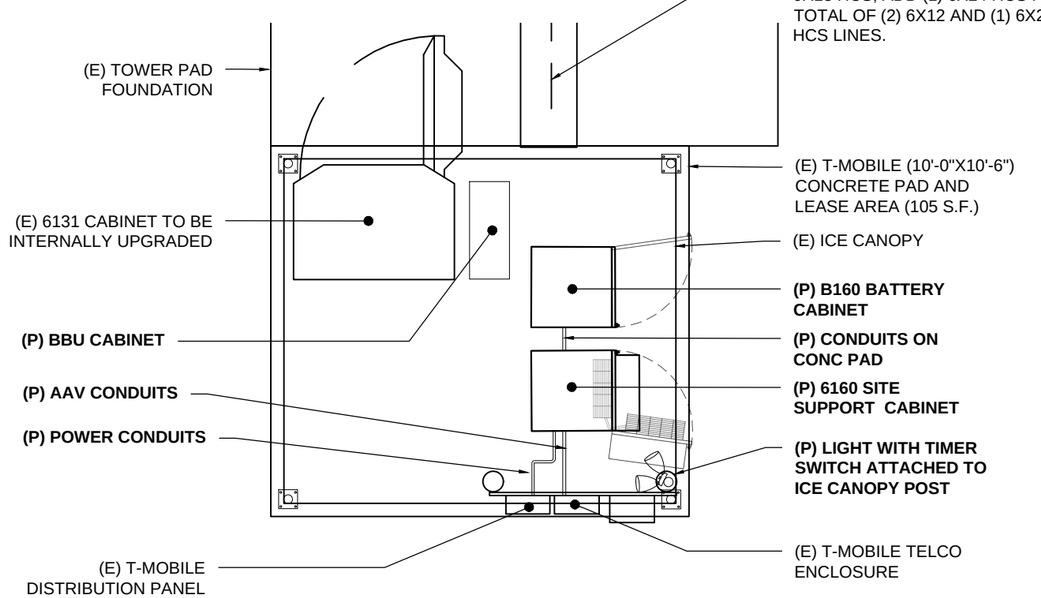
N-1: GENERAL NOTES



SITE PLAN
SCALE: 3/32" = 1'-0" (1 / A-1)



EXISTING CABINET LAYOUT PLAN
SCALE: 1/4" = 1'-0" (2 / A-1)



PROPOSED CABINET LAYOUT PLAN
SCALE: 1/4" = 1'-0" (3 / A-1)

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NORTHEAST SITE SOLUTIONS
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET, SUITE 1
NEWTON, MA 02460
617-212-3123

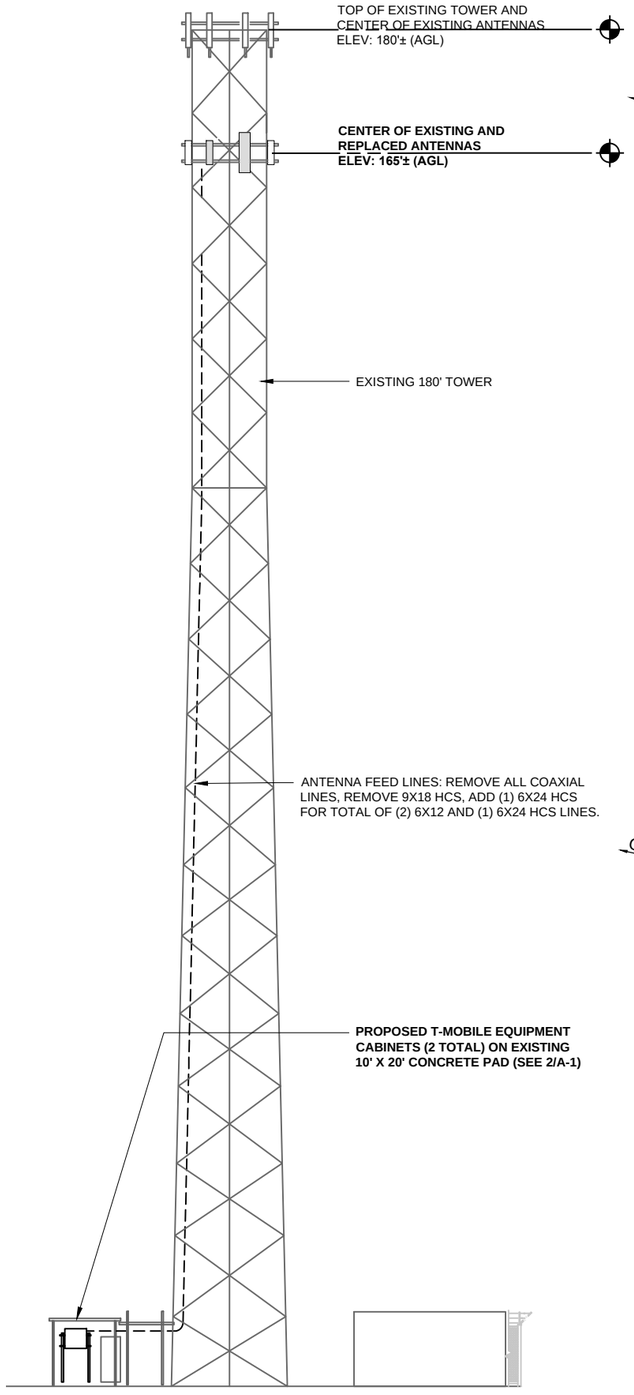
PROFESSIONAL SEAL
STATE OF CONNECTICUT
NO. ARI. 11162
LICENSED ARCHITECT

REV	DESCRIPTION	DATE
A	PRELIMINARY	06/24/21

SITE NUMBER: CT11170C
SITE NAME: HARTFORD/ N. BRITAIN AVE_1

SITE ADDRESS: 1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

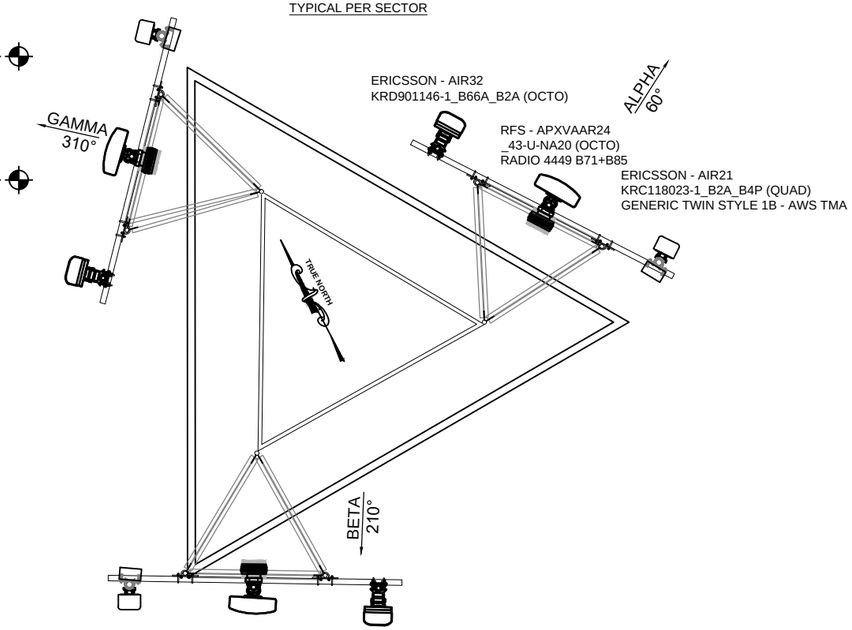
SHEET TITLE:
A-1: PLAN



ELEVATION
SCALE: 1" = 20'

1 / A-2

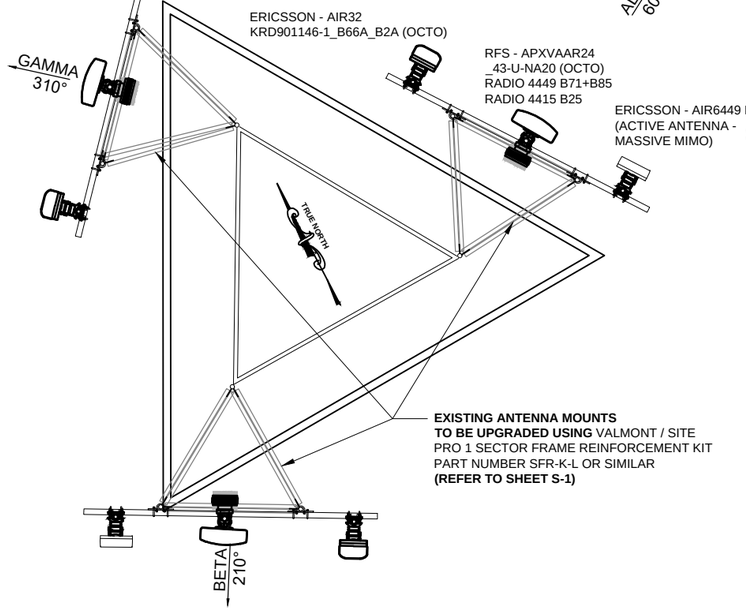
TYPICAL PER SECTOR



EXISTING ANTENNA PLAN
N.T.S.

2 / A-2

TYPICAL PER SECTOR

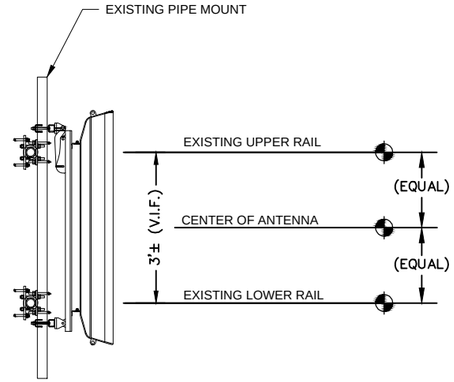


FINAL ANTENNA PLAN
N.T.S.

3 / A-2

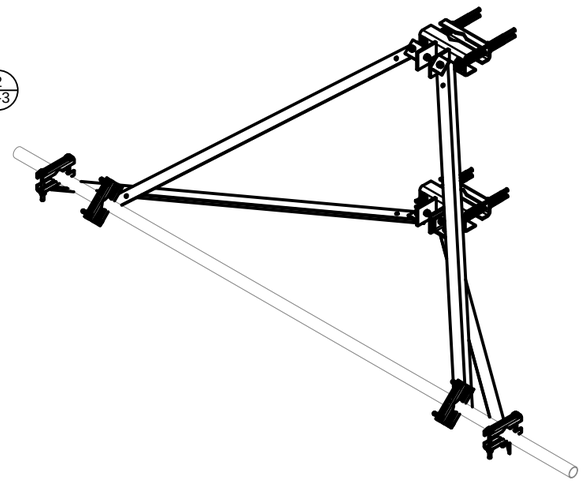
STRUCTURAL NOTES:

PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT CONTRACTOR SHOULD REVIEW THE STRUCTURAL ANALYSIS REPORT DATED JUNE 14, 2021 PREPARED BY PAUL J. FORD & COMPANY AND THE MOUNT EVALUATION REPORT DATED JANUARY 1, 2021 PREPARED BY EFI GLOBAL INC. AND ADHERE TO THE REPORTS FULLY AND ALL THE RECOMMENDATIONS THEREIN, INCLUDING BUT NOT LIMITED TO ANTENNA PLACEMENT, COAX ROUTING, STRUCTURAL IMPROVEMENTS, ETC.



ANTENNA MOUNTING
N.T.S.

3 / A-2



VALMONT / SITE PRO 1
PART NUMBER SFR-K-L OR SIMILAR

ANTENNA MOUNT REINFORCEMENT
N.T.S.

4 / A-2

APPLICANT:
T-MOBILE NORTHEAST LLC
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CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET, SUITE 1
NEWTON, MA 02460
617-212-3123

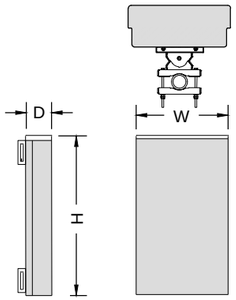
PROFESSIONAL SEAL

REV	DESCRIPTION	DATE
A	PRELIMINARY	06/24/21

SITE NUMBER: CT11170C
SITE NAME: HARTFORD/ N. BRITAIN AVE_1

SITE ADDRESS: 1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

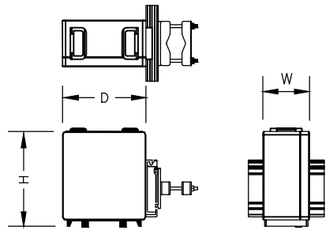
SHEET TITLE:
A-2: ELEVATIONS, ANTENNA PLANS AND DETAILS



ERICSON ANTENNA SPECIFICATIONS	
MODEL #	AIR6449 B41
MANUF.	ERICSSON
HEIGHT	33.1"
WIDTH	20.5"
DEPTH	8.3"
WEIGHT	103 LB

ERICSSON ANTENNA
N.T.S

2 A-4



REMOTE RADIO UNIT SPECIFICATIONS	
MODEL #	RADIO 4415 B25
MANUF.	ERICSSON
HEIGHT	14.9"
WIDTH	13.2"
DEPTH	5.4"
WEIGHT	46.3 LB

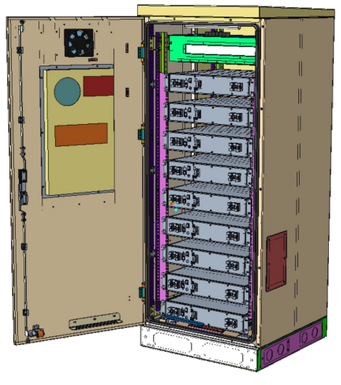
REMOTE RADIO UNIT
N.T.S.

3 A-3

SITE SUPPORT CABINET SPECIFICATIONS	
MODEL #	6160
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	25.6"
DEPTH	25.6"
WEIGHT	

SITE SUPPORT CABINET
N.T.S.

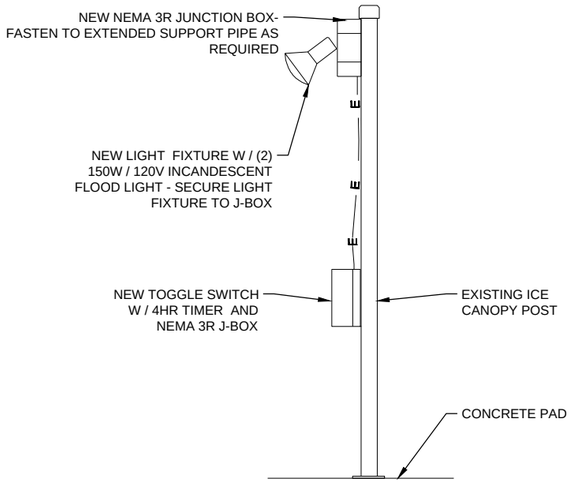
4 A-3



BATTERY CABINET SPECIFICATIONS	
MODEL #	B160
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	26"
DEPTH	26"
WEIGHT	

BATTERY CABINET
N.T.S.

5 A-3



SERVICE LIGHT DETAILS
N.T.S.

6 A-3

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
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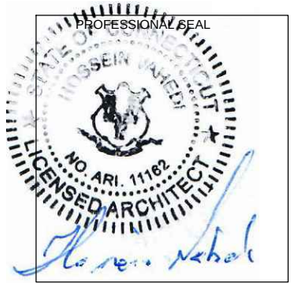
PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	06/24/21

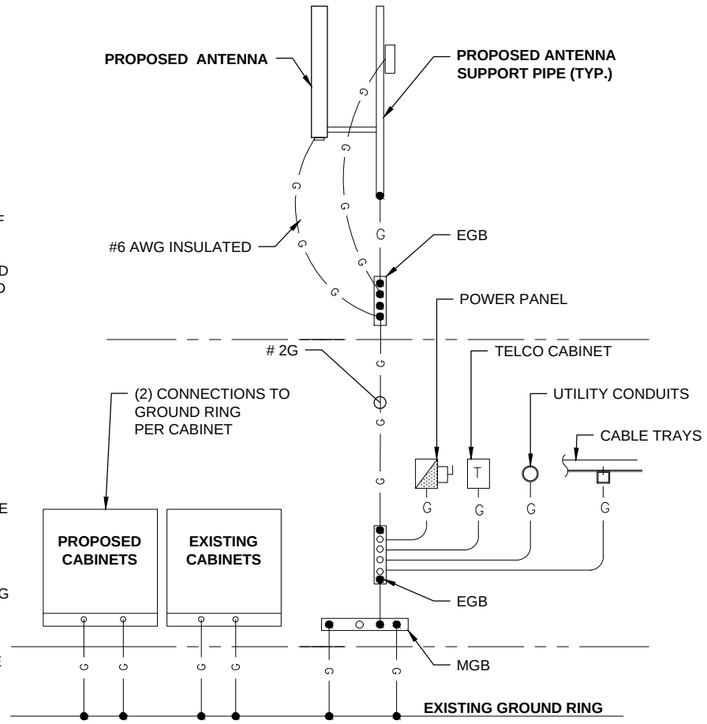
SITE NUMBER: CT11170C
SITE NAME: HARTFORD/ N. BRITAIN AVE_1

SITE ADDRESS: 1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

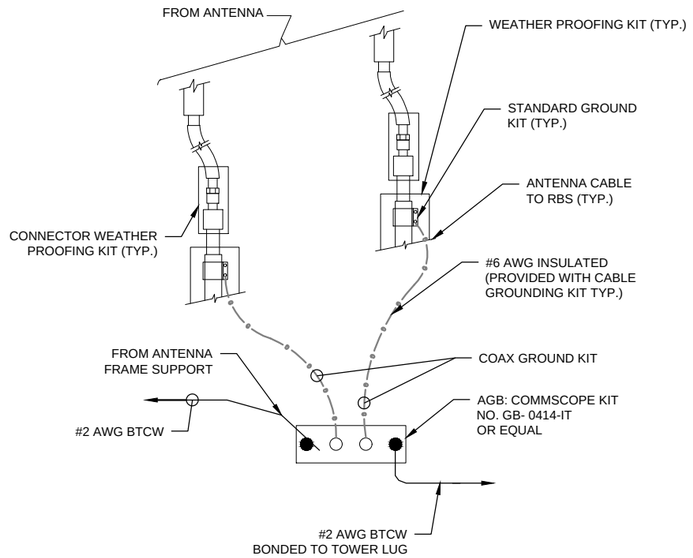
SHEET TITLE:
A-3: ANTENNA AND EQUIPMENT SPECIFICATIONS

ELECTRICAL & GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PRODUCED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) ND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLING BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE ARE PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELECOM CABINET AND RBS CABINET AS INDICATED ON DRAWING A -1. PROVIDE FULL LENGTH PULL ROPE INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NAME 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUNDING COAX CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURES COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSTALLATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE GROUND.
14. ALL GROUND CONNECTION TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AS RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY BOND ANY METER OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PROCEDURES (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN RBS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTION.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20 BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

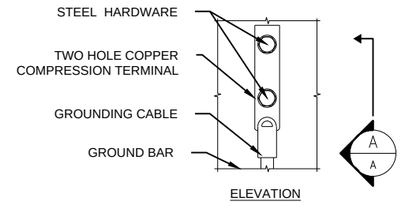


GROUNDING RISER DIAGRAM
N.T.S. — 1 / E-1

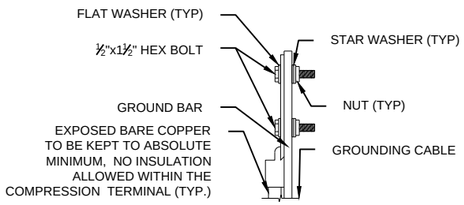


NOTES:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB

ANTENNA CABLE GROUNDING
N.T.S. — 2 / E-1



ELEVATION



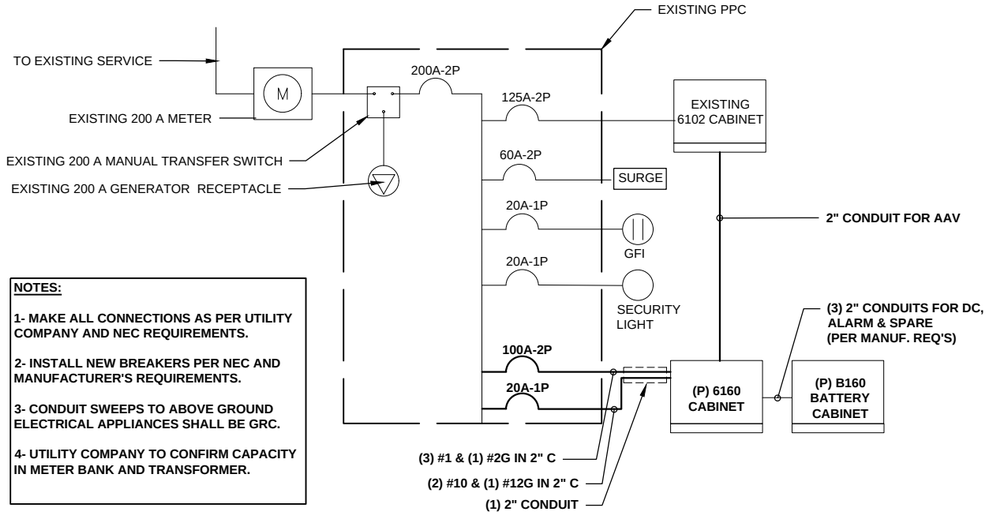
SECTION A-A

NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

GROUND BAR CONNECTIONS
N.T.S. — 3 / E-1

SPECIAL CONTRACTOR'S NOTES:

CONTRACTOR TO VERIFY THE POWER FEED & PHASE OF METER BANK AND THAT THE EXISTING AND PROPOSED CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.



NOTES:

1- MAKE ALL CONNECTIONS AS PER UTILITY COMPANY AND NEC REQUIREMENTS.

2- INSTALL NEW BREAKERS PER NEC AND MANUFACTURER'S REQUIREMENTS.

3- CONDUIT SWEEPS TO ABOVE GROUND ELECTRICAL APPLIANCES SHALL BE GRC.

4- UTILITY COMPANY TO CONFIRM CAPACITY IN METER BANK AND TRANSFORMER.

TYPICAL ONE LINE DIAGRAM
N.T.S. — 4 / E-1

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
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860-692-7100

PROJECT MANAGER
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420 MAIN STREET, BLDG 4
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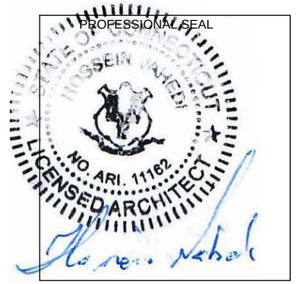
PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	06/24/21

SITE NUMBER: CT11170C
SITE NAME: HARTFORD/ N. BRITAIN AVE_1

SITE ADDRESS: 1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

SHEET TITLE:
E-1: GROUNDING DETAILS AND ONE LINE DIAGRAM

1.0 DESIGN INFORMATION AND GENERAL REQUIREMENTS

1.0 GENERAL
a. ALL DIMENSIONS ARE APPROXIMATE, CONTRACTOR SHOULD VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL MEMBERS AND COMMENCEMENT OF WORK.

1.1 CODES
a. 2018 CONNECTICUT STATE BUILDING CODE,
b. MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-10, AMERICAN SOCIETY OF CIVIL ENGINEERS
c. STEEL CONSTRUCTION MANUAL, 14TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
d. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, ANSI/TIA-222-G, TELECOMMUNICATIONS INDUSTRY ASSOCIATION

1.2 LOADS AND DESIGN CRITERIA
a. WIND LOADING: V: 125 MPH (ULTIMATE) / 97 MPH (NOMINAL), EXPOSURE C, RISK CATEGORY II
b. EQUIPMENT AS LISTED IN MOUNT STRUCTURAL ANALYSIS REPORT PREPARED BY DESTEK ENGINEERING, LLC, DATED 06/14/2019.

1.3 NOTES
a. PRIOR TO PURCHASE OR FABRICATION OF MATERIAL, THE CONTRACTOR SHALL PERFORM AN INSPECTION VERIFYING MEMBER AND BOLT SIZES. SHOULD THE CONTRACTOR DISCOVER ANY DAMAGED OR MISSING MEMBERS OR THE MEMBER OR BOLT SIZES DO NOT MATCH THOSE LISTED, DESTEK SHALL BE NOTIFIED IMMEDIATELY.
b. CONTRACTOR TO REPLACE ALL MEMBERS AND BOLTS REMOVED WITH NEW MEMBERS AND BOLTS OF SAME TYPE, UNLESS NOTED OTHERWISE.

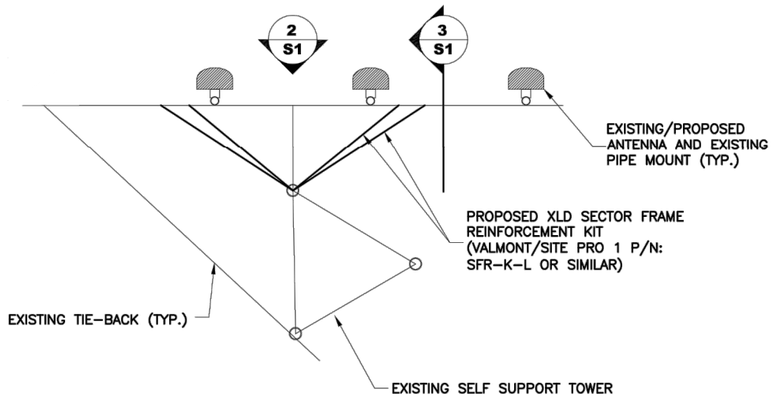
2.0 STRUCTURAL STEEL

2.1 MATERIALS
a. STRUCTURAL STEEL . . . . . ASTM A992
MISC ANGLE & PLATE . . . . ASTM A36
PIPE . . . . . ASTM A53 GR. B
RODS . . . . . ASTM A572-50 (MINIMUM)
HSS. . . . . ASTM A500, GR. B, Fy=46 KSI
b. BOLTS . . . . . ASTM A325 U.N.O.
c. WELDING ELECTRODES . . . . . AWS A5.1 (E70XX)
d. STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 360-10"
e. WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
f. THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
g. POOR MATCHING OF HOLES SHALL BE CORRECTED BY DRILLING TO THE NEXT LARGER SIZE. WELDING FOR REDRILLING WILL NOT BE PERMITTED.

2.2 CONNECTIONS
a. SHOP CONNECTIONS MAY BE BOLTED OR WELDED
b. CONNECTIONS WHERE THE BEAM SHEAR (V) IS NOT NOTED ON THE DRAWINGS, SIMPLE SHEAR CONNECTIONS SHALL BE DESIGNED TO DEVELOP 1/2 OF THE MAXIMUM TOTAL UNIFORM LOAD CAPACITY OF THE BEAM.
c. FIELD CONNECTIONS SHALL BE MADE WITH A325 BOLTS AND HARDENED WASHERS EXCEPT AS INDICATED ON THE DESIGN DRAWINGS
d. CONNECTIONS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED BY THE STEEL FABRICATOR. CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" AND "AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".
e. DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER.
f. BOLT HOLES SHALL BE CUT, DRILLED OR PUNCHED AT RIGHT ANGLES TO THE SURFACE OF THE METAL AND SHALL NOT BE MADE OR ENLARGED BY BURNING. HOLES SHALL BE CLEAN CUT WITHOUT TORN OR RAGGED EDGES. OUTSIDE BURRS RESULTING FROM DRILLING OR REAMING OPERATION SHALL BE REMOVED WITH A TOOL MAKING A 1/16 INCH BEVEL. BOLT HOLES SHALL BE 1/16 INCH OVERSIZE.

2.3 FINISHES
a. STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123
b. BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED PER ASTM A153.
c. ALL SURFACES DAMAGED BY FIELD WELDING OR CUTTING SHALL BE PAINTED WITH COLD GALVANIZING COMPOUND TWICE. THE PAINT SHOULD BE AT LEAST 93% PURE ZINC. RUST-OLEUM PROFESSIONAL, (MODEL# 7585838) OR SIMILAR.

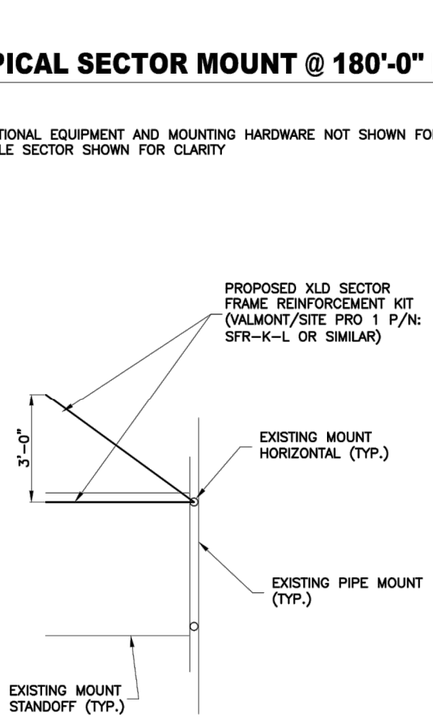
2.4 WELDING
a. CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS; INSTALLING 3000 (NFPA 701) FIRE BLANKET AROUND COAX. MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. CONTRACTOR SHOULD BE ABLE TO TRANSPORT THE WATER TO THE HEIGHT WELDING BEING PERFORMED.
b. WELDING ON GALVANIZED SURFACE SHOULD BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GROUND GALVANIZING BEFORE WELDING.
c. WELDING CERTIFICATE MUST BE PROVIDED PRIOR TO WELDING. ALL WELDING SHALL BE PERFORMED BY AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES.



1 S1 TYPICAL SECTOR MOUNT @ 180'-0" PLAN

N.T.S.

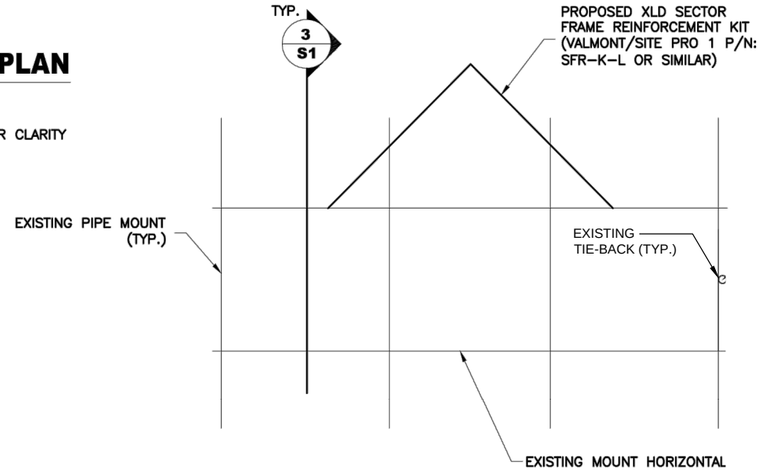
NOTE:
- ADDITIONAL EQUIPMENT AND MOUNTING HARDWARE NOT SHOWN FOR CLARITY
- SINGLE SECTOR SHOWN FOR CLARITY



3 S1 SECTOR MOUNT SIDE VIEW

1/4" = 1'-0"

NOTE:
- ADDITIONAL EQUIPMENT, MOUNTING HARDWARE, AND TIE-BACKS NOT SHOWN FOR CLARITY



2 S1 SECTOR MOUNT ELEVATION

1/4" = 1'-0"

NOTE:
- ANTENNAS, ADDITIONAL EQUIPMENT, MOUNTING HARDWARE, AND EXISTING STANDOFF ARMS NOT SHOWN FOR CLARITY

PROPOSED MODIFICATION TO BE INSTALLED AT ALL THREE SECTORS.

APPLICANT:
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T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
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420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET, SUITE 1
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL
STATE OF CONNECTICUT
NO. ARI. 11162
LICENSED ARCHITECT

REV	DESCRIPTION	DATE
A	PRELIMINARY	06/24/21

SITE NUMBER: CT11170C
SITE NAME: HARTFORD/ N. BRITAIN AVE_1

SITE ADDRESS: 1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

SHEET TITLE:
S-1: STRUCTURAL MOUNT UPGRADE DETAILS

Exhibit D

PAUL J. FORD & COMPANY

Report Date: June 14, 2021

Client: Hirschfeld Communications LLC
1030 New Britain Avenue
West Hartford, CT 06110
Attn: Ian Ormesher
(703) 447-1350
iormesher@hirschfeldcos.com

Structure: Existing 185-ft Self Support Tower
Site Name: West Hartford
Site Reference #: CT001
Site Address: 1030 New Britain Ave
City, County, State: West Hartford, Hartford County, CT
Latitude, Longitude: 41.736092°, -72.720499°

PJF Project: A64120-0001.002.8700

Paul J. Ford and Company is pleased to submit this "**Structural Analysis Report**" to determine the tower stress level.

Analysis Criteria:

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph as required by the 2018 Connecticut State Building Code and Appendix N. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Proposed Appurtenance Loads:
The structure was analyzed with the proposed loading configuration shown in Table 1 combined with the other considered equipment shown in Table 2 of this report.

Summary of Analysis Results:
Existing Structure: Pass – 95.8%
Existing Foundation: Pass – 33.0%

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Hirschfeld Communications LLC. If you have any questions or need further assistance on this or any other projects, please give us a call.

Respectfully Submitted by:
Paul J. Ford and Company

Michael T Bange

Michael Bange, EI
Structural Designer
mbange@pauljford.com

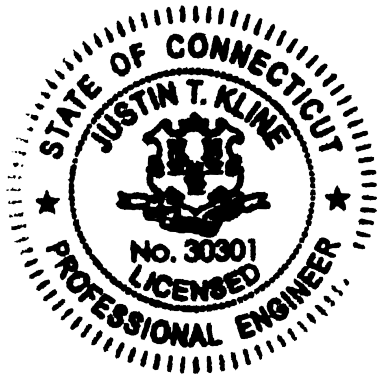


TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180 ft Self Support tower designed by PiRod in June of 1998.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Risk Category:	II
Nominal Wind Speed:	97 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
165.0	165.0	3	ericsson	RRUS 4415 B25	3	1-1/4
		3	ericsson	AIR32 KRD901146-1_B66_B2A w/ Mount Pipe		
		3	ericsson	AIR6449 B41 w/ Mount Pipe		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
		3	Sitepro1	SFR-K-L Reinforcement Kit		
		1	tower mounts	Sector Mount		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
180.0	180.0	3	ericsson	RRUS 4478 B14	12 2 4	1-5/8 1/2 3/4
		6	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe		
		3	commscope	CBC23SR-43		
		3	commscope	ION-M23 SDARS		
		3	ericsson	RRUS 11		
		3	ericsson	RRUS 12		
		3	ericsson	RRUS 32		
		3	ericsson	RRUS 32 B66		
		3	ericsson	RRUS A2 MODULE		
		3	kathrein	80010965 w/ Mount Pipe		
		1	miscl	GPS		
		3	powerwave technologies	7770 w/ Mount Pipe		
		6	powerwave technologies	LGP21401		
		3	raycap	DC6-48-60-18-8F		
		1	tower mounts	Platform Mount		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference
Manufacturer Drawings	PiROD Inc., 6/10/1998	203949-B
Geotechnical Report	PiROD Inc., 6/5/1998	A-114804
Pile Driving Report	Simeon Beer, 7/13/1998	-
Site Application	Hirschfeld Communications, 1/26/2021	-

3.1) Analysis Method

tnxTower (version 8.0.9.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

1) Tower and structures were maintained in accordance with the TIA-222 Standard.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	180 - 170	Leg	1 1/2" solid	2	-18.88	54.43	34.7	Pass
T2	170 - 150	Leg	2" solid	38	73.81	106.69	69.2	Pass
T3	150 - 130	Leg	2 1/4" solid	102	-135.26	148.69	91.0	Pass
T4	130 - 120	Leg	Pirod 105244 (12x1.25)	166	-136.44	142.49	95.8	Pass
T5	120 - 100	Leg	Pirod 105217 (12x1.5)	175	-162.94	214.86	75.8	Pass
T6	100 - 80	Leg	Pirod 105217 (12x1.5)	190	-184.63	214.86	85.9	Pass
T7	80 - 60	Leg	Pirod 105218 (12x1.75)	205	-206.97	300.68	68.8	Pass
T8	60 - 40	Leg	Pirod 105218 (12x1.75)	220	-229.45	300.68	76.3	Pass
T9	40 - 20	Leg	Pirod 105219 (12x2)	235	-252.89	399.87	63.2	Pass
T10	20 - 0	Leg	Pirod 105219 (12x2)	250	-275.18	399.87	68.8	Pass
T1	180 - 170	Diagonal	3/4" solid	12	-3.41	6.09	56.0	Pass
T2	170 - 150	Diagonal	7/8" solid	48	-5.52	9.34	59.2	Pass
T3	150 - 130	Diagonal	1" solid	161	-6.08	15.16	40.1	Pass
T4	130 - 120	Diagonal	L 2.5 x 2.5 x 3/16	173	-7.94	13.56	58.6 69.0 (b)	Pass
T5	120 - 100	Diagonal	L 2.5 x 2.5 x 3/16	186	-5.39	11.92	45.2 52.9 (b)	Pass
T6	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	194	-5.02	8.66	58.0	Pass
T7	80 - 60	Diagonal	L 3 x 3 x 3/16	209	-5.45	12.12	45.0	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T8	60 - 40	Diagonal	L 3 x 3 x 3/16	224	-5.89	9.79	60.2	Pass
T9	40 - 20	Diagonal	L 3 x 3 x 5/16	239	-6.59	12.87	51.2	Pass
T10	20 - 0	Diagonal	L 3 x 3 x 5/16	254	-8.35	10.64	78.4	Pass
T1	180 - 170	Horizontal	3/4" solid	30	-0.49	3.31	14.9	Pass
T2	170 - 150	Horizontal	3/4" solid	52	-1.38	2.74	50.4	Pass
T3	150 - 130	Horizontal	7/8" solid	116	-2.41	4.10	58.8	Pass
T1	180 - 170	Top Girt	7/8" solid	5	-1.72	6.14	28.1	Pass
T2	170 - 150	Top Girt	7/8" solid	42	-1.96	6.22	31.4	Pass
T3	150 - 130	Top Girt	1" solid	104	-2.41	8.40	28.7	Pass
T1	180 - 170	Bottom Girt	7/8" solid	7	-1.40	6.14	22.9	Pass
T2	170 - 150	Bottom Girt	7/8" solid	45	-2.52	4.94	51.0	Pass
T3	150 - 130	Bottom Girt	1" solid	107	-2.70	6.83	39.5	Pass
							Summary	
						Leg (T4)	95.8	Pass
						Diagonal (T10)	78.4	Pass
						Horizontal (T3)	58.8	Pass
						Top Girt (T2)	31.4	Pass
						Bottom Girt (T2)	51.0	Pass
						Bolt Checks	69.0	Pass
						Rating =	95.8	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	50.2	Pass
1	Base Foundation (Structure)	0	9.1	Pass
1	Base Foundation (Soil Interaction)	0	33.0	Pass

Structure Rating (max from all components) =	**95.8%**

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

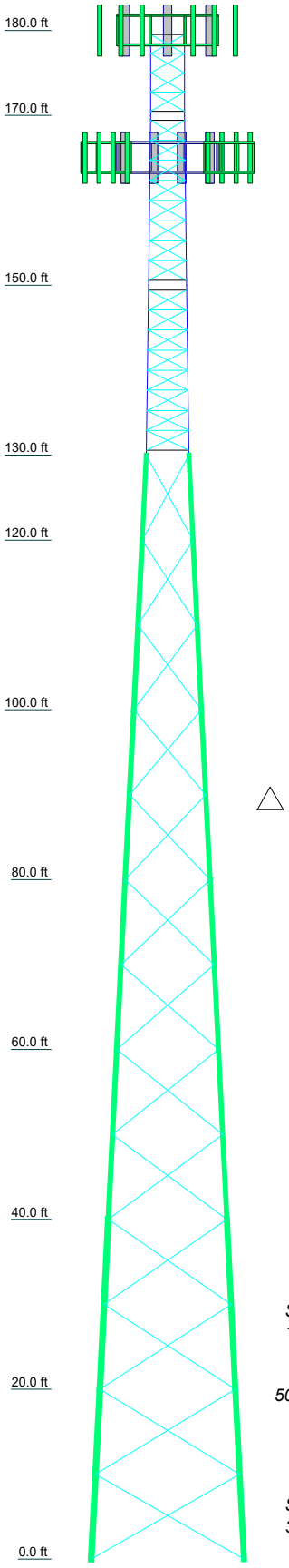
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section		T1										
Legs		A										
Leg Grade		A572-50										
Diagonals		SR 2" solid	SR 7/8" solid	SR 3/4" solid								
Diagonal Grade		A572-50										
Top Girts		SR 2 1/4" solid	SR 1" solid	SR 7/8" solid								
Bottom Girts		B	SR 1" solid	SR 7/8" solid								
Horizontals		Pirod 105217 (12x1.5)	L 2.5 x 2.5 x 3/16	SR 1" solid	SR 7/8" solid							
Face Width (ft)	18	16	14	12	10	8	6	5	4.5	4	4 @ 2.25	0.4
# Panels @ (ft)	26.4	5.2	5.0	3.3	3.2	2.7	2.6	1.1	16 @ 2.35833	1.3	1.7	
Weight (K)		Pirod 105219 (12x2)	L 3 x 3 x 5/16	L 3 x 3 x 3/16	Pirod 105218 (12x1.75)	A572-50	A36	N.A.	N.A.	N.A.	13 @ 10	



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 1 1/2" solid	B	Pirod 105244 (12x1.25)

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 95.8%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 282 K
SHEAR: 26 K

UPLIFT: -250 K
SHEAR: 23 K

AXIAL 148 K
SHEAR 12 K *MOMENT 1424 kip-ft*
TORQUE 9 kip-ft
50.0 mph WIND - 1.00 in ICE

AXIAL 46 K
SHEAR 39 K *MOMENT 4153 kip-ft*
TORQUE 34 kip-ft
REACTIONS - 97.0 mph WIND

Paul J. Ford and Company
250 E. Broad St., Ste 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job:	***180-ft Self-Support Tower / WESTHARTFORD_DEXTERS***		
Project:	***PJF# 64120-0001 / CT0001***		
Client: Hirschfeld Communications, LLC	Drawn by: Michael Bange	App'd:	
Code: TIA-222-G	Date: 06/10/21	Scale: NTS	
Path: G:\TOWER\641 Hirschfeld Communications\2020\64120-0001 CT001\64120-0001.002.8700 SA\TNX\64120-0001.002.8700.eri		Dwg No. E-1	

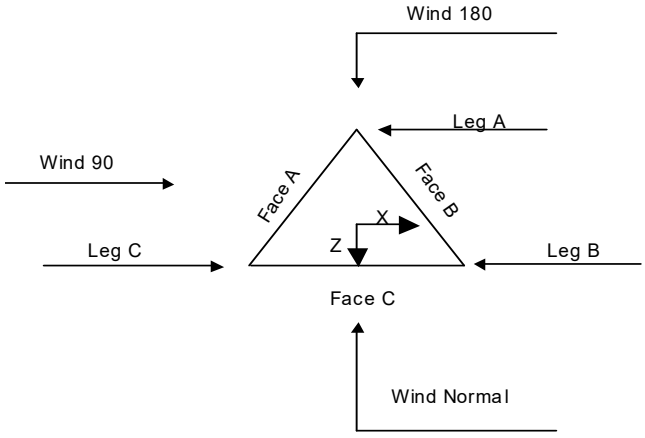
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 18.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in Hartford County, Connecticut.
- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 97.0 mph.
- Structure Class II.
- Exposure Category C.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 1.00 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50.0 mph is used in combination with ice.
- Deflections calculated using a wind speed of 60.0 mph.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals		Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area	√	SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
√	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	180.00-170.00		106778 (48)	4.00	1	10.00
T2	170.00-150.00		100246 (48/54)	4.00	1	20.00
T3	150.00-130.00		119703 (54/60)	4.50	1	20.00
T4	130.00-120.00		U06 105218 [L2.5 x 3/16]	5.00	1	10.00
T5	120.00-100.00		U08 105217 [L2.5 x 3/16]	6.00	1	20.00
T6	100.00-80.00		U10 105217 [L2.5 x 3/16]	8.00	1	20.00
T7	80.00-60.00		U12 105218 [L3 x 3/16]	10.00	1	20.00
T8	60.00-40.00		U14 105218 [L3 x 3/16]	12.00	1	20.00
T9	40.00-20.00		U16 105219 [L3 x 5/16]	14.00	1	20.00
T10	20.00-0.00		U18 105219 [L3 x 5/16]	16.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	180.00-170.00	2.25	X Brace	No	Steps	6.00	6.00
T2	170.00-150.00	2.36	X Brace	No	Steps	6.80	6.80
T3	150.00-130.00	2.36	X Brace	No	Steps	6.80	6.80
T4	130.00-120.00	10.00	X Brace	No	No	0.00	0.00
T5	120.00-100.00	10.00	X Brace	No	No	0.00	0.00
T6	100.00-80.00	10.00	X Brace	No	No	0.00	0.00
T7	80.00-60.00	10.00	X Brace	No	No	0.00	0.00
T8	60.00-40.00	10.00	X Brace	No	No	0.00	0.00
T9	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T10	20.00-0.00	10.00	X Brace	No	No	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 180.00-170.00	Solid Round	1 1/2" solid	A572-50 (50 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)
T2 170.00-150.00	Solid Round	2" solid	A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T3 150.00-130.00	Solid Round	2 1/4" solid	A572-50 (50 ksi)	Solid Round	1" solid	A572-50 (50 ksi)
T4 130.00-120.00	Truss Leg	Pirod 105244 (12x1.25)	A572-50 (50 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T5 120.00-100.00	Truss Leg	Pirod 105217 (12x1.5)	A572-50 (50 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T6 100.00-80.00	Truss Leg	Pirod 105217 (12x1.5)	A572-50 (50 ksi)	Single Angle	L 2.5 x 2.5 x 3/16	A36 (36 ksi)
T7 80.00-60.00	Truss Leg	Pirod 105218 (12x1.75)	A572-50 (50 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T8 60.00-40.00	Truss Leg	Pirod 105218 (12x1.75)	A572-50 (50 ksi)	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)
T9 40.00-20.00	Truss Leg	Pirod 105219 (12x2)	A572-50 (50 ksi)	Single Angle	L 3 x 3 x 5/16	A36 (36 ksi)
T10 20.00-0.00	Truss Leg	Pirod 105219 (12x2)	A572-50 (50 ksi)	Single Angle	L 3 x 3 x 5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Top Girt Type*	*Top Girt Size*	*Top Girt Grade*	*Bottom Girt Type*	*Bottom Girt Size*	*Bottom Girt Grade*
T1 180.00-170.00	Solid Round	7/8" solid	A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T2 170.00-150.00	Solid Round	7/8" solid	A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T3 150.00-130.00	Solid Round	1" solid	A572-50 (50 ksi)	Solid Round	1" solid	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*No. of Mid Girts*	*Mid Girt Type*	*Mid Girt Size*	*Mid Girt Grade*	*Horizontal Type*	*Horizontal Size*	*Horizontal Grade*
T1 180.00-170.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)
T2 170.00-150.00	None	Solid Round		A36 (36 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)
T3 150.00-130.00	None	Solid Round		A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.00-170.00	0.00	0.00	A36 (36 ksi)	1	1	1.02	Mid-Pt	Mid-Pt	Mid-Pt
T2 170.00-150.00	0.00	0.00	A36 (36 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T3 150.00-130.00	0.00	0.00	A36 (36 ksi)	1	1	1.03	Mid-Pt	Mid-Pt	Mid-Pt
T4 130.00-120.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 120.00-100.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T6 100.00-80.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 80.00-60.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T8 60.00-40.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T9 40.00-20.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T10 20.00-0.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 180.00-170.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 170.00-150.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 150.00-130.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 130.00-120.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.00-100.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.00-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 80.00-60.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 60.00-40.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 40.00-20.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 20.00-0.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
Tower Elevation ft	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 130.00-120.00	1	0.5	0.85	1	0.5	0.85
T5 120.00-100.00	1	0.5	0.85	1	0.5	0.85
T6 100.00-80.00	1	0.5	0.85	1	0.5	0.85
T7 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T8 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T9 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T10 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-170.00	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1
T2 170.00-150.00	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1
T3 150.00-130.00	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1	0.00	1
T4 130.00-120.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 100.00-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T9 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T10 20.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-170.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T2 170.00-150.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T3 150.00-130.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T4 130.00-120.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T5 120.00-100.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 100.00-80.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 80.00-60.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 60.00-40.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T9 40.00-20.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T10 20.00-0.00	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-170.00	Sleeve DS	0.63 A325N	5	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0
T2 170.00-150.00	Sleeve DS	0.75 A325N	5	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0
T3 150.00-130.00	Flange	1.00 A325N	6	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.50 A325N	0	0.00 A325N	0	0.50 A325N	0
T4 130.00-120.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	1.00 A325N	0	1.00 A325N	0	1.00 A325N	0
T5 120.00-100.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	1.00 A325N	0	1.00 A325N	0	1.00 A325N	0
T6 100.00-80.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0
T7 80.00-60.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0
T8 60.00-40.00	Flange	1.00 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0	0.00 A325N	0
T9 40.00-20.00	Flange	1.25 A325N	6	1.25 A325N	1	0.00 A325N	0	0.00 A325N	0	1.25 A325N	0	1.25 A325N	0	1.25 A325N	0
T10 20.00-0.00	Flange	1.25 F1554-105	0	1.25 A325N	1	0.00 A325N	0	0.00 A325N	0	1.00 A325N	0	1.00 A325N	0	1.00 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A (1 5/8" foam)	A	No	No	Ar (CaAa)	180.00 - 8.00	-6.00	0.45	12	6	1.00 0.50	1.98		0.92
FSJ4-50B(1/2")	A	No	No	Ar (CaAa)	180.00 - 8.00	-6.00	0.45	2	2	1.00 0.50	0.52		0.14
9776(3/4")	A	No	No	Ar (CaAa)	180.00 - 8.00	-6.00	0.45	4	4	1.00 0.50	0.73		0.31
T-Brackets (Af) ***	A	No	No	Af (CaAa)	180.00 - 8.00	-6.00	0.45	1	1	1.00	1.00		8.40

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement ft*	*Face Offset in*	*Lateral Offset (Frac FW)*	*#*	*# Per Row*	*Clear Spacing in*	*Width or Diameter in*	*Perimeter in*	*Weight plf*
T-Brackets (Af)	C	No	No	Af (CaAa)	165.00 - 8.00	-6.00	-0.45	1	1	1.00	1.00		8.40
LDF6-50 (1 1/4" foam) ***	C	No	No	Ar (CaAa)	165.00 - 8.00	-6.00	-0.45	3	3	1.00	1.55		0.66

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral ft* *Vert ft* *ft*	*Azimuth Adjustment °*	*Placement ft*		*C_AA_A Front ft^2*	*C_AA_A Side ft^2*	*Weight K*
Platform Mount [LP 405-1]	C	None		0.000	180.00	No Ice	20.88	20.88	1.80
						1/2" Ice	28.89	28.89	2.28
						1" Ice	37.04	37.04	2.87
7770_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						1" Ice	6.61	5.71	0.16
7770_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						1" Ice	6.61	5.71	0.16
7770_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	5.75	4.25	0.06
						1/2" Ice	6.18	5.01	0.10
						1" Ice	6.61	5.71	0.16
(2) OPA-65R-LCUU-H6_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	9.68	7.12	0.11
						1/2" Ice	10.25	8.30	0.18
						1" Ice	10.79	9.20	0.26
(2) OPA-65R-LCUU-H6_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	9.68	7.12	0.11
						1/2" Ice	10.25	8.30	0.18
						1" Ice	10.79	9.20	0.26
(2) OPA-65R-LCUU-H6_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	9.68	7.12	0.11
						1/2" Ice	10.25	8.30	0.18
						1" Ice	10.79	9.20	0.26
80010965_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	14.05	7.63	0.14
						1/2" Ice	14.69	8.90	0.23
						1" Ice	15.30	9.96	0.34
80010965_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	14.05	7.63	0.14
						1/2" Ice	14.69	8.90	0.23
						1" Ice	15.30	9.96	0.34
80010965_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	14.05	7.63	0.14
						1/2" Ice	14.69	8.90	0.23
						1" Ice	15.30	9.96	0.34
ION-M23 SDARS	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	1.84	1.76	0.05
						1/2" Ice	2.05	1.98	0.06
						1" Ice	2.27	2.19	0.08
ION-M23 SDARS	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	1.84	1.76	0.05
						1/2" Ice	2.05	1.98	0.06
						1" Ice	2.27	2.19	0.08
ION-M23 SDARS	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice	1.84	1.76	0.05
						1/2" Ice	2.05	1.98	0.06
						1" Ice	2.27	2.19	0.08

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *K*
CBC23SR-43	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	0.42 0.50 0.59	0.14 0.20 0.27	0.01 0.01 0.01
CBC23SR-43	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	0.42 0.50 0.59	0.14 0.20 0.27	0.01 0.01 0.01
CBC23SR-43	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	0.42 0.50 0.59	0.14 0.20 0.27	0.01 0.01 0.01
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.21 1.89 2.11	1.21 1.89 2.11	0.03 0.05 0.08
DC6-48-60-18-8F	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.21 1.89 2.11	1.21 1.89 2.11	0.03 0.05 0.08
DC6-48-60-18-8F	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.21 1.89 2.11	1.21 1.89 2.11	0.03 0.05 0.08
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.10 1.24 1.38	0.35 0.44 0.54	0.01 0.02 0.03
RRUS 11	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
RRUS 11	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
RRUS 11	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	0.05 0.07 0.10
RRUS 12	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
RRUS 12	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
RRUS 12	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	3.15 3.36 3.59	1.29 1.44 1.60	0.06 0.08 0.11
RRUS A2 MODULE	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice 1" Ice	1.60 1.76 1.92	0.38 0.47 0.57	0.02 0.03 0.04
RRUS A2 MODULE	B	From Leg	4.00	0.000	180.00	No Ice	1.60	0.38	0.02

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* ft^2	C_AA_A *Side* ft^2	*Weight* *K*
			0.00			1/2"	1.76	0.47	0.03
			0.00			Ice	1.92	0.57	0.04
						1" Ice			
RRUS A2 MODULE	C	From Leg	4.00	0.000	180.00	No Ice	1.60	0.38	0.02
			0.00			1/2"	1.76	0.47	0.03
			0.00			Ice	1.92	0.57	0.04
						1" Ice			
RRUS 32	A	From Leg	4.00	0.000	180.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			0.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 32	B	From Leg	4.00	0.000	180.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			0.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 32	C	From Leg	4.00	0.000	180.00	No Ice	2.86	1.78	0.06
			0.00			1/2"	3.08	1.97	0.08
			0.00			Ice	3.32	2.17	0.10
						1" Ice			
RRUS 32 B66	A	From Leg	4.00	0.000	180.00	No Ice	2.74	1.67	0.05
			0.00			1/2"	2.96	1.86	0.07
			0.00			Ice	3.19	2.05	0.10
						1" Ice			
RRUS 32 B66	B	From Leg	4.00	0.000	180.00	No Ice	2.74	1.67	0.05
			0.00			1/2"	2.96	1.86	0.07
			0.00			Ice	3.19	2.05	0.10
						1" Ice			
RRUS 32 B66	C	From Leg	4.00	0.000	180.00	No Ice	2.74	1.67	0.05
			0.00			1/2"	2.96	1.86	0.07
			0.00			Ice	3.19	2.05	0.10
						1" Ice			
RRUS 4478 B14	A	From Leg	4.00	0.000	180.00	No Ice	0.00	1.25	0.06
			0.00			1/2"	0.00	1.40	0.08
			0.00			Ice	0.00	1.55	0.10
						1" Ice			
RRUS 4478 B14	B	From Leg	4.00	0.000	180.00	No Ice	0.00	1.25	0.06
			0.00			1/2"	0.00	1.40	0.08
			0.00			Ice	0.00	1.55	0.10
						1" Ice			
RRUS 4478 B14	C	From Leg	4.00	0.000	180.00	No Ice	0.00	1.25	0.06
			0.00			1/2"	0.00	1.40	0.08
			0.00			Ice	0.00	1.55	0.10
						1" Ice			
GPS	C	From Leg	4.00	0.000	180.00	No Ice	0.13	0.13	0.02
			0.00			1/2"	0.24	0.24	0.02
			0.00			Ice	0.31	0.31	0.02
						1" Ice			
***									
AIR32 KRD901146-1_B66_B2A w/ Mount Pipe	A	From Leg	4.00	0.000	165.00	No Ice	11.39	5.90	0.11
			0.00			1/2"	11.86	6.56	0.19
			0.00			Ice	12.33	7.24	0.28
						1" Ice			
AIR32 KRD901146-1_B66_B2A w/ Mount Pipe	B	From Leg	4.00	0.000	165.00	No Ice	11.39	5.90	0.11
			0.00			1/2"	11.86	6.56	0.19
			0.00			Ice	12.33	7.24	0.28
						1" Ice			
AIR32 KRD901146-1_B66_B2A w/ Mount Pipe	C	From Leg	4.00	0.000	165.00	No Ice	11.39	5.90	0.11
			0.00			1/2"	11.86	6.56	0.19
			0.00			Ice	12.33	7.24	0.28
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	A	From Leg	4.00	0.000	165.00	No Ice	20.48	11.02	0.19
			0.00			1/2"	21.23	12.55	0.32
			0.00			Ice	21.99	14.10	0.47
						1" Ice			

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.19 0.32 0.47
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	20.48 21.23 21.99	11.02 12.55 14.10	0.19 0.32 0.47
AIR6449 B41_TIA w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	5.89 6.26 6.63	3.28 3.74 4.22	0.12 0.17 0.22
AIR6449 B41_TIA w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	5.89 6.26 6.63	3.28 3.74 4.22	0.12 0.17 0.22
AIR6449 B41_TIA w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	5.89 6.26 6.63	3.28 3.74 4.22	0.12 0.17 0.22
RADIO 4449 B12/B71	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RADIO 4449 B12/B71	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	0.07 0.09 0.11
RRUS 4415 B25	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.68 0.79 0.91	0.04 0.06 0.07
RRUS 4415 B25	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.68 0.79 0.91	0.04 0.06 0.07
RRUS 4415 B25	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.68 0.79 0.91	0.04 0.06 0.07
Sector Mount [SM 402-3]	C	From Leg	0.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	18.87 26.47 33.99	18.87 26.47 33.99	0.85 1.21 1.70
(2) L 2 x 2 x 3/16 x 6.5' Mount Angle	A	From Leg	2.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	1.30 1.75 2.20	0.03 0.06 0.09	0.02 0.03 0.05
(2) L 2 x 2 x 3/16 x 6.5' Mount Angle	B	From Leg	2.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	1.30 1.75 2.20	0.03 0.06 0.09	0.02 0.03 0.05
(2) L 2 x 2 x 3/16 x 6.5' Mount Angle	C	From Leg	2.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice	1.30 1.75 2.20	0.03 0.06 0.09	0.02 0.03 0.05
***									

Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in^2	in^2	K	K	in	in	in^2
Pirod 105244 (12x1.25)	1026.86	3397.26	0.56	0.95	7.13	23.59	3.68
Pirod 105217 (12x1.5)	2303.92	6585.93	0.71	1.94	8.00	22.87	5.30
Pirod 105217 (12x1.5)	2303.92	6554.05	0.71	1.88	8.00	22.76	5.30
Pirod 105218 (12x1.75)	2432.86	6587.02	0.85	1.83	8.45	22.87	7.22
Pirod 105218 (12x1.75)	2432.86	6536.27	0.85	1.74	8.45	22.70	7.22
Pirod 105219 (12x2)	2608.79	6534.42	1.22	1.70	9.06	22.69	9.42
Pirod 105219 (12x2)	2608.79	6387.80	1.22	1.38	9.06	22.18	9.42

Load Combinations

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

Comb. No.	Description
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	7.64	49	0.466	0.076
T2	170 - 150	6.62	43	0.454	0.072
T3	150 - 130	4.76	43	0.398	0.062
T4	130 - 120	3.22	43	0.307	0.050
T5	120 - 100	2.63	43	0.253	0.041
T6	100 - 80	1.70	43	0.187	0.028
T7	80 - 60	1.02	43	0.128	0.019
T8	60 - 40	0.56	43	0.089	0.012
T9	40 - 20	0.24	43	0.053	0.007
T10	20 - 0	0.07	43	0.026	0.003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Platform Mount [LP 405-1]	49	7.64	0.466	0.076	37524
165.00	AIR32 KRD901146-1_B66_B2A w/ Mount Pipe	43	6.13	0.444	0.070	17908

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	32.01	11	1.937	0.320
T2	170 - 150	27.74	11	1.889	0.303
T3	150 - 130	19.92	11	1.663	0.261
T4	130 - 120	13.48	11	1.285	0.210
T5	120 - 100	10.99	11	1.057	0.171
T6	100 - 80	7.10	11	0.781	0.118
T7	80 - 60	4.29	11	0.537	0.080
T8	60 - 40	2.32	11	0.373	0.052
T9	40 - 20	1.01	11	0.220	0.028
T10	20 - 0	0.28	11	0.108	0.013

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Platform Mount [LP 405-1]	11	32.01	1.937	0.320	9071
165.00	AIR32 KRD901146-1_B66_B2A w/ Mount Pipe	11	25.68	1.850	0.293	4340

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.63	5	4.36	24.85	0.175	1	Bolt DS
T2	170	Leg	A325N	0.75	5	15.94	35.78	0.445	1	Bolt DS
T3	150	Leg	A325N	1.00	6	21.94	53.01	0.414	1	Bolt Tension
T4	130	Leg	A325N	1.00	6	21.52	53.01	0.406	1	Bolt Tension
		Diagonal	A325N	1.00	1	7.36	10.66	0.690	1	Member Block Shear
T5	120	Leg	A325N	1.00	6	25.37	53.01	0.478	1	Bolt Tension
		Diagonal	A325N	1.00	1	5.64	10.66	0.529	1	Member Block Shear
T6	100	Leg	A325N	1.00	6	28.47	53.01	0.537	1	Bolt Tension
		Diagonal	A325N	1.00	1	4.77	10.66	0.448	1	Member Block Shear
T7	80	Leg	A325N	1.00	6	31.62	53.01	0.596	1	Bolt Tension
		Diagonal	A325N	1.00	1	5.16	11.68	0.442	1	Member Block Shear
T8	60	Leg	A325N	1.00	6	34.74	53.01	0.655	1	Bolt Tension
		Diagonal	A325N	1.00	1	5.53	11.68	0.473	1	Member Block Shear
T9	40	Leg	A325N	1.25	6	37.86	82.83	0.457	1	Bolt Tension
		Diagonal	A325N	1.25	1	6.13	20.30	0.302	1	Member Block Shear
T10	20	Diagonal	A325N	1.25	1	7.62	20.30	0.375	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	1 1/2" solid	10.00	2.25	72.0 K=1.00	1.77	-18.88	54.43	0.347 [1]
T2	170 - 150	2" solid	20.00	2.36	56.6 K=1.00	3.14	-74.89	111.84	0.670 [1]
T3	150 - 130	2 1/4" solid	20.00	2.36	50.3 K=1.00	3.98	-135.26	148.69	0.910 [1]
T4	130 - 120	Pirod 105244 (12x1.25)	10.02	10.02	45.4 K=1.00	3.68	-136.44	142.49	0.958 [1]
T5	120 - 100	Pirod 105217 (12x1.5)	20.03	10.02	37.8 K=1.00	5.30	-162.94	214.86	0.758 [1]
T6	100 - 80	Pirod 105217 (12x1.5)	20.03	10.02	37.8 K=1.00	5.30	-184.63	214.86	0.859 [1]
T7	80 - 60	Pirod 105218 (12x1.75)	20.03	10.02	32.4 K=1.00	7.22	-206.97	300.68	0.688 [1]
T8	60 - 40	Pirod 105218 (12x1.75)	20.03	10.02	32.4 K=1.00	7.22	-229.45	300.68	0.763 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	Pirod 105219 (12x2)	20.03	10.02	28.4 K=1.00	9.42	-252.89	399.87	0.632 [1]
T10	20 - 0	Pirod 105219 (12x2)	20.03	10.02	28.4 K=1.00	9.42	-275.18	399.87	0.688 [1]

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	130 - 120	0.5	1.48	121.0	165.67	0.20	1.15	3.39	0.340
T5	120 - 100	0.5	1.47	120.0	238.57	0.20	0.95	3.34	0.286
T6	100 - 80	0.5	1.47	120.0	238.57	0.20	0.30	3.34	0.091
T7	80 - 60	0.5	1.46	119.0	324.71	0.20	0.28	3.38	0.083
T8	60 - 40	0.5	1.46	119.0	324.71	0.20	0.27	3.38	0.080
T9	40 - 20	0.625	1.45	94.4	424.12	0.31	0.31	6.96	0.046
T10	20 - 0	0.625	1.45	94.4	424.12	0.31	0.92	6.96	0.133

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	3/4" solid	4.59	2.22	128.0 K=0.90	0.44	-3.41	6.09	0.560 [1]
T2	170 - 150	7/8" solid	5.04	2.44	120.6 K=0.90	0.60	-5.52	9.34	0.592 [1]
T3	150 - 130	1" solid	5.12	2.47	107.6 K=0.91	0.79	-6.08	15.16	0.401 [1]
T4	130 - 120	L 2.5 x 2.5 x 3/16	11.42	4.98	120.8 K=1.00	0.90	-7.94	13.56	0.586 [1]
T5	120 - 100	L 2.5 x 2.5 x 3/16	11.93	5.38	130.5 K=1.00	0.90	-5.39	11.92	0.452 [1]
T6	100 - 80	L 2.5 x 2.5 x 3/16	13.80	6.33	153.4 K=1.00	0.90	-5.02	8.66	0.580 [1]
T7	80 - 60	L 3 x 3 x 3/16	15.24	7.08	142.5 K=1.00	1.09	-5.45	12.12	0.450 [1]
T8	60 - 40	L 3 x 3 x 3/16	16.80	7.88	158.6 K=1.00	1.09	-5.89	9.79	0.602 [1]
T9	40 - 20	L 3 x 3 x 5/16	18.45	8.68	176.8 K=1.00	1.78	-6.59	12.87	0.512 [1]
T10	20 - 0	L 3 x 3 x 5/16	20.16	9.54	194.4 K=1.00	1.78	-8.35	10.64	0.784 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	3/4" solid	4.00	3.88	173.6 K=0.70	0.44	-0.49	3.31	0.149 [1]
T2	170 - 150	3/4" solid	4.43	4.26	190.9 K=0.70	0.44	-1.38	2.74	0.504 [1]

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T3	150 - 130	7/8" solid	4.93	4.74	182.0 K=0.70	0.60	-2.41	4.10	0.588 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	180 - 170	7/8" solid	4.00	3.88	148.8 K=0.70	0.60	-1.72	6.14	0.281 [1]
T2	170 - 150	7/8" solid	4.01	3.85	147.7 K=0.70	0.60	-1.96	6.22	0.314 [1]
T3	150 - 130	1" solid	4.51	4.33	145.4 K=0.70	0.79	-2.41	8.40	0.287 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	180 - 170	7/8" solid	4.00	3.88	148.8 K=0.70	0.60	-1.40	6.14	0.229 [1]
T2	170 - 150	7/8" solid	4.49	4.32	165.9 K=0.70	0.60	-2.52	4.94	0.510 [1]
T3	150 - 130	1" solid	4.99	4.80	161.2 K=0.70	0.79	-2.70	6.83	0.395 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	180 - 170	1 1/2" solid	10.00	0.50	16.0	1.77	18.46	79.52	0.232 [1]
T2	170 - 150	2" solid	20.00	0.57	13.6	2.19	73.81	106.69	0.692 [1] [#]
T3	150 - 130	2 1/4" solid	20.00	0.57	12.1	3.98	131.62	178.92	0.736 [1]
T4	130 - 120	Pirod 105244 (12x1.25)	10.02	10.02	45.4	3.68	129.11	165.67	0.779 [1]
T5	120 - 100	Pirod 105217 (12x1.5)	20.03	10.02	37.8	5.30	152.20	238.57	0.638 [1]
T6	100 - 80	Pirod 105217 (12x1.5)	20.03	10.02	37.8	5.30	170.83	238.57	0.716 [1]
T7	80 - 60	Pirod 105218 (12x1.75)	20.03	10.02	32.4	7.22	189.70	324.71	0.584 [1]
T8	60 - 40	Pirod 105218 (12x1.75)	20.03	10.02	32.4	7.22	208.47	324.71	0.642 [1]
T9	40 - 20	Pirod 105219 (12x2)	20.03	10.02	28.4	9.42	227.13	424.12	0.536 [1]
T10	20 - 0	Pirod 105219 (12x2)	20.03	10.02	28.4	9.42	244.49	424.12	0.576 [1]

[1] P_u / ϕP_n controls
[#] Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	130 - 120	0.5	1.48	121.0	165.67	0.20	1.15	3.39	0.340
T5	120 - 100	0.5	1.47	120.0	238.57	0.20	0.95	3.34	0.286
T6	100 - 80	0.5	1.47	120.0	238.57	0.20	0.30	3.34	0.091
T7	80 - 60	0.5	1.46	119.0	324.71	0.20	0.28	3.38	0.083
T8	60 - 40	0.5	1.46	119.0	324.71	0.20	0.27	3.38	0.080
T9	40 - 20	0.625	1.45	94.4	424.12	0.31	0.31	6.96	0.046
T10	20 - 0	0.625	1.45	94.4	424.12	0.31	0.92	6.96	0.133

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	3/4" solid	4.59	2.22	142.3	0.44	3.40	19.88	0.171 [1]
T2	170 - 150	7/8" solid	5.04	2.44	134.0	0.60	5.49	27.06	0.203 [1]
T3	150 - 130	1" solid	5.12	2.47	118.7	0.79	6.02	35.34	0.170 [1]
T4	130 - 120	L 2.5 x 2.5 x 3/16	11.42	4.98	80.0	0.52	7.36	22.55	0.326 [1]
T5	120 - 100	L 2.5 x 2.5 x 3/16	11.93	5.38	86.2	0.52	5.64	22.55	0.250 [1]
T6	100 - 80	L 2.5 x 2.5 x 3/16	13.80	6.33	100.7	0.52	4.77	22.55	0.212 [1]
T7	80 - 60	L 3 x 3 x 3/16	15.24	7.08	93.1	0.66	5.16	28.67	0.180 [1]
T8	60 - 40	L 3 x 3 x 3/16	16.80	7.88	103.4	0.66	5.53	28.67	0.193 [1]
T9	40 - 20	L 3 x 3 x 5/16	17.62	8.27	111.0	1.01	6.13	44.05	0.139 [1]
T10	20 - 0	L 3 x 3 x 5/16	20.16	9.54	127.6	1.01	7.62	44.05	0.173 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	3/4" solid	4.00	3.88	248.0	0.44	0.65	19.88	0.033 [1]
T2	170 - 150	3/4" solid	4.37	4.20	268.9	0.44	1.38	19.88	0.069 [1]
T3	150 - 130	7/8" solid	4.87	4.68	256.8	0.60	2.41	27.06	0.089 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	7/8" solid	4.00	3.88	212.6	0.60	1.72	27.06	0.064 [1]
T2	170 - 150	7/8" solid	4.01	3.85	211.1	0.60	1.95	27.06	0.072 [1]
T3	150 - 130	1" solid	4.51	4.33	207.7	0.79	2.41	35.34	0.068 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 170	7/8" solid	4.00	3.88	212.6	0.60	1.48	27.06	0.055 [1]
T2	170 - 150	7/8" solid	4.49	4.32	236.9	0.60	2.57	27.06	0.095 [1]
T3	150 - 130	1" solid	4.99	4.80	230.3	0.79	2.87	35.34	0.081 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

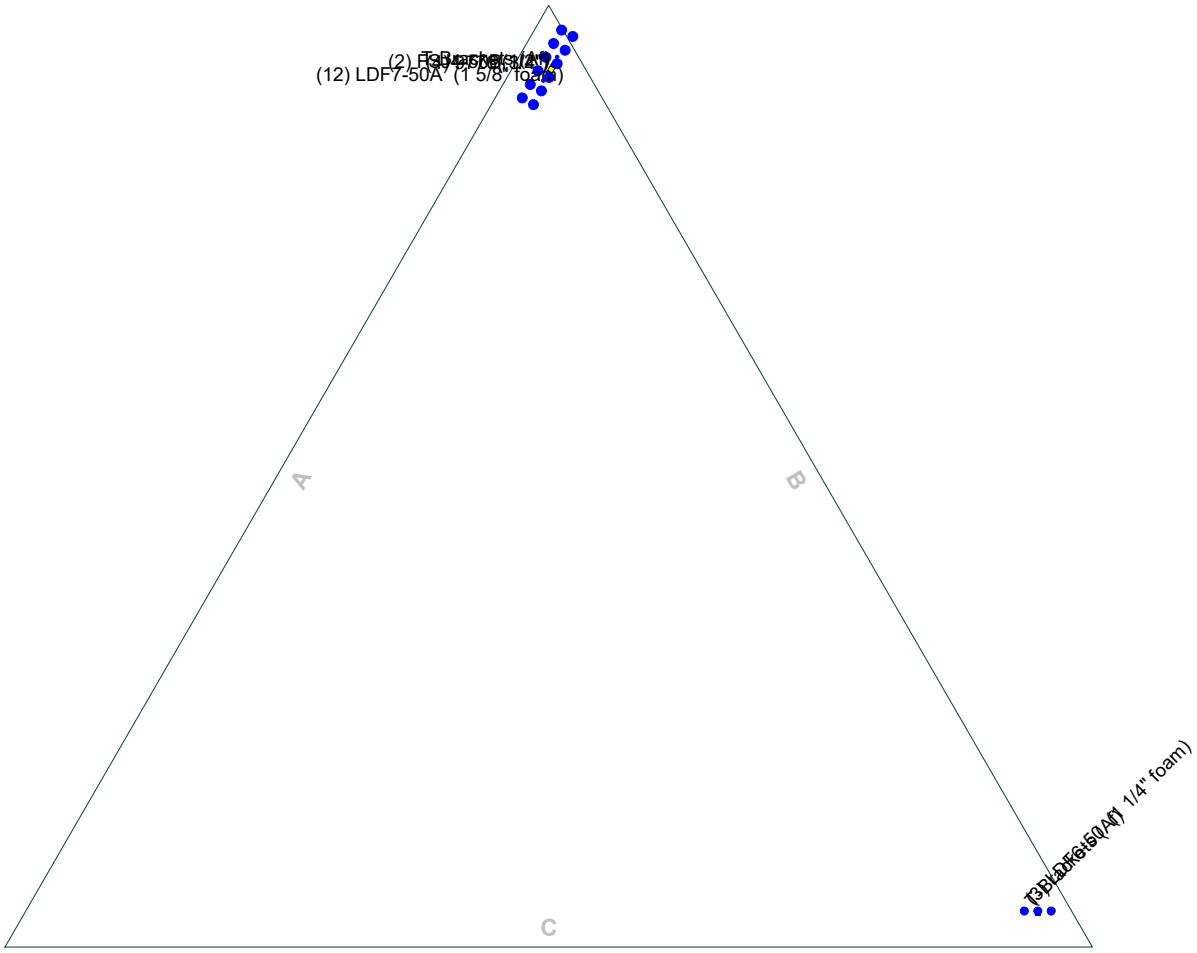
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	180 - 170	Leg	1 1/2" solid	2	-18.88	54.43	34.7	Pass
T2	170 - 150	Leg	2" solid	38	73.81	106.69	69.2	Pass
T3	150 - 130	Leg	2 1/4" solid	102	-135.26	148.69	91.0	Pass
T4	130 - 120	Leg	Pirod 105244 (12x1.25)	166	-136.44	142.49	95.8	Pass
T5	120 - 100	Leg	Pirod 105217 (12x1.5)	175	-162.94	214.86	75.8	Pass
T6	100 - 80	Leg	Pirod 105217 (12x1.5)	190	-184.63	214.86	85.9	Pass
T7	80 - 60	Leg	Pirod 105218 (12x1.75)	205	-206.97	300.68	68.8	Pass
T8	60 - 40	Leg	Pirod 105218 (12x1.75)	220	-229.45	300.68	76.3	Pass
T9	40 - 20	Leg	Pirod 105219 (12x2)	235	-252.89	399.87	63.2	Pass
T10	20 - 0	Leg	Pirod 105219 (12x2)	250	-275.18	399.87	68.8	Pass
T1	180 - 170	Diagonal	3/4" solid	12	-3.41	6.09	56.0	Pass
T2	170 - 150	Diagonal	7/8" solid	48	-5.52	9.34	59.2	Pass
T3	150 - 130	Diagonal	1" solid	161	-6.08	15.16	40.1	Pass
T4	130 - 120	Diagonal	L 2.5 x 2.5 x 3/16	173	-7.94	13.56	58.6 69.0 (b)	Pass
T5	120 - 100	Diagonal	L 2.5 x 2.5 x 3/16	186	-5.39	11.92	45.2 52.9 (b)	Pass
T6	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	194	-5.02	8.66	58.0	Pass
T7	80 - 60	Diagonal	L 3 x 3 x 3/16	209	-5.45	12.12	45.0	Pass
T8	60 - 40	Diagonal	L 3 x 3 x 3/16	224	-5.89	9.79	60.2	Pass
T9	40 - 20	Diagonal	L 3 x 3 x 5/16	239	-6.59	12.87	51.2	Pass
T10	20 - 0	Diagonal	L 3 x 3 x 5/16	254	-8.35	10.64	78.4	Pass
T1	180 - 170	Horizontal	3/4" solid	30	-0.49	3.31	14.9	Pass
T2	170 - 150	Horizontal	3/4" solid	52	-1.38	2.74	50.4	Pass
T3	150 - 130	Horizontal	7/8" solid	116	-2.41	4.10	58.8	Pass
T1	180 - 170	Top Girt	7/8" solid	5	-1.72	6.14	28.1	Pass
T2	170 - 150	Top Girt	7/8" solid	42	-1.96	6.22	31.4	Pass
T3	150 - 130	Top Girt	1" solid	104	-2.41	8.40	28.7	Pass
T1	180 - 170	Bottom Girt	7/8" solid	7	-1.40	6.14	22.9	Pass
T2	170 - 150	Bottom Girt	7/8" solid	45	-2.52	4.94	51.0	Pass
T3	150 - 130	Bottom Girt	1" solid	107	-2.70	6.83	39.5	Pass
							Summary	
						Leg (T4)	95.8	Pass
						Diagonal (T10)	78.4	Pass
						Horizontal (T3)	58.8	Pass
						Top Girt (T2)	31.4	Pass
						Bottom Girt (T2)	51.0	Pass
						Bolt Checks	69.0	Pass
						RATING =	**95.8**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face Truss-Leg



Paul J. Ford and Company
250 E. Broad St., Ste 600
Columbus, OH 43215
Phone: 614-221-6679
FAX:

Job:	***180-ft Self-Support Tower / WESTHARTFORD_DEXTERS***		
Project:	***PJF# 64120-0001 / CT0001***		
Client: Hirschfeld Communications, LLC		Drawn by: Michael Bange	App'd:
Code: TIA-222-G		Date: 06/10/21	Scale: NTS
Path: G:\TOWER\641 Hirschfeld Communications\2020\64120-0001 CT001\64120-0001.002.8700 SA\TNX\64120-0001.002.8700.eri			Dwg No. E-7

APPENDIX C

ADDITIONAL CALCULATIONS

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

Page	1	of	1
By	MTB	Date	6/10/2021
Project #	64120-0001		

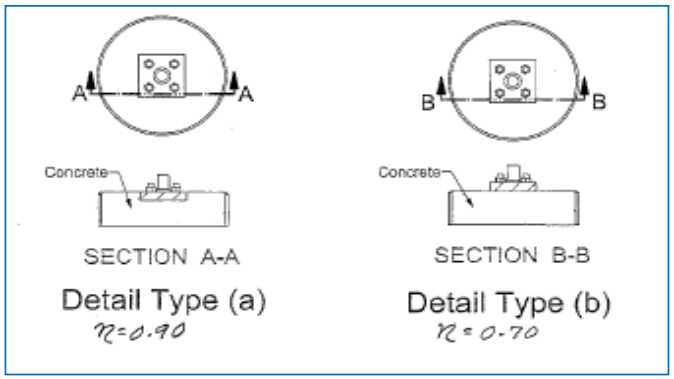
Self-Support Tower Anchor Rod Capacity - TIA-G

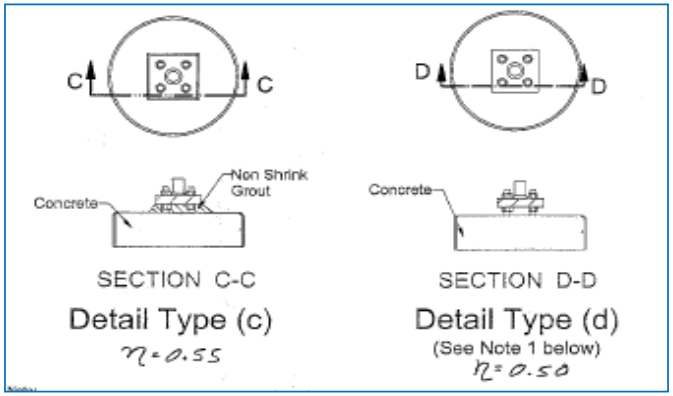
Loads

Compression :	282	kips	Tension :	250	kips	Code:	TIA-G
Comp. Shear :	26	kips	Ten.Shear :	23	kips	Maximum Ratio:	1.00

Existing Anchor Rods

Anchor Rod Condition (n) :	0.55	
Anchor Rod ø :	1 1/4	in
Anchor Rod Quantity :	6	
Anchor Rod Grade :	F1554 Gr. 105	
F_y :	105	ksi
F_u :	125	ksi
Threads per Inch	7	
Net Tensile Area	0.97	in^2
ϕ_t :	0.80	
$\phi_t R_{nt}$:	581.47	kip
Anchor Rod Ratio :	0.502	





Factored Foundation Loads:

	Comp	Uplift	
Factored Axial Load (+Comp, -Ten) =	**282**	**-250**	kips
Factored Horiz. Load at Top of Pier =	**26**	**23**	kips
Factored OTM at Top of Pier =	**0**	**0**	k-ft

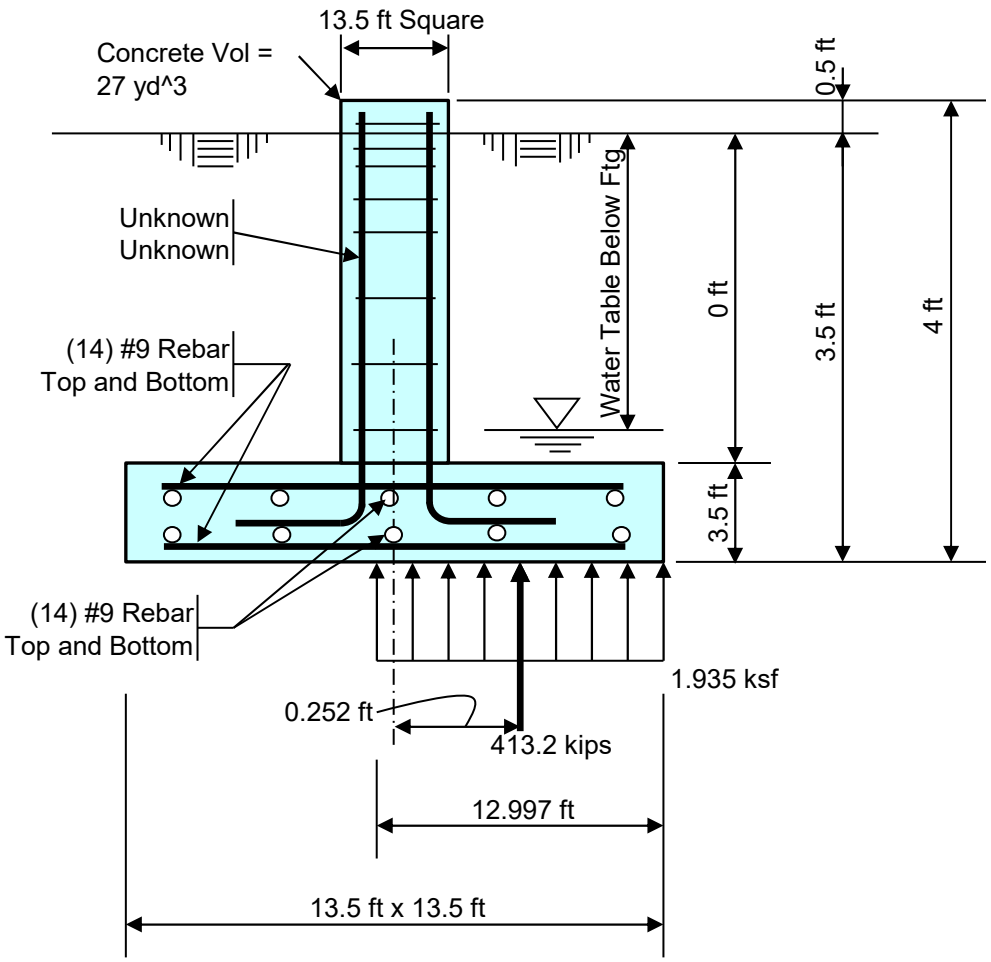
LRFD Resistance and Load Factors:

	Φ	Dead Load Factors	
Soil Bearing =	**0.75**		
Soil Weight =	**0.75**	1.2	0.9
Concrete Weight =	**0.75**	1.2	0.9

Soil Properties:

Depth to Water Table =	**99**	ft
Uplift Cone from	**Top**	of footing
Depth to Ignore for Uplift and PP =	**3.33**	ft

Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
3.5	**100**	**0**	**28**	**12**	**3.50**



Dimensions:

Pier Shape =	**Square**	
Pier Width =	**13.5**	ft Square
Pier Height above Grade =	**0.5**	ft
Depth to Bottom of Footing =	**3.5**	ft
Footing Thickness =	**3.5**	ft
Footing Width, B =	**13.5**	ft
Footing Length, L =	**13.5**	ft

Concrete:

Concrete Strength =	**3**	ksi
Rebar Strength =	**60**	ksi

Total Pad Reinf Stl = **28.00** in^2 >= 12.25 in^2 = Min Stl, OK

Total Pier Reinf Stl =

Footing Thickness = **3.50** ft >= 0.75 ft = Min Ftg Thk, OK

Summary Results:

	Required		Available	
Maximum Net Soil Bearing =	**1.935**	ksf	**9.000**	ksf
Uplift =	**250.0**	kips	**96.4**	kips
Punching Shear Stress =	**0.000**	ksi	**0.159**	ksi
Bending Shear Stress =	**-4.7**	kips	**496.6**	kips
Bending Moment =	**0.004**	in / in	**0.0**	in / in
Conc Pier Reinforcing Steel =				Rebar Unknown

Stress Ratio = **0.0%** in Punching Shear

Stress Ratio = **0.9%** in Bending Shear

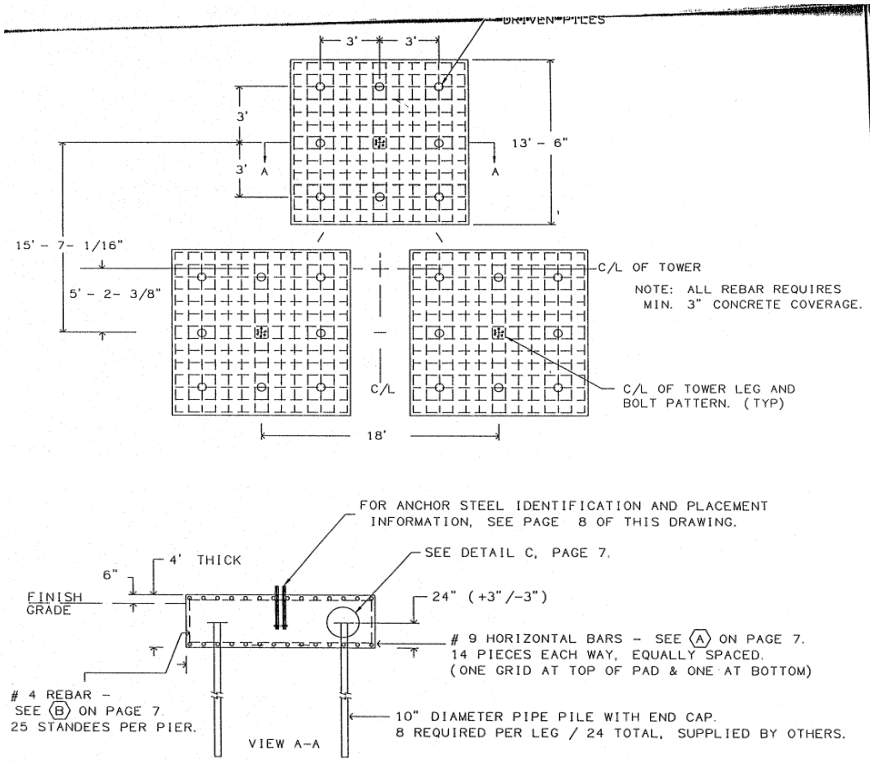
Stress Ratio = **9.1%** in Bending Moment

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

By MTB Date 6/10/2021
Project # 64118-0001

West Hartford Foundation Analysis

Uplift (kips):	250
Compression (kips):	282
Concrete Weight (kcf):	0.15
Mat Length/Width (ft):	13.5
Mat Depth (ft):	4
Mat Weight (kips):	109.4
Mat Bearing Area (ft^2):	182.3
Pile Quantity	8
Pile Diameter (in):	10
Pile Length (ft):	50
Depth to Ignore (ft):	8
Total Pile Surface Area (ft^2):	879.6
Ultimate Bearing Pressure (ksf):	12
Ultimate Skin Friction (ksf):	1
$Ø_{soil}$:	0.75
Mat Bearing Capacity (kips):	1640.3
Skin Friction Capcity (kips):	659.7
Total Uplift Load (kips):	250.0
Total Compression Load (kips):	413.2



Uplift Capacity (kips):	758.1
Compression Capacity (kips):	2300.0
Uplift Usage Capacity:	**33.0%**
Compression Usage Capacity:	**18.0%**

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES BY PAUL J. FORD AND COMPANY

1) Paul J. Ford and Company has not made a field inspection to verify the tower member sizes or the antenna/coax loading. If the existing conditions are not as represented on these drawings, we should be contacted immediately to evaluate the significance of the deviation.

2) No allowance was made for any damaged, missing, or rusted members. The analysis of this tower assumes that no physical deterioration has occurred in any of the structural components of the tower and that all the tower members have the same load carrying capacity as the day the tower was erected.

3) It is not possible to have all the detailed information to perform a thorough analysis of every structural sub-component of an existing tower. The structural analysis by Paul J. Ford and Company verifies the adequacy of the main structural members of the tower. Paul J. Ford and Company provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc.

4) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard ANSI/TIA-222-G. If the owner or local or state agencies require a higher design wind load, Paul J. Ford and Company should be made aware of this requirement.

5) The enclosed sketches are a schematic representation of the tower that we have analyzed. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions and for the proper fit and clearance in the field.

6) Miscellaneous items such as antenna mounts etc. have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Exhibit E

Date: 1/22/2021

To: T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

Subject:	**Mount Structural Analysis Report**	
T-Mobile Designation:	**Site ID:**	CT11170C
	Site Name:	Hartford/N. Britain Ave_1
EFI Designation:	**Project Number:**	049.01141 - 2075094
Site Data:	**1030 New Britain Avenue, West Hartford, CT 06110** **Latitude: 41.7313°, Longitude: -72.7238°**	

EFI Global, Inc. is pleased to submit this **"Mount Structural Analysis Report"** to determine the structural capacity of the antenna mount utilized by T-Mobile at the above referenced site.

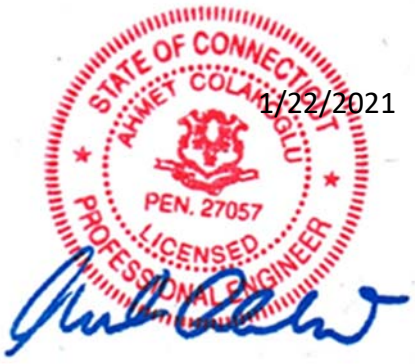
The purpose of the analysis is to determine acceptability of the mount stress level for the changes proposed by T-Mobile. Under the following load case we have determined the mount to have:

Existing + Proposed Equipment **Adequate Capacity (66.3%)**
Note: See Analysis Criteria for loading configuration

The analysis has been performed in accordance with TIA-222-G Standard and the 2018 Connecticut State Building Code (2015 IBC).

We at *EFI Global, Inc.* appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects, please give us a call.

Sincerely,
EFI Global, Inc.
License No: PEC0001245



1/22/2021

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

1) ANALYSIS CRITERIA

The analysis was performed for the existing and proposed appurtenances as specified in the loading information referenced below, and per the following loading criteria of Table 1.

Table 1 - Loading and Analysis Criteria

Rad Center	165’
Structure Type	Self-Support Tower
Exposure Category	C
Wind Speed	125 mph* √0.6 = 97 mph (ASD)
Ice Loading	1.0” with 50 mph Wind
Risk Category	II
Topographic Factor	Kzt = 1.0

Table 1.1 - Existing Appurtenance Configuration

Qty	Model
3	Ericsson AIR32 B66A/B2A - Antennas
3	RFS APXVAARR24_43-U-NA20 - Antennas
3	Ericsson AIR21 B2A/B4P - Antennas
3	Generic Twin Style 1B - AWS - TMAs
3	Radio 4449 B71+B85 - RRUs

Table 1.2 - Proposed and Final Appurtenance Configuration

Qty	Model
3	Ericsson AIR32 B66A/B2A - Antennas
3	RFS APXVAARR24_43-U-NA20 - Antennas
3	Ericsson AIR6449 B41 - Antennas
3	Radio 4449 B71+B85 - RRUs*
3	Radio 4415 B25 - RRUs*

*** To be mounted behind antennas.**

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Table 1.3 - Assumed Material Properties: Hot Rolled

Member Type	ASTM Material Designation	Fy (ksi)	Fu (ksi)
Pipes	A53 Gr. B	35	60
Angles/Channels	A36	36	58
Rectangular HSS	A500 Gr. B - 46	46	58
Round HSS	A500 Gr. B - 42	42	58
Others (UNO)	A572 Gr. 50	50	65

2) ANALYSIS PROCEDURE

The analysis is based on the following information:

Table 2 - Documents

Document	Provided By	Date
RFDS	T-Mobile	1/14/2021
Mount Structural Analysis Report - Upgrade	Destek Engineering	6/14/2019
Construction Drawings	URS Corporation AES	10/17/2001
Construction Drawings	Northeast Site Solutions	9/24/2018

2.1) Analysis Method

Risa-3D, a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses for various loading cases. Selected output from the analysis is included in the Appendix

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2.2) Analysis Conditions and Assumptions

1) The mount was built and installed in accordance with the manufacturer's specifications.
2) The mount has been maintained and will be maintained in accordance with the manufacturer's specifications. All structural members and connections of the mount are in good condition and can achieve theoretical strength.
3) The configuration of antennas is as specified in "1) Analysis Criteria".
4) The analysis was performed for the subject mount only. It does not include an evaluation of the other mounts or the building, which should be analyzed by others.
5) The evaluation does not include any antenna rigging loads. The equipment should not be rigged using the subject antenna mount as the support.
6) The analysis includes a minimum 250 lbf maintenance point load at the worst-case location on the mount, as well as a minimum 250 lbf maintenance point load at each antenna location in conjunction with a 30 mph wind load.
7) Any steel grating represented in this model is for loading purposes only and it is not considered to provide any structural restraint or support.
8) Member sizes per the available mount analysis report and construction drawings, and assumed based on our experience with similar structures. Please refer to calculation output in the appendix of this report for sizes and lengths assumed.
9) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.

EFI Global, Inc. (EFI) must be notified immediately if any of these assumptions are discovered to be incorrect. The results of this analysis may be affected if any of the assumptions are not valid or have been made in error.

3) ANALYSIS RESULTS AND CONCLUSION

The analysis results are shown on the table below.

Table 3.1 - Mount Component Stresses vs. Capacity

Component	% Capacity	Pass / Fail
Horizontal Face Pipe	45.6	Pass
Horizontal Standoff Tube	31.4	Pass
Vertical Standoff Pipe	< 20.0	Pass
Antenna Mount Pipe	66.3	Pass
Pipe Kicker	< 20.0	Pass
Reinforcement Standoff Angle	28.1	Pass

T-Frame Sector Mounts: The existing T-Frame sector mounts have **adequate** capacity for the proposed changes by T-Mobile. For the code specified load combinations and as a maximum, the mount members are stressed to **66.3%** of their structural capacity.

EFI has assumed that the modifications specified in the referenced Mount Structural Analysis Report by Destek Engineering, dated 6/14/2019 (drawings attached), will be installed at the site prior to the equipment upgrade proposed in this analysis. The analysis also assumes the following:

- **The mount centerline is equal to the RAD centerline**
- **(4) 96" long 2.0 STD mount pipes are equally spaced along the face**
- **The tieback arm is attached directly to the adjacent mount's tower leg**

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1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

APPENDIX

INPUT LOADS
ANALYSIS OUTPUT
REFERENCED UPGRADE DRAWINGS

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

CLIENT: T-Mobile

PROJECT: CT11170C

SUBJECT: Antenna Loads -TIA 222 G Stanadard (chapter 16 revisions)

Tower Height	180.00	ft	Type of Mount: Sector
Basic Wind Speed, V	97	mph (=Ultimate Speed*Sqrt(0.6))	
Basic Wind Speed with Ice, V_i	50	mph	
Maintanence Load Factor, L_{FM}	0.0957	Load Factor for Maint. Load Cases (Basic Wind Speed=30 mph)	
Design Ice Thickness, t_i	1	inches	

Table 2-3 Importance Factors

Structure Classification	Wind Load Without Ice	Wind Load With Ice	Ice Thickness	Earthquake
II	1	1	1	1

1

Table 2-4 Exposure Category Coefficients

Exposure Category	Zg	α	Kzmin	Ke	m
C	900	9.5	0.85	1	0.6

Table 2-5 Topographic Categories

Kzt 1.000

Table 2-2 Wind Directionality Factor, Kd

Structure Type	Kd	
Lattice Tower	0.95	DOES NOT CHANGE

Gust Effect Factor Gh

Structure Type	Gh	
Lattice Tower	1.00	DOES NOT CHANGE

Shielding Factor, Ka

Structure Type	Ka	
Lattice Tower	0.90	DOES NOT CHANGE

Seismic Factors

Ss	0.825	
S1	0.281	
Fa	1.17	
Fv	1.838	
R	3	Truss or Pole

CLIENT: T-Mobile

PROJECT: CT11170C

SUBJECT: Antenna Loads -TIA 222 G Stanadard (chapter 16 revisions)

Rad Center **165.00** ft

Antenna AND Mount Without Ice

Mounting Pole	Height (ft)	Model Number	#	Weight (lbs)	H (in)	*W (in)	D (in)	Ka	**A_N (ft2)	***A_T (ft2)	Aspect (FRONT)	Aspect (SIDE)	Ca (FRONT)	Ca (SIDE)	K_z	q_z (psf)	Pounds: Wind Load (Front)	Wind Load (Side)	Dead Load	Total Wind Load (Front)	Total Wind Load (Side)	Total Dead Load	Lateral Load (Seismic)	Vertical Load (Seismic)
Pos. 1	**165.00**	Ericsson AIR32 B66A/B2A	1	132.0	56.6	12.9	8.7	0.90	5.07	3.42	4.39	6.51	1.28	1.38	1.406	32.2	188.5	136.5	132	189	136	132	15	17
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
																				95	**69**	**66**	**8**	**8**
Pos.2	**165.00**	RFS APXVAARR24_43-U-NA20	1	153.3	95.9	24.0	8.7	0.90	15.98	5.79	4.00	11.02	1.27	1.53	1.406	32.2	586.2	257.4	153.3	586	368	274	32	35
	165.00	Radio 4449 B71+B85	1	75.0	18.0	N/A	13.2	0.90	-	1.65	-	1.36	-	1.20	1.406	32.2	0.0	57.3	75					
	165.00	Radio 4415 B25	1	46.0	16.5	N/A	13.4	0.90	-	1.54	-	1.23	-	1.20	1.406	32.2	0.0	53.4	46					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
																				294	**185**	**138**	**16**	**18**
Pos.3 (Empty Pipe)		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0	0	0	0	0	0
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
																				0	**0**	**0**	**0**	**0**
Pos.4	**165.00**	Ericsson AIR6449 B41	1	103.0	33.1	20.5	8.3	0.90	4.71	1.91	1.61	3.99	1.20	1.27	1.406	32.2	163.8	70.0	103	164	70	103	12	13
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0					
																				82	**35**	**52**	**6**	**7**

* Enter N/A in the W column for front shielded appurtenances.

** A_N is the product of H and W

*** A_T is the product of H and D

DL 509

Mount	Height (ft)	Member	*L (in)	**W (in)	D (in)	Weight (lb/ft)	*** Ca	K_z	q_z (psf)	Wind Load (PLF)	Lateral Load (Seismic)	Vertical Load (Seismic)
	165.00	1.5 STD Pipe	12.00	1.90	0.00		1.20	1.406	29.0	6	-	-
	165.00	2.0 STD Pipe	12.00	2.38	0.00		1.20	1.406	29.0	7	-	-
	165.00	2.5 STD Pipe	12.00	2.88	0.00		1.20	1.406	29.0	8	-	-
	165.00	4.0 STD Pipe	12.00	4.50	0.00		1.20	1.406	29.0	13	-	-
	165.00	Angle Diagonal	0.00	3.00	3.00		-	-	-	-	-	-
	165.00	L2.5x2.5x1/4	12.00	2.50	2.50		2.00	1.406	29.0	12	-	-
	165.00	Angle Diagonal	0.00	0.00	0.00		-	-	-	-	-	-
	165.00	Plate Horizontal	0.00	6.00	0.38		-	-	-	-	-	-
	165.00	Tube Standoff (HSS3x3)	12.00	3.00	3.00		2.00	1.406	29.0	14	-	-
	165.00	Tube Radial	0.00	4.00	4.00		-	-	-	-	-	-
	165.00	Double Angle	0.00	2.00	2.00		-	-	-	-	-	-
	165.00	Double Angle	0.00	3.00	3.00		-	-	-	-	-	-
	165.00	Channel (Weak Axis Bending)	0.00	0.00	0.00		-	-	-	-	-	-
	165.00	Channel (Weak Axis Bending)	0.00	3.63	5.38		-	-	-	-	-	-

* The dimension L is the longest dimension of the member

** The dimension W is the height or width of the member that resists wind load

*** Ca will equal 1.2 for round members and 2.0 for flat members

CLIENT: T-Mobile

PROJECT: CT11170C

SUBJECT: Antenna Loads -TIA 222 G Stanadard (chapter 16 revisions)

ti (in) 2.349238 Kiz 1.1746189 reduction 0.2657

Antenna AND Mount With Ice

Mounting Pole	Height (ft)	Model Number	#	H (in)	W (in)	D (in)	Ka	*A_N (ft2)	*A_T (ft2)	*Volume Ice (ft3)	*Weight Ice (lbs)	**Ca (FRONT)	**Ca (SIDE)	Kz	q_z (psf)	Pounds: Ice Wind Load (Front)	Ice Wind Load (Side)	Combined Wind Load (Front)	Combined Wind Load (Side)	Ice Dead Load	**Total Wind Load (Front)	**Total Wind Load (Side)	Total Ice Load
Pos. 1	**165.00**	Ericsson AIR32 B66A/B2A	1	56.6	12.9	8.7	0.90	2.42	2.28	4.69	262.55	0.72	0.75	1.406	8.6	13.4	13.1	63.5	49.4	263	64	49	263
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					32	**25**	**132**
Pos.2	**165.00**	RFS APXVAARR24_43-U-NA20	1	95.9	24.0	8.7	0.90	4.07	3.57	10.80	604.65	0.72	0.81	1.406	8.6	22.6	22.3	178.4	90.7	605	178	132	807
	165.00	Radio 4449 B71+B85	1	18.0	9.4	13.2	0.90	-	1.17	2.02	113.24	0.70	0.70	1.406	8.6	0.0	6.3	0.0	21.5	113			
	165.00	Radio 4415 B25	1	16.5	5.9	13.4	0.90	-	1.13	1.60	89.50	0.70	0.70	1.406	8.6	0.0	6.1	0.0	20.3	90			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					90	**67**	**404**
Pos.3 (Empty Pipe)		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0	0	0	0
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					0	**0**	**0**
Pos.4	**165.00**	Ericsson AIR6449 B41	1	33.1	20.5	8.3	0.90	1.90	1.50	3.91	218.71	0.70	0.71	1.406	8.6	10.2	8.2	53.8	26.8	219	54	27	219
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					27	**14**	**110**

* A_N ,A_T, Volume Ice and Weight Ice are calculated per unit

** Ca will equal 1.2 for all ice load calculations

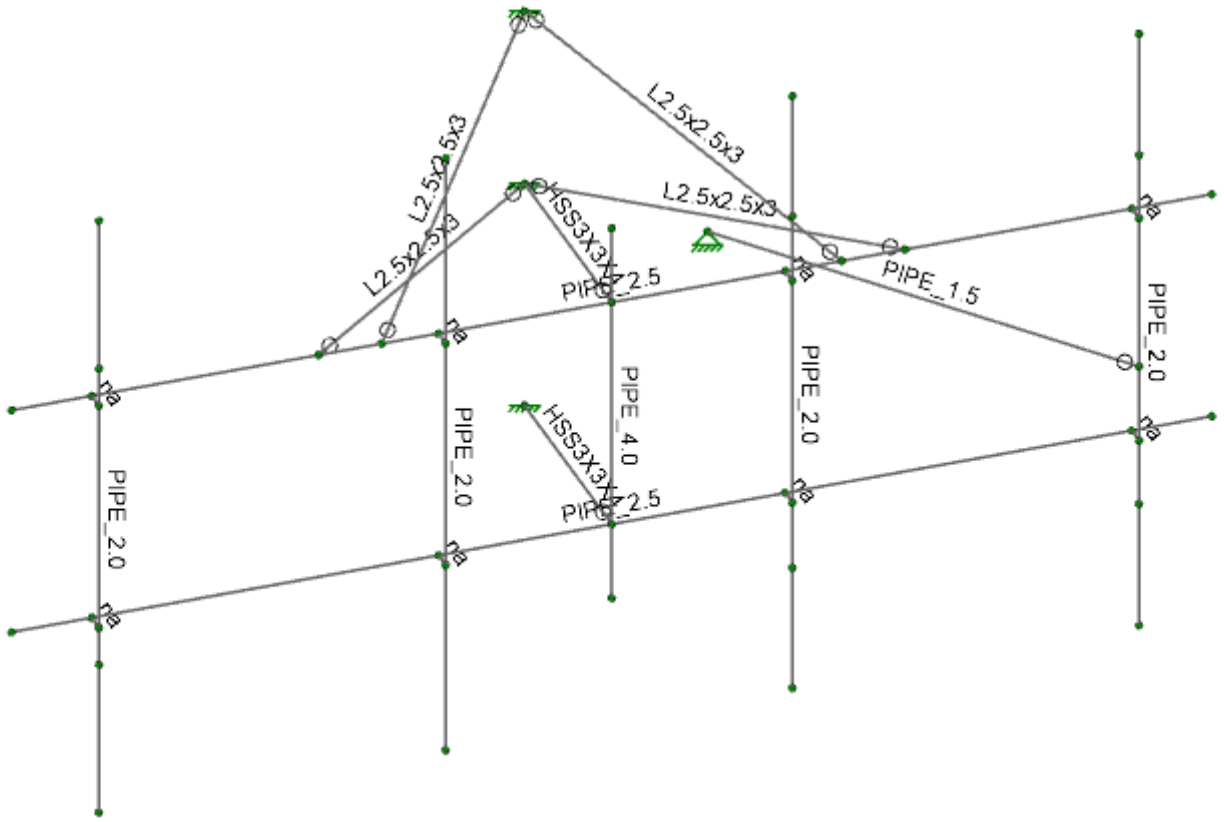
Mount	Height (ft)	Member	*L (in)	**W (in)	D (in)	***A_N (ft2)	Volume Ice (ft3)	Weight Ice (lbs)	****Ca (FRONT)	Kz	q_z (psf)	PLF: Ice Wind Load (Front)	Combined Wind Load (Front)	Ice Dead Load
	165.00	1.5 STD Pipe	12.00	1.90	0.00	0.61	0.22	12.20	1.20	1.406	7.7	5.6	7.1	12
	165.00	2.0 STD Pipe	12.00	2.38	0.00	0.62	0.24	13.57	1.20	1.406	7.7	5.7	7.6	14
	165.00	2.5 STD Pipe	12.00	2.88	0.00	0.64	0.27	15.01	1.20	1.406	7.7	5.9	8.1	15
	165.00	4.0 STD Pipe	12.00	4.50	0.00	0.69	0.35	19.66	1.20	1.406	7.7	6.4	9.9	20
	165.00	Angle Diagonal	0.00	3.00	3.00	-	-	-	-	-	-	-	-	-
	165.00	L2.5x2.5x1/4	12.00	2.50	2.50	0.63	0.16	9.14	1.20	1.406	7.7	5.8	9.0	9
	165.00	Angle Diagonal	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	165.00	Plate Horizontal	0.00	6.00	0.38	-	-	-	-	-	-	-	-	-
	165.00	Tube Standoff (HSS3x3)	12.00	3.00	3.00	0.64	0.51	28.57	1.20	1.406	7.7	5.9	9.8	29
	165.00	Tube Radial	0.00	4.00	4.00	-	-	-	-	-	-	-	-	-
	165.00	Double Angle	0.00	2.00	2.00	-	-	-	-	-	-	-	-	-
	165.00	Double Angle	0.00	3.00	3.00	-	-	-	-	-	-	-	-	-
	165.00	Channel (Weak Axis Bending)	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	165.00	Channel (Weak Axis Bending)	0.00	3.63	5.38	-	-	-	-	-	-	-	-	-

* The dimension L is the longest dimension of the member

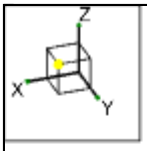
** The dimension W is the height or width of the member that resists wind load

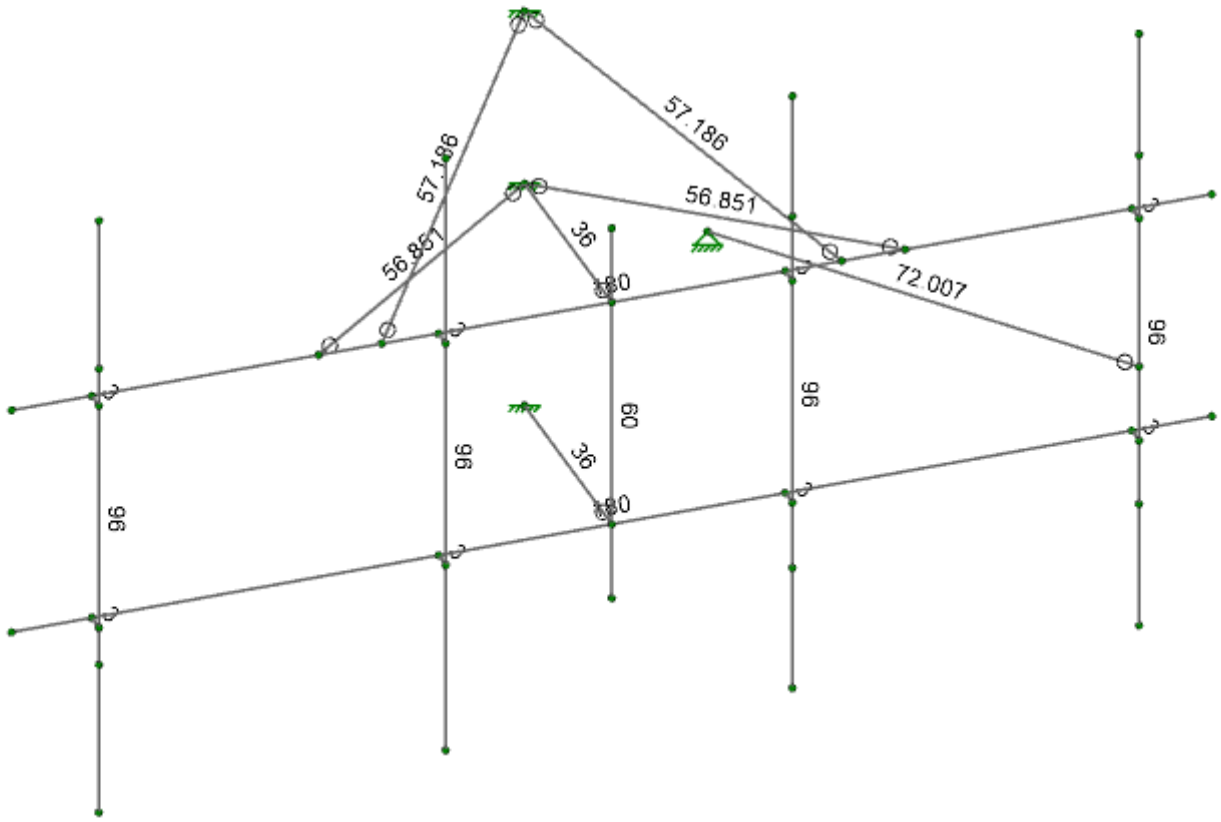
*** A_N is the area of ice built up on the LW plane

**** Ca will equal 1.2 for all ice load calculations



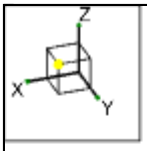
EFI/T-Mobile	CT11170C	1
EM		Jan 22, 2021
049.01141 - 2075094		CT11170C.r3d

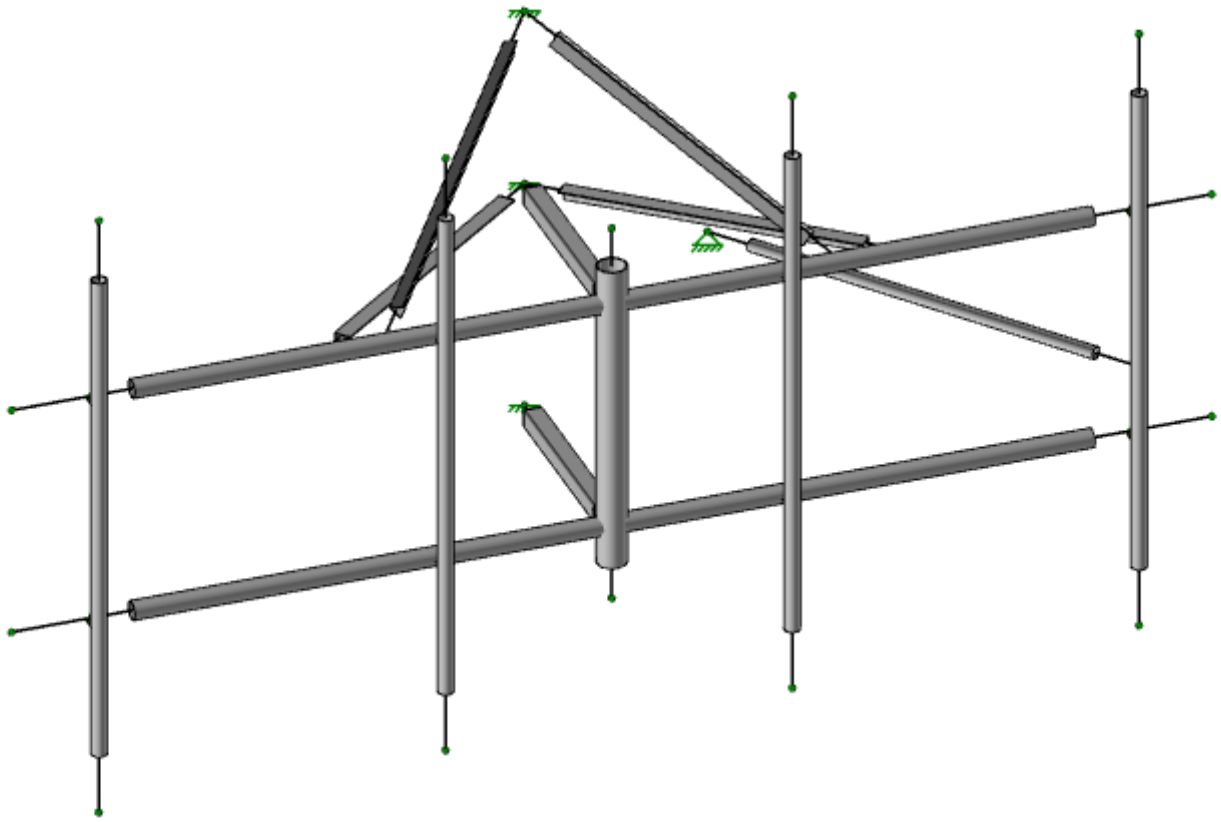




Member Length (in) Displayed

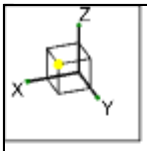
EFI/T-Mobile	CT11170C	2
EM		Jan 22, 2021
049.01141 - 2075094		CT11170C.r3d

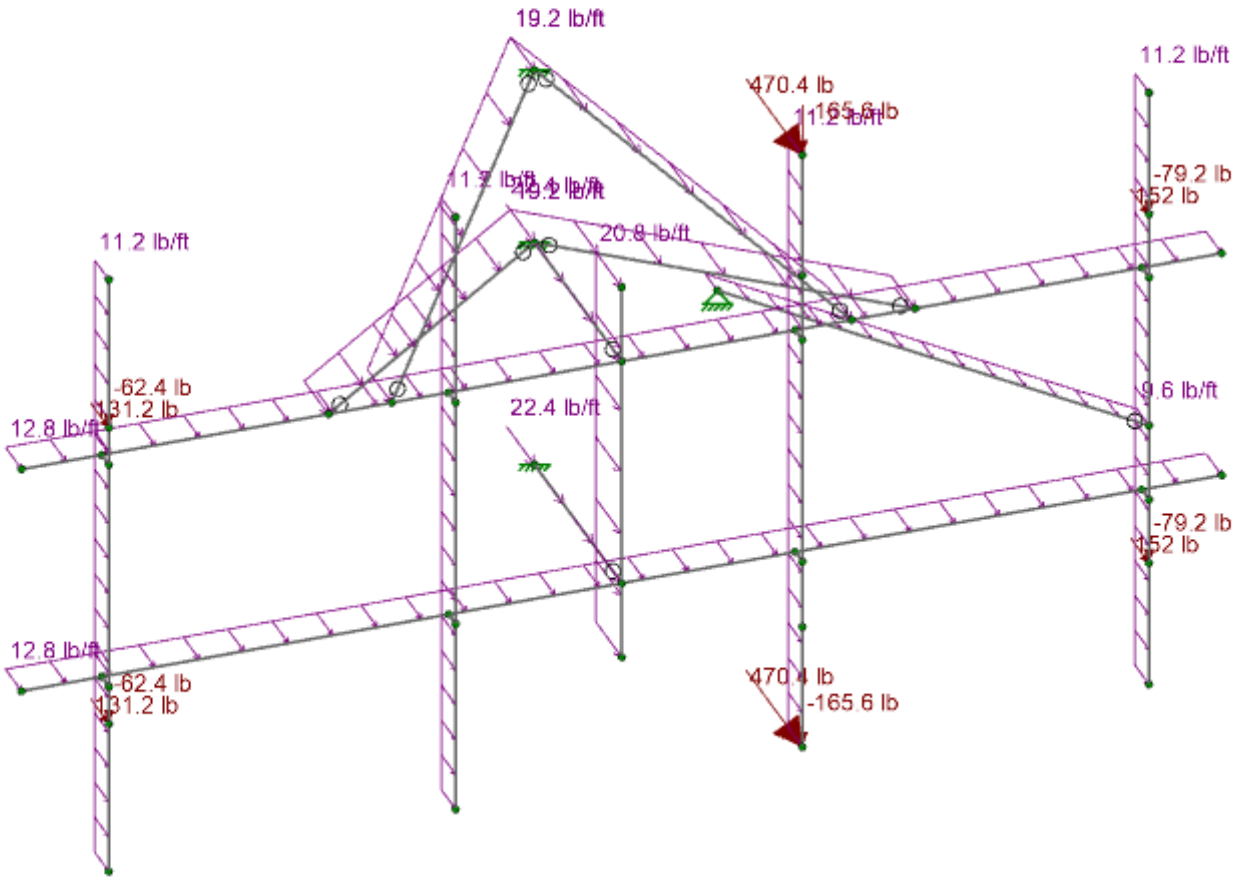




Member Length (in) Displayed

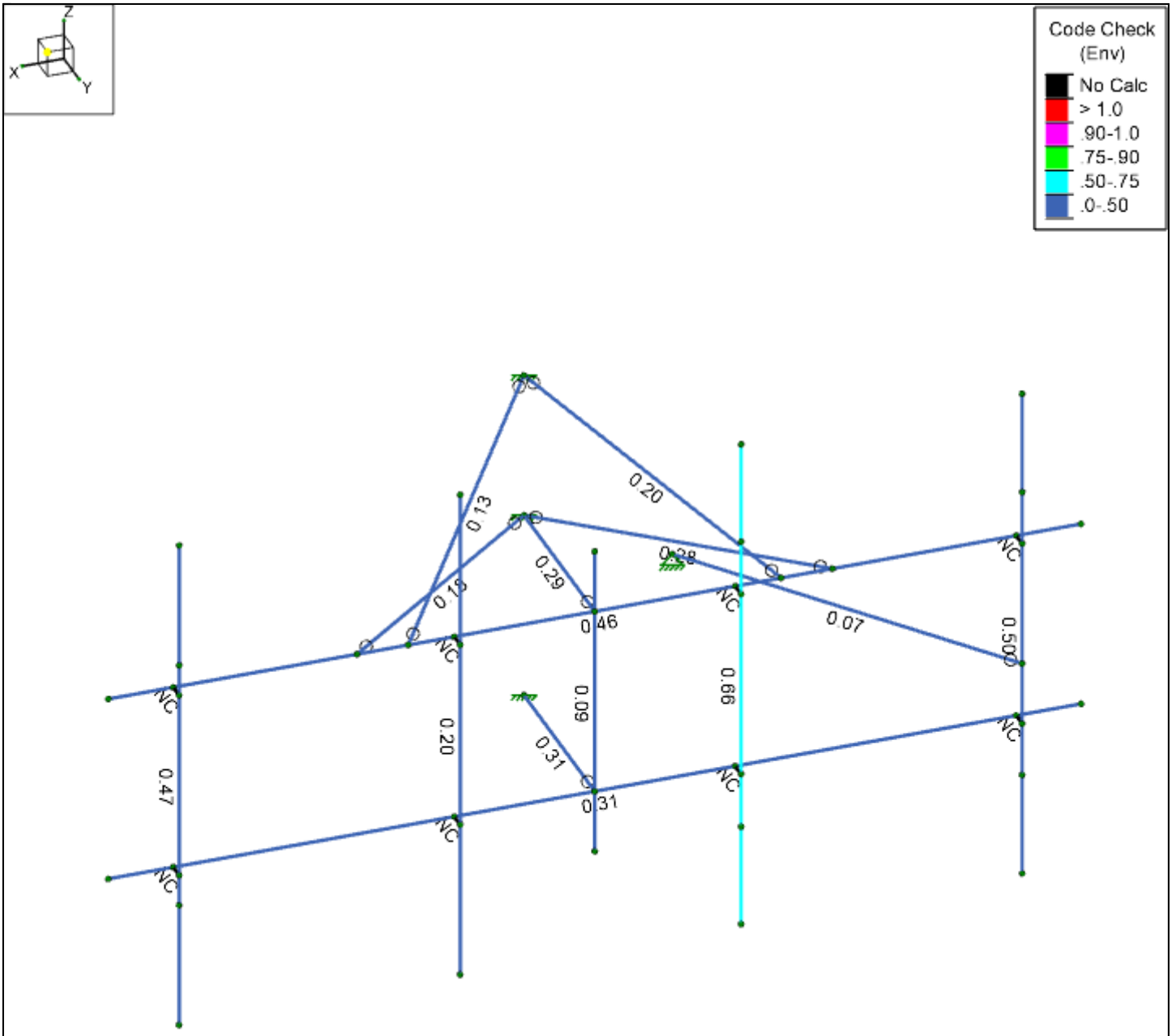
EFI/T-Mobile	CT11170C	3
EM		Jan 22, 2021
049.01141 - 2075094		CT11170C.r3d





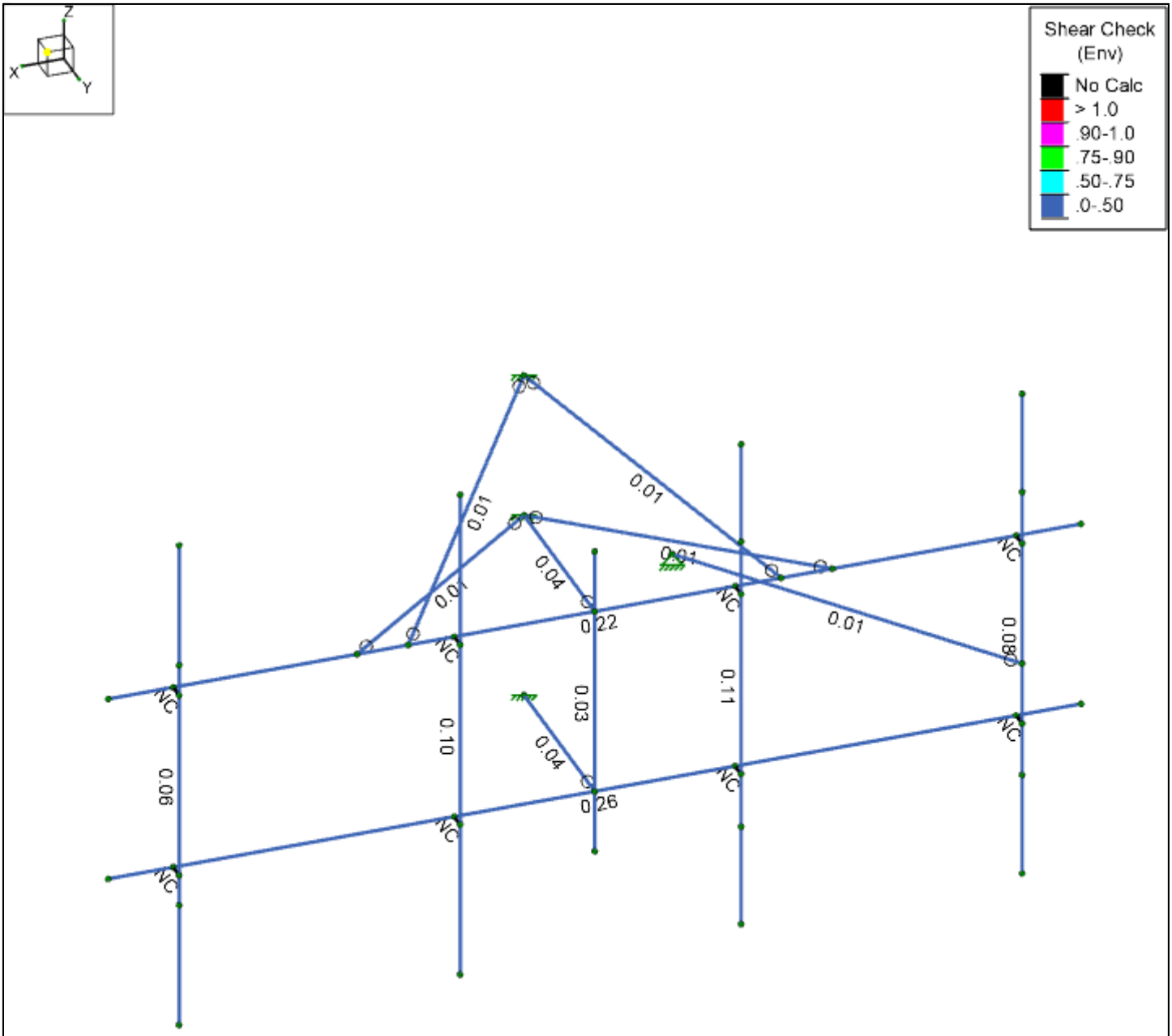
Loads: LC 1, DL + WL (NO ICE) 0 Degree

EFI/T-Mobile	CT11170C	4
EM		Jan 22, 2021
049.01141 - 2075094		CT11170C.r3d



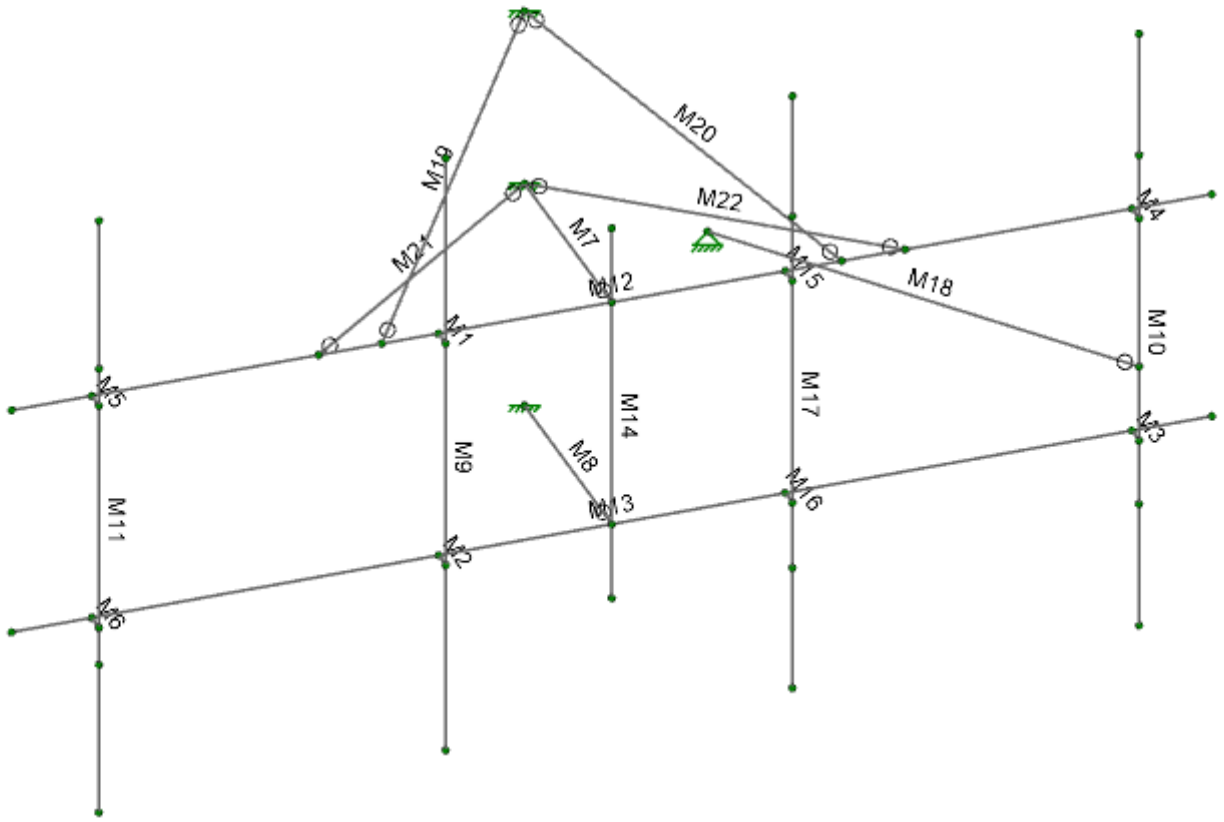
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

EFI/T-Mobile	CT11170C	5
EM		Jan 22, 2021
049.01141 - 2075094		CT11170C.r3d



Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

EFI/T-Mobile	CT11170C	6
EM		Jan 22, 2021
049.01141 - 2075094		CT11170C.r3d



Envelope Only Solution

EFI/T-Mobile	CT11170C	7
EM		Jan 22, 2021
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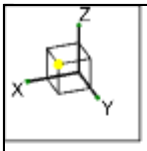
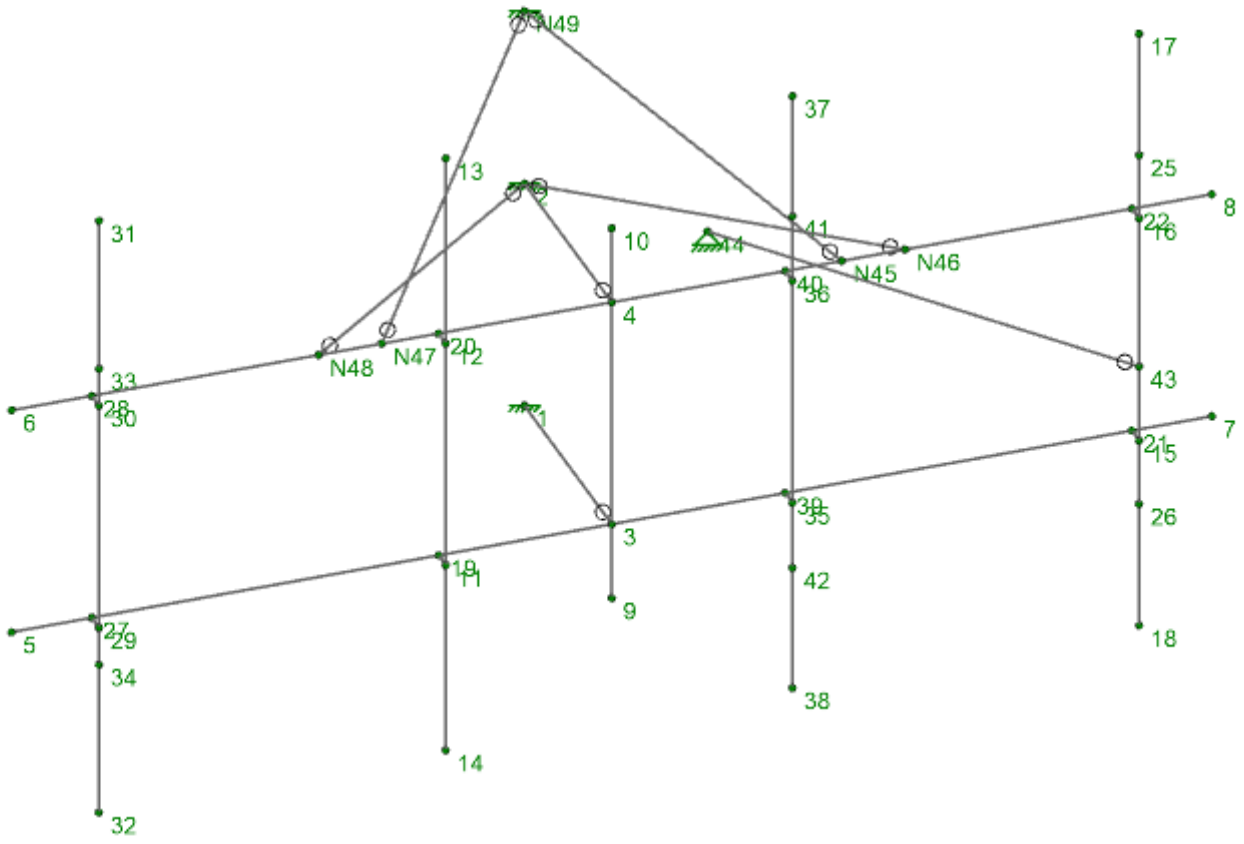




Envelope Only Solution

EFI/T-Mobile	CT11170C	8
EM		Jan 22, 2021
049.01141 - 2075094		CT11170C.r3d

Model Settings

Number of Reported Sections	5
Number of Internal Sections	97
Member Area Load Mesh Size (in²)	144
Consider Shear Deformation	Yes
Consider Torsional Warping	Yes

Approximate Mesh Size (in)	12
Transfer Forces Between Intersecting Wood Walls	No
Increase Wood Wall Nailing Capacity for Wind Loads	Yes
Include P-Delta for Walls	Yes
Optimize Masonry and Wood Walls	Yes
Maximum Number of Iterations	3

Single	No
Multiple (Optimum)	Yes
Maximum	No

Global Axis corresponding to vertical direction	Z
Convert Existing Data	Yes

Default Global Plane for z-axis	XZ

Plate Local Axis Orientation	Nodal

Hot Rolled Steel	AISC 14th (360-10): LRFD
Stiffness Adjustment	Yes (Iterative)
Notional Annex	None
Connections	AISC 13th (360-05): ASD
Cold Formed Steel	AISI NAS-01: ASD
Stiffness Adjustment	Yes (Iterative)
Wood	AF&PA NDS-05/08: ASD
Temperature	< 100F
Concrete	ACI 318-05
Masonry	ACI 530-05: ASD
Aluminum	AA ADM1-05: ASD
Structure Type	Building
Stiffness Adjustment	Yes (Iterative)
Stainless	AISC 14th (360-10): ASD
Stiffness Adjustment	Yes (Iterative)

Analysis Methodology	Exact Integration Method
Parme Beta Factor	0.65
Compression Stress Block	Rectangular Stress Block
Analyze using Cracked Sections	Yes
Leave room for horizontal rebar splices (2*d bar spacing)	No
List forces which were ignored for design in the Detail Report	Yes

Column Min Steel	1
Column Max Steel	8
Rebar Material Spec	ASTM A615
Warn if beam-column framing arrangement is not understood	No
Number of Shear Regions	4
Region 2 & 3 Spacing Increase Increment (in)	4

Code	ASCE 7-05

Model Settings (Continued)

Risk Category	I
Drift Cat	Other
Base Elevation (ft)	-999999
Include the weight of the structure in base shear calcs	Yes

S_1(g)	1
SD_1(g)	1
SD_S(g)	1
T_L(sec)	-1

T (sec)	
T (sec)	
C_t	0.035
C_t	0.035
C_t Exp.	0.75
C_t Exp.	0.75
R	8.5
R	8.5
Ω_o	1
Ω_o	1
C_d	4
C_d	4
ρ	1
ρ	1

Line Project Grid

No Data to Print...

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. C...	Density [k...	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
3	A992	29000	11154	0.3	0.65	0.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	0.3	0.65	0.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	0.3	0.65	0.49	46	1.2	58	1.1
6	A53 Gr.B	29000	11154	0.3	0.65	0.49	35	1.5	60	1.2
7	A529 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.2

Cold Formed Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff...	Density [k/ft³]	Yield [ksi]	Fu [ksi]
1	A570_33	29500	11346	0.3	0.65	0.49	33	52
2	A607_C1_55	29500	11346	0.3	0.65	0.49	55	70

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Standoff T...	HSS3X3X4	Beam	None	A500 Gr.42	Typical	2.44	3.02	3.02	5.08
2	Standoff...	PIPE_4.0	Column	None	A53 Gr.B	Typical	2.96	6.82	6.82	13.6
3	Frame Face	PIPE_2.5	Beam	None	A53 Gr.B	Typical	1.61	1.45	1.45	2.89
4	Antenna...	PIPE_2.0	Column	None	A53 Gr.B	Typical	1.02	0.627	0.627	1.25
5	Stabilizer...	PIPE_1.5	Beam	None	A53 Gr.B	Typical	0.749	0.293	0.293	0.586
6	Reinforce...	L2.5x2.5x3	Beam	None	A36 Gr.36	Typical	0.901	0.535	0.535	0.011

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	CF1A	1.5CU1.2...	Beam	None	A570_33	Typical	0.131	0.022	0.052	5.4e-05

Primary Member Properties

	Label	I Node	J Node	K Node	Rotate(deg)	Section/S...	Type	Design List	Material	Design Rule
1	M1	20	12			RIGID	None	None	LINK	Typical
2	M2	19	11			RIGID	None	None	LINK	Typical
3	M3	21	15			RIGID	None	None	LINK	Typical
4	M4	22	16			RIGID	None	None	LINK	Typical
5	M5	28	30			RIGID	None	None	LINK	Typical
6	M6	27	29			RIGID	None	None	LINK	Typical
7	M7	2	4			Standoff T...	Beam	None	A500 Gr.42	Typical
8	M8	1	3			Standoff T...	Beam	None	A500 Gr.42	Typical
9	M9	13	14			Antenna...	Column	None	A53 Gr.B	Typical
10	M10	17	18			Antenna...	Column	None	A53 Gr.B	Typical
11	M11	31	32			Antenna...	Column	None	A53 Gr.B	Typical
12	M12	6	8			Frame Face	Beam	None	A53 Gr.B	Typical
13	M13	5	7			Frame Face	Beam	None	A53 Gr.B	Typical
14	M14	10	9			Standoff...	Column	None	A53 Gr.B	Typical
15	M15	40	36			RIGID	None	None	LINK	Typical
16	M16	39	35			RIGID	None	None	LINK	Typical
17	M17	37	38			Antenna...	Column	None	A53 Gr.B	Typical
18	M18	43	44			Stabilizer...	Beam	None	A53 Gr.B	Typical
19	M19	N49	N47		270	Reinforce...	Beam	None	A36 Gr.36	Typical
20	M20	N49	N45			Reinforce...	Beam	None	A36 Gr.36	Typical
21	M21	2	N48		270	Reinforce...	Beam	None	A36 Gr.36	Typical
22	M22	2	N46			Reinforce...	Beam	None	A36 Gr.36	Typical

Advanced Member Properties

	Label	I Release	J Release	I Offset [in]	J Offset [in]	T/C Only	Physical	Deflectio...	Analysis...	Activation	Seismic...
1	M1						Yes	** NA **			None
2	M2						Yes	** NA **			None
3	M3						Yes	** NA **			None
4	M4						Yes	** NA **			None
5	M5						Yes	** NA **			None
6	M6						Yes	** NA **			None
7	M7		BenPIN				Yes				None
8	M8		BenPIN				Yes				None
9	M9						Yes	** NA **			None
10	M10						Yes	** NA **			None
11	M11						Yes	** NA **			None
12	M12						Yes				None
13	M13						Yes				None
14	M14						Yes	** NA **			None
15	M15						Yes	** NA **			None
16	M16						Yes	** NA **			None
17	M17						Yes	** NA **			None
18	M18	BenPIN					Yes				None
19	M19	BenPIN	BenPIN				Yes				None
20	M20	BenPIN	BenPIN				Yes				None
21	M21	BenPIN	BenPIN				Yes				None
22	M22	BenPIN	BenPIN				Yes				None

Hot Rolled Member Properties

	Label	Shape	Length [in]	Lb y-y [in]	Lb z-z [in]	Lcomp t...	Lcomp...	L-Torqu...	K y-y	K z-z	Cb	Function
1	M7	Standof...	36			Lbyy						Lateral
2	M8	Standof...	36			Lbyy						Lateral
3	M9	Antenn...	96			Lbyy						Lateral
4	M10	Antenn...	96			Lbyy						Lateral
5	M11	Antenn...	96			Lbyy						Lateral
6	M12	Frame...	180									Lateral
7	M13	Frame...	180									Lateral
8	M14	Standof...	60			Lbyy						Lateral
9	M17	Antenn...	96			Lbyy						Lateral
10	M18	Stabiliz...	72.007			Lbyy						Lateral
11	M19	Reinfor...	57.186			Lbyy						Lateral
12	M20	Reinfor...	57.186			Lbyy						Lateral
13	M21	Reinfor...	56.851			Lbyy						Lateral
14	M22	Reinfor...	56.851			Lbyy						Lateral

Cold Formed Member Properties

No Data to Print...

Nodes

	Label	X [in]	Y [in]	Z [in]	Temp [deg F]	Detach From Dia...
1	1	0	0	0		
2	2	0	0	36		
3	3	0	36	0		
4	4	0	36	36		
5	5	90	36	0		
6	6	90	36	36		
7	7	-90	36	0		
8	8	-90	36	36		
9	9	0	36	-12		
10	10	0	36	48		
11	11	26	39	0		
12	12	26	39	36		

Nodes (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [deg F]	Detach From Dia...
13	13	26	39	66		
14	14	26	39	-30		
15	15	-78	39	0		
16	16	-78	39	36		
17	17	-78	39	66		
18	18	-78	39	-30		
19	19	26	36	0		
20	20	26	36	36		
21	21	-78	36	0		
22	22	-78	36	36		
23	25	-78	39	46.3		
24	26	-78	39	-10.3		
25	27	78	36	0		
26	28	78	36	36		
27	29	78	39	0		
28	30	78	39	36		
29	31	78	39	66		
30	32	78	39	-30		
31	33	78	39	42		
32	34	78	39	-6		
33	35	-26	39	0		
34	36	-26	39	36		
35	37	-26	39	66		
36	38	-26	39	-30		
37	39	-26	36	0		
38	40	-26	36	36		
39	41	-26	39	46.5		
40	42	-26	39	-10.5		
41	43	-78	39	12		
42	44	-34	-18	12		
43	N45	-34.5	36	36		
44	N46	-44	36	36		
45	N47	34.5	36	36		
46	N48	44	36	36		
47	N49	0	0	64		

Boundary Conditions

	Node 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	1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
3	44	Reaction	Reaction	Reaction			
4	N49	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Basic Load Cases

	BLC Desc...	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Me...	Surface(P...
1	DEAD LO...	None			-1	6				
2	DEAD LO...	None				6		14		
3	WIND LO...	None				6		14		
4	WIND LO...	None				6		14		
5	WIND LO...	None				6		14		
6	WIND LO...	None				6		14		
7	LIVE LOA...	None				1				
8	LIVE LOA...	None				1				
9	LIVE LOA...	None								
10	MAINTEN...	None				1				
11	MAINTEN...	None				1				
12	MAINTEN...	None				1				

Basic Load Cases (Continued)

	BLC Desc...	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Me...	Surface(P...
13	MAINTEN...	None				1				

Node Loads and Enforced Displacements (BLC 1 : DEAD LOAD)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	25	L	Z	-66	Active
2	26	L	Z	-66	Active
3	37	L	Z	-138	Active
4	38	L	Z	-138	Active
5	33	L	Z	-52	Active
6	34	L	Z	-52	Active

Node Loads and Enforced Displacements (BLC 2 : DEAD LOAD ICE)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	25	L	Z	-132	Active
2	26	L	Z	-132	Active
3	37	L	Z	-404	Active
4	38	L	Z	-404	Active
5	33	L	Z	-110	Active
6	34	L	Z	-110	Active

Node Loads and Enforced Displacements (BLC 3 : WIND LOAD (NO ICE) FRONT)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	25	L	Y	95	Active
2	26	L	Y	95	Active
3	37	L	Y	294	Active
4	38	L	Y	294	Active
5	33	L	Y	82	Active
6	34	L	Y	82	Active

Node Loads and Enforced Displacements (BLC 4 : WIND LOAD (NO ICE) SIDE)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	25	L	X	69	Active
2	26	L	X	69	Active
3	37	L	X	185	Active
4	38	L	X	185	Active
5	33	L	X	35	Active
6	34	L	X	35	Active

Node Loads and Enforced Displacements (BLC 5 : WIND LOAD (ICE) FRONT)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	25	L	Y	32	Active
2	26	L	Y	32	Active
3	37	L	Y	90	Active
4	38	L	Y	90	Active
5	33	L	Y	27	Active
6	34	L	Y	27	Active

Node Loads and Enforced Displacements (BLC 6 : WIND LOAD (ICE) SIDE)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	25	L	X	25	Active
2	26	L	X	25	Active
3	37	L	X	67	Active
4	38	L	X	67	Active
5	33	L	X	14	Active
6	34	L	X	14	Active

Node Loads and Enforced Displacements (BLC 7 : LIVE LOAD 1)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	5	L	Z	-250	Active

Node Loads and Enforced Displacements (BLC 8 : LIVE LOAD 2)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	7	L	Z	-250	Active

Node Loads and Enforced Displacements (BLC 10 : MAINTENANCE LOAD 1)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	18	L	Z	-500	Active

Node Loads and Enforced Displacements (BLC 11 : MAINTENANCE LOAD 2)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	38	L	Z	-500	Active

Node Loads and Enforced Displacements (BLC 12 : MAINTENANCE LOAD 3)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	14	L	Z	-500	Active

Node Loads and Enforced Displacements (BLC 13 : MAINTENANCE LOAD 4)

	Node Label	L, D, M	Direction	Magnitude [(lb, k-ft),...	Inactive [(lb, k-ft), (in,...
1	32	L	Z	-500	Active

Member Distributed Loads (BLC 2 : DEAD LOAD ICE)

	Member Label	Direction	Start Magnitud...	End Magnitude...	Start Location [...	End Location [(...	Inactive [(lb, k-...
1	M9	Z	-14	-14	0	%100	Active
2	M10	Z	-14	-14	0	%100	Active
3	M11	Z	-14	-14	0	%100	Active
4	M17	Z	-14	-14	0	%100	Active
5	M18	Z	-12	-12	0	%100	Active
6	M12	Z	-15	-15	0	%100	Active
7	M13	Z	-15	-15	0	%100	Active
8	M14	Z	-20	-20	0	%100	Active
9	M7	Z	-29	-29	0	%100	Active
10	M8	Z	-29	-29	0	%100	Active
11	M19	Z	-9	-9	0	%100	Active
12	M20	Z	-9	-9	0	%100	Active
13	M21	Z	-9	-9	0	%100	Active
14	M22	Z	-9	-9	0	%100	Active

Member Distributed Loads (BLC 3 : WIND LOAD (NO ICE) FRONT)

	Member Label	Direction	Start Magnitud...	End Magnitude...	Start Location [...	End Location [(...	Inactive [(lb, k-...
1	M9	PY	7	7	0	%100	Active
2	M10	PY	7	7	0	%100	Active
3	M11	PY	7	7	0	%100	Active
4	M17	PY	7	7	0	%100	Active
5	M18	PY	6	6	0	%100	Active
6	M12	PY	8	8	0	%100	Active
7	M13	PY	8	8	0	%100	Active
8	M14	PY	13	13	0	%100	Active
9	M7	PY	14	14	0	%100	Active
10	M8	PY	14	14	0	%100	Active
11	M19	PY	12	12	0	%100	Active
12	M20	PY	12	12	0	%100	Active
13	M21	PY	12	12	0	%100	Active
14	M22	PY	12	12	0	%100	Active

Member Distributed Loads (BLC 4 : WIND LOAD (NO ICE) SIDE)

	Member Label	Direction	Start Magnitud...	End Magnitude...	Start Location [...	End Location [(...	Inactive [(lb, k-...
1	M9	PX	7	7	0	%100	Active
2	M10	PX	7	7	0	%100	Active
3	M11	PX	7	7	0	%100	Active
4	M17	PX	7	7	0	%100	Active
5	M18	PX	6	6	0	%100	Active
6	M12	PX	8	8	0	%100	Active
7	M13	PX	8	8	0	%100	Active
8	M14	PX	13	13	0	%100	Active
9	M7	PX	14	14	0	%100	Active
10	M8	PX	14	14	0	%100	Active
11	M19	PX	12	12	0	%100	Active
12	M20	PX	12	12	0	%100	Active
13	M21	PX	12	12	0	%100	Active
14	M22	PX	12	12	0	%100	Active

Member Distributed Loads (BLC 5 : WIND LOAD (ICE) FRONT)

	Member Label	Direction	Start Magnitud...	End Magnitude...	Start Location [...	End Location [(...	Inactive [(lb, k-...
1	M9	PY	7.6	7.6	0	%100	Active
2	M10	PY	7.6	7.6	0	%100	Active
3	M11	PY	7.6	7.6	0	%100	Active
4	M17	PY	7.6	7.6	0	%100	Active
5	M18	PY	7.1	7.1	0	%100	Active
6	M12	PY	8.1	8.1	0	%100	Active
7	M13	PY	8.1	8.1	0	%100	Active
8	M14	PY	9.9	9.9	0	%100	Active
9	M7	PY	9.8	9.8	0	%100	Active
10	M8	PY	9.8	9.8	0	%100	Active
11	M19	PY	9	9	0	%100	Active
12	M20	PY	9	9	0	%100	Active
13	M21	PY	9	9	0	%100	Active
14	M22	PY	9	9	0	%100	Active

Member Distributed Loads (BLC 6 : WIND LOAD (ICE) SIDE)

	Member Label	Direction	Start Magnitud...	End Magnitude...	Start Location [...	End Location [(...	Inactive [(lb, k-...
1	M9	PX	7.6	7.6	0	%100	Active
2	M10	PX	7.6	7.6	0	%100	Active
3	M11	PX	7.6	7.6	0	%100	Active
4	M17	PX	7.6	7.6	0	%100	Active
5	M18	PX	7.1	7.1	0	%100	Active
6	M12	PX	8.1	8.1	0	%100	Active
7	M13	PX	8.1	8.1	0	%100	Active
8	M14	PX	9.9	9.9	0	%100	Active
9	M7	PX	9.8	9.8	0	%100	Active
10	M8	PX	9.8	9.8	0	%100	Active
11	M19	PX	9	9	0	%100	Active
12	M20	PX	9	9	0	%100	Active
13	M21	PX	9	9	0	%100	Active
14	M22	PX	9	9	0	%100	Active

Load Combinations

	De...	So...	PD...	SR...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
1	DL...	Yes	Y		1	1.2			3	1.6														
2	DL...	Yes	Y		1	1.2			3	1.3...	4	0.8												
3	DL...	Yes	Y		1	1.2			3	0.8	4	1.3...												
4	DL...	Yes	Y		1	1.2					4	1.6												
5	DL...	Yes	Y		1	1.2			3	-0.8	4	1.3...												
6	DL...	Yes	Y		1	1.2			3	-1....	4	0.8												

Load Combinations (Continued)

	De...	So...	PD...	SR...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
7	DL...	Yes	Y		1	1.2			3	-1.6														
8	DL...	Yes	Y		1	1.2			3	-1....	4	-0.8												
9	DL...	Yes	Y		1	1.2			3	-0.8	4	-1....												
10	DL...	Yes	Y		1	1.2					4	-1.6												
11	DL...	Yes	Y		1	1.2			3	0.8	4	-1....												
12	DL...	Yes	Y		1	1.2			3	1.3...	4	-0.8												
13	DL...	Yes	Y		1	1.2	2	1	5	1														
14	DL...	Yes	Y		1	1.2	2	1	5	0.8...	6	0.5												
15	DL...	Yes	Y		1	1.2	2	1	5	0.5	6	0.8...												
16	DL...	Yes	Y		1	1.2	2	1			6	1												
17	DL...	Yes	Y		1	1.2	2	1	5	-0.5	6	0.8...												
18	DL...	Yes	Y		1	1.2	2	1	5	-0....	6	0.5												
19	DL...	Yes	Y		1	1.2	2	1	5	-1														
20	DL...	Yes	Y		1	1.2	2	1	5	-0....	6	-0.5												
21	DL...	Yes	Y		1	1.2	2	1	5	-0.5	6	-0....												
22	DL...	Yes	Y		1	1.2	2	1			6	-1												
23	DL...	Yes	Y		1	1.2	2	1	5	0.5	6	-0....												
24	DL...	Yes	Y		1	1.2	2	1	5	0.8...	6	-0.5												
25	DE...	Yes	Y		1	1.2					7	1.5												
26	DE...	Yes	Y		1	1.2					8	1.5												
27	DE...	Yes	Y		1	1.2					9	1.5												
28	DL...	Yes	Y		1	1.2	10	1.5	3	0.0...														
29	DL...	Yes	Y		1	1.2	11	1.5	3	0.0...														
30	DL...	Yes	Y		1	1.2	12	1.5	3	0.0...														
31	DL...	Yes	Y		1	1.2	13	1.5	3	0.0...														
32	DL...	Yes	Y		1	1.2	10	1.5	4	0.0...														
33	DL...	Yes	Y		1	1.2	11	1.5	4	0.0...														
34	DL...	Yes	Y		1	1.2	12	1.5	4	0.0...														
35	DL...	Yes	Y		1	1.2	13	1.5	4	0.0...														
36	DL...	Yes	Y		1	1.2	10	1.5	3	-0....														
37	DL...	Yes	Y		1	1.2	11	1.5	3	-0....														
38	DL...	Yes	Y		1	1.2	12	1.5	3	-0....														
39	DL...	Yes	Y		1	1.2	13	1.5	3	-0....														
40	DL...	Yes	Y		1	1.2	10	1.5	4	-0....														
41	DL...	Yes	Y		1	1.2	11	1.5	4	-0....														
42	DL...	Yes	Y		1	1.2	12	1.5	4	-0....														
43	DL...	Yes	Y		1	1.2	13	1.5	4	-0....														

Node Reactions

	Node...		X [lbs]	LC	Y [lbs]	LC	Z [lbs]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	1	max	750.408	10	925.106	7	273.014	13	0.643	13	0.178	28	2.262	4
2		min	-786.456	4	-796.71	1	29.263	7	0.043	7	-0.113	39	-2.149	10
3	2	max	1297.5...	43	4371.3...	19	325.007	13	0.644	13	0.191	32	1.99	4
4		min	-2045....	32	-175.35	1	45.713	7	0.045	7	-0.122	43	-2.112	10
5	44	max	397.567	2	543.491	8	46.348	14	0	43	0	43	0	43
6		min	-398.032	8	-547.276	2	8.256	8	0	1	0	1	0	1
7	N49	max	2153.8...	28	-1197....	1	3270.5...	19	0	2	0	9	0	3
8		min	-1387....	39	-4079.54	17	893.912	1	0	8	0	3	0	9
9	Totals:	max	1828.3...	10	2671.7...	7	3860.4...	21						
10		min	-1828....	4	-2671....	1	1153.3...	3						

Node Displacements

	Node...		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rota...	LC	Y Rota...	LC	Z Rota...	LC
1	1	max	0	4	0	1	0	7	0	7	0	39	0	10
2		min	0	10	0	7	0	13	0	13	0	28	0	4
3	2	max	0	32	0	1	0	7	0	7	0	43	0	10
4		min	0	43	0	19	0	13	0	13	0	32	0	4

Node Displacements (Continued)

	Node...		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rota...	LC	Y Rota...	LC	Z Rota...	LC
5	3	max	0.167	4	0	1	-0.002	7	1.048e...	1	8.652e...	39	3.965e...	9
6		min	-0.159	10	0	7	-0.045	13	-8.768...	7	-1.356...	28	-3.195...	3
7	4	max	0.147	4	0	5	-0.003	7	6.035e...	7	9.295e...	43	4.624e...	9
8		min	-0.156	10	0	24	-0.045	13	-7.5e-04	1	-1.451...	32	-3.789...	3
9	5	max	0.167	4	0.677	12	-0.002	36	6.033e...	1	5.155e...	25	1.029e...	12
10		min	-0.16	10	-0.621	6	-0.465	31	-5.923...	7	-4.64e...	32	-9.332...	6
11	6	max	0.148	4	0.533	11	-0.002	36	3.686e...	1	5.962e...	43	1.011e...	12
12		min	-0.156	10	-0.476	5	-0.474	31	-4.147...	7	-4.53e...	32	-9.234...	6
13	7	max	0.169	4	0.137	3	-0.053	39	6.599e...	12	4.593e...	31	5.294e...	43
14		min	-0.16	10	-0.134	9	-0.519	28	-7.372...	6	-5.691...	26	-2.115...	32
15	8	max	0.147	4	0.275	3	-0.055	43	5.032e...	8	-2.901...	39	1.001e...	8
16		min	-0.157	10	-0.221	9	-0.53	32	-6.854...	2	-6.75e...	28	-2.813...	14
17	9	max	0.172	4	0.013	1	-0.002	7	1.051e...	1	8.652e...	39	3.965e...	9
18		min	-0.158	10	-0.011	7	-0.045	13	-8.8e-04	7	-1.356...	28	-3.195...	3
19	10	max	0.139	4	0.009	1	-0.003	7	6.067e...	7	9.293e...	43	4.624e...	9
20		min	-0.155	10	-0.007	7	-0.045	13	-7.531...	1	-1.451...	32	-3.789...	3
21	11	max	0.179	4	0.118	11	0.01	36	3.e-03	1	3.437e...	31	5.862e...	11
22		min	-0.172	10	-0.105	5	-0.044	31	-2.249...	7	-3.011...	36	-5.466...	6
23	12	max	0.16	4	0.105	9	0.01	36	1.286e...	1	2.001e...	31	4.138e...	10
24		min	-0.169	10	-0.11	3	-0.043	31	-1.567...	7	-4.863...	37	-4.363...	4
25	13	max	0.166	4	0.13	9	0.01	36	9.975e...	1	2.001e...	31	4.138e...	10
26		min	-0.171	10	-0.126	3	-0.043	31	-1.279...	7	-4.864...	37	-4.363...	4
27	14	max	0.182	4	0.182	12	0.01	36	3.288e...	1	3.44e-03	43	5.862e...	11
28		min	-0.196	10	-0.147	6	-0.044	31	-2.537...	7	-3.189...	5	-5.466...	6
29	15	max	0.171	4	0.126	3	-0.053	43	6.599e...	12	5.062e...	31	5.294e...	43
30		min	-0.159	10	-0.135	9	-0.458	32	-7.372...	6	-5.43e...	36	-2.115...	32
31	16	max	0.152	4	0.254	4	-0.053	43	5.032e...	8	-2.854...	39	9.927e...	8
32		min	-0.158	10	-0.214	10	-0.458	32	-6.854...	2	-6.745...	28	-2.808...	14
33	17	max	0.111	4	0.464	3	-0.053	43	5.765e...	8	-2.856...	39	9.927e...	8
34		min	-0.23	40	-0.37	9	-0.458	32	-7.588...	2	-6.748...	28	-2.808...	14
35	18	max	0.217	4	0.303	1	-0.053	43	7.327e...	12	5.85e-05	12	5.294e...	43
36		min	-0.142	10	-0.334	7	-0.459	32	-8.1e-03	6	-5.304...	36	-2.115...	32
37	19	max	0.167	4	0.118	11	0.009	36	3.e-03	1	3.437e...	31	5.862e...	11
38		min	-0.159	10	-0.105	5	-0.048	31	-2.249...	7	-3.011...	36	-5.466...	6
39	20	max	0.147	4	0.105	9	0.009	36	1.286e...	1	2.001e...	31	4.138e...	10
40		min	-0.156	10	-0.11	3	-0.04	31	-1.567...	7	-4.863...	37	-4.363...	4
41	21	max	0.169	4	0.126	3	-0.052	39	6.599e...	12	5.062e...	31	5.294e...	43
42		min	-0.16	10	-0.135	9	-0.455	28	-7.372...	6	-5.43e...	36	-2.115...	32
43	22	max	0.147	4	0.254	4	-0.051	31	5.032e...	8	-2.854...	39	9.927e...	8
44		min	-0.157	10	-0.214	10	-0.45	36	-6.854...	2	-6.745...	28	-2.808...	14
45	25	max	0.136	4	0.322	3	-0.053	43	5.694e...	8	-2.855...	39	9.927e...	8
46		min	-0.174	10	-0.264	9	-0.458	32	-7.517...	2	-6.747...	28	-2.808...	14
47	26	max	0.185	4	0.175	2	-0.053	43	7.256e...	12	5.06e-05	31	5.294e...	43
48		min	-0.151	10	-0.192	8	-0.459	32	-8.029...	6	-5.357...	36	-2.115...	32
49	27	max	0.167	4	0.553	12	-0.007	36	6.033e...	1	4.837e...	43	1.028e...	12
50		min	-0.16	10	-0.509	6	-0.407	31	-5.923...	7	-4.687...	32	-9.324...	6
51	28	max	0.148	4	0.427	11	-0.007	36	3.686e...	1	5.958e...	43	1.01e-02	12
52		min	-0.156	10	-0.381	5	-0.402	31	-4.147...	7	-4.577...	32	-9.226...	6
53	29	max	0.18	4	0.553	12	-0.006	32	6.033e...	1	4.837e...	43	1.028e...	12
54		min	-0.175	10	-0.509	6	-0.409	43	-5.923...	7	-4.687...	32	-9.324...	6
55	30	max	0.161	4	0.427	11	-0.006	32	3.686e...	1	5.958e...	43	1.01e-02	12
56		min	-0.172	10	-0.381	5	-0.409	43	-4.147...	7	-4.577...	32	-9.226...	6
57	31	max	0.199	35	0.387	11	-0.006	32	3.235e...	1	5.965e...	35	1.01e-02	12
58		min	-0.153	10	-0.328	5	-0.409	43	-3.697...	7	-4.648...	40	-9.226...	6
59	32	max	0.186	4	0.717	12	-0.006	32	6.483e...	1	4.746e...	43	1.028e...	12
60		min	-0.214	10	-0.67	6	-0.41	43	-6.373...	7	-4.901...	32	-9.324...	6
61	33	max	0.166	4	0.419	11	-0.006	32	3.383e...	1	5.956e...	35	1.01e-02	12
62		min	-0.167	10	-0.37	5	-0.409	43	-3.844...	7	-4.559...	40	-9.226...	6

Node Displacements (Continued)

	Node...		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rota...	LC	Y Rota...	LC	Z Rota...	LC
63	34	max	0.18	4	0.585	12	-0.006	32	6.336e...	1	4.809e...	43	1.028e...	12
64		min	-0.182	10	-0.541	6	-0.41	43	-6.225...	7	-4.812...	32	-9.324...	6
65	35	max	0.173	4	0.079	3	-0.005	39	8.001e...	1	5.874e...	9	3.132e...	8
66		min	-0.166	10	-0.101	9	-0.088	14	-7.228...	7	-4.12e...	32	-2.56e...	2
67	36	max	0.159	4	0.095	4	-0.005	39	5.692e...	8	1.048e...	3	4.757e...	10
68		min	-0.171	10	-0.135	10	-0.087	14	-6.771...	2	-2.399...	40	-3.97e...	4
69	37	max	0.377	4	0.528	2	-0.005	39	2.058e...	7	1.036e...	4	4.757e...	10
70		min	-0.41	10	-0.535	8	-0.087	14	-2.167...	1	-1.107...	10	-3.97e...	4
71	38	max	0.432	4	0.59	1	-0.005	39	2.274e...	1	9.762e...	10	3.132e...	8
72		min	-0.367	10	-0.588	7	-0.089	14	-2.197...	7	-1.168...	4	-2.56e...	2
73	39	max	0.168	4	0.079	3	0.005	7	8.001e...	1	5.874e...	9	3.132e...	8
74		min	-0.159	10	-0.101	9	-0.096	13	-7.228...	7	-4.12e...	32	-2.56e...	2
75	40	max	0.147	4	0.095	4	-0.003	31	5.692e...	8	1.048e...	3	4.757e...	10
76		min	-0.157	10	-0.135	10	-0.077	19	-6.771...	2	-2.399...	40	-3.97e...	4
77	41	max	0.2	4	0.177	2	-0.005	39	1.431e...	7	6.396e...	4	4.757e...	10
78		min	-0.219	10	-0.206	8	-0.087	14	-1.54e...	1	-7.103...	10	-3.97e...	4
79	42	max	0.228	4	0.19	2	-0.005	39	1.656e...	1	5.832e...	10	3.132e...	8
80		min	-0.201	10	-0.203	8	-0.088	14	-1.579...	7	-7.756...	4	-2.56e...	2
81	43	max	0.169	4	0.132	4	-0.053	43	4.039e...	11	1.548e...	31	5.35e-04	39
82		min	-0.165	10	-0.129	10	-0.458	32	-5.233...	5	-3.253...	7	-2.224...	14
83	44	max	0	8	0	2	0	8	-2.629...	11	1.005e...	5	4.159e...	9
84		min	0	2	0	8	0	14	-7.693...	17	-4.295...	23	-4.222...	3
85	N45	max	0.147	4	0.131	4	-0.005	31	5.581e...	8	-1.026...	3	3.326e...	10
86		min	-0.157	10	-0.17	10	-0.091	21	-6.782...	2	-4.728...	40	-4.447...	4
87	N46	max	0.147	4	0.173	4	-0.013	31	5.459e...	8	-1.125...	31	1.759e...	10
88		min	-0.157	10	-0.193	10	-0.144	36	-6.796...	2	-7.922...	36	-4.909...	16
89	N47	max	0.147	4	0.141	10	0.009	36	1.677e...	1	4.373e...	31	4.738e...	10
90		min	-0.156	10	-0.145	4	-0.066	31	-1.988...	7	1.568e...	37	-4.056...	4
91	N48	max	0.148	4	0.189	10	0.005	36	2.115e...	1	7.316e...	31	6.153e...	11
92		min	-0.156	10	-0.182	4	-0.123	31	-2.459...	7	5.969e...	36	-4.818...	5
93	N49	max	0	39	0	17	0	1	0	8	0	3	0	9
94		min	0	28	0	1	0	19	0	2	0	9	0	3

LRFD

	Member	Shape	Code...	Loc [in]	LC	Shear...	Loc [in]	Dir	LC	phi*P...	phi*P...	phi*M...	phi*M...	Cb	Eqn
1	M7	HSS3...	0.294	0	10	0.041	0	y	4	86487...	92232	7.812	7.812	1.69	H1-1b
2	M8	HSS3...	0.314	0	4	0.039	0	y	4	86487...	92232	7.812	7.812	1.688	H1-1b
3	M9	PIPE...	0.204	66	31	0.101	30		1	14916...	32130	1.872	1.872	3	H1-1b
4	M10	PIPE...	0.498	30	40	0.082	54		2	14916...	32130	1.872	1.872	3	H1-1b
5	M11	PIPE...	0.474	30	31	0.059	30		31	14916...	32130	1.872	1.872	2.444	H1-1b
6	M12	PIPE...	0.456	125.625	23	0.218	90		1	10110...	50715	3.596	3.596	2.453	H1-1b
7	M13	PIPE...	0.311	90	1	0.255	90		1	10110...	50715	3.596	3.596	1.499	H3-6
8	M14	PIPE...	0.088	47.5	1	0.030	47.5		8	86073...	93240	10.631	10.631	1.293	H1-1b
9	M17	PIPE...	0.663	30	7	0.106	30		12	14916...	32130	1.872	1.872	1.444	H1-1b
10	M18	PIPE...	0.073	36.003	20	0.007	72.007		21	11972...	23593.5	1.105	1.105	1.136	H1-1b
11	M19	L2.5x...	0.126	28.593	22	0.006	57.186	y	10	13854...	29192.4	0.873	1.682	1.136	H2-1
12	M20	L2.5x...	0.197	28.593	15	0.012	57.186	y	8	13854...	29192.4	0.873	1.682	1.136	H2-1
13	M21	L2.5x...	0.180	28.425	19	0.008	56.851	y	13	13972...	29192.4	0.873	1.685	1.136	H2-1
14	M22	L2.5x...	0.281	27.833	17	0.012	56.851	y	8	13972...	29192.4	0.873	1.685	1.136	H2-1

Cold Formed Steel Code Checks

No Data to Print...

1.0 DESIGN INFORMATION AND GENERAL REQUIREMENTS

1.0 GENERAL
a. ALL DIMENSIONS ARE APPROXIMATE, CONTRACTOR SHOULD VERIFY ALL DIMENSIONS BEFORE FABRICATION OF STEEL MEMBERS AND COMMENCEMENT OF WORK.

1.1 CODES
a. 2018 CONNECTICUT STATE BUILDING CODE,
b. MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE/SEI 7-10, AMERICAN SOCIETY OF CIVIL ENGINEERS
c. STEEL CONSTRUCTION MANUAL, 14TH EDITION, AMERICAN INSTITUTE OF STEEL CONSTRUCTION
d. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, ANSI/TIA-222-G, TELECOMMUNICATIONS INDUSTRY ASSOCIATION

1.2 LOADS AND DESIGN CRITERIA
a. WIND LOADING: V: 125 MPH (ULTIMATE) / 97 MPH (NOMINAL), EXPOSURE C, RISK CATEGORY II
b. EQUIPMENT AS LISTED IN MOUNT STRUCTURAL ANALYSIS REPORT PREPARED BY DESTEK ENGINEERING, LLC, DATED 06/14/2019.

1.3 NOTES
a. PRIOR TO PURCHASE OR FABRICATION OF MATERIAL, THE CONTRACTOR SHALL PERFORM AN INSPECTION VERIFYING MEMBER AND BOLT SIZES. SHOULD THE CONTRACTOR DISCOVER ANY DAMAGED OR MISSING MEMBERS OR THE MEMBER OR BOLT SIZES DO NOT MATCH THOSE LISTED, DESTEK SHALL BE NOTIFIED IMMEDIATELY.
b. CONTRACTOR TO REPLACE ALL MEMBERS AND BOLTS REMOVED WITH NEW MEMBERS AND BOLTS OF SAME TYPE, UNLESS NOTED OTHERWISE.

2.0 STRUCTURAL STEEL

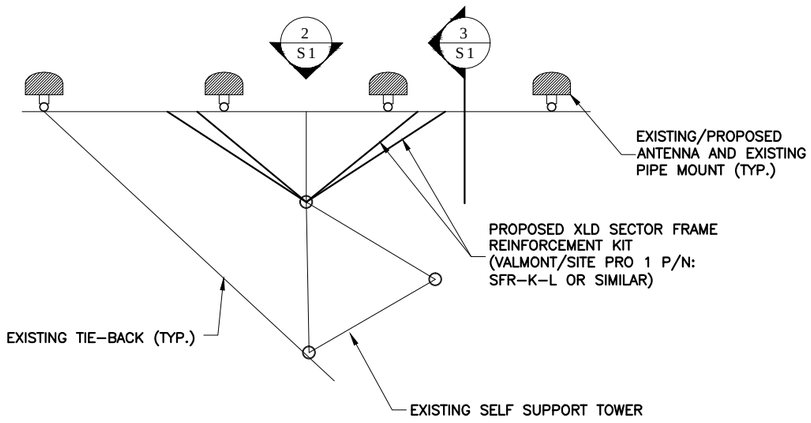
2.1 MATERIALS
a. STRUCTURAL STEEL . . . . . ASTM A992
MISC ANGLE & PLATE . . . . ASTM A36
PIPE . . . . . ASTM A53 GR. B
RODS . . . . . ASTM A572-50 (MINIMUM)
HSS. . . . . ASTM A500, GR. B, Fy=46 KSI
b. BOLTS . . . . . ASTM A325 U.N.O.
c. WELDING ELECTRODES . . . . . AWS A5.1 (E70XX)
d. STEEL CONSTRUCTION SHALL CONFORM TO "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, ANSI/AISC 360-10"
e. WELDING SHALL CONFORM TO AWS D1.1/D1.3/D1.7 AS APPLICABLE.
f. THE FABRICATOR SHALL FURNISH CHECKED SHOP AND ERECTION DRAWINGS TO THE ENGINEER, AND OBTAIN APPROVAL PRIOR TO FABRICATING ANY STRUCTURAL STEEL. SHOP DRAWINGS SHALL CONFORM TO "DETAILING FOR STEEL CONSTRUCTION, 2ND EDITION"
g. POOR MATCHING OF HOLES SHALL BE CORRECTED BY DRILLING TO THE NEXT LARGER SIZE. WELDING FOR REDRILLING WILL NOT BE PERMITTED.

2.2 CONNECTIONS
a. SHOP CONNECTIONS MAY BE BOLTED OR WELDED
b. CONNECTIONS WHERE THE BEAM SHEAR (V) IS NOT NOTED ON THE DRAWINGS, SIMPLE SHEAR CONNECTIONS SHALL BE DESIGNED TO DEVELOP 1/2 OF THE MAXIMUM TOTAL UNIFORM LOAD CAPACITY OF THE BEAM.
c. FIELD CONNECTIONS SHALL BE MADE WITH A325 BOLTS AND HARDENED WASHERS EXCEPT AS INDICATED ON THE DESIGN DRAWINGS
d. CONNECTIONS NOT SHOWN ON DRAWINGS SHALL BE DESIGNED BY THE STEEL FABRICATOR. CONNECTIONS SHALL BE DESIGNED IN ACCORDANCE WITH AISC "SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS" AND "AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".
e. DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT PRIOR WRITTEN APPROVAL OF ENGINEER.
f. BOLT HOLES SHALL BE CUT, DRILLED OR PUNCHED AT RIGHT ANGLES TO THE SURFACE OF THE METAL AND SHALL NOT BE MADE OR ENLARGED BY BURNING. HOLES SHALL BE CLEAN CUT WITHOUT TORN OR RAGGED EDGES. OUTSIDE BURRS RESULTING FROM DRILLING OR REAMING OPERATION SHALL BE REMOVED WITH A TOOL MAKING A 1/16 INCH BEVEL. BOLT HOLES SHALL BE 1/16 INCH OVERSIZE.

2.3 FINISHES
a. STRUCTURAL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION PER ASTM A123
b. BOLTS AND NUTS SHALL BE HOT DIP GALVANIZED PER ASTM A153.
c. ALL SURFACES DAMAGED BY FIELD WELDING OR CUTTING SHALL BE PAINTED WITH COLD GALVANIZING COMPOUND TWICE. THE PAINT SHOULD BE AT LEAST 93% PURE ZINC. RUST-OLEUM PROFESSIONAL, (MODEL# 7585838) OR SIMILAR.

2.4 WELDING
a. CONTRACTOR TO TAKE ALL NECESSARY PRECAUTIONS FOR FIRE PREVENTION DURING WELDING, SUCH AS; INSTALLING 3000 (NFPA 701) FIRE BLANKET AROUND COAX. MORE SPLATTER AND SPARKS SHOULD BE ANTICIPATED WHILE WELDING ON GALVANIZED SURFACE. COAX IS FLAMMABLE AND SHALL CATCH FIRE IF NOT PROTECTED. WATER SHALL BE ON SITE OF ADEQUATE AMOUNT AND AVAILABLE AT SHORT NOTICE AT ALL TIMES DURING WELDING ACTIVITY. CONTRACTOR SHOULD BE ABLE TO TRANSPORT THE WATER TO THE HEIGHT WELDING BEING PERFORMED.
b. WELDING ON GALVANIZED SURFACE SHOULD BE DONE WITH EXTREME CAUTION. IF THE WELD MATERIAL IS CONTAMINATED WITH ZINC, IT DOES NOT PROVIDE A STRUCTURAL WELD. GROUND GALVANIZING BEFORE WELDING.
c. WELDING CERTIFICATE MUST BE PROVIDED PRIOR TO WELDING. ALL WELDING SHALL BE PERFORMED BY AWS QUALIFIED WELDER WHO HAS EXPERIENCE WITH GALVANIZED SURFACES.

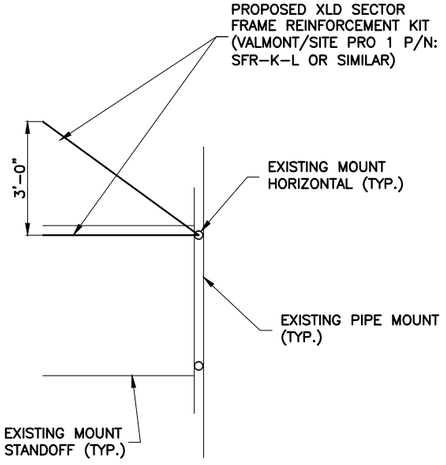
DRAWINGS PLOTTED TO SCALE ON 11x17 SHEETS



1/S1 TYPICAL SECTOR MOUNT @ 180'-0" PLAN

N.T.S.

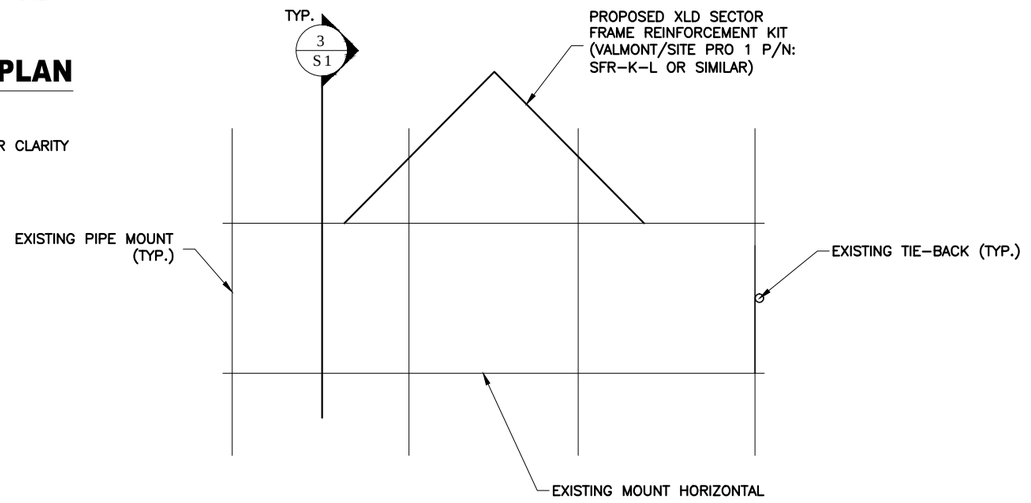
NOTE:
- ADDITIONAL EQUIPMENT AND MOUNTING HARDWARE NOT SHOWN FOR CLARITY
- SINGLE SECTOR SHOWN FOR CLARITY



3/S1 SECTOR MOUNT SIDE VIEW

1/4" = 1'-0"

NOTE:
- ADDITIONAL EQUIPMENT, MOUNTING HARDWARE, AND TIE-BACKS NOT SHOWN FOR CLARITY



2/S1 SECTOR MOUNT ELEVATION

1/4" = 1'-0"

NOTE:
- ANTENNAS, ADDITIONAL EQUIPMENT, MOUNTING HARDWARE, AND EXISTING STANDOFF ARMS NOT SHOWN FOR CLARITY

PROPOSED MODIFICATION TO BE INSTALLED AT ALL THREE SECTORS.

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED PROFESSIONAL ENGINEER
06-14-2019

Ahmet Colakoglu, PE
CT License No: 27057

DESTEK ENGINEERING
DESTEK ENGINEERING, LLC
1281 KENNESTONE CIRCLE
SUITE 100
MARIETTA, GA 30066
TEL NO: 770-693-0835
ADMIN@DESTEKENGINEERING.COM
LICENSE NO: PEC001429

PREPARED FOR:
T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

NUM	DATE	DESCRIPTION:
A	06/14/19	ISSUED FOR CONSTRUCTION

CT11170C

ADDRESS:
1030 NEW BRITAIN AVENUE,
WEST HARTFORD, CT 06110

DESIGNED: SA
DRAWN: SA
CHECKED: AC

JOB #: 1975051

S1
UPGRADE
DETAILS

Exhibit F

INFINIGY

Non-Ionizing Radiation Report

Compiled For: Northeast Site Solutions on behalf of T-Mobile

Site Name: CT11170C

Site ID: CT11170C

1030 New Britain Avenue, West Hartford, CT 06117

Latitude: 41.731301; Longitude: -72.723795

Structure Type: Self Support

Report Date: July 8, 2021

Report Written By: Tim Harris

Status: T-Mobile will be compliant with FCC rules on RF Exposure.

Table of Contents

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1. Executive Summary:

Northeast Site Solutions on behalf of T-Mobile has contracted Infinigy Solutions, LLC to determine whether the site CT11170C located at 1030 New Britain Avenue in West Hartford, CT Will Be Compliant with all Federal Communications Commission (FCC) rules and regulations for radio frequency (RF) exposure as indicated in **47CFR§1.1310**.

The report incorporates a theoretical RF field analysis in accordance with the FCC Rules and Regulations for all individuals classified as "Occupational or Controlled" and "General Public or Uncontrolled" (see Appendix A and B).

This document and the conclusions herein are based on information provided by Northeast Site Solutions on behalf of T-Mobile.

As a result of the analysis, **T-Mobile Will Be Compliant with FCC rules.**

T-Mobile, All Bands Cumulative Exposure %		
Uncontrolled / General Population	Exposure values at the site (mW/cm^2)	0.0153
	% Exposure	1.88 %
Controlled / Occupational	Exposure values at the site (mW/cm^2)	0.0153
	% Exposure	0.38 %

2. Site Summary:

Site Information	
Site Name: CT11170C	
Site Address: 1030 New Britain Avenue, West Hartford, CT 06117	
Site Type: Self Support Tower	
Compliance Status	Will Be Compliant
Mitigation Required	No
Signage Required	Yes
Barriers Required	No
Access Locked	No
Area Controlled or Uncontrolled	Uncontrolled

3. Site Compliance

This report also incorporates overview of the site information:

- Antenna Inventory Table
- Calculation Tables showing exposure for each carrier transmit frequency
- Total exposure for all carriers existing and proposed at ground level considering the centerline of all antennas and horizontal distance from the tower.
- Maximum Effective Radiated Power Assumed as Worst Case for Calculations used in this study
- Calculations based on flat ground around base of the structure

4. Site Compliance Recommendations

Infinigy recommends the following upon the installation of antennas at the site:

Base of tower

Install an RF caution sign. Note: The recommendation for alerting signage is moot if there is an RF caution, or greater already installed.

5. Antenna Inventory Table

Ant ID	Sector	Operator	Antenna manufacturer	Antenna Model	Operating Frequency/Technology	Rad Ctr (Ft)	Az (Deg)	Total ERP Power (Watts)
1a	Alpha	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	2100 MHz LTE	165	60	6104
1b	Alpha	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	1900 MHz LTE	165	60	2870
1c	Alpha	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	1900 MHz GSM	165	60	1435
2a	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	700 MHz LTE	165	60	2256
2b	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz LTE	165	60	1128
2c	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz 5G	165	60	1128
2d	Alpha	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz LTE	165	60	3166
3a	Alpha	T-Mobile	Ericsson	AIR6449 B41	2500 MHz LTE	165	60	3590
3b	Alpha	T-Mobile	Ericsson	AIR6449 B41	2500 MHz 5G	165	60	3591
4a	Beta	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	2100 MHz LTE	165	210	6104
4b	Beta	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	1900 MHz LTE	165	210	2870
4c	Beta	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	1900 MHz GSM	165	210	1435
5a	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	700 MHz LTE	165	210	2256
5b	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz LTE	165	210	1128
5c	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz 5G	165	210	1128
5d	Beta	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz LTE	165	210	3166
6a	Beta	T-Mobile	Ericsson	AIR6449 B41	2500 MHz LTE	165	210	3590
6b	Beta	T-Mobile	Ericsson	AIR6449 B41	2500 MHz 5G	165	210	3591
7a	Gamma	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	2100 MHz LTE	165	310	6104
7b	Gamma	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	1900 MHz LTE	165	310	2870
7c	Gamma	T-Mobile	Ericsson	AIR32 KRD901146-1_B66A_B2A	1900 MHz GSM	165	310	1435
8a	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	700 MHz LTE	165	310	2256
8b	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz LTE	165	310	1128
8c	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	600 MHz 5G	165	310	1128

Ant ID	Sector	Operator	Antenna manufacturer	Antenna Model	Operating Frequency/Technology	Rad Ctr (Ft)	Az (Deg)	Total ERP Power (Watts)
8d	Gamma	T-Mobile	RFS	APXVARR24_43-C-NA20	1900 MHz LTE	165	310	3166
9a	Gamma	T-Mobile	Ericsson	AIR6449 B41	2500 MHz LTE	165	310	3590
9b	Gamma	T-Mobile	Ericsson	AIR6449 B41	2500 MHz 5G	165	310	3591

6. RF Guidelines

To ensure safety of company workers, the following points need to be taken into consideration and implemented at wireless sites in accordance with the Carriers policies:

a) Worksite: Any employee at the site should avoid working directly in front of the antenna or in areas predicted to exceed general population exposure limits by 100%. Workers should insist that the transmitters be switched off during the work period.

b) RF Safety Training and Awareness: All employees working in areas exceeding the general population limits should have a basic awareness of RF safety measures. Videos, classroom lectures and online courses are all appropriate training methods on these topics.

c) Site Access: Restricting access to transmitting antenna locations is one of the most important elements of RF safety. This can be done with:

- Locked doors/gates/ladder access
- Alarmed doors
- Restrictive barriers

d) Three-foot Buffer: There is an inverse relationship between the strength of the field and the distance from the antenna. The RF field diminishes with distance from the antenna. Workers should maintain a three-foot distance from the antennas.

e) Antennas: Workers should always assume that the antenna is transmitting and should never stop right in front of the antenna. If someone must pass by an antenna, he/she should move quickly, thus reducing RF exposure.

7. T-Mobile Exposure Analysis By Band and Technology

T-Mobile 600 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.4**
	Exposure values at the site (mW/cm^2)	**0.0007**
	% Exposure	**0.17%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.0**
	Exposure values at the site (mW/cm^2)	**0.0007**
	% Exposure	**0.03%**

T-Mobile 600 MHz 5G		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.4**
	Exposure values at the site (mW/cm^2)	**0.0007**
	% Exposure	**0.17%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.0**
	Exposure values at the site (mW/cm^2)	**0.0007**
	% Exposure	**0.03%**

T-Mobile 700 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**0.5**
	Exposure values at the site (mW/cm^2)	**0.0014**
	% Exposure	**0.27%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**2.3**
	Exposure values at the site (mW/cm^2)	**0.0014**
	% Exposure	**0.06%**

T-Mobile 1900 MHz GSM		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0009**
	% Exposure	**0.09%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0009**
	% Exposure	**0.02%**

T-Mobile 1900 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0037**
	% Exposure	**0.37%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0037**
	% Exposure	**0.07%**

T-Mobile 2100 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0037**
	% Exposure	**0.37%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0037**
	% Exposure	**0.07%**

T-Mobile 2500 MHz LTE		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0022**
	% Exposure	**0.22%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0022**
	% Exposure	**0.04%**

T-Mobile 2500 MHz 5G		
Uncontrolled / General Population	FCC's exposure limits (mW/cm^2)	**1.0**
	Exposure values at the site (mW/cm^2)	**0.0022**
	% Exposure	**0.22%**
Controlled / Occupational	FCC's Exposure limits(mW/cm^2)	**5.0**
	Exposure values at the site (mW/cm^2)	**0.0022**
	% Exposure	**0.04%**

8. Appendix A: FCC Guidelines

FCC Policies

The Federal Communications Commission (FCC) in 1996 implemented regulations and policies for analysis of RF propagation to evaluate RF emissions. All the analysis and results of this report are compared with FCC's (Federal Communications Commission) rules to determine whether a site is compliant for Occupational/Controlled or General Public/Uncontrolled exposure. All the analysis of RF propagation is done in terms of a percentage. The limits primarily indicate the power density and are generally expressed in terms of milliwatts per centimeter square, mW/cm^2.

FCC guidelines incorporate two separate tiers of exposure limits that are dependent on the scenario/ situation in which that exposure takes place or the status of the individuals who are subjected to that exposure. The decision as to which tier is applied to a scenario is based on the following definitions:

Occupational / Controlled

These limits apply in situations when someone is exposed to RF energy through his/her occupation, is fully aware of the harmful effects of the RF exposure and has an ability to exercise control over this exposure. Occupational / controlled exposure limits also apply when 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. limits for Occupational/Controlled exposure can be found on Table 1(A).

General Population / Uncontrolled

These limits apply to situations in which the general public may be exposed or in which persons who are exposed because of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure to RF. Therefore, members of the general public would always be considered under this category, for example, in the case of a telecommunications tower that exposes people in a nearby residential area. Exposure limits for General Population/Uncontrolled can be found on Table 1(B).

Table 1. LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

(A) Limits for Occupational/Controlled Exposure

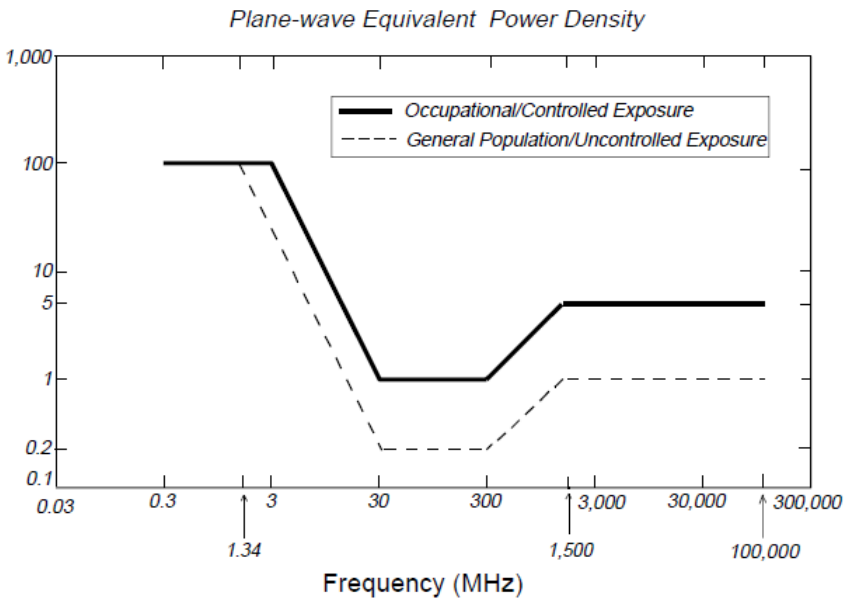
Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	$(900/f^2)$*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $|E|^2$, $|H|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	$(180/f^2)$*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

Figure 1. *FCC Limits for Maximum Permissible Exposure (MPE)*



OSHA Statement:

The objective of the OSHA Act is to ensure the safety and health of the working men and women by enforcing certain standards. The act also assists and encourages the states in their efforts to ensure safe and healthy working conditions through means of research, information, education and training in the field of occupational safety and health and for other purposes.

According to OSHA Act section 5, important duties to be considered are:

(a) Each employer

1) Shall furnish to each of his employees' employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious harm to his employees
2) Shall comply with occupational safety and health standards promulgated under this act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

9. Preparer Certification

I, Tim Harris, preparer of this report, certify that I am fully trained and aware of the rules and regulations of both the Federal Communications Commission and the Occupational Safety and Heath Administration regarding Human Exposure to Radio Frequency Radiation. In addition, I have been trained in RF safety practices, rules, and regulations.

I certify that the information contained in this report is true and correct to the best of my knowledge.

Timothy A. Harris *7/8/2021*

Signature Date

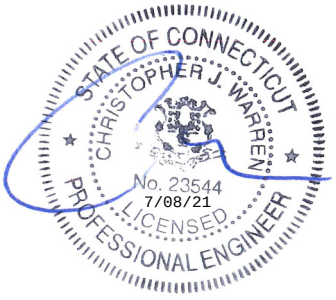
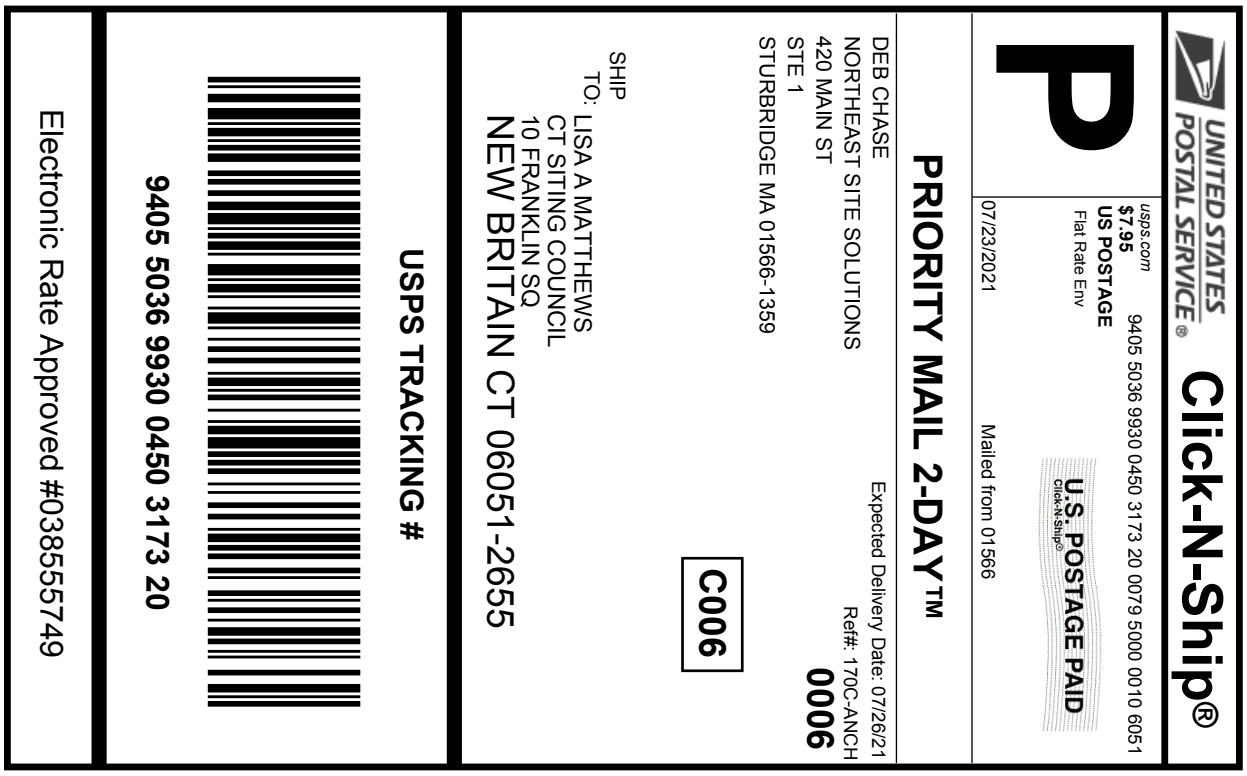


Exhibit G



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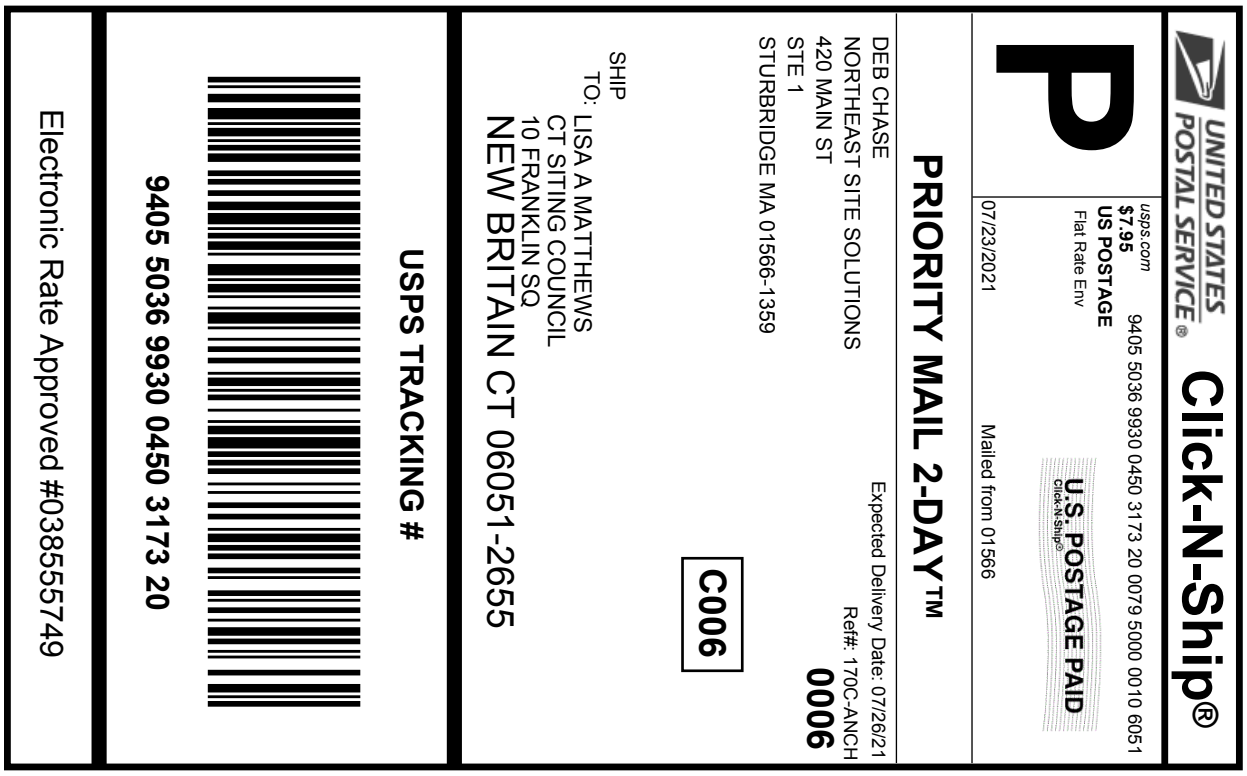

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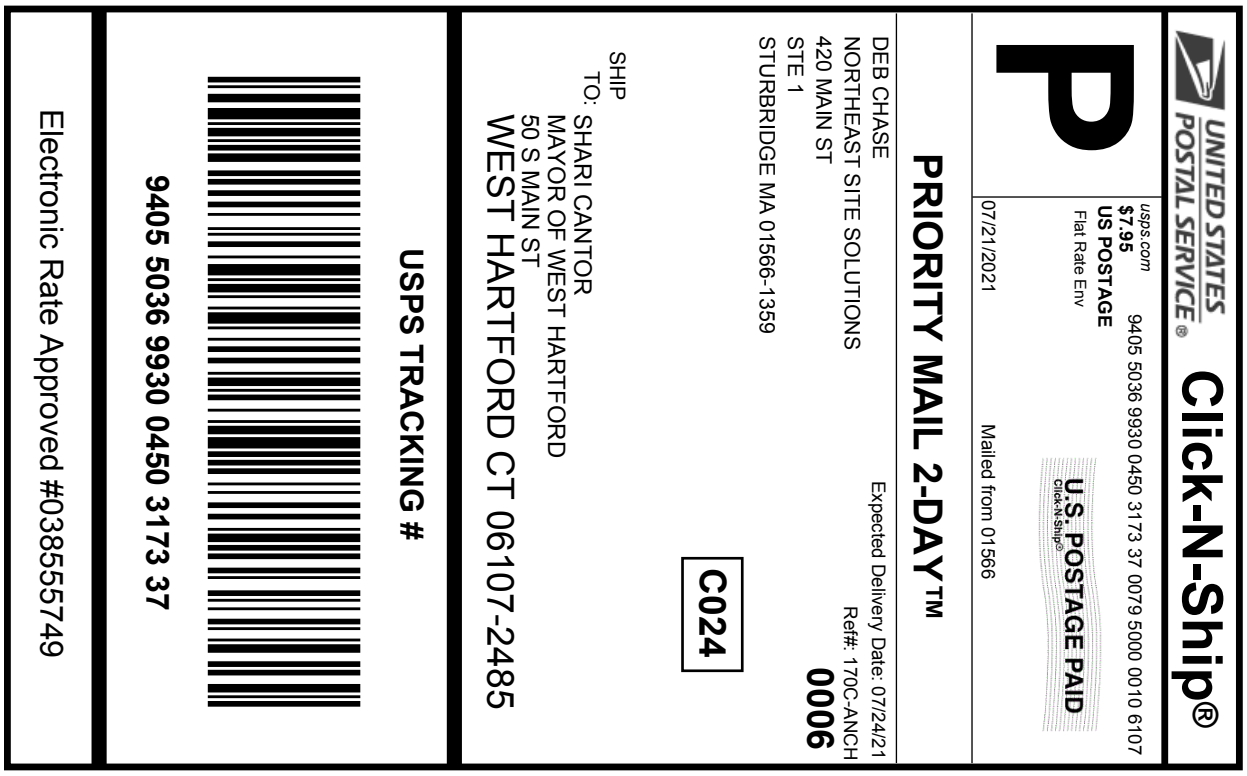

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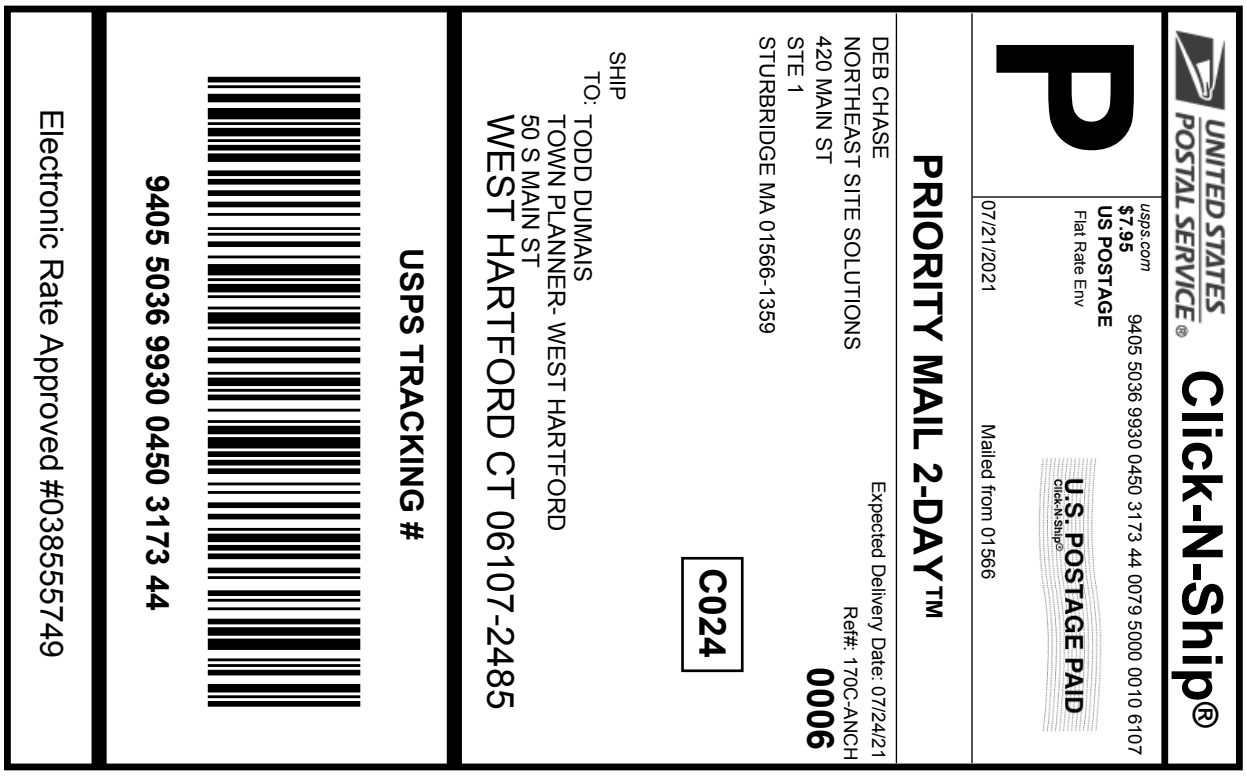

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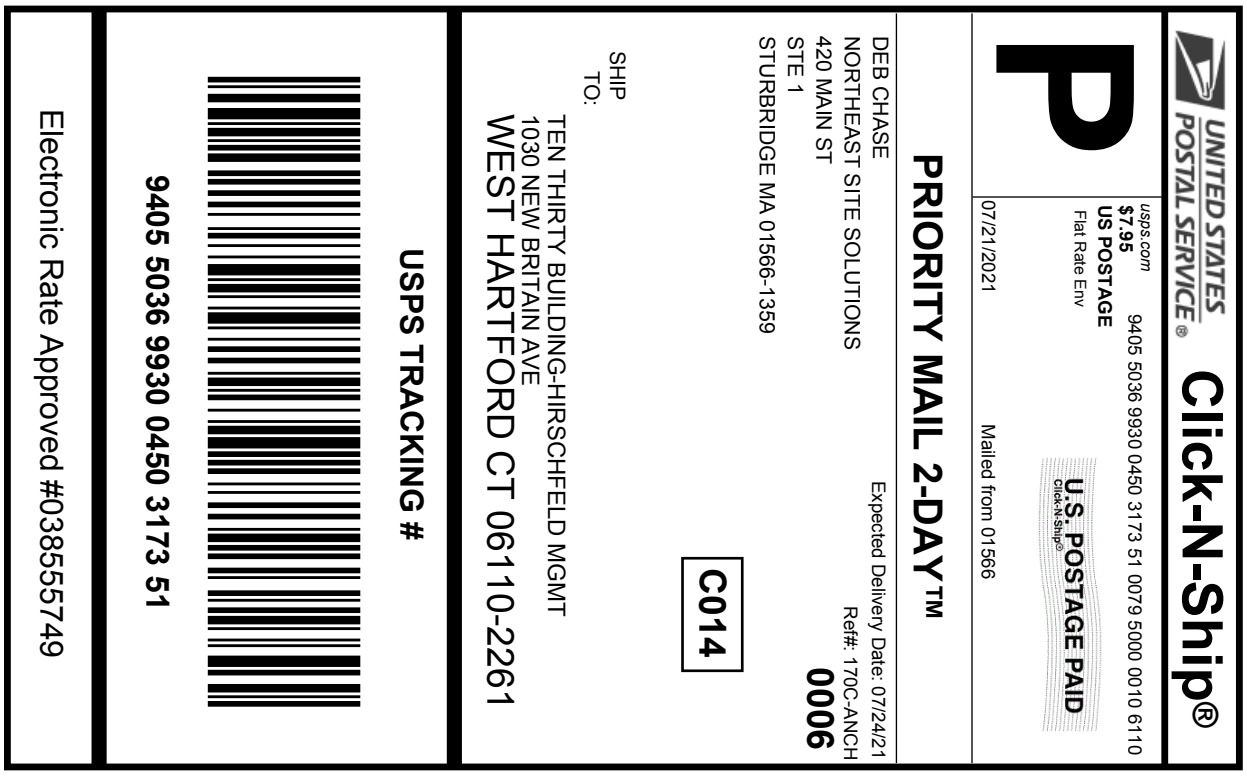

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