NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
199 Brickyard Rd Farmington, CT 06032
860-209-4690
denise@northeastsitesolutions.com

August 15, 2016

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

RE: Notice of Exempt Modification
1030 New Britain Avenue, West Hartford CT 06110
Latitude: 41.73130
Longitude: -72.72380
T-Mobile Site#: CT11170C_L1900

Dear Ms. Bachman:

T-Mobile currently maintains six (6) 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 700 MHz antenna, Add three (3) new 1900/2100 MHz antenna and add (1) hybrid cable. The new antennas would be installed at the 165-foot level of the tower.

Planned Modifications:

Remove: (12) 1-5/8" Coax

Remove and Replace:
(3) Ericsson KRC 118 048/1 Antenna (REMOVE) - (3) Commscope LNX-6515 Antenna **(REPLACE)**

Install New: (1) 1-5/8" Hybrid Cable
(3)AIR32 B66Aa/B2a Antenna

Existing to Remain:
(3)AIR21 B2A /B4P
(3) RRUS11 B12
(3) Twin TMA
(6) 1-5/8" Coax
(1) 1-5/8" Hybrid Cable

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.

NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

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 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,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 199 Brickyard Rd, Farmington, CT 06032
Email: denise@northeastsitesolutions.com

Attachments
cc: Shari Cantor- Mayor - as elected official
Ten Thirty Building Co LLC - as tower owner
Ten Thirty Building Co LLC c/o Hirschfeld MGMT Inc - as property owner

Exhibit A

DEPARTMENT OF
COMMUNITY SERVICES

May 21, 1997

T. Donald Hirschfeld
1030 New Britain Avenue
West Hartford, CT 06110

SUBJECT: 1030 NEW BRITAIN AVENUE - SITE PLAN
SSU TOWER

Dear Mr. Hirschfeld:

Donald R. Foster, Town Planner, has approved the site plan application for the subject property. Site plan approval is granted for the construction of a 199 foot communication tower.

Please submit to the Planning Office one (1) mylar and two (2) blueprints of the approved plan, all signed and sealed by the professional responsible for preparing the plan.

If we could be of further assistance please call me at 523-3123.

Sincerely,

Mila Limson
Senior Planner

C: Donald R. Foster, Town Planner
Eva Espinosa, Zoning Official
Ronald Van Winkle, Director of Community Services

1030NBA:

TOWN OF WEST HARTFORD

TOWN OF WEST HARTFORD 50 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06107-2431
(860) 523-3123 FAX: (860) 523-3200

SP 812

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

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COMMUNITY SERVICES

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TOWN OF WEST HARTFORD 50 SOUTH MAIN STREET
WEST HARTFORD, CONNECTICUT 06107-2431
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SP 812

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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

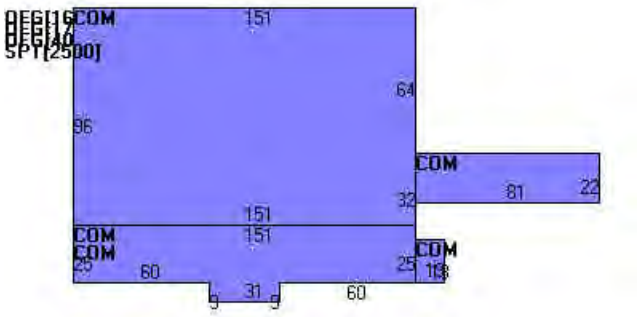
Good:
Replacement Cost
Less Depreciation: $676,200

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			
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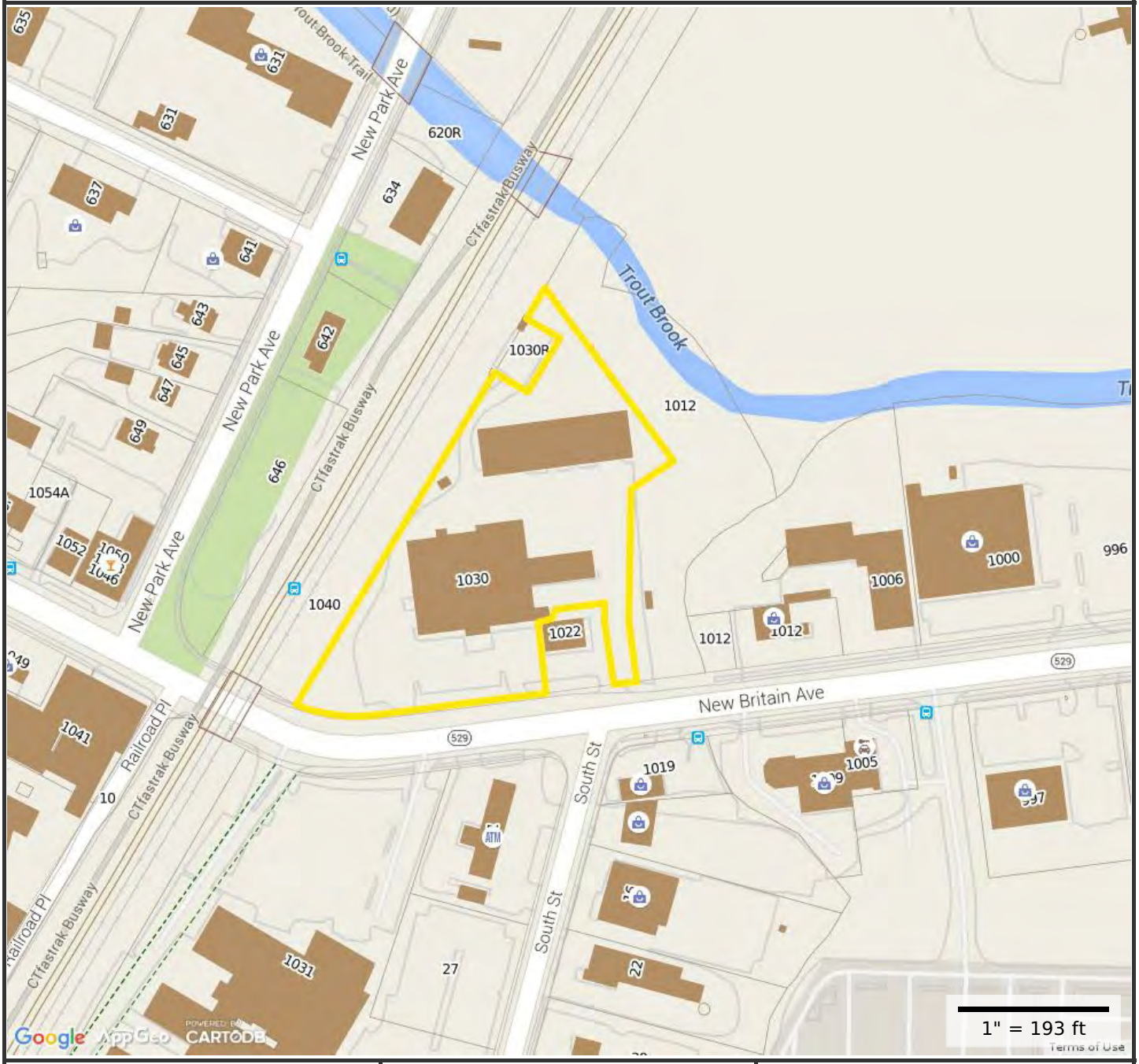


Property Information

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

T-MOBILE NORTHEAST LLC

SITE #: CT11170C

SITE NAME: HARTFORD/ N. BRITAIN AVE_1

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

WIRELESS BROADBAND FACILITY
CONSTRUCTION DRAWINGS
(792DB CONFIGURATION)

VICINITY MAP

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

CALL BEFORE YOU DIG:

WWW.CBYD.COM

CALL 800 922 4455, OR 811

CALL THREE WORKING DAYS PRIOR TO DIGGING

SAFETY PRECAUTIONS SHALL BE IMPLEMENTED BY CONTRACTOR(S) AT ALL TRENCHING IN ACCORDANCE WITH CURRENT OSHA STANDARDS.

COLOR CODE FOR UTILITY LOCATIONS

ELECTRIC – RED		**SEWER**	**– GREEN**
GAS/OIL	– YELLOW	**SURVEY**	**– PINK**
TEL/CATV	– ORANGE	PROPOSED EXCAVATION	– WHITE
WATER	– BLUE	**RECLAIMED WATER**	**– PURPLE**

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 HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONSTRUCT 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 T–MOBILE REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF THE CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES, THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXPENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING OF ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
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 CONTRACT DOCUMENTS.
6. THE CONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. 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.
8. THE CONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUM OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ANY PERMITS AND INSPECTIONS WHICH ARE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY, OR LOCAL GOVERNMENT AUTHORITY.
11. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC., DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE CONTRACTOR SHALL KEEP THE GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE CONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS, AS WELL AS THE LATEST EDITIONS OF ANY PERTINENT STATE SAFETY REGULATIONS.
14. THE CONTRACTOR SHALL NOTIFY THE T–MOBILE REPRESENTATIVE 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 T–MOBILE REPRESENTATIVE.
15. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC., ON THE JOB.
16. THE CONTRACTOR SHALL RETURN ALL DISTURBED AREAS TO THEIR ORIGINAL CONDITION AT THE COMPLETION OF WORK.
17. ATLANTIS DESIGN GROUP, INC. HAS NOT CONDUCTED A STRUCTURAL ANALYSIS FOR THIS PROJECT AND DOES NOT ASSUME ANY LIABILITY FOR THE ADEQUACY OF THE STRUCTURE AND COMPONENTS.
18. REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT" PREPARED BY PAUL J. FORD AND COMPANY , STRUCTURAL ENGINEERS, "T–MOBILE SITE ID CT1070C", DATED JULY 26, 2016.

SITE INFORMATION

SITE NUMBER:	CT11170C
SITE NAME:	HARTFORD/ N. BRITAIN AVE_1
SITE ADDRESS:	1030 NEW BRITAIN AVE WEST HARTFORD, CT 06110
LAT./LONG.:	N 41.73130/ W –72.72380
JURISDICTION:	TOWN OF WEST HARTFORD, CT
PROPERTY OWNER:	HIRSCHFELD COMMUNICATIONS LLC 1030 NEW BRITAIN AVENUE WEST HARTFORD, CONNECTICUT 06110 860.953.7000 FAX 860.953.9300

CODE COMPLIANCE

CONNECTICUT STATE BUILDING CODE

2005 CONNECTICUT BUILDING CODE WITH 2013 AMENDMENT
2011 NATIONAL ELECTRICAL CODE

CONSTRUCTION TYPE: 2B USE GROUP: N/A

PROJECT SUB–CONTRACTORS

APPLICANT:	T–MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 (860) 692–7100
PROJECT MANAGER	LISA LIN ALLEN NORTHEAST SITE SOLUTIONS 54 MAIN STREET STURBRIDGE, MA 01566 (508) 434–5237
A&E:	ATLANTIS DESIGN GROUP INC. 54 JACQUELINE ROAD, SUITE #7 WALTHAM, MA 02452 (617)–852–3611

SHEET INDEX

SHEET	DESCRIPTION
T–1	TITLE SHEET
N–1	GENERAL AND ELECTRICAL NOTES
A–1	SITE PLAN AND ELEVATION
A–2	ANTENNA PLAN AND DETAILS
E–1	GROUNDING AND COAX/FIBER DIAGRAM
E–2	GROUNDING DETAILS

T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX:(860) 692-7159

ATLANTIS DESIGN GROUP, INC.
54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617–852–3611
Fax Number : 781–742–2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
06/06/16	ISSUED FOR REVIEW	A
07/28/16	REVISION	0

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CT11170C
DRAWN BY:	FG
CHECKED BY:	KM

STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11162
LICENSED ARCHITECT

PROFESSIONAL SEAL

SITE NUMBER
CT11170C
SITE NAME
HARTFORD/ N. BRITAIN AVE_1
SITE ADDRESS
1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

ELECTRICAL NOTES:

WORK INCLUDED

1. INCLUDE ALL LABOR, MATERIALS, EQUIPMENT, PLANT SERVICES AND ADMINISTRATIVE TASKS REQUIRED TO COMPLETE AND MAKE OPERABLE THE ELECTRICAL WORK SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
   A. PREPARE AND SUBMIT SHOP DRAWINGS, DIAGRAMS AND ILLUSTRATIONS.
   B. PROCURE ALL NECESSARY PERMITS AND APPROVALS AND PAY ALL REQUIRED FEES AND CHARGES IN CONNECTION WITH THE WORK OF THIS CONTRACT.
   C. SUBMIT AS-BUILT DRAWINGS, OPERATING AND MAINTENANCE INSTRUCTIONS AND MANUALS.
   D. EXECUTE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING OF EXISTING OR NEWLY INSTALLED CONSTRUCTION REQUIRED FOR THE WORK OF THIS CONTRACT. FOR SLAB PENETRATIONS THROUGH POST TENSION SLABS, X-RAY EXACT AREA OF PENETRATION PRIOR TO PERFORMING WORK. COORDINATE ALL X-RAY WORK WITH BUILDING ENGINEER.
   E. PROVIDE HANGERS, SUPPORTS, FOUNDATIONS, STRUCTURAL FRAMING SUPPORTS, AND BASES FOR CONDUIT AND EQUIPMENT PROVIDED OR INSTALLED UNDER THE WORK OF HIS CONTRACT. PROVIDE COUNTER FLASHING, SLEEVES AND SEALS FOR FLOOR AND WALL PENETRATIONS.
   F. MAINTAIN ALL EXISTING ELECTRICAL SERVICES IN THE BUILDING AREAS NOT AFFECTED BY THE ALTERATION DURING THE PROGRESS OF THE WORK INCLUDING PROVIDING ALL TEMPORARY JUMPERS, CONDUITS, CAPS, PROTECTIVE DEVICES, CONNECTIONS AND EQUIPMENT REQUIRED. PROVIDE TEMPORARY LIGHT AND POWER FOR CONSTRUCTION PURPOSES.
2. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO CALL FOR AN INSTALLATION THAT IS COMPLETE IN EVERY RESPECT. IT IS NOT THE INTENT TO GIVE EVERY DETAIL ON THE DRAWINGS AND IN THE SPECIFICATIONS. IF AN ITEM OF WORK IS INDICATED IN THE DRAWINGS, IT IS CONSIDERED SUFFICIENT FOR INCLUSION IN THE CONTRACT. FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT USUALLY FURNISHED OR NEEDED TO MAKE A COMPLETE INSTALLATION WHETHER OR NOT SPECIFICALLY MENTIONED IN THE CONTRACT DOCUMENTS.

GENERAL REQUIREMENTS

1. PROVIDE ALL WORK IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND LOCAL AND STATE ELECTRICAL CODES.
2. THE ELECTRICAL PLANS ARE DIAGRAMMATIC ONLY. REFER TO THE ARCHITECTURAL PLANS FOR THE EXACT DIMENSIONS OF THE BUILDING.
3. LOAD CALCULATIONS ARE BASED ON EXISTING BUILDING INFORMATION/DRAWINGS PROVIDED TO ENGINEERING. CONTRACTOR IS TO VERIFY ALL EXISTING RATINGS AND LOADS PRIOR TO PURCHASING OF SPECIFIED EQUIPMENT FOR COMPLIANCE TO NEC. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES AND REQUEST FURTHER DIRECTION BY ENGINEER.
4. EXISTING BUILDING EQUIPMENT IS NOTED ON THE DRAWINGS. NEW OR RELOCATED EQUIPMENT IS SHOWN WITH SOLID LINES. FUTURE EQUIPMENT (NOT IN THIS CONTRACT) IS DEPICTED WITH SHADED LINES. REQUEST CLARIFICATION OF DRAWINGS OR OF SPECIFICATIONS PRIOR TO PRICING OR INSTALLATION.
5. GENERAL
   A. AFTER CAREFULLY STUDYING THE DRAWINGS AND SPECIFICATIONS, AND BEFORE SUBMITTING THE PROPOSAL, MAKE A MANDATORY SITE VISIT TO ASCERTAIN CONDITIONS OF THE SITE, AND THE NATURE AND EXACT QUANTITY OF WORK TO BE PERFORMED. NO EXTRA COMPENSATION WILL BE ALLOWED FOR FAILURE TO NOTIFY THE OWNER, IN WRITING, OF ANY DISCREPANCIES THAT MAY HAVE BEEN NOTED BETWEEN THE EXISTING CONDITIONS AND THE DRAWINGS AND SPECIFICATIONS.
   B. VERIFY ALL MEASUREMENTS AT THE SITE AND BE RESPONSIBLE FOR CORRECTNESS OF SAME.
6. QUALITY, WORKMANSHIP, MATERIALS AND SAFETY
   A. PROVIDE NEW MATERIALS AND EQUIPMENT OF A DOMESTIC MANUFACTURER BY THOSE REGULARLY ENGAGED IN THE PRODUCTION AND MANUFACTURE OF SPECIFIED MATERIALS AND EQUIPMENT. WHERE UL, OR OTHER AGENCY, HAS ESTABLISHED STANDARDS FOR MATERIALS, PROVIDE MATERIALS WHICH ARE LISTED AND LABELED ACCORDINGLY. THE COMMERCIALLY STANDARD ITEMS OF EQUIPMENT AND THE SPECIFIC NAMES MENTIONED HEREIN ARE INTENDED FOR THE PROPER FUNCTIONING OF THE WORK.
   B. WORK SHALL BE PERFORMED BY WORKMEN SKILLED IN THE TRADE REQUIRED FOR THE WORK. INSTALL MATERIALS AND EQUIPMENT TO PRESENT A NEAT APPEARANCE WHEN COMPLETED AND IN ACCORDANCE WITH THE APPROVED RECOMMENDATIONS OF THE MANUFACTURER AND IN ACCORDANCE WITH CONTRACT DOCUMENTS.
   C. PROVIDE LABOR, MATERIALS, APPARATUS AND APPLIANCES ESSENTIAL TO THE FUNCTIONING OF THE SYSTEMS DESCRIBED OR INDICATED HEREIN, OR WHICH MAY BE REASONABLY IMPLIED AS ESSENTIAL WHENEVER MENTIONED IN THE CONTRACT DOCUMENT OR NOT.
   D. MAKE WRITTEN REQUESTS FOR SUPPLEMENTARY INSTRUCTIONS TO ARCHITECT/ENGINEER IN CASE OF DOUBT AS TO WORK INTENDED OR IN EVENT OF NEED FOR EXPLANATION THEREOF.
   E. PERFORMANCE AND MATERIAL REQUIREMENTS SCHEDULED OR SPECIFIED ARE MINIMUM STANDARD ACCEPTABLE. THE RIGHT TO JUDGE THE QUALITY OF EQUIPMENT THAT DEVIATES FROM THE CONTRACT DOCUMENT REMAINS SOLELY WITH ARCHITECT/ENGINEER. CONTRACT DOCUMENT OR NOT.

GUARANTEE

1. GUARANTEE MATERIALS, PARTS AND LABOR FOR WORK FOR ONE YEAR FROM THE DATE OF ISSUANCE OF OCCUPANCY PERMIT. DURING THAT PERIOD, MAKE GOOD FAULTS OR IMPERFECTIONS THAT MAY ARISE DUE TO DEFECTS OR OMISSIONS IN MATERIALS OR WORKMANSHIP WITH NO ADDITIONAL COMPENSATION AND AS DIRECTED BY ARCHITECT.

CLEANING

1. REMOVE ALL CONSTRUCTION DEBRIS RESULTING FROM THE WORK.
2. CLEAN EQUIPMENT AND SYSTEMS FOLLOWING THE COMPLETION OF THE PROJECT TO THE SATISFACTION OF THE ENGINEER.

COORDINATION AND SUPERVISION

1. CAREFULLY LAY OUT ALL WORK IN ADVANCE TO AVOID UNNECESSARY CUTTING, CHANNELING, CHASING OR DRILLING OF FLOORS, WALLS, PARTITIONS, CEILINGS OR OTHER SURFACES. WHERE SUCH WORK IS NECESSARY, HOWEVER, PATCH AND REPAIR THE WORK IN AN APPROVED MANNER BY SKILLED MECHANICS AT NO ADDITIONAL COST TO THE OWNER. RENDER FULL COOPERATION TO OTHER TRADES WHERE WORK WILL BE INSTALLED IN CLOSE PROXIMITY TO WORK OF OTHER TRADES. ASSIST IN WORKING OUT SPACE CONDITIONS. IF WORK IS INSTALLED BEFORE COORDINATION WITH OTHER TRADES, OR CAUSES INTERFERENCE, MAKE CHANGES NECESSARY TO CORRECT CONDITIONS WITHOUT EXTRA CHARGE.

SUBMITTALS

1. AS-BUILT DRAWINGS:
   A. UPON COMPLETION OF THE WORK, FURNISH TO THE OWNER "AS-BUILT" DRAWINGS.
2. SERVICE MANUALS:
   A. UPON COMPLETION OF THE WORK, FULLY INSTRUCT T-MOBILE AS TO THE OPERATION AND MAINTENANCE OF ALL MATERIAL, EQUIPMENT AND SYSTEMS.
   B. PROVIDE 3 COMPLETE BOUND SETS OF INSTRUCTIONS FOR OPERATING AND MAINTAINING ALL SYSTEMS AND EQUIPMENT.

CUTTING AND PATCHING

1. PROVIDE ALL CUTTING, DRILLING, ROUGH AND FINISH PATCHING REQUIRED TO COMPLETE THE WORK.
2. OBTAIN OWNER APPROVAL PRIOR TO CUTTING THROUGH FLOORS OR WALLS FOR PIPING OR CONDUIT.

TESTS, INSPECTION AND APPROVAL

1. BEFORE ENERGIZING ANY ELECTRICAL INSTALLATION, INSPECT EACH UNIT IN DETAIL. TIGHTEN ALL BOLTS AND CONNECTIONS (TORQUE-TIGHTEN WHERE REQUIRED) AND DETERMINE THAT ALL COMPONENTS ARE ALIGNED, AND THE EQUIPMENT IS IN SAFE, OPERATIONAL CONDITION.
2. PROVIDE THE COMPLETE ELECTRICAL SYSTEM FREE OF GROUND FAULTS AND SHORT CIRCUITS SUCH THAT THE SYSTEM WILL OPERATE SATISFACTORILY UNDER FULL LOAD CONDITIONS, WITHOUT EXCESSIVE HEATING AT ANY POINT IN THE SYSTEM.

SPECIAL REQUIREMENTS

1. DO NOT LEAVE ANY WORK INCOMPLETE NOR ANY HAZARDOUS SITUATIONS CREATED WHICH WILL AFFECT THE LIFE OR SAFETY OF THE PUBLIC AND/OR BUILDING OCCUPANTS. DO NOT INTERFERE WITH OR CUTOFF ANY OF THE EXISTING SERVICES WITHOUT THE OWNER'S WRITTEN PERMISSION.
2. WHEN NECESSARY TO TEMPORARILY DISCONNECT ANY EXISTING BUILDING UTILITIES AND SERVICE SYSTEMS, INCLUDING FEEDER OR BRANCH CIRCUITING SUPPLYING EXISTING FACILITIES, CONFER WITH THE OWNER AND ARRANGE THE PERIOD OF INTERRUPTION FOR A TIME MUTUALLY AGREED UPON. SHUTDOWN NOTE: SCHEDULE AND NOTIFY OWNER 48 HOURS PRIOR TO SHUTDOWN. ALL SHUTDOWN WORK TO BE SCHEDULED AT A TIME CONVENIENT TO OWNER.

GROUNDING

1. ROUTE ALL GROUNDING CONDUCTORS AS SHOWN ON CONDUIT/GROUNDING RISER.
2. ROUTE 500 KCMIL CU. THHN CONDUCTOR FROM THE MGB LOCATION TO BUILDING STEEL. VERIFY BUILDING STEEL IS EFFECTIVELY GROUNDED PER NEC TO THE MAIN SERVICE GROUNDING ELECTRODE CONDUCTOR (GEC).
3. MAKE ALL GROUND CONNECTIONS FROM MGB TO ELECTRICAL EQUIPMENT WITH 2 HOLE, CRIMP TYPE, BURNDY COMPRESSION TERMINATIONS, SIZED AS REQUIRED.
4. USE 1 HOLE, CRIMP TYPE, BURNDY COMPRESSIONS TERMINATIONS, SIZED AS REQUIRED, AT EQUIPMENT GROUND CONNECTIONS.
5. HIRE AN INDEPENDENT LAB TO PERFORM THE SPECIFIED OHMS TESTING. PROVIDE 4 SETS OF THE CERTIFIED DOCUMENTS TO THE OWNER FOR VERIFICATION PRIOR TO THE PROJECT COMPLETION.

RACEWAYS

1. ALL WIRING TO BE INSTALLED IN CONDUIT SYSTEMS IN ACCORDANCE WITH THE FOLLOWING:
   A. EXTERIOR FEEDERS AND CONTROL, WHERE UNDERGROUND, TO BE IN SCH 40 PVC.
   B. EXTERIOR, ABOVE GROUND POWER CONDUITS TO BE GALVANIZED RIGID STEEL (RGS).
   C. ALL TELECOMMUNICATION CONDUITS, INTERIOR/EXTERIOR, TO BE EMT.
   D. INSTALL PULL ROPES IN ALL NEW EMPTY CONDUITS INSTALLED ON THIS PROJECT.
   E. ALL TELECOM CONDUITS AND PULL BOXES INSTALLED ON THIS PROJECT TO BE LABELED "T-MOBILE". OWNER WILL PROVIDE LABELS FOR CONTRACTOR TO INSTALL.
   F. INTERIOR FEEDERS TO BE INSTALLED IN E.M.T. WITH STEEL COMPRESSION FITTINGS.
   G. MINIMUM SIZE CONDUIT TO BE ¾" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
   H. FINAL CONNECTIONS TO MOTORS AND VIBRATING EQUIPMENT TO BE INSTALLED IN LIQUID-TIGHT FLEXIBLE METAL CONDUIT.
   I. CONDUIT TO BE RUN CONCEALED IN CEILINGS, FINISHED AREAS OR DRYWALL PARTITIONS, UNLESS OTHERWISE NOTED.
   J. THE ROUTING OF CONDUITS INDICATED ON THE DRAWINGS IS DIAGRAMMATIC. BEFORE INSTALLING ANY WORK, EXAMINE THE WORKING LAYOUTS AND SHOP DRAWINGS OF THE OTHER TRADES TO DETERMINE THE EXACT LOCATIONS AND CLEARANCES.
   K. ALL EXTERIOR MOUNTING HARDWARE TO BE GALVANIZED STEEL. COORDINATE WITH BUILDING ENGINEER PRIOR TO ATTACHING TO BUILDING STRUCTURE.
   L. PENETRATIONS OF WALLS, FLOORS AND ROOFS, FOR THE PASSAGE OF ELECTRICAL RACEWAYS, TO BE PROPERLY SEALED AFTER INSTALLATION OF RACEWAYS SO AS TO MAINTAIN THE STRUCTURAL OR WATERPROOF INTEGRITY OF THE WALL, FLOOR OR ROOF SYSTEM TO BE PENETRATED. SEAL ALL CONDUIT PENETRATIONS THROUGH FIRE OR SMOKE RATED WALLS, CEILINGS OR SMOKE TIGHT CORRIDOR PARTITIONS TO MAINTAIN PROPER RATING OF WALL OR CEILING.
   M. PROVIDE ALL CONDUIT ENDS WITH INSULATED METALLIC GROUNDING BUSHINGS.
   N. CONDUIT TO BE SUPPORTED AT MAXIMUM DISTANCE OF 8'-0", OR AS REQUIRED BY NEC, IN HORIZONTAL AND VERTICAL DIRECTIONS.
   O. PROVIDE STAINLESS STEEL BLANK COVER PLATES FOR ALL JUNCTION BOXES AND/OR OUTLET BOXES NOT USED IN EXPOSED AREAS. PROVIDE ALL OTHER UNUSED BOXES WITH STANDARD STEEL COVER PLATES.
   P. WHERE APPLICABLE, PROVIDE ROOFTOP CONDUIT SUPPORT SYSTEM, CONFORMING TO ROOFTOP WARRANTY REQUIREMENTS, PER BUILDING.

WIRES AND CABLES

1. CONTRACTOR TO COORDINATE WITH EQUIPMENT SUPPLIER AND VENDOR FOR EXACT EQUIPMENT OVER-CURRENT PROTECTION VOLTAGE, WIRE SIZE AND PLUG CONFIGURATION, IF APPLICABLE, PRIOR TO BID.
2. ALL EQUIPMENT/DEVICES TO BE PROVIDED WITH INSULATED GROUND CONDUCTOR.
3. ALL WIRE AND CABLE TO BE 600VOLT, COPPER, WITH THWN/THHN INSULATION, EXCEPT AS NOTED.
4. WIRE FOR POWER AND LIGHTING WILL NOT BE LESS THAN NO. 12AWG. ALL WIRE NO. 8 AND LARGER TO BE STRANDED.
5. CONTROL WIRING IS NOT TO BE LESS THAN NO. 14AWG, FLEXIBLE IN SINGLE CONDUCTORS OR MULTI-CONDUCTOR CABLES. CONTROL WIRING WILL CONSIST OF MULTI-CONDUCTOR CABLES WHEREVER POSSIBLE. CABLES TO BE PROVIDED WITH AN OVERALL FLAME-RETARDANT, EXTRUDED JACKET AND RATED FOR PLENUM USE. ALL CONTROL WIRE TO BE 600VOLT RATED.
6. WIRE PREVIOUSLY PULLED INTO CONDUIT IS CONSIDERED USED AND IS NOT TO BE RE-PULLED.
7. HOME RUNS AND BRANCH CIRCUIT WIRING FOR 20A, 120V CIRCUITS:

LENGTH (FT.)	HOME RUN WIRE SIZE
0 TO 50	NO. 12
51 TO 100	NO. 10
101 TO 150	NO. 8

8. VOLTAGE DROP IS NOT TO EXCEED 3%.
9. MAKE ALL CONNECTIONS WITH UL APPROVED, SOLDERLESS, PRESSURE TYPE INSULATED CONNECTORS: SCOTCHLOK OR AND APPROVED EQUAL.

WIRING DEVICES

1. ALL RECEPTACLES INSTALLED IN THIS PROJECT TO BE GROUNDING TYPE, WITH GROUNDING PIN SLOT CONNECTED TO DEVICE GROUND SCREW FOR GROUND WIRE CONNECTION.

DISCONNECT SWITCHES AND FUSES

1. DISCONNECT SWITCHES TO BE VOLTAGE-RATED TO SUIT THE CHARACTERISTICS OF THE SYSTEM FROM WHICH THEY ARE SUPPLIED.
2. PROVIDE HEAVY-DUTY, METAL-ENCLOSED, EXTERNALLY-OPERATED DISCONNECT SWITCHES, FUSED OR UNFUSED, OF SUCH TYPE AND SIZE AS REQUIRED TO PROPERLY PROTECT OR DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED.
3. PROVIDE NEMA 1 DISCONNECT SWITCHES FOR INTERIOR INSTALLATION, NEMA 3R FOR EXTERIOR INSTALLATION.
4. DISCONNECT SWITCHES TO BE MANUFACTURED BY:
   A. GENERAL ELECTRIC COMPANY
   B. SQUARE-D
5. PROVIDE RK-1 TYPE FUSES, UNLESS NOTED OTHERWISE.

INSTALLATION

1. INSTALL DISCONNECT SWITCHES WHERE INDICATED ON DRAWINGS.
2. INSTALL FUSES IN FUSIBLE DISCONNECT SWITCHES. FUSES MUST MATCH IN TYPE AND RATING.
3. FUSES TO BE MOUNTED SO THAT THE LABELS SHOWING THEIR RATINGS CAN BE READ WITHOUT REQUIRING FUSE REMOVAL.
4. FURNISH AND DEPOSIT SPARE FUSES AT THE JOB SITE AS FOLLOWS:
   A. THREE SPARES FOR EACH TYPE AND SIZE, IN EXCESS OF 60A, USED FOR INITIAL FUSING.
   B. TEN PERCENT SPARES FOR EACH TYPE AND SIZE, UP TO AND INCLUDING 60A, USED FOR INITIAL FUSING. IN NO CASE WILL LESS THAN THREE FUSES OF ONE PARTICULAR TYPE AND SIZE BE FURNISHED.

GENERAL NOTES:

INTENT

1. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.
2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED, OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH
3. THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.
4. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.
5. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A CHANGE ORDER.

CONFLICTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATIONS OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.
2. THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING SUCH BIDDER MIGHT HAVE FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING.
3. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

CONTRACTS AND WARRANTIES

1. CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.
2. SEE MASTER CONTRACTION SERVICES AGREEMENT FOR ADDITIONAL DETAILS.

STORAGE

1. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

CLEANUP

1. THE CONTRACTORS SHALL, AT ALL TIMES, KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK. THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY TO USE.
2. EXTERIOR
   A. VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.
   B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
   C. IF NECESSARY, TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.
3. INTERIOR
   A. VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS, FLOOR, AND CEILING.
   B. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.
   C. REMOVE PAINT DROPPINGS, SPOTS, STAINS, AND DIRT FROM FINISHED SURFACES.

CHANGE ORDER PROCEDURE:

1. REFER TO SECTION 17 OF SIGNED MCSA: SEE PROFESSIONAL SERVICE AGREEMENT FOR MCSA.

RELATED DOCUMENTS AND COORDINATION

1. GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

SHOP DRAWINGS

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.
2. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

PRODUCTS AND SUBSTITUTIONS

1. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST, IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION. INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBERS AND COMPLETE DOCUMENTATION SHOWING COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.
2. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED. THE CONTRACTOR SHALL, IF DEEMED NECESSARY BY THE OWNER, SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

QUALITY ASSURANCE

1. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE, BUT NOT BE LIMITED TO THE APPLICABLE CODES SET FORTH BY THE LOCAL GOVERNING BODY. SEE "CODE COMPLIANCE" T-1.

ADMINISTRATION

1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.
2. SUBMIT A BAR TYPE PROGRESS CHART, NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE, INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT THE SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.
3. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETING WITH ALL MAJOR PARTIES. THIS WOULD INCLUDE, BUT NOT LIMITED TO, THE OWNER, PROJECT MANAGER, CONTRACTOR, LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SUBCONTRACTED).
4. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER, NOR WILL WIRELESS SERVICE BE ARRANGED.
5. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL WPCS SAFETY REQUIREMENTS IN THEIR AGREEMENT.
6. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER.
7. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.
8. NOTIFY THE OWNER/PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.

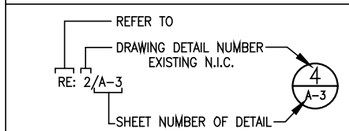
INSURANCE AND BONDS

1. CONTRACTOR, AT THEIR OWN EXPENSE, SHALL CARRY AND MAINTAIN, FOR THE DURATION OF THE PROJECT, ALL INSURANCE, AS REQUIRED AND LISTED, AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.
2. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.
3. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

ARCHITECTURAL SYMBOLS

STORAGE

DETAIL REFERENCE KEY



ABBREVIATIONS

ADJ	ADJUSTABLE
AGL	ABOVE GROUND LINE
&	AND
APPROX	APPROXIMATE
@	AT
BTS	BASE TRANSMISSION STATION
CAB	CABINET
CLG	CEILING
CONC	CONCRETE
CONT	CONTINUOUS
DIA OR ø	DIAMETER
DWG	DRAWING
EA	EACH
ELEC	ELECTRICAL
ELEV	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EGB	EQUIPMENT GROUND BAR
(E)	EXISTING
EXT	EXTERIOR
FF	FINISHED FLOOR
GA	GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GRND	GROUND
LG	LONG
MAX	MAXIMUM
MECH	MECHANICAL
MW	MICROWAVE DISH
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTL	METAL
(N)	NEW
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
OC	ON CENTER
OPP	OPPOSITE
(P)	PROPOSED
PCS	PERSONAL COMMUNICATION SYSTEM
PPC	POWER PROTECTION CABINET
SF	SQUARE FOOT
SHT	SHEET
SIM	SIMILAR
SS	STAINLESS STEEL
STL	STEEL
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TYP	TYPICAL
VIF	VERIFY IN FIELD
UON	UNLESS OTHERWISE NOTED
WWF	WELDED WIRE FABRIC
W/	WITH

T-MOBILE NORTHEAST, LLC
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54 Jacqueline Road, Suite #7
Waltham, MA 02452
Phone number: 617-852-3611
Fax Number : 781-742-2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
06/06/16	ISSUED FOR REVIEW	A
07/28/16	REVISION	0

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: CT11170C
DRAWN BY: FG
CHECKED BY: KM

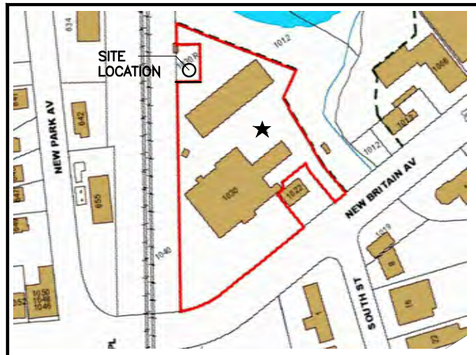
STATE OF CONNECTICUT
HOSSEIN VAHEDI
NO. ARI. 11462
LICENSED ARCHITECT

PROFESSIONAL SEAL

SITE NUMBER
CT11170C
SITE NAME
HARTFORD/ N. BRITAIN AVE_1
SITE ADDRESS
1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

SHEET TITLE
GENERAL AND ELECTRICAL NOTES

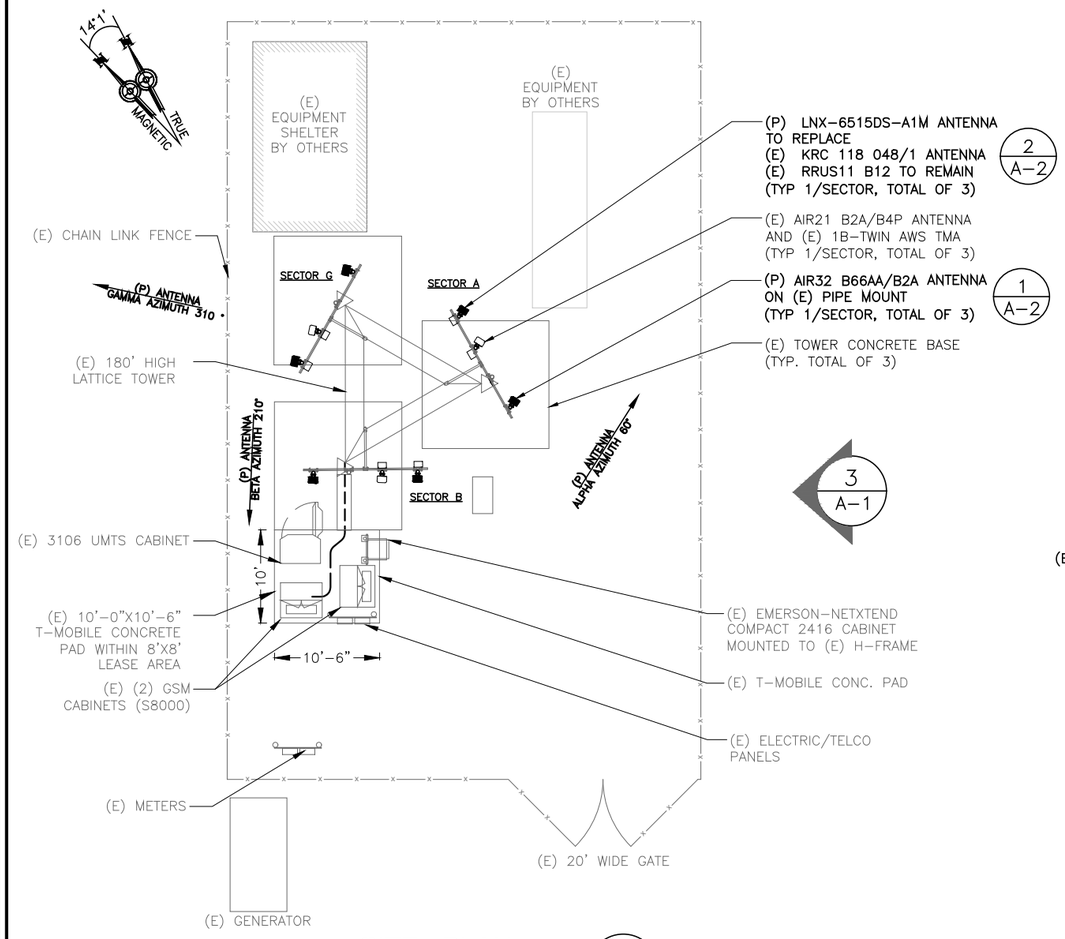
SHEET NUMBER
N-1



KEY PLAN

SCALE: N.T.S.

1 / A–1



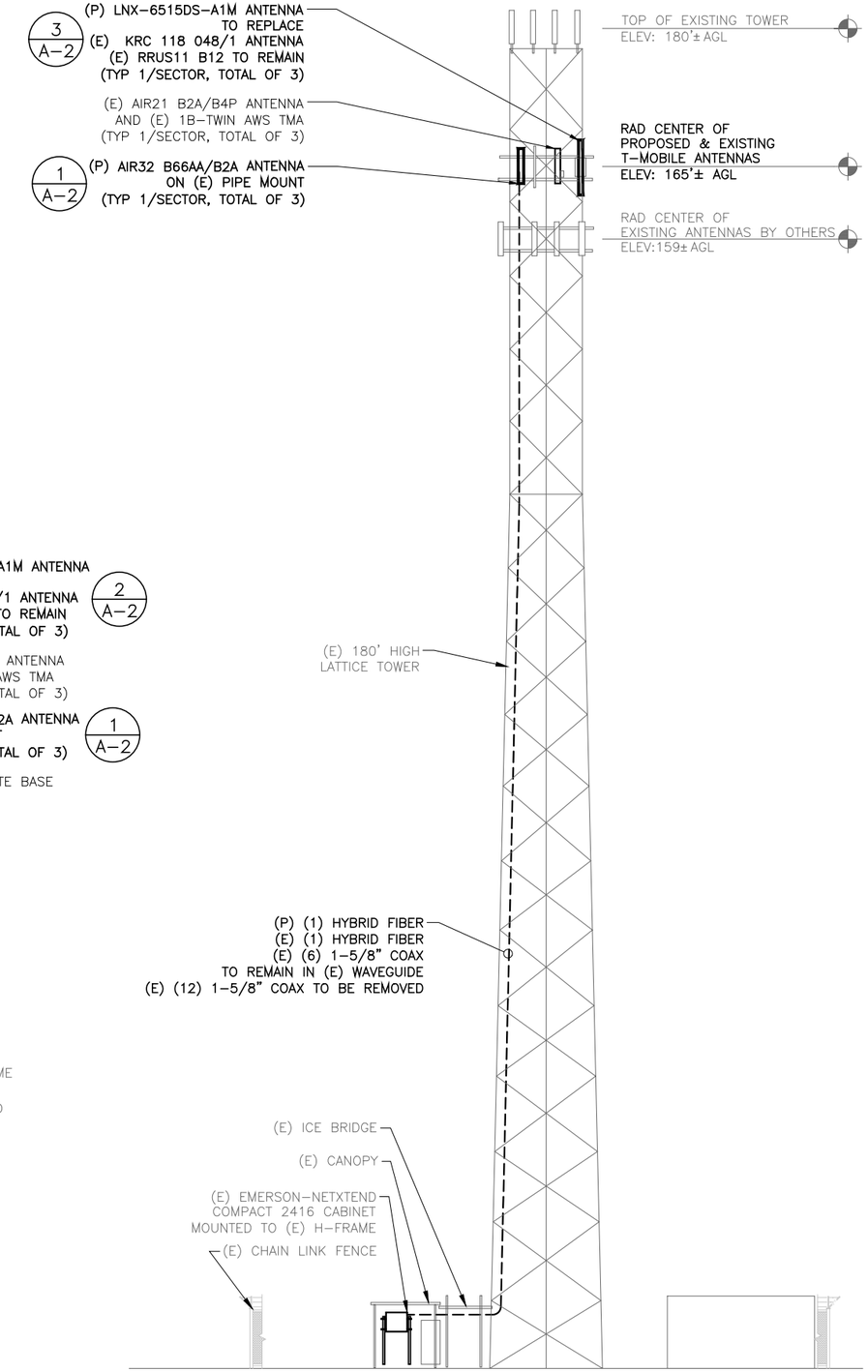
SITE PLAN

SCALE: 1/16" = 1'–0" (11x17)

2 / A–1

0 16 32 48

SCALE 1"=16' (11x17)
1"=8' (24x36)



ELEVATION

SCALE: 1" = 30'–0" (11x17)

3 / A–1

0 30 60 90

SCALE 1"=30' (11x17)
1"=15' (24x36)

STRUCTURAL DISCLAIMER

REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED, "STRUCTURAL ANALYSIS REPORT" PREPARED BY PAUL J. FORD AND COMPANY , STRUCTURAL ENGINEERS, "T–MOBILE SITE ID CT1070C", DATED JULY 26, 2016.

GENERAL SITE NOTES

1. SITE INFORMATION WAS OBTAINED FROM A FIELD INVESTIGATION PERFORMED BY ATLANTIS GROUP, INC. CONTRACTOR TO FIELD VERIFY DIMENSIONS AS NECESSARY BEFORE CONSTRUCTION.

2. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE SIGNS OF ADVERTISING.

3. THE PROPOSED DEVELOPMENT IS UNMANNED AND THEREFORE DOES NOT REQUIRE A MEANS OF WATER SUPPLY OR SEWAGE DISPOSAL.

4. NO LANDSCAPING WORK IS PROPOSED IN CONJUNCTION WITH THIS DEVELOPMENT OTHER THAN THAT WHICH IS SHOWN.

5. THE PROPOSED DEVELOPMENT DOES NOT INCLUDE OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES.

6. UTILITIES SHOWN ON PLAN ARE TAKEN FROM OWNERS RECORDS AND FIELD LOCATION OF VISIBLE SURFACE FEATURES. THE EXISTENCE, EXTENT AND EXACT HORIZONTAL AND VERTICAL LOCATIONS OF UTILITIES HAS NOT BEEN VERIFIED. ANY CONTRACTOR PERFORMING WORK ON THIS SITE MUST CONTACT CALL BEFORE YOU DIG THREE WORKING DAYS PRIOR TO COMMENCING WORK.

7. ALL OBSOLETE OR UNUSED FACILITIES SHALL BE REMOVED WITHIN 12 MONTHS OF CESSATION OF OPERATIONS.

SITE LEGEND

- SITE PROPERTY LINE
- STREET OR ROAD
- CHAIN LINK FENCE
- OPAQUE WOODEN FENCE
- BOARD ON BOARD FENCE
- DECIDUOUS TREES/SHRUBS
- EVERGREEN TREES/SHRUBS
- TREE LINE
- UTILITY POLE
- (E) EXISTING
- (N) NEW
- (P) PROPOSED
- (F) FUTURE
- PROP. LTE ANTENNA
- PROP. UMTS/GSM ANTENNA
- EX. GSM ANTENNA
- EX. UMTS ANTENNA

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Phone number: 617–852–3611
Fax Number : 781–742–2247

SUBMITTALS

DATE	DESCRIPTION	REVISION
05/06/16	ISSUED FOR REVIEW	A
07/28/16	REVISION	0

DEPT.	DATE	APP'D	REVISIONS
RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO: CT11170C
DRAWN BY: FG
CHECKED BY: KM

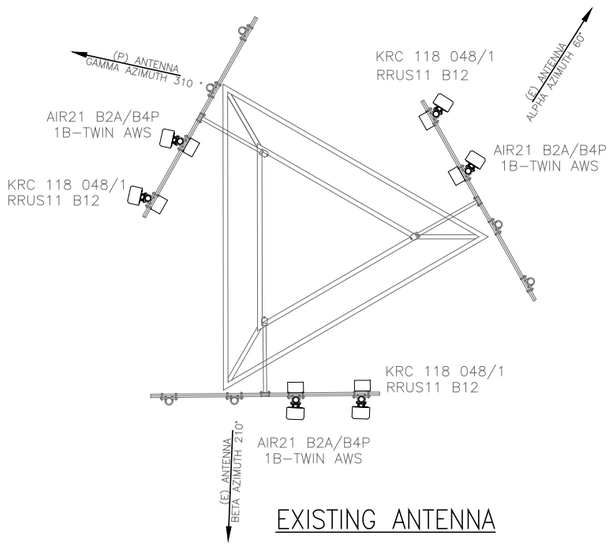
PROFESSIONAL SEAL

SITE NUMBER
CT11170C
SITE NAME
HARTFORD/ N. BRITAIN AVE_1
SITE ADDRESS
1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

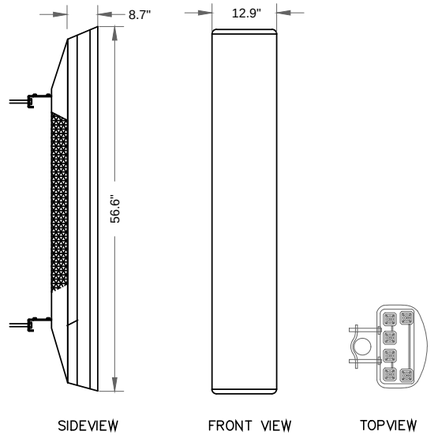
SHEET TITLE
SITE PLAN

SHEET NUMBER
A-1

REFER TO STRUCTURAL ANALYSIS DOCUMENT ENTITLED,
"STRUCTURAL ANALYSIS REPORT" PREPARED BY PAUL J.
FORD AND COMPANY , STRUCTURAL ENGINEERS,
"T-MOBILE SITE ID CT1070C", DATED JULY 26, 2016.



EXISTING ANTENNA

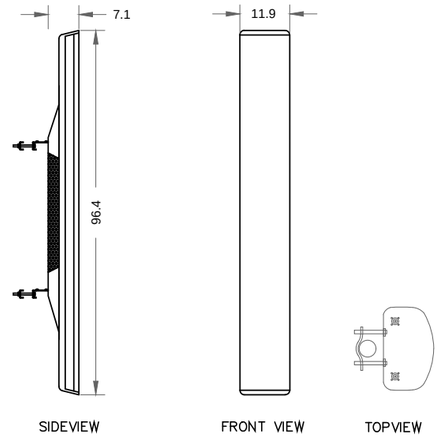


MANUFACTURER: ERICSSON
MODEL NO.:ERICSSON AIR32 AIR32 B66Aa/B2a
DIMENSIONS – HxWxD, (IN) 56.6"x12.9"x8.7"

ERICSSON AIR32 B66Aa/B2a ANTENNA DETAILS

1 / A-2

SCALE: N.T.S

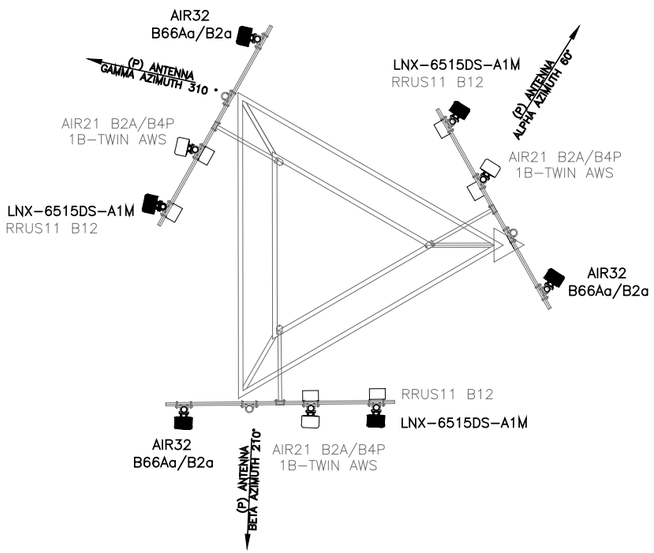


MANUFACTURE: COMMSCOPE
MODEL NO. LNX-6515DS-VTM
DIMENSIONS – HxWxD, (IN) 96.4x11.9x7.1
WEIGHT – 50.3 LB

COMMSCOPE LNX-6515DS-VTM ANTENNA DETAILS

3 / A-2

SCALE: N.T.S

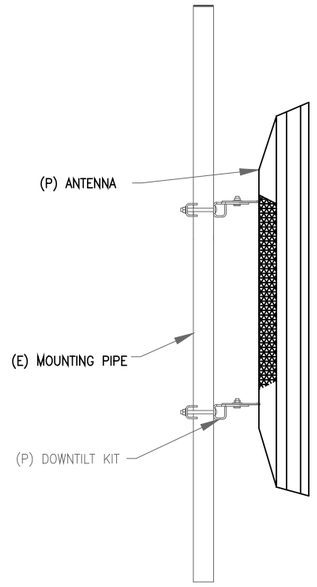


PROPOSED ANTENNA

ANTENNA PLAN

SCALE: N.T.S

4 / A-2



ANTENNA MOUNT DETAILS

SCALE: N.T.S

2 / A-2

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ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CT11170C
DRAWN BY:	FG
CHECKED BY:	KM

PROFESSIONAL SEAL

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HARTFORD/ N. BRITAIN AVE_1
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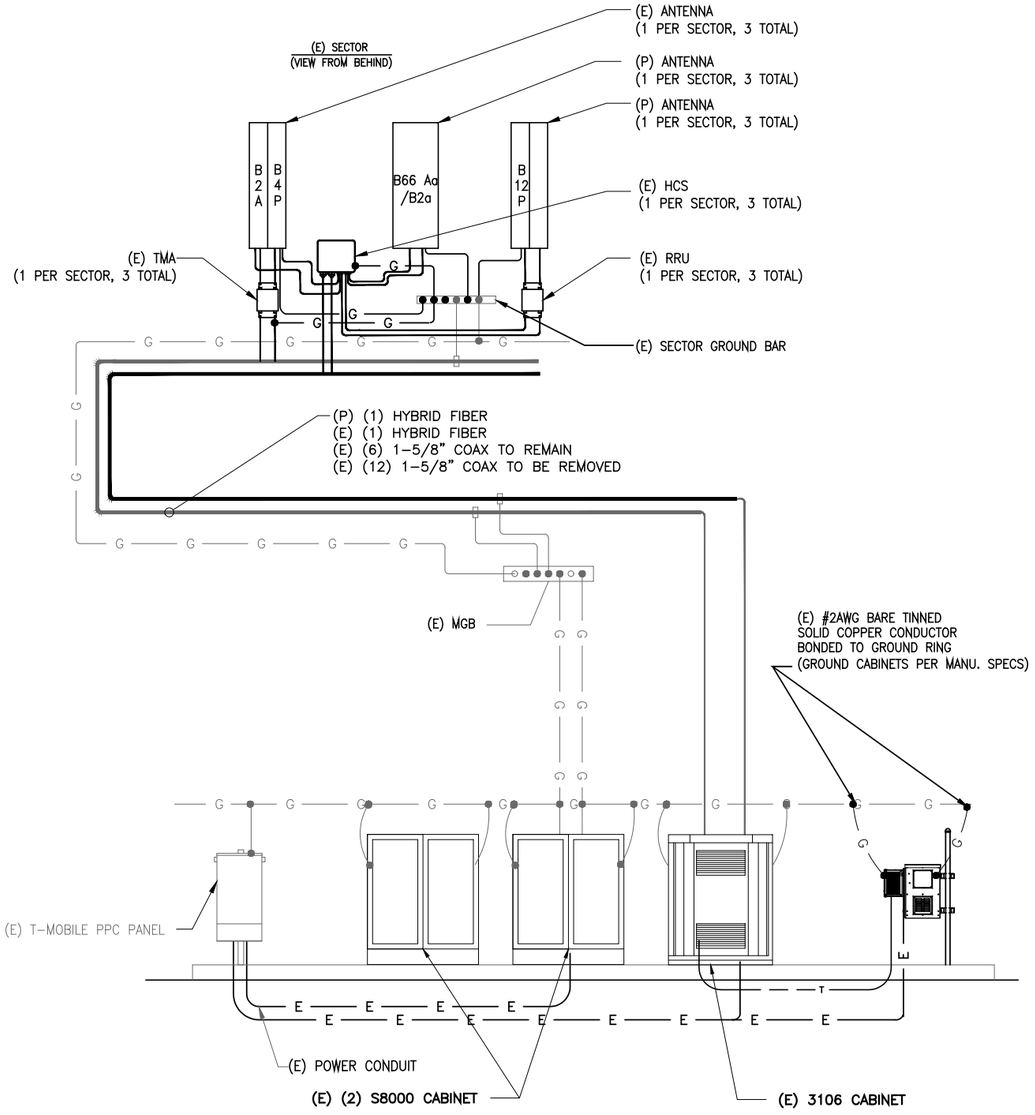
1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

SHEET TITLE
ANTENNA PLAN AND DETAILS

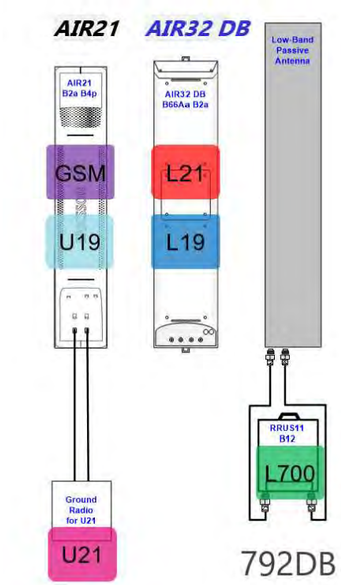
SHEET NUMBER
A-2

NOTES:
A. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.N.
B. DO NOT INSTALL GROUND KIT AT BEND. DIRECT GROUND WIRE DOWN TO ANTENNA BUSSBAR.
C. PROVIDE GROUNDING ELECTRODES IN QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
D. ADD COAX GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF COAX RUN (FROM EQUIPMENT TO ANTENNA) IS GREATER THAN 20'-0".
E. GROUND HCS BOX W/ #2AWG GROUNDING CONDUCTOR ATTACHED TO GOOD GROUND AS DIRECT AND SHORT AS POSSIBLE. USE GREEN STRANDED INSULATED CONDUCTOR TO CONNECT TO BUSSBAR/GROUND HALO OR BARE TINNED SOLID COPPER CONDUCTOR TO CONNECT TO GROUND RING.



GROUNDING AND ONE LINE DIAGRAM 1 E-1

SCALE: N.T.S



TRUNK FIBER NOTES:
1. IN GENERAL THIS CABLE WILL HANDLE SIMILARLY TO 7/8" COAXIAL CABLE, AND SIMILAR INSTALLATION TECHNIQUES APPLY. ALL CABLES ARE INDIVIDUALLY SERIALIZED, BE SURE TO WRITE DOWN THE CABLE SERIAL NUMBER FOR FUTURE REFERENCE.
2. THE TERMINATED FIBER ENDS (THE BROKEN OUT FIBERS PLUS CONNECTORS) HOWEVER ARE FRAGILE, AND THESE MUST BE PROTECTED DURING THE INSTALLATION PROCESS.
3. LEAVE THE PROTECTIVE TUBE AND SOCK AROUND THE FIBER TAILS AND CONNECTORS IN PLACE DURING HOISTING AND SECURING THE CABLE. REMOVE THIS ONLY JUST PRIOR TO MAKING THE FINAL CONNECTIONS TO THE OVP BOX.
4. DO NOT BEND THE FIBER ENDS (IN THE ORANGE FURCATION TUBES) TIGHTER THAN ¾" (19MM) BEND RADIUS, ELSE THERE IS A RISK OF BREAKING THE GLASS FIBERS.
5. BE SURE THAT THE LACE UP ENDS AND FIBER CONNECTORS ARE NOT DAMAGED BY ATTACHMENT OF A HOISTING GRIP OR DURING THE HOISTING PROCESS. ATTACH A HOISTING GRIP ON THE JACKETED CABLE NO LESS THAN 6 INCHES BELOW THE FIBER BREAKOUT POINT. IF A HOISTING GRIP IS NOT EASILY ATTACHED, USE A SIMPLE LINE ATTACHED BELOW THE FIBER BREAK-OUT POINT (I.E. AT THE CABLE OUTER JACKET). PREVENT THE FIBER TAILS (IN PROTECTIVE TUBE) AT THE CABLE END FROM UNDUE MOVEMENT DURING HOISTING BY SECURING THE PROTECTIVE TUBE (WITH OUTER SOCK) TO THE HOISTING LINE.
6. DURING HOISTING ENSURE THAT THERE IS A FREE PATH AND THAT THE CABLE, AND ESPECIALLY THE FIBER ENDS, WILL NOT BE SNAGGED ON TOWER MEMBERS OR OTHER OBSTACLES.
7. INSTALLATION TEMPERATURE RANGE IS -22F TO 158F (-30C TO +70C).
8. MINIMUM CABLE BEND RADII ARE 22.2" (565MM) LOADED (WITH TENSION ON THE CABLE) AND 11.1" (280MM) UNLOADED.
9. MAXIMUM CABLE TENSILE LOAD IS 3560 N (800 LB) SHORT TERM (DURING INSTALLATION) AND 1070 N (240 LB) LONG TERM.
10. COMMSCOPE NON LACE UP GRIP RECOMMENDED FOR MONOPOLE INSTALLATIONS.
11. MAXIMUM HANGER SPACING 3FT (0.9 M).

HYBRID FIBER/POWER JUMPER NOTES:
1. IN GENERAL THIS CABLE WILL HANDLE SIMILARLY TO A 3/8" COAXIAL CABLE.
2. THE TERMINATED FIBER ENDS HOWEVER ARE FRAGILE AND MUST BE PROTECTED DURING INSTALLATION. LEAVE THE PACKAGING AROUND THE FIBER ENDS IN PLACE UNTIL READY TO CONNECT THE JUMPER BETWEEN OVP AND RRU OR BBU.
3. DO NOT BEND THE FIBER BREAKOUT CABLE (BETWEEN THE MAIN CABLE AND THE FIBER CONNECTOR) TIGHTER THAN ¾" (19MM) RADIUS, ELSE THERE IS A RISK OF BREAKING THE GLASS.
4. ATTACH THE MAIN CABLE SECURELY TO THE STRUCTURE OR EQUIPMENT USING HANGERS AND/OR CABLE TIES TO PREVENT STRAIN ON CONNECTIONS FROM MOVEMENT IN WIND OR SNOW/ICE CONDITIONS.
5. ENSURE THE LC FIBER CONNECTORS ARE SEATED FIRMLY IN PANEL IN OVP OR IN EQUIPMENT.
6. INSTALLATION TEMPERATURE RANGE IS -22F TO 158F (-30C TO 70C).
7. MINIMUM CABLE BEND RADII ARE 10.3 INCH (265MM) LOADED (WITH TENSION ON THE CABLE) AND 5.2 INCH (130MM) UNLOADED.
8. MAXIMUM CABLE TENSILE LOAD IS 350 LB (1560N) SHORT TERM (DURING INSTALLATION) AND 105 LB (470N) LONG TERM.
9. STANDARD LENGTHS AVAILABLE ARE 6 FEET, 15 FEET AND 20 FEET

792DB CONFIGURATION
COAX/FIBER PLUMBING DIAGRAM 2 E-1

SCALE: N.T.S

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RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

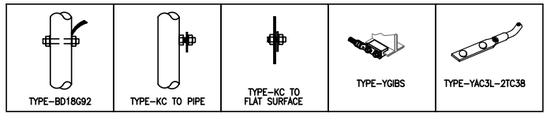
PROJECT NO: CT11170C
DRAWN BY: FG
CHECKED BY: KM

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

SITE NUMBER
CT11170C
SITE NAME
HARTFORD/ N. BRITAIN AVE_1
SITE ADDRESS
1030 NEW BRITAIN AVE
WEST HARTFORD, CT 06110

SHEET TITLE
GROUNDING AND ONE LINE DIAGRAM
COAX/FIBER DIAGRAM

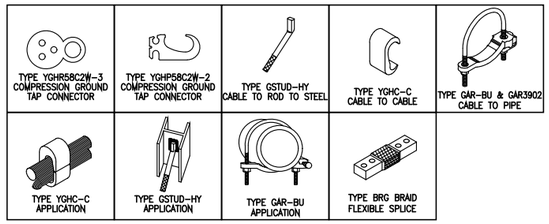
SHEET NUMBER
E-1



BURNDY GROUNDING DETAILS

1 E-2

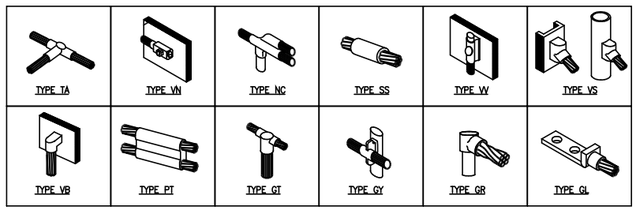
SCALE: N.T.S



BURNDY GROUNDING PRODUCTS

2 E-2

SCALE: N.T.S



CADWELD GROUNDING CONNECTION PRODUCTS

3 E-2

SCALE: N.T.S

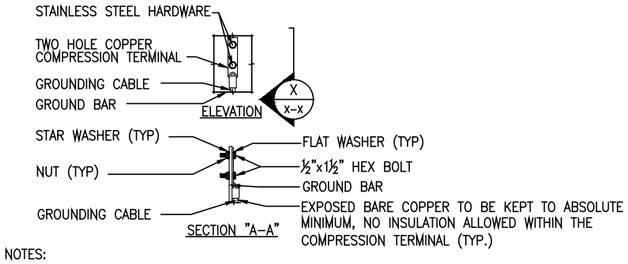
TERMINATION TYPES:
A. MECHANICAL COMPRESSION LUG
B. DOUBLE BARRELL COMPRESSION CONNECTOR
C. EXOTHERMIC TERMINATION
D. BEAM CLAMP

	SOLID #2 TINNED COPPER	#6 GROUND LEAD	#2/0 STRANDED MAIN DOWN CONDUCTOR	MASTER GRND BAR	STRUCTURAL OR TOWER STEEL	BLDG SERVICE ENTR OR GRND RING	GROUND ROD
SOLID #2 TINNED COPPER	B OR C	B OR C		C	A, C, OR D		C
#6 GROUND LEAD	B OR C			A	A, C, OR D		
#2/0 STRANDED GRNDG ELECTRODE CONDUCTOR				A	A, C, OR D	A	
MASTER GROUND BAR	C	A	A				
STRUCTURAL OR TOWER STEEL	A, C, OR D	A, C, OR D	A, C, OR D				
GROUND RING	C		C				C

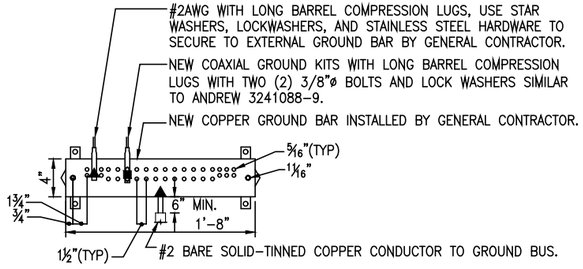
GROUNDING TERMINATION MATRIX

7 E-2

SCALE: N.T.S



NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

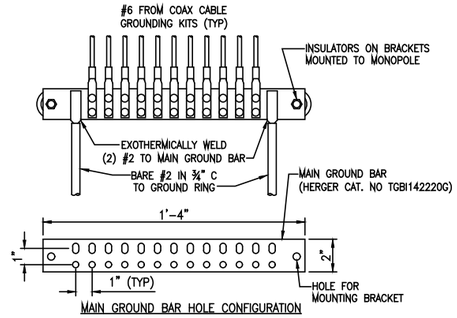


NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

TYPICAL GROUND BAR CONNECTIONS DETAIL

4 E-2

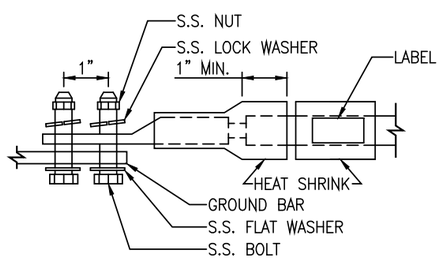
SCALE: N.T.S



GROUND BAR DETAIL

5 E-2

SCALE: N.T.S



LUG NOTES:
1. ALL HARDWARE IS 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS.
2. ALL HARDWARE SHALL BE S.S. ⅜"ø OR LARGER.
3. FOR GROUND BOND TO STEEL ONLY: INSERT A DRAGON TOOTH WASHER BETWEEN LUG AND STEEL. COAT ALL SURFACES WITH ANTI-OXIDIZATION COMPOUND PRIOR TO MATING.

GROUND BAR DETAIL

6 E-2

SCALE: N.T.S

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RFE			
RF MAN.			
ZONING			
OPS			
CONSTR.			
SITE AC.			

PROJECT NO:	CT11170C
DRAWN BY:	FG
CHECKED BY:	KM

STATE OF CONNECTICUT
HOSSEIN VAHEDI
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LICENSED ARCHITECT
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SITE ADDRESS
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WEST HARTFORD, CT 06110

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-2

Exhibit D

PJF PAUL J. FORD & COMPANY

Report Date: July 26, 2016

Client: Hirschfeld Communications, LLC
1030 New Britain Avenue
West Hartford, CT
Attn: Ian Ormesher
Phone: 860.953.7000

Structure: Existing 180-ft Tower
Site Name: WESTHARTFORD_DEXTERST
Site Reference: CT0001
City, County, State: West Hartford, Hartford County, CT

PJF Project: 64116-0002.002.8700

Paul J. Ford and Company is pleased to submit this "**Structural Analysis Report**" to determine the structural integrity of the above mentioned tower. The purpose of this analysis is to determine the acceptability of the tower stress level.

Analysis Criteria:

Reference Standard:	TIA/EIA-222-F Standard, "Structural Standard for Antenna Supporting Structures and Antennas" and the 2005 CT State Building Code
Basic Wind Speed:	80 mph fastest mile wind speed without ice
Wind Speed with Ice:	69.3 mph fastest mile speed with 0.50" radial ice
Service Wind Speed:	50.0 mph (Operational) without ice

Proposed Appurtenance Loads:
The structure was analyzed with the addition of the proposed appurtenance loads shown in Table 1 combined with the existing and reserved loads shown in Table 2 of this report.

Summary of Analysis Results:

Existing Structure:	96.3%	**Pass***
Existing Foundation:	44.7%	**Pass***

***The tower and its foundations will have sufficient capacity to carry the existing and proposed loads once the loading changes described in Section 4.1 of this report are made.**

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:

Jonathan Sommer, EI
Structural Designer
jsommer@pjfweb.com

(CMH)

STATE OF CONNECTICUT
JOSEPH PACHICARAH JACOBS
No. PEN 22731
LICENSED PROFESSIONAL ENGINEER

JUL 27 2016

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 180 ft Self Support tower designed by PiROD in June of 1998. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 69.3 mph with 0.5 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
165.0	165.0	3	commscope	LNX-6515DS-A1M w/ Mount Pipe	1	Fiber	-
		3	ericsson	AIR 32 B4A/B2P w/ Mount Pipe			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
180.0	180.0	3	powerwave technologies	7770.00 w/ Mount Pipe	-	-	3
		3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	-	-	2
		3	ericsson	RRUS A2 MODULE			
		6	powerwave technologies	LGP21901			
		1	raycap	DC6-48-60-18-8F			
		3	cci antennas	OPA-65R-LCUU-H6 w/ Mount Pipe	12 2 4	1-5/8 Fiber DC	1
		3	ericsson	RRUS 11			
		3	ericsson	RRUS 12			
		3	ericsson	RRUS 32			
		1	miscl	GPS			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 405-1]			
165.0	165.0	3	ericsson	AIR 21 B2A/B4P w/ Mount Pipe	6 1	1-5/8 Fiber	
		3	ericsson	KRY 112 71			
		3	ericsson	RRUS 11 B12			
		1	tower mounts	Sector Mount [SM 402-3]			
		-			12	1-5/8	3
159.0	159.0	2	andrew	Andrew VHLP2-18	6 1 1	1/2 Ethernet DC	1
		3	kathrein	840 10045			
		3	miscl	RRH (22" x 12" x 9.4")			
		5	tower mounts	4'x2" Pipe Mount			
		1	tower mounts	Sector Mount [SM 411-3]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks
Manufacturer Drawings	PiROD Inc., 203949-B, 6/10/1998
Geotechnical Report	PiROD Inc., 6/5/1998

3.1) Analysis Method

tnxTower (version 7.0.5.1), 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.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.
5) Feedlines must be installed in the configuration shown in Appendix B in order for the results of this analysis to be considered valid.

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	1	-11.49	48.44	23.7	Pass
T2	170 - 150	Leg	2" solid	37	-57.06	97.53	58.5	Pass
T3	150 - 130	Leg	2 1/4" solid	101	-114.46	128.80	88.9	Pass
T4	130 - 120	Leg	Pirod 105216 (12x1.25)	165	-118.42	122.94	96.3	Pass
T5	120 - 100	Leg	Pirod 105217 (12x1.5)	174	-150.84	184.67	81.7	Pass
T6	100 - 80	Leg	Pirod 105217 (12x1.5)	189	-177.39	184.67	96.1	Pass
T7	80 - 60	Leg	Pirod 105218 (12x1.75)	204	-203.04	258.24	78.6	Pass
T8	60 - 40	Leg	Pirod 105218 (12x1.75)	219	-227.39	258.24	88.1	Pass
T9	40 - 20	Leg	Pirod 105219 (12x2)	234	-251.66	343.62	73.2	Pass
T10	20 - 0	Leg	Pirod 105219 (12x2)	249	-273.96	343.62	79.7	Pass
T1	180 - 170	Diagonal	3/4" solid	10	-2.07	5.36	38.7	Pass
T2	170 - 150	Diagonal	7/8" solid	50	-5.47	8.23	66.5	Pass
T3	150 - 130	Diagonal	1" solid	114	-5.46	11.87	46.0	Pass
T4	130 - 120	Diagonal	L 2.5 x 2.5 x 3/16	172	-8.16	12.23	66.8	Pass
T5	120 - 100	Diagonal	L 2.5 x 2.5 x 3/16	181	-5.64	9.65	58.5	Pass
T6	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	196	-5.55	7.63	72.7	Pass
T7	80 - 60	Diagonal	L 3 x 3 x 3/16	211	-5.53	10.68	51.8	Pass
T8	60 - 40	Diagonal	L 3 x 3 x 3/16	226	-5.67	8.62	65.7	Pass
T9	40 - 20	Diagonal	L 3 x 3 x 5/16	241	-6.05	11.34	53.3	Pass
T10	20 - 0	Diagonal	L 3 x 3 x 5/16	256	-7.70	9.38	82.1	Pass
T1	180 - 170	Horizontal	7/8" solid	30	-0.30	5.41	5.5	Pass
T2	170 - 150	Horizontal	7/8" solid	59	-0.73	4.60	15.9	Pass
T3	150 - 130	Horizontal	7/8" solid	158	-1.44	4.22	34.2	Pass
T1	180 - 170	Top Girt	7/8" solid	6	-1.02	5.41	18.8	Pass
T2	170 - 150	Top Girt	7/8" solid	41	-1.22	5.48	22.2	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T3	150 - 130	Top Girt	1" solid	105	-1.94	7.40	26.3	Pass
T1	180 - 170	Bottom Girt	7/8" solid	7	-0.88	5.41	16.3	Pass
T2	170 - 150	Bottom Girt	7/8" solid	44	-2.30	4.35	52.9	Pass
T3	150 - 130	Bottom Girt	1" solid	107	-2.24	6.01	37.2	Pass
							Summary	
						Leg (T4)	96.3	Pass
						Diagonal (T10)	82.1	Pass
						Horizontal (T3)	34.2	Pass
						Top Girt (T3)	26.3	Pass
						Bottom Girt (T2)	52.9	Pass
						Bolt Checks	67.8	Pass
						RATING =	96.3	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Foundation	0	44.7	Pass

Structure Rating (max from all components) =	96.3%

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

4.1) Recommendations

The tower and its foundations will have sufficient capacity to carry the existing and proposed loads once the following loading changes are made.

- Stack (2) 1-5/8” fiber cables on (6) 1-5/8” lines to 165’ as shown in Appendix B of this report.

APPENDIX A

TNXTOWER OUTPUT

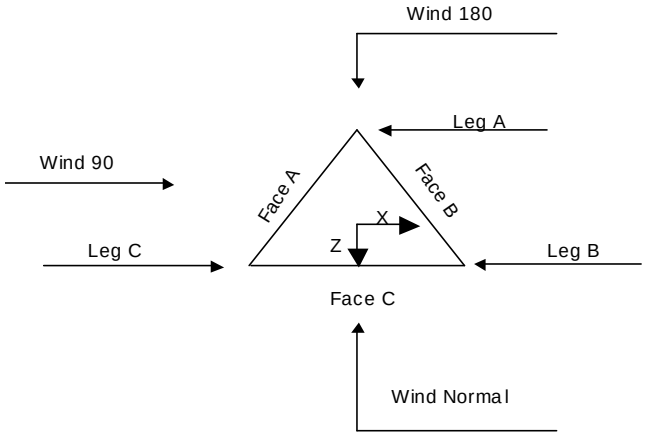
Tower Input Data

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/EIA-222-F standard.
The following design criteria apply:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 80.0 mph.
3) Nominal ice thickness of 0.50 in.
4) Ice density of 56 pcf.
5) A wind speed of 69.3 mph is used in combination with ice.
6) Deflections calculated using a wind speed of 50.0 mph.
7) A non-linear (P-delta) analysis was used.
8) Pressures are calculated at each section.
9) Stress ratio used in tower member design is 1.333.
10) 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				



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 105216 (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	7/8" solid	A572-50 (50 ksi)
T2 170.00-150.00	None	Solid Round		A36 (36 ksi)	Solid Round	7/8" 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	36.00	36.00	36.00
T2 170.00-	0.00	0.00	A36	1	1	1.03	54.00	54.00	36.00

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
150.00			(36 ksi)						
T3 150.00-130.00	0.00	0.00	A36 (36 ksi)	1	1	1.03	36.00	36.00	36.00
T4 130.00-120.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T5 120.00-100.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T6 100.00-80.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T7 80.00-60.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T8 60.00-40.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T9 40.00-20.00	0.00	0.50	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00
T10 20.00-0.00	0.00	0.75	A36 (36 ksi)	1	1	1.05	36.00	36.00	36.00

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	No	1	0.9 0.9	0.7 0.7	0.7 0.7	0.7 0.7	0.7 0.7	0.7 0.7	1 1
T2 170.00-150.00	No	No	1	0.9 0.9	0.7 0.7	0.7 0.7	0.7 0.7	0.7 0.7	0.7 0.7	1 1
T3 150.00-130.00	No	No	1	0.9 0.9	0.7 0.7	0.7 0.7	0.7 0.7	0.7 0.7	0.7 0.7	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)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — 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 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	1.00 A325N	0	1.00 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	1.00 A325N	0	1.00 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	1.25 A325N	0	1.25 A325N	0	1.25 A325N	0	1.25 A325N	0	1.25 A325N	0

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.
T10 20.00-0.00	Flange	1.25 F1554-105	6	1.25 A325N	1	1.25 A325N	0	1.00 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	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	Yes	Ar (CfAe)	180.00 - 8.00	0.00	-0.45	12	6	1.00 0.50	1.98		0.92
FSJ4-50B(1/2")	A	Yes	Ar (CfAe)	180.00 - 8.00	0.00	-0.45	2	2	2.00 0.50	0.52		0.14
9776(3/4") ***	A	Yes	Ar (CfAe)	180.00 - 8.00	0.00	-0.45	4	4	2.00 0.50	0.73		0.31
LDF7-50A (1 5/8" foam) ***	A	Yes	Ar (CfAe)	165.00 - 8.00	0.00	0.45	8	6	1.00 0.50	1.98		0.92
LDF4-50A (1/2" foam) ***	C	Yes	Ar (CfAe)	159.00 - 8.00	0.00	-0.48	8	8	0.63	0.63		0.15

Discrete Tower Loads

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
Platform Mount [LP 405-1]	C	None		0.000	180.00	No Ice 1/2" Ice	20.80 28.10	20.80 28.10	1.80 2.07
7770.00 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	6.22 6.71	4.82 5.51	0.09 0.14
7770.00 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	6.22 6.71	4.82 5.51	0.09 0.14
7770.00 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	6.22 6.71	4.82 5.51	0.09 0.14
(2) LGP21401	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	1.29 1.45	0.36 0.48	0.01 0.02
(2) LGP21401	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	1.29 1.45	0.36 0.48	0.01 0.02
(2) LGP21401	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	1.29 1.45	0.36 0.48	0.01 0.02
DC6-48-60-18-8F	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	1.47 1.67	1.47 1.67	0.02 0.04
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	10.60 11.27	7.18 8.36	0.10 0.18
OPA-65R-LCUU-H6 w/	B	From Leg	4.00	0.000	180.00	No Ice	10.60	7.18	0.10

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
Mount Pipe			0.00 0.00			1/2" Ice	11.27	8.36	0.18
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	10.60 11.27	7.18 8.36	0.10 0.18
RRUS 11	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	0.05 0.07
RRUS 11	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	0.05 0.07
RRUS 11	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.26 3.50	1.38 1.56	0.05 0.07
RRUS 12	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.67 3.93	1.49 1.67	0.06 0.08
RRUS 12	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.67 3.93	1.49 1.67	0.06 0.08
RRUS 12	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.67 3.93	1.49 1.67	0.06 0.08
RRUS A2 MODULE	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	1.87 2.05	0.42 0.53	0.02 0.03
RRUS A2 MODULE	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	1.87 2.05	0.42 0.53	0.02 0.03
RRUS A2 MODULE	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	1.87 2.05	0.42 0.53	0.02 0.03
GPS	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	0.20 0.27	0.20 0.27	0.02 0.02
(2) LGP21901	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	0.01 0.01
(2) LGP21901	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	0.01 0.01
(2) LGP21901	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	0.27 0.34	0.18 0.25	0.01 0.01
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	10.60 11.27	7.18 8.36	0.10 0.18
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	10.60 11.27	7.18 8.36	0.10 0.18
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	10.60 11.27	7.18 8.36	0.10 0.18
RRUS 32	A	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.33 3.60	1.98 2.21	0.06 0.08
RRUS 32	B	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.33 3.60	1.98 2.21	0.06 0.08
RRUS 32	C	From Leg	4.00 0.00 0.00	0.000	180.00	No Ice 1/2" Ice	3.33 3.60	1.98 2.21	0.06 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	1.47 1.67	1.47 1.67	0.02 0.04

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
***									
Sector Mount [SM 402-3]	C	From Leg	0.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	18.91 26.78	18.91 26.78	0.85 1.23
AIR 21 B2A/B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	6.65 7.17	5.55 6.38	0.10 0.16
AIR 21 B2A/B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	6.65 7.17	5.55 6.38	0.10 0.16
AIR 21 B2A/B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	6.65 7.17	5.55 6.38	0.10 0.16
KRY 112 71	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	0.68 0.80	0.45 0.56	0.01 0.02
KRY 112 71	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	0.68 0.80	0.45 0.56	0.01 0.02
KRY 112 71	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	0.68 0.80	0.45 0.56	0.01 0.02
RRUS 11 B12	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	0.05 0.07
RRUS 11 B12	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	0.05 0.07
RRUS 11 B12	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	3.31 3.55	1.36 1.54	0.05 0.07
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	11.68 12.40	9.84 11.37	0.08 0.17
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	11.68 12.40	9.84 11.37	0.08 0.17
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	11.68 12.40	9.84 11.37	0.08 0.17
AIR 32 B4A/B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	7.65 8.20	6.40 7.33	0.13 0.19
AIR 32 B4A/B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	7.65 8.20	6.40 7.33	0.13 0.19
AIR 32 B4A/B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice	7.65 8.20	6.40 7.33	0.13 0.19
***									
Sector Mount [SM 411-3]	C	From Leg	0.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	21.88 30.68	21.88 30.68	1.07 1.48
(2) 4'x2'' Pipe Mount	A	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	0.79 1.03	0.79 1.03	0.03 0.03
4'x2'' Pipe Mount	B	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	0.79 1.03	0.79 1.03	0.03 0.03
(2) 4'x2'' Pipe Mount	C	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	0.79 1.03	0.79 1.03	0.03 0.03
840 10045	A	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	2.96 3.27	2.96 3.27	0.04 0.07

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
840 10045	B	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	2.96 3.27	2.96 3.27	0.04 0.07
840 10045	C	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	2.96 3.27	2.96 3.27	0.04 0.07
RRH (22" x 12" x 9.4")	A	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	2.57 2.79	2.01 2.22	0.01 0.03
RRH (22" x 12" x 9.4")	B	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	2.57 2.79	2.01 2.22	0.01 0.03
RRH (22" x 12" x 9.4")	C	From Leg	4.00 0.00 0.00	0.000	159.00	No Ice 1/2" Ice	2.57 2.79	2.01 2.22	0.01 0.03
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
Andrew VHLP2-18	A	Paraboloid w/Radome	From Leg	4.00 0.00 0.00	0.000		159.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.03 0.05
Andrew VHLP2-18	C	Paraboloid w/Radome	From Leg	4.00 0.00 0.00	0.000		159.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.03 0.05
***											

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105216 (12x1.25)	2176.93	3447.56	0.60	0.46	7.56	11.97	3.68
Pirod 105217 (12x1.5)	2303.92	3618.80	0.71	0.47	8.00	12.57	5.30
Pirod 105217 (12x1.5)	2303.92	3618.80	0.71	0.47	8.00	12.57	5.30
Pirod 105218 (12x1.75)	2432.86	3798.39	0.85	0.49	8.45	13.19	7.22
Pirod 105218 (12x1.75)	2432.86	3798.39	0.85	0.49	8.45	13.19	7.22
Pirod 105219 (12x2)	2608.79	4065.88	1.22	0.53	9.06	14.12	9.42
Pirod 105219 (12x2)	2608.79	4065.88	1.22	0.53	9.06	14.12	9.42

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	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	9.96	35	0.591	0.126
T2	170 - 150	8.67	35	0.580	0.126
T3	150 - 130	6.27	35	0.518	0.096
T4	130 - 120	4.25	35	0.404	0.061
T5	120 - 100	3.47	35	0.334	0.044
T6	100 - 80	2.24	35	0.247	0.026
T7	80 - 60	1.35	35	0.170	0.016
T8	60 - 40	0.73	35	0.118	0.010
T9	40 - 20	0.32	35	0.069	0.005
T10	20 - 0	0.09	35	0.034	0.002

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]	35	9.96	0.591	0.126	44135
165.00	Sector Mount [SM 402-3]	35	8.05	0.570	0.121	18897
159.00	Andrew VHLP2-18	35	7.31	0.553	0.112	16101

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 170	29.29	23	1.670	0.388
T2	170 - 150	25.67	23	1.643	0.384
T3	150 - 130	18.82	23	1.490	0.293
T4	130 - 120	12.96	23	1.188	0.189
T5	120 - 100	10.63	23	0.996	0.136
T6	100 - 80	6.91	23	0.749	0.081
T7	80 - 60	4.19	23	0.521	0.049
T8	60 - 40	2.27	23	0.364	0.030
T9	40 - 20	0.99	23	0.215	0.015
T10	20 - 0	0.27	23	0.105	0.007

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]	23	29.29	1.670	0.388	17496
165.00	Sector Mount [SM 402-3]	23	23.90	1.619	0.369	7590
159.00	Andrew VHLP2-18	23	21.82	1.577	0.342	6544

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.63	5	2.14	12.89	0.166 ✔	1.333	Bolt DS
T2	170	Leg	A325N	0.75	5	10.29	18.56	0.554 ✔	1.333	Bolt DS
T3	150	Leg	A325N	1.00	6	16.96	34.52	0.491 ✔	1.333	Bolt Tension
T4	130	Leg	A325N	1.00	6	17.05	34.56	0.493 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.00	1	7.00	7.75	0.903 ✔	1.333	Member Block Shear
T5	120	Leg	A325N	1.00	6	21.28	34.56	0.616 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.00	1	6.35	7.75	0.820 ✔	1.333	Member Block Shear
T6	100	Leg	A325N	1.00	6	24.67	34.56	0.714 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.00	1	4.94	7.75	0.638 ✔	1.333	Member Block Shear
T7	80	Leg	A325N	1.00	6	27.84	34.56	0.805 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.00	1	5.12	8.43	0.607 ✔	1.333	Member Block Shear
T8	60	Leg	A325N	1.00	6	30.80	34.56	0.891 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.00	1	5.28	8.43	0.626 ✔	1.333	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T9	40	Leg	A325N	1.25	6	33.58	54.00	0.622 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.25	1	5.65	14.95	0.378 ✔	1.333	Member Block Shear
T10	20	Leg	F1554-105	1.25	6	36.07	50.62	0.713 ✔	1.333	Bolt Tension
		Diagonal	A325N	1.25	1	6.31	14.95	0.422 ✔	1.333	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	180 - 170	1 1/2" solid	10.00	2.25	72.0 K=1.00	20.56	1.77	-11.49	36.34	0.316 ✔
T2	170 - 150	2" solid	20.00	2.36	56.6 K=1.00	23.29	3.14	-57.06	73.16	0.780 ✔
T3	150 - 130	2 1/4" solid	20.00	2.36	50.3 K=1.00	24.30	3.98	-114.46	96.62	1.185 ✔
T4	130 - 120	Pirod 105216 (12x1.25)	10.02	10.02	45.4 K=1.00	25.05	3.68	-118.42	92.23	1.284 ✔
T5	120 - 100	Pirod 105217 (12x1.5)	20.03	10.02	37.8 K=1.00	26.13	5.30	-150.84	138.54	1.089 ✔
T6	100 - 80	Pirod 105217 (12x1.5)	20.03	10.02	37.8 K=1.00	26.13	5.30	-177.39	138.54	1.280 ✔
T7	80 - 60	Pirod 105218 (12x1.75)	20.03	10.02	32.4 K=1.00	26.85	7.22	-203.04	193.73	1.048 ✔
T8	60 - 40	Pirod 105218 (12x1.75)	20.03	10.02	32.4 K=1.00	26.85	7.22	-227.39	193.73	1.174 ✔
T9	40 - 20	Pirod 105219 (12x2)	20.03	10.02	28.4 K=1.00	27.35	9.42	-251.66	257.78	0.976 ✔
T10	20 - 0	Pirod 105219 (12x2)	20.03	10.02	28.4 K=1.00	27.35	9.42	-273.96	257.78	1.063 ✔

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T4	130 - 120	0.5	1.48	121.0	10.13	0.20	0.94	2.23	0.424 ✔
T5	120 - 100	0.5	1.47	120.0	10.28	0.20	0.73	2.26	0.323 ✔
T6	100 - 80	0.5	1.47	120.0	10.28	0.20	0.21	2.26	0.091 ✔
T7	80 - 60	0.5	1.46	119.0	10.42	0.20	0.19	2.29	0.082 ✔
T8	60 - 40	0.5	1.46	119.0	10.42	0.20	0.20	2.29	0.089 ✔
T9	40 - 20	0.625	1.45	94.4	13.67	0.31	0.21	4.69	0.045 ✔

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T10	20 - 0	0.625	1.45	94.4	13.67	0.31	0.84	4.69	0.180

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	3/4" solid	4.59	2.22	128.0 K=0.90	9.11	0.44	-2.07	4.02	0.515
T2	170 - 150	7/8" solid	5.04	2.44	120.6 K=0.90	10.26	0.60	-5.47	6.17	0.886
T3	150 - 130	1" solid	5.49	2.66	114.8 K=0.90	11.34	0.79	-5.46	8.90	0.613
T4	130 - 120	L 2.5 x 2.5 x 3/16	11.42	4.98	120.8 K=1.00	10.17	0.90	-8.16	9.17	0.890
T5	120 - 100	L 2.5 x 2.5 x 3/16	12.50	5.63	136.4 K=1.00	8.02	0.90	-5.64	7.24	0.780
T6	100 - 80	L 2.5 x 2.5 x 3/16	13.80	6.33	153.4 K=1.00	6.35	0.90	-5.55	5.73	0.969
T7	80 - 60	L 3 x 3 x 3/16	15.24	7.08	142.5 K=1.00	7.35	1.09	-5.53	8.01	0.690
T8	60 - 40	L 3 x 3 x 3/16	16.80	7.88	158.6 K=1.00	5.94	1.09	-5.67	6.47	0.876
T9	40 - 20	L 3 x 3 x 5/16	18.45	8.68	176.8 K=1.00	4.78	1.78	-6.05	8.51	0.711
T10	20 - 0	L 3 x 3 x 5/16	20.16	9.54	194.4 K=1.00	3.95	1.78	-7.70	7.03	1.094

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	7/8" solid	4.00	3.88	148.8 K=0.70	6.74	0.60	-0.30	4.06	0.073
T2	170 - 150	7/8" solid	4.37	4.20	161.3 K=0.70	5.74	0.60	-0.73	3.45	0.212
T3	150 - 130	7/8" solid	4.57	4.39	168.4 K=0.70	5.27	0.60	-1.44	3.17	0.455

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	7/8" solid	4.00	3.88	148.8 K=0.70	6.74	0.60	-1.02	4.06	0.251
T2	170 - 150	7/8" solid	4.01	3.85	147.7 K=0.70	6.84	0.60	-1.22	4.11	0.296
T3	150 - 130	1" solid	4.51	4.33	145.4	7.07	0.79	-1.94	5.55	0.350

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=0.70					✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	7/8" solid	4.00	3.88	148.8 K=0.70	6.74	0.60	-0.88	4.06	0.217 ✔
T2	170 - 150	7/8" solid	4.49	4.32	165.9 K=0.70	5.43	0.60	-2.30	3.26	0.705 ✔
T3	150 - 130	1" solid	4.99	4.80	161.2 K=0.70	5.75	0.79	-2.24	4.51	0.496 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	1 1/2" solid	10.00	0.50	16.0	30.00	1.77	10.68	53.01	0.201 ✔
T2	170 - 150	2" solid	20.00	0.57	13.6	32.50	2.19	51.44	71.13	0.723 # ✔
T3	150 - 130	2 1/4" solid	20.00	0.57	12.1	30.00	3.98	101.78	119.28	0.853 ✔
T4	130 - 120	Pirod 105216 (12x1.25)	10.02	10.02	45.4	30.00	3.68	102.31	110.45	0.926 ✔
T5	120 - 100	Pirod 105217 (12x1.5)	20.03	10.02	37.8	30.00	5.30	127.68	159.04	0.803 ✔
T6	100 - 80	Pirod 105217 (12x1.5)	20.03	10.02	37.8	30.00	5.30	148.00	159.04	0.931 ✔
T7	80 - 60	Pirod 105218 (12x1.75)	20.03	10.02	32.4	30.00	7.22	167.02	216.47	0.772 ✔
T8	60 - 40	Pirod 105218 (12x1.75)	20.03	10.02	32.4	30.00	7.22	184.78	216.47	0.854 ✔
T9	40 - 20	Pirod 105219 (12x2)	20.03	10.02	28.4	30.00	9.42	201.47	282.74	0.713 ✔
T10	20 - 0	Pirod 105219 (12x2)	20.03	10.02	28.4	30.00	9.42	216.43	282.74	0.765 ✔

Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T4	130 - 120	0.5	1.48	121.0	10.13	0.20	0.94	2.23	0.424 ✔

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T5	120 - 100	0.5	1.47	120.0	10.28	0.20	0.73	2.26	0.323 ✔
T6	100 - 80	0.5	1.47	120.0	10.28	0.20	0.21	2.26	0.091 ✔
T7	80 - 60	0.5	1.46	119.0	10.42	0.20	0.19	2.29	0.082 ✔
T8	60 - 40	0.5	1.46	119.0	10.42	0.20	0.20	2.29	0.089 ✔
T9	40 - 20	0.625	1.45	94.4	13.67	0.31	0.21	4.69	0.045 ✔
T10	20 - 0	0.625	1.45	94.4	13.67	0.31	0.84	4.69	0.180 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	3/4" solid	4.59	2.22	142.3	30.00	0.44	2.06	13.25	0.156 ✔
T2	170 - 150	7/8" solid	5.04	2.44	134.0	30.00	0.60	5.52	18.04	0.306 ✔
T3	150 - 130	1" solid	5.12	2.47	118.7	30.00	0.79	5.95	23.56	0.253 ✔
T4	130 - 120	L 2.5 x 2.5 x 3/16	11.42	4.98	80.0	29.00	0.52	7.00	15.03	0.466 ✔
T5	120 - 100	L 2.5 x 2.5 x 3/16	11.93	5.38	86.2	29.00	0.52	6.35	15.03	0.423 ✔
T6	100 - 80	L 2.5 x 2.5 x 3/16	13.13	6.02	95.9	29.00	0.52	4.94	15.03	0.329 ✔
T7	80 - 60	L 3 x 3 x 3/16	14.50	6.73	88.6	29.00	0.66	5.12	19.12	0.268 ✔
T8	60 - 40	L 3 x 3 x 3/16	16.01	7.49	98.4	29.00	0.66	5.28	19.12	0.276 ✔
T9	40 - 20	L 3 x 3 x 5/16	17.62	8.27	111.0	29.00	1.01	5.65	29.37	0.193 ✔
T10	20 - 0	L 3 x 3 x 5/16	20.16	9.54	127.6	29.00	1.01	6.31	29.37	0.215 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	7/8" solid	4.00	3.88	212.6	30.00	0.60	0.43	18.04	0.024 ✔
T2	170 - 150	7/8" solid	4.37	4.20	230.5	30.00	0.60	0.96	18.04	0.053 ✔
T3	150 - 130	7/8" solid	4.57	4.39	240.6	30.00	0.60	1.69	18.04	0.094 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	7/8" solid	4.00	3.88	212.6	30.00	0.60	1.01	18.04	0.056 ✔
T2	170 - 150	7/8" solid	4.01	3.85	211.1	30.00	0.60	1.24	18.04	0.069 ✔
T3	150 - 130	1" solid	4.51	4.33	207.7	30.00	0.79	2.18	23.56	0.092 ✔

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 170	7/8" solid	4.00	3.88	212.6	30.00	0.60	0.92	18.04	0.051 ✔
T2	170 - 150	7/8" solid	4.49	4.32	236.9	30.00	0.60	2.15	18.04	0.119 ✔
T3	150 - 130	1" solid	4.99	4.80	230.3	30.00	0.79	2.48	23.56	0.105 ✔

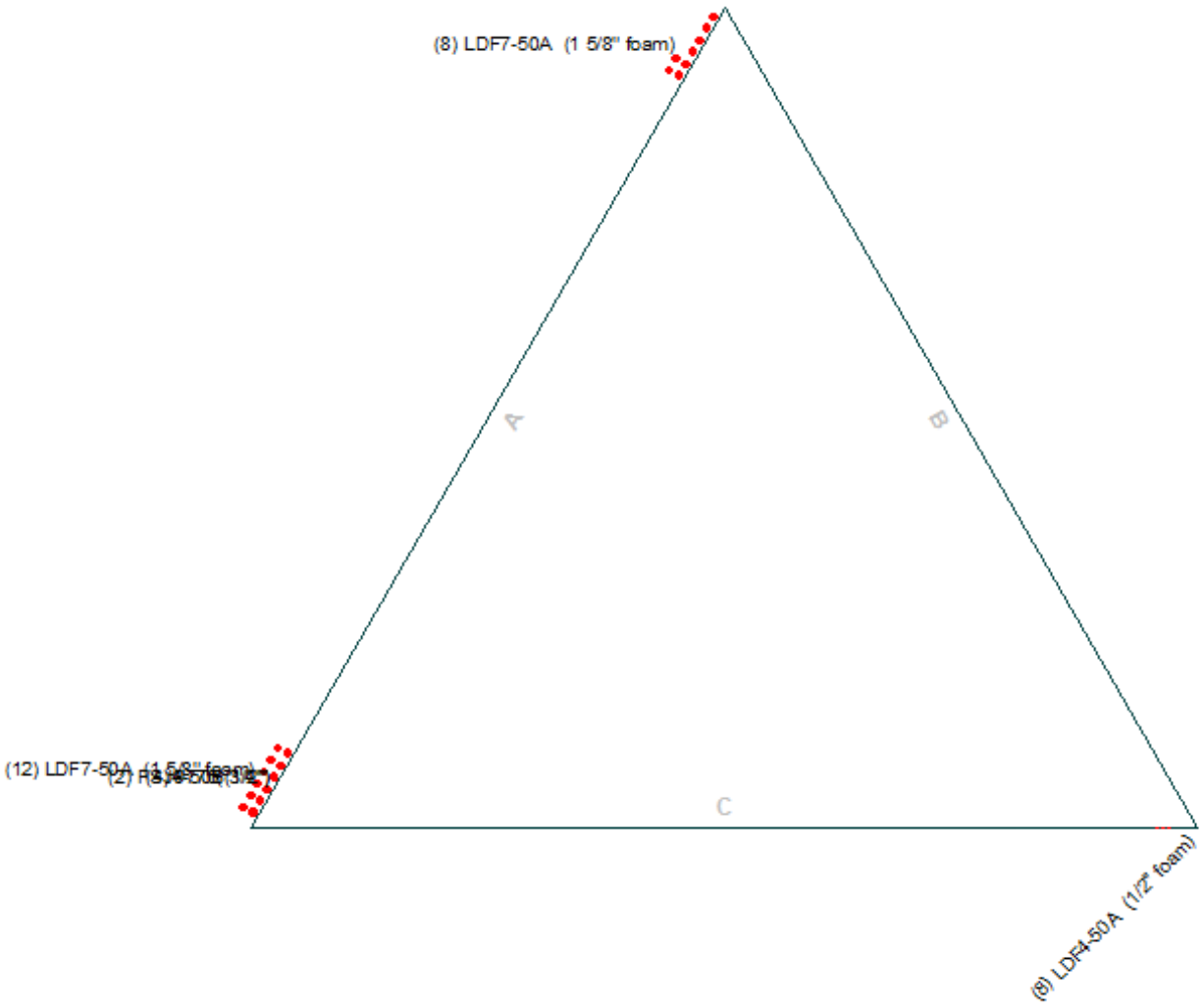
Section Capacity Table

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	1	-11.49	48.44	23.7	Pass
T2	170 - 150	Leg	2" solid	37	-57.06	97.53	58.5	Pass
T3	150 - 130	Leg	2 1/4" solid	101	-114.46	128.80	88.9	Pass
T4	130 - 120	Leg	Pirod 105216 (12x1.25)	165	-118.42	122.94	96.3	Pass
T5	120 - 100	Leg	Pirod 105217 (12x1.5)	174	-150.84	184.67	81.7	Pass
T6	100 - 80	Leg	Pirod 105217 (12x1.5)	189	-177.39	184.67	96.1	Pass
T7	80 - 60	Leg	Pirod 105218 (12x1.75)	204	-203.04	258.24	78.6	Pass
T8	60 - 40	Leg	Pirod 105218 (12x1.75)	219	-227.39	258.24	88.1	Pass
T9	40 - 20	Leg	Pirod 105219 (12x2)	234	-251.66	343.62	73.2	Pass
T10	20 - 0	Leg	Pirod 105219 (12x2)	249	-273.96	343.62	79.7	Pass
T1	180 - 170	Diagonal	3/4" solid	10	-2.07	5.36	38.7	Pass
T2	170 - 150	Diagonal	7/8" solid	50	-5.47	8.23	66.5	Pass
T3	150 - 130	Diagonal	1" solid	114	-5.46	11.87	46.0	Pass
T4	130 - 120	Diagonal	L 2.5 x 2.5 x 3/16	172	-8.16	12.23	66.8	Pass
T5	120 - 100	Diagonal	L 2.5 x 2.5 x 3/16	181	-5.64	9.65	58.5	Pass
T6	100 - 80	Diagonal	L 2.5 x 2.5 x 3/16	196	-5.55	7.63	72.7	Pass
T7	80 - 60	Diagonal	L 3 x 3 x 3/16	211	-5.53	10.68	51.8	Pass
T8	60 - 40	Diagonal	L 3 x 3 x 3/16	226	-5.67	8.62	65.7	Pass
T9	40 - 20	Diagonal	L 3 x 3 x 5/16	241	-6.05	11.34	53.3	Pass
T10	20 - 0	Diagonal	L 3 x 3 x 5/16	256	-7.70	9.38	82.1	Pass
T1	180 - 170	Horizontal	7/8" solid	30	-0.30	5.41	5.5	Pass
T2	170 - 150	Horizontal	7/8" solid	59	-0.73	4.60	15.9	Pass
T3	150 - 130	Horizontal	7/8" solid	158	-1.44	4.22	34.2	Pass
T1	180 - 170	Top Girt	7/8" solid	6	-1.02	5.41	18.8	Pass
T2	170 - 150	Top Girt	7/8" solid	41	-1.22	5.48	22.2	Pass
T3	150 - 130	Top Girt	1" solid	105	-1.94	7.40	26.3	Pass
T1	180 - 170	Bottom Girt	7/8" solid	7	-0.88	5.41	16.3	Pass
T2	170 - 150	Bottom Girt	7/8" solid	44	-2.30	4.35	52.9	Pass
T3	150 - 130	Bottom Girt	1" solid	107	-2.24	6.01	37.2	Pass
							Summary	
						Leg (T4)	96.3	Pass
						Diagonal (T10)	82.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Horizontal (T3)	34.2	Pass
						Top Girt (T3)	26.3	Pass
						Bottom Girt (T2)	52.9	Pass
						Bolt Checks	67.8	Pass
						RATING =	**96.3**	**Pass**

APPENDIX B

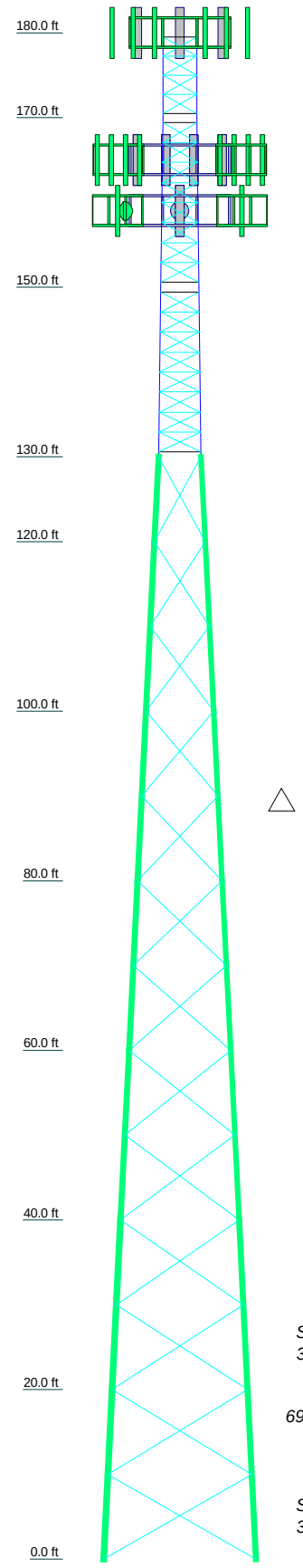
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10		
Legs	A	SR 2" solid	SR 2 1/4" solid	B	Pirod 105217 (12x1.5)	Pirod 105218 (12x1.75)	Pirod 105219 (12x2)					
Leg Grade	A572-50											
Diagonals	SR 3/4" solid	SR 7/8" solid	SR 1" solid	L 2.5 x 2.5 x 3/16		L 3 x 3 x 3/16		L 3 x 3 x 5/16				
Diagonal Grade	A572-50			A36								
Top Girts	SR 7/8" solid		SR 1" solid	N.A.								
Bottom Girts	SR 7/8" solid		SR 1" solid	N.A.								
Horizontals	SR 7/8" solid			N.A.								
Face Width (ft)	4	4.5		5	6	8	10	12	14	16	18	
# Panels @ (ft)	4 @ 2.25	16 @ 2.35833					13 @ 10					
Weight (K)	0.4	1.3	1.7	1.1	2.6	2.7	3.2	3.3	5.0	5.2	26.5	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount [LP 405-1]	180	DC6-48-60-18-8F	180
7770.00 w/ Mount Pipe	180	Sector Mount [SM 402-3]	165
7770.00 w/ Mount Pipe	180	AIR 21 B2A/B4P w/ Mount Pipe	165
7770.00 w/ Mount Pipe	180	AIR 21 B2A/B4P w/ Mount Pipe	165
(2) LGP21401	180	AIR 21 B2A/B4P w/ Mount Pipe	165
(2) LGP21401	180	KRY 112 71	165
(2) LGP21401	180	KRY 112 71	165
DC6-48-60-18-8F	180	KRY 112 71	165
OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRUS 11 B12	165
OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRUS 11 B12	165
OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRUS 11 B12	165
RRUS 11	180	LNX-6515DS-A1M w/ Mount Pipe	165
RRUS 11	180	LNX-6515DS-A1M w/ Mount Pipe	165
RRUS 11	180	LNX-6515DS-A1M w/ Mount Pipe	165
RRUS 12	180	AIR 32 B4A/B2P w/ Mount Pipe	165
RRUS 12	180	AIR 32 B4A/B2P w/ Mount Pipe	165
RRUS 12	180	AIR 32 B4A/B2P w/ Mount Pipe	165
RRUS A2 MODULE	180	Sector Mount [SM 411-3]	159
RRUS A2 MODULE	180	(2) 4'x2" Pipe Mount	159
RRUS A2 MODULE	180	4'x2" Pipe Mount	159
GPS	180	(2) 4'x2" Pipe Mount	159
(2) LGP21901	180	840 10045	159
(2) LGP21901	180	840 10045	159
(2) LGP21901	180	840 10045	159
OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRH (22" x 12" x 9.4")	159
OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRH (22" x 12" x 9.4")	159
OPA-65R-LCUU-H6 w/ Mount Pipe	180	RRH (22" x 12" x 9.4")	159
RRUS 32	180	Andrew VHLP2-18	159
RRUS 32	180	Andrew VHLP2-18	159
RRUS 32	180		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 1 1/2" solid	B	Pirod 105216 (12x1.25)

MATERIAL STRENGTH

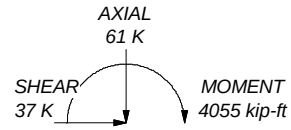
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

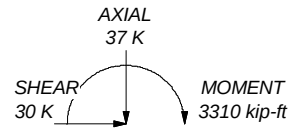
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.0 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69.3 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50.0 mph wind.
5. TOWER RATING: 96.3%

MAX. CORNER REACTIONS AT BASE:
DOWN: 281 K
SHEAR: 26 K

UPLIFT: -221 K
SHEAR: 21 K



TORQUE 18 kip-ft
69.3 mph WIND - 0.50 in ICE



TORQUE 15 kip-ft
REACTIONS - 80.0 mph WIND

Paul J. Ford and Company
250 E. Broad Street Suite 600
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job: ***180-ft Self-Support Tower / WESTHARTFORD_DEXTERST***			
Project: ***PJF# 64116-0002 / CT0001***			
Client: Hirschfeld Communications, LLC	Drawn by: Jonathan Sommer	App'd:	
Code: TIA/EIA-222-F	Date: 07/26/16	Scale: NTS	
Path: G:\TOWER\641..Hirschfeld Communications\2016\64116-0002.CT0001\64116-0002.002.8700.SA\TNX\64116-0002.002.8700_CONDITIONAL.eri		Dwg No. E-1	

PAUL J. FORD & COMPANY

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 performed a site visit 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 very detailed information to perform a very 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) The structural integrity of the existing tower foundation can only be verified if exact foundation sizes and soil conditions are known. Paul J. Ford and Company will not accept any responsibility for the adequacy of the existing foundations unless the foundation sizes and a soils report are provided.

5) It is the owner's responsibility to determine the amount of ice accumulation, if any, that should be considered in the structural analysis.

6) This tower has been analyzed according to the minimum design wind loads recommended by the Telecommunications Industry Association Standard TIA/EIA-222-F. 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.

7) The attached 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.

8) 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

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11170C

Hartford/ N. Britain Ave_1
1030 New Britain Ave
West Hartford, CT 06110

August 2, 2016

EBI Project Number: 6216003472

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	4.67 %

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

EBI Consulting
environmental | engineering | due diligence

August 2, 2016

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

Emissions Analysis for Site: **CT11170C – Hartford/ N. Britain Ave_1**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1030 New Britain Ave, West Hartford, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **1030 New Britain Ave, West Hartford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

3) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel

6) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

7) Since the 2100 MHz UMTS radios are ground mounted there are additional cabling losses accounted for. For each ground mounted 2100 MHz UMTS RF path 2.28 dB of additional cable loss was used in these calculations. This is based on manufacturers Specifications for 215 feet of 1-5/8" coax cable on each 2100 MHz UMTS path.

8) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

9) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antennas used in this modeling are the **Ericsson AIR32 B4A/B2P** & **Ericsson AIR21 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR32 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Ericsson AIR21 B2A/B4P** has a maximum gain of **15.9 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antenna mounting height centerline of the proposed antennas is **165 feet** above ground level (AGL).

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

13) All calculations were done with respect to uncontrolled / general public threshold limits.

EBI Consulting
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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B4A/B2P	Make / Model:	Ericsson AIR32 B4A/B2P	Make / Model:	Ericsson AIR32 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	165	Height (AGL):	165	Height (AGL):	165
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	1.33	Antenna B1 MPE%	1.33	Antenna C1 MPE%	1.33
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	165	Height (AGL):	165	Height (AGL):	165
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	6,049.41	ERP (W):	6,049.41	ERP (W):	6,049.41
Antenna A2 MPE%	0.86	Antenna B2 MPE%	0.86	Antenna C2 MPE%	0.86
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	165	Height (AGL):	165	Height (AGL):	165
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A3 MPE%	0.26	Antenna B3 MPE%	0.26	Antenna C3 MPE%	0.26

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.45 %**
AT&T	1.87 %
Clearwire	0.08 %
Sprint	0.27 %
Site Total MPE %:	**4.67 %**

T-Mobile Sector A Total:	2.45 %
T-Mobile Sector B Total:	2.45 %
T-Mobile Sector C Total:	2.45 %
Site Total:	4.67 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	165	6.64	AWS - 2100 MHz	1000	0.66%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	165	6.64	PCS - 1900 MHz	1000	0.66%
T-Mobile AWS - 2100 MHz UMTS	2	690.43	165	1.96	AWS - 2100 MHz	1000	0.20%
T-Mobile PCS - 1950 MHz UMTS	2	1,167.14	165	3.32	PCS - 1950 MHz	1000	0.33%
T-Mobile PCS - 1950 MHz GSM	2	1,167.14	165	3.32	PCS - 1950 MHz	1000	0.33%
T-Mobile 700 MHz LTE	1	865.21	165	1.23	700 MHz	467	0.26%
						Total*:	**2.45%**

*NOTE: Totals may vary by .01% due to summing of remainders

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	2.45 %
Sector B:	2.45 %
Sector C:	2.45 %
T-Mobile Per Sector Maximum:	2.45 %
Site Total:	4.67 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.67%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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