Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

September 26, 2014

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

RE: **Metro PCS-Exempt Modification - Crown Site BU: 806378**
T-Mobile Site ID: CTHA534A
Located at: 126 Pioneer Heights Road, Somers, CT 06071

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of Metro PCS. Metro PCS is making modifications to certain existing sites in its Connecticut system in order to implement their LTE technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies ("R.C.S.A."), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Ms. Lisa Pellegrini, First Selectman for the Town of Summers and Clarence and Lena Farnham, Property Owner.

Metro PCS plans to modify the existing wireless communications facility owned by Crown Castle and located at **126 Pioneer Heights Road, Somers, CT 06071**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to Metro PCS's operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") § 16-50i (d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the 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 tower. Metro PCS's replacement and new antennas will be located at the same elevation on the existing tower.

2. There will be no proposed modifications to the ground and no extension of boundaries.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for Metro PCS's modified facility is included as Exhibit-3.

5. A Structural Modification Report confirming that the tower and foundation can support Metro PCS's proposed modifications is included as Exhibit-2.

For the foregoing reasons, Metro PCS respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Jerry Feathers
Real Estate Specialist

Enclosure

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Ms. Lisa Pellegrini, First Selectman
Town of Somers
600 Main Street
Somers, CT 06071

cc: Clarence and Lena Farnham
126 Pioneer Heights Road
Somers, CT 06071

metroPCS

SITE NAME: CROWN SOMERS LATTICE TOWER

SITE ID NUMBER: CTHA534A

SITE ADDRESS: 126 PIONEER HEIGHTS RD
SOMERS, CT 06071

PROJECT SUMMARY

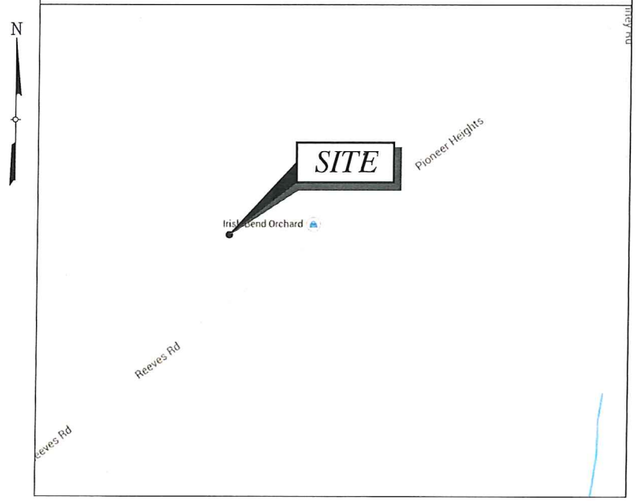
SITE ID NUMBER:	CTHA534A
SITE NAME:	CROWN SELF SUPPORT TOWER
CROWN BU#:	806378
SITE ADDRESS:	126 PIONEER HEIGHTS RD SOMERS, CT 06071
COUNTY:	TOLLAND
PROPERTY OWNER:	CROWN CASTLE USA
APPLICANT:	metroPCS WIRELESS, INC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
ENGINEER:	TECTONIC ENGINEERING AND SURVEYING CONSULTANTS, P.C. 1279 ROUTE 300 NEWBURGH, NY 12550
CONTACT: PHONE:	JAMES QUICKSELL (845) 567-6656 EXT. 2835
SITE ACQUISITION:	CROWN CASTLE 1200 MACARTHUR BLVD SUITE 200 MAHWAH, NJ 07430
CONTACT: PHONE:	PETE TISI (201) 491-6009
PARCEL INFO:	01-13-A
LATITUDE: (NAD 83)	41.9487° N
LONGITUDE: (NAD 83)	72.4924° W

SITE DIRECTIONS

HEAD NORTHEAST ON GRIFFIN RD S TOWARD W NEWBERRY RD. TAKE THE SECOND RIGHT ONTO DAY HILL RD. TURN RIGHT ONTO CT-75 S. TURN LEFT ONTO THE INTERSTATE 91N RAMP TO SPRINGFIELD. MERGE ONTO I-91 N. TAKE EIST 45 FOR CT-140 TOWARD WAREHOUSE POINT/ELLINGTON. TURN RIGHT ONTO CT-140E. TURN RIGHT ONTO CT-140E/MELROSE RD. TAKE THE THIRD LEFT ONTO REEVES RD. CONTINUE ONTO PIONEER HEIGHTS RD. DESTINATION WILL BE ON THE LEFT.

LOCATION MAP

SCALE: NTS



SHEET INDEX

SHEET NO	DESCRIPTION	REV NO
T-1	TITLE SHEET	1
A-1	SITE PLAN	1
A-2	EQUIPMENT LAYOUT PLANS	1
A-3	ELEVATION & DETAIL	1
A-4	ANTENNA LAYOUT PLANS & DETAILS	1
A-5	DETAILS	1
A-6	DETAILS	1
A-7	NOTES AND EQUIPMENT SCHEDULE	1
A-8	NOTES	1

THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL ITEMS HAVE BEEN ADDRESSED AND EACH OF THE DRAWINGS HAS BEEN REVISED AND ISSUED "FOR CONSTRUCTION".

CONFIGURATION

5A

REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

ORIGINAL SIZE IN INCHES

TECTONIC
• PLANNING • ENGINEERING • CONSTRUCTION MANAGEMENT • SURVEYING
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NEWBURGH, NY 12550
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Fax: (845) 567-8703

metroPCS
metroPCS WIRELESS, INC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
7061.CTHA534A	JQ

REV	DATE	REVISION	DRAWN BY
0	07/07/14	FOR COMMENT	KA
1	08/15/14	FOR CONSTRUCTION	DC

ISSUED BY	DATE
JMQ	8/15/14

STATE OF CONNECTICUT
MANOJKUMAR M. PATEL
No. 22030
LICENSED
PROFESSIONAL ENGINEER

SITE INFORMATION

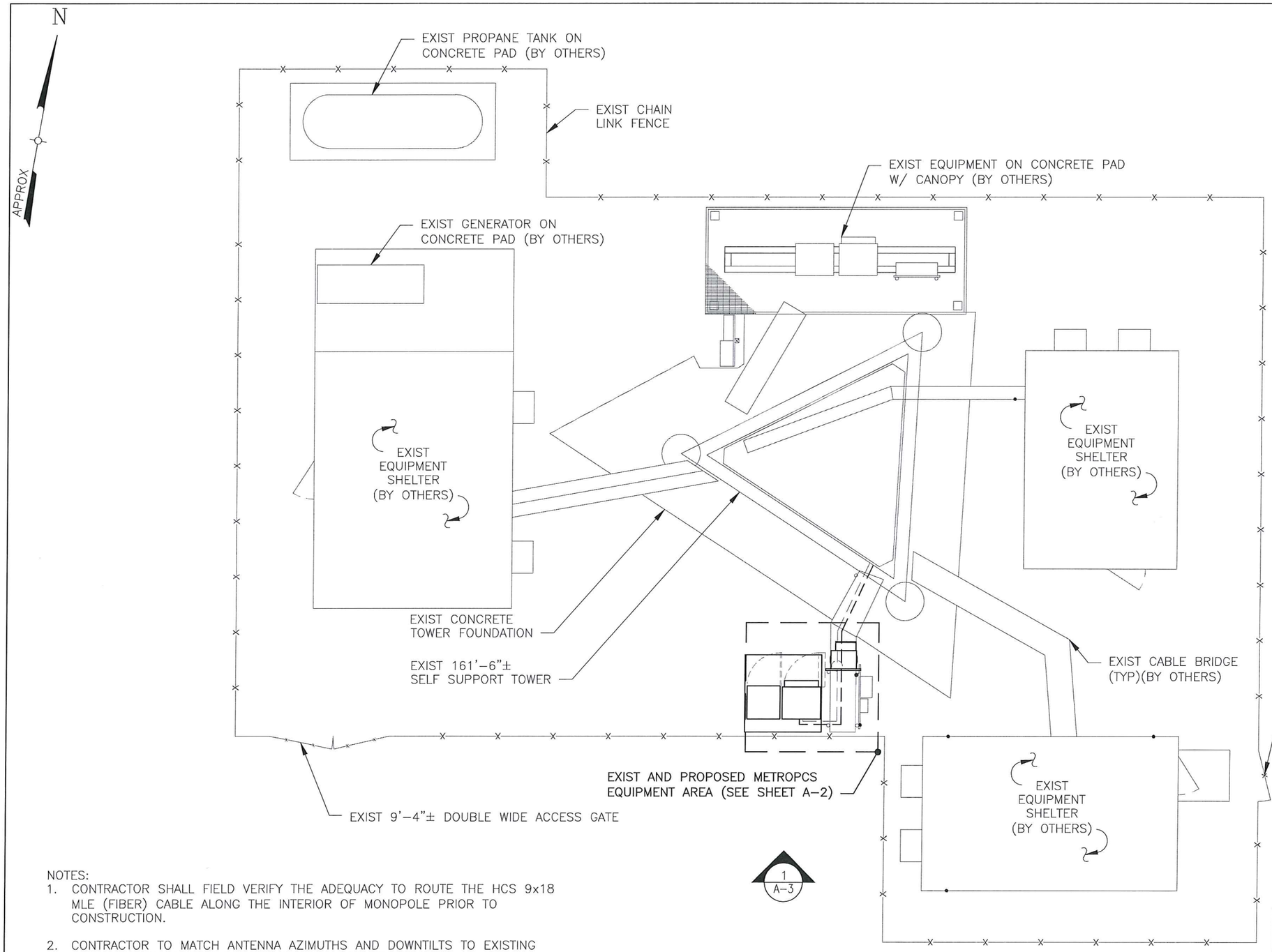
CTHA534A
CROWN SOMERS LATTICE TOWER
126 PIONEER HEIGHTS RD
SOMERS, CT 06071

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



NOTES:

1. CONTRACTOR SHALL FIELD VERIFY THE ADEQUACY TO ROUTE THE HCS 9x18 MLE (FIBER) CABLE ALONG THE INTERIOR OF MONOPOLE PRIOR TO CONSTRUCTION.
2. CONTRACTOR TO MATCH ANTENNA AZIMUTHS AND DOWNTILTS TO EXISTING CONDITION AND NOTIFY RF ENGINEER OF ANY DISCREPANCY.
3. LOCK & TAG BREAKERS FOR ALL EQUIPMENT BEING TURNED OFF (WHEN APPLICABLE).
4. CONTRACTOR TO RE-VERIFY CABLE LENGTHS PRIOR TO CONSTRUCTION.
5. SEE RFDS FOR FINAL EQUIPMENT CONFIGURATION.

1/A-1 SITE PLAN

SCALE: 1/8" = 1'-0'

CONFIGURATION
5A
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

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STATE OF CONNECTICUT
MANOJKUMAR R. PATEL
No. 22038
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

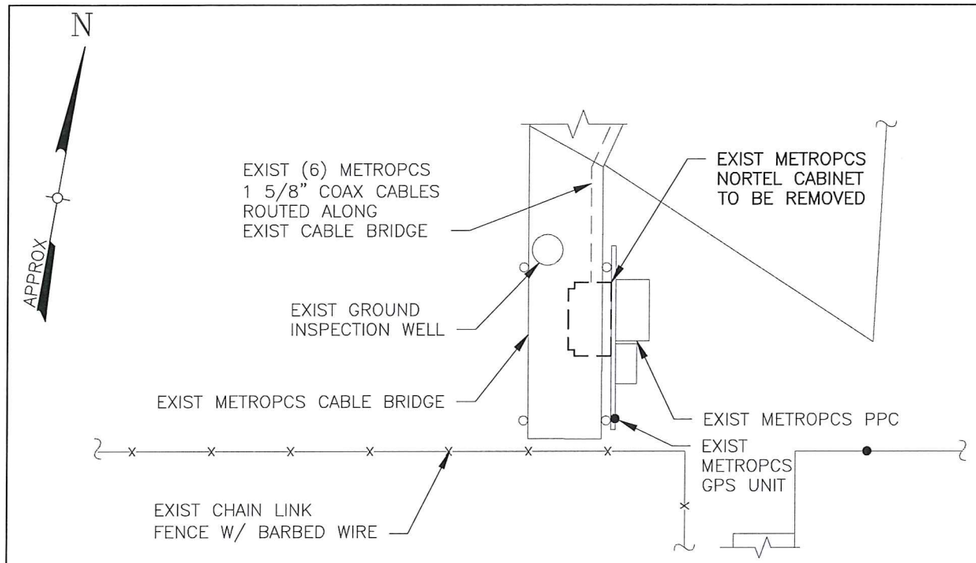
CTHA534A
CROWN SOMERS LATTICE TOWER
126 PIONEER HEIGHTS RD
SOMERS, CT 06071

SHEET TITLE

SITE PLAN

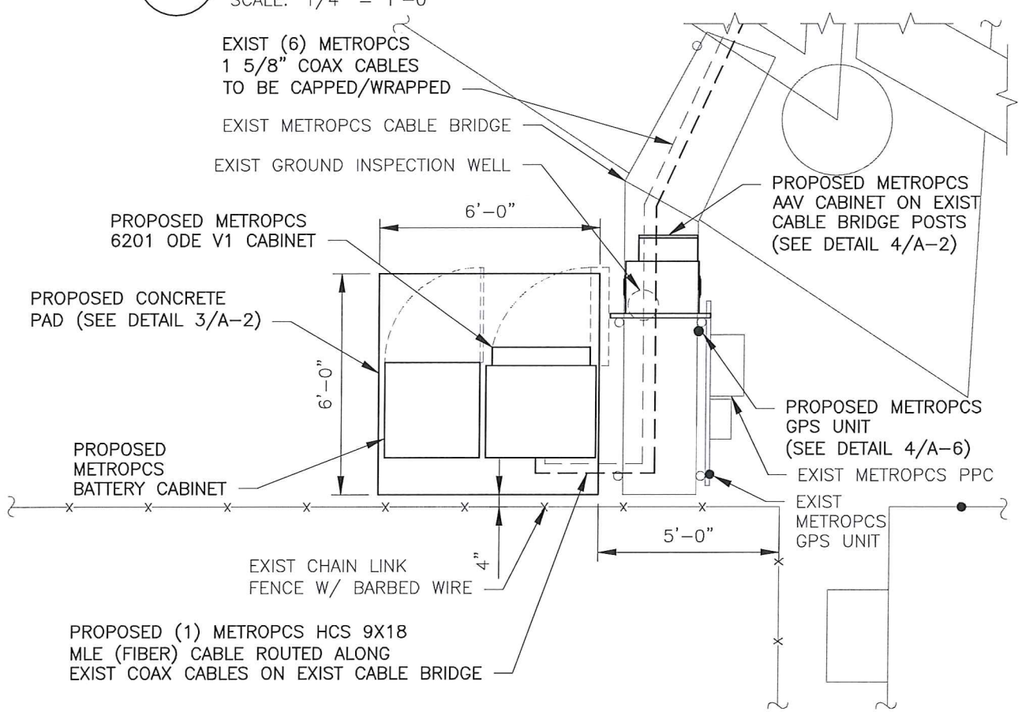
SHEET NUMBER

A-1



1 / A–2 EXIST EQUIPMENT PLAN

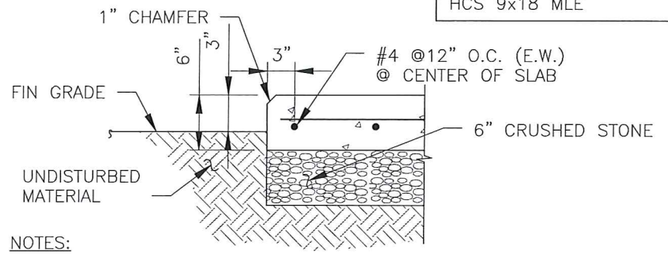
SCALE: 1/4" = 1'–0'



2 / A–2 PROPOSED EQUIPMENT PLAN

SCALE: 1/4" = 1'–0'

HCS LENGTH			
FROM EQUIPMENT CABINET TO ANTENNA			
SECTOR	ALPHA	BETA	GAMMA
LENGTH	140'±	140'±	140'±
SIZE	1"		
HCS 9x18 MLE			

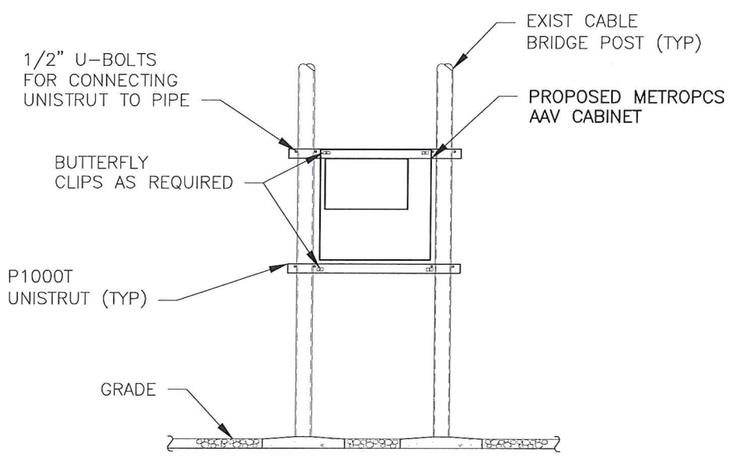


NOTES:

1. CONCRETE PAD IS TO BE CAST IN PLACE W/MIN f'c = 3000 PSI.
2. USE GALVANIZED HILTI EXPANSION ANCHORS OR APPROVED EQUAL FOR EQUIPMENT ANCHORAGE.
3. FOR SIZE AND LOCATION OF ANCHORS AND OTHER REQUIREMENTS, SEE EQUIPMENT VENDOR DRAWINGS.

3 / A–2 CONCRETE PAD DETAIL

SCALE: N.T.S.



4 / A–2 AAV MOUNTING DETAIL

SCALE: 3/8" = 1'–0"

CONFIGURATION
5A
REFER TO LATEST T–MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

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CROWN CASTLE

APPROVALS

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SITE INFORMATION

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SOMERS, CT 06071

SHEET TITLE

EQUIPMENT LAYOUT PLANS

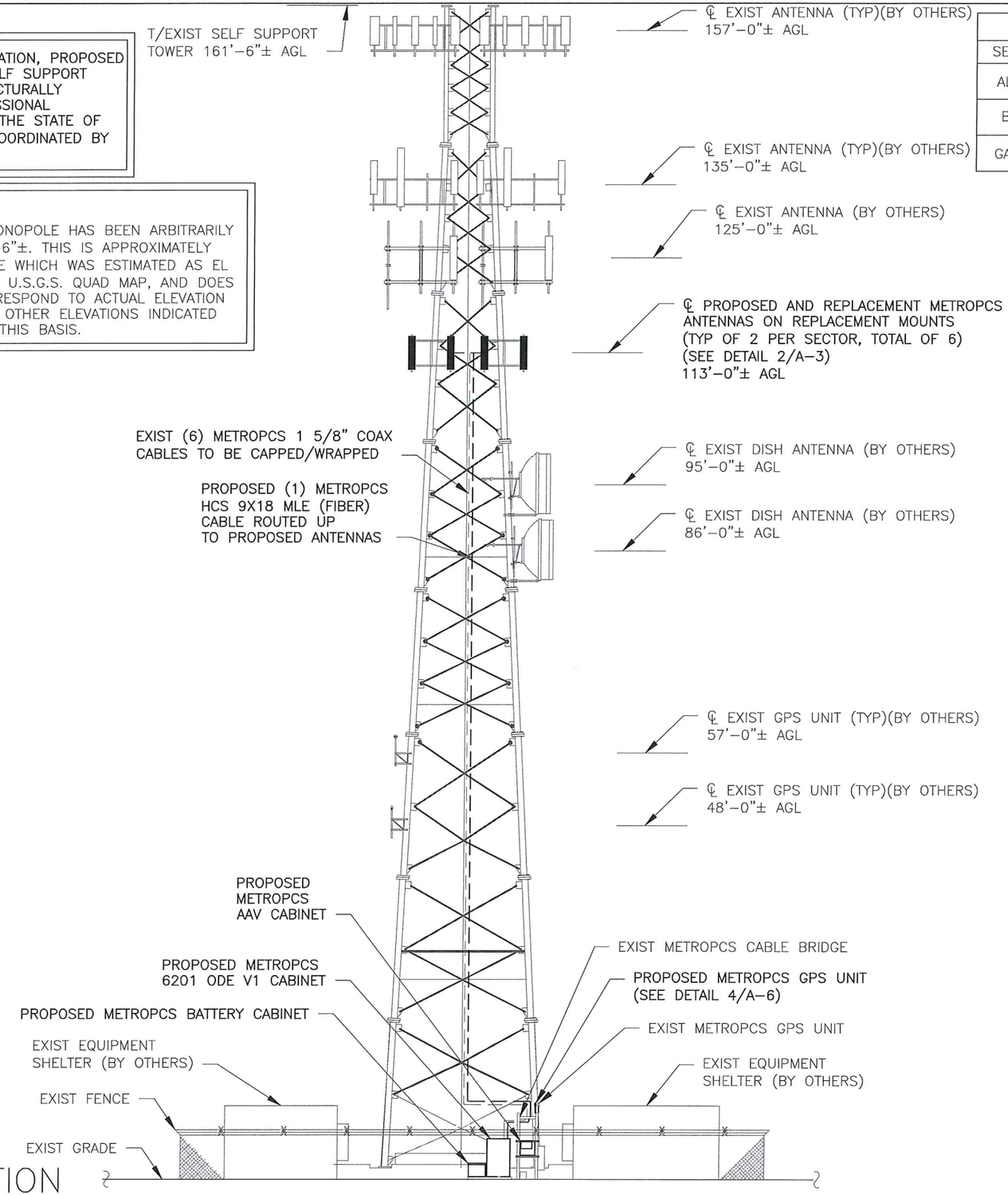
SHEET NUMBER

A–2

THE PROPOSED INSTALLATION, PROPOSED MOUNTS & EXISTING SELF SUPPORT TOWER SHALL BE STRUCTURALLY ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).

ELEVATION NOTE:

ELEVATION OF EXIST MONOPOLE HAS BEEN ARBITRARILY ASSIGNED AS EL 558'–6"±. THIS IS APPROXIMATELY 161'–6"± ABOVE GRADE WHICH WAS ESTIMATED AS EL 397'–0"± TAKEN FROM U.S.G.S. QUAD MAP, AND DOES NOT NECESSARILY CORRESPOND TO ACTUAL ELEVATION ABOVE SEA LEVEL. ALL OTHER ELEVATIONS INDICATED WERE DETERMINED ON THIS BASIS.



1/A–3 ELEVATION

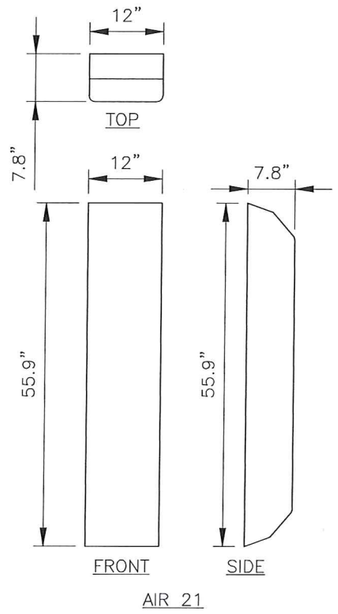
SCALE: 1/16" = 1'–0"

EXIST ANTENNA SCHEDULE

SECTOR	MAKE	QUANTITY	MODEL#	SIZE
ALPHA	RFS	1	APXV18–206517S	53.1x6.9x3.15
BETA	RFS	1	APXV18–206517S	53.1x6.9x3.15
GAMMA	RFS	1	APXV18–206517S	53.1x6.9x3.15

PROPOSED ANTENNA SCHEDULE

SECTOR	MAKE	QUANTITY	MODEL#	SIZE
ALPHA	ERICSSON	1	AIR21 B2A/B4P	12x8x56
	ERICSSON	1	AIR21 B4A/B2P	12x8x56
BETA	ERICSSON	1	AIR21 B2A/B4P	12x8x56
	ERICSSON	1	AIR21 B4A/B2P	12x8x56
GAMMA	ERICSSON	1	AIR21 B2A/B4P	12x8x56
	ERICSSON	1	AIR21 B4A/B2P	12x8x56



2/A–3 DETAIL

SCALE: 1/2" = 1'–0"

CONFIGURATION

5A

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BLOOMFIELD, CT 06002

CROWN CASTLE

APPROVALS

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OPERATIONS _____
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ISSUED BY	DATE
JMQ	8/15/14

STATE OF CONNECTICUT · JAYANGKUMAR PILLAI · No. 22038 · LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

CTHA534A
CROWN SOMERS LATTICE TOWER
126 PIONEER HEIGHTS RD
SOMERS, CT 06071

SHEET TITLE

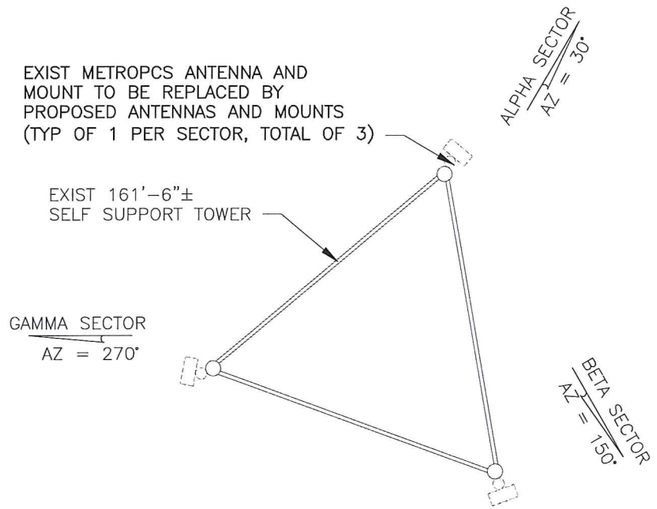
ELEVATION & DETAIL

SHEET NUMBER

A–3

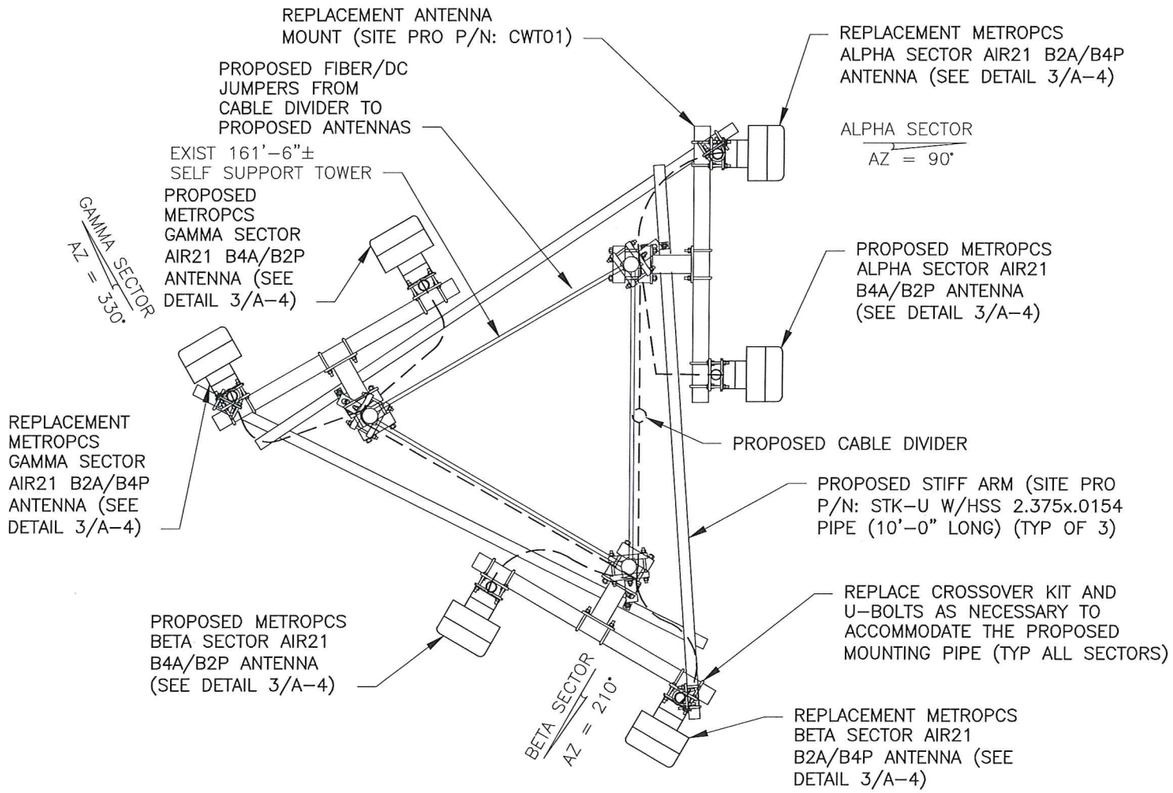
N

APPROX



1 / A-4 EXIST ANTENNA PLAN

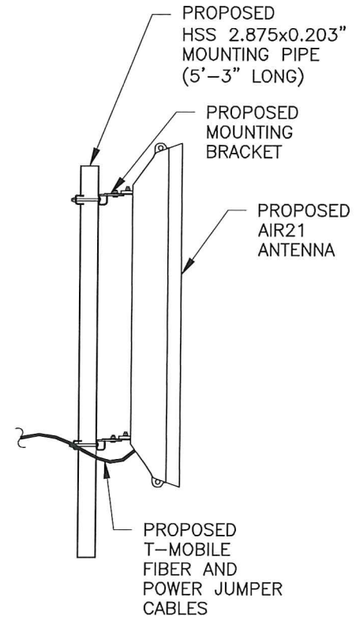
SCALE: 3/8" = 1'-0"



2 / A-4 PROPOSED ANTENNA PLAN

SCALE: 3/8" = 1'-0"

THE PROPOSED INSTALLATION, PROPOSED MOUNTS & EXISTING SELF SUPPORT TOWER SHALL BE STRUCTURALLY ANALYZED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT (TO BE COORDINATED BY OTHERS).



3 / A-4 ANTENNA DETAIL

SCALE: 1/2" = 1'-0"

CONFIGURATION

5A

REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

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CROWN CASTLE

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1	08/15/14	FOR CONSTRUCTION	DC

ISSUED BY: JMQ
DATE: 8/15/14

STATE OF CONNECTICUT
ANGELO KARABETSOS
No. 22038
LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

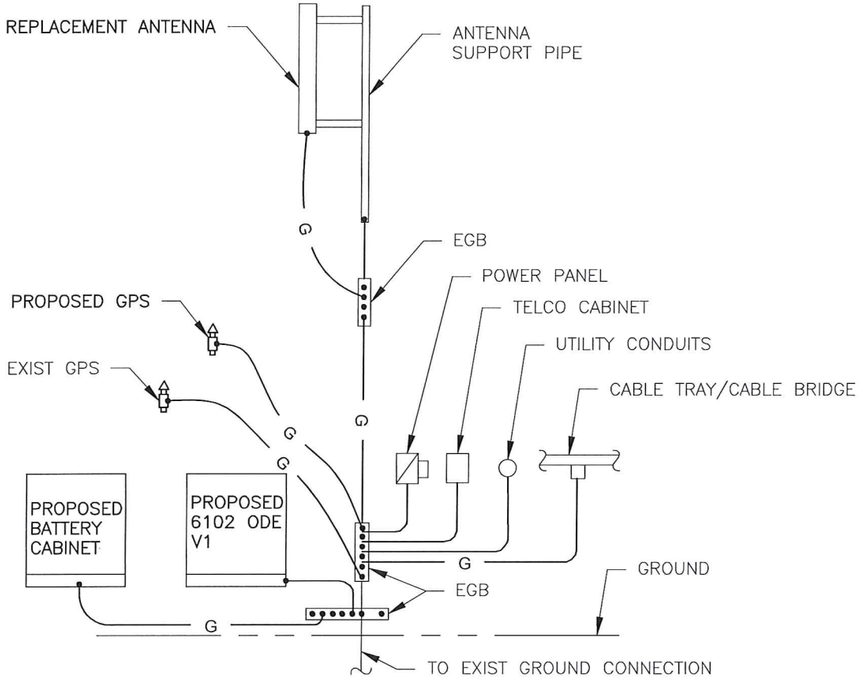
CTHA534A
CROWN SOMERS LATTICE TOWER
126 PIONEER HEIGHTS RD
SOMERS, CT 06071

SHEET TITLE

ANTENNA LAYOUT PLANS & DETAILS

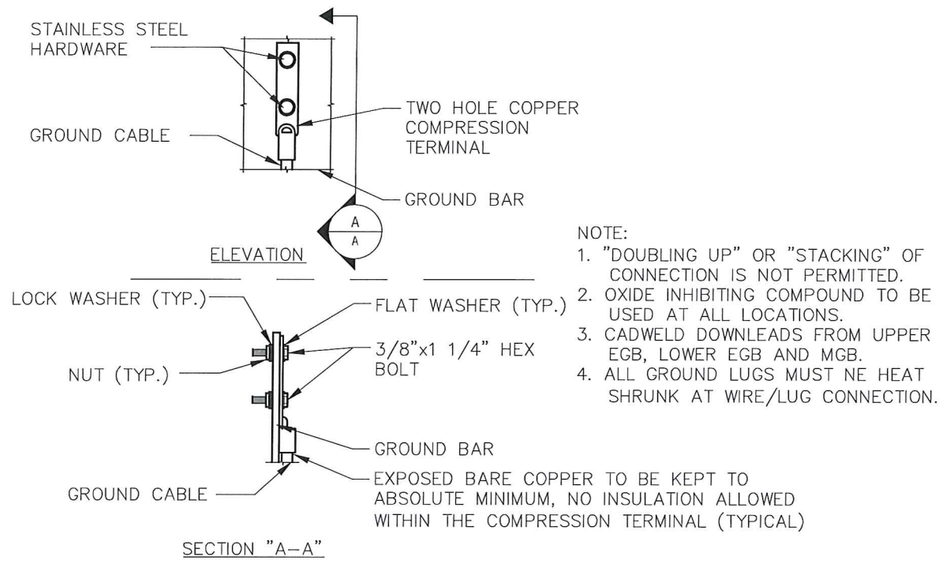
SHEET NUMBER

A-4



1 / A-5 GROUNDING RISER DIAGRAM

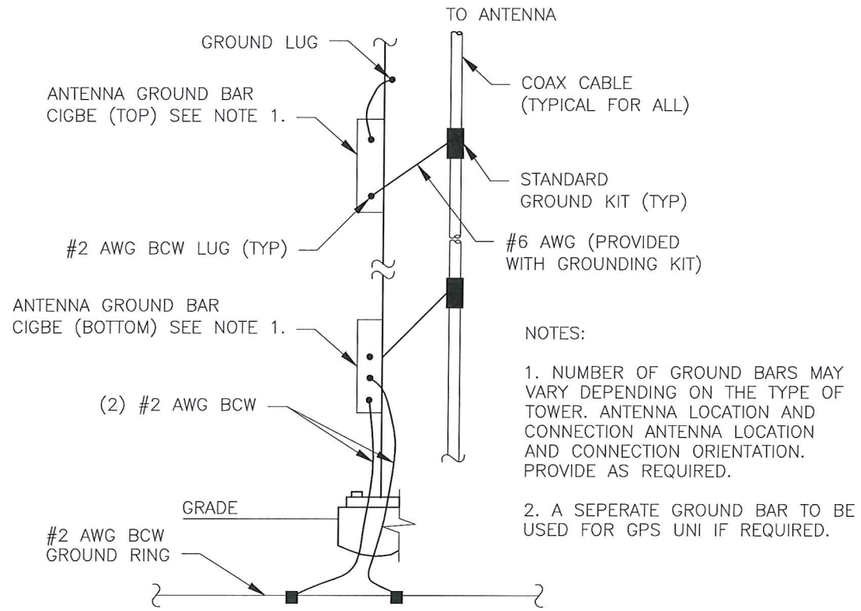
SCALE: NTS



NOTE:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

2 / A-5 GROUNDING BAR CONN. DETAIL

SCALE: NTS



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.

2. A SEPERATE GROUND BAR TO BE USED FOR GPS UNI IF REQUIRED.

3 / A-5 ANTENNA CABLE GROUNDING

SCALE: NTS

CONFIGURATION
5A
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STATE OF CONNECTICUT MANOJKUMAR PATEL No. 22038 LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION
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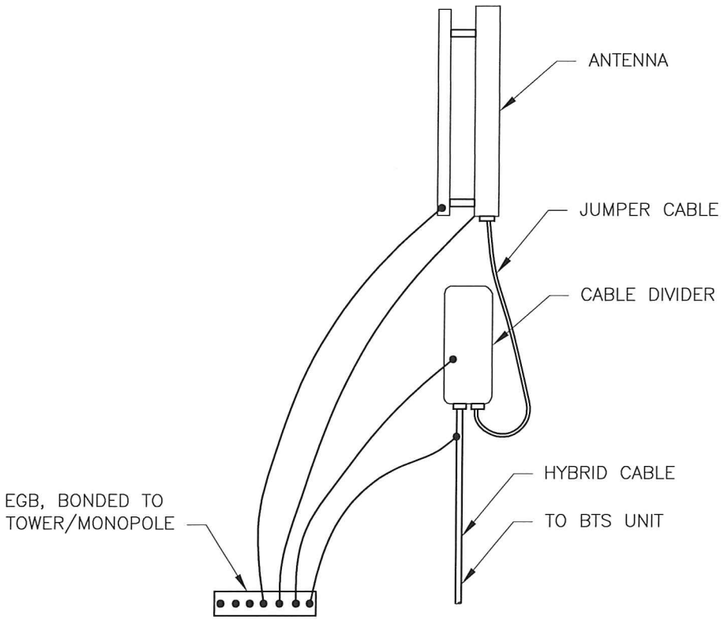
SHEET TITLE
DETAILS

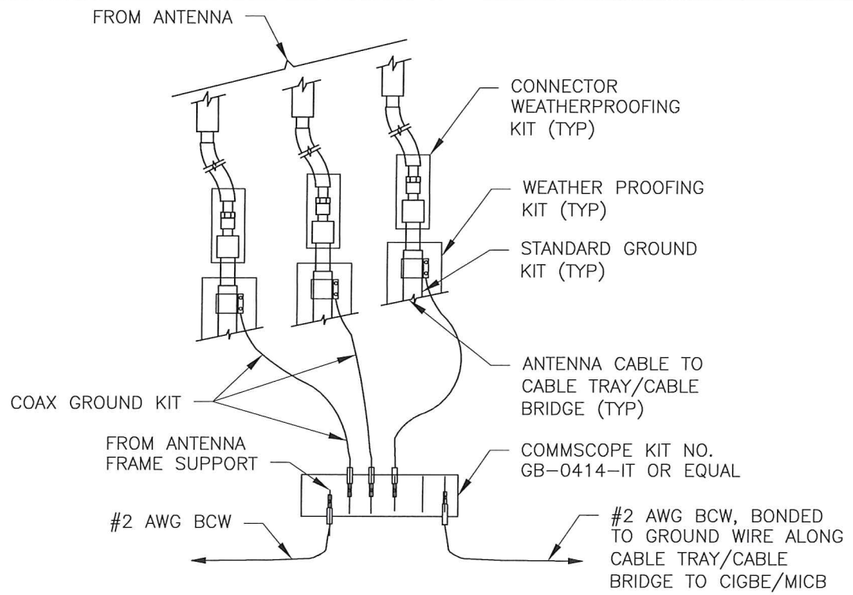
SHEET NUMBER
A-5



HYBRID CABLE CONNECTION AND GROUNDING DETAIL

1 / A-6

SCALE: NTS

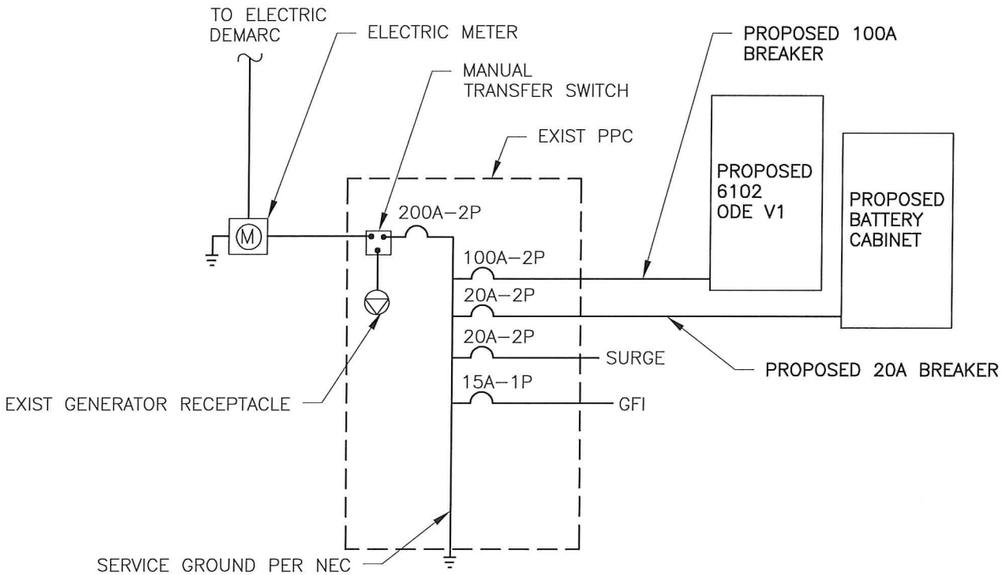


NOTE:
DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

2 / A-6

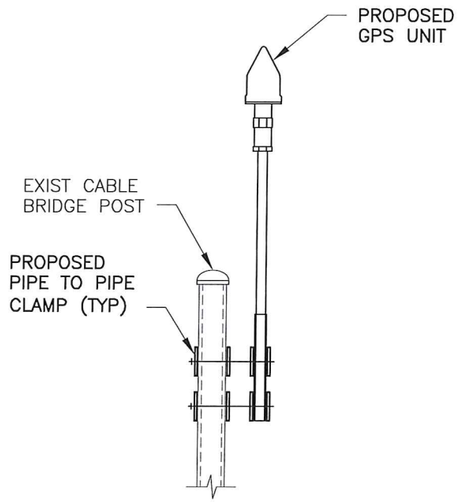
SCALE: NTS



ONE-LINE POWER DIAGRAM

3 / A-6

SCALE: NTS



DETAIL

4 / A-6

SCALE: 3/4" = 1'-0"

CONFIGURATION
5A
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

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metroPCS WIRELESS, INC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
7061.CTHA534A	JQ

REV	DATE	REVISION	DRAWN BY
0	07/07/14	FOR COMMENT	KA
1	08/15/14	FOR CONSTRUCTION	DC

ISSUED BY	DATE
JMQ	8/15/14

STATE OF CONNECTICUT MANOJKUMAR TELI No. 22078 LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

CTHA534A
CROWN SOMERS LATTICE TOWER
126 PIONEER HEIGHTS RD
SOMERS, CT 06071

SHEET TITLE

DETAILS

SHEET NUMBER

A-6

GROUNDING NOTES

1. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
2. ALL GROUNDING WORK SHALL BE IN ACCORDANCE WITH metroPCS STANDARD PRACTICE.
3. ALL BUS CONNECTORS SHALL BE TWO-HOLE, LONG-BARREL TYPE COMPRESSION LUGS, T&B OR EQUAL, UNLESS OTHERWISE NOTED ON DRAWINGS. ALL LUGS SHALL BE ATTACHED TO BUSSES USING BOLTS, NUTS, AND LOCK WASHERS. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED.
4. ALL CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS, T&B #TBM 8 OR EQUIVALENT.
5. ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON-OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
6. ALL COPPER BUSSES SHALL BE CLEANED, POLISHED, AND A NON-OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
7. ALL BENDS SHALL BE AS SHALLOW AS POSSIBLE, WITH NO TURN SHORTER THAN AN 8-INCH NOMINAL RADIUS.
8. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2. ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS, OR CEILINGS. IF CONDUCTORS MUST RUN THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
9. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE PROJECT MANAGER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
10. ALL ROOF TOP ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 GROUND WIRE CONNECTED TO THE NEAREST GROUND BUS. ALL CONNECTIONS ARE TO BE CAD-WELDED IF POSSIBLE.
11. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE PROJECT MANAGER.
12. GROUNDING CONNECTION TO TRAVEL IN A DOWNWARD DIRECTION.
13. ALL EXPOSED #2 WIRE MUST BE TINN NOT BTW.
14. TECTONIC TAKES NO RESPONSIBILITY OR LIABILITY FOR THE GROUNDING SYSTEM AS SHOWN ON THIS SITE. THIS IS A STANDARD GROUNDING SYSTEM.

Appendix A - Antenna, Feedline, TME Specifications

Antenna Specifications

Quantity	Manufacturer	Model	Type	Height	Width	Depth	Weight	Flat Plate Area
3	ERICSSON	ERICSSON AIR 21 B4A B2P	PANEL	55.9 IN	12.1 IN	7.87 IN	91.5 LBS	0.0
3	ERICSSON	ERICSSON AIR 21 B2A B4P	PANEL	55.0 IN	12.1 IN	7.87 IN	91.5 LBS	0.0

Feedline Specifications

Quantity	Manufacturer	Model	Nominal Size	Nominal O.D.
6	COMMSCOPE	CR 50 1873	1-5/8"	1.98 IN
1	HUBER AND SUHNER	1.2 Masterline Extreme Hybrid	1 3/16'	1.2 IN

1 / A-7 EQUIPMENT SCHEDULE

SCALE: NTS

CONFIGURATION

5A

REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

ORIGINAL SIZE IN INCHES

TECTONIC
• PLANNING • ENGINEERING • CONSTRUCTION MANAGEMENT • SURVEYING
TECTONIC Engineering and Surveying Consultants, P.C.
1279 ROUTE 300
NEWBURGH, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703

metroPCS
metroPCS WIRELESS, INC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

CROWN CASTLE

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ISSUED BY: JMQ DATE: 8/15/14

STATE OF CONNECTICUT · JOSEPH M. QUINN · No. 22038 · LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

CTHA534A
CROWN SOMERS LATTICE TOWER
126 PIONEER HEIGHTS RD
SOMERS, CT 06071

SHEET TITLE

NOTES AND EQUIPMENT SCHEDULE

SHEET NUMBER

A-7

GENERAL NOTES

1. CONTRACTOR SHALL NOT COMMENCE ANY WORK UNTIL HE OBTAINS, AT HIS OWN EXPENSE, ALL INSURANCE REQUIRED BY metroPCS, THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
2. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATE "ISSUED FOR PERMIT"
3. THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
4. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
6. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THIS PROJECT IN ACCORDANCE WITH THE OVERALL INTENT OF THESE DRAWINGS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
8. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
9. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
10. POWER TO THE FACILITY IS MONITORED BY AN EXISTING METER.
11. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIP GALVANIZED STEEL.
12. CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
13. IF ANY PIPING EXISTS BENEATH THE SITE AREA, CONTRACTOR MUST LOCATE IT AND CONTACT OWNER'S REPRESENTATIVE.
14. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL CONSTRUCTION MEANS AND METHODS. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
15. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.
16. THE CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. THE CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUB-CONTRACTORS AND RELATED PARTIES. THE SUB-CONTRACTOR SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
17. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
18. ALL MATERIAL PROVIDED BY metroPCS IS TO BE REVIEWED BY THE CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS PRIOR TO INSTALLATION. ANY DEFICIENCIES TO PROVIDE MATERIALS SHALL BE BROUGHT TO THE CONSTRUCTION MANAGER'S ATTENTION IMMEDIATELY.
19. THE MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
20. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.

GENERAL NOTES

21. THE CONTRACTOR SHALL RECEIVE CLARIFICATION AND AUTHORIZATION IN WRITING TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONSTRUCTION DOCUMENTS.
22. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
23. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST-ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
24. THE CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
26. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS MAY TAKE PRECEDENCE.
27. THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
28. THE CONTRACTOR SHALL KEEP CONTRACT AREA CLEAN, HAZARD FREE AND DISPOSE OF ALL DEBRIS AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITIONS AND FREE FROM PAINT SPOTS, DUST OR SMUDGES OF ANY NATURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
29. BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORK, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.
30. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE 2005 CONNECTICUT STATE BUILDING CODE (INCLUDING AMMENDMENTS), AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
31. CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
32. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT AND APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
33. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
34. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.

CONFIGURATION
5A
REFER TO LATEST T-MOBILE RF DATA SHEET FOR FINAL RF DESIGN & BOM.

0 1 2 3

ORIGINAL SIZE IN INCHES

TECTONIC
- PLANNING
- ENGINEERING
- CONSTRUCTION MANAGEMENT
- SURVEYING

TECTONIC Engineering and Surveying Consultants, P.C.
1279 ROUTE 300
NEWBURGH, NY 12550
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Fax: (845) 567-8703

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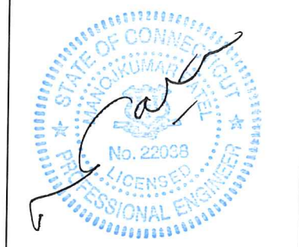


SITE INFORMATION

CTHA534A
CROWN SOMERS LATTICE TOWER
126 PIONEER HEIGHTS RD
SOMERS, CT 06071

SHEET TITLE

NOTES

SHEET NUMBER

A-8

Date: **June 27, 2014**

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
ncoomes@verticalstructures.com

Subject: **Structural Analysis Report**

Carrier Designation:	***Metro PCS* Change-Out**	
	Carrier Site Number:	HFC1497A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	806378
	Crown Castle Site Name:	HRT 086
	Crown Castle JDE Job Number:	295278
	Crown Castle Work Order Number:	780401
	Crown Castle Application Number:	252178 Rev. 1
Engineering Firm Designation:	**Vertical Structures, Inc. Project Number:**	2014-004-027
Site Data:	**126 Pioneer Heights Road, Somers, CT, Tolland County** **Latitude *41° 56' 55.98"*, Longitude *-72° 29' 31.55"*** **161.375 Foot - Self Support Tower**	

Dear Charles McGuirt,

Vertical Structures, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 660245.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

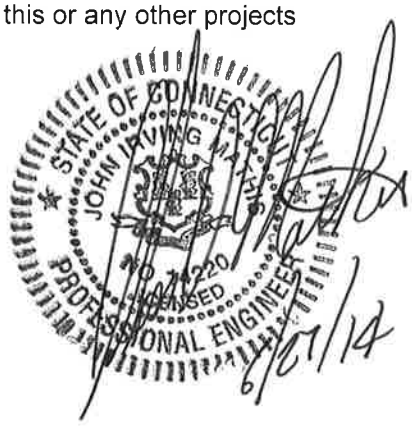
The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2005 Connecticut State Building Code based upon a wind speed of 85 mph fastest mile.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Nathan Coomes, P.E.
Project Engineer



Date: **June 27, 2014**

Charles McGuirt
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277
(704) 405-6607

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
(859) 624-8360
ncoomes@verticalstructures.com

Subject: Structural Analysis Report

Carrier Designation:	***Metro PCS* Change-Out**	
	Carrier Site Number:	HFC1497A
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	806378
	Crown Castle Site Name:	HRT 086
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	Crown Castle Work Order Number:	780401
	Crown Castle Application Number:	252178 Rev. 1
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Site Data:	**126 Pioneer Heights Road, Somers, CT, Tolland County**	
	Latitude *41° 56' 55.98"*, Longitude *-72° 29' 31.55"*	
	161.375 Foot - Self Support Tower	

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Respectfully submitted by:

Nathan Coomes, P.E.
Project Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 161.375 ft Self Support tower designed by Rohn in 1986. The tower was originally designed for a 30 psf wind pressure in accordance with a previous revision of the EIA Standard. The tower has been reworked multiple times to accommodate additional loading.

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 85 mph with no ice and 50 mph under service loads. Also, per Crown Castle's direction and in accordance with ASCE-7-05 we have considered a fastest mile wind speed of 38 mph with an escalating 1.0 inch ice thickness.

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
113.0	113.0	1		Side Arm Mount [SO 101-3]			
		3	ericsson	AIR 21 B2A B4P w/ Mount Pipe	1	1 3/16	
		3	ericsson	AIR 21 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
157.0	157.0	1		Sector Mount [SM 504-3]	18	1 5/8	1
		3	antel	BXA-70063-4CF-EDIN-X w/ Mount Pipe			
		6	antel	LPA-185063/8CFx2 w/ Mount Pipe			
		2	antel	LPA-80063/4CF w/ Mount Pipe			
		2	antel	LPA-80063/4CFx5 w/ Mount Pipe			
		2	celwave	APL866513-42T6 w/ 8' Pipe Mount			
145.0	147.0	12	decibel	DB844H90-XY w/ Mount Pipe	12	1 5/8	3
	145.0	1	rohn	6' Side-Arm Pipe (1) w/ 12' Horizontal mounting pipe (3)			
135.0	137.0	2	andrew	SBNH-1D6565C w/ Mount Pipe	1 2 13	3/8 3/4 1 1/4	1
		3	communications components	DTMABP7819VG12A TMA			
		6	ericsson	RRUS-11 BTS			
		3	powerwave technologies	7770.00 w/ Mount Pipe			
		3	powerwave technologies	LGP13519 Diplexer			
		4	powerwave technologies	P65-17-XLH-RR w/ Mount Pipe			
		1	raycap	DC6-48-60-18-8F			
	135.0	1		Sector Mount [SM 504-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
125.0	126.0	3	alcatel lucent	1900MHz RRH (65MHz) TMA	3	1 1/4	1
		3	alcatel lucent	800MHz 2x50W RRH w/ Filter			
		3	alcatel lucent	TD-RRH8x20-25 BTS	1	5/8	2
		1	celwave	APXV9ERR18-C-A20 w/ Mount Pipe			1
		2	celwave	APXVSPP18-C-A20 w/ Mount Pipe			
		3	celwave	APXVTM14-C-120 w/ Mount Pipe			2
	125.0	1		Pipe Mount [PM 601-3]			1
		1		Sector Mount [SM 402-3]			
113.0	113.0	1			6	1 5/8	1
		3	rfs	APXV18-206517-A w/ Mount Pipe			3
95.0	95.0	1		Pipe Mount	1	EW52	1
		1	andrew	UHX8-59H			
86.0	86.0	1		Pipe Mount	2	EW52	1
		1	andrew	UHX8-59H			
57.0	60.0	1		GPS	1	1/2	1
	57.0	1		Side Arm Mount [SO 202-1]			
48.0	50.0	1	lucent	KS24019-L112A	1	1/2	1
	48.0	1		Side Arm Mount [SO 202-1]			

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

Table 3 - Design 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)
180	180	4	celwave	PD10017		
		4	rohn	3' Sidearm		
171	171	6	celwave	PD1132		
		3	rohn	6' Sidearm		
161	161	2		6' Std. Dish		
100	100	1	celwave	PD1109		
		1	rohn	6' Sidearm		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Metro PCS Change-Out Revision #1	252178	CCIsites
Tower Drawing	Rohn Drawing No. A861587-1	1285424	CCIsites
Foundation Drawing	Rohn Drawing No. C820155	1918334	CCIsites
Tower Leg Information	HEB September 3, 1999 Letter	821786	CCIsites
Geotechnical Report	FDH Project No. 06-10109G	1275233	CCIsites
Rework Design	All-Points Technology Job #CT105160	262063	CCIsites
Rework Drawings	Vertical Structures Job No. 2006-004-066	1278690	CCIsites
Rework Drawings	Vertical Structures Job No. 2011-004-006	2961397	CCIsites
Rework Drawings	Vertical Structures Job No. 2012-004-047	3265393	CCIsites
Post-Modification Inspection	TEP Project No. 127290	3684249	CCIsites

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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.

This analysis may be affected if any assumptions are not valid or have been made in error. Vertical Structures, Inc. should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	161.375 - 141.25	Leg	ROHN 2 STD	3	-15270.30	32298.46	47.3	Pass
T2	141.25 - 136.188	Leg	ROHN 2.5 EH	39	-16838.10	65601.99	25.7	Pass
T3	136.188 - 131.188	Leg	ROHN 2.5 EH	51	-24458.10	65600.53	37.3	Pass
T4	131.188 - 126.188	Leg	ROHN 2.5 EH	60	-31026.60	65600.53	47.3	Pass
T5	126.188 - 121.125	Leg	ROHN 2.5 EH	69	-43772.50	65601.99	66.7	Pass
T6	121.125 - 114.396	Leg	ROHN 3 EH	78	-48765.30	83786.24	58.2	Pass
T7	114.396 - 107.729	Leg	ROHN 3 EH	87	-59592.80	83784.51	71.1	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T8	107.729 - 100.979	Leg	ROHN 3 EH	96	-76012.70	83786.78	90.7	Pass
T9	100.979 - 94.2292	Leg	ROHN 3.5 EH	105	-81405.80	110272.15	73.8	Pass
T10	94.2292 - 87.5625	Leg	ROHN 3.5 EH	114	-91640.40	110269.22	83.1	Pass
T11	87.5625 - 80.8125	Leg	ROHN 3.5 EH	123	-109175.00	132220.66	82.6	Pass
T12	80.8125 - 74.0625	Leg	ROHN 4 EH	135	-114144.00	139069.22	82.1	Pass
T13	74.0625 - 67.3958	Leg	ROHN 4 EH	144	-124548.00	139067.89	89.6	Pass
T14	67.3958 - 60.625	Leg	ROHN 4 EH	153	-140353.00	161110.37	87.1	Pass
T15	60.625 - 50.5208	Leg	ROHN 5 EH	165	-147438.00	177462.28	83.1	Pass
T16	50.5208 - 40.4167	Leg	ROHN 5 EH	174	-170662.00	177462.28	96.2	Pass
T17	40.4167 - 30.3125	Leg	ROHN 5 EH	183	-177093.00	217442.95	81.4	Pass
T18	30.3125 - 20.2083	Leg	ROHN 5 EH	195	-198929.00	217500.27	91.5	Pass
T19	20.2083 - 0	Leg	ROHN 6 STD w/ 2" B7 (Composite Controls) (VSI)	207	-226523.00	251897.00	89.9	Pass
T1	161.375 - 141.25	Diagonal	L1 3/4x1 3/4x3/16	12	-2257.77	8233.69	27.4 42.2 (b)	Pass
T2	141.25 - 136.188	Diagonal	L1 3/4x1 3/4x3/16	48	-2200.01	6292.83	35.0 40.0 (b)	Pass
T3	136.188 - 131.188	Diagonal	L1 3/4x1 3/4x3/16	57	-3341.08	5692.96	58.7 60.8 (b)	Pass
T4	131.188 - 126.188	Diagonal	L1 3/4x1 3/4x3/16	63	-3646.29	5163.16	70.6	Pass
T5	126.188 - 121.125	Diagonal	L2x2x3/16	72	-4520.42	7121.45	63.5 82.8 (b)	Pass
T6	121.125 - 114.396	Diagonal	L2 1/2x2 1/2x1/4	81	-5197.37	13636.32	38.1 80.4 (b)	Pass
T7	114.396 - 107.729	Diagonal	L2 1/2x2 1/2x1/4	90	-5398.49	12364.21	43.7 84.2 (b)	Pass
T8	107.729 - 100.979	Diagonal	L2 1/2x2 1/2x1/4	99	-5656.03	11251.04	50.3 87.7 (b)	Pass
T9	100.979 - 94.2292	Diagonal	L2 1/2x2 1/2x3/16	111	-5869.87	7928.39	74.0	Pass
T10	94.2292 - 87.5625	Diagonal	L2 1/2x2 1/2x3/16	120	-7040.96	7231.13	97.4	Pass
T11	87.5625 - 80.8125	Diagonal	2L2 1/2x2 1/2x3/16x1/4	129	-7807.35	28255.60	27.6 71.5 (b)	Pass
T12	80.8125 - 74.0625	Diagonal	L3x3x3/16	141	-7862.83	10664.01	73.7	Pass
T13	74.0625 - 67.3958	Diagonal	L3x3x3/16	150	-7652.22	9783.97	78.2	Pass
T14	67.3958 - 60.625	Diagonal	L3x3x3/16	159	-7905.64	9013.80	87.7	Pass
T15	60.625 - 50.5208	Diagonal	2L3x3x3/16x1/4	171	-8994.21	29304.00	30.7 76.3 (b)	Pass
T16	50.5208 - 40.4167	Diagonal	2L3x3x3/16x1/4	180	-9083.88	27080.03	33.5 77.8 (b)	Pass
T17	40.4167 - 30.3125	Diagonal	2L3x3x1/4x1/4	189	-9003.99	32519.33	27.7 76.8 (b)	Pass
T18	30.3125 - 20.2083	Diagonal	2L3x3x1/4x1/4	201	-9595.38	29757.36	32.2 78.1 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T19	20.2083 - 0	Diagonal	2L3 1/2x3 1/2x1/4x1/4	213	-9988.65	40256.47	24.8 82.3 (b)	Pass
T11	87.5625 - 80.8125	Secondary Horizontal	L2x2x3/16	131	-1893.36	4040.92	46.9	Pass
T14	67.3958 - 60.625	Secondary Horizontal	L2x2x3/16	161	-2434.22	2956.31	82.3	Pass
T17	40.4167 - 30.3125	Secondary Horizontal	L3x3x1/4	191	-3071.41	9343.57	32.9 35.8 (b)	Pass
T18	30.3125 - 20.2083	Secondary Horizontal	L3x3x3/16	204	-3450.12	6383.47	54.0	Pass
T1	161.375 - 141.25	Top Girt	L2x2x1/8	5	-449.35	2488.54	18.1	Pass
T2	141.25 - 136.188	Top Girt	L2x2x1/8	40	-403.04	2452.43	16.4	Pass
							Summary	
						Leg (T16)	96.2	Pass
						Diagonal (T10)	97.4	Pass
						Secondary Horizontal (T14)	82.3	Pass
						Top Girt (T1)	18.1	Pass
						Bolt Checks	87.7	Pass
						Rating =	97.4	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	77.7	Pass
1	Base Foundation Soil Interaction	0	83.3	Pass

Structure Rating (max from all components) =	97.4%

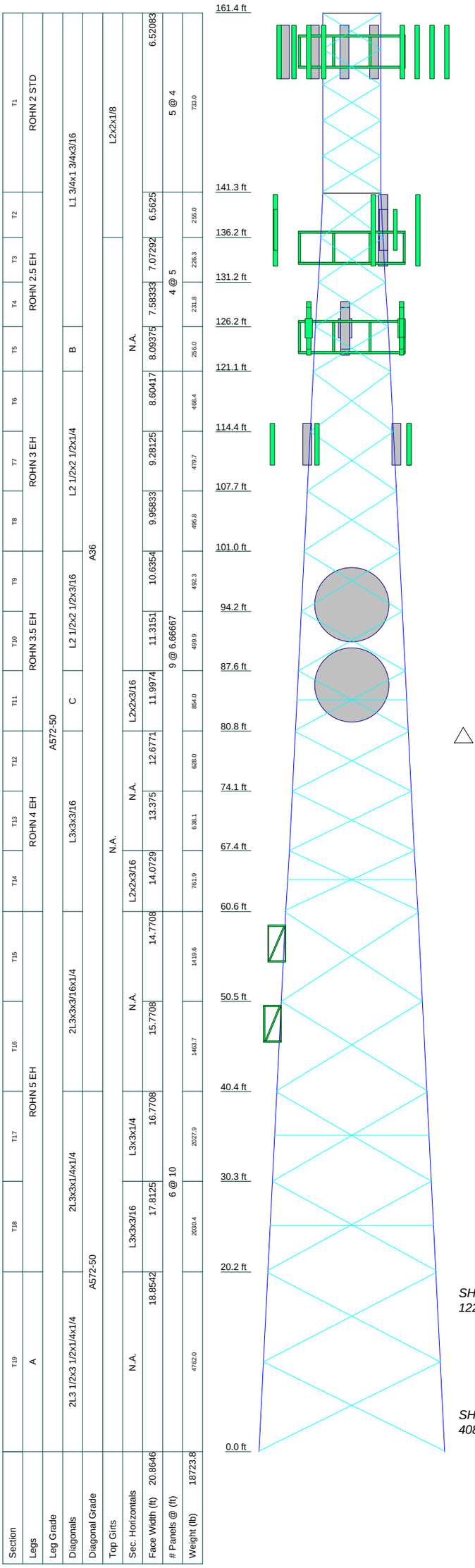
Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity.

4.1) Recommendations

N/A

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Sector Mount [SM 504-3]	157	DC6-48-60-18-8F	135
(2) LPA-185063/8CFx2 w/ Mount Pipe (VSI)	157	Sector Mount [SM 402-3]	125
		APXVSPP18-C-A20 w/ Mount Pipe	125
(2) LPA-185063/8CFx2 w/ Mount Pipe (VSI)	157	APXV9ERR18-C-A20 w/ Mount Pipe	125
		APXVSPP18-C-A20 w/ Mount Pipe	125
(2) LPA-185063/8CFx2 w/ Mount Pipe (VSI)	157	APXVTM14-C-120 w/ Mount Pipe	125
		APXVTM14-C-120 w/ Mount Pipe	125
(2) APL866513-42T6 w/ 8' Pipe Mount (VSI)	157	APXVTM14-C-120 w/ Mount Pipe	125
		Pipe Mount [PM 601-3]	125
(2) LPA-80063/4CF w/ Mount Pipe (VSI)	157	1900MHz RRH (65MHz) TMA	125
(2) LPA-80063/4CFx5 w/Mount Pipe	157	1900MHz RRH (65MHz) TMA	125
BXA-70063-4CF-EDIN-X w/ Mount Pipe	157	1900MHz RRH (65MHz) TMA	125
		800MHz 2x50W RRH w/ Filter	125
BXA-70063-4CF-EDIN-X w/ Mount Pipe	157	800MHz 2x50W RRH w/ Filter	125
		800MHz 2x50W RRH w/ Filter	125
BXA-70063-4CF-EDIN-X w/ Mount Pipe	157	TD-RRH8x20-25 BTS	125
Sector Mount [SM 504-3]	135	TD-RRH8x20-25 BTS	125
7770.00 w/ mount pipe	135	TD-RRH8x20-25 BTS	125
7770.00 w/ mount pipe	135	Side Arm Mount [SO 101-3] (Metro PCS)	113
7770.00 w/ mount pipe	135	(2) AIR 21 B4A B2P w/ Mount Pipe (Metro PCS)	113
LGP13519 Diplexer	135		
LGP13519 Diplexer	135	AIR 21 B2A B4P w/ Mount Pipe (Metro PCS)	113
LGP13519 Diplexer	135		
SBNH-1D6565C w/ Mount Pipe	135	AIR 21 B4A B2P w/ Mount Pipe (Metro PCS)	113
P65-17-XLH-RR w/ Mount Pipe	135		
(2) P65-17-XLH-RR w/ Mount Pipe	135	(2) AIR 21 B2A B4P w/ Mount Pipe (Metro PCS)	113
P65-17-XLH-RR w/ Mount Pipe	135		
SBNH-1D6565C w/ Mount Pipe	135	4'x4" Pipe Mount	95
(2) RRUS-11 BTS (19.69 x 16.97 x 7.17)	135	4" Tube Face Mount	95
		4" Tube Face Mount	95
(2) RRUS-11 BTS (19.69 x 16.97 x 7.17)	135	UHX8-59H	95
		4" Tube Face Mount	86
(2) RRUS-11 BTS (19.69 x 16.97 x 7.17)	135	4'x4" Pipe Mount	86
		UHX8-59H	86
DTMABP7819VG12A TMA	135	Side Arm Mount [SO 202-1]	57
DTMABP7819VG12A TMA	135	Generic GPS (VSI)	57
DTMABP7819VG12A TMA	135	KS24019-L112A	48
		Side Arm Mount [SO 202-1]	48

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 6 STD w/ 2" B7 (Composite Controls) (VSI)	C	2L2 1/2x2 1/2x3/16x1/4
B	L2x2x3/16		

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 Tolland County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.4%

MAX. CORNER REACTIONS AT BASE:
DOWN: 225469 lb
SHEAR: 25120 lb

UPLIFT: -193189 lb
SHEAR: 22292 lb

AXIAL
85891 lb

SHEAR
12255 lb

MOMENT
1307983 lb-ft

TORQUE 12770 lb-ft
38 mph WIND - 1.0000 in ICE

AXIAL
34341 lb

SHEAR
40895 lb

MOMENT
3867314 lb-ft

TORQUE 55067 lb-ft
REACTIONS - 85 mph WIND

Vertical Structures, Inc.
309 Spangler Drive, Suite E
Richmond, KY 40475
Phone: (859) 624-8360
FAX: (859) 624-8369

Job:	***HRT 086, CT BU#806378***		
Project:	***Vertical Structures Job No. 2014-004-027***		
Client:	Crown Castle	Drawn by: Bryce Collins	App'd:
Code:	TIA/EIA-222-F	Date: 06/27/14	Scale: NTS
Path:	\\nas1\BCollins\2014-004-027 HRT 086, CT\TNX\806378.eri		Dwg No. E-1

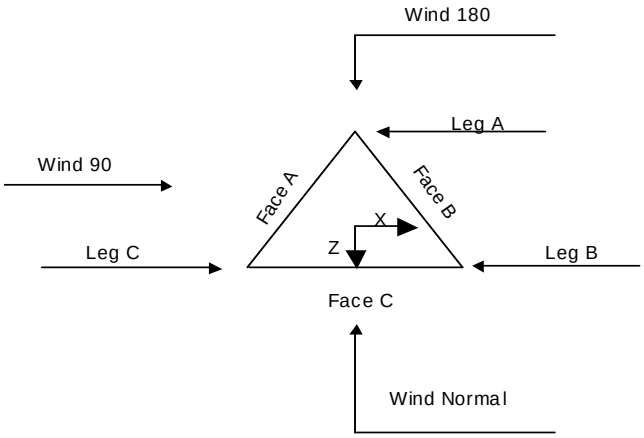
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 161.38 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 6.52 ft at the top and 20.86 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
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		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate	√	Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios		Use Clear Spans For KL/r	√	SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys	√	Retension Guys To Initial Tension	√	All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends		Include Shear-Torsion Interaction
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)	√	Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	161.38-141.25			6.52	1	20.13
T2	141.25-136.19			6.56	1	5.06
T3	136.19-131.19			7.07	1	5.00
T4	131.19-126.19			7.58	1	5.00
T5	126.19-121.13			8.09	1	5.06
T6	121.13-114.40			8.60	1	6.73
T7	114.40-107.73			9.28	1	6.67
T8	107.73-100.98			9.96	1	6.75
T9	100.98-94.23			10.64	1	6.75
T10	94.23-87.56			11.32	1	6.67
T11	87.56-80.81			12.00	1	6.75
T12	80.81-74.06			12.68	1	6.75
T13	74.06-67.40			13.38	1	6.67
T14	67.40-60.62			14.07	1	6.77
T15	60.62-50.52			14.77	1	10.10
T16	50.52-40.42			15.77	1	10.10
T17	40.42-30.31			16.77	1	10.10
T18	30.31-20.21			17.81	1	10.10
T19	20.21-0.00			18.85	1	20.21

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	161.38-141.25	4.00	X Brace	No	No	0.7500	0.7500
T2	141.25-136.19	5.00	X Brace	No	No	0.7500	0.0000
T3	136.19-131.19	5.00	X Brace	No	No	0.0000	0.0000
T4	131.19-126.19	5.00	X Brace	No	No	0.0000	0.0000
T5	126.19-121.13	5.00	X Brace	No	No	0.0000	0.7500
T6	121.13-114.40	6.67	X Brace	No	No	0.7500	0.0000
T7	114.40-107.73	6.67	X Brace	No	No	0.0000	0.0000
T8	107.73-100.98	6.67	X Brace	No	No	0.0000	1.0000
T9	100.98-94.23	6.67	X Brace	No	No	1.0000	0.0000
T10	94.23-87.56	6.67	X Brace	No	No	0.0000	0.0000
T11	87.56-80.81	6.67	X Brace	No	Yes	0.0000	1.0000
T12	80.81-74.06	6.67	X Brace	No	No	1.0000	0.0000
T13	74.06-67.40	6.67	X Brace	No	No	0.0000	0.0000
T14	67.40-60.62	6.67	X Brace	No	Yes	0.0000	1.2500
T15	60.62-50.52	10.00	X Brace	No	No	1.2500	0.0000
T16	50.52-40.42	10.00	X Brace	No	No	0.0000	1.2500
T17	40.42-30.31	10.00	X Brace	No	Yes	1.2500	0.0000
T18	30.31-20.21	10.00	X Brace	No	Yes	0.0000	1.2500
T19	20.21-0.00	10.00	X Brace	No	No	1.2500	1.2500

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 161.38-141.25	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 141.25-136.19	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 136.19-131.19	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 131.19-126.19	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T5 126.19-121.13	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T6 121.13-114.40	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T7 114.40-107.73	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T8 107.73-100.98	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T9 100.98-94.23	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T10 94.23-87.56	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T11 87.56-80.81	Pipe	ROHN 3.5 EH	A572-50 (50 ksi)	Double Angle	2L2 1/2x2 1/2x3/16x1/4	A36 (36 ksi)
T12 80.81-74.06	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T13 74.06-67.40	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T14 67.40-60.62	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T15 60.62-50.52	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T16 50.52-40.42	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T17 40.42-30.31	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T18 30.31-20.21	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T19 20.21-0.00	Arbitrary Shape	ROHN 6 STD w/ 2" B7 (Composite Controls) (VSI)	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x1/4	A572-50 (50 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 161.38-141.25	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 141.25-136.19	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T11 87.56-80.81	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T14 67.40-60.62	Equal Angle	L2x2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T17 40.42-30.31	Equal Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T18 30.31-20.21	Equal Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 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
T1 161.38-141.25	1.62	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T2 141.25-136.19	0.34	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T3 136.19-131.19	0.34	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T4 131.19-126.19	0.34	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000

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
T5 126.19-121.13	0.34	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T6 121.13-114.40	0.36	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T7 114.40-107.73	0.36	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T8 107.73-100.98	0.36	0.1875	A36 (36 ksi)	1	1	1	30.0000	30.0000
T9 100.98-94.23	0.36	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T10 94.23-87.56	0.36	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T11 87.56-80.81	0.50	0.3750	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T12 80.81-74.06	0.36	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T13 74.06-67.40	0.36	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T14 67.40-60.62	0.36	0.3750	A36 (36 ksi)	1	1	1	30.0000	30.0000
T15 60.62-50.52	0.52	0.2500	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T16 50.52-40.42	0.75	0.2500	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T17 40.42-30.31	0.75	0.2500	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T18 30.31-20.21	0.75	0.2500	A36 (36 ksi)	1	1	1	Mid-Pt	60.0000
T19 20.21-0.00	1.04	0.2500	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000

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 161.38-141.25	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 141.25-136.19	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 136.19-131.19	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 131.19-126.19	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 126.19-121.13	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 121.13-114.40	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 114.40-107.73	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 107.73-100.98	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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
T9	No	No	1	1	1	1	1	1	1	1
100.98-94.23				1	1	1	1	1	1	1
T10	No	No	1	1	1	1	1	1	1	1
94.23-87.56				1	1	1	1	1	1	1
T11	No	No	1	1	1	1	1	1	0.5	1
87.56-80.81				1	1	1	1	1	0.5	1
T12	No	No	1	1	1	1	1	1	1	1
80.81-74.06				1	1	1	1	1	1	1
T13	No	No	1	1	1	1	1	1	1	1
74.06-67.40				1	1	1	1	1	1	1
T14	No	No	1	1	1	1	1	1	0.5	1
67.40-60.62				1	1	1	1	1	0.5	1
T15	No	No	1	1	1	1	1	1	1	1
60.62-50.52				1	1	1	1	1	1	1
T16	No	No	1	1	1	1	1	1	1	1
50.52-40.42				1	1	1	1	1	1	1
T17	No	No	1	1	1	1	1	1	0.5	1
40.42-30.31				1	1	1	1	1	0.5	1
T18	No	No	1	1	1	1	1	1	0.5	1
30.31-20.21				1	1	1	1	1	0.5	1
T19	No	No	1	1	1	1	1	1	1	1
20.21-0.00				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	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
161.38-141.25														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
141.25-136.19														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
136.19-131.19														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
131.19-126.19														
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
126.19-121.13														
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
121.13-114.40														
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
114.40-107.73														
T8	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
107.73-100.98														
T9	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
100.98-94.23														
T10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
94.23-87.56														

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
T11 87.56-80.81	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 80.81-74.06	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 74.06-67.40	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 67.40-60.62	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 60.62-50.52	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 50.52-40.42	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 40.42-30.31	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 30.31-20.21	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T19 20.21-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 161.38-141.25	2.5000	3.2813	2.5000	3.2813	0.0000	0.0000	0.0000	0.0000
T2 141.25-136.19	2.5000	3.5313	2.5000	3.5313	0.0000	0.0000	0.0000	0.0000
T3 136.19-131.19	2.5000	3.5313	2.5000	3.5313	0.0000	0.0000	0.0000	0.0000
T4 131.19-126.19	2.5000	3.5313	2.5000	3.5313	0.0000	0.0000	0.0000	0.0000
T5 126.19-121.13	2.5000	3.5313	2.5000	3.5313	0.0000	0.0000	0.0000	0.0000
T6 121.13-114.40	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T7 114.40-107.73	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T8 107.73-100.98	2.5000	3.8438	2.5000	3.8438	0.0000	0.0000	0.0000	0.0000
T9 100.98-94.23	2.5000	4.0938	2.5000	4.0938	0.0000	0.0000	0.0000	0.0000
T10 94.23-87.56	2.5000	4.0938	2.5000	4.0938	0.0000	0.0000	0.0000	0.0000
T11 87.56-80.81	2.5000	4.0938	2.5000	4.0938	0.0000	0.0000	0.0000	0.0000
T12 80.81-74.06	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T13 74.06-67.40	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T14 67.40-60.62	2.5000	4.3438	2.5000	4.3438	0.0000	0.0000	0.0000	0.0000
T15 60.62-50.52	2.5000	4.8753	2.5000	4.8753	0.0000	0.0000	0.0000	0.0000
T16 50.52-40.42	2.5000	4.8753	2.5000	4.8753	0.0000	0.0000	0.0000	0.0000
T17 40.42-30.31	2.5000	4.8753	2.5000	4.8753	0.0000	0.0000	0.0000	0.0000
T18 30.31-20.21	2.5000	4.8753	2.5000	4.8753	0.0000	0.0000	0.0000	0.0000
T19 20.21-0.00	2.5000	5.4063	2.5000	5.4063	0.0000	0.0000	0.0000	0.0000

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 161.38-141.25	Flange	0.6250 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 141.25-136.19	Flange	0.7500 A325N	0	0.5000 A325N	1	0.5000 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 136.19-131.19	Flange	0.7500 A325N	0	0.5000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 131.19-126.19	Flange	0.7500 A325N	0	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 126.19-121.13	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 121.13-114.40	Flange	0.8750 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 114.40-107.73	Flange	0.8750 A325N	0	0.5000 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 107.73-100.98	Flange	0.8750 A325N	4	0.5000 A325X	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 100.98-94.23	Flange	0.8750 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 94.23-87.56	Flange	0.8750 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 87.56-80.81	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T12 80.81-74.06	Flange	1.0000 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 74.06-67.40	Flange	1.0000 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 67.40-60.62	Flange	1.0000 A325N	4	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T15 60.62-50.52	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 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.
T16	Flange	1.0000	4	0.6250	1	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
50.52-40.42		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T17	Flange	1.0000	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	1
40.42-30.31		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T18	Flange	1.0000	6	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	1
30.31-20.21		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T19 20.21-0.00	Flange	1.0000	0	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
		A449		A325N		A325N		A325N		A325N		A325N		A325N	

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
EW52	A	Yes	Ar (CfAe)	86.00 - 8.00	1.0000	0.45	1	1	1.7426	1.7426		0.59
LDF4-50A (1/2 FOAM)	A	Yes	Ar (CfAe)	60.00 - 8.00	1.0000	0.45	1	1	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM)	A	Yes	Ar (CfAe)	157.00 - 8.00	1.0000	0.4	18	6	0.2700 1.0000	1.9800		0.82
Feedline Ladder (1-1/2" Rails) (Af) **	A	Yes	Af (CfAe)	161.38 - 8.00	0.5000	0.4	1	1	3.0000	1.5000	12.0000	3.66
Feedline Ladder (1-1/2" Rails) (Af)	B	Yes	Af (CfAe)	137.00 - 10.00	0.5000	-0.4	1	1	3.0000	1.5000	12.0000	3.66
Feedline Ladder (1-1/2" Rails) (Af)	B	Yes	Af (CfAe)	161.38 - 137.00	0.5000	-0.4	1	1	3.0000	3.0000	12.0000	3.66
HB114-1-08U4-M5J (1-1/4")	B	Yes	Ar (CfAe)	126.00 - 10.00	1.0000	-0.3	3	3	1.0000	1.5400		0.66
HB058-M12-XXXF (5/8")	B	Yes	Ar (CfAe)	126.00 - 10.00	1.0000	-0.3	1	1	0.8400	0.8400		0.25
EW52	B	Yes	Ar (CfAe)	86.00 - 10.00	1.0000	-0.33	2	2	1.0000	1.7426		0.59
EW52	B	Yes	Ar (CfAe)	95.00 - 86.00	1.0000	-0.33	1	1	1.0000	1.7426		0.59
LDF4-50A (1/2 FOAM) **	B	Yes	Ar (CfAe)	50.00 - 8.00	2.0000	-0.32	1	1	0.6300	0.6300		0.15
LDF6-50A (1-1/4 FOAM)	B	Yes	Ar (CfAe)	137.00 - 10.00	1.0000	-0.4	13	6	1.4500	1.5500		0.66
FB-L98-002-XXX (3/8")	B	Yes	Ar (CfAe)	137.00 - 10.00	1.0000	-0.4	1	1	0.3937	0.3937		0.10
WR-VG86ST-BRD (Power Cable) ** ***	B	Yes	Ar (CfAe)	137.00 - 10.00	1.0000	-0.4	2	2	1.0000	0.7760		0.15
2" Solid Rod Reinf (Ar) (VSI)	A	No	Ar (Leg)	25.00 - 0.00	0.0000	-0.05	1	1	2.3330	2.3330		0.00
2" Solid Rod Reinf (Ar) (VSI)	B	No	Ar (Leg)	25.00 - 0.00	0.0000	-0.05	1	1	2.3330	2.3330		0.00
2" Solid Rod	C	No	Ar (Leg)	25.00 - 0.00	0.0000	-0.05	1	1	2.3330	2.3330		0.00

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
Reinf (Ar) (VSI) ***												
Feedline Ladder (1-1/2" Rails) (Af) (Metro PCS)	A	Yes	Af (CfAe)	113.00 - 8.00	0.5000	-0.4	1	1	3.0000	3.0000	12.0000	3.66
CR 50 1873 (1-5/8 FOAM) (Metro PCS)	A	Yes	Ar (CfAe)	113.00 - 8.00	1.0000	-0.4	6	6	1.0000	1.9800		0.83
1.2 Masterline Extreme Hybrid (1 3/16") (Metro PCS)	A	Yes	Ar (CfAe)	113.00 - 8.00	1.0000	-0.4	1	1	1.2000	1.2000		0.10

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	161.38-141.25	A	15.592	2.516	0.000	0.000	306.13
		B	0.000	5.031	0.000	0.000	73.66
		C	0.000	0.000	0.000	0.000	0.00
T2	141.25-136.19	A	5.012	0.633	0.000	0.000	93.25
		B	0.761	1.164	0.000	0.000	25.82
		C	0.000	0.000	0.000	0.000	0.00
T3	136.19-131.19	A	4.950	0.625	0.000	0.000	92.10
		B	4.686	0.625	0.000	0.000	63.20
		C	0.000	0.000	0.000	0.000	0.00
T4	131.19-126.19	A	4.950	0.625	0.000	0.000	92.10
		B	4.686	0.625	0.000	0.000	63.20
		C	0.000	0.000	0.000	0.000	0.00
T5	126.19-121.13	A	5.012	0.633	0.000	0.000	93.25
		B	6.962	0.633	0.000	0.000	74.86
		C	0.000	0.000	0.000	0.000	0.00
T6	121.13-114.40	A	6.662	0.841	0.000	0.000	123.95
		B	9.368	0.841	0.000	0.000	100.06
		C	0.000	0.000	0.000	0.000	0.00
T7	114.40-107.73	A	12.345	2.151	0.000	0.000	168.87
		B	9.281	0.833	0.000	0.000	99.13
		C	0.000	0.000	0.000	0.000	0.00
T8	107.73-100.98	A	14.040	2.531	0.000	0.000	183.33
		B	9.397	0.844	0.000	0.000	100.37
		C	0.000	0.000	0.000	0.000	0.00
T9	100.98-94.23	A	14.040	2.531	0.000	0.000	183.33
		B	9.509	0.844	0.000	0.000	100.83
		C	0.000	0.000	0.000	0.000	0.00
T10	94.23-87.56	A	13.867	2.500	0.000	0.000	181.07
		B	10.249	0.833	0.000	0.000	103.07
		C	0.000	0.000	0.000	0.000	0.00
T11	87.56-80.81	A	14.793	2.531	0.000	0.000	186.39
		B	11.130	0.844	0.000	0.000	107.42
		C	0.000	0.000	0.000	0.000	0.00
T12	80.81-74.06	A	15.020	2.531	0.000	0.000	187.31
		B	11.357	0.844	0.000	0.000	108.34
		C	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T13	74.06-67.40	A	14.835	2.500	0.000	0.000	185.00
		B	11.217	0.833	0.000	0.000	107.00
		C	0.000	0.000	0.000	0.000	0.00
T14	67.40-60.62	A	15.067	2.539	0.000	0.000	187.89
		B	11.392	0.846	0.000	0.000	108.67
		C	0.000	0.000	0.000	0.000	0.00
T15	60.62-50.52	A	22.982	3.789	0.000	0.000	281.81
		B	17.001	1.263	0.000	0.000	162.17
		C	0.000	0.000	0.000	0.000	0.00
T16	50.52-40.42	A	23.014	3.789	0.000	0.000	281.91
		B	17.504	1.263	0.000	0.000	163.61
		C	0.000	0.000	0.000	0.000	0.00
T17	40.42-30.31	A	23.014	3.789	0.000	0.000	281.91
		B	17.531	1.263	0.000	0.000	163.69
		C	0.000	0.000	0.000	0.000	0.00
T18	30.31-20.21	A	24.878	3.789	0.000	0.000	281.91
		B	19.395	1.263	0.000	0.000	163.69
		C	1.863	0.000	0.000	0.000	0.00
T19	20.21-0.00	A	35.665	4.578	0.000	0.000	340.61
		B	25.675	1.276	0.000	0.000	165.68
		C	7.858	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	161.38-141.25	A	1.201	5.750	19.966	0.000	0.000	1086.92
		B		0.000	7.716	0.000	0.000	229.10
		C		0.000	0.000	0.000	0.000	0.00
T2	141.25-136.19	A	1.188	1.838	6.047	0.000	0.000	331.66
		B		0.667	2.968	0.000	0.000	106.30
		C		0.000	0.000	0.000	0.000	0.00
T3	136.19-131.19	A	1.183	1.811	5.970	0.000	0.000	326.86
		B		4.090	8.272	0.000	0.000	358.07
		C		0.000	0.000	0.000	0.000	0.00
T4	131.19-126.19	A	1.177	1.806	5.967	0.000	0.000	326.14
		B		4.077	8.269	0.000	0.000	357.06
		C		0.000	0.000	0.000	0.000	0.00
T5	126.19-121.13	A	1.172	1.824	6.038	0.000	0.000	329.45
		B		6.984	10.433	0.000	0.000	434.63
		C		0.000	0.000	0.000	0.000	0.00
T6	121.13-114.40	A	1.165	2.417	8.021	0.000	0.000	436.68
		B		9.392	13.968	0.000	0.000	579.21
		C		0.000	0.000	0.000	0.000	0.00
T7	114.40-107.73	A	1.157	5.814	16.480	0.000	0.000	656.57
		B		9.260	13.832	0.000	0.000	571.12
		C		0.000	0.000	0.000	0.000	0.00
T8	107.73-100.98	A	1.148	6.778	18.963	0.000	0.000	721.97
		B		9.327	13.999	0.000	0.000	575.37
		C		0.000	0.000	0.000	0.000	0.00
T9	100.98-94.23	A	1.139	6.747	18.949	0.000	0.000	718.51
		B		9.534	13.992	0.000	0.000	575.85
		C		0.000	0.000	0.000	0.000	0.00
T10	94.23-87.56	A	1.129	6.631	18.701	0.000	0.000	706.05
		B		11.330	13.812	0.000	0.000	592.39
		C		0.000	0.000	0.000	0.000	0.00
T11	87.56-80.81	A	1.119	8.400	18.919	0.000	0.000	734.36

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B		11.402	15.163	0.000	0.000	616.29
		C		0.000	0.000	0.000	0.000	0.00
T12	80.81-74.06	A	1.108	8.868	18.902	0.000	0.000	736.86
		B		11.326	15.511	0.000	0.000	618.16
		C		0.000	0.000	0.000	0.000	0.00
T13	74.06-67.40	A	1.096	8.705	18.651	0.000	0.000	722.97
		B		11.107	15.311	0.000	0.000	606.07
		C		0.000	0.000	0.000	0.000	0.00
T14	67.40-60.62	A	1.083	8.782	18.923	0.000	0.000	728.98
		B		11.192	15.540	0.000	0.000	610.62
		C		0.000	0.000	0.000	0.000	0.00
T15	60.62-50.52	A	1.065	15.162	28.198	0.000	0.000	1099.22
		B		16.518	23.171	0.000	0.000	901.03
		C		0.000	0.000	0.000	0.000	0.00
T16	50.52-40.42	A	1.039	15.093	28.141	0.000	0.000	1084.68
		B		18.425	23.142	0.000	0.000	908.69
		C		0.000	0.000	0.000	0.000	0.00
T17	40.42-30.31	A	1.008	14.833	28.072	0.000	0.000	1065.33
		B		18.178	23.107	0.000	0.000	891.84
		C		0.000	0.000	0.000	0.000	0.00
T18	30.31-20.21	A	1.000	18.223	28.053	0.000	0.000	1079.64
		B		21.540	23.098	0.000	0.000	906.51
		C		3.460	0.000	0.000	0.000	19.51
T19	20.21-0.00	A	1.000	32.431	33.895	0.000	0.000	1363.19
		B		33.298	23.336	0.000	0.000	982.71
		C		14.594	0.000	0.000	0.000	82.29

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	161.38-141.25	A	0.000	3.422	1.688	2.522
		B	0.000	1.146	0.469	0.844
		C	0.000	0.000	0.000	0.000
T2	141.25-136.19	A	0.000	1.119	0.589	0.858
		B	0.000	0.540	0.201	0.414
		C	0.000	0.000	0.000	0.000
T3	136.19-131.19	A	0.000	0.774	0.394	0.573
		B	0.000	1.211	0.375	0.896
		C	0.000	0.000	0.000	0.000
T4	131.19-126.19	A	0.000	0.754	0.386	0.560
		B	0.000	1.180	0.367	0.877
		C	0.000	0.000	0.000	0.000
T5	126.19-121.13	A	0.000	0.737	0.433	0.629
		B	0.000	1.596	0.583	1.362
		C	0.000	0.000	0.000	0.000
T6	121.13-114.40	A	0.000	0.782	0.579	0.840
		B	0.000	1.712	0.788	1.837
		C	0.000	0.000	0.000	0.000
T7	114.40-107.73	A	0.000	1.623	1.102	1.754
		B	0.000	1.655	0.769	1.788
		C	0.000	0.000	0.000	0.000
T8	107.73-100.98	A	0.000	1.797	1.219	1.956
		B	0.000	1.605	0.753	1.747
		C	0.000	0.000	0.000	0.000
T9	100.98-94.23	A	0.000	1.747	1.197	1.917

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
		B	0.000	1.576	0.748	1.730
		C	0.000	0.000	0.000	0.000
T10	94.23-87.56	A	0.000	1.702	1.178	1.884
		B	0.000	1.663	0.798	1.840
		C	0.000	0.000	0.000	0.000
T11	87.56-80.81	A	0.000	2.547	1.643	2.671
		B	0.000	2.440	1.136	2.560
		C	0.000	0.000	0.000	0.000
T12	80.81-74.06	A	0.000	1.757	1.460	2.380
		B	0.000	1.675	1.015	2.268
		C	0.000	0.000	0.000	0.000
T13	74.06-67.40	A	0.000	1.716	1.445	2.349
		B	0.000	1.634	1.005	2.237
		C	0.000	0.000	0.000	0.000
T14	67.40-60.62	A	0.000	2.435	1.866	3.022
		B	0.000	2.317	1.297	2.876
		C	0.000	0.000	0.000	0.000
T15	60.62-50.52	A	0.000	1.870	1.583	2.635
		B	0.000	1.691	1.080	2.383
		C	0.000	0.000	0.000	0.000
T16	50.52-40.42	A	0.000	1.787	1.557	2.579
		B	0.000	1.696	1.090	2.448
		C	0.000	0.000	0.000	0.000
T17	40.42-30.31	A	0.000	2.424	2.195	3.607
		B	0.000	2.304	1.539	3.428
		C	0.000	0.000	0.000	0.000
T18	30.31-20.21	A	0.000	2.376	2.174	3.564
		B	0.000	2.257	1.524	3.386
		C	0.000	0.000	0.000	0.000
T19	20.21-0.00	A	0.000	1.961	2.094	3.432
		B	0.000	1.574	1.234	2.755
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	161.38-141.25	-1.2338	-10.0088	-0.4692	-4.9372
T2	141.25-136.19	-1.1787	-11.3353	-0.3789	-5.6338
T3	136.19-131.19	-0.1980	-17.7808	0.3727	-11.0445
T4	131.19-126.19	-0.1982	-18.7065	0.3848	-11.6457
T5	126.19-121.13	0.6124	-20.3299	0.8753	-12.8976
T6	121.13-114.40	0.6430	-20.3522	0.9573	-14.0303
T7	114.40-107.73	-6.5254	-15.6486	-4.2768	-10.9327
T8	107.73-100.98	-8.5403	-15.2206	-5.7815	-10.7136
T9	100.98-94.23	-8.6562	-15.5674	-5.9460	-11.1976
T10	94.23-87.56	-8.7029	-16.8452	-5.8658	-12.5396
T11	87.56-80.81	-7.7912	-16.7875	-5.2155	-11.2094
T12	80.81-74.06	-8.2814	-18.3775	-6.1104	-13.4167
T13	74.06-67.40	-8.5510	-18.9661	-6.3259	-13.8711
T14	67.40-60.62	-7.9237	-17.5667	-5.5660	-11.9471
T15	60.62-50.52	-9.7646	-22.0451	-7.6111	-17.9510
T16	50.52-40.42	-10.0316	-23.2620	-7.6659	-19.6479
T17	40.42-30.31	-9.2038	-21.3622	-6.9193	-17.5393
T18	30.31-20.21	-9.1364	-21.1970	-6.8395	-17.3122

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T19	20.21-0.00	-6.9854	-13.7770	-5.6172	-12.1378

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 lb
Sector Mount [SM 504-3]	A	None		0.0000	157.00	No Ice	34.25	34.25	1707.90
						1/2" Ice	48.98	48.98	2286.00
						1" Ice	63.71	63.71	2864.10
						2" Ice	93.17	93.17	4020.30
						4" Ice	152.09	152.09	6332.70
(2) LPA-185063/8CFx2 w/ Mount Pipe (VSI)	A	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice	3.23	3.94	27.25
						1/2" Ice	3.62	4.55	62.46
						1" Ice	4.05	5.19	103.19
						2" Ice	4.93	6.58	204.15
						4" Ice	6.84	9.63	511.18
(2) LPA-185063/8CFx2 w/ Mount Pipe (VSI)	B	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice	3.23	3.94	27.25
						1/2" Ice	3.62	4.55	62.46
						1" Ice	4.05	5.19	103.19
						2" Ice	4.93	6.58	204.15
						4" Ice	6.84	9.63	511.18
(2) LPA-185063/8CFx2 w/ Mount Pipe (VSI)	C	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice	3.23	3.94	27.25
						1/2" Ice	3.62	4.55	62.46
						1" Ice	4.05	5.19	103.19
						2" Ice	4.93	6.58	204.15
						4" Ice	6.84	9.63	511.18
(2) APL866513-42T6 w/ 8' Pipe Mount (VSI)	A	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice	5.24	5.63	44.90
						1/2" Ice	6.03	6.83	97.28
						1" Ice	6.75	7.88	156.17
						2" Ice	8.04	9.65	297.44
						4" Ice	10.78	13.41	711.44
(2) LPA-80063/4CF w/ Mount Pipe (VSI)	B	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice	7.02	6.95	34.60
						1/2" Ice	7.43	7.59	97.91
						1" Ice	7.86	8.25	167.60
						2" Ice	8.73	9.63	328.69
						4" Ice	10.57	12.73	761.38
(2) LPA-80063/4CFx5 w/Mount Pipe	C	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice	7.73	7.75	45.55
						1/2" Ice	8.46	8.87	116.68
						1" Ice	9.07	9.71	194.79
						2" Ice	10.32	11.43	375.62
						4" Ice	12.96	15.08	869.71
BXA-70063-4CF-EDIN-X w/ Mount Pipe	A	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice	6.12	4.42	39.10
						1/2" Ice	6.93	5.55	86.15
						1" Ice	7.66	6.53	144.20
						2" Ice	8.98	8.23	282.56
						4" Ice	11.77	11.90	686.13
BXA-70063-4CF-EDIN-X w/ Mount Pipe	B	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice	6.12	4.42	39.10
						1/2" Ice	6.93	5.55	86.15
						1" Ice	7.66	6.53	144.20
						2" Ice	8.98	8.23	282.56
						4" Ice	11.77	11.90	686.13

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 lb
BXA-70063-4CF-EDIN-X w/ Mount Pipe	C	From Leg	4.25 -2.50 0.00	-30.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.12 6.93 7.66 8.98 11.77	4.42 5.55 6.53 8.23 11.90	39.10 86.15 144.20 282.56 686.13
**									
**									
Sector Mount [SM 504-3]	A	None		0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	34.25 48.98 63.71 93.17 152.09	34.25 48.98 63.71 93.17 152.09	1707.90 2286.00 2864.10 4020.30 6332.70
7770.00 w/ mount pipe	A	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 105.42 160.42 293.10 679.83
7770.00 w/ mount pipe	B	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 105.42 160.42 293.10 679.83
7770.00 w/ mount pipe	C	From Leg	4.00 3.00 2.00	36.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.22 6.77 7.30 8.38 10.69	4.35 5.20 5.92 7.41 10.76	56.90 105.42 160.42 293.10 679.83
LGP13519 Diplexer	A	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.18 0.25 0.32 0.49 0.94	5.50 7.92 11.41 22.43 66.02
LGP13519 Diplexer	B	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.18 0.25 0.32 0.49 0.94	5.50 7.92 11.41 22.43 66.02
LGP13519 Diplexer	C	From Leg	4.00 3.00 2.00	36.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	0.18 0.25 0.32 0.49 0.94	5.50 7.92 11.41 22.43 66.02
SBNH-1D6565C w/ Mount Pipe	A	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.45 12.06 12.69 14.03 17.05	9.60 11.02 12.29 14.51 19.14	95.30 182.27 278.99 505.69 1129.60
P65-17-XLH-RR w/ Mount Pipe	A	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.47 12.08 12.71 14.07 17.08	8.70 10.11 11.38 13.58 18.18	88.20 171.36 264.18 482.82 1089.49
(2) P65-17-XLH-RR w/ Mount Pipe	B	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.47 12.08 12.71 14.07 17.08	8.70 10.11 11.38 13.58 18.18	88.20 171.36 264.18 482.82 1089.49

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 lb
P65-17-XLH-RR w/ Mount Pipe	C	From Leg	4.00 3.00 2.00	36.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.47 12.08 12.71 14.07 17.08	8.70 10.11 11.38 13.58 18.18	88.20 171.36 264.18 482.82 1089.49
SBNH-1D6565C w/ Mount Pipe	C	From Leg	4.00 3.00 2.00	36.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	11.45 12.06 12.69 14.03 17.05	9.60 11.02 12.29 14.51 19.14	95.30 182.27 278.99 505.69 1129.60
(2) RRUS-11 BTS (19.69 x 16.97 x 7.17)	A	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	47.62 68.42 92.25 149.81 309.89
(2) RRUS-11 BTS (19.69 x 16.97 x 7.17)	B	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	47.62 68.42 92.25 149.81 309.89
(2) RRUS-11 BTS (19.69 x 16.97 x 7.17)	C	From Leg	4.00 3.00 2.00	36.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	47.62 68.42 92.25 149.81 309.89
DTMABP7819VG12A TMA	A	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.40 0.51 0.61 0.86 1.45	19.18 26.48 35.63 60.23 140.10
DTMABP7819VG12A TMA	B	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.40 0.51 0.61 0.86 1.45	19.18 26.48 35.63 60.23 140.10
DTMABP7819VG12A TMA	C	From Leg	4.00 3.00 2.00	36.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.14 1.28 1.44 1.77 2.54	0.40 0.51 0.61 0.86 1.45	19.18 26.48 35.63 60.23 140.10
DC6-48-60-18-8F	A	From Leg	3.50 3.50 2.00	46.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.57 2.80 3.04 3.54 4.66	4.32 4.60 4.88 5.49 6.80	18.90 50.21 85.17 166.87 382.77
** Sector Mount [SM 402-3]	A	None		0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.91 26.78 34.65 50.39 81.87	18.91 26.78 34.65 50.39 81.87	850.68 1233.15 1615.62 2380.56 3910.44
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	1.28 -0.75 1.00	6.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	82.55 150.56 226.53 405.98 908.95
APXV9ERR18-C-A20 w/	B	From Leg	1.28	46.0000	125.00	No Ice	8.50	7.47	87.55

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Mount Pipe			-0.75 1.00			1/2" Ice 1" Ice 2" Ice 4" Ice	9.15 9.77 11.03 13.68	8.66 9.56 11.39 15.53	158.03 236.54 421.23 935.37
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.95 8.13 9.02 10.84 14.85	82.55 150.56 226.53 405.98 908.95
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	1.28 -0.75 1.00	6.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.68 8.48 9.21 10.57 13.43	5.51 6.69 7.73 9.54 13.47	82.20 142.82 210.60 371.59 832.80
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.68 8.48 9.21 10.57 13.43	5.51 6.69 7.73 9.54 13.47	82.20 142.82 210.60 371.59 832.80
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.68 8.48 9.21 10.57 13.43	5.51 6.69 7.73 9.54 13.47	82.20 142.82 210.60 371.59 832.80
Pipe Mount [PM 601-3]	C	None		0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.39 5.48 6.57 8.75 13.11	4.39 5.48 6.57 8.75 13.11	195.00 237.41 279.82 364.65 534.30
1900MHz RRH (65MHz) TMA	A	From Leg	1.28 -0.75 1.00	6.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.77 3.01 3.26 3.78 4.93	2.70 2.94 3.18 3.70 4.85	60.00 83.90 111.08 176.02 353.75
1900MHz RRH (65MHz) TMA	B	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.77 3.01 3.26 3.78 4.93	2.70 2.94 3.18 3.70 4.85	60.00 83.90 111.08 176.02 353.75
1900MHz RRH (65MHz) TMA	C	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.77 3.01 3.26 3.78 4.93	2.70 2.94 3.18 3.70 4.85	60.00 83.90 111.08 176.02 353.75
800MHz 2x50W RRH w/ Filter	A	From Leg	1.28 -0.75 1.00	6.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	64.00 86.12 111.30 171.62 337.52
800MHz 2x50W RRH w/ Filter	B	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.40 2.61 2.83 3.30 4.34	2.25 2.46 2.68 3.13 4.15	64.00 86.12 111.30 171.62 337.52
800MHz 2x50W RRH w/ Filter	C	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.68	64.00 86.12 111.30

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 lb
						2" Ice	3.30	3.13	171.62
						4" Ice	4.34	4.15	337.52
TD-RRH8x20-25 BTS	A	From Leg	1.28 -0.75 1.00	6.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	70.00 97.15 127.83 200.54 396.84
TD-RRH8x20-25 BTS	B	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	70.00 97.15 127.83 200.54 396.84
TD-RRH8x20-25 BTS	C	From Leg	1.28 -0.75 1.00	46.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.72 5.01 5.32 5.95 7.31	1.70 1.92 2.15 2.62 3.68	70.00 97.15 127.83 200.54 396.84
**									
Side Arm Mount [SO 101-3] (Metro PCS)	C	None		0.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.50 8.90 10.30 13.10 18.70	7.50 8.90 10.30 13.10 18.70	252.00 333.00 414.00 576.00 900.00
(2) AIR 21 B4A B2P w/ Mount Pipe (Metro PCS)	A	From Leg	2.00 0.00 0.00	-4.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.14 7.83 8.43 9.66 12.25	5.96 7.09 7.96 9.72 13.45	117.05 177.37 244.68 403.93 854.96
AIR 21 B2A B4P w/ Mount Pipe (Metro PCS)	B	From Leg	2.00 0.00 0.00	-4.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.14 7.83 8.43 9.66 12.25	5.96 7.09 7.96 9.72 13.45	117.05 177.37 244.68 403.93 854.96
AIR 21 B4A B2P w/ Mount Pipe (Metro PCS)	B	From Leg	2.00 0.00 0.00	-4.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.14 7.83 8.43 9.66 12.25	5.96 7.09 7.96 9.72 13.45	117.05 177.37 244.68 403.93 854.96
(2) AIR 21 B2A B4P w/ Mount Pipe (Metro PCS)	C	From Leg	2.00 0.00 0.00	-4.0000	113.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.14 7.83 8.43 9.66 12.25	5.96 7.09 7.96 9.72 13.45	117.05 177.37 244.68 403.93 854.96
**									
4'x4" Pipe Mount	A	From Leg	0.50 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.00 0.00 0.00 0.00 0.00	1.32 1.58 1.84 2.46 3.89	44.00 56.99 73.03 114.89 241.97
4" Tube Face Mount	A	From Face	0.50 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.33 10.40 12.47 16.61 24.89	0.50 1.00 1.50 2.50 4.50	150.00 200.00 250.00 350.00 550.00
4" Tube Face Mount	B	From Face	0.50 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice 1" Ice	8.33 10.40 12.47	0.50 1.00 1.50	150.00 200.00 250.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	16.61	2.50	350.00
						4" Ice	24.89	4.50	550.00
4'x4" Pipe Mount	A	From Leg	0.50	0.0000	86.00	No Ice	0.00	1.32	44.00
			0.00			1/2" Ice	0.00	1.58	56.99
			0.00			1" Ice	0.00	1.84	73.03
						2" Ice	0.00	2.46	114.89
						4" Ice	0.00	3.89	241.97
4" Tube Face Mount	A	From Face	0.50	0.0000	86.00	No Ice	8.33	0.50	150.00
			0.00			1/2" Ice	10.40	1.00	200.00
			0.00			1" Ice	12.47	1.50	250.00
						2" Ice	16.61	2.50	350.00
						4" Ice	24.89	4.50	550.00
Side Arm Mount [SO 202-1]	C	From Leg	1.00	0.0000	57.00	No Ice	2.96	2.53	110.00
			0.00			1/2" Ice	4.10	3.51	133.55
			0.00			1" Ice	5.24	4.49	157.10
						2" Ice	7.52	6.45	204.20
						4" Ice	12.08	10.37	298.40
Generic GPS (VSI)	C	From Leg	2.00	0.0000	57.00	No Ice	1.40	1.40	25.00
			0.00			1/2" Ice	1.70	1.70	30.00
			3.00			1" Ice	1.90	1.90	35.00
						2" Ice	2.20	2.20	40.00
						4" Ice	2.50	2.50	45.00
KS24019-L112A	C	From Leg	2.00	0.0000	48.00	No Ice	0.10	0.10	5.00
			0.00			1/2" Ice	0.18	0.18	6.50
			2.00			1" Ice	0.26	0.26	8.00
						2" Ice	0.42	0.42	11.00
						4" Ice	0.74	0.74	17.00
Side Arm Mount [SO 202-1]	C	From Leg	1.00	0.0000	48.00	No Ice	2.96	2.53	110.00
			0.00			1/2" Ice	4.10	3.51	133.55
			0.00			1" Ice	5.24	4.49	157.10
						2" Ice	7.52	6.45	204.20
						4" Ice	12.08	10.37	298.40

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
UHX8-59H	A	Paraboloid w/Shroud (HP)	From Leg	1.00	46.0000		95.00	8.38	No Ice	55.09	461.00
				0.00					1/2" Ice	56.19	784.55
				0.00					1" Ice	57.29	1108.10
									2" Ice	59.49	1755.20
									4" Ice	63.89	3049.40
UHX8-59H	A	Paraboloid w/Shroud (HP)	From Leg	1.00	-14.0000		86.00	8.38	No Ice	55.09	461.00
				0.00					1/2" Ice	56.19	784.55
				0.00					1" Ice	57.29	1108.10
									2" Ice	59.49	1755.20
									4" Ice	63.89	3049.40

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	161.375	Leg	A325N	0.6250	4	3176.09	13420.60	0.237 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2293.68	4078.13	0.562 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	417.26	2718.75	0.153 ✔	1.333	Member Bearing
T2	141.25	Diagonal	A325N	0.5000	1	2200.01	4123.34	0.534 ✔	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	528.43	2718.75	0.194 ✔	1.333	Member Bearing
T3	136.188	Diagonal	A325N	0.5000	1	3341.08	4123.34	0.810 ✔	1.333	Bolt Shear
T4	131.188	Diagonal	A325N	0.5000	1	3646.29	4123.34	0.884 ✔	1.333	Bolt Shear
T5	126.188	Leg	A325N	0.7500	4	8997.80	19215.10	0.468 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	4499.76	4078.13	1.103 ✔	1.333	Member Bearing
T6	121.125	Diagonal	A325X	0.5000	1	5099.19	4757.81	1.072 ✔	1.333	Gusset Bearing
T7	114.396	Diagonal	A325X	0.5000	1	5337.69	4757.81	1.122 ✔	1.333	Gusset Bearing
T8	107.729	Leg	A325N	0.8750	4	16237.50	26248.70	0.619 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.5000	1	5563.41	4757.81	1.169 ✔	1.333	Gusset Bearing
T9	100.979	Diagonal	A325N	0.5000	2	2934.94	4123.34	0.712 ✔	1.333	Bolt Shear
T10	94.2292	Diagonal	A325N	0.5000	2	3520.48	4123.34	0.854 ✔	1.333	Bolt Shear
T11	87.5625	Leg	A325N	0.8750	4	23397.50	26099.40	0.896 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	7771.34	8156.25	0.953 ✔	1.333	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	1893.36	5437.50	0.348 ✔	1.333	Member Bearing
T12	80.8125	Diagonal	A325N	0.5000	2	3931.42	4123.34	0.953 ✔	1.333	Bolt Shear
T13	74.0625	Diagonal	A325N	0.5000	2	3787.29	4072.28	0.930 ✔	1.333	Member Bearing
T14	67.3958	Leg	A325N	1.0000	4	30314.80	34270.30	0.885 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3905.67	4072.28	0.959 ✔	1.333	Member Bearing
		Secondary Horizontal	A325N	0.6250	1	2434.22	5437.50	0.448 ✔	1.333	Member Bearing
T15	60.625	Diagonal	A325N	0.6250	1	8751.44	8609.38	1.017 ✔	1.333	Gusset Bearing
T16	50.5208	Leg	A325N	1.0000	4	36860.10	34189.90	1.078 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	8924.23	8609.38	1.037 ✔	1.333	Gusset Bearing
T17	40.4167	Diagonal	A325N	0.6250	1	8808.99	8609.38	1.023 ✔	1.333	Gusset Bearing
		Secondary Horizontal	A325N	0.6250	1	3071.41	6442.72	0.477 ✔	1.333	Bolt Shear
T18	30.3125	Leg	A325N	1.0000	6	28530.60	34371.60	0.830 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	8961.95	8609.38	1.041 ✔	1.333	Gusset Bearing
		Secondary Horizontal	A325N	0.6250	1	3450.12	5437.50	0.635 ✔	1.333	Member Bearing
T19	20.2083	Diagonal	A325N	0.6250	1	9450.60	8609.38	1.098 ✔	1.333	Gusset Bearing

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	161.375 - 141.25	ROHN 2 STD	20.13	4.00	61.0 K=1.00	22.549	1.0745	-15270.30	24229.90	0.630 ✔
T2	141.25 - 136.188	ROHN 2.5 EH	5.07	5.01	65.0 K=1.00	21.838	2.2535	-16838.10	49213.80	0.342 ✔
T3	136.188 - 131.188	ROHN 2.5 EH	5.01	5.01	65.0 K=1.00	21.838	2.2535	-24458.10	49212.70	0.497 ✔
T4	131.188 - 126.188	ROHN 2.5 EH	5.01	5.01	65.0 K=1.00	21.838	2.2535	-31026.60	49212.70	0.630 ✔
T5	126.188 - 121.125	ROHN 2.5 EH	5.07	5.01	65.0 K=1.00	21.838	2.2535	-43772.50	49213.80	0.889 ✔
T6	121.125 - 114.396	ROHN 3 EH	6.74	6.68	70.5 K=1.00	20.841	3.0159	-48765.30	62855.40	0.776 ✔
T7	114.396 - 107.729	ROHN 3 EH	6.68	6.68	70.5 K=1.00	20.841	3.0159	-59592.80	62854.10	0.948 ✔
T8	107.729 - 100.979	ROHN 3 EH	6.76	6.68	70.5 K=1.00	20.841	3.0159	-76012.70	62855.80	1.209 ✔
T9	100.979 - 94.2292	ROHN 3.5 EH	6.76	6.68	61.3 K=1.00	22.489	3.6784	-81405.80	82724.80	0.984 ✔
T10	94.2292 - 87.5625	ROHN 3.5 EH	6.68	6.68	61.3 K=1.00	22.489	3.6784	-91640.40	82722.60	1.108 ✔
T11	87.5625 - 80.8125	ROHN 3.5 EH	6.76	3.43	31.5 K=1.00	26.965	3.6784	-109175.00	99190.30	1.101 ✔
T12	80.8125 - 74.0625	ROHN 4 EH	6.76	6.68	54.3 K=1.00	23.671	4.4074	-114144.00	104328.00	1.094 ✔
T13	74.0625 - 67.3958	ROHN 4 EH	6.68	6.68	54.3 K=1.00	23.671	4.4074	-124548.00	104327.00	1.194 ✔
T14	67.3958 - 60.625	ROHN 4 EH	6.78	3.42	27.8 K=1.00	27.423	4.4074	-140353.00	120863.00	1.161 ✔
T15	60.625 - 50.5208	ROHN 5 EH	10.12	10.02	65.4 K=1.00	21.782	6.1120	-147438.00	133130.00	1.107 ✔
T16	50.5208 - 40.4167	ROHN 5 EH	10.12	10.02	65.4 K=1.00	21.782	6.1120	-170662.00	133130.00	1.282 ✔
T17	40.4167 - 30.3125	ROHN 5 EH	10.12	5.16	33.7 K=1.00	26.689	6.1120	-177093.00	163123.00	1.086 ✔
T18	30.3125 - 20.2083	ROHN 5 EH	10.12	5.15	33.6 K=1.00	26.696	6.1120	-198929.00	163166.00	1.219 ✔
T19	20.2083 - 0	ROHN 6 STD w/ 2" B7 (Composite Controls) (VSI)	20.24	10.02	66.0 K=1.00	21.666	8.7220	-226523.00	188970.00	1.199 ✔

3.

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	161.375 - 141.25	L1 3/4x1 3/4x3/16	7.00	3.50	122.3 K=1.00	9.945	0.6211	-2257.77	6176.81	0.366 ✔
T2	141.25 - 136.188	L1 3/4x1 3/4x3/16	7.74	4.01	140.2 K=1.00	7.601	0.6211	-2200.01	4720.80	0.466 ✔
T3	136.188 - 131.188	L1 3/4x1 3/4x3/16	8.15	4.22	147.4 K=1.00	6.876	0.6211	-3341.08	4270.79	0.782 ✔
T4	131.188 - 126.188	L1 3/4x1 3/4x3/16	8.58	4.43	154.7 K=1.00	6.236	0.6211	-3646.29	3873.34	0.941 ✔
T5	126.188 - 121.125	L2x2x3/16	9.01	4.64	141.4 K=1.00	7.472	0.7150	-4520.42	5342.42	0.846 ✔
T6	121.125 - 114.396	L2 1/2x2 1/2x1/4	10.40	5.39	131.8 K=1.00	8.596	1.1900	-5197.37	10229.80	0.508 ✔
T7	114.396 - 107.729	L2 1/2x2 1/2x1/4	10.94	5.66	138.4 K=1.00	7.795	1.1900	-5398.49	9275.48	0.582 ✔
T8	107.729 - 100.979	L2 1/2x2 1/2x1/4	11.50	5.94	145.1 K=1.00	7.093	1.1900	-5656.03	8440.39	0.670 ✔
T9	100.979 - 94.2292	L2 1/2x2 1/2x3/16	12.05	6.21	150.5 K=1.00	6.594	0.9020	-5869.87	5947.78	0.987 ✔
T10	94.2292 - 87.5625	L2 1/2x2 1/2x3/16	12.63	6.50	157.6 K=1.00	6.014	0.9020	-7040.96	5424.70	1.298 ✔
T11	87.5625 - 80.8125	2L2 1/2x2 1/2x3/16x1/4	13.22	6.79	109.5 K=1.00	11.746	1.8047	-7807.35	21197.00	0.368 ✔
T12	80.8125 - 74.0625	2L 'a' > 38.8661 in - 129 L3x3x3/16	13.80	7.08	142.6 K=1.00	7.339	1.0900	-7862.83	8000.01	0.983 ✔
T13	74.0625 - 67.3958	L3x3x3/16	14.43	7.40	148.9 K=1.00	6.734	1.0900	-7652.22	7339.81	1.043 ✔
T14	67.3958 - 60.625	L3x3x3/16	15.05	7.71	155.1 K=1.00	6.204	1.0900	-7905.64	6762.04	1.169 ✔
T15	60.625 - 50.5208	2L3x3x3/16x1/4	17.35	8.96	121.0 K=1.00	10.086	2.1797	-8994.21	21983.50	0.409 ✔
T16	50.5208 - 40.4167	2L 'a' > 51.1759 in - 171 2L3x3x3/16x1/4	18.19	9.37	126.5 K=1.00	9.320	2.1797	-9083.88	20315.10	0.447 ✔
T17	40.4167 - 30.3125	2L 'a' > 53.5306 in - 180 2L3x3x1/4x1/4	19.07	9.82	132.7 K=1.00	8.485	2.8750	-9003.99	24395.60	0.369 ✔
T18	30.3125 - 20.2083	2L 'a' > 56.2683 in - 189 2L3x3x1/4x1/4	19.97	10.26	138.7 K=1.00	7.765	2.8750	-9595.38	22323.60	0.430 ✔
T19	20.2083 - 0	2L 'a' > 58.8218 in - 201 2L3 1/2x3 1/2x1/4x1/4 2L 'a' > 63.5487 in - 213	21.69	11.11	129.2 K=1.00	8.948	3.3750	-9988.65	30199.90	0.331 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	87.5625 -	L2x2x3/16	12.32	12.32	187.7	4.240	0.7150	-1893.36	3031.45	0.625

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
	80.8125				K=0.50					✔
T14	67.3958 - 60.625	L2x2x3/16	14.41	14.41	219.4 K=0.50	3.102	0.7150	-2434.22	2217.79	1.098 ✔
T17	40.4167 - 30.3125	L3x3x1/4	17.28	17.28	175.2 K=0.50	4.868	1.4400	-3071.41	7009.43	0.438 ✔
T18	30.3125 - 20.2083	L3x3x3/16	18.31	18.31	184.4 K=0.50	4.393	1.0900	-3450.12	4788.80	0.720 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	161.375 - 141.25	L2x2x1/8	6.52	6.52	196.8 K=1.00	3.854	0.4844	-449.35	1866.87	0.241 ✔
T2	141.25 - 136.188	L2x2x1/8	6.57	6.57	198.3 K=1.00	3.798	0.4844	-403.04	1839.78	0.219 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	161.375 - 141.25	ROHN 2 STD	20.13	4.00	61.0	30.000	1.0745	12704.40	32235.90	0.394 ✔
T2	141.25 - 136.188	ROHN 2.5 EH	5.07	5.01	65.0	30.000	2.2535	14023.50	67606.20	0.207 ✔
T3	136.188 - 131.188	ROHN 2.5 EH	5.01	5.01	65.0	30.000	2.2535	19317.00	67606.20	0.286 ✔
T4	131.188 - 126.188	ROHN 2.5 EH	5.01	5.01	65.0	30.000	2.2535	25452.80	67606.20	0.376 ✔
T5	126.188 - 121.125	ROHN 2.5 EH	5.07	5.01	65.0	30.000	2.2535	35991.20	67606.20	0.532 ✔
T6	121.125 - 114.396	ROHN 3 EH	6.74	6.68	70.5	30.000	3.0159	40520.80	90477.90	0.448 ✔
T7	114.396 - 107.729	ROHN 3 EH	6.68	6.68	70.5	30.000	3.0159	50140.90	90477.90	0.554 ✔
T8	107.729 - 100.979	ROHN 3 EH	6.76	6.68	70.5	30.000	3.0159	64950.20	90477.90	0.718 ✔
T9	100.979 - 94.2292	ROHN 3.5 EH	6.76	6.68	61.3	30.000	3.6784	69091.20	110352.00	0.626 ✔
T10	94.2292 - 87.5625	ROHN 3.5 EH	6.68	6.68	61.3	30.000	3.6784	78455.00	110352.00	0.711 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	87.5625 - 80.8125	ROHN 3.5 EH	6.76	3.43	31.5	30.000	3.6784	93590.10	110352.00	0.848 ✔
T12	80.8125 - 74.0625	ROHN 4 EH	6.76	6.68	54.3	30.000	4.4074	97940.00	132223.00	0.741 ✔
T13	74.0625 - 67.3958	ROHN 4 EH	6.68	6.68	54.3	30.000	4.4074	107274.00	132223.00	0.811 ✔
T14	67.3958 - 60.625	ROHN 4 EH	6.78	3.42	27.8	30.000	4.4074	121259.00	132223.00	0.917 ✔
T15	60.625 - 50.5208	ROHN 5 EH	10.12	10.02	65.4	30.000	6.1120	127371.00	183359.00	0.695 ✔
T16	50.5208 - 40.4167	ROHN 5 EH	10.12	10.02	65.4	30.000	6.1120	147441.00	183359.00	0.804 ✔
T17	40.4167 - 30.3125	ROHN 5 EH	10.12	5.16	33.7	30.000	6.1120	152964.00	183359.00	0.834 ✔
T18	30.3125 - 20.2083	ROHN 5 EH	10.12	5.15	33.6	30.000	6.1120	171183.00	183359.00	0.934 ✔
T19	20.2083 - 0	ROHN 6 STD w/ 2" B7 (Composite Controls) (VSI)	20.24	10.02	66.0	30.000	8.7220	194165.00	261660.00	0.742 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	161.375 - 141.25	L1 3/4x1 3/4x3/16	7.00	3.50	78.3	29.000	0.3779	2293.68	10960.00	0.209 ✔
T2	141.25 - 136.188	L1 3/4x1 3/4x3/16	7.74	4.01	89.7	29.000	0.3779	2022.49	10960.00	0.185 ✔
T3	136.188 - 131.188	L1 3/4x1 3/4x3/16	8.15	4.22	94.3	29.000	0.3779	3298.93	10960.00	0.301 ✔
T4	131.188 - 126.188	L1 3/4x1 3/4x3/16	8.58	4.43	99.0	29.000	0.3779	3596.09	10960.00	0.328 ✔
T5	126.188 - 121.125	L2x2x3/16	9.01	4.64	90.3	29.000	0.4484	4499.76	13002.40	0.346 ✔
T6	121.125 - 114.396	L2 1/2x2 1/2x1/4	10.40	5.39	84.2	29.000	0.7753	5099.19	22484.10	0.227 ✔
T7	114.396 - 107.729	L2 1/2x2 1/2x1/4	10.94	5.66	88.4	29.000	0.7753	5337.69	22484.10	0.237 ✔
T8	107.729 - 100.979	L2 1/2x2 1/2x1/4	11.50	5.94	92.6	29.000	0.7753	5563.41	22484.10	0.247 ✔
T9	100.979 - 94.2292	L2 1/2x2 1/2x3/16	12.05	6.21	95.7	29.000	0.5886	5748.31	17069.70	0.337 ✔
T10	94.2292 - 87.5625	L2 1/2x2 1/2x3/16	12.63	6.50	100.3	29.000	0.5886	6836.54	17069.70	0.401 ✔
T11	87.5625 - 80.8125	2L2 1/2x2 1/2x3/16x1/4	13.22	6.79	104.7	29.000	1.1777	7771.34	34154.30	0.228 ✔
T12	80.8125 - 74.0625	2L 'a' > 38.8661 in - 128 L3x3x3/16	13.80	7.08	90.5	29.000	0.7296	7697.81	21158.70	0.364 ✔
T13	74.0625 -	L3x3x3/16	14.43	7.40	94.5	29.000	0.7296	7574.59	21158.70	0.358

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
	67.3958									✔
T14	67.3958 - 60.625	L3x3x3/16	15.05	7.71	98.5	29.000	0.7296	7811.33	21158.70	0.369 ✔
T15	60.625 - 50.5208	2L3x3x3/16x1/4	17.35	8.96	114.4	29.000	1.4238	8751.44	41291.00	0.212 ✔
T16	50.5208 - 40.4167	2L 'a' > 51.1759 in - 170 2L3x3x3/16x1/4	18.19	9.37	119.7	29.000	1.4238	8924.23	41291.00	0.216 ✔
T17	40.4167 - 30.3125	2L 'a' > 53.5306 in - 179 2L3x3x1/4x1/4	19.07	9.82	126.7	32.500	1.8750	8808.99	60937.50	0.145 ✔
T18	30.3125 - 20.2083	2L 'a' > 56.2683 in - 188 2L3x3x1/4x1/4	19.97	10.26	132.4	32.500	1.8750	8961.95	60937.50	0.147 ✔
T19	20.2083 - 0	2L 'a' > 58.8218 in - 200 2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	122.2	32.500	2.2500	9450.60	73125.00	0.129 ✔
		2L 'a' > 63.5487 in - 212								

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	87.5625 - 80.8125	L2x2x3/16	12.32	12.32	239.7	29.000	0.4308	1893.36	12492.70	0.152 ✔
T14	67.3958 - 60.625	L2x2x3/16	14.41	14.41	280.2	29.000	0.4308	2434.22	12492.70	0.195 ✔
T17	40.4167 - 30.3125	L3x3x1/4	17.28	17.28	223.0	29.000	0.9394	3071.41	27241.90	0.113 ✔
T18	30.3125 - 20.2083	L3x3x3/16	18.31	18.31	234.0	29.000	0.7120	3450.12	20648.90	0.167 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	161.375 - 141.25	L2x2x1/8	6.52	6.52	125.0	29.000	0.3047	417.26	8835.94	0.047 ✔
T2	141.25 - 136.188	L2x2x1/8	6.57	6.57	125.9	29.000	0.3047	528.43	8835.94	0.060 ✔

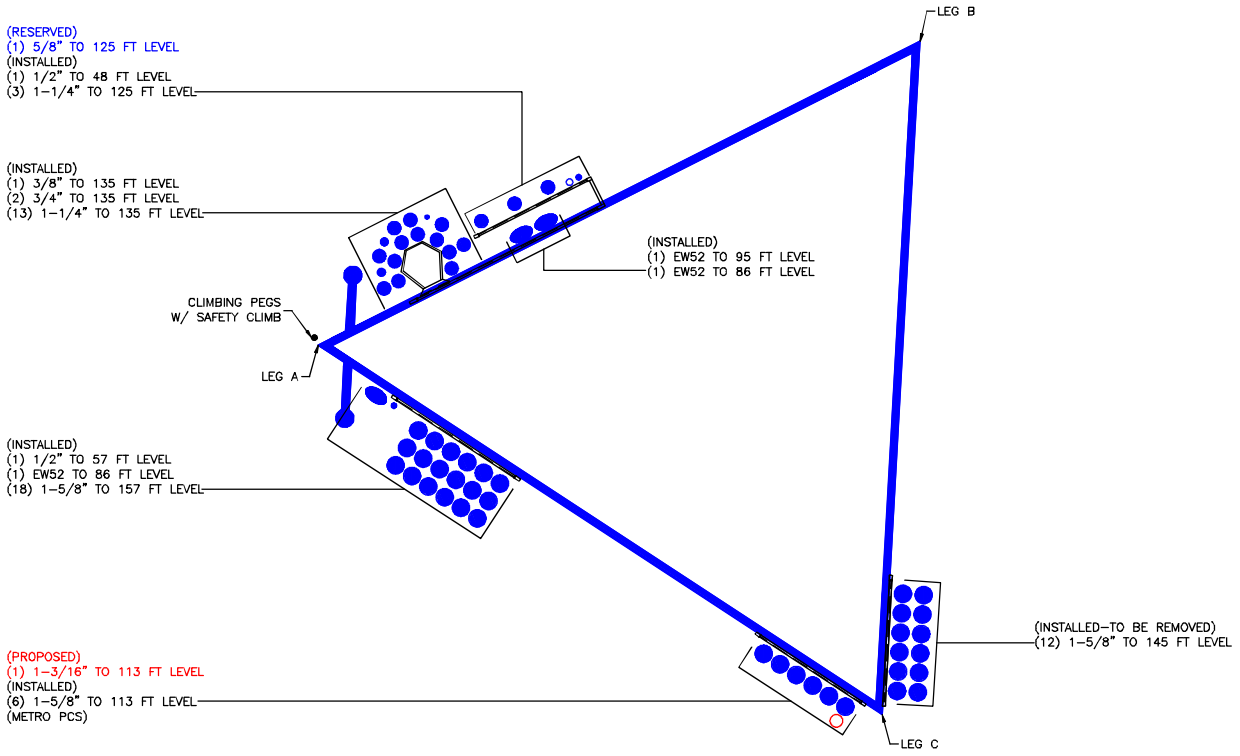
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
T1	161.375 - 141.25	Leg	ROHN 2 STD	3	-15270.30	32298.46	47.3	Pass
T2	141.25 - 136.188	Leg	ROHN 2.5 EH	39	-16838.10	65601.99	25.7	Pass
T3	136.188 - 131.188	Leg	ROHN 2.5 EH	51	-24458.10	65600.53	37.3	Pass
T4	131.188 - 126.188	Leg	ROHN 2.5 EH	60	-31026.60	65600.53	47.3	Pass
T5	126.188 - 121.125	Leg	ROHN 2.5 EH	69	-43772.50	65601.99	66.7	Pass
T6	121.125 - 114.396	Leg	ROHN 3 EH	78	-48765.30	83786.24	58.2	Pass
T7	114.396 - 107.729	Leg	ROHN 3 EH	87	-59592.80	83784.51	71.1	Pass
T8	107.729 - 100.979	Leg	ROHN 3 EH	96	-76012.70	83786.78	90.7	Pass
T9	100.979 - 94.2292	Leg	ROHN 3.5 EH	105	-81405.80	110272.15	73.8	Pass
T10	94.2292 - 87.5625	Leg	ROHN 3.5 EH	114	-91640.40	110269.22	83.1	Pass
T11	87.5625 - 80.8125	Leg	ROHN 3.5 EH	123	-109175.00	132220.66	82.6	Pass
T12	80.8125 - 74.0625	Leg	ROHN 4 EH	135	-114144.00	139069.22	82.1	Pass
T13	74.0625 - 67.3958	Leg	ROHN 4 EH	144	-124548.00	139067.89	89.6	Pass
T14	67.3958 - 60.625	Leg	ROHN 4 EH	153	-140353.00	161110.37	87.1	Pass
T15	60.625 - 50.5208	Leg	ROHN 5 EH	165	-147438.00	177462.28	83.1	Pass
T16	50.5208 - 40.4167	Leg	ROHN 5 EH	174	-170662.00	177462.28	96.2	Pass
T17	40.4167 - 30.3125	Leg	ROHN 5 EH	183	-177093.00	217442.95	81.4	Pass
T18	30.3125 - 20.2083	Leg	ROHN 5 EH	195	-198929.00	217500.27	91.5	Pass
T19	20.2083 - 0	Leg	ROHN 6 STD w/ 2" B7 (Composite Controls) (VSI)	207	-226523.00	251897.00	89.9	Pass
T1	161.375 - 141.25	Diagonal	L1 3/4x1 3/4x3/16	12	-2257.77	8233.69	27.4 42.2 (b)	Pass
T2	141.25 - 136.188	Diagonal	L1 3/4x1 3/4x3/16	48	-2200.01	6292.83	35.0 40.0 (b)	Pass
T3	136.188 - 131.188	Diagonal	L1 3/4x1 3/4x3/16	57	-3341.08	5692.96	58.7 60.8 (b)	Pass
T4	131.188 - 126.188	Diagonal	L1 3/4x1 3/4x3/16	63	-3646.29	5163.16	70.6	Pass
T5	126.188 - 121.125	Diagonal	L2x2x3/16	72	-4520.42	7121.45	63.5 82.8 (b)	Pass
T6	121.125 - 114.396	Diagonal	L2 1/2x2 1/2x1/4	81	-5197.37	13636.32	38.1 80.4 (b)	Pass
T7	114.396 - 107.729	Diagonal	L2 1/2x2 1/2x1/4	90	-5398.49	12364.21	43.7 84.2 (b)	Pass
T8	107.729 - 100.979	Diagonal	L2 1/2x2 1/2x1/4	99	-5656.03	11251.04	50.3 87.7 (b)	Pass
T9	100.979 - 94.2292	Diagonal	L2 1/2x2 1/2x3/16	111	-5869.87	7928.39	74.0	Pass
T10	94.2292 - 87.5625	Diagonal	L2 1/2x2 1/2x3/16	120	-7040.96	7231.13	97.4	Pass
T11	87.5625 - 80.8125	Diagonal	2L2 1/2x2 1/2x3/16x1/4	129	-7807.35	28255.60	27.6 71.5 (b)	Pass
T12	80.8125 - 74.0625	Diagonal	L3x3x3/16	141	-7862.83	10664.01	73.7	Pass
T13	74.0625 - 67.3958	Diagonal	L3x3x3/16	150	-7652.22	9783.97	78.2	Pass
T14	67.3958 - 60.625	Diagonal	L3x3x3/16	159	-7905.64	9013.80	87.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T15	60.625 - 50.5208	Diagonal	2L3x3x3/16x1/4	171	-8994.21	29304.00	30.7 76.3 (b)	Pass
T16	50.5208 - 40.4167	Diagonal	2L3x3x3/16x1/4	180	-9083.88	27080.03	33.5 77.8 (b)	Pass
T17	40.4167 - 30.3125	Diagonal	2L3x3x1/4x1/4	189	-9003.99	32519.33	27.7 76.8 (b)	Pass
T18	30.3125 - 20.2083	Diagonal	2L3x3x1/4x1/4	201	-9595.38	29757.36	32.2 78.1 (b)	Pass
T19	20.2083 - 0	Diagonal	2L3 1/2x3 1/2x1/4x1/4	213	-9988.65	40256.47	24.8 82.3 (b)	Pass
T11	87.5625 - 80.8125	Secondary Horizontal	L2x2x3/16	131	-1893.36	4040.92	46.9	Pass
T14	67.3958 - 60.625	Secondary Horizontal	L2x2x3/16	161	-2434.22	2956.31	82.3	Pass
T17	40.4167 - 30.3125	Secondary Horizontal	L3x3x1/4	191	-3071.41	9343.57	32.9 35.8 (b)	Pass
T18	30.3125 - 20.2083	Secondary Horizontal	L3x3x3/16	204	-3450.12	6383.47	54.0	Pass
T1	161.375 - 141.25	Top Girt	L2x2x1/8	5	-449.35	2488.54	18.1	Pass
T2	141.25 - 136.188	Top Girt	L2x2x1/8	40	-403.04	2452.43	16.4	Pass
						Summary		
						Leg (T16)	96.2	Pass
						Diagonal (T10)	97.4	Pass
						Secondary Horizontal (T14)	82.3	Pass
						Top Girt (T1)	18.1	Pass
						Bolt Checks	87.7	Pass
						RATING =	**97.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806378 TOWER ID: C_BASELEVEL

BASE LEVEL DRAWING

PLOT DATE: 6/6/2014 FILE NAME: 806378_BASELEVEL.dwg

Xref R:\Standards - URE\CAD Standards V5.0\Templates\Typical Blocks For Templates\TITLE BLOCK STD-VER 5.1.dwg

CROWN REGION ADDRESS

USA

25/04/12	UPDATED PER WORK ORDER #484581	SF
04/06/12	UPDATED PER WORK ORDER # 498222	ATF
12/07/12	UPDATED PER WORK ORDER # 508609	MAJ
11/10/12	UPDATED PER WORK ORDER # 540705	DAH
18/07/13	UPDATED PER WORK ORDER # 633030	ARR
15/11/13	UPDATED PER WORK ORDER # 668095	KW
15/11/13	UPDATED PER WORK ORDER # 670174	KW
23/12/13	UPDATED PER WORK ORDER # 692800 681480	TKS
6/6/2014	UPDATED PER WORK ORDER 780394	ADE

DRAWN BY: **KD/MDB**
CHECKED BY: **SL**
DRAWING DATE: **04/05/06**

SITE NUMBER:
SITE NAME:

SITE NAME

HRT 606 943248

BUSINESS UNIT NUMBER

806378

SITE ADDRESS

126 PIONEER HEIGHTS ROAD
SOMERS, CT 06071
TOLLAND COUNTY
USA

SHEET TITLE

BASE LEVEL

SHEET NUMBER

A1-0

APPENDIX C

ADDITIONAL CALCULATIONS

ANCHOR BOLT CALCULATIONS

Customer:	Crown Castle
Site Name:	HRT 086, CT BU#806378
Job Number:	2014-004-027
Tower Model:	160' Rohn SSV Self-Supporting Tower
Date:	6/27/2014

Input Information:

# Bolts	6	
Bolt Diameter	1	in
Bolt Ultimate Tensile Strength, F_u	120	ksi
Steel Grade	A449	
Applied Shear	22.292	kips
Uplift per Leg	193.189	kips

Bolt Cross-Sectional Area, **A**	0.785	in^2
Applied Shear, f_v	4.73	ksi
Maximum Allowable Tensile Stress, F_t	39.6	ksi
Allowable Tension Force	186.61	kips
Maximum Allowable	248.75	kips
% Capacity	**77.7%**	

The Bolt Group is sufficient for the applied Uplift Force

Maximum Allowable Tensile Stress, F_t

$$0.43F_u - 1.8f_v \leq 0.33F_u$$

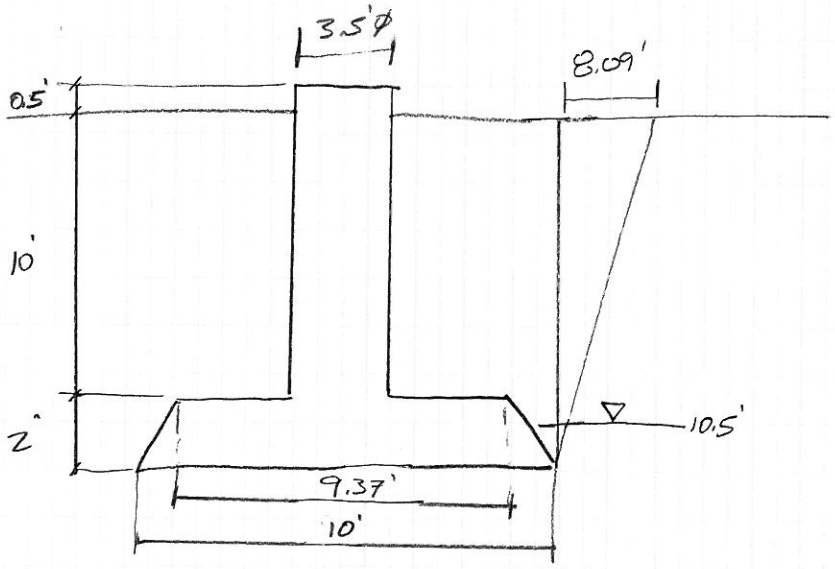
This equation is for threaded parts, A449 bolts over 1 1/2" dia. (threads included in shear plane) Manual of Steel Construction ASD, 9th Edition, pg. 5-74, Table J3.3

VERTICAL STRUCTURES, INC.
309 Spangler Drive, Suite E
Richmond, Kentucky 40475
Phone: (859) 624-8360
Fax: (859) 624-8369

Subject: FOUNDATION CALCS

Design By: BC
Date: 6/27/14
Chk'd By: NC
Page

Cust: CROWN
Job No.
Location: H2T 086, CT



$\gamma_s = 105 pcf$

$\phi = 34°$

$\sigma_{ALL} = 8.25 ksf$

CONSERVATIVELY NEGLECT ADDITIONAL BALLAST FROM TRIANGULAR MAT

$$V_s = \frac{12}{3}\left(100 + 685.4 + \sqrt{100 \times 685.4}\right) - V_c = 4188.8 - V_c$$

$$V_c = \frac{3.5^2\pi}{4} \times 10.5 + 9.37^2 \times 2 = 276.6\ FT^3$$

$$\therefore V_s = 3912.2\ FT^3$$

$$W_s = 0.105\,(3912.2) = 410.8^k$$

$$W_c = 0.150\left[\frac{3.5^2\pi}{4} \times 10.5 + 9.37^2 \times 0.5\right] + (0.15 - 0.0624)(9.37^2 \times 1.5) = 33.3^k$$

$$U_{12} = \frac{33.3^k}{1.25} + \frac{410.8^k}{2} = 232.0^k$$

Applied Bearing = P/A + M/S

A = 100 sq. ft.

S = 166.7 cub. ft

$\frac{225.469\ k}{100\ sq.\ ft} + \frac{(25.120\ k)\ (12.5')}{166.7\ cub.\ ft} = 4.14\ ksf < 8.25\ ksf$ OK

EBI Consulting
environmental | engineering | due diligence

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

MetroPCS Existing Facility

Site ID: CTHA534A

Crown Somers Lattice Tower

126 Pioneer Heights Road
Somers, CT 06071

August 15, 2014

EBI Project Number: 62144270

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August 15, 2014

MetroPCS USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Re: Emissions Values for Site: **CTHA534A - Crown Somers Lattice Tower**

EBI Consulting was directed to analyze the proposed MetroPCS facility located at 126 Pioneer Heights Road, Somers, CT, for the purpose of determining whether the emissions from the Proposed MetroPCS 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 µW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

General population/uncontrolled exposure limits apply to situations in which the general 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 (µW/cm2). The general population exposure limit for the cellular band is 567 µW/cm2, and the general population exposure limit for the PCS and AWS bands is 1000 µW/cm2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed MetroPCS Wireless antenna facility located at 126 Pioneer Heights Road, Somers, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since MetroPCS is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is 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 (1935.000 MHz—to 1945.000 MHz) were considered for each sector of the proposed installation.
2) 2 UMTS channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation.
3) 2 LTE channels (2110.000 MHz to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation.
4) 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.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
6) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications.

7) The antenna mounting height centerline of the proposed antennas is **113 feet** above ground level (AGL).
8) 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.

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

Site ID	CTHA534A - Crown Somers Lattice Tower
Site Addresss	126 Pioneer Heights Road, Somers, CT 06071
Site Type	Self Support Tower

Sector 1

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	113	107	None	0	0	48.326044	1.517468	0.15175%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	113	107	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	113	107	1-5/8"	0	0	24.163022	0.758734	0.07587%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	113	107	1-5/8"	0	0	24.163022	0.758734	0.07587%
														Sector total Power Density Value:		0.303%	

Sector 2

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	113	107	None	0	0	48.326044	1.517468	0.15175%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	113	107	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	113	107	1-5/8"	0	0	24.163022	0.758734	0.07587%
2b	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	113	107	1-5/8"	0	0	24.163022	0.758734	0.07587%
														Sector total Power Density Value:		0.303%	

Sector 3

Antenna Number	Antenna Make	Antenna Model	Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	113	107	None	0	0	48.326044	1.517468	0.15175%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	113	107	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	113	107	1-5/8"	0	0	24.163022	0.758734	0.07587%
2b	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	113	107	1-5/8"	0	0	24.163022	0.758734	0.07587%
														Sector total Power Density Value:		0.303%	

Site Composite MPE %

Carrier	MPE %
MetroPCS	0.910%
AT&T	22.640%
Nextel	2.440%
Verizon Wireless	12.160%
Sprint	6.460%
Total Site MPE %	**44.610%**

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Summary

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

The anticipated Maximum Composite contributions from the MetroPCS facility are **0.910% (0.303% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **44.610%** 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.

Scott Heffernan
RF Engineering Director

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