STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

July 12, 2013

John Lawrence
New Cingular Wireless PCS, LLC
95 Ryan Drive, Suite #1
Raynham, MA 02767

RE: **TS-CING-004-130627–** New Cingular Wireless PCS, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 324 Montevideo Road, Avon, Connecticut.

Dear Mr. Lawrence:

At a public meeting held July 11, 2013, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures with the following conditions:

- Any deviation from the proposed installation as specified in the original tower share request and supporting materials with the Council shall render this decision invalid;
- Any material changes to the proposed installation as specified in the original tower share request and supporting materials filed with the Council shall require an explicit request for modification to the Council pursuant to Connecticut General Statutes § 16-50aa, including all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65;
- Not less than 45 days after completion of the proposed installation, the Council shall be notified in writing that the installation has been completed;
- The validity of this action shall expire one year from the date of this letter;
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration; and
- Prior to antenna installation, the reinforcements detailed in Section 4 of the Structural Analysis Report prepared by Centek Engineering dated June 13, 2013, and stamped by Carlo Centore shall be implemented;
- Within 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the structure and foundation do not exceed 100 percent of the post-construction structural rating.

This decision is under the exclusive jurisdiction of the Council. This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

CSC
CONNECTICUT SITING COUNCIL

This decision applies only to this request for tower sharing and is not applicable to any other request or construction. Please be advised that the validity of this action shall expire one year from the date of this letter.

The proposed shared use is to be implemented as specified in your letter dated February 24, 2011, including the placement of all necessary equipment and shelters within the tower compound.

Thank you for your attention and cooperation.

Very truly yours,

Robert Stein UHB

Robert Stein
Chairman

RS/CDM/cm

c: The Honorable Mark W. Zacchio, Chairman, Town of Avon
Steven V. Kushner, Town Planner, Town of Avon
Talcott Mountain Science Center

TS-CING-004-130627

at&t
Your world. Delivered.

New Cingular Wireless
PCS, LLC
00 Enterprise Drive
Rocky Hill, Connecticut 06067

John Lawrence
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767
Phone: (781)715-5532
jlawrence@clinellc.com

ORIGINAL

RECEIVED
JUN 27 2013
CONNECTICUT
SITING COUNCIL

June 25, 2013

Honorable Robert Stein, Chairman,
and Members of the Connecticut Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: **Request for Tower Share**
New Cingular Wireless PCS, LLC ("AT&T") Request for Approval of the Shared Use of an Existing Tower at 324 Montevideo Road, Avon, CT.
AT&T site number: CT1178

Dear Chairman Stein and Members of the Council:

AT&T proposes to share an existing telecommunications tower (the tower) located at 324 Montevideo Road, Avon CT 06001 (the facility). The subject parcel is identified by the Town of Avon as Map 009 Lot 3180324. The property is owned by the Talcott Mountain Science Center for Student Involvement, Inc. and is roughly 2.05+ acres and accommodates the Talcott Mountain Science Center. The existing tower is owned and operated by Talcott Mountain Science Center for Student Involvement, Inc. of 324 Montevideo Road, Avon, CT 06001.

Pursuant to Connecticut General Statues Section 16-50aa (the Statute), AT&T requests a finding from the Connecticut Siting Council that the shared use of this facility is technically, legally, environmentally and economically feasible, will meet safety concerns, will avoid the unnecessary proliferation of towers and is in the public interest. AT&T further requests an order approving the shared use of this facility.

The purpose of this request is to use an existing Tower to develop AT&T's wireless broadband network to provide high speed wireless data and to develop wireless service within the State of Connecticut and in this part of Avon, CT: thus avoiding the need for an additional tower in Avon.

AT&T is licensed by the Federal Communications Commission ("FCC") to provide multiple technologies, including Global Systems for Mobile Communications ("GSM" or "2G"), Universal Mobile Telecommunications Service ("UMTS" or "3G") and long-term evolution ("4G" or "LTE") services in Hartford County. AT&T is building and enhancing its network to take advantage of its licensed spectrum, and improve its broadband high speed wireless voice

ORIGINAL

and data services.

Existing Facility & Proposed Modification

The Avon facility is a 60' lattice tower located at 324 Montevideo Road, Avon, CT. Site coordinates (NAD83) are N41° 48' 42.26" and W72° 47'55.37". Currently Verizon is the only other wireless carriers located on this Tower. The site plan of the facility is included in the Conceptual Drawings, prepared by Vanasse Hangen Brustlin, Inc., attached hereto. In order to accommodate AT&T's proposed installation, structural modifications are required. The modification plan prepared by Centek Engineering is attached hereto.

AT&T intends to install nine (9) SBNH-1D6565C Andrew panel antennas, three (3) KRC 118 054/1 Ericsson antennas, fifteen (15) Ericsson RRUs and three (3) Surge arrestor mounted on a new antenna frame within the existing dome on top of the Tower. AT&T will install three (3) 1/2" RET cables, six (6) DC cables and three (3) fiber lines on the tower.

AT&T has leased a portion of the existing shelter and space for a 4'x9'emergency backup generator. The equipment will be installed within the fenced in compound. An ice bridge will connect the cabinet equipment with the tower. A GPS antenna will be located on the ice bridge. The power and telephone cables will be located underground along a 15' wide access and utility easement.

Consistent with the requirements of the Statute, it is feasible for AT&T to collocate at this facility. To confirm that the tower can support AT&T's proposed antennas and equipment, AT&T commissioned Centek Engineering to perform a structural analysis of the tower. According to the report dated June 13, 2013. With tower reinforcements the tower will be structurally capable of supporting the proposed installation. The structural analysis and modification design is attached hereto.

The Proposal is Legally Feasible.

The Council has authority, pursuant to statute, to issue an order approving of the shared use of this tower. By issuing an order approving AT&T's shared use of this tower, AT&T will be able to proceed with obtaining a building permit for the proposed installation. AT&T's proposal is legally feasible.

AT&T is a telecommunication provider licensed by the FCC to provide service in the State of Connecticut, including but not limited to Hartford County. AT&T is entering into an agreement with the owner of this facility, Talcott Mountain Science Center for Student Involvement, Inc., for the location of this proposed equipment on the tower so that it may provide telecommunications services to the surrounding community. Consequently, the proposal is legally feasible.

The Proposal is Environmentally Feasible.

Pursuant to the Statute, the proposal will be environmentally feasible for the following reasons:

- The overall impact on the Town of Avon will be decreased with the sharing of a single tower versus the proliferation of multiple towers.

- The proposal will not increase the height of the tower.
  There will be little increase in the visibility of the tower with the addition of the antennas and associated equipment.

- There will be no increased impact on air quality because no air pollutants will be generated during normal operation of the facility.

- There will only be a brief, slight increase in noise pollution while the site is under construction.

- During construction, the proposed project will generate a small amount of traffic as construction takes place. Upon completion, traffic will be limited to an average of one trip per month for maintenance and inspections.

- There will be no adverse impact to the health and safety of the surrounding community or workers at the facility due to the addition of AT&T's antennas to the tower. AT&T has performed an analysis of the radio frequency field emanating from the transmitting antennas on the tower to ensure compliance with the National Council on Radiation Protection and measurements (NCRP) standard for maximum permissible exposure (MPE) adopted by the FCC. The analysis dated June 25, 2013 indicates that AT&T and Verizon's antennas will cumulatively emit 53.16% of the NCRP standard for maximum permissible exposure. Power density report is attached. The report indicates that maximum level of exposure will be well below the FCC's mandated radio frequency exposure limits. The report is attached hereto and the calculations are below.

Transmission Mode	Antenna Centerline AGL (ft)	Frequency (MHz)	Number of Channels	Effective Radiated Power per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	% MPE (Uncontrolled/ General Public)
AT&T UMTS	70	850	2	500.00	0.0734	0.5667	12.95%
AT&T UMTS	70	1900	2	500.00	0.0734	1	7.34%
AT&T LTE	70	700	2	500.00	0.0734	0.4667	15.73%
AT&T LTE	70	2100	2	500.00	0.0734	1	7.34%
Verizon All Technologies	55	Combined	Combined	Combined	Combined	Combined	9.80%
Total							**53.16%**

- AT&T expects to enhance safety in this portion of Avon by improving wireless telecommunications for local residents and travelers. AT&T is currently developing its network to provide its customers with quality and reliable coverage to comply with their FCC license, the site is a necessary part of AT&T's network development.

- Specifically, this proposal is designed to provide reliable wireless coverage for this section of Avon, CT.

Conclusions:

For the reasons stated above, the attachment of AT&T's antennas and associated equipment to the tower would meet all the requirements set forth in the Statute. The proposal is legally, technically, economically and environmentally feasible and meets all public safety concerns. Therefore, AT&T respectfully requests that the Council approve this request for the shared use of this tower located at 324 Montevideo Road, Avon, CT.

Respectfully yours,

John Lawrence
Real Estate Consultant

CC: *Brandon Robertson, Town Manager (via mail)*
Jonathan Craig, Director of the Talcott Mountain Science Center (via e-mail)
Michele Briggs, New Cingular Wireless PCS, LLC (via e-mail)

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067

John Lawrence
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767
Phone: (781)715-5532
jlawrence@clinellc.com

June 25, 2013

Town of Avon
Brandon Robertson, Town Manager
60 West Main Street
Avon, CT 06001

Re: Request for Tower Share – Notice
New Cingular Wireless PCS, LLC ("AT&T") Request for Approval of the Shared Use of an Existing Tower at 324 Montevideo Road, Avon, CT.
AT&T site number: CT1178

Dear Brandon Robertson, Town Manager

New Cingular Wireless PCS, LLC ("AT&T") intends to add telecommunications antennas and associated equipment at an existing Tower located at 324 Montevideo Road in Avon, CT. The Tower is owned and operated by Talcott Mountain Science Center for Student Involvement, Inc., a non-stock corporation, having a mailing address of 324 Montevideo Road, Avon, CT 06001.

A Request for Tower Share has been filed with the Connecticut Siting Council as required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50aa. Please accept this letter as notification to the Town of Avon under the Tower Share Application Guidelines.

The attached letter fully sets forth AT&T's proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact John Lawrence, Real Estate Consultant for AT&T, at (781) 715-5532 or Linda Roberts, Executive Director of the Connecticut Siting Council, at (860) 827-2935.

Sincerely,

John Lawrence
Real Estate Consultant

Enclosure
Honorable Robert Stein, Chairmen of the Connecticut Siting Council

New Cingular Wireless PCS, LLC
500 Enterprise Drive
Rocky Hill, Connecticut 06067

John Lawrence
Real Estate Consultant
95 Ryan Drive, Suite #1
Raynham, MA 02767
Phone: (781)715-5532
jlawrence@clinellc.com

June 25, 2013

The Talcott Mountain Science Center
Jonathan Craig, Director
324 Montevideo Road
Avon, CT 06001

Re: Request for Tower Share – Notice
New Cingular Wireless PCS, LLC ("AT&T") Request for Approval of the Shared Use of an Existing Tower at 324 Montevideo Road, Avon, CT.
AT&T site number: CT1178

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A Request for Tower Share has been filed with the Connecticut Siting Council as required by Regulations of Connecticut State Agencies ("R.C.S.A.") Section 16-50aa. Please accept this letter as notification to the land owner under the Tower Share Application Guidelines.

The attached letter fully sets forth AT&T's proposal. However, if you have any questions or require any further information on the plans for the site or the Siting Council's procedures, please contact John Lawrence, Real Estate Consultant for AT&T, at (781) 715-5532 or Linda Roberts, Executive Director of the Connecticut Siting Council, at (860) 827-2935.

Sincerely,

John Lawrence
Real Estate Consultant

Enclosure
Honorable Robert Stein, Chairmen of the Connecticut Siting Council

TOWER MODIFICATION DESIGN

CT1178

324 MONTEVIDEO ROAD

AVON, CT 06001

VICINITY MAP

NORTH

PROJECT SUMMARY

SITE ADDRESS:	324 MONTEVIDEO ROAD AVON, CT 06001
PROJECT COORDINATES:	LAT: 41°-48'-42.26"N LON: 72°-47'-55.37"W ELEV: ±907' AMSL
TOWER OWNER:	TALCOTT MOUNTAIN SCIENCE CENTER 324 MONTEVIDEO ROAD AVON, CT 06001
AT&T CONTACT:	CHRIS POLICINSKI 781.708.3736
AT&T SITE NUMBER:	CT1178
AT&T SITE NAME:	NA
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CARLO F. CENTORE, PE 203.488.0580 ext. 122

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DESIGNED BY: TJL
DRAWN BY: TJL
CHK'D BY: CFC

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	6/13/13	TJL/CLT	CFC	ISSUED FOR CONSTRUCTION

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

AT&T MOBILITY
PROPOSED ANTENNA INSTALLATION & TOWER REINFORCEMENT DESIGN
CT1178
324 MONTEVIDEO ROAD
AVON, CT 06001

DATE: 6/11/13
SCALE: AS SHOWN
JOB NO. 13140.C02

TITLE SHEET

SHEET NO.
T-1
Sheet No. 1 of 6

DESIGN BASIS

1. GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

2. TIA/EIA-222-F-1996 "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".

3. DESIGN CRITERIA

   WIND LOAD: (TIA/EIA-222-F-1996)
   BASIC WIND SPEED (V) = 80 MPH (FASTEST MILE)

   WIND LOAD: (2005 CT STATE BUILDING CODE APPENDIX K)
   BASIC WIND SPEED (V) = 95 MPH (3-SECOND GUST)
   EQUIVALENT TO (V) = 77.5 MPH (FASTEST MILE)

   TIA/EIA-222-F-1996 WIND SPEED CONTROLS

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS AND REINFORCEMENT DESIGN PREPARED BY CENTEK ENGINEERING, INC., FOR AT&T MOBILITY, DATED 6/13/13.

2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM A PREVIOUS STRUCTURAL REPORT PREPARED BY CENTEK ENGINEERING PROJECT #12001.CO76, DATED OCTOBER 31, 2012.

3. PROVIDE TEMPORARY ANCHORS, GUYING AND/OR BRACING AS REQUIRED TO SAFELY CONDUCT THE WORK.

4. ALL WORK SHALL BE IN ACCORDANCE WITH TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES".

5. THE TOWER STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER REINFORCEMENTS ARE COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE TOWER STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIE-DOWNS, WHICH MIGHT BE NECESSARY.

6. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

7. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.

8. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.

10. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.

11. TOWER REINFORCING SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.

12. EXISTING COAXIAL CABLES AND ALL ACCESSORIES SHALL BE RELOCATED AS NECESSARY AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH TOWER REINFORCEMENT.

13. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
5	6/13/13	TJL/CLT	CFC	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER — STATE OF CONNECTICUT — No. 16894 — LICENSED

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

AT&T MOBILITY
PROPOSED ANTENNA INSTALLATION & TOWER REINFORCEMENT DESIGN

CT1178
334 MONTEVIDEO ROAD
AVON CT, 06001

DATE:	6/11/13
SCALE:	AS SHOWN
JOB NO.	13140.C02

DESIGN BASIS & GENERAL NOTES

SHEET NO.
N-1
Sheet No. 2 of 6

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD).

2. MATERIAL SPECIFICATIONS

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI).
   C. STRUCTURAL STEEL (TOWER REINF. PLATES---ASTM A572_GR50 (50 KSI)
   D. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   E. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   F. PIPE---ASTM A53 GRADE B (FY = 35 KSI)

3. FASTENER SPECIFICATIONS

   A. CONNECTION BOLTS---ASTM A325-N, UNLESS OTHERWISE SCHEDULED.
   B. U-BOLTS---ASTM A307
   C. ANCHOR RODS---ASTM F1554
   D. WELDING ELECTRODES---ASTM E70XX FOR A36 & A572_GR50 STEELS, ASTM E80XX FOR A572_GR65 STEEL.
   E. BLIND BOLTS---AS1252 PROPERTY CLASS 8.8 (FU=120 KSI).

4. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.

5. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.

6. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

7. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

8. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.

9. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

10. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.

11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".

12. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING THE SCHEDULED ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

13. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

14. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

15. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.

16. LOCK WASHER ARE NOT PERMITTED FOR A325 BOLTED STEEL ASSEMBLIES.

17. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.

18. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

19. FABRICATE BEAMS WITH MILL CAMBER UP.

20. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.

21. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

NO.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	6/13/13	TJL/GLT	CFC	ISSUED FOR CONSTRUCTION

CENTEK engineering
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AT&T MOBILITY
PROPOSED ANTENNA INSTALLATION & TOWER REINFORCEMENT DESIGN

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STRUCTURAL STEEL NOTES

SHEET NO.
N-2
Sheet No. 3 of 6

MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	–	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED SHOP DRAWINGS	–	EARTHWORK: BACKFILL MATERIAL & COMPACTION	–	POST–INSTALLED ANCHOR ROD PULL–OUT TEST
–	EOR APPROVED POST–INSTALLED ANCHOR MPII	–	CONCRETE TESTING	X	PHOTOGRAPHS
–	FABRICATION INSPECTION	X	STEEL INSPECTION		
–	FABRICATOR CERTIFIED WELDER INSPECTION	–	POST INSTALLED ANCHOR ROD VERIFICATION		
X	MATERIAL CERTIFICATIONS	–	BASE PLATE GROUT VERIFICATION		
		–	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON–SITE COLD GALVANIZING VERIFICATION		
		–	GUY WIRE TENSION REPORT		
		X	CONTRACTOR AS–BUILT REDLINE DRAWINGS		

NOTES:
1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
2. "X" DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
3. "–" DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
4. EOR – ENGINEER OF RECORD
4. MPII – "MANUFACTURER'S PRINTED INSTALLATION GUIDELINES"

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).

2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.

3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.

4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.

5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON–SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON–SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON–SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:

   – CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
   – WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS–BUILT CONDITION.

REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:

   – PRE–CONSTRUCTION: GENERAL CONDITION OF THE SITE.
   – DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
   – POST–CONSTRUCTION: FINAL CONDITION OF THE SITE

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	6/13/13	TJL/CLT	CFC	ISSUED FOR CONSTRUCTION

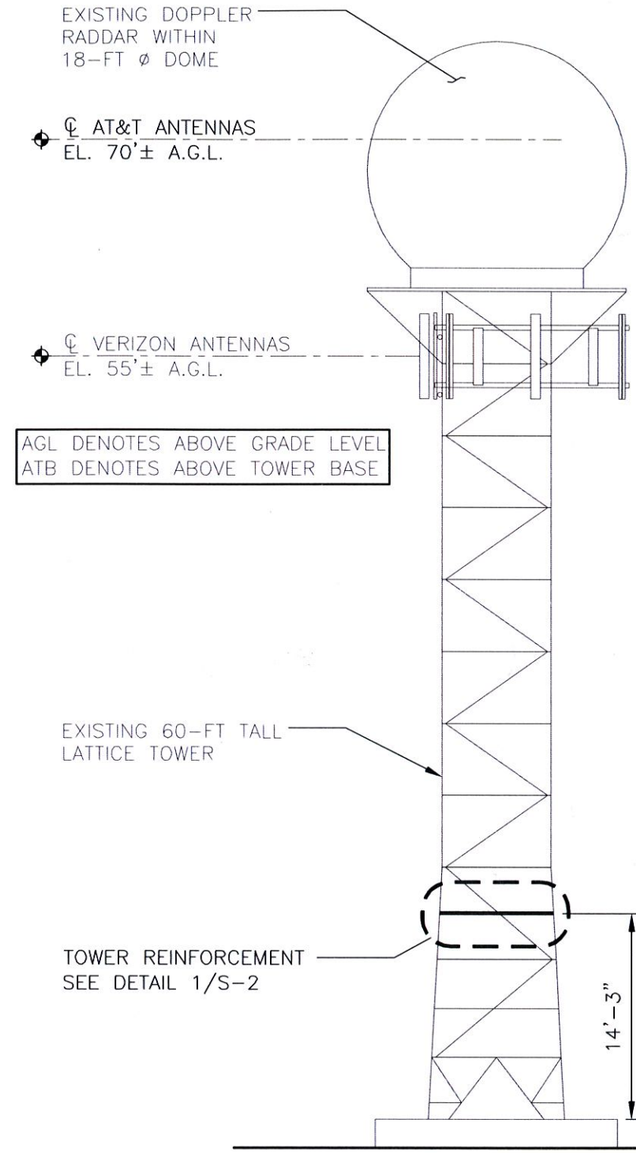
CENTEK engineering
Centered on Solutions℠
www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

AT&T MOBILITY
PROPOSED ANTENNA INSTALLATION & TOWER REINFORCEMENT DESIGN
CT11178
334 MONTEVIDEO ROAD
AVON CT, 06001

DATE:	6/11/13
SCALE:	AS SHOWN
JOB NO.	13140.C02

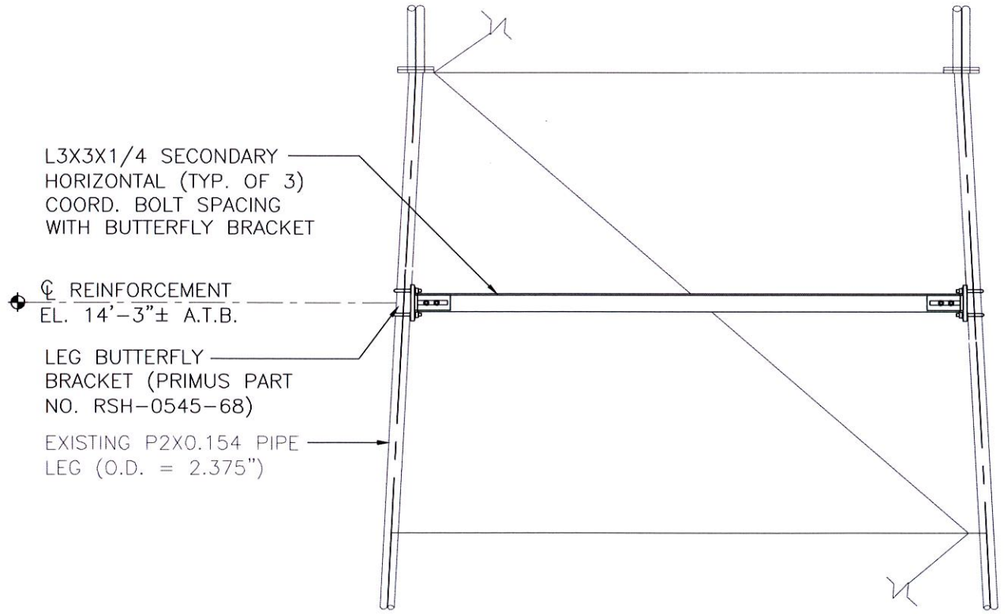
MODIFICATION INSPECTION REQUIREMENTS

SHEET NO.
MI-1
Sheet No. 4 of 6



1 / S-1 **TOWER ELEVATION - PROPOSED**

SCALE: 1" = 10'-0"



2 / S-1 **TOWER REINFORCEMENT ELEVATION**

SCALE: 1" = 10'-0"

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
D	6/13/13	TJL/GLT	CFC	ISSUED FOR CONSTRUCTION

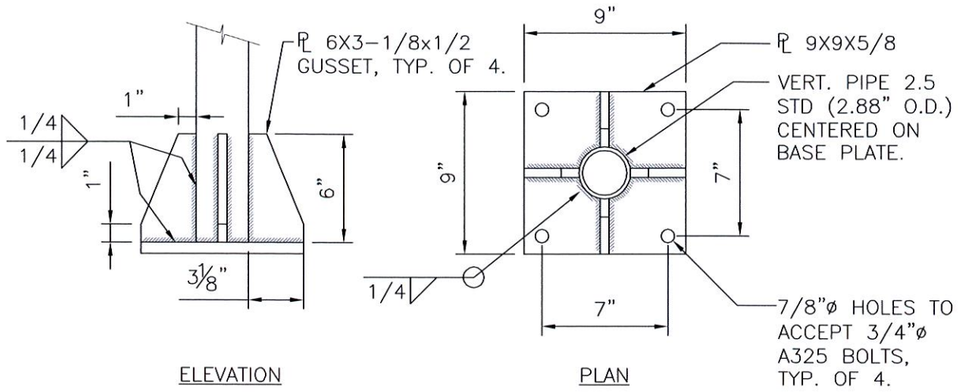
CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
PROPOSED ANTENNA INSTALLATION & TOWER REINFORCEMENT DESIGN
CT1178
301 MONTVERDE ROAD
AVON CT. 06001

DATE:	6/11/13
SCALE:	AS SHOWN
JOB NO.	13140.C02

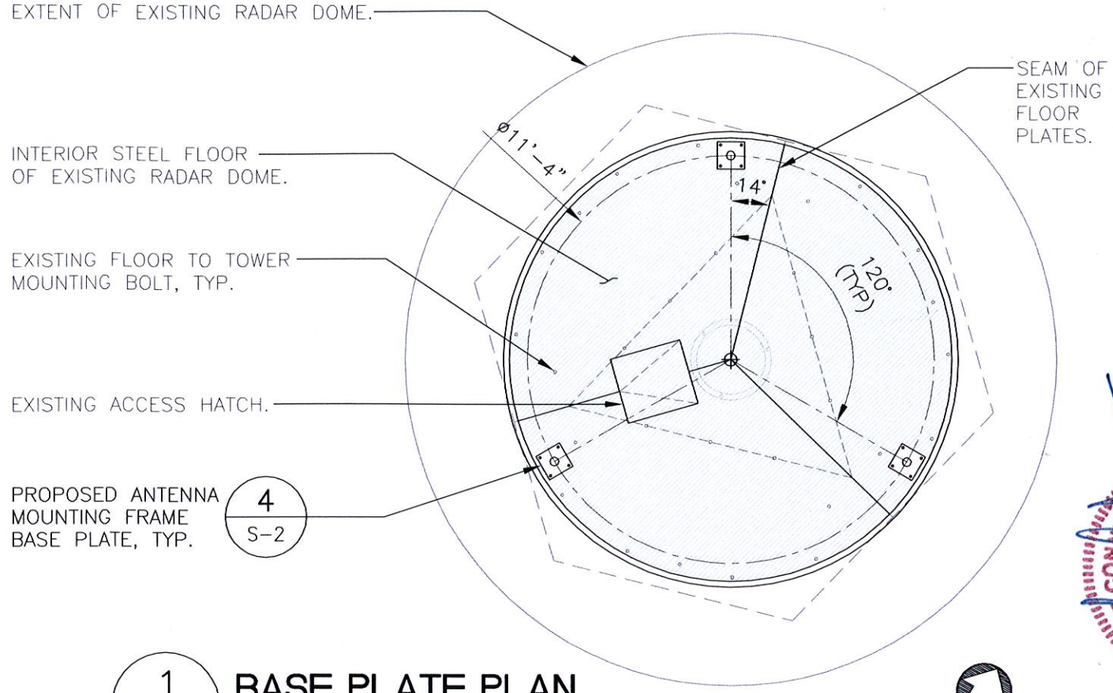
TOWER ELEVATION & FEEDLINE PLAN

SHEET NO.
S-1
Sheet No. 5 of 6



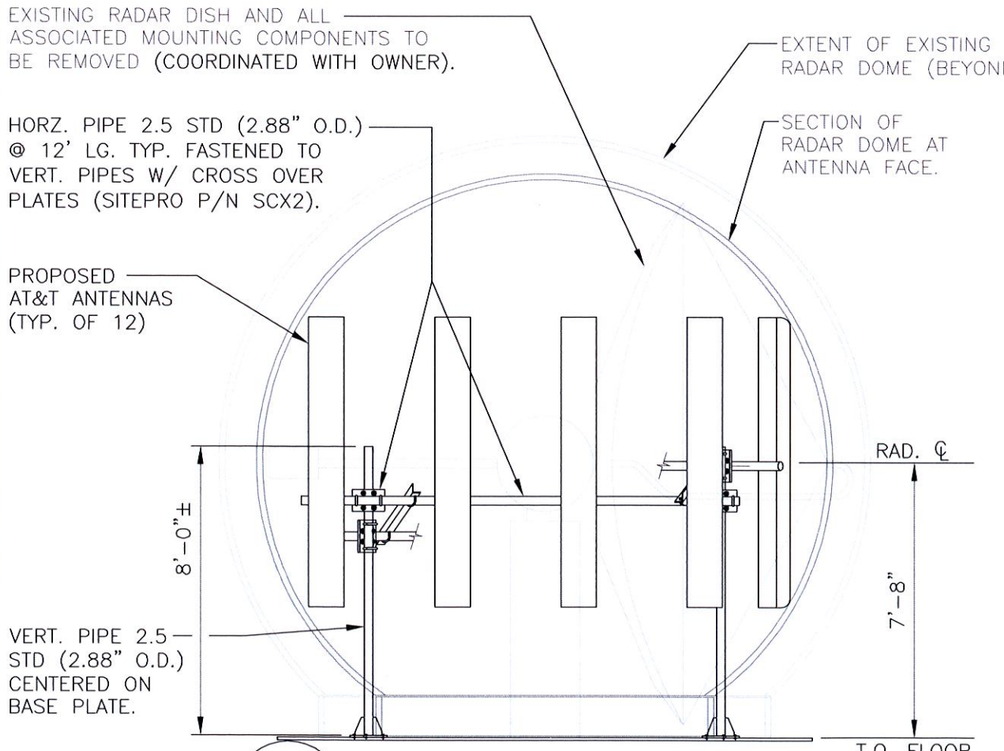
4 / S-2 TYP. BASE PLATE DETAIL

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



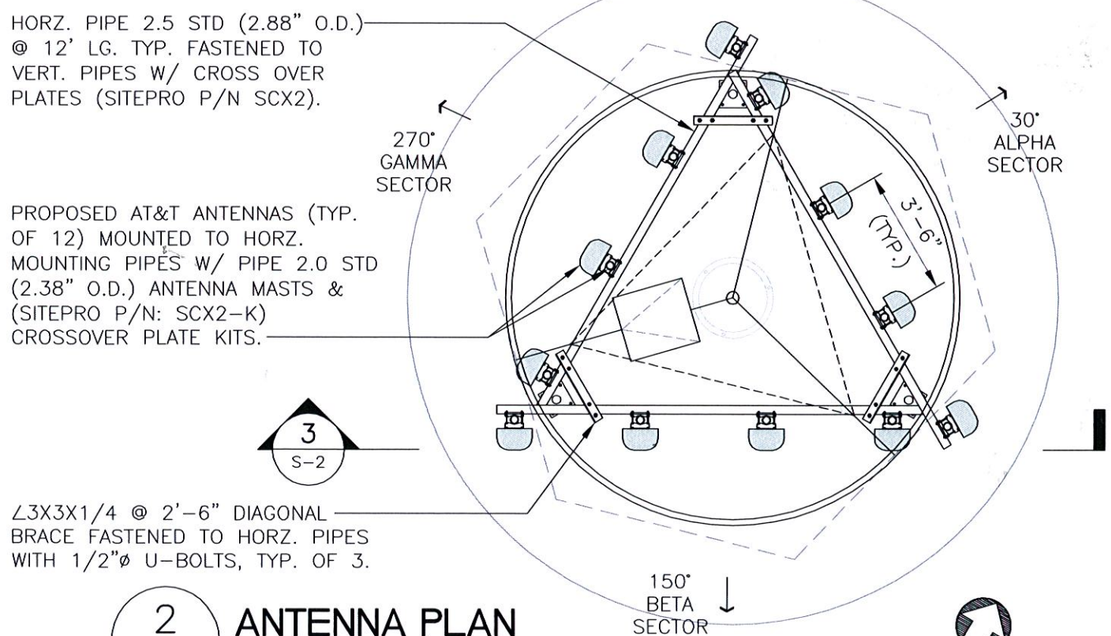
1 / S-2 BASE PLATE PLAN

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



3 / S-2 ANTENNA ELEVATION

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



2 / S-2 ANTENNA PLAN

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	6/13/13	TJL/GLT	CFC	ISSUED FOR CONSTRUCTION

DESIGNED BY: TJL
DRAWN BY: TJL
CHK'D BY: CFC

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

AT&T MOBILITY
PROPOSED ANTENNA INSTALLATION & TOWER REINFORCEMENT DESIGN
CT1178
334 MONTVERNON ROAD
AVON CT. 06001

DATE: 6/11/13
SCALE: AS SHOWN
JOB NO. 13140.C02

ANTENNA MOUNT DETAILS

SHEET NO. S-2
Sheet No. 6 of 6

Michael Lawton
SAI Communications
260 Cedar Hill St.
Marlborough, MA 01752
Mike.Lawton@sai-comm.com

June 25, 2013

Connecticut Siting Council

Subject: AT&T Wireless, S1178 – Avon – Talcott Mountain

Dear Connecticut Siting Council:

At the request of AT&T Wireless, SAI Communications has performed an assessment of the RF Power Density at the proposed site located at 324 Montevideo Road, Avon, CT.
Calculations were done in compliance with FCC OET Bulletin 65. This report provides an FCC compliance assessment based on a "worst-case" analysis that all transmitters are simultaneously operating at full power and pointing directly at the ground.

FCC OET Bulletin 65 formula:

$$S = \frac{2.56 * 1.64 * ERP}{4 * \pi * R^2}$$

Transmission Mode	Antenna Centerline AGL (ft)	Frequency (MHz)	Number of Channels	Effective Radiated Power per Channel (Watts)	Power Density (mW/cm^2)	Standard Limits (mW/cm^2)	% MPE (Uncontrolled/ General Public)
AT&T UMTS	70	850	2	500.00	0.0734	0.5667	12.95%
AT&T UMTS	70	1900	2	500.00	0.0734	1	7.34%
AT&T LTE	70	700	2	500.00	0.0734	0.4667	15.73%
AT&T LTE	70	2100	2	500.00	0.0734	1	7.34%
Verizon All Technologies	55	Combined	Combined	Combined	Combined	Combined	9.80%
Total							**53.16%**

Conclusion: AT&T's proposed antenna installation is calculated to be within 53.16% of FCC Standard for General Public/Uncontrolled Maximum Permissible Exposure (MPE).

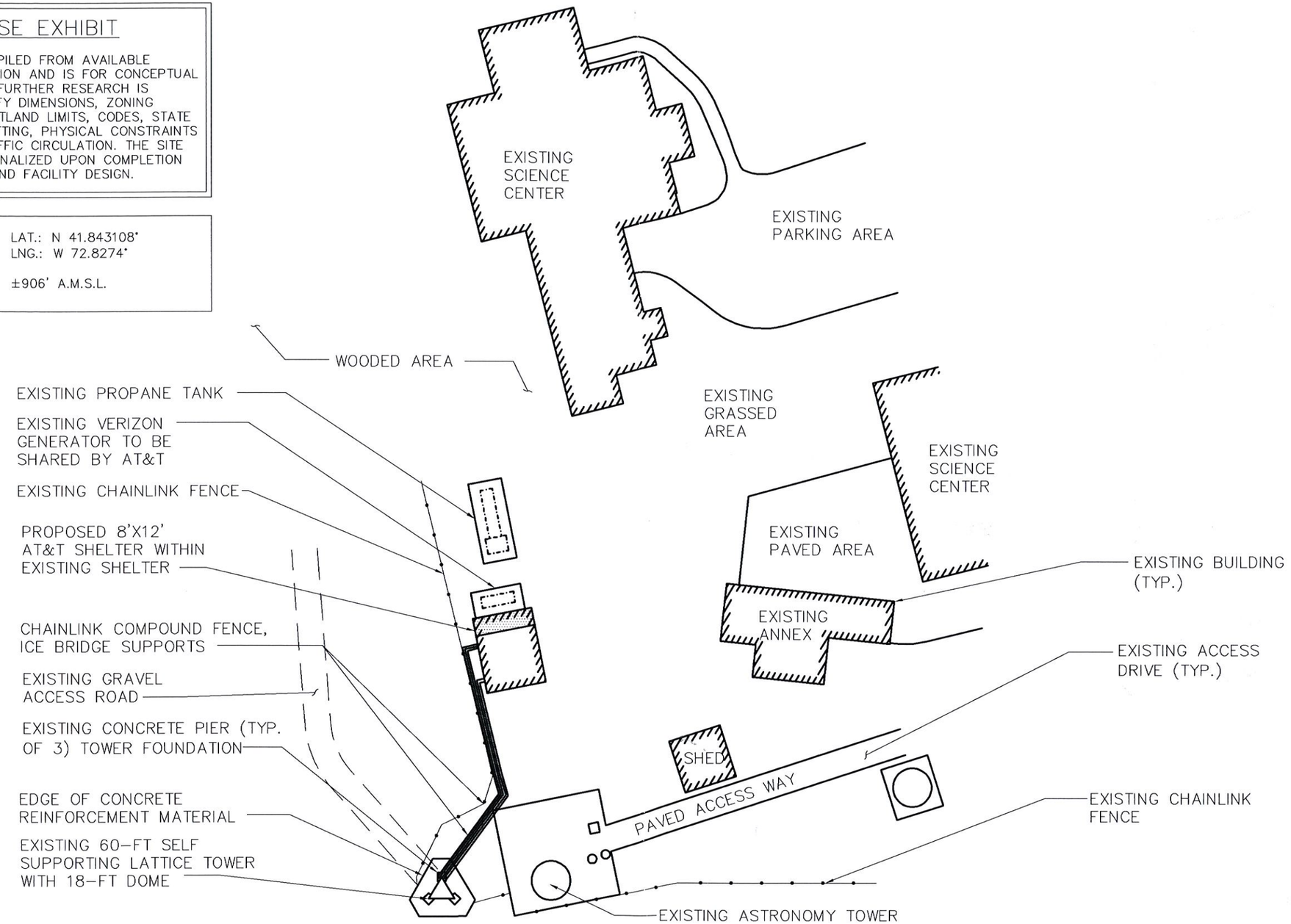
Sincerely,

Michael Lawton
SAI Communications

LEASE EXHIBIT

THIS PLAN IS COMPILED FROM AVAILABLE EXISTING INFORMATION AND IS FOR CONCEPTUAL PLANNING ONLY. FURTHER RESEARCH IS REQUIRED TO VERIFY DIMENSIONS, ZONING REQUIREMENTS, WETLAND LIMITS, CODES, STATE AND LOCAL PERMITTING, PHYSICAL CONSTRAINTS ON SITE, AND TRAFFIC CIRCULATION. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

COORDINATES: (NAD83)	LAT.: N 41.843108°
	LNG.: W 72.8274°
SITE ELEVATION:	±906' A.M.S.L.



1 / L-1 SITE PLAN

SCALE: N.T.S.

APPROXIMATE NORTH

VHB
Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
54 Tuttle Place
Middletown, Connecticut 06457
860.632.1500 • FAX 860.632.7879

SAI
22 KEEWAYDIN DRIVE
SALEM, NH 03079

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

No.	Revision	Date	Appvd

Designed by | Drawn by KEJ | Checked by PV
CAD checked by | Approved by
Scale N.T.S. | Date May 2, 2013

Project Title
Site No. CT1178
Talcott Mountain Center

324 Montevideo Road
Avon, Connecticut

Issued for
Not Approved for Construction

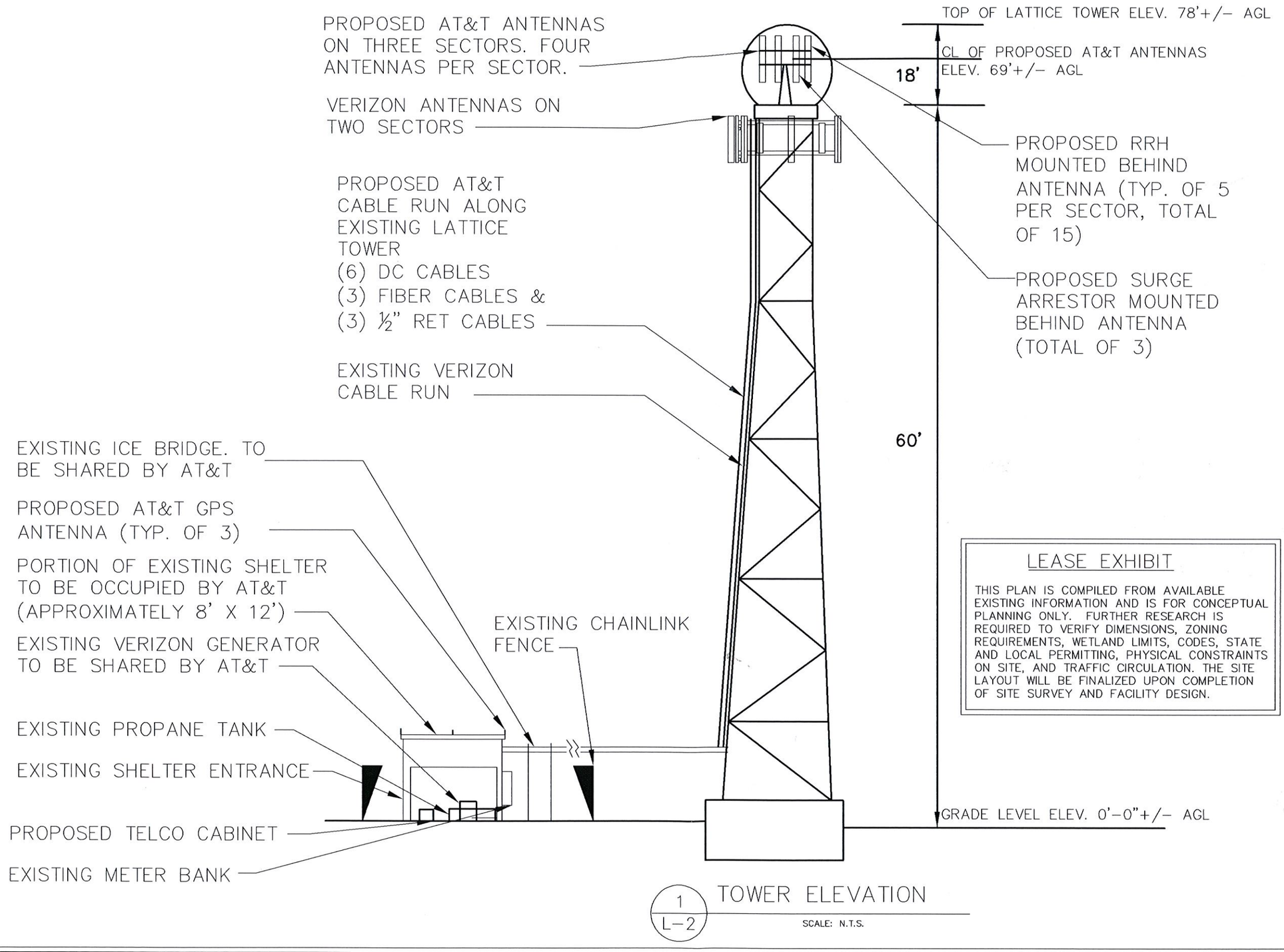
Drawing Title
Lease Exhibit:
Site Plan

Drawing Number
L-1

Sheet 1 of 2

Project Number
99901.00

SIMSBURY_TOWER_C-1.DWG



1 / L-2 TOWER ELEVATION

SCALE: N.T.S.

LEASE EXHIBIT

THIS PLAN IS COMPILED FROM AVAILABLE EXISTING INFORMATION AND IS FOR CONCEPTUAL PLANNING ONLY. FURTHER RESEARCH IS REQUIRED TO VERIFY DIMENSIONS, ZONING REQUIREMENTS, WETLAND LIMITS, CODES, STATE AND LOCAL PERMITTING, PHYSICAL CONSTRAINTS ON SITE, AND TRAFFIC CIRCULATION. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

VHB
Vanasse Hangen Brustlin, Inc.
Transportation
Land Development
Environmental Services
54 Tuttle Place
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SAI
22 KEEWAYDIN DRIVE
SALEM, NH 03079

at&t
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

No	Revision	Date	Appvd

Designed by | Drawn by KEJ | Checked by PV
CAD checked by | Approved by
Scale N.T.S. | Date May 2, 2013

Project Title
Site No. CT1178
Talcott Mountain Center

324 Montevideo Road
Avon, Connecticut

Issued for
Not Approved for Construction

Drawing Title
Lease Exhibit:
Tower Elevation

Drawing Number
L-2

Sheet 2 of 2

Project Number
99901.00

SIMSBURY_TOWER_C-1.DWG

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

60-ft Existing Lattice Tower

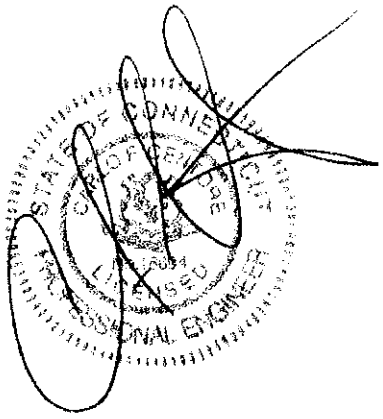
Proposed AT&T Mobility
Antenna Upgrade

AT&T Site Ref: CT1178

324 Montevideo Road
Avon, CT

Centek Project No. 13140.C01

Date: June 13, 2013



Prepared for:

AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

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

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by AT&T Mobility on the existing lattice (tower) located in Avon, CT.

The host tower is a 60-ft, three legged, steel lattice tower. The tower geometry, structure member sizes and foundation information were obtained from a previous structural report prepared by Centek Engineering, Inc. job no.; 12001.CO76 dated October 31, 2012.

Antenna and appurtenance information were obtained from the aforementioned Centek structural report, visual verification conducted by Centek personnel on May 30, 2013 and a RF data sheet.

The tower consists of one (1) tapered and two (2) straight vertical steel sections consisting of ASTM A53-B-35 (35ksi) pipe legs. Diagonal and horizontal lateral support bracing consists of steel angle conforming to ASTM A36 (36ksi) and steel pipe conforming to ASTM A53-B-35 (35ksi). The vertical tower sections are connected by bolted flange plates while the pipe legs and bracing are connected by bolted and welded gusset connections. The tower face width is 7.58-ft at the top and 9.70-ft at the bottom.

AT&T proposes the installation of twelve (12) panel antennas, fifteen (15) RRH's and three (3) surge arrestors mounted within the existing doppler radar dome. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- UNKNOWN (Existing):
  Antennas: One (1) 18-ft dome mounted to the top of the tower.
  Coax Cables: One (1) 7/8" ∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- VERIZON WIRELESS (Existing):
  Antennas: One (1) RFS APX75-866514-CT8, one (1) Antel BXA-70080-6CF, two (2) Antel LPA-80063-6CF, two (2) LPA-80080-6CF and four (4) Antel LPA-171063-8CF panel antennas mounted on two (2) 13-ft face mount fames with a RAD center elevation of ±55-ft above finished grade.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables on a leg/face of the existing tower as specified in Section 3 of this report.
- **AT&T (PROPOSED):**
  Antennas: Nine (9) Andrew SBNH-1D6565C panel antennas, three (3) Ericsson KRC 118 054/1 panel antennas, fifteen (15) Ericsson RRUS-11 remote radio units and three (3) Raycap DC6-48-60-18-8F surge arrestor mounted within the existing doppler radar dome with a RAD center elevation of ±67-ft above grade.
  Coax Cables: One (1) fiber cable and six (6) dc control cables running on a leg of the existing tower.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All existing coax cables to be installed as indicated in this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower shaft, and the model assumes that the shaft members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix K of the CSBC[1] and the wind speed data available in the TIA/EIA-222-F-96 Standard. The higher of the two wind speeds is utilized in preparation on the tower analysis.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice on the tower structure and its components.

Basic Wind Speed:	Hartford; v = 80 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Avon; v = 95 mph (3 second gust) equivalent to v = 77.5 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA-EIA wind speed controls.	
Load Cases:	Load Case 1; 80 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 69 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 69 mph wind speed velocity represents 75% of the wind pressure generated by the 80 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

[1] The 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement. (CSBC)

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

- Calculated stresses **with the proposed reinforcements detailed in section 4 of this report** were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **97.9%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T5)	0'-6.3'	97.9%	**PASS**
Diagonal (T2)	19.5'-39.5'	66.3%	**PASS**

Foundation and Anchors

The foundation consists of a 3.5-ft thick triangular mat. The tower legs are encased within the concrete mat.

Review of the foundation and anchor design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

- The tower base reactions developed from the governing Load Case 1 were used in the verification of the foundation and its anchors:

Load Effect	Proposed Tower Reactions
Leg Shear	7 kips
Leg Compression	72 kips
Leg Uplift	64 kips
Base Moment	576 ft-kips
Base Shear	11 kips

- The foundation system was found to be within allowable limits.

Foundation Type	Design Limit	Allowable Limit/FS	Proposed Loading	Result
Triangular Mat Foundation	Bearing Pressure	12.0 ksf (1)	1.3 ksf	**PASS**
	OM (2)	2.0 (3)	2.9	**PASS**

Note 1: Minimum allowable soil bearing pressure taken as 12.0ksf (conservative) for basalt rock.
Note 2: (OM) Denotes overturning moment.
Note 3: Min required Factor of Safety (FS) of 2.0 required per IBC 2003/2005 CSBC Section 3108.4.2.

Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed antenna modification **with the implementation of the proposed structural modifications in Section 4.0 of this report.**

The analysis is based, in part, on the information provided to this office by AT&T Mobility. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

STATE OF CONNECTICUT
CARLO FRANCESCO CENTORE
NO. 26954
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Timothy J. Lynn, EIT
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

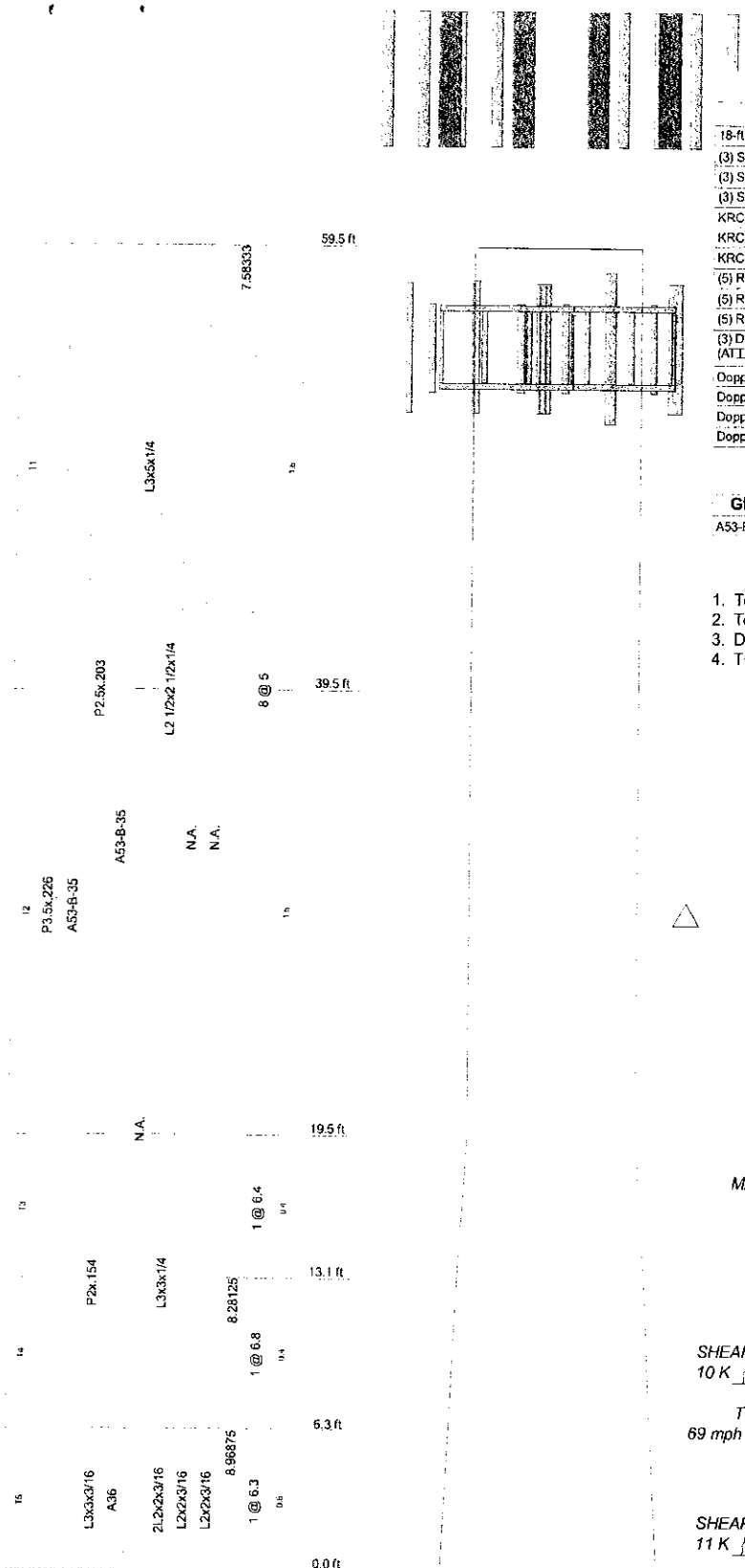
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or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

General Description of Structural Analysis Program

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
18-ft Doppler	68.5	LPA-171063-8CF (Verizon - Existing)	55
(3) SBNH-1D6565C (ATI - Proposed)	67	LPA-80080-6CF (Verizon - Existing)	55
(3) SBNH-1D6565C (ATI - Proposed)	67	LPA-80063-6CF (Verizon - Existing)	55
(3) SBNH-1D6565C (ATI - Proposed)	67	LPA-80080-6CF (Verizon - Existing)	55
KRC 118 054/1 (ATI - Proposed)	67	LPA-171063-8CF (Verizon - Existing)	55
KRC 118 054/1 (ATI - Proposed)	67	BXA-70080-6CF (Verizon - Existing)	55
KRC 118 054/1 (ATI - Proposed)	67	13-ft Face Mount Frame (Verizon - Existing)	55
(5) RRUS-11 (ATI - Proposed)	67		
(5) RRUS-11 (ATI - Proposed)	67	13-ft Face Mount Frame (Verizon - Existing)	55
(5) RRUS-11 (ATI - Proposed)	67		
(3) DC6-48-60-18-8F Surge Arrestor (ATI - Proposed)	67	LPA-80063-6CF (Verizon - Existing)	55
		LPA-171063-8CF (Verizon - Existing)	55
Doppler Platform	60	APX75-866514-CT8 (Verizon - Existing)	55
Doppler Platform Support	57	LPA-171063-8CF (Verizon - Existing)	55
Doppler Platform Support	57		
Doppler Platform Support	57		

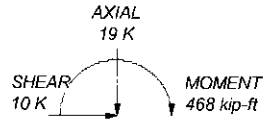
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A36	36 ksi	58 ksi

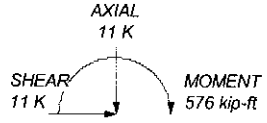
TOWER DESIGN NOTES

1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 97.9%

MAX. CORNER REACTIONS AT BASE:
DOWN: 72 K
UPLIFT: -64 K
SHEAR: 7 K



TORQUE 2 kip-ft
69 mph WIND - 0.5000 in ICE



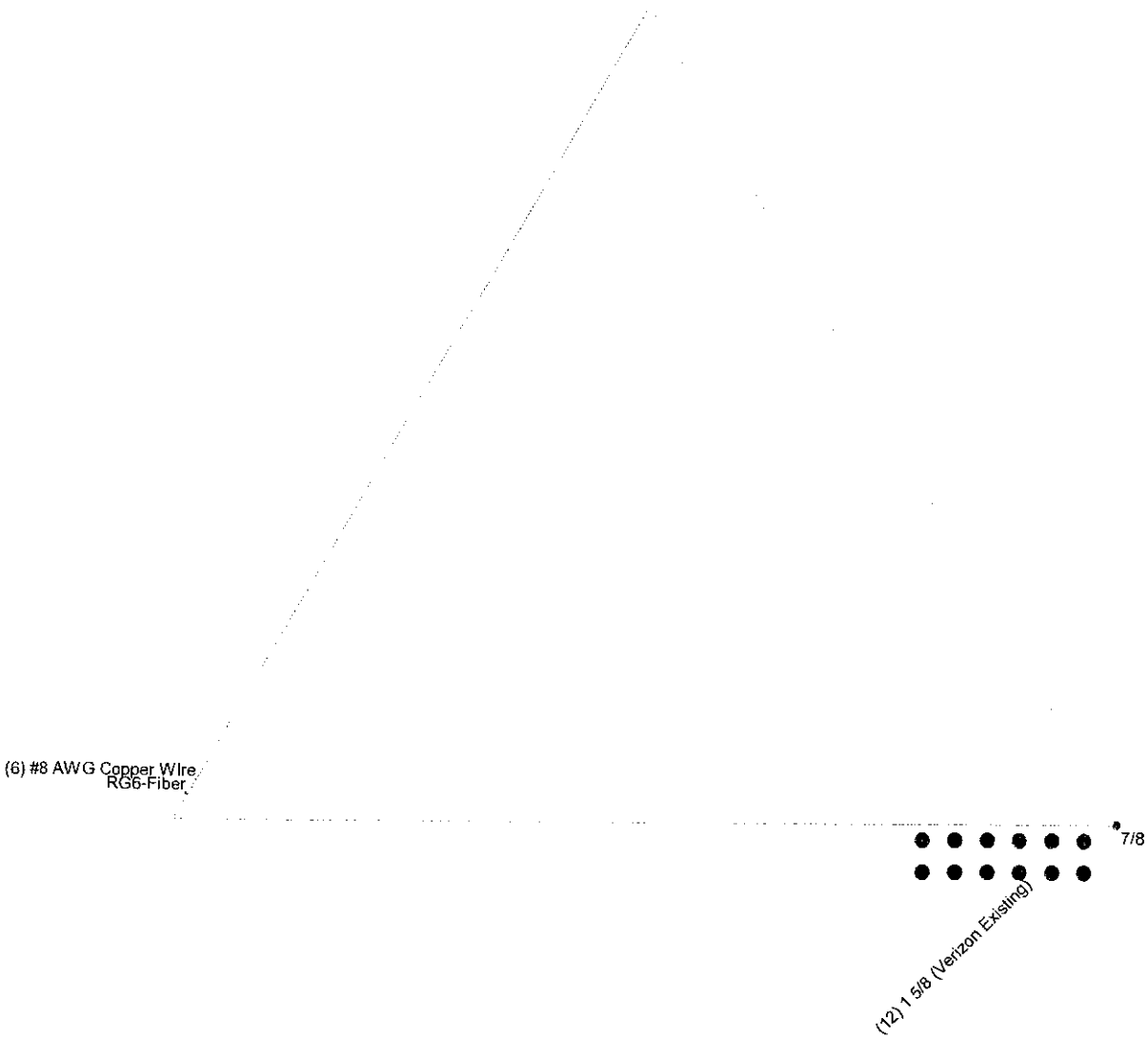
TORQUE 1 kip-ft
REACTIONS - 80 mph WIND

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: 13140.CO2 - CT1178			
Project: 60' Lattice Tower - 324 Montevideo Road, Avon, CT			
Client: AT&T Mobility	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 06/13/13	Scale: NTS	
Path:		Dwg No. E-1	

Feedline Plan

Round _____ Flat _____ App In Face App Out Face



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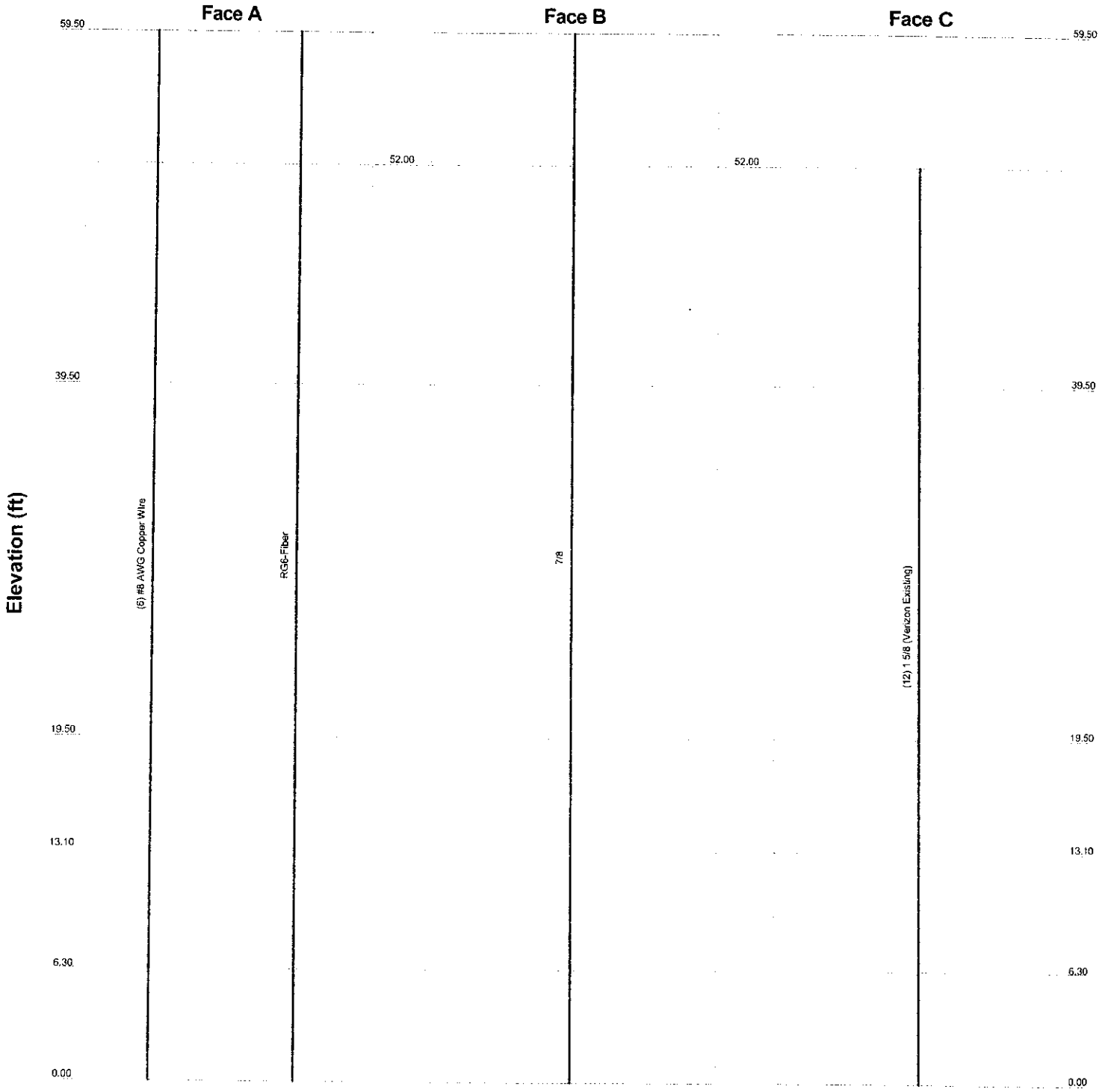
Code: TIA/EIA-222-F	Date: 06/13/13	Scale: NTS	
Path:		Dwg No. E-7	

Feedline Distribution Chart
0' - 59'6"

Round Flat App In Face App Out Face Truss Leg



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Job: *13140.CO2 - CT1178*		
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tnxTower	Job	Page
	13140.CO2 - CT1178	1 of 28
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project 60' Lattice Tower - 324 Montevideo Road, Avon, CT	Date 13:55:54 06/13/13
	Client AT&T Mobility	Designed by TJL

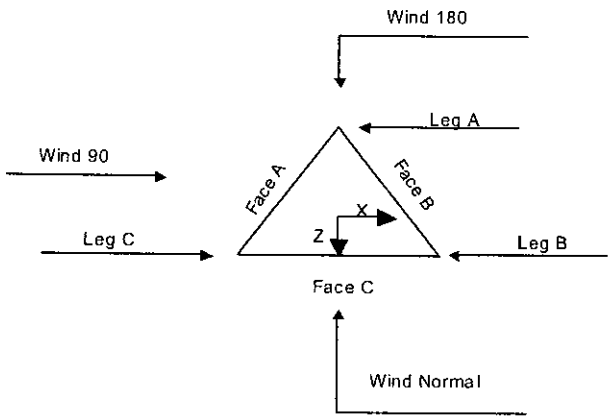
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 59.50 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 7.58 ft at the top and 9.71 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 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, feedline 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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	59.50-39.50			7.58	1	20.00
T2	39.50-19.50			7.58	1	20.00
T3	19.50-13.10			7.58	1	6.40
T4	13.10-6.30			8.28	1	6.80
T5	6.30-0.00			8.97	1	6.30

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	59.50-39.50	5.00	K Brace Left	No	Yes	0.0000	0.0000
T2	39.50-19.50	5.00	K Brace Left	No	Yes	0.0000	0.0000
T3	19.50-13.10	6.40	K Brace Right	No	Yes	0.0000	0.0000
T4	13.10-6.30	6.80	K Brace Left	No	Yes	0.0000	0.0000
T5	6.30-0.00	6.30	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 59.50-39.50	Pipe	P3.5x.226	A53-B-35 (35 ksi)	Pipe	P2.5x.203	A53-B-35 (35 ksi)
T2 39.50-19.50	Pipe	P3.5x.226	A53-B-35 (35 ksi)	Pipe	P2.5x.203	A53-B-35 (35 ksi)
T3 19.50-13.10	Pipe	P3.5x.226	A53-B-35 (35 ksi)	Pipe	P2x.154	A53-B-35 (35 ksi)
T4 13.10-6.30	Pipe	P3.5x.226	A53-B-35 (35 ksi)	Pipe	P2x.154	A53-B-35 (35 ksi)
T5 6.30-0.00	Pipe	P3.5x.226	A53-B-35 (35 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 59.50-39.50	Single Angle	L3x5x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 59.50-39.50	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T2 39.50-19.50	None	Single Angle		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T3 19.50-13.10	None	Single Angle		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T4 13.10-6.30	None	Single Angle		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 6.30-0.00	None	Single Angle		A36 (36 ksi)	Double Equal Angle	2L2x2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T5 6.30-0.00	A36 (36 ksi)	Horizontal (1)	Single Angle	L2x2x3/16	1
		Diagonal (1)	Single Angle	L2x2x3/16	1

Tower Section Geometry *(cont'd)*

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
T1 59.50-39.50	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 39.50-19.50	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 19.50-13.10	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 13.10-6.30	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 6.30-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] X Brace Diags X	K Brace Diags X	Single Diags X	Girts X	Horiz. X	Sec. Horiz. X	Inner Brace X
ft				Y	Y	Y	Y	Y	Y	Y
T1 59.50-39.50	Yes	No	1	1	1	1	1	1	1	1
T2 39.50-19.50	Yes	No	1	1	1	1	1	1	1	1
T3 19.50-13.10	Yes	No	0.5	1	1	1	1	1	1	1
T4 13.10-6.30	Yes	No	0.5	1	1	1	1	1	1	1
T5 6.30-0.00	Yes	No	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
ft	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 59.50-39.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 39.50-19.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 19.50-13.10	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 13.10-6.30	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 6.30-0.00	0.0000	0.75	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 59.50-39.50	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T2 39.50-19.50	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T3 19.50-13.10	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T4 13.10-6.30	0.0000	3.0000	0.0000	3.0000	0.0000	0.0000	0.0000	0.0000
T5 6.30-0.00	0.0000	3.0000	0.0000	3.0000	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 59.50-39.50	Flange	0.8750 A325N	4	0.5000 A325N	2	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.6250 A325N	0
T2 39.50-19.50	Flange	0.8750 A325N	4	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.6250 A325N	0
T3 19.50-13.10	Flange	0.0000 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.7500 A325N	1	0.6250 A325N	0
T4 13.10-6.30	Flange	0.0000 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.6250 A325N	0
T5 6.30-0.00	Flange	0.0000 A325N	0	0.7500 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.5000 A325N	1	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon Existing)	C	Yes	Ar (CfAe)	52.00 - 0.00	1.0000	-0.38	12	6	1.9800	1.9800		1.04
7/8	B	No	Ar (Leg)	59.50 - 0.00	0.0000	0	1	1	1.1100	1.1100		0.54
#8 AWG Copper Wire	A	No	Ar (CfAe)	59.50 - 0.00	0.0000	-0.45	6	6	0.2500	0.1285		0.05
RG6-Fiber	A	No	Ar (CfAe)	59.50 - 0.00	0.0000	-0.47	1	1	0.5000	0.5000		1.00

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 K
T1	59.50-39.50	A	2.118	0.000	0.000	0.000	0.03
		B	1.850	0.000	0.000	0.000	0.01
		C	14.225	0.000	0.000	0.000	0.16
T2	39.50-19.50	A	2.118	0.000	0.000	0.000	0.03
		B	1.850	0.000	0.000	0.000	0.01
		C	21.650	0.000	0.000	0.000	0.25
T3	19.50-13.10	A	0.678	0.000	0.000	0.000	0.01
		B	0.592	0.000	0.000	0.000	0.00
		C	6.928	0.000	0.000	0.000	0.08
T4	13.10-6.30	A	0.720	0.000	0.000	0.000	0.01
		B	0.629	0.000	0.000	0.000	0.00
		C	7.361	0.000	0.000	0.000	0.08
T5	6.30-0.00	A	0.667	0.000	0.000	0.000	0.01
		B	0.583	0.000	0.000	0.000	0.00
		C	6.820	0.000	0.000	0.000	0.08

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 K
T1	59.50-39.50	A	0.500	4.381	3.154	0.000	0.000	0.06
		B		3.517	0.000	0.000	0.000	0.03
		C		22.142	0.000	0.000	0.000	0.38
T2	39.50-19.50	A	0.500	4.381	3.154	0.000	0.000	0.06
		B		3.517	0.000	0.000	0.000	0.03
		C		33.317	0.000	0.000	0.000	0.61
T3	19.50-13.10	A	0.500	1.402	1.009	0.000	0.000	0.02
		B		1.125	0.000	0.000	0.000	0.01
		C		10.661	0.000	0.000	0.000	0.20
T4	13.10-6.30	A	0.500	1.489	1.072	0.000	0.000	0.02
		B		1.196	0.000	0.000	0.000	0.01
		C		11.328	0.000	0.000	0.000	0.21
T5	6.30-0.00	A	0.500	1.380	0.994	0.000	0.000	0.02
		B		1.108	0.000	0.000	0.000	0.01
		C		10.495	0.000	0.000	0.000	0.19

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	59.50-39.50	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.710	1.751	0.541	0.815
T2	39.50-19.50	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.136	2.802	0.825	1.242
T3	19.50-13.10	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.252	0.663	0.248	0.373
T4	13.10-6.30	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T5	6.30-0.00	C	0.249	0.658	0.248	0.373
		A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.679	1.037	1.560

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	59.50-39.50	3.7289	4.2956	3.3303	5.0373
T2	39.50-19.50	5.7020	5.9648	5.3804	6.7049
T3	19.50-13.10	6.5536	6.7969	6.2218	7.6408
T4	13.10-6.30	7.0986	7.2922	6.7582	8.2130
T5	6.30-0.00	5.3170	5.5200	4.6915	5.9968

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert ft / ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
18-ft Doppler	C	None		0.0000	68.50	No Ice	203.47	203.47	2.00
						1/2" Ice	205.47	205.47	4.40
Doppler Platform	C	None		0.0000	60.00	No Ice	0.00	0.00	1.00
						1/2" Ice	0.00	0.00	1.30
Doppler Platform Support	A	None		0.0000	57.00	No Ice	3.17	3.17	0.10
						1/2" Ice	3.87	3.87	0.14
Doppler Platform Support	B	None		0.0000	57.00	No Ice	3.17	3.17	0.10
						1/2" Ice	3.87	3.87	0.14
Doppler Platform Support	C	None		0.0000	57.00	No Ice	3.17	3.17	0.10
						1/2" Ice	3.87	3.87	0.14
13-ft Face Mount Frame (Verizon - Existing)	B	From Face	0.50 0.00 0.00	0.0000	55.00	No Ice	6.50	6.50	0.30
						1/2" Ice	7.80	7.80	0.35
13-ft Face Mount Frame (Verizon - Existing)	A	From Face	0.50 0.00 0.00	0.0000	55.00	No Ice	6.50	6.50	0.30
						1/2" Ice	7.80	7.80	0.35
LPA-80063-6CF (Verizon - Existing)	B	From Face	0.50 6.00 0.00	0.0000	55.00	No Ice	10.31	9.01	0.03
						1/2" Ice	10.87	9.55	0.10
LPA-171063-8CF (Verizon - Existing)	B	From Face	0.50 4.00 0.00	0.0000	55.00	No Ice	3.69	3.69	0.01
						1/2" Ice	4.06	4.06	0.04
APX75-866514-CT8 (Verizon - Existing)	B	From Face	0.50 0.00 0.00	0.0000	55.00	No Ice	9.77	4.71	0.03
						1/2" Ice	10.38	5.21	0.08
LPA-171063-8CF (Verizon - Existing)	B	From Face	0.50 -4.00	0.0000	55.00	No Ice	3.69	3.69	0.01
						1/2" Ice	4.06	4.06	0.04

tnxTower	Job	Page
	13140.CO2 - CT1178	8 of 28
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	**Project** 60' Lattice Tower - 324 Montevideo Road, Avon, CT	**Date** 13:55:54 06/13/13
	Client AT&T Mobility	**Designed by** TJL

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft²	C_AA_A Side ft²	Weight K
				0.00						
LPA-80063-6CF	B	From Face	0.50	0.0000	55.00		No Ice	10.31	9.01	0.03
(Verizon - Existing)			-6.00				1/2" Ice	10.87	9.55	0.10
				0.00						
LPA-80080-6CF	A	From Face	0.50	0.0000	55.00		No Ice	4.33	9.09	0.02
(Verizon - Existing)			-8.75				1/2" Ice	4.76	9.64	0.07
				0.00						
LPA-171063-8CF	A	From Face	0.50	0.0000	55.00		No Ice	3.69	3.69	0.01
(Verizon - Existing)			-6.75				1/2" Ice	4.06	4.06	0.04
				0.00						
BXA-70080-6CF	A	From Face	0.50	0.0000	55.00		No Ice	5.77	4.56	0.02
(Verizon - Existing)			-2.75				1/2" Ice	6.22	5.00	0.05
				0.00						
LPA-171063-8CF	A	From Face	0.50	0.0000	55.00		No Ice	3.69	3.69	0.01
(Verizon - Existing)			1.25				1/2" Ice	4.06	4.06	0.04
				0.00						
LPA-80080-6CF	A	From Face	0.50	0.0000	55.00		No Ice	4.33	9.09	0.02
(Verizon - Existing)			3.25				1/2" Ice	4.76	9.64	0.07
				0.00						
(3) SBNH-1D6565C	A	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.06
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.13
				0.00						
(3) SBNH-1D6565C	B	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.06
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.13
				0.00						
(3) SBNH-1D6565C	C	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.06
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.13
				0.00						
KRC 118 054/1	A	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.12
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.19
				0.00						
KRC 118 054/1	B	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.12
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.19
				0.00						
KRC 118 054/1	C	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.12
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.19
				0.00						
(5) RRUS-11	A	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.05
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.07
				0.00						
(5) RRUS-11	B	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.05
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.07
				0.00						
(5) RRUS-11	C	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.05
(AT&T - Proposed)			0.00				1/2" Ice	0.00	0.00	0.07
				0.00						
(3) DC6-48-60-18-8F Surge	A	From Face	4.00	0.0000	67.00		No Ice	0.00	0.00	0.02
Arrestor			0.00				1/2" Ice	0.00	0.00	0.04
(AT&T - Proposed)				0.00						

Tower Pressures - No Ice

$G_H = 1.202$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 59.50-39.50	49.50	1.123	18	158.333	A	6.344	23.761	13.333	44.29	0.000	0.000
					B	6.344	23.492		44.69	0.000	0.000
					C	5.802	35.157		32.55	0.000	0.000
T2 39.50-19.50	29.50	1	16	158.333	A	6.042	23.761	13.333	44.74	0.000	0.000
					B	6.042	23.492		45.15	0.000	0.000
					C	5.217	42.156		28.15	0.000	0.000
T3 19.50-13.10	16.30	1	16	52.903	A	1.812	6.895	4.275	49.10	0.000	0.000
					B	1.812	6.809		49.59	0.000	0.000
					C	1.565	12.893		29.57	0.000	0.000
T4 13.10-6.30	9.70	1	16	60.920	A	1.987	7.359	4.541	48.59	0.000	0.000
					B	1.987	7.267		49.07	0.000	0.000
					C	1.739	13.750		29.32	0.000	0.000
T5 6.30-0.00	3.15	1	16	60.936	A	7.126	4.877	4.210	35.07	0.000	0.000
					B	7.126	4.792		35.32	0.000	0.000
					C	6.089	11.029		24.59	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.202$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 59.50-39.50	49.50	1.123	14	0.5000	160.000	A	9.498	34.663	16.667	37.74	0.000	0.000
						B	6.344	33.799		41.52	0.000	0.000
						C	5.529	50.673		29.66	0.000	0.000
T2 39.50-19.50	29.50	1	12	0.5000	160.000	A	9.196	34.663	16.667	38.00	0.000	0.000
						B	6.042	33.799		41.83	0.000	0.000
						C	4.800	60.797		25.41	0.000	0.000
T3 19.50-13.10	16.30	1	12	0.5000	53.437	A	2.822	10.109	5.344	41.33	0.000	0.000
						B	1.812	9.833		45.89	0.000	0.000
						C	1.440	18.706		26.53	0.000	0.000
T4 13.10-6.30	9.70	1	12	0.5000	61.487	A	3.059	10.809	5.676	40.93	0.000	0.000
						B	1.987	10.515		45.40	0.000	0.000
						C	1.614	19.989		26.28	0.000	0.000
T5 6.30-0.00	3.15	1	12	0.5000	61.462	A	8.119	9.565	5.262	29.76	0.000	0.000
						B	7.126	9.292		32.05	0.000	0.000
						C	5.565	18.001		22.33	0.000	0.000

Tower Pressure - Service

$G_H = 1.202$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²

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	13140.CO2 - CT1178	10 of 28
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project 60' Lattice Tower - 324 Montevideo Road, Avon, CT	Date 13:55:54 06/13/13
	Client AT&T Mobility	Designed by TJL

Section Elevation	z	K_z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1 59.50-39.50	49.50	1.123	7	158.333	A	6.344	23.761	13.333	44.29	0.000	0.000
					B	6.344	23.492		44.69	0.000	0.000
					C	5.802	35.157		32.55	0.000	0.000
T2 39.50-19.50	29.50	1	6	158.333	A	6.042	23.761	13.333	44.74	0.000	0.000
					B	6.042	23.492		45.15	0.000	0.000
					C	5.217	42.156		28.15	0.000	0.000
T3 19.50-13.10	16.30	1	6	52.903	A	1.812	6.895	4.275	49.10	0.000	0.000
					B	1.812	6.809		49.59	0.000	0.000
					C	1.565	12.893		29.57	0.000	0.000
T4 13.10-6.30	9.70	1	6	60.920	A	1.987	7.359	4.541	48.59	0.000	0.000
					B	1.987	7.267		49.07	0.000	0.000
					C	1.739	13.750		29.32	0.000	0.000
T5 6.30-0.00	3.15	1	6	60.936	A	7.126	4.877	4.210	35.07	0.000	0.000
					B	7.126	4.792		35.32	0.000	0.000
					C	6.089	11.029		24.59	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
T1	0.19	1.58	A	0.19	2.629	0.588	1	1	20.325	1.44	72.08	C
59.50-39.50			B	0.188	2.635	0.588	1	1	20.160			
			C	0.259	2.412	0.604	1	1	27.042			
T2	0.29	1.52	A	0.188	2.636	0.588	1	1	20.015	1.41	70.51	C
39.50-19.50			B	0.187	2.642	0.588	1	1	19.849			
			C	0.299	2.298	0.616	1	1	31.170			
T3	0.09	0.39	A	0.165	2.719	0.584	1	1	5.838	0.44	68.55	C
19.50-13.10			B	0.163	2.724	0.584	1	1	5.786			
			C	0.273	2.369	0.608	1	1	9.405			
T4 13.10-6.30	0.10	0.42	A	0.153	2.759	0.582	1	1	6.270	0.48	70.41	C
			B	0.152	2.764	0.582	1	1	6.215			
			C	0.254	2.425	0.603	1	1	10.030			
T5 6.30-0.00	0.09	0.57	A	0.197	2.606	0.59	1	1	10.002	0.59	94.06	C
			B	0.196	2.611	0.59	1	1	9.951			
			C	0.281	2.348	0.61	1	1	12.820			
Sum Weight:	0.76	4.48						OTM	126.62 kip-ft	4.36		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	K	K							ft^2	K	plf	
T1	0.19	1.58	A	0.19	2.629	0.588	0.825	1	19.215	1.39	69.37	C
59.50-39.50			B	0.188	2.635	0.588	0.825	1	19.050			
			C	0.259	2.412	0.604	0.825	1	26.026			
T2	0.29	1.52	A	0.188	2.636	0.588	0.825	1	18.957	1.37	68.44	C
39.50-19.50			B	0.187	2.642	0.588	0.825	1	18.792			
			C	0.299	2.298	0.616	0.825	1	30.257			
T3	0.09	0.39	A	0.165	2.719	0.584	0.825	1	5.520	0.43	66.55	C

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Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project 60' Lattice Tower - 324 Montevideo Road, Avon, CT	Date 13:55:54 06/13/13
	Client AT&T Mobility	Designed by TJL

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
19.50-13.10			B	0.163	2.724	0.584	0.825	1	5.468			
			C	0.273	2.369	0.608	0.825	1	9.131			
T4 13.10-6.30	0.10	0.42	A	0.153	2.759	0.582	0.825	1	5.922	0.46	68.27	C
			B	0.152	2.764	0.582	0.825	1	5.867			
			C	0.254	2.425	0.603	0.825	1	9.726			
T5 6.30-0.00	0.09	0.57	A	0.197	2.606	0.59	0.825	1	8.755	0.54	86.24	C
			B	0.196	2.611	0.59	0.825	1	8.704			
			C	0.281	2.348	0.61	0.825	1	11.754			
Sum Weight:	0.76	4.48						OTM	122.22 kip-ft	4.19		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.19	1.58	A	0.19	2.629	0.588	0.8	1	19.057	1.38	68.98	C
59.50-39.50			B	0.188	2.635	0.588	0.8	1	18.891			
			C	0.259	2.412	0.604	0.8	1	25.881			
T2	0.29	1.52	A	0.188	2.636	0.588	0.8	1	18.806	1.36	68.15	C
39.50-19.50			B	0.187	2.642	0.588	0.8	1	18.641			
			C	0.299	2.298	0.616	0.8	1	30.127			
T3	0.09	0.39	A	0.165	2.719	0.584	0.8	1	5.475	0.42	66.27	C
19.50-13.10			B	0.163	2.724	0.584	0.8	1	5.423			
			C	0.273	2.369	0.608	0.8	1	9.092			
T4 13.10-6.30	0.10	0.42	A	0.153	2.759	0.582	0.8	1	5.872	0.46	67.97	C
			B	0.152	2.764	0.582	0.8	1	5.818			
			C	0.254	2.425	0.603	0.8	1	9.682			
T5 6.30-0.00	0.09	0.57	A	0.197	2.606	0.59	0.8	1	8.577	0.54	85.12	C
			B	0.196	2.611	0.59	0.8	1	8.526			
			C	0.281	2.348	0.61	0.8	1	11.602			
Sum Weight:	0.76	4.48						OTM	121.59 kip-ft	4.17		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.19	1.58	A	0.19	2.629	0.588	0.85	1	19.374	1.40	69.76	C
59.50-39.50			B	0.188	2.635	0.588	0.85	1	19.208			
			C	0.259	2.412	0.604	0.85	1	26.171			
T2	0.29	1.52	A	0.188	2.636	0.588	0.85	1	19.108	1.37	68.74	C
39.50-19.50			B	0.187	2.642	0.588	0.85	1	18.943			
			C	0.299	2.298	0.616	0.85	1	30.388			
T3	0.09	0.39	A	0.165	2.719	0.584	0.85	1	5.566	0.43	66.84	C
19.50-13.10			B	0.163	2.724	0.584	0.85	1	5.514			
			C	0.273	2.369	0.608	0.85	1	9.170			
T4 13.10-6.30	0.10	0.42	A	0.153	2.759	0.582	0.85	1	5.972	0.47	68.58	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			B	0.152	2.764	0.582	0.85	1	5.917			
			C	0.254	2.425	0.603	0.85	1	9.769			
T5 6.30-0.00	0.09	0.57	A	0.197	2.606	0.59	0.85	1	8.933	0.55	87.36	C
			B	0.196	2.611	0.59	0.85	1	8.882			
			C	0.281	2.348	0.61	0.85	1	11.906			
Sum Weight:	0.76	4.48						OTM	122.85 kip-ft	4.21		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.48	2.19	A	0.276	2.362	0.609	1	1	30.603	1.35	67.59	C
59.50-39.50			B	0.251	2.435	0.602	1	1	26.694			
			C	0.351	2.169	0.633	1	1	37.601			
T2	0.71	2.11	A	0.274	2.367	0.608	1	1	30.282	1.35	67.42	C
39.50-19.50			B	0.249	2.44	0.602	1	1	26.376			
			C	0.41	2.045	0.656	1	1	44.666			
T3	0.23	0.56	A	0.242	2.462	0.6	1	1	8.886	0.42	65.55	C
19.50-13.10			B	0.218	2.537	0.594	1	1	7.655			
			C	0.377	2.111	0.642	1	1	13.458			
T4 13.10-6.30	0.24	0.60	A	0.226	2.513	0.596	1	1	9.501	0.46	67.17	C
			B	0.203	2.585	0.591	1	1	8.202			
			C	0.351	2.168	0.633	1	1	14.267			
T5 6.30-0.00	0.22	0.89	A	0.288	2.329	0.612	1	1	13.975	0.53	84.44	C
			B	0.267	2.387	0.606	1	1	12.761			
			C	0.383	2.098	0.645	1	1	17.176			
Sum Weight:	1.87	6.36						OTM	119.63 kip-ft	4.11		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.48	2.19	A	0.276	2.362	0.609	0.825	1	28.941	1.32	65.85	C
59.50-39.50			B	0.251	2.435	0.602	0.825	1	25.584			
			C	0.351	2.169	0.633	0.825	1	36.634			
T2	0.71	2.11	A	0.274	2.367	0.608	0.825	1	28.673	1.32	66.15	C
39.50-19.50			B	0.249	2.44	0.602	0.825	1	25.319			
			C	0.41	2.045	0.656	0.825	1	43.826			
T3	0.23	0.56	A	0.242	2.462	0.6	0.825	1	8.392	0.41	64.32	C
19.50-13.10			B	0.218	2.537	0.594	0.825	1	7.338			
			C	0.377	2.111	0.642	0.825	1	13.206			
T4 13.10-6.30	0.24	0.60	A	0.226	2.513	0.596	0.825	1	8.965	0.45	65.84	C
			B	0.203	2.585	0.591	0.825	1	7.854			
			C	0.351	2.168	0.633	0.825	1	13.984			
T5 6.30-0.00	0.22	0.89	A	0.288	2.329	0.612	0.825	1	12.554	0.50	79.65	C

tnxTower	Job	Page
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Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	**Project** 60' Lattice Tower - 324 Montevideo Road, Avon, CT	**Date** 13:55:54 06/13/13
	Client AT&T Mobility	**Designed by** TJL

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			B	0.267	2.387	0.606	0.825	1	11.514			
			C	0.383	2.098	0.645	0.825	1	16.202			
Sum Weight:	1.87	6.36						OTM	116.85 kip-ft	4.00		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.48	2.19	A	0.276	2.362	0.609	0.8	1	28.703	1.31	65.60	C
59.50-39.50			B	0.251	2.435	0.602	0.8	1	25.426			
			C	0.351	2.169	0.633	0.8	1	36.495			
T2	0.71	2.11	A	0.274	2.367	0.608	0.8	1	28.443	1.32	65.97	C
39.50-19.50			B	0.249	2.44	0.602	0.8	1	25.168			
			C	0.41	2.045	0.656	0.8	1	43.706			
T3	0.23	0.56	A	0.242	2.462	0.6	0.8	1	8.322	0.41	64.15	C
19.50-13.10			B	0.218	2.537	0.594	0.8	1	7.293			
			C	0.377	2.111	0.642	0.8	1	13.170			
T4 13.10-6.30	0.24	0.60	A	0.226	2.513	0.596	0.8	1	8.889	0.45	65.65	C
			B	0.203	2.585	0.591	0.8	1	7.805			
			C	0.351	2.168	0.633	0.8	1	13.944			
T5 6.30-0.00	0.22	0.89	A	0.288	2.329	0.612	0.8	1	12.351	0.50	78.97	C
			B	0.267	2.387	0.606	0.8	1	11.335			
			C	0.383	2.098	0.645	0.8	1	16.063			
Sum Weight:	1.87	6.36						OTM	116.46 kip-ft	3.99		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.48	2.19	A	0.276	2.362	0.609	0.85	1	29.178	1.32	66.10	C
59.50-39.50			B	0.251	2.435	0.602	0.85	1	25.743			
			C	0.351	2.169	0.633	0.85	1	36.772			
T2	0.71	2.11	A	0.274	2.367	0.608	0.85	1	28.903	1.33	66.33	C
39.50-19.50			B	0.249	2.44	0.602	0.85	1	25.470			
			C	0.41	2.045	0.656	0.85	1	43.946			
T3	0.23	0.56	A	0.242	2.462	0.6	0.85	1	8.463	0.41	64.50	C
19.50-13.10			B	0.218	2.537	0.594	0.85	1	7.383			
			C	0.377	2.111	0.642	0.85	1	13.242			
T4 13.10-6.30	0.24	0.60	A	0.226	2.513	0.596	0.85	1	9.042	0.45	66.03	C
			B	0.203	2.585	0.591	0.85	1	7.904			
			C	0.351	2.168	0.633	0.85	1	14.024			
T5 6.30-0.00	0.22	0.89	A	0.288	2.329	0.612	0.85	1	12.757	0.51	80.34	C
			B	0.267	2.387	0.606	0.85	1	11.692			
			C	0.383	2.098	0.645	0.85	1	16.341			
Sum Weight:	1.87	6.36						OTM	117.25	4.02		

tnxTower	Job	Page
	13140.CO2 - CT1178	14 of 28
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	**Project** 60' Lattice Tower - 324 Montevideo Road, Avon, CT	**Date** 13:55:54 06/13/13
	Client AT&T Mobility	**Designed by** TJL

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
									kip-ft			

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.19	1.58	A	0.19	2.629	0.588	1	1	20.325	0.56	28.16	C
59.50-39.50			B	0.188	2.635	0.588	1	1	20.160			
			C	0.259	2.412	0.604	1	1	27.042			
T2	0.29	1.52	A	0.188	2.636	0.588	1	1	20.015	0.55	27.54	C
39.50-19.50			B	0.187	2.642	0.588	1	1	19.849			
			C	0.299	2.298	0.616	1	1	31.170			
T3	0.09	0.39	A	0.165	2.719	0.584	1	1	5.838	0.17	26.78	C
19.50-13.10			B	0.163	2.724	0.584	1	1	5.786			
			C	0.273	2.369	0.608	1	1	9.405			
T4 13.10-6.30	0.10	0.42	A	0.153	2.759	0.582	1	1	6.270	0.19	27.50	C
			B	0.152	2.764	0.582	1	1	6.215			
			C	0.254	2.425	0.603	1	1	10.030			
T5 6.30-0.00	0.09	0.57	A	0.197	2.606	0.59	1	1	10.002	0.23	36.74	C
			B	0.196	2.611	0.59	1	1	9.951			
			C	0.281	2.348	0.61	1	1	12.820			
Sum Weight:	0.76	4.48						OTM	49.46 kip-ft	1.70		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.19	1.58	A	0.19	2.629	0.588	0.825	1	19.215	0.54	27.10	C
59.50-39.50			B	0.188	2.635	0.588	0.825	1	19.050			
			C	0.259	2.412	0.604	0.825	1	26.026			
T2	0.29	1.52	A	0.188	2.636	0.588	0.825	1	18.957	0.53	26.74	C
39.50-19.50			B	0.187	2.642	0.588	0.825	1	18.792			
			C	0.299	2.298	0.616	0.825	1	30.257			
T3	0.09	0.39	A	0.165	2.719	0.584	0.825	1	5.520	0.17	26.00	C
19.50-13.10			B	0.163	2.724	0.584	0.825	1	5.468			
			C	0.273	2.369	0.608	0.825	1	9.131			
T4 13.10-6.30	0.10	0.42	A	0.153	2.759	0.582	0.825	1	5.922	0.18	26.67	C
			B	0.152	2.764	0.582	0.825	1	5.867			
			C	0.254	2.425	0.603	0.825	1	9.726			
T5 6.30-0.00	0.09	0.57	A	0.197	2.606	0.59	0.825	1	8.755	0.21	33.69	C
			B	0.196	2.611	0.59	0.825	1	8.704			
			C	0.281	2.348	0.61	0.825	1	11.754			
Sum Weight:	0.76	4.48						OTM	47.74 kip-ft	1.64		

tnxTower	Job	Page
	13140.CO2 - CT1178	15 of 28
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project 60' Lattice Tower - 324 Montevideo Road, Avon, CT	Date 13:55:54 06/13/13
	Client AT&T Mobility	Designed by TJL

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.19	1.58	A	0.19	2.629	0.588	0.8	1	19.057	0.54	26.95	C
59.50-39.50			B	0.188	2.635	0.588	0.8	1	18.891			
			C	0.259	2.412	0.604	0.8	1	25.881			
T2	0.29	1.52	A	0.188	2.636	0.588	0.8	1	18.806	0.53	26.62	C
39.50-19.50			B	0.187	2.642	0.588	0.8	1	18.641			
			C	0.299	2.298	0.616	0.8	1	30.127			
T3	0.09	0.39	A	0.165	2.719	0.584	0.8	1	5.475	0.17	25.89	C
19.50-13.10			B	0.163	2.724	0.584	0.8	1	5.423			
			C	0.273	2.369	0.608	0.8	1	9.092			
T4 13.10-6.30	0.10	0.42	A	0.153	2.759	0.582	0.8	1	5.872	0.18	26.55	C
			B	0.152	2.764	0.582	0.8	1	5.818			
			C	0.254	2.425	0.603	0.8	1	9.682			
T5 6.30-0.00	0.09	0.57	A	0.197	2.606	0.59	0.8	1	8.577	0.21	33.25	C
			B	0.196	2.611	0.59	0.8	1	8.526			
			C	0.281	2.348	0.61	0.8	1	11.602			
Sum Weight:	0.76	4.48						OTM	47.50 kip-ft	1.63		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.19	1.58	A	0.19	2.629	0.588	0.85	1	19.374	0.54	27.25	C
59.50-39.50			B	0.188	2.635	0.588	0.85	1	19.208			
			C	0.259	2.412	0.604	0.85	1	26.171			
T2	0.29	1.52	A	0.188	2.636	0.588	0.85	1	19.108	0.54	26.85	C
39.50-19.50			B	0.187	2.642	0.588	0.85	1	18.943			
			C	0.299	2.298	0.616	0.85	1	30.388			
T3	0.09	0.39	A	0.165	2.719	0.584	0.85	1	5.566	0.17	26.11	C
19.50-13.10			B	0.163	2.724	0.584	0.85	1	5.514			
			C	0.273	2.369	0.608	0.85	1	9.170			
T4 13.10-6.30	0.10	0.42	A	0.153	2.759	0.582	0.85	1	5.972	0.18	26.79	C
			B	0.152	2.764	0.582	0.85	1	5.917			
			C	0.254	2.425	0.603	0.85	1	9.769			
T5 6.30-0.00	0.09	0.57	A	0.197	2.606	0.59	0.85	1	8.933	0.21	34.12	C
			B	0.196	2.611	0.59	0.85	1	8.882			
			C	0.281	2.348	0.61	0.85	1	11.906			
Sum Weight:	0.76	4.48						OTM	47.99 kip-ft	1.65		

Force Totals

tnxTower	Job	Page
	13140.CO2 - CT1178	16 of 28
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project 60' Lattice Tower - 324 Montevideo Road, Avon, CT	Date 13:55:54 06/13/13
	Client AT&T Mobility	Designed by TJL

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	1.63					
Bracing Weight	2.85					
Total Member Self-Weight	4.48			0.88	-1.44	
Total Weight	11.04			0.88	-1.44	
Wind 0 deg - No Ice		0.16	-11.18	-567.81	-10.10	1.22
Wind 30 deg - No Ice		5.65	-9.63	-492.68	-291.19	1.45
Wind 45 deg - No Ice		7.89	-7.90	-404.26	-406.28	1.44
Wind 60 deg - No Ice		9.58	-5.63	-288.45	-493.55	1.33
Wind 90 deg - No Ice		11.03	-0.16	-7.78	-565.94	0.90
Wind 120 deg - No Ice		9.60	5.45	277.72	-489.24	0.23
Wind 135 deg - No Ice		7.67	7.67	393.77	-394.03	-0.18
Wind 150 deg - No Ice		5.38	9.48	485.78	-276.18	-0.55
Wind 180 deg - No Ice		-0.16	10.98	564.54	7.23	-1.14
Wind 210 deg - No Ice		-5.65	9.63	494.45	288.32	-1.45
Wind 225 deg - No Ice		-7.89	7.90	406.02	403.41	-1.44
Wind 240 deg - No Ice		-9.75	5.73	292.73	495.04	-1.45
Wind 270 deg - No Ice		-11.03	0.16	9.55	563.07	-0.90
Wind 300 deg - No Ice		-9.43	-5.36	-273.44	482.02	-0.19
Wind 315 deg - No Ice		-7.67	-7.67	-392.00	391.16	0.18
Wind 330 deg - No Ice		-5.38	-9.48	-484.01	273.31	0.55
Member Ice	1.88					
Total Weight Ice	18.57			3.26	-3.69	
Wind 0 deg - Ice		0.12	-9.42	-459.22	-10.33	1.10
Wind 30 deg - Ice		4.76	-8.14	-398.52	-239.32	1.55
Wind 45 deg - Ice		6.66	-6.67	-326.49	-333.20	1.62
Wind 60 deg - Ice		8.10	-4.75	-232.14	-404.48	1.59
Wind 90 deg - Ice		9.32	-0.12	-3.38	-463.45	1.24
Wind 120 deg - Ice		8.09	4.60	228.75	-400.59	0.57
Wind 135 deg - Ice		6.49	6.50	323.63	-323.81	0.12
Wind 150 deg - Ice		4.56	8.02	398.40	-227.81	-0.30
Wind 180 deg - Ice		-0.12	9.29	462.57	2.96	-1.06
Wind 210 deg - Ice		-4.76	8.14	405.04	231.95	-1.55
Wind 225 deg - Ice		-6.66	6.67	333.02	325.83	-1.62
Wind 240 deg - Ice		-8.21	4.81	240.26	399.86	-1.67
Wind 270 deg - Ice		-9.32	0.12	9.91	456.07	-1.24
Wind 300 deg - Ice		-7.98	-4.54	-220.64	390.47	-0.53
Wind 315 deg - Ice		-6.49	-6.50	-317.10	316.43	-0.12
Wind 330 deg - Ice		-4.56	-8.02	-391.87	220.44	0.30
Total Weight	11.04			0.88	-1.44	
Wind 0 deg - Service		0.06	-4.37	-223.20	-3.02	0.48
Wind 30 deg - Service		2.21	-3.76	-193.86	-112.82	0.57
Wind 45 deg - Service		3.08	-3.08	-159.31	-157.78	0.56
Wind 60 deg - Service		3.74	-2.20	-114.08	-191.87	0.52
Wind 90 deg - Service		4.31	-0.06	-4.44	-220.15	0.35
Wind 120 deg - Service		3.75	2.13	107.08	-190.19	0.09
Wind 135 deg - Service		3.00	3.00	152.41	-152.99	-0.07
Wind 150 deg - Service		2.10	3.70	188.36	-106.96	-0.22
Wind 180 deg - Service		-0.06	4.29	219.12	3.75	-0.44
Wind 210 deg - Service		-2.21	3.76	191.74	113.55	-0.57
Wind 225 deg - Service		-3.08	3.08	157.20	158.51	-0.56
Wind 240 deg - Service		-3.81	2.24	112.95	194.30	-0.57
Wind 270 deg - Service		-4.31	0.06	2.33	220.87	-0.35
Wind 300 deg - Service		-3.68	-2.09	-108.21	189.21	-0.08
Wind 315 deg - Service		-3.00	-3.00	-154.53	153.72	0.07
Wind 330 deg - Service		-2.10	-3.70	-190.47	107.68	0.22

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	59.5 - 39.5	Leg	Max Tension	5	23.37	0.29	-0.67
			Max. Compression	13	-28.21	0.79	-0.18
			Max. Mx	6	18.94	-1.02	0.08
			Max. My	3	-23.71	-0.37	0.97
			Max. Vy	14	1.67	-0.15	0.25
			Max. Vx	10	-1.67	0.25	0.44
		Diagonal	Max Tension	11	6.34	0.00	0.00
			Max. Compression	3	-6.41	0.00	0.00
			Max. Mx	20	3.09	0.06	0.00
			Max. My	22	-0.05	0.00	-0.00
			Max. Vy	20	-0.03	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Horizontal	Max Tension	5	0.88	0.00	0.00
			Max. Compression	13	-0.86	0.00	0.00
			Max. Mx	30	0.12	-0.05	0.00
			Max. My	20	0.36	0.00	0.00
			Max. Vy	30	0.02	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Top Girt	Max Tension	5	1.95	0.00	0.00
			Max. Compression	13	-1.89	0.00	0.00
			Max. Mx	18	0.02	-0.07	0.00
			Max. My	19	0.73	0.00	-0.00
			Max. Vy	18	0.04	0.00	0.00
T2	39.5 - 19.5	Leg	Max Tension	5	49.69	0.21	-0.88
			Max. Compression	13	-55.91	0.86	-0.47
			Max. Mx	14	34.62	1.17	0.20
			Max. My	3	-47.46	-0.23	1.12
			Max. Vy	7	0.36	-0.81	-0.47
			Max. Vx	2	-0.33	-0.01	0.95
		Diagonal	Max Tension	11	7.22	0.00	0.00
			Max. Compression	3	-7.29	0.00	0.00
			Max. Mx	20	5.22	0.06	0.00
			Max. My	22	-0.23	0.00	-0.00
			Max. Vy	20	-0.03	0.00	0.00
			Max. Vx	22	-0.00	0.00	0.00
		Horizontal	Max Tension	13	0.97	0.00	0.00
			Max. Compression	13	-0.97	0.00	0.00
			Max. Mx	18	0.11	-0.05	0.00
			Max. My	20	0.70	0.00	0.00
			Max. Vy	18	0.02	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T3	19.5 - 13.1	Leg	Max Tension	5	55.38	0.27	0.57
			Max. Compression	13	-62.03	0.77	0.16
			Max. Mx	6	-52.33	0.87	-0.01
			Max. My	13	-61.98	-0.30	-0.71
			Max. Vy	12	-0.19	0.84	0.10
			Max. Vx	31	-0.16	0.36	0.30
		Diagonal	Max Tension	14	3.64	0.00	0.00
			Max. Compression	6	-3.66	0.00	0.00
			Max. Mx	20	2.98	0.05	0.00
			Max. My	22	-0.42	0.00	-0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Horizontal	Max Tension	5	1.52	0.00	0.00
			Max. Compression	13	-1.83	0.00	0.00
			Max. Mx	18	0.10	-0.05	0.00
			Max. My	30	0.91	0.00	0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
T4	13.1 - 6.3	Leg	Max Tension	5	59.39	0.17	-0.57
			Max. Compression	13	-66.44	0.19	-0.25

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	50.34	-0.29	-0.13
			Max. My	4	-21.20	-0.10	-0.72
			Max. Vy	10	0.09	-0.25	0.20
			Max. Vx	5	0.20	-0.04	-0.71
		Diagonal	Max Tension	6	4.08	0.00	0.00
			Max. Compression	14	-4.12	0.00	0.00
			Max. Mx	29	3.14	0.06	0.00
			Max. My	19	0.22	0.00	-0.00
			Max. Vy	29	-0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Horizontal	Max Tension	13	1.15	0.00	0.00
			Max. Compression	13	-1.15	0.00	0.00
			Max. Mx	18	0.10	-0.07	0.00
			Max. My	20	0.85	0.00	0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
T5	6.3 - 0	Leg	Max Tension	5	60.77	0.25	0.46
			Max. Compression	13	-68.30	1.28	0.09
			Max. Mx	13	-68.25	1.28	0.09
			Max. My	6	-58.33	-0.20	-0.73
			Max. Vy	13	-0.53	1.28	0.09
			Max. Vx	5	-0.30	-0.04	-0.71
		Diagonal	Max Tension	6	2.79	0.12	0.00
			Max. Compression	14	-2.86	0.00	0.00
			Max. Mx	13	-1.95	-0.16	-0.00
			Max. My	30	-1.95	-0.13	0.00
			Max. Vy	13	-0.05	0.00	0.00
			Max. Vx	30	-0.00	0.00	0.00
		Horizontal	Max Tension	14	2.63	-0.02	-0.01
			Max. Compression	6	-2.89	-0.02	-0.01
			Max. Mx	5	0.62	-0.06	-0.00
			Max. My	22	-0.56	0.01	-0.01
			Max. Vy	22	-0.03	-0.04	-0.01
			Max. Vx	22	0.00	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	13	1.18	0.00	0.00
			Max. Compression	13	-1.18	0.00	0.00
			Max. Mx	26	0.88	-0.00	0.00
			Max. My	28	0.89	0.00	0.00
			Max. Vy	26	0.00	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	13	0.99	0.00	0.00
			Max. Compression	13	-0.99	0.00	0.00
			Max. Mx	30	0.85	-0.00	0.00
			Max. My	19	0.32	0.00	0.00
			Max. Vy	30	0.00	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	13	72.15	6.21	-3.41
	Max. H_x	13	72.15	6.21	-3.41
	Max. H_z	4	-62.29	-5.35	3.14

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	5	-64.40	-5.63	3.09
	Min. H_x	5	-64.40	-5.63	3.09
	Min. H_z	13	72.15	6.21	-3.41
Leg B	Max. Vert	7	70.66	-5.97	-3.50
	Max. H_x	15	-62.31	5.39	3.17
	Max. H_z	16	-60.00	5.11	3.24
	Min. Vert	15	-62.31	5.39	3.17
	Min. H_x	7	70.66	-5.97	-3.50
	Min. H_z	8	67.76	-5.60	-3.53
Leg A	Max. Vert	2	71.29	-0.00	7.00
	Max. H_x	14	2.54	0.66	0.13
	Max. H_z	2	71.29	-0.00	7.00
	Min. Vert	10	-63.55	0.01	-6.34
	Min. H_x	6	4.61	-0.65	0.45
	Min. H_z	10	-63.55	0.01	-6.34

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	11.04	-0.00	-0.00	0.88	-1.44	0.00
Dead+Wind 0 deg - No Ice	11.04	0.16	-11.18	-568.40	-10.13	1.22
Dead+Wind 30 deg - No Ice	11.04	5.65	-9.63	-493.29	-291.56	1.45
Dead+Wind 45 deg - No Ice	11.04	7.89	-7.89	-404.77	-406.80	1.44
Dead+Wind 60 deg - No Ice	11.04	9.58	-5.63	-288.84	-494.19	1.33
Dead+Wind 90 deg - No Ice	11.04	11.02	-0.16	-7.81	-566.63	0.91
Dead+Wind 120 deg - No Ice	11.04	9.60	5.45	277.99	-489.75	0.23
Dead+Wind 135 deg - No Ice	11.04	7.67	7.67	394.24	-394.51	-0.18
Dead+Wind 150 deg - No Ice	11.04	5.38	9.48	486.36	-276.51	-0.56
Dead+Wind 180 deg - No Ice	11.04	-0.16	10.98	565.25	7.25	-1.14
Dead+Wind 210 deg - No Ice	11.04	-5.65	9.63	495.06	288.68	-1.46
Dead+Wind 225 deg - No Ice	11.04	-7.89	7.89	406.54	403.92	-1.44
Dead+Wind 240 deg - No Ice	11.04	-9.75	5.73	293.06	495.56	-1.45
Dead+Wind 270 deg - No Ice	11.04	-11.02	0.16	9.59	563.75	-0.90
Dead+Wind 300 deg - No Ice	11.04	-9.43	-5.35	-273.77	482.62	-0.19
Dead+Wind 315 deg - No Ice	11.04	-7.67	-7.67	-392.47	391.63	0.18
Dead+Wind 330 deg - No Ice	11.04	-5.38	-9.48	-484.59	273.63	0.55
Dead+Ice+Temp	18.57	-0.00	-0.00	3.27	-3.70	-0.00
Dead+Wind 0 deg+Ice+Temp	18.57	0.12	-9.42	-460.60	-10.38	1.11
Dead+Wind 30 deg+Ice+Temp	18.57	4.76	-8.14	-399.77	-240.08	1.55
Dead+Wind 45 deg+Ice+Temp	18.57	6.66	-6.67	-327.53	-334.26	1.63
Dead+Wind 60 deg+Ice+Temp	18.57	8.10	-4.75	-232.89	-405.78	1.60
Dead+Wind 90 deg+Ice+Temp	18.57	9.32	-0.12	-3.41	-464.90	1.25
Dead+Wind 120 deg+Ice+Temp	18.57	8.09	4.60	229.42	-401.79	0.57
Dead+Wind 135 deg+Ice+Temp	18.57	6.49	6.50	324.63	-324.82	0.12
Dead+Wind 150 deg+Ice+Temp	18.57	4.55	8.02	399.64	-228.52	-0.31
Dead+Wind 180 deg+Ice+Temp	18.57	-0.12	9.29	464.03	2.98	-1.06
Dead+Wind 210 deg+Ice+Temp	18.57	-4.76	8.14	406.32	232.68	-1.56
Dead+Wind 225 deg+Ice+Temp	18.57	-6.66	6.67	334.08	326.86	-1.63
Dead+Wind 240 deg+Ice+Temp	18.57	-8.21	4.81	241.00	401.06	-1.68
Dead+Wind 270 deg+Ice+Temp	18.57	-9.32	0.12	9.96	457.49	-1.25
Dead+Wind 300 deg+Ice+Temp	18.57	-7.98	-4.54	-221.32	391.69	-0.53
Dead+Wind 315 deg+Ice+Temp	18.57	-6.49	-6.50	-318.08	317.41	-0.12
Dead+Wind 330 deg+Ice+Temp	18.57	-4.55	-8.02	-393.09	221.11	0.31
Dead+Wind 0 deg - Service	11.04	0.06	-4.37	-221.50	-4.84	0.48
Dead+Wind 30 deg - Service	11.04	2.21	-3.76	-192.16	-114.77	0.57

Load Combination	Vertical K	Shear$_x$ K	Shear$_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 45 deg - Service	11.04	3.08	-3.08	-157.58	-159.78	0.56
Dead+Wind 60 deg - Service	11.04	3.74	-2.20	-112.29	-193.92	0.52
Dead+Wind 90 deg - Service	11.04	4.31	-0.06	-2.51	-222.22	0.35
Dead+Wind 120 deg - Service	11.04	3.75	2.13	109.13	-192.19	0.09
Dead+Wind 135 deg - Service	11.04	2.99	3.00	154.54	-154.98	-0.07
Dead+Wind 150 deg - Service	11.04	2.10	3.70	190.52	-108.89	-0.22
Dead+Wind 180 deg - Service	11.04	-0.06	4.29	221.34	1.96	-0.45
Dead+Wind 210 deg - Service	11.04	-2.21	3.76	193.92	111.89	-0.57
Dead+Wind 225 deg - Service	11.04	-3.08	3.08	159.34	156.91	-0.56
Dead+Wind 240 deg - Service	11.04	-3.81	2.24	115.02	192.71	-0.57
Dead+Wind 270 deg - Service	11.04	-4.31	0.06	4.28	219.34	-0.35
Dead+Wind 300 deg - Service	11.04	-3.68	-2.09	-106.40	187.65	-0.07
Dead+Wind 315 deg - Service	11.04	-2.99	-3.00	-152.77	152.10	0.07
Dead+Wind 330 deg - Service	11.04	-2.10	-3.70	-188.76	106.01	0.22

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-11.04	0.00	0.00	11.04	0.00	0.000%
2	0.16	-11.04	-11.18	-0.16	11.04	11.18	0.005%
3	5.65	-11.04	-9.63	-5.65	11.04	9.63	0.005%
4	7.89	-11.04	-7.90	-7.89	11.04	7.89	0.005%
5	9.58	-11.04	-5.63	-9.58	11.04	5.63	0.005%
6	11.03	-11.04	-0.16	-11.02	11.04	0.16	0.005%
7	9.60	-11.04	5.45	-9.60	11.04	-5.45	0.005%
8	7.67	-11.04	7.67	-7.67	11.04	-7.67	0.005%
9	5.38	-11.04	9.48	-5.38	11.04	-9.48	0.005%
10	-0.16	-11.04	10.98	0.16	11.04	-10.98	0.005%
11	-5.65	-11.04	9.63	5.65	11.04	-9.63	0.005%
12	-7.89	-11.04	7.90	7.89	11.04	-7.89	0.005%
13	-9.75	-11.04	5.73	9.75	11.04	-5.73	0.005%
14	-11.03	-11.04	0.16	11.02	11.04	-0.16	0.005%
15	-9.43	-11.04	-5.36	9.43	11.04	5.35	0.005%
16	-7.67	-11.04	-7.67	7.67	11.04	7.67	0.005%
17	-5.38	-11.04	-9.48	5.38	11.04	9.48	0.005%
18	0.00	-18.57	0.00	0.00	18.57	0.00	0.000%
19	0.12	-18.57	-9.42	-0.12	18.57	9.42	0.000%
20	4.76	-18.57	-8.14	-4.76	18.57	8.14	0.000%
21	6.66	-18.57	-6.67	-6.66	18.57	6.67	0.000%
22	8.10	-18.57	-4.75	-8.10	18.57	4.75	0.000%
23	9.32	-18.57	-0.12	-9.32	18.57	0.12	0.000%
24	8.09	-18.57	4.60	-8.09	18.57	-4.60	0.000%
25	6.49	-18.57	6.50	-6.49	18.57	-6.50	0.000%
26	4.56	-18.57	8.02	-4.55	18.57	-8.02	0.000%
27	-0.12	-18.57	9.29	0.12	18.57	-9.29	0.000%
28	-4.76	-18.57	8.14	4.76	18.57	-8.14	0.000%
29	-6.66	-18.57	6.67	6.66	18.57	-6.67	0.000%
30	-8.21	-18.57	4.81	8.21	18.57	-4.81	0.000%
31	-9.32	-18.57	0.12	9.32	18.57	-0.12	0.000%
32	-7.98	-18.57	-4.54	7.98	18.57	4.54	0.000%
33	-6.49	-18.57	-6.50	6.49	18.57	6.50	0.000%
34	-4.56	-18.57	-8.02	4.55	18.57	8.02	0.000%
35	0.06	-11.04	-4.37	-0.06	11.04	4.37	0.003%
36	2.21	-11.04	-3.76	-2.21	11.04	3.76	0.003%
37	3.08	-11.04	-3.08	-3.08	11.04	3.08	0.003%
38	3.74	-11.04	-2.20	-3.74	11.04	2.20	0.003%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
39	4.31	-11.04	-0.06	-4.31	11.04	0.06	0.003%
40	3.75	-11.04	2.13	-3.75	11.04	-2.13	0.003%
41	3.00	-11.04	3.00	-2.99	11.04	-3.00	0.003%
42	2.10	-11.04	3.70	-2.10	11.04	-3.70	0.003%
43	-0.06	-11.04	4.29	0.06	11.04	-4.29	0.003%
44	-2.21	-11.04	3.76	2.21	11.04	-3.76	0.003%
45	-3.08	-11.04	3.08	3.08	11.04	-3.08	0.003%
46	-3.81	-11.04	2.24	3.81	11.04	-2.24	0.003%
47	-4.31	-11.04	0.06	4.31	11.04	-0.06	0.003%
48	-3.68	-11.04	-2.09	3.68	11.04	2.09	0.003%
49	-3.00	-11.04	-3.00	2.99	11.04	3.00	0.003%
50	-2.10	-11.04	-3.70	2.10	11.04	3.70	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00098297
3	Yes	4	0.00000001	0.00097401
4	Yes	4	0.00000001	0.00097151
5	Yes	4	0.00000001	0.00097279
6	Yes	4	0.00000001	0.00098218
7	Yes	4	0.00000001	0.00098388
8	Yes	4	0.00000001	0.00098005
9	Yes	4	0.00000001	0.00097471
10	Yes	4	0.00000001	0.00097286
11	Yes	4	0.00000001	0.00098167
12	Yes	4	0.00000001	0.00098435
13	Yes	4	0.00000001	0.00098274
14	Yes	4	0.00000001	0.00097410
15	Yes	4	0.00000001	0.00097292
16	Yes	4	0.00000001	0.00097743
17	Yes	4	0.00000001	0.00098240
18	Yes	4	0.00000001	0.00005501
19	Yes	5	0.00000001	0.00013316
20	Yes	5	0.00000001	0.00013206
21	Yes	5	0.00000001	0.00013175
22	Yes	5	0.00000001	0.00013195
23	Yes	5	0.00000001	0.00013332
24	Yes	5	0.00000001	0.00013367
25	Yes	5	0.00000001	0.00013312
26	Yes	5	0.00000001	0.00013237
27	Yes	5	0.00000001	0.00013200
28	Yes	5	0.00000001	0.00013315
29	Yes	5	0.00000001	0.00013351
30	Yes	5	0.00000001	0.00013330
31	Yes	5	0.00000001	0.00013193
32	Yes	5	0.00000001	0.00013154
33	Yes	5	0.00000001	0.00013212
34	Yes	5	0.00000001	0.00013285
35	Yes	4	0.00000001	0.00095943
36	Yes	4	0.00000001	0.00095686
37	Yes	4	0.00000001	0.00095616
38	Yes	4	0.00000001	0.00095676
39	Yes	4	0.00000001	0.00096010

40	Yes	4	0.00000001	0.00096012
41	Yes	4	0.00000001	0.00095852
42	Yes	4	0.00000001	0.00095628
43	Yes	4	0.00000001	0.00095540
44	Yes	4	0.00000001	0.00095855
45	Yes	4	0.00000001	0.00095944
46	Yes	4	0.00000001	0.00095854
47	Yes	4	0.00000001	0.00095492
48	Yes	4	0.00000001	0.00095435
49	Yes	4	0.00000001	0.00095619
50	Yes	4	0.00000001	0.00095840

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	59.5 - 39.5	1.283	37	0.1480	0.0022
T2	39.5 - 19.5	0.635	37	0.1256	0.0023
T3	19.5 - 13.1	0.156	46	0.0697	0.0018
T4	13.1 - 6.3	0.067	46	0.0466	0.0067
T5	6.3 - 0	0.006	46	0.0224	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
68.50	18-ft Doppler	37	1.283	0.1480	0.0022	122698
67.00	(3) SBNH-1D6565C	37	1.283	0.1480	0.0022	122698
60.00	Doppler Platform	37	1.283	0.1480	0.0022	122698
57.00	Doppler Platform Support	37	1.198	0.1461	0.0026	122698
55.00	13-ft Face Mount Frame	37	1.131	0.1446	0.0029	122698

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	59.5 - 39.5	3.282	13	0.3781	0.0051
T2	39.5 - 19.5	1.627	13	0.3211	0.0068
T3	19.5 - 13.1	0.399	13	0.1785	0.0059
T4	13.1 - 6.3	0.172	13	0.1196	0.0167
T5	6.3 - 0	0.014	13	0.0575	0.0017

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
68.50	18-ft Doppler	13	3.282	0.3781	0.0051	48163
67.00	(3) SBNH-1D6565C	13	3.282	0.3781	0.0051	48163
60.00	Doppler Platform	13	3.282	0.3781	0.0051	48163
57.00	Doppler Platform Support	13	3.067	0.3733	0.0063	48163
55.00	13-ft Face Mount Frame	13	2.896	0.3694	0.0071	48163

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	59.5	Leg	A325N	0.8750	4	5.84	26.46	0.221 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3.21	4.12	0.777 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.5000	1	0.88	4.12	0.215 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.6250	2	0.97	6.44	0.151 ✓	1.333	Bolt Shear
T2	39.5	Leg	A325N	0.8750	4	12.42	26.46	0.470 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	2	3.64	4.12	0.884 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.5000	1	0.97	4.12	0.235 ✓	1.333	Bolt Shear
T3	19.5	Diagonal	A325N	0.7500	1	3.66	9.28	0.394 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.7500	1	1.83	9.28	0.197 ✓	1.333	Bolt Shear
T4	13.1	Diagonal	A325N	0.7500	1	4.12	9.28	0.444 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.5000	1	1.15	4.12	0.279 ✓	1.333	Bolt Shear
T5	6.3	Diagonal	A325N	0.7500	1	2.79	6.80	0.410 ✓	1.333	Member Bearing
		Horizontal	A325N	0.5000	1	2.89	8.25	0.350 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	59.5 - 39.5	P3.5x.226	20.00	5.00	44.9 K=1.00	18.319	2.6795	-28.21	49.09	0.575 ✓
T2	39.5 - 19.5	P3.5x.226	20.00	5.00	44.9 K=1.00	18.319	2.6795	-55.91	49.09	1.139 ✓
T3	19.5 - 13.1	P3.5x.226	6.41	6.41	28.8 K=0.50	19.497	2.6795	-62.03	52.24	1.187 ✓
T4	13.1 - 6.3	P3.5x.226	6.81	6.81	30.6 K=0.50	19.377	2.6795	-66.44	51.92	1.280 ✓

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T5	6.3 - 0	P3.5x.226	6.31	3.16	28.3 K=1.00	19.526	2.6795	-68.30	52.32	1.305 ✓

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	59.5 - 39.5	P2.5x.203	8.67	8.67	109.8 K=1.00	11.571	1.7040	-6.41	19.72	0.325 ✓
T2	39.5 - 19.5	P2.5x.203	8.67	8.67	109.8 K=1.00	11.571	1.7040	-7.29	19.72	0.370 ✓
T3	19.5 - 13.1	P2x.154	9.81	9.81	149.6 K=1.00	6.676	1.0745	-3.66	7.17	0.510 ✓
T4	13.1 - 6.3	P2x.154	10.60	10.60	161.6 K=1.00	5.722	1.0745	-4.12	6.15	0.670 ✓
T5	6.3 - 0	L3x3x3/16	7.96	7.39	107.2 K=1.14	11.867	1.0900	-2.86	12.94	0.221 ✓

Horizontal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	59.5 - 39.5	L2 1/2x2 1/2x1/4	7.58	7.02	171.6 K=1.00	5.072	1.1900	-0.86	6.04	0.142 ✓
T2	39.5 - 19.5	L2 1/2x2 1/2x1/4	7.58	7.02	171.6 K=1.00	5.072	1.1900	-0.97	6.04	0.160 ✓
T3	19.5 - 13.1	L3x3x1/4	7.58	6.96	141.0 K=1.00	7.506	1.4400	-1.83	10.81	0.169 ✓
T4	13.1 - 6.3	L3x3x1/4	8.28	7.72	156.5 K=1.00	6.100	1.4400	-1.15	8.78	0.131 ✓
T5	6.3 - 0	2L2x2x3/16	8.97	8.41	120.1 K=1.00	10.270	1.4300	-2.89	14.69	0.197 ✓

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	59.5 - 39.5	L3x5x1/4	7.58	6.82	122.1 K=0.99	9.242	1.9400	-1.89	17.93	0.105 ✓

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T5	6.3 - 0	L2x2x3/16	2.24	2.08	91.6 K=1.45	14.013	0.7150	-1.18	10.02	0.118 ✓

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T5	6.3 - 0	L2x2x3/16	3.76	3.46	112.7 K=1.07	11.308	0.7150	-0.99	8.09	0.123 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	59.5 - 39.5	P3.5x.226	20.00	5.00	44.9	21.000	2.6795	23.37	56.27	0.415 ✓
T2	39.5 - 19.5	P3.5x.226	20.00	5.00	44.9	21.000	2.6795	49.69	56.27	0.883 ✓
T3	19.5 - 13.1	P3.5x.226	6.41	6.41	57.6	21.000	2.6795	55.38	56.27	0.984 ✓
T4	13.1 - 6.3	P3.5x.226	6.81	6.81	61.1	21.000	2.6795	59.39	56.27	1.055 ✓
T5	6.3 - 0	P3.5x.226	6.31	3.16	28.3	21.000	2.6795	60.77	56.27	1.080 ✓

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	59.5 - 39.5	P2.5x.203	8.67	8.67	109.8	21.000	1.7040	6.34	35.79	0.177 ✓
T2	39.5 - 19.5	P2.5x.203	8.67	8.67	109.8	21.000	1.7040	7.22	35.79	0.202 ✓
T3	19.5 - 13.1	P2x.154	9.81	9.81	149.6	21.000	1.0745	3.64	22.57	0.161

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	13.1 - 6.3	P2x.154	10.60	10.60	161.6	21.000	1.0745	4.08	22.57	0.181 ✓
T5	6.3 - 0	L3x3x3/16	7.96	7.39	98.2	29.000	0.6945	2.79	20.14	0.138 ✓

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	59.5 - 39.5	L2 1/2x2 1/2x1/4	7.58	7.02	113.1	29.000	0.7753	0.88	22.48	0.039 ✓
T2	39.5 - 19.5	L2 1/2x2 1/2x1/4	7.58	7.02	113.1	29.000	0.7753	0.97	22.48	0.043 ✓
T3	19.5 - 13.1	L3x3x1/4	7.58	6.96	93.5	29.000	0.9159	1.52	26.56	0.057 ✓
T4	13.1 - 6.3	L3x3x1/4	8.28	7.72	102.6	29.000	0.9628	1.15	27.92	0.041 ✓
T5	6.3 - 0	2L2x2x3/16	8.97	8.41	123.4	29.000	0.8967	2.63	26.00	0.101 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	59.5 - 39.5	L3x5x1/4	7.58	6.82	101.0	29.000	1.3144	1.95	38.12	0.051 ✓

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T5	6.3 - 0	L2x2x3/16	2.24	2.08	40.4	21.600	0.7150	1.18	15.44	0.077 ✓

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T5	6.3 - 0	L2x2x3/16	3.76	3.46	67.3	21.600	0.7150	0.99	15.44	0.064 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	59.5 - 39.5	Leg	P3.5x.226	1	-28.21	65.43	43.1	Pass
T2	39.5 - 19.5	Leg	P3.5x.226	28	-55.91	65.43	85.4	Pass
T3	19.5 - 13.1	Leg	P3.5x.226	55	-62.03	69.64	89.1	Pass
T4	13.1 - 6.3	Leg	P3.5x.226	64	-66.44	69.21	96.0	Pass
T5	6.3 - 0	Leg	P3.5x.226	73	-68.30	69.75	97.9	Pass
T1	59.5 - 39.5	Diagonal	P2.5x.203	9	-6.41	26.28	24.4 58.3 (b)	Pass
T2	39.5 - 19.5	Diagonal	P2.5x.203	36	-7.29	26.28	27.7 66.3 (b)	Pass
T3	19.5 - 13.1	Diagonal	P2x.154	61	-3.66	9.56	38.2	Pass
T4	13.1 - 6.3	Diagonal	P2x.154	70	-4.12	8.20	50.3	Pass
T5	6.3 - 0	Diagonal	L3x3x3/16	77	-2.86	17.24	16.6 30.7 (b)	Pass
T1	59.5 - 39.5	Horizontal	L2 1/2x2 1/2x1/4	24	-0.86	8.05	10.7 16.1 (b)	Pass
T2	39.5 - 19.5	Horizontal	L2 1/2x2 1/2x1/4	37	-0.97	8.05	12.0 17.6 (b)	Pass
T3	19.5 - 13.1	Horizontal	L3x3x1/4	60	-1.83	14.41	12.7 14.8 (b)	Pass
T4	13.1 - 6.3	Horizontal	L3x3x1/4	67	-1.15	11.71	9.8 21.0 (b)	Pass
T5	6.3 - 0	Horizontal	2L2x2x3/16	76	-2.89	19.58	14.7 26.3 (b)	Pass
T1	59.5 - 39.5	Top Girt	L3x5x1/4	4	-1.89	23.90	7.9 11.3 (b)	Pass
T5	6.3 - 0	Redund Horz 1 Bracing	L2x2x3/16	95	-1.18	13.36	8.9	Pass
T5	6.3 - 0	Redund Diag 1 Bracing	L2x2x3/16	79	-0.99	10.78	9.2	Pass

	Summary	
Leg (T5)	97.9	Pass
Diagonal (T2)	66.3	Pass
Horizontal (T5)	26.3	Pass
Top Girt (T1)	11.3	Pass
Redund Horz 1 Bracing (T5)	8.9	Pass
Redund Diag 1 Bracing (T5)	9.2	Pass
Bolt Checks	66.3	Pass
RATING =	**97.9**	**Pass**

Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 576 \cdot kips$	(User Input from RISATower)	
Shear Force =	$S_t := 11 \cdot kip$	(User Input from RISATower)	
Axial Force =	$WT_t := 11 \cdot kip$	(User Input from RISATower)	
Max Compression Force =	$C_t := 72 \cdot kip$	(User Input from RISATower)	
Uplift Force =	$U_t := 64 \cdot kip$	(User Input from RISATower)	
Tower Height =	$H_t := 59.5 \cdot ft$	(User Input)	
Tower Width =	$W_t := 8.97 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Mat Data:

Overall Depth of Mat =	$D_f := 3.5 \cdot ft$	(User Input)	
Thickness of Mat =	$T_f := 3.5 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 0ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.0 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 0.0 \cdot ft$	(User Input)	
Foundation Reinforcement Area =	$A_{matreinf} := 310.10ft^2$	(User Input)	
Distance From Center of Compression Leg to Extreme Edge of Proposed Mat =	$C_x := 5.75ft$	(User Input)	
Distance From Tower/Mat Centroid to Front Edge of Proposed Mat =	$WT_x := 11.25ft$	(User Input)	
Distance From Tower/Mat Centroid to Rear Edge of Proposed Mat =	$WTx_2 := 8.38ft$	(User Input)	
Distance From Center of Uplift Legs to Extreme Edge of Proposed Mat =	$U_x := 14.00ft$	(User Input)	
Section Moment of Area/Inertia of Mat =	$I_{mat} := 8120.4ft^4$	(User Input)	
Section Modulus of Mat =	$S_{mat} := \left(\frac{I_{mat}}{WT_x}\right) = 743.03 \cdot ft^3$	(User Input)	
Overall Width of Mat From Toe to Rear Edge=	$W_f := 19.63 \cdot ft$	(User Input)	
Overall Width of Mat at Toe =	$W_{ftoe} := 6.25ft$	(User Input)	
Overturing Moment Factor of Safety Required =	$FS_{reqd} := 2.0$	(User Input)	

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Subject:		FOUNDATION REINFORCEMENT DESIGN
Location:		Avon, CT
Rev. 0: 6/10/13		Prepared by: T.J.L. Checked by: C.F.C. Job No. 13075.CO21

Material Properties:

Concrete Compressive Strength =	$f_c := 4000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\theta_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 12000 \cdot psf$	(User Input)	(Note: Allowable soil bearing pressure may be increased by 1/3rd for transient load efffects.
Unit Weight of Soil =	$\gamma_{soil} := 0 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	Bouyancy := 0	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 3.5 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	Z := 2	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Proposed Mat Reinforcement:

Bar Size =	$BS_{top} := 7$	(User Input)	(Top of Mat)
Bar Diameter =	$d_{btop} := 0.875 \cdot in$	(User Input)	(Top of Mat)
Bar Size =	$BS_{bot} := 7$	(User Input)	(Bottom of Mat)
Bar Diameter =	$d_{bbot} := 0.875 \cdot in$	(User Input)	(Bottom of Mat)
Clear Cover of Reinforcement =	$Cvr_{Mat} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{Mat} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{Mat} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{Mat} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{Mat} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Mat Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.6 \cdot in^2$

Mat Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.6 \cdot in^2$

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\theta_s)}{1 - \sin(\theta_s)} = 3$

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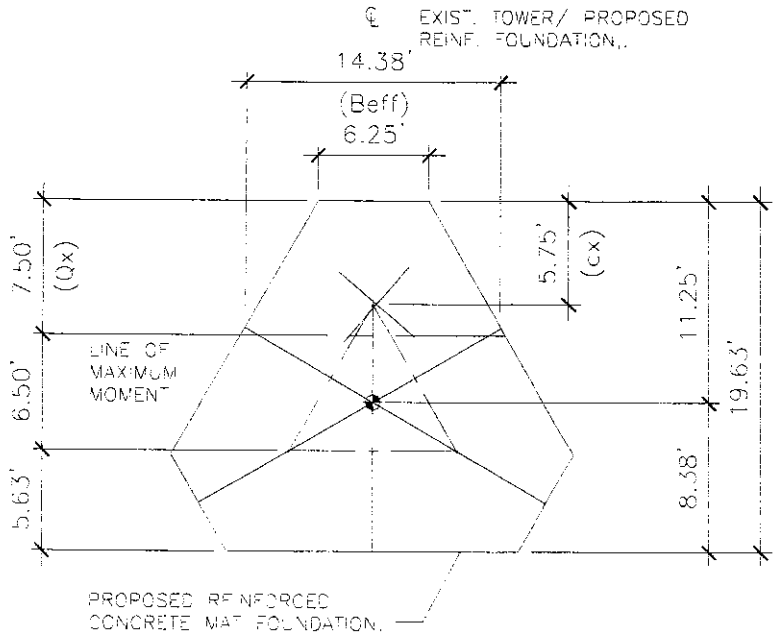
Load Factor = $LF := \begin{cases} 1.333 \text{ if } H_t \le 700\cdot ft \\ 1.7 \text{ if } H_t \ge 1200\cdot ft \\ 1.333 + \left(\frac{H_t - 700ft}{1200ft - 700ft}\right)\cdot 0.4 \text{ otherwise} \end{cases}$ = 1.33



PLAN

```
Area:                          310.100242
Perimeter:                      67.852540
Bounding box:          X: -11.308757  --  11.308757
                       Y: -8.333333  --  11.254008
Centroid:              X: 0.000000
                       Y: 0.000000
Moments of inertia:    X: 8120.374659
                       Y: 8120.374659
Product of inertia:    XY: 0.000000
Radii of gyration:     X: 5.117254
                       Y: 5.117254
Principal moments and X-Y directions about centroid:
                       I: 8120.374659 along [0.006003 0.999982]
                       J: 8120.374659 along [-0.999982 0.006003]
```

Proposed Reinforced Foundation Geometry:

Stability of Mat:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 0 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 0 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 0$ $A_p := W_{ftoe} \cdot T_p = 0$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 0 \cdot kip$

Volume of Existing Concrete Piers Within Mat = $V_{pier} := 3 \cdot \left(T_f \cdot \frac{d_p^2 \cdot \pi}{4} \right) = 0 \cdot ft^3$

Volume of Proposed Mat = $V_{matreinf} := A_{matreinf} \cdot T_f = 1085.35 \cdot ft^3$

Weight of Concrete Mat = $WT_c := V_{matreinf} \gamma_{conc} = 162.8 \cdot kips$

Total Weight of Concrete Mat and Tower = $WT_{tot} := WT_c = 162.8 \cdot kips$

Overturning Moment = $M_{ot} := OM + S_t \cdot (T_f) = 614.5 \cdot kip \cdot ft$

Required Moment = $M_{design} := M_{ot} \cdot FS_{reqd} = 1229 \cdot kip \cdot ft$

Resisting Moment without Anchors = $M_r := (WT_{tot}) \cdot WT_x = 1779 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 2.9$

$OverTurning\_Moment\_Check := if(FS \geq FS_{reqd}, "Okay", "Provide Anchorage")$

$OverTurning\_Moment\_Check = "Okay"$

Reinforced Concrete Mat Shear and Moment Calculations:

Mat Dead Load = $WT_{tot} = 162.8 \cdot kips$

Equivalent Soil Reaction Occuring at Base of Foundation = $Q := C_t + WT_{tot} - U_t = 170.8 \cdot kips$

Summing Moments About Toe of Mat Foundation to Find Distance of Soil Reaction (Qx) =

$$M := \left[\left(C_t \cdot C_x\right) + \left(WT_{tot} \cdot WT_x\right) - \left(U_t \cdot U_x\right)\right] - S_t \cdot \left(T_f + L_{pag}\right) = 1289.57 \cdot kip \cdot ft$$

$$Q_x := \frac{M}{Q} = 7.55 \cdot ft$$

Qx > Cx Therefore Shear and Moment Calculations Are As Follows:

$C_x = 5.75 \cdot ft$

$V1_A := -C_t = -72 \cdot kips$

$V2_A := V1_A + Q = 98.8 \cdot kips$

$V3_A := V2_A - WT_{tot} = -64 \cdot kips$

$V4_A := V3_A + U_t = 0 \cdot kips$

$$M1_A := -\left[\frac{S_t}{2} \cdot \left(T_f + L_{pag}\right)\right] = -19.25 \cdot kip \cdot ft$$

$$M2_A := M1_A + V1_A \cdot \left(Q_x - C_x\right) = -148.86 \cdot kip \cdot ft$$

$$M3_A := M2_A + V2_A \cdot \left(WT_x - Q_x\right) = 184.97 \cdot kip \cdot ft$$

$$M4_A := M3_A + V3_A \cdot \left(U_x - WT_x\right) = 19.25 \cdot kip \cdot ft$$

$$M5_A := M4_A - \left[\frac{S_t}{2} \cdot \left(T_f + L_{pag}\right)\right] = 0 \cdot kip \cdot ft$$

$M_1 := |M1_A| = 19.25 \cdot kip \cdot ft$

$M_2 := |M2_A| = 148.86 \cdot kip \cdot ft$

$M_3 := |M3_A| = 184.97 \cdot kip \cdot ft$

$M_4 := |M4_A| = 19.25 \cdot kip \cdot ft$

$M_5 := |M5_A| = 0 \cdot kip \cdot ft$

$$M_{max} := \max\begin{pmatrix} M_1 \\ M_2 \\ M_3 \\ M_4 \\ M_5 \\ 0 \\ 0 \\ 0 \end{pmatrix} = 184.97 \cdot kip \cdot ft$$

Mat Steel Reinforcement Design:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

Design Moment = $M_n := \left(\frac{LF}{\phi_m}\right) \cdot M_{max} = 273.97 \cdot kip \cdot ft$

$$\beta := \begin{cases} 0.85 & \text{if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 & \text{if } f_c > 8000 \cdot psi \\ \left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000\right)}{1000}\right] \cdot 0.5\right] & \text{otherwise} \end{cases} = 0.85$$

(ACI-200810.2.7.3)

$b_{eff} := 171in$ (User Input) Effective width taken at point of maximum moment through triangular mat foundation.

$d := T_f - Cvr_{Mat} - d_{bbot} = 38.13 \cdot in$

$A_{st} := \frac{M_n}{(0.9 f_y \cdot d)} = 1.6 \cdot in^2$

$a := \frac{A_{st} \cdot f_y}{\beta \cdot f_c \cdot b_{eff}} = 0.16 \cdot in$

$A_{st} := \frac{M_n}{f_y \left(d - \frac{a}{2}\right)} = 1.44 \cdot in^2$

$\rho := \frac{A_{st}}{b_{eff} d} = 0.00022$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \ge 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases} = 0.0018$$

(ACI -2008 7.12.2.1)

Determine Bottom Bars:

$$As := \begin{cases} A_{st} & \text{if } \rho > \frac{\rho_{sh}}{2} \\ \rho_{sh} \cdot b_{eff} \cdot \frac{d}{2} & \text{otherwise} \end{cases} = 5.87 \cdot in^2$$

Quantity of Rebar Required = $Nbar_{reqd} := \frac{As}{A_{bbot}} = 9.8$ $Nbar_{prov} := 14$

Rebar Spacing = $B_s := \left(\frac{b_{eff} - 2 \cdot Cvr_{Mat} - d_{bbot}}{Nbar_{prov}}\right) - d_{bbot} = 10.8 \cdot in$

(USE #7 @12" o.c. min.
Area of steel =
0.60in^2*14 = 8.40in^2

Soil Bearing Pressure:

Distance to Kern = $X_k := \frac{W_f}{3} = 6.54$

If Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Distance of Equivalent Soil Reaction From Toe = $a := Q_x = 7.55\,ft$

Eccentricity_Check := if(a > X_k, "InsideMiddleThird", "OutsideMiddleThird")

Eccentricity_Check = "InsideMiddleThird"

Total Load = $P_{total} := Q = 171\,kip$

For Equilibrium Total Soil Reacton Shall Equal Total Downward Dead Load

Maximum Pressure in Mat = $P_{max} := \frac{P_{total}}{A_{matreinf}} + \frac{P_{total}\cdot(WT_x - Q_x)\cdot WT_x}{I_{mat}} = 1.33\,ksf$

Max_Pressure_Check := if($P_{max} < q_s$, "Okay", "No Good")

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{P_{total}}{A_{matreinf}} - \frac{P_{total}\cdot(WT_x - Q_x)\cdot WT_x}{I_{mat}} = -0.23\,ksf$

Min_Pressure_Check := if[($P_{min} \geq 0$)·($P_{min} < q_s$), "Okay", "No Good"]

Min_Pressure_Check = "No Good"

If Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced as Follows:-

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max}-P_{min}}{W_f}}\cdot\frac{1}{3} = 5.59$

Area Under Mat Subjected to Triangular Pressure Distribution = $A_{pressure} := a\cdot\left(\frac{a}{\tan(60\cdot deg)}\right) + W_{ftoe}\cdot(a) = 80.1\,ft^2$

Total Pressure Within Triangular Pressure Diagram = $P_a := \frac{2\cdot P_{total}}{3\cdot A_{pressure}} = 1.42\,ksf$

Adjusted Soil Pressure = $q_{adj} := if(a \leq X_k, P_a, P_{max}) = 1.33\,ksf$

Pressure_Check := if($q_{adj} < q_s$, "Okay", "No Good")

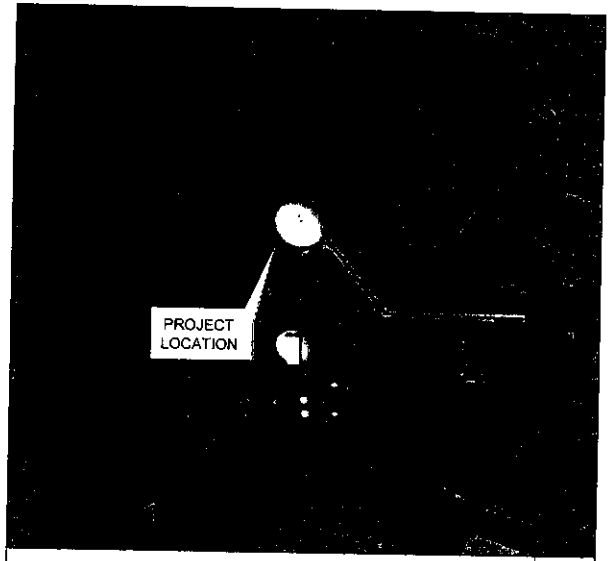
Pressure_Check = "Okay"

TOWER MODIFICATION DESIGN

CT1178

324 MONTEVIDEO ROAD

AVON, CT 06001



VICINITY MAP

NORTH

PROJECT SUMMARY

SITE ADDRESS:	324 MONTEVIDEO ROAD AVON, CT 06001
PROJECT COORDINATES:	LAT: 41°-48'-42.26"N LON: 72°-47'-55.37"W ELEV: ±907' AMSL
TOWER OWNER:	TALCOTT MOUNTAIN SCIENCE CENTER 324 MONTEVIDEO ROAD AVON, CT 06001
AT&T CONTACT:	CHRIS POLICINSKI 781.708.3736
AT&T SITE NUMBER:	CT1178
AT&T SITE NAME:	NA
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CARLO F. CENTORE, PE 203.488.0580 ext. 122

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
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N-2	STRUCTURAL STEEL NOTES	0
MI-1	MODIFICATION INSPECTION REQUIREMENTS	0
S-1	TOWER ELEVATION & FEEDLINE PLAN	0
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DESIGNED BY: GAL
DRAWN BY: TJL
CHK'D BY: CFC

REV.	DATE	DESCRIPTION
0	6/13/13	CFC ISSUED FOR CONSTRUCTION

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AT&T MOBILITY

CT1178

DATE: 6/11/13
SCALE: AS SHOWN
JOB NO: 13140.002

TITLE SHEET

SHEET NO.
T-1

DESIGN BASIS

1. GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

2. TIA/EIA-222-F-1996 "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES".

3. DESIGN CRITERIA

   WIND LOAD: (TIA/EIA-222-F-1996)
   BASIC WIND SPEED (V) = 80 MPH (FASTEST MILE)

   WIND LOAD: (2005 CT STATE BUILDING CODE APPENDIX K)
   BASIC WIND SPEED (V) = 95 MPH (3-SECOND GUST)
   EQUIVALENT TO (V) = 77.5 MPH (FASTEST MILE)

   TIA/EIA-222-F-1996 WIND SPEED CONTROLS

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS AND REINFORCEMENT DESIGN PREPARED BY CENTEK ENGINEERING, INC., FOR AT&T MOBILITY, DATED 6/13/13.

2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM A PREVIOUS STRUCTURAL REPORT PREPARED BY CENTEK ENGINEERING PROJECT #12001.C076, DATED OCTOBER 31, 2012.

3. PROVIDE TEMPORARY ANCHORS, GUYING AND/OR BRACING AS REQUIRED TO SAFELY CONDUCT THE WORK.

4. ALL WORK SHALL BE IN ACCORDANCE WITH TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES".

5. THE TOWER STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER REINFORCEMENTS ARE COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO INSURE THE SAFETY OF THE TOWER STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIE-DOWNS, WHICH MIGHT BE NECESSARY.

6. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

7. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.

8. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.

9. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.

10. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.

11. TOWER REINFORCING SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF RADIO ANTENNAS AND SUPPORT STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.

12. EXISTING COAXIAL CABLES AND ALL ACCESSORIES SHALL BE RELOCATED AS NECESSARY AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH TOWER REINFORCEMENT.

13. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

REV	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	6/13/13	TJL/DLT	CFC	ISSUED FOR CONSTRUCTION

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DATE:	6/11/13
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JOB NO.	13140.002

DESIGN BASIS & GENERAL NOTES

SHEET NO.
N-1

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD).

2. MATERIAL SPECIFICATIONS

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI).
   C. STRUCTURAL STEEL (TOWER REINF. PLATES---ASTM A572_GR50 (50 KSI)
   D. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   E. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   F. PIPE---ASTM A53 GRADE B (FY = 35 KSI)

3. FASTENER SPECIFICATIONS

   A. CONNECTION BOLTS---ASTM A325-N, UNLESS OTHERWISE SCHEDULED.
   B. U-BOLTS---ASTM A307
   C. ANCHOR RODS---ASTM F1554
   D. WELDING ELECTRODES---ASTM E70XX FOR A36 & A572_GR50 STEELS, ASTM E80XX FOR A572_GR65 STEEL.
   E. BLIND BOLTS---AS1252 PROPERTY CLASS 8.8 (FU=120 KSI).

4. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.

5. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.

6. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

7. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

8. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.

9. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

10. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.

11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".

12. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING THE SCHEDULED ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

13. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

14. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

15. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.

16. LOCK WASHER ARE NOT PERMITTED FOR A325 BOLTED STEEL ASSEMBLIES.

17. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.

18. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

19. FABRICATE BEAMS WITH MILL CAMBER UP.

20. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.

21. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

DESIGNED BY: TJL
DRAWN BY: TJL
CHK'D BY: CPC

REV	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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DATE: 6/11/13
SCALE: AS SHOWN
JOB NO. 13140.C02

STRUCTURAL STEEL NOTES

SHEET NO.
N-2

MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	–	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED SHOP DRAWINGS	–	EARTHWORK: BACKFILL MATERIAL & COMPACTION	–	POST-INSTALLED ANCHOR ROD PULL-OUT TEST
–	EOR APPROVED POST-INSTALLED ANCHOR MPII	–	CONCRETE TESTING	X	PHOTOGRAPHS
–	FABRICATION INSPECTION	X	STEEL INSPECTION		
–	FABRICATOR CERTIFIED WELDER INSPECTION	–	POST INSTALLED ANCHOR ROD VERIFICATION		
X	MATERIAL CERTIFICATIONS	–	BASE PLATE GROUT VERIFICATION		
		–	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON-SITE COLD GALVANIZING VERIFICATION		
		–	GUY WIRE TENSION REPORT		
		X	CONTRACTOR AS-BUILT REDLINE DRAWINGS		

NOTES:
1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
2. "X" DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT
3. "–" DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
4. EOR – ENGINEER OF RECORD
4. MPII – "MANUFACTURER'S PRINTED INSTALLATION GUIDELINES"

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).
2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.
3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.
4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.
5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.
2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON-SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.
2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:

   – CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
   – WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS-BUILT CONDITION.

REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:

   – PRE-CONSTRUCTION: GENERAL CONDITION OF THE SITE
   – DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
   – POST-CONSTRUCTION: FINAL CONDITION OF THE SITE

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DRAWN BY: TJL
CHK'D BY: CFC

NO.	DATE	ISSUES OR REVISIONS	BY	DESCRIPTION
0	6/13/13	100% DD	CFC	ISSUED FOR CONSTRUCTION

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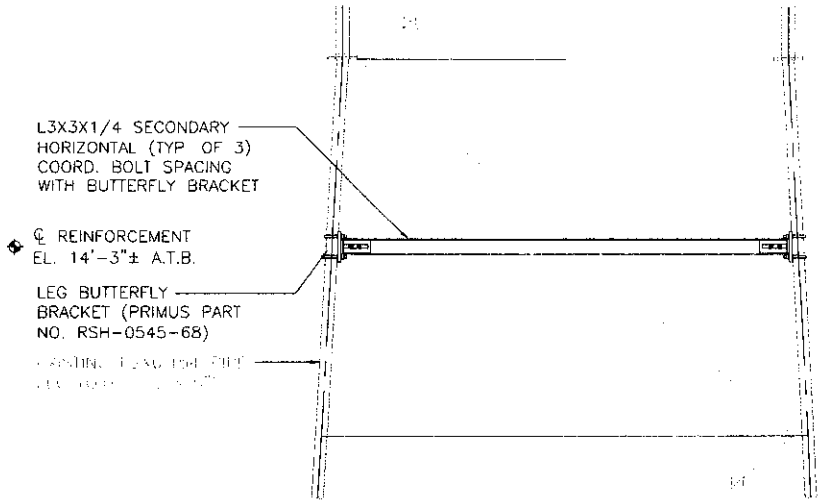
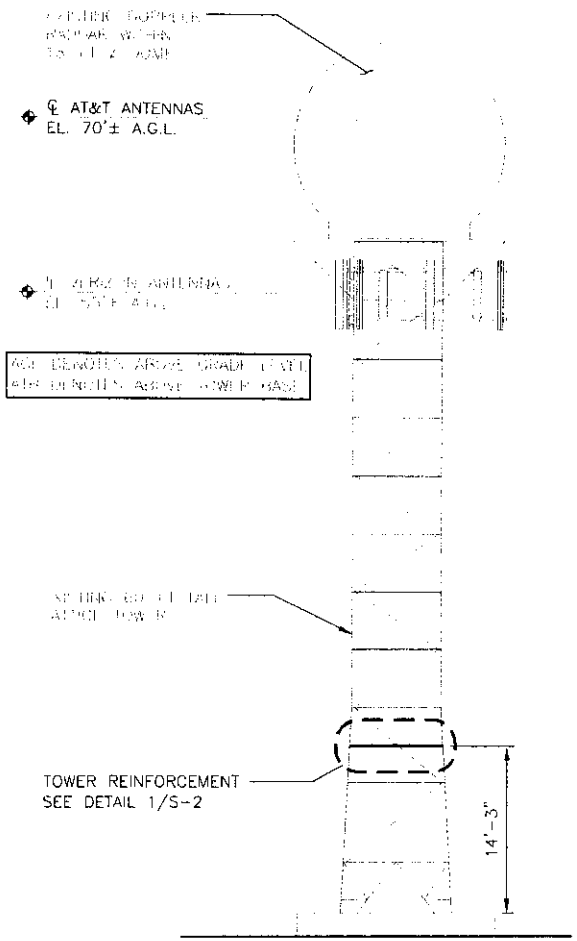
DATE: 6/11/13
SCALE: AS SHOWN
JOB NO. 13140.002

MODIFICATION INSPECTION REQUIREMENTS

SHEET NO.
MI-1



2 / S-1 **TOWER REINFORCEMENT ELEVATION**
SCALE: 1" = 10'-0"



1 / S-1 **TOWER ELEVATION - PROPOSED**
SCALE: 1" = 10'-0"

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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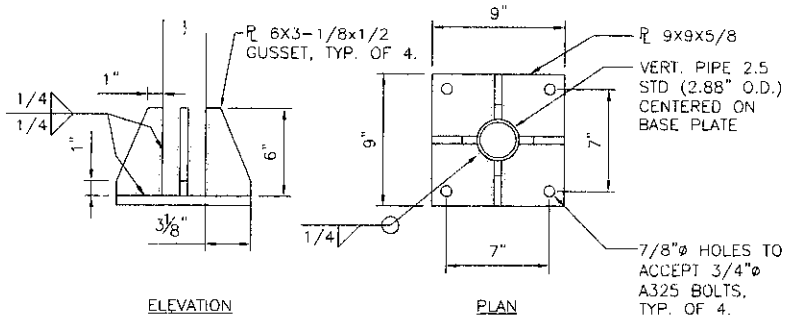
DATE	8/11/13
SCALE	AS SHOWN
JOB NO.	13140.002

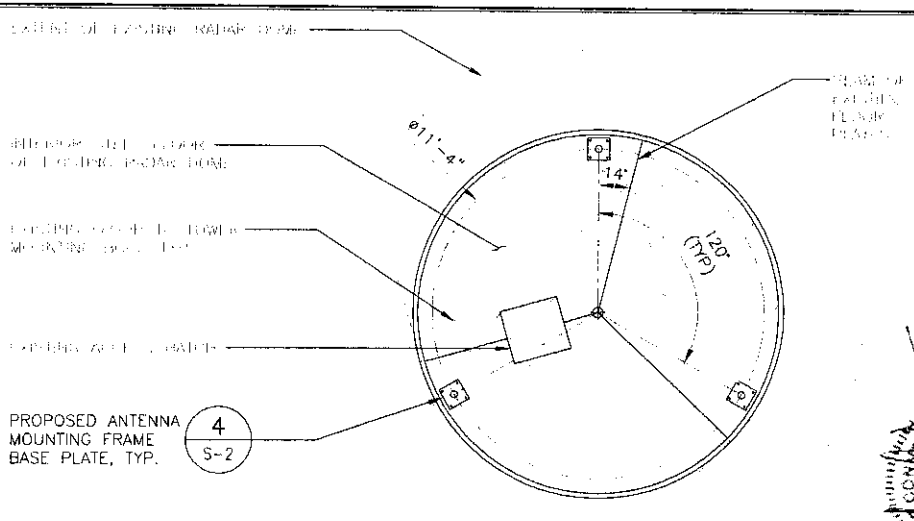
TOWER ELEVATION & FEEDLINE PLAN

SHEET NO.
S-1



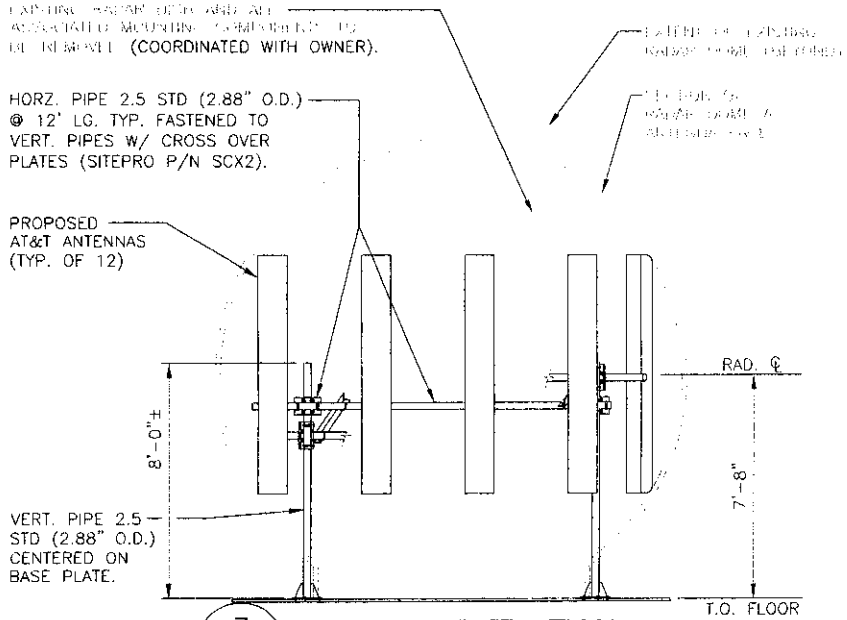
4 S-2 TYP. BASE PLATE DETAIL

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



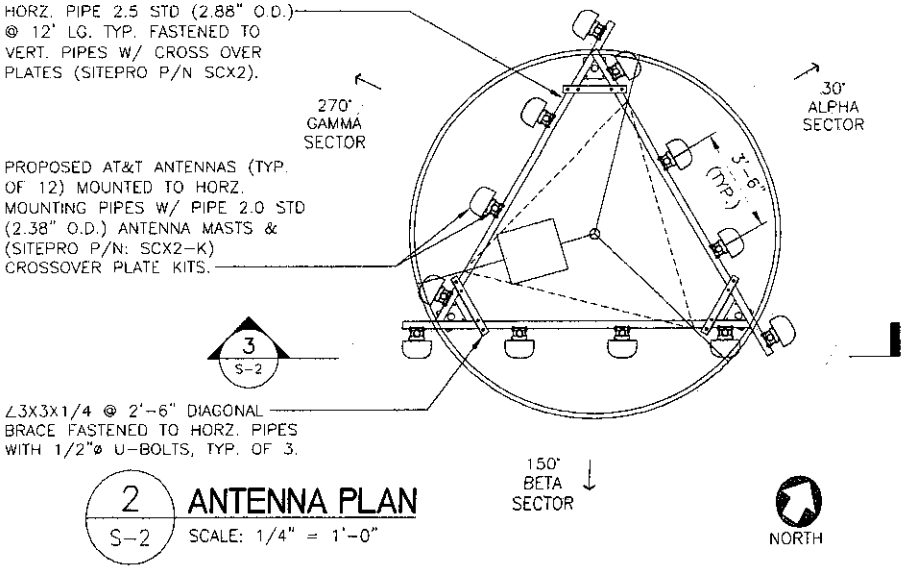
1 S-2 BASE PLATE PLAN

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



3 S-2 ANTENNA ELEVATION

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



2 S-2 ANTENNA PLAN

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

DESIGNED BY:	TJL
DRAWN BY:	TJL
CHK'D BY:	CFC

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JOB NO	13140.002

ANTENNA MOUNT DETAILS

SHEET NO.
S-2
Sheet No. 2 of 4

Section 1 - RFDS GENERAL INFORMATION

[illegible]	s1178	DATE:	3/29/2013	RF DESIGN ENG:	Radu Alecsandru	[illegible]
[illegible]	Pre-construction	[illegible]	Y	RF DESIGN PHONE:	ra9161@att.com	[illegible]
REVISION:	V02	RF ENGINEER:	Cameron Syme	RF DESIGN EMAIL:	860-513-7598	[illegible]

Pre-construction RFDS for leasing and zoning purposes, general design. It is not the finalized location, CL and azimuths. RRU positioning may be different based on the structural analysis.

Section 2 - LOCATION INFORMATION

[illegible]	NE	[illegible]	CT	LOCATION NAME:	Avon - Montevideo	[illegible]	Avon - Montevideo
[illegible]	Montevideo Rd	CITY:	Avon	STATE:	NER	[illegible]	s1178
[illegible]		COUNTY:		[illegible]	CT	[illegible]	
LATITUDE (D-M-S):	N41° 48' 42.26"	LONGITUDE (D-M-S):	W73° 47' 55.37"	LATITUDE (DEC):		[illegible]	

Section 3 - LICENSE COVERAGE/FILING INFORMATION

Section 4 - TOWER/REGULATORY INFORMATION

GROUND ELEVATION:	STRUCTURE TYPE:	[illegible]
HEIGHT OVERALL:	FCC ASR NUMBER:	[illegible]
STRUCTURE HEIGHT:		[illegible]

Section 5 - E-911 INFORMATION

	PSAP NAME	PSAP ID	E911 PHASE	MPC SVC PROVIDER	[illegible]	ESRK	DATE LIVE PH1	DATE LIVE PH2

Section 6 - RBS GENERAL INFORMATION

[illegible]	s1178	[illegible]	No	CELLULAR NETWORK:	[illegible]
[illegible]	Sectorized	[illegible]		[illegible]	[illegible]

Section 7 - RBS SPECIFIC INFORMATION

	GSM RBSs	UMTS 1ST CARRIER RBSs	UMTS 2ND CARRIER RBSs	UMTS 3RD CARRIER RBSs	UMTS 4TH CARRIER RBSs	LTE RBSs

Section 8 - RBS INDIVIDUAL INFORMATION

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS

Section 9 - SOFT SECTOR ID

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS

Section 10 - CID-SAC

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS

Section 11 - CURRENT RADIO COUNTS (Existing)

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS

Section 12 - CURRENT T1 COUNTS (Existing)

	GSM 1st Cabinet	GSM 2nd Cabinet	UMTS 1st Cabinet	UMTS 2nd Cabinet	LTE 1st Cabinet	LTE 2nd Cabinet

Section 13 - NEW/PROPOSED RADIO COUNTS

	GSM 850 RBS	GSM 1900 RBS	UMTS 850 RBS	UMTS 1900 RBS	UMTS 2ND 850 RBS	UMTS 2ND 1900 RBS	UMTS 3RD 850 RBS	UMTS 3RD 1900 RBS	UMTS 4TH 850 RBS	UMTS 4TH 1900 RBS	LTE 700 RBS	LTE AWS RBS

Section 14 - NEW/PROPOSED T1 COUNTS

	GSM 1st Cabinet	GSM 2nd Cabinet	UMTS 1st Cabinet	UMTS 2nd Cabinet	LTE 1st Cabinet	LTE 2nd Cabinet

Section 15A - CURRENT SECTOR/CELL INFORMATION - ALPHA (OR OMNI)

ANTENNA CHARTS FROM RADIO	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)

Section 15B - CURRENT SECTOR/CELL INFORMATION - BETA

ANTENNA CHARTS FROM RADIO	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)

Section 15C - CURRENT SECTOR/CELL INFORMATION - GAMMA

ANTENNA CHARTS FROM RADIO	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)

Section 15D - CURRENT SECTOR/CELL INFORMATION - DELTA					
ANTENNA CONFIG (FROM RADIO)	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)
TX/RX?					
TECHNOLOGY					
FEEDERS (# / TYPE / LENGTH)					
ANTENNA MAKE - MODEL					
ANTENNA VENDOR					
ANTENNA SIZE (H x W x D)					
ANTENNA WEIGHT					
ANTENNA GAIN					
AZIMUTH					
RADIATION CENTER					
ANTENNA TIP HEIGHT					
MAGNETIC DECLINATION					
ELECTRICAL TILT (700/850/1900/AWS)					
MECHANICAL DOWNTILT					
[illegible]					
[illegible]					
[illegible] POWER (WATTS)					
ERP (WATTS)					
[illegible] (QTY/MODEL)					
[illegible] COMBINER (QTY/MODEL)					
TMA/LNA (TYPE/MODEL)					
CURRENT INJECTORS FOR TMA					
CURRENT [illegible] POWER CABLE					
ANTENNA SHARING KIT					
BIAS TEE					
DIPLEXER (QTY/MODEL)					
DUPLEXER (QTY/MODEL)					
SURGE ARRESTOR (QTY/MODEL)					
DC BLOCK (QTY/MODEL)					
RET EQUIPMENT (QTY/MODEL)					
1900 [illegible] TMAS					

Section 15E - CURRENT SECTOR/CELL INFORMATION - EPSILON					
ANTENNA CONFIG (FROM RADIO)	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)
TX/RX?					
TECHNOLOGY					
FEEDERS (# / TYPE / LENGTH)					
ANTENNA MAKE - MODEL					
ANTENNA VENDOR					
ANTENNA SIZE (H x W x D)					
ANTENNA WEIGHT					
ANTENNA GAIN					
AZIMUTH					
RADIATION CENTER					
ANTENNA TIP HEIGHT					
MAGNETIC DECLINATION					
ELECTRICAL TILT (700/850/1900/AWS)					
MECHANICAL DOWNTILT					
[illegible]					
[illegible]					
[illegible] POWER (WATTS)					
ERP (WATTS)					
[illegible] (QTY/MODEL)					
[illegible] COMBINER (QTY/MODEL)					
TMA/LNA (TYPE/MODEL)					
CURRENT INJECTORS FOR TMA					
CURRENT [illegible] POWER CABLE					
ANTENNA SHARING KIT					
BIAS TEE					
DIPLEXER (QTY/MODEL)					
DUPLEXER (QTY/MODEL)					
SURGE ARRESTOR (QTY/MODEL)					
DC BLOCK (QTY/MODEL)					
RET EQUIPMENT (QTY/MODEL)					
1900 [illegible] TMAS					

Section 15F - CURRENT SECTOR/CELL INFORMATION - ZETA					
ANTENNA CONFIG (FROM RADIO)	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)
TX/RX?					
TECHNOLOGY					
FEEDERS (# / TYPE / LENGTH)					
ANTENNA MAKE - MODEL					
ANTENNA VENDOR					
ANTENNA SIZE (H x W x D)					
ANTENNA WEIGHT					
ANTENNA GAIN					
AZIMUTH					
RADIATION CENTER					
ANTENNA TIP HEIGHT					
MAGNETIC DECLINATION					
ELECTRICAL TILT (700/850/1900/AWS)					
MECHANICAL DOWNTILT					
[illegible]					
[illegible]					
[illegible] POWER (WATTS)					
ERP (WATTS)					
[illegible] (QTY/MODEL)					
[illegible] COMBINER (QTY/MODEL)					
TMA/LNA (TYPE/MODEL)					
CURRENT INJECTORS FOR TMA					
CURRENT [illegible] POWER CABLE					
ANTENNA SHARING KIT					
BIAS TEE					
DIPLEXER (QTY/MODEL)					
DUPLEXER (QTY/MODEL)					
SURGE ARRESTOR (QTY/MODEL)					
DC BLOCK (QTY/MODEL)					
RET EQUIPMENT (QTY/MODEL)					
1900 [illegible] TMAS					

Section 16A - NEW/PROPOSED SECTOR/CELL INFORMATION - ALPHA (OR GAMA)

	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)
	TBD TBD	TBD TBD	TBD TBD	TBD TBD	
	UMTS-DB	LTE-DB	LTE-DB	LTE-DB	
	1 Optic Fiber w 2 DC lines	1 Optic Fiber w 4 DC lines (common to LTE)	2 Optic Fiber w 4 DC lines (common to LTE)	3 Optic Fiber w 4 DC lines (common to LTE)	
	SBNH-1D6565C	SBNH-1D6565C	SBNH-1D6565C	KRC 118 054/1	
	Andrew	Andrew	Andrew	Ericsson	
	96 x 12 x 7	96 x 12 x 7	96 x 12 x 7	96 x12.1 x8.7"	
	61	61	61	121	
	16.4dBi @ 850MHz	16.4dBi @ 850MHz	16.4dBi @ 850MHz	17.6 dBi (PCS)	
	90 °	90 °	90 °	90 °	
	60 °	60 °	60 °	60 °	
	84 °	84 °	84 °	84 °	
	4 '	4 '	4 '	4 '	
	0 '	0 '	0 '	0 '	
	UMTS-RRUS (top) x 2	Ericsson RRUS	Ericsson RRUS	Ericsson RRUS	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	SQUID	2 SQUID (common to LTE)	2 SQUID (common to LTE)	2 SQUID (common to LTE)	
	n/a	n/a	n/a	n/a	
	Home Run RET cable	n/a	n/a	n/a	
	CCU - Kathrein 860 10008	n/a	n/a	n/a	

Section 16B - NEW/PROPOSED SECTOR/CELL INFORMATION - BETA

	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)
	TBD TBD	TBD TBD	TBD TBD	TBD TBD	
	UMTS-DB	LTE-DB	LTE-DB	LTE-DB	
	1 Optic Fiber w 2 DC lines	1 Optic Fiber w 4 DC lines (common to LTE)	2 Optic Fiber w 4 DC lines (common to LTE)	3 Optic Fiber w 4 DC lines (common to LTE)	
	SBNH-1D6565C	SBNH-1D6565C	SBNH-1D6565C	KRC 118 054/1	
	Andrew	Andrew	Andrew	Ericsson	
	96 x 12 x 7	96 x 12 x 7	96 x 12 x 7	96 x12.1 x8.7"	
	61	61	61	121	
	16.4dBi @ 850MHz	16.4dBi @ 850MHz	16.4dBi @ 850MHz	17.6 dBi (PCS)	
	210 °	210 °	210 °	210 °	
	60 °	60 °	60 °	60 °	
	84 °	84 °	84 °	84 °	
	4 '	4 '	4 '	4 '	
	0 '	0 '	0 '	0 '	
	UMTS-RRUS (top) x 2	Ericsson RRUS	Ericsson RRUS	Ericsson RRUS	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	SQUID	2 SQUID (common to LTE)	2 SQUID (common to LTE)	2 SQUID (common to LTE)	
	n/a	n/a	n/a	n/a	
	Home Run RET cable	n/a	n/a	n/a	
	CCU - Kathrein 860 10008	n/a	n/a	n/a	

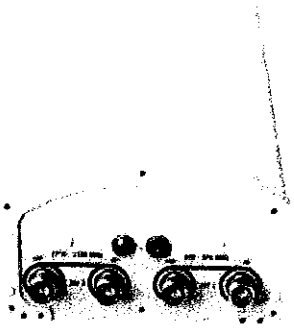
Section 16C - NEW/PROPOSED SECTOR/CELL INFORMATION - GAMMA

	ANTENNA 1 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 2 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 3 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 4 GSM, UMTS (850 / 1900) or LTE (700 / AWS)	ANTENNA 5 GSM, UMTS (850 / 1900) or LTE (700 / AWS)
	TBD TBD	TBD TBD	TBD TBD	TBD TBD	
	UMTS-DB	LTE-DB	LTE-DB	LTE-DB	
	1 Optic Fiber w 2 DC lines	1 Optic Fiber w 4 DC lines (common to LTE)	2 Optic Fiber w 4 DC lines (common to LTE)	3 Optic Fiber w 4 DC lines (common to LTE)	
	SBNH-1D6565C	SBNH-1D6565C	SBNH-1D6565C	KRC 118 054/1	
	Andrew	Andrew	Andrew	Ericsson	
	96 x 12 x 7	96 x 12 x 7	96 x 12 x 7	96 x12.1 x8.7"	
	61	61	61	121	
	16.4dBi @ 850MHz	16.4dBi @ 850MHz	16.4dBi @ 850MHz	17.6 dBi (PCS)	
	330 °	330 °	330 °	330 °	
	60 °	60 °	60 °	60 °	
	84 °	84 °	84 °	84 °	
	4 '	4 '	4 '	4 '	
	0 '	0 '	0 '	0 '	
	UMTS-RRUS (top) x 2	Ericsson RRUS	Ericsson RRUS	Ericsson RRUS	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	n/a	n/a	n/a	n/a	
	SQUID	2 SQUID (common to LTE)	2 SQUID (common to LTE)	2 SQUID (common to LTE)	
	n/a	n/a	n/a	n/a	
	Home Run RET cable	n/a	n/a	n/a	
	CCU - Kathrein 860 10008	n/a	n/a	n/a	

Product Specifications

COMMSCOPE®

on the go



Andrew Solutions

SBNH-1D6565C

Andrew® DualPol® Dual Band Teletilt® Antenna, 698–896 MHz and 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Internal next generation actuator eliminates field installation and defines new standards for reliability

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1710–1880	1850–1990	1920–2180
Gain, dBi	15.7	16.4	18.0	18.0	18.0
Beamwidth, Horizontal, degrees	71	67	58	57	59
Beamwidth, Vertical, degrees	8.6	7.8	5.5	5.1	4.8
Beam Tilt, degrees	0–11	0–11	0–7	0–7	0–7
USLS, typical, dB	15	15	16	16	16
Front-to-Back Ratio at 180°, dB	25	28	34	31	31
Front-to-Back Total Power at 180° ± 20°, dB	21	22	30	27	26
CPR at Boresight, dB	24	21	17	17	17
CPR at Sector, dB	11	8	9	8	9
Isolation, dB	30	30	30	30	30
Isolation, Intersystem, dB	35	35	35	35	35
VSWR | Return Loss, dB	1.5:1 | 14.0	1.5:1 | 14.0	1.5:1 | 14.0	1.5:1 | 14.0	1.5:1 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-150	-150	-150	-150	-150
Input Power per Port, maximum, watts	400	400	300	300	300
Polarization	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm
Lightning Protection	dc Ground	dc Ground	dc Ground	dc Ground	dc Ground

Mechanical Specifications

Color | Radome Material	Light gray | Fiberglass, UV resistant
Connector Interface | Location | Quantity	7-16 DIN Female | Bottom | 4
Wind Loading, maximum	879.0 N @ 150 km/h 197.6 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	2449.00 mm | 96.42 in
Width	301.00 mm | 11.85 in
Net Weight	27.60 kg | 60.85 lb

Remote Electrical Tilt (RET) Information

Adjustment Time, full range, maximum	30 s
Annual Failure Rate, maximum	0.01%
Power Consumption, during motor movements, maximum	11.0 W
Power Consumption, idle state, maximum	2.0 W

RRUS 11

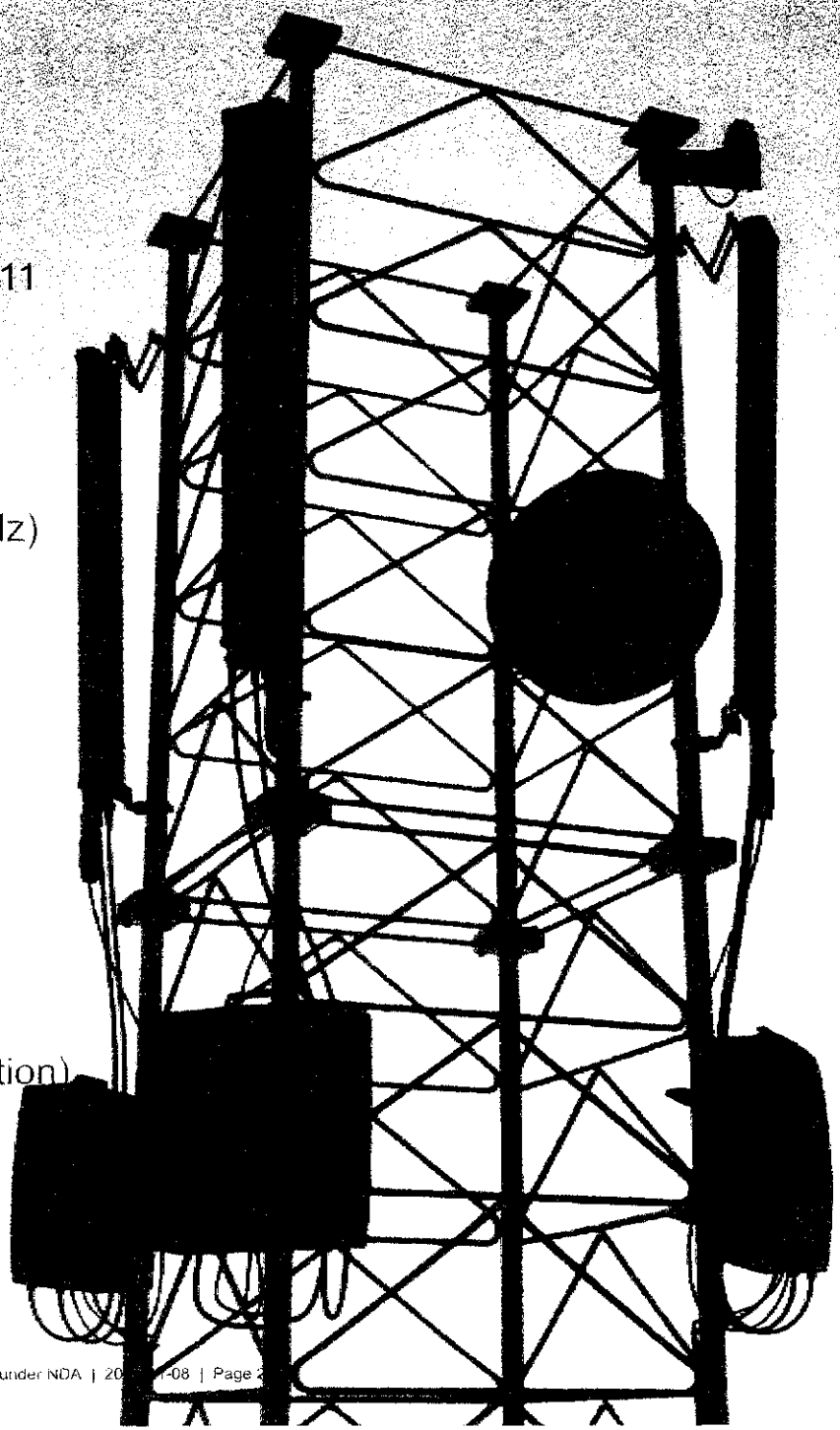
Frequency (AT&T)
- ✓ Band 12 (Lower 700 MHz)
- ✓ Band 4 (AWS, 17/2100 MHz) — 2Q2011

RF Characteristics
- ✓ Output power: 2x30 Watts
- ✓ 2x2 MIMO Capable
- ✓ IBW of 20 MHz
- ✓ Rx Sens.: Better than -105 dBm (5 MHz)

RET/TMA Support
- ✓ AISG 2.0 Compatible
- ✓ Via RET Port and Centre Conductor
- ✓ Cascading
- ✓ 30 VDC Bias

Environmental
- ✓ Self Convection
- ✓ Temperature -40 to 131 F

Power
- ✓ Input voltage: -48 VDC or AC (exemption)
- ✓ Fuse size: 13 – 32 A
  - Recommended: 25 A
- ✓ Power Consumption:
  - Typical 200 Watts
  - Max 310 Watts
  - Excl. RET and TMA load



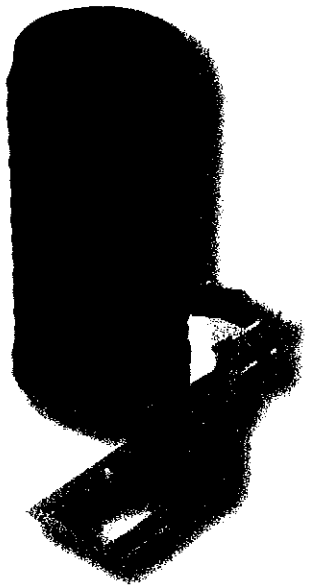
DC6-48-60-18-8F

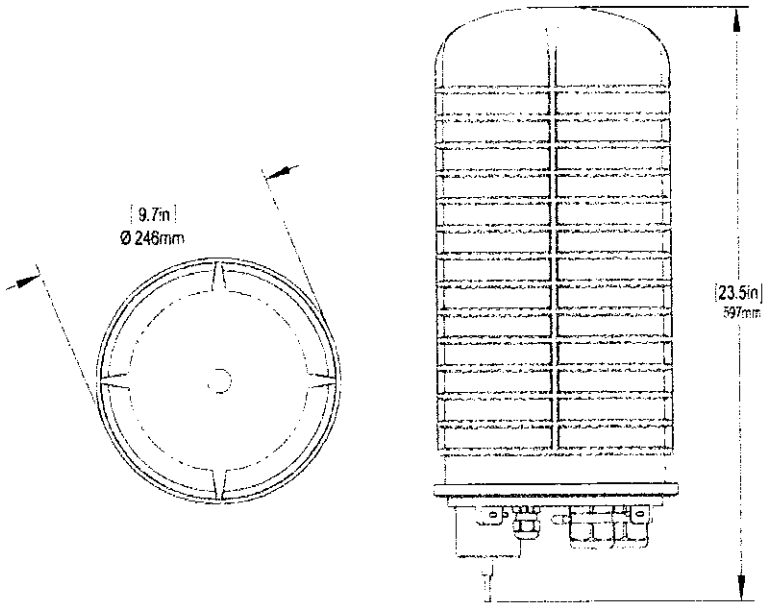
DC Surge Suppression Solution

The DC6-48-60-18 is a dual chambered, DC surge suppression system for use in multi-circuit, Distributed Antenna Systems. The system will protect up to 6 Remote Radio Heads from voltage surges and lightning, and connect up to 18 fiber pairs. The system is enclosed in a NEMA 4 rated, waterproof enclosure.

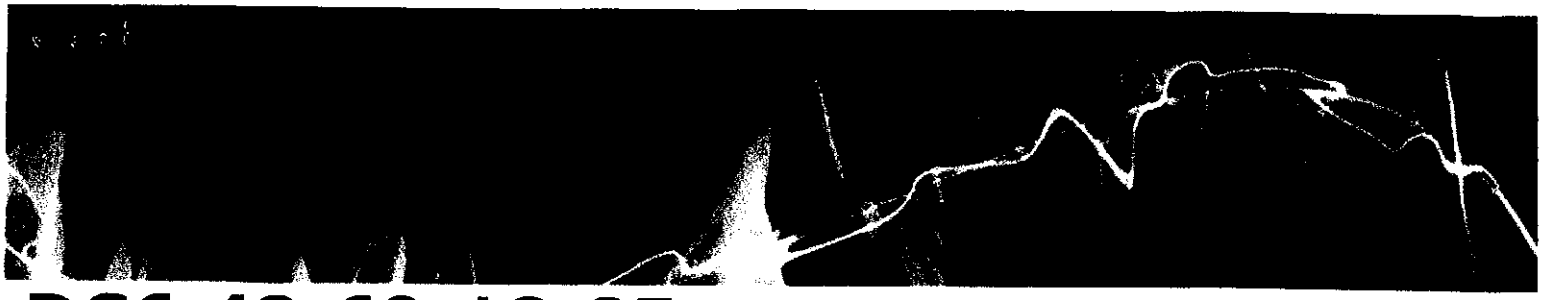
FEATURES

- Protects up to 6 Remote Radio Heads, each with its own protection circuit.
- Flexible design allows for installation at the top of a tower for Remote Radio Head protection.
- Includes fiber connections for up to 18 pairs of fiber.
- LED indicators on individual circuits provide visual indication of suppressor status.
- Form 'C' relays allow for remote monitoring of the suppressor status.
- Patented Strikesorb technology provides over 60 kA of surge current capacity per circuit.
- Strikesorb suppression modules are fully recognized to UL 1449-3rd Edition Safety Standard, meeting all intermediate and high current fault requirements to facilitate use in OEM applications.
- Raycap recommends that DC protection system be installed within 2 meters or 6 feet of the radio.
- Dome design is lightweight and aerodynamic providing maximum flexibility for installation on top of towers.





Phone 208.777.1166 Toll Free 800.890.2569 Fax 208.777.4466 www.raycapsurgeprotection.com



DC6-48-60-18-8F

DC Power Surge Protection

Electrical Specifications	
Model Number	DC6-48-60-18-8F
[illegible]	[illegible]
Nominal Discharge Current (I_n)	20 kA 8/20 µs
[illegible]	[illegible]
Maximum Continuous Operating Voltage (U_c)	75 VDC
[illegible]	[illegible]

Mechanical Specifications	
Suppression Connection Method	Compression lug, #2-#14 AWG Copper, #2-#12 Aluminum
[illegible]	[illegible]
Environmental Rating	IP 68, 7m 72hrs
[illegible]	[illegible]
Storage Temperature	-70° C to + 80° C
[illegible]	[illegible]
Resistance to Aggressive Materials	CEI IEC 61073-2 including acids and bases
[illegible]	[illegible]
Weight	20 lbs without Mounting Bracket

STANDARDS

Strikesorb modules are compliant to the following Surge Protection Device (SPD) Standards:

- ANSI/UL 1449 – 3rd Edition
- IEEE C62.41
- NEMA LS-1, IEC 61643-1:2005 2nd Edition:2005
- IEC 61643-12
- EN 61643-11:2002 (including A11:2007)

GS-07F-0435V

Certified to ISO 9001:2000

TÜV Rheinland of North America

Raycap

Raycap, Inc. 806 W. Clearwater Loop • Post Falls • Idaho • 83854 • USA
Phone 208.777.1166 • Toll Free 800.890.2569 • Fax 208.777.4466 • www.raycapsurgeprotection.com

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
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E-Mail: siting.council@ct.gov
www.ct.gov/csc

June 27, 2013

The Honorable Mark W. Zacchio
Chairman
Town of Avon
60 West Main Street
Avon, CT 06001-3743

RE: **TS-CING-004-130627–** New Cingular Wireless PCS, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 324 Montevideo Road, Avon, Connecticut.

Dear Chairman Zacchio:

The Connecticut Siting Council (Council) received a request for tower sharing, pursuant to Connecticut General Statutes § 16-50aa, a copy of which has already been provided to you.

The Council will consider this item at a future public meeting. A copy of the agenda will be forwarded to you.

If you have any questions or comments regarding the proposal, please call me or inform the council by July 11, 2013.

Thank you for your cooperation and consideration.

Very truly yours,

Melanie Bachman
Acting Executive Director

MB/cm

c: Steven V. Kushner, Town Planner, Town of Avon

CONNECTICUT SITING COUNCIL