



June 27, 2019

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

Re: Notice of Exempt Modification – Antenna Swap
Property Address: 142 BALWIN DRIVE NEW HAVEN, CT 06514
Applicant: AT&T Mobility, LLC

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (8) wireless telecommunication antennas at an antenna center line height of 80-feet on an existing 120 –self-support tower, owned by the STATE OF CONNECTICUT DEPARTMENT OF PUBLIC SAFETY. AT&T now intends to install REMOVE (3) PANEL ANTENNAS, INSTALL (3) PANEL ANTENNAS REMOVE (3) RRUS-11, REMOVE (3) RRUS-32 B2 REMOVE (3) RRUS-12 INSTALL (3) RRUS-E2 B29 INSTALL (3) 8843 B2/B66A, INSTALL (3) B5/B12 4449, INSTALL (1) DC ONLY SQUID W/ (2) DC CABLE INSTALL (3) SECTOR FRAMES.

This facility was approved by the Connecticut Siting Council, Petition No. 69.2 on June 25, 1981. There were no conditions that could feasibly be violated by this modification, including the total facility height or mounting restrictions. This modification therefore complies with the approval.

The following is a list of subsequent decisions by the Connecticut Siting Council:

EM-CING-093-121031 - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 142 Baldwin Drive, New Haven, Connecticut.

[EM-CING-093-160926](#) -New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 142 Baldwin Drive (West Rock Ridge), **New Haven, Connecticut. [Decision](#). [Condition 1 Compliance Extension Request and CSC Approval Completion Letter](#)**

[EM-AT&T-093-180912](#) – AT&T notice of intent to modify an existing telecommunications facility located at 142 Baldwin Drive, New Haven, Connecticut. [Decision](#)



Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-510j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to The Honorable Mayor Toni Harp, Mayor of the City of New Haven, City Assessor Alex Pullen 165 Church St New Haven, CT 06510 and Tower Owner, State of CT Department of Public Safety.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b) (2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 80-foot level of the 120-foot self-support tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require an extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

David Barbagallo

CC w/enclosures:

| Honorable Mayor Toni Harp, Mayor of the City of New Haven,
City Assessor, Alex Pullen
Tower Owner, State of CT Department of Public Safety.

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DRIVING DIRECTIONS
FROM 550 COCHITUATE RD.:
GET ON I-90 WEST/MASSACHUSETTS TURNPIKE. HEAD NORTHEAST TOWARD LEGGATT MCCALL CONN. TURN LEFT ONTO LEGGATT MCCALL CONN. CONTINUE ONTO BURR STREET. TURN LEFT ONTO COCHITUATE ROAD. USE THE RIGHT LANE TO TAKE THE RAMP TO I-90 EAST/MASSPIKE WEST/SPRINGFIELD/BOSTON. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR I-90 WEST/MASSACHUSETTS TURNPIKE/WORCESTER/SPRINGFIELD AND MERGE ONTO I-90 WEST/MASSACHUETTS TURNPIKE. CONTINUE ON I-90 WEST/MASSACHUETTS TURNPIKE. TAKE I-84, I-91 SOUTH AND CT-15 SOUTH/WILBUR CROSS PKWY TO CT-10 SOUTH IN HAMDEN. TAKE EXIT CT-15 SOUTH/WILBUR CROSS PKWY. MERGE ONTO I-90 WEST/MASSACHUETTS TURNPIKE. USE THE RIGHT 2 LANES TO TAKE EXIT 9 FOR I-84 TOWARD US-20/HARTFORD/NEW YORK CITY. CONTINUE ONTO I-84. USE THE LEFT 2 LANES TO TAKE EXIT 57 FOR CT-15 SOUTH TOWARD I-91 SOUTH/CHARTER OAK BRIDGE/NEW YORK CITY. CONTINUE ONTO CT-15 SOUTH. CONTINUE ONTO CT-15 SOUTH/US-5 SOUTH. TAKE EXIT 86 TO MERGE ONTO I-91 SOUTH TOWARD NEW HAVEN/NEW YORK CITY. TAKE EXIT 17 TO MERGE ONTO CT-15 SOUTH/WILBUR CROSS PKWY. TAKE EXIT 60 FOR CT-10 TOWARD HAMDEN/NEW HAVEN. TAKE BENHEM STREET TO WINTERGREEN AVE. TURN RIGHT ONTO CT-10 SOUTH. TURN RIGHT ONTO BENHAM STREET. TURN LEFT ONTO LANE STREET. CONTINUE ONTO BROOK STREET. TURN RIGHT ONTO WINTERGREEN AVE.

LOCATION MAP



PROJECT
LTE 6C/7C/5G NR/RETROFIT
SITE NAME
NEW HAVEN WEST ROCK
CELL SITE ID
CTL02013
FA SITE NUMBER
10035296
PACE ID
MRCTB034929/MRCTB035008/MRCTB034946
MRCTB034915/MRCTB034921
SITE ADDRESS
142 BALDWIN DRIVE
NEW HAVEN, CT 06514
STRUCTURE TYPE
SELF SUPPORT

PROJECT TEAM	
 PROJECT MANAGER	 1033 Watervliet Shaker Rd Albany, NY 12205 Office # (518) 690-0790 Fax # (518) 690-0793 ENGINEER

SCOPE OF WORK (PER LTE RFDS, DATED: 02/04/2019, V5.00):	
- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED. - FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. - FACILITY HAS NO PLUMBING OR REFRIGERANTS. - THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS. - ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRU AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.	TOWER SCOPE - REMOVE (3) PANEL ANTENNAS - INSTALL (3) PANEL ANTENNAS - REMOVE (3) RRUS-11 - REMOVE (3) RRUS-32 B2 - REMOVE (3) RRUS-12 - INSTALL (3) RRUS-E2 B29 - INSTALL (3) 8843 B2/B66A - INSTALL (3) B5/B12 4449 - INSTALL (1) DC ONLY SQUID W/ (2) DC CABLES - INSTALL (3) SECTOR FRAMES GROUND SCOPE - SWAP 2ND XMU WITH 6630 - ADD IDLe - ADD 5G 6630 - INSTALL (1) DC12 AND (12) TELCO FLEX

PROJECT SUMMARY	
SITE NAME:	NEW HAVEN WEST ROCK
CELL SITE ID:	CTL02013
FA SITE #:	10035296
SITE ADDRESS:	142 BALDWIN DRIVE NEW HAVEN, CT 06514
COUNTY:	NEW HAVEN
SITE COORDINATES:	
LATITUDE:	41.3454361° N (NAD 83)
LONGITUDE:	72.9706931° W (NAD 83)
ELEVATION:	±545' (AMSL)
RAD CENTER	±80' (AGL)
LANDLORD:	STATE OF CONNECTICUT DEPARTMENT OF PUBLIC SAFETY
APPLICANT:	AT&T MOBILITY 550 COCHITUATE RD. FRAMINGHAM, MA 01701
CLIENT REPRESENTATIVE:	SMARTLINK, LLC 85 RANGEWAY RD. SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	ED WEISSMAN (917) 528-1857
ENGINEER:	INFINIGY 1033 WATERVLIET SHAKER ROAD ALBANY, NY 12205
CONTACT:	ALEX WELLER (518) 690-0790
BUILDING CODE:	2015 IBC/2018 CONNECTICUT STATE BUILDING CODE (ANSI/TIA-222-G) UNIFORM BUILDING CODE BUILDING OFFICIALS & CODE ADMINISTRATORS UNIFORM MECHANICAL CODE UNIFORM PLUMBING CODE LOCAL BUILDING CODE CITY/COUNTY ORDINANCES
ELECTRICAL CODE:	NATIONAL ELECTRICAL CODE (LATEST EDITION)



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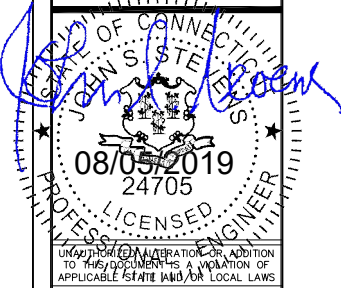
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE



INFINIGY ENGINEERING, PLLC
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793



AT&T



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2	ISSUED FOR PERMIT	BMM	05/16/19			
1	ISSUED FOR PERMIT	BMM	04/30/19			
0	ISSUED FOR REVIEW	BMM	04/15/19			
No.	Submission / Revision	App'd	Date			
Drawn:	BMM	Date:	04/15/19			
Designed:	ASW	Date:	04/15/19			
Checked:	AD	Date:	04/15/19			
Project Number:						
1106-A0001-C						
Project Title:						
NEW HAVEN WEST ROCK CTL02013 FA# 10035296 142 BALDWIN DRIVE NEW HAVEN, CT 06514						
Prepared For:						
						
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Date:	08/05/19					
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GENERAL NOTES			
<u>PART 1 – GENERAL REQUIREMENTS</u> 1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING: A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT. C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC"). D. AND NFPA 101 (LIFE SAFETY CODE). E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM). F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).		2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY AT&T TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.	
1.2 DEFINITIONS: A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS. B: COMPANY: AT&T CORPORATION C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT. D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK. E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.		2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.	
1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.		2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.	
1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.		<u>PART 3 – RECEIPT OF MATERIAL & EQUIPMENT</u> 3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR AT&T PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL: A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT. B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES. C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT. D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO AT&T OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH. E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING. F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.	
1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION. A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.		<u>PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION</u> 4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.	
1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.		4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.	
1.7 NOTICE TO PROCEED: A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED. B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE AT&T WITH AN OPERATIONAL WIRELESS FACILITY.		4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION. A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY. B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.	
<u>PART 2 – EXECUTION</u> 2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.		4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.	
2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.		4.5 CONDUCT TESTING AS REQUIRED HEREIN.	
2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.		<u>PART 5 – TESTS AND INSPECTIONS</u> 5.1 TESTS AND INSPECTIONS: A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION. B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS. C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS. D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES. E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.	
		F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS. G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.	
<u>PART 6 – TRENCHING AND BACKFILLING</u> 6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED. A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY. B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND. C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE. D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD. E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE. F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED. G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.			
SYMBOL DESCRIPTION  CIRCUIT BREAKER  NON-FUSIBLE DISCONNECT SWITCH  FUSIBLE DISCONNECT SWITCH  SURFACE MOUNTED PANEL BOARD  TRANSFORMER  KILOWATT HOUR METER  JUNCTION BOX  PULL BOX TO NEC/TELCO STANDARDS ----- UNDERGROUND UTILITIES  EXOTHERMIC WELD CONNECTION  MECHANICAL CONNECTION  GROUND ROD  GROUND ROD WITH INSPECTION SLEEVE  GROUND BAR  120AC DUPLEX RECEPTACLE  GROUND CONDUCTOR  DC POWER AND FIBER OPTIC TRUNK CABLES  DC POWER CABLES  REPRESENTS DETAIL NUMBER  REF. DRAWING NUMBER			
ABBREVIATIONS			
CIGBE COAX ISOLATED GROUND BAR EXTERNAL MIGB MASTER ISOLATED GROUND BAR SST SELF SUPPORTING TOWER GPS GLOBAL POSITIONING SYSTEM TYP. TYPICAL DWG. DRAWING BCW BARE COPPER WIRE BFG BELOW FINISH GRADE PVC POLYVINYL CHLORIDE CAB CABINET C CONDUIT SS STAINLESS STEEL G GROUND AWG AMERICAN WIRE GAUGE RGS RIGID GALVANIZED STEEL AHJ AUTHORITY HAVING JURISDICTION TTLNA TOWER TOP LOW NOISE AMPLIFIER UNO UNLESS NOTED OTHERWISE EMT ELECTRICAL METALLIC TUBING AGL ABOVE GROUND LEVEL			

INFINIGY

INFINIGY ENGINEERING, PLLC
1033 Waterliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793



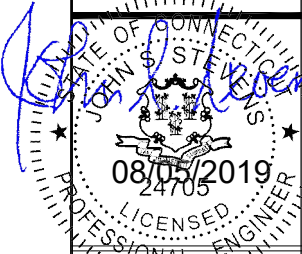
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Designed: <u>ASW</u> Date: <u>04/15/19</u>		
Checked: <u>AJD</u> Date: <u>04/15/19</u>		
Project Number:		
<u>1106-A0001-C</u>		
Project Title:		
NEW HAVEN WEST ROCK CTL02013 FA# 10035296 142 BALDWIN DRIVE NEW HAVEN, CT 06514		
Prepared For:		
smartlink		
Drawing Scale:	CD	
<u>AS NOTED</u>		
Date:		
<u>08/05/19</u>		
Drawing Title		
GENERAL NOTES		
Drawing Number		
C1		



INFINIGY ENGINEERING, PLLC
1033 Watervliet Shaker Rd
Albany, NY 12205
Office # (518) 690-0790
Fax # (518) 690-0793





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1106-A0001-C		
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C1		

EXISTING FENCED
EQUIPMENT COMPOUND

EXISTING SELF
SUPPORT TOWER

EXISTING AT&T
EQUIPMENT SHELTER

PROPOSED AT&T (2) DC CABLES TO
BE ROUTED WITH EXISTING CABLES

EXISTING AT&T ICE
BRIDGE (TYP.)

EXISTING CARRIER EQUIPMENT
CONCRETE PAD (TYP.)

EXISTING ICE
BRIDGE (TYP.)

EXISTING
PROPANE TANK

EXISTING DOUBLE SWING
ACCESS GATE (TYP.)

EXISTING CARRIER
EQUIPMENT SHELTER (TYP.)

GRAPHIC SCALE:



SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"

1 SITE PLAN
SCALE: AS NOTED

BASEMAPPING PREPARED FROM A SITE WALK
PERFORMED BY INFINIGY ENGINEERING ON
11/17/18 AND PROVIDED INFORMATION, AND
DOES NOT REPRESENT AN ACTUAL FIELD SURVEY.

EXISTING
AC PANEL

EXISTING
TELCO BOARD

EXISTING AT&T
UMTS CABINET

EXISTING AT&T LTE RACK TO
REMAIN, INSTALL:
• SWAP 2ND XMU WITH 6630
• ADD IDLe
• ADD 5G 6630
• INSTALL (1) DC12
• INSTALL (12) TELCO FLEX

EXISTING AT&T
EQUIPMENT CABINET

EXISTING AT&T
RXAIT RACK

PROPOSED AT&T (2) DC
CABLES TO BE ROUTED
WITH EXISTING CABLES

EXISTING AT&T
GSM CABINET

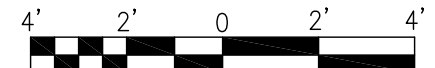
EXISTING AT&T
GSM CABINET

EXISTING AT&T
EQUIPMENT CABINET

EXISTING AT&T
GALAXY POWER PLANT

EXISTING AT&T
BATTERY RACK

GRAPHIC SCALE:

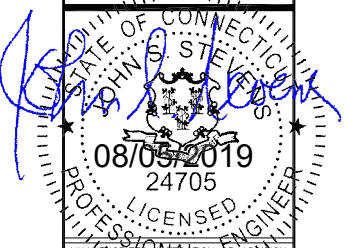


SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

2 ENLARGED EQUIPMENT PLAN
SCALE: AS NOTED

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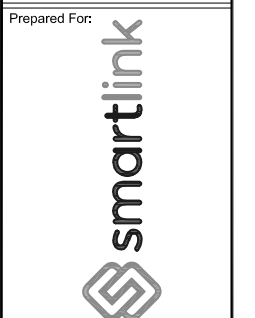
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Drawn: BMM Date: 04/15/19
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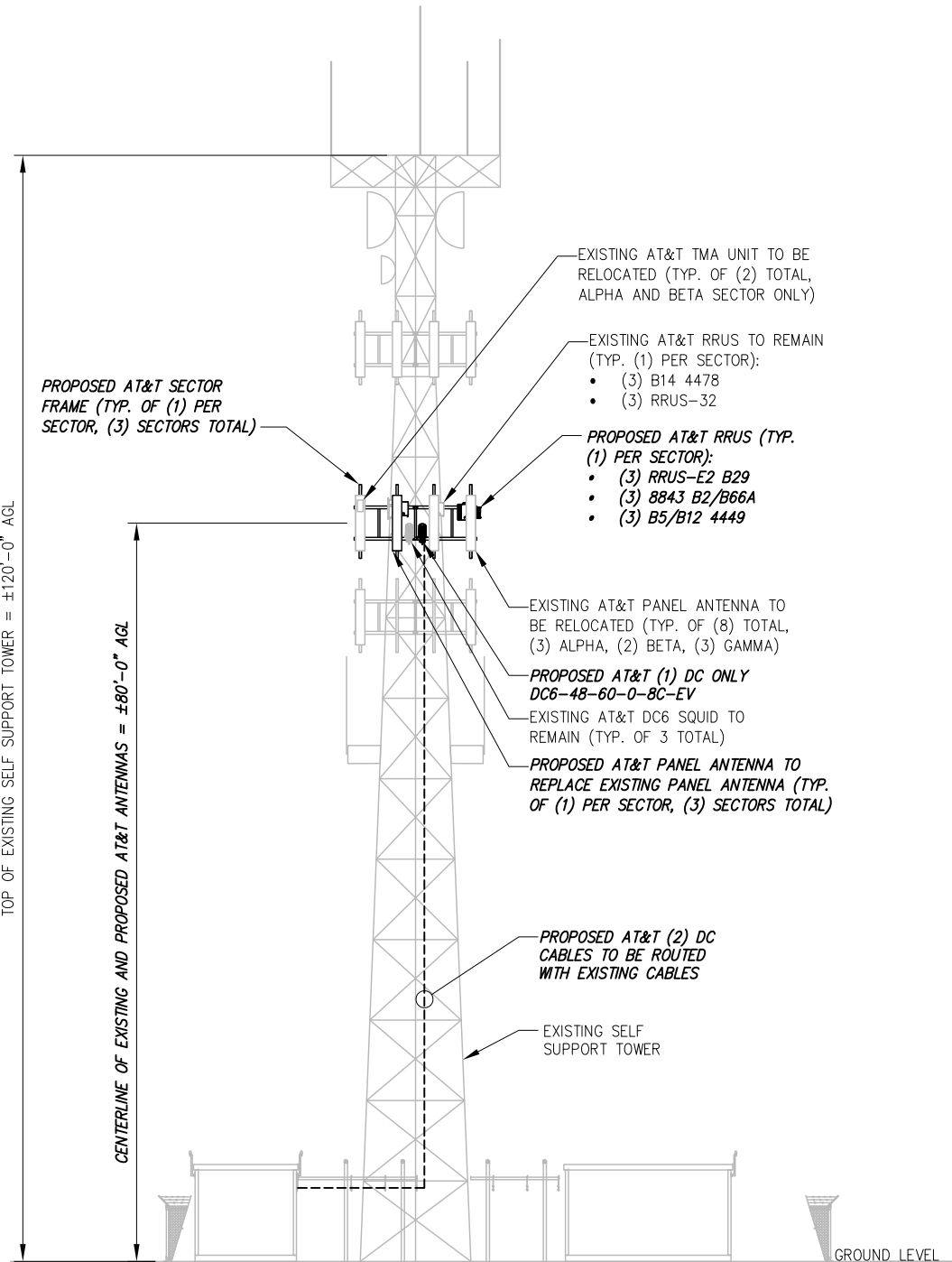
Project Title:
NEW HAVEN
WEST ROCK
CTL02013
FA# 10035296
142 BALDWIN DRIVE
NEW HAVEN, CT 06514



Drawing Scale:
AS NOTED
Date:
08/05/19
CD

Drawing Title
OVERALL &
ENLARGED
SITE PLAN

Drawing Number
C2



1 ELEVATION VIEW
-- NOT TO SCALE

FINAL ANTENNA CONFIGURATION & CABLE SCHEDULE BASED ON LTE RFDS DATED 02/04/19, V 5.00										
SECTOR	ANTENNA POSITION	ANTENNA STATUS & TECHNOLOGY	ANTENNA MANF /MODEL	TMA/ DIPLEXER	RRUS	AZIMUTH	ANTENNA CL HEIGHT	CABLE FEEDER		RAYCAP UNIT
								TYPE	LENGTH	
ALPHA	A-1	(E) LTE 700/1900/ AWS	CCI TPA-65R-LCUUUU-H8	--	(1) (P) RRUS-E2 B29 (1) (P) B2/B66A 8843	10°	±80'	(1) (E) FIBER CABLE (2) (E) DC CABLES	--	(3) (E) DC6 "SQUID" (1) (P) DC6-48-60-0-8C-EV
	A-2	(E) LTE 700	KATHREIN 800-10966	--	(1) (E) B14 4478	10°	±80'	SEE A-1 FOR CABLE INFORMATION	--	
	A-3	(P) LTE 700/850/WCS /5G 850	KATHREIN 800-10966	--	(1) (E) RRUS-32 (1) (P) B5/B12 4449	10°	±80'	SEE A-1 FOR CABLE INFORMATION	--	
	A-4	(E) UMTS 850	ANDREW SBNH-1D6565C	(1) (E) DTMAPB7819VG12A	--	40°	±80'	(2) (E) 1-5/8" COAX	±95'	
BETA	B-1	(E) LTE 700/1900/ AWS	CCI TPA-65R-LCUUUU-H8	--	(1) (P) RRUS-E2 B29 (1) (P) B2/B66A 8843	120°	±80'	(1) (E) FIBER CABLE (2) (E) DC CABLES (2) (P) DC CABLES	--	
	B-2	(E) LTE 700	KATHREIN 800-10966	--	(1) (E) B14 4478	120°	±80'	SEE B-1 FOR CABLE INFORMATION	--	
	B-3	(P) LTE 700/850/WCS /5G 850	KATHREIN 800-10966	--	(1) (E) RRUS-32 (1) (P) B5/B12 4449	120°	±80'	SEE B-1 FOR CABLE INFORMATION	--	
	B-4	(E) UMTS 850	ANDREW SBNH-1D6565C	(1) (E) DTMAPB7819VG12A	--	210°	±80'	(2) (E) 1-5/8" COAX	±95'	
GAMMA	G-1	(E) LTE 700/1900/ AWS	QUINTEL QS66512-2	--	(1) (P) RRUS-E2 B29 (1) (P) B2/B66A 8843	250°	±80'	(1) (E) FIBER CABLE (2) (E) DC CABLES	--	
	G-2	(E) LTE 700	KATHREIN 800-10965	--	(1) (E) B14 4478	250°	±80'	SEE G-1 FOR CABLE INFORMATION	--	
	G-3	(P) LTE 700/850/WCS /5G 850	KATHREIN 800-10965	--	(1) (E) RRUS-32 (1) (P) B5/B12 4449	250°	±80'	SEE G-1 FOR CABLE INFORMATION	--	
	G-4	--	--	--	--	--	--	SEE G-1 FOR CABLE INFORMATION	--	

2 AT&T ANTENNA SCHEDULE
-- NOT TO SCALE

NOTE:

- INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER LOADING FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY REGARDING ITS EXISTING OR PROPOSED LOADING. FINAL INSTALLATION TO COMPLY STRUCTURAL ANALYSIS.
- FOR ADDITIONAL STRUCTURAL INFORMATION PERTAINING TO THE ANTENNA MOUNT, SEE 'MOUNT ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 08/05/19.

SEPARATION NOTE:

- 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNA
- 6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE

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Project Number: 1106-A0001-C

Project Title: NEW HAVEN WEST ROCK CTL02013 FA# 10035296 142 BALDWIN DRIVE NEW HAVEN, CT 06514

Prepared For: smartlink

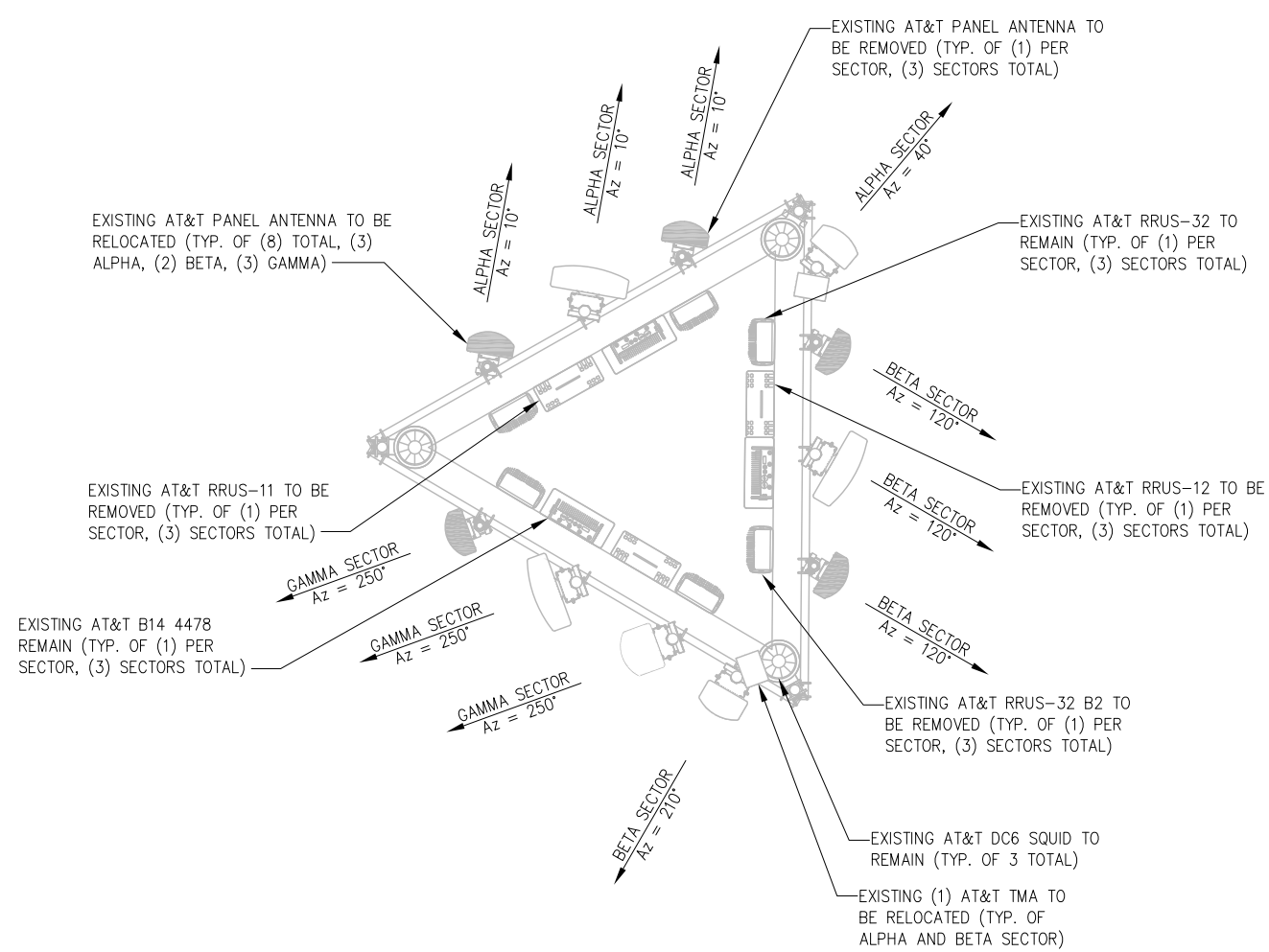
Drawing Scale: AS NOTED

Date: 08/05/19

CD

ELEVATION VIEW

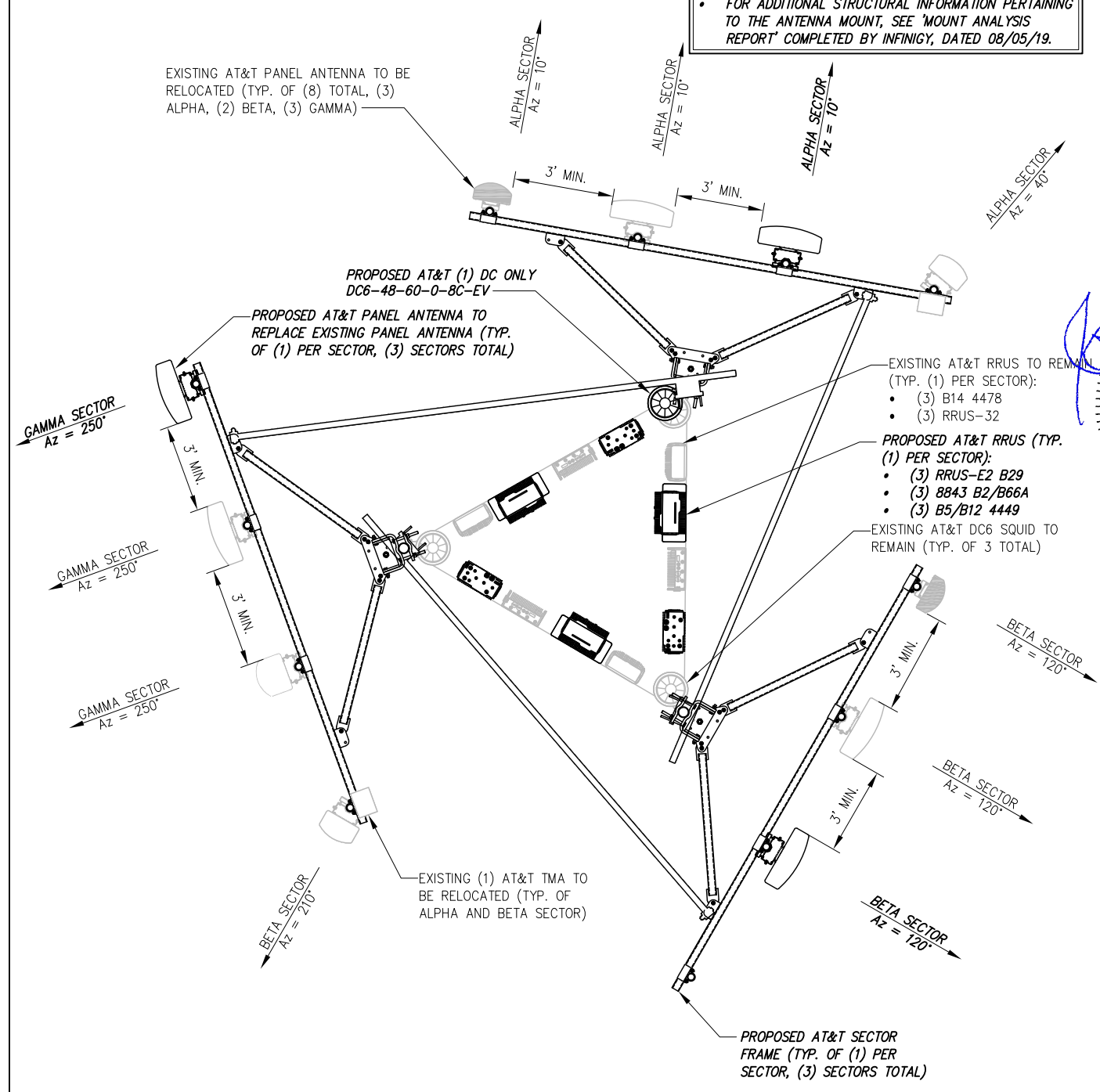
Drawing Number: C3



1 ANTENNA ORIENTATION PLAN (EXISTING)
NOT TO SCALE

SEPARATION NOTE:
• 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNA
• 6 FEET MINIMUM SEPARATION BETWEEN 700BC & 700 DE

NOTE:
• INFINIGY ENGINEERING HAS NOT EVALUATED THE TOWER LOADING FOR THIS SITE, AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY REGARDING ITS EXISTING OR PROPOSED LOADING. FINAL INSTALLATION TO COMPLY STRUCTURAL ANALYSIS.
• FOR ADDITIONAL STRUCTURAL INFORMATION PERTAINING TO THE ANTENNA MOUNT, SEE 'MOUNT ANALYSIS REPORT' COMPLETED BY INFINIGY, DATED 08/05/19.

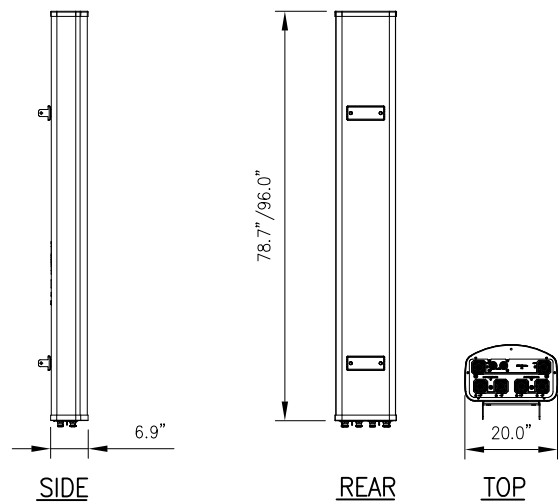


2 PROPOSED ANTENNA ORIENTATION PLAN
NOT TO SCALE

INFINIGY

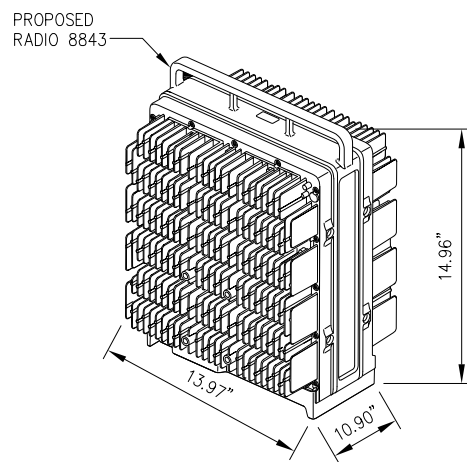
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Checked:	AD	Date:	04/15/19
Project Number: 1106-A0001-C			
Project Title: NEW HAVEN WEST ROCK CTL02013 FA# 10035296 142 BALDWIN DRIVE NEW HAVEN, CT 06514			
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Drawing Scale: AS NOTED		CD	
Date: 08/05/19			
Drawing Title ANTENNA ORIENTATION PLAN			
Drawing Number C4			



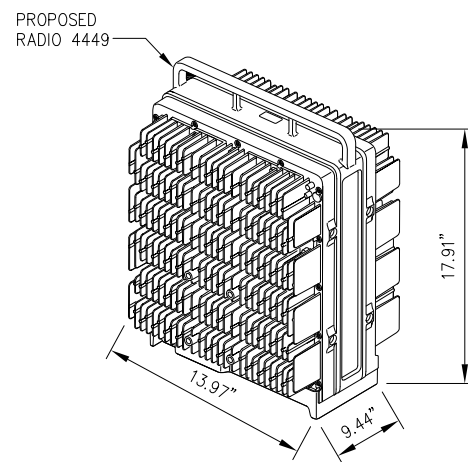
KATHREIN MODEL NO.: 800-10965/800-10966	
RADOME MATERIAL:	FIBERGLASS,
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	78.7"x20.0"x6.9"/96.0"x20.0"x6.9"
WEIGHT, W/	
PRE-MOUNTED BRACKETS:	108.6/114.6 LBS
CONNECTOR:	7-16 DIN FEMALE

1 ANTENNA DETAIL
-- NOT TO SCALE



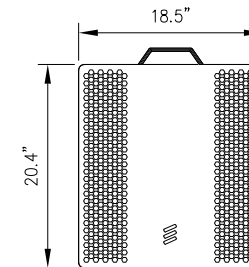
RADIO 8843 SPECIFICATIONS	
• HxWxD, (INCHES) :	14.96"x13.97"x10.90"
• WEIGHT (LBS) :	71.87
• COLOR :	GRAY

2 ERICSSON RADIO 8843 DETAIL
-- NOT TO SCALE

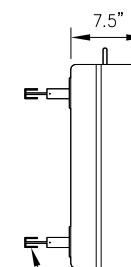


RADIO 4449 SPECIFICATIONS	
• HxWxD, (INCHES) :	17.91"x13.97"x9.44"
• WEIGHT (LBS) :	70.54
• COLOR :	GRAY

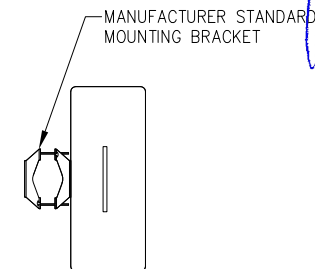
3 ERICSSON RADIO 4449 DETAIL
-- NOT TO SCALE



FRONT



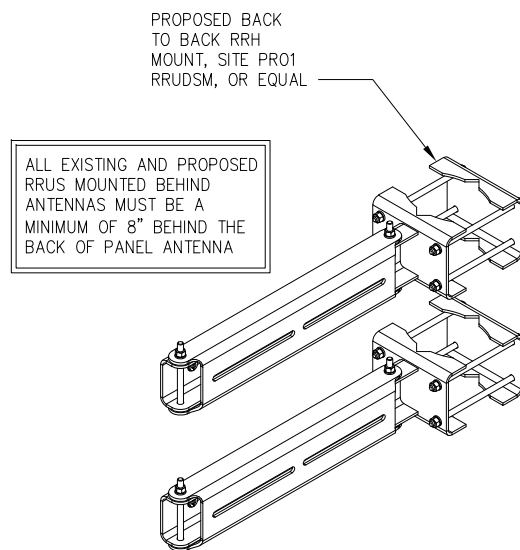
SIDE



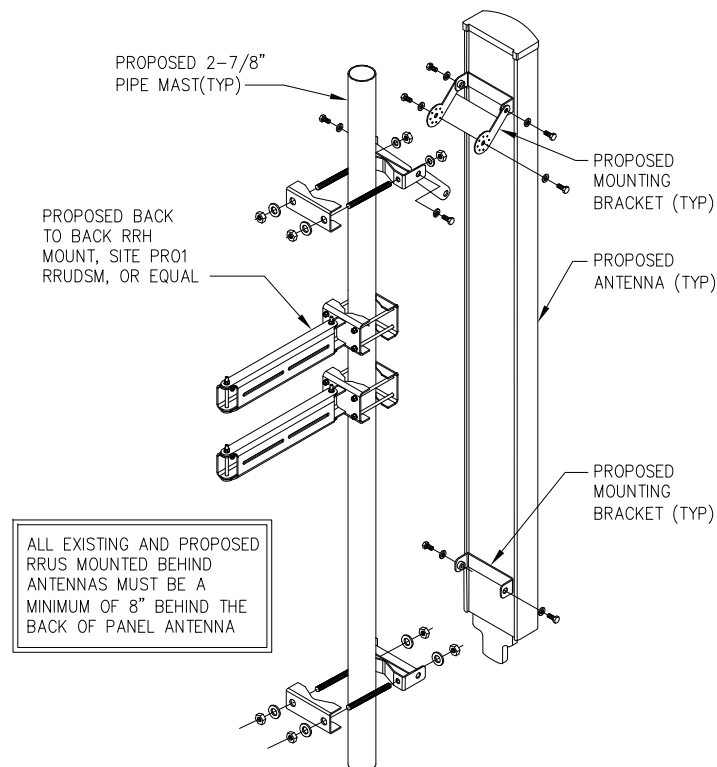
TOP

RRUS-E2 SPECIFICATIONS	
• HxWxD, (INCHES) :	20.4"x18.5"x7.5"
• WEIGHT (LBS) :	60
• COLOR :	GRAY

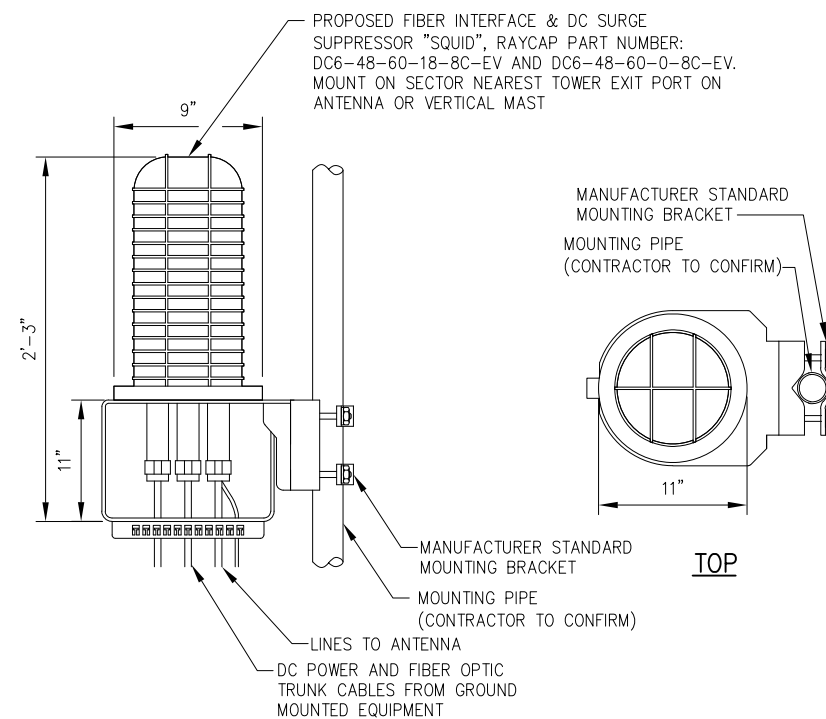
4 ERICSSON RRUS MOUNTING DETAIL
-- NOT TO SCALE



5 BACK TO BACK PIPE MOUNT DETAIL
-- NOT TO SCALE



6 MOUNTING DETAIL
-- NOT TO SCALE



SIDE

7 SQUID DETAIL
-- NOT TO SCALE

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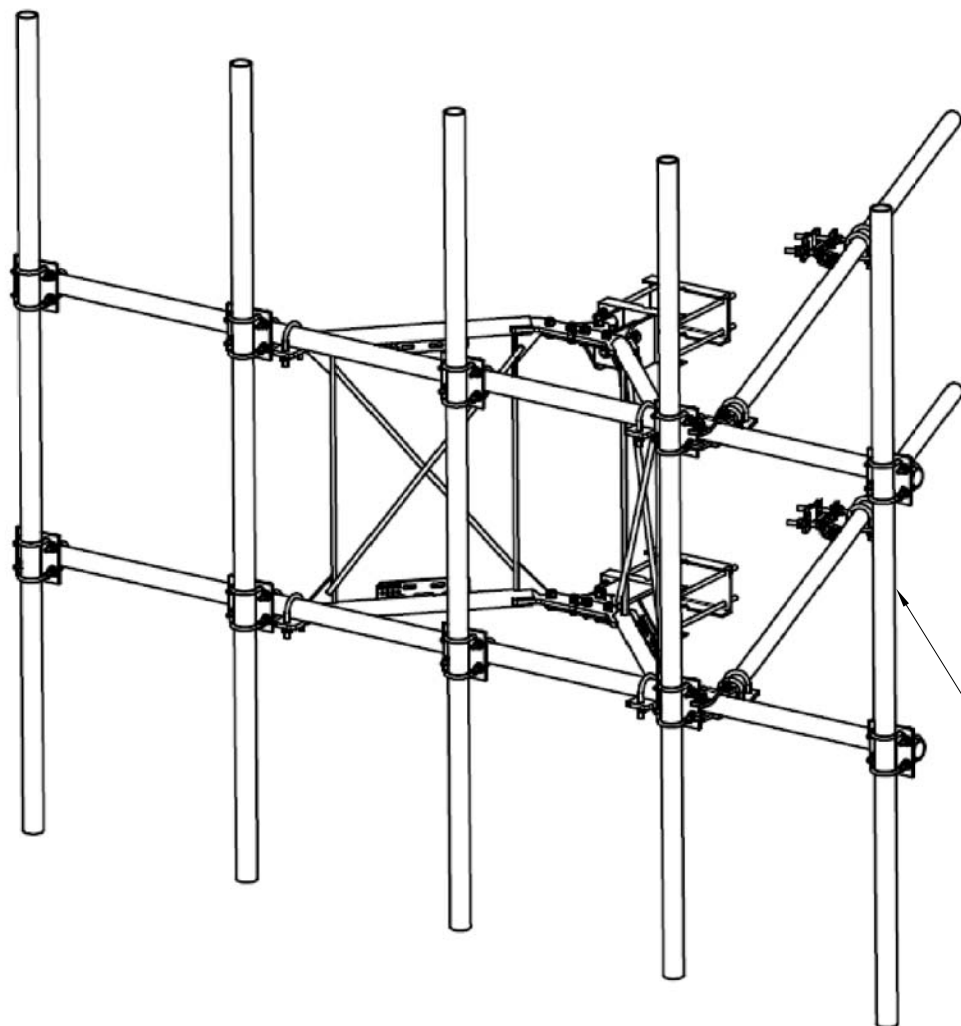
Project Title:
**NEW HAVEN
WEST ROCK
CTL02013
FA# 10035296**
142 BALDWIN DRIVE
NEW HAVEN, CT 06514

Prepared For:
smartlink

Drawing Scale:
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Date:
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Drawing Title
**EQUIPMENT
DETAILS**

Drawing Number
C5

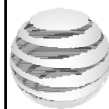


1 SECTOR FRAME DETAIL
-- NOT TO SCALE

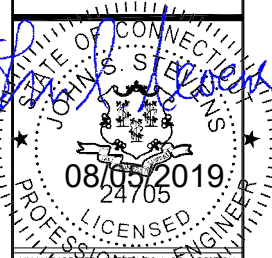
PROPOSED SECTOR FRAME (SITE PR01 VFA12-WLL-30120), CONTRACTOR TO INSTALL PER MANUFACTURERS SPECS

INFINIGY

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at&t



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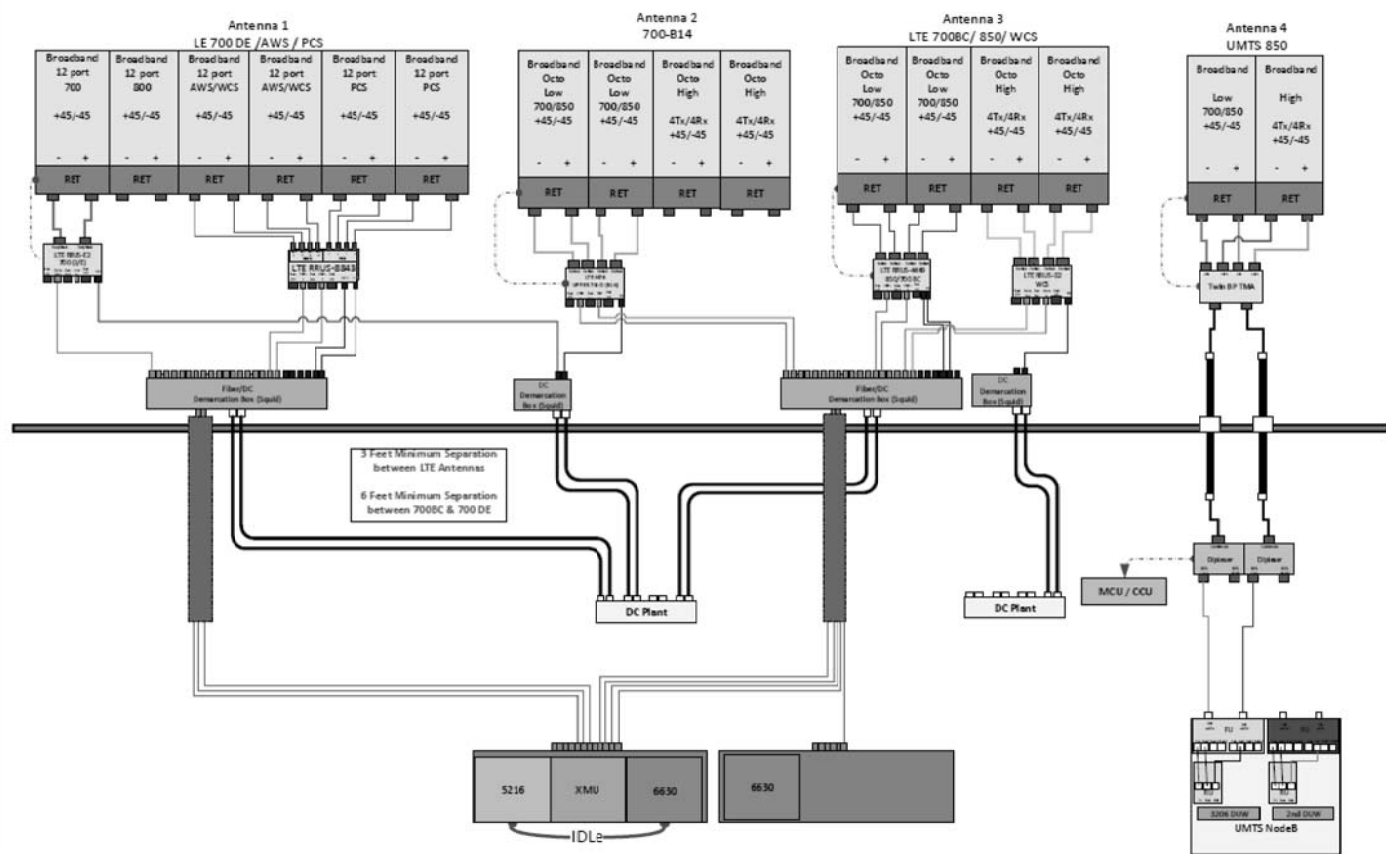
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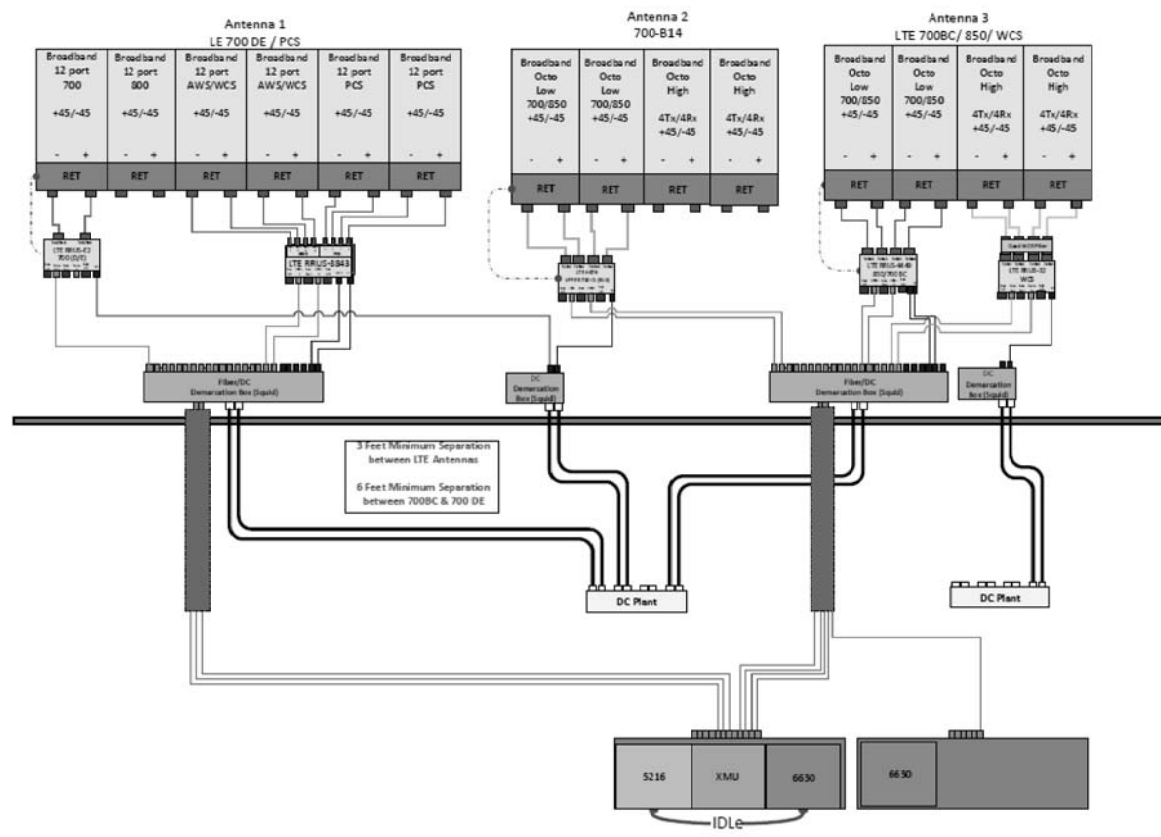
EQUIPMENT
DETAILS

Drawing Number

C5A



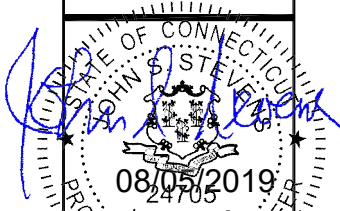
ALPHA AND BETA SECTOR



GAMMA SECTOR

1 PLUMBING DIAGRAM (FINAL CONFIGURATION)
NOT TO SCALE

*BASED ON LTE RFDS, V. 5.0, DATED 02/04/19



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FA# 10035296
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NEW HAVEN, CT 06514

Prepared For:

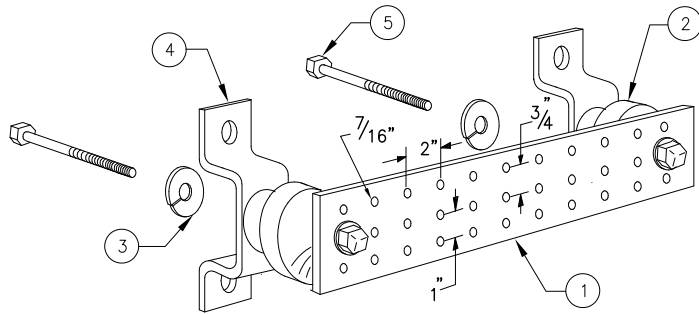


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Date:	08/05/19

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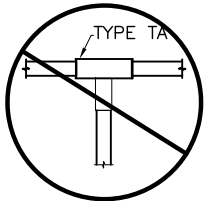
Drawing Title
**PLUMBING
DIAGRAM**

Drawing Number
C6

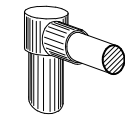


LEGEND

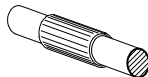
- 1 - SOLID TINNED COPPER GROUND BAR, 1/4"x 4"x 20" MIN., NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
- 2 - INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4
- 3 - 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8
- 4 - WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056
- 5 - 5/8-11 X 1" H.H.C.S. BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1
- 6 - GROUND BAR SHALL BE SIZED TO ACCOMODATE ALL GROUNDING CONNECTIONS REQUIRED PLUS PROVIDE 50% SPARE CAPACITY
- 7 - GROUND BARS SHALL NEITHER BE FIELD FABRICATED NOR NEW HOLES DRILLED
- 8 - GROUND LUGS SHALL MATCH THE HOLE SPACING ON THE BAR
- 9 - HARDWARE DIAMETER SHALL BE MINIMUM 3/8"



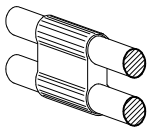
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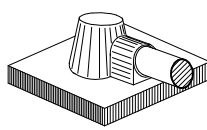
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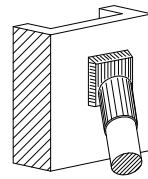
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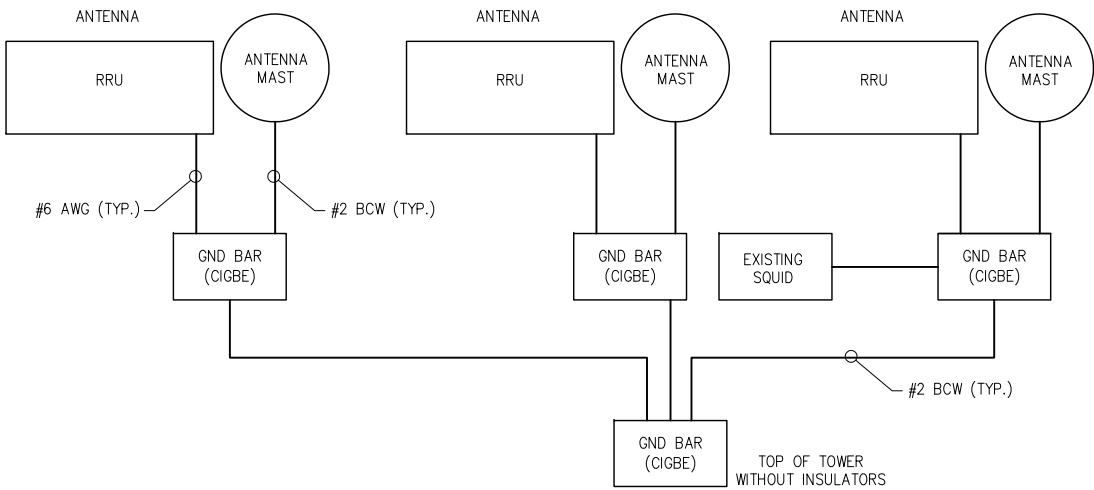
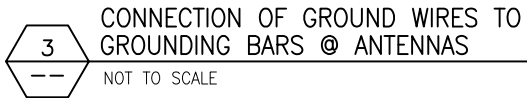
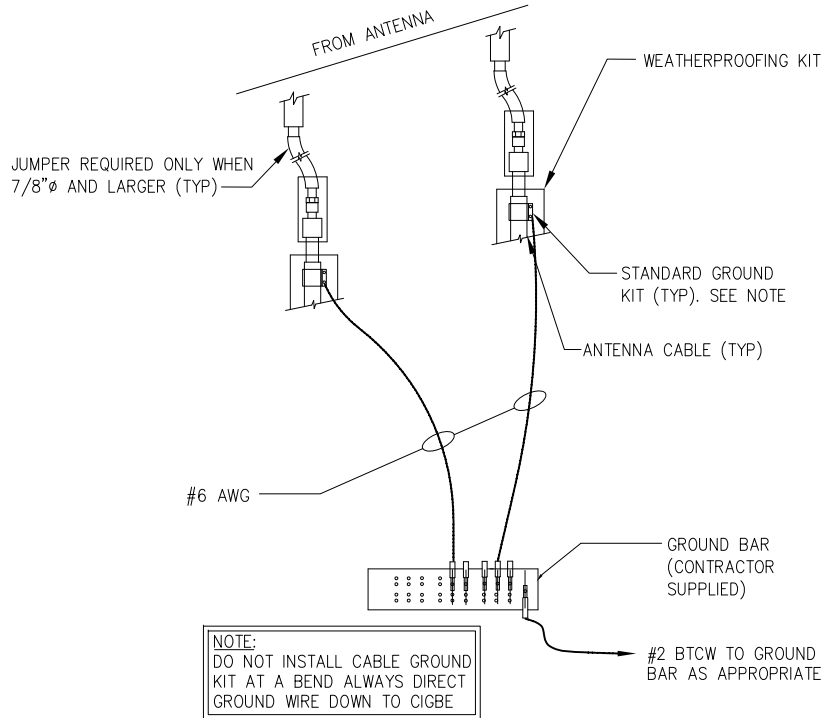
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TYPE KA

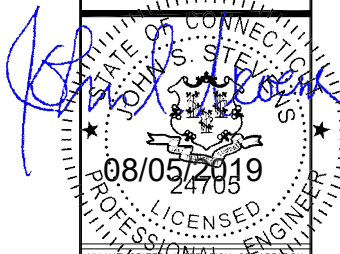


TYPE VS



INFINIGY

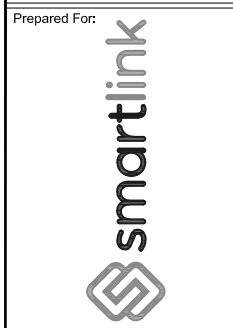
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Albany, NY 12205
Office # (518) 690-0790
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Checked:	AJD	Date:	04/15/19
Project Number:			
1106-A0001-C			

Project Title:
NEW HAVEN
WEST ROCK
CTL02013
FA# 10035296
142 BALDWIN DRIVE
NEW HAVEN, CT 06514



Drawing Scale:	AS NOTED
Date:	08/05/19

CD

Drawing Title
**GROUNDING
DETAILS**

Drawing Number
C7



FROM ZERO TO INFINIGY
the solutions are endless

1033 WATERVLiet SHAKER RD, ALBANY, NY 12205

Mount Analysis Report

August 5, 2019

Site Name	New Haven West Rock
Site Number	CTL02013
FA Number	10035296
PTN Number	2051A0KGAX/2051A0KD6V/2051A0KE0N 2051A0KDX8/2051A0KDXA
Pace Number	MRCTB034929/MRCTB035008/MRCTB034946 MRCTB034915/MRCTB034921
Client	Smartlink
Carrier	AT&T
Infinigy Job Number	499-006
Site Location	142 Baldwin Drive New Haven, CT 06514 41° 20' 43.57" N NAD83 72° 58' 14.50" W NAD83
Mount Centerline EL.	80.0 ft
Mount Classification	Sector Frame
Mount Usage	50.4%
Overall Result	Pass

Upon reviewing the results of this analysis, it is our opinion that the proposed mount meets the specified TIA code requirements. The proposed mounts and connections for the carrier are therefore deemed adequate to support the final loading configuration as listed in this report.



Brenden Archer
Structural Engineering Lead

AZ CA CO FL GA MD NC NH NJ NY TX WA



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Calculations.....	Appended

Introduction

Infinigy Engineering has been requested to perform a mount analysis on the proposed AT&T mounts. All supporting documents have been obtained from the client and are assumed to be accurate and applicable to this site. The mount was analyzed using RISA-3D Version 17.0.4 analysis software.

Supporting Documentation

Photos	Infinigy Engineering Job #499-006, dated November 18, 2018
RFDS	AT&T RFDS ID #2586608, dated February 4, 2019
Construction Drawings	Infinigy Engineering Job #499-006, dated August 5, 2019

Analysis Code Requirements

Wind Speed	97 mph (3-Second Gust, V_{ASD}) / 125 mph (3-Second Gust, V_{ULT})
Wind Speed w/ ice	50 mph (3-Second Gust, V_{ASD}) w/ 1.50" ice
TIA Revision	ANSI/TIA-222-H
Adopted IBC	2015 IBC/ 2018 Connecticut State Building Code
Structure Class	II
Exposure Category	B
Topographic Category	1
Calculated Crest Height	0 ft

Conclusion

Upon reviewing the results of this analysis, it is our opinion that the proposed mount meets the specified TIA code requirements. The proposed mounts and connections for the carrier are therefore deemed adequate to support the final loading configuration as listed in this report.

If you have any questions, require additional information, or actual conditions differ from those as detailed in this report please contact me via the information below:

Brenden Archer
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Final Configuration Loading

Mount CL (ft)	Rad. HT (ft)	Horiz. O/S (ft) ⁽¹⁾	Qty	Appurtenance ^{(2),(3)}	Carrier
80.0	80.0	0.0	2	Andrew SBNH-1D6565C	AT&T
		12.0	2	CCI TPA-65R-LCUUUU-H8	
		9.0	2	Kathrein 800-10965	
		9.0	4	Kathrein 800-10966	
		12.0	1	Quintel QS66512-2	
		0.0	2	CCI DTMAPB7819VG12A	
		--	3	Ericsson RRUS-32	
			3	Ericsson RRUS-4449 B5/B12	
			3	Ericsson RRUS-4478 B14	
			3	Ericsson RRUS-8843 B2/B66A	
			2	Ericsson RRUS E2 B29	
			3	Raycap DC6-48-60-18-8F	
			1	Raycap DC6-48-60-0-8C-EV	

(1) Horizontal Offset is defined as the distance from the left most edge of the platform when viewed facing the tower.

(2) Radios are mounted on self-support tower face pipe horizontal.

(3) Raycaps are attached to tower legs.

Structure Usages

Mount Pipe	21.4%	Pass
Standoff	50.4%	Pass
Horizontal	38.4%	Pass
RATING =	50.4%	Pass

Mount Connection Reactions

Reaction Data	Design Reactions	Analysis Reactions	Result
Tension (kips)	12.34	3.12	25.3%
Shear (kips)	7.70	1.67	21.7%
Unity Check	--	--	47.0%

*Assumed (2) 1/2" A307 Anchors. Contractor to field to verify anchor diameters prior to proper installation.

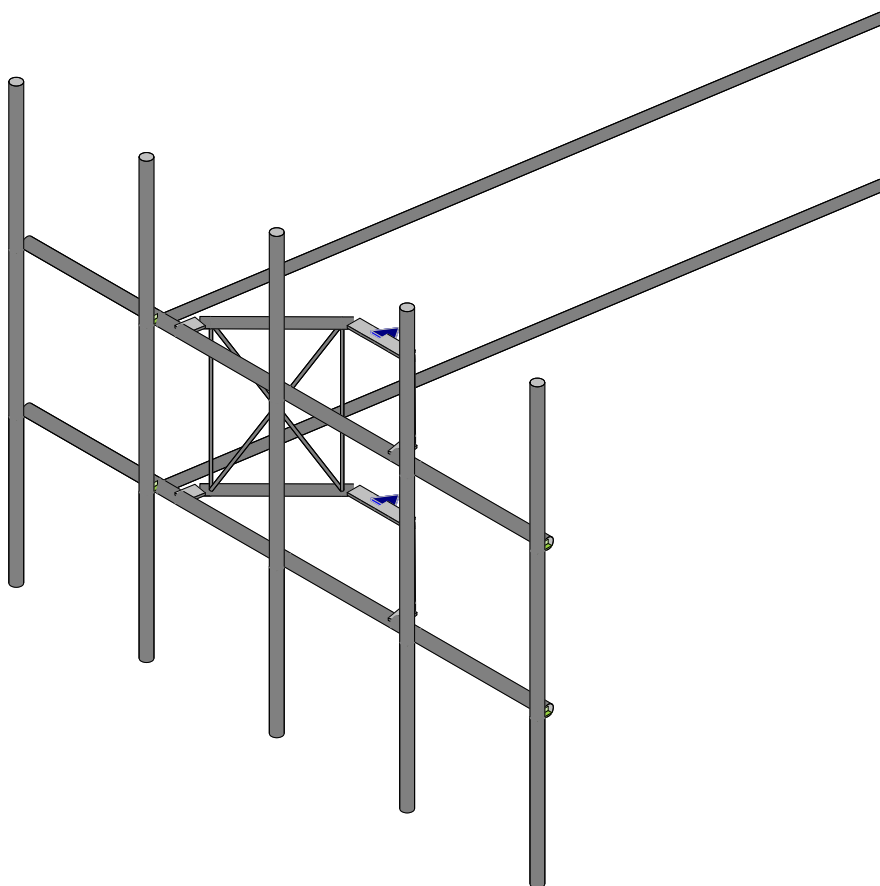
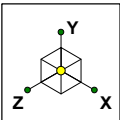
- Mount Connection reactions are acceptable per code calculate capacity.

Assumptions and Limitations

Our structural calculations are completed assuming all information provided to Infinigy Engineering is accurate and applicable to this site. For the purposes of calculations, we assume an overall structure condition of “like new” and all members and connections to be free of corrosion and/or structural defects. The structure owner and/or contractor shall verify the structure’s condition prior to installation of any proposed equipment. If actual conditions differ from those described in this report Infinigy Engineering should be notified immediately to complete a revised evaluation.

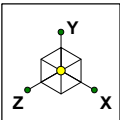
Our evaluation is completed using standard TIA, AISC, ACI, and ASCE methods and procedures. Our structural results are proprietary and should not be used by others as their own. Infinigy Engineering is not responsible for decisions made by others that are or are not based on our supplied assumptions and conclusions.

This report is an evaluation of the proposed carriers mount structure only and does not reflect adequacy of the existing tower, other mounts, or coax mounting attachments. These elements are assumed to be adequate for the purposes of this analysis and are assumed to have been installed per their manufacturer requirements.

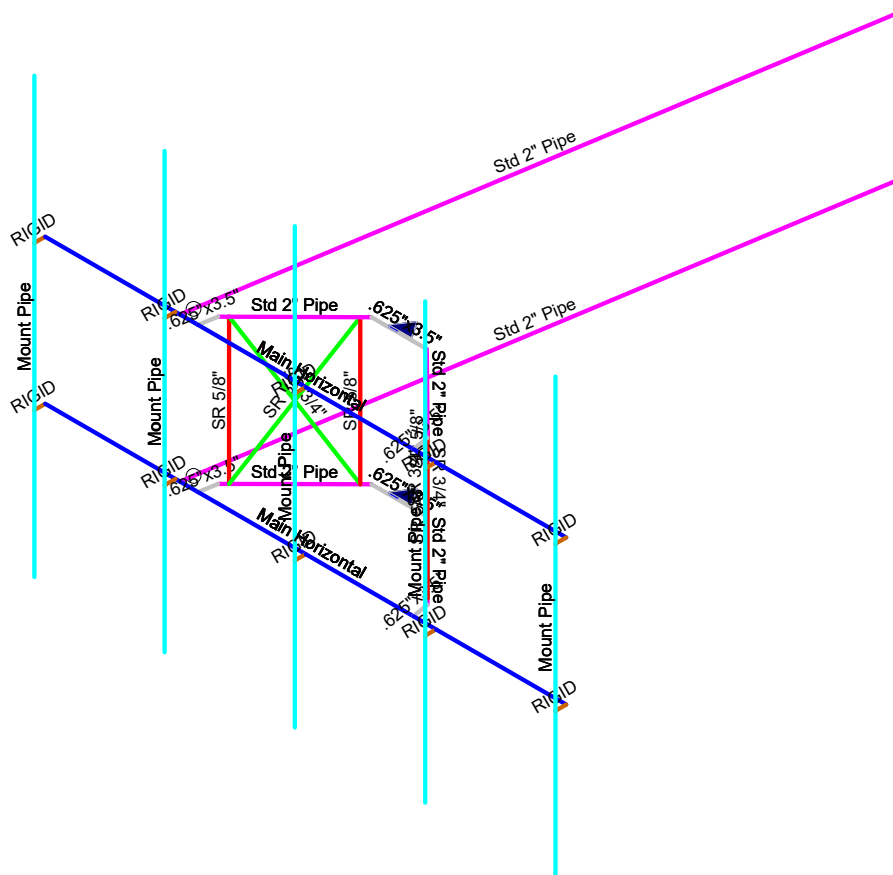


Envelope Only Solution

Infinigy Engineering, PLLC,	CTL02013	Final Configuration
KLB		Aug 5, 2019 at 2:16 PM
499-006		CTL02013_loaded.r3d

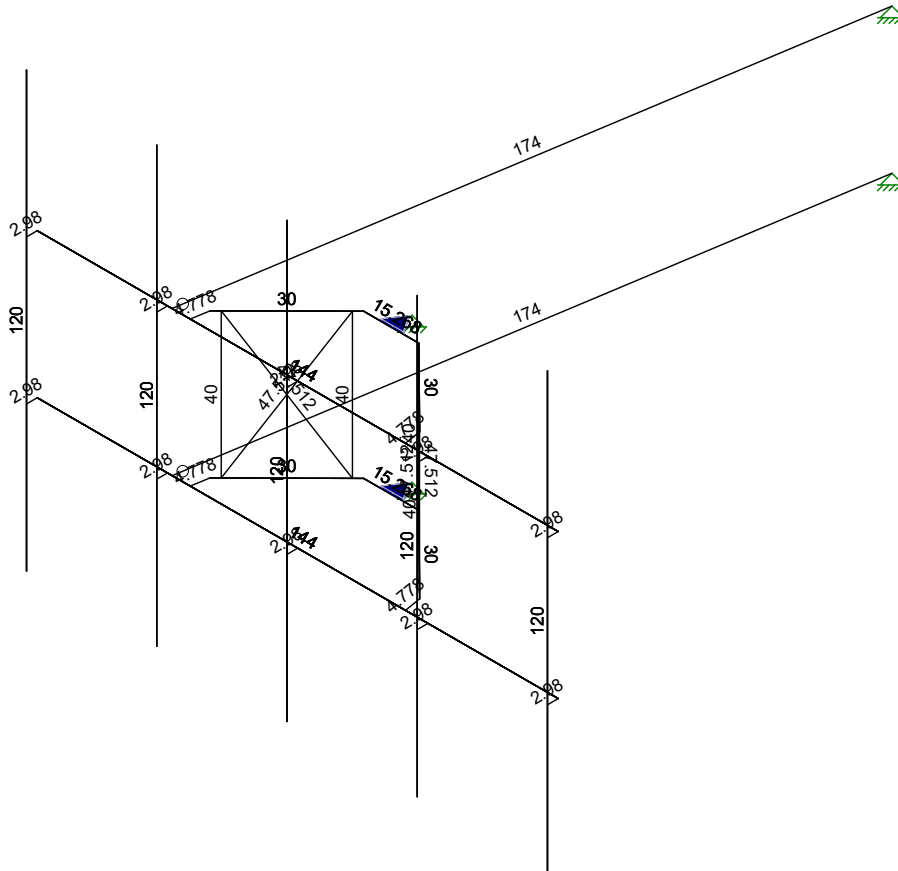


Section Sets	
■	Main Horizontal
■	SR 3/4"
■	SR 5/8"
■	.625"x3.5"
■	Std 2" Pipe
■	Mount Pipe
■	RIGID

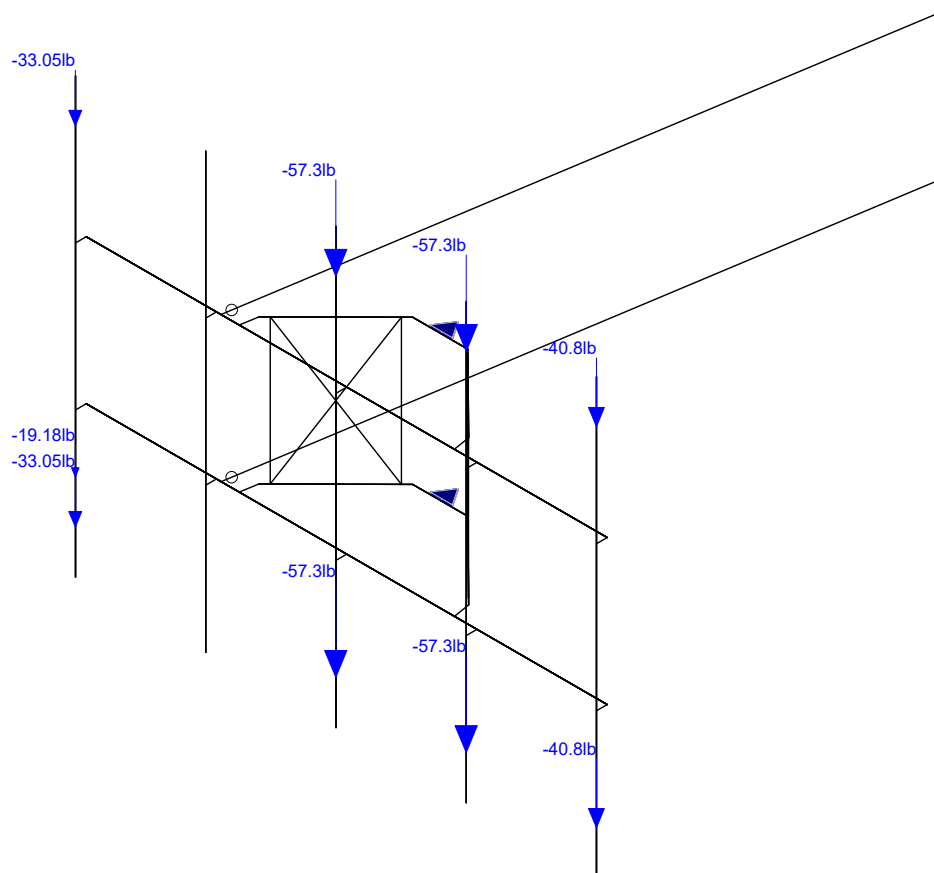
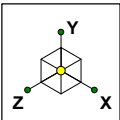


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Infinigy Engineering, PLLC,	CTL02013	Final Configuration
KLB		Aug 5, 2019 at 2:16 PM
499-006		CTL02013_loaded.r3d

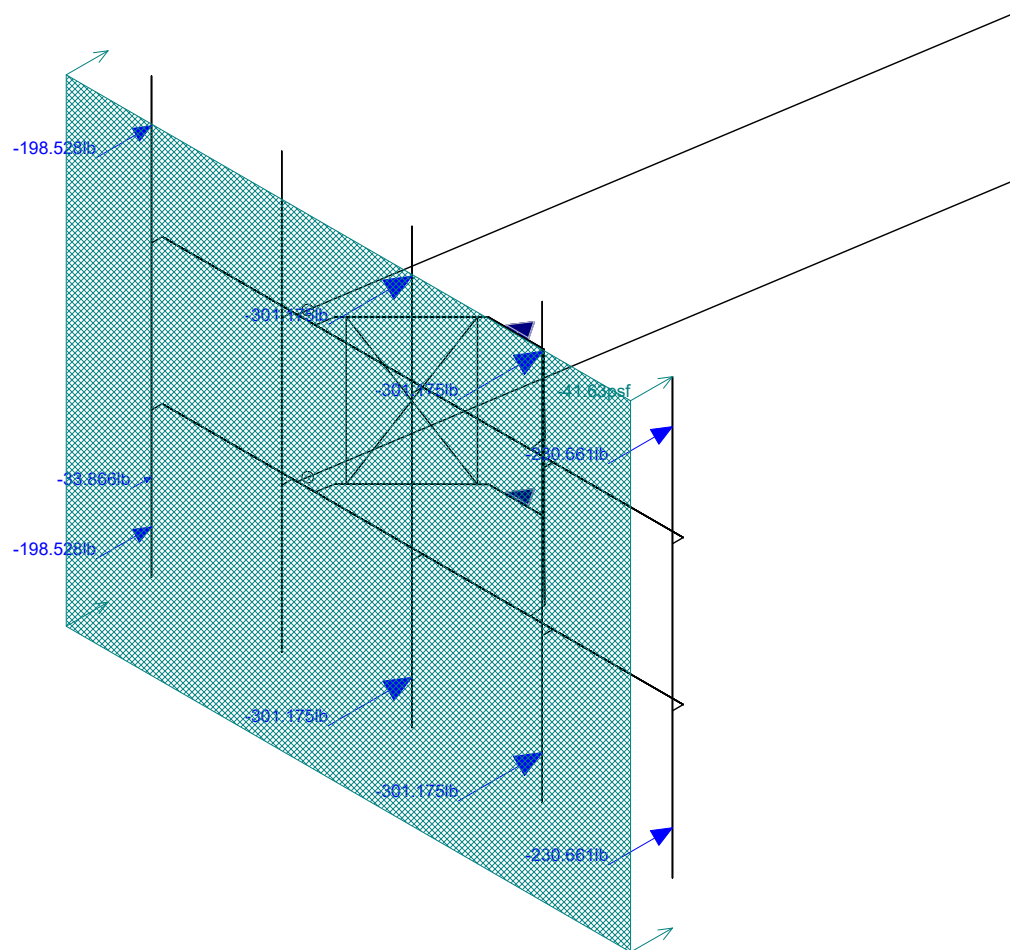
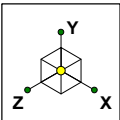


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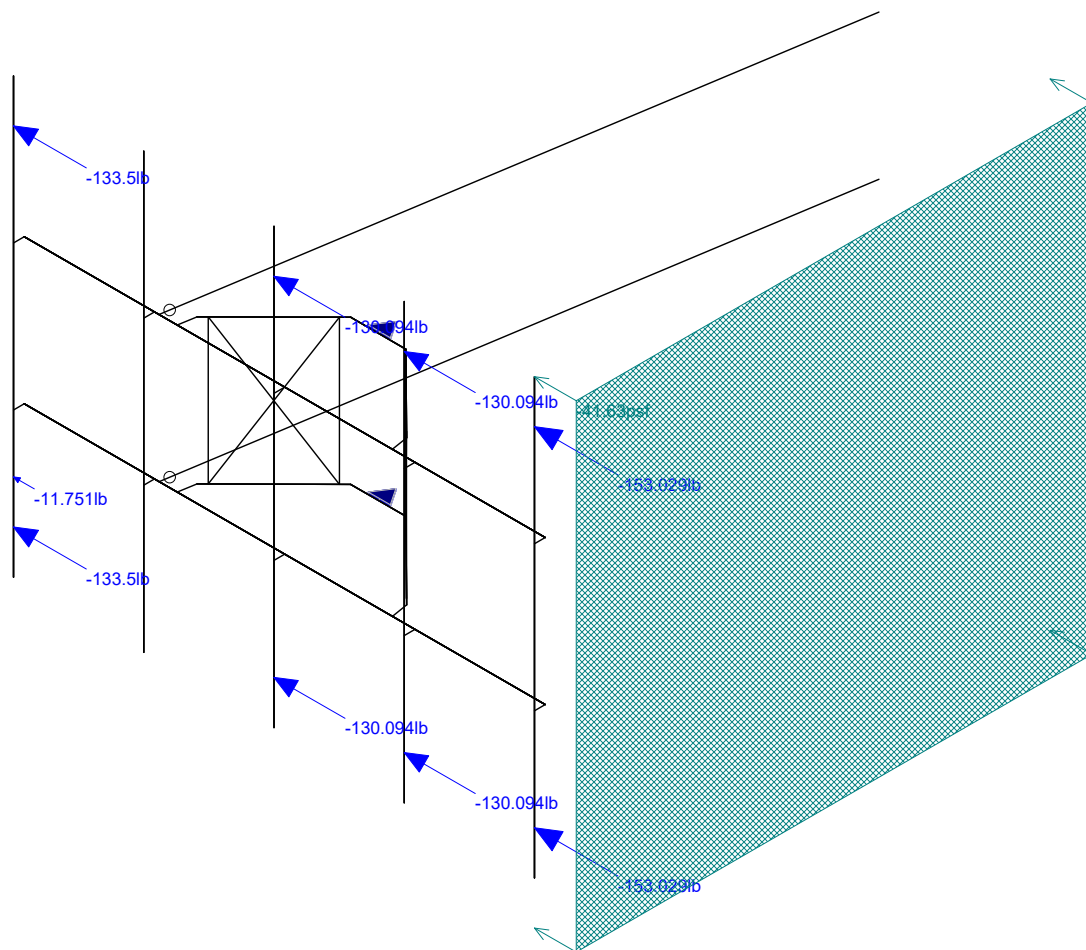
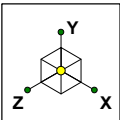
Loads: BLC 1, Self Weight
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Infinigy Engineering, PLLC,	CTL02013	Final Configuration
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499-006		CTL02013_loaded.r3d



Loads: BLC 2, Wind Load AZI 000
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Infinigy Engineering, PLLC,	CTL02013	Final Configuration
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499-006		CTL02013_loaded.r3d



Loads: BLC 3, Wind Load AZI 090
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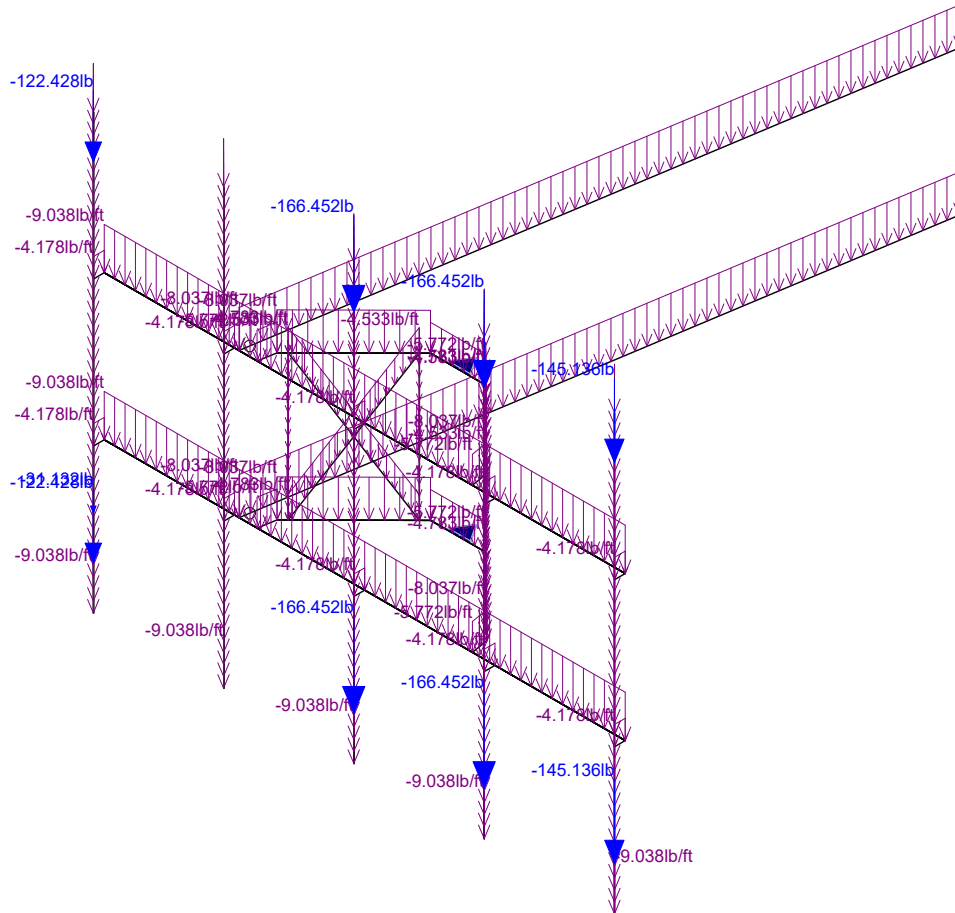
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499-006

CTL02013

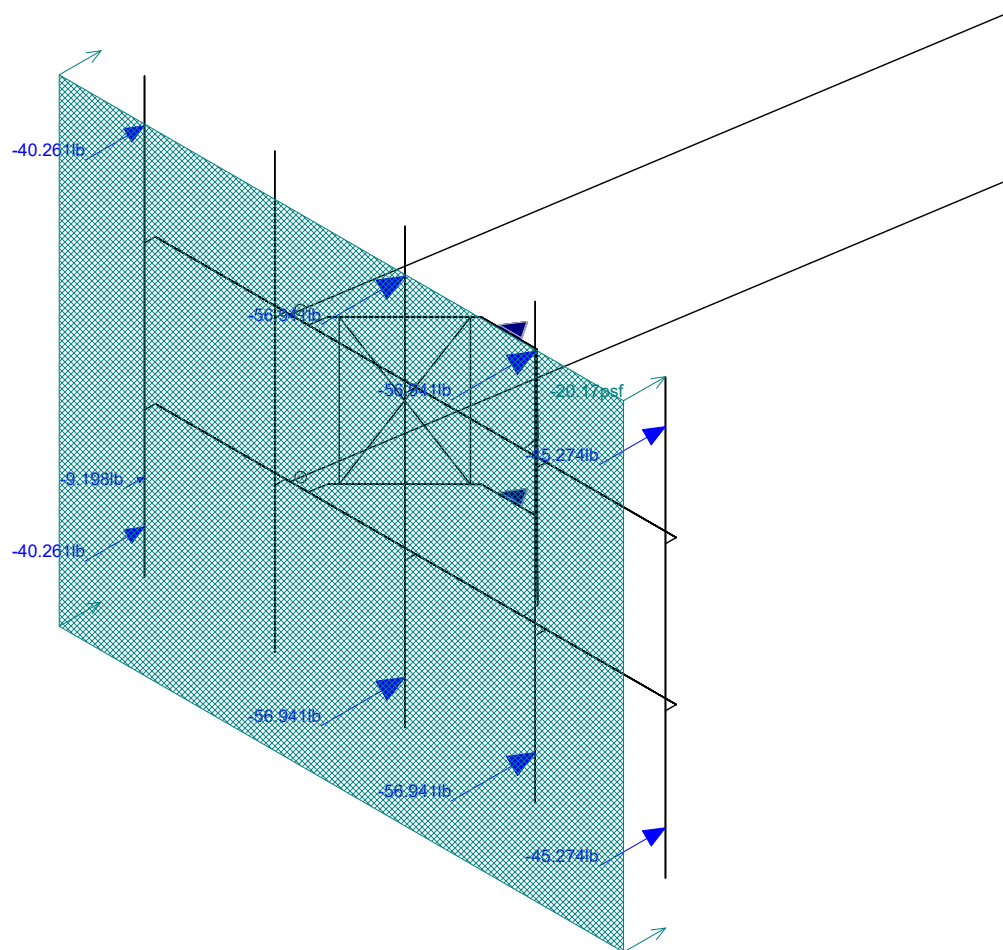
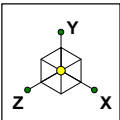
Final Configuration

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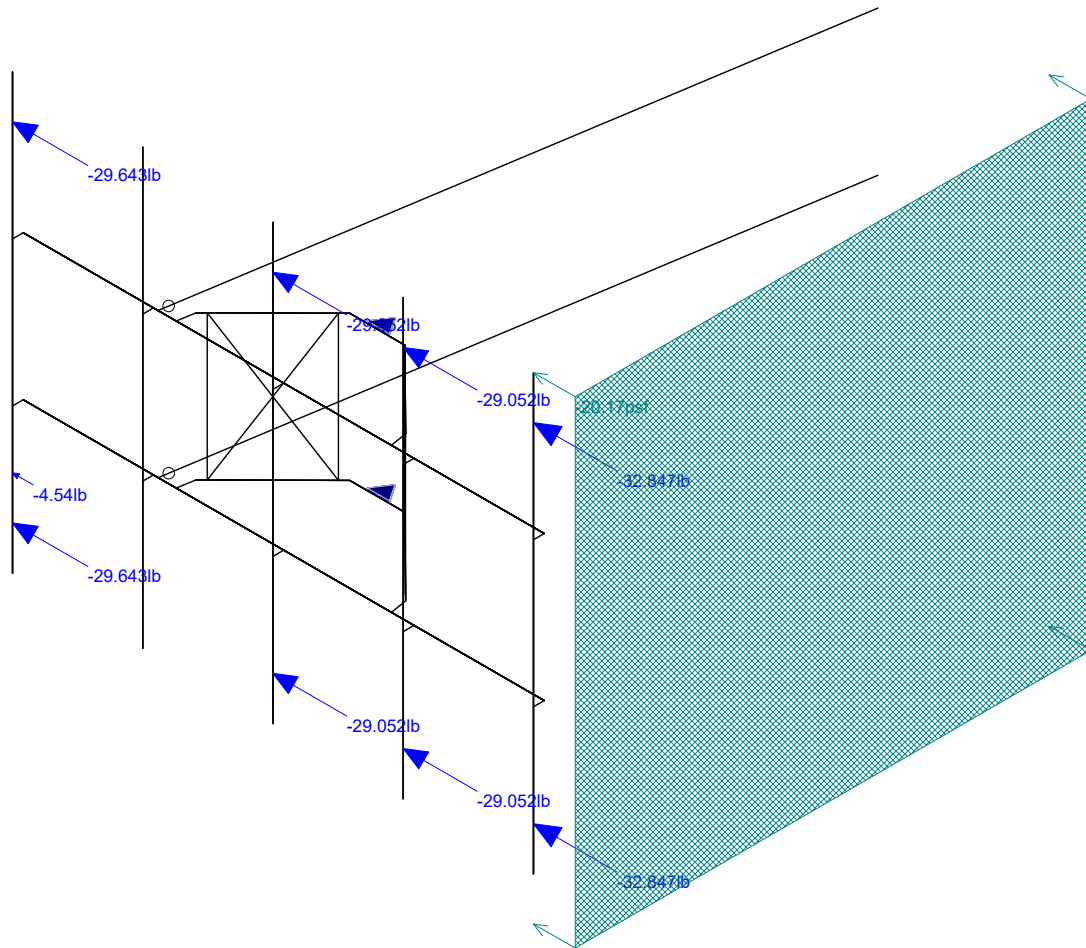


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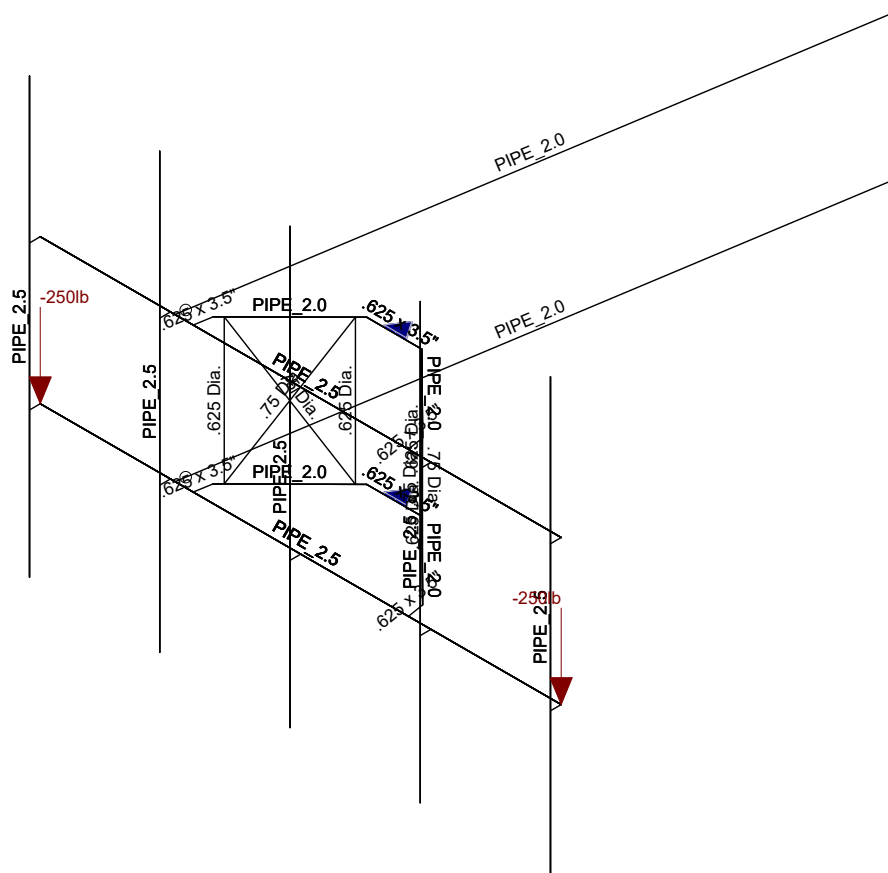
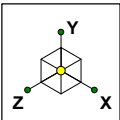


Loads: BLC 5, Wind + Ice Load AZI 000
Envelope Only Solution

Infinigy Engineering, PLLC,	CTL02013	Final Configuration
KLB		Aug 5, 2019 at 2:17 PM
499-006		CTL02013_loaded.r3d



CTL02013_loaded.r3d



Loads: BLC 7, Service Live 1
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Infinigy Engineering, PLLC,
KLB
499-006

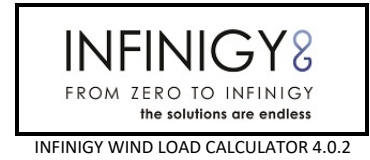
CTL02013

Final Configuration

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CTL02013_loaded.r3d

Site Name: **CTL02013**
 Client: **Smartlink**
 Carrier: **AT&T Mobility**
 Engineer: **BDA**
 Date: **8/5/2019**



Site Information Inputs:
 Adopted Building Code: **2015 IBC**
 Structure Load Standard: **TIA-222-H**
 Antenna Load Standard: **TIA-222-H**
 Structure Risk Category: **II**
 Structure Type: **Mount - Sector**
 Number of Sectors: **3**
 Main Structure Shape: **Round**

Rooftop Inputs:
 Rooftop Wind Speed-Up?: **No**

Wind Loading Inputs:
 Design Wind Velocity: **125** mph (ultimate 3-second gust)
 Wind Centerline 1 (z_1): **80.0** ft
 Side Face Angle (θ): **60** degrees
 Exposure Category: **B**
 Topographic Category: **1**

Wind with No Ice		
q_z (psf)	G _h	F _{ST} (psf)
34.69	1.00	41.63

Wind with Ice		
q_z (psf)	G _h	F _{ST} (psf)
5.55	1.00	20.17

Ice Loading Inputs:
 Is Ice Loading Needed?: **Yes**
 Ice Wind Velocity: **50** mph (ultimate 3-second gust)
 Base Ice Thickness: **1.50** in

Appurtenances	Elevation (ft)	Total Quantity	K _a	Front Shape	Side Shape	q_z (psf)	EPA (ft ²)	F _z (lbs)	F _x (lbs)	F _z (60) (lbs)	F _x (30) (lbs)
ANDREW SBNH-1D6565C	80.0	2	1.00	Flat	Flat	34.69	11.45	397.06	267.00	299.51	364.54
CCI ANTENNAS TPA-65R-LCUUUU-H8	80.0	2	1.00	Flat	Flat	34.69	13.30	461.32	306.06	344.87	422.51
KATHREIN 80010966	80.0	2	1.00	Flat	Flat	34.69	17.36	602.35	260.19	345.73	516.81
KATHREIN 80010966	80.0	2	1.00	Flat	Flat	34.69	17.36	602.35	260.19	345.73	516.81
KATHREIN 80010965	80.0	1	1.00	Flat	Flat	34.69	13.81	479.22	202.37	271.58	410.01
KATHREIN 80010965	80.0	1	1.00	Flat	Flat	34.69	13.81	479.22	202.37	271.58	410.01
QUINTEL TECHNOLOGY QS66512-2	80.0	1	1.00	Flat	Flat	34.69	8.13	282.16	235.90	247.47	270.59
ERICSSON TME-RRUS E2 B29	80.0	3	1.00	Flat	Flat	34.69	3.15	109.11	44.59	60.72	92.98
ERICSSON TME-RRUS 32	80.0	3	1.00	Flat	Flat	34.69	2.86	99.12	61.63	71.00	89.75
ERICSSON TME-RADIO 4449	80.0	3	1.00	Flat	Flat	34.69	1.98	68.69	48.92	53.86	63.75
ERICSSON TME-RRUS 4478 B14	80.0	3	1.00	Flat	Flat	34.69	1.84	63.92	36.73	43.53	57.12
ERICSSON TME-RADIO 8843	80.0	3	1.00	Flat	Flat	34.69	1.98	68.69	58.80	61.27	66.22
CCI ANTENNAS TME-DTMABP7819VG12A	80.0	2	1.00	Flat	Flat	34.69	0.98	33.87	11.75	17.28	28.34
RAYCAP TME-DC6-48-60-18-8F	80.0	3	1.00	Round	Round	34.69	1.21	42.03	42.03	42.03	42.03
RAYCAP TME-DC6-48-60-0-8C-EV	80.0	1	1.00	Round	Round	34.69	1.21	42.03	42.03	42.03	42.03

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M32	NP1	N11			RIGID	None	None	RIGID	Typical
2	M2	N12	N1		90	.625"x3.5"	Beam	Pipe	A36 Gr.36	Typical
3	M4	N17	N4		90	.625"x3.5"	Beam	Pipe	A36 Gr.36	Typical
4	M6	N16	N7		90	.625"x3.5"	Beam	Pipe	A36 Gr.36	Typical
5	M8	N13	N10		90	.625"x3.5"	Beam	Pipe	A36 Gr.36	Typical
6	M14	N11	N14			Main Horizontal	Beam	Pipe	A53-b	Typical
7	M15	N18	N15			Main Horizontal	Beam	Pipe	A53-b	Typical
8	M16	N1	N2			Std 2" Pipe	Beam	Pipe	A53-b	Typical
9	M17	N4	N3			Std 2" Pipe	Beam	Pipe	A53-b	Typical
10	M18	N7	N8			Std 2" Pipe	Beam	Pipe	A53-b	Typical
11	M19	N10	N9			Std 2" Pipe	Beam	Pipe	A53-b	Typical
12	M24	N50	N51			SR 5/8"	Beam	Pipe	A36 Gr.36	Typical
13	M25	N54A	N55A			SR 5/8"	Beam	Pipe	A36 Gr.36	Typical
14	M26	N57A	N56A			SR 5/8"	Beam	Pipe	A36 Gr.36	Typical
15	M27	N53	N52			SR 5/8"	Beam	Pipe	A36 Gr.36	Typical
16	M28	N57A	N52			SR 3/4"	Beam	Pipe	A36 Gr.36	Typical
17	M29	N56A	N53			SR 3/4"	Beam	Pipe	A36 Gr.36	Typical
18	M30	N51	N54A			SR 3/4"	Beam	Pipe	A36 Gr.36	Typical
19	M31	N50	N55A			SR 3/4"	Beam	Pipe	A36 Gr.36	Typical
20	M39A	N50B	N18			RIGID	None	None	RIGID	Typical
21	MP5	N13B	N13A			Mount Pipe	Beam	Pipe	A53-b	Typical
22	M37B	N44	N52A			RIGID	None	None	RIGID	Typical
23	M38	N47	N53A			RIGID	None	None	RIGID	Typical
24	MP4	N42	N43			Mount Pipe	Beam	Pipe	A53-b	Typical
25	M40B	N50A	N36			RIGID	None	None	RIGID	Typical
26	M41A	N51A	N34			RIGID	None	None	RIGID	Typical
27	MP3	N48	N49			Mount Pipe	Beam	Pipe	A53-b	Typical
28	M43	N54B	N55			RIGID	None	None	RIGID	Typical
29	M44	N55B	N54			RIGID	None	None	RIGID	Typical
30	MP2	N52B	N53B			Mount Pipe	Beam	Pipe	A53-b	Typical
31	M46	N58	N14			RIGID	None	None	RIGID	Typical
32	M47	N59	N15			RIGID	None	None	RIGID	Typical
33	MP1	N56	N57			Mount Pipe	Beam	Pipe	A53-b	Typical
34	M40C	N9	N2		90	.625"x3.5"	Beam	Pipe	A36 Gr.36	Typical
35	M41B	N8	N3		90	.625"x3.5"	Beam	Pipe	A36 Gr.36	Typical
36	M36	TF6	N9A			Std 2" Pipe	Beam	Pipe	A53-b	Typical
37	M37	N69	N68			Std 2" Pipe	Beam	Pipe	A53-b	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[LB]
1	General				
2	RIGID		10	29.8	0
3	Total General		10	29.8	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	.625 Dia.	4	160	13.919
7	A36 Gr.36	.625 x 3.5"	6	49.6	30.797
8	A36 Gr.36	.75 Dia.	4	190	23.808
9	A53-b	PIPE 2.0	6	468	135.363
10	A53-b	PIPE 2.5	7	888	405.407
11	Total HR Steel		27	1755.7	609.294
12					
13	Plate Elements	Thickness (in)		Volume (yds^3)	
14	gen_Steel	.6	2	0	7.766

Company : Infinigy Engineering, PLLC,
 Designer : KLB
 Job Number : 499-006
 Model Name : CTL02013

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 Checked By: _____

Material Takeoff (Continued)

	Material	Size	Pieces	Length[in]	Weight[LB]
15	Total Plates		2	0	7.766

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed Area(Me...	Surface(...
1	Self Weight	DL		-1			9		
2	Wind Load AZI 000	WLZ					9	1	
3	Wind Load AZI 090	WLX					9	1	
4	Ice Weight	OL1					9	37	
5	Wind + Ice Load AZI 000	OL2					9	1	
6	Wind + Ice Load AZI 090	OL3					9	1	
7	Service Live 1	LL				2			
8	BLC 2 Transient Area Loads	None						25	
9	BLC 3 Transient Area Loads	None						31	
10	Maintenance Load 1	None				1			
11	Maintenance Load 2	None				1			
12	Maintenance Load 3	None				1			
13	Maintenance Load 4	None				1			
14	Maintenance Load 5	None				1			
15	BLC 5 Transient Area Loads	None						25	
16	BLC 6 Transient Area Loads	None						31	

Load Combinations

	Description	S...P...	S...B...Fa...	BLC Fac...	BLC Fa...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...
1	1.4DL	Y...Y	DL 1.4												
2	1.2DL + 1WL AZI 0	Y...Y	DL 1.2 WLZ	1 W...											
3	1.2DL + 1WL AZI 30	Y...Y	DL 1.2 WLZ	.866 W...	.5										
4	1.2DL + 1WL AZI 60	Y...Y	DL 1.2 WLZ	.5 W...	.866										
5	1.2DL + 1WL AZI 90	Y...Y	DL 1.2 WLZ	W...	1										
6	1.2DL + 1WL AZI 120	Y...Y	DL 1.2 WLZ	-.5 W...	.866										
7	1.2DL + 1WL AZI 150	Y...Y	DL 1.2 WLZ	-.866 W...	.5										
8	1.2DL + 1WL AZI 180	Y...Y	DL 1.2 WLZ	-1 W...											
9	1.2DL + 1WL AZI 210	Y...Y	DL 1.2 WLZ	-.866 W...	-.5										
10	1.2DL + 1WL AZI 240	Y...Y	DL 1.2 WLZ	-.5 W...	-.866										
11	1.2DL + 1WL AZI 270	Y...Y	DL 1.2 WLZ	W...	-1										
12	1.2DL + 1WL AZI 300	Y...Y	DL 1.2 WLZ	.5 W...	-.866										
13	1.2DL + 1WL AZI 330	Y...Y	DL 1.2 WLZ	.866 W...	-.5										
14	0.9DL + 1WL AZI 0	Y...Y	1 .9 WLZ	1 W...											
15	0.9DL + 1WL AZI 30	Y...Y	1 .9 WLZ	.866 W...	.5										
16	0.9DL + 1WL AZI 60	Y...Y	1 .9 WLZ	.5 W...	.866										
17	0.9DL + 1WL AZI 90	Y...Y	1 .9 WLZ	W...	1										
18	0.9DL + 1WL AZI 120	Y...Y	1 .9 WLZ	-.5 W...	.866										
19	0.9DL + 1WL AZI 150	Y...Y	1 .9 WLZ	-.866 W...	.5										
20	0.9DL + 1WL AZI 180	Y...Y	1 .9 WLZ	-1 W...											
21	0.9DL + 1WL AZI 210	Y...Y	1 .9 WLZ	-.866 W...	-.5										
22	0.9DL + 1WL AZI 240	Y...Y	1 .9 WLZ	-.5 W...	-.866										
23	0.9DL + 1WL AZI 270	Y...Y	1 .9 WLZ	W...	-1										
24	0.9DL + 1WL AZI 300	Y...Y	1 .9 WLZ	.5 W...	-.866										
25	0.9DL + 1WL AZI 330	Y...Y	1 .9 WLZ	.866 W...	-.5										
26	1.2D + 1.0Di	Y...Y	DL 1.2 OL1	1											
27	1.2D + 1.0Di + 1.0Wi AZI 0	Y...Y	DL 1.2 OL1	1 OL2	1 ...										
28	1.2D + 1.0Di + 1.0Wi AZI 30	Y...Y	DL 1.2 OL1	1 OL2	.866 ...	.5									
29	1.2D + 1.0Di + 1.0Wi AZI 60	Y...Y	DL 1.2 OL1	1 OL2	.5 ...	.8...									
30	1.2D + 1.0Di + 1.0Wi AZI 90	Y...Y	DL 1.2 OL1	1 OL2	... 1										
31	1.2D + 1.0Di + 1.0Wi AZI 120	Y...Y	DL 1.2 OL1	1 OL2	-.5 ...	.8...									

Load Combinations (Continued)

	Description	S...P...	S...B...Fa...	BLC	Fac...	BLCFa...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...
32	1.2D + 1.0Di + 1.0Wi AZI 150	Y...Y	DL 1.2	OL1	1	OL2-.866	...	.5					
33	1.2D + 1.0Di + 1.0Wi AZI 180	Y...Y	DL 1.2	OL1	1	OL2 -.1	...						
34	1.2D + 1.0Di + 1.0Wi AZI 210	Y...Y	DL 1.2	OL1	1	OL2-.866	...	-.5					
35	1.2D + 1.0Di + 1.0Wi AZI 240	Y...Y	DL 1.2	OL1	1	OL2 -.5	...	----					
36	1.2D + 1.0Di + 1.0Wi AZI 270	Y...Y	DL 1.2	OL1	1	OL2	...	-.1					
37	1.2D + 1.0Di + 1.0Wi AZI 300	Y...Y	DL 1.2	OL1	1	OL2 .5	...	----					
38	1.2D + 1.0Di + 1.0Wi AZI 330	Y...Y	DL 1.2	OL1	1	OL2 .866	...	-.5					
39	1.2DL + 1.5LV	Y...Y	DL 1.2	LL	1.5								
40	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ .058	...						
41	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ .05	...	.0...					
42	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ .029	...	.05					
43	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ	...	.0...					
44	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ-.029	...	.05					
45	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ-.05	...	.0...					
46	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ-.058	...						
47	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ-.05	...	----					
48	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ-.029	...	-.05					
49	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ	...	----					
50	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ .029	...	-.05					
51	1.2DL + 1.5LM (LM-1) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	10	1.5	WLZ .05	...	----					
52	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ .058	...						
53	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ .05	...	.0...					
54	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ .029	...	.05					
55	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ	...	.0...					
56	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ-.029	...	.05					
57	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ-.05	...	.0...					
58	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ-.058	...						
59	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ-.05	...	----					
60	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ-.029	...	-.05					
61	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ	...	----					
62	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ .029	...	-.05					
63	1.2DL + 1.5LM (LM-2) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	11	1.5	WLZ .05	...	----					
64	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ .058	...						
65	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ .05	...	.0...					
66	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ .029	...	.05					
67	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ	...	.0...					
68	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ-.029	...	.05					
69	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ-.05	...	.0...					
70	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ-.058	...						
71	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ-.05	...	----					
72	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ-.029	...	-.05					
73	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ	...	----					
74	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ .029	...	-.05					
75	1.2DL + 1.5LM (LM-3) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	12	1.5	WLZ .05	...	----					
76	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ .058	...						
77	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ .05	...	.0...					
78	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ .029	...	.05					
79	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ	...	.0...					
80	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ-.029	...	.05					
81	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ-.05	...	.0...					
82	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ-.058	...						
83	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ-.05	...	----					
84	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ-.029	...	-.05					
85	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ	...	----					
86	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ .029	...	-.05					
87	1.2DL + 1.5LM (LM-4) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	13	1.5	WLZ .05	...	----					
88	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...Y	DL 1.2	14	1.5	WLZ .058	...						

Load Combinations (Continued)

	Description	S...P...	S...B...Fa...	BLC	Fac...	BLC	Fa...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...	B...F...
89	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ .05	...	.0...						
90	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ .029	...	.05						
91	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ	...	.0...						
92	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ-.029	...	.05						
93	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ-.05	...	.0...						
94	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ-.058	...							
95	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ-.05	...	-.0...						
96	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ-.029	...	-.05						
97	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ	...	-.0...						
98	1.2DL + 1.5LM (LM-5) + 1SWL (30 mph) AZ...	Y...	Y	DL 1.2	14	1.5	WLZ.029	...	-.05						

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N1B	max	1617.668	91	1674.042	33	3118.658	38	0	98	0	98	0	98
2		min	-1470.851	49	407.95	14	-1479.323	19	0	1	0	1	0	1
3	N1A	max	1469.327	43	1754.451	27	1487.185	25	0	98	0	98	0	98
4		min	-1615.815	97	428.127	20	-3118.51	32	0	1	0	1	0	1
5	N9A	max	149.701	98	88.995	36	1045.67	18	0	98	0	98	0	98
6		min	-134.972	18	22.393	18	-1133.489	12	0	1	0	1	0	1
7	N68	max	131.625	24	88.6	36	1116.832	6	0	98	0	98	0	98
8		min	-149.723	92	22.364	18	-1026.006	24	0	1	0	1	0	1
9	Totals:	max	1896.598	5	3600.562	27	2984.878	2						
10		min	-1896.598	23	911.831	20	-2984.878	20						

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Main Horizontal	PIPE 2.5	Beam	Pipe	A53-b	Typical	1.61	1.45	1.45	2.89
2	SR 3/4"	.75 Dia.	Beam	Pipe	A36 Gr.36	Typical	.442	.016	.016	.031
3	SR 5/8"	.625 Dia.	Beam	Pipe	A36 Gr.36	Typical	.307	.007	.007	.015
4	.625"x3.5"	.625 x 3.5"	Beam	Pipe	A36 Gr.36	Typical	2.188	.071	2.233	.253
5	Std 2" Pipe	PIPE 2.0	Beam	Pipe	A53-b	Typical	1.02	.627	.627	1.25
6	Mount Pipe	PIPE 2.5	Beam	Pipe	A53-b	Typical	1.61	1.45	1.45	2.89

Joint Boundary Conditions

Joint Label	X [lb/in]	Y [lb/in]	Z [lb/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1A	Reaction	Reaction	Reaction		
2	N1B	Reaction	Reaction	Reaction		
3	N9A	Reaction	Reaction	Reaction		
4	N68	Reaction	Reaction	Reaction		

Member Advanced Data

Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
1	M32					Yes	** NA **			None
2	M2					Yes				None
3	M4					Yes				None
4	M6					Yes				None
5	M8					Yes				None
6	M14					Yes				None
7	M15					Yes				None
8	M16					Yes				None
9	M17					Yes				None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Rat...	Analysis ...	Inactive	Seismic...
10	M18						Yes				None
11	M19						Yes				None
12	M24						Yes				None
13	M25						Yes				None
14	M26						Yes				None
15	M27						Yes				None
16	M28						Yes				None
17	M29					Tension ...	Yes				None
18	M30						Yes				None
19	M31					Tension ...	Yes				None
20	M39A						Yes	** NA **			None
21	MP5						Yes				None
22	M37B						Yes	** NA **			None
23	M38						Yes	** NA **			None
24	MP4						Yes				None
25	M40B						Yes	** NA **			None
26	M41A						Yes	** NA **			None
27	MP3						Yes				None
28	M43						Yes	** NA **			None
29	M44						Yes	** NA **			None
30	MP2						Yes				None
31	M46						Yes	** NA **			None
32	M47						Yes	** NA **			None
33	MP1						Yes	Default			None
34	M40C						Yes				None
35	M41B						Yes				None
36	M36	BenPIN					Yes	Default			None
37	M37	BenPIN					Yes	Default			None

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. (/1...	Density[lb/ft^3]	Yield[psi]	Ry	Fu[psi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	490	36000	1.5	58000	1.2
2	A572 Gr.50	29000	11154	.3	.65	490	50000	1.1	58000	1.2
3	A992	29000	11154	.3	.65	490	50000	1.1	58000	1.2
4	A500 Gr.42	29000	11154	.3	.65	490	42000	1.3	58000	1.1
5	A500 Gr.46	29000	11154	.3	.65	490	46000	1.2	58000	1.1
6	A53-b	29000	11154	.3	.65	490	35000	1.5	58000	1.2

Joint Loads and Enforced Displacements (BLC 7 : Service Live 1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2/i...
1	N18	L	Y	-250
2	N15	L	Y	-250

Joint Loads and Enforced Displacements (BLC 10 : Maintenance Load 1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2/i...
1	N18	L	Y	-500

Joint Loads and Enforced Displacements (BLC 11 : Maintenance Load 2)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2/i...
1	N53A	L	Y	-500

Joint Loads and Enforced Displacements (BLC 12 : Maintenance Load 3)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2/i...
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Joint Loads and Enforced Displacements (BLC 12 : Maintenance Load 3) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2/i...
1	N34	L	Y	-500

Joint Loads and Enforced Displacements (BLC 13 : Maintenance Load 4)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2/i...
1	N54	L	Y	-500

Joint Loads and Enforced Displacements (BLC 14 : Maintenance Load 5)

	Joint Label	L,D,M	Direction	Magnitude[(lb,lb-ft), (in,rad), (lb*s^2/in, lb*s^2/i...
1	N15	L	Y	-500

Member Point Loads (BLC 1 : Self Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP5	Y	-33.05	12
2	MP1	Y	-40.8	12
3	MP2	Y	-57.3	12
4	MP3	Y	-57.3	12
5	MP5	Y	-19.18	24
6	MP5	Y	-33.05	108
7	MP1	Y	-40.8	108
8	MP2	Y	-57.3	108
9	MP3	Y	-57.3	108

Member Point Loads (BLC 2 : Wind Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP5	Z	-198.528	12
2	MP1	Z	-230.661	12
3	MP2	Z	-301.175	12
4	MP3	Z	-301.175	12
5	MP5	Z	-33.866	24
6	MP5	Z	-198.528	108
7	MP1	Z	-230.661	108
8	MP2	Z	-301.175	108
9	MP3	Z	-301.175	108

Member Point Loads (BLC 3 : Wind Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP5	X	-133.5	12
2	MP1	X	-153.029	12
3	MP2	X	-130.094	12
4	MP3	X	-130.094	12
5	MP5	X	-11.751	24
6	MP5	X	-133.5	108
7	MP1	X	-153.029	108
8	MP2	X	-130.094	108
9	MP3	X	-130.094	108

Member Point Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP5	Y	-122.428	12
2	MP1	Y	-145.136	12
3	MP2	Y	-166.452	12
4	MP3	Y	-166.452	12
5	MP5	Y	-31.132	24

Member Point Loads (BLC 4 : Ice Weight) (Continued)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
6	MP5	Y	-122.428	108
7	MP1	Y	-145.136	108
8	MP2	Y	-166.452	108
9	MP3	Y	-166.452	108

Member Point Loads (BLC 5 : Wind + Ice Load AZI 000)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP5	Z	-40.261	12
2	MP1	Z	-45.274	12
3	MP2	Z	-56.941	12
4	MP3	Z	-56.941	12
5	MP5	Z	-9.198	24
6	MP5	Z	-40.261	108
7	MP1	Z	-45.274	108
8	MP2	Z	-56.941	108
9	MP3	Z	-56.941	108

Member Point Loads (BLC 6 : Wind + Ice Load AZI 090)

	Member Label	Direction	Magnitude[lb,lb-ft]	Location[in,%]
1	MP5	X	-29.643	12
2	MP1	X	-32.847	12
3	MP2	X	-29.052	12
4	MP3	X	-29.052	12
5	MP5	X	-4.54	24
6	MP5	X	-29.643	108
7	MP1	X	-32.847	108
8	MP2	X	-29.052	108
9	MP3	X	-29.052	108

Member Distributed Loads (BLC 4 : Ice Weight)

	Member Label	Direction	Start Magnitude[lb/ft,F.psf]	End Magnitude[lb/ft,F.psf]	Start Locatio...	End Location[...
1	M32	Y	-4.178	-4.178	0	%100
2	M2	Y	-5.772	-5.772	0	%100
3	M4	Y	-5.772	-5.772	0	%100
4	M6	Y	-5.772	-5.772	0	%100
5	M8	Y	-5.772	-5.772	0	%100
6	M14	Y	-9.038	-9.038	0	%100
7	M15	Y	-9.038	-9.038	0	%100
8	M16	Y	-8.037	-8.037	0	%100
9	M17	Y	-8.037	-8.037	0	%100
10	M18	Y	-8.037	-8.037	0	%100
11	M19	Y	-8.037	-8.037	0	%100
12	M24	Y	-4.533	-4.533	0	%100
13	M25	Y	-4.533	-4.533	0	%100
14	M26	Y	-4.533	-4.533	0	%100
15	M27	Y	-4.533	-4.533	0	%100
16	M28	Y	-4.783	-4.783	0	%100
17	M29	Y	-4.783	-4.783	0	%100
18	M30	Y	-4.783	-4.783	0	%100
19	M31	Y	-4.783	-4.783	0	%100
20	M39A	Y	-4.178	-4.178	0	%100
21	MP5	Y	-9.038	-9.038	0	%100
22	M37B	Y	-4.178	-4.178	0	%100
23	M38	Y	-4.178	-4.178	0	%100

Member Distributed Loads (BLC 4 : Ice Weight) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft.F,psf]	End Magnitude[lb/ft.F,psf]	Start Locatio...	End Location[...
24	MP4	Y	-9.038	-9.038	0	%100
25	M40B	Y	-4.178	-4.178	0	%100
26	M41A	Y	-4.178	-4.178	0	%100
27	MP3	Y	-9.038	-9.038	0	%100
28	M43	Y	-4.178	-4.178	0	%100
29	M44	Y	-4.178	-4.178	0	%100
30	MP2	Y	-9.038	-9.038	0	%100
31	M46	Y	-4.178	-4.178	0	%100
32	M47	Y	-4.178	-4.178	0	%100
33	MP1	Y	-9.038	-9.038	0	%100
34	M40C	Y	-5.772	-5.772	0	%100
35	M41B	Y	-5.772	-5.772	0	%100
36	M36	Y	-8.037	-8.037	0	%100
37	M37	Y	-8.037	-8.037	0	%100

Member Distributed Loads (BLC 8 : BLC 2 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft.F,psf]	End Magnitude[lb/ft.F,psf]	Start Locatio...	End Location[...
1	M2	Z	-363	-363	0	4.778
2	M4	Z	-363	-363	0	4.778
3	M6	Z	-363	-363	0	4.778
4	M8	Z	-363	-363	0	4.778
5	M14	Z	-9.974	-9.974	0	144
6	M15	Z	-9.974	-9.974	0	144
7	M16	Z	-5.855	-5.855	0	30
8	M17	Z	-5.855	-5.855	0	30
9	M18	Z	-5.855	-5.855	0	30
10	M19	Z	-5.855	-5.855	0	30
11	M24	Z	-2.168	-2.168	0	40
12	M25	Z	-2.168	-2.168	0	40
13	M26	Z	-2.168	-2.168	0	40
14	M27	Z	-2.168	-2.168	0	40
15	M28	Z	-2.407	-2.407	0	47.512
16	M30	Z	-2.407	-2.407	0	47.512
17	MP5	Z	-9.974	-9.974	0	120
18	MP4	Z	-9.974	-9.974	0	120
19	MP3	Z	-9.974	-9.974	0	120
20	MP2	Z	-9.974	-9.974	0	120
21	MP1	Z	-9.974	-9.974	0	120
22	M40C	Z	-2.168	-2.168	0	15.268
23	M41B	Z	-2.168	-2.168	0	15.268
24	M36	Z	-1.284	-1.284	0	174
25	M37	Z	-1.284	-1.284	0	174

Member Distributed Loads (BLC 9 : BLC 3 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft.F,psf]	End Magnitude[lb/ft.F,psf]	Start Locatio...	End Location[...
1	M32	X	0	0	0	2.98
2	M2	X	-2.138	-2.138	0	4.778
3	M4	X	-2.138	-2.138	0	4.778
4	M6	X	-2.138	-2.138	0	4.778
5	M8	X	-2.138	-2.138	0	4.778
6	M16	X	-5.797	-5.797	0	30
7	M17	X	-5.797	-5.797	0	30
8	M18	X	-5.797	-5.797	0	30
9	M19	X	-5.797	-5.797	0	30
10	M24	X	-2.168	-2.168	0	40
11	M25	X	-2.168	-2.168	0	40

Member Distributed Loads (BLC 9 : BLC 3 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft.F,psf]	End Magnitude[lb/ft.F,psf]	Start Locatio...	End Location[...
12	M26	X	-2.168	-2.168	0	40
13	M27	X	-2.168	-2.168	0	40
14	M28	X	-2.403	-2.403	0	47.512
15	M30	X	-2.403	-2.403	0	47.512
16	M39A	X	0	0	0	2.98
17	MP5	X	-9.974	-9.974	0	120
18	M37B	X	0	0	0	2.98
19	M38	X	0	0	0	2.98
20	MP4	X	-9.974	-9.974	0	120
21	M40B	X	0	0	0	2.98
22	M41A	X	0	0	0	2.98
23	MP3	X	-9.974	-9.974	0	120
24	M43	X	0	0	0	2.98
25	M44	X	0	0	0	2.98
26	MP2	X	-9.974	-9.974	0	120
27	M46	X	0	0	0	2.98
28	M47	X	0	0	0	2.98
29	MP1	X	-9.974	-9.974	0	120
30	M36	X	-8.139	-8.139	0	135.212
31	M37	X	-8.139	-8.139	0	135.212

Member Distributed Loads (BLC 15 : BLC 5 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft.F,psf]	End Magnitude[lb/ft.F,psf]	Start Locatio...	End Location[...
1	M2	Z	-.176	-.176	0	4.778
2	M4	Z	-.176	-.176	0	4.778
3	M6	Z	-.176	-.176	0	4.778
4	M8	Z	-.176	-.176	0	4.778
5	M14	Z	-4.832	-4.832	0	144
6	M15	Z	-4.832	-4.832	0	144
7	M16	Z	-2.837	-2.837	0	30
8	M17	Z	-2.837	-2.837	0	30
9	M18	Z	-2.837	-2.837	0	30
10	M19	Z	-2.837	-2.837	0	30
11	M24	Z	-1.051	-1.051	0	40
12	M25	Z	-1.051	-1.051	0	40
13	M26	Z	-1.051	-1.051	0	40
14	M27	Z	-1.051	-1.051	0	40
15	M28	Z	-1.166	-1.166	0	47.512
16	M30	Z	-1.166	-1.166	0	47.512
17	MP5	Z	-4.832	-4.832	0	120
18	MP4	Z	-4.832	-4.832	0	120
19	MP3	Z	-4.832	-4.832	0	120
20	MP2	Z	-4.832	-4.832	0	120
21	MP1	Z	-4.832	-4.832	0	120
22	M40C	Z	-1.051	-1.051	0	15.268
23	M41B	Z	-1.051	-1.051	0	15.268
24	M36	Z	-.622	-.622	0	174
25	M37	Z	-.622	-.622	0	174

Member Distributed Loads (BLC 16 : BLC 6 Transient Area Loads)

	Member Label	Direction	Start Magnitude[lb/ft.F,psf]	End Magnitude[lb/ft.F,psf]	Start Locatio...	End Location[...
1	M32	X	0	0	0	2.98
2	M2	X	-1.036	-1.036	0	4.778
3	M4	X	-1.036	-1.036	0	4.778
4	M6	X	-1.036	-1.036	0	4.778
5	M8	X	-1.036	-1.036	0	4.778

Member Distributed Loads (BLC 16 : BLC 6 Transient Area Loads) (Continued)

Member Label	Direction	Start Magnitude[lb/ft,F,psf]	End Magnitude[lb/ft,F,psf]	Start Location	End Location
6 M16	X	-2.809	-2.809	0	30
7 M17	X	-2.809	-2.809	0	30
8 M18	X	-2.809	-2.809	0	30
9 M19	X	-2.809	-2.809	0	30
10 M24	X	-1.051	-1.051	0	40
11 M25	X	-1.051	-1.051	0	40
12 M26	X	-1.051	-1.051	0	40
13 M27	X	-1.051	-1.051	0	40
14 M28	X	-1.164	-1.164	0	47.512
15 M30	X	-1.164	-1.164	0	47.512
16 M39A	X	0	0	0	2.98
17 MP5	X	-4.832	-4.832	0	120
18 M37B	X	0	0	0	2.98
19 M38	X	0	0	0	2.98
20 MP4	X	-4.832	-4.832	0	120
21 M40B	X	0	0	0	2.98
22 M41A	X	0	0	0	2.98
23 MP3	X	-4.832	-4.832	0	120
24 M43	X	0	0	0	2.98
25 M44	X	0	0	0	2.98
26 MP2	X	-4.832	-4.832	0	120
27 M46	X	0	0	0	2.98
28 M47	X	0	0	0	2.98
29 MP1	X	-4.832	-4.832	0	120
30 M36	X	-3.943	-3.943	0	135.212
31 M37	X	-3.943	-3.943	0	135.212

Envelope AISC 15th(360-16): LRFD Steel Code Checks

Member	Shape	Code Che...	Loc[in]	LC	Shear Ch...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*P...	phi*M...	phi*M.....	Eqn
1 M6	.625 x 3.5"	.504	0	8	.213	4.778	y	28	69777.888	70875	922.8...	5167.....	H1-1b
2 M8	.625 x 3.5"	.491	0	2	.206	0	y	33	69777.888	70875	922.8...	5167.....	H1-1b
3 M26	.625 Dia.	.442	0	33	.006	0		33	4378.175	9940...	103.5...	103.5...1	H1-1a
4 M25	.625 Dia.	.432	40	27	.004	0		33	4378.175	9940...	103.5...	103.5...1	H1-1a
5 M27	.625 Dia.	.396	40	27	.005	40		88	4378.175	9940...	103.5...	103.5...	H1-1a
6 M18	PIPE 2.0	.384	27.632	27	.136	30		38	31128.673	32130	1871...	1871.....	H1-1b
7 M19	PIPE 2.0	.376	28.421	33	.146	30		32	31128.673	32130	1871...	1871.....	H1-1b
8 M24	.625 Dia.	.368	40	27	.006	0		46	4378.175	9940...	103.5...	103.5...1	H1-1a
9 M4	.625 x 3.5"	.365	0	8	.216	4.778	y	32	69777.888	70875	922.8...	5167.....	H1-1b
10 M41B	.625 x 3.5"	.360	0	27	.676	3.616	y	27	48614.526	70875	922.8...	5167.....	H1-1b
11 M40C	.625 x 3.5"	.357	0	34	.705	3.616	y	33	48614.526	70875	922.8...	5167.....	H1-1b
12 M17	PIPE 2.0	.355	27.632	37	.141	30		28	31128.673	32130	1871...	1871.....	H1-1b
13 M2	.625 x 3.5"	.351	0	2	.209	4.778	y	31	69777.888	70875	922.8...	5167.....	H1-1b
14 M16	PIPE 2.0	.348	28.421	31	.152	30		36	31128.673	32130	1871...	1871.....	H1-1b
15 M15	PIPE 2.5	.346	102.316	2	.147	102.316		8	30825.381	50715	3596...	3596.....	H1-1b
16 M14	PIPE 2.5	.344	102.316	8	.143	102.316		2	30825.381	50715	3596...	3596.....	H1-1b
17 M37	PIPE 2.0	.340	82.421	5	.010	0		36	4678.532	32130	1871...	1871.....	H1-1a
18 M36	PIPE 2.0	.318	82.421	6	.010	0		36	4678.532	32130	1871...	1871.....	H1-1a
19 M28	.75 Dia.	.316	47.512	27	.009	47.512		2	3679.003	1431...	178.9...	178.9...	H1-1a
20 M30	.75 Dia.	.225	0	27	.008	0		3	3679.003	1431...	178.9...	178.9...	H1-1b
21 MP2	PIPE 2.5	.214	41.053	92	.048	41.053		91	22373.407	50715	3596...	3596.....	H1-1b
22 MP4	PIPE 2.5	.203	41.053	42	.039	78.947		46	22373.407	50715	3596...	3596.....	H1-1b
23 MP3	PIPE 2.5	.197	82.105	8	.022	82.105		8	22373.407	50715	3596...	3596.....	H1-1b
24 MP1	PIPE 2.5	.195	78.947	95	.043	41.053		92	22373.407	50715	3596...	3596.....	H1-1b
25 MP5	PIPE 2.5	.193	78.947	44	.042	78.947		46	22373.407	50715	3596...	3596.....	H1-1b
26 M29	.75 Dia.	.000	0	98	.000	0		98	3679.003	1431...	178.9...	178.9...1	H1-1a

Company : Infinigy Engineering, PLLC,
 Designer : KLB
 Job Number : 499-006
 Model Name : CTL02013

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 Checked By: _____

Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)

Member	Shape	Code Che...	Loc[in]	LC	Shear Ch...	Loc[in]	Dir	LC	phi*Pnc [lb]	phi*P...	phi*M...	phi*M.....	Eqn
27	M31	.75 Dia.	.000	0	98	.000	0	98	3679.003	1431...	178.9...	178.9...	1H1-1a

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 120' SELF SUPPORT LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT



AT&T Site ID # : CTLO2013
Site Name : New Haven – State Police Tower #27
Site Address: 142 Baldwin Drive, New Haven, CT

60605194
SMK-005

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 - **ANALYSIS UNDER TIA-222-F DESIGN CRITERIA (DESPP / CSP)**

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 120' self-supporting lattice tower structure located at 142 Baldwin Drive, New Haven, Connecticut.

The structural analysis was conducted in accordance with the 2018 Connecticut State Building Code which includes the TIA-222-G¹ Standard, 2015 International Building Code, the 2018 Connecticut State Building Code Amendments, the AISC² Load Resistance Factor Design (LRFD), the ASCE 7³ design Code, and the Connecticut State Police Requirements which include the TIA/EIA-222-F⁴.

The antenna loading considered in the analysis consists of all the existing and proposed antennas, transmission lines and ancillary items as outlined in the Introduction Section of this Report.

The proposed AT&T antenna installations are listed below:

Proposed Appurtenances	Carrier	Antenna Center Elevation
<u>Remove:</u> (2) CCI HPA-65R-BUU-H8 Panel Antennas (Alpha and Beta Sectors, 1 panel each sector) (2) CCI HPA-65R-BUU-H6 Panel Antenna (Gamma Sector) (3) Ericsson RRUS-11 RRH Units (3) Ericsson RRUS-32 B2 RRH Units (3) Ericsson RRUS-12 RRH Units	AT&T (existing)	@ 80'
<u>Install:</u> (2) Kathrein 800-10966 Panel Antennas (Alpha & Beta Sectors, 1 panel each sector) (1) Kathrein 800-10965 Panel antenna (Gamma Sector) (3) Ericsson RRUS-E2 B29 RRH Units (3) Ericsson B2 B66 8843 Radio Units (3) Ericsson B5/B21 4449 Radio Units (1) Distribution Box (DC Squid)	AT&T (Proposed)	@ 80'

The results of the structural analysis indicated that:

1. The previously modified existing steel tower structure IS considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
2. The previously modified existing tower anchor bolts ARE considered structurally adequate for the proposed antenna loading with the classification specified herein.
3. The existing foundation IS considered structurally adequate for the proposed antenna loading with the load classification specified herein.
4. The existing tower's sway (deflection) is 0.3208 degrees, and the existing tower's twist (rotation) is 0.1697 degrees. These figures combined ARE within the Connecticut State Police requirement of 0.75 degrees for combined twist (rotation) and sway (deflection) with the load classification specified herein.
5. The maximum structural capacity calculated herein is **99.4 %**

1. TIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version G)

2. AISC = American Institute of Steel Construction (14th Edition)

3. ASCE 7 = American Society of Civil Engineers Standard 7 (2010 Edition)

4. TIA/EIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version F)

1. EXECUTIVE SUMMARY - *continued*

The analysis results presented herewith are based upon tower modifications proposed by AECOM tower modification report on behalf of AT&T, Sprint and T-Mobile, project (60579836 / SMK-003; 60579840 / ASM-010; 60579905 / NSS-044), signed and sealed on March 1, 2019. If the tower has not been modified to the specifications proposed by AECOM, please notify the engineer in writing immediately.

This analysis is based on:

- 1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
- 2) Tower geometry and structural member sizes utilized in the preparation of this report were obtained from manufacturer's original design documents prepared by Stainless, Inc. report number 358810, noted as revision B, dated March 3, 1995.
- 3) Tower Mapping and Existing Inventory via tower climb, performed by D&K Nationwide Communications, Inc. on March 30, 2016.
- 5) Antenna inventory provided by Connecticut State Police via e-mail on April 7, 2016.
- 6) Previous structural analysis and evaluation performed by AECOM on behalf of AT&T, project number 60565638 / SMK-001, signed and sealed in May 21, 2018.
- 7) Previous structural analysis and evaluation performed by AECOM on behalf of T-Mobile, project number 60577309 / NSS-043, signed and sealed on May 25, 2018.
- 8) Previous structural analysis and evaluation performed by AECOM on behalf of Sprint, project number 60565103 / ASM-005, signed and sealed on June 11, 2018.
- 9) Updated antenna Radio Frequency Data Sheet provided by Smartlink on behalf of AT&T, obtained via e-mail dated June 22, 2018.
- 10) Geotechnical Review of Existing State Police Communications Tower #27, prepared by Welti Geotechnical, P.C. dated August 13, 2018.
- 11) Previous structural analysis and modification performed by AECOM on behalf of AT&T, Sprint and T-Mobile project number (60579836 / SMK-003; 60579840 / ASM-010; 60579905 / NSS-044), signed and sealed on March 1, 2019.
- 12) Proposed update to existing Radio Frequency Data Sheet antenna and equipment provided by AT&T obtained via e-mail dated, April 23, 2019.
- 13) Antenna and mount configuration as specified within Section 2 and 6 of this report.
- 14) Coax cable orientation as specified in section 6 of this report.

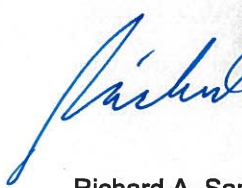
1. EXECUTIVE SUMMARY - *continued*

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the antenna, cabling, and mount configuration used, as well as the physical condition of the tower members, connections and foundation. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please contact the office at (860) 529-8882.

Sincerely,

AECOM,



Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/mcd

cc: CF/Book - AECOM

2. INTRODUCTION

The subject tower is located at 142 Baldwin Drive, New Haven, Connecticut. The structure is an existing 120' self supporting steel tapered lattice tower, designed and manufactured by Stainless, Inc.

The structural analysis was conducted in accordance with the following:

- TIA-222-G Standard for Standard for a wind velocity of range of 95 mph to 115 mph (3-second gust) and 50 mph (3-second gust) concurrent with 0.75" ice thickness, considered to increase in thickness with height
- 2015 International Building Code with 2018 Connecticut State Building Code Amendments for a wind speed of 105 mph (3-second gust)
- 2010 AISC Load Resistance Factor Design (LRFD)
- 2010 ASCE 7 Minimum Design Loads for Buildings and Other Structures for the ice thickness referenced in the TIA-222-G Standard
- Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) and 90 mph (fastest mile) concurrent with 0.5" ice. Twist (rotation) and sway (deflection) were determined in accordance with Connecticut State Police Requirements for a wind velocity of 90 mph (fastest mile) concurrent with 0.5" ice, analyzed under the TIA/EIA-222-F design Standard.

The inventory together with the proposed AT&T antenna arrangement is summarized in the table below:

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(1) 4' Lightning Rod	#27 Tower (existing)	18' Pipe Mast on Top of Tower	138'	---
(1) UHF3 Dipole Antenna	#26 CSP-15 (existing)	2' Flange Mount	120'	(1) LDF6-50A
(1) UHF-6 Whip Antenna	CSP-1 (existing)	Share with below mount	120'	(1) LDF5-50A
(1) OGT9-806 Whip Antenna	#25-B CSP-7 (existing)	Share with below Mount	120'	(1) LDF7-50A
(1) SC479-HF1LDF Whip Antenna	#24-C CSP-21 (existing)	Share with below Mount	120'	(1) AVA7-50A
(1) OGT9-806 Whip Antenna	#24-D CSP-8 (existing)	Share with below Mount	120'	(1) LDF7-50A
(1) (Inverted) SC479-HF1LDF Whip Antenna	#25-A CSP-17 (existing)	(2) 5' Sidearm Mounts w/ 8' Pipe	114'	(1) AVA7-50A
(1) Junction Box	#24-A (existing)	(2) 4' Sidearm mounts w/ 8' Pipe	113.5'	(2) 3/8"
(1) (Inverted) Whip Antenna	#24-B (existing)	Share with above Mount	113.5'	(1) 1/2"
(1) (Inverted) Dipole Antenna	#24-E (existing)	Share with above Mount	113.5'	(1) 1-1/4" Cable
(1) (Inverted) SC479-HF1LDF Whip Antenna	#23-A CSP-22 (existing)	Share with above mount	112.75'	(1) AVA7-50A

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(1) (Inverted) SC479-HF1LDF Whip Antenna	#23-B CSP-23 (existing)	Share with above mount	112.75'	(1) AVA7-50A
(1) Sinclair Whip Antenna	#22 (existing)	(1) 4'x8' Gate-boom 3' Standoff w/ 2-1/2" Pipe	112'	(3) 1 5/8"
(1) Junction Box	#23-C (existing)	(1) Unistrut mount attached to Waveguide ladder	112'	(1) 1/2"
(1) PA6-65 Dish Antenna	#21 CSP-5 (existing)	2-1/2" Pipe Mounted to leg	110'	(1) WEP65
(1) (Inverted) SC479-HF1LDF Whip Antenna	CSP-9 (existing)	See above mount @ 113'	110'	(1) LDF7-50A
(1) SC479-HF1LDF Whip Antenna	CSP-18 (existing)	See above mount @ 113'	110'	(1) AVA7-50A
(1) (Inverted) SC479-HF1LDF Whip Antenna	CSP-19 (existing)	See above mount @ 113'	110'	(1) AVA7-50A
(1) 432E-83I-01T TTA Unit	CSP-20 (existing)	See above mount @ 113'	110'	(1) LDF4-50A
(1) WPA-70040-4CF-EDIN Panel Antenna	CSP-28 (existing)	Leg Mounted	110'	(1) AVA7-50A
(1) PA6-65 Dish Antenna	#20 CSP-3 (existing)	2-1/2" Pipe Mounted to leg	109'	(1) WEP65
(1) PA6-65 Dish Antenna	#19 CSP-6 (existing)	2-1/2" Pipe Mounted to leg	107'	(1) WEP65
(1) SE419-SWBPALDF Panel Antenna	CSP-29 (existing)	Leg Mounted	105'	(1) AVA7-50A
(1) 432E-83I-01T TTA Unit	CSP-30 (existing)	Face Mounted	105'	(1) LDF4-50A
(1) 422-86A-99116 TTA Unit	CSP-31 (existing)	Face Mounted	105'	(1) LDF3-50A
(1) 422-86A-99116 TTA Unit	CSP-32 (existing)	Face Mounted	105'	(1) LDF3-50A
(1) AP13-850 Panel Antenna	#18A CSP-12 (existing)	2-1/2" Pipe Mounted to Face	101'	(1) LDF7-50A
(1) SE419-SWBPALDF Panel Antenna	#18B CSP-13 (existing)	2-1/2" Pipe Mounted to Face	101'	(1) LDF7-50A
(3) APXVAARR24_43—U-NA20 Panels (3) Ericsson AIR 3246 B66 Panels (3) Ericsson 2217 B2 RRH's (3) Ericsson 4449 B71 + B12 RRH's (3) AIR32 B66 Panel Antennas (3) TMA Units	T-Mobile (existing)	(3) EUSF10-U T-Arm Mounts attached to Leg	95'	(6) 1-5/8" (3) 1-1/4" Fiber Optic Cables (6x12 6AWG)
(1) (Inverted) OGT9-806 Whip Antenna	#16A CSP-10 (existing)	(2) 5' Standoff Mounts w/ 4-1/2" Pipe Mount	92'	(1) LDF7-50A
(1) PD-458 Whip Antenna	#16B CSP-2 (existing)	Share with above mount	92'	(1) LDF5-50A
(1) Dipole Antenna	#15 (existing)	3' Sidearm w/ 2" Pipe Mount	86'	(1) 7/8"

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(1) 3' Yagi Antenna	#12 (existing)	Share with above mount	81'	(1) 1/2"
(1) DB-230 Yagi Antenna	#13 CSP-11 (existing)	Share with above mount	81'	(1) LDF5-50A
(2) Kathrein 800-10966 Panel Antennas Alpha & Beta Sectors, 1 panel each sector) (1) Kathrein 800-10965 Panel antenna (Gamma Sector) (3) RRUS E2-B29 RRH Units (3) RRUS B2/B66 Radio 8843 RRH Units (3) RRUS B5/B12 Radio 4449 RRH Units (1) DC6-48-60-0-8F Surge Suppressor Units	AT&T (Proposed)	See below Mount	80'	Shared with below Cables
(2) CCI TPA-65R-LCUUUU-H8 Panel Antennas (Alpha & Beta Sectors, 1 panel each sector) (2) Kathrein 800-10966 Panel Antennas Alpha & Beta Sectors, 1 panel each sector) (2) Andrew SBNH-1D6565C Panels (Alpha & Beta Sectors, 1 per sector) (1) Kathrein 800-10965 Panel antenna (Gamma Sector) (1) Quintel QS66512-3 Panel Antenna (Gamma Sector) (3) RRUS-32 RRH Units (3) DC6-48-60-18-8F Surge Suppressor Units (2) DTMABP7819VG12A TMA Units	AT&T (existing)	(3) Antenna Face Mounts	80'	(4) 1-1/4" (2) 1/2" Fiber Optic Cables (6) 3/4" DC Cables
(1) 22' Dipole Antenna	#14 (existing)	4' Sidearm	77'	(1) 1/2"
(3) NNVV-65B-R4 Panel Antennas (3) Nokia MIMO Panel Antennas (3) TD-RRH8x20-25 RRH Units (3) ALU RRH 800 MHz 2x50W (3) 1900 RRH Units	Sprint (existing)	Pipe Mounts on Existing Frame	71'	(4) 1-1/4" Hybriflex Cables
(1) 6' Dual Yagi Antenna	#9 (existing)	2' Sidearm	65'	(1) 1/2"
(1) GPS Antenna	#8 (existing)	3' Sidearm	63'	(1) 7/8"
(1) DB-264 20' Dipole Antenna	#7 CSP-4 (existing)	2' Sidearm	55'	(1) LDF5-50A
(1) DB-803 Whip Antenna	#6 CSP-16 (existing)	2' Sidearm	53'	(1) LDF4-50A
(1) 10' Dipole Antenna	#4A (existing)	3' Sidearm	48'	(1) 1/2"
(1) 3' Yagi Antenna	#4B (existing)	Shared with above mount	48'	(1) 1/2"

<i>Antenna Type</i>	<i>Carrier</i>	<i>Mount</i>	<i>Antenna Centerline Elevation</i>	<i>Cable</i>
(1) 5' Whip Antenna	#3 (existing)	Leg Mounted	47'	(1) 1/2"
(1) 3' Whip Antenna	#2 (existing)	Leg Mounted	43'	(1) 7/8"
(1) 4' Dish with Shroud Cover	#1A (existing)	4' Sidearm	41'	(2) 1/2"
(1) 1'x1' Panel Antenna	#1B (existing)	<i>Shared with above mount</i>	41'	(1) 3/8"
(1) 6' Whip Antenna	#5 CSP-14 (existing)	1' Sidearm Mount	39'	(1) LDF4-50A

Notes: Refer to TNX Tower feed-line plan within Section 6 of this report for coax locations. Antenna elevations and ID numbering obtained from Tower Mapping and Existing Inventory via tower climb, performed by D&K Nationwide Communications, Inc. on March 30, 2016.

"A#" refers to the antenna number used in the structural analysis program to identify tower appurtenances.

This structural analysis and evaluation of the communications tower was performed by AECOM for AT&T. The purpose of this analysis was to investigate the structural integrity of the previously modified tower and foundation for existing and proposed antenna loads in compliance with the 2018 Connecticut State Building Code. This analysis was conducted to evaluate stress on the tower and the effect forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with, the TIA-222-G–Structural Standard for Antenna Towers and Antenna Supporting Structures and Antennas, the 2015 International Building Code with 2018 Connecticut State Building Code Amendments and the American Institute of Steel Construction (AISC) Manual of Steel Construction – Load Resistance Factor Design (LRFD)

The structural analysis was conducted using TNX Tower version 8.0.5.0 and used the following conditions for this tower review (following the TIA/EIA-222-G Standard):

- Structure Class 3 – (Essential Communications)
 - o NOTE: ASCE 7 and CT State Building Code Applied Risk Category 4 for design wind loads (see below)
- Topographic Category 4 – (Tower location on top of ridge – rolling wind conditions considered)
 - o Crest Height used for analysis: (approximate elevations listed below)
 - Tower Base Elevation = 450 feet
 - High point (2 mile Radius) = 550 feet (Ref. NW Regicides Trail)
 - Low Point (2 mile Radius) = 50 feet (Ref. Benchmark @ Southern Connecticut State University)
 - “H” = (Avg of High/Low) – Base Elevation = 150 feet
- Exposure Class C – (Open Terrain with scattered obstructions)
- Load Conditions:
 - o Two load conditions were evaluated as shown which were compared to design stresses according to AISC and TIA-222-G Standard.

Basic Wind Speed:

- TIA-222-G:
 - o New Haven County (Wind Speed Range): $V = 95 \text{ mph} - 115 \text{ mph}$ (3-second gust) [Annex of TIA/EIA-222-G 2006]
- IBC 2015 w/ 2018 CT State Building Code Amendment:
 - o (2015) IBC Section 1609.1.1 – Determination of Wind Loads – Exception 5 “Designs using TIA-222” applies for determination of Design Wind Load obtained as “ V_{ult} ” are to be converted to “ V_{asd} ” when applying the TIA-222-G design Standard (under Section 1609.3) for Basic Wind Speed.
 - o (2018) CT State Building Code Amendment to the IBC Section 1609.3 wind loads are obtained from Appendix N of the State Building Code.
 - **$V_{asd} = 105 \text{ mph}$** (3-Second Gust) Wind Design Parameter for the City of New Haven, Connecticut for Risk Category four (IV) for essential communications (Connecticut State Police).

Load Condition 1 = 105 mph (3-second gust) Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 50 mph (3-second gust) Wind Load (with ice) + Ice Load + Tower Dead Load

Ice thickness used for this analysis is **0.75 inch** (assumed to start at the base of the tower) and is considered to increase in thickness with height. The initial ice thickness for design is referenced in the Annex of TIA-222-G and follows the same design criteria as the ASCE 7 Standard.

The load conditions below implement the design requirements of the Connecticut State Police for the tower structures deflection limits with the allowable deflection limit of the combination of the tower’s sway (deflection) and twist (rotation) under the TIA-222-F design Standard. This design limit required the design combined value of sway (deflection) and twist (rotation) to be under 0.75 degrees following the TIA-222-F design Standard.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS (cont.)

Load Condition 3 = 90 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

Seismic event consideration factors/values for design:

- $S_s = 0.186$ (2018 CT State Building Code – Location Specific Value)
- $S_1 = 0.062$ (2018 CT State Building Code – Location Specific Value)
- Site Classification = “C” – from Geotechnical Report description of “Fractured Rock”
- Seismic Design Category = “C” – (2015 International Building Code)
- $F_a = 1.2$ (Obtained from TIA-222-G Table 2-12 Considering above conditions)
- $F_v = 1.7$ (Obtained from TIA-222-G Table 2-13 Considering above conditions)

Strength Limit State Load Combinations (TIA-222-G Section 2.3.2):

The structural analysis herein has considered the following load combinations within the analysis:

1. **1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.6 Wind load without ice**
2. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Dead weight of ice due to factored ice thickness + 1.0 Concurrent wind load with factored ice thickness + 1.0 Load effects due to temperature
3. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Earthquake Load

NOTE 1: The above **bolded** load combination is considered to create the governing design loads per the results of the analysis.

NOTE 2: The above “Dead Load Guy Assemblies” are not considered as part of the analysis and are considered as a value of zero.

NOTE 3: The “Load effects due to temperature” do not apply for structures that are self-sustaining (from the TIA-222-G Standard)

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the strength design in accordance with AISC (LRFD). The calculated stresses for the tower structure were ABOVE the required design strength limit under the proposed configuration and loading (stated herein). The calculated stresses for the tower anchor bolts and foundation were within the required design strength limit under the proposed configuration and loading (stated herein). Detailed analysis and calculations for the proposed loading are provided in Section 6 of this report.

The modified tower's sway (deflection) is 0.3208 degrees and the modified tower's twist (rotation) is 0.1697 degrees. These figures combined are within the Connecticut State Police required maximum 0.75 degrees for combined twist and sway when applying the TIA/EIA-222-F design conditions.

Controlling Tower Component Stress vs. Capacity Summary:

Component / (Section No.)	Critical Component Size	Controlling Elevation	Stress (% capacity)	Pass/Fail
Leg (T8)	Pipe 5"x0.400" (t) / Compression	25' – 50'	96.1	Pass
Diagonal (T9)	(2)L3-1/2x3-1/2x3/8 / Compression	0' – 25'	91.6	Pass
Horizontal (T7)	L3-1/2x3-1/2x1/4 / Compression	50' – 75'	98.1	Pass
Top Grit (T9)	L4x4x5/16 / Compression	0' – 25'	99.7	Pass
Redundant Horizontal Bracing (T9)	L2-1/2x2-1/2x1/4 / Compression	0' – 25'	33.4	Pass
Redundant Diagonal Bracing (T9)	L2-1/2x2-1/2x1/4 / Compression	0' – 25'	61.6	Pass
Inner Bracing (T9)	L2-1/2x2-1/2x3/16 / Compression	0' – 25'	13.9	Pass
Tower Connection Bolt	(2) 5/8" Diameter A325X Bolts / Shear Capacity	25'	99.4	Pass

Foundation Summary:

Component	Required	Computed	% Capacity	Pass/Fail
Anchor Rod - Capacity (TIA-222-G – 4.9.9)	Ratio < 1.0	0.966	96.6	Pass
Foundation – Spread Foot (6'x6') Uplift Capacity	625.89 Kip (Factored Resistance)	391 Kip	62.5	Pass
Foundation – Rock Anchorage – Bonded Embedment Length	20 Feet (installed)	16.50 Ft	78.7	Pass
Foundation – Bearing on Rock Capacity	13.4400 ksf (Factored Resistance)	12.676 ksf	73.5	Pass

Structure Rating (Maximum from all components) =	99.4 %	Pass
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4. FINDINGS AND EVALUATION (cont.)

Maximum Deformations – Proposed Condition

ANSI/TIA-222-G Section 2.8.2 - Limit State Deformations

1. A rotation of 4 degrees about the vertical axis (twist) or any horizontal axis (sway) of the structure
2. A horizontal displacement (in feet) of 3% of the height of the structure.

Load Case Description	Current		Allowable	
	Sway (degree)	Displacement (Feet)	Sway (degree)	Displacement (Feet)
Service Wind Load	0.1334	0.7365	4.0	3.6

Tower Twist & Sway at Top (Connecticut State Police Requirements - TIA-222-F):

Description	Current	Total	Allowable
Tower Twist (degrees)	0.1697	0.4905	0.750
Tower Sway (degrees)	0.3208		

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the structural analysis indicated that:

1. The previously modified existing steel tower structure IS considered structurally adequate for the proposed antenna loading with the wind classification specified herein.
2. The previously modified existing tower anchor bolts ARE considered structurally adequate for the proposed antenna loading with the classification specified herein.
3. The existing foundation IS considered structurally adequate for the proposed antenna loading with the load classification specified herein.
4. The existing tower's sway (deflection) is 0.3208 degrees, and the existing tower's twist (rotation) is 0.1697 degrees. These figures combined ARE within the Connecticut State Police requirement of 0.75 degrees for combined twist (rotation) and sway (deflection) with the load classification specified herein.
5. The maximum structural capacity calculated herein is **99.4 %**

The analysis results presented herewith are based upon tower modifications proposed by AECOM tower modification report on behalf of AT&T, Sprint and T-Mobile, project (60579836 / SMK-003; 60579840 / ASM-010; 60579905 / NSS-044), signed and sealed on March 1, 2019. If the tower has not been modified to the specifications proposed by AECOM, please notify the engineer in writing immediately.

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations are in good condition without defect and were properly constructed to support original design loads as specified in the original design documents.

AECOM is not responsible for any modifications completed prior to or hereafter in which AECOM is not or was not directly involved. Modifications include but are not limited to:

- A. Adding antennas
- B. Removing/replacing antennas
- C. Adding coaxial cables

AECOM hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact AECOM. AECOM disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The tower owner shall refer to TIA-222-G Section 14.2 for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. It is also recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6. DRAWINGS AND DATA

SEISMIC BASE SHEAR ANALYSIS



Seismic (Vs) Base Shear Implementing TIA-222-G, IBC 2015 & Connecticut State Building Code of 2018

Calculation of Seismic Base Shear Implementing TIA-222-G, IBC 2015 & CT State Building Code 2018.

Location: New Haven, CT -Site Class "C"

$$S_{DS} = \frac{2}{3} F_A S_S, \text{ where } S_S = 0.186 \quad \text{and } F_A = 1.2 \quad S_{DS} = \frac{2}{3} F_A S_S = \frac{2}{3} * 1.2 * 0.186 = 0.1488$$

$$S_{D1} = \frac{2}{3} F_V S_1, \text{ where } S_1 = 0.062 \quad \text{and } F_V = 1.7 \quad S_{D1} = \frac{2}{3} F_V S_1 = \frac{2}{3} * 1.7 * 0.062 = 0.0703$$

TIA-222-G SECTION 2.7 EARTHQUAKE LOADS (PROCEDURES):

1. Importance Factor "I" (tables 2-3 TIA-222-G) = 1.5 (Structure Class 3)

ANSI/TIA-222-G 2.7.7.1 (TOTAL BASE SEISMIC SHEAR (Vs))

W=DL TOWER	=	41.290	Kips	
W=Antennas/Mounts	=	12.058	Kips	
W=Cables	=	4.532	Kips	
		57.700	Kips	= WT Total = "W"

$$V_s = \frac{S_{DS} * W * I}{R} = \frac{0.149 * 57.700 \text{kips} * 1.5}{3.0} = 4.2987 \text{ kips}, \quad \text{where } R = 3.0 \text{ for Lattice Tower}$$

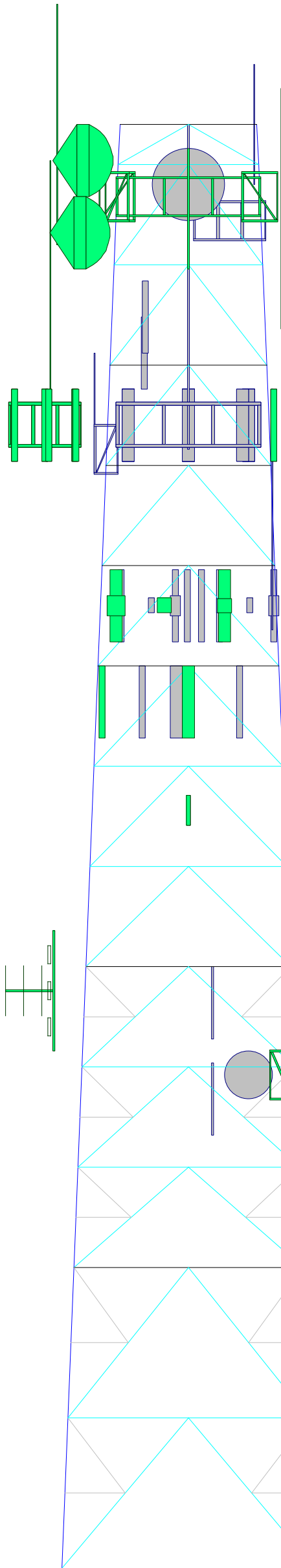
$$V_{S.min} = \frac{0.5 * S_{D1} * W * I}{R} = \frac{0.5 * 0.0703 * 57.700 \text{kips} * 1.5}{3.0} = 1.0141 \text{ kips}$$

*By visual inspection, the above "Base Shear" value when considering the following Load Combination is less than the base shear of wind on structure.

$1.2 * DL + 1.0 E < 1.2 DL + 1.6 W$, (122 Kips), therefore seismic effect on structure
Does NOT control Design.

TNX TOWER INPUT/OUTPUT SUMMARY

Section	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P6.875x.400	P.5x.400	P5x.375			P.5x.250			
Leg Grade	A572-60			A500-50					
Diagonals	2L13 1/2x3 1/2x38x3/8	2L3x3x5/16x3/8	2L3x3x5/16x3/8	2L2 1/2x2x3/8x3/8	2L2 1/2x2 1/2x1/4x3/8		2L2 1/2x2x3/16x3/8		
Diagonal Grade		A529-50		A36	A529-50		A36		
Top Girts	L4x4x5/16	L3 1/2x3 1/2x5/16	L3x3x5/16		L3x3x1/4		N.A.	A	
Horizontals	L4x4x3/8	L4x4x5/16	L3 1/2x3 1/2x1/4		N.A.		L2 1/2x2 1/2x3/16	N.A.	
Red. Horizontals					N.A.				
Red. Diagonals					N.A.				
Inner Bracing	L2 1/2x2 1/2x3/16								
Face Width (ft)	21.0188	19.0178				13.0153	12.3483	11.6814	11.4148
# Panels @ (ft)	2 @ 12.5								B
Weight (K)	26.0								0.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4' (#27)	138	Face Mount ((#11)ATT)	80
16"x2.5" Pipe Mount (#27 Mount)	138	TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	80
16"x3" Omni (inverted) (#23-A - CSP-22)	120 - 106	SBNH-1D6565C (ATT)	80
16"x3" Omni (inverted) (#23-B - CSP-23)	120 - 106	800-10966 Kathrien Panel w/ Pipe Mt. (ATT)	80
SC479-HF1LDF (inverted) (#24-B)	120 - 106	RRUS-32 (ATT)	80
SC479-HF1LDF (#24-C - CSP#21)	120	DC6-48-60-18-8F (Squid) Suppressor (ATT)	80
OGT9-840 (#24-D - CSP#8)	120	4478 Radio Unit (4x40W) (ATT)	80
OGT9-840 (#25-B - CSP#7)	120	TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	80
10"x2" Dipole Antenna (#26 - CSP-15)	120	SBNH-1D6565C (ATT)	80
TMA 432-83H-01T (CSP-24)	120	800-10966 Kathrien Panel w/ Pipe Mt. (ATT)	80
SC479-HF1LDF (inverted) (CSP - 9 (P))	120 - 106	DC6-48-60-18-8F (Squid) Suppressor (ATT)	80
TMA 432-83H-01T (CSP-24)	120	RRUS-32 (ATT)	80
6" DISH (SOLID) (#19 - CSP-3)	117	(2) DTMABP7819VG12A TMA (ATT)	80
6" DISH (SOLID) (#21 - CSP-5)	115	4478 Radio Unit (4x40W) (ATT)	80
Rohn 6" Side-Arm(1) (#24 Antennas Mount)	114	QS66512-2 Panel Antenna (ATT)	80
Rohn 6" Side-Arm(1) (#24 Antennas Mount)	114	800-10965 Kathrien Panel w/ Pipe Mount (ATT)	80
Junction Box (#24-A)	114	RRUS-32 (ATT)	80
10"x2" Dipole Antenna (inverted) (#24-E)	114 - 104	4478 Radio Unit (4x40W) (ATT)	80
Rohn 6" Side-Arm(1) (#25 Antennas Mount)	114	DC6-48-60-0-8F (Squid) Unit (ATT)	80
SC479-HF1LDF (inverted) (#25-A - CSP-17)	114 - 100	800-10966 Kathrein Panel Antenna w/ Pipe Mount (ATT - Proposed)	80
Pirod 4' Side Mount Standoff (1) (#22, 23-A, 23-B Mount)	113	800-10966 Kathrein Panel Antenna w/ Pipe Mount (ATT - Proposed)	80
16"x3" Omni (#22)	113	800-10965 Kathrein Panel Antenna (ATT - Proposed)	80
Junction Box (#23-C)	112	RRUS E2 B29 RRH Unit (ATT - Proposed)	80
6" DISH (SOLID) (#20 - CSP-6)	111	RRUS E2 B29 RRH Unit (ATT - Proposed)	80
6"8"x4" Pipe Mount (#21 - Dish Mount)	110	RRUS E2 B29 RRH Unit (ATT - Proposed)	80
SC479-HF1LDF (CSP-18 (New Install))	110	RRUS E2 B29 RRH Unit (ATT - Proposed)	80
SC479-HF1LDF (inverted) (CSP-19 (New Install))	110 - 96	RRUS 8846 B2 B66A RRH Unit (ATT - Proposed)	80
TMA 432-83H-01T (CSP-20)	110	RRUS 8846 B2 B66A RRH Unit (ATT - Proposed)	80
WPA-70040-4CF-EDIN Panel (CSP-28)	110	RRUS 8846 B2 B66A RRH Unit (ATT - Proposed)	80
6"8"x4" Pipe Mount (#19 - Dish Mount)	107	Ericsson 4449 B71 + B12 Radio Unit (ATT - Proposed)	80
6"8"x4" Pipe Mount (#20 - Dish Mount)	107	Ericsson 4449 B71 + B12 Radio Unit (ATT - Proposed)	80
SE419-SWBPALDF Panel Antenna (CSP-29)	105	Ericsson 4449 B71 + B12 Radio Unit (ATT - Proposed)	80
TMA 432-83H-01T (CSP-30)	105	DC6-48-60-0-8F (Squid) Unit (ATT - Proposed)	80
AP13-850/065D w/Mount Pipe (#18-B - CSP-12(E))	104	20' 4-Bay Dipole (#14)	77
TMA 432-83H-01T (CSP-32)	103	3'4"x4" Pipe Mount (horizontal) ((Bottom mount) #15)	76
SE419-SWBPALDF Panel Antenna (#18-A - CSP 13(P))	101	Face Mount (Sprint)	72
PD458-406 (# 16-B - CSP-2)	100 - 92	Face Mount (Sprint)	72
3'4"x4" Pipe Mount (horizontal) ((Top Mount) #15)	96	Face Mount (Sprint)	72
SC479-HF1LDF (inverted) (# 16-A - CSP-10)	95 - 81	ALU 4x45W (1900 MHz) (Sprint)	72
EUSF10-U ((#17) T-Mobile)	95	ALU 4x45W (1900 MHz) (Sprint)	72
EUSF10-U ((#17) T-Mobile)	95	ALU 4x45W (1900 MHz) (Sprint)	72
EUSF10-U ((#17) T-Mobile)	95	ALU TD-RRH-8x20-25 (Sprint)	72
TMA2093F00V1-1 Twin TMA ((#17) T-Mobile)	95	ALU TD-RRH-8x20-25 (Sprint)	72
TMA2093F00V1-1 Twin TMA ((#17) T-Mobile)	95	ALU TD-RRH-8x20-25 (Sprint)	72
TMA2093F00V1-1 Twin TMA ((#17) T-Mobile)	95	ALU 800MHz 2x50W (Sprint)	72
AIR32 B66Aa/B2a Antenna Panel ((#17) T-Mobile)	95	ALU 800MHz 2x50W (Sprint)	72
AIR32 B66Aa/B2a Antenna Panel ((#17) T-Mobile)	95	ALU 800MHz 2x50W (Sprint)	72
AIR32 B66Aa/B2a Antenna Panel ((#17) T-Mobile)	95	NNVV-65B-R4 Panel Antenna (Sprint)	72
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	95	NNVV-65B-R4 Panel Antenna (Sprint)	72
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	95	NNVV-65B-R4 Panel Antenna (Sprint)	72
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	95	AAHC Panel Antenna (Sprint)	72
AIR 3246 B66 Panel Antenna (T-Mobile)	95	AAHC Panel Antenna (Sprint)	72
AIR 3246 B66 Panel Antenna (T-Mobile)	95	4'6"x3" Pipe Mount (horizontal) ((Bottom mount) #14)	67
AIR 3246 B66 Panel Antenna (T-Mobile)	95	6' Yagi w/ Mount (#9)	65
2217 B2 Radio Unit (T-Mobile)	95	2'6"x4" Pipe Mount (For #8)	63
2217 B2 Radio Unit (T-Mobile)	95	GPS (#8)	63
4449 B71 + B12 Radio Unit (T-Mobile)	95	20' 4-Bay Dipole w/ 2' Sidearm Mount (#7 - CSP-4)	55
4449 B71 + B12 Radio Unit (T-Mobile)	95	1.0" Dia 4' Omni w/Pipe Mount (#6 - CSP#16)	53
4449 B71 + B12 Radio Unit (T-Mobile)	95	Pirod 4' Side Mount Standoff (1) (#4-AB)	48
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Invert #16-A) (# 16-AB)	92	10'x6" Dipole Antenna (#4-A)	48
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Upright # 16-B) (# 16-AB)	92	3' Yagi (#4-B)	48
4'6"x3" Pipe Mount (horizontal) ((Top Mount) #14)	87	5'x1.5in dia Whip Antenna /w mount (#3)	47
20' 4-Bay Dipole (#15)	86	3' Whip (3in diameter) /w mount (#2)	43
3' Yagi (#13 - CSP-11)	82	4 FT DISH (#1-A)	41
3' Yagi (#12)	81	Pirod 6' Side Mount Standoff (1) (#1-A Dish Mount)	41
Face Mount ((#11)ATT)	80	1'x1' Panel Antenna (#1-B (mount Share #1-A))	40
Face Mount ((#11)ATT)	80	6'x1" Whip Antenna w/ Mount (#5 - CSP#14)	39

SYMBOL LIST

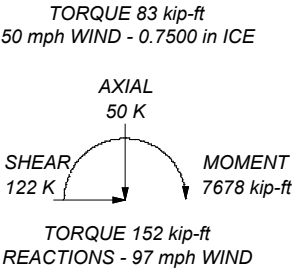
MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	B	1 @ 3.33333

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A572-60	60 ksi	75 ksi

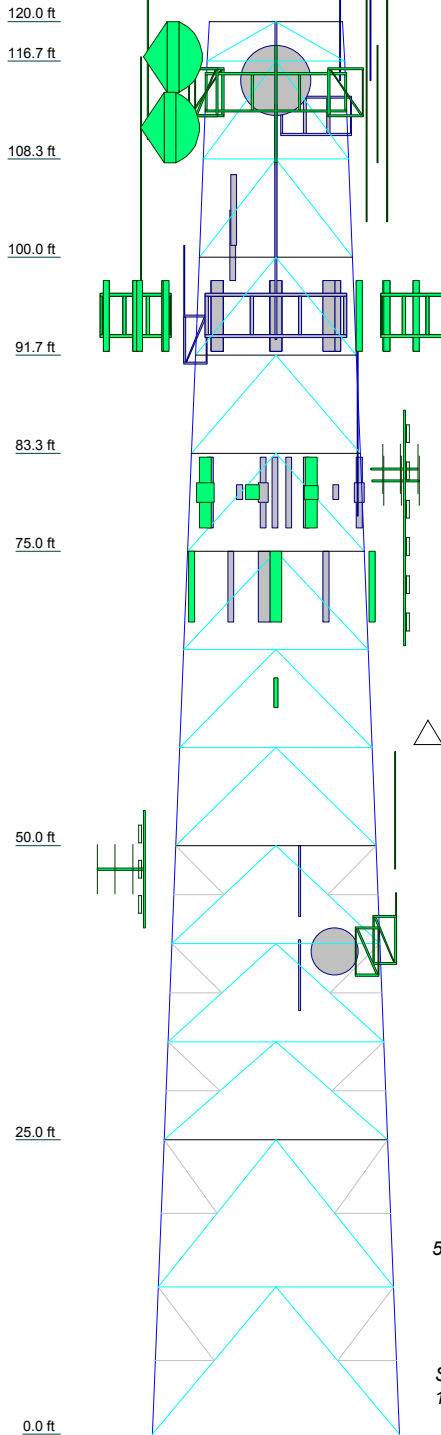
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.391 K
6. Topographic Category 4 with Crest Height of 150.00 ft
7. Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016).
8. Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016.
9. Considerations of application of TIA-222-G Sections 2.6.9.2 and 2.6.9.2.2 are considering a change to the applied "Ka" value as stated within the Standard (pg. 21, 23)
10. TOWER RATING: 99.7% ↓ 2814 kip-ft



AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job: 120' Self-Supporting Lattice Tower		
	Project:	Connecticut State Police Tower - West Rock - Analysis	
	Client:	SMK-005 / (AT&T)	Drawn by: MCD
	Code:	TIA-222-G	Date: 05/31/19
Path:			App'd: Scale: NTS Dwg No. E-1

Section	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P6.875x400	P5x375	P5x250					
Leg Grade	A572-60							
Diagonals	2L3 1/2x3 1/2x3/8x3/8	2L3x3/5/16x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8	2L2 1/2x2 1/2x1/4x3/8
Diagonal Grade		A529-50	A529-50	A529-50	A529-50	A529-50	A529-50	A529-50
Top Gifts	L4x4x5/16	L3 1/2x3 1/2x5/16	L3x3x5/16	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4	L3x3x1/4
Horizontal	L4x4x3/8	L4x4x5/16						
Red. Horizontal								
Red. Diagonals								
Inner Bracing	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x3/16
Face Width (ft)	21.0188	19.0179	17.017	15.0162	13.0153	12.3483	11.6614	4.146
# Panels @ (ft)	2 @ 12.5			11 @ 8.33333				
Weight (K)	26.0	7.6		5.4	1.1	0.8	0.8	0.5



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	2L2 1/2x2x3/8x3/8	C	1 @ 3.33333
B	L2 1/2x2 1/2x3/16		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-50	50 ksi	62 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi	A572-60	60 ksi	75 ksi

TOWER DESIGN NOTES

- Tower designed for Exposure C to the TIA-222-G Standard.
- Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
- Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
- Deflections are based upon a 60 mph wind.
- Tower Structure Class III.
- Topographic Category 4 with Crest Height of 150.00 ft
- Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016).
- Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016.
- Considerations of application of TIA-222-G Sections 2.6.9.2 and 2.6.9.2.2 are considering a change to the applied "Ka" value as stated within the Standard (pg. 21, 23)
- TOWER RATING: 99.7%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:

DOWN: 439 K
SHEAR: 66 K

UPLIFT: -391 K
SHEAR: 61 K

AXIAL
211 K
SHEAR
44 K
MOMENT
2814 kip-ft
TORQUE 83 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL
50 K
SHEAR
122 K
MOMENT
7678 kip-ft
TORQUE 152 kip-ft
REACTIONS - 97 mph WIND

AECOM

500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	120' Self-Supporting Lattice Tower		
Project:	Connecticut State Police Tower - West Rock - Analysis		
Client:	SMK-005 / (AT&T)	Drawn by:	MCD
Code:	TIA-222-G	Date:	05/31/19
Path:		Scale:	NTS
		Dwg No.	E-1

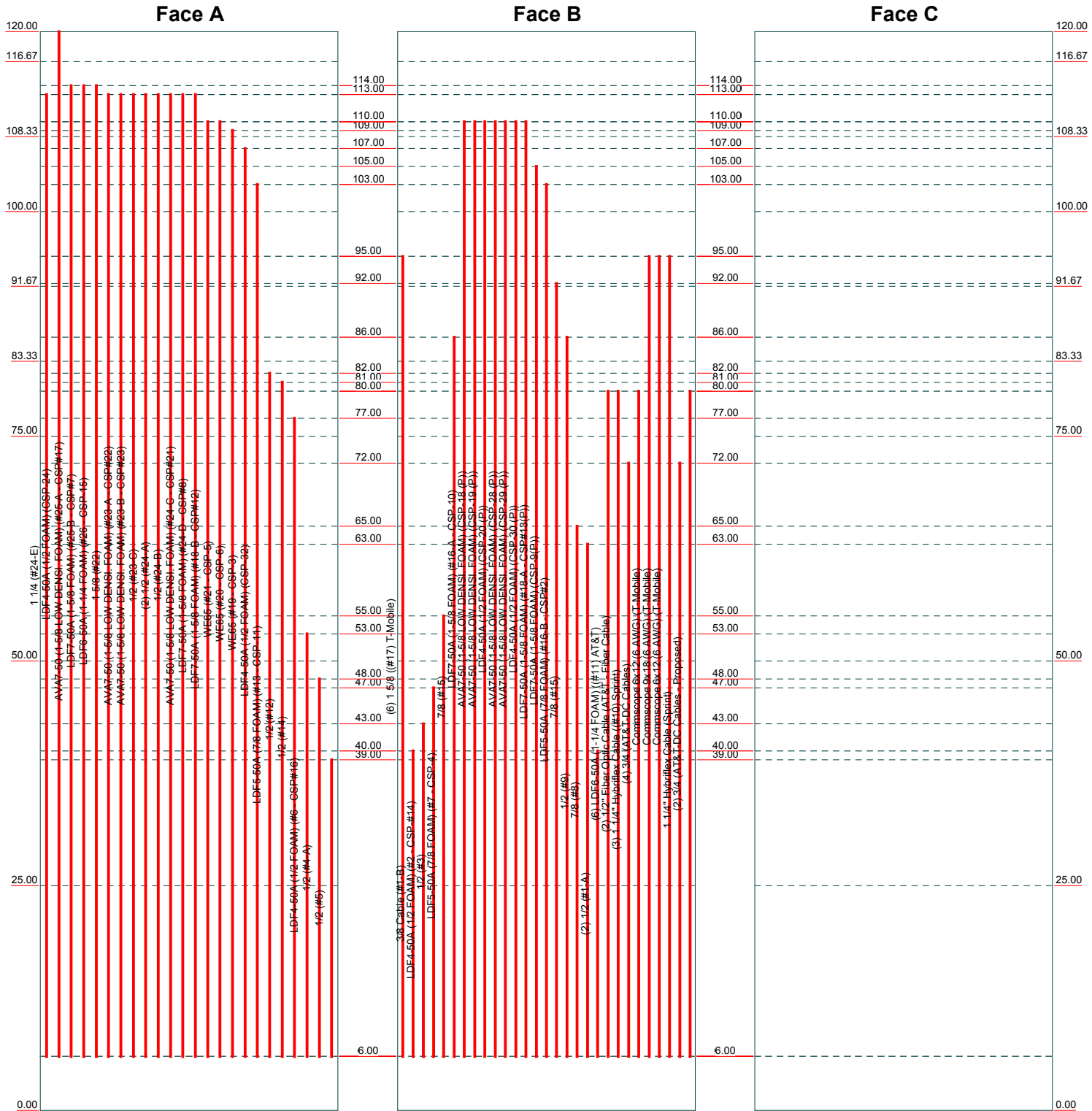
TNX TOWER FEEDLINE DISTRIBUTION CHART

Feed Line Distribution Chart

0' - 120'

Round Flat App In Face App Out Face Truss Leg

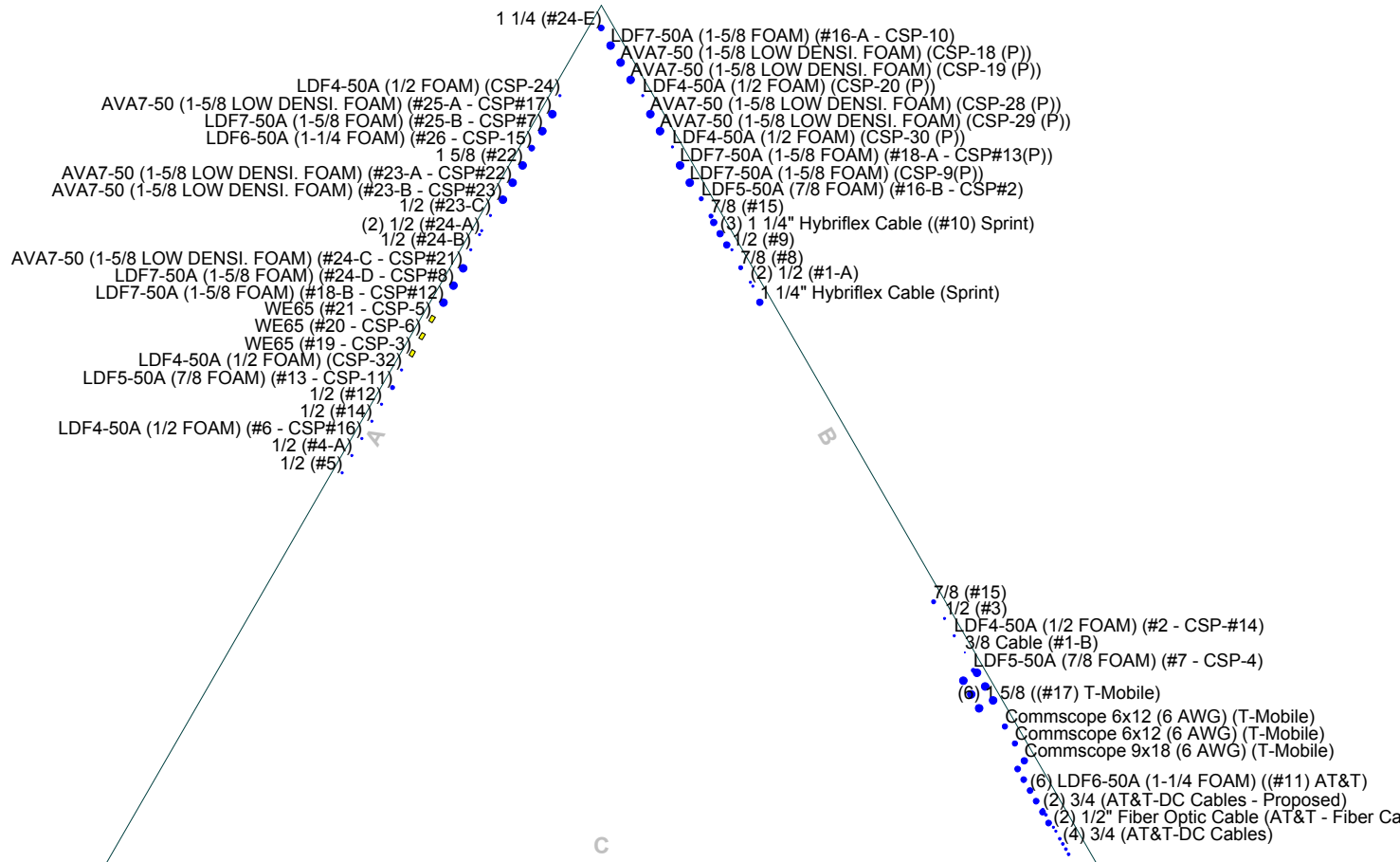
Elevation (ft)



TNX TOWER FEEDLINE PLAN

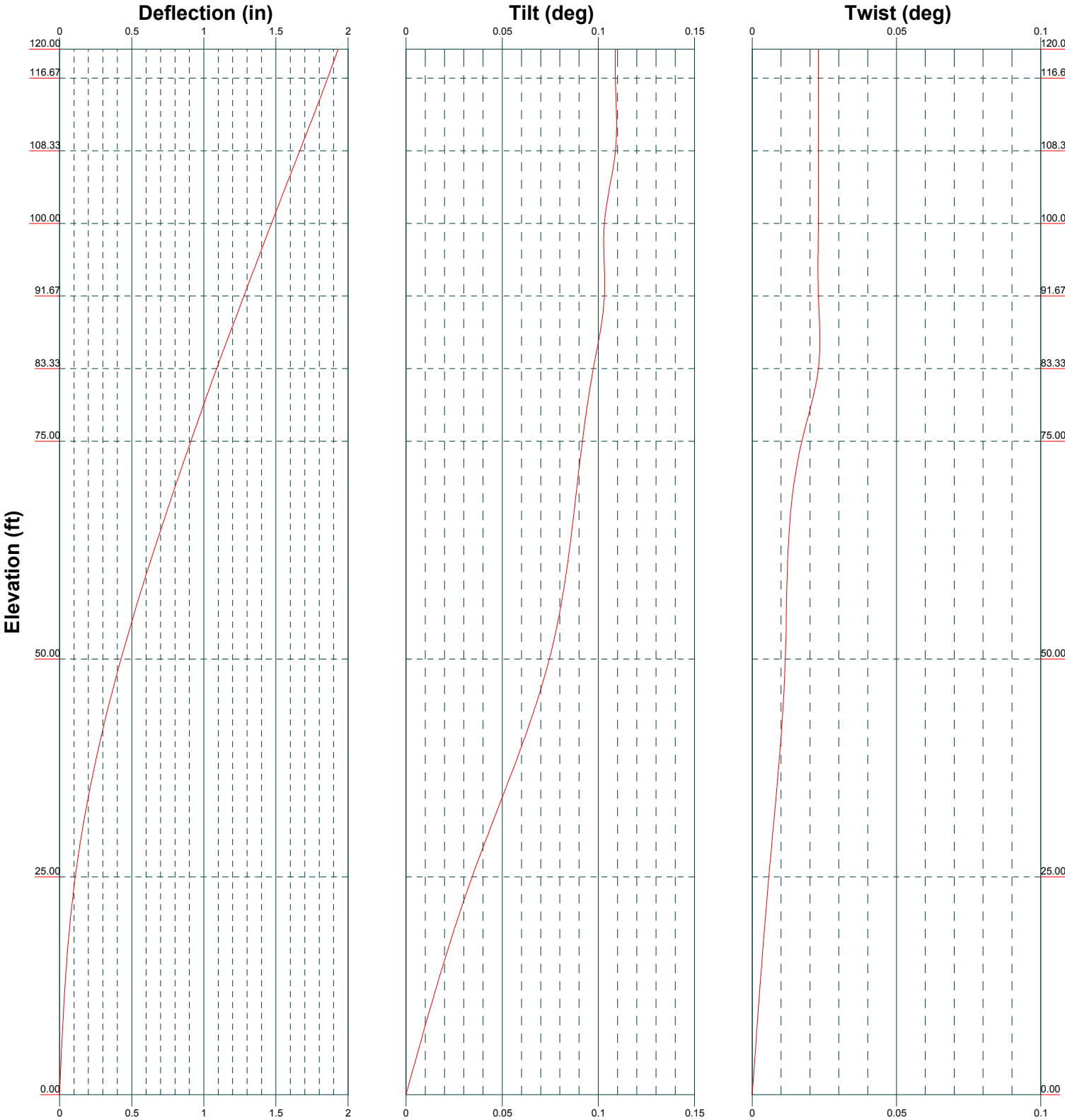
Feed Line Plan

Round Flat App In Face App Out Face



AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991		Job: 120' Self-Supporting Lattice Tower Project: Connecticut State Police Tower - West Rock - Analysis	
Client: SMK-005 / (AT&T)	Drawn by: MCD	App'd:	
Code: TIA-222-G	Date: 05/31/19	Scale: NTS	
Path:		Dwg No. E-7	

TNX DEFLECTION, TILT AND TWIST



TNX TOWER DETAILED OUTPUT

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	1 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 11.41 ft at the top and 21.02 ft at the base.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

Basic wind speed of 97 mph.

Structure Class III.

Exposure Category C.

Topographic Category 4.

Crest Height 150.00 ft.

Nominal ice thickness of 0.7500 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016)..

Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016..

Considerations of application of TIA-222-G Sections 2.6.9.2 and 2.6.9.2.2 are considering a change to the applied "Ka" value as stated within the Standard (pg. 21, 23).

Pressures are calculated at each section.

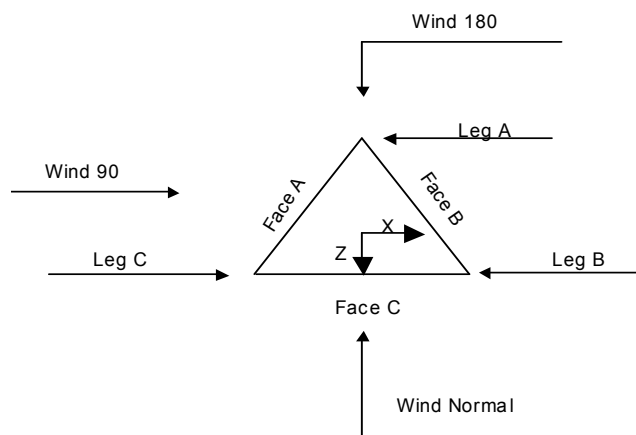
Stress ratio used in tower member design is 1.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	2 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	120.00-116.67			11.41	1	3.33
T2	116.67-108.33			11.68	1	8.33
T3	108.33-100.00			12.35	1	8.33
T4	100.00-91.67			13.02	1	8.33
T5	91.67-83.33			13.68	1	8.33
T6	83.33-75.00			14.35	1	8.33
T7	75.00-50.00			15.02	1	25.00
T8	50.00-25.00			17.02	1	25.00
T9	25.00-0.00			19.02	1	25.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	120.00-116.67	3.33	K Brace Down	No	Yes	0.0000	0.0000
T2	116.67-108.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T3	108.33-100.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T4	100.00-91.67	8.33	K Brace Down	No	Yes	0.0000	0.0000
T5	91.67-83.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T6	83.33-75.00	8.33	K Brace Down	No	Yes	0.0000	0.0000

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	3 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T7	75.00-50.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T8	50.00-25.00	8.33	K1 Down	No	Yes	0.0000	0.0000
T9	25.00-0.00	12.50	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 120.00-116.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T2 116.67-108.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T3 108.33-100.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T4 100.00-91.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2 1/2x1/4x3/8	A529-50 (50 ksi)
T5 91.67-83.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/8	A529-50 (50 ksi)
T6 83.33-75.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/8x3/8	A36 (36 ksi)
T7 75.00-50.00	Pipe	P5x.375	A500-50 (50 ksi)	Double Equal Angle	2L3x3x5/16x3/8	A529-50 (50 ksi)
T8 50.00-25.00	Pipe	P.5x.400	A572-60 (60 ksi)	Double Equal Angle	2L3x3x3/8x3/8	A529-50 (50 ksi)
T9 25.00-0.00	Pipe	P6.875x.400	A572-60 (60 ksi)	Double Equal Angle	2L3 1/2x3 1/2x3/8x3/8	A529-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
<i>ft</i>						
T1 120.00-116.67	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 100.00-91.67	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 91.67-83.33	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T6 83.33-75.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 75.00-50.00	Single Angle	L3x3x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)
T8 50.00-25.00	Equal Angle	L3 1/2x3 1/2x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)
T9 25.00-0.00	Equal Angle	L4x4x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)

<i>tnxTower</i> <i>AECOM</i> 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	4 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
T1 120.00-116.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 116.67-108.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 108.33-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 100.00-91.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 91.67-83.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T6 83.33-75.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T7 75.00-50.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A529-50 (50 ksi)
T8 50.00-25.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x5/16	A529-50 (50 ksi)
T9 25.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x3/8	A529-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
T4 100.00-91.67	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 91.67-83.33	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 83.33-75.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 75.00-50.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 50.00-25.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T9 25.00-0.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Redundant Bracing Grade</i>	<i>Redundant Type</i>	<i>Redundant Size</i>	<i>K Factor</i>
T8 50.00-25.00	A529-50 (50 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 1
T9 25.00-0.00	A529-50 (50 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 1

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	Page
	120' Self-Supporting Lattice Tower	5 of 65
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	Client SMK-005 / (AT&T)	Designed by MCD

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 in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T1 120.00-116.67	0.00	0.0000	A36 (36 ksi)	1	1	1.05	26.9200	36.0000	36.0000
T2 116.67-108.33	0.00	0.0000	A36 (36 ksi)	1	1	1.05	41.4800	36.0000	36.0000
T3 108.33-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	42.3200	36.0000	36.0000
T4 100.00-91.67	0.00	0.0000	A36 (36 ksi)	1	1	1.05	43.1200	36.0000	36.0000
T5 91.67-83.33	0.00	0.0000	A36 (36 ksi)	1	1	1.05	44.0000	36.0000	36.0000
T6 83.33-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	44.8800	36.0000	36.0000
T7 75.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	47.6400	36.0000	36.0000
T8 50.00-25.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	50.6000	36.0000	36.0000
T9 25.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	32.6600	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹							
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 120.00-116.67	Yes	Yes	1	1	1	1	1	1	1	1
T2 116.67-108.33	Yes	Yes	1	1	1	1	1	1	1	1
T3 108.33-100.00	Yes	Yes	1	1	1	1	1	1	1	1
T4 100.00-91.67	Yes	Yes	1	1	1	1	1	1	1	1
T5 91.67-83.33	Yes	Yes	1	1	1	1	1	1	1	1
T6 83.33-75.00	Yes	Yes	1	1	1	1	1	1	1	1
T7 75.00-50.00	Yes	Yes	1	1	1	1	1	1	1	1
T8 50.00-25.00	Yes	Yes	1	1	1	1	1	1	1	1
T9 25.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1

¹Note: 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.

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	6 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-116.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 116.67-108.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 108.33-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 100.00-91.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 91.67-83.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 83.33-75.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 75.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 50.00-25.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 25.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

Tower Elevation 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 120.00-116.67	Flange	0.0000	0	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T2 116.67-108.33	Flange	0.0000	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T3 108.33-100.00	Flange	0.0000	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T4 100.00-91.67	Flange	0.7500	6	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T5 91.67-83.33	Flange	0.7500	0	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T6 83.33-75.00	Flange	0.7500	0	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T7 75.00-50.00	Flange	0.7500	6	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T8 50.00-25.00	Flange	0.7500	6	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T9 25.00-0.00	Flange	1.0000	8	1.0000	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A490X		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	7 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (#17) T-Mobile)	B	No	No	Ar (CaAa)	95.00 - 6.00	-5.0000	0.29	6	3	1.9800	1.9800		1.04
3/8 Cable (#1-B)	B	No	No	Ar (CaAa)	40.00 - 6.00	-2.0000	0.25	1	1	0.3750	0.3750		0.20
LDF4-50A (1/2 FOAM) (#2 - CSP-#14)	B	No	No	Ar (CaAa)	43.00 - 6.00	-2.0000	0.23	1	1	0.6300	0.6300		0.15
1/2 (#3)	B	No	No	Ar (CaAa)	47.00 - 6.00	-2.0000	0.21	1	1	0.5800	0.5800		0.25
LDF5-50A (7/8 FOAM) (#7 - CSP-4)	B	No	No	Ar (CaAa)	55.00 - 6.00	-2.0000	0.27	1	1	1.0900	1.0900		0.33
7/8 (#15)	B	No	No	Ar (CaAa)	86.00 - 6.00	-2.0000	0.19	1	1	1.1100	1.1100		0.54
1 1/4 (#24-E)	A	No	No	Ar (CaAa)	113.00 - 6.00	-2.0000	0.48	1	1	1.5500	1.5500		0.66
LDF4-50A (1/2 FOAM) (CSP-24)	A	No	No	Ar (CaAa)	120.00 - 6.00	-2.0000	0.4	1	1	0.6300	0.6300		0.15
AVA7-50 (1-5/8 LOW DENSEL FOAM) (#25-A - CSP#17)	A	No	No	Ar (CaAa)	114.00 - 6.00	-2.0000	0.38	1	1	1.9800	1.9800		0.72
LDF7-50A (1-5/8 FOAM) (#25-B - CSP#7)	A	No	No	Ar (CaAa)	114.00 - 6.00	-2.0000	0.36	1	1	1.9800	1.9800		0.82
LDF6-50A (1-1/4 FOAM) (#26 - CSP-15)	A	No	No	Ar (CaAa)	114.00 - 6.00	-2.0000	0.34	1	1	1.5500	1.5500		0.66
1 5/8 (#22)	A	No	No	Ar (CaAa)	113.00 - 6.00	-2.0000	0.32	1	1	1.9800	1.9800		1.04
AVA7-50 (1-5/8 LOW DENSEL FOAM) (#23-A - CSP#22)	A	No	No	Ar (CaAa)	113.00 - 6.00	-2.0000	0.3	1	1	1.9800	1.9800		0.72
AVA7-50 (1-5/8 LOW DENSEL FOAM) (#23-B - CSP#23)	A	No	No	Ar (CaAa)	113.00 - 6.00	-2.0000	0.28	1	1	1.9800	1.9800		0.72
1/2 (#23-C)	A	No	No	Ar (CaAa)	113.00 - 6.00	-2.0000	0.26	1	1	0.5800	0.5800		0.25
1/2 (#24-A)	A	No	No	Ar (CaAa)	113.00 - 6.00	-2.0000	0.24	2	2	0.5800	0.5800		0.25
1/2 (#24-B)	A	No	No	Ar (CaAa)	113.00 - 6.00	-2.0000	0.22	1	1	0.5800	0.5800		0.25
AVA7-50 (1-5/8 LOW DENSEL FOAM) (#24-C -	A	No	No	Ar (CaAa)	113.00 - 6.00	-2.0000	0.2	1	1	1.9800	1.9800		0.72

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	9 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF4-50A (1/2 FOAM) (CSP-30 (P))	B	No	No	Ar (CaAa)	110.00 - 6.00	-2.0000	-0.34	1	1	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM) (#18-A - CSP#13(P))	B	No	No	Ar (CaAa)	105.00 - 6.00	-2.0000	-0.32	1	1	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (CSP-9(P))	B	No	No	Ar (CaAa)	103.00 - 6.00	-2.0000	-0.3	1	1	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM) (#16-B - CSP#2)	B	No	No	Ar (CaAa)	92.00 - 6.00	-2.0000	-0.28	1	1	1.0900	1.0900		0.33
7/8 (#15)	B	No	No	Ar (CaAa)	86.00 - 6.00	-2.0000	-0.26	1	1	1.1100	1.1100		0.54
1/2 (#9)	B	No	No	Ar (CaAa)	65.00 - 6.00	-2.0000	-0.22	1	1	0.5800	0.5800		0.25
7/8 (#8)	B	No	No	Ar (CaAa)	63.00 - 6.00	-2.0000	-0.2	1	1	1.1100	1.1100		0.54
1/2 (#1-A)	B	No	No	Ar (CaAa)	40.00 - 6.00	-2.0000	-0.18	2	2	0.5800	0.5800		0.25
LDF6-50A (1-1/4 FOAM) (#11) AT&T)	B	No	No	Ar (CaAa)	80.00 - 6.00	-4.5000	0.41	6	6	1.5500	1.5500		0.66
1/2" Fiber Optic Cable (AT&T - Fiber Cable)	B	No	No	Ar (CaAa)	80.00 - 6.00	-4.5000	0.45	2	2	0.5800	0.5800		0.25
1 1/4" Hybriflex Cable (#10) Sprint)	B	No	No	Ar (CaAa)	72.00 - 6.00	-2.0000	-0.24	3	3	1.6250	1.6250		1.60
3/4 (AT&T-DC Cables)	B	No	No	Ar (CaAa)	80.00 - 6.00	-4.5000	0.47	4	4	0.7500	0.7500		0.54
Commscope 6x12 (6 AWG) (T-Mobile)	B	No	No	Ar (CaAa)	95.00 - 6.00	-2.0000	0.355	1	1	1.4300	1.4300		1.63
Commscope 9x18 (6 AWG) (T-Mobile)	B	No	No	Ar (CaAa)	95.00 - 6.00	-2.0000	0.375	1	1	1.5900	1.5900		2.59
Commscope 6x12 (6 AWG) (T-Mobile)	B	No	No	Ar (CaAa)	95.00 - 6.00	-2.0000	0.335	1	1	1.4300	1.4300		1.63
1 1/4" Hybriflex Cable (Sprint)	B	No	No	Ar (CaAa)	72.00 - 6.00	-2.0000	-0.16	1	1	1.6250	1.6250		1.60
3/4 (AT&T-DC Cables - Proposed)	B	No	No	Ar (CaAa)	80.00 - 6.00	-4.5000	0.43	2	2	0.7500	0.7500		0.54

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	10 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Feed Line/Linear Appurtenances Section Areas

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_{AA}</i> <i>In Face ft²</i>	<i>C_{AA}</i> <i>Out Face ft²</i>	<i>Weight K</i>
T1	120.00-116.67	A	0.000	0.000	0.210	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	116.67-108.33	A	0.000	0.000	11.019	0.000	0.04
		B	0.000	0.000	1.860	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	0.000	0.000	24.677	0.000	0.09
		B	0.000	0.000	10.884	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	0.000	0.000	25.365	0.000	0.09
		B	0.000	0.000	18.080	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T5	91.67-83.33	A	0.000	0.000	25.365	0.000	0.09
		B	0.000	0.000	27.709	0.000	0.15
		C	0.000	0.000	0.000	0.000	0.00
T6	83.33-75.00	A	0.000	0.000	26.592	0.000	0.09
		B	0.000	0.000	36.447	0.000	0.20
		C	0.000	0.000	0.000	0.000	0.00
T7	75.00-50.00	A	0.000	0.000	81.909	0.000	0.29
		B	0.000	0.000	141.458	0.000	0.82
		C	0.000	0.000	0.000	0.000	0.00
T8	50.00-25.00	A	0.000	0.000	85.441	0.000	0.30
		B	0.000	0.000	152.212	0.000	0.88
		C	0.000	0.000	0.000	0.000	0.00
T9	25.00-0.00	A	0.000	0.000	65.508	0.000	0.23
		B	0.000	0.000	117.316	0.000	0.67
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R</i> <i>ft²</i>	<i>A_F</i> <i>ft²</i>	<i>C_{AA}</i> <i>In Face ft²</i>	<i>C_{AA}</i> <i>Out Face ft²</i>	<i>Weight K</i>
T1	120.00-116.67	A	2.449	0.000	0.000	1.843	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	116.67-108.33	A	2.455	0.000	0.000	48.248	0.000	0.90
		B		0.000	0.000	7.589	0.000	0.15
		C		0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	2.465	0.000	0.000	99.265	0.000	1.86
		B		0.000	0.000	43.581	0.000	0.86
		C		0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	2.474	0.000	0.000	103.539	0.000	1.94
		B		0.000	0.000	64.018	0.000	1.32
		C		0.000	0.000	0.000	0.000	0.00
T5	91.67-83.33	A	2.484	0.000	0.000	103.845	0.000	1.96
		B		0.000	0.000	93.486	0.000	1.98
		C		0.000	0.000	0.000	0.000	0.00
T6	83.33-75.00	A	2.494	0.000	0.000	112.856	0.000	2.12
		B		0.000	0.000	133.576	0.000	2.62
		C		0.000	0.000	0.000	0.000	0.00
T7	75.00-50.00	A	2.511	0.000	0.000	359.051	0.000	6.77
		B		0.000	0.000	543.189	0.000	10.34
		C		0.000	0.000	0.000	0.000	0.00
T8	50.00-25.00	A	2.516	0.000	0.000	392.866	0.000	7.37

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
T9	25.00-0.00	B	2.401	0.000	0.000	623.825	0.000	11.69
		C		0.000	0.000	0.000	0.000	0.00
		A		0.000	0.000	293.263	0.000	5.29
		B		0.000	0.000	475.972	0.000	8.57
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	120.00-116.67	-0.0376	-0.5794	-0.1519	-2.1640
T2	116.67-108.33	-2.2305	-14.3303	-3.9608	-24.0534
T3	108.33-100.00	-4.3428	-27.3369	-5.8426	-37.6871
T4	100.00-91.67	-0.3593	-25.4356	-2.2150	-36.1471
T5	91.67-83.33	5.0365	-22.7159	3.3312	-33.4696
T6	83.33-75.00	9.8418	-19.2050	10.2978	-27.0302
T7	75.00-50.00	13.0368	-18.9011	15.0133	-26.6356
T8	50.00-25.00	12.9359	-18.7575	16.2430	-27.5418
T9	25.00-0.00	12.5917	-18.2462	16.8647	-27.8807

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	8	LDF4-50A (1/2 FOAM)	116.67 - 120.00	0.6000	0.5082
T2	7	1 1/4	108.33 - 113.00	0.6000	0.6000
T2	8	LDF4-50A (1/2 FOAM)	108.33 - 116.67	0.6000	0.6000
T2	9	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 114.00	0.6000	0.6000
T2	10	LDF7-50A (1-5/8 FOAM)	108.33 - 114.00	0.6000	0.6000
T2	11	LDF6-50A (1-1/4 FOAM)	108.33 - 114.00	0.6000	0.6000
T2	12	1 5/8	108.33 - 113.00	0.6000	0.6000
T2	13	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 113.00	0.6000	0.6000
T2	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 113.00	0.6000	0.6000
T2	15	1/2	108.33 - 113.00	0.6000	0.6000
T2	16	1/2	108.33 - 113.00	0.6000	0.6000
T2	17	1/2	108.33 - 113.00	0.6000	0.6000
T2	18	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 113.00	0.6000	0.6000

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	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T2	19	LDF7-50A (1-5/8 FOAM)	108.33 - 113.00	0.6000	0.6000
T2	20	LDF7-50A (1-5/8 FOAM)	108.33 - 110.00	0.6000	0.6000
T2	21	WE65	108.33 - 110.00	0.6000	0.6000
T2	22	WE65	108.33 - 109.00	0.6000	0.6000
T2	31	LDF7-50A (1-5/8 FOAM)	108.33 - 110.00	0.6000	0.6000
T2	32	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 110.00	0.6000	0.6000
T2	33	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 110.00	0.6000	0.6000
T2	34	LDF4-50A (1/2 FOAM)	108.33 - 110.00	0.6000	0.6000
T2	35	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 110.00	0.6000	0.6000
T2	36	AVA7-50 (1-5/8 LOW DENS. FOAM)	108.33 - 110.00	0.6000	0.6000
T2	37	LDF4-50A (1/2 FOAM)	108.33 - 110.00	0.6000	0.6000
T3	7	1 1/4	100.00 - 108.33	0.6000	0.6000
T3	8	LDF4-50A (1/2 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	9	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	10	LDF7-50A (1-5/8 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	11	LDF6-50A (1-1/4 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	12	1 5/8	100.00 - 108.33	0.6000	0.6000
T3	13	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	15	1/2	100.00 - 108.33	0.6000	0.6000
T3	16	1/2	100.00 - 108.33	0.6000	0.6000
T3	17	1/2	100.00 - 108.33	0.6000	0.6000
T3	18	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	19	LDF7-50A (1-5/8 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	20	LDF7-50A (1-5/8 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	21	WE65	100.00 - 108.33	0.6000	0.6000
T3	22	WE65	100.00 - 108.33	0.6000	0.6000
T3	23	WE65	100.00 - 107.00	0.6000	0.6000
T3	24	LDF4-50A (1/2 FOAM)	100.00 - 103.00	0.6000	0.6000
T3	31	LDF7-50A (1-5/8 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	32	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	13 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T3	33	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	34	LDF4-50A (1/2 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	35	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	36	AVA7-50 (1-5/8 LOW DENS. FOAM)	100.00 - 108.33	0.6000	0.6000
T3	37	LDF4-50A (1/2 FOAM)	100.00 - 108.33	0.6000	0.6000
T3	38	LDF7-50A (1-5/8 FOAM)	100.00 - 105.00	0.6000	0.6000
T3	39	LDF7-50A (1-5/8 FOAM)	100.00 - 103.00	0.6000	0.6000
T4	1	1 5/8	91.67 - 95.00	0.6000	0.6000
T4	7	1 1/4	91.67 - 100.00	0.6000	0.6000
T4	8	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	9	AVA7-50 (1-5/8 LOW DENS. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	10	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	11	LDF6-50A (1-1/4 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	12	1 5/8	91.67 - 100.00	0.6000	0.6000
T4	13	AVA7-50 (1-5/8 LOW DENS. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	15	1/2	91.67 - 100.00	0.6000	0.6000
T4	16	1/2	91.67 - 100.00	0.6000	0.6000
T4	17	1/2	91.67 - 100.00	0.6000	0.6000
T4	18	AVA7-50 (1-5/8 LOW DENS. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	19	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	20	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	21	WE65	91.67 - 100.00	0.6000	0.6000
T4	22	WE65	91.67 - 100.00	0.6000	0.6000
T4	23	WE65	91.67 - 100.00	0.6000	0.6000
T4	24	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	31	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	32	AVA7-50 (1-5/8 LOW DENS. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	33	AVA7-50 (1-5/8 LOW DENS. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	34	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	35	AVA7-50 (1-5/8 LOW DENS. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	36	AVA7-50 (1-5/8 LOW DENS. FOAM)	91.67 - 100.00	0.6000	0.6000
T4	37	LDF4-50A (1/2 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	38	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	39	LDF7-50A (1-5/8 FOAM)	91.67 - 100.00	0.6000	0.6000
T4	40	LDF5-50A (7/8 FOAM)	91.67 - 92.00	0.6000	0.6000
T4	50	Commscope 6x12 (6 AWG)	91.67 - 95.00	0.6000	0.6000
T4	51	Commscope 9x18 (6 AWG)	91.67 - 95.00	0.6000	0.6000
T4	52	Commscope 6x12 (6 AWG)	91.67 - 95.00	0.6000	0.6000
T5	1	1 5/8	83.33 - 91.67	0.6000	0.6000
T5	6	7/8	83.33 - 86.00	0.6000	0.6000
T5	7	1 1/4	83.33 - 91.67	0.6000	0.6000
T5	8	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	9	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	10	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	11	LDF6-50A (1-1/4 FOAM)	83.33 - 91.67	0.6000	0.6000

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	14 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T5	12	1 5/8	83.33 - 91.67	0.6000	0.6000
T5	13	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	15	1/2	83.33 - 91.67	0.6000	0.6000
T5	16	1/2	83.33 - 91.67	0.6000	0.6000
T5	17	1/2	83.33 - 91.67	0.6000	0.6000
T5	18	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	19	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	20	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	21	WE65	83.33 - 91.67	0.6000	0.6000
T5	22	WE65	83.33 - 91.67	0.6000	0.6000
T5	23	WE65	83.33 - 91.67	0.6000	0.6000
T5	24	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	31	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	32	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	33	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	34	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	35	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	36	AVA7-50 (1-5/8 LOW DENS. FOAM)	83.33 - 91.67	0.6000	0.6000
T5	37	LDF4-50A (1/2 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	38	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	39	LDF7-50A (1-5/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	40	LDF5-50A (7/8 FOAM)	83.33 - 91.67	0.6000	0.6000
T5	41	7/8	83.33 - 86.00	0.6000	0.6000
T5	50	Commscope 6x12 (6 AWG)	83.33 - 91.67	0.6000	0.6000
T5	51	Commscope 9x18 (6 AWG)	83.33 - 91.67	0.6000	0.6000
T5	52	Commscope 6x12 (6 AWG)	83.33 - 91.67	0.6000	0.6000
T6	1	1 5/8	75.00 - 83.33	0.6000	0.6000
T6	6	7/8	75.00 - 83.33	0.6000	0.6000
T6	7	1 1/4	75.00 - 83.33	0.6000	0.6000
T6	8	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	9	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	10	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	11	LDF6-50A (1-1/4 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	12	1 5/8	75.00 - 83.33	0.6000	0.6000
T6	13	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	15	1/2	75.00 - 83.33	0.6000	0.6000
T6	16	1/2	75.00 - 83.33	0.6000	0.6000
T6	17	1/2	75.00 - 83.33	0.6000	0.6000
T6	18	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	19	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	20	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	21	WE65	75.00 - 83.33	0.6000	0.6000
T6	22	WE65	75.00 - 83.33	0.6000	0.6000
T6	23	WE65	75.00 - 83.33	0.6000	0.6000
T6	24	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	25	LDF5-50A (7/8 FOAM)	75.00 - 82.00	0.6000	0.6000
T6	26	1/2	75.00 - 81.00	0.6000	0.6000
T6	27	1/2	75.00 - 77.00	0.6000	0.6000
T6	31	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	15 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T6	32	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	33	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	34	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	35	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	36	AVA7-50 (1-5/8 LOW DENS. FOAM)	75.00 - 83.33	0.6000	0.6000
T6	37	LDF4-50A (1/2 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	38	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	39	LDF7-50A (1-5/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	40	LDF5-50A (7/8 FOAM)	75.00 - 83.33	0.6000	0.6000
T6	41	7/8	75.00 - 83.33	0.6000	0.6000
T6	45	LDF6-50A (1-1/4 FOAM)	75.00 - 80.00	0.6000	0.6000
T6	47	1/2" Fiber Optic Cable	75.00 - 80.00	0.6000	0.6000
T6	49	3/4	75.00 - 80.00	0.6000	0.6000
T6	50	Commscope 6x12 (6 AWG)	75.00 - 83.33	0.6000	0.6000
T6	51	Commscope 9x18 (6 AWG)	75.00 - 83.33	0.6000	0.6000
T6	52	Commscope 6x12 (6 AWG)	75.00 - 83.33	0.6000	0.6000
T6	54	3/4	75.00 - 80.00	0.6000	0.6000
T7	1	1 5/8	50.00 - 75.00	0.6000	0.6000
T7	5	LDF5-50A (7/8 FOAM)	50.00 - 55.00	0.6000	0.6000
T7	6	7/8	50.00 - 75.00	0.6000	0.6000
T7	7	1 1/4	50.00 - 75.00	0.6000	0.6000
T7	8	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	9	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	10	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	11	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	12	1 5/8	50.00 - 75.00	0.6000	0.6000
T7	13	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	15	1/2	50.00 - 75.00	0.6000	0.6000
T7	16	1/2	50.00 - 75.00	0.6000	0.6000
T7	17	1/2	50.00 - 75.00	0.6000	0.6000
T7	18	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	19	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	20	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	21	WE65	50.00 - 75.00	0.6000	0.6000
T7	22	WE65	50.00 - 75.00	0.6000	0.6000
T7	23	WE65	50.00 - 75.00	0.6000	0.6000
T7	24	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	25	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	26	1/2	50.00 - 75.00	0.6000	0.6000
T7	27	1/2	50.00 - 75.00	0.6000	0.6000
T7	28	LDF4-50A (1/2 FOAM)	50.00 - 53.00	0.6000	0.6000
T7	31	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	32	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	33	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	34	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	35	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	36	AVA7-50 (1-5/8 LOW DENS. FOAM)	50.00 - 75.00	0.6000	0.6000
T7	37	LDF4-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	38	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	16 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T7	39	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	40	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	41	7/8	50.00 - 75.00	0.6000	0.6000
T7	42	1/2	50.00 - 65.00	0.6000	0.6000
T7	43	7/8	50.00 - 63.00	0.6000	0.6000
T7	45	LDF6-50A (1-1/4 FOAM)	50.00 - 75.00	0.6000	0.6000
T7	47	1/2" Fiber Optic Cable	50.00 - 75.00	0.6000	0.6000
T7	48	1 1/4" Hybriflex Cable	50.00 - 72.00	0.6000	0.6000
T7	49	3/4	50.00 - 75.00	0.6000	0.6000
T7	50	Commscope 6x12 (6 AWG)	50.00 - 75.00	0.6000	0.6000
T7	51	Commscope 9x18 (6 AWG)	50.00 - 75.00	0.6000	0.6000
T7	52	Commscope 6x12 (6 AWG)	50.00 - 75.00	0.6000	0.6000
T7	53	1 1/4" Hybriflex Cable	50.00 - 72.00	0.6000	0.6000
T7	54	3/4	50.00 - 75.00	0.6000	0.6000
T8	1	1 5/8	25.00 - 50.00	0.6000	0.6000
T8	2	3/8 Cable	25.00 - 40.00	0.6000	0.6000
T8	3	LDF4-50A (1/2 FOAM)	25.00 - 43.00	0.6000	0.6000
T8	4	1/2	25.00 - 47.00	0.6000	0.6000
T8	5	LDF5-50A (7/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	6	7/8	25.00 - 50.00	0.6000	0.6000
T8	7	1 1/4	25.00 - 50.00	0.6000	0.6000
T8	8	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	9	AVA7-50 (1-5/8 LOW DENSEL. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	10	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	11	LDF6-50A (1-1/4 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	12	1 5/8	25.00 - 50.00	0.6000	0.6000
T8	13	AVA7-50 (1-5/8 LOW DENSEL. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	14	AVA7-50 (1-5/8 LOW DENSEL. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	15	1/2	25.00 - 50.00	0.6000	0.6000
T8	16	1/2	25.00 - 50.00	0.6000	0.6000
T8	17	1/2	25.00 - 50.00	0.6000	0.6000
T8	18	AVA7-50 (1-5/8 LOW DENSEL. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	19	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	20	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	21	WE65	25.00 - 50.00	0.6000	0.6000
T8	22	WE65	25.00 - 50.00	0.6000	0.6000
T8	23	WE65	25.00 - 50.00	0.6000	0.6000
T8	24	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	25	LDF5-50A (7/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	26	1/2	25.00 - 50.00	0.6000	0.6000
T8	27	1/2	25.00 - 50.00	0.6000	0.6000
T8	28	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	29	1/2	25.00 - 48.00	0.6000	0.6000
T8	30	1/2	25.00 - 39.00	0.6000	0.6000
T8	31	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	32	AVA7-50 (1-5/8 LOW DENSEL. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	33	AVA7-50 (1-5/8 LOW DENSEL. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	34	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	35	AVA7-50 (1-5/8 LOW DENSEL. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	36	AVA7-50 (1-5/8 LOW DENSEL. FOAM)	25.00 - 50.00	0.6000	0.6000
T8	37	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	38	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	39	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	40	LDF5-50A (7/8 FOAM)	25.00 - 50.00	0.6000	0.6000

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	17 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T8	41	7/8	25.00 - 50.00	0.6000	0.6000
T8	42	1/2	25.00 - 50.00	0.6000	0.6000
T8	43	7/8	25.00 - 50.00	0.6000	0.6000
T8	44	1/2	25.00 - 40.00	0.6000	0.6000
T8	45	LDF6-50A (1-1/4 FOAM)	25.00 - 50.00	0.6000	0.6000
T8	47	1/2" Fiber Optic Cable	25.00 - 50.00	0.6000	0.6000
T8	48	1 1/4" Hybriflex Cable	25.00 - 50.00	0.6000	0.6000
T8	49	3/4	25.00 - 50.00	0.6000	0.6000
T8	50	Commscope 6x12 (6 AWG)	25.00 - 50.00	0.6000	0.6000
T8	51	Commscope 9x18 (6 AWG)	25.00 - 50.00	0.6000	0.6000
T8	52	Commscope 6x12 (6 AWG)	25.00 - 50.00	0.6000	0.6000
T8	53	1 1/4" Hybriflex Cable	25.00 - 50.00	0.6000	0.6000
T8	54	3/4	25.00 - 50.00	0.6000	0.6000
T9	1	1 5/8	6.00 - 25.00	0.6000	0.6000
T9	2	3/8 Cable	6.00 - 25.00	0.6000	0.6000
T9	3	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	4	1/2	6.00 - 25.00	0.6000	0.6000
T9	5	LDF5-50A (7/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	6	7/8	6.00 - 25.00	0.6000	0.6000
T9	7	1 1/4	6.00 - 25.00	0.6000	0.6000
T9	8	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	9	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	10	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	11	LDF6-50A (1-1/4 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	12	1 5/8	6.00 - 25.00	0.6000	0.6000
T9	13	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	14	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	15	1/2	6.00 - 25.00	0.6000	0.6000
T9	16	1/2	6.00 - 25.00	0.6000	0.6000
T9	17	1/2	6.00 - 25.00	0.6000	0.6000
T9	18	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	19	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	20	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	21	WE65	6.00 - 25.00	0.6000	0.6000
T9	22	WE65	6.00 - 25.00	0.6000	0.6000
T9	23	WE65	6.00 - 25.00	0.6000	0.6000
T9	24	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	25	LDF5-50A (7/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	26	1/2	6.00 - 25.00	0.6000	0.6000
T9	27	1/2	6.00 - 25.00	0.6000	0.6000
T9	28	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	29	1/2	6.00 - 25.00	0.6000	0.6000
T9	30	1/2	6.00 - 25.00	0.6000	0.6000
T9	31	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	32	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	33	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	34	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	35	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	36	AVA7-50 (1-5/8 LOW DENS. FOAM)	6.00 - 25.00	0.6000	0.6000
T9	37	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	38	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	39	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	40	LDF5-50A (7/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	41	7/8	6.00 - 25.00	0.6000	0.6000

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	18 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	42	1/2	6.00 - 25.00	0.6000	0.6000
T9	43	7/8	6.00 - 25.00	0.6000	0.6000
T9	44	1/2	6.00 - 25.00	0.6000	0.6000
T9	45	LDF6-50A (1-1/4 FOAM)	6.00 - 25.00	0.6000	0.6000
T9	47	1/2" Fiber Optic Cable	6.00 - 25.00	0.6000	0.6000
T9	48	1 1/4" Hybriflex Cable	6.00 - 25.00	0.6000	0.6000
T9	49	3/4	6.00 - 25.00	0.6000	0.6000
T9	50	Commscope 6x12 (6 AWG)	6.00 - 25.00	0.6000	0.6000
T9	51	Commscope 9x18 (6 AWG)	6.00 - 25.00	0.6000	0.6000
T9	52	Commscope 6x12 (6 AWG)	6.00 - 25.00	0.6000	0.6000
T9	53	1 1/4" Hybriflex Cable	6.00 - 25.00	0.6000	0.6000
T9	54	3/4	6.00 - 25.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		$C_A A_A$ Front ft ²	$C_A A_A$ Side ft ²	Weight K
Pirot 6' Side Mount Standoff (1)	B	From Leg	1.00	0.0000	41.00	No Ice	4.97	4.97	0.07
(#1-A Dish Mount)			4.00			1/2" Ice	6.12	6.12	0.13
1'x1' Panel Antenna			0.00			1" Ice	7.27	7.27	0.19
(#1-B (mount Share #1-A))	B	From Leg	1.00	0.0000	40.00	No Ice	1.20	0.13	0.01
			4.00			1/2" Ice	1.34	0.21	0.02
			0.00			1" Ice	1.48	0.29	0.02
3' Whip (3in diameter) /w mount	B	From Leg	0.50	0.0000	43.00	No Ice	1.18	1.18	0.02
(#2)			0.00			1/2" Ice	1.64	1.64	0.03
			0.00			1" Ice	2.04	2.04	0.05
5'x1.5in dia Whip Antenna /w mount	A	From Leg	0.50	0.0000	47.00	No Ice	1.81	1.81	0.03
(#3)			0.00			1/2" Ice	2.64	2.64	0.05
			0.00			1" Ice	3.30	3.30	0.07
10'x6" Dipole Antenna (#4-A)	C	From Leg	3.00	0.0000	48.00	No Ice	9.17	1.67	0.05
			0.00			1/2" Ice	9.89	2.79	0.08
			0.00			1" Ice	10.62	3.93	0.12
3' Yagi (#4-B)	C	From Leg	3.00	0.0000	48.00	No Ice	2.08	2.08	0.03
			0.00			1/2" Ice	3.79	3.79	0.05
			0.00			1" Ice	5.52	5.52	0.09
Pirot 4' Side Mount Standoff (1)	C	None		0.0000	48.00	No Ice	2.72	2.72	0.05
(#4-A&B)						1/2" Ice	4.91	4.91	0.09
						1" Ice	7.10	7.10	0.13
6'x1" Whip Antenna w/ Mount	A	From Leg	1.00	0.0000	39.00	No Ice	2.02	2.02	0.05
(#5 - CSP#14)			0.00			1/2" Ice	3.14	3.14	0.07
			0.00			1" Ice	4.13	4.13	0.10
1.0" Dia 4' Omni w/Pipe Mount	B	From Leg	2.00	0.0000	53.00	No Ice	0.94	0.94	0.02
(#6 - CSP#16)			0.00			1/2" Ice	1.39	1.39	0.03
			0.00			1" Ice	1.80	1.80	0.05
20' 4-Bay Dipole w/ 2' Sidearm Mount	A	From Leg	2.00	0.0000	55.00	No Ice	4.00	4.00	0.06
(#7 - CSP-4)			0.00			1/2" Ice	6.00	6.00	0.10
			0.00			1" Ice	8.00	8.00	0.14
GPS (#8)	B	From Leg	3.00	0.0000	63.00	No Ice	1.00	1.00	0.01
			0.00			1/2" Ice	1.50	1.50	0.01
			0.00			1" Ice	2.00	2.00	0.02

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	19 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
2'6"x4" Pipe Mount (For #8)	B	None		0.0000	63.00	No Ice 0.58 1/2" Ice 0.91 1" Ice 1.09	0.58 0.91 1.09	0.03 0.04 0.05
6' Yagi w/ Mount (#9)	B	From Leg	2.00 0.00 0.00	0.0000	65.00	No Ice 7.59 1/2" Ice 8.18 1" Ice 8.79	0.71 0.98 1.26	0.05 0.09 0.14
3' Yagi (#12)	B	From Leg	1.00 0.00 0.00	40.0000	81.00	No Ice 2.08 1/2" Ice 3.79 1" Ice 5.52	2.08 3.79 5.52	0.03 0.05 0.09
3' Yagi (#13 - CSP-11)	B	From Leg	1.00 0.00 0.00	-40.0000	82.00	No Ice 2.08 1/2" Ice 3.79 1" Ice 5.52	2.08 3.79 5.52	0.03 0.05 0.09
20' 4-Bay Dipole (#14)	B	From Leg	4.00 0.00 0.00	0.0000	77.00	No Ice 4.00 1/2" Ice 6.00 1" Ice 8.00	4.00 6.00 8.00	0.06 0.10 0.14
4'6"x3" Pipe Mount (horizontal)	B	None		0.0000	67.00	No Ice 1.30 1/2" Ice 1.57 1" Ice 1.86	1.30 1.57 1.86	0.03 0.08 0.14
((Bottom mount) #14)						No Ice 1.30 1/2" Ice 1.57 1" Ice 1.86	1.30 1.57 1.86	0.03 0.08 0.14
4'6"x3" Pipe Mount (horizontal)	B	None		0.0000	87.00	No Ice 1.30 1/2" Ice 1.57 1" Ice 1.86	1.30 1.57 1.86	0.03 0.08 0.14
((Top Mount) #14)						No Ice 4.00 1/2" Ice 6.00 1" Ice 8.00	4.00 6.00 8.00	0.06 0.10 0.14
20' 4-Bay Dipole (#15)	A	From Leg	4.00 0.00 0.00	0.0000	86.00	No Ice 4.00 1/2" Ice 6.00 1" Ice 8.00	4.00 6.00 8.00	0.06 0.10 0.14
3'4"x4" Pipe Mount (horizontal)	A	None		0.0000	76.00	No Ice 1.05 1/2" Ice 1.27 1" Ice 1.52	1.05 1.27 1.52	0.04 0.09 0.13
((Bottom mount) #15)						No Ice 1.05 1/2" Ice 1.27 1" Ice 1.52	1.05 1.27 1.52	0.04 0.09 0.13
3'4"x4" Pipe Mount (horizontal)	A	None		0.0000	96.00	No Ice 1.05 1/2" Ice 1.27 1" Ice 1.52	1.05 1.27 1.52	0.04 0.09 0.13
((Top Mount) #15)						No Ice 1.74 1/2" Ice 2.60 1" Ice 3.31	1.74 2.60 3.31	0.04 0.05 0.08
SC479-HF1LDF (inverted) (# 16-A - CSP-10)	B	From Face	4.00 0.00 0.00	0.0000	81.00 - 95.00	No Ice 1.74 1/2" Ice 2.60 1" Ice 3.31	1.74 2.60 3.31	0.04 0.05 0.08
PD458-406 (# 16-B - CSP-2)	A	From Face	4.00 0.00 0.00	0.0000	100.00 - 92.00	No Ice 4.59 1/2" Ice 6.89 1" Ice 9.19	4.59 6.89 9.19	0.02 0.04 0.05
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Upright # 16-B) (# 16-A&B)	A	None		0.0000	92.00	No Ice 2.30 1/2" Ice 3.13 1" Ice 3.62	2.30 3.13 3.62	0.04 0.15 0.27
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Invert #16-A) (# 16-A&B)	A	None		0.0000	92.00	No Ice 2.30 1/2" Ice 3.13 1" Ice 3.62	2.30 3.13 3.62	0.04 0.15 0.27
SE419-SWBPALDF Panel Antenna (#18-A - CSP 13(P))	A	From Face	0.50 0.00 0.00	0.0000	101.00	No Ice 11.64 1/2" Ice 12.29 1" Ice 12.95	7.88 8.51 9.14	0.05 0.11 0.19
AP13-850/065D w/Mount Pipe (#18-B - CSP-12(E))	A	From Face	0.50 0.00 0.00	0.0000	104.00	No Ice 5.31 1/2" Ice 5.93 1" Ice 6.44	3.92 4.96 5.72	0.04 0.08 0.14
6'8"x4" Pipe Mount (#19 - Dish Mount)	C	None		0.0000	107.00	No Ice 1.68 1/2" Ice 3.01 1" Ice 3.42	1.68 3.01 3.42	0.07 0.09 0.12
6'8"x4" Pipe Mount (#20 - Dish Mount)	C	None		0.0000	107.00	No Ice 1.68 1/2" Ice 3.01 1" Ice 3.42	1.68 3.01 3.42	0.07 0.09 0.12
6'8"x4" Pipe Mount (#21 - Dish Mount)	A	None		0.0000	110.00	No Ice 1.69 1/2" Ice 3.01 1" Ice 3.42	1.69 3.01 3.42	0.07 0.09 0.12

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	20 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Pirol 4' Side Mount Standoff (1)	B	None		0.0000	113.00	No Ice	2.72	2.72	0.05
(#22, 23-A, 23-B Mount)						1/2" Ice	4.91	4.91	0.09
						1" Ice	7.10	7.10	0.13
16'x3" Omni (#22)	B	From Leg	4.00	0.0000	113.00	No Ice	5.06	5.06	0.03
			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
16'x3" Omni (inverted) (#23-A - CSP-22)	B	From Leg	4.00	0.0000	106.00 - 120.00	No Ice	5.06	5.06	0.03
			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
16'x3" Omni (inverted) (#23-B - CSP-23)	B	From Leg	2.00	0.0000	106.00 - 120.00	No Ice	5.06	5.06	0.03
			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
Junction Box (#23-C)	B	From Face	0.50	0.0000	112.00	No Ice	3.15	1.05	0.02
			0.00			1/2" Ice	3.39	1.21	0.04
			0.00			1" Ice	3.63	1.37	0.06
Rohn 6' Side-Arm(1) (#24 Antennas Mount)	B	From Leg	0.00	20.0000	114.00	No Ice	10.60	10.60	0.14
			0.00			1/2" Ice	15.40	15.40	0.21
			0.00			1" Ice	20.20	20.20	0.28
Rohn 6' Side-Arm(1) (#24 Antennas Mount)	C	From Leg	0.00	-20.0000	114.00	No Ice	10.60	10.60	0.14
			0.00			1/2" Ice	15.40	15.40	0.21
			0.00			1" Ice	20.20	20.20	0.28
Junction Box (#24-A)	C	From Face	3.00	0.0000	114.00	No Ice	3.15	1.05	0.02
			0.00			1/2" Ice	3.39	1.21	0.04
			0.00			1" Ice	3.63	1.37	0.06
SC479-HF1LDF (inverted) (#24-B)	C	From Face	6.00	0.0000	106.00 - 120.00	No Ice	5.06	5.06	0.03
			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
SC479-HF1LDF (#24-C - CSP#21)	B	From Face	6.00	0.0000	120.00	No Ice	3.82	3.82	0.03
			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
OGT9-840 (#24-D - CSP#8)	B	From Face	3.00	0.0000	120.00	No Ice	2.27	2.27	0.02
			0.00			1/2" Ice	3.44	3.44	0.04
			0.00			1" Ice	4.61	4.61	0.06
10'x2" Dipole Antenna (inverted) (#24-E)	C	From Face	3.00	0.0000	104.00 - 114.00	No Ice	9.17	1.67	0.05
			0.00			1/2" Ice	9.89	2.79	0.08
			0.00			1" Ice	10.62	3.93	0.12
Rohn 6' Side-Arm(1) (#25 Antennas Mount)	C	From Leg	0.00	60.0000	114.00	No Ice	10.60	10.60	0.14
			0.00			1/2" Ice	15.40	15.40	0.21
			0.00			1" Ice	20.20	20.20	0.28
SC479-HF1LDF (inverted) (#25-A - CSP-17)	C	From Leg	6.00	60.0000	100.00 - 114.00	No Ice	5.06	5.06	0.03
			0.00			1/2" Ice	6.54	6.54	0.07
			0.00			1" Ice	8.04	8.04	0.11
OGT9-840 (#25-B - CSP#7)	C	From Leg	6.00	60.0000	120.00	No Ice	2.27	2.27	0.02
			0.00			1/2" Ice	3.44	3.44	0.04
			0.00			1" Ice	4.61	4.61	0.06
10'x2" Dipole Antenna (#26 - CSP-15)	A	From Leg	0.50	0.0000	120.00	No Ice	9.17	1.67	0.05
			0.00			1/2" Ice	9.89	2.79	0.08
			0.00			1" Ice	10.62	3.93	0.12
Lightning Rod 5/8x4' (#27)	C	None		0.0000	138.00	No Ice	0.25	0.25	0.03
						1/2" Ice	0.66	0.66	0.03
						1" Ice	0.97	0.97	0.04
16'x2.5" Pipe Mount (#27 Mount)	C	None		0.0000	138.00	No Ice	4.00	4.00	0.09
						1/2" Ice	4.80	4.80	0.09
						1" Ice	5.60	5.60	0.10
TMA 432-83H-01T (CSP-32)	C	None		0.0000	103.00	No Ice	1.40	0.82	0.03
						1/2" Ice	1.55	0.94	0.04
						1" Ice	1.70	1.06	0.05

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	Client	SMK-005 / (AT&T)	Designed by	MCD

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_AA_A Front ft²</i>	<i>C_AA_A Side ft²</i>	<i>Weight K</i>
Inventory									
* T-Mobile Proposed Inventory									
APXVAARR24_43-U-NA20 Panel (RFS)	A	From Leg	3.00	0.0000	95.00	No Ice	20.24	10.79	0.21
(T-Mobile)			4.50			1/2" Ice	20.89	12.21	0.34
			0.00			1" Ice	21.55	13.49	0.48
APXVAARR24_43-U-NA20 Panel (RFS)	B	From Leg	3.00	0.0000	95.00	No Ice	20.24	10.79	0.21
(T-Mobile)			4.50			1/2" Ice	20.89	12.21	0.34
			0.00			1" Ice	21.55	13.49	0.48
APXVAARR24_43-U-NA20 Panel (RFS)	C	From Leg	3.00	0.0000	95.00	No Ice	20.24	10.79	0.21
(T-Mobile)			4.50			1/2" Ice	20.89	12.21	0.34
			0.00			1" Ice	21.55	13.49	0.48
AIR 3246 B66 Panel Antenna (T-Mobile)	A	From Leg	3.00	0.0000	95.00	No Ice	7.99	6.34	0.21
			4.50			1/2" Ice	8.39	7.01	0.28
			0.00			1" Ice	8.81	7.70	0.36
AIR 3246 B66 Panel Antenna (T-Mobile)	B	From Leg	3.00	0.0000	95.00	No Ice	7.99	6.34	0.21
			4.50			1/2" Ice	8.39	7.01	0.28
			0.00			1" Ice	8.81	7.70	0.36
AIR 3246 B66 Panel Antenna (T-Mobile)	C	From Leg	3.00	0.0000	95.00	No Ice	7.99	6.34	0.21
			4.50			1/2" Ice	8.39	7.01	0.28
			0.00			1" Ice	8.81	7.70	0.36
2217 B2 Radio Unit (T-Mobile)	A	From Leg	3.00	0.0000	95.00	No Ice	2.27	2.27	0.05
			-4.50			1/2" Ice	2.45	2.45	0.07
			0.00			1" Ice	2.65	2.65	0.10
2217 B2 Radio Unit (T-Mobile)	B	From Leg	3.00	0.0000	95.00	No Ice	2.27	2.27	0.05
			-4.50			1/2" Ice	2.45	2.45	0.07
			0.00			1" Ice	2.65	2.65	0.10
2217 B2 Radio Unit (T-Mobile)	C	From Leg	3.00	0.0000	95.00	No Ice	2.27	2.27	0.05
			-4.50			1/2" Ice	2.45	2.45	0.07
			0.00			1" Ice	2.65	2.65	0.10
4449 B71 + B12 Radio Unit (T-Mobile)	A	From Leg	3.00	0.0000	95.00	No Ice	1.66	1.16	0.08
			-4.50			1/2" Ice	1.82	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B71 + B12 Radio Unit (T-Mobile)	B	From Leg	3.00	0.0000	95.00	No Ice	1.66	1.16	0.08
			-4.50			1/2" Ice	1.82	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
4449 B71 + B12 Radio Unit (T-Mobile)	C	From Leg	3.00	0.0000	95.00	No Ice	1.66	1.16	0.08
			-4.50			1/2" Ice	1.82	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
* T-Mobile Propsoed Inventory									
* Sprint Inventory Exist/Proposed									
Face Mount (Sprint)	A	From Face	0.00	0.0000	72.00	No Ice	9.73	9.73	0.31
			0.00			1/2" Ice	13.12	13.12	0.42
			0.00			1" Ice	16.51	16.51	0.54
Face Mount (Sprint)	B	From Face	0.00	0.0000	72.00	No Ice	9.73	9.73	0.31
			0.00			1/2" Ice	13.12	13.12	0.42
			0.00			1" Ice	16.51	16.51	0.54
Face Mount (Sprint)	C	From Face	0.00	0.0000	72.00	No Ice	9.73	9.73	0.31
			0.00			1/2" Ice	13.12	13.12	0.42
			0.00			1" Ice	16.51	16.51	0.54
ALU 4x45W (1900 MHz) (Sprint)	A	From Face	0.00	0.0000	72.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08
			0.50			1" Ice	2.97	1.98	0.10
ALU 4x45W (1900 MHz) (Sprint)	B	From Face	0.00	0.0000	72.00	No Ice	2.54	1.61	0.06
			0.00			1/2" Ice	2.75	1.79	0.08

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	23 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
ALU 4x45W (1900 MHz) (Sprint)	C	From Face	0.00 0.00 0.00 0.00	0.0000	72.00	1" Ice No Ice 1/2" Ice 1" Ice	2.97 2.54 2.75 2.97	1.98 1.61 1.79 1.98	0.10 0.06 0.08 0.10
ALU TD-RRH-8x20-25 (Sprint)	A	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	4.03 4.28 4.54	1.53 1.70 1.89	0.08 0.10 0.13
ALU TD-RRH-8x20-25 (Sprint)	B	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	4.03 4.28 4.54	1.53 1.70 1.89	0.08 0.10 0.13
ALU TD-RRH-8x20-25 (Sprint)	C	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	4.03 4.28 4.54	1.53 1.70 1.89	0.08 0.10 0.13
ALU 800MHz 2x50W (Sprint)	A	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
ALU 800MHz 2x50W (Sprint)	B	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
ALU 800MHz 2x50W (Sprint)	C	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	2.06 2.24 2.43	1.93 2.11 2.29	0.06 0.09 0.11
NNVV-65B-R4 Panel Antenna (Sprint)	A	From Leg	0.00 -1.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	5.75 6.21 6.67	0.09 0.16 0.24
NNVV-65B-R4 Panel Antenna (Sprint)	B	From Leg	0.00 -1.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	5.75 6.21 6.67	0.09 0.16 0.24
NNVV-65B-R4 Panel Antenna (Sprint)	C	From Leg	0.00 -1.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	12.27 12.77 13.27	5.75 6.21 6.67	0.09 0.16 0.24
AAHC Panel Antenna (Sprint)	A	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	4.20 4.46 4.72	2.07 2.26 2.46	0.10 0.14 0.17
AAHC Panel Antenna (Sprint)	B	From Face	0.50 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	4.20 4.46 4.72	2.07 2.26 2.46	0.10 0.14 0.17
AAHC Panel Antenna (Sprint)	C	From Face	0.50 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice 1" Ice	4.20 4.46 4.72	2.07 2.26 2.46	0.10 0.14 0.17
* Sprint Inventory Exist/Proposed									
** AT&T Existing Inventory									
Face Mount (#11) ATT)	A	From Face	0.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.86 10.66 12.46	7.86 10.66 13.46	0.24 0.34 0.43
Face Mount (#11) ATT)	B	From Face	0.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.86 10.66 12.46	7.86 10.66 13.46	0.24 0.34 0.43
Face Mount (#11) ATT)	C	From Face	0.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.86 10.66 12.46	7.86 10.66 13.46	0.24 0.34 0.43
TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	A	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	12.86 13.46 14.08	10.38 11.79 13.05	0.10 0.20 0.31
SBNH-1D6565C (ATT)	A	From Face	0.50 8.00	0.0000	80.00	No Ice 1/2" Ice	11.48 12.11	9.64 11.07	0.08 0.17

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	24 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
800-10966 Kathrien Panel w/ Pipe Mt. (ATT)	A	From Face	0.00 0.50 2.00 0.00	0.0000	80.00	1" Ice No Ice 1/2" Ice 1" Ice	12.75 17.36 17.99 18.63	12.39 9.40 10.82 12.09	0.27 0.14 0.26 0.38
RRUS-32 (ATT)	A	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.06 0.08 0.11
DC6-48-60-18-8F (Squid) Suppressor (ATT)	A	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05
4478 Radio Unit (4x40W) (ATT)	A	From Face	0.50 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	1.08 1.21 1.35	0.06 0.07 0.09
TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	B	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	12.86 13.46 14.08	10.38 11.79 13.05	0.10 0.20 0.31
SBNH-1D6565C (ATT)	B	From Face	0.50 -6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	11.48 12.11 12.75	9.64 11.07 12.39	0.08 0.17 0.27
800-10966 Kathrien Panel w/ Pipe Mt. (ATT)	B	From Face	0.50 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	17.36 17.99 18.63	9.40 10.82 12.09	0.14 0.26 0.38
DC6-48-60-18-8F (Squid) Suppressor (ATT)	B	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.45	0.79 1.27 1.45	0.02 0.04 0.05
RRUS-32 (ATT)	B	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.06 0.08 0.11
(2) DTMABP7819VG12A TMA (ATT)	B	From Face	0.50 -6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.36 1.51 1.66	0.51 0.61 0.72	0.02 0.03 0.04
4478 Radio Unit (4x40W) (ATT)	B	From Face	0.50 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	1.08 1.21 1.35	0.06 0.07 0.09
QS66512-2 Panel Antenna (ATT)	C	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	8.13 8.59 9.05	8.22 9.19 10.02	0.13 0.21 0.29
800-10965 Kathrien Panel w/ Pipe Mount (ATT)	C	From Face	0.50 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	13.84 14.38 14.93	7.42 8.56 9.46	0.13 0.23 0.33
RRUS-32 (ATT)	C	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	0.06 0.08 0.11
4478 Radio Unit (4x40W) (ATT)	C	From Face	0.50 2.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	1.08 1.21 1.35	0.06 0.07 0.09
DC6-48-60-0-8F (Squid) Unit (ATT)	C	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	1.09 1.70 1.91	1.09 1.70 1.91	0.03 0.05 0.07
** AT&T Existing Inventory									
** AT&T Update 04262019 - Proposed									
800-10966 Kathrein Panel Antenna w/ Pipe Mount (ATT - Proposed)	A	From Face	0.50 -3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	17.36 17.99 18.63	9.53 11.22 12.31	0.16 0.28 0.41
800-10966 Kathrein Panel Antenna w/ Pipe Mount	B	From Face	0.50 -3.00	0.0000	80.00	No Ice 1/2" Ice	17.36 17.99	9.53 11.22	0.16 0.28

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	Client	SMK-005 / (AT&T)	Designed by	MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
(ATT - Proposed)			0.00			1" Ice 18.63	12.31	0.41
800-10965 Kathrein Panel Antenna	C	From Face	0.50	0.0000	80.00	No Ice 13.93	7.61	0.15
(ATT - Proposed)			-3.00			1/2" Ice 14.51	8.91	0.25
RRUS E2 B29 RRH Unit	A	From Face	0.00	0.0000	80.00	1" Ice 15.08	9.84	0.36
(ATT - Proposed)			0.50			No Ice 3.15	1.29	0.06
RRUS E2 B29 RRH Unit			6.00			1/2" Ice 3.36	1.44	0.08
(ATT - Proposed)			0.00			1" Ice 3.59	1.60	0.11
RRUS E2 B29 RRH Unit	B	From Face	0.50	0.0000	80.00	No Ice 3.15	1.29	0.06
(ATT - Proposed)			6.00			1/2" Ice 3.36	1.44	0.08
RRUS E2 B29 RRH Unit			0.00			1" Ice 3.59	1.60	0.11
(ATT - Proposed)			0.50			No Ice 3.15	1.29	0.06
RRUS E2 B29 RRH Unit	C	From Face	6.00	0.0000	80.00	1/2" Ice 3.36	1.44	0.08
(ATT - Proposed)			0.00			1" Ice 3.59	1.60	0.11
RRUS 8846 B2 B66A RRH Unit	A	From Face	0.50	0.0000	80.00	No Ice 1.64	1.35	0.07
(ATT - Proposed)			-3.00			1/2" Ice 1.80	1.50	0.09
RRUS 8846 B2 B66A RRH Unit			0.00			1" Ice 1.97	1.65	0.11
(ATT - Proposed)			0.50			No Ice 1.64	1.35	0.07
RRUS 8846 B2 B66A RRH Unit	B	From Face	-3.00	0.0000	80.00	1/2" Ice 1.80	1.50	0.09
(ATT - Proposed)			0.00			1" Ice 1.97	1.65	0.11
RRUS 8846 B2 B66A RRH Unit	C	From Face	0.50	0.0000	80.00	No Ice 1.64	1.35	0.07
(ATT - Proposed)			-3.00			1/2" Ice 1.80	1.50	0.09
Ericsson 4449 B71 + B12 Radio Unit	A	From Face	0.00	0.0000	80.00	1" Ice 1.97	1.65	0.11
(ATT - Proposed)			0.50			No Ice 1.66	1.16	0.08
Ericsson 4449 B71 + B12 Radio Unit			2.00			1/2" Ice 1.82	1.29	0.10
(ATT - Proposed)			0.00			1" Ice 1.98	1.44	0.11
Ericsson 4449 B71 + B12 Radio Unit	B	From Face	0.50	0.0000	80.00	No Ice 1.66	1.16	0.08
(ATT - Proposed)			2.00			1/2" Ice 1.82	1.29	0.10
Ericsson 4449 B71 + B12 Radio Unit			0.00			1" Ice 1.98	1.44	0.11
(ATT - Proposed)			0.50			No Ice 1.66	1.16	0.08
DC6-48-60-0-8F (Squid) Unit	C	From Face	2.00	0.0000	80.00	1/2" Ice 1.82	1.29	0.10
(ATT - Proposed)			0.00			1" Ice 1.98	1.44	0.11
DC6-48-60-0-8F (Squid) Unit	B	From Leg	0.50	0.0000	80.00	No Ice 1.09	1.09	0.03
(ATT - Proposed)			0.00			1/2" Ice 1.70	1.70	0.05
			0.00			1" Ice 1.91	1.91	0.07

** AT&T Update 04262019 - Proposed

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
4 FT DISH (#1-A)	A	Paraboloid w/Shroud (HP)	From Leg	1.50	Worst		41.00	4.00	No Ice 12.57	0.14
				5.00					1/2" Ice 13.10	0.28
				0.00					1" Ice 13.62	0.42
6' DISH (SOLID) (#19 - CSP-3)	C	Paraboloid w/Radome	From Leg	0.50	Worst		117.00	6.00	No Ice 28.27	0.09
				0.00					1/2" Ice 29.05	0.24
				0.00					1" Ice 29.83	0.39
6' DISH (SOLID)	A	Paraboloid	From	0.50	Worst		115.00	6.00	No Ice 28.27	0.09

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	Client	SMK-005 / (AT&T)	Designed by	MCD

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
(#21 - CSP-5)		w/Radome	Leg	0.00					1/2" Ice 29.05	0.24
				0.00					1" Ice 29.83	0.39
6' DISH (SOLID)	C	Paraboloid	From	0.50	Worst		111.00	6.00	No Ice 28.27	0.09
(#20 - CSP-6)		w/Radome	Leg	0.00					1/2" Ice 29.05	0.24
				0.00					1" Ice 29.83	0.39

222-G Verification Constants

Constant	Value
Wind Importance Factor Without Ice	1.15
Wind Importance Factor With Ice Factor	1
Ice Importance Factor	1.25
K _d	0.85
Z _g	900
α	9.5
K _{zmin}	0.85
K _c	1
K _t	0.72
f	1.5

222-G Section Verification ArRr By Element

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	F a c e	e	e w/Ice	A _r ft ²	A _r w/Ice ft ²	A _r R _r ft ²	A _r R _r w/Ice ft ²
T1 120.00-116.67	1	P.5x.250	60.575	57.643	C	0.195	0.492	1.390	2.753	0.635	1.873
	1	P.5x.250	60.575	57.643	A	0.195	0.492	1.390	2.753	0.635	1.873
	2	P.5x.250	60.575	57.643	C	0.195	0.492	1.390	2.753	0.635	1.873
	2	P.5x.250	60.575	57.643	B	0.195	0.492	1.390	2.753	0.635	1.873
	3	P.5x.250	60.575	57.643	B	0.195	0.492	1.390	2.753	0.635	1.873
	3	P.5x.250	60.575	57.643	A	0.195	0.492	1.390	2.753	0.635	1.873
					A		Sum:	2.781	5.505	1.270	3.747
					B			2.781	5.505	1.270	3.747
					C			2.781	5.505	1.270	3.747
					C			2.781	5.505	1.270	3.747
T2 116.67-108.33	13	P.5x.250	60.908	58.031	C	0.13	0.309	3.476	6.890	1.474	4.147
	13	P.5x.250	60.908	58.031	A	0.13	0.309	3.476	6.890	1.474	4.147
	14	P.5x.250	60.908	58.031	C	0.13	0.309	3.476	6.890	1.474	4.147
	14	P.5x.250	60.908	58.031	B	0.13	0.309	3.476	6.890	1.474	4.147
	15	P.5x.250	60.908	58.031	B	0.13	0.309	3.476	6.890	1.474	4.147
	15	P.5x.250	60.908	58.031	A	0.13	0.309	3.476	6.890	1.474	4.147
					A		Sum:	6.952	13.780	2.948	8.294
					B			6.952	13.780	2.948	8.294
					C			6.952	13.780	2.948	8.294
					C			6.952	13.780	2.948	8.294
T3 108.33-100.00	25	P.5x.250	61.411	58.619	C	0.126	0.301	3.476	6.903	1.458	4.136
	25	P.5x.250	61.411	58.619	A	0.126	0.301	3.476	6.903	1.458	4.136
	26	P.5x.250	61.411	58.619	C	0.126	0.301	3.476	6.903	1.458	4.136
	26	P.5x.250	61.411	58.619	B	0.126	0.301	3.476	6.903	1.458	4.136
	27	P.5x.250	61.411	58.619	B	0.126	0.301	3.476	6.903	1.458	4.136
	27	P.5x.250	61.411	58.619	A	0.126	0.301	3.476	6.903	1.458	4.136

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	Client	SMK-005 / (AT&T)	Designed by	MCD

Section Elevation ft	Elem. Num.	Size	C	C w/Ice	F a c e	e	e w/Ice	A _r ft ²	A _r w/Ice ft ²	A _r R _r ft ²	A _r R _r w/Ice ft ²
T4 100.00-91.67					A		Sum:	6.952	13.805	2.916	8.272
					B			6.952	13.805	2.916	8.272
					C			6.952	13.805	2.916	8.272
	37	P.5x.250	61.946	59.244	C	0.126	0.298	3.476	6.916	1.450	4.137
	37	P.5x.250	61.946	59.244	A	0.126	0.298	3.476	6.916	1.450	4.137
	38	P.5x.250	61.946	59.244	C	0.126	0.298	3.476	6.916	1.450	4.137
	38	P.5x.250	61.946	59.244	B	0.126	0.298	3.476	6.916	1.450	4.137
	39	P.5x.250	61.946	59.244	B	0.126	0.298	3.476	6.916	1.450	4.137
	39	P.5x.250	61.946	59.244	A	0.126	0.298	3.476	6.916	1.450	4.137
					A		Sum:	6.952	13.832	2.900	8.274
T5 91.67-83.33					B			6.952	13.832	2.900	8.274
					C			6.952	13.832	2.900	8.274
	52	P.5x.250	62.51	59.9	C	0.122	0.291	3.476	6.930	1.434	4.130
	52	P.5x.250	62.51	59.9	A	0.122	0.291	3.476	6.930	1.434	4.130
	53	P.5x.250	62.51	59.9	C	0.122	0.291	3.476	6.930	1.434	4.130
	53	P.5x.250	62.51	59.9	B	0.122	0.291	3.476	6.930	1.434	4.130
	54	P.5x.250	62.51	59.9	B	0.122	0.291	3.476	6.930	1.434	4.130
	54	P.5x.250	62.51	59.9	A	0.122	0.291	3.476	6.930	1.434	4.130
					A		Sum:	6.952	13.859	2.869	8.261
					B			6.952	13.859	2.869	8.261
T6 83.33-75.00					C			6.952	13.859	2.869	8.261
	67	P.5x.250	63.095	60.58	C	0.119	0.284	3.476	6.943	1.419	4.126
	67	P.5x.250	63.095	60.58	A	0.119	0.284	3.476	6.943	1.419	4.126
	68	P.5x.250	63.095	60.58	C	0.119	0.284	3.476	6.943	1.419	4.126
	68	P.5x.250	63.095	60.58	B	0.119	0.284	3.476	6.943	1.419	4.126
	69	P.5x.250	63.095	60.58	B	0.119	0.284	3.476	6.943	1.419	4.126
	69	P.5x.250	63.095	60.58	A	0.119	0.284	3.476	6.943	1.419	4.126
					A		Sum:	6.952	13.886	2.838	8.251
					B			6.952	13.886	2.838	8.251
					C			6.952	13.886	2.838	8.251
T7 75.00-50.00	82	P5x.375	71.529	65.42	C	0.129	0.288	11.602	22.075	4.735	13.138
	82	P5x.375	71.529	65.42	A	0.129	0.288	11.602	22.075	4.735	13.138
	83	P5x.375	71.529	65.42	C	0.129	0.288	11.602	22.075	4.735	13.138
	83	P5x.375	71.529	65.42	B	0.129	0.288	11.602	22.075	4.735	13.138
	84	P5x.375	71.529	65.42	B	0.129	0.288	11.602	22.075	4.735	13.138
	84	P5x.375	71.529	65.42	A	0.129	0.288	11.602	22.075	4.735	13.138
					A		Sum:	23.204	44.151	9.469	26.277
					B			23.204	44.151	9.469	26.277
					C			23.204	44.151	9.469	26.277
	121	P.5x.400	65.738	63.404	C	0.147	0.352	10.428	20.924	4.352	12.906
T8 50.00-25.00	121	P.5x.400	65.738	63.404	A	0.147	0.352	10.428	20.924	4.352	12.906
	122	P.5x.400	65.738	63.404	C	0.147	0.352	10.428	20.924	4.352	12.906
	122	P.5x.400	65.738	63.404	B	0.147	0.352	10.428	20.924	4.352	12.906
	123	P.5x.400	65.738	63.404	B	0.147	0.352	10.428	20.924	4.352	12.906
	123	P.5x.400	65.738	63.404	A	0.147	0.352	10.428	20.924	4.352	12.906
					A		Sum:	20.856	41.848	8.705	25.813
					B			20.856	41.848	8.705	25.813
					C			20.856	41.848	8.705	25.813
	196	P6.875x.400	89.856	73.358	C	0.135	0.284	14.338	24.353	5.899	14.471
	196	P6.875x.400	89.856	73.358	A	0.135	0.284	14.338	24.353	5.899	14.471
T9 25.00-0.00	197	P6.875x.400	89.856	73.358	C	0.135	0.284	14.338	24.353	5.899	14.471
	197	P6.875x.400	89.856	73.358	B	0.135	0.284	14.338	24.353	5.899	14.471
	198	P6.875x.400	89.856	73.358	B	0.135	0.284	14.338	24.353	5.899	14.471
	198	P6.875x.400	89.856	73.358	A	0.135	0.284	14.338	24.353	5.899	14.471
					A		Sum:	28.676	48.705	11.797	28.941
					B			28.676	48.705	11.797	28.941
					C			28.676	48.705	11.797	28.941

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	28 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

222-G Section Verification Tables - No Ice

Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F_a c e	e	$A_e R_r$
ft	ft	ft				in	psf			ft ²
T1 120.00-116.67	118.33		1.311	3.265	1.49		46	A B C	0.195 0.195 0.195	1.270 1.270 1.270
T2 116.67-108.33	112.50		1.297	3.08	1.522		46	A B C	0.13 0.13 0.13	2.948 2.948 2.948
T3 108.33-100.00	104.17		1.277	2.834	1.573		47	A B C	0.126 0.126 0.126	2.916 2.916 2.916
T4 100.00-91.67	95.83		1.254	2.607	1.629		48	A B C	0.126 0.126 0.126	2.900 2.900 2.900
T5 91.67-83.33	87.50		1.231	2.399	1.69		49	A B C	0.122 0.122 0.122	2.869 2.869 2.869
T6 83.33-75.00	79.17		1.205	2.207	1.759		50	A B C	0.119 0.119 0.119	2.838 2.838 2.838
T7 75.00-50.00	62.50		1.146	1.868	1.919		52	A B C	0.129 0.129 0.129	9.469 9.469 9.469
T8 50.00-25.00	37.50		1.029	1.455	2.235		54	A B C	0.147 0.147 0.147	8.705 8.705 8.705
T9 25.00-0.00	12.50		0.85	1.133	2.675		54	A B C	0.135 0.135 0.135	11.797 11.797 11.797

222-G Section Verification Tables - Ice

Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F_a c e	e	$A_e R_r$
ft	ft	ft				in	psf			ft ²
T1 120.00-116.67	118.33	118.33	1.311	3.265	1.49	2.4493	11	A B C	0.492 0.492 0.492	10.406 10.406 10.406
T2 116.67-108.33	112.50	112.50	1.297	3.08	1.522	2.4554	11	A B C	0.309 0.309 0.309	16.007 16.007 16.007
T3 108.33-100.00	104.17	104.17	1.277	2.834	1.573	2.4646	11	A B C	0.301 0.301 0.301	16.247 16.247 16.247
T4 100.00-91.67	95.83	95.83	1.254	2.607	1.629	2.4742	11	A B C	0.298 0.298 0.298	16.539 16.539 16.539
T5 91.67-83.33	87.50	87.50	1.231	2.399	1.69	2.4840	11	A B C	0.291 0.291 0.291	16.805 16.805 16.805
T6 83.33-75.00	79.17	79.17	1.205	2.207	1.759	2.4937	12	A	0.284	17.080

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	29 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F_a c e	e	$A_e R_r$
ft	ft	ft				in	psf			ft ²
T7 75.00-50.00	62.50	62.50	1.146	1.868	1.919	2.5109	12	B	0.284	17.080
								C	0.284	17.080
								A	0.288	54.616
T8 50.00-25.00	37.50	37.50	1.029	1.455	2.235	2.5163	13	B	0.288	54.616
								C	0.288	54.616
								A	0.352	73.321
T9 25.00-0.00	12.50	12.50	0.85	1.133	2.675	2.4009	12	B	0.352	73.321
								C	0.352	73.321
								A	0.284	64.315
								B	0.284	64.315
								C	0.284	64.315

222-G Section Verification Tables - Service

Section Elevation	z_{wind}	z_{ice}	K_z	K_h	K_{zt}	t_z	q_z	F_a c e	e	$A_e R_r$
ft	ft	ft				in	psf			ft ²
T1 120.00-116.67	118.33		1.311	3.265	1.49		15	A	0.195	1.270
								B	0.195	1.270
								C	0.195	1.270
T2 116.67-108.33	112.50		1.297	3.08	1.522		15	A	0.13	2.948
								B	0.13	2.948
								C	0.13	2.948
T3 108.33-100.00	104.17		1.277	2.834	1.573		16	A	0.126	2.916
								B	0.126	2.916
								C	0.126	2.916
T4 100.00-91.67	95.83		1.254	2.607	1.629		16	A	0.126	2.900
								B	0.126	2.900
								C	0.126	2.900
T5 91.67-83.33	87.50		1.231	2.399	1.69		16	A	0.122	2.869
								B	0.122	2.869
								C	0.122	2.869
T6 83.33-75.00	79.17		1.205	2.207	1.759		17	A	0.119	2.838
								B	0.119	2.838
								C	0.119	2.838
T7 75.00-50.00	62.50		1.146	1.868	1.919		17	A	0.129	9.469
								B	0.129	9.469
								C	0.129	9.469
T8 50.00-25.00	37.50		1.029	1.455	2.235		18	A	0.147	8.705
								B	0.147	8.705
								C	0.147	8.705
T9 25.00-0.00	12.50		0.85	1.133	2.675		18	A	0.135	11.797
								B	0.135	11.797
								C	0.135	11.797

Tower Pressures - No Ice

$$G_H = 0.850$$

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	30 of 65
	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
T1 120.00-116.67	118.33	1.311	46	39.883	A	4.994	2.781	2.781	35.77	0.210	0.000
					B	4.994	2.781		35.77	0.000	0.000
					C	4.994	2.781		35.77	0.000	0.000
T2 116.67-108.33	112.50	1.297	46	103.599	A	6.523	6.952	6.952	51.59	11.019	0.000
					B	6.523	6.952		51.59	1.860	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3 108.33-100.00	104.17	1.277	47	109.157	A	6.751	6.952	6.952	50.73	24.677	0.000
					B	6.751	6.952		50.73	10.884	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4 100.00-91.67	95.83	1.254	48	114.715	A	7.506	6.952	6.952	48.08	25.365	0.000
					B	7.506	6.952		48.08	18.080	0.000
					C	7.506	6.952		48.08	0.000	0.000
T5 91.67-83.33	87.50	1.231	49	120.273	A	7.766	6.952	6.952	47.23	25.365	0.000
					B	7.766	6.952		47.23	27.709	0.000
					C	7.766	6.952		47.23	0.000	0.000
T6 83.33-75.00	79.17	1.205	50	125.831	A	8.028	6.952	6.952	46.41	26.592	0.000
					B	8.028	6.952		46.41	36.447	0.000
					C	8.028	6.952		46.41	0.000	0.000
T7 75.00-50.00	62.50	1.146	52	412.014	A	29.741	23.204	23.204	43.83	81.909	0.000
					B	29.741	23.204		43.83	141.458	0.000
					C	29.741	23.204		43.83	0.000	0.000
T8 50.00-25.00	37.50	1.029	54	460.861	A	47.069	20.856	20.856	30.70	85.441	0.000
					B	47.069	20.856		30.70	152.212	0.000
					C	47.069	20.856		30.70	0.000	0.000
T9 25.00-0.00	12.50	0.85	54	514.792	A	40.991	28.676	28.676	41.16	65.508	0.000
					B	40.991	28.676		41.16	117.316	0.000
					C	40.991	28.676		41.16	0.000	0.000

Tower Pressure - With Ice

$$G_H = 0.850$$

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
T1 120.00-116.67	118.33	1.311	11	2.4493	41.245	A	4.994	15.290	5.505	27.14	1.843	0.000
						B	4.994	15.290		27.14	0.000	0.000
						C	4.994	15.290		27.14	0.000	0.000
T2 116.67-108.33	112.50	1.297	11	2.4554	107.012	A	6.523	26.593	13.780	41.61	48.248	0.000
						B	6.523	26.593		41.61	7.589	0.000
						C	6.523	26.593		41.61	0.000	0.000
T3 108.33-100.00	104.17	1.277	11	2.4646	112.583	A	6.751	27.116	13.805	40.76	99.265	0.000
						B	6.751	27.116		40.76	43.581	0.000
						C	6.751	27.116		40.76	0.000	0.000
T4 100.00-91.67	95.83	1.254	11	2.4742	118.154	A	7.506	27.650	13.832	39.34	103.539	0.000
						B	7.506	27.650		39.34	64.018	0.000
						C	7.506	27.650		39.34	0.000	0.000
T5 91.67-83.33	87.50	1.231	11	2.4840	123.725	A	7.766	28.193	13.859	38.54	103.845	0.000
						B	7.766	28.193		38.54	93.486	0.000
						C	7.766	28.193		38.54	0.000	0.000
T6 83.33-75.00	79.17	1.205	12	2.4937	129.297	A	8.028	28.743	13.886	37.76	112.856	0.000
						B	8.028	28.743		37.76	133.576	0.000
						C	8.028	28.743		37.76	0.000	0.000
T7 75.00-50.00	62.50	1.146	12	2.5109	422.484	A	29.741	91.767	44.151	36.34	359.051	0.000
						B	29.741	91.767		36.34	543.189	0.000

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	31 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Section Elevation	z	K _Z	q _z	t _Z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
T8 50.00-25.00	37.50	1.029	13	2.5163	471.355	C	29.741	91.767	41.848	36.34	0.000	0.000
						A	47.069	118.868		25.22	392.866	0.000
						B	47.069	118.868		25.22	623.825	0.000
T9 25.00-0.00	12.50	0.85	12	2.4009	524.804	C	47.069	118.868	48.705	25.22	0.000	0.000
						A	40.991	108.237		32.64	293.263	0.000
						B	40.991	108.237		32.64	475.972	0.000
						C	40.991	108.237		32.64	0.000	0.000

Tower Pressure - Service

$$G_H = 0.850$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1 120.00-116.67	118.33	1.311	15	39.883	A	4.994	2.781	2.781	35.77	0.210	0.000
					B	4.994	2.781		35.77	0.000	0.000
					C	4.994	2.781		35.77	0.000	0.000
T2 116.67-108.33	112.50	1.297	15	103.599	A	6.523	6.952	6.952	51.59	11.019	0.000
					B	6.523	6.952		51.59	1.860	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3 108.33-100.00	104.17	1.277	16	109.157	A	6.751	6.952	6.952	50.73	24.677	0.000
					B	6.751	6.952		50.73	10.884	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4 100.00-91.67	95.83	1.254	16	114.715	A	7.506	6.952	6.952	48.08	25.365	0.000
					B	7.506	6.952		48.08	18.080	0.000
					C	7.506	6.952		48.08	0.000	0.000
T5 91.67-83.33	87.50	1.231	16	120.273	A	7.766	6.952	6.952	47.23	25.365	0.000
					B	7.766	6.952		47.23	27.709	0.000
					C	7.766	6.952		47.23	0.000	0.000
T6 83.33-75.00	79.17	1.205	17	125.831	A	8.028	6.952	6.952	46.41	26.592	0.000
					B	8.028	6.952		46.41	36.447	0.000
					C	8.028	6.952		46.41	0.000	0.000
T7 75.00-50.00	62.50	1.146	17	412.014	A	29.741	23.204	23.204	43.83	81.909	0.000
					B	29.741	23.204		43.83	141.458	0.000
					C	29.741	23.204		43.83	0.000	0.000
T8 50.00-25.00	37.50	1.029	18	460.861	A	47.069	20.856	20.856	30.70	85.441	0.000
					B	47.069	20.856		30.70	152.212	0.000
					C	47.069	20.856		30.70	0.000	0.000
T9 25.00-0.00	12.50	0.85	18	514.792	A	40.991	28.676	28.676	41.16	65.508	0.000
					B	40.991	28.676		41.16	117.316	0.000
					C	40.991	28.676		41.16	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K				psf			ft ²	K	plf	
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	46	1	1	6.264	0.64	193.44	C
			B	0.195	2.613		1	1	6.264			

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	Page
	120' Self-Supporting Lattice Tower	32 of 65
	Project Connecticut State Police Tower - West Rock - Analysis	Date 15:40:48 05/31/19
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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T2 116.67-108.33	0.05	0.81	C A B	0.195 0.13 0.13	2.613 2.846 2.846	46	1 1 1	1 1 1	6.264 9.471 9.471	1.37	164.49	C
T3 108.33-100.00	0.13	0.82	C A B C	0.13 0.126 0.126 0.126	2.846 2.864 2.864 2.864	47	1 1 1 1	1 1 1 1	9.471 9.668 9.668 9.668	1.97	236.35	C
T4 100.00-91.67	0.18	1.14	A B C	0.126 0.126 0.126	2.862 2.862 2.862	48	1 1 1	1 1 1	10.406 10.406 10.406	2.28	273.96	C
T5 91.67-83.33	0.24	1.17	A B C	0.122 0.122 0.122	2.876 2.876 2.876	49	1 1 1	1 1 1	10.635 10.635 10.635	2.60	311.85	C
T6 83.33-75.00	0.29	1.36	A B C	0.119 0.119 0.119	2.889 2.889 2.889	50	1 1 1	1 1 1	10.866 10.866 10.866	2.94	352.25	C
T7 75.00-50.00	1.11	5.38	A B C	0.129 0.129 0.129	2.852 2.852 2.852	52	1 1 1	1 1 1	39.210 39.210 39.210	10.83	433.04	C
T8 50.00-25.00	1.18	7.25	A B C	0.147 0.147 0.147	2.781 2.781 2.781	54	1 1 1	1 1 1	55.773 55.773 55.773	13.71	548.26	C
T9 25.00-0.00	0.90	7.57	A B C	0.135 0.135 0.135	2.826 2.826 2.826	54	1 1 1	1 1 1	52.788 52.788 52.788	11.78	471.14	C
Sum Weight:	4.07	25.96						OTM	2452.09 kip-ft	48.11		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.00	0.48	A B C	0.195 0.195 0.195	2.613 2.613 2.613	46	0.825 0.825 0.825	1 1 1	5.390 5.390 5.390	0.56	166.66	C
T2 116.67-108.33	0.05	0.81	A B C	0.13 0.13 0.13	2.846 2.846 2.846	46	0.825 0.825 0.825	1 1 1	8.329 8.329 8.329	1.24	149.08	C
T3 108.33-100.00	0.13	0.82	A B C	0.126 0.126 0.126	2.864 2.864 2.864	47	0.825 0.825 0.825	1 1 1	8.486 8.486 8.486	1.83	220.04	C
T4 100.00-91.67	0.18	1.14	A B C	0.126 0.126 0.126	2.862 2.862 2.862	48	0.825 0.825 0.825	1 1 1	9.092 9.092 9.092	2.13	255.52	C
T5 91.67-83.33	0.24	1.17	A B C	0.122 0.122 0.122	2.876 2.876 2.876	49	0.825 0.825 0.825	1 1 1	9.275 9.275 9.275	2.44	292.33	C
T6 83.33-75.00	0.29	1.36	A B C	0.119 0.119 0.119	2.889 2.889 2.889	50	0.825 0.825 0.825	1 1 1	9.461 9.461 9.461	2.76	331.59	C
T7 75.00-50.00	1.11	5.38	A B	0.129 0.129	2.852 2.852	52	0.825 0.825	1 1	34.006 34.006	10.17	406.90	C

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	Page
	120' Self-Supporting Lattice Tower	33 of 65
	Project Connecticut State Police Tower - West Rock - Analysis	Date 15:40:48 05/31/19
	Client SMK-005 / (AT&T)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T8 50.00-25.00	1.18	7.25	C	0.129	2.852		0.825	1	34.006			
			A	0.147	2.781	54	0.825	1	47.536	12.65	506.07	C
			B	0.147	2.781		0.825	1	47.536			
			C	0.147	2.781		0.825	1	47.536			
T9 25.00-0.00	0.90	7.57	A	0.135	2.826	54	0.825	1	45.615	10.86	434.25	C
			B	0.135	2.826		0.825	1	45.615			
			C	0.135	2.826		0.825	1	45.615			
Sum Weight:	4.07	25.96						OTM	2278.40 kip-ft	44.64		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	46	0.8	1	5.265	0.54	162.83	C
			B	0.195	2.613		0.8	1	5.265			
			C	0.195	2.613		0.8	1	5.265			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	46	0.8	1	8.166	1.22	146.88	C
			B	0.13	2.846		0.8	1	8.166			
			C	0.13	2.846		0.8	1	8.166			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	47	0.8	1	8.317	1.81	217.71	C
			B	0.126	2.864		0.8	1	8.317			
			C	0.126	2.864		0.8	1	8.317			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	48	0.8	1	8.904	2.11	252.88	C
			B	0.126	2.862		0.8	1	8.904			
			C	0.126	2.862		0.8	1	8.904			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	49	0.8	1	9.081	2.41	289.54	C
			B	0.122	2.876		0.8	1	9.081			
			C	0.122	2.876		0.8	1	9.081			
T6 83.33-75.00	0.29	1.36	A	0.119	2.889	50	0.8	1	9.260	2.74	328.64	C
			B	0.119	2.889		0.8	1	9.260			
			C	0.119	2.889		0.8	1	9.260			
T7 75.00-50.00	1.11	5.38	A	0.129	2.852	52	0.8	1	33.262	10.08	403.16	C
			B	0.129	2.852		0.8	1	33.262			
			C	0.129	2.852		0.8	1	33.262			
T8 50.00-25.00	1.18	7.25	A	0.147	2.781	54	0.8	1	46.360	12.50	500.04	C
			B	0.147	2.781		0.8	1	46.360			
			C	0.147	2.781		0.8	1	46.360			
T9 25.00-0.00	0.90	7.57	A	0.135	2.826	54	0.8	1	44.590	10.72	428.98	C
			B	0.135	2.826		0.8	1	44.590			
			C	0.135	2.826		0.8	1	44.590			
Sum Weight:	4.07	25.96						OTM	2253.58 kip-ft	44.14		

Tower Forces - No Ice - Wind 90 To Face

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	Page
	120' Self-Supporting Lattice Tower	34 of 65
	Project Connecticut State Police Tower - West Rock - Analysis	Date 15:40:48 05/31/19
	Client SMK-005 / (AT&T)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	46	0.85	1	5.515	0.57	170.48	C
			B	0.195	2.613		0.85	1	5.515			
			C	0.195	2.613		0.85	1	5.515			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	46	0.85	1	8.492	1.26	151.28	C
			B	0.13	2.846		0.85	1	8.492			
			C	0.13	2.846		0.85	1	8.492			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	47	0.85	1	8.655	1.85	222.37	C
			B	0.126	2.864		0.85	1	8.655			
			C	0.126	2.864		0.85	1	8.655			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	48	0.85	1	9.280	2.15	258.15	C
			B	0.126	2.862		0.85	1	9.280			
			C	0.126	2.862		0.85	1	9.280			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	49	0.85	1	9.470	2.46	295.12	C
			B	0.122	2.876		0.85	1	9.470			
			C	0.122	2.876		0.85	1	9.470			
T6 83.33-75.00	0.29	1.36	A	0.119	2.889	50	0.85	1	9.661	2.79	334.54	C
			B	0.119	2.889		0.85	1	9.661			
			C	0.119	2.889		0.85	1	9.661			
T7 75.00-50.00	1.11	5.38	A	0.129	2.852	52	0.85	1	34.749	10.27	410.63	C
			B	0.129	2.852		0.85	1	34.749			
			C	0.129	2.852		0.85	1	34.749			
T8 50.00-25.00	1.18	7.25	A	0.147	2.781	54	0.85	1	48.713	12.80	512.10	C
			B	0.147	2.781		0.85	1	48.713			
			C	0.147	2.781		0.85	1	48.713			
T9 25.00-0.00	0.90	7.57	A	0.135	2.826	54	0.85	1	46.640	10.99	439.52	C
			B	0.135	2.826		0.85	1	46.640			
			C	0.135	2.826		0.85	1	46.640			
Sum Weight:	4.07	25.96						OTM	2303.21 kip-ft	45.14		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.03	2.26	A	0.492	1.911	11	1	1	15.399	0.27	82.27	C
			B	0.492	1.911		1	1	15.399			
			C	0.492	1.911		1	1	15.399			
T2 116.67-108.33	1.05	3.46	A	0.309	2.271	11	1	1	22.530	0.77	92.78	C
			B	0.309	2.271		1	1	22.530			
			C	0.309	2.271		1	1	22.530			
T3 108.33-100.00	2.72	3.55	A	0.301	2.294	11	1	1	22.998	1.29	154.24	C
			B	0.301	2.294		1	1	22.998			
			C	0.301	2.294		1	1	22.998			
T4 100.00-91.67	3.27	4.37	A	0.298	2.303	11	1	1	24.045	1.47	176.71	C
			B	0.298	2.303		1	1	24.045			
			C	0.298	2.303		1	1	24.045			
T5 91.67-83.33	3.94	4.50	A	0.291	2.321	11	1	1	24.571	1.69	202.48	C
			B	0.291	2.321		1	1	24.571			
			C	0.291	2.321		1	1	24.571			
T6 83.33-75.00	4.75	4.80	A	0.284	2.338	12	1	1	25.107	2.02	242.91	C
			B	0.284	2.338		1	1	25.107			
			C	0.284	2.338		1	1	25.107			

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	Page
	120' Self-Supporting Lattice Tower	35 of 65
	Project Connecticut State Police Tower - West Rock - Analysis	Date 15:40:48 05/31/19
	Client SMK-005 / (AT&T)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T7 75.00-50.00	17.11	17.33	A	0.288	2.329	12	1	1	84.357	7.51	300.28	C
			B	0.288	2.329		1	1	84.357			
			C	0.288	2.329		1	1	84.357			
T8 50.00-25.00	19.06	23.85	A	0.352	2.167	13	1	1	120.390	9.26	370.55	C
			B	0.352	2.167		1	1	120.390			
			C	0.352	2.167		1	1	120.390			
T9 25.00-0.00	13.86	21.61	A	0.284	2.338	12	1	1	105.306	7.44	297.61	C
			B	0.284	2.338		1	1	105.306			
			C	0.284	2.338		1	1	105.306			
Sum Weight:	65.78	85.73						OTM	1611.92 kip-ft	31.73		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.03	2.26	A	0.492	1.911	11	0.825	1	14.526	0.26	77.75	C
			B	0.492	1.911		0.825	1	14.526			
			C	0.492	1.911		0.825	1	14.526			
T2 116.67-108.33	1.05	3.46	A	0.309	2.271	11	0.825	1	21.389	0.75	89.94	C
			B	0.309	2.271		0.825	1	21.389			
			C	0.309	2.271		0.825	1	21.389			
T3 108.33-100.00	2.72	3.55	A	0.301	2.294	11	0.825	1	21.817	1.26	151.22	C
			B	0.301	2.294		0.825	1	21.817			
			C	0.301	2.294		0.825	1	21.817			
T4 100.00-91.67	3.27	4.37	A	0.298	2.303	11	0.825	1	22.731	1.44	173.28	C
			B	0.298	2.303		0.825	1	22.731			
			C	0.298	2.303		0.825	1	22.731			
T5 91.67-83.33	3.94	4.50	A	0.291	2.321	11	0.825	1	23.212	1.66	198.84	C
			B	0.291	2.321		0.825	1	23.212			
			C	0.291	2.321		0.825	1	23.212			
T6 83.33-75.00	4.75	4.80	A	0.284	2.338	12	0.825	1	23.702	1.99	239.04	C
			B	0.284	2.338		0.825	1	23.702			
			C	0.284	2.338		0.825	1	23.702			
T7 75.00-50.00	17.11	17.33	A	0.288	2.329	12	0.825	1	79.152	7.38	295.34	C
			B	0.288	2.329		0.825	1	79.152			
			C	0.288	2.329		0.825	1	79.152			
T8 50.00-25.00	19.06	23.85	A	0.352	2.167	13	0.825	1	112.153	9.07	362.96	C
			B	0.352	2.167		0.825	1	112.153			
			C	0.352	2.167		0.825	1	112.153			
T9 25.00-0.00	13.86	21.61	A	0.284	2.338	12	0.825	1	98.133	7.26	290.56	C
			B	0.284	2.338		0.825	1	98.133			
			C	0.284	2.338		0.825	1	98.133			
Sum Weight:	65.78	85.73						OTM	1579.88 kip-ft	31.08		

Tower Forces - With Ice - Wind 60 To Face

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	120' Self-Supporting Lattice Tower	36 of 65
	Project Connecticut State Police Tower - West Rock - Analysis	Date 15:40:48 05/31/19
	Client SMK-005 / (AT&T)	Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.03	2.26	A	0.492	1.911	11	0.8	1	14.401	0.26	77.10	C
			B	0.492	1.911		0.8	1	14.401			
			C	0.492	1.911		0.8	1	14.401			
T2 116.67-108.33	1.05	3.46	A	0.309	2.271	11	0.8	1	21.226	0.75	89.53	C
			B	0.309	2.271		0.8	1	21.226			
			C	0.309	2.271		0.8	1	21.226			
T3 108.33-100.00	2.72	3.55	A	0.301	2.294	11	0.8	1	21.648	1.26	150.79	C
			B	0.301	2.294		0.8	1	21.648			
			C	0.301	2.294		0.8	1	21.648			
T4 100.00-91.67	3.27	4.37	A	0.298	2.303	11	0.8	1	22.544	1.44	172.79	C
			B	0.298	2.303		0.8	1	22.544			
			C	0.298	2.303		0.8	1	22.544			
T5 91.67-83.33	3.94	4.50	A	0.291	2.321	11	0.8	1	23.017	1.65	198.32	C
			B	0.291	2.321		0.8	1	23.017			
			C	0.291	2.321		0.8	1	23.017			
T6 83.33-75.00	4.75	4.80	A	0.284	2.338	12	0.8	1	23.502	1.99	238.49	C
			B	0.284	2.338		0.8	1	23.502			
			C	0.284	2.338		0.8	1	23.502			
T7 75.00-50.00	17.11	17.33	A	0.288	2.329	12	0.8	1	78.409	7.37	294.64	C
			B	0.288	2.329		0.8	1	78.409			
			C	0.288	2.329		0.8	1	78.409			
T8 50.00-25.00	19.06	23.85	A	0.352	2.167	13	0.8	1	110.976	9.05	361.88	C
			B	0.352	2.167		0.8	1	110.976			
			C	0.352	2.167		0.8	1	110.976			
T9 25.00-0.00	13.86	21.61	A	0.284	2.338	12	0.8	1	97.108	7.24	289.55	C
			B	0.284	2.338		0.8	1	97.108			
			C	0.284	2.338		0.8	1	97.108			
Sum Weight:	65.78	85.73						OTM	1575.30 kip-ft	30.99		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.03	2.26	A	0.492	1.911	11	0.85	1	14.650	0.26	78.40	C
			B	0.492	1.911		0.85	1	14.650			
			C	0.492	1.911		0.85	1	14.650			
T2 116.67-108.33	1.05	3.46	A	0.309	2.271	11	0.85	1	21.552	0.75	90.35	C
			B	0.309	2.271		0.85	1	21.552			
			C	0.309	2.271		0.85	1	21.552			
T3 108.33-100.00	2.72	3.55	A	0.301	2.294	11	0.85	1	21.986	1.26	151.65	C
			B	0.301	2.294		0.85	1	21.986			
			C	0.301	2.294		0.85	1	21.986			
T4 100.00-91.67	3.27	4.37	A	0.298	2.303	11	0.85	1	22.919	1.45	173.77	C
			B	0.298	2.303		0.85	1	22.919			
			C	0.298	2.303		0.85	1	22.919			
T5 91.67-83.33	3.94	4.50	A	0.291	2.321	11	0.85	1	23.406	1.66	199.36	C
			B	0.291	2.321		0.85	1	23.406			
			C	0.291	2.321		0.85	1	23.406			
T6 83.33-75.00	4.75	4.80	A	0.284	2.338	12	0.85	1	23.903	2.00	239.60	C
			B	0.284	2.338		0.85	1	23.903			

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	Page
	120' Self-Supporting Lattice Tower	38 of 65
	Project Connecticut State Police Tower - West Rock - Analysis	Date 15:40:48 05/31/19
	Client SMK-005 / (AT&T)	Designed by MCD

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	15	0.825	1	5.390	0.18	55.45	C
			B	0.195	2.613		0.825	1	5.390			
			C	0.195	2.613		0.825	1	5.390			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	15	0.825	1	8.329	0.41	49.60	C
			B	0.13	2.846		0.825	1	8.329			
			C	0.13	2.846		0.825	1	8.329			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	16	0.825	1	8.486	0.61	73.21	C
			B	0.126	2.864		0.825	1	8.486			
			C	0.126	2.864		0.825	1	8.486			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	16	0.825	1	9.092	0.71	85.01	C
			B	0.126	2.862		0.825	1	9.092			
			C	0.126	2.862		0.825	1	9.092			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	16	0.825	1	9.275	0.81	97.26	C
			B	0.122	2.876		0.825	1	9.275			
			C	0.122	2.876		0.825	1	9.275			
T6 83.33-75.00	0.29	1.36	A	0.119	2.889	17	0.825	1	9.461	0.92	110.32	C
			B	0.119	2.889		0.825	1	9.461			
			C	0.119	2.889		0.825	1	9.461			
T7 75.00-50.00	1.11	5.38	A	0.129	2.852	17	0.825	1	34.006	3.38	135.38	C
			B	0.129	2.852		0.825	1	34.006			
			C	0.129	2.852		0.825	1	34.006			
T8 50.00-25.00	1.18	7.25	A	0.147	2.781	18	0.825	1	47.536	4.21	168.37	C
			B	0.147	2.781		0.825	1	47.536			
			C	0.147	2.781		0.825	1	47.536			
T9 25.00-0.00	0.90	7.57	A	0.135	2.826	18	0.825	1	45.615	3.61	144.48	C
			B	0.135	2.826		0.825	1	45.615			
			C	0.135	2.826		0.825	1	45.615			
Sum Weight:	4.07	25.96						OTM	758.04 kip-ft	14.85		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	15	0.8	1	5.265	0.18	54.17	C
			B	0.195	2.613		0.8	1	5.265			
			C	0.195	2.613		0.8	1	5.265			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	15	0.8	1	8.166	0.41	48.87	C
			B	0.13	2.846		0.8	1	8.166			
			C	0.13	2.846		0.8	1	8.166			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	16	0.8	1	8.317	0.60	72.43	C
			B	0.126	2.864		0.8	1	8.317			
			C	0.126	2.864		0.8	1	8.317			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	16	0.8	1	8.904	0.70	84.14	C
			B	0.126	2.862		0.8	1	8.904			
			C	0.126	2.862		0.8	1	8.904			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	16	0.8	1	9.081	0.80	96.33	C
			B	0.122	2.876		0.8	1	9.081			
			C	0.122	2.876		0.8	1	9.081			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T6 83.33-75.00	0.29	1.36	A	0.119	2.889	17	0.8	1	9.260	0.91	109.34	C
			B	0.119	2.889		0.8	1	9.260			
			C	0.119	2.889		0.8	1	9.260			
T7 75.00-50.00	1.11	5.38	A	0.129	2.852	17	0.8	1	33.262	3.35	134.13	C
			B	0.129	2.852		0.8	1	33.262			
			C	0.129	2.852		0.8	1	33.262			
T8 50.00-25.00	1.18	7.25	A	0.147	2.781	18	0.8	1	46.360	4.16	166.37	C
			B	0.147	2.781		0.8	1	46.360			
			C	0.147	2.781		0.8	1	46.360			
T9 25.00-0.00	0.90	7.57	A	0.135	2.826	18	0.8	1	44.590	3.57	142.72	C
			B	0.135	2.826		0.8	1	44.590			
			C	0.135	2.826		0.8	1	44.590			
Sum Weight:	4.07	25.96						OTM	749.78 kip-ft	14.69		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F K	w plf	Ctrl. Face
ft	K	K										
T1 120.00-116.67	0.00	0.48	A	0.195	2.613	15	0.85	1	5.515	0.19	56.72	C
			B	0.195	2.613		0.85	1	5.515			
			C	0.195	2.613		0.85	1	5.515			
T2 116.67-108.33	0.05	0.81	A	0.13	2.846	15	0.85	1	8.492	0.42	50.33	C
			B	0.13	2.846		0.85	1	8.492			
			C	0.13	2.846		0.85	1	8.492			
T3 108.33-100.00	0.13	0.82	A	0.126	2.864	16	0.85	1	8.655	0.62	73.98	C
			B	0.126	2.864		0.85	1	8.655			
			C	0.126	2.864		0.85	1	8.655			
T4 100.00-91.67	0.18	1.14	A	0.126	2.862	16	0.85	1	9.280	0.72	85.89	C
			B	0.126	2.862		0.85	1	9.280			
			C	0.126	2.862		0.85	1	9.280			
T5 91.67-83.33	0.24	1.17	A	0.122	2.876	16	0.85	1	9.470	0.82	98.19	C
			B	0.122	2.876		0.85	1	9.470			
			C	0.122	2.876		0.85	1	9.470			
T6 83.33-75.00	0.29	1.36	A	0.119	2.889	17	0.85	1	9.661	0.93	111.30	C
			B	0.119	2.889		0.85	1	9.661			
			C	0.119	2.889		0.85	1	9.661			
T7 75.00-50.00	1.11	5.38	A	0.129	2.852	17	0.85	1	34.749	3.42	136.62	C
			B	0.129	2.852		0.85	1	34.749			
			C	0.129	2.852		0.85	1	34.749			
T8 50.00-25.00	1.18	7.25	A	0.147	2.781	18	0.85	1	48.713	4.26	170.38	C
			B	0.147	2.781		0.85	1	48.713			
			C	0.147	2.781		0.85	1	48.713			
T9 25.00-0.00	0.90	7.57	A	0.135	2.826	18	0.85	1	46.640	3.66	146.23	C
			B	0.135	2.826		0.85	1	46.640			
			C	0.135	2.826		0.85	1	46.640			
Sum Weight:	4.07	25.96						OTM	766.29 kip-ft	15.02		

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Force Totals

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	7.17					
Bracing Weight	18.79					
Total Member Self-Weight	25.96			-11.29	-12.98	
Total Weight	41.78			-11.29	-12.98	
Wind 0 deg - No Ice		-0.03	-76.02	-4976.66	-8.07	39.78
Wind 30 deg - No Ice		36.50	-63.24	-4180.04	-2401.45	-8.94
Wind 45 deg - No Ice		51.29	-51.28	-3396.04	-3375.78	-33.23
Wind 60 deg - No Ice		62.39	-36.00	-2390.47	-4111.86	-55.26
Wind 90 deg - No Ice		73.05	0.03	-6.38	-4798.42	-86.77
Wind 120 deg - No Ice		65.86	38.03	2475.65	-4288.68	-95.03
Wind 135 deg - No Ice		52.73	52.72	3450.59	-3452.90	-89.48
Wind 150 deg - No Ice		36.55	63.27	4162.37	-2409.95	-77.83
Wind 180 deg - No Ice		0.03	72.05	4755.58	-17.89	-39.78
Wind 210 deg - No Ice		-36.50	63.24	4157.46	2375.49	8.94
Wind 225 deg - No Ice		-51.29	51.28	3373.47	3349.83	33.23
Wind 240 deg - No Ice		-65.83	37.99	2467.15	4257.82	55.26
Wind 270 deg - No Ice		-73.05	-0.03	-16.20	4772.47	86.77
Wind 300 deg - No Ice		-62.42	-36.05	-2398.97	4090.82	95.03
Wind 315 deg - No Ice		-51.33	-51.32	-3402.99	3356.77	89.48
Wind 330 deg - No Ice		-36.55	-63.27	-4184.95	2384.00	77.83
Member Ice	59.76					
Total Weight Ice	202.80			-246.20	-110.33	
Wind 0 deg - Ice		-0.01	-43.83	-2940.91	-109.13	34.90
Wind 30 deg - Ice		21.61	-37.47	-2555.50	-1438.85	-7.60
Wind 45 deg - Ice		30.51	-30.52	-2128.14	-1986.52	-28.81
Wind 60 deg - Ice		37.29	-21.53	-1574.21	-2404.66	-48.06
Wind 90 deg - Ice		43.25	0.01	-245.00	-2769.45	-75.65
Wind 120 deg - Ice		37.94	21.93	1102.19	-2437.58	-82.97
Wind 135 deg - Ice		30.79	30.80	1650.38	-2001.17	-78.17
Wind 150 deg - Ice		21.64	37.48	2064.30	-1440.93	-68.05
Wind 180 deg - Ice		0.01	43.09	2411.89	-111.53	-34.90
Wind 210 deg - Ice		-21.61	37.47	2063.10	1218.19	7.60
Wind 225 deg - Ice		-30.51	30.52	1635.74	1765.87	28.81
Wind 240 deg - Ice		-37.93	21.90	1100.11	2215.72	48.06
Wind 270 deg - Ice		-43.25	-0.01	-247.40	2548.79	75.65
Wind 300 deg - Ice		-37.30	-21.56	-1576.29	2185.21	82.97
Wind 315 deg - Ice		-30.53	-30.54	-2129.84	1767.57	78.17
Wind 330 deg - Ice		-21.64	-37.48	-2556.70	1220.27	68.05
Total Weight	41.78			-11.29	-12.98	
Wind 0 deg - Service		-0.01	-25.29	-1653.73	0.30	13.23
Wind 30 deg - Service		12.14	-21.04	-1388.69	-796.00	-2.97
Wind 45 deg - Service		17.06	-17.06	-1127.85	-1120.16	-11.06
Wind 60 deg - Service		20.76	-11.98	-793.29	-1365.06	-18.38
Wind 90 deg - Service		24.31	0.01	-0.09	-1593.49	-28.87
Wind 120 deg - Service		21.91	12.65	825.70	-1423.89	-31.62
Wind 135 deg - Service		17.54	17.54	1150.07	-1145.82	-29.77
Wind 150 deg - Service		12.16	21.05	1386.88	-798.83	-25.90
Wind 180 deg - Service		0.01	23.97	1584.25	-2.97	-13.23
Wind 210 deg - Service		-12.14	21.04	1385.25	793.32	2.97
Wind 225 deg - Service		-17.06	17.06	1124.41	1117.49	11.06
Wind 240 deg - Service		-21.90	12.64	822.87	1419.58	18.38
Wind 270 deg - Service		-24.31	-0.01	-3.35	1590.81	28.87
Wind 300 deg - Service		-20.77	-11.99	-796.12	1364.02	31.62
Wind 315 deg - Service		-17.08	-17.07	-1130.16	1119.80	29.77
Wind 330 deg - Service		-12.16	-21.05	-1390.32	796.15	25.90

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Load Combinations

<i>Comb. No.</i>	<i>Description</i>
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service

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<i>Comb. No.</i>	<i>Description</i>
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

<i>Section No.</i>	<i>Elevation ft</i>	<i>Component Type</i>	<i>Condition</i>	<i>Gov. Load Comb.</i>	<i>Axial K</i>	<i>Major Axis Moment kip-ft</i>	<i>Minor Axis Moment kip-ft</i>
T1	120 - 116.667	Leg	Max Tension	9	0.42	0.00	0.00
			Max. Compression	46	-1.33	0.51	0.10
			Max. Mx	18	0.29	-2.06	-0.21
			Max. My	16	-0.27	0.00	-2.17
			Max. Vy	3	-1.19	2.05	0.21
			Max. Vx	16	1.69	0.00	-2.17
		Diagonal	Max Tension	29	0.18	0.00	0.00
			Max. Compression	41	-0.51	0.00	0.00
			Max. Mx	34	-0.32	0.15	0.00
			Max. My	34	-0.32	0.00	-0.00
			Max. Vy	34	-0.09	0.00	0.00
			Max. Vx	34	0.00	0.00	0.00
		Top Girt	Max Tension	31	0.25	0.00	0.00
			Max. Compression	14	-0.25	0.02	0.00
			Max. Mx	43	-0.07	0.09	0.02
			Max. My	35	-0.02	0.09	0.02
			Max. Vy	43	-0.08	0.09	0.02
			Max. Vx	35	0.01	0.00	0.00
			Max Tension	19	0.18	-2.06	-0.21
			Max. Compression	46	-4.58	0.33	-0.05
			Max. Mx	18	0.08	-2.06	-0.21
			Max. My	32	-0.35	-0.06	-2.24
T2	116.667 - 108.333	Leg	Max. Vy	3	1.65	2.05	0.21
			Max. Vx	16	-1.70	0.00	-2.17
			Max Tension	5	5.38	0.00	0.00
			Max. Compression	4	-5.50	0.00	0.00
			Max. Mx	34	-0.16	0.24	0.00
			Max. My	34	-0.17	0.00	-0.01
		Diagonal	Max. Vy	34	-0.09	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
			Max Tension	18	3.92	0.00	0.00
			Max. Compression	3	-3.93	0.01	0.00
			Max. Mx	43	-0.29	0.10	0.03
			Max. My	35	0.65	0.09	0.03
		Horizontal	Max. Vy	43	-0.08	0.10	0.03
			Max. Vx	35	0.01	0.00	0.00
			Max Tension	19	6.88	-1.36	-0.30
			Max. Compression	35	-9.90	0.31	0.04
			Max. Mx	18	6.29	-2.09	-0.08
			Max. My	26	-1.33	-0.02	-2.47
			Max. Vy	13	-0.72	2.04	0.37
			Max. Vx	35	0.01	0.00	0.00
T3	108.333 - 100	Leg	Max Tension	19	6.88	-1.36	-0.30
			Max. Compression	35	-9.90	0.31	0.04
			Max. Mx	18	6.29	-2.09	-0.08
			Max. My	26	-1.33	-0.02	-2.47
			Max. Vy	13	-0.72	2.04	0.37
			Max. Vx	35	0.01	0.00	0.00

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T4	100 - 91.6667	Diagonal	Max. Vx	26	1.01	-0.02	-2.47
			Max Tension	5	9.10	0.00	0.00
			Max. Compression	4	-9.22	0.00	0.00
			Max. Mx	34	-0.20	0.26	0.00
			Max. My	34	-0.17	0.00	-0.01
			Max. Vy	34	-0.10	0.00	0.00
		Horizontal	Max. Vx	34	-0.00	0.00	0.00
			Max Tension	18	5.90	0.00	0.00
			Max. Compression	3	-6.02	0.02	0.01
			Max. Mx	48	-0.17	0.11	0.03
			Max. My	38	-0.30	0.11	0.03
			Max. Vy	48	0.09	0.11	0.03
		Leg	Max. Vx	35	-0.01	0.00	0.00
			Max Tension	19	17.78	-2.08	-0.08
			Max. Compression	2	-22.95	1.48	0.03
			Max. Mx	8	16.15	3.97	0.45
			Max. My	10	-1.66	-0.07	-4.00
			Max. Vy	8	1.90	-1.51	0.18
		Diagonal	Max. Vx	10	-2.03	-0.04	1.65
			Max Tension	5	13.27	0.00	0.00
			Max. Compression	4	-13.49	0.00	0.00
			Max. Mx	34	-0.40	0.31	0.00
			Max. My	34	-0.35	0.00	0.01
			Max. Vy	34	0.12	0.00	0.00
		Top Girt	Max. Vx	34	0.00	0.00	0.00
			Max Tension	20	8.47	0.00	0.00
			Max. Compression	5	-8.46	0.03	-0.00
			Max. Mx	48	-0.52	0.16	0.00
			Max. My	2	0.67	0.02	-0.03
			Max. Vy	48	-0.11	0.16	0.00
		Inner Bracing	Max. Vx	2	0.00	0.02	-0.03
			Max Tension	5	0.14	0.00	0.00
			Max. Compression	4	-0.15	0.00	0.00
			Max. Mx	34	-0.01	-0.11	0.00
			Max. Vy	34	0.07	0.00	0.00
			Max Tension	19	32.27	-1.53	-0.03
T5	91.6667 - 83.3333	Leg	Max. Compression	2	-40.06	2.32	-0.22
			Max. Mx	8	29.64	-2.43	0.38
			Max. My	10	-3.99	-0.03	3.07
			Max. Vy	24	-0.36	2.43	-0.38
			Max. Vx	10	-0.65	-0.03	3.07
		Diagonal	Max Tension	21	16.86	0.00	0.00
			Max. Compression	20	-17.09	0.00	0.00
			Max. Mx	34	-0.46	0.34	0.00
			Max. My	34	-0.33	0.00	-0.01
			Max. Vy	34	-0.12	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Top Girt	Max Tension	20	11.08	0.00	0.00
			Max. Compression	5	-11.01	0.03	-0.00
			Max. Mx	48	-0.69	0.18	0.01
			Max. My	2	2.60	0.01	-0.03
			Max. Vy	48	0.12	0.18	0.01
			Max. Vx	2	-0.01	0.01	-0.03
		Inner Bracing	Max Tension	5	0.19	0.00	0.00
			Max. Compression	4	-0.19	0.00	0.00
			Max. Mx	34	-0.01	-0.12	0.00
			Max. Vy	34	0.07	0.00	0.00
			Max Tension	19	51.77	-2.35	0.22
			Max. Compression	2	-62.97	4.30	-0.30
T6	83.3333 - 75	Leg	Max. Mx	8	47.64	5.42	0.26

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	44 of 65
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	Client	SMK-005 / (AT&T)	Designed by	MCD

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T7	75 - 50	Diagonal	Max. My	26	-6.14	-0.09	6.20
			Max. Vy	8	-2.45	-2.43	0.38
			Max. Vx	26	-2.92	-0.04	-3.07
			Max Tension	21	21.42	0.00	0.00
			Max. Compression	20	-21.71	0.00	0.00
			Max. Mx	34	-0.55	0.39	0.00
			Max. My	34	-0.38	0.00	0.01
			Max. Vy	34	-0.14	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
			Max Tension	6	14.69	0.04	-0.01
			Max. Compression	23	-14.61	0.00	0.00
			Max. Mx	38	-1.23	0.21	0.01
		Top Girt	Max. My	2	2.77	0.01	-0.04
			Max. Vy	38	-0.12	0.21	0.01
			Max. Vx	2	0.01	0.01	-0.04
			Max Tension	23	0.25	0.00	0.00
			Max. Compression	22	-0.26	0.00	0.00
			Max. Mx	34	-0.01	-0.13	0.00
			Max. Vy	34	-0.07	0.00	0.00
			Max Tension	19	139.85	-0.86	0.22
			Max. Compression	2	-160.76	-0.42	-0.09
			Max. Mx	8	72.06	-4.51	0.26
			Max. My	10	-6.47	-0.06	4.95
		Diagonal	Max. Vy	8	-1.84	-4.51	0.26
			Max. Vx	26	-1.99	-0.09	-4.95
			Max Tension	17	30.44	0.00	0.00
			Max. Compression	16	-30.81	0.00	0.00
			Max. Mx	34	-0.72	0.54	0.00
			Max. My	34	-0.62	0.00	-0.02
			Max. Vy	34	-0.18	0.00	0.00
			Max. Vx	34	0.01	0.00	0.00
		Horizontal	Max Tension	32	21.94	0.00	0.00
			Max. Compression	15	-21.94	0.07	0.02
			Max. Mx	38	0.95	0.31	0.02
			Max. My	12	3.18	0.01	-0.07
			Max. Vy	38	0.16	0.31	0.02
			Max. Vx	12	0.01	0.01	-0.07
		Top Girt	Max Tension	6	19.24	0.05	-0.01
			Max. Compression	15	-19.23	0.05	0.01
			Max. Mx	38	-1.53	0.23	0.01
			Max. My	24	1.44	0.02	-0.05
			Max. Vy	38	-0.14	0.23	0.01
			Max. Vx	24	0.01	0.02	-0.05
		Inner Bracing	Max Tension	15	0.33	0.00	0.00
			Max. Compression	14	-0.34	0.00	0.00
			Max. Mx	34	-0.01	-0.18	0.00
			Max. Vy	34	0.09	0.00	0.00
		Leg	Max Tension	19	241.05	2.91	0.15
			Max. Compression	2	-272.14	5.00	0.09
			Max. Mx	2	-272.09	-5.03	-0.21
			Max. My	10	-12.78	-0.43	3.81
			Max. Vy	2	2.50	5.00	0.09
			Max. Vx	10	1.85	-0.29	2.51
		Diagonal	Max Tension	17	37.56	-0.17	0.01
			Max. Compression	14	-38.90	0.00	0.00
			Max. Mx	16	12.90	-0.34	-0.01
			Max. My	35	-1.51	-0.16	0.03
			Max. Vy	37	0.14	-0.18	-0.03
			Max. Vx	48	0.01	0.00	0.00
		Horizontal	Max Tension	16	28.01	0.12	-0.00
			Max. Compression	15	-28.20	0.14	0.02

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	Client	SMK-005 / (AT&T)	Designed by	MCD

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T9	25 - 0	Top Girt	Max. Mx	38	-1.50	0.50	0.02
			Max. My	24	-0.32	-0.04	-0.10
			Max. Vy	38	0.22	0.50	0.02
			Max. Vx	24	-0.01	-0.04	-0.10
			Max Tension	16	23.44	0.09	-0.00
			Max. Compression	15	-23.68	0.09	0.02
			Max. Mx	38	-1.48	0.36	0.01
			Max. My	24	-0.61	-0.01	-0.07
			Max. Vy	38	-0.18	0.36	0.01
			Max. Vx	24	0.01	-0.01	-0.07
		Redund Horz 1 Bracing	Max Tension	2	4.72	0.00	0.00
			Max. Compression	2	-4.72	0.00	0.00
			Max. Mx	34	0.90	-0.06	0.00
			Max. My	34	0.76	0.00	0.00
			Max. Vy	34	0.05	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	3.24	0.00	0.00
			Max. Compression	2	-3.24	0.00	0.00
			Max. Mx	34	0.76	-0.08	0.00
			Max. My	34	0.51	0.00	-0.00
			Max. Vy	34	0.05	0.00	0.00
		Inner Bracing	Max. Vx	34	-0.00	0.00	0.00
			Max Tension	15	0.41	0.00	0.00
			Max. Compression	14	-0.42	0.00	0.00
			Max. Mx	34	-0.02	-0.22	0.00
			Max. Vy	34	0.10	0.00	0.00
		Leg	Max Tension	19	332.59	6.58	0.33
			Max. Compression	2	-373.84	0.00	0.00
			Max. Mx	2	-373.57	9.64	0.15
			Max. My	10	-14.21	-0.63	5.78
			Max. Vy	2	-2.98	9.64	0.15
		Diagonal	Max. Vx	10	-1.64	-0.63	5.78
			Max Tension	17	50.21	-0.43	0.01
			Max. Compression	14	-51.75	0.00	0.00
			Max. Mx	30	26.61	-0.66	0.02
			Max. My	43	-3.57	-0.04	-0.05
		Horizontal	Max. Vy	37	0.17	-0.34	-0.05
			Max. Vx	46	0.01	0.00	0.00
			Max Tension	16	31.70	0.17	-0.00
			Max. Compression	15	-32.40	0.19	0.02
			Max. Mx	38	-2.36	0.55	0.02
		Top Girt	Max. My	24	-0.03	-0.07	-0.10
			Max. Vy	38	-0.23	0.55	0.02
			Max. Vx	24	0.01	-0.07	-0.10
			Max Tension	16	29.93	0.13	-0.00
			Max. Compression	15	-30.19	0.15	0.02
		Redund Horz 1 Bracing	Max. Mx	38	-1.65	0.53	0.02
			Max. My	24	-0.88	-0.06	-0.10
			Max. Vy	38	-0.22	0.53	0.02
			Max. Vx	24	0.01	-0.06	-0.10
			Max Tension	2	6.48	0.00	0.00
		Redund Diag 1 Bracing	Max. Compression	2	-6.48	0.00	0.00
			Max. Mx	34	1.11	-0.07	0.00
			Max. My	34	0.93	0.00	0.00
			Max. Vy	34	0.06	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Redund Horz 1 Bracing	Max Tension	2	5.25	0.00	0.00
			Max. Compression	2	-5.25	0.00	0.00
			Max. Mx	34	1.11	-0.07	0.00
			Max. My	34	0.93	0.00	0.00
			Max. Vy	34	0.06	0.00	0.00

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	Client	SMK-005 / (AT&T)	Designed by	MCD

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	2	-5.25	0.00	0.00
			Max. Mx	34	1.15	-0.11	0.00
			Max. My	34	0.80	0.00	-0.00
			Max. Vy	34	0.05	0.00	0.00
			Max. Vx	34	-0.00	0.00	0.00
		Inner Bracing	Max Tension	15	0.52	0.00	0.00
			Max. Compression	14	-0.53	0.00	0.00
			Max. Mx	34	-0.02	-0.27	0.00
			Max. Vy	34	0.11	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	434.22	55.87	-35.04
	Max. H _x	24	434.22	55.87	-35.04
	Max. H _z	7	-378.98	-48.27	34.16
	Min. Vert	9	-390.45	-51.26	32.38
	Min. H _x	9	-390.45	-51.26	32.38
	Min. H _z	22	406.28	50.04	-35.19
Leg B	Max. Vert	12	436.45	-55.05	-36.60
	Max. H _x	29	-390.08	50.42	33.90
	Max. H _z	31	-378.71	47.07	36.31
	Min. Vert	29	-390.08	50.42	33.90
	Min. H _x	12	436.45	-55.05	-36.60
	Min. H _z	14	416.56	-50.17	-38.27
Leg A	Max. Vert	2	438.50	1.76	65.97
	Max. H _x	26	17.89	19.45	1.22
	Max. H _z	2	438.50	1.76	65.97
	Min. Vert	19	-391.47	-1.74	-60.61
	Min. H _x	11	12.66	-19.43	0.87
	Min. H _z	19	-391.47	-1.74	-60.61

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	41.78	-0.00	0.00	-11.29	-12.98	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	50.14	-0.04	-121.63	-7677.71	-7.71	63.64
0.9 Dead+1.6 Wind 0 deg - No Ice	37.61	-0.04	-121.63	-7674.33	-3.82	63.64
1.2 Dead+1.6 Wind 30 deg - No Ice	50.14	58.41	-101.19	-6452.18	-3703.54	-14.30
0.9 Dead+1.6 Wind 30 deg - No Ice	37.61	58.41	-101.19	-6448.79	-3699.65	-14.30
1.2 Dead+1.6 Wind 45 deg - No Ice	50.14	82.06	-82.05	-5241.81	-5208.71	-53.17
0.9 Dead+1.6 Wind 45 deg - No Ice	37.61	82.06	-82.05	-5238.42	-5204.82	-53.17
1.2 Dead+1.6 Wind 60 deg - No Ice	50.14	99.83	-57.60	-3688.87	-6346.25	-88.41

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<i>Load Combination</i>	<i>Vertical K</i>	<i>Shear_x K</i>	<i>Shear_z K</i>	<i>Overturning Moment, M_x kip-ft</i>	<i>Overturning Moment, M_z kip-ft</i>	<i>Torque kip-ft</i>
Ice						
0.9 Dead+1.6 Wind 60 deg - No	37.61	99.83	-57.60	-3685.48	-6342.36	-88.41
Ice						
1.2 Dead+1.6 Wind 90 deg - No	50.14	116.89	0.04	-5.69	-7405.12	-138.83
Ice						
0.9 Dead+1.6 Wind 90 deg - No	37.61	116.89	0.04	-2.30	-7401.23	-138.83
Ice						
1.2 Dead+1.6 Wind 120 deg -	50.14	105.37	60.85	3825.34	-6613.84	-152.05
No Ice						
0.9 Dead+1.6 Wind 120 deg -	37.61	105.37	60.85	3828.73	-6609.95	-152.05
No Ice						
1.2 Dead+1.6 Wind 135 deg -	50.14	84.37	84.35	5331.87	-5325.86	-143.17
No Ice						
0.9 Dead+1.6 Wind 135 deg -	37.61	84.37	84.35	5335.25	-5321.96	-143.17
No Ice						
1.2 Dead+1.6 Wind 150 deg -	50.14	58.48	101.23	6432.94	-3717.15	-124.53
No Ice						
0.9 Dead+1.6 Wind 150 deg -	37.61	58.48	101.23	6436.33	-3713.26	-124.53
No Ice						
1.2 Dead+1.6 Wind 180 deg -	50.14	0.04	115.28	7350.70	-23.43	-63.64
No Ice						
0.9 Dead+1.6 Wind 180 deg -	37.61	0.04	115.28	7354.09	-19.53	-63.64
No Ice						
1.2 Dead+1.6 Wind 210 deg -	50.14	-58.41	101.19	6425.09	3672.40	14.30
No Ice						
0.9 Dead+1.6 Wind 210 deg -	37.61	-58.41	101.19	6428.47	3676.30	14.30
No Ice						
1.2 Dead+1.6 Wind 225 deg -	50.14	-82.06	82.05	5214.72	5177.57	53.17
No Ice						
0.9 Dead+1.6 Wind 225 deg -	37.61	-82.06	82.05	5218.11	5181.46	53.17
No Ice						
1.2 Dead+1.6 Wind 240 deg -	50.14	-105.33	60.78	3811.74	6574.85	88.41
No Ice						
0.9 Dead+1.6 Wind 240 deg -	37.61	-105.33	60.78	3815.12	6578.74	88.41
No Ice						
1.2 Dead+1.6 Wind 270 deg -	50.14	-116.89	-0.04	-21.40	7373.98	138.83
No Ice						
0.9 Dead+1.6 Wind 270 deg -	37.61	-116.89	-0.04	-18.01	7377.87	138.83
No Ice						
1.2 Dead+1.6 Wind 300 deg -	50.14	-99.87	-57.68	-3702.47	6322.96	152.05
No Ice						
0.9 Dead+1.6 Wind 300 deg -	37.61	-99.87	-57.68	-3699.09	6326.86	152.05
No Ice						
1.2 Dead+1.6 Wind 315 deg -	50.14	-82.12	-82.11	-5252.92	5188.68	143.17
No Ice						
0.9 Dead+1.6 Wind 315 deg -	37.61	-82.12	-82.11	-5249.53	5192.57	143.17
No Ice						
1.2 Dead+1.6 Wind 330 deg -	50.14	-58.48	-101.23	-6460.03	3686.01	124.53
No Ice						
0.9 Dead+1.6 Wind 330 deg -	37.61	-58.48	-101.23	-6456.65	3689.90	124.53
No Ice						
1.2 Dead+1.0 Ice+1.0 Temp	211.15	-0.00	0.00	-248.46	-112.92	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0	211.15	-0.01	-43.83	-2811.78	-111.72	34.90
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 30 deg+1.0	211.15	21.61	-37.47	-2445.49	-1376.62	-7.60
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 45 deg+1.0	211.15	30.51	-30.52	-2038.93	-1897.65	-28.81
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 60 deg+1.0	211.15	37.29	-21.53	-1511.93	-2295.49	-48.06
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90 deg+1.0	211.15	43.25	0.01	-247.26	-2642.40	-75.65

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	Client SMK-005 / (AT&T)	Designed by MCD

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
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	211.15	37.94	21.93	1034.24	-2326.39	-82.97
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	211.15	30.79	30.80	1555.84	-1911.48	-78.17
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	211.15	21.64	37.48	1949.77	-1378.70	-68.05
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	211.15	0.01	43.09	2280.56	-114.12	-34.90
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	211.15	-21.61	37.47	1948.56	1150.77	7.60
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	211.15	-30.51	30.52	1542.01	1671.81	28.81
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	211.15	-37.93	21.90	1032.16	2099.34	48.06
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	211.15	-43.25	-0.01	-249.66	2416.55	75.65
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	211.15	-37.30	-21.56	-1514.01	2070.84	82.97
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	211.15	-30.53	-30.54	-2040.63	1673.50	78.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	211.15	-21.64	-37.48	-2446.69	1152.86	68.05
Dead+Wind 0 deg - Service	41.78	-0.01	-25.29	-1604.99	-11.34	13.23
Dead+Wind 30 deg - Service	41.78	12.14	-21.04	-1350.15	-779.86	-2.97
Dead+Wind 45 deg - Service	41.78	17.06	-17.06	-1098.46	-1092.84	-11.06
Dead+Wind 60 deg - Service	41.78	20.76	-11.98	-775.54	-1329.39	-18.38
Dead+Wind 90 deg - Service	41.78	24.31	0.01	-9.65	-1549.57	-28.87
Dead+Wind 120 deg - Service	41.78	21.91	12.65	786.98	-1385.03	-31.62
Dead+Wind 135 deg - Service	41.78	17.54	17.54	1100.25	-1117.20	-29.77
Dead+Wind 150 deg - Service	41.78	12.16	21.05	1329.20	-782.69	-25.90
Dead+Wind 180 deg - Service	41.78	0.01	23.97	1520.05	-14.61	-13.23
Dead+Wind 210 deg - Service	41.78	-12.14	21.04	1327.57	753.91	2.97
Dead+Wind 225 deg - Service	41.78	-17.06	17.06	1075.89	1066.89	11.06
Dead+Wind 240 deg - Service	41.78	-21.90	12.64	784.15	1357.45	18.38
Dead+Wind 270 deg - Service	41.78	-24.31	-0.01	-12.92	1523.62	28.87
Dead+Wind 300 deg - Service	41.78	-20.77	-11.99	-778.37	1305.07	31.62
Dead+Wind 315 deg - Service	41.78	-17.08	-17.07	-1100.77	1069.20	29.77
Dead+Wind 330 deg - Service	41.78	-12.16	-21.05	-1351.78	756.74	25.90

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-41.78	0.00	0.00	41.78	-0.00	0.000%
2	-0.04	-50.14	-121.63	0.04	50.14	121.63	0.000%
3	-0.04	-37.61	-121.63	0.04	37.61	121.63	0.000%
4	58.41	-50.14	-101.19	-58.41	50.14	101.19	0.000%
5	58.41	-37.61	-101.19	-58.41	37.61	101.19	0.000%
6	82.06	-50.14	-82.05	-82.06	50.14	82.05	0.000%
7	82.06	-37.61	-82.05	-82.06	37.61	82.05	0.000%
8	99.83	-50.14	-57.60	-99.83	50.14	57.60	0.000%
9	99.83	-37.61	-57.60	-99.83	37.61	57.60	0.000%
10	116.89	-50.14	0.04	-116.89	50.14	-0.04	0.000%
11	116.89	-37.61	0.04	-116.89	37.61	-0.04	0.000%
12	105.37	-50.14	60.85	-105.37	50.14	-60.85	0.000%
13	105.37	-37.61	60.85	-105.37	37.61	-60.85	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
14	84.37	-50.14	84.35	-84.37	50.14	-84.35	0.000%
15	84.37	-37.61	84.35	-84.37	37.61	-84.35	0.000%
16	58.48	-50.14	101.23	-58.48	50.14	-101.23	0.000%
17	58.48	-37.61	101.23	-58.48	37.61	-101.23	0.000%
18	0.04	-50.14	115.28	-0.04	50.14	-115.28	0.000%
19	0.04	-37.61	115.28	-0.04	37.61	-115.28	0.000%
20	-58.41	-50.14	101.19	58.41	50.14	-101.19	0.000%
21	-58.41	-37.61	101.19	58.41	37.61	-101.19	0.000%
22	-82.06	-50.14	82.05	82.06	50.14	-82.05	0.000%
23	-82.06	-37.61	82.05	82.06	37.61	-82.05	0.000%
24	-105.33	-50.14	60.78	105.33	50.14	-60.78	0.000%
25	-105.33	-37.61	60.78	105.33	37.61	-60.78	0.000%
26	-116.89	-50.14	-0.04	116.89	50.14	0.04	0.000%
27	-116.89	-37.61	-0.04	116.89	37.61	0.04	0.000%
28	-99.87	-50.14	-57.68	99.87	50.14	57.68	0.000%
29	-99.87	-37.61	-57.68	99.87	37.61	57.68	0.000%
30	-82.12	-50.14	-82.11	82.12	50.14	82.11	0.000%
31	-82.12	-37.61	-82.11	82.12	37.61	82.11	0.000%
32	-58.48	-50.14	-101.23	58.48	50.14	101.23	0.000%
33	-58.48	-37.61	-101.23	58.48	37.61	101.23	0.000%
34	0.00	-211.15	0.00	0.00	211.15	-0.00	0.000%
35	-0.01	-211.15	-43.83	0.01	211.15	43.83	0.000%
36	21.61	-211.15	-37.47	-21.61	211.15	37.47	0.000%
37	30.51	-211.15	-30.52	-30.51	211.15	30.52	0.000%
38	37.29	-211.15	-21.53	-37.29	211.15	21.53	0.000%
39	43.25	-211.15	0.01	-43.25	211.15	-0.01	0.000%
40	37.94	-211.15	21.93	-37.94	211.15	-21.93	0.000%
41	30.79	-211.15	30.80	-30.79	211.15	-30.80	0.000%
42	21.64	-211.15	37.48	-21.64	211.15	-37.48	0.000%
43	0.01	-211.15	43.09	-0.01	211.15	-43.09	0.000%
44	-21.61	-211.15	37.47	21.61	211.15	-37.47	0.000%
45	-30.51	-211.15	30.52	30.51	211.15	-30.52	0.000%
46	-37.93	-211.15	21.90	37.93	211.15	-21.90	0.000%
47	-43.25	-211.15	-0.01	43.25	211.15	0.01	0.000%
48	-37.30	-211.15	-21.56	37.30	211.15	21.56	0.000%
49	-30.53	-211.15	-30.54	30.53	211.15	30.54	0.000%
50	-21.64	-211.15	-37.48	21.64	211.15	37.48	0.000%
51	-0.01	-41.78	-25.29	0.01	41.78	25.29	0.000%
52	12.14	-41.78	-21.04	-12.14	41.78	21.04	0.000%
53	17.06	-41.78	-17.06	-17.06	41.78	17.06	0.000%
54	20.76	-41.78	-11.98	-20.76	41.78	11.98	0.000%
55	24.31	-41.78	0.01	-24.31	41.78	-0.01	0.000%
56	21.91	-41.78	12.65	-21.91	41.78	-12.65	0.000%
57	17.54	-41.78	17.54	-17.54	41.78	-17.54	0.000%
58	12.16	-41.78	21.05	-12.16	41.78	-21.05	0.000%
59	0.01	-41.78	23.97	-0.01	41.78	-23.97	0.000%
60	-12.14	-41.78	21.04	12.14	41.78	-21.04	0.000%
61	-17.06	-41.78	17.06	17.06	41.78	-17.06	0.000%
62	-21.90	-41.78	12.64	21.90	41.78	-12.64	0.000%
63	-24.31	-41.78	-0.01	24.31	41.78	0.01	0.000%
64	-20.77	-41.78	-11.99	20.77	41.78	11.99	0.000%
65	-17.08	-41.78	-17.07	17.08	41.78	17.07	0.000%
66	-12.16	-41.78	-21.05	12.16	41.78	21.05	0.000%

Maximum Tower Deflections - Service Wind

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 116.667	1.931	51	0.1063	0.0207
T2	116.667 - 108.333	1.858	51	0.1063	0.0206
T3	108.333 - 100	1.665	51	0.1065	0.0215
T4	100 - 91.6667	1.469	51	0.1059	0.0223
T5	91.6667 - 83.3333	1.278	51	0.1038	0.0218
T6	83.3333 - 75	1.089	51	0.1000	0.0208
T7	75 - 50	0.910	51	0.0940	0.0191
T8	50 - 25	0.426	51	0.0735	0.0136
T9	25 - 0	0.109	51	0.0358	0.0069

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 5/8x4'	51	1.931	0.1063	0.0207	68807
120.00	16'x3" Omni (inverted)	51	1.931	0.1063	0.0207	68807
117.00	6' DISH (SOLID)	51	1.865	0.1063	0.0206	68807
115.00	6' DISH (SOLID)	51	1.820	0.1063	0.0206	68807
114.00	Rohn 6' Side-Arm(1)	51	1.797	0.1064	0.0207	72255
113.00	Piord 4' Side Mount Standoff (1)	51	1.774	0.1064	0.0208	80592
112.00	Junction Box	51	1.751	0.1064	0.0210	94664
111.00	6' DISH (SOLID)	51	1.728	0.1065	0.0211	115877
110.00	6'8"x4" Pipe Mount	51	1.704	0.1065	0.0212	148159
109.00	10'x2" Dipole Antenna (inverted)	51	1.681	0.1065	0.0214	202082
107.00	6'8"x4" Pipe Mount	51	1.634	0.1065	0.0217	602121
106.00	16'x3" Omni (inverted)	51	1.610	0.1065	0.0218	Inf
105.00	SE419-SWBPALDF Panel Antenna	51	1.587	0.1064	0.0220	615154
104.00	AP13-850/065D w/Mount Pipe	51	1.563	0.1064	0.0221	351894
103.00	TMA 432-83H-01T	51	1.540	0.1063	0.0222	250410
101.00	SE419-SWBPALDF Panel Antenna	51	1.493	0.1060	0.0223	170806
100.00	PD458-406	51	1.469	0.1059	0.0223	158470
96.00	3'4"x4" Pipe Mount (horizontal)	51	1.377	0.1051	0.0222	216657
95.00	SC479-HF1LDF (inverted)	51	1.354	0.1048	0.0221	262558
92.00	PD458-406	51	1.285	0.1039	0.0218	361220
88.00	SC479-HF1LDF (inverted)	51	1.194	0.1024	0.0214	146268
87.00	4'6"x3" Pipe Mount (horizontal)	51	1.171	0.1020	0.0213	118967
86.00	20' 4-Bay Dipole	51	1.149	0.1015	0.0212	101327
82.00	3' Yagi	51	1.060	0.0991	0.0206	81996
81.00	3' Yagi	51	1.038	0.0984	0.0204	85590
80.00	Face Mount	51	1.017	0.0977	0.0202	91893
77.00	20' 4-Bay Dipole	51	0.952	0.0955	0.0195	123449
76.00	3'4"x4" Pipe Mount (horizontal)	51	0.931	0.0947	0.0193	133820
72.00	Face Mount	51	0.847	0.0918	0.0185	127585
67.00	4'6"x3" Pipe Mount (horizontal)	51	0.744	0.0883	0.0175	89193
65.00	6' Yagi w/ Mount	51	0.704	0.0869	0.0171	79375
63.00	GPS	51	0.665	0.0854	0.0166	71503
55.00	20' 4-Bay Dipole w/ 2' Sidearm Mount	51	0.513	0.0788	0.0148	51196
53.00	1.0" Dia 4' Omni w/Pipe Mount	51	0.478	0.0768	0.0143	47823
48.00	10'x6" Dipole Antenna	51	0.393	0.0711	0.0131	41673
47.00	5'x1.5in dia Whip Antenna /w mount	51	0.377	0.0698	0.0128	40760
43.00	3' Whip (3in diameter) /w mount	51	0.316	0.0643	0.0118	37593
41.00	4 FT DISH	51	0.287	0.0613	0.0113	36194
40.00	1'x1' Panel Antenna	51	0.273	0.0598	0.0110	35532
39.00	6'x1" Whip Antenna w/ Mount	51	0.260	0.0583	0.0107	34894

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 116.667	9.228	2	0.5077	0.0995
T2	116.667 - 108.333	8.876	2	0.5077	0.0989
T3	108.333 - 100	7.957	2	0.5084	0.1034
T4	100 - 91.6667	7.022	2	0.5052	0.1073
T5	91.6667 - 83.3333	6.107	2	0.4952	0.1047
T6	83.3333 - 75	5.208	2	0.4769	0.1000
T7	75 - 50	4.353	2	0.4484	0.0916
T8	50 - 25	2.040	2	0.3509	0.0654
T9	25 - 0	0.523	2	0.1712	0.0332

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 5/8x4'	2	9.228	0.5077	0.0995	14479
120.00	16'x3" Omni (inverted)	2	9.228	0.5077	0.0995	14479
117.00	6' DISH (SOLID)	2	8.911	0.5076	0.0989	14479
115.00	6' DISH (SOLID)	2	8.696	0.5078	0.0993	14479
114.00	Rohn 6' Side-Arm(1)	2	8.587	0.5079	0.0996	15220
113.00	Pirot 4' Side Mount Standoff (1)	2	8.477	0.5080	0.1002	16993
112.00	Junction Box	2	8.367	0.5082	0.1008	19991
111.00	6' DISH (SOLID)	2	8.255	0.5083	0.1014	24524
110.00	6'8"x4" Pipe Mount	2	8.144	0.5084	0.1022	31455
109.00	10'x2" Dipole Antenna (inverted)	2	8.032	0.5084	0.1029	43113
107.00	6'8"x4" Pipe Mount	2	7.807	0.5083	0.1043	132701
106.00	16'x3" Omni (inverted)	2	7.694	0.5081	0.1050	472580
105.00	SE419-SWBPALDF Panel Antenna	2	7.582	0.5079	0.1056	138406
104.00	AP13-850/065D w/Mount Pipe	2	7.469	0.5075	0.1061	75622
103.00	TMA 432-83H-01T	2	7.357	0.5071	0.1066	52492
101.00	SE419-SWBPALDF Panel Antenna	2	7.133	0.5060	0.1072	35599
100.00	PD458-406	2	7.022	0.5052	0.1073	33085
96.00	3'4"x4" Pipe Mount (horizontal)	2	6.580	0.5013	0.1066	45474
95.00	SC479-HF1LDF (inverted)	2	6.471	0.5001	0.1062	55234
92.00	PD458-406	2	6.143	0.4958	0.1049	76762
88.00	SC479-HF1LDF (inverted)	2	5.708	0.4885	0.1029	30996
87.00	4'6"x3" Pipe Mount (horizontal)	2	5.600	0.4863	0.1024	25187
86.00	20' 4-Bay Dipole	2	5.492	0.4840	0.1018	21440
82.00	3' Yagi	2	5.069	0.4728	0.0988	17336
81.00	3' Yagi	2	4.964	0.4696	0.0979	18098
80.00	Face Mount	2	4.861	0.4662	0.0970	19433
77.00	20' 4-Bay Dipole	2	4.555	0.4555	0.0938	26124
76.00	3'4"x4" Pipe Mount (horizontal)	2	4.453	0.4520	0.0927	28319
72.00	Face Mount	2	4.052	0.4381	0.0889	26931
67.00	4'6"x3" Pipe Mount (horizontal)	2	3.561	0.4215	0.0842	18766
65.00	6' Yagi w/ Mount	2	3.369	0.4148	0.0821	16686
63.00	GPS	2	3.179	0.4078	0.0801	15021
55.00	20' 4-Bay Dipole w/ 2' Sidearm Mount	2	2.456	0.3760	0.0713	10737
53.00	1.0" Dia 4' Omni w/Pipe Mount	2	2.286	0.3666	0.0689	10027

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
48.00	10'x6" Dipole Antenna	2	1.882	0.3393	0.0629	8733
47.00	5'x1.5in dia Whip Antenna /w mount	2	1.805	0.3332	0.0617	8542
43.00	3' Whip (3in diameter) /w mount	2	1.512	0.3069	0.0567	7877
41.00	4 FT DISH	2	1.375	0.2929	0.0542	7584
40.00	1'x1' Panel Antenna	2	1.309	0.2856	0.0529	7445
39.00	6'x1" Whip Antenna w/ Mount	2	1.244	0.2783	0.0516	7311

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T1	120	Diagonal	A325X	0.7500	1	0.51	31.32	0.016 ✓	1	Member Bearing
		Top Girt	A325X	0.6250	2	0.12	7.19	0.017 ✓	1	Member Block Shear
T2	116.667	Diagonal	A325X	0.7500	1	5.38	17.94	0.300 ✓	1	Member Block Shear
		Horizontal	A325X	0.6250	2	1.96	7.19	0.273 ✓	1	Member Block Shear
T3	108.333	Diagonal	A325X	0.7500	1	9.10	17.94	0.507 ✓	1	Member Block Shear
		Horizontal	A325X	0.6250	2	2.95	7.19	0.411 ✓	1	Member Block Shear
T4	100	Leg	A325X	0.7500	6	2.96	29.82	0.099 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	13.27	26.81	0.495 ✓	1	Member Block Shear
		Top Girt	A325X	0.6250	2	4.24	10.26	0.413 ✓	1	Member Block Shear
T5	91.6667	Diagonal	A325X	0.7500	1	16.86	26.81	0.629 ✓	1	Member Block Shear
		Top Girt	A325X	0.6250	2	5.54	10.26	0.540 ✓	1	Member Block Shear
T6	83.3333	Diagonal	A325X	0.7500	1	21.42	35.89	0.597 ✓	1	Member Block Shear
		Top Girt	A325X	0.6250	2	7.35	10.26	0.716 ✓	1	Member Block Shear
T7	75	Leg	A325X	0.7500	6	12.61	29.82	0.423 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	30.44	35.34	0.861 ✓	1	Member Bearing
		Horizontal	A325X	0.6250	2	10.97	13.03	0.842 ✓	1	Member Block Shear
		Top Girt	A325X	0.6250	2	9.62	14.38	0.669 ✓	1	Member Block Shear
T8	50	Leg	A325X	0.7500	6	28.65	29.82	0.961 ✓	1	Bolt Tension
		Diagonal	A325X	0.7500	1	38.90	43.74	0.889 ✓	1	Bolt Shear
		Horizontal	A325X	0.6250	2	14.10	15.19	0.929 ✓	1	Bolt Shear
		Top Girt	A325X	0.6250	2	11.84	15.19	0.780 ✓	1	Bolt Shear
T9	25	Leg	A325X	1.0000	8	34.53	53.01	0.651 ✓	1	Bolt Tension
		Diagonal	A325X	1.0000	1	50.21	54.84	0.916 ✓	1	Member Block Shear
		Horizontal	A490X	0.6250	2	16.20	18.98	0.853 ✓	1	Bolt Shear

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
		Top Girt	A325X	0.6250	2	15.10	15.19	0.994	1	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	P.5x.250	3.34	3.34	23.8 K=1.00	3.7306	-1.33	161.06	0.008 ¹
T2	116.667 - 108.333	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-4.58	129.56	0.035 ¹
T3	108.333 - 100	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-9.90	129.56	0.076 ¹
T4	100 - 91.6667	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-22.95	129.56	0.177 ¹
T5	91.6667 - 83.3333	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-40.06	129.56	0.309 ¹
T6	83.3333 - 75	P.5x.250	8.34	8.34	59.5 K=1.00	3.7306	-62.97	129.56	0.486 ¹
T7	75 - 50	P5x.375	25.03	8.34	54.4 K=1.00	6.1120	-160.76	221.46	0.726 ¹
T8	50 - 25	P.5x.400	25.03	4.17	30.7 K=1.00	5.7805	-272.14	287.44	0.947 ¹
T9	25 - 0	P6.875x.400	25.03	6.26	32.7 K=1.00	8.1367	-373.84	399.96	0.935 ¹

¹ P_u / φP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	2L2 1/2x2x3/16x3/8	6.73	6.21	102.5 K=1.00	1.6200	-0.51	30.19	0.017 ¹
T2	116.667 - 108.333	2L2 1/2x2x3/16x3/8	10.37	9.75	159.7 K=1.00	1.6200	-5.50	14.34	0.384 ¹
T3	108.333 - 100	2L2 1/2x2x3/16x3/8	10.58	9.97	163.1 K=1.00	1.6200	-9.22	13.75	0.670 ¹
T4	100 - 91.6667	2L2 1/2x2 1/2x1/4x3/8	10.78	10.18	158.9 K=1.00	2.3800	-13.49	21.29	0.634 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T5	91.6667 - 83.3333	2L2 1/2x2 1/2x1/4x3/8	11.00	10.41	162.4 K=1.00	2.3800	-17.09	20.38	0.838 ¹ ✓
T6	83.3333 - 75	2L2 1/2x2x3/8x3/8	11.22	10.64	170.5 K=1.00	3.0900	-21.71	24.02	0.904 ¹ ✓
T7	75 - 50	2L3x3x5/16x3/8	11.91	11.32	147.3 K=1.00	3.5500	-30.81	36.97	0.833 ¹ ✓
T8	50 - 25	2L3x3x3/8x3/8	12.65	12.10	134.3 K=1.00	4.2200	-38.90	52.87	0.736 ¹ ✓
T9	25 - 0	2L 'a' > 45.3266 in - 135 2L3 1/2x3 1/2x3/8x3/8	16.33	15.56	125.4 K=1.00	4.9700	-51.75	71.42	0.725 ¹ ✓

¹ P_u / φP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	116.667 - 108.333	L2 1/2x2 1/2x3/16	11.68	5.43	129.0 K=0.98	0.9020	-3.93	12.17	0.323 ¹ ✓
T3	108.333 - 100	L2 1/2x2 1/2x3/16	12.35	5.77	135.1 K=0.97	0.9020	-6.02	11.16	0.540 ¹ ✓
T7	75 - 50	L3 1/2x3 1/2x1/4	16.35	7.75	130.7 K=0.98	1.6900	-21.94	22.37	0.981 ¹ ✓
T8	50 - 25	L4x4x5/16	18.35	8.77	130.0 K=0.98	2.4000	-28.20	32.10	0.879 ¹ ✓
T9	25 - 0	L4x4x3/8	20.02	9.52	139.1 K=0.96	2.8600	-32.40	33.38	0.971 ¹ ✓

¹ P_u / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	L2 1/2x2 1/2x3/16	11.41	5.30	126.5 K=0.98	0.9020	-0.25	12.58	0.020 ¹ ✓
T4	100 - 91.6667	L3x3x1/4	13.02	6.10	122.8 K=0.99	1.4400	-8.46	21.08	0.401 ¹ ✓
T5	91.6667 - 83.3333	L3x3x1/4	13.68	6.43	128.0 K=0.98	1.4400	-11.01	19.70	0.559 ¹ ✓
T6	83.3333 - 75	L3x3x1/4	14.35	6.77	133.1 K=0.97	1.4400	-14.61	18.35	0.796 ¹ ✓
T7	75 - 50	L3x3x5/16	15.02	7.10	138.9 K=0.96	1.7800	-19.23	20.86	0.922 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L3 1/2x3 1/2x5/16	17.02	8.08	135.7 K=0.97	2.0900	-23.68	25.66	0.923 ¹ ✓
T9	25 - 0	L4x4x5/16	19.02	9.10	133.8 K=0.97	2.4000	-30.19	30.27	0.997 ¹ ✓

¹ P_u / φP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2 1/2x1/4	4.59	4.38	113.5 K=1.06	1.1900	-4.72	20.86	0.226 ¹ ✓
T9	25 - 0	L2 1/2x2 1/2x1/4	5.00	4.72	117.7 K=1.02	1.1900	-6.48	19.42	0.334 ¹ ✓

¹ P_u / φP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2 1/2x1/4	6.08	5.79	141.5 K=1.00	1.1900	-3.13	13.43	0.233 ¹ ✓
T9	25 - 0	L2 1/2x2 1/2x1/4	7.85	7.38	180.4 K=1.00	1.1900	-5.09	8.26	0.616 ¹ ✓

¹ P_u / φP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T4	100 - 91.6667	L2 1/2x2x3/16	6.51	6.51	182.9 K=1.00	0.8090	-0.15	5.46	0.027 ¹ ✓
T5	91.6667 - 83.3333	L2 1/2x2x3/16	6.84	6.84	192.3 K=1.00	0.8090	-0.19	4.94	0.039 ¹ ✓
T6	83.3333 - 75	L2 1/2x2x3/16	7.17	7.17	201.6 K=1.00	0.8090	-0.26	4.50	0.057 ¹ ✓
T7	75 - 50	L2 1/2x2x3/16	7.51	7.51	211.0 K=1.00	0.8090	-0.34	4.11	0.082 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2x3/16	8.51	8.51	239.1 K=1.00	0.8090	-0.42	3.20	0.130 ¹ ✓
T9	25 - 0	L2 1/2x2 1/2x3/16	9.51	9.51	230.5 K=1.00	0.9020	-0.53	3.83	0.139 ¹ ✓

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	P.5x.250	3.34	3.34	23.8	3.7306	0.42	167.88	0.002 ¹ ✓
T2	116.667 - 108.333	P.5x.250	8.34	8.34	59.5	3.7306	0.18	167.88	0.001 ¹ ✓
T3	108.333 - 100	P.5x.250	8.34	8.34	59.5	3.7306	6.88	167.88	0.041 ¹ ✓
T4	100 - 91.6667	P.5x.250	8.34	8.34	59.5	3.7306	17.78	167.88	0.106 ¹ ✓
T5	91.6667 - 83.3333	P.5x.250	8.34	8.34	59.5	3.7306	32.27	167.88	0.192 ¹ ✓
T6	83.3333 - 75	P.5x.250	8.34	8.34	59.5	3.7306	51.77	167.88	0.308 ¹ ✓
T7	75 - 50	P5x.375	25.03	8.34	54.4	6.1120	139.85	275.04	0.508 ¹ ✓
T8	50 - 25	P.5x.400	25.03	4.17	30.7	5.7805	241.05	312.15	0.772 ¹ ✓
T9	25 - 0	P6.875x.400	25.03	6.26	32.7	8.1367	332.59	439.38	0.757 ¹ ✓

¹ P_u / φP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	2L2 1/2x2x3/16x3/8	6.73	6.21	98.1	0.9689	0.18	42.15	0.004 ¹ ✓
T2	116.667 - 108.333	2L2 1/2x2x3/16x3/8	10.37	9.75	151.7	0.9689	5.38	42.15	0.128 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T3	108.333 - 100	2L2 1/2x2x3/16x3/8	10.58	9.97	154.9	0.9689	9.10	42.15	0.216 ¹
T4	100 - 91.6667	2L2 1/2x2 1/2x1/4x3/8	10.78	10.18	163.1	1.4569	13.27	71.02	0.187 ¹
T5	91.6667 - 83.3333	2L2 1/2x2 1/2x1/4x3/8	11.00	10.41	166.6	1.4569	16.86	71.02	0.237 ¹
T6	83.3333 - 75	2L2 1/2x2x3/8x3/8	11.22	10.64	170.4	1.8253	21.42	79.40	0.270 ¹
T7	75 - 50	2L3x3x5/16x3/8	11.91	11.32	150.8	2.2523	30.44	109.80	0.277 ¹
T8	50 - 25	2L3x3x3/8x3/8	12.65	12.10	105.3	2.6728	37.56	130.30	0.288 ¹
T9	25 - 0	2L 'a' > 45.3266 in - 138 2L3 1/2x3 1/2x3/8x3/8	16.33	15.56	118.4	3.0947	50.21	150.87	0.333 ¹

¹ P_u / φP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T2	116.667 - 108.333	L2 1/2x2 1/2x3/16	11.68	5.43	130.3	0.5710	3.92	24.84	0.158 ¹
T3	108.333 - 100	L2 1/2x2 1/2x3/16	12.35	5.77	138.0	0.5710	5.90	24.84	0.238 ¹
T7	75 - 50	L3 1/2x3 1/2x1/4	16.35	7.75	87.4	1.1269	21.94	54.94	0.399 ¹
T8	50 - 25	L4x4x5/16	18.35	8.77	86.8	1.6242	28.01	79.18	0.354 ¹
T9	25 - 0	L4x4x3/8	20.02	9.52	94.9	1.9341	31.70	94.29	0.336 ¹

¹ P_u / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 116.667	L2 1/2x2 1/2x3/16	11.41	5.30	127.2	0.5710	0.25	24.84	0.010 ¹
T4	100 - 91.6667	L3x3x1/4	13.02	6.10	81.3	0.9394	8.47	40.86	0.207 ¹
T5	91.6667 - 83.3333	L3x3x1/4	13.68	6.43	85.6	0.9394	11.08	40.86	0.271 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T6	83.3333 - 75	L3x3x1/4	14.35	6.77	89.9	0.9394	14.69	40.86	0.360 ¹
T7	75 - 50	L3x3x5/16	15.02	7.10	95.0	1.1592	19.24	56.51	0.340 ¹
T8	50 - 25	L3 1/2x3 1/2x5/16	17.02	8.08	92.0	1.3917	23.44	67.85	0.345 ¹
T9	25 - 0	L4x4x5/16	19.02	9.10	90.0	1.6242	29.93	79.18	0.378 ¹

¹ P_u / φP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2 1/2x1/4	4.59	4.38	68.3	1.1900	4.72	53.55	0.088 ¹
T9	25 - 0	L2 1/2x2 1/2x1/4	5.00	4.72	73.6	1.1900	6.48	53.55	0.121 ¹

¹ P_u / φP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T8	50 - 25	L2 1/2x2 1/2x1/4	5.84	5.55	86.6	1.1900	3.24	53.55	0.060 ¹
T9	25 - 0	L2 1/2x2 1/2x1/4	7.71	7.23	112.9	1.1900	5.25	53.55	0.098 ¹

¹ P_u / φP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T4	100 - 91.6667	L2 1/2x2x3/16	6.51	6.51	130.2	0.8090	0.14	26.21	0.006 ¹
T5	91.6667 - 83.3333	L2 1/2x2x3/16	6.84	6.84	136.9	0.8090	0.19	26.21	0.007 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u K	φP _n K	Ratio $\frac{P_u}{\phi P_n}$
T6	83.3333 - 75	L2 1/2x2x3/16	7.17	7.17	143.6	0.8090	0.25	26.21	0.010 ¹ ✓
T7	75 - 50	L2 1/2x2x3/16	7.51	7.51	150.2	0.8090	0.33	26.21	0.013 ¹ ✓
T8	50 - 25	L2 1/2x2x3/16	8.51	8.51	170.2	0.8090	0.41	26.21	0.016 ¹ ✓
T9	25 - 0	L2 1/2x2 1/2x3/16	9.51	9.51	146.7	0.9020	0.52	29.22	0.018 ¹ ✓

¹ P_u / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	φP _{allow} K	% Capacity	Pass Fail
T1	120 - 116.667	Leg	P.5x.250	1	-1.33	161.06	2.0	Pass
		Leg	P.5x.250	2	-1.19	161.06	1.6	Pass
		Leg	P.5x.250	3	-1.10	161.06	1.5	Pass
T2	116.667 - 108.333	Leg	P.5x.250	13	-4.58	129.56	3.5	Pass
		Leg	P.5x.250	14	-4.17	129.56	3.2	Pass
		Leg	P.5x.250	15	-3.80	129.56	2.9	Pass
T3	108.333 - 100	Leg	P.5x.250	25	-8.98	129.56	6.9	Pass
		Leg	P.5x.250	26	-8.65	129.56	6.7	Pass
		Leg	P.5x.250	27	-9.90	129.56	7.6	Pass
T4	100 - 91.6667	Leg	P.5x.250	37	-22.05	129.56	17.0	Pass
		Leg	P.5x.250	38	-21.69	129.56	16.7	Pass
		Leg	P.5x.250	39	-22.95	129.56	17.7	Pass
T5	91.6667 - 83.3333	Leg	P.5x.250	52	-38.31	129.56	29.6	Pass
		Leg	P.5x.250	53	-38.20	129.56	29.5	Pass
		Leg	P.5x.250	54	-40.06	129.56	30.9	Pass
T6	83.3333 - 75	Leg	P.5x.250	67	-60.32	129.56	46.6	Pass
		Leg	P.5x.250	68	-60.65	129.56	46.8	Pass
		Leg	P.5x.250	69	-62.97	129.56	48.6	Pass
T7	75 - 50	Leg	P5x.375	82	-156.99	221.46	70.9	Pass
		Leg	P5x.375	83	-158.17	221.46	71.4	Pass
		Leg	P5x.375	84	-160.76	221.46	72.6	Pass
T8	50 - 25	Leg	P.5x.400	121	-267.88	287.44	93.2	Pass
		Leg	P.5x.400	122	-269.75	287.44	94.9 (b)	Pass
		Leg	P.5x.400	123	-272.14	287.44	95.0 (b)	Pass
T9	25 - 0	Leg	P6.875x.400	196	-369.43	399.96	92.4	Pass
		Leg	P6.875x.400	197	-371.68	399.96	92.9	Pass
		Leg	P6.875x.400	198	-373.84	399.96	93.5	Pass
T1	120 - 116.667	Diagonal	2L2 1/2x2x3/16x3/8	7	-0.51	30.19	1.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	8	-0.50	30.19	1.6	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	9	-0.51	30.19	1.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	10	-0.50	30.19	1.7	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	11	-0.48	30.19	1.6	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	12	-0.50	30.19	1.7	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T2	116.667 - 108.333	Diagonal	2L2 1/2x2x3/16x3/8	17	-5.39	14.34	37.6	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	18	-5.40	14.34	37.6	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	20	-4.23	14.34	29.5	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	21	-4.23	14.34	29.5	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	23	-5.50	14.34	38.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	24	-5.49	14.34	38.3	Pass
T3	108.333 - 100	Diagonal	2L2 1/2x2x3/16x3/8	29	-8.43	13.75	61.3	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	30	-8.44	13.75	61.4	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	32	-7.09	13.75	51.5	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	33	-7.09	13.75	51.6	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	35	-9.22	13.75	67.0	Pass
		Diagonal	2L2 1/2x2x3/16x3/8	36	-9.21	13.75	66.9	Pass
T4	100 - 91.6667	Diagonal	2L2 1/2x2 1/2x1/4x3/8	43	-11.17	21.29	52.5	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	44	-11.18	21.29	52.5	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	45	-11.13	21.29	52.3	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	46	-11.12	21.29	52.2	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	47	-13.49	21.29	63.4	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	48	-13.49	21.29	63.4	Pass
T5	91.6667 - 83.3333	Diagonal	2L2 1/2x2 1/2x1/4x3/8	58	-14.19	20.38	69.6	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	59	-14.20	20.38	69.7	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	60	-14.86	20.38	72.9	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	61	-14.85	20.38	72.9	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	62	-17.09	20.38	83.8	Pass
		Diagonal	2L2 1/2x2 1/2x1/4x3/8	63	-17.09	20.38	83.8	Pass
T6	83.3333 - 75	Diagonal	2L2 1/2x2x3/8x3/8	73	-17.84	24.02	74.2	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	74	-17.84	24.02	74.2	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	75	-20.46	24.02	85.1	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	76	-20.39	24.02	84.9	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	77	-21.70	24.02	90.3	Pass
		Diagonal	2L2 1/2x2x3/8x3/8	78	-21.71	24.02	90.4	Pass
T7	75 - 50	Diagonal	2L3x3x5/16x3/8	89	-25.55	36.97	69.1	Pass
		Diagonal	2L3x3x5/16x3/8	90	-25.52	36.97	71.2 (b) 69.0	Pass
		Diagonal	2L3x3x5/16x3/8	92	-30.81	36.97	71.2 (b) 83.3	Pass
		Diagonal	2L3x3x5/16x3/8	93	-30.80	36.97	86.1 (b) 83.3	Pass
		Diagonal	2L3x3x5/16x3/8	95	-29.69	36.97	86.1 (b) 80.3	Pass
		Diagonal	2L3x3x5/16x3/8	96	-29.73	36.97	83.0 (b) 80.4	Pass
		Diagonal	2L3x3x5/16x3/8	101	-24.84	38.56	83.0 (b) 64.4	Pass
		Diagonal	2L3x3x5/16x3/8	102	-24.82	38.56	69.2 (b) 64.4	Pass
		Diagonal	2L3x3x5/16x3/8	104	-29.24	38.56	69.3 (b) 75.8	Pass
		Diagonal	2L3x3x5/16x3/8	105	-29.23	38.56	81.7 (b) 75.8	Pass
		Diagonal	2L3x3x5/16x3/8	107	-28.80	38.56	81.7 (b) 74.7	Pass
		Diagonal	2L3x3x5/16x3/8	108	-28.82	38.56	80.5 (b) 74.7	Pass
		Diagonal	2L3x3x5/16x3/8	112	-23.43	40.22	80.5 (b) 58.2	Pass
		Diagonal	2L3x3x5/16x3/8	113	-23.42	40.22	65.3 (b) 58.2	Pass
		Diagonal	2L3x3x5/16x3/8	114	-27.31	40.22	65.3 (b) 67.9	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	235	-49.56	73.97	67.0	Pass
							88.8 (b)	
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	238	-45.44	73.97	61.4	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	241	-45.92	73.97	81.4 (b)	
							62.1	Pass
		Diagonal	2L3 1/2x3 1/2x3/8x3/8	241	-45.92	73.97	82.1 (b)	Pass
T2	116.667 - 108.333	Horizontal	L2 1/2x2 1/2x3/16	16	-3.80	12.17	31.3	Pass
		Horizontal	L2 1/2x2 1/2x3/16	19	-3.08	12.17	25.3	Pass
		Horizontal	L2 1/2x2 1/2x3/16	22	-3.93	12.17	32.3	Pass
		Horizontal	L2 1/2x2 1/2x3/16	28	-5.59	11.16	50.1	Pass
T3	108.333 - 100	Horizontal	L2 1/2x2 1/2x3/16	31	-4.52	11.16	40.5	Pass
		Horizontal	L2 1/2x2 1/2x3/16	34	-6.02	11.16	54.0	Pass
		Horizontal	L3 1/2x3 1/2x1/4	88	-17.95	22.37	80.2	Pass
		Horizontal	L3 1/2x3 1/2x1/4	91	-21.94	22.37	98.1	Pass
		Horizontal	L3 1/2x3 1/2x1/4	94	-20.94	22.37	93.6	Pass
		Horizontal	L3 1/2x3 1/2x1/4	100	-17.15	23.95	71.6	Pass
		Horizontal	L3 1/2x3 1/2x1/4	103	-20.53	23.95	85.7	Pass
		Horizontal	L3 1/2x3 1/2x1/4	106	-19.94	23.95	83.2	Pass
		Horizontal	L4x4x5/16	127	-21.82	32.10	68.0	Pass
		Horizontal	L4x4x5/16	134	-28.20	32.10	72.5 (b)	
							87.9	Pass
		Horizontal	L4x4x5/16	141	-25.87	32.10	92.9 (b)	Pass
		Horizontal	L4x4x5/16	151	-20.65	34.09	80.6	Pass
							85.7 (b)	
		Horizontal	L4x4x5/16	158	-26.59	34.09	60.6	Pass
		Horizontal	L4x4x5/16	165	-24.66	34.09	68.4 (b)	
							78.0	Pass
		Horizontal	L4x4x5/16	165	-24.66	34.09	87.5 (b)	Pass
		Horizontal	L4x4x3/8	202	-24.44	33.38	72.3	Pass
		Horizontal	L4x4x3/8	209	-32.40	33.38	73.2	Pass
		Horizontal	L4x4x3/8	216	-29.20	33.38	97.1	Pass
		Top Girt	L2 1/2x2 1/2x3/16	4	-0.25	12.58	87.5	Pass
		Top Girt	L2 1/2x2 1/2x3/16	5	-0.21	12.58	2.0	Pass
		Top Girt	L2 1/2x2 1/2x3/16	6	-0.11	12.58	1.7	Pass
		Top Girt	L3x3x1/4	40	-7.47	21.08	0.9	Pass
		Top Girt	L3x3x1/4	41	-7.36	21.08	35.4	Pass
		Top Girt	L3x3x1/4	42	-8.46	21.08	34.9	Pass
		Top Girt	L3x3x1/4	42	-8.46	21.08	35.4 (b)	
							40.1	Pass
		Top Girt	L3x3x1/4	55	-9.38	19.70	41.3 (b)	Pass
		Top Girt	L3x3x1/4	56	-9.97	19.70	47.6	Pass
		Top Girt	L3x3x1/4	57	-11.01	19.70	50.6	Pass
		Top Girt	L3x3x1/4	70	-11.78	18.35	55.9	Pass
		Top Girt	L3x3x1/4	71	-14.11	18.35	64.2	Pass
		Top Girt	L3x3x1/4	72	-14.61	18.35	76.9	Pass
		Top Girt	L3x3x1/4	72	-14.61	18.35	79.6	Pass
		Top Girt	L3x3x5/16	85	-15.84	20.86	76.0	Pass
		Top Girt	L3x3x5/16	86	-19.23	20.86	92.2	Pass
		Top Girt	L3x3x5/16	87	-19.16	20.86	91.9	Pass
		Top Girt	L3 1/2x3 1/2x5/16	124	-19.24	25.66	75.0	Pass
		Top Girt	L3 1/2x3 1/2x5/16	125	-23.68	25.66	92.3	Pass
		Top Girt	L3 1/2x3 1/2x5/16	126	-22.55	25.66	87.9	Pass
		Top Girt	L4x4x5/16	199	-23.16	30.27	76.5	Pass
							76.9 (b)	
		Top Girt	L4x4x5/16	200	-30.19	30.27	99.7	Pass
		Top Girt	L4x4x5/16	201	-27.44	30.27	90.6	Pass
							90.8 (b)	
		Top Girt	L4x4x5/16	201	-27.44	30.27	22.3	Pass
T8	50 - 25	Redund Horiz 1	L2 1/2x2 1/2x1/4	129	-4.64	20.86		Pass

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	Client	SMK-005 / (AT&T)	Designed by	MCD

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	25 - 0	Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	132	-4.68	20.86	22.4	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	136	-4.68	20.86	22.4	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	139	-4.72	20.86	22.6	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	143	-4.72	20.86	22.6	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	146	-4.64	20.86	22.3	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	153	-4.64	21.58	21.5	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	156	-4.68	21.58	21.7	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	160	-4.68	21.58	21.7	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	163	-4.72	21.58	21.9	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	167	-4.72	21.58	21.9	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	170	-4.64	21.58	21.5	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	176	-4.64	22.31	20.8	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	179	-4.68	22.31	21.0	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	182	-4.68	22.31	21.0	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	185	-4.72	22.31	21.2	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	188	-4.72	22.31	21.2	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	191	-4.64	22.31	20.8	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	204	-6.41	19.42	33.0	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	207	-6.45	19.42	33.2	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	211	-6.45	19.42	33.2	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	214	-6.48	19.42	33.4	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	218	-6.48	19.42	33.4	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	221	-6.41	19.42	33.0	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	227	-6.41	20.47	31.3	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	230	-6.45	20.47	31.5	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	233	-6.45	20.47	31.5	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	236	-6.48	20.47	31.7	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	239	-6.48	20.47	31.7	Pass
		Bracing						
		Redund Horiz 1	L2 1/2x2 1/2x1/4	242	-6.41	20.47	31.3	Pass
		Bracing						
T8	50 - 25	Redund Diag 1	L2 1/2x2 1/2x1/4	130	-3.08	13.43	22.9	Pass
		Bracing						

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	Project	Connecticut State Police Tower - West Rock - Analysis	Date	15:40:48 05/31/19
	Client	SMK-005 / (AT&T)	Designed by	MCD

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	25 - 0	Redund Diag 1	L2 1/2x2 1/2x1/4	133	-3.10	13.43	23.1	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	137	-3.10	13.43	23.1	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	140	-3.13	13.43	23.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	144	-3.13	13.43	23.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	147	-3.08	13.43	22.9	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	154	-3.13	14.00	22.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	157	-3.15	14.00	22.5	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	161	-3.15	14.00	22.5	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	164	-3.18	14.00	22.7	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	168	-3.18	14.00	22.7	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	171	-3.13	14.00	22.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	177	-3.19	14.60	21.8	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	180	-3.21	14.60	22.0	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	183	-3.21	14.60	22.0	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	186	-3.24	14.60	22.2	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	189	-3.24	14.60	22.2	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	192	-3.19	14.60	21.8	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	205	-5.03	8.26	60.9	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	208	-5.06	8.26	61.2	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	212	-5.06	8.26	61.2	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	215	-5.09	8.26	61.6	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	219	-5.09	8.26	61.6	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	222	-5.03	8.26	60.9	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	228	-5.19	8.60	60.3	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	231	-5.22	8.60	60.7	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	234	-5.22	8.60	60.7	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	237	-5.25	8.60	61.1	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	240	-5.25	8.60	61.1	Pass
		Bracing						
		Redund Diag 1	L2 1/2x2 1/2x1/4	243	-5.19	8.60	60.3	Pass
		Bracing						
T4	100 - 91.6667	Inner Bracing	L2 1/2x2x3/16	49	-0.13	5.46	2.4	Pass
		Inner Bracing	L2 1/2x2x3/16	50	-0.15	5.46	2.7	Pass
		Inner Bracing	L2 1/2x2x3/16	51	-0.15	5.46	2.7	Pass

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	Client	SMK-005 / (AT&T)	Designed by	MCD

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T5	91.6667 - 83.3333	Inner Bracing	L2 1/2x2x3/16	64	-0.18	4.94	3.6	Pass
		Inner Bracing	L2 1/2x2x3/16	65	-0.19	4.94	3.9	Pass
		Inner Bracing	L2 1/2x2x3/16	66	-0.19	4.94	3.9	Pass
T6	83.3333 - 75	Inner Bracing	L2 1/2x2x3/16	79	-0.25	4.50	5.5	Pass
		Inner Bracing	L2 1/2x2x3/16	80	-0.26	4.50	5.7	Pass
		Inner Bracing	L2 1/2x2x3/16	81	-0.26	4.50	5.7	Pass
T7	75 - 50	Inner Bracing	L2 1/2x2x3/16	97	-0.02	3.46	1.2	Pass
		Inner Bracing	L2 1/2x2x3/16	98	-0.02	3.46	1.2	Pass
		Inner Bracing	L2 1/2x2x3/16	99	-0.02	3.46	1.2	Pass
		Inner Bracing	L2 1/2x2x3/16	109	-0.02	3.76	1.1	Pass
		Inner Bracing	L2 1/2x2x3/16	110	-0.02	3.76	1.1	Pass
		Inner Bracing	L2 1/2x2x3/16	111	-0.02	3.76	1.1	Pass
		Inner Bracing	L2 1/2x2x3/16	118	-0.34	4.11	8.2	Pass
		Inner Bracing	L2 1/2x2x3/16	119	-0.34	4.11	8.2	Pass
		Inner Bracing	L2 1/2x2x3/16	120	-0.34	4.11	8.2	Pass
T8	50 - 25	Inner Bracing	L2 1/2x2x3/16	148	-0.03	2.75	1.3	Pass
		Inner Bracing	L2 1/2x2x3/16	149	-0.03	2.75	1.3	Pass
		Inner Bracing	L2 1/2x2x3/16	150	-0.03	2.75	1.3	Pass
		Inner Bracing	L2 1/2x2x3/16	172	-0.03	2.96	1.3	Pass
		Inner Bracing	L2 1/2x2x3/16	173	-0.03	2.96	1.3	Pass
		Inner Bracing	L2 1/2x2x3/16	174	-0.03	2.96	1.3	Pass
		Inner Bracing	L2 1/2x2x3/16	193	-0.42	3.20	13.0	Pass
		Inner Bracing	L2 1/2x2x3/16	194	-0.42	3.20	13.0	Pass
		Inner Bracing	L2 1/2x2x3/16	195	-0.40	3.20	12.4	Pass
T9	25 - 0	Inner Bracing	L2 1/2x2 1/2x3/16	223	-0.03	3.46	1.2	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	224	-0.03	3.46	1.2	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	225	-0.03	3.46	1.2	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	244	-0.53	3.83	13.9	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	245	-0.53	3.83	13.9	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	246	-0.48	3.83	12.6	Pass
Summary								
Leg (T8)							96.1	Pass
Diagonal (T9)							91.6	Pass
Horizontal (T7)							98.1	Pass
Top Girt (T9)							99.7	Pass
Redund Horz 1 Bracing (T9)							33.4	Pass
Redund Diag 1 Bracing (T9)							61.6	Pass
Inner Bracing (T9)							13.9	Pass
Bolt Checks							99.4	Pass
RATING =							99.7	Pass

ANCHOR BOLT ANALYSIS

ANCHOR BOLT ANALYSIS

Input Data

Tower Reactions:

Uplift:	Uplift := 391-kips	user input
Shear:	Shear := 66-kips	user input
Compression:	Compression := 439-kips	user input

Anchor Bolt Data:

Use ASTM A36

(actual material strength unknown therefore assume min design values)

Number of Anchor Bolts = N	N := 6	user input	MODified Anchorage - Steel Bolts
Bolt Ultimate Strength:	F _u := 58-ksi	user input	Number of Anchor Bolts = N
Bolt Yield Strength:	F _y := 36-ksi	user input	Bolt Ultimate Strength:
Bolt Modulus:	E := 29000 ksi	user input	Bolt Yield Strength:
Thickness of Anchor Bolts	D := 1.50in	user input	Bolt Modulus:
Threads per Inch:	n := 6	user input	Thickness of Anchor Bolts
Coefficient of Friction:	μ := 0.55	user input	Threads per Inch:
	(for baseplate with grout ASCE 10-15)		
Length from top of pier to bottom of leveling nut:	L _{ar} := 0in	user input	
Bolt Modulus:	E _{ww} := 29000-ksi	user input	

Anchor Bolt Section Properties:

Gross Area of Bolt:

$$A_{ge} := N \cdot \frac{\pi}{4} \cdot D^2 \quad A_{ge} = 10.6 \cdot \text{in}^2 \quad A_{g,pm} := N_{M1} \cdot \frac{\pi}{4} \cdot D_{M1}^2 \quad A_{g,pm} = 3.17 \cdot \text{in}^2$$

Net Area of Bolt:

$$A_{ne} := N \cdot \left[\frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^2 \right] \quad A_{n,pm} := N_{M1} \cdot \left[\frac{\pi}{4} \cdot \left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)^2 \right]$$

$$A_{ne} = 8.43 \cdot \text{in}^2 \quad A_{n,pm} = 2.58 \cdot \text{in}^2$$

Net Diameter:

$$D_{ne} := N \cdot \left(D - \frac{0.9743 \cdot \text{in}}{n} \right) \quad D_{ne} = 8.03 \cdot \text{in} \quad D_{n,pm} := N_{M1} \cdot \left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right) \quad D_{n,pm} = 2.56 \cdot \text{in}$$

Radius of Gyration of Bolt:

$$r_e := N \cdot \frac{\left(D - \frac{0.9743 \cdot \text{in}}{n} \right)}{4} \quad r_e = 2.01 \cdot \text{in} \quad r_{pm} := N_{M1} \cdot \frac{\left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)}{4} \quad r_{pm} = 0.64 \cdot \text{in}$$

Plastic Section Modulus of Bolt:

$$Z_{xe} := N \cdot \frac{\left(D - \frac{0.9743 \cdot \text{in}}{n} \right)^3}{6} \quad Z_{xe} = 2.39 \cdot \text{in}^3 \quad Z_{x,pm} := N_{M1} \cdot \frac{\left(D_{M1} - \frac{0.9743 \cdot \text{in}}{n_{M1}} \right)^3}{6} \quad Z_{x,pm} = 0.7 \cdot \text{in}^3$$

Forces:

Tension Force:

$$T_u := \frac{\text{Uplift}}{1}$$

$$T_u = 391 \cdot \text{kip}$$

$$T_{ub} := T_u$$

Resistance Factor for Flexure (ANSI/TIA-222-G 4.7):

$$\phi_f := 0.9$$

Resistance Factor for Anchor Bolt (ANSI/TIA-222-G 4.5.4.2):

$$\phi_b := 0.80$$

Resistance Factor for Tension (ANSI/TIA-222-G 4.9.6.1):

$$\phi_t := 0.75 \quad \phi_{t,pm} := 0.65$$

Shear Force:

$$V_u := \frac{\text{Shear}}{1}$$

$$V_u = 66 \cdot \text{kip}$$

$$V_{ub} := V_u$$

Resistance Factor for Shear (ANSI/TIA-222-G 4.9.6.3):

$$\phi_v := 0.75 \quad \phi_{v,pm} := 0.60$$

ANSI/TIA-222-G 4.7.1 Flexural Members:

Nominal Flexure Strength, M_n :

$$M_n := F_y \cdot Z_{xe} + F_y \cdot Z_{x,pm}$$

$$M_n = 9.28 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_f \cdot M_n = 8.35 \cdot \text{ft} \cdot \text{kip}$$

Applied Moment due to Shear (worst case lever arm), M_u :

$$M_u := L_{ar} \cdot V_u$$

$$M_u = 0 \cdot \text{ft} \cdot \text{kip}$$

Flexure Check:

$$\text{FlexureCheck} := \text{if}(M_u \leq \phi_f \cdot M_n, \text{"OK"}, \text{"NO GOOD"})$$

$$\text{FlexureCheck} = \text{"OK"}$$

$$\frac{M_u}{\phi_f \cdot M_n} = 0.0\%$$

ANSI/TIA-222-G 4.9.6.1 Tensile Strength:

Design Tensile Strength, R_{nt} :

$$R_{nt} := F_u \cdot A_{ne} \quad R_{nt,pm} := F_u \cdot A_{n,pm}$$

$$R_{nt} = 489.03 \cdot \text{ft} \cdot \text{kip} \quad R_{nt,pm} = 149.46 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_t \cdot R_{nt} = 366.77 \cdot \text{ft} \cdot \text{kip} \quad \phi_{t,pm} \cdot R_{nt,pm} = 97.15 \cdot \text{ft} \cdot \text{kip}$$

Tension Check:

$$\text{TensionCheck} := \text{if}(T_u \leq (\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm}), \text{"OK"}, \text{"NO GOOD"})$$

$$\text{TensionCheck} = \text{"OK"}$$

$$\frac{T_u}{\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm}} = 84.28\%$$

ANSI/TIA-222-G 4.9.6.3 Design Shear Strength:

Design Shear Strength, R_{nv} :

$$R_{nv} := 0.45 \cdot F_u \cdot A_{ge} \quad R_{nv,pm} := 0.45 \cdot F_u \cdot A_{g,pm}$$

$$R_{nv} = 276.74 \cdot \text{ft} \cdot \text{kip} \quad R_{nv,pm} = 82.67 \cdot \text{ft} \cdot \text{kip}$$

$$\phi_v \cdot R_{nv} = 207.55 \cdot \text{ft} \cdot \text{kip} \quad \phi_{v,pm} \cdot R_{nv,pm} = 49.6 \cdot \text{ft} \cdot \text{kip}$$

Shear Check:

$$\text{ShearCheck} := \text{if}(V_u \leq (\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm}), \text{"OK"}, \text{"NO GOOD"})$$

$$\text{ShearCheck} = \text{"OK"}$$

$$\frac{V_u}{\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm}} = 25.67\%$$

ANSI/TIA-222-G 4.9.6.4 Combined Shear and Tension:

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})} \right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})} \right]^2 \leq 1$$

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm})} \right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm})} \right]^2 = 0.78$$

Combined Shear and Tension Check:

$$\text{ShearAndTensionCheck} := \text{if} \left[\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv} + \phi_{v,pm} \cdot R_{nv,pm})} \right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt} + \phi_{t,pm} \cdot R_{nt,pm})} \right]^2 \leq 1, \text{"OK"}, \text{"NO GOOD"} \right]$$

ShearAndTensionCheck = "OK"

ANSI/TIA-222-G 4.9.9 Anchor Rods (Capacity):

$$\frac{\left[T_u + \left(\frac{V_u}{\eta} \right) \right]}{\phi_b \cdot P_n} \leq 1$$

$\eta := 0.55$

user input from ANSI/TIA-222-G 4.9.9

$$\frac{\left[T_u + \left(\frac{V_u}{\eta} \right) \right]}{(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm})} = 0.966$$

Capacity Check:

$$\text{CapacityCheck} := \text{if} \left[\frac{\left[T_u + \left(\frac{V_u}{\eta} \right) \right]}{(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm})} \leq 1, \text{"OK"}, \text{"NO GOOD"} \right]$$

CapacityCheck = "OK"

NOTE: Because the reinforcement of additional bolts are within capacity, the anchor bolts are considered to be OK for the design loads. Apply the previously calculated force that is not contained by the existing anchorage (prior to the additional anchorage modifications) with the previously installed anchorage to verify the capacity of the existing anchorage system.

$$T_u + \left(\frac{V_u}{\eta} \right) = 511 \cdot \text{kip}$$

$$511 \text{ kip} - 529 \text{ kip} = -18.00 \cdot \text{kip}$$

$$\phi_b \cdot F_u \cdot A_{ne} = 1 \cdot \text{kip}$$

$$(\phi_b \cdot F_u \cdot A_{ne}) + (\phi_t \cdot F_u \cdot A_{g,pm}) = 529 \cdot \text{kip}$$

Above force required for additional anchorage required for uplift resistance for Strength Design (LRFD) - see previously installed anchors for Strength design check. (Disregard above note if value is negative)

WELDED BEAM TO LEG ANCHOR ANALYSIS

NOTE: The following calculation sheets are checking the capacity of the welded connection and anchorage for the New Haven / Hamden (CSP), CT Tower.

* From the Mathcad analysis for anchor bolts, the force required to be contained (by the additional anchors) -->

$$Des_{Uplift} := \frac{(529\text{kip} - 391.22\text{kip})}{N_{M1}} = 68890 \cdot \text{lb}$$

"d" arm --> $d := 1\text{ft} + 2\text{in}$

* Identify Existing Conditions (Materials and Weld Length)

Yield Steel (f_y) -->

$$F_y := 50\text{ksi}$$

Modulus Steel (E) -->

$$E := 29000\text{ksi}$$

WT 10.5x31 -->

$$t_w := 0.40\text{in}$$

$$t_f := 0.615\text{in}$$

$$d_{WT} := (10.5 - t_f)\text{in}$$

Weld Length:

$$l_{weld} := 30\text{in}$$

Area (WT 10.5x31 Stem) -->

$$A_{stem} := t_w \cdot l_{weld} = 12 \cdot \text{in}^2$$

Section Modulus (x-axis) (Stem) -->

$$S_{stem} := \frac{t_w \cdot l_{weld}^2}{6} = 60 \cdot \text{in}^3$$

$$\sigma_{force.M} := \frac{Des_{Uplift} \cdot d}{S_{stem}} = 16074.33 \cdot \text{psi}$$

$$\sigma_{force.P} := \frac{Des_{Uplift}}{A_{stem}} = 5740.83 \cdot \text{psi}$$

* CHECK - Flexure in WT (AISC - LRFD Method):

* Apply AISC Chapter F - Flexure, Section F9, Equation F9-10 (governs design): $\theta_f := 0.90$

$$F_{cr} := \left(1.43 - 0.515 \cdot \frac{d_{WT} + t_f}{t_w} \cdot \sqrt{\frac{F_y}{E}} \right) \cdot F_y = 41.93 \cdot \text{ksi}$$

$$M_{capacity.beam} := F_{cr} \cdot \frac{t_w \cdot l_{weld}^2}{6} \cdot \theta_f = 2264.02 \cdot \text{kip} \cdot \text{in}$$

* CHECK - Flexure in WT (AISC - LRFD Method):

$$CHECK_1 := \text{if} \left(\frac{Des_{Uplift} \cdot d}{M_{capacity.beam}} < 1.0, \text{"OK"}, \text{"No Good"} \right)$$

$$\frac{Des_{Uplift} \cdot d}{M_{capacity.beam}} = 0.43$$

CHECK₁ = "OK"

* CHECK - Axial Stress in WT (AISC - LRFD Method):

$$CHECK_2 := \text{if} \left(\frac{\sigma_{force.M} + \sigma_{force.P}}{F_{cr} \cdot \theta_f} < 1.0, \text{"OK"}, \text{"No Good"} \right)$$

$$\frac{\sigma_{force.M} + \sigma_{force.P}}{F_{cr} \cdot \theta_f} = 0.58$$

CHECK₂ = "OK"

Job	120' Stainless Lattice Tower - New Haven, CT	Project No.	SMK-005	Page	of
Description	Tower Anchor Bolts - TIA-222-G Conditions Check	Computed by	MCD	Sheet	6 of 7
	Previous MODification Anchorage	Checked by		Date	05/31/19
				Date	

*** CHECK - Shear in WT (AISC - LRFD Method):**

* Apply AISC Chapter G - Shear, Section G3, Equation G3-1:

$$\theta_v := 0.90$$

$$V_{cap} := 0.6 \cdot F_y \cdot A_w \cdot C_v \quad \text{--->} \quad C_v := 1.20 \quad A_w := t_w \cdot (d_{WT} - 0.630 \text{ in}) = 3.93 \cdot \text{in}^2 \quad F_y = 50 \cdot \text{ksi}$$

$$V_{cap} := \theta_v \cdot 0.6 \cdot F_y \cdot A_w \cdot C_v = 127.25 \cdot \text{kip}$$

*** CHECK - Shear in WT (AISC - LRFD Method):**

$$\text{CHECK}_3 := \text{if} \left(\frac{\text{Des}_{\text{Uplift}}}{V_{cap}} < 1.0, "OK", "No Good" \right) \quad \frac{\text{Des}_{\text{Uplift}}}{V_{cap}} = 0.54$$

CHECK₃ = "OK"

*** CHECK - Shear Stress in WT (AISC - LRFD Method):**

$$\text{CHECK}_4 := \text{if} \left(\frac{\sigma_{\text{force.P}}}{F_y \cdot \theta_v \cdot 0.6} < 1.0, "OK", "No Good" \right) \quad \frac{\sigma_{\text{force.P}}}{F_y \cdot \theta_v \cdot 0.6} = 0.21$$

CHECK₄ = "OK"

*** CHECK - Combined Flexure - Shear Stress in WT (AISC - LRFD Method):**

$$\text{CHECK}_5 := \text{if} \left[\frac{\sigma_{\text{force.M}} + \sigma_{\text{force.P}}}{F_{cr} \cdot \theta_f} + \frac{\sigma_{\text{force.P}}}{(F_y \cdot \theta_v \cdot 0.6)} < 1.0, "OK", "No Good" \right] \quad \frac{\sigma_{\text{force.M}} + \sigma_{\text{force.P}}}{F_{cr} \cdot \theta_f} + \frac{\sigma_{\text{force.P}}}{(F_y \cdot \theta_v \cdot 0.6)} = 0.79$$

CHECK₅ = "OK"

*** CHECK - Combined Flexure - Shear Force in WT (AISC - LRFD Method):**

$$\text{CHECK}_6 := \text{if} \left(\frac{\text{Des}_{\text{Uplift}} \cdot d}{M_{\text{capacity.beam}}} + \frac{\text{Des}_{\text{Uplift}}}{V_{cap}} < 1.0, "OK", "No Good" \right) \quad \frac{\text{Des}_{\text{Uplift}} \cdot d}{M_{\text{capacity.beam}}} + \frac{\text{Des}_{\text{Uplift}}}{V_{cap}} = 0.97$$

CHECK₆ = "OK"

Job 120' Stainless Lattice Tower - New Haven, CT
 Description Tower Anchor Bolts - TIA-222-G Conditions Check
Previous MODification Anchorage

Project No. SMK-005
 Computed by MCD
 Checked by _____

* CHECK - Weld in WT (AISC - LRFD Method):

$$t_{\text{weld}} := \frac{3}{8} \text{ in}$$

$$F_{y\text{Electrode}} := 70 \text{ ksi}$$

$$\theta_{\text{weld}} := 0.75$$

$$S_{x,\text{weld}} := 2 \cdot \frac{t_{\text{weld}} \cdot \left(l_{\text{weld}} - \frac{9}{16} \text{ in} \right)^2}{6} = 108.32 \cdot \text{in}^3$$

* Moment Induced into Weld (AISC - LRFD Method):

$$M_{\text{applied}} := \text{Des}_{\text{Uplift}} \cdot d = 964.46 \cdot \text{kip} \cdot \text{in}$$

* Stress Caused by Moment on Weld (AISC - LRFD Method): $\sigma_{\text{applied.M}} := \frac{M_{\text{applied}}}{S_{x,\text{weld}}} = 8.9 \cdot \text{ksi}$

* Stress Capacity in Weld (AISC - LRFD Method):

$$\sigma_{\text{weld}} := F_{y\text{Electrode}} \cdot 0.6 \cdot \theta_{\text{weld}} = 31.5 \cdot \text{ksi}$$

* CHECK - Stress in Weld on WT - Moment Induced (AISC - LRFD Method):

$$\text{CHECK}_7 := \text{if} \left(\frac{\sigma_{\text{applied.M}}}{\sigma_{\text{weld}}} < 1.0, "OK", "No Good" \right)$$

$$\frac{\sigma_{\text{applied.M}}}{\sigma_{\text{weld}}} = 0.28$$

CHECK₇ = "OK"

* CHECK - Stress in Weld on WT - Shear Induced (AISC - LRFD Method):

$$\text{CHECK}_8 := \text{if} \left(\frac{\frac{\text{Des}_{\text{Uplift}}}{A_{\text{w}}}}{\sigma_{\text{weld}}} < 1.0, "OK", "No Good" \right)$$

$$\frac{\frac{\text{Des}_{\text{Uplift}}}{A_{\text{w}}}}{\sigma_{\text{weld}}} = 0.56$$

CHECK₈ = "OK"

* CHECK - Combined Flexure - Shear Stress Force in Weld on WT (AISC - LRFD Method):

$$\text{CHECK}_9 := \text{if} \left(\frac{\frac{\text{Des}_{\text{Uplift}}}{A_{\text{w}}}}{\sigma_{\text{weld}}} + \frac{\sigma_{\text{applied.M}}}{\sigma_{\text{weld}}} < 1.0, "OK", "No Good" \right)$$

$$\frac{\frac{\text{Des}_{\text{Uplift}}}{A_{\text{w}}}}{\sigma_{\text{weld}}} + \frac{\sigma_{\text{applied.M}}}{\sigma_{\text{weld}}} = 0.84$$

CHECK₉ = "OK"

FOUNDATION ANALYSIS

FOUNDATION CHECK

INPUT DATA

Factored Max Pier Reactions:

Uplift: Uplift := 391·kips
 Shear: Shear := 66kips
 Compression: Compression := 439·kips

Foundation Structure

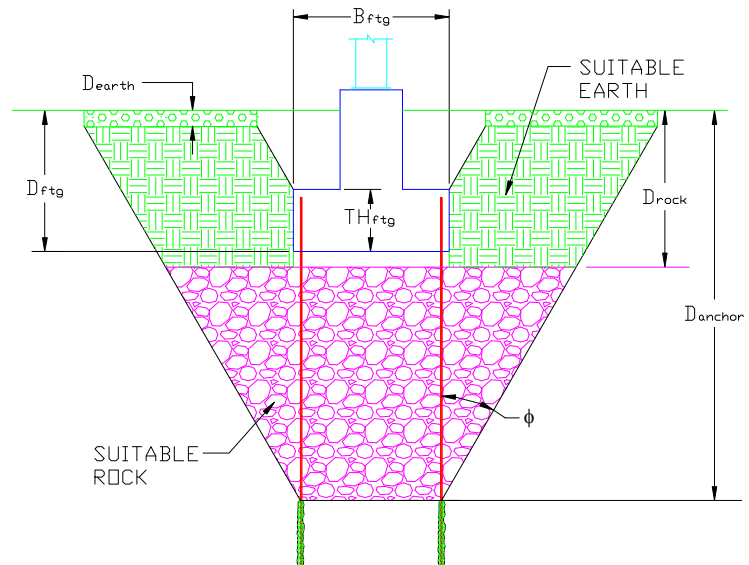
Footing Width: $B_{ftg} := 6\text{ft}$
 Footing Length: $L_{ftg} := 6\text{ft}$
 Footing Thickness: $TH_{ftg} := 2.5\text{ft}$

Depths:

Depth to Bottom of Footing: $D_{ftg} := 3.50\text{ft}$
 (from grade line)
 Depth to Suitable Rock: $D_{rock} := 2.5\text{ft}$
 (from grade line)
 Depth to Suitable Earth: $D_{earth} := 1\text{ft}$
 (from grade line)
 Anchor Depth: $D_{anchor} := 24.5\text{ft}$

Soil Properties:

Internal Friction Angle: $\phi := 30\text{deg}$
 Unit Weight of Earth: $\gamma_{earth} := 120 \frac{\text{lb}}{\text{ft}^3}$
 Unit Weight of Rock: $\gamma_{rock} := 165 \frac{\text{lb}}{\text{ft}^3}$
 Allowable Bearing: Bearing := 11500·psf
 Ultimate Bearing: $U_{Bearing} := 2 \cdot \text{Bearing}$



$$DL_{foot} := \left[(B_{ftg} \cdot L_{ftg} \cdot TH_{ftg}) + \left[\frac{\pi}{4} \cdot (2\text{ft})^2 \cdot 2.0\text{ft} \right] \right] \cdot 0.150 \frac{\text{kips}}{\text{ft}^3}$$

$$DL_{foot} = 14442.48 \text{ lb}$$

$$DL_{Soil} := \left[B_{ftg} \cdot L_{ftg} \cdot D_{earth} - \left[\frac{\pi}{4} \cdot (3\text{ft})^2 \cdot D_{earth} \right] + \left[\frac{1}{2} \cdot (1.5\text{ft}) \cdot \tan(\phi) \cdot (1.5\text{ft}) \cdot 4 \cdot B_{ftg} \right] \right] \cdot \gamma_{earth}$$

$$DL_{Soil} = 5342.38 \text{ lb}$$

Anchors:

Number of Anchors (along width):	$NW_{\text{anchor}} := 2$	Number of Anchors (along length):	$NL_{\text{anchor}} := 2$
Anchor Spacing* (along width):	$SW_{\text{anchor}} := 3\text{ft}$	Anchor Spacing* (along length):	$SL_{\text{anchor}} := 3\text{ft}$
Hole Diameter:	$\text{hole}_d := 2.5\text{in}$	Ultimate Bond Stress:	$\sigma_{\text{bond}} := 200\cdot\text{psi}$

NOTE: Ultimate Bond Stress is 2x allowable per TIA-222-G, Section 9.

Ultimate Bond Stress:

Force (per anchor):	$P_{\text{design}} := \frac{\text{Uplift} - [0.9 \cdot (DL_{\text{foot}} + DL_{\text{Soil}})]}{NW_{\text{anchor}} + NL_{\text{anchor}}}$	$\sigma_{\text{Work.bond}} := \frac{\sigma_{\text{bond}}}{2}$
		$P_{\text{design}} = 93.30\cdot\text{kips}$

CALCULATE RESISTANCE

Intermediate Dimensions:

Suitable Earth Height:	$H := D_{\text{rock}} - D_{\text{earth}}$	$H = 1.50\text{ft}$
Suitable Rock Height:	$Z := D_{\text{anchor}} - D_{\text{earth}} - D_{\text{rock}}$	$Z = 21.00\text{ft}$
Total Anchor Width:	$W := (NW_{\text{anchor}} - 1) \cdot SW_{\text{anchor}}$	$W = 3.00\text{ft}$
Total Anchor Length:	$L := (NL_{\text{anchor}} - 1) \cdot SL_{\text{anchor}}$	$L = 3.00\text{ft}$
Earth Above Footing:	$PD := D_{\text{ftg}} - TH_{\text{ftg}} + 6\text{in}$	$PD = 1.50\text{ft}$

Volumes:

Gross Volume:

$GV_1 := W \cdot L \cdot (Z + H)$	$GV_1 = 202.50\cdot\text{ft}^3$
$GV_2 := \left[\frac{1}{2} \cdot (Z + H) \cdot \tan(\phi) \cdot (Z + H) \right] \cdot (W + L) \cdot 2$	$GV_2 = 1753.70\cdot\text{ft}^3$
$GV_3 := \frac{1}{3} \cdot \pi \cdot [(Z + H) \cdot \tan(\phi)]^2 \cdot (Z + H)$	$GV_3 = 3976.08\cdot\text{ft}^3$
$GV := GV_1 + GV_2 + GV_3$	$GV = 5932.28\cdot\text{ft}^3$

Rock Volume:

$RV_1 := W \cdot L \cdot (Z)$	$RV_1 = 189.00\cdot\text{ft}^3$
$RV_2 := \left[\frac{1}{2} \cdot (Z) \cdot \tan(\phi) \cdot (Z) \right] \cdot (W + L) \cdot 2$	$RV_2 = 1527.67\cdot\text{ft}^3$
$RV_3 := \frac{1}{3} \cdot \pi \cdot [(Z) \cdot \tan(\phi)]^2 \cdot (Z)$	$RV_3 = 3232.70\cdot\text{ft}^3$
$RV := RV_1 + RV_2 + RV_3$	$RV = 4949.37\cdot\text{ft}^3$

Volume of Neglect Above Footing:

$NV_1 := B_{\text{ftg}} \cdot L_{\text{ftg}} \cdot H - \frac{\pi}{4} \cdot (3\text{ft})^2 \cdot H$	$NV_1 = 43.40\cdot\text{ft}^3$
$NV_2 := \left[\frac{1}{2} \cdot (PD) \cdot \tan(\phi) \cdot (PD) \right] \cdot (B_{\text{ftg}} + L_{\text{ftg}}) \cdot 2$	$NV_2 = 15.59\cdot\text{ft}^3$
$NV_3 := \frac{1}{3} \cdot \pi \cdot [(PD) \cdot \tan(\phi)]^2 \cdot (PD)$	$NV_3 = 1.18\cdot\text{ft}^3$
$NV := NV_1 + NV_2 + NV_3$	$NV = 60.16\cdot\text{ft}^3$

Total Suitable Earth Volume:	$EV := GV - RV - NV$	$EV = 922.75\cdot\text{ft}^3$
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Resisting Forces:

Resisting Rock Force: $F_{rock} := RV \cdot \gamma_{rock}$ $F_{rock} = 816.65 \cdot \text{kips}$

Resisting Earth Force: $F_{earth} := EV \cdot \gamma_{earth}$ $F_{earth} = 110.73 \cdot \text{kips}$

Total Resisting Force: $F_{total} := (F_{rock} + F_{earth}) \cdot 0.9$ $F_{total} = 834.64 \cdot \text{kips}$

NOTE: "0.9" is TIA-222-G Reducing factor for uplift resistance (LC2)

Check Uplift:

Condition1 := if $\left(\frac{F_{total} \cdot 0.75}{Uplift} \geq 1.00, "OK", "Overstressed" \right)$ $\frac{F_{total} \cdot 0.75}{Uplift} = 1.60$ Condition1 = "OK"

Embedment Length:

$L_b := \frac{P_{design}}{\pi \cdot hole_d \cdot \sigma_{Work.bond} \cdot 0.60}$ $L_b = 16.50 \text{ ft}$

NOTE: "0.60" reduction factor from TIA-222-G for uplift resistance for Rock Anchor

Condition2 := if $\left(\frac{Z}{L_b} \geq 1.00, "OK", "Overstressed" \right)$ $\frac{Z}{L_b} = 1.27$ Condition2 = "OK"

Check Bearing:

MaxBearing := $\frac{\text{Compression} + 1.2 \cdot DL_{foot}}{B_{ftg} \cdot L_{ftg}}$ $\text{MaxBearing} = 12675.86 \cdot \text{psf}$

Condition3 := if $\left(\frac{\text{MaxBearing}}{U_{Bearing} \cdot 0.75} \leq 1.00, "OK", "Overstressed" \right)$

NOTE: "0.75" is TIA-222-G Reducing factor for bearing resistance

$\frac{\text{MaxBearing}}{U_{Bearing} \cdot 0.75} = 0.7348$ Condition3 = "OK"

GEOTECHNICAL STUDY

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August 13, 2018

Mr. Ignacio C. Artai
AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067

**Ref: Geotechnical Review of Existing State Police Communications Tower #27
West Rock, New Haven, CT**

Dear Naish:

1.0 The existing tower foundation plan notes from Stainless, Inc. dated 12/9/93 indicate that the foundation design was based on a geotechnical assessment by Dr. Clarence Welti, P.E., P.C. (CWPEPC) dated 12/29/93. The foundation plan and notes and foundation design calculations dated 11/16/93 have been reviewed and for conformance with the recommendations in the geotechnical report and to evaluate the adequacy of existing lattice tower foundation with an increase in loading on the structure.

2.0 The geotechnical assessment by CWPEPC dated 12/29/93 was based on boring B-4 which encountered hard Basalt bedrock at 1.5 feet below the ground surface. The report recommended that the foundations be placed at least 2 feet into the bedrock to resist shear loading and that rock anchors be used to resist uplift. The recommended foundation design parameters were as follows.

Parameter	Value
Allowable Bearing on Hard Bedrock	40 Tons/sf
Allowable Lateral Loading on Hard Bedrock	20 Kips/sf
Allowable Cement/Rock Bond Value for the design of rock anchors	100 psi
Friction between Rock and Concrete Foundation	0.70

3.0 The foundation plans and notes by Stainless Inc. dated 12/9/1993 (with revisions to 7/5/94) show the tower foundation design includes a lattice tower with three legs, spaced at 21 feet apart, supported on individual piers and footings. Each of the footings is set a minimum 2'-6" into the bedrock with 4 rock anchors installed to a minimum 20 feet into the bedrock. The plan notes indicated that one anchor from each foundation should be proof tested to 85 Kips and that the foundation design is based on a maximum bearing pressure of 11,500 psf. The rock anchors are 1" dia. (150 ksi) bars with an allowable design loading of 76.5 Kips (0.65Fy).

3.1 The foundation design calculations indicate that the tension load on the anchors was up to 74.12 Kips/anchor and the maximum cement/rock bond stress was up to 39.3 psi. If additional resistance to up lift is needed to address new loading or code requirements, additional anchors or concrete weight would be required.

4.0 This report has been prepared for specific application to the subject project in accordance with generally accepted soil and foundation engineering practices. No other warranty, express or implied, is made. In the event that any changes in the nature, design and location of structures are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

The analyses and recommendations submitted in this report are based in part upon data obtained from referenced explorations. The extent of variations between explorations may not become evident until construction. If variations then appear evident, it will be necessary to re-evaluate the recommendations of this report.

Welti Geotechnical, P.C., should perform a general review of the final design and specifications in order that geotechnical design recommendations may be properly interpreted and implemented as they were intended.

If you have any questions please call me.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Max Welti", written in a cursive style.

Max Welti, P. E.

ANALYSIS UNDER TIA-222-F DESIGN CRITERIA (DESPP / CSP)

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job 120' Self-Supporting Lattice Tower	Page 1 of 34
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Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 11.41 ft at the top and 21.02 ft at the base.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

Basic wind speed of 90 mph.

Nominal ice thickness of 0.5000 in.

Ice density of 56 pcf.

A wind speed of 90 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 90 mph.

Antenna/Mount/Cable's marked (# ##) refer to site tower climb identification numbers. Tower climb by D and K Nationwide Communications, Inc. (March 30, 2016)..

Antenna/Mount/Cable's marked (CSP-#) refer to Connecticut State Police inventory obtained via e-mail dated April 8, 2016..

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

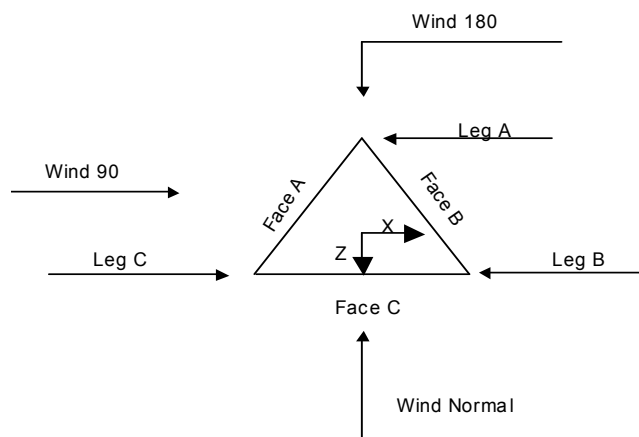
Stress ratio used in tower member design is 1.333.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

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Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	120.00-116.67			11.41	1	3.33
T2	116.67-108.33			11.68	1	8.33
T3	108.33-100.00			12.35	1	8.33
T4	100.00-91.67			13.02	1	8.33
T5	91.67-83.33			13.68	1	8.33
T6	83.33-75.00			14.35	1	8.33
T7	75.00-50.00			15.02	1	25.00
T8	50.00-25.00			17.02	1	25.00
T9	25.00-0.00			19.02	1	25.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	120.00-116.67	3.33	K Brace Down	No	Yes	0.0000	0.0000
T2	116.67-108.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T3	108.33-100.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T4	100.00-91.67	8.33	K Brace Down	No	Yes	0.0000	0.0000
T5	91.67-83.33	8.33	K Brace Down	No	Yes	0.0000	0.0000
T6	83.33-75.00	8.33	K Brace Down	No	Yes	0.0000	0.0000

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<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T7	75.00-50.00	8.33	K Brace Down	No	Yes	0.0000	0.0000
T8	50.00-25.00	8.33	K1 Down	No	Yes	0.0000	0.0000
T9	25.00-0.00	12.50	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 120.00-116.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T2 116.67-108.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T3 108.33-100.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/16x3/8	A36 (36 ksi)
T4 100.00-91.67	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2 1/2x1/4x3/8	A36 (36 ksi)
T5 91.67-83.33	Pipe	P.5x.250	A500-50 (50 ksi)	Double Equal Angle	2L2 1/2x2 1/2x1/4x3/8	A529-50 (50 ksi)
T6 83.33-75.00	Pipe	P.5x.250	A500-50 (50 ksi)	Double Angle	2L2 1/2x2x3/8x3/8	A36 (36 ksi)
T7 75.00-50.00	Pipe	P5x.375	A500-50 (50 ksi)	Double Equal Angle	2L3x3x5/16x3/8	A529-50 (50 ksi)
T8 50.00-25.00	Pipe	P.5x.400	A572-60 (60 ksi)	Double Equal Angle	2L3x3x3/8x3/8	A529-50 (50 ksi)
T9 25.00-0.00	Pipe	P6.875x.400	A572-60 (60 ksi)	Double Equal Angle	2L3 1/2x3 1/2x3/8x3/8	A529-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
<i>ft</i>						
T1 120.00-116.67	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 100.00-91.67	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 91.67-83.33	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T6 83.33-75.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 75.00-50.00	Equal Angle	L3x3x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)
T8 50.00-25.00	Equal Angle	L3 1/2x3 1/2x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)
T9 25.00-0.00	Equal Angle	L4x4x5/16	A529-50 (50 ksi)	Solid Round		A36 (36 ksi)

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Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
T1 120.00-116.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T2 116.67-108.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 108.33-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 100.00-91.67	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 91.67-83.33	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T6 83.33-75.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T7 75.00-50.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A529-50 (50 ksi)
T8 50.00-25.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x5/16	A529-50 (50 ksi)
T9 25.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x3/8	A529-50 (50 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Secondary Horizontal Type</i>	<i>Secondary Horizontal Size</i>	<i>Secondary Horizontal Grade</i>	<i>Inner Bracing Type</i>	<i>Inner Bracing Size</i>	<i>Inner Bracing Grade</i>
T4 100.00-91.67	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 91.67-83.33	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T6 83.33-75.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T7 75.00-50.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T8 50.00-25.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T9 25.00-0.00	Solid Round		A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i> <i>ft</i>	<i>Redundant Bracing Grade</i>	<i>Redundant Type</i>	<i>Redundant Size</i>	<i>K Factor</i>
T8 50.00-25.00	A529-50 (50 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 1
T9 25.00-0.00	A529-50 (50 ksi)	Horizontal (1) Diagonal (1)	Equal Angle Equal Angle	1 1

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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 in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T1 120.00-116.67	0.00	0.0000	A36 (36 ksi)	1	1	1	26.9200	36.0000	36.0000
T2 116.67-108.33	0.00	0.0000	A36 (36 ksi)	1	1	1	41.4800	36.0000	36.0000
T3 108.33-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	42.3200	36.0000	36.0000
T4 100.00-91.67	0.00	0.0000	A36 (36 ksi)	1	1	1	43.1200	36.0000	36.0000
T5 91.67-83.33	0.00	0.0000	A36 (36 ksi)	1	1	1	44.0000	36.0000	36.0000
T6 83.33-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1	44.8800	36.0000	36.0000
T7 75.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1	47.6400	36.0000	36.0000
T8 50.00-25.00	0.00	0.0000	A36 (36 ksi)	1	1	1	50.6000	36.0000	36.0000
T9 25.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	65.3200	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹							
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 120.00-116.67	Yes	Yes	1	1	1	1	1	1	1	1
T2 116.67-108.33	Yes	Yes	1	1	1	1	1	1	1	1
T3 108.33-100.00	Yes	Yes	1	1	1	1	1	1	1	1
T4 100.00-91.67	Yes	Yes	1	1	1	1	1	1	1	1
T5 91.67-83.33	Yes	Yes	1	1	1	1	1	1	1	1
T6 83.33-75.00	Yes	Yes	1	1	1	1	1	1	1	1
T7 75.00-50.00	Yes	Yes	1	1	1	1	1	1	1	1
T8 50.00-25.00	Yes	Yes	1	1	1	1	1	1	1	1
T9 25.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1

¹Note: 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.

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Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-116.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 116.67-108.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 108.33-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 100.00-91.67	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 91.67-83.33	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 83.33-75.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 75.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 50.00-25.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 25.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

Tower Elevation 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 120.00-116.67	Flange	0.0000	0	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T2 116.67-108.33	Flange	0.0000	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T3 108.33-100.00	Flange	0.0000	0	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T4 100.00-91.67	Flange	0.7500	6	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T5 91.67-83.33	Flange	0.7500	0	0.7500	1	0.6250	2	0.0000	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T6 83.33-75.00	Flange	0.7500	0	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T7 75.00-50.00	Flange	0.7500	6	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T8 50.00-25.00	Flange	0.7500	6	0.7500	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	
T9 25.00-0.00	Flange	1.0000	8	1.0000	1	0.6250	2	0.6250	0	0.6250	0	0.6250	2	0.6250	0
		A325X		A325X		A325X		A325X		A325N		A325X		A325N	

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (#17) T-Mobile)	B	Yes	No	Ar (CfAe)	95.00 - 6.00	-5.0000	0.31	6	6	1.9800	1.9800		1.04
3/8 Cable (#1-B)	B	Yes	No	Ar (CfAe)	40.00 - 6.00	-2.0000	0.25	1	1	0.3750	0.3750		0.20
LDF4-50A (1/2 FOAM) (#2 - CSP-#14)	B	Yes	No	Ar (CfAe)	43.00 - 6.00	-2.0000	0.23	1	1	0.6300	0.6300		0.15
1/2 (#3)	B	Yes	No	Ar (CfAe)	47.00 - 6.00	-2.0000	0.21	1	1	0.5800	0.5800		0.25
LDF5-50A (7/8 FOAM) (#7 - CSP-4)	B	Yes	No	Ar (CfAe)	55.00 - 6.00	-2.0000	0.27	1	1	1.0900	1.0900		0.33
7/8 (#15)	B	Yes	No	Ar (CfAe)	86.00 - 6.00	-2.0000	-0.37	1	1	1.1100	1.1100		0.54
1 1/4 (#24-E)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.48	1	1	1.5500	1.5500		0.66
LDF4-50A (1/2 FOAM) (CSP-24)	A	Yes	No	Ar (CfAe)	120.00 - 6.00	-2.0000	0.4	1	1	0.6300	0.6300		0.15
AVA7-50 (1-5/8 LOW DENSE FOAM) (#25-A - CSP#17)	A	Yes	No	Ar (CfAe)	114.00 - 6.00	-2.0000	0.38	1	1	1.9800	1.9800		0.72
LDF7-50A (1-5/8 FOAM) (#25-B - CSP#7)	A	Yes	No	Ar (CfAe)	114.00 - 6.00	-2.0000	0.36	1	1	1.9800	1.9800		0.82
LDF6-50A (1-1/4 FOAM) (#26 - CSP-15)	A	Yes	No	Ar (CfAe)	114.00 - 6.00	-2.0000	0.34	1	1	1.5500	1.5500		0.66
1 5/8 (#22)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.32	1	1	1.9800	1.9800		1.04
AVA7-50 (1-5/8 LOW DENSE FOAM) (#23-A - CSP#22)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.3	1	1	1.9800	1.9800		0.72
AVA7-50 (1-5/8 LOW DENSE FOAM) (#23-B - CSP#23)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.28	1	1	1.9800	1.9800		0.72
1/2 (#23-C)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.26	1	1	0.5800	0.5800		0.25
1/2 (#24-A)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.24	2	2	0.5800	0.5800		0.25
1/2 (#24-B)	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.22	1	1	0.5800	0.5800		0.25
AVA7-50 (1-5/8 LOW DENSE FOAM) (#24-C -	A	Yes	No	Ar (CfAe)	113.00 - 6.00	-2.0000	0.2	1	1	1.9800	1.9800		0.72

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF4-50A (1/2 FOAM) (CSP-30 (P))	B	Yes	No	Ar (CfAe)	110.00 - 6.00	-2.0000	-0.34	1	1	0.6300	0.6300		0.15
LDF7-50A (1-5/8 FOAM) (#18-A - CSP#13(P))	B	Yes	No	Ar (CfAe)	105.00 - 6.00	-2.0000	-0.32	1	1	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (CSP-9(P))	B	Yes	No	Ar (CfAe)	103.00 - 6.00	-2.0000	-0.3	1	1	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM) (#16-B - CSP#2)	B	Yes	No	Ar (CfAe)	92.00 - 6.00	-2.0000	-0.28	1	1	1.0900	1.0900		0.33
7/8 (#15)	B	Yes	No	Ar (CfAe)	86.00 - 6.00	-2.0000	-0.26	1	1	1.1100	1.1100		0.54
1/2 (#9)	B	Yes	No	Ar (CfAe)	65.00 - 6.00	-2.0000	-0.22	1	1	0.5800	0.5800		0.25
7/8 (#8)	B	Yes	No	Ar (CfAe)	63.00 - 6.00	-2.0000	-0.2	1	1	1.1100	1.1100		0.54
1/2 (#1-A)	B	Yes	No	Ar (CfAe)	40.00 - 6.00	-2.0000	-0.18	2	2	0.5800	0.5800		0.25
LCF114-50J (1-1/4 FOAM) (#11) AT&T 6(E))	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.41	6	6	1.5800	1.5800		0.70
1/2" Fiber Optic Cable (AT&T - Fiber Cable)	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.45	2	2	0.5800	0.5800		0.25
1 1/4" Hybriflex Cable (#10) Sprint)	B	Yes	No	Ar (CfAe)	72.00 - 6.00	-2.0000	-0.24	3	3	1.6250	1.6250		1.60
3/4 (AT&T-DC Cables)	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.47	4	4	0.7500	0.7500		0.54
Commscope 6x12 (6 AWG) (T-Mobile)	B	Yes	No	Ar (CfAe)	95.00 - 6.00	-2.0000	0.345	1	1	1.4300	1.4300		1.63
Commscope 9x18 (6 AWG) (T-Mobile)	B	Yes	No	Ar (CfAe)	95.00 - 6.00	-2.0000	0.365	1	1	1.5900	1.5900		2.59
Commscope 6x12 (6 AWG) (T-Mobile)	B	Yes	No	Ar (CfAe)	95.00 - 6.00	-2.0000	0.325	1	1	1.4300	1.4300		1.63
1 1/4" Hybriflex Cable (#10) Sprint)	B	Yes	No	Ar (CfAe)	72.00 - 6.00	-2.0000	-0.16	1	1	1.6250	1.6250		1.60
3/4 (AT&T-DC Cables - Proposed)	B	Yes	No	Ar (CfAe)	80.00 - 6.00	-4.5000	0.43	2	2	0.7500	0.7500		0.54

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Feed Line/Linear Appurtenances Section Areas

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face</i>	<i>A_R ft²</i>	<i>A_F ft²</i>	<i>C_{AA} In Face ft²</i>	<i>C_{AA} Out Face ft²</i>	<i>Weight K</i>
T1	120.00-116.67	A	0.175	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	116.67-108.33	A	8.669	0.308	0.000	0.000	0.04
		B	1.550	0.000	0.000	0.000	0.01
		C	0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	15.359	3.123	0.000	0.000	0.09
		B	9.070	0.000	0.000	0.000	0.04
		C	0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	15.639	3.299	0.000	0.000	0.09
		B	15.066	0.000	0.000	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T5	91.67-83.33	A	15.639	3.299	0.000	0.000	0.09
		B	23.091	0.000	0.000	0.000	0.15
		C	0.000	0.000	0.000	0.000	0.00
T6	83.33-75.00	A	16.661	3.299	0.000	0.000	0.09
		B	30.447	0.000	0.000	0.000	0.20
		C	0.000	0.000	0.000	0.000	0.00
T7	75.00-50.00	A	51.762	9.897	0.000	0.000	0.29
		B	118.257	0.000	0.000	0.000	0.83
		C	0.000	0.000	0.000	0.000	0.00
T8	50.00-25.00	A	54.705	9.897	0.000	0.000	0.30
		B	127.219	0.000	0.000	0.000	0.88
		C	0.000	0.000	0.000	0.000	0.00
T9	25.00-0.00	A	42.053	7.522	0.000	0.000	0.23
		B	98.048	0.000	0.000	0.000	0.68
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R ft²</i>	<i>A_F ft²</i>	<i>C_{AA} In Face ft²</i>	<i>C_{AA} Out Face ft²</i>	<i>Weight K</i>
T1	120.00-116.67	A	0.500	0.453	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	116.67-108.33	A	0.500	14.194	0.889	0.000	0.000	0.13
		B		2.522	0.000	0.000	0.000	0.02
		C		0.000	0.000	0.000	0.000	0.00
T3	108.33-100.00	A	0.500	24.928	5.244	0.000	0.000	0.27
		B		14.598	0.000	0.000	0.000	0.13
		C		0.000	0.000	0.000	0.000	0.00
T4	100.00-91.67	A	0.500	25.653	5.494	0.000	0.000	0.28
		B		23.844	0.000	0.000	0.000	0.23
		C		0.000	0.000	0.000	0.000	0.00
T5	91.67-83.33	A	0.500	25.653	5.494	0.000	0.000	0.28
		B		36.729	0.000	0.000	0.000	0.37
		C		0.000	0.000	0.000	0.000	0.00
T6	83.33-75.00	A	0.500	27.925	5.494	0.000	0.000	0.29
		B		47.289	2.983	0.000	0.000	0.50
		C		0.000	0.000	0.000	0.000	0.00
T7	75.00-50.00	A	0.500	88.303	16.481	0.000	0.000	0.91
		B		183.382	14.917	0.000	0.000	2.01
		C		0.000	0.000	0.000	0.000	0.00

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<i>Tower Section</i>	<i>Tower Elevation ft</i>	<i>Face or Leg</i>	<i>Ice Thickness in</i>	<i>A_R ft²</i>	<i>A_F ft²</i>	<i>C_AA_A In Face ft²</i>	<i>C_AA_A Out Face ft²</i>	<i>Weight K</i>
T8	50.00-25.00	A	0.500	96.163	16.481	0.000	0.000	0.96
		B		201.952	16.367	0.000	0.000	2.17
		C		0.000	0.000	0.000	0.000	0.00
T9	25.00-0.00	A	0.500	74.385	12.525	0.000	0.000	0.74
		B		156.378	13.173	0.000	0.000	1.67
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

<i>Section</i>	<i>Elevation ft</i>	<i>Face</i>	<i>A_R ft²</i>	<i>A_R Ice ft²</i>	<i>A_F ft²</i>	<i>A_F Ice ft²</i>
T1	120.00-116.67	A	0.000	0.024	0.024	0.061
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	116.67-108.33	A	0.000	0.406	0.601	1.015
		B	0.000	0.068	0.104	0.169
		C	0.000	0.000	0.000	0.000
T3	108.33-100.00	A	0.000	0.809	1.213	2.023
		B	0.000	0.383	0.595	0.958
		C	0.000	0.000	0.000	0.000
T4	100.00-91.67	A	0.000	0.820	1.314	2.209
		B	0.000	0.614	1.045	1.655
		C	0.000	0.000	0.000	0.000
T5	91.67-83.33	A	0.000	0.806	1.294	2.175
		B	0.000	0.930	1.577	2.509
		C	0.000	0.000	0.000	0.000
T6	83.33-75.00	A	0.000	0.851	1.344	2.297
		B	0.000	1.254	2.050	3.385
		C	0.000	0.000	0.000	0.000
T7	75.00-50.00	A	0.000	2.596	4.698	8.143
		B	0.000	4.816	9.011	15.110
		C	0.000	0.000	0.000	0.000
T8	50.00-25.00	A	0.000	5.452	8.972	15.934
		B	0.000	10.374	17.669	30.322
		C	0.000	0.000	0.000	0.000
T9	25.00-0.00	A	0.000	3.101	5.360	9.569
		B	0.000	5.942	10.602	18.333
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

<i>Section</i>	<i>Elevation ft</i>	<i>CP_X in</i>	<i>CP_Z in</i>	<i>CP_X Ice in</i>	<i>CP_Z Ice in</i>
T1	120.00-116.67	-0.0430	-0.6586	-0.0912	-1.3622
T2	116.67-108.33	-3.1815	-21.4919	-4.1311	-28.4310
T3	108.33-100.00	-7.2736	-56.0056	-9.1473	-72.7375
T4	100.00-91.67	0.9321	-55.1470	1.2709	-72.2668
T5	91.67-83.33	13.4071	-53.9377	17.6879	-71.4627
T6	83.33-75.00	26.2851	-50.4731	32.9276	-68.9153
T7	75.00-50.00	34.3755	-49.5544	43.6988	-70.5704

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Section	Elevation	CP _x	CP _z	CP _x	CP _z
	ft	in	in	Ice in	Ice in
T8	50.00-25.00	28.7800	-41.7139	35.7749	-57.6310
T9	25.00-0.00	25.5250	-36.4093	32.9046	-51.5735

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Pirot 6' Side Mount Standoff (1)	B	From Leg	1.00	0.0000	41.00	No Ice 1/2" Ice	4.97 6.12	0.07 0.13
(#1-A Dish Mount)			0.00					
1'x1' Panel Antenna	B	From Leg	1.00	0.0000	40.00	No Ice 1/2" Ice	1.40 1.56	0.13 0.02
(#1-B (mount Share #1-A))			0.00				0.21	0.00
3' Whip (3in diameter) /w mount	B	From Leg	0.50	0.0000	43.00	No Ice 1/2" Ice	1.27 1.64	0.02 0.03
(#2)			0.00					
5'x1.5in dia Whip Antenna /w mount	A	From Leg	0.50	0.0000	47.00	No Ice 1/2" Ice	1.81 2.64	0.03 0.05
(#3)			0.00					
10'x6" Dipole Antenna	C	From Leg	3.00	0.0000	48.00	No Ice 1/2" Ice	9.17 9.89	0.05 0.08
(#4-A)			0.00				2.79	
3' Yagi	C	From Leg	3.00	0.0000	48.00	No Ice 1/2" Ice	2.08 3.79	0.03 0.05
(#4-B)			0.00					
Pirot 4' Side Mount Standoff (1)	C	None		0.0000	48.00	No Ice 1/2" Ice	2.72 4.91	0.05 0.09
(#4-A&B)								
6'x1" Whip Antenna w/ Mount	A	From Leg	1.00	0.0000	39.00	No Ice 1/2" Ice	2.02 3.14	0.05 0.07
(#5 - CSP#14)			0.00					
1.0" Dia 4' Omni w/Pipe Mount	B	From Leg	2.00	0.0000	53.00	No Ice 1/2" Ice	0.94 1.39	0.02 0.03
(#6 - CSP#16)			0.00					
20' 4-Bay Dipole w/ 2' Sidearm Mount	A	From Leg	2.00	0.0000	55.00	No Ice 1/2" Ice	4.00 6.00	0.06 0.10
(#7 - CSP-4)			0.00					
GPS	B	From Leg	3.00	0.0000	63.00	No Ice 1/2" Ice	1.00 1.50	0.01 0.01
(#8)			0.00					
2'6"x4" Pipe Mount (For #8)	B	None		0.0000	63.00	No Ice 1/2" Ice	0.75 0.95	0.03 0.04
6' Yagi w/ Mount	B	From Leg	2.00	0.0000	65.00	No Ice 1/2" Ice	8.79 9.46	0.05 0.09
(#9)			0.00				0.98	
3' Yagi	B	From Leg	1.00	40.0000	81.00	No Ice 1/2" Ice	2.08 3.79	0.03 0.05
(#12)			0.00					
3' Yagi	B	From Leg	1.00	-40.0000	82.00	No Ice 1/2" Ice	2.08 3.79	0.03 0.05
(#13 - CSP-11)			0.00					

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
20' 4-Bay Dipole (#14)	B	From Leg	4.00 0.00 0.00	0.0000	77.00	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	0.06 0.10
4'6"x3" Pipe Mount (horizontal)	B	None		0.0000	67.00	No Ice 1/2" Ice	1.30 1.57	1.30 1.57	0.03 0.08
((Bottom mount) #14)									
4'6"x3" Pipe Mount (horizontal)	B	None		0.0000	87.00	No Ice 1/2" Ice	1.30 1.57	1.30 1.57	0.03 0.08
((Top Mount) #14)									
20' 4-Bay Dipole (#15)	A	From Leg	4.00 0.00 0.00	0.0000	86.00	No Ice 1/2" Ice	4.00 6.00	4.00 6.00	0.06 0.10
3'4"x4" Pipe Mount (horizontal)	A	None		0.0000	76.00	No Ice 1/2" Ice	1.05 1.27	1.05 1.27	0.04 0.09
((Bottom mount) #15)									
3'4"x4" Pipe Mount (horizontal)	A	None		0.0000	96.00	No Ice 1/2" Ice	1.05 1.27	1.05 1.27	0.04 0.09
((Top Mount) #15)									
SC479-HFILD F (inverted) (# 16-A - CSP-10)	B	From Face	4.00 0.00 0.00	0.0000	81.00 - 95.00	No Ice 1/2" Ice	1.74 2.60	1.74 2.60	0.04 0.05
PD458-406 (# 16-B - CSP-2)	A	From Face	4.00 0.00 0.00	0.0000	100.00 - 92.00	No Ice 1/2" Ice	4.59 6.89	4.59 6.89	0.02 0.04
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Upright # 16-B) (# 16-A&B)	A	None		0.0000	92.00	No Ice 1/2" Ice	2.30 3.13	2.30 3.13	0.04 0.15
(2) (Horizontal) 8'x2 1/2" Pipe Mount (Invert #16-A) (# 16-A&B)	A	None		0.0000	92.00	No Ice 1/2" Ice	2.30 3.13	2.30 3.13	0.04 0.15
SE419-SWBPALDF Panel Antenna (#18-A - CSP 13(P))	A	From Face	0.50 0.00 0.00	0.0000	101.00	No Ice 1/2" Ice	11.64 12.29	7.88 8.51	0.05 0.11
AP13-850/065D w/Mount Pipe (#18-B - CSP-12(E))	A	From Face	0.50 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice	5.61 6.30	3.92 4.96	0.04 0.08
6'8"x4" Pipe Mount (#19 - Dish Mount)	C	None		0.0000	107.00	No Ice 1/2" Ice	2.60 3.01	2.60 3.01	0.07 0.09
6'8"x4" Pipe Mount (#20 - Dish Mount)	C	None		0.0000	107.00	No Ice 1/2" Ice	2.60 3.01	2.60 3.01	0.07 0.09
6'8"x4" Pipe Mount (#21 - Dish Mount)	A	None		0.0000	110.00	No Ice 1/2" Ice	2.60 3.01	2.60 3.01	0.07 0.09
Pirot 4' Side Mount Standoff (1) (#22, 23-A, 23-B Mount)	B	None		0.0000	113.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	0.05 0.09
16'x3" Omni (#22)	B	From Leg	4.00 0.00 0.00	0.0000	113.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
16'x3" Omni (inverted) (#23-A - CSP-22)	B	From Leg	4.00 0.00 0.00	0.0000	106.00 - 120.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
16'x3" Omni (inverted) (#23-B - CSP-23)	B	From Leg	2.00 0.00 0.00	0.0000	106.00 - 120.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
Junction Box (#23-C)	B	From Face	0.50 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice	3.15 3.39	1.05 1.21	0.02 0.04

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	14 of 34
	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>	
Rohn 6' Side-Arm(1) (#24 Antennas Mount)	B	From Leg	0.00 0.00 0.00	20.0000	114.00	No Ice 1/2" Ice	10.60 15.40	10.60 15.40	0.14 0.21
Rohn 6' Side-Arm(1) (#24 Antennas Mount)	C	From Leg	0.00 0.00 0.00	-20.0000	114.00	No Ice 1/2" Ice	10.60 15.40	10.60 15.40	0.14 0.21
Junction Box (#24-A)	C	From Face	3.00 0.00 0.00	0.0000	114.00	No Ice 1/2" Ice	3.15 3.39	1.05 1.21	0.02 0.04
SC479-HF1LDF (inverted) (#24-B)	C	From Face	6.00 0.00 0.00	0.0000	106.00 - 120.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
SC479-HF1LDF (#24-C - CSP#21)	B	From Face	6.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
OGT9-840 (#24-D - CSP#8)	B	From Face	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	2.27 3.44	2.27 3.44	0.02 0.04
10'x2" Dipole Antenna (inverted) (#24-E)	C	From Face	3.00 0.00 0.00	0.0000	104.00 - 114.00	No Ice 1/2" Ice	9.17 9.89	1.67 2.79	0.05 0.08
Rohn 6' Side-Arm(1) (#25 Antennas Mount)	C	From Leg	0.00 0.00 0.00	60.0000	114.00	No Ice 1/2" Ice	10.60 15.40	10.60 15.40	0.14 0.21
SC479-HF1LDF (inverted) (#25-A - CSP-17)	C	From Leg	6.00 0.00 0.00	60.0000	100.00 - 114.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
OGT9-840 (#25-B - CSP#7)	C	From Leg	6.00 0.00 0.00	60.0000	120.00	No Ice 1/2" Ice	2.27 3.44	2.27 3.44	0.02 0.04
10'x2" Dipole Antenna (#26 - CSP-15)	A	From Leg	0.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	9.17 9.89	1.67 2.79	0.05 0.08
Lightning Rod 5/8x4' (#27)	C	None		0.0000	138.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	0.03 0.03
16'x2.5" Pipe Mount (#27 Mount)	C	None		0.0000	138.00	No Ice 1/2" Ice	4.00 4.80	4.00 4.80	0.09 0.09
TMA 432-83H-01T (CSP-32)	C	None		0.0000	103.00	No Ice 1/2" Ice	1.63 1.81	0.95 1.09	0.03 0.04
TMA 432-83H-01T (CSP-24)	B	None		0.0000	120.00	No Ice 1/2" Ice	1.63 1.81	0.95 1.09	0.03 0.04
SC479-HF1LDF (inverted) (CSP - 9 (P))	B	From Leg	3.00 0.00 0.00	0.0000	106.00 - 120.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
SC479-HF1LDF (CSP-18 (New Install))	A	From Leg	3.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
SC479-HF1LDF (inverted) (CSP-19 (New Install))	A	From Leg	3.00 0.00 0.00	0.0000	96.00 - 110.00	No Ice 1/2" Ice	5.06 6.54	5.06 6.54	0.03 0.07
TMA 432-83H-01T (CSP-20)	A	None		0.0000	110.00	No Ice 1/2" Ice	1.63 1.81	0.95 1.09	0.03 0.04
SE419-SWBPALDF Panel Antenna (CSP-29)	A	From Leg	0.50 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	11.64 12.29	7.88 8.51	0.05 0.11
TMA 432-83H-01T (CSP-30)	A	None		0.0000	105.00	No Ice 1/2" Ice	1.63 1.81	0.95 1.09	0.03 0.04

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	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
WPA-70040-4CF-EDIN Panel (CSP-28)	A	None		0.0000	110.00	No Ice 1/2" Ice	11.04 11.50	3.65 4.01	0.02 0.08
TMA 432-83H-01T (CSP-24)	A	None		0.0000	120.00	No Ice 1/2" Ice	1.63 1.81	0.95 1.09	0.03 0.04
* T-Mobile Existing Inventory									
EUSF10-U (T-Mobile)	A	From Leg	0.50 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
EUSF10-U (T-Mobile)	C	From Leg	0.50 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
EUSF10-U (T-Mobile)	B	From Leg	0.50 0.00 0.00	0.0000	95.00	No Ice 1/2" Ice	8.91 12.66	3.67 5.24	0.41 0.51
TMA2093F00V1-1 Twin TMA (T-Mobile)	A	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	0.42 0.53	1.12 1.27	0.03 0.03
TMA2093F00V1-1 Twin TMA (T-Mobile)	B	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	0.42 0.53	1.12 1.27	0.03 0.03
TMA2093F00V1-1 Twin TMA (T-Mobile)	C	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	0.42 0.53	1.12 1.27	0.03 0.03
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	A	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	6.35 6.91	5.37 6.23	0.15 0.21
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	B	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	6.35 6.91	5.37 6.23	0.15 0.21
AIR32 B66Aa/B2a Antenna Panel (T-Mobile)	C	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	6.35 6.91	5.37 6.23	0.15 0.21
* T-Mobile Existing Inventory									
* T-Mobile Propsoed Inventory									
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	A	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	22.38 23.16	10.79 12.21	0.21 0.34
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	B	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	22.38 23.16	10.79 12.21	0.21 0.34
APXVAARR24_43-U-NA20 Panel (RFS) (T-Mobile)	C	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	22.38 23.16	10.79 12.21	0.21 0.34
AIR 3246 B66 Panel Antenna (T-Mobile)	A	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	8.92 9.41	6.47 7.22	0.21 0.28
AIR 3246 B66 Panel Antenna (T-Mobile)	B	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	8.92 9.41	6.47 7.22	0.21 0.28
AIR 3246 B66 Panel Antenna (T-Mobile)	C	From Leg	3.00 4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	8.92 9.41	6.47 7.22	0.21 0.28
2217 B2 Radio Unit	A	From Leg	3.00	0.0000	95.00	No Ice	2.64	2.64	0.05

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	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
(T-Mobile)			-4.50 0.00		1/2" Ice	2.86	2.86	0.07
2217 B2 Radio Unit (T-Mobile)	B	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	2.64 2.86	0.05 0.07
2217 B2 Radio Unit (T-Mobile)	C	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	2.64 2.86	0.05 0.07
4449 B71 + B12 Radio Unit (T-Mobile)	A	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	1.93 2.12	0.08 0.10
4449 B71 + B12 Radio Unit (T-Mobile)	B	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	1.93 2.12	0.08 0.10
4449 B71 + B12 Radio Unit (T-Mobile)	C	From Leg	3.00 -4.50 0.00	0.0000	95.00	No Ice 1/2" Ice	1.93 2.12	0.08 0.10
* T-Mobile Propsoed Inventory								
* Sprint Original Inventory - Climbed by D&K								
Face Mount (Sprint)	A	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	9.73 13.12	0.31 0.42
Face Mount (Sprint)	B	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	9.73 13.12	0.31 0.42
Face Mount (Sprint)	C	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	9.73 13.12	0.31 0.42
ALU 4x45W (1900 MHz) (Sprint)	A	From Face	0.00 0.00 0.50	0.0000	72.00	No Ice 1/2" Ice	2.96 3.21	0.06 0.08
ALU 4x45W (1900 MHz) (Sprint)	B	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	2.96 3.21	0.06 0.08
ALU 4x45W (1900 MHz) (Sprint)	C	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	2.96 3.21	0.06 0.08
ALU 800MHz 2x50W (Sprint)	A	From Face	0.00 0.00 0.50	0.0000	72.00	No Ice 1/2" Ice	2.40 2.61	0.06 0.09
ALU 800MHz 2x50W (Sprint)	B	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	2.40 2.61	0.06 0.09
ALU 800MHz 2x50W (Sprint)	C	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	2.40 2.61	0.06 0.09
ALU TD-RRH-8x20-25 (Sprint)	A	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	4.70 5.00	0.08 0.10
ALU TD-RRH-8x20-25 (Sprint)	B	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	4.70 5.00	0.08 0.10
ALU TD-RRH-8x20-25 (Sprint)	C	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	4.70 5.00	0.08 0.10

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	17 of 34
	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>		<i>C_{AA} Front ft²</i>	<i>C_{AA} Side ft²</i>	<i>Weight K</i>
NNVV-65B-R4 Panel Antenna (Sprint)	A	From Leg	0.00 -1.00 0.00	0.0000	72.00	No Ice 1/2" Ice	13.72 14.32	5.75 6.21	0.09 0.16
NNVV-65B-R4 Panel Antenna (Sprint)	B	From Leg	0.00 -1.00 0.00	0.0000	72.00	No Ice 1/2" Ice	13.72 14.32	5.75 6.21	0.09 0.16
NNVV-65B-R4 Panel Antenna (Sprint)	C	From Leg	0.00 -1.00 0.00	0.0000	72.00	No Ice 1/2" Ice	13.72 14.32	5.75 6.21	0.09 0.16
AAHC Panel Antenna (Sprint)	A	From Face	0.00 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	4.90 5.20	2.40 2.63	0.10 0.14
AAHC Panel Antenna (Sprint)	B	From Face	0.50 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	4.90 5.20	2.40 2.63	0.10 0.14
AAHC Panel Antenna (Sprint)	C	From Face	0.50 0.00 0.00	0.0000	72.00	No Ice 1/2" Ice	4.90 5.20	2.40 2.63	0.10 0.14
*** AT&T Update 04262019									
- Existing									
Face Mount ((#11) ATT)	A	From Face	0.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	7.86 10.66	7.86 10.66	0.24 0.34
Face Mount ((#11) ATT)	B	From Face	0.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	7.86 10.66	7.86 10.66	0.24 0.34
Face Mount ((#11) ATT)	C	From Face	0.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	7.86 10.66	7.86 10.66	0.24 0.34
TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	A	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	13.08 13.81	10.38 11.79	0.10 0.20
SBNH-1D6565C (ATT)	A	From Face	0.50 -6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	11.48 12.11	9.64 11.07	0.08 0.17
800-10966 Kathrien Panel w/ Pipe Mt. (ATT)	A	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	18.67 19.42	9.40 10.82	0.14 0.26
RRUS-32 (ATT)	A	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	3.20 3.46	1.85 2.08	0.06 0.08
DC6-48-60-18-8F (Squid) Suppressor (ATT)	A	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.27 1.46	1.27 1.46	0.02 0.04
4478 Radio Unit (4x40W) (ATT)	A	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.26 1.42	1.26 1.42	0.06 0.07
TPA-65R-LCUUUU-H8 Panel w/ RET (ATT)	B	From Face	0.50 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	13.08 13.81	10.38 11.79	0.10 0.20
SBNH-1D6565C (ATT)	B	From Face	0.50 -6.00 0.00	0.0000	80.00	No Ice 1/2" Ice	11.48 12.11	9.64 11.07	0.08 0.17
800-10966 Kathrien Panel w/ Pipe Mt. (ATT)	B	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	18.67 19.42	9.40 10.82	0.14 0.26
DC6-48-60-18-8F (Squid)	B	From Leg	0.50	0.0000	80.00	No Ice	1.27	1.27	0.02

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	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
Suppressor (ATT)			0.00			1/2" Ice	1.46	1.46	0.04
RRUS-32 (ATT)	B	From Face	0.50	0.0000	80.00	No Ice	3.20	1.85	0.06
			6.00			1/2" Ice	3.46	2.08	0.08
			0.00						
(2) DTMABP7819VG12A TMA (ATT)	B	From Face	0.50	0.0000	80.00	No Ice	1.59	0.58	0.02
			-6.00			1/2" Ice	1.76	0.70	0.03
			0.00						
4478 Radio Unit (4x40W) (ATT)	B	From Face	0.50	0.0000	80.00	No Ice	1.26	1.26	0.06
			0.00			1/2" Ice	1.42	1.42	0.07
			0.00						
QS66512-2 Panel Antenna (ATT)	C	From Face	0.50	0.0000	80.00	No Ice	8.40	8.22	0.13
			6.00			1/2" Ice	8.95	9.19	0.21
			0.00						
800-10965 Kathrein Panel w/ Pipe Mount (ATT)	C	From Face	0.50	0.0000	80.00	No Ice	15.33	7.42	0.13
			0.00			1/2" Ice	15.98	8.56	0.23
			0.00						
RRUS-32 (ATT)	C	From Face	0.50	0.0000	80.00	No Ice	3.20	1.85	0.06
			6.00			1/2" Ice	3.46	2.08	0.08
			0.00						
4478 Radio Unit (4x40W) (ATT)	C	From Face	0.50	0.0000	80.00	No Ice	1.26	1.26	0.06
			0.00			1/2" Ice	1.42	1.42	0.07
			0.00						
DC6-48-60-0-8F (Squid) Unit (ATT)	C	From Leg	0.50	0.0000	80.00	No Ice	1.68	1.68	0.03
			0.00			1/2" Ice	1.92	1.92	0.05
			0.00						
*** AT&T Update 04262019 - Existing									
*** AT&T Update 04262019 - Proposed									
800-10966 Kathrein Panel Antenna w/ Pipe Mount (ATT - Proposed)	A	From Face	0.50	0.0000	80.00	No Ice	18.67	9.80	0.16
			-3.00			1/2" Ice	19.42	11.22	0.28
			0.00						
800-10966 Kathrein Panel Antenna w/ Pipe Mount (ATT - Proposed)	B	From Face	0.50	0.0000	80.00	No Ice	18.67	9.80	0.16
			-3.00			1/2" Ice	19.42	11.22	0.28
			0.00						
800-10965 Kathrein Panel Antenna (ATT - Proposed)	C	From Face	0.50	0.0000	80.00	No Ice	15.43	7.85	0.15
			-3.00			1/2" Ice	16.11	8.91	0.25
			0.00						
RRUS E2 B29 RRH Unit (ATT - Proposed)	A	From Face	0.50	0.0000	80.00	No Ice	3.67	1.49	0.06
			6.00			1/2" Ice	3.93	1.67	0.08
			0.00						
RRUS E2 B29 RRH Unit (ATT - Proposed)	B	From Face	0.50	0.0000	80.00	No Ice	3.67	1.49	0.06
			6.00			1/2" Ice	3.93	1.67	0.08
			0.00						
RRUS E2 B29 RRH Unit (ATT - Proposed)	C	From Face	0.50	0.0000	80.00	No Ice	3.67	1.49	0.06
			6.00			1/2" Ice	3.93	1.67	0.08
			0.00						
RRUS 8846 B2 B66A RRH Unit (ATT - Proposed)	A	From Face	0.50	0.0000	80.00	No Ice	1.91	1.58	0.07
			-3.00			1/2" Ice	2.10	1.75	0.09
			0.00						
RRUS 8846 B2 B66A RRH Unit (ATT - Proposed)	B	From Face	0.50	0.0000	80.00	No Ice	1.91	1.58	0.07
			-3.00			1/2" Ice	2.10	1.75	0.09
			0.00						
RRUS 8846 B2 B66A RRH Unit (ATT - Proposed)	C	From Face	0.50	0.0000	80.00	No Ice	1.91	1.58	0.07
			-3.00			1/2" Ice	2.10	1.75	0.09
			0.00						

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	19 of 34
	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K
Ericsson 4449 B71 + B12 Radio Unit (ATT - Proposed)	A	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
Ericsson 4449 B71 + B12 Radio Unit (ATT - Proposed)	B	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
Ericsson 4449 B71 + B12 Radio Unit (ATT - Proposed)	C	From Face	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.93 2.12	1.35 1.51	0.08 0.10
DC6-48-60-0-8F (Squid) Unit (ATT - Proposed)	B	From Leg	0.50 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice	1.68 1.92	1.68 1.92	0.03 0.05
*** AT&T Update 04262019 - Proposed									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft ²	Weight K
4 FT DISH (#1-A)	A	Paraboloid w/Shroud (HP)	From Leg	1.50 5.00 0.00	Worst		41.00	4.00	No Ice 1/2" Ice	12.57 13.10	0.14 0.28
6' DISH (SOLID) (#19 - CSP-3)	C	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		117.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.09 0.24
6' DISH (SOLID) (#21 - CSP-5)	A	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		115.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.09 0.24
6' DISH (SOLID) (#20 - CSP-6)	C	Paraboloid w/Radome	From Leg	0.50 0.00 0.00	Worst		111.00	6.00	No Ice 1/2" Ice	28.27 29.05	0.09 0.24

Tower Pressures - No Ice

$$G_H = 1.149$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1 120.00-116.67	118.33	1.44	30	39.883	A	4.970	2.956	2.781	35.08	0.000	0.000
					B	4.994	2.781		35.77	0.000	0.000
					C	4.994	2.781		35.77	0.000	0.000
T2	112.50	1.42	29	103.599	A	6.230	15.621	6.952	31.81	0.000	0.000

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	20 of 34
	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
116.67-108.33					B	6.419	8.502		46.59	0.000	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3	104.17	1.389	29	109.157	A	8.662	22.311	6.952	22.45	0.000	0.000
108.33-100.00					B	6.156	16.022		31.35	0.000	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4	95.83	1.356	28	114.715	A	9.491	22.591	6.952	21.67	0.000	0.000
100.00-91.67					B	6.461	22.018		24.41	0.000	0.000
					C	7.506	6.952		48.08	0.000	0.000
T5	87.50	1.321	27	120.273	A	9.771	22.591	6.952	21.48	0.000	0.000
					B	6.189	30.042		19.19	0.000	0.000
					C	7.766	6.952		47.23	0.000	0.000
T6	79.17	1.284	27	125.831	A	9.983	23.613	6.952	20.69	0.000	0.000
					B	5.977	37.399		16.03	0.000	0.000
					C	8.028	6.952		46.41	0.000	0.000
T7	62.50	1.2	25	412.014	A	34.940	74.966	23.204	21.11	0.000	0.000
					B	20.730	141.461		14.31	0.000	0.000
					C	29.741	23.204		43.83	0.000	0.000
T8	37.50	1.037	22	460.861	A	47.994	75.561	20.856	16.88	0.000	0.000
					B	29.400	148.074		11.75	0.000	0.000
					C	47.069	20.856		30.70	0.000	0.000
T9	12.50	1	21	514.792	A	43.153	70.730	28.676	25.18	0.000	0.000
					B	30.389	126.724		18.25	0.000	0.000
					C	40.991	28.676		41.16	0.000	0.000

Tower Pressure - With Ice

$$G_H = 1.149$$

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
T1	118.33	1.44	30	0.5000	40.161	A	4.933	5.763	3.337	31.20	0.000	0.000
120.00-116.67						B	4.994	5.334		32.31	0.000	0.000
						C	4.994	5.334		32.31	0.000	0.000
T2	112.50	1.42	29	0.5000	104.294	A	6.397	24.740	8.342	26.79	0.000	0.000
116.67-108.33						B	6.354	13.406		42.22	0.000	0.000
						C	6.523	10.951		47.74	0.000	0.000
T3	104.17	1.389	29	0.5000	109.852	A	9.972	35.162	8.342	18.48	0.000	0.000
108.33-100.00						B	5.793	25.257		26.87	0.000	0.000
						C	6.751	11.043		46.88	0.000	0.000
T4	95.83	1.356	28	0.5000	115.410	A	10.790	35.967	8.342	17.84	0.000	0.000
						B	5.851	34.365		20.74	0.000	0.000
						C	7.506	11.135		44.75	0.000	0.000
T5	87.50	1.321	27	0.5000	120.968	A	11.084	36.074	8.342	17.69	0.000	0.000
						B	5.257	47.027		15.96	0.000	0.000
						C	7.766	11.227		43.92	0.000	0.000
T6	79.17	1.284	27	0.5000	126.526	A	11.224	38.396	8.342	16.81	0.000	0.000
						B	7.626	57.356		12.84	0.000	0.000
						C	8.028	11.321		43.11	0.000	0.000
T7	62.50	1.2	25	0.5000	414.099	A	38.079	122.564	27.375	17.04	0.000	0.000
						B	29.548	215.422		11.17	0.000	0.000
						C	29.741	36.857		41.11	0.000	0.000
T8	37.50	1.037	22	0.5000	462.946	A	47.615	131.042	25.027	14.01	0.000	0.000
						B	33.114	231.909		9.44	0.000	0.000
						C	47.069	40.331		28.63	0.000	0.000

<i>tnxTower</i> AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	21 of 34
	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

Section Elevation	z	K _Z	q _z	t _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	in	ft ²		ft ²	ft ²	ft ²			
T9 25.00-0.00	12.50	1	21	0.5000	516.877	A	43.948	116.529	32.848	20.47	0.000	0.000
						B	35.831	195.681		14.19	0.000	0.000
						C	40.991	45.245		38.09	0.000	0.000

Tower Pressure - Service

$$G_H = 1.149$$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
T1 120.00-116.67	118.33	1.44	30	39.883	A	4.970	2.956	2.781	35.08	0.000	0.000
					B	4.994	2.781		35.77	0.000	0.000
					C	4.994	2.781		35.77	0.000	0.000
T2 116.67-108.33	112.50	1.42	29	103.599	A	6.230	15.621	6.952	31.81	0.000	0.000
					B	6.419	8.502		46.59	0.000	0.000
					C	6.523	6.952		51.59	0.000	0.000
T3 108.33-100.00	104.17	1.389	29	109.157	A	8.662	22.311	6.952	22.45	0.000	0.000
					B	6.156	16.022		31.35	0.000	0.000
					C	6.751	6.952		50.73	0.000	0.000
T4 100.00-91.67	95.83	1.356	28	114.715	A	9.491	22.591	6.952	21.67	0.000	0.000
					B	6.461	22.018		24.41	0.000	0.000
					C	7.506	6.952		48.08	0.000	0.000
T5 91.67-83.33	87.50	1.321	27	120.273	A	9.771	22.591	6.952	21.48	0.000	0.000
					B	6.189	30.042		19.19	0.000	0.000
					C	7.766	6.952		47.23	0.000	0.000
T6 83.33-75.00	79.17	1.284	27	125.831	A	9.983	23.613	6.952	20.69	0.000	0.000
					B	5.977	37.399		16.03	0.000	0.000
					C	8.028	6.952		46.41	0.000	0.000
T7 75.00-50.00	62.50	1.2	25	412.014	A	34.940	74.966	23.204	21.11	0.000	0.000
					B	20.730	141.461		14.31	0.000	0.000
					C	29.741	23.204		43.83	0.000	0.000
T8 50.00-25.00	37.50	1.037	22	460.861	A	47.994	75.561	20.856	16.88	0.000	0.000
					B	29.400	148.074		11.75	0.000	0.000
					C	47.069	20.856		30.70	0.000	0.000
T9 25.00-0.00	12.50	1	21	514.792	A	43.153	70.730	28.676	25.18	0.000	0.000
					B	30.389	126.724		18.25	0.000	0.000
					C	40.991	28.676		41.16	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	1	1	6.714	0.60	179.73	A
			B	0.195	2.613	0.589	1	1	6.632			
			C	0.195	2.613	0.589	1	1	6.632			
T2 116.67-108.33	0.05	0.77	A	0.211	2.56	0.593	1	1	15.488	1.34	160.92	A
			B	0.144	2.794	0.581	1	1	11.355			
			C	0.13	2.846	0.579	1	1	10.546			

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	Page
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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T3 108.33-100.00	0.13	0.78	A	0.284	2.34	0.611	1	1	22.295	1.73	207.15	A
			B	0.203	2.585	0.591	1	1	15.626			
			C	0.126	2.864	0.578	1	1	10.769			
T4 100.00-91.67	0.18	1.09	A	0.28	2.351	0.61	1	1	23.269	1.77	212.13	A
			B	0.248	2.443	0.601	1	1	19.703			
			C	0.126	2.862	0.578	1	1	11.525			
T5 91.67-83.33	0.24	1.11	A	0.269	2.382	0.607	1	1	23.482	1.78	213.95	B
			B	0.301	2.293	0.616	1	1	24.703			
			C	0.122	2.876	0.578	1	1	11.782			
T6 83.33-75.00	0.29	1.30	A	0.267	2.388	0.606	1	1	24.301	1.97	236.99	B
			B	0.345	2.184	0.631	1	1	29.561			
			C	0.119	2.889	0.577	1	1	12.041			
T7 75.00-50.00	1.12	5.12	A	0.267	2.388	0.606	1	1	80.391	6.68	267.32	B
			B	0.394	2.077	0.649	1	1	112.543			
			C	0.129	2.852	0.578	1	1	43.163			
T8 50.00-25.00	1.18	6.90	A	0.268	2.384	0.607	1	1	93.833	6.47	258.76	B
			B	0.385	2.094	0.646	1	1	125.001			
			C	0.147	2.781	0.581	1	1	59.188			
T9 25.00-0.00	0.91	7.21	A	0.221	2.527	0.595	1	1	85.234	5.91	236.29	B
			B	0.305	2.282	0.618	1	1	108.642			
			C	0.135	2.826	0.579	1	1	57.605			
Sum Weight:	4.09	24.73						OTM	1617.45 kip-ft	28.25		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.825	1	5.845	0.52	156.45	A
			B	0.195	2.613	0.589	0.825	1	5.759			
			C	0.195	2.613	0.589	0.825	1	5.759			
T2 116.67-108.33	0.05	0.77	A	0.211	2.56	0.593	0.825	1	14.398	1.25	149.60	A
			B	0.144	2.794	0.581	0.825	1	10.232			
			C	0.13	2.846	0.579	0.825	1	9.404			
T3 108.33-100.00	0.13	0.78	A	0.284	2.34	0.611	0.825	1	20.779	1.61	193.07	A
			B	0.203	2.585	0.591	0.825	1	14.548			
			C	0.126	2.864	0.578	0.825	1	9.588			
T4 100.00-91.67	0.18	1.09	A	0.28	2.351	0.61	0.825	1	21.608	1.64	196.99	A
			B	0.248	2.443	0.601	0.825	1	18.572			
			C	0.126	2.862	0.578	0.825	1	10.211			
T5 91.67-83.33	0.24	1.11	A	0.269	2.382	0.607	0.825	1	21.772	1.70	204.57	B
			B	0.301	2.293	0.616	0.825	1	23.620			
			C	0.122	2.876	0.578	0.825	1	10.423			
T6 83.33-75.00	0.29	1.30	A	0.267	2.388	0.606	0.825	1	22.554	1.91	228.61	B
			B	0.345	2.184	0.631	0.825	1	28.515			
			C	0.119	2.889	0.577	0.825	1	10.636			
T7 75.00-50.00	1.12	5.12	A	0.267	2.388	0.606	0.825	1	74.277	6.47	258.70	B
			B	0.394	2.077	0.649	0.825	1	108.915			
			C	0.129	2.852	0.578	0.825	1	37.958			
T8 50.00-25.00	1.18	6.90	A	0.268	2.384	0.607	0.825	1	85.434	6.20	248.11	B
			B	0.385	2.094	0.646	0.825	1	119.856			
			C	0.147	2.781	0.581	0.825	1	50.951			
T9 25.00-0.00	0.91	7.21	A	0.221	2.527	0.595	0.825	1	77.682	5.62	224.73	B
			B	0.305	2.282	0.618	0.825	1	103.324			

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	23 of 34
	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
Sum Weight:	4.09	24.73	C	0.135	2.826	0.579	0.825	1 OTM	50.431 1533.90 kip-ft	26.92		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.8	1	5.720	0.51	153.12	A
			B	0.195	2.613	0.589	0.8	1	5.634			
			C	0.195	2.613	0.589	0.8	1	5.634			
T2 116.67-108.33	0.05	0.77	A	0.211	2.56	0.593	0.8	1	14.242	1.23	147.98	A
			B	0.144	2.794	0.581	0.8	1	10.071			
			C	0.13	2.846	0.579	0.8	1	9.241			
T3 108.33-100.00	0.13	0.78	A	0.284	2.34	0.611	0.8	1	20.562	1.59	191.05	A
			B	0.203	2.585	0.591	0.8	1	14.395			
			C	0.126	2.864	0.578	0.8	1	9.419			
T4 100.00-91.67	0.18	1.09	A	0.28	2.351	0.61	0.8	1	21.371	1.62	194.83	A
			B	0.248	2.443	0.601	0.8	1	18.411			
			C	0.126	2.862	0.578	0.8	1	10.024			
T5 91.67-83.33	0.24	1.11	A	0.269	2.382	0.607	0.8	1	21.528	1.69	203.23	B
			B	0.301	2.293	0.616	0.8	1	23.465			
			C	0.122	2.876	0.578	0.8	1	10.228			
T6 83.33-75.00	0.29	1.30	A	0.267	2.388	0.606	0.8	1	22.304	1.90	227.41	B
			B	0.345	2.184	0.631	0.8	1	28.366			
			C	0.119	2.889	0.577	0.8	1	10.435			
T7 75.00-50.00	1.12	5.12	A	0.267	2.388	0.606	0.8	1	73.403	6.44	257.47	B
			B	0.394	2.077	0.649	0.8	1	108.397			
			C	0.129	2.852	0.578	0.8	1	37.214			
T8 50.00-25.00	1.18	6.90	A	0.268	2.384	0.607	0.8	1	84.234	6.16	246.59	B
			B	0.385	2.094	0.646	0.8	1	119.121			
			C	0.147	2.781	0.581	0.8	1	49.774			
T9 25.00-0.00	0.91	7.21	A	0.221	2.527	0.595	0.8	1	76.603	5.58	223.07	B
			B	0.305	2.282	0.618	0.8	1	102.564			
			C	0.135	2.826	0.579	0.8	1	49.406			
Sum Weight:	4.09	24.73						OTM	1521.96 kip-ft	26.73		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.85	1	5.969	0.53	159.77	A
			B	0.195	2.613	0.589	0.85	1	5.883			
			C	0.195	2.613	0.589	0.85	1	5.883			
T2 116.67-108.33	0.05	0.77	A	0.211	2.56	0.593	0.85	1	14.554	1.26	151.22	A
			B	0.144	2.794	0.581	0.85	1	10.392			

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	Page
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	Project DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis Client Smartlink / SMK-005 / AT&T	Date 16:30:30 05/31/19 Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T3 108.33-100.00	0.13	0.78	C	0.13	2.846	0.579	0.85	1	9.567			
			A	0.284	2.34	0.611	0.85	1	20.996	1.63	195.08	A
			B	0.203	2.585	0.591	0.85	1	14.702			
T4 100.00-91.67	0.18	1.09	C	0.126	2.864	0.578	0.85	1	9.757			
			A	0.28	2.351	0.61	0.85	1	21.845	1.66	199.16	A
			B	0.248	2.443	0.601	0.85	1	18.734			
			C	0.126	2.862	0.578	0.85	1	10.399			
T5 91.67-83.33	0.24	1.11	A	0.269	2.382	0.607	0.85	1	22.017	1.72	205.91	B
			B	0.301	2.293	0.616	0.85	1	23.775			
			C	0.122	2.876	0.578	0.85	1	10.617			
T6 83.33-75.00	0.29	1.30	A	0.267	2.388	0.606	0.85	1	22.803	1.92	229.80	B
			B	0.345	2.184	0.631	0.85	1	28.665			
			C	0.119	2.889	0.577	0.85	1	10.836			
T7 75.00-50.00	1.12	5.12	A	0.267	2.388	0.606	0.85	1	75.150	6.50	259.93	B
			B	0.394	2.077	0.649	0.85	1	109.433			
			C	0.129	2.852	0.578	0.85	1	38.702			
T8 50.00-25.00	1.18	6.90	A	0.268	2.384	0.607	0.85	1	86.634	6.24	249.63	B
			B	0.385	2.094	0.646	0.85	1	120.591			
			C	0.147	2.781	0.581	0.85	1	52.127			
T9 25.00-0.00	0.91	7.21	A	0.221	2.527	0.595	0.85	1	78.761	5.66	226.38	B
			B	0.305	2.282	0.618	0.85	1	104.084			
			C	0.135	2.826	0.579	0.85	1	51.456			
Sum Weight:	4.09	24.73						OTM	1545.83 kip-ft	27.11		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.70	A	0.266	2.389	0.606	1	1	8.426	0.69	207.26	A
			B	0.257	2.416	0.604	1	1	8.214			
			C	0.257	2.416	0.604	1	1	8.214			
T2 116.67-108.33	0.15	1.14	A	0.299	2.3	0.615	1	1	21.623	1.68	201.84	A
			B	0.189	2.632	0.588	1	1	14.241			
			C	0.168	2.708	0.584	1	1	12.922			
T3 108.33-100.00	0.40	1.16	A	0.411	2.043	0.656	1	1	33.041	2.23	268.01	A
			B	0.283	2.343	0.611	1	1	21.219			
			C	0.162	2.728	0.583	1	1	13.193			
T4 100.00-91.67	0.51	1.56	A	0.405	2.054	0.654	1	1	34.302	2.28	273.15	A
			B	0.348	2.175	0.632	1	1	27.567			
			C	0.162	2.73	0.583	1	1	14.001			
T5 91.67-83.33	0.65	1.60	A	0.39	2.084	0.648	1	1	34.443	2.30	276.60	B
			B	0.432	2.004	0.665	1	1	36.543			
			C	0.157	2.746	0.583	1	1	14.307			
T6 83.33-75.00	0.79	1.77	A	0.392	2.08	0.648	1	1	36.121	2.77	332.03	B
			B	0.514	1.883	0.705	1	1	48.035			
			C	0.153	2.761	0.582	1	1	14.616			
T7 75.00-50.00	2.92	6.89	A	0.388	2.088	0.647	1	1	117.348	9.87	394.85	B
			B	0.592	1.809	0.748	1	1	190.787			
			C	0.161	2.732	0.583	1	1	51.236			
T8 50.00-25.00	3.13	9.28	A	0.386	2.093	0.646	1	1	132.263	9.20	367.83	B
			B	0.572	1.824	0.737	1	1	204.062			
			C	0.189	2.634	0.588	1	1	70.790			
T9 25.00-0.00	2.42	9.42	A	0.31	2.269	0.619	1	1	116.098	7.88	315.36	B

tnxTower AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job	120' Self-Supporting Lattice Tower	Page	25 of 34
	Project	DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date	16:30:30 05/31/19
	Client	Smartlink / SMK-005 / AT&T	Designed by	MCD

Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	<i>F a c e</i>	<i>e</i>	<i>C_F</i>	<i>R_R</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>ft²</i>	<i>F</i> <i>K</i>	<i>w</i> <i>plf</i>	<i>Ctrl. Face</i>
Sum Weight:	10.97	33.53	B C	0.448 0.167	1.977 2.71	0.672 0.584	1 1	1 OTM	167.391 67.423 2202.85 kip-ft	38.91		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	<i>F a c e</i>	<i>e</i>	<i>C_F</i>	<i>R_R</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>ft²</i>	<i>F</i> <i>K</i>	<i>w</i> <i>plf</i>	<i>Ctrl. Face</i>
T1 120.00-116.67	0.00	0.70	A B C	0.266 0.257 0.257	2.389 2.416 2.416	0.606 0.604 0.604	0.825 0.825 0.825	1 1 1	7.563 7.340 7.340	0.62	186.03	A
T2 116.67-108.33	0.15	1.14	A B C	0.299 0.189 0.168	2.3 2.632 2.708	0.615 0.588 0.584	0.825 0.825 0.825	1 1 1	20.504 13.129 11.781	1.59	191.39	A
T3 108.33-100.00	0.40	1.16	A B C	0.411 0.283 0.162	2.043 2.343 2.728	0.656 0.611 0.583	0.825 0.825 0.825	1 1 1	31.296 20.205 12.012	2.12	253.85	A
T4 100.00-91.67	0.51	1.56	A B C	0.405 0.348 0.162	2.054 2.175 2.73	0.654 0.632 0.583	0.825 0.825 0.825	1 1 1	32.414 26.543 12.687	2.15	258.11	A
T5 91.67-83.33	0.65	1.60	A B C	0.39 0.432 0.157	2.084 2.004 2.746	0.648 0.665 0.583	0.825 0.825 0.825	1 1 1	32.503 35.623 12.948	2.25	269.63	B
T6 83.33-75.00	0.79	1.77	A B C	0.392 0.514 0.153	2.08 1.883 2.761	0.648 0.705 0.582	0.825 0.825 0.825	1 1 1	34.157 46.700 13.211	2.69	322.81	B
T7 75.00-50.00	2.92	6.89	A B C	0.388 0.592 0.161	2.088 1.809 2.732	0.647 0.748 0.583	0.825 0.825 0.825	1 1 1	110.684 185.616 46.031	9.60	384.15	B
T8 50.00-25.00	3.13	9.28	A B C	0.386 0.572 0.189	2.093 1.824 2.634	0.646 0.737 0.588	0.825 0.825 0.825	1 1 1	123.930 198.268 62.553	8.93	357.39	B
T9 25.00-0.00	2.42	9.42	A B C	0.31 0.448 0.167	2.269 1.977 2.71	0.619 0.672 0.584	0.825 0.825 0.825	1 1 OTM	108.407 161.120 60.250 2119.01 kip-ft	7.59	303.55	B
Sum Weight:	10.97	33.53								37.55		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	<i>F a c e</i>	<i>e</i>	<i>C_F</i>	<i>R_R</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>ft²</i>	<i>F</i> <i>K</i>	<i>w</i> <i>plf</i>	<i>Ctrl. Face</i>
T1 120.00-116.67	0.00	0.70	A B C	0.266 0.257 0.257	2.389 2.416 2.416	0.606 0.604 0.604	0.8 0.8 0.8	1 1 1	7.439 7.215 7.215	0.61	182.99	A
T2	0.15	1.14	A	0.299	2.3	0.615	0.8	1	20.344	1.58	189.90	A

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	Project DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis Client Smartlink / SMK-005 / AT&T	Date 16:30:30 05/31/19 Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
116.67-108.33			B	0.189	2.632	0.588	0.8	1	12.970			
			C	0.168	2.708	0.584	0.8	1	11.618			
T3	0.40	1.16	A	0.411	2.043	0.656	0.8	1	31.047	2.10	251.83	A
108.33-100.00			B	0.283	2.343	0.611	0.8	1	20.060			
			C	0.162	2.728	0.583	0.8	1	11.843			
T4	0.51	1.56	A	0.405	2.054	0.654	0.8	1	32.144	2.13	255.96	A
100.00-91.67			B	0.348	2.175	0.632	0.8	1	26.397			
			C	0.162	2.73	0.583	0.8	1	12.500			
T5	0.65	1.60	A	0.39	2.084	0.648	0.8	1	32.226	2.24	268.64	B
91.67-83.33			B	0.432	2.004	0.665	0.8	1	35.491			
			C	0.157	2.746	0.583	0.8	1	12.754			
T6	0.79	1.77	A	0.392	2.08	0.648	0.8	1	33.877	2.68	321.49	B
83.33-75.00			B	0.514	1.883	0.705	0.8	1	46.510			
			C	0.153	2.761	0.582	0.8	1	13.010			
T7	2.92	6.89	A	0.388	2.088	0.647	0.8	1	109.732	9.57	382.62	B
75.00-50.00			B	0.592	1.809	0.748	0.8	1	184.878			
			C	0.161	2.732	0.583	0.8	1	45.287			
T8	3.13	9.28	A	0.386	2.093	0.646	0.8	1	122.740	8.90	355.90	B
50.00-25.00			B	0.572	1.824	0.737	0.8	1	197.440			
			C	0.189	2.634	0.588	0.8	1	61.377			
T9 25.00-0.00	2.42	9.42	A	0.31	2.269	0.619	0.8	1	107.308	7.55	301.86	B
			B	0.448	1.977	0.672	0.8	1	160.224			
			C	0.167	2.71	0.584	0.8	1	59.225			
Sum Weight:	10.97	33.53						OTM	2107.04 kip-ft	37.35		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1	0.00	0.70	A	0.266	2.389	0.606	0.85	1	7.686	0.63	189.06	A
120.00-116.67			B	0.257	2.416	0.604	0.85	1	7.465			
			C	0.257	2.416	0.604	0.85	1	7.465			
T2	0.15	1.14	A	0.299	2.3	0.615	0.85	1	20.664	1.61	192.89	A
116.67-108.33			B	0.189	2.632	0.588	0.85	1	13.288			
			C	0.168	2.708	0.584	0.85	1	11.944			
T3	0.40	1.16	A	0.411	2.043	0.656	0.85	1	31.546	2.13	255.87	A
108.33-100.00			B	0.283	2.343	0.611	0.85	1	20.350			
			C	0.162	2.728	0.583	0.85	1	12.180			
T4	0.51	1.56	A	0.405	2.054	0.654	0.85	1	32.684	2.17	260.26	A
100.00-91.67			B	0.348	2.175	0.632	0.85	1	26.690			
			C	0.162	2.73	0.583	0.85	1	12.875			
T5	0.65	1.60	A	0.39	2.084	0.648	0.85	1	32.780	2.26	270.63	B
91.67-83.33			B	0.432	2.004	0.665	0.85	1	35.754			
			C	0.157	2.746	0.583	0.85	1	13.142			
T6	0.79	1.77	A	0.392	2.08	0.648	0.85	1	34.438	2.70	324.13	B
83.33-75.00			B	0.514	1.883	0.705	0.85	1	46.891			
			C	0.153	2.761	0.582	0.85	1	13.412			
T7	2.92	6.89	A	0.388	2.088	0.647	0.85	1	111.636	9.64	385.68	B
75.00-50.00			B	0.592	1.809	0.748	0.85	1	186.355			
			C	0.161	2.732	0.583	0.85	1	46.774			
T8	3.13	9.28	A	0.386	2.093	0.646	0.85	1	125.120	8.97	358.88	B
50.00-25.00			B	0.572	1.824	0.737	0.85	1	199.095			
			C	0.189	2.634	0.588	0.85	1	63.730			

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	Project DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis Client Smartlink / SMK-005 / AT&T	Date 16:30:30 05/31/19 Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T9 25.00-0.00	2.42	9.42	A	0.31	2.269	0.619	0.85	1	109.506	7.63	305.24	B
			B	0.448	1.977	0.672	0.85	1	162.016			
			C	0.167	2.71	0.584	0.85	1	61.275			
Sum Weight:	10.97	33.53						OTM	2130.99 kip-ft	37.74		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1	0.00	0.45	A	0.199	2.6	0.59	1	1	6.714	0.60	179.73	A
120.00-116.67			B	0.195	2.613	0.589	1	1	6.632			
			C	0.195	2.613	0.589	1	1	6.632			
T2	0.05	0.77	A	0.211	2.56	0.593	1	1	15.488	1.34	160.92	A
116.67-108.33			B	0.144	2.794	0.581	1	1	11.355			
			C	0.13	2.846	0.579	1	1	10.546			
T3	0.13	0.78	A	0.284	2.34	0.611	1	1	22.295	1.73	207.15	A
108.33-100.00			B	0.203	2.585	0.591	1	1	15.626			
			C	0.126	2.864	0.578	1	1	10.769			
T4	0.18	1.09	A	0.28	2.351	0.61	1	1	23.269	1.77	212.13	A
100.00-91.67			B	0.248	2.443	0.601	1	1	19.703			
			C	0.126	2.862	0.578	1	1	11.525			
T5	0.24	1.11	A	0.269	2.382	0.607	1	1	23.482	1.78	213.95	B
91.67-83.33			B	0.301	2.293	0.616	1	1	24.703			
			C	0.122	2.876	0.578	1	1	11.782			
T6	0.29	1.30	A	0.267	2.388	0.606	1	1	24.301	1.97	236.99	B
83.33-75.00			B	0.345	2.184	0.631	1	1	29.561			
			C	0.119	2.889	0.577	1	1	12.041			
T7	1.12	5.12	A	0.267	2.388	0.606	1	1	80.391	6.68	267.32	B
75.00-50.00			B	0.394	2.077	0.649	1	1	112.543			
			C	0.129	2.852	0.578	1	1	43.163			
T8	1.18	6.90	A	0.268	2.384	0.607	1	1	93.833	6.47	258.76	B
50.00-25.00			B	0.385	2.094	0.646	1	1	125.001			
			C	0.147	2.781	0.581	1	1	59.188			
T9 25.00-0.00	0.91	7.21	A	0.221	2.527	0.595	1	1	85.234	5.91	236.29	B
			B	0.305	2.282	0.618	1	1	108.642			
			C	0.135	2.826	0.579	1	1	57.605			
Sum Weight:	4.09	24.73						OTM	1617.45 kip-ft	28.25		

Tower Forces - Service - Wind 45 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1	0.00	0.45	A	0.199	2.6	0.59	0.825	1	5.845	0.52	156.45	A
120.00-116.67			B	0.195	2.613	0.589	0.825	1	5.759			
			C	0.195	2.613	0.589	0.825	1	5.759			

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	Project DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis Client Smartlink / SMK-005 / AT&T	Date 16:30:30 05/31/19 Designed by MCD

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T2 116.67-108.33	0.05	0.77	A	0.211	2.56	0.593	0.825	1	14.398	1.25	149.60	A
			B	0.144	2.794	0.581	0.825	1	10.232			
			C	0.13	2.846	0.579	0.825	1	9.404			
T3 108.33-100.00	0.13	0.78	A	0.284	2.34	0.611	0.825	1	20.779	1.61	193.07	A
			B	0.203	2.585	0.591	0.825	1	14.548			
			C	0.126	2.864	0.578	0.825	1	9.588			
T4 100.00-91.67	0.18	1.09	A	0.28	2.351	0.61	0.825	1	21.608	1.64	196.99	A
			B	0.248	2.443	0.601	0.825	1	18.572			
			C	0.126	2.862	0.578	0.825	1	10.211			
T5 91.67-83.33	0.24	1.11	A	0.269	2.382	0.607	0.825	1	21.772	1.70	204.57	B
			B	0.301	2.293	0.616	0.825	1	23.620			
			C	0.122	2.876	0.578	0.825	1	10.423			
T6 83.33-75.00	0.29	1.30	A	0.267	2.388	0.606	0.825	1	22.554	1.91	228.61	B
			B	0.345	2.184	0.631	0.825	1	28.515			
			C	0.119	2.889	0.577	0.825	1	10.636			
T7 75.00-50.00	1.12	5.12	A	0.267	2.388	0.606	0.825	1	74.277	6.47	258.70	B
			B	0.394	2.077	0.649	0.825	1	108.915			
			C	0.129	2.852	0.578	0.825	1	37.958			
T8 50.00-25.00	1.18	6.90	A	0.268	2.384	0.607	0.825	1	85.434	6.20	248.11	B
			B	0.385	2.094	0.646	0.825	1	119.856			
			C	0.147	2.781	0.581	0.825	1	50.951			
T9 25.00-0.00	0.91	7.21	A	0.221	2.527	0.595	0.825	1	77.682	5.62	224.73	B
			B	0.305	2.282	0.618	0.825	1	103.324			
			C	0.135	2.826	0.579	0.825	1	50.431			
Sum Weight:	4.09	24.73						OTM	1533.90 kip-ft	26.92		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	R _R	D _F	D _R	A _E	F	w	Ctrl. Face
ft	K	K							ft ²	K	plf	
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.8	1	5.720	0.51	153.12	A
			B	0.195	2.613	0.589	0.8	1	5.634			
			C	0.195	2.613	0.589	0.8	1	5.634			
T2 116.67-108.33	0.05	0.77	A	0.211	2.56	0.593	0.8	1	14.242	1.23	147.98	A
			B	0.144	2.794	0.581	0.8	1	10.071			
			C	0.13	2.846	0.579	0.8	1	9.241			
T3 108.33-100.00	0.13	0.78	A	0.284	2.34	0.611	0.8	1	20.562	1.59	191.05	A
			B	0.203	2.585	0.591	0.8	1	14.395			
			C	0.126	2.864	0.578	0.8	1	9.419			
T4 100.00-91.67	0.18	1.09	A	0.28	2.351	0.61	0.8	1	21.371	1.62	194.83	A
			B	0.248	2.443	0.601	0.8	1	18.411			
			C	0.126	2.862	0.578	0.8	1	10.024			
T5 91.67-83.33	0.24	1.11	A	0.269	2.382	0.607	0.8	1	21.528	1.69	203.23	B
			B	0.301	2.293	0.616	0.8	1	23.465			
			C	0.122	2.876	0.578	0.8	1	10.228			
T6 83.33-75.00	0.29	1.30	A	0.267	2.388	0.606	0.8	1	22.304	1.90	227.41	B
			B	0.345	2.184	0.631	0.8	1	28.366			
			C	0.119	2.889	0.577	0.8	1	10.435			
T7 75.00-50.00	1.12	5.12	A	0.267	2.388	0.606	0.8	1	73.403	6.44	257.47	B
			B	0.394	2.077	0.649	0.8	1	108.397			
			C	0.129	2.852	0.578	0.8	1	37.214			
T8 50.00-25.00	1.18	6.90	A	0.268	2.384	0.607	0.8	1	84.234	6.16	246.59	B
			B	0.385	2.094	0.646	0.8	1	119.121			

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Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	<i>F a c e</i>	<i>e</i>	<i>C_F</i>	<i>R_R</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>ft²</i>	<i>F</i> <i>K</i>	<i>w</i> <i>plf</i>	<i>Ctrl. Face</i>
T9 25.00-0.00	0.91	7.21	C	0.147	2.781	0.581	0.8	1	49.774			
			A	0.221	2.527	0.595	0.8	1	76.603	5.58	223.07	B
			B	0.305	2.282	0.618	0.8	1	102.564			
			C	0.135	2.826	0.579	0.8	1	49.406			
Sum Weight:	4.09	24.73						OTM	1521.96 kip-ft	26.73		

Tower Forces - Service - Wind 90 To Face

Section Elevation <i>ft</i>	Add Weight <i>K</i>	Self Weight <i>K</i>	<i>F a c e</i>	<i>e</i>	<i>C_F</i>	<i>R_R</i>	<i>D_F</i>	<i>D_R</i>	<i>A_E</i> <i>ft²</i>	<i>F</i> <i>K</i>	<i>w</i> <i>plf</i>	<i>Ctrl. Face</i>
T1 120.00-116.67	0.00	0.45	A	0.199	2.6	0.59	0.85	1	5.969	0.53	159.77	A
			B	0.195	2.613	0.589	0.85	1	5.883			
			C	0.195	2.613	0.589	0.85	1	5.883			
T2 116.67-108.33	0.05	0.77	A	0.211	2.56	0.593	0.85	1	14.554	1.26	151.22	A
			B	0.144	2.794	0.581	0.85	1	10.392			
			C	0.13	2.846	0.579	0.85	1	9.567			
T3 108.33-100.00	0.13	0.78	A	0.284	2.34	0.611	0.85	1	20.996	1.63	195.08	A
			B	0.203	2.585	0.591	0.85	1	14.702			
			C	0.126	2.864	0.578	0.85	1	9.757			
T4 100.00-91.67	0.18	1.09	A	0.28	2.351	0.61	0.85	1	21.845	1.66	199.16	A
			B	0.248	2.443	0.601	0.85	1	18.734			
			C	0.126	2.862	0.578	0.85	1	10.399			
T5 91.67-83.33	0.24	1.11	A	0.269	2.382	0.607	0.85	1	22.017	1.72	205.91	B
			B	0.301	2.293	0.616	0.85	1	23.775			
			C	0.122	2.876	0.578	0.85	1	10.617			
T6 83.33-75.00	0.29	1.30	A	0.267	2.388	0.606	0.85	1	22.803	1.92	229.80	B
			B	0.345	2.184	0.631	0.85	1	28.665			
			C	0.119	2.889	0.577	0.85	1	10.836			
T7 75.00-50.00	1.12	5.12	A	0.267	2.388	0.606	0.85	1	75.150	6.50	259.93	B
			B	0.394	2.077	0.649	0.85	1	109.433			
			C	0.129	2.852	0.578	0.85	1	38.702			
T8 50.00-25.00	1.18	6.90	A	0.268	2.384	0.607	0.85	1	86.634	6.24	249.63	B
			B	0.385	2.094	0.646	0.85	1	120.591			
			C	0.147	2.781	0.581	0.85	1	52.127			
T9 25.00-0.00	0.91	7.21	A	0.221	2.527	0.595	0.85	1	78.761	5.66	226.38	B
			B	0.305	2.282	0.618	0.85	1	104.084			
			C	0.135	2.826	0.579	0.85	1	51.456			
Sum Weight:	4.09	24.73						OTM	1545.83 kip-ft	27.11		

Force Totals

Load Case	Vertical Forces <i>K</i>	Sum of Forces <i>X</i> <i>K</i>	Sum of Forces <i>Z</i> <i>K</i>	Sum of Overturning Moments, <i>M_x</i> <i>kip-ft</i>	Sum of Overturning Moments, <i>M_z</i> <i>kip-ft</i>	Sum of Torques <i>kip-ft</i>
Leg Weight	6.83					
Bracing Weight	17.89					

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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
Total Member Self-Weight	24.73			-10.48	-12.29	
Total Weight	40.55			-10.48	-12.29	
Wind 0 deg - No Ice		-0.05	-51.03	-3719.14	-6.97	46.62
Wind 30 deg - No Ice		24.85	-43.18	-3157.59	-1809.29	-13.04
Wind 45 deg - No Ice		35.03	-35.11	-2570.05	-2547.95	-41.41
Wind 60 deg - No Ice		42.76	-24.71	-1812.45	-3109.43	-66.61
Wind 90 deg - No Ice		49.78	0.05	-5.15	-3615.51	-103.82
Wind 120 deg - No Ice		44.13	25.56	1848.47	-3197.46	-116.66
Wind 135 deg - No Ice		35.10	35.17	2556.63	-2555.48	-104.47
Wind 150 deg - No Ice		24.93	43.23	3141.96	-1818.51	-90.78
Wind 180 deg - No Ice		0.05	49.50	3602.70	-17.62	-44.31
Wind 210 deg - No Ice		-24.85	43.18	3136.64	1784.70	13.04
Wind 225 deg - No Ice		-35.03	35.11	2549.10	2523.36	41.41
Wind 240 deg - No Ice		-44.08	25.47	1839.24	3167.55	70.04
Wind 270 deg - No Ice		-49.78	-0.05	-15.80	3590.93	103.82
Wind 300 deg - No Ice		-42.81	-24.79	-1821.68	3090.17	110.91
Wind 315 deg - No Ice		-35.10	-35.17	-2577.58	2530.89	104.47
Wind 330 deg - No Ice		-24.93	-43.23	-3162.92	1793.93	90.78
Member Ice	8.80					
Total Weight Ice	62.90			-33.54	-26.14	
Wind 0 deg - Ice		-0.05	-65.64	-4689.11	-20.96	89.30
Wind 30 deg - Ice		32.13	-55.81	-4000.56	-2296.04	-22.30
Wind 45 deg - Ice		45.33	-45.42	-3262.58	-3230.48	-76.15
Wind 60 deg - Ice		55.36	-32.00	-2308.92	-3942.16	-124.33
Wind 90 deg - Ice		64.35	0.05	-28.35	-4574.92	-195.18
Wind 120 deg - Ice		56.76	32.86	2298.75	-4030.33	-218.56
Wind 135 deg - Ice		45.40	45.49	3202.84	-3237.82	-198.55
Wind 150 deg - Ice		32.22	55.86	3938.67	-2305.03	-172.88
Wind 180 deg - Ice		0.05	64.08	4526.23	-31.33	-86.15
Wind 210 deg - Ice		-32.13	55.81	3933.49	2243.75	22.30
Wind 225 deg - Ice		-45.33	45.42	3195.50	3178.19	76.15
Wind 240 deg - Ice		-56.71	32.77	2289.76	3972.85	129.26
Wind 270 deg - Ice		-64.35	-0.05	-38.73	4522.63	195.18
Wind 300 deg - Ice		-55.42	-32.09	-2317.91	3895.06	210.48
Wind 315 deg - Ice		-45.40	-45.49	-3269.91	3185.53	198.55
Wind 330 deg - Ice		-32.22	-55.86	-4005.75	2252.74	172.88
Total Weight	40.55			-10.48	-12.29	
Wind 0 deg - Service		-0.05	-51.03	-3709.42	4.57	46.62
Wind 30 deg - Service		24.85	-43.18	-3147.86	-1797.76	-13.04
Wind 45 deg - Service		35.03	-35.11	-2560.32	-2536.41	-41.41
Wind 60 deg - Service		42.76	-24.71	-1802.72	-3097.90	-66.61
Wind 90 deg - Service		49.78	0.05	4.58	-3603.98	-103.82
Wind 120 deg - Service		44.13	25.56	1858.20	-3185.92	-116.66
Wind 135 deg - Service		35.10	35.17	2566.36	-2543.94	-104.47
Wind 150 deg - Service		24.93	43.23	3151.69	-1806.98	-90.78
Wind 180 deg - Service		0.05	49.50	3612.43	-6.08	-44.31
Wind 210 deg - Service		-24.85	43.18	3146.37	1796.24	13.04
Wind 225 deg - Service		-35.03	35.11	2558.83	2534.89	41.41
Wind 240 deg - Service		-44.08	25.47	1848.97	3179.08	70.04
Wind 270 deg - Service		-49.78	-0.05	-6.07	3602.46	103.82
Wind 300 deg - Service		-42.81	-24.79	-1811.95	3101.71	110.91
Wind 315 deg - Service		-35.10	-35.17	-2567.85	2542.43	104.47
Wind 330 deg - Service		-24.93	-43.23	-3153.19	1805.46	90.78

Load Combinations

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<i>Comb. No.</i>	<i>Description</i>
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 Tower Deflections - Service Wind

<i>Section No.</i>	<i>Elevation ft</i>	<i>Horz. Deflection in</i>	<i>Gov. Load Comb.</i>	<i>Tilt °</i>	<i>Twist °</i>
T1	120 - 116.667	4.635	35	0.2606	0.0904
T2	116.667 - 108.333	4.454	35	0.2605	0.0900
T3	108.333 - 100	3.981	35	0.2609	0.0920

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T4	100 - 91.6667	3.499	35	0.2592	0.0919
T5	91.6667 - 83.3333	3.028	35	0.2536	0.0879
T6	83.3333 - 75	2.568	35	0.2433	0.0836
T7	75 - 50	2.133	35	0.2275	0.0777
T8	50 - 25	0.972	35	0.1755	0.0533
T9	25 - 0	0.234	35	0.0838	0.0259

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 5/8x4'	35	4.635	0.2606	0.0904	26892
120.00	16'x3" Omni (inverted)	35	4.635	0.2606	0.0904	26892
117.00	6' DISH (SOLID)	35	4.473	0.2605	0.0900	26892
115.00	6' DISH (SOLID)	35	4.362	0.2606	0.0901	26892
114.00	Rohn 6' Side-Arm(1)	35	4.306	0.2607	0.0903	28010
113.00	Pirod 4' Side Mount Standoff (1)	35	4.249	0.2607	0.0906	30876
112.00	Junction Box	35	4.193	0.2608	0.0909	35670
111.00	6' DISH (SOLID)	35	4.135	0.2609	0.0912	42718
110.00	6'8"x4" Pipe Mount	35	4.078	0.2609	0.0915	53118
109.00	10'x2" Dipole Antenna (inverted)	35	4.020	0.2609	0.0918	69882
107.00	6'8"x4" Pipe Mount	35	3.904	0.2609	0.0922	180392
106.00	16'x3" Omni (inverted)	35	3.846	0.2608	0.0924	781089
105.00	SE419-SWBPALDF Panel Antenna	35	3.788	0.2607	0.0924	293026
104.00	AP13-850/065D w/Mount Pipe	35	3.730	0.2605	0.0925	137719
103.00	TMA 432-83H-01T	35	3.672	0.2602	0.0924	91660
101.00	SE419-SWBPALDF Panel Antenna	35	3.556	0.2596	0.0922	59773
100.00	PD458-406	35	3.499	0.2592	0.0919	55051
96.00	3'4"x4" Pipe Mount (horizontal)	35	3.272	0.2570	0.0904	73790
95.00	SC479-HF1LDF (inverted)	35	3.215	0.2563	0.0899	88813
92.00	PD458-406	35	3.047	0.2539	0.0881	121566
88.00	SC479-HF1LDF (inverted)	35	2.824	0.2498	0.0861	51553
87.00	4'6"x3" Pipe Mount (horizontal)	35	2.768	0.2485	0.0856	42139
86.00	20' 4-Bay Dipole	35	2.713	0.2472	0.0851	36005
82.00	3' Yagi	35	2.497	0.2410	0.0828	29226
81.00	3' Yagi	35	2.444	0.2392	0.0821	30479
80.00	Face Mount	35	2.391	0.2373	0.0815	32676
77.00	20' 4-Bay Dipole	35	2.235	0.2314	0.0793	43653
76.00	3'4"x4" Pipe Mount (horizontal)	35	2.184	0.2294	0.0785	47327
72.00	Face Mount	35	1.981	0.2218	0.0752	46281
67.00	4'6"x3" Pipe Mount (horizontal)	35	1.733	0.2128	0.0707	33441
65.00	6' Yagi w/ Mount	35	1.636	0.2091	0.0688	30012
63.00	GPS	35	1.541	0.2054	0.0669	27220
55.00	20' 4-Bay Dipole w/ 2' Sidearm Mount	35	1.179	0.1886	0.0586	19839
53.00	1.0" Dia 4' Omni w/Pipe Mount	35	1.095	0.1837	0.0565	18591
48.00	10'x6" Dipole Antenna	35	0.894	0.1695	0.0511	16393
47.00	5'x1.5in dia Whip Antenna /w mount	35	0.856	0.1663	0.0500	16087
43.00	3' Whip (3in diameter) /w mount	35	0.712	0.1528	0.0456	15032
41.00	4 FT DISH	35	0.645	0.1455	0.0434	14558
40.00	1'x1' Panel Antenna	35	0.613	0.1418	0.0423	14332
39.00	6'x1" Whip Antenna w/ Mount	35	0.581	0.1381	0.0412	14113

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 116.667	5.727	19	0.3206	0.1672
T2	116.667 - 108.333	5.505	19	0.3205	0.1666
T3	108.333 - 100	4.924	19	0.3210	0.1693
T4	100 - 91.6667	4.332	19	0.3189	0.1699
T5	91.6667 - 83.3333	3.754	19	0.3121	0.1658
T6	83.3333 - 75	3.188	19	0.2996	0.1579
T7	75 - 50	2.653	19	0.2805	0.1471
T8	50 - 25	1.219	19	0.2174	0.1006
T9	25 - 0	0.297	19	0.1045	0.0486

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightning Rod 5/8x4'	19	5.727	0.3206	0.1672	22634
120.00	16'x3" Omni (inverted)	19	5.727	0.3206	0.1672	22634
117.00	6' DISH (SOLID)	19	5.527	0.3205	0.1666	22634
115.00	6' DISH (SOLID)	19	5.391	0.3206	0.1668	22634
114.00	Rohn 6' Side-Arm(1)	19	5.322	0.3207	0.1670	23547
113.00	Pirot 4' Side Mount Standoff (1)	19	5.253	0.3208	0.1674	25911
112.00	Junction Box	19	5.183	0.3208	0.1678	29860
111.00	6' DISH (SOLID)	19	5.113	0.3209	0.1683	35649
110.00	6'8"x4" Pipe Mount	19	5.042	0.3210	0.1687	44158
109.00	10'x2" Dipole Antenna (inverted)	19	4.971	0.3210	0.1691	57821
107.00	6'8"x4" Pipe Mount	19	4.829	0.3209	0.1696	146899
106.00	16'x3" Omni (inverted)	19	4.758	0.3208	0.1697	602177
105.00	SE419-SWBPALDF Panel Antenna	19	4.686	0.3207	0.1697	259062
104.00	AP13-850/065D w/Mount Pipe	19	4.615	0.3204	0.1698	117700
103.00	TMA 432-83H-01T	19	4.544	0.3202	0.1700	76068
101.00	SE419-SWBPALDF Panel Antenna	19	4.402	0.3194	0.1700	49481
100.00	PD458-406	19	4.332	0.3189	0.1699	45590
96.00	3'4"x4" Pipe Mount (horizontal)	19	4.052	0.3163	0.1686	61908
95.00	SC479-HF1LDF (inverted)	19	3.983	0.3154	0.1680	75105
92.00	PD458-406	19	3.776	0.3124	0.1661	104718
88.00	SC479-HF1LDF (inverted)	19	3.502	0.3075	0.1627	42862
87.00	4'6"x3" Pipe Mount (horizontal)	19	3.434	0.3060	0.1617	34869
86.00	20' 4-Bay Dipole	19	3.366	0.3044	0.1607	29704
82.00	3' Yagi	19	3.100	0.2969	0.1563	24080
81.00	3' Yagi	19	3.035	0.2947	0.1551	25160
80.00	Face Mount	19	2.970	0.2924	0.1539	27048
77.00	20' 4-Bay Dipole	19	2.779	0.2853	0.1499	36621
76.00	3'4"x4" Pipe Mount (horizontal)	19	2.716	0.2829	0.1485	39904
72.00	Face Mount	19	2.465	0.2737	0.1425	39248
67.00	4'6"x3" Pipe Mount (horizontal)	19	2.160	0.2627	0.1340	28135
65.00	6' Yagi w/ Mount	19	2.040	0.2583	0.1304	25195
63.00	GPS	19	1.923	0.2538	0.1267	22811
55.00	20' 4-Bay Dipole w/ 2' Sidearm Mount	19	1.476	0.2334	0.1109	16548
53.00	1.0" Dia 4' Omni w/Pipe Mount	19	1.371	0.2274	0.1068	15493
48.00	10'x6" Dipole Antenna	19	1.122	0.2101	0.0964	13588
47.00	5'x1.5in dia Whip Antenna /w mount	19	1.075	0.2062	0.0943	13311
43.00	3' Whip (3in diameter) /w mount	19	0.896	0.1896	0.0860	12349
41.00	4 FT DISH	19	0.812	0.1807	0.0818	11921

<i>tnxTower</i> <i>AECOM</i> 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job 120' Self-Supporting Lattice Tower	Page 34 of 34
	Project DESPP/CSP Loading Criteria (TIA-222-F) - West Rock - Analysis	Date 16:30:30 05/31/19
	Client Smartlink / SMK-005 / AT&T	Designed by MCD

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
40.00	1'x1' Panel Antenna	19	0.772	0.1762	0.0797	11718
39.00	6'x1" Whip Antenna w/ Mount	19	0.732	0.1715	0.0776	11522

Program Version 8.0.5.0 - 11/28/2018 File:P:/Projects/Telcom/StructuralsByLocation/Connecticut/NewHavenCSP#27/07_SMK-005_60605194/TIA-F/TNX/TnS Results_CSP#27.eri

**PREVIOUSLY PROPOSED STRUCTURE MODIFICATIONS
(REFERENCE) FROM ANALYSIS REPORT DATED MARCH 11, 2019**

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL COMPLY WITH THE CURRENT CONNECTICUT STATE BUILDING AND LIFE SAFETY CODES, SUPPLEMENTS AND AMENDMENTS.
2. CONTRACTOR IS TO REVIEW ALL DRAWINGS AND NOTES IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUB-CONTRACTORS AND ALL RELATED PARTIES. THE SUB-CONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON DRAWINGS OR WRITTEN IN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION AND ELECTRICAL SUB-CONTRACTORS SHALL PAY FOR THEIR PERMITS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS ON SITE AT ALL TIMES AND ENSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUB-CONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. CONTRACTOR SHALL FURNISH 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. INSTALLATION OF THIS WIRELESS COMMUNICATIONS EQUIPMENT SITE REQUIRES WORK IN THE IMMEDIATE VICINITY OF EXISTING OPERATING TELECOMMUNICATION SYSTEMS. THE CONTRACTOR SHALL PROVIDE AND COORDINATE THE METHODS OF PROTECTION WITH THE VARIOUS TELECOMMUNICATION CARRIERS AND THE TOWER OWNER. THERE SHALL BE NO INTERRUPTION OF OPERATION WITHOUT TIMELY COORDINATION WITH AND APPROVAL BY THE VARIOUS COMMUNICATIONS OPERATORS INCLUDING THE CONNECTICUT STATE POLICE.
8. NO MOVEMENT, ALTERATION, OR DISCONNECTION OF CONNECTICUT STATE POLICE ANTENNAS MAY OCCUR WITHOUT THE NOTIFICATION AND APPROVAL OF THE CONNECTICUT STATE POLICE. CONTACT THE NETWORK CONTROL CENTER AT 860-865-8008.
9. TOWER REINFORCING WORK AFFECTING CRITICAL CONNECTICUT STATE POLICE ANTENNAS MAY BE REQUIRED TO BE CONDUCTED AT TIMES AS DETERMINED BY THE REQUIREMENTS OF THE CONNECTICUT STATE POLICE.
10. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER MFR'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR ARCHITECT.
11. 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.
12. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ARCHITECT FOR REVIEW. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTAL TO THE ARCHITECT FOR REVIEW.
13. 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. SUBMIT ANY DISCREPANCIES FROM THE DRAWINGS TO THE ARCHITECT.
14. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURE AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
15. CONTRACTOR SHALL COMPLY WITH OWNER ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL/ROCK DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
16. CONTRACTOR TO CONTACT "CALL BEFORE YOU DIG" AT 1-800-922-4455 TO VERIFY AND IDENTIFY THE EXACT LOCATIONS OF ALL UNDERGROUND UTILITIES AND OBSTRUCTIONS IDENTIFIED PRIOR TO COMMENCING WORK IN THE CONTRACT AREA.
17. DIMENSIONS OF EXISTING TOWER ARE BASED ON MANUFACTURER'S DRAWINGS PREPARED BY STAINLESS, INC., DATED MARCH 3, 1995, AND ARE NOT GUARANTEED. CONTRACTOR SHALL TAKE FIELD DIMENSIONS AS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THEIR ACCURACY. WHEN SHOP DRAWINGS BASED ON FIELD MEASUREMENT ARE SUBMITTED FOR REVIEW, DIMENSIONS ARE PROVIDED FOR THE ENGINEER'S REFERENCE ONLY.
18. TOWER INVENTORY IS BASED ON INFORMATION OBTAINED FROM D&K NATIONWIDE COMMUNICATIONS, INC., MARCH 30, 2016 AND BY CONNECTICUT STATE POLICE DATED APRIL 7, 2016.
19. CONTRACTOR TO VERIFY REQUIRED CLEARANCES INCLUDING BUT NOT LIMITED TO EXISTING BUILDINGS, EQUIPMENT PADS AND SHELTERS PRIOR TO COMMENCING WORK.
20. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION. NO MEMBER OF THE TOWER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY. THE CONTRACTOR SHALL BE AWARE OF WEATHER AND WIND CONDITIONS AND NOT PERFORM MEMBER REPLACEMENT IN UNFAVORABLE CONDITIONS.

STRUCTURAL NOTES

STRUCTURAL STEEL MATERIAL:

STRUCTURAL STEEL LEG:

LEG PIPES 0.400 THICK AND THICKER.....	A572-60 (60 KSI)
LEG PIPES 3/8" THICK AND THINNER.....	A572-50 (50 KSI)
EXISTING BEAMS, CHANNELS, PLATES, ANGLES.....	A36
REPLACEMENT ANGLES.....	A529 Gr 50 (50 KSI)
WELDED "T" BEAM.....	A992 (50 KSI)

STRUCTURAL STEEL SHALL CONFORM TO ALL THE REQUIREMENTS OF THE ASTM SPECIFICATION, AS REFERENCED IN THE CODE.

UNLESS OTHERWISE NOTED, ALL STEEL WILL BE GALVANIZED IN ACCORDANCE WITH ASTM 123 AFTER FABRICATION. TOUCH UP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCH-UP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.

SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL STEEL WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. SUBMIT 2 SETS OF PRINTS FOR THE ENGINEER REVIEW.

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

THE OMISSION OF ANY MATERIAL THAT WAS SHOWN ON THE CONTRACT DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF PROVIDING THE SAME.

CONNECTIONS / FIELD ASSEMBLY:

BOLTED CONNECTIONS: UNLESS OTHERWISE NOTED, ALL JOINTS ARE SLIP CRITICAL TYPE, REQUIRING 5/8", 3/4", 7/8", 1" DIA. A325-X & A490-X BOLTS, A563 NUTS AND F436 WASHERS, ALL GALVANIZED. BEVELED WASHERS SHALL BE USED ON BEAM FLANGES HAVING A SLOPE GREATER THAN 1:20.

STRUCTURE IS DESIGNED TO BE LEVEL AND PLUMB, SELF-SUPPORTING AND STABLE AFTER WORK IS COMPLETED.

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

ALL WELDING SHALL BE DONE BY A CERTIFIED WELDER IN ACCORDANCE WITH AWS STANDARDS, USING E70XX ELECTRODES UNLESS OTHERWISE NOTED. WHERE WELD SIZES ARE NOT SHOWN PROVIDE THE MINIMUM SIZES PER "PREQUALIFIED WELDED JOINTS" TABLES IN AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION.

INSPECTIONS:

SPECIAL INSPECTIONS ARE REQUIRED PER THE CODE FOR STRUCTURAL STEEL WORK.

PLEASE CONTACT AECOM @ 860-990-6767 FOR CONSTRUCTION PHASE SERVICES AND/OR SPECIAL INSPECTIONS.

AT&T, SPRINT, AND T-MOBILE WILL SUPPLY THE SERVICES OF THE REQUIRED SPECIAL INSPECTOR AND TESTING AGENTS AS REQUIRED. CONTRACTOR SHALL COORDINATE INSPECTIONS OF FABRICATOR'S AND ERECTOR'S WORK AND MATERIALS TO MEET THE REQUIREMENTS OF THE STATEMENT OF SPECIAL INSPECTIONS FOR THIS PROJECT.

COPIES OF TESTING AND INSPECTION REPORTS WILL BE PROVIDED TO AT&T, SPRINT, T-MOBILE, STATE BUILDING OFFICIAL, ENGINEER OF RECORD AND CONTRACTOR.



PROJECT NO.

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Drawn by: GAT

Checked by: KAB

Approved by: RAS

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1	3/1/2019	3RD PARTY UPDATES
REV.	DATE:	DESCRIPTION

Scale: AS NOTED Date: 08/14/18

Job No.

File No.

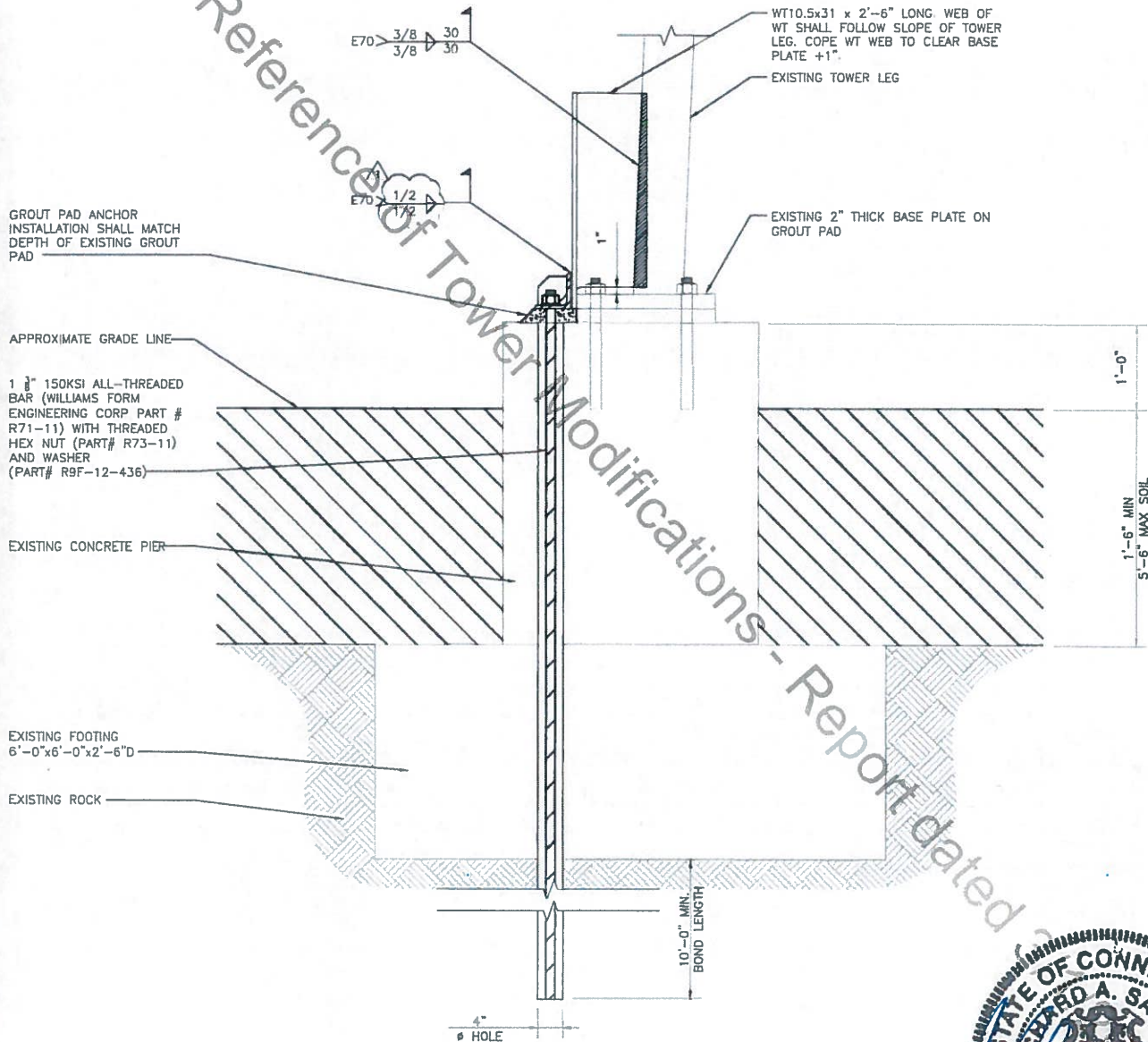
Dwg. No.

SK-1

Dwg. 1 of 5

NOTES:

1. ELEVATION OF EXISTING SOIL AND ROCK DETERMINED FROM GEOTECHNICAL REPORT DATED AUGUST 13, 2018.
2. PRODUCTS LISTED BY WILLIAMS FORM ENGINEERING CORP. ARE MINIMUM DESIGN REQUIREMENTS. CONTRACTOR MAY SUBSTITUTE MATERIALS THAT MEET OR EXCEED THESE LISTED PRODUCTS.
3. CONTRACTOR SHALL AVOID EXISTING PIER REINFORCING WHEN DRILLING 4" DIAMETER ROCK ANCHOR HOLE.
4. ROCK ANCHOR BAR IS NOT INTENDED TO BE PRE-STRESSED FOR THIS INSTALLATION. MINIMUM GROUT BOND LENGTH FOR ANCHOR SHALL BE NO LESS THAN 10 FEET INTO ROCK.
5. GROUT SHALL FILL DRILLED HOLE AND MUST SET PRIOR TO FURTHER ANCHORAGE INSTALLATION. GROUT MATERIAL CONSIDERED FOR DESIGN IS US SPEC RA GROUT SUPPLIED BY WILLIAMS FORM ENGINEERING CORP.
6. GROUT PAD EXTENSION SHALL CREATE LEVEL SURFACE AREA FOR ANCHOR TO BE INSTALLED.



1 ANCHOR ELEVATION @ LEGS A, B & C
SK-2 SCALE: 1/2"=1'-0" (EXISTING ROCK ANCHORS NOT SHOWN FOR CLARITY)



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Dwg. No.
SK-2
Dwg. 2 of 5

NOTES:

1. REFER TO STRUCTURAL NOTES ON SK-1 FOR STEEL GRADE REQUIREMENTS FOR REPLACEMENT MEMBERS.
2. CONTRACTOR SHALL FIELD VERIFY EXISTING TOWER INFORMATION AND ANGLE MEMBER ORIENTATION PRIOR TO ORDERING MATERIALS.
3. REINFORCEMENT OF TOWER IS REQUIRED FOR ALL 3 SIDES OF EXISTING TOWER STRUCTURE.
4. CONNECTION BOLTS FOR REPLACEMENT MEMBERS SHALL BE REPLACED IN KIND. EXISTING BOLTS SHALL NOT BE RE-USED FOR CONNECTING REPLACEMENT MEMBERS. THIS ALSO APPLIES TO EXISTING STITCH BOLTS FOR BACK-TO-BACK ANGLES. LOCATIONS OF EXISTING STITCH BOLTS SHALL BE FIELD VERIFIED PRIOR TO ORDERING OF MATERIALS.
5. CONTRACTOR SHALL VERIFY THE APPLICABILITY OF INSTALLING A 7/8" DIA BOLT AT THE INDICATED TOWER LEG FLANGE CONNECTION. CONTRACTOR SHALL OBTAIN PRIOR APPROVAL FROM THE CONNECTICUT STATE POLICE IF THE EXISTING FLANGE BOLT HOLES NEED TO BE INCREASED VIA DRILLING OR OTHER METHODS OF CONSTRUCTION.
5. BACK-TO-BACK ANGLES WITHIN ELEVATION REGION 0'-25' SHALL INCLUDE ADDITIONAL STITCH BOLTS. REFER TO SHEET SK-4A FOR CONNECTION DETAILS.

REPLACE EXISTING DIAGONAL
(2)L2-1/2x2x3/16 (LLBB) WITH
(2)L2-1/2x2-1/2x1/4 @ ELEVATION RANGE 83.4'-100'

REPLACE EXISTING DIAGONAL
(2)L3x2-1/2x1/4 (LLBB) WITH
(2)L3x3x5/16 @ ELEVATION RANGE 50'-75'

REPLACE EXISTING (6) 3/4" DIA A325X BOLTS WITH (6) 7/8" A490X BOLTS AT LEG FLANGE CONNECTION (ELEVATION 50') SEE NOTE 5.

REPLACE EXISTING DIAGONAL
(2)L3x2-1/2x1/4 (LLBB) WITH
(2)L3x3x3/8 @ ELEVATION RANGE 25'-50'

REPLACE EXISTING HORIZONTAL
L4x4x1/4 WITH L4x4x3/8 @ ELEVATION 12.5'

REPLACE (2) EXISTING HORIZONTAL
ANGLE CONNECTION BOLTS 5/8" DIA
A325X WITH 5/8" DIA A490X BOLTS
AT ELEVATION 12.5'

REPLACE EXISTING DIAGONAL
(2)L3-1/2x3x5/16 (LLBB) WITH
(2)L3-1/2x3-1/2x3/8 @ ELEVATION RANGE 0'-25'

REFER TO NOTE 5 FOR CONNECTION
DETAILS.

EL 120'-0"

EL 100'-0"

EL 83'-4"

EL 75'-0"

EL 50'-0"

EL 25'-0"

EL 0'-0"

REPLACE EXISTING HORIZONTAL
(TOP-GIRT) L3x3x1/4 WITH
L3x3x5/16 @ ELEVATION 75'

REPLACE EXISTING HORIZONTAL
L3x3x1/4 WITH L3-1/2x3-1/2x1/4
@ ELEVATION 58.3 & 66.7'

REPLACE EXISTING HORIZONTAL
(TOP-GIRT) L3x3x1/4 WITH
L3-1/2x3-1/2x5/16 @ ELEVATION 50'

REPLACE EXISTING HORIZONTAL
L3x3x1/2 WITH L4x4x5/16 @
ELEVATION 33.3 & 41.7'

REPLACE EXISTING HORIZONTAL
(TOP-GIRT) L4x4x1/4 WITH
L4x4x3/8 @ ELEVATION 25'

INSTALL REDUNDANT HORIZONTAL
AND DIAGONAL L2-1/2x2-1/2x3/8
ANGLES @ ELEVATION RANGE
0'-50'. REFER TO SK-5 FOR
CONNECTION DETAILS

1 TOWER ELEVATION
SK-4 SCALE: 1" = 30'-0"

NOTES:
REFER TO SK-1 STRUCTURAL NOTES FOR MORE INFORMATION



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Dwg. No.
SK-4

NOTES:

1. REFER TO STRUCTURAL NOTES ON SK-1 FOR STEEL GRADE REQUIREMENTS FOR REPLACEMENT MEMBERS.
2. DIMENSIONS SHOWN ARE ASSUMED LENGTHS AND SHALL BE FIELD VERIFIED FOR LOCATIONS FROM ENDS PRIOR TO ORDERING MATERIALS FOR INSTALLATION.
3. CONNECTION PLATES BETWEEN BACK-TO-BACK PLATES FOR PROPOSED LOCATIONS SHALL MATCH EXISTING SPACER PLATE DIMENSIONS AND APPLY SOKSI STEEL PLATE MATERIALS, UNLESS INDICATED OTHERWISE.
4. REFER TO SK-4 FOR MATERIAL DETAILS NOT INDICATED ON THIS SHEET.
5. DETAILS FOR ADDITIONAL STITCH BOLTS APPLY TO ALL (MAIN) DIAGONAL MEMBERS WITHIN THE 0'-25' REGION.

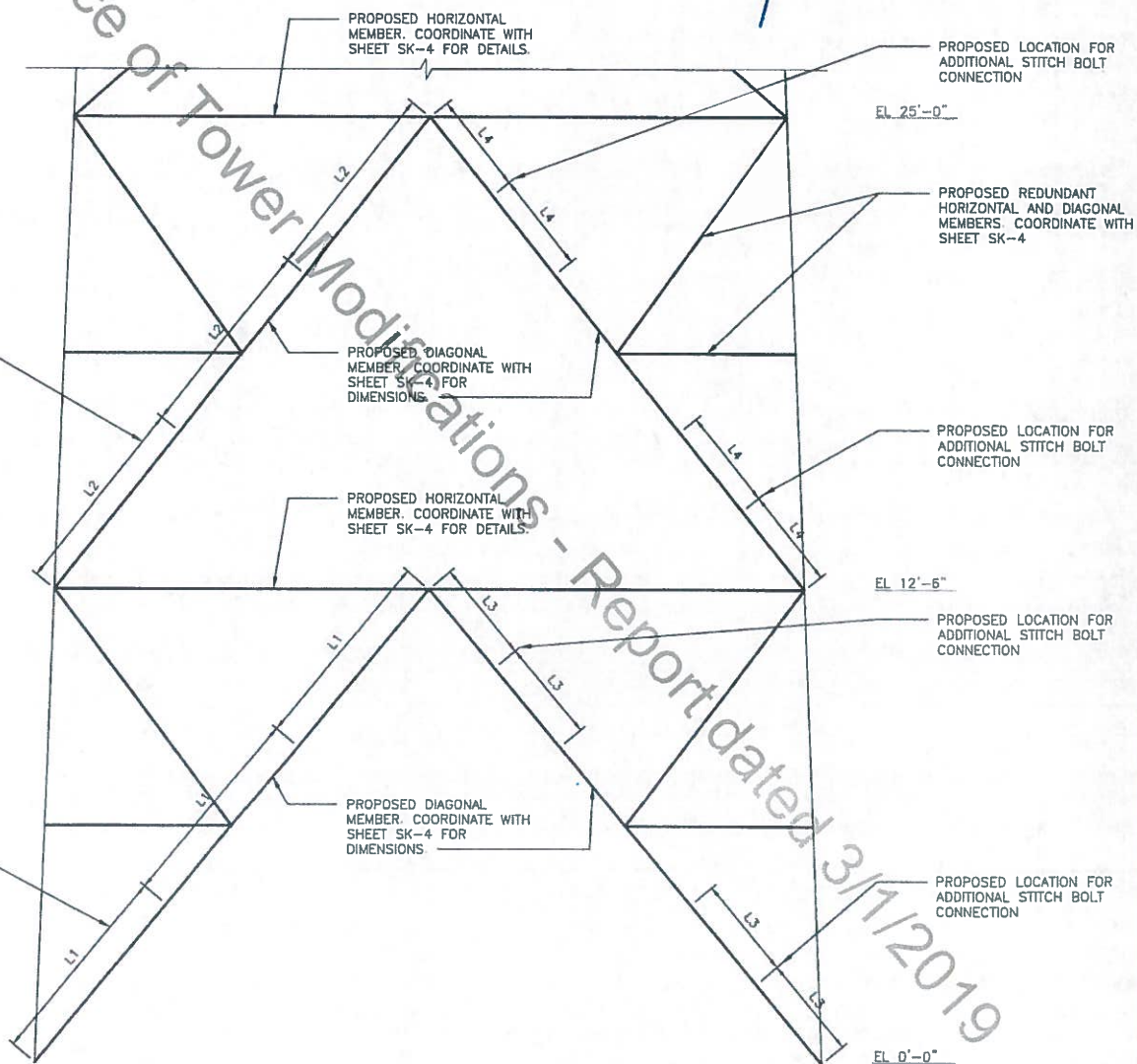
NOTE:

LENGTH OF L2 AND L4 ARE INTENDED AS APPROXIMATELY HALF THE LENGTH OF L1 AND L3 (RESPECTIVELY) SHOWN BELOW. CONTRACTOR SHALL FIELD VERIFY INSTALLATION OF PROPOSED LOCATIONS INDICATED ON THIS SHEET.



STITCH BOLTS
(ASSUMED
EQUIDISTANT) FROM
CENTER OF BOLT, TO
BE FIELD VERIFIED

STITCH BOLTS
(ASSUMED
EQUIDISTANT) FROM
CENTER OF BOLT, TO
BE FIELD VERIFIED



1 TOWER ELEVATION (ELEVATION 0'-25' REGION)
SK-4A SCALE: 1" = 5'-0"

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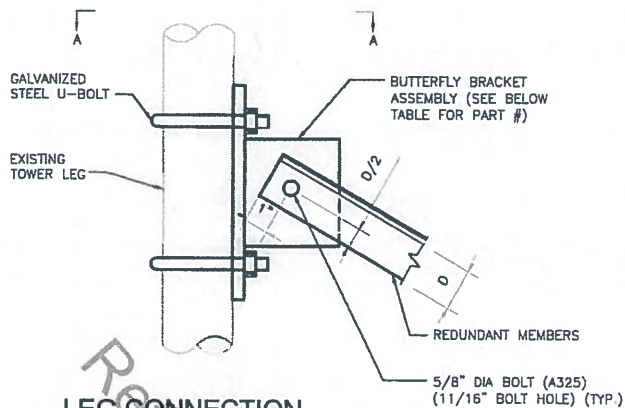
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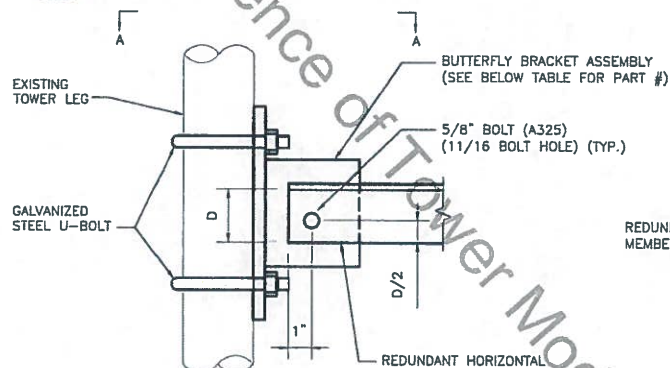
Dwg. No.

SK-4A

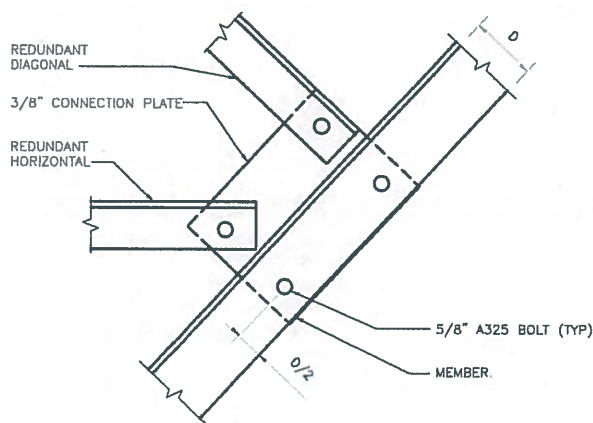
Dwg. 4A of 5



3
SK-5
LEG CONNECTION REDUNDANT DIAGONAL
SCALE: 1-1/2\"=1'-0\"



2
SK-5
LEG CONNECTION REDUNDANT HORIZONTAL
SCALE: 1-1/2\"=1'-0\"

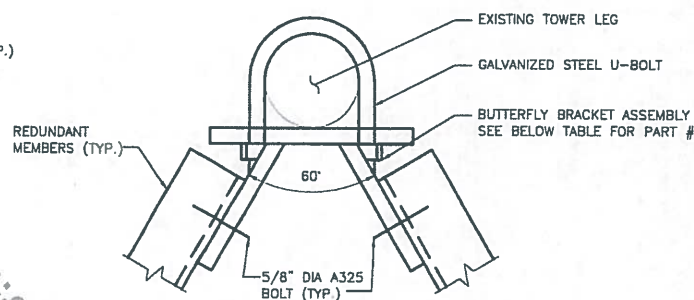


1
SK-5
REDUNDANT MEMBER CONNECTION
SCALE: 1-1/2\"=1'-0\"

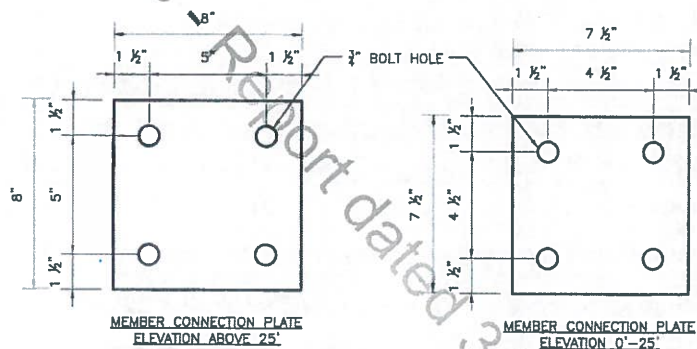
ELEVATION	LEG BUTTERFLY BRACKET #
0'-25'	RSH-0568-86
25'-50'	RSH-0545-68

NOTE: LEG BUTTERFLY BRACKET ASSEMBLY INFORMATION BASED PRIMUS ELECTRONICS CORPORATION. CONTRACTOR SHALL USE PRODUCTS SIMILAR TO OR EXCEEDING IN QUALITY FOR CONSTRUCTION.

- NOTES:**
1. REFER TO SK-1 FOR STRUCTURAL NOTES. COORDINATE SHEET WITH SK-4 FOR SECONDARY HORIZONTAL/DIAGONAL CONNECTION MEMBERS.
 2. CONTRACTOR SHALL FIELD VERIFY DIMENSIONS SHOWN PRIOR TO ORDERING MATERIALS.
 3. DIMENSIONS NOTED AS 'D' (DEPTH) VARY REFER TO SK-4 FOR MEMBER SIZE REQUIREMENTS.



5
SK-5
SECTION A
SCALE: N.T.S.



4
SK-5
CONNECTION PLATES
SCALE: 1-1/2\"=1'-0\"

- NOTE:**
1. DETAILS 2 & 3 ABOVE ILLUSTRATE CONNECTIONS OF DIAGONAL AND HORIZONTAL MEMBERS TO TOWER LEGS. BUTTERFLY BRACKET ASSEMBLIES USED FOR CONNECTION TO EXISTING LEGS SHALL BE INSTALLED AS CLOSE TO EXISTING ADJOINING MEMBER AS POSSIBLE.

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SK-5

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of \$6 billion.

More information on AECOM and its services can be found at www.aecom.com.

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**Smartlink on behalf of
AT&T Mobility, LLC
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USID – 61157
Site ID – CT2013
(MRCTB034929/MRCTB035008/MR
CTB034946/MRCTB034915/MRCTB
034921)
Site Name – NEW HAVEN WEST
ROCK**

**142 BALDWIN DRIVE
NEW HAVEN, CT 06514**

Latitude: N41-20-43.57
Longitude: W72-58-14.49
Structure Type: Self-Support

Report generated date: June 25, 2019
Report by: Zyotty Thamsil
Customer Contact: David Barbagallo

**AT&T Mobility, LLC will be compliant when the
remediation recommended in Section 5.2 or
other appropriate remediation is implemented.**

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1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Max Cumulative Simulated RFE Level on the Ground	<1% General Public Limit
Compliant per FCC Rules and Regulations?	Will Be Compliant
Compliant per AT&T Mobility, LLC's Policy?	No

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CTL02013_2019-LTE-Next-Carrier_LTE_rx855w_2051A0KGAX_10035296_61157_10-01-2018_As-Built-In-Progress_v5.00

CD's: 10035296_AE201_190516_CTL02013_REV2

RF Powers Used: Max RRH Power

1.2 Fall Arrest Anchor Point Summary

Fall Arrest Anchor & Parapet Info	Parapet Available (Y/N)	Parapet Height (inches)	Fall Arrest Anchor Available (Y/N)
Roof Safety Info	N	N/A	N

1.3 Signage Summary

a. Pre-Site Visit AT&T Signage (Existing Signage)

AT&T Signage Locations									
	Information 1	Information 2	Notice	Notice 2	Caution	Caution 2	Warning	Warning 2	Barriers
Access Point(s)									
Alpha									
Beta									
Gamma									
Delta									
Epsilon									

b. Proposed AT&T Signage

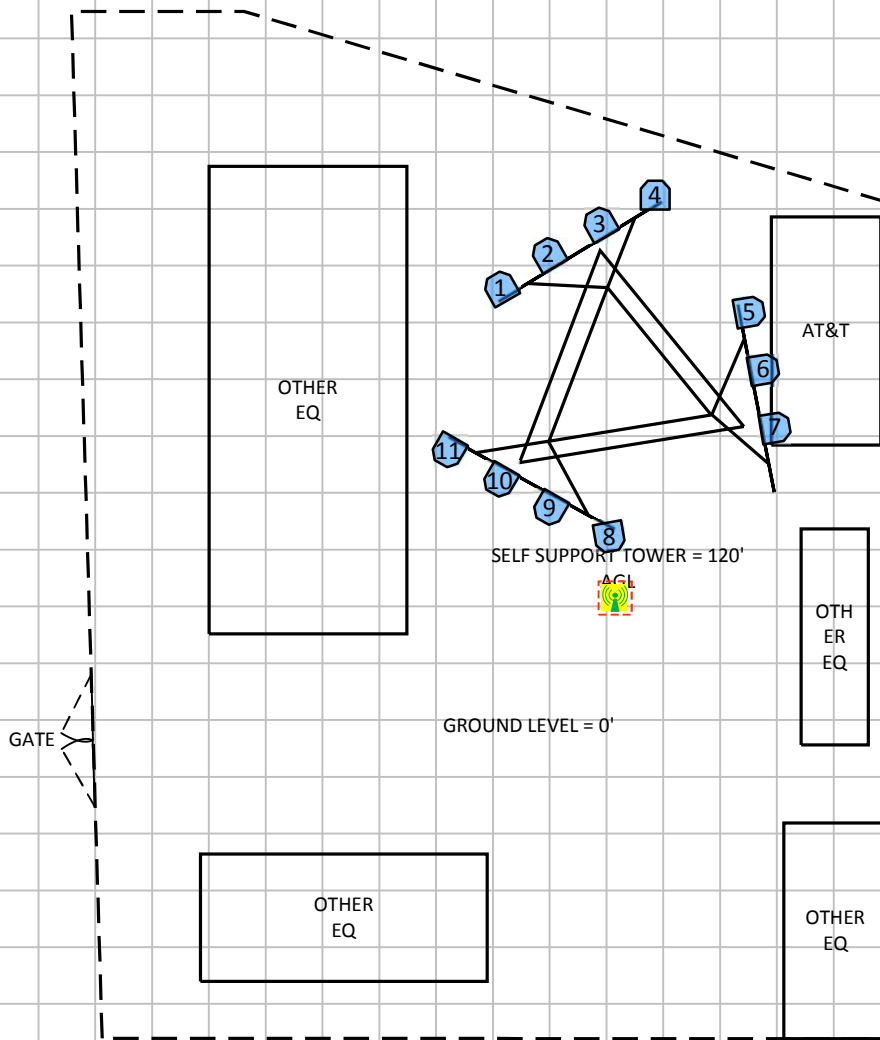
AT&T Signage Locations									
	Information 1	Information 2	Notice	Notice 2	Caution	Caution 2	Warning	Warning 2	Barriers
Access Point(s)						1			
Alpha									
Beta									
Gamma									
Delta									
Epsilon									

2 Scale Maps of Site

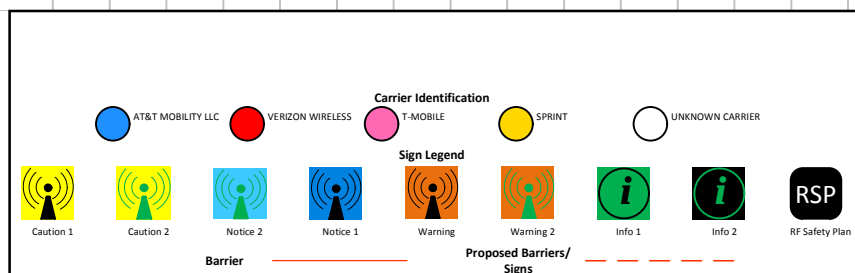
The following diagrams are included:

-) Site Scale Map
-) RF Exposure Diagram
-) RF Exposure Diagram – Elevation View

Site Scale Map For: NEW HAVEN WEST ROCK



(Feet)
 0 8.5 16.9
 www.sitesafe.com
 Site Name: NEW HAVEN WEST ROCK
 6/25/2019 7:45:00 PM



3 Antenna Inventory

The following antenna inventory was obtained by the customer and was utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Misc Loss	TX Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
1	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	722	LTE	10	61.9	8	80	TPO	Watt	0	1	1815.9	13.56	76'	0°	6°
1	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	1900	LTE	10	68.2	8	160	TPO	Watt	0	1	3891.5	13.86	76'	0°	7°
1	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2100	LTE	10	65.2	8	160	TPO	Watt	0	1	3982.2	13.96	76'	0°	7°
2	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	763	LTE	10	67.9	8	160	TPO	Watt	0	1	3623.4	13.55	76'	0°	6°
3	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10966	Panel	737	LTE	10	67.9	8	160	TPO	Watt	0	1	3623.4	13.55	76'	0°	6°
3	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10966	Panel	850	LTE	10	66	8	80	TPO	Watt	0	1	2128.6	14.25	76'	0°	6°
3	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	2300	LTE	10	59.7	8	100	TPO	Watt	0	1	3935.5	15.95	76'	0°	3°
3	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10966	Panel	5G 850	LTE	10	66	8	80	TPO	Watt	0	1	2128.6	14.25	76'	0°	6°
4	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	850	UMTS	40	67	8	40	TPO	Watt	0	1	974.7	13.868	76'	0°	0°
5	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	722	LTE	120	61.9	8	80	TPO	Watt	0	1	1815.9	13.56	76'	0°	6°
5	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	1900	LTE	120	68.2	8	160	TPO	Watt	0	1	3891.5	13.86	76'	0°	7°
5	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas TPA-65R-LCUUUU-H8	Panel	2100	LTE	120	65.2	8	160	TPO	Watt	0	1	3982.2	13.96	76'	0°	7°
6	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	763	LTE	120	67.9	8	160	TPO	Watt	0	1	3623.4	13.55	76'	0°	6°
7	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10966	Panel	737	LTE	120	67.9	8	160	TPO	Watt	0	1	3623.4	13.55	76'	0°	6°
7	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10966	Panel	850	LTE	120	66	8	80	TPO	Watt	0	1	2128.6	14.25	76'	0°	6°
7	AT&T MOBILITY LLC	Kathrein-Scala 800-10966	Panel	2300	LTE	120	59.7	8	100	TPO	Watt	0	1	3935.5	15.95	76'	0°	3°
7	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10966	Panel	5G 850	LTE	120	66	8	80	TPO	Watt	0	1	2128.6	14.25	76'	0°	6°
8	AT&T MOBILITY LLC	Andrew SBNH-1D6565C	Panel	850	UMTS	210	67	8	40	TPO	Watt	0	1	974.7	13.868	76'	0°	0°
9	AT&T MOBILITY LLC	Quintel QS66512-2	Panel	2100	LTE	250	57	6	160	TPO	Watt	0	1	4787.6	14.76	77'	0°	2°

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Technology	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Power	Power Type	Power Unit	Misc Loss	TX Count	Total ERP (Watts)	Ant Gain (dBd)	Z (AGL)	MDT	EDT
	(PROPOSED)																	
9	AT&T MOBILITY LLC (PROPOSED)	Quintel QS66512-2	Panel	722	LTE	250	69	6	80	TPO	Watt	0	1	1119.7	11.46	77'	0°	7°
9	AT&T MOBILITY LLC (PROPOSED)	Quintel QS66512-2	Panel	1900	LTE	250	68	6	160	TPO	Watt	0	1	4169.8	14.16	77'	0°	2°
10	AT&T MOBILITY LLC	Kathrein-Scala 800-10965	Panel	763	LTE	250	63.9	6.6	160	TPO	Watt	0	1	2845.2	12.5	76.7'	0°	7°
11	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10965	Panel	850	LTE	250	61.7	6.6	80	TPO	Watt	0	1	1841.2	13.62	76.7'	0°	7°
11	AT&T MOBILITY LLC	Kathrein-Scala 800-10965	Panel	2300	LTE	250	59.1	6.6	100	TPO	Watt	0	1	3655.9	15.63	76.7'	0°	3°
11	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10965	Panel	5G 850	LTE	250	61.7	6.6	80	TPO	Watt	0	1	1841.2	13.62	76.7'	0°	7°
11	AT&T MOBILITY LLC (PROPOSED)	Kathrein-Scala 800-10965	Panel	737	LTE	250	63.9	6.6	160	TPO	Watt	0	1	2845.2	12.5	76.7'	0°	7°

Note: The Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

Note: The 722, 1900 and 2100 MHz LTE technology is being added to an existing antenna.

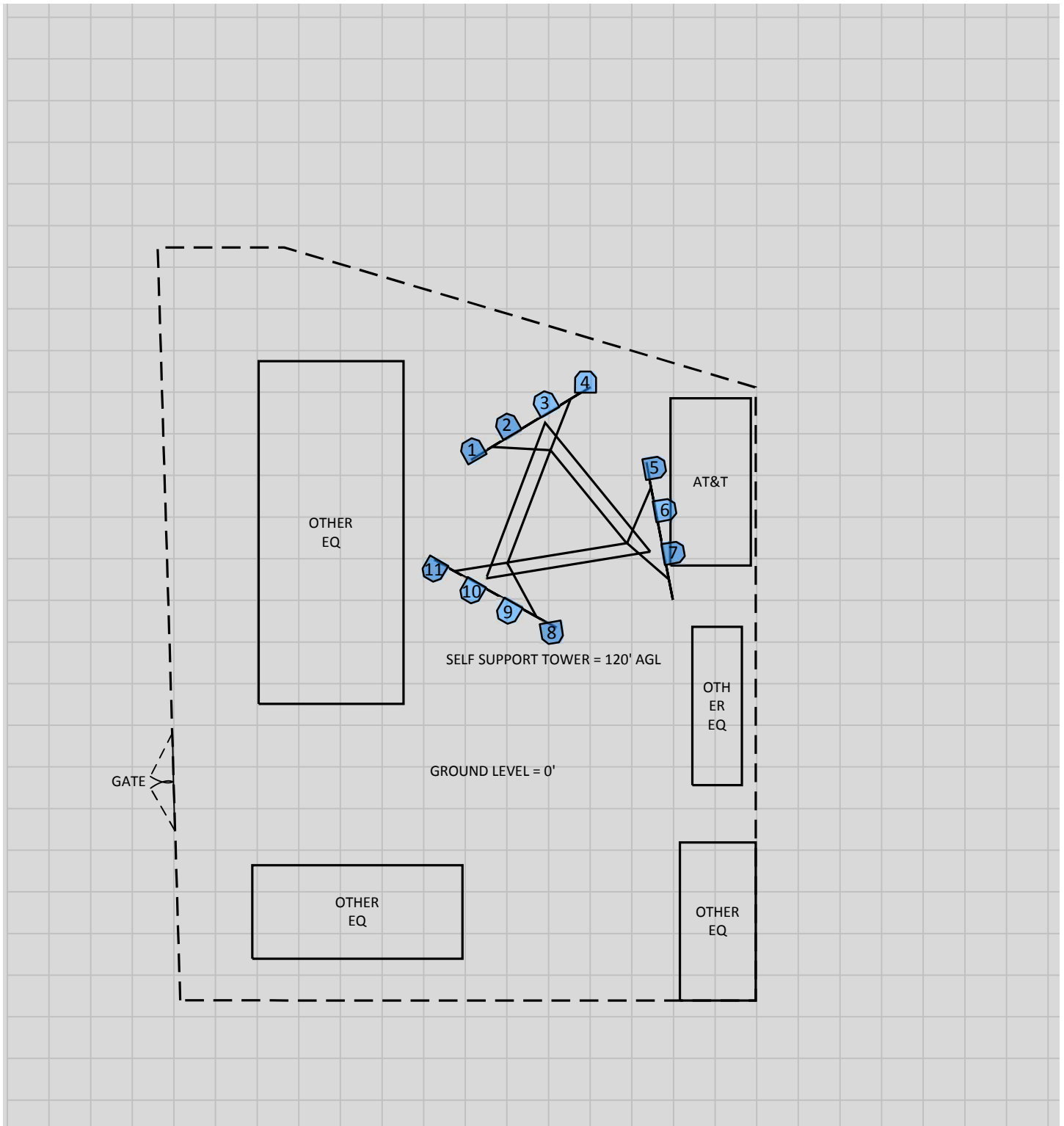
4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas. The total analyzed elevations in the below RF Exposure Simulations are listed below.

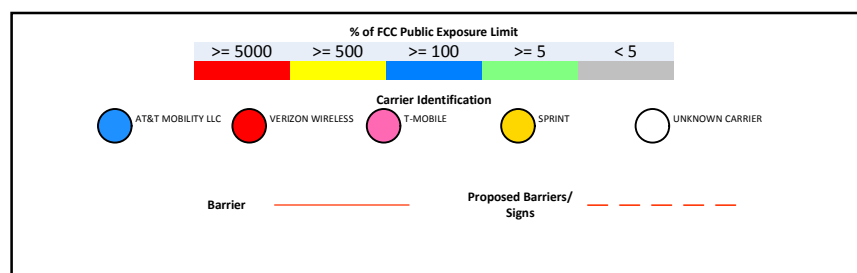
) Ground Level = 0'

The Antenna Inventory heights are referenced to the same level.

RF Exposure Simulation For: NEW HAVEN WEST ROCK



% of FCC Public Exposure Limit
Spatial average 0' - 6'



(Feet)

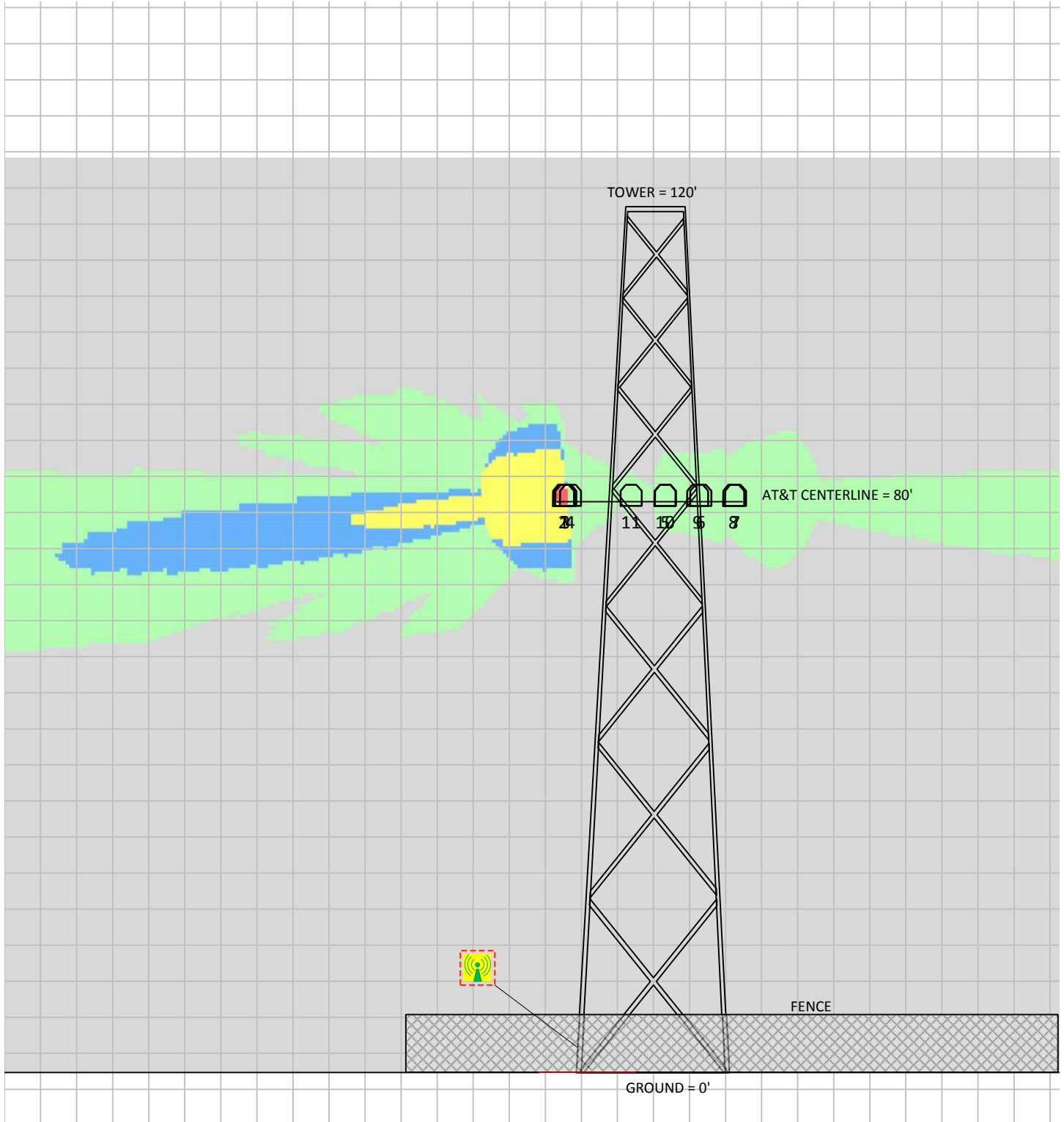
0 9 18

www.sitesafe.com
Site Name: NEW HAVEN WEST ROCK
6/25/2019 7:40:38 PM

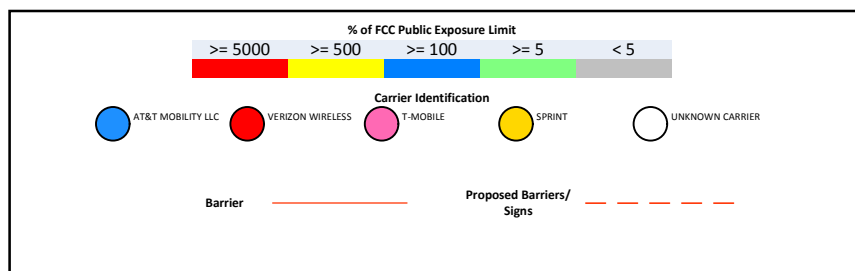
Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: NEW HAVEN WEST ROCK

Elevation View



% of FCC Public Exposure Limit



(Feet)

0 10 20

www.sitesafe.com
Site Name: NEW HAVEN WEST ROCK
6/25/2019 7:47:46 PM

Sitesafe OET-65 Model
Near Field Boundary:
1.5 * Aperture
Reflection Factor: 1
Single Level (0)

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Tower Access Location

- (1) Yellow Caution 2B sign(s) required on the access peg(s).

Notes:

-) Data concerning all other carriers on site was unavailable and therefore not included in this report.
-) Signage may already be in place. Sitesafe does not have record of any existing signage because there were no previous visits or data supplied regarding them. All remediation is based on a worst-case scenario.
-) Any existing signage that conflicts with the proposed signage in this report should be removed per AT&T Signage Posting Rules.

6 Reviewer Certification

The reviewer whose signature appears below hereby certifies and affirms:

That I am an employee of Site Safe, LLC, in Vienna, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Zyotty Thamsil.

June 25, 2019

Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communications Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

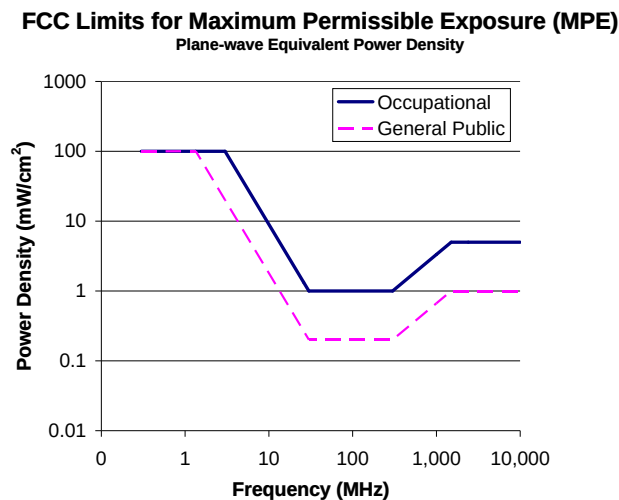
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



Limits for Occupational/Controlled Exposure (MPE)

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

Limits for General Population/Uncontrolled Exposure (MPE)

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

f = frequency in MHz

*Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

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

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

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lockout/Tagout procedure aimed to control the unexpected energization or startup of machines when maintenance or service is being performed.

Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a worker's understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet-based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

-) Locked door or gate
-) Alarmed door
-) Locked ladder access
-) Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst-case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- J Areas indicated as Gray are predicted to be below 5% of the MPE limits. Gray represents areas more than 20 times below the most conservative exposure limit. **Gray areas are accessible to anyone.**
- J Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone.**
- J Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers.**
- J Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels.**
- J Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

If trained occupational personnel require access to areas that are delineated as above 100% of the limit, Sitesafe recommends that they utilize the proper personal protection equipment (RF monitors), coordinate with the carriers to reduce or shutdown power, or make real-time power density measurements with the appropriate power density meter to determine real-time MPE levels. This will allow the personnel to ensure that their work area is within exposure limits.

Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

Appendix F – Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible for taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site complies with FCC standards with regards to Human Exposure to Radio Frequency Electromagnetic Fields from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to a half-wave dipole antenna.

Gain (of an antenna) – The ratio of the maximum power in a given direction to the maximum power in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antenna as compared to an omnidirectional antenna.

General Population/Uncontrolled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are **unaware** of the potential for exposure and who have no control over their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of “Generic” as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use its industry specific knowledge of antenna models to select a worst-case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC as an area where RF exposure may occur to persons who are **aware** of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of RF exposure on humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency Exposure or Electromagnetic Fields – Electromagnetic waves that are propagated from antennas through space.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy a 6-foot tall human body will absorb while present in an electromagnetic field of energy.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

Appendix G – References

The following references can be followed for further information about RF Health and Safety.

Site Safe, LLC

<http://www.sitesafe.com>

FCC Radio Frequency Safety

<http://www.fcc.gov/encyclopedia/radio-frequency-safety>

National Council on Radiation Protection and Measurements (NCRP)

<http://www.ncrponline.org>

Institute of Electrical and Electronics Engineers, Inc., (IEEE)

<http://www.ieee.org>

American National Standards Institute (ANSI)

<http://www.ansi.org>

Environmental Protection Agency (EPA)

<http://www.epa.gov/radtown/wireless-tech.html>

National Institutes of Health (NIH)

<http://www.niehs.nih.gov/health/topics/agents/emf/>

Occupational Safety and Health Agency (OSHA)

<http://www.osha.gov/SLTC/radiofrequencyradiation/>

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

<http://www.icnirp.org>

World Health Organization (WHO)

<http://www.who.int/peh-emf/en/>

National Cancer Institute

<http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones>

American Cancer Society (ACS)

http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?sitearea=PED

European Commission Scientific Committee on Emerging and Newly Identified Health Risks

http://ec.europa.eu/health/ph_risk/committees/04_scenihp/docs/scenihp_o_022.pdf

Fairfax County, Virginia Public School Survey

<http://www.fcps.edu/fts/safety-security/RFEESurvey/>

UK Health Protection Agency Advisory Group on Non-Ionizing Radiation

http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368

Norwegian Institute of Public Health

<http://www.fhi.no/dokumenter/545eea7147.pdf>

142 Baldwin Drive CT State Police Tower

Write a description for your map.

Legend

-  Untitled Placemark
-  West Rock Nature Center

 142 Baldwin Drive

Baldwin Dr 

400 ft

Google Earth

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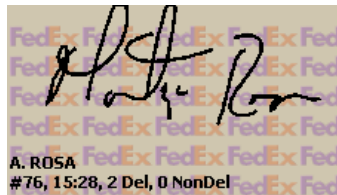


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KENSINGTON, CT US 06037
860 681-7708

TO

City of New Haven
Toni Harp
New Haven, CT US 06510
203 946-8200

Shipment Facts

TRACKING NUMBER

775623165174

DIMENSIONS

13x9x1 in.

TERMS

Shipper

SHIP DATE

Fri 7/05/2019

SERVICE

FedEx Ground

DELIVERY ATTEMPTS

1

PACKAGING

Package

ACTUAL DELIVERY

Mon 7/08/2019 3:29 pm

WEIGHT

1 lbs / 0.45 kgs

TOTAL PIECES

1

STANDARD TRANSIT

7/08/2019

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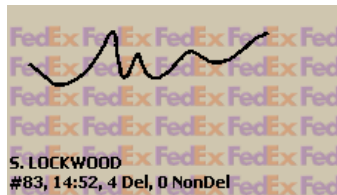
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TO

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Brian Benito
Middletown, CT US 06457
860 212-4407

Shipment Facts

TRACKING NUMBER

775624168191

SERVICE

FedEx Ground

WEIGHT

1 lbs / 0.45 kgs

DELIVERY ATTEMPTS

1

TOTAL PIECES

1

TERMS

Shipper

PACKAGING

Package

STANDARD TRANSIT

 7/08/2019

SHIP DATE

 Fri 7/05/2019

ACTUAL DELIVERY

Sat 7/06/2019 2:53 pm

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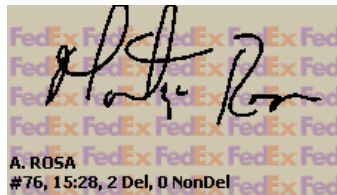


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New Haven, CT US 06510
203 946-4800

Shipment Facts

TRACKING NUMBER

775623232212

SERVICE

FedEx Ground

WEIGHT

1 lbs / 0.45 kgs

DELIVERY ATTEMPTS

1

TOTAL PIECES

1

TERMS

Shipper

PACKAGING

Package

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