Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

July 20, 2016

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

Tower Share Application
160 Witch Meadow Road
Salem, CT 06420
N 41.63009457
W -73.05609390

Dear Ms. Bachman,

This letter and attachments are submitted on behalf of T-Mobile Northeast LLC ("T-Mobile"). T-Mobile plans to install antennas and related equipment at the SBA site located at 160 Witch Meadow Road, Salem, CT 06420.

T-Mobile will install six (6) 700/1900 MHz antennas and nine (9) RRHs at the 175' level of the existing 195' monopole. One (1) hybrid cable will also be installed inside the existing monopole. T-Mobile's equipment cabinets will be placed within a 7' X 15' lease area on a 6' X 11' concrete pad within the existing fenced equipment compound. Included are plans prepared by Hudson Design Group dated June 10, 2016, depicting the planned changes and attached as **Exhibit A**. Also included is a structural analysis prepared by Tower Engineering Solutions, dated June 10, 2016, confirming that the existing tower is structurally capable of supporting T-Mobile's equipment and attached as **Exhibit B**.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies 16-50aa, of T-Mobile's intent to share a telecommunications facility pursuant to R.C.S.A. 16-50j-88. In accordance with R.C.S.A., a copy of this letter is being sent to Kevin T. Lyden, First Selectman for the Town of Salem, Renz Construction Corporation the property owner, as well as SBA the tower owner. Please see the attached letter from SBA authorizing the proposed shared use of the facility attached as **Exhibit C**.

The planned modifications of the facility fall squarely within those activities explicitly provided for in R.C.S.A. 16-50j-89.

1. The proposed modifications will not result in an increase in the height of the existing structure. The top of the monopole is approximately 195'; T-Mobile's proposed antennas will be located at a center line height of 175'.

2. The proposed modifications will not require the extension of the site boundary as depicted on the attached site plan. T-Mobile's equipment will be located entirely within the existing compound area.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria. The incremental effect of the proposed changes will be negligible.

4. The operation of the proposed antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard. As indicated in the attached power density calculations, the combined site operations will result in a total power density of 2.40% as evidenced by the power density calculations attached as **Exhibit D**.

Connecticut General Statutes 16-50aa indicates that the Council must approve the shared use of a telecommunications facility provided it finds the shared use is technically, legally, environmentally, and economically feasible and meets public safety concerns. As demonstrated in this letter, T-Mobile respectfully submits that the shared use of this facility satisfies these criteria.

A. Technical Feasibility. The existing monopole has been deemed structurally capable of supporting T-Mobile's proposed loading. The structural analysis is included as Exhibit B.
B. Legal Feasibility. As referenced above, C.G.S. 16-50aa has been authorized to issue orders approving the shared use of an existing tower such as this monopole in Salem. Under the authority granted to the Council, an order of the Council approving the requested shared use would permit T-Mobile to obtain a building permit for the proposed installation. Further, a Letter of Authorization from the owner is included as Exhibit C, authorizing T-Mobile to file this application for shared use.
C. Environmental Feasibility. The proposed shared use of this facility would have a minimal environmental effect. The installation of T-Mobile's equipment at the 175' level of the existing 195' monopole would have an insignificant visual impact on the area around the tower. T-Mobile's ground equipment would be installed within the existing facility compound. T-Mobile's shared use would therefore not cause any significant alteration in the physical or environmental characteristics of the existing site. Additionally, as evidenced by Exhibit D, the proposed antennas will not increase radio frequency emissions to a level at or above the Federal Communications Commission safety standard.
D. Economic Feasibility. T-Mobile will be entering into an agreement with the owner of this facility to mutually agreeable terms. As previously mentioned, the Letter of Authorization has been provided by the owner to assist T-Mobile with this tower sharing application.
E. Public Safety Concerns. As discussed above, the monopole is structurally capable of supporting T-Mobile's proposed loading. T-Mobile is not aware of any public safety concerns relative to the proposed sharing of the existing monopole. T-Mobile's intentions of providing new and improved wireless service through the shared use of this facility is expected to enhance the safety and welfare of local residents and individuals traveling through Salem.

Sincerely,

Gregg Shappy

Gregg Shappy
Transcend Wireless

10 Industrial Ave., Suite 3
Mahwah, New Jersey
gshappy@transcendwireless.com
845-553-2045

cc: Kevin T. Lyden – Town of Salem, First Selectman
Michael Villa - SBA
Renz Construction Corporation (property owner)

SITE NUMBER: CTHA101F

160 WITCH MEADOW ROAD
SALEM, CT 06420
NEW LONDON COUNTY

SITE NAME: CTHA101F

RF DESIGN GUIDELINE: 707C

T-MOBILE TECHNICIAN SITE SAFETY NOTES	
LOCATION	SPECIAL RESTRICTIONS
SECTOR A: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
SECTOR B: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
SECTOR C: ANTENNA/TMA/RRH	ACCESS NOT PERMITTED
GPS/LMU:	RESTRICTED CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

GENERAL NOTES

THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF T-MOBILE. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.

THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE T-MOBILE NORTHEAST, LLC REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SPECIAL STRUCTURAL NOTES

TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.

STRUCTURAL DESIGNS AND DETAILS FOR ANTENNA MOUNTS COMPLETED BY HUDSON DESIGN ON BEHALF OF T-MOBILE ARE INCLUSIVE OF THE ENTIRE ANTENNA SUPPORT STRUCTURE (GLOBAL STRUCTURAL STABILITY ANALYSIS BY OTHERS), EXISTING TOWER PLATFORM, EXISTING ANTENNA MOUNTS AND ALL OTHER ASPECTS OF THE STRUCTURE THAT WILL SUPPORT THE T-MOBILE MODERNIZATION EQUIPMENT DEPLOYMENT AS DEPICTED HEREIN.

HUDSON DESIGN ASSUMES THAT THE TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES

PROJECT SUMMARY

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT INSTALLATION
ZONING JURISDICTION: (TOWN OF SALEM)	BASED ON INFORMATION PROVIDED BY T-MOBILE, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW).
SITE ADDRESS:	160 WITCH MEADOW ROAD SALEM, CT 06420
LATITUDE:	41° 30' 10.19" N
LONGITUDE:	72° 17' 49.56" W
JURISDICTION:	NATIONAL, STATE & LOCAL CODES OR ORDINANCES
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
TOWER OWNER:	SBA COMMUNICATIONS CORPORATION 8051 CONGRESS AVENUE BOCA RATON, FL 33487
SBA SITE ID:	CT01916-S

APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE

DRIVING DIRECTIONS:

HEAD NORTHEAST ON GRIFFIN RD S AND TURN RIGHT ONTO DAY HILL RD. USE THE RAMP TO MERGE ONTO I-91 S. CONTINUE ON I-91 S AND USE THE LEFT LANE TO TAKE EXIT 30 FOR I-84 E TOWARD CT-2 E HARTFORD/NEW LONDON. MERGE ONTO I-84 E. TAKE EXIT 55 FOR CT-2 E. CONTINUE ONTO CT-2 E. KEEP RIGHT AT THE FORK AND CONTINUE ONTO CT-11 S. TAKE EXIT 5 FOR WITCH MEADOW RD. TURN LEFT ONTO WITCH MEADOW RD. DESTINATION WILL BE ON THE LEFT.

ARRIVE AT 160 WITCH MEADOW ROAD SALEM, CT 06420

CALL BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455 OR DIAL 811
UNDERGROUND SERVICE ALERT

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
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A-2	TOWER EQUIPMENT DETAILS	0
A-3	GROUND EQUIPMENT DETAILS	0
E-1	ELECTRICAL DETAILS & NOTES	0
G-1	GROUNDING SCHEMATIC & RISER DIAGRAM	0
G-2	GROUNDING DETAILS & NOTES	0

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

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TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

Hudson Design Groupllc

1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

CHECKED BY: DR

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	06/10/16	ISSUED FOR REVIEW	VP

SITE NUMBER:
CTHA101F
SBA SITE ID:
CT01916-S
SITE NAME:
CTHA101F
SITE ADDRESS:
160 WITCH MEADOW ROAD
SALEM, CT 06420
NEW LONDON COUNTY

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – TRANSCEND WIRELESS
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T-MOBILE

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
    BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT, + 2009 & 2013 CT AMENDMENTS
    ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
    LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

    SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

    AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

    MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

    EQUIPMENT AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

T-MOBILE NORTHEAST LLC
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Hudson Design Groupe LLC
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N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

CHECKED BY: DR

APPROVED BY: DJC

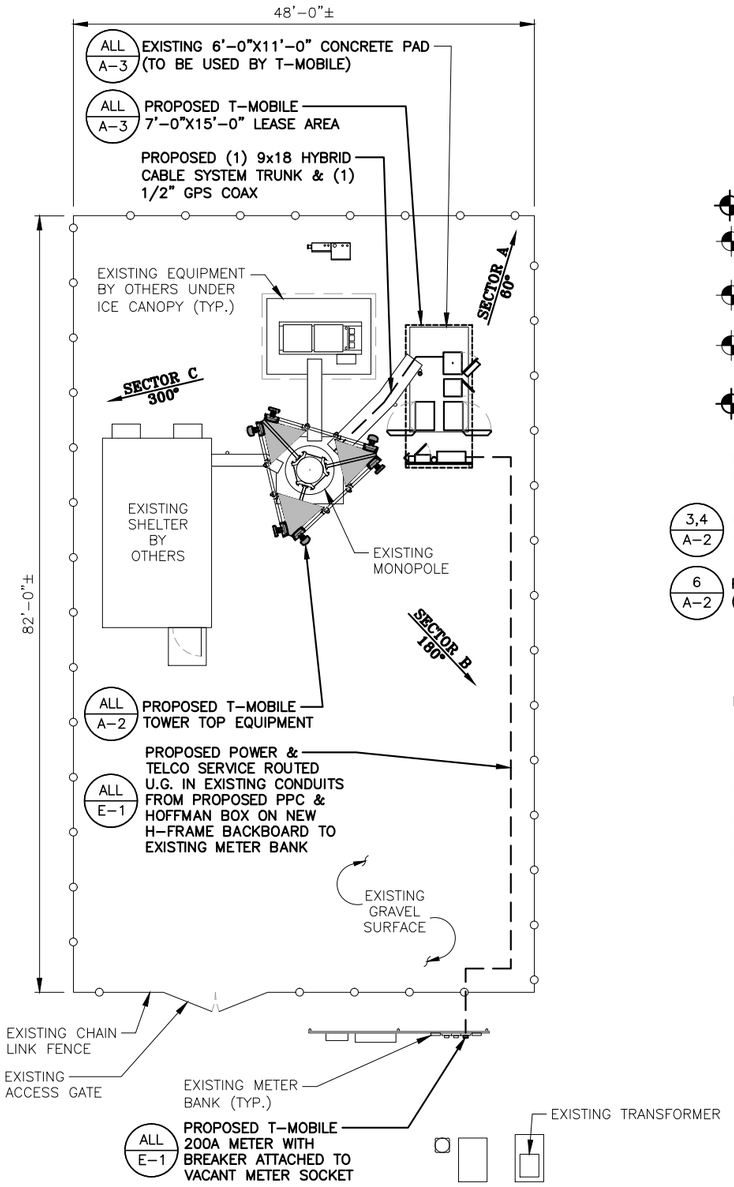
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	06/10/16	ISSUED FOR REVIEW	VP

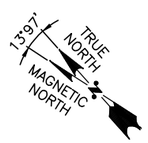
SITE NUMBER:
CTHA101F
SBA SITE ID:
CT01916-S
SITE NAME:
CTHA101F
SITE ADDRESS:
160 WITCH MEADOW ROAD
SALEM, CT 06420
NEW LONDON COUNTY

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1



SPECIAL WORK NOTE:
FENCE NOT ALLOWED TO COME DOWN DURING CONSTRUCTION, NO EXCEPTIONS.

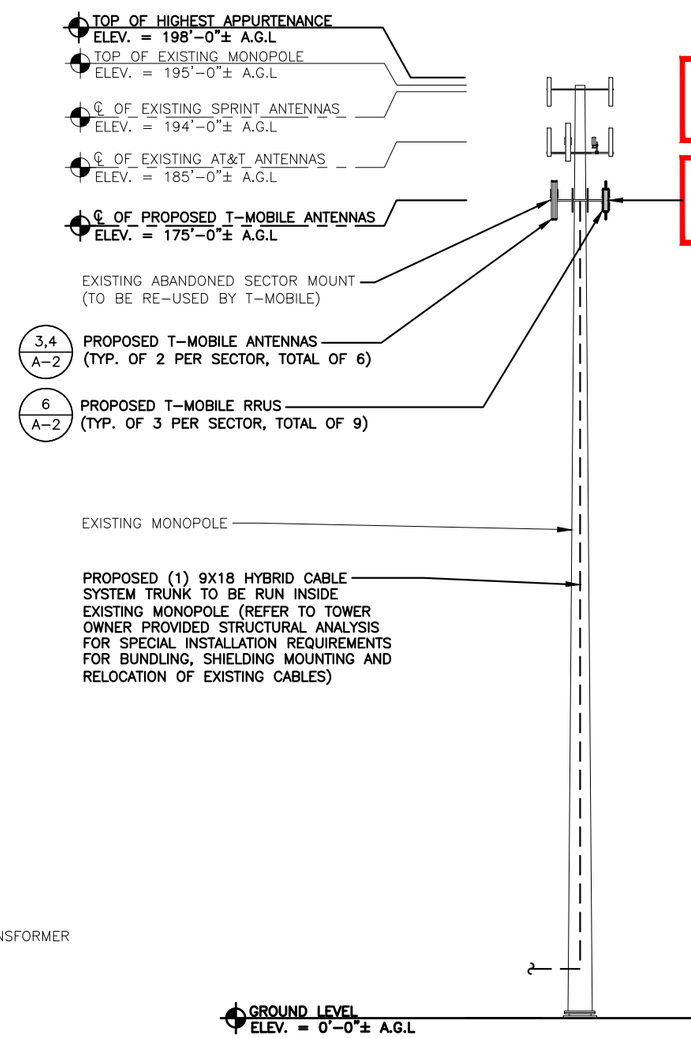


COMPOUND PLAN (1 / A-1)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"

SPECIAL WORK NOTE:
NO MACHINES ALLOWED IN COMPOUND FOR EXCAVATION FOR ANY REASON, NO EXPCETIONS.

SPECIAL WORK NOTE:
EXISTING UNDERGROUND UTILITY LOCATIONS ARE UNKNOWN. WHERE DIRECTED OR REQUIRED, HAND-EXCAVATE PROPOSED UTILITY TRENCHING

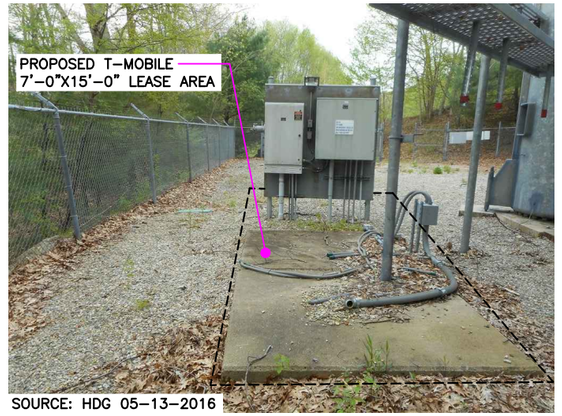
STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY TOWER OWNER TO DETERMINE IF THERE ARE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.



SPECIAL WORK NOTE:
NO EQUIPMENT ALLOWED TO BLOCK AND/OR HINDER SAFETY CLIMB & IT'S PATH.

SPECIAL WORK NOTE:
VERTICALLY CENTER THE PIPE MAST AND ANTENNA ON FACE OF EXISTING FRAME.

TOWER ELEVATION (2 / A-1)
22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"
0 8'-0" 16'-0" 32'-0" 48'-0"



SOURCE: HDG 05-13-2016

EQUIPMENT LOCATION PHOTO DETAIL (3 / A-1)
SCALE: N.T.S

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

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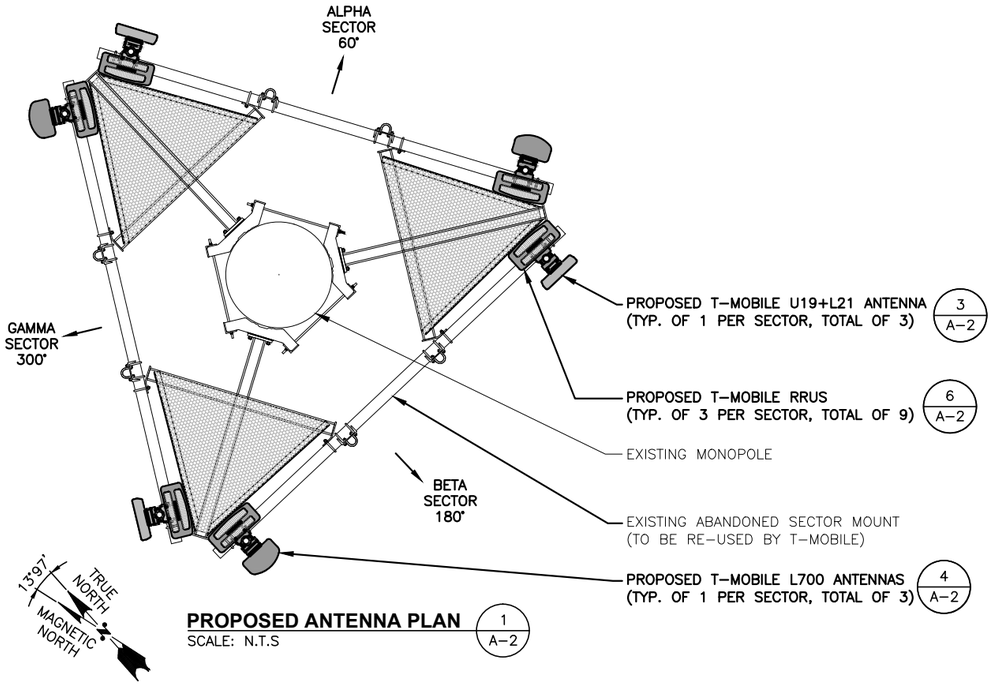
SHEET TITLE
COMPOUND PLAN, ELEVATION & EQUIPMENT LOCATION

SHEET NUMBER
A-1

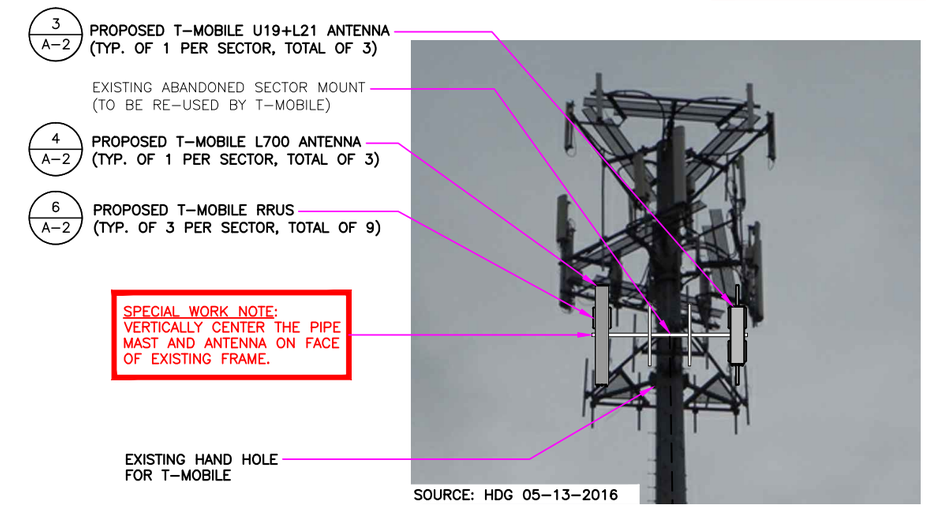


PROPOSED ANTENNA PLAN (1 / A-2)

SCALE: N.T.S

SPECIAL WORK NOTE:
NO EQUIPMENT ALLOWED TO BLOCK AND/OR HINDER SAFETY CLIMB & IT'S PATH.

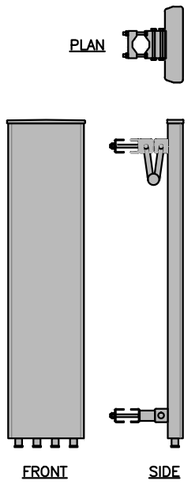
STRUCTURAL NOTES:
PRIOR TO COMMENCING CONSTRUCTION, GC SHALL REFER TO STRUCTURAL ANALYSIS PROVIDED BY TOWER OWNER TO DETERMINE IF THERE ARE ANY SUPPLEMENTAL OR SPECIAL INSTALLATION REQUIREMENTS, OR RELOCATION ARRANGEMENTS.



PROPOSED ANTENNA MOUNT PHOTO DETAIL (2 / A-2)

SCALE: N.T.S

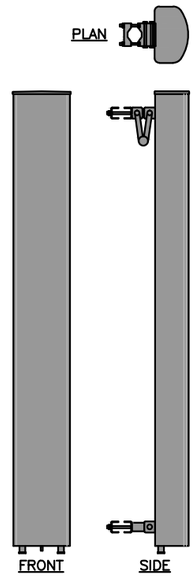
U19+L21 ANTENNA DIMENSIONS	
MODEL #	APX16DWV-16DWV-S-E-A20
MANUF.	RFS
WIDTH	13"
DEPTH	3.15"
HEIGHT	55.9"
WEIGHT	40.7 LBS



U19+L21 ANTENNA DETAIL (3 / A-2)

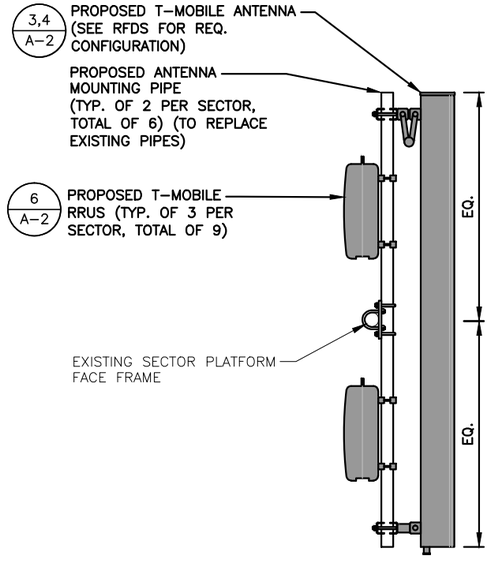
SCALE: N.T.S

L700 ANTENNA DIMENSIONS	
MODEL #	LNX-6515DS-A1M
MANUF.	COMMSCOPE
WIDTH	11.9"
DEPTH	7.1"
HEIGHT	96"
WEIGHT	43.7 LBS



L700 ANTENNA DETAIL (4 / A-2)

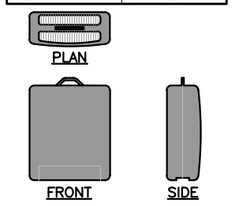
SCALE: N.T.S



PROPOSED ANTENNA & RRU MOUNTING DETAIL (5 / A-2)

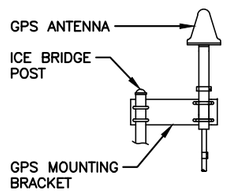
SCALE: N.T.S

RRU DIMENSIONS	
MODEL #	RRUS B2
MODEL #	RRUS B12
MANUF.	ERICSSON
WIDTH	17"
DEPTH	7"
HEIGHT	20"
WEIGHT	50.6 LBS



PROPOSED RRU DETAIL (6 / A-2)

SCALE: N.T.S



GPS DIMENSIONS	
MODEL #	CCAH32ST03
MANUF.	NAIS
HEIGHT	3.9"
WIDTH	3.5"

GPS ANTENNA MOUNTING DETAIL (7 / A-2)

SCALE: N.T.S

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SUBMITTALS

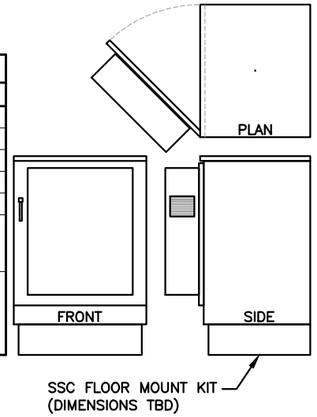
REV.	DATE	DESCRIPTION	BY
0	06/10/16	ISSUED FOR REVIEW	VP

SITE NUMBER:
CTHA101F
SBA SITE ID:
CT01916-S
SITE NAME:
CTHA101F
SITE ADDRESS:
160 WITCH MEADOW ROAD
SALEM, CT 06420
NEW LONDON COUNTY

SHEET TITLE
TOWER EQUIPMENT DETAILS

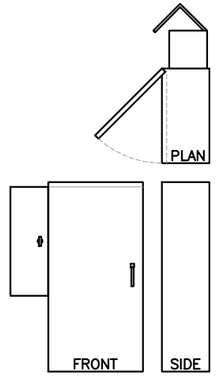
SHEET NUMBER
A-2

SSC DIMENSIONS	
MODEL #	**SXF17-2824**
MANUF.	PURCELL
WIDTH	28"
DEPTH	23.5"
HEIGHT	35.5"
PLINTH	6.5"
WEIGHT (BASE CONFIGURATION)	70 LBS
NOTE: INSTALL CABINET ANCHORS AND FLOOR MOUNT KIT ANCHORS PER MANUFACTURER'S INSTALLATION GUIDELINES	



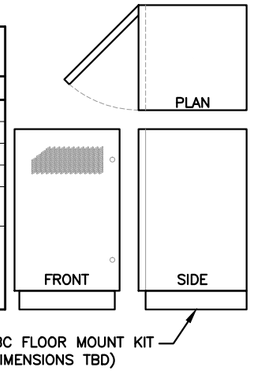
SITE SUPPORT CABINET (SSC) 1/A-3
SCALE: N.T.S

PPC DIMENSIONS	
MODEL #	**3799340400**
MANUF.	DELTA
WIDTH	20"
DEPTH	10"
HEIGHT	40"
WEIGHT	75 LBS
NOTE: INSTALL CABINET ANCHORS PER MANUFACTURER'S INSTALLATION GUIDELINES	

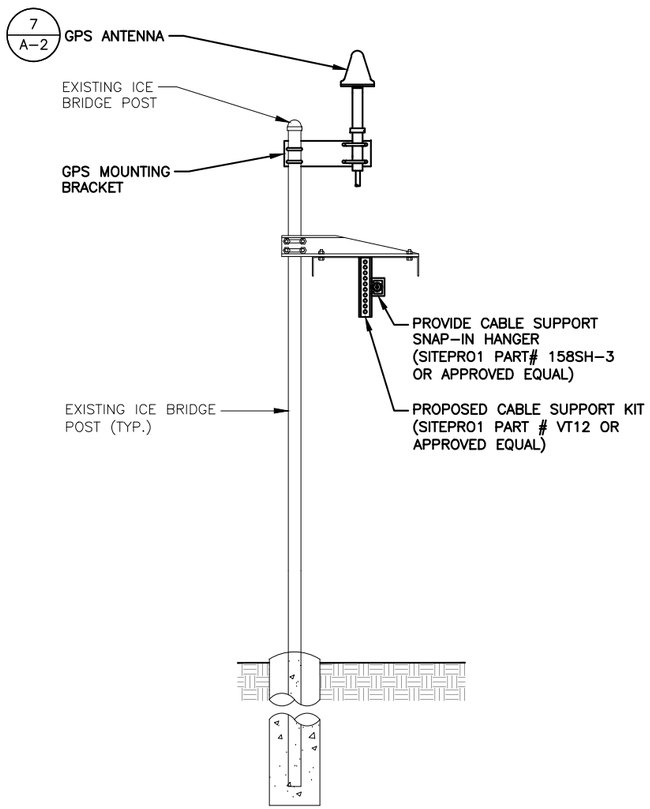


POWER PROTECTION CABINET (PPC) 2/A-3
SCALE: N.T.S

PBC DIMENSIONS	
MODEL #	**PBC-05**
MANUF.	ERICSSON
WIDTH	22.2"
DEPTH	22.8"
HEIGHT	34.1"
WEIGHT W/O BATTERIES	194 LBS
NOTE: 1. INSTALL CABINET ANCHORS AND FLOOR MOUNT KIT ANCHORS PER MANUFACTURER'S INSTALLATION GUIDELINES	

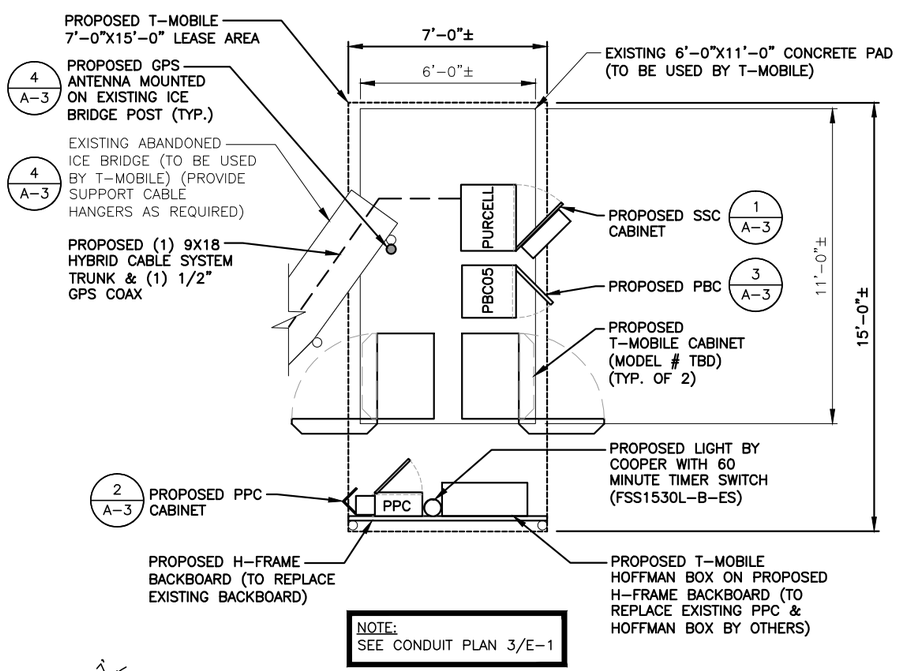


POWER AND BATTERY CABINET (PBC) 3/A-3
SCALE: N.T.S

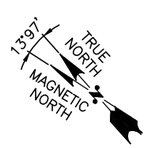


NOTE:
ALL STEEL IS GALVANIZED. ALL BOLTS TO BE FURNISHED W/ WASHERS AND NUTS.

COAX ICE BRIDGE DETAIL 4/A-3
SCALE: N.T.S



NOTE:
SEE CONDUIT PLAN 3/E-1



EQUIPMENT PLAN 5/A-3
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

0 1'-4" 2'-8" 5'-4" 8'-0"

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SALEM, CT 06420
NEW LONDON COUNTY

SHEET TITLE
GROUND EQUIPMENT DETAILS

SHEET NUMBER
A-3

ELECTRICAL NOTES

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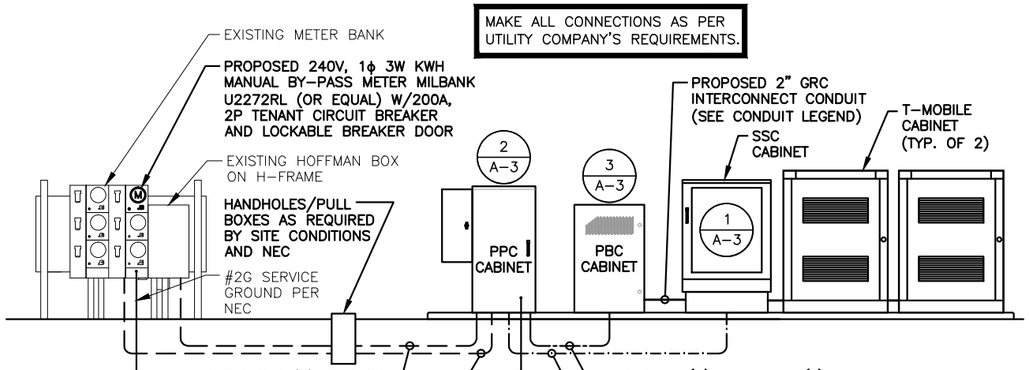
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL METER BANK AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-3. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.

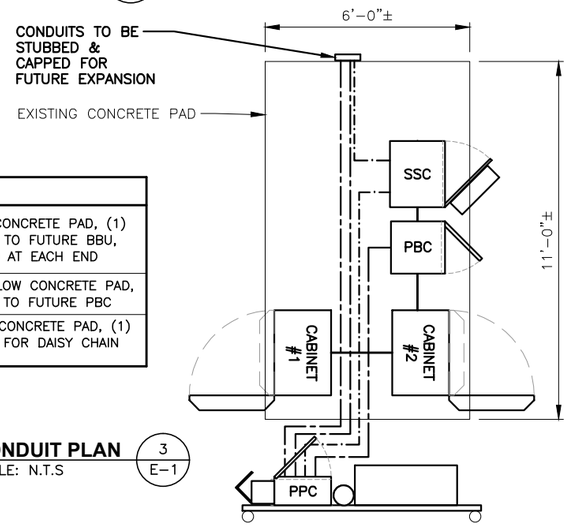
LEGEND

A	AMPERE
V	VOLT
KWH	KILOWATT – HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BGR	BURIED GROUND RING
BTCW	BARE TINNED SOLID COPPER WIRE
G	GROUND
⏚	GROUND
MGB	MASTER GROUND BAR
	O MECHANICAL CONNECTION
	● CADWELD CONNECTION
EGB	EQUIPMENT GROUND BAR
—G—	GROUND COPPER WIRE, SIZE AS NOTED
———	EXPOSED WIRING
———	#6G AWG INSULATED STRANDED
———	COAXIAL CABLE/HYBRID CABLE
⊙	5/8"x8' COPPER CLAD STAINLESS STEEL GROUND ROD
⊛	GROUND ROD WITH TEST WELL
●—●—	● EXOTHERMIC (CAD WELD) OR
	O MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
⊠	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

MAKE ALL CONNECTIONS AS PER UTILITY COMPANY'S REQUIREMENTS.



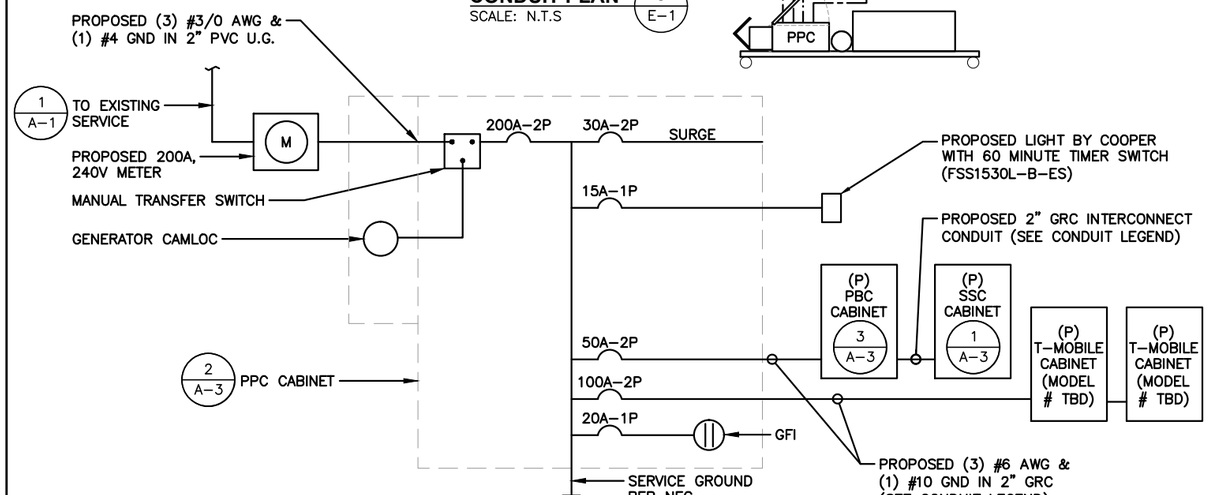
POWER RISER DIAGRAM 1 E-1
SCALE: N.T.S



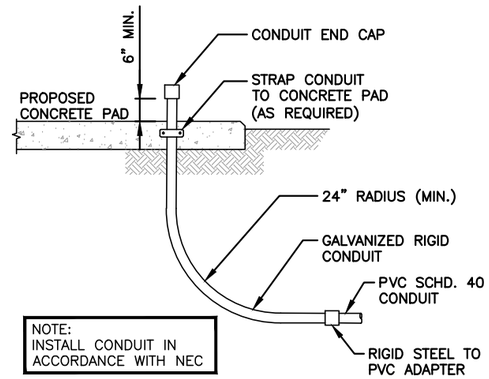
CONDUIT PLAN 3 E-1
SCALE: N.T.S

CONDUIT LEGEND

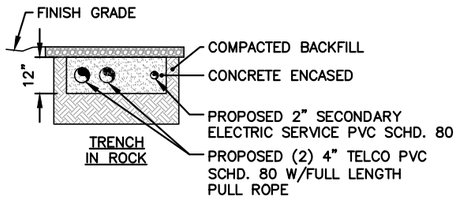
———	2"ø GRC INETRCONNECT KIT, -48V DC, ON CONCRETE PAD, (1) CONDUIT PBC TO SSC AND (1) CONDUIT PBC TO FUTURE BBU, ANCHOR AT 3' INTERVALS , GROUNDING BOND AT EACH END
- - - -	2"ø PVC SCHD. 40 CONDUIT, AC-POWER, BELOW CONCRETE PAD, (1) CONDUIT PPC TO PBC, (2) CONDUIT PPC TO FUTURE PBC
-·-·-	2"ø PVC SCHD. 40 CONDUIT, TELCO, BELOW CONCRETE PAD, (1) CONDUIT PPC TO SSC AND (1) CONDUIT SSC FOR DAISY CHAIN TO FUTURE SSC

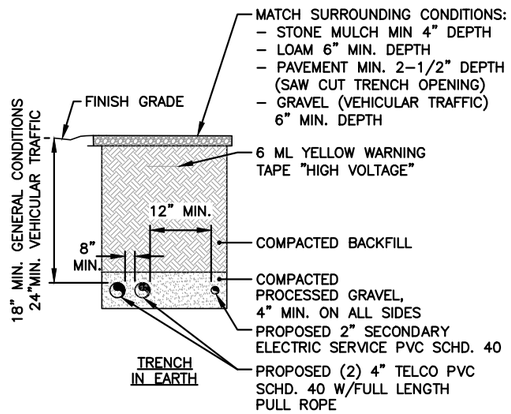


EQUIPMENT ONE LINE DIAGRAM 4 E-1
SCALE: N.T.S



CONDUIT SWEEP DETAIL 2 E-1
SCALE: N.T.S





SPECIAL WORK NOTE:
EXISTING UNDERGROUND UTILITY LOCATIONS ARE UNKNOWN. WHERE DIRECTED OR REQUIRED, HAND-EXCAVATE PROPOSED UTILITY TRENCHING

BURIED CONDUIT DETAIL 5 E-1
SCALE: N.T.S

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SBA SITE ID:
CT01916-S
SITE NAME:
CTHA101F
SITE ADDRESS:
160 WITCH MEADOW ROAD
SALEM, CT 06420
NEW LONDON COUNTY

SHEET TITLE
ELECTRICAL DETAILS & NOTES

SHEET NUMBER
E-1

ELECTRICAL NOTES

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4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL METER BANK AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-3. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
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LEGEND

A	AMPERE
V	VOLT
KWH	KILOWATT – HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BGR	BURIED GROUND RING
BTCW	BARE TINNED SOLID COPPER WIRE
G	GROUND
⏚	GROUND
MGB	MASTER GROUND BAR ○ MECHANICAL CONNECTION ● CADWELD CONNECTION
EGB	EQUIPMENT GROUND BAR
—G—	GROUND COPPER WIRE, SIZE AS NOTED
———	EXPOSED WIRING
———	#6G AWG INSULATED STRANDED
———	COAXIAL CABLE/HYBRID CABLE
⊙	5/8"x8' COPPER CLAD STAINLESS STEEL GROUND ROD
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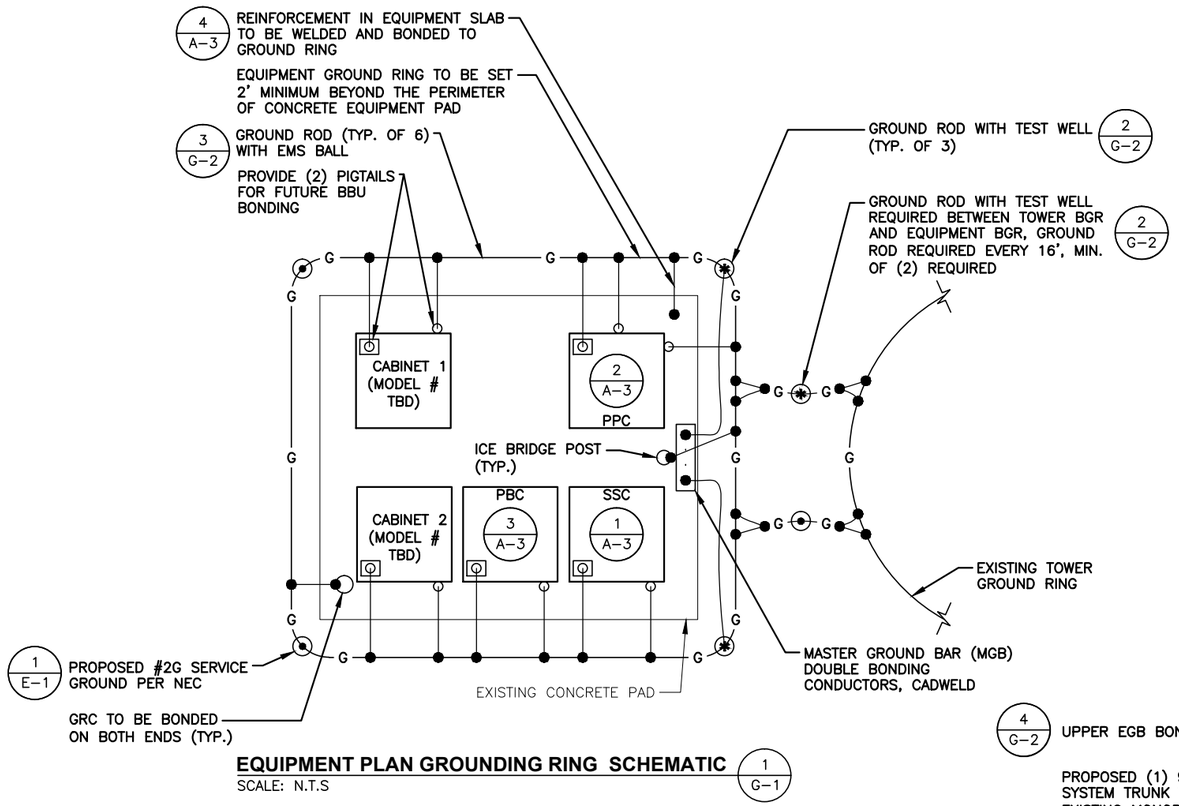
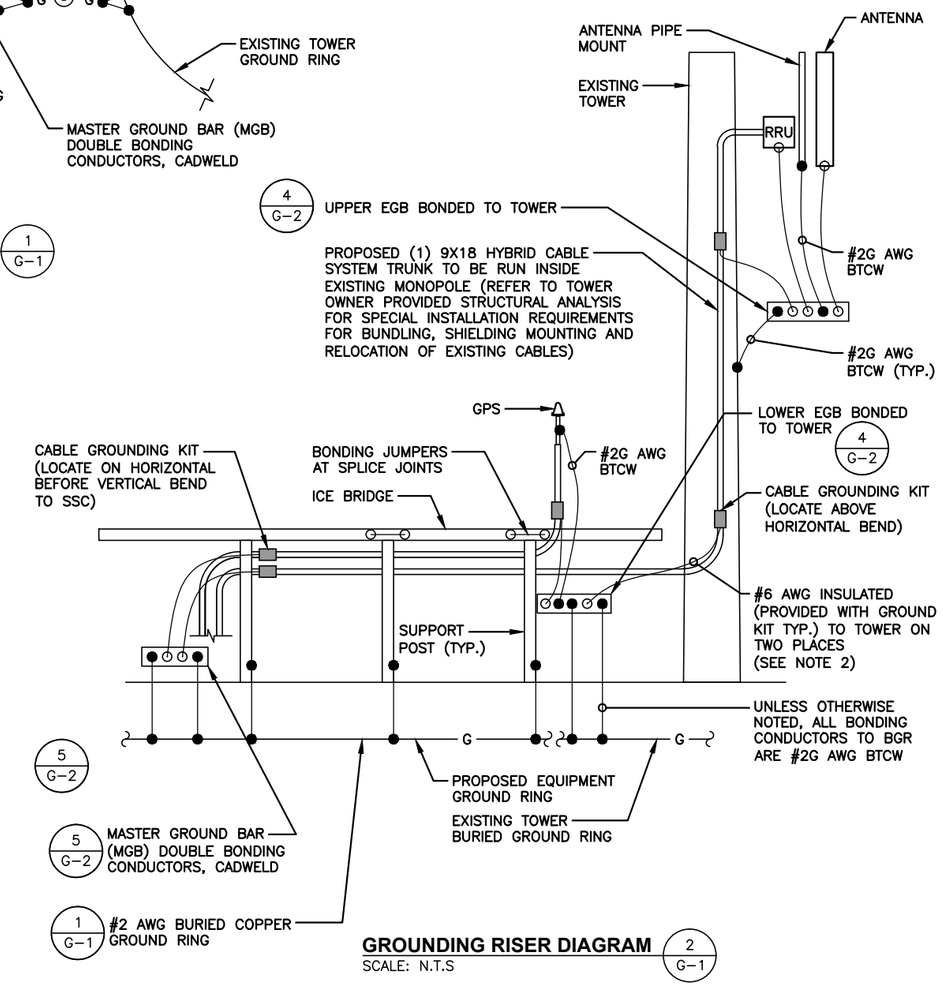
●—●—	● EXOTHERMIC (CAD WELD) OR ○ MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
⊠	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL



EQUIPMENT PLAN GROUNDING RING SCHEMATIC 1/G-1
SCALE: N.T.S

NOTE:
1. BASE BID TO INCLUDE INSTALLATION OF A BURIED GROUND RING AND (6) GROUND RODS OR SINGLE XIT HORIZONTAL CHEMICAL ROD AS DETERMINED BY FIELD CONDITIONS. ADDITIONAL RODS AS REQUIRED TO ACHIEVE 5 OHMS RESISTANCE.
2. MAXIMUM VERTICAL/HORIZONTAL DISTANCE BETWEEN CABLE GROUNDING KITS SHALL NOT EXCEED 100 FEET. INSTALL ADDITIONAL KITS AS REQUIRED BY FIELD CONDITIONS.
3. ALL CONNECTIONS TO EQUIPMENT PER MANUFACTURER'S GUIDELINES.
4. ALL ABOVE-GRADE DOWNLEADS TO BGR SHALL BE INSTALLED IN 1" NON-METALLIC CONDUIT SECURED EVERY 2' WITH NON-METALLIC CLIPS.



GROUNDING RISER DIAGRAM 2/G-1
SCALE: N.T.S

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SALEM, CT 06420
NEW LONDON COUNTY

SHEET TITLE
GROUNDING SCHEMATIC & RISER DIAGRAM

SHEET NUMBER
G-1

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7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION.
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10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.

LEGEND

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V	VOLT
KWH	KILOWATT – HOUR
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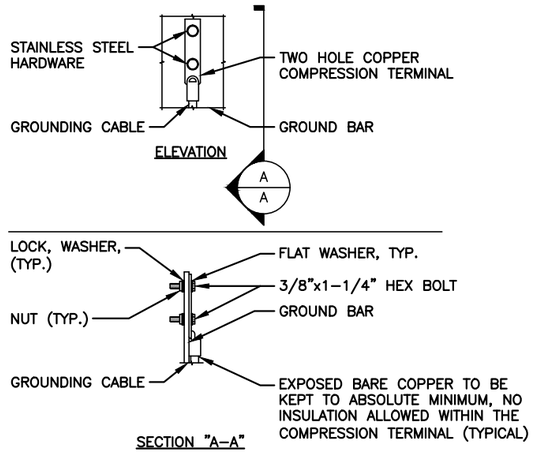
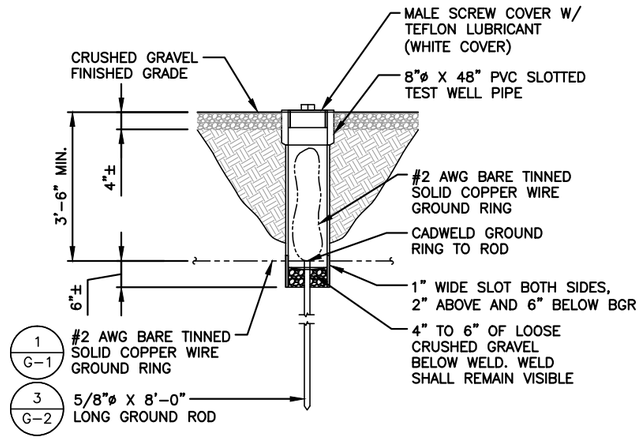
GRC	GALVANIZED RIGID CONDUIT
BGR	BURIED GROUND RING
BTCW	BARE TINNED SOLID COPPER WIRE
G	GROUND
⏚	GROUND
MGB	MASTER GROUND BAR
	○ MECHANICAL CONNECTION
	● CADWELD CONNECTION
EGB	EQUIPMENT GROUND BAR
—G—	GROUND COPPER WIRE, SIZE AS NOTED
———	EXPOSED WIRING
———	#6G AWG INSULATED STRANDED
———	COAXIAL CABLE/HYBRID CABLE
⊙	5/8"x8' COPPER CLAD STAINLESS STEEL GROUND ROD
✱	GROUND ROD WITH TEST WELL
⊸●—●⊸	● EXOTHERMIC (CAD WELD) OR
	○ MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
⊠	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL



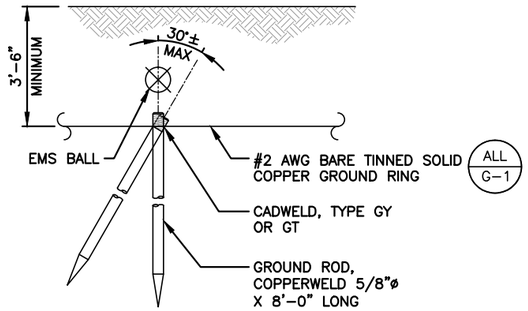
NOTE:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL 1 / G-2
SCALE: N.T.S



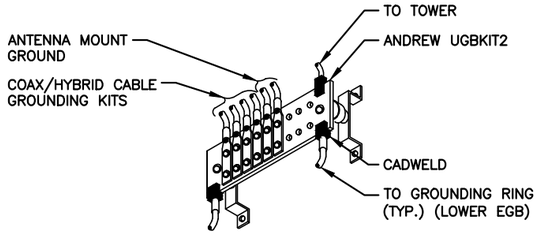
NOTE:
1. PROPOSED BGR TO BE INSTALLED 3'-6" MIN. BELOW GRADE OR BELOW LOCAL FROST DEPTH, WHICHEVER IS GREATER.
2. ONE TEST WELL SHALL BE PROVIDED BETWEEN THE TOWER GROUND LOOP AND TWO ON THE EQUIPMENT GROUND LOOP

GROUND ROD TEST WELL DETAIL 2 / G-2
SCALE: N.T.S

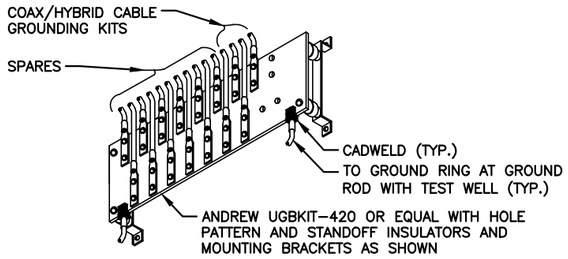


NOTE:
1. PROPOSED BGR TO BE INSTALLED 3'-6" MIN. BELOW GRADE OR BELOW LOCAL FROST DEPTH, WHICHEVER IS GREATER.
2. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 30 DEGREES FROM THE VERTICAL.

GROUND ROD DETAIL 3 / G-2
SCALE: N.T.S



EQUIPMENT GROUND BAR (EGB) 4 / G-2
SCALE: N.T.S



MASTER GROUND BAR (MGB) 5 / G-2
SCALE: N.T.S

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 648-1116

Transcend Wireless
TRANSCEND WIRELESS
10 INDUSTRIAL AVE
MAHWAH, NJ 07430
TEL: (201) 684-0055
FAX:(201) 684-0066

Hudson Design Groupllc
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

CHECKED BY: DR

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	06/10/16	ISSUED FOR REVIEW	VP

SITE NUMBER:
CTHA101F
SBA SITE ID:
CT01916-S
SITE NAME:
CTHA101F
SITE ADDRESS:
160 WITCH MEADOW ROAD
SALEM, CT 06420
NEW LONDON COUNTY

SHEET TITLE
GROUNDING DETAILS & NOTES

SHEET NUMBER
G-2

Tower Engineering Solutions
Phone (972) 483-0607, Fax (972) 975-9615
8445 Freeport Parkway, Suite 375, Irving, Texas 75063

Structural Analysis Report

Existing 195 ft Nudd Corporation Monopole

Customer Name: SBA Communications Corp

Customer Site Number: CT01916-S

Customer Site Name: North Salem

Carrier Name: T-Mobile

Carrier Site ID / Name: CTHA101F

Site Location: 160 Witch Meadow Road

Salem, Connecticut

New London County

Latitude: 41.502828

Longitude: -72.297052

6/10/16

Analysis Result:

Max Structural Usage: 84.8 % [Pass]

Max Foundation Usage: 38.0% [Pass]

Report Prepared By : Fabiaye Arinyedokiari

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Max Foundation Usage: 38.0% [Pass]

Report Prepared By : Fabiaye Arinyedokiari

Introduction

The purpose of this report is to summarize the analysis results on the 195 ft Nudd Corporation Monopole to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Nudd Corporation, Project #7014 dated February 2, 2000
Foundation Drawing	Nudd Corporation, Project #7014 dated February 2, 2000
Geotechnical Report	FDH Engineering, Project #1207124EG1 dated August 10, 2012
Modification Drawings	Semaan Engineering, Project #CT-01916 dated May 6, 2002 FDH Engineering, Inc., Project #13SBAH1400 dated September 25, 2013

Analysis Criteria

The analysis was performed in accordance with the requirements and stipulations of the ANSI/TIA/EIA 222-F**.** In accordance with this standard, the structure was analyzed using **TESPoles,** a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Basic Wind Speed Used in the Analysis:	90 mph (fastest mile) / Equivalent to 110 mph 3-second gust wind speed
Basic Wind Speed with Ice:	78 mph (fastest mile) with 1/2" radial ice concurrent
Operational Wind Speed:	50 mph + 0" Radial ice
Standard/Codes:	ANSI/TIA/EIA 222-F / 2005 Connecticut State Building Code

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	195.0	6	Decibel DB980H90E-M - Panel	(3) T-Arm	(15) 1 5/8"	Sprint
2		6	EMS RR90-11-00DBL - Panel			
3	185.0	6	Powerwave 7770.00 - Panel	(3) T-Arm	(12) 1 1/4" (1) 1/2" Fiber (2) 3/4" DC	AT&T
4		1	Raycap DC6-48-60-18-8F – Surge Arrestor			
5		6	Powerwave LGP21401 – TMA			
6		6	Powerwave LGP21903 - Diplexers			
7		2	Powerwave P65-17-XLH-RR - Panel			
8		6	Ericsson RRUS-11 - RRU			
9		1	Andrew SBNH-1D6565C - Panel			
-	175.0	-	-	Empty Low Profile Platform	-	-

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
10	175.0	3	RFS APX16DWV-16DWVS-E-A20 - Panel	Low Profile Platform	(1) 1 1/4" Hybrid	T-Mobile
11		3	Commscope LNX-6515DS-A1M - Panel			
12		9	RRUS11			

All transmission lines are considered running inside of the pole shafts.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

	Pole shafts	Anchor Bolts	Base Plate	Reinforcement
Max. Usage:	**79.2%**	**84.8%**	**61.9%**	**73.0%**
Pass/Fail	**Pass**	**Pass**	**Pass**	**Pass**

Foundations

	Moment (Kip-Ft)	Shear (Kips)
Original Design Reactions	6090.0	44.2
Analysis Reactions	4885.5	38.7
% of Design Reactions	80.2%	87.5%

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by ANSI/TIA/EIA 222-F for the installed antennas. Maximum twist/sway at the elevation of the proposed equipment is 1.7600 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the ANSI/TIA/EIA 222-F Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC.** Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.

2. The analysis is based on the presumption that the tower members and components along with any existing reinforcement items have been correctly and properly designed, manufactured, installed and maintained.

3. All the existing structural members were assumed to be in good condition with no physical damage or deterioration associated with corrosion.

4. An initial tension of 10% of the break strength on all the existing guy wires was assumed in all the structural analyses of guyed towers unless different values were provided by the client. **TES** cannot take responsibility for the deviations in the analysis results because of differences in the initial tension forces of the existing guy wires.

5. Secondary component or connection secondary components, welds and bolts are assumed to be able to carry their intended original design loads. **TES** cannot take responsibility for verification of the adequacy on the connections, bolts and welds present in the structure.

6. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed or/and ice loads are different from the minimum values recommended by the EIA/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.

7. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.

8. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.

9. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Usage Diagram - Max Stress 79.2% at 145.0ft

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69	Page: 1	
Base Elev:	0.000 (ft)				

Tower Engineering Solutions

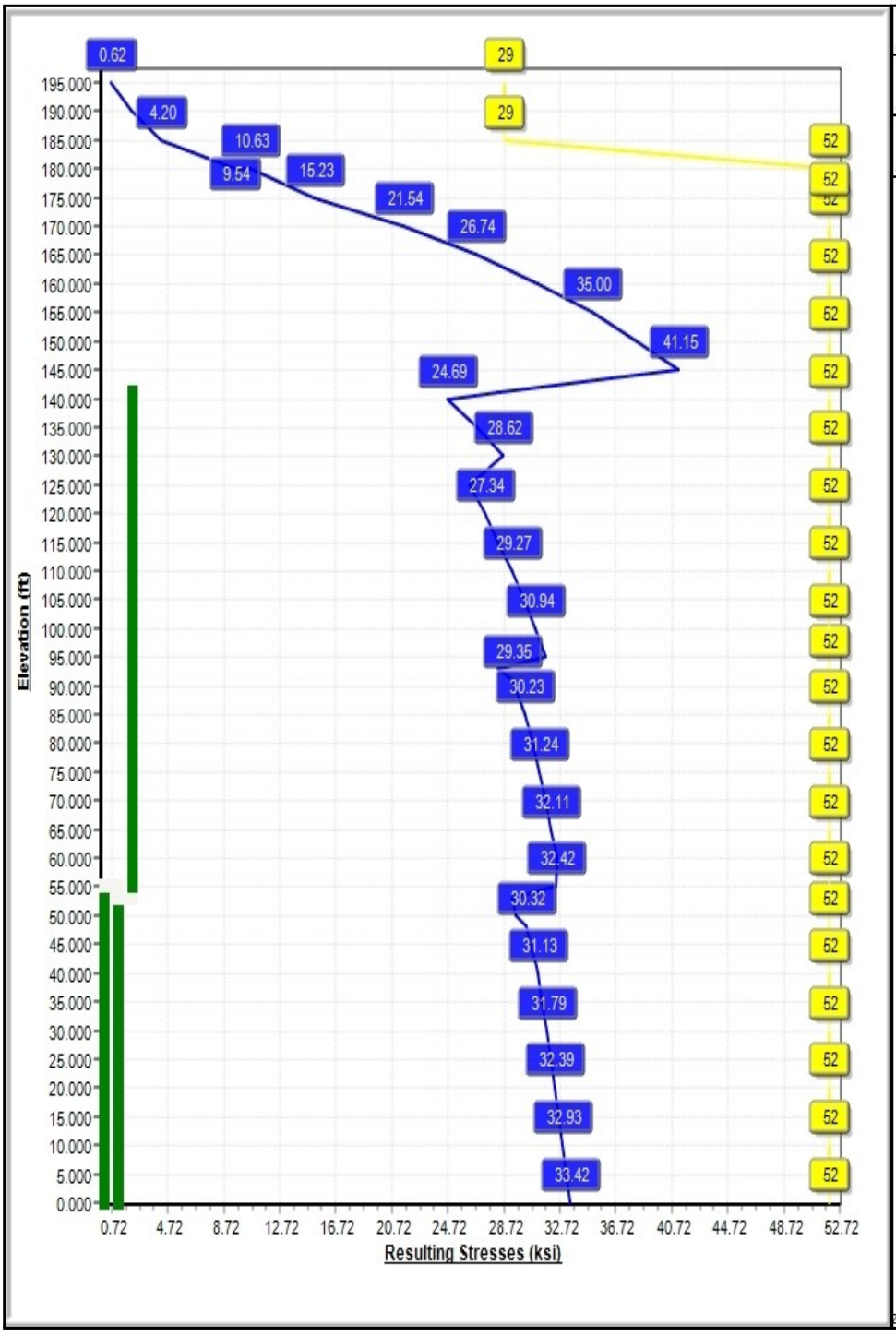
Dead Load Factor:	1.00
Wind Load Factor:	1.00

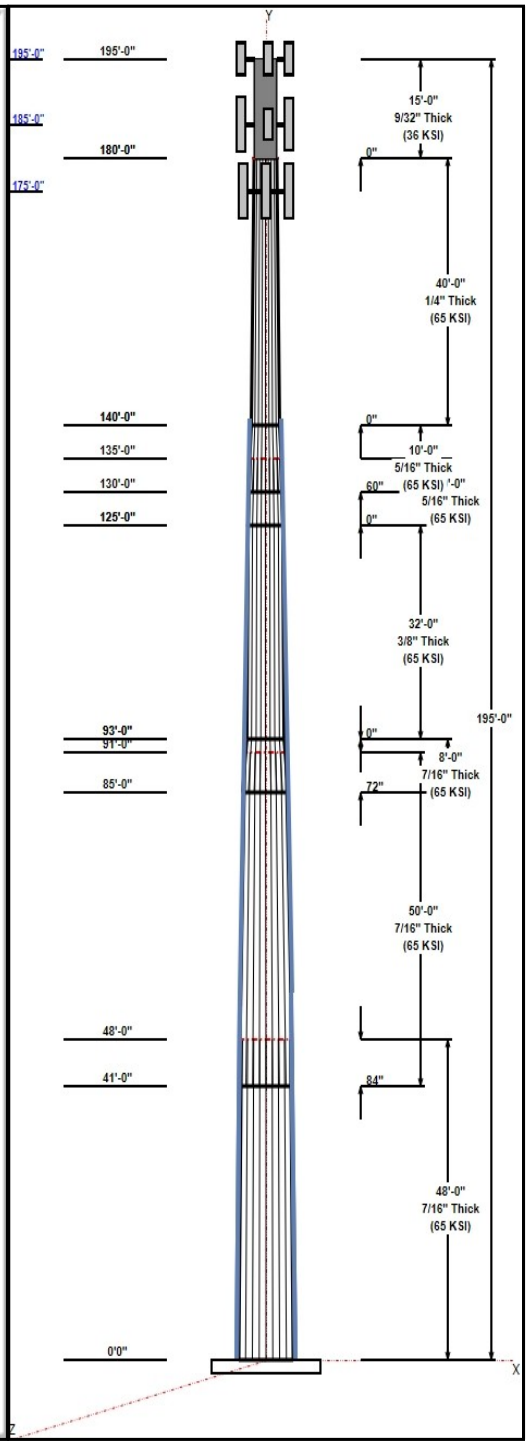
52 Alllowable Stress

41 Resulting Stress

Load Case : 90 mph Wind with 0 in Ice

Iterations: 24





Structure: CT01916-S-SBA

Type: Custom
Site Name: North Salem
Height: 195.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: 18 Sided
Taper: 0.00000

6/10/2016

Tower Engineering Solutions

Shaft Properties

Seq	Length (ft)	Top (in)	Bottom (in)	Thick (in)	Joint Type	Taper	Grade (ksi)
1	48.00	53.07	64.50	0.438		0.23819	65
2	50.00	43.70	55.61	0.438	Slip	0.23819	65
3	8.00	44.10	46.00	0.438	Slip	0.23819	65
4	32.00	36.48	44.10	0.375	Butt	0.23819	65
5	10.00	34.09	36.48	0.313	Butt	0.23819	65
6	10.00	33.53	35.91	0.313	Slip	0.23819	65
7	40.00	24.00	33.53	0.250	Butt	0.23819	65
8	15.00	24.00	24.00	0.281	Butt	0.00000	36

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description	Carrier
195.00	195.00	6	DB980H90E-M	Sprint
195.00	195.00	6	RR90-11-00DBL	Sprint
195.00	195.00	3	T-Arm (Round)	Sprint
185.00	185.00	6	7770.00	AT&T
185.00	185.00	1	DC6-48-60-18-8F	AT&T
185.00	185.00	6	LGP21401	AT&T
185.00	185.00	6	LGP21903	AT&T
185.00	185.00	2	P65-17-XLH-RR	AT&T
185.00	185.00	6	RRUS-11	AT&T
185.00	185.00	1	SBNH-1D6565C	AT&T
185.00	185.00	3	T-Arm (Round)	AT&T
175.00	175.00	3	APX16DWV-16DWVS-E-A	T-Mobile
175.00	175.00	3	LNX-6515DS-A1M	T-Mobile
175.00	175.00	1	Low Profile	T-Mobile
175.00	175.00	9	RRUS11	T-Mobile

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Placement	Description	Carrier
0.00	195.00	Inside	1 5/8" Coax	Sprint
0.00	185.00	Inside	1 1/4" Coax	AT&T
0.00	185.00	Inside	1/2" Fiber	AT&T
0.00	185.00	Inside	3/4" DC	AT&T
177.75	182.25	Outside	(3) Bypass Stiffeners	
0.00	175.00	Inside	1-1/4" Hybrid	T-Mobile
0.00	143.00	Outside	(4) C6x10.5	
0.00	55.00	Outside	(4) C5x9	

Anchor Bolts

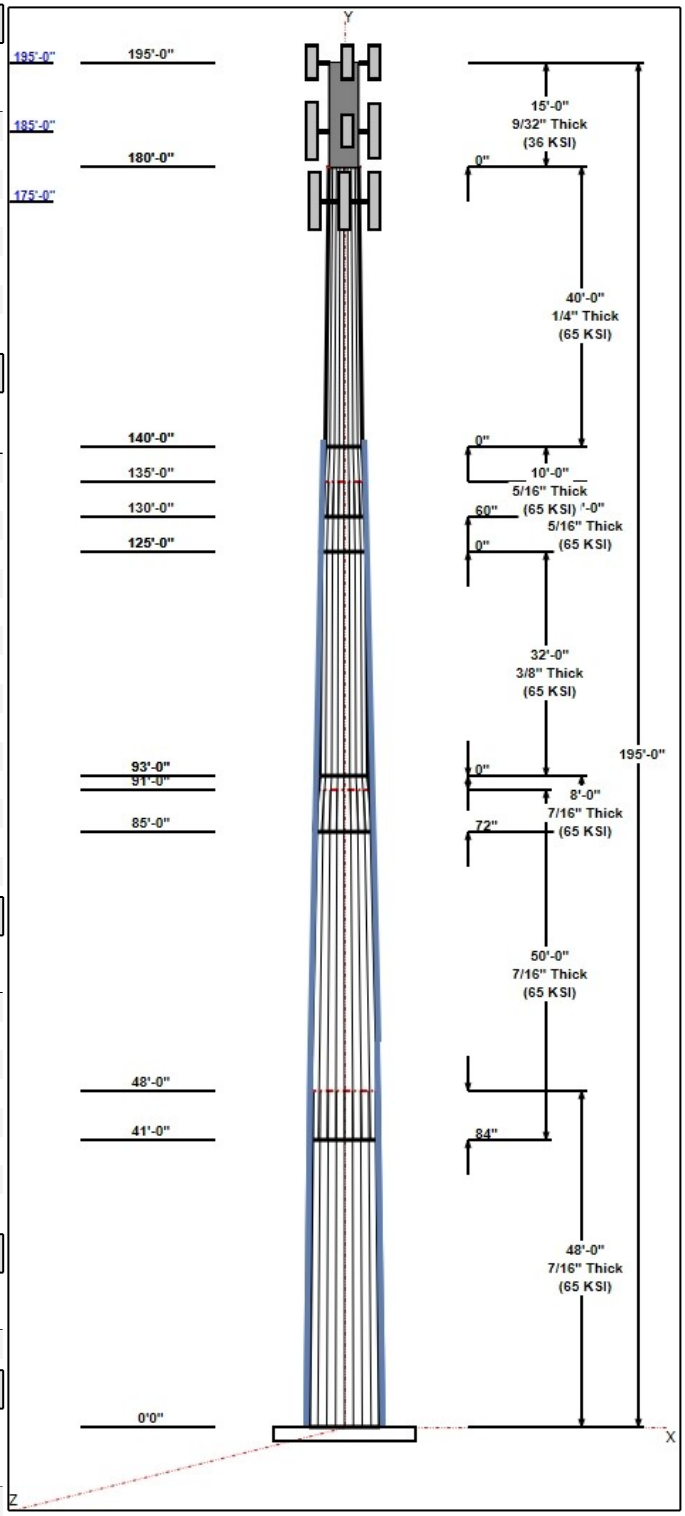
Qty	Specifications	Grade (ksi)	Arrangement
29	2.00" A687	105.0	Radial

Base Plate

Thickness (in)	Specifications (in)	Grade (ksi)	Geometry
1.5000	63.6	50.0	Round

Reactions

Load Case	Moment	Shear	Axial
90 mph Wind with 0" Ice	4885.5	38.7	54.4



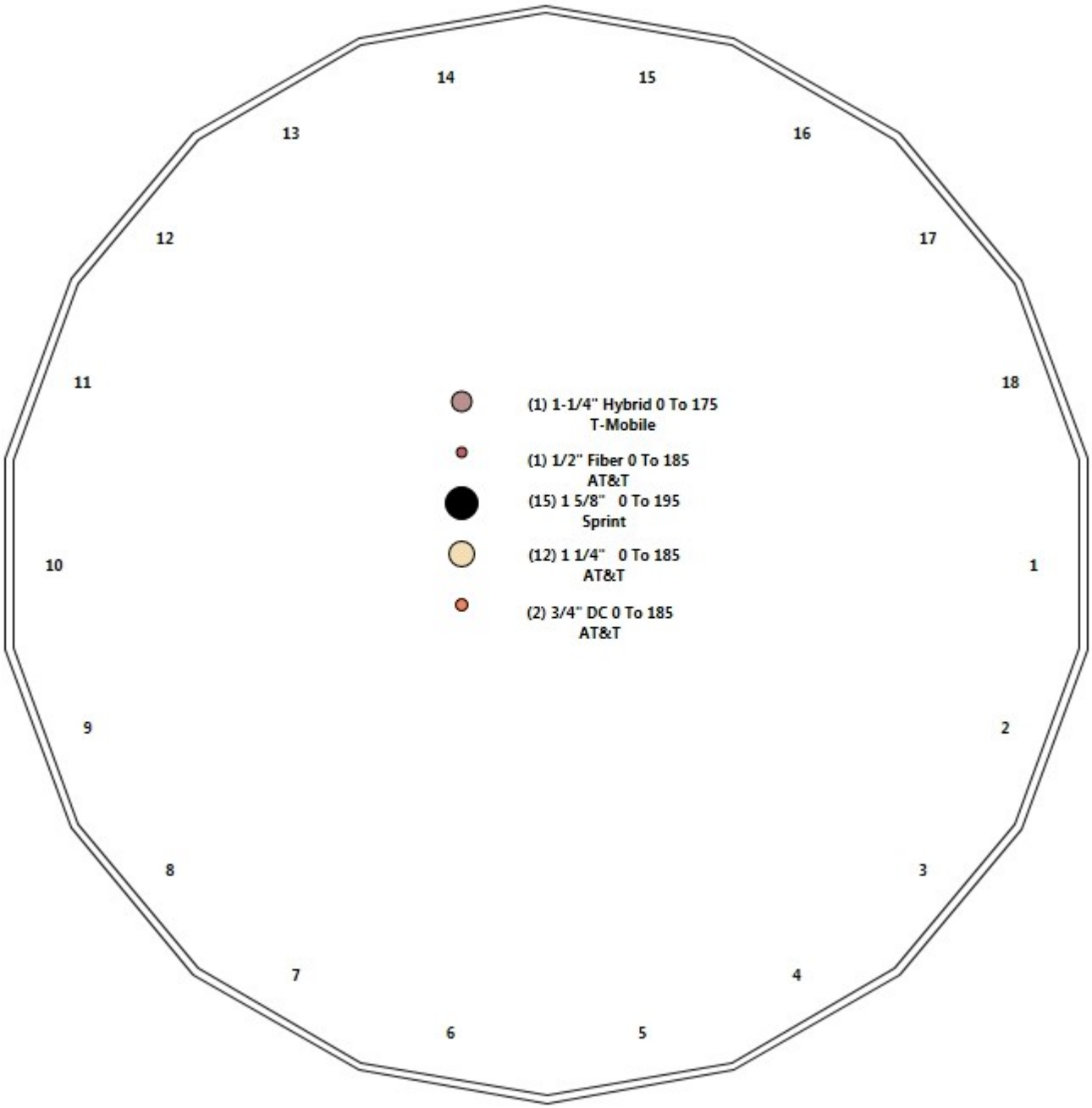
77.94 mph Wind with 0.5" Ice	4088.2	31.7	61.2
50 mph Wind with 0" Ice	1509.4	11.9	54.5

Structure: CT01916-S-SBA - Coax Line Placement

Type: Monopole
Site Name: North Salem
Height: 195.00 (ft)

6/10/2016

Tower Engineering Solutions



Shaft Properties

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 5	

Tower Engineering Solutions

Sec. No.	Shape	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Overlap (in)	Weight (lb)
1	18	48.000	0.4375	65		0.00	13,233
2	18	50.000	0.4375	65	Slip	84.00	11,627
3	18	8.000	0.4375	65	Slip	72.00	1,686
4	18	32.000	0.3750	65	Flange	0.00	5,173
5	18	10.000	0.3125	65	Flange	0.00	1,180
6	18	10.000	0.3125	65	Slip	60.00	1,161
7	18	40.000	0.2500	65	Flange	0.00	3,080
8	R	15.000	0.2810	36	Flange	0.00	1,069
					Total Shaft Weight:		**38,209**

	Bottom						Top						
Sec. No.	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (sqin)	Ix (in^4)	W/t Ratio	D/t Ratio	Taper
1	64.50	0.00	88.96	46124.76	24.59	147.43	53.07	48.00	73.08	25574.1	19.98	121.30	0.238194
2	55.61	41.00	76.61	29462.36	21.00	127.11	43.70	91.00	60.07	14204.8	16.20	99.88	0.238194
3	46.00	85.00	63.27	16597.56	17.13	105.15	44.10	93.00	60.63	14601.1	16.36	100.80	0.238194
4	44.10	93.00	52.04	12569.07	19.32	117.59	36.48	125.0	42.97	7074.93	15.74	97.27	0.238194
5	36.48	125.0	35.87	5926.45	19.17	116.72	34.09	135.0	33.51	4830.83	17.83	109.10	0.238194
6	35.91	130.0	35.31	5652.53	18.85	114.91	33.53	140.0	32.94	4592.07	17.51	107.29	0.238194
7	33.53	140.0	26.40	3694.43	22.24	134.11	24.00	180.0	18.84	1343.00	15.52	96.00	0.238194
8	24.00	180.0	20.94	1473.63	0.00	85.41	24.00	195.0	20.94	1473.63	0.00	85.41	0.000000

Additional Steel

							Intermediate Connectors		Termination Connectors			
Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Fu (ksi)	Offset (in)	Description	Spacing (in)	Description	Spacing (in)	Lower Qty	Upper Qty
0.00	55.00	4	PLT C6x10.5 (1.25 hole)	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00		
0.00	53.00	4	PLT C5 x 9 (1.25" hole)	65	80	2.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00		7
55.00	141.0	4	PLT C6x10.5 (1.25 hole)	65	80	0.00	5/8" Hollo Bolt	24.00	5/8" Hollo Bolt	3.00		13

Loading Summary

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 6	

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Discrete Appurtenances

				No Ice			Ice				
No.	**Elev (ft)**	**Description**	**Qty**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Weight (lb)**	**CaAa (sf)**	**CaAa Factor**	**Hor. Ecc. (ft)**	**Vert Ecc (ft)**
1	195.00	DB980H90E-M	6	8.50	3.80	0.73	0.00	4.370	0.73	0.00	0.00
2	195.00	RR90-11-00DBL	6	21.00	5.23	0.77	48.38	5.600	0.78	0.00	0.00
3	195.00	T-Arm (Round)	3	450.00	8.00	0.75	550.00	10.500	0.75	0.00	0.00
4	185.00	7770.00	6	35.00	5.88	0.73	0.00	6.530	0.73	0.00	0.00
5	185.00	DC6-48-60-18-8F	1	31.80	1.47	0.75	49.50	1.670	0.75	0.00	0.00
6	185.00	LGP21401	6	14.10	1.29	0.67	21.20	1.530	0.67	0.00	0.00
7	185.00	LGP21903	6	5.50	0.27	0.67	7.90	0.380	0.67	0.00	0.00
8	185.00	P65-17-XLH-RR	2	59.00	11.46	0.75	121.00	12.390	0.75	0.00	0.00
9	185.00	RRUS-11	6	51.00	2.91	0.75	67.00	3.140	0.75	0.00	0.00
10	185.00	SBNH-1D6565C	1	66.10	11.44	0.80	132.00	12.370	0.80	0.00	0.00
11	185.00	T-Arm (Round)	3	450.00	8.00	0.75	550.00	10.500	0.75	0.00	0.00
12	175.00	APX16DWV-16DWVS-E-A20	3	40.70	7.07	0.62	0.00	7.740	0.62	0.00	0.00
13	175.00	LNX-6515DS-A1M	3	49.80	11.41	0.80	115.60	12.340	0.80	0.00	0.00
14	175.00	Low Profile Platform-Round	1	1500.00	22.00	1.00	1800.00	27.000	1.00	0.00	0.00
15	175.00	RRUS11	9	50.60	3.25	0.71	66.50	3.450	0.72	0.00	0.00
		Totals:	**62**	**5,953.40**			**7,335.68**				

Linear Appurtenances

			No Ice		Ice		
Bottom Elev. (ft)	**Top Elev. (ft)**	**Description**	**Weight (lb/ft)**	**CaAa (sf/ft)**	**Weight (lb/ft)**	**CaAa (sf/ft)**	**Exposed**
0.00	195.00	(15) 1 5/8" Coax	15.60	0.00	15.60	0.00	Inside
0.00	185.00	(12) 1 1/4" Coax	3.96	0.00	3.96	0.00	Inside
0.00	185.00	(1) 1/2" Fiber	0.16	0.00	0.16	0.00	Inside
0.00	185.00	(2) 3/4" DC	0.80	0.00	0.80	0.00	Inside
177.75	182.25	(3) (3) Bypass Stiffeners	0.00	3.32	0.00	3.90	Outside
0.00	175.00	(1) 1-1/4" Hybrid	0.95	0.00	1.10	0.00	Inside
0.00	143.00	(4) (4) C6x10.5	0.00	0.50	0.00	0.67	Outside
0.00	55.00	(4) (4) C5x9	10.50	0.62	16.00	0.62	Outside
		Totals:	**4,696.65**		**5,024.70**		

Shaft Section Properties

Structure: CT01916-S-SBA
Site Name: North Salem
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

6/10/2016

Tower Engineering Solutions

Increment Length: 5 (ft)

Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	Fy (ksi)	Fb (ksi)	Weight (lb)	Additional Reinforcing Area (in^2)	Additional Reinforcing Ixp (in^4)	Additional Reinforcing Iyp (in^4)	Additional Reinforcing Weight (lb)
0.00	RB1 RB2	0.4375	64.500	88.956	46124.8	24.59	147.43	65	52	0.0	10.56	16323.4	11497.4	
5.00		0.4375	63.309	87.302	43599.8	24.11	144.71	65	52	1499.4	10.56	15770.4	11108.0	180.0
10.00		0.4375	62.118	85.648	41168.7	23.63	141.98	65	52	1471.3	10.56	15226.9	10725.4	180.0
15.00		0.4375	60.927	83.994	38829.7	23.15	139.26	65	52	1443.1	10.56	14693.0	10349.5	180.0
20.00		0.4375	59.736	82.341	36581.0	22.67	136.54	65	52	1415.0	10.56	14168.6	9980.3	180.0
25.00		0.4375	58.545	80.687	34420.9	22.19	133.82	65	52	1386.9	10.56	13653.7	9617.8	180.0
30.00		0.4375	57.354	79.033	32347.5	21.71	131.10	65	52	1358.7	10.56	13148.4	9262.0	180.0
35.00		0.4375	56.163	77.379	30359.1	21.23	128.37	65	52	1330.6	10.56	12652.7	8912.9	180.0
40.00		0.4375	54.972	75.726	28453.9	20.75	125.65	65	52	1302.5	10.56	12166.4	8570.6	180.0
41.00	Bot - Section 2	0.4375	54.734	75.395	28082.7	20.65	125.11	65	52	257.1	10.56	12070.3	8502.9	36.0
45.00		0.4375	53.781	74.072	26630.1	20.27	122.93	65	52	2050.9	10.56	12039.0	8480.9	144.0
48.00	Top - Section 1	0.4375	53.942	74.295	26871.1	20.33	123.30	65	52	1514.6	10.56	11753.4	8279.7	108.0
50.00		0.4375	53.465	73.633	26159.7	20.14	122.21	65	52	503.4	10.56	11564.9	8147.0	72.0
53.00	RT2	0.4375	52.751	72.641	25116.3	19.85	120.57	65	52	746.6	10.56	11285.0	7949.9	108.0
55.00	RT1 RB3	0.4375	52.274	71.979	24436.4	19.66	119.48	65	52	492.1	12.36	36134.5	32674.7	84.0
60.00		0.4375	51.083	70.326	22790.5	19.18	116.76	65	52	1210.6	12.36	5606.4	3948.3	210.0
65.00		0.4375	49.892	68.672	21220.2	18.70	114.04	65	52	1182.4	12.36	5368.8	3781.1	210.0
70.00		0.4375	48.701	67.018	19723.7	18.22	111.32	65	52	1154.3	12.36	5136.5	3617.5	210.0
75.00		0.4375	47.510	65.364	18299.4	17.74	108.60	65	52	1126.2	12.36	4909.2	3457.5	210.0
80.00		0.4375	46.319	63.711	16945.2	17.26	105.87	65	52	1098.0	12.36	4687.1	3301.1	210.0
85.00	Bot - Section 3	0.4375	45.128	62.057	15659.6	16.78	103.15	65	52	1069.9	12.36	4470.2	3148.4	210.0
90.00		0.4375	43.938	60.403	14440.8	16.30	100.43	65	52	2104.2	12.36	4413.5	3108.4	210.0
91.00	Top - Section 2	0.4375	44.574	61.287	15084.3	16.55	101.88	65	52	414.1	12.36	4371.0	3078.5	42.0
93.00	Top - Section 3	0.0000	0.000	0.000	0.0	NAN	NAN	0	0	414.8	12.36	4286.6	3019.1	84.0
93.00	Bot - Section 4	0.4375	44.098	60.626	14601.1	16.36	100.80	65	52					
95.00		0.3750	43.622	51.472	12162.7	19.10	116.32	65	52	352.2	12.36	4203.1	2960.3	84.0
100.00		0.3750	42.431	50.055	11185.3	18.54	113.15	65	52	863.7	12.36	3997.8	2815.7	210.0
105.00		0.3750	41.240	48.637	10261.6	17.98	109.97	65	52	839.6	12.36	3797.6	2674.8	210.0
110.00		0.3750	40.049	47.220	9390.3	17.42	106.80	65	52	815.5	12.36	3602.6	2537.5	210.0
115.00		0.3750	38.858	45.802	8569.8	16.86	103.62	65	52	791.3	12.36	3412.8	2403.8	210.0
120.00		0.3750	37.667	44.385	7798.5	16.30	100.44	65	52	767.2	12.36	3228.0	2273.8	210.0
125.00	Top - Section 4	0.0000	0.000	0.000	0.0	NAN	NAN	0	0	743.1	12.36	3048.5	2147.3	210.0
125.00	Bot - Section 5	0.3750	36.476	42.967	7074.9	15.74	97.27	65	52					
130.00	Bot - Section 6	0.3125	35.285	34.687	5360.0	18.50	112.91	65	52	600.2	12.36	2874.0	2024.5	210.0
135.00	Top - Section 5	0.3125	34.719	34.125	5104.0	18.18	111.10	65	52	1170.8	12.36	2792.9	1967.4	210.0
140.00	Top - Section 6	0.0000	0.000	0.000	0.0	NAN	NAN	0	0	570.6	12.36	2626.1	1849.9	210.0
140.00	Bot - Section 7	0.3125	33.528	32.944	4592.1	17.51	107.29	65	52					
141.00	RT3	0.2500	33.290	26.216	3615.7	22.07	133.16	65	52	89.5	12.36	2593.3	1826.9	42.0
145.00		0.2500	32.337	25.460	3311.8	21.40	129.35	65	52	351.7				
150.00		0.2500	31.146	24.515	2956.5	20.56	124.58	65	52	425.1				
155.00		0.2500	29.955	23.570	2627.6	19.72	119.82	65	52	409.1				
160.00		0.2500	28.764	22.625	2324.1	18.88	115.06	65	52	393.0				
165.00		0.2500	27.573	21.680	2044.9	18.04	110.29	65	52	376.9				
170.00		0.2500	26.382	20.735	1789.0	17.20	105.53	65	52	360.8				
175.00		0.2500	25.191	19.790	1555.3	16.36	100.76	65	52	344.7				
180.00	Top - Section 7	0.0000	0.000	0.000	0.0	NAN	NAN	0	0	328.7				
180.00	Bot - Section 8	0.2500	24.000	18.845	1343.0	15.52	96.00	65	52					
185.00		0.2810	24.000	20.939	1473.6	0.00	85.41	36	29	356.3				
190.00		0.2810	24.000	20.939	1473.6	0.00	85.41	36	29	356.3				
195.00		0.2810	24.000	20.939	1473.6	0.00	85.41	36	29	356.3				
									Total Weight	**38209.1**				**5604.0**

Wind Loading - Shaft

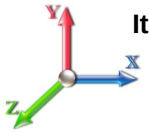
Structure: CT01916-S-SBA
Site Name: North Salem
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

6/10/2016

Tower Engineering Solutions

Load Case: 90 mph Wind with 0" Ice
Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1 RB2	0.00	1.00	20.736	35.04	483.75	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	20.736	35.04	474.82	0.650	0.000	5.00	26.627	17.31	606.5	0.0	1679.4
10.00		0.00	1.00	20.736	35.04	465.89	0.650	0.000	5.00	26.131	16.98	595.2	0.0	1651.3
15.00		0.00	1.00	20.736	35.04	456.95	0.650	0.000	5.00	25.634	16.66	583.9	0.0	1623.1
20.00		0.00	1.00	20.736	35.04	448.02	0.650	0.000	5.00	25.138	16.34	572.6	0.0	1595.0
25.00		0.00	1.00	20.736	35.04	439.09	0.650	0.000	5.00	24.642	16.02	561.3	0.0	1566.9
30.00		0.00	1.00	20.736	35.04	430.16	0.650	0.000	5.00	24.146	15.69	550.0	0.0	1538.7
35.00		0.00	1.02	21.088	35.64	424.78	0.650	0.000	5.00	23.649	15.37	547.8	0.0	1510.6
40.00		0.00	1.06	21.908	37.02	423.78	0.650	0.000	5.00	23.153	15.05	557.2	0.0	1482.5
41.00	Bot - Section 2	0.00	1.06	22.063	37.29	423.43	0.650	0.000	1.00	4.571	2.97	110.8	0.0	293.1
45.00		0.00	1.09	22.657	38.29	421.63	0.650	0.000	4.00	18.378	11.95	457.4	0.0	2194.9
48.00	Top - Section 1	0.00	1.11	23.079	39.00	419.88	0.650	0.000	3.00	13.575	8.82	344.2	0.0	1622.6
50.00		0.00	1.13	23.350	39.46	425.51	0.650	0.000	2.00	8.951	5.82	229.6	0.0	575.4
53.00	RT2	0.00	1.14	23.742	40.12	423.33	0.650	0.000	3.00	13.277	8.63	346.3	0.0	854.6
55.00	RT1 RB3	0.00	1.16	23.994	40.55	421.74	0.650	0.000	2.00	8.752	5.69	230.7	0.0	576.1
60.00		0.00	1.19	24.598	41.57	417.28	0.650	0.000	5.00	21.533	14.00	581.8	0.0	1420.6
65.00		0.00	1.21	25.167	42.53	412.24	0.650	0.000	5.00	21.037	13.67	581.6	0.0	1392.4
70.00		0.00	1.24	25.706	43.44	406.68	0.650	0.000	5.00	20.540	13.35	580.0	0.0	1364.3
75.00		0.00	1.26	26.218	44.31	400.67	0.650	0.000	5.00	20.044	13.03	577.3	0.0	1336.2
80.00		0.00	1.29	26.706	45.13	394.24	0.650	0.000	5.00	19.548	12.71	573.5	0.0	1308.0
85.00	Bot - Section 3	0.00	1.31	27.172	45.92	387.45	0.650	0.000	5.00	19.052	12.38	568.7	0.0	1279.9
90.00		0.00	1.33	27.620	46.68	380.32	0.650	0.000	5.00	18.920	12.30	574.0	0.0	2314.2
91.00	Top - Section 2	0.00	1.34	27.707	46.82	378.85	0.650	0.000	1.00	3.724	2.42	113.4	0.0	456.1
93.00	Top - Section 3	0.00	1.34	27.880	47.12	383.50	0.650	0.000	2.00	7.389	4.80	226.3	0.0	498.8
95.00		0.00	1.35	28.050	47.40	380.51	0.650	0.000	2.00	7.310	4.75	225.2	0.0	436.2
100.00		0.00	1.37	28.464	48.10	372.84	0.650	0.000	5.00	17.928	11.65	560.5	0.0	1073.7
105.00		0.00	1.39	28.863	48.78	364.91	0.650	0.000	5.00	17.431	11.33	552.7	0.0	1049.6
110.00		0.00	1.41	29.250	49.43	356.73	0.650	0.000	5.00	16.935	11.01	544.1	0.0	1025.5
115.00		0.00	1.43	29.623	50.06	348.33	0.650	0.000	5.00	16.439	10.69	534.9	0.0	1001.3
120.00		0.00	1.45	29.986	50.68	339.71	0.650	0.000	5.00	15.943	10.36	525.1	0.0	977.2
125.00	Top - Section 4	0.00	1.46	30.338	51.27	330.90	0.650	0.000	5.00	15.446	10.04	514.8	0.0	953.1
130.00	Bot - Section 6	0.00	1.48	30.679	51.85	321.89	0.650	0.000	5.00	14.950	9.72	503.8	0.0	810.2
135.00	Top - Section 5	0.00	1.50	31.012	52.41	312.71	0.650	0.000	5.00	14.714	9.56	501.3	0.0	1380.8
140.00	Top - Section 6	0.00	1.51	31.336	52.96	309.12	0.650	0.000	5.00	14.218	9.24	489.4	0.0	780.6
141.00	RT3	0.00	1.51	31.400	53.07	307.23	0.650	0.000	1.00	2.784	1.81	96.0	0.0	131.5
145.00		0.00	1.53	31.652	53.49	299.64	0.650	0.000	4.00	10.938	7.11	380.3	0.0	351.7
150.00		0.00	1.54	31.960	54.01	290.00	0.650	0.000	5.00	13.226	8.60	464.3	0.0	425.1
155.00		0.00	1.56	32.261	54.52	280.22	0.650	0.000	5.00	12.729	8.27	451.1	0.0	409.1
160.00		0.00	1.57	32.555	55.02	270.30	0.650	0.000	5.00	12.233	7.95	437.5	0.0	393.0
165.00		0.00	1.58	32.842	55.50	260.25	0.650	0.000	5.00	11.737	7.63	423.4	0.0	376.9
170.00		0.00	1.60	33.123	55.98	250.08	0.650	0.000	5.00	11.241	7.31	409.0	0.0	360.8
175.00	Appurtenance(s)	0.00	1.61	33.399	56.44	239.78	0.650	0.000	5.00	10.744	6.98	394.2	0.0	344.7
180.00	Top - Section 7	0.00	1.62	33.669	56.90	229.36	0.650	0.000	5.00	10.248	6.66	379.0	0.0	328.7
185.00	Appurtenance(s)	0.00	1.64	33.933	57.35	230.26	0.590	0.000	5.00	10.000	5.90	338.3	0.0	356.3
190.00		0.00	1.65	34.193	57.79	231.14	0.590	0.000	5.00	10.000	5.90	340.9	0.0	356.3
195.00	Appurtenance(s)	0.00	1.66	34.448	58.22	232.00	0.590	0.000	5.00	10.000	5.90	343.5	0.0	356.3
								Totals:	**195.00**			**20,079.6**		**43,813.1**

Discrete Appurtenance Forces

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 9	

Tower Engineering Solutions

Load Case: 90 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	T-Arm (Round)	3	34.448	58.217	0.75	18.00	1350.00	0.000	0.000	1047.90	0.00	0.00
2	195.00	RR90-11-00DBL	6	34.448	58.217	0.77	24.16	126.00	0.000	0.000	1406.66	0.00	0.00
3	195.00	DB980H90E-M	6	34.448	58.217	0.73	16.64	51.00	0.000	0.000	968.96	0.00	0.00
4	185.00	T-Arm (Round)	3	33.933	57.347	0.75	18.00	1350.00	0.000	0.000	1032.25	0.00	0.00
5	185.00	SBNH-1D6565C	1	33.933	57.347	0.80	9.15	66.10	0.000	0.000	524.84	0.00	0.00
6	185.00	RRUS-11	6	33.933	57.347	0.75	13.10	306.00	0.000	0.000	750.96	0.00	0.00
7	185.00	P65-17-XLH-RR	2	33.933	57.347	0.75	17.19	118.00	0.000	0.000	985.80	0.00	0.00
8	185.00	LGP21903	6	33.933	57.347	0.67	1.09	33.00	0.000	0.000	62.24	0.00	0.00
9	185.00	LGP21401	6	33.933	57.347	0.67	5.19	84.60	0.000	0.000	297.39	0.00	0.00
10	185.00	DC6-48-60-18-8F	1	33.933	57.347	0.75	1.10	31.80	0.000	0.000	63.23	0.00	0.00
11	185.00	7770.00	6	33.933	57.347	0.73	25.75	210.00	0.000	0.000	1476.95	0.00	0.00
12	175.00	RRUS11	9	33.399	56.444	0.71	20.77	455.40	0.000	0.000	1172.20	0.00	0.00
13	175.00	Low Profile Platform-Round	1	33.399	56.444	1.00	22.00	1500.00	0.000	0.000	1241.77	0.00	0.00
14	175.00	LNX-6515DS-A1M	3	33.399	56.444	0.80	27.38	149.40	0.000	0.000	1545.67	0.00	0.00
15	175.00	APX16DWV-16DWVS-E-A20	3	33.399	56.444	0.62	13.15	122.10	0.000	0.000	742.25	0.00	0.00
						Totals:		**5,953.40**			**13,319.08**		

Total Applied Force Summary

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 10	

Tower Engineering Solutions

Load Case: 90 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		802.77	1839.28	0.00	0.00
10.00		791.46	1811.15	0.00	0.00
15.00		780.16	1783.01	0.00	0.00
20.00		768.86	1754.87	0.00	0.00
25.00		757.55	1726.73	0.00	0.00
30.00		746.25	1698.60	0.00	0.00
35.00		747.40	1670.46	0.00	0.00
40.00		764.53	1642.32	0.00	0.00
41.00		152.54	325.09	0.00	0.00
45.00		628.95	2322.84	0.00	0.00
48.00		475.20	1718.50	0.00	0.00
50.00		317.97	639.31	0.00	0.00
53.00		481.08	950.53	0.00	0.00
55.00		321.52	640.06	0.00	0.00
60.00		685.77	1527.95	0.00	0.00
65.00		687.92	1499.81	0.00	0.00
70.00		688.63	1471.68	0.00	0.00
75.00		688.05	1443.54	0.00	0.00
80.00		686.29	1415.40	0.00	0.00
85.00		683.47	1387.27	0.00	0.00
90.00		690.73	2421.56	0.00	0.00
91.00		136.77	477.56	0.00	0.00
93.00		273.42	541.79	0.00	0.00
95.00		272.64	479.18	0.00	0.00
100.00		680.81	1181.06	0.00	0.00
105.00		674.63	1156.94	0.00	0.00
110.00		667.71	1132.82	0.00	0.00
115.00		660.10	1108.70	0.00	0.00
120.00		651.83	1084.59	0.00	0.00
125.00		642.94	1060.47	0.00	0.00
130.00		633.46	917.58	0.00	0.00
135.00		632.29	1488.13	0.00	0.00
140.00		621.82	887.93	0.00	0.00
141.00		122.56	153.00	0.00	0.00
145.00		433.79	437.58	0.00	0.00
150.00		464.32	532.50	0.00	0.00
155.00		451.11	516.43	0.00	0.00
160.00		437.47	500.35	0.00	0.00
165.00		423.43	484.27	0.00	0.00
170.00		409.00	468.19	0.00	0.00
175.00	(16) appurtenances	5096.09	2679.01	0.00	0.00
180.00		804.07	431.26	0.00	0.00
185.00	(31) appurtenances	5960.41	2658.35	0.00	0.00
190.00		340.94	434.25	0.00	0.00
195.00	(15) appurtenances	3766.99	1961.25	0.00	0.00
	Totals:	**38,605.70**	**54,463.14**	**0.00**	**0.00**

Resulting Forces and Deflections

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 11	

Tower Engineering Solutions

Load Case: 90 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 24

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-38.663	-54.422	0.000	0.000	0.000	-4885.519	0.000	0.000	0.000	0.000	0.000
5.00	-37.967	-52.505	0.000	0.000	0.000	-4692.208	-0.064	0.000	0.064	-0.118	0.000
10.00	-37.276	-50.618	0.000	0.000	0.000	-4502.375	-0.252	0.000	0.252	-0.238	0.000
15.00	-36.590	-48.762	0.000	0.000	0.000	-4315.996	-0.566	0.000	0.566	-0.359	0.000
20.00	-35.909	-46.936	0.000	0.000	0.000	-4133.047	-1.008	0.000	1.008	-0.481	0.000
25.00	-35.233	-45.140	0.000	0.000	0.000	-3953.502	-1.578	0.000	1.578	-0.604	0.000
30.00	-34.563	-43.375	0.000	0.000	0.000	-3777.338	-2.278	0.000	2.278	-0.729	0.000
35.00	-33.884	-41.640	0.000	0.000	0.000	-3604.527	-3.109	0.000	3.109	-0.855	0.000
40.00	-33.147	-39.966	0.000	0.000	0.000	-3435.108	-4.074	0.000	4.074	-0.983	0.000
41.00	-33.034	-39.606	0.000	0.000	0.000	-3401.962	-4.283	0.000	4.283	-1.009	0.000
45.00	-32.421	-37.244	0.000	0.000	0.000	-3269.828	-5.173	0.000	5.173	-1.113	0.000
48.00	-31.952	-35.499	0.000	0.000	0.000	-3172.567	-5.898	0.000	5.898	-1.191	0.000
50.00	-31.660	-34.831	0.000	0.000	0.000	-3108.664	-6.408	0.000	6.408	-1.244	0.000
53.00	-31.195	-33.856	0.000	0.000	0.000	-3013.686	-7.215	0.000	7.215	-1.320	0.000
55.00	-30.915	-33.171	0.000	0.000	0.000	-2951.297	-7.779	0.000	7.779	-1.371	0.000
60.00	-30.271	-31.585	0.000	0.000	0.000	-2796.722	-9.292	0.000	9.292	-1.515	0.000
65.00	-29.618	-30.030	0.000	0.000	0.000	-2645.371	-10.956	0.000	10.956	-1.659	0.000
70.00	-28.958	-28.505	0.000	0.000	0.000	-2497.283	-12.772	0.000	12.772	-1.806	0.000
75.00	-28.293	-27.012	0.000	0.000	0.000	-2352.494	-14.742	0.000	14.742	-1.954	0.000
80.00	-27.624	-25.550	0.000	0.000	0.000	-2211.029	-16.868	0.000	16.868	-2.103	0.000
85.00	-26.952	-24.118	0.000	0.000	0.000	-2072.910	-19.151	0.000	19.151	-2.253	0.000
90.00	-26.198	-21.686	0.000	0.000	0.000	-1938.150	-21.591	0.000	21.591	-2.405	0.000
91.00	-26.058	-21.193	0.000	0.000	0.000	-1911.953	-22.098	0.000	22.098	-2.436	0.000
93.00	-25.784	-20.636	0.000	0.000	0.000	-1859.837	-23.132	0.000	23.132	-2.498	0.000
95.00	-25.530	-20.119	0.000	0.000	0.000	-1808.270	-24.191	0.000	24.191	-2.557	0.000
100.00	-24.850	-18.900	0.000	0.000	0.000	-1680.622	-26.957	0.000	26.957	-2.721	0.000
105.00	-24.170	-17.708	0.000	0.000	0.000	-1556.375	-29.895	0.000	29.895	-2.886	0.000
110.00	-23.492	-16.544	0.000	0.000	0.000	-1435.526	-33.004	0.000	33.004	-3.050	0.000
115.00	-22.817	-15.408	0.000	0.000	0.000	-1318.067	-36.286	0.000	36.286	-3.215	0.000
120.00	-22.144	-14.299	0.000	0.000	0.000	-1203.985	-39.739	0.000	39.739	-3.378	0.000
125.00	-21.476	-13.219	0.000	0.000	0.000	-1093.265	-43.362	0.000	43.362	-3.540	0.000
130.00	-20.822	-12.282	0.000	0.000	0.000	-985.887	-47.154	0.000	47.154	-3.701	0.000
135.00	-20.126	-10.776	0.000	0.000	0.000	-881.777	-51.124	0.000	51.124	-3.881	0.000
140.00	-19.462	-9.899	0.000	0.000	0.000	-781.147	-55.279	0.000	55.279	-4.055	0.000
141.00	-19.345	-9.723	0.000	0.000	0.000	-761.685	-56.131	0.000	56.131	-4.089	0.000
145.00	-18.916	-9.247	0.000	0.000	0.000	-684.306	-59.620	0.000	59.620	-4.240	0.000
150.00	-18.453	-8.666	0.000	0.000	0.000	-589.729	-64.205	0.000	64.205	-4.513	0.000
155.00	-17.997	-8.108	0.000	0.000	0.000	-497.467	-69.070	0.000	69.070	-4.775	0.000
160.00	-17.550	-7.575	0.000	0.000	0.000	-407.482	-74.200	0.000	74.200	-5.020	0.000
165.00	-17.110	-7.069	0.000	0.000	0.000	-319.735	-79.573	0.000	79.573	-5.242	0.000
170.00	-16.680	-6.590	0.000	0.000	0.000	-234.184	-85.165	0.000	85.165	-5.435	0.000
175.00	-11.360	-4.388	0.000	0.000	0.000	-150.787	-90.936	0.000	90.936	-5.588	0.000
180.00	-10.523	-4.021	0.000	0.000	0.000	-93.990	-96.844	0.000	96.844	-5.700	0.000
185.00	-4.329	-1.969	0.000	0.000	0.000	-41.373	-102.848	0.000	102.848	-5.772	0.000
190.00	-3.946	-1.570	0.000	0.000	0.000	-19.730	-108.900	0.000	108.900	-5.801	0.000
195.00	-3.767	0.000	0.000	0.000	0.000	0.000	0.000	0.000	114.972	-5.811	0.000

Resulting Stresses

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 12	

Tower Engineering Solutions

Load Case: 90 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 24

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)		f/Fb Stress Ratio
0.00	0.61	0.88	0.00	0.00	0.00	32.81	33.42	52.0		0.643
5.00	0.60	0.88	0.00	0.00	0.00	32.58	33.18	52.0		0.638
10.00	0.59	0.88	0.00	0.00	0.00	32.34	32.93	52.0		0.633
15.00	0.58	0.88	0.00	0.00	0.00	32.08	32.66	52.0		0.628
20.00	0.57	0.88	0.00	0.00	0.00	31.82	32.39	52.0		0.623
25.00	0.56	0.88	0.00	0.00	0.00	31.54	32.09	52.0		0.617
30.00	0.55	0.88	0.00	0.00	0.00	31.24	31.79	52.0		0.612
35.00	0.54	0.88	0.00	0.00	0.00	30.93	31.47	52.0		0.605
40.00	0.53	0.88	0.00	0.00	0.00	30.60	31.13	52.0		0.599
41.00	0.53	0.88	0.00	0.00	0.00	30.54	31.06	52.0		0.598
45.00	0.50	0.88	0.00	0.00	0.00	30.05	30.55	52.0		0.588
48.00	0.48	0.87	0.00	0.00	0.00	29.84	30.32	52.0		0.583
50.00	0.47	0.87	0.00	0.00	0.00	29.07	29.54	52.0		0.568
53.00	0.47	0.87	0.00	0.00	0.00	28.85	29.31	52.0		0.564
55.00	0.46	0.87	0.00	0.00	0.00	32.42	32.42	52.0		0.624
60.00	0.45	0.87	0.00	0.00	0.00	32.06	32.51	52.0		0.625
65.00	0.44	0.87	0.00	0.00	0.00	31.67	32.11	52.0		0.618
70.00	0.43	0.87	0.00	0.00	0.00	31.26	31.69	52.0		0.610
75.00	0.41	0.87	0.00	0.00	0.00	30.82	31.24	52.0		0.601
80.00	0.40	0.87	0.00	0.00	0.00	30.35	30.75	52.0		0.592
85.00	0.39	0.88	0.00	0.00	0.00	29.84	30.23	52.0		0.582
90.00	0.36	0.87	0.00	0.00	0.00	29.12	29.47	52.0		0.567
91.00	0.35	0.86	0.00	0.00	0.00	29.01	29.35	52.0		0.565
93.00	0.34	0.86	0.00	0.00	0.00	27.93	28.27	52.0		0.544
95.00	0.39	1.00	0.00	0.00	0.00	31.30	31.69	52.0		0.610
100.00	0.38	1.00	0.00	0.00	0.00	30.56	30.94	52.0		0.595
105.00	0.36	1.00	0.00	0.00	0.00	29.77	30.13	52.0		0.580
110.00	0.35	1.00	0.00	0.00	0.00	28.92	29.27	52.0		0.563
115.00	0.34	1.00	0.00	0.00	0.00	28.00	28.34	52.0		0.545
120.00	0.32	1.01	0.00	0.00	0.00	27.01	27.34	52.0		0.526
125.00	0.31	1.01	0.00	0.00	0.00	25.94	26.25	52.0		0.505
130.00	0.35	1.21	0.00	0.00	0.00	28.26	28.62	52.0		0.551
135.00	0.32	1.19	0.00	0.00	0.00	26.53	26.85	52.0		0.517
140.00	0.30	1.19	0.00	0.00	0.00	24.39	24.69	52.0		0.475
141.00	0.37	1.49	0.00	0.00	0.00	27.95	28.32	52.0		0.545
145.00	0.36	1.50	0.00	0.00	0.00	40.71	41.15	52.0		0.792
150.00	0.35	1.52	0.00	0.00	0.00	37.85	38.29	52.0		0.737
155.00	0.34	1.54	0.00	0.00	0.00	34.55	35.00	52.0		0.673
160.00	0.33	1.56	0.00	0.00	0.00	30.73	31.18	52.0		0.600
165.00	0.33	1.59	0.00	0.00	0.00	26.27	26.74	52.0		0.514
170.00	0.32	1.62	0.00	0.00	0.00	21.04	21.54	52.0		0.414
175.00	0.22	1.16	0.00	0.00	0.00	14.88	15.23	52.0		0.293
180.00	0.21	1.13	0.00	0.00	0.00	10.23	10.63	52.0		0.204
180.00	0.21	1.13	0.00	0.00	0.00	10.23	10.63	52.0		0.183
185.00	0.09	0.41	0.00	0.00	0.00	4.04	4.20	28.8	28.8	0.146
190.00	0.07	0.38	0.00	0.00	0.00	1.93	2.11	28.8	28.8	0.073
195.00	0.00	0.36	0.00	0.00	0.00	0.00	0.62	28.8	28.8	0.022

Resulting Stresses

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 13	

Wind Loading - Shaft

Structure: CT01916-S-SBA
Site Name: North Salem
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

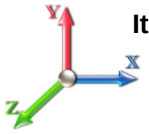
Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

6/10/2016

Tower Engineering Solutions

Load Case: 77.94 mph Wind with 0.5" Ice

Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 24

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1 RB2	0.00	1.00	15.551	26.28	418.93	0.650	0.500	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	15.551	26.28	411.19	0.650	0.500	5.00	27.044	17.58	462.0	194.9	1874.3
10.00		0.00	1.00	15.551	26.28	403.46	0.650	0.500	5.00	26.547	17.26	453.5	191.3	1842.5
15.00		0.00	1.00	15.551	26.28	395.72	0.650	0.500	5.00	26.051	16.93	445.0	187.6	1810.8
20.00		0.00	1.00	15.551	26.28	387.99	0.650	0.500	5.00	25.555	16.61	436.5	184.0	1779.0
25.00		0.00	1.00	15.551	26.28	380.25	0.650	0.500	5.00	25.059	16.29	428.1	180.3	1747.2
30.00		0.00	1.00	15.551	26.28	372.52	0.650	0.500	5.00	24.562	15.97	419.6	176.7	1715.4
35.00		0.00	1.02	15.815	26.73	367.86	0.650	0.500	5.00	24.066	15.64	418.1	173.1	1683.7
40.00		0.00	1.06	16.430	27.77	366.99	0.650	0.500	5.00	23.570	15.32	425.4	169.4	1651.9
41.00	Bot - Section 2	0.00	1.06	16.546	27.96	366.69	0.650	0.500	1.00	4.654	3.03	84.6	33.7	326.9
45.00		0.00	1.09	16.992	28.72	365.13	0.650	0.500	4.00	18.711	12.16	349.3	134.8	2329.7
48.00	Top - Section 1	0.00	1.11	17.308	29.25	363.62	0.650	0.500	3.00	13.825	8.99	262.9	99.8	1722.3
50.00		0.00	1.13	17.511	29.59	368.49	0.650	0.500	2.00	9.117	5.93	175.4	65.9	641.3
53.00	RT2	0.00	1.14	17.805	30.09	366.61	0.650	0.500	3.00	13.527	8.79	264.6	97.6	952.2
55.00	RT1 RB3	0.00	1.16	17.995	30.41	365.22	0.650	0.500	2.00	8.919	5.80	176.3	64.5	640.6
60.00		0.00	1.19	18.448	31.18	361.37	0.650	0.500	5.00	21.950	14.27	444.8	157.6	1578.1
65.00		0.00	1.21	18.874	31.90	357.00	0.650	0.500	5.00	21.453	13.94	444.8	153.9	1546.4
70.00		0.00	1.24	19.278	32.58	352.19	0.650	0.500	5.00	20.957	13.62	443.8	150.3	1514.6
75.00		0.00	1.26	19.662	33.23	346.98	0.650	0.500	5.00	20.461	13.30	441.9	146.6	1482.8
80.00		0.00	1.29	20.028	33.85	341.41	0.650	0.500	5.00	19.965	12.98	439.2	143.0	1451.0
85.00	Bot - Section 3	0.00	1.31	20.378	34.44	335.53	0.650	0.500	5.00	19.468	12.65	435.8	139.4	1419.3
90.00		0.00	1.33	20.714	35.01	329.35	0.650	0.500	5.00	19.337	12.57	440.0	138.4	2452.6
91.00	Top - Section 2	0.00	1.34	20.779	35.12	328.08	0.650	0.500	1.00	3.808	2.48	86.9	27.5	483.6
93.00	Top - Section 3	0.00	1.34	20.909	35.34	332.11	0.650	0.500	2.00	7.556	4.91	173.5	54.5	553.3
95.00		0.00	1.35	21.036	35.55	329.52	0.650	0.500	2.00	7.477	4.86	172.8	53.9	490.1
100.00		0.00	1.37	21.347	36.08	322.88	0.650	0.500	5.00	18.344	11.92	430.2	131.1	1204.8
105.00		0.00	1.39	21.646	36.58	316.01	0.650	0.500	5.00	17.848	11.60	424.4	127.5	1177.1
110.00		0.00	1.41	21.936	37.07	308.93	0.650	0.500	5.00	17.352	11.28	418.1	123.8	1149.3
115.00		0.00	1.43	22.216	37.55	301.65	0.650	0.500	5.00	16.855	10.96	411.3	120.2	1121.5
120.00		0.00	1.45	22.488	38.00	294.19	0.650	0.500	5.00	16.359	10.63	404.1	116.6	1093.8
125.00	Top - Section 4	0.00	1.46	22.752	38.45	286.56	0.650	0.500	5.00	15.863	10.31	396.5	112.9	1066.0
130.00	Bot - Section 6	0.00	1.48	23.008	38.88	278.76	0.650	0.500	5.00	15.367	9.99	388.4	109.3	919.5
135.00	Top - Section 5	0.00	1.50	23.258	39.31	270.81	0.650	0.500	5.00	15.131	9.84	386.6	107.6	1488.3
140.00	Top - Section 6	0.00	1.51	23.501	39.72	267.70	0.650	0.500	5.00	14.635	9.51	377.8	103.9	884.5
141.00	RT3	0.00	1.51	23.548	39.80	266.07	0.650	0.500	1.00	2.867	1.86	74.2	20.6	152.2
145.00		0.00	1.53	23.737	40.12	259.49	0.650	0.500	4.00	11.271	7.33	293.9	80.2	431.9
150.00		0.00	1.54	23.968	40.51	251.14	0.650	0.500	5.00	13.642	8.87	359.2	96.7	521.8
155.00		0.00	1.56	24.194	40.89	242.67	0.650	0.500	5.00	13.146	8.54	349.4	93.0	502.1
160.00		0.00	1.57	24.415	41.26	234.08	0.650	0.500	5.00	12.650	8.22	339.3	89.4	482.4
165.00		0.00	1.58	24.630	41.62	225.38	0.650	0.500	5.00	12.154	7.90	328.8	85.7	462.6
170.00		0.00	1.60	24.841	41.98	216.57	0.650	0.500	5.00	11.657	7.58	318.1	82.1	442.9
175.00	Appurtenance(s)	0.00	1.61	25.048	42.33	207.65	0.650	0.500	5.00	11.161	7.25	307.1	78.5	423.2
180.00	Top - Section 7	0.00	1.62	25.250	42.67	198.63	0.650	0.500	5.00	10.665	6.93	295.8	74.8	403.5
185.00	Appurtenance(s)	0.00	1.64	25.449	43.01	199.41	0.590	0.500	5.00	10.417	6.15	264.3	74.8	431.1
190.00		0.00	1.65	25.643	43.34	200.17	0.590	0.500	5.00	10.417	6.15	266.3	74.8	431.1
195.00	Appurtenance(s)	0.00	1.66	25.834	43.66	200.91	0.590	0.500	5.00	10.417	6.15	268.3	74.8	431.1
								Totals:	**195.00**			**15,426.9**		**48,910.3**

Discrete Appurtenance Forces

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 15	

Load Case: 77.94 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 24

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	T-Arm (Round)	3	25.834	43.660	0.75	23.63	1650.00	0.000	0.000	1031.46	0.00	0.00
2	195.00	RR90-11-00DBL	6	25.834	43.660	0.78	26.21	290.28	0.000	0.000	1144.24	0.00	0.00
3	195.00	DB980H90E-M	6	25.834	43.660	0.73	19.14	0.00	0.000	0.000	835.68	0.00	0.00
4	185.00	T-Arm (Round)	3	25.449	43.008	0.75	23.63	1650.00	0.000	0.000	1016.07	0.00	0.00
5	185.00	SBNH-1D6565C	1	25.449	43.008	0.80	9.90	132.00	0.000	0.000	425.61	0.00	0.00
6	185.00	RRUS-11	6	25.449	43.008	0.75	14.13	402.00	0.000	0.000	607.70	0.00	0.00
7	185.00	P65-17-XLH-RR	2	25.449	43.008	0.75	18.59	242.00	0.000	0.000	799.30	0.00	0.00
8	185.00	LGP21903	6	25.449	43.008	0.67	1.53	47.40	0.000	0.000	65.70	0.00	0.00
9	185.00	LGP21401	6	25.449	43.008	0.67	6.15	127.20	0.000	0.000	264.53	0.00	0.00
10	185.00	DC6-48-60-18-8F	1	25.449	43.008	0.75	1.25	49.50	0.000	0.000	53.87	0.00	0.00
11	185.00	7770.00	6	25.449	43.008	0.73	28.60	0.00	0.000	0.000	1230.09	0.00	0.00
12	175.00	RRUS11	9	25.048	42.331	0.72	22.36	598.50	0.000	0.000	946.34	0.00	0.00
13	175.00	Low Profile Platform-Round	1	25.048	42.331	1.00	27.00	1800.00	0.000	0.000	1142.93	0.00	0.00
14	175.00	LNX-6515DS-A1M	3	25.048	42.331	0.80	29.62	346.80	0.000	0.000	1253.66	0.00	0.00
15	175.00	APX16DWV-16DWVS-E-A20	3	25.048	42.331	0.62	14.40	0.00	0.000	0.000	609.41	0.00	0.00
						Totals:		**7,335.68**			**11,426.58**		

Total Applied Force Summary

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 16	

Tower Engineering Solutions

Load Case: 77.94 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 24

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		631.50	2061.68	0.00	0.00
10.00		623.02	2029.90	0.00	0.00
15.00		614.54	1998.13	0.00	0.00
20.00		606.06	1966.35	0.00	0.00
25.00		597.59	1934.58	0.00	0.00
30.00		589.11	1902.80	0.00	0.00
35.00		590.48	1871.03	0.00	0.00
40.00		604.48	1839.25	0.00	0.00
41.00		120.67	364.33	0.00	0.00
45.00		497.43	2479.61	0.00	0.00
48.00		376.05	1834.76	0.00	0.00
50.00		251.73	716.24	0.00	0.00
53.00		381.03	1064.62	0.00	0.00
55.00		254.76	715.53	0.00	0.00
60.00		549.24	1685.50	0.00	0.00
65.00		551.66	1653.73	0.00	0.00
70.00		552.96	1621.95	0.00	0.00
75.00		553.25	1590.18	0.00	0.00
80.00		552.63	1558.40	0.00	0.00
85.00		551.17	1526.63	0.00	0.00
90.00		557.25	2559.96	0.00	0.00
91.00		110.44	505.09	0.00	0.00
93.00		220.90	596.28	0.00	0.00
95.00		220.41	533.08	0.00	0.00
100.00		551.01	1312.18	0.00	0.00
105.00		546.95	1284.42	0.00	0.00
110.00		542.31	1256.67	0.00	0.00
115.00		537.13	1228.92	0.00	0.00
120.00		531.44	1201.16	0.00	0.00
125.00		525.27	1173.41	0.00	0.00
130.00		518.65	1026.87	0.00	0.00
135.00		518.25	1595.70	0.00	0.00
140.00		510.85	991.86	0.00	0.00
141.00		100.84	173.64	0.00	0.00
145.00		347.65	517.81	0.00	0.00
150.00		359.19	629.16	0.00	0.00
155.00		349.38	609.44	0.00	0.00
160.00		339.26	589.73	0.00	0.00
165.00		328.83	570.01	0.00	0.00
170.00		318.10	550.30	0.00	0.00
175.00	(16) appurtenances	4259.43	3275.88	0.00	0.00
180.00		670.26	506.10	0.00	0.00
185.00	(31) appurtenances	5104.58	3183.78	0.00	0.00
190.00		266.34	509.08	0.00	0.00
195.00	(15) appurtenances	3279.70	2449.36	0.00	0.00
	Totals:	**31,663.79**	**61,245.12**	**0.00**	**0.00**

Resulting Forces and Deflections

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 17	

Tower Engineering Solutions

Load Case: 77.94 mph Wind with 0.5" Ice

Iterations: 24

Dead Load Factor 1.00

Wind Load Factor 1.00

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-31.718	-61.217	0.000	0.000	0.000	-4088.175	0.000	0.000	0.000	0.000	0.000
5.00	-31.187	-59.102	0.000	0.000	0.000	-3929.590	-0.053	0.000	0.053	-0.099	0.000
10.00	-30.659	-57.020	0.000	0.000	0.000	-3773.657	-0.211	0.000	0.211	-0.199	0.000
15.00	-30.134	-54.971	0.000	0.000	0.000	-3620.364	-0.474	0.000	0.474	-0.300	0.000
20.00	-29.611	-52.955	0.000	0.000	0.000	-3469.699	-0.844	0.000	0.844	-0.403	0.000
25.00	-29.091	-50.972	0.000	0.000	0.000	-3321.647	-1.322	0.000	1.322	-0.507	0.000
30.00	-28.573	-49.023	0.000	0.000	0.000	-3176.196	-1.909	0.000	1.909	-0.612	0.000
35.00	-28.049	-47.106	0.000	0.000	0.000	-3033.331	-2.607	0.000	2.607	-0.718	0.000
40.00	-27.471	-45.245	0.000	0.000	0.000	-2893.088	-3.416	0.000	3.416	-0.825	0.000
41.00	-27.388	-44.856	0.000	0.000	0.000	-2865.618	-3.591	0.000	3.591	-0.847	0.000
45.00	-26.908	-42.348	0.000	0.000	0.000	-2756.068	-4.339	0.000	4.339	-0.935	0.000
48.00	-26.540	-40.495	0.000	0.000	0.000	-2675.344	-4.948	0.000	4.948	-1.001	0.000
50.00	-26.314	-39.758	0.000	0.000	0.000	-2622.264	-5.377	0.000	5.377	-1.045	0.000
53.00	-25.949	-38.677	0.000	0.000	0.000	-2543.324	-6.054	0.000	6.054	-1.110	0.000
55.00	-25.735	-37.929	0.000	0.000	0.000	-2491.427	-6.529	0.000	6.529	-1.153	0.000
60.00	-25.227	-36.202	0.000	0.000	0.000	-2362.755	-7.801	0.000	7.801	-1.274	0.000
65.00	-24.711	-34.509	0.000	0.000	0.000	-2236.622	-9.201	0.000	9.201	-1.396	0.000
70.00	-24.188	-32.849	0.000	0.000	0.000	-2113.068	-10.729	0.000	10.729	-1.520	0.000
75.00	-23.660	-31.223	0.000	0.000	0.000	-1992.128	-12.388	0.000	12.388	-1.645	0.000
80.00	-23.127	-29.630	0.000	0.000	0.000	-1873.830	-14.178	0.000	14.178	-1.771	0.000
85.00	-22.590	-28.072	0.000	0.000	0.000	-1758.197	-16.102	0.000	16.102	-1.899	0.000
90.00	-21.979	-25.503	0.000	0.000	0.000	-1645.249	-18.159	0.000	18.159	-2.028	0.000
91.00	-21.868	-24.987	0.000	0.000	0.000	-1623.270	-18.587	0.000	18.587	-2.054	0.000
93.00	-21.648	-24.380	0.000	0.000	0.000	-1579.534	-19.458	0.000	19.458	-2.107	0.000
95.00	-21.448	-23.819	0.000	0.000	0.000	-1536.239	-20.352	0.000	20.352	-2.157	0.000
100.00	-20.901	-22.479	0.000	0.000	0.000	-1429.002	-22.685	0.000	22.685	-2.297	0.000
105.00	-20.353	-21.168	0.000	0.000	0.000	-1324.499	-25.165	0.000	25.165	-2.436	0.000
110.00	-19.805	-19.888	0.000	0.000	0.000	-1222.734	-27.792	0.000	27.792	-2.577	0.000
115.00	-19.257	-18.639	0.000	0.000	0.000	-1123.711	-30.564	0.000	30.564	-2.716	0.000
120.00	-18.710	-17.419	0.000	0.000	0.000	-1027.426	-33.483	0.000	33.483	-2.856	0.000
125.00	-18.165	-16.231	0.000	0.000	0.000	-933.875	-36.548	0.000	36.548	-2.994	0.000
130.00	-17.631	-15.188	0.000	0.000	0.000	-843.052	-39.756	0.000	39.756	-3.131	0.000
135.00	-17.060	-13.579	0.000	0.000	0.000	-754.899	-43.117	0.000	43.117	-3.285	0.000
140.00	-16.511	-12.593	0.000	0.000	0.000	-669.600	-46.637	0.000	46.637	-3.434	0.000
141.00	-16.418	-12.403	0.000	0.000	0.000	-653.089	-47.359	0.000	47.359	-3.464	0.000
145.00	-16.077	-11.856	0.000	0.000	0.000	-587.420	-50.315	0.000	50.315	-3.593	0.000
150.00	-15.723	-11.188	0.000	0.000	0.000	-507.036	-54.204	0.000	54.204	-3.828	0.000
155.00	-15.373	-10.546	0.000	0.000	0.000	-428.423	-58.333	0.000	58.333	-4.053	0.000
160.00	-15.027	-9.929	0.000	0.000	0.000	-351.560	-62.691	0.000	62.691	-4.264	0.000
165.00	-14.685	-9.340	0.000	0.000	0.000	-276.428	-67.260	0.000	67.260	-4.457	0.000
170.00	-14.347	-8.779	0.000	0.000	0.000	-203.005	-72.016	0.000	72.016	-4.623	0.000
175.00	-9.845	-5.843	0.000	0.000	0.000	-131.269	-76.930	0.000	76.930	-4.756	0.000
180.00	-9.143	-5.382	0.000	0.000	0.000	-82.043	-81.962	0.000	81.962	-4.854	0.000
185.00	-3.787	-2.643	0.000	0.000	0.000	-36.329	-87.077	0.000	87.077	-4.917	0.000
190.00	-3.479	-2.157	0.000	0.000	0.000	-17.394	-92.235	0.000	92.235	-4.942	0.000
195.00	-3.280	0.000	0.000	0.000	0.000	0.000	0.000	0.000	97.411	-4.951	0.000

Resulting Stresses

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 18	

Tower Engineering Solutions

Load Case: 77.94 mph Wind with 0.5" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 24

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)		f/Fb Stress Ratio
0.00	0.69	0.72	0.00	0.00	0.00	27.46	28.15	52.0		0.541
5.00	0.68	0.72	0.00	0.00	0.00	27.28	27.96	52.0		0.538
10.00	0.67	0.72	0.00	0.00	0.00	27.10	27.77	52.0		0.534
15.00	0.65	0.72	0.00	0.00	0.00	26.91	27.57	52.0		0.530
20.00	0.64	0.72	0.00	0.00	0.00	26.71	27.35	52.0		0.526
25.00	0.63	0.73	0.00	0.00	0.00	26.50	27.13	52.0		0.522
30.00	0.62	0.73	0.00	0.00	0.00	26.27	26.89	52.0		0.517
35.00	0.61	0.73	0.00	0.00	0.00	26.03	26.64	52.0		0.512
40.00	0.60	0.73	0.00	0.00	0.00	25.77	26.37	52.0		0.507
41.00	0.59	0.73	0.00	0.00	0.00	25.72	26.32	52.0		0.506
45.00	0.57	0.73	0.00	0.00	0.00	25.33	25.90	52.0		0.498
48.00	0.55	0.72	0.00	0.00	0.00	25.16	25.71	52.0		0.495
50.00	0.54	0.72	0.00	0.00	0.00	24.52	25.06	52.0		0.482
53.00	0.53	0.72	0.00	0.00	0.00	24.34	24.88	52.0		0.479
55.00	0.53	0.72	0.00	0.00	0.00	27.37	27.37	52.0		0.526
60.00	0.51	0.72	0.00	0.00	0.00	27.08	27.60	52.0		0.531
65.00	0.50	0.73	0.00	0.00	0.00	26.78	27.28	52.0		0.525
70.00	0.49	0.73	0.00	0.00	0.00	26.45	26.94	52.0		0.518
75.00	0.48	0.73	0.00	0.00	0.00	26.10	26.58	52.0		0.511
80.00	0.47	0.73	0.00	0.00	0.00	25.72	26.19	52.0		0.504
85.00	0.45	0.73	0.00	0.00	0.00	25.31	25.76	52.0		0.496
90.00	0.42	0.73	0.00	0.00	0.00	24.72	25.14	52.0		0.484
91.00	0.41	0.72	0.00	0.00	0.00	24.63	25.03	52.0		0.482
93.00	0.40	0.72	0.00	0.00	0.00	23.72	24.12	52.0		0.464
95.00	0.46	0.84	0.00	0.00	0.00	26.59	27.05	52.0		0.520
100.00	0.45	0.84	0.00	0.00	0.00	25.98	26.43	52.0		0.509
105.00	0.44	0.84	0.00	0.00	0.00	25.33	25.77	52.0		0.496
110.00	0.42	0.85	0.00	0.00	0.00	24.63	25.05	52.0		0.482
115.00	0.41	0.85	0.00	0.00	0.00	23.87	24.28	52.0		0.467
120.00	0.39	0.85	0.00	0.00	0.00	23.05	23.45	52.0		0.451
125.00	0.38	0.85	0.00	0.00	0.00	22.16	22.54	52.0		0.434
130.00	0.44	1.02	0.00	0.00	0.00	24.17	24.61	52.0		0.473
135.00	0.40	1.01	0.00	0.00	0.00	22.72	23.11	52.0		0.445
140.00	0.38	1.01	0.00	0.00	0.00	20.91	21.29	52.0		0.410
141.00	0.47	1.26	0.00	0.00	0.00	23.97	24.44	52.0		0.470
145.00	0.47	1.27	0.00	0.00	0.00	34.94	35.48	52.0		0.683
150.00	0.46	1.29	0.00	0.00	0.00	32.54	33.08	52.0		0.636
155.00	0.45	1.31	0.00	0.00	0.00	29.76	30.29	52.0		0.583
160.00	0.44	1.34	0.00	0.00	0.00	26.51	27.05	52.0		0.520
165.00	0.43	1.37	0.00	0.00	0.00	22.71	23.26	52.0		0.447
170.00	0.42	1.39	0.00	0.00	0.00	18.24	18.82	52.0		0.362
175.00	0.30	1.00	0.00	0.00	0.00	12.95	13.36	52.0		0.257
180.00	0.29	0.98	0.00	0.00	0.00	8.93	9.37	52.0		0.180
180.00	0.29	0.98	0.00	0.00	0.00	8.93	9.37	52.0		0.162
185.00	0.13	0.36	0.00	0.00	0.00	3.55	3.73	28.8	28.8	0.129
190.00	0.10	0.33	0.00	0.00	0.00	1.70	1.89	28.8	28.8	0.066
195.00	0.00	0.31	0.00	0.00	0.00	0.00	0.54	28.8	28.8	0.019

Resulting Stresses

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 19	

Wind Loading - Shaft

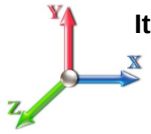
Structure: CT01916-S-SBA
Site Name: North Salem
Height: 195.00 (ft)
Base Elev: 0.000 (ft)

Code: EIA/TIA-222-F
Exposure: C
Gh: 1.69
Struct Class: II

6/10/2016

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice
Dead Load Factor 1.00
Wind Load Factor 1.00



Iterations: 23

Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Aa (sf)	CfAa (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00	RB1 RB2	0.00	1.00	6.400	10.82	268.75	0.650	0.000	0.00	0.000	0.00	0.0	0.0	0.0
5.00		0.00	1.00	6.400	10.82	263.79	0.650	0.000	5.00	26.627	17.31	187.2	0.0	1679.4
10.00		0.00	1.00	6.400	10.82	258.83	0.650	0.000	5.00	26.131	16.98	183.7	0.0	1651.3
15.00		0.00	1.00	6.400	10.82	253.86	0.650	0.000	5.00	25.634	16.66	180.2	0.0	1623.1
20.00		0.00	1.00	6.400	10.82	248.90	0.650	0.000	5.00	25.138	16.34	176.7	0.0	1595.0
25.00		0.00	1.00	6.400	10.82	243.94	0.650	0.000	5.00	24.642	16.02	173.2	0.0	1566.9
30.00		0.00	1.00	6.400	10.82	238.98	0.650	0.000	5.00	24.146	15.69	169.8	0.0	1538.7
35.00		0.00	1.02	6.509	11.00	235.99	0.650	0.000	5.00	23.649	15.37	169.1	0.0	1510.6
40.00		0.00	1.06	6.762	11.43	235.43	0.650	0.000	5.00	23.153	15.05	172.0	0.0	1482.5
41.00	Bot - Section 2	0.00	1.06	6.809	11.51	235.24	0.650	0.000	1.00	4.571	2.97	34.2	0.0	293.1
45.00		0.00	1.09	6.993	11.82	234.24	0.650	0.000	4.00	18.378	11.95	141.2	0.0	2194.9
48.00	Top - Section 1	0.00	1.11	7.123	12.04	233.27	0.650	0.000	3.00	13.575	8.82	106.2	0.0	1622.6
50.00		0.00	1.13	7.207	12.18	236.40	0.650	0.000	2.00	8.951	5.82	70.9	0.0	575.4
53.00	RT2	0.00	1.14	7.328	12.38	235.19	0.650	0.000	3.00	13.277	8.63	106.9	0.0	854.6
55.00	RT1 RB3	0.00	1.16	7.406	12.52	234.30	0.650	0.000	2.00	8.752	5.69	71.2	0.0	576.1
60.00		0.00	1.19	7.592	12.83	231.82	0.650	0.000	5.00	21.533	14.00	179.6	0.0	1420.6
65.00		0.00	1.21	7.768	13.13	229.02	0.650	0.000	5.00	21.037	13.67	179.5	0.0	1392.4
70.00		0.00	1.24	7.934	13.41	225.94	0.650	0.000	5.00	20.540	13.35	179.0	0.0	1364.3
75.00		0.00	1.26	8.092	13.68	222.59	0.650	0.000	5.00	20.044	13.03	178.2	0.0	1336.2
80.00		0.00	1.29	8.242	13.93	219.02	0.650	0.000	5.00	19.548	12.71	177.0	0.0	1308.0
85.00	Bot - Section 3	0.00	1.31	8.387	14.17	215.25	0.650	0.000	5.00	19.052	12.38	175.5	0.0	1279.9
90.00		0.00	1.33	8.525	14.41	211.29	0.650	0.000	5.00	18.920	12.30	177.2	0.0	2314.2
91.00	Top - Section 2	0.00	1.34	8.552	14.45	210.47	0.650	0.000	1.00	3.724	2.42	35.0	0.0	456.1
93.00	Top - Section 3	0.00	1.34	8.605	14.54	213.05	0.650	0.000	2.00	7.389	4.80	69.8	0.0	498.8
95.00		0.00	1.35	8.657	14.63	211.39	0.650	0.000	2.00	7.310	4.75	69.5	0.0	436.2
100.00		0.00	1.37	8.785	14.85	207.13	0.650	0.000	5.00	17.928	11.65	173.0	0.0	1073.7
105.00		0.00	1.39	8.908	15.06	202.73	0.650	0.000	5.00	17.431	11.33	170.6	0.0	1049.6
110.00		0.00	1.41	9.028	15.26	198.19	0.650	0.000	5.00	16.935	11.01	167.9	0.0	1025.5
115.00		0.00	1.43	9.143	15.45	193.52	0.650	0.000	5.00	16.439	10.69	165.1	0.0	1001.3
120.00		0.00	1.45	9.255	15.64	188.73	0.650	0.000	5.00	15.943	10.36	162.1	0.0	977.2
125.00	Top - Section 4	0.00	1.46	9.363	15.82	183.83	0.650	0.000	5.00	15.446	10.04	158.9	0.0	953.1
130.00	Bot - Section 6	0.00	1.48	9.469	16.00	178.83	0.650	0.000	5.00	14.950	9.72	155.5	0.0	810.2
135.00	Top - Section 5	0.00	1.50	9.572	16.18	173.73	0.650	0.000	5.00	14.714	9.56	154.7	0.0	1380.8
140.00	Top - Section 6	0.00	1.51	9.672	16.35	171.73	0.650	0.000	5.00	14.218	9.24	151.1	0.0	780.6
141.00	RT3	0.00	1.51	9.691	16.38	170.69	0.650	0.000	1.00	2.784	1.81	29.6	0.0	131.5
145.00		0.00	1.53	9.769	16.51	166.46	0.650	0.000	4.00	10.938	7.11	117.4	0.0	351.7
150.00		0.00	1.54	9.864	16.67	161.11	0.650	0.000	5.00	13.226	8.60	143.3	0.0	425.1
155.00		0.00	1.56	9.957	16.83	155.68	0.650	0.000	5.00	12.729	8.27	139.2	0.0	409.1
160.00		0.00	1.57	10.048	16.98	150.17	0.650	0.000	5.00	12.233	7.95	135.0	0.0	393.0
165.00		0.00	1.58	10.136	17.13	144.59	0.650	0.000	5.00	11.737	7.63	130.7	0.0	376.9
170.00		0.00	1.60	10.223	17.28	138.93	0.650	0.000	5.00	11.241	7.31	126.2	0.0	360.8
175.00	Appurtenance(s)	0.00	1.61	10.308	17.42	133.21	0.650	0.000	5.00	10.744	6.98	121.7	0.0	344.7
180.00	Top - Section 7	0.00	1.62	10.392	17.56	127.42	0.650	0.000	5.00	10.248	6.66	117.0	0.0	328.7
185.00	Appurtenance(s)	0.00	1.64	10.473	17.70	127.92	0.590	0.000	5.00	10.000	5.90	104.4	0.0	356.3
190.00		0.00	1.65	10.553	17.84	128.41	0.590	0.000	5.00	10.000	5.90	105.2	0.0	356.3
195.00	Appurtenance(s)	0.00	1.66	10.632	17.97	128.89	0.590	0.000	5.00	10.000	5.90	106.0	0.0	356.3
								Totals:	**195.00**			**6,197.4**		**43,813.1**

Discrete Appurtenance Forces

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 21	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 23

No.	Elev (ft)	Description	Qty	qz (psf)	qzGh (psf)	CaAa Factor	Total CaAa (sf)	Dead Load (lb)	Horiz Ecc (ft)	Vert Ecc (ft)	Wind FX (lb)	Mom Y (lb-ft)	Mom Z (lb-ft)
1	195.00	T-Arm (Round)	3	10.632	17.968	0.75	18.00	1350.00	0.000	0.000	323.43	0.00	0.00
2	195.00	RR90-11-00DBL	6	10.632	17.968	0.77	24.16	126.00	0.000	0.000	434.16	0.00	0.00
3	195.00	DB980H90E-M	6	10.632	17.968	0.73	16.64	51.00	0.000	0.000	299.06	0.00	0.00
4	185.00	T-Arm (Round)	3	10.473	17.700	0.75	18.00	1350.00	0.000	0.000	318.60	0.00	0.00
5	185.00	SBNH-1D6565C	1	10.473	17.700	0.80	9.15	66.10	0.000	0.000	161.99	0.00	0.00
6	185.00	RRUS-11	6	10.473	17.700	0.75	13.10	306.00	0.000	0.000	231.78	0.00	0.00
7	185.00	P65-17-XLH-RR	2	10.473	17.700	0.75	17.19	118.00	0.000	0.000	304.26	0.00	0.00
8	185.00	LGP21903	6	10.473	17.700	0.67	1.09	33.00	0.000	0.000	19.21	0.00	0.00
9	185.00	LGP21401	6	10.473	17.700	0.67	5.19	84.60	0.000	0.000	91.79	0.00	0.00
10	185.00	DC6-48-60-18-8F	1	10.473	17.700	0.75	1.10	31.80	0.000	0.000	19.51	0.00	0.00
11	185.00	7770.00	6	10.473	17.700	0.73	25.75	210.00	0.000	0.000	455.85	0.00	0.00
12	175.00	RRUS11	9	10.308	17.421	0.71	20.77	455.40	0.000	0.000	361.79	0.00	0.00
13	175.00	Low Profile Platform-Round	1	10.308	17.421	1.00	22.00	1500.00	0.000	0.000	383.26	0.00	0.00
14	175.00	LNX-6515DS-A1M	3	10.308	17.421	0.80	27.38	149.40	0.000	0.000	477.06	0.00	0.00
15	175.00	APX16DWV-16DWVS-E-A20	3	10.308	17.421	0.62	13.15	122.10	0.000	0.000	229.09	0.00	0.00
						Totals:		**5,953.40**			**4,110.83**		

Total Applied Force Summary

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 22	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 23

Elev (ft)	Description	Lateral FX (-) (lb)	Axial FY (-) (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)
0.00		0.00	0.00	0.00	0.00
5.00		247.77	1839.28	0.00	0.00
10.00		244.28	1811.15	0.00	0.00
15.00		240.79	1783.01	0.00	0.00
20.00		237.30	1754.87	0.00	0.00
25.00		233.81	1726.73	0.00	0.00
30.00		230.32	1698.60	0.00	0.00
35.00		230.68	1670.46	0.00	0.00
40.00		235.97	1642.32	0.00	0.00
41.00		47.08	325.09	0.00	0.00
45.00		194.12	2322.84	0.00	0.00
48.00		146.67	1718.50	0.00	0.00
50.00		98.14	639.31	0.00	0.00
53.00		148.48	950.53	0.00	0.00
55.00		99.23	640.06	0.00	0.00
60.00		211.66	1527.95	0.00	0.00
65.00		212.32	1499.81	0.00	0.00
70.00		212.54	1471.68	0.00	0.00
75.00		212.36	1443.54	0.00	0.00
80.00		211.82	1415.40	0.00	0.00
85.00		210.95	1387.27	0.00	0.00
90.00		213.19	2421.56	0.00	0.00
91.00		42.21	477.56	0.00	0.00
93.00		84.39	541.79	0.00	0.00
95.00		84.15	479.18	0.00	0.00
100.00		210.13	1181.06	0.00	0.00
105.00		208.22	1156.94	0.00	0.00
110.00		206.08	1132.82	0.00	0.00
115.00		203.73	1108.70	0.00	0.00
120.00		201.18	1084.59	0.00	0.00
125.00		198.44	1060.47	0.00	0.00
130.00		195.51	917.58	0.00	0.00
135.00		195.15	1488.13	0.00	0.00
140.00		191.92	887.93	0.00	0.00
141.00		37.83	153.00	0.00	0.00
145.00		133.89	437.58	0.00	0.00
150.00		143.31	532.50	0.00	0.00
155.00		139.23	516.43	0.00	0.00
160.00		135.02	500.35	0.00	0.00
165.00		130.69	484.27	0.00	0.00
170.00		126.23	468.19	0.00	0.00
175.00	(16) appurtenances	1572.87	2679.01	0.00	0.00
180.00		248.17	431.26	0.00	0.00
185.00	(31) appurtenances	1839.63	2658.35	0.00	0.00
190.00		105.23	434.25	0.00	0.00
195.00	(15) appurtenances	1162.65	1961.25	0.00	0.00
	Totals:	**11,915.34**	**54,463.14**	**0.00**	**0.00**

Resulting Forces and Deflections

Structure:	CT01916-S-SB	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 23	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 23

Elev (ft)	Lateral FX (-) (kips)	Axial FY (-) (kips)	Lateral FZ (kips)	Moment MX (ft-kips)	Torsion MY (ft-kips)	Moment MZ (ft-kips)	Deflect X (in)	Deflect Z (in)	Deflect Resultant (in)	Rotation Sway (deg)	Rotation Twist (deg)
0.00	-11.933	-54.459	0.000	0.000	0.000	-1509.398	0.000	0.000	0.000	0.000	0.000
5.00	-11.718	-52.613	0.000	0.000	0.000	-1449.737	-0.020	0.000	0.020	-0.037	0.000
10.00	-11.505	-50.794	0.000	0.000	0.000	-1391.148	-0.078	0.000	0.078	-0.073	0.000
15.00	-11.293	-49.004	0.000	0.000	0.000	-1333.625	-0.175	0.000	0.175	-0.111	0.000
20.00	-11.083	-47.242	0.000	0.000	0.000	-1277.159	-0.311	0.000	0.311	-0.149	0.000
25.00	-10.875	-45.509	0.000	0.000	0.000	-1221.744	-0.487	0.000	0.487	-0.187	0.000
30.00	-10.668	-43.804	0.000	0.000	0.000	-1167.370	-0.704	0.000	0.704	-0.225	0.000
35.00	-10.459	-42.128	0.000	0.000	0.000	-1114.030	-0.961	0.000	0.961	-0.264	0.000
40.00	-10.232	-40.482	0.000	0.000	0.000	-1061.736	-1.259	0.000	1.259	-0.304	0.000
41.00	-10.197	-40.154	0.000	0.000	0.000	-1051.504	-1.323	0.000	1.323	-0.312	0.000
45.00	-10.008	-37.827	0.000	0.000	0.000	-1010.717	-1.598	0.000	1.598	-0.344	0.000
48.00	-9.864	-36.106	0.000	0.000	0.000	-980.693	-1.822	0.000	1.822	-0.368	0.000
50.00	-9.774	-35.464	0.000	0.000	0.000	-960.966	-1.980	0.000	1.980	-0.384	0.000
53.00	-9.630	-34.511	0.000	0.000	0.000	-931.646	-2.229	0.000	2.229	-0.408	0.000
55.00	-9.544	-33.867	0.000	0.000	0.000	-912.385	-2.404	0.000	2.404	-0.424	0.000
60.00	-9.346	-32.334	0.000	0.000	0.000	-864.664	-2.872	0.000	2.872	-0.468	0.000
65.00	-9.145	-30.828	0.000	0.000	0.000	-817.935	-3.386	0.000	3.386	-0.513	0.000
70.00	-8.942	-29.352	0.000	0.000	0.000	-772.211	-3.947	0.000	3.947	-0.558	0.000
75.00	-8.737	-27.903	0.000	0.000	0.000	-727.502	-4.556	0.000	4.556	-0.604	0.000
80.00	-8.531	-26.484	0.000	0.000	0.000	-683.816	-5.213	0.000	5.213	-0.650	0.000
85.00	-8.325	-25.092	0.000	0.000	0.000	-641.159	-5.919	0.000	5.919	-0.696	0.000
90.00	-8.092	-22.669	0.000	0.000	0.000	-599.536	-6.674	0.000	6.674	-0.743	0.000
91.00	-8.049	-22.190	0.000	0.000	0.000	-591.444	-6.831	0.000	6.831	-0.753	0.000
93.00	-7.965	-21.647	0.000	0.000	0.000	-575.345	-7.150	0.000	7.150	-0.772	0.000
95.00	-7.887	-21.164	0.000	0.000	0.000	-559.416	-7.478	0.000	7.478	-0.791	0.000
100.00	-7.678	-19.980	0.000	0.000	0.000	-519.981	-8.333	0.000	8.333	-0.841	0.000
105.00	-7.469	-18.819	0.000	0.000	0.000	-481.592	-9.242	0.000	9.242	-0.892	0.000
110.00	-7.260	-17.684	0.000	0.000	0.000	-444.248	-10.203	0.000	10.203	-0.943	0.000
115.00	-7.053	-16.572	0.000	0.000	0.000	-407.947	-11.219	0.000	11.219	-0.994	0.000
120.00	-6.846	-15.485	0.000	0.000	0.000	-372.684	-12.287	0.000	12.287	-1.045	0.000
125.00	-6.640	-14.423	0.000	0.000	0.000	-338.456	-13.408	0.000	13.408	-1.095	0.000
130.00	-6.439	-13.503	0.000	0.000	0.000	-305.255	-14.581	0.000	14.581	-1.144	0.000
135.00	-6.225	-12.014	0.000	0.000	0.000	-273.059	-15.810	0.000	15.810	-1.200	0.000
140.00	-6.020	-11.127	0.000	0.000	0.000	-241.934	-17.096	0.000	17.096	-1.254	0.000
141.00	-5.985	-10.972	0.000	0.000	0.000	-235.913	-17.359	0.000	17.359	-1.265	0.000
145.00	-5.853	-10.530	0.000	0.000	0.000	-211.974	-18.439	0.000	18.439	-1.311	0.000
150.00	-5.712	-9.993	0.000	0.000	0.000	-182.707	-19.859	0.000	19.859	-1.396	0.000
155.00	-5.573	-9.473	0.000	0.000	0.000	-154.147	-21.365	0.000	21.365	-1.477	0.000
160.00	-5.436	-8.969	0.000	0.000	0.000	-126.283	-22.954	0.000	22.954	-1.553	0.000
165.00	-5.302	-8.483	0.000	0.000	0.000	-99.103	-24.619	0.000	24.619	-1.622	0.000
170.00	-5.170	-8.014	0.000	0.000	0.000	-72.595	-26.351	0.000	26.351	-1.682	0.000
175.00	-3.521	-5.380	0.000	0.000	0.000	-46.747	-28.139	0.000	28.139	-1.729	0.000
180.00	-3.263	-4.955	0.000	0.000	0.000	-29.141	-29.970	0.000	29.970	-1.764	0.000
185.00	-1.342	-2.355	0.000	0.000	0.000	-12.828	-31.831	0.000	31.831	-1.786	0.000
190.00	-1.224	-1.924	0.000	0.000	0.000	-6.118	-33.707	0.000	33.707	-1.795	0.000
195.00	-1.163	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.589	-1.798	0.000

Resulting Stresses

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 24	

Tower Engineering Solutions

Load Case: 50 mph Wind with 0" Ice

Dead Load Factor 1.00

Wind Load Factor 1.00

Iterations: 23

Applied Stresses

Elev (ft)	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	fb Combined (ksi)	Fb Allow Stress (ksi)		f/Fb Stress Ratio
0.00	0.61	0.27	0.00	0.00	0.00	10.14	10.75	52.0		0.207
5.00	0.60	0.27	0.00	0.00	0.00	10.07	10.67	52.0		0.205
10.00	0.59	0.27	0.00	0.00	0.00	9.99	10.58	52.0		0.204
15.00	0.58	0.27	0.00	0.00	0.00	9.91	10.50	52.0		0.202
20.00	0.57	0.27	0.00	0.00	0.00	9.83	10.41	52.0		0.200
25.00	0.56	0.27	0.00	0.00	0.00	9.75	10.31	52.0		0.198
30.00	0.55	0.27	0.00	0.00	0.00	9.65	10.21	52.0		0.196
35.00	0.54	0.27	0.00	0.00	0.00	9.56	10.10	52.0		0.194
40.00	0.53	0.27	0.00	0.00	0.00	9.46	9.99	52.0		0.192
41.00	0.53	0.27	0.00	0.00	0.00	9.44	9.97	52.0		0.192
45.00	0.51	0.27	0.00	0.00	0.00	9.29	9.80	52.0		0.189
48.00	0.49	0.27	0.00	0.00	0.00	9.22	9.71	52.0		0.187
50.00	0.48	0.27	0.00	0.00	0.00	8.99	9.47	52.0		0.182
53.00	0.48	0.27	0.00	0.00	0.00	8.92	9.39	52.0		0.181
55.00	0.47	0.27	0.00	0.00	0.00	10.02	10.02	52.0		0.193
60.00	0.46	0.27	0.00	0.00	0.00	9.91	10.37	52.0		0.200
65.00	0.45	0.27	0.00	0.00	0.00	9.79	10.24	52.0		0.197
70.00	0.44	0.27	0.00	0.00	0.00	9.67	10.11	52.0		0.194
75.00	0.43	0.27	0.00	0.00	0.00	9.53	9.96	52.0		0.192
80.00	0.42	0.27	0.00	0.00	0.00	9.39	9.80	52.0		0.189
85.00	0.40	0.27	0.00	0.00	0.00	9.23	9.63	52.0		0.185
90.00	0.38	0.27	0.00	0.00	0.00	9.01	9.38	52.0		0.180
91.00	0.36	0.26	0.00	0.00	0.00	8.97	9.33	52.0		0.180
93.00	0.36	0.26	0.00	0.00	0.00	8.64	9.00	52.0		0.173
95.00	0.41	0.31	0.00	0.00	0.00	9.68	10.09	52.0		0.194
100.00	0.40	0.31	0.00	0.00	0.00	9.45	9.85	52.0		0.190
105.00	0.39	0.31	0.00	0.00	0.00	9.21	9.60	52.0		0.185
110.00	0.37	0.31	0.00	0.00	0.00	8.95	9.32	52.0		0.179
115.00	0.36	0.31	0.00	0.00	0.00	8.67	9.03	52.0		0.174
120.00	0.35	0.31	0.00	0.00	0.00	8.36	8.71	52.0		0.168
125.00	0.34	0.31	0.00	0.00	0.00	8.03	8.37	52.0		0.161
130.00	0.39	0.37	0.00	0.00	0.00	8.75	9.14	52.0		0.176
135.00	0.35	0.37	0.00	0.00	0.00	8.22	8.57	52.0		0.165
140.00	0.34	0.37	0.00	0.00	0.00	7.55	7.89	52.0		0.152
141.00	0.42	0.46	0.00	0.00	0.00	8.66	9.08	52.0		0.175
145.00	0.41	0.46	0.00	0.00	0.00	12.61	13.05	52.0		0.251
150.00	0.41	0.47	0.00	0.00	0.00	11.73	12.16	52.0		0.234
155.00	0.40	0.48	0.00	0.00	0.00	10.71	11.14	52.0		0.214
160.00	0.40	0.48	0.00	0.00	0.00	9.52	9.95	52.0		0.191
165.00	0.39	0.49	0.00	0.00	0.00	8.14	8.58	52.0		0.165
170.00	0.39	0.50	0.00	0.00	0.00	6.52	6.96	52.0		0.134
175.00	0.27	0.36	0.00	0.00	0.00	4.61	4.92	52.0		0.095
180.00	0.26	0.35	0.00	0.00	0.00	3.17	3.49	52.0		0.067
180.00	0.26	0.35	0.00	0.00	0.00	3.17	3.49	52.0		0.060
185.00	0.11	0.13	0.00	0.00	0.00	1.25	1.38	28.8	28.8	0.048
190.00	0.09	0.12	0.00	0.00	0.00	0.60	0.72	28.8	28.8	0.025
195.00	0.00	0.11	0.00	0.00	0.00	0.00	0.19	28.8	28.8	0.007

Resulting Stresses

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 25	

Final Analysis Summary

Structure:	CT01916-S-SBA	**Code:**	EIA/TIA-222-F	6/10/2016	
Site Name:	North Salem	**Exposure:**	C		
Height:	195.00 (ft)	**Gh:**	1.69		
Base Elev:	0.000 (ft)	**Struct Class:**	II	Page: 26	

Tower Engineering Solutions

Reactions

Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
90 mph Wind with 0" Ice	38.7	0.00	54.42	0.00	0.00	4885.52
77.94 mph Wind with 0.5" Ice	31.7	0.00	61.22	0.00	0.00	4088.18
50 mph Wind with 0" Ice	11.9	0.00	54.46	0.00	0.00	1509.40

Max Stresses

Load Case	fa Axial (Y) (ksi)	fvx Shear (X) (ksi)	fvz Shear (Z) (ksi)	fvt Torsion (ksi)	fbx Bending (X) (ksi)	fbz Bending (Z) (ksi)	Combined Stress (ksi)	Allowable Stress (ksi)	Elev (ft)	Stress Ratio
90 mph Wind with 0" Ice	0.36	1.50	0.00	0.00	0.00	40.71	41.15	52.0	145.00	0.792
77.94 mph Wind with 0.5" Ice	0.47	1.27	0.00	0.00	0.00	34.94	35.48	52.0	145.00	0.683
50 mph Wind with 0" Ice	0.41	0.46	0.00	0.00	0.00	12.61	13.05	52.0	145.00	0.251

Additional Steel Summary

			Intermediate Connectors			Upper Termination			Lower Termination			Max Member			
Elev From (ft)	Elev To (ft)	Member	VQ/I (lb/in)	V (kips)	Shear Allow (kips)	MQ/I (kips)	Num Reqd	Num Actual	MQ/I (kips)	Num Reqd	Num Actual	MQ/I (kips)	Ta (kips)	Pa (kips)	Ratio
0.0	55.0	(4) PLT-C6x10.5 (1.25 hole)	92.8	2.23	22.5	106.2	5	0	105.1	0		106.3	143.9	148.0	0.718
0.0	53.0	(4) PLT-C5 x 9 (1.25" hole)	-82.0	-1.97	22.5	81.54	4	0	91.6	0		91.6	65.0	125.3	0.730
55.0	141.0	(4) PLT-C6x10.5 (1.25 hole)	197.4	4.74	22.5	93.25	5	0	106.3	1	0	106.3	143.9	148.0	0.718

Monopole Mat Foundation Design

			Date: 6/10/2016
Customer Name:	T-Mobile	**EIA/TIA Standard:**	EIA-222-F
Site Name:	North Salem	**Structure Height (Ft.):**	195
Site Number:	CT01916-S-SBA	**Engineer Name:**	F. Arinyedokia
Engr. Number:	22956	**Engineer Login ID:**	

Foundation Info Obtained from: Drawings/Calculations

Structure Type: Monopole

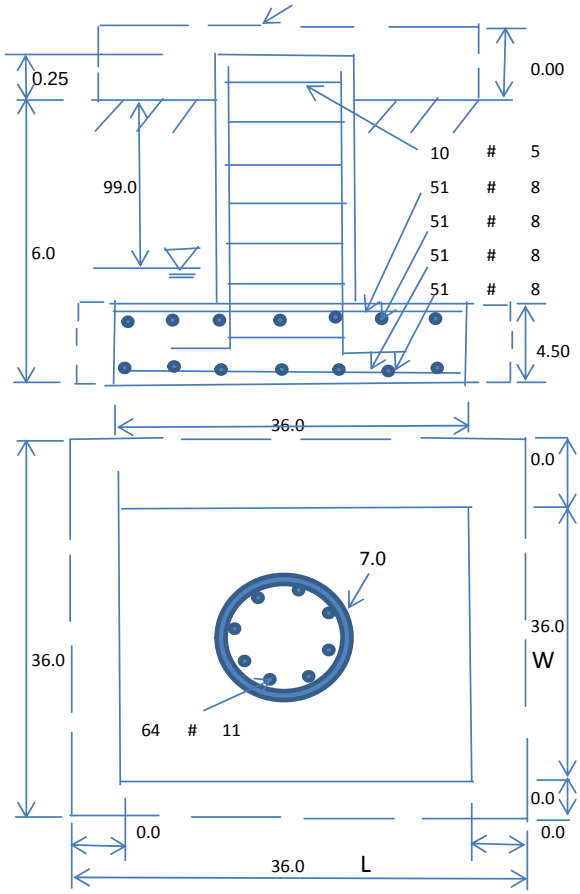
Analysis or Design? Analysis

Base Reactions (Unfactored)

Axial Load (Kips):	54.4	Shear Force (Kips):	38.7
Uplift Force (Kips):	0.0	Moment (Kips-ft):	4885.5
Allowable overstress %:	5.0%		

Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	7.0	Depth of Base BG (ft.):	6.0
Pier Height A. G. (ft.):	0.25	Thickness of Pad (ft):	4.50
Length of Pad (ft.):	36	Width of Pad (ft.):	36
Final Length of pad (ft)	36.0	Final width of pad (ft):	36.0
Control Value for Cell D18:	0	Control Value for Cell F18:	0



Material Properties and Reabr Info:

Concrete Strength (psi):	3500	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	11	Tie / Stirrup Size #:	5	
Qty. of Vertical Rebars:	64	Tie Spacing (in):	8.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	8	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	51	Qty. of Rebar in Pad (W):	51	
Rebar at the top of the concrete pad:				
Qty. of Rebar in Pad (L):	51	Qty. of Rebar in Pad (W):	51	
Apply 1.35 factor for e/w Per G:	1.35			

Soil Design Parameters:

Soil Unit Weight (pcf):	100.0	Soil Buoyant Weight:	50.0	Pcf		
Water Table B.G.S. (ft):	99.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:	30
Allowable Net Soil Bearing (psf):	5000	Allowable Skin Friction:	0	Psf	Angle from Bottm of Pad:	25
Consider Friction for O.T.M. (Y/N):	No	Consider Friction for bearing (Y/N):	No		Angle from Bottm of Pad:	25
Consider soil hor. resist. for OTM.:	No	Reduction factor on the maximum soil bearing pressure:	1.00			

Foundation Analysis and Design:

Total Dry Soil Volume (cu. Ft.):	1886.27	Total Dry Soil Weight (Kips):	188.63
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	188.63	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	5899.35	Total Dry Concrete Weight (Kips):	884.90
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	884.90	Total Vertical Load on Base (Kips):	1127.95

Check Soil Capacities:

					Load/ Capacity Ratio	
Calculated Maxium Net Soil Pressure under the base (psf):	1162	<	Allowable Soil Bearing (psf):	5000	0.23	OK!
Allowable Foundation Overturning Resistance (SF=1.5, kips-ft.):	13535.4	>	Applied Momont (kips-ft):	5127	0.38	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	3.96	OK!				

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75		
Strength reduction factor (Axial compresion):	0.65	Wind Load Factor on Concrete Design:	1.30		

(1) Concrete Pier:

					Load/ Capacity Ratio	
Vertical Steel Rebar Area (sq. in./each):	1.56		Tie / Stirrup Area (sq. in./each):	0.31		
Calculated Moment Capacity (Mn,Kips-Ft):	15779.9	>	Design Factored Moment (Mu, Kips-F	4953.2	0.31	OK!
Calculated Shear Capacity (Kips):	804.3	>	Design Factored Shear (Kips):	50.3	0.06	OK!
Calculated Tension Capacity (Tn, Kips):	5391.4	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	8418.7	>	Design Factored Axial Load (Pu Kips):	70.7	0.01	OK!
Moment & Axial Strength Combination:	0.31	OK!	Check Tie Spacing (Design/Required):		0.6667	OK!
Pier Reinforcement Ratio:	0.018	Reinforcement Ratio is satisfied per ACI				

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Direction, Kips):	1936.0	>	One-Way Factored Shear (L-D. Kips):	339.7	0.18	OK!
One-Way Design Shear Capacity (W-Direction, Kips):	1936.0	>	One-Way Factored Shear (W-D., Kips)	339.7	0.18	OK!
One-Way Design Shear Capacity (Corner-Corner. Kips):	2361.4	>	One-Way Factored Shear (C-C, Kips):	316.7	0.13	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0018	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0018		
Lower Steel Pad Moment Capacity (L-Direction. Kips-ft):	8985.4	>	Moment at Bottom (L-Direct. K-Ft):	1344.8	0.15	OK!
Lower Steel Pad Moment Capacity (W-Direction. Kips-ft):	8985.4	>	Moment at Bottom (W-Direct. K-Ft):	1344.8	0.15	OK!
Lower Steel Pad Moment Capacity (Corner-Corner,K-ft):	12668.8	>	Moment at Bottom (C-C Dir. K-Ft):	1901.9	0.15	OK!
Upper Steel Pad Reinforcement Ratio (L-Direct.):	0.0018	OK!	Upper Steel Reinf. Ratio (W-Direct.):	0.0018		
Upper Steel Pad Moment Capacity (L-Direction. Kips-ft):	8985.4	>	Moment at the top (L-Dir Kips-Ft):	943.4	0.10	OK!
Upper Steel Pad Moment Capacity (W-Direction. Kips-ft):	8985.4	>	Moment at the top (W-Dir Kips-Ft):	943.4	0.10	OK!
Upper Steel Pad Moment Capacity (Corner-Corner. K-ft):	12668.8	>	Moment at the top (C-C Direc. K-Ft):	1433.4	0.11	OK!

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

T-Mobile Existing Facility

Site ID: CTHA101F

CTHA101F
160 Witch Meadow Rd
Salem, CT 06420

June 17, 2016

EBI Project Number: 6216002849

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	2.40 %

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

EBI Consulting
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June 17, 2016

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

Emissions Analysis for Site: **CTHA101F – CTHA101F**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **160 Witch Meadow Rd, Salem, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **160 Witch Meadow Rd, Salem, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

3) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

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

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

6) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-VTM** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWVS-E-A20** has a maximum gain of **16.3 dBd** at their main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-VTM** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline of the proposed antennas is **175 feet** above ground level (AGL).

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

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	175	Height (AGL):	175	Height (AGL):	175
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	180	Total TX Power(W):	180	Total TX Power(W):	180
ERP (W):	7,678.43	ERP (W):	7,678.43	ERP (W):	7,678.43
Antenna A1 MPE%	0.97	Antenna B1 MPE%	0.97	Antenna C1 MPE%	0.97
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM	Make / Model:	Commscope LNX-6515DS-VTM
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	175	Height (AGL):	175	Height (AGL):	175
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	865.21	ERP (W):	865.21	ERP (W):	865.21
Antenna A2 MPE%	0.23	Antenna B2 MPE%	0.23	Antenna C2 MPE%	0.23

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**1.20 %**
AT&T	1.07 %
Sprint	0.13 %
Site Total MPE %:	**2.40 %**

T-Mobile Sector A Total:	1.20 %
T-Mobile Sector B Total:	1.20 %
T-Mobile Sector C Total:	1.20 %
Site Total:	2.40 %

T-Mobile _Max per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 2100 MHz (AWS) LTE	**2**	**2559.48**	**175**	**6.44**	**2100**	**1000**	**0.64 %**
T-Mobile 1900 MHz (PCS) UMTS	**2**	**1279.74**	**175**	**3.22**	**1900**	**1000**	**0.32 %**
T-Mobile 700 MHz LTE	**1**	**865.21**	**175**	**1.09**	**700**	**467**	**0.23 %**
						Total*:	**1.20 %**

Note: Totals may vary by 0.01 percent due to summing of remainders

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	1.20 %
Sector B:	1.20 %
Sector C:	1.20 %
T-Mobile Per Sector Maximum:	1.20 %
Site Total:	2.40 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **2.40%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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