426 Kinds Park Dr. EXT Apt D
Liverpool, NY 13090
ahebel@clinellc.com
215.588.7035

March 9, 2021

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

Re: Notice of Exempt Modifications – AT&T Site CT1070
AT&T Telecommunications Facility @ 52 East Center Street Manchester, CT 06040

Dear Ms. Bachman,

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains a wireless telecommunications facility on an existing +/- 198' monopole tower at the above referenced address, latitude 41.77563111, longitude -72.5208050. Said self-support tower is owned and managed by EIP Communications I, LLC.

AT&T desires to modify its existing telecommunications facility by adding three (3) antennas, replacing (3) antennas, replacing (3) RRUs, adding (6) RRUs, adding one (1) surge arrestor with the associated cables as more particularly detailed and described on the enclosed Construction Drawings prepared by Dewberry Engineers Inc., last revised on March 9, 2021. The centerline height of the existing antennas is and will remain at 63 feet.

Please accept this letter as notification pursuant to R.C.S.A §16-50j-73 for construction that constitutes an exempt modification pursuant to R.C.S.A §16-50j-72(b)(2). In accordance with R.C.S.A §16-50j-73, a copy of this letter is being sent to the following individuals: Scott Shanley Town General Manager for the Town of Manchester: Gary Anderson Director of Planning and Economic Development: Michael Ashley Culbert for EIP Communications as tower owner and Southern New England Telephone Company as property owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b)(2). Specifically:

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require an extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commissions safety standard. *Please see the RF emissions calculation for AT&T's modified facility enclosed herewith.*
5. The proposed modifications will not cause an ineligible change or alternation in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading. Please see the structural analysis dated February 19, 2021 and prepared by Tower Engineering Professionals enclosed herewith.

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

Best Regards,

Allison Hebel
Site Acquisition Consultant – Agent for AT&T
Centerline Communications LLC
750 West Center St. Ste 301
West Bridgewater, MA 02379
215-588-7035
ahebel@clinellc.com

Enclosures:
Exhibit 1 – Construction Drawings
Exhibit 2 – Property Card and GIS
Exhibit 3 – Structural Analysis
Exhibit 4 – Mount Analysis
Exhibit 5 – RF Emissions Analysis Report Evaluation
Exhibit 6 – Available Town of Manchester Original Tower Approval Records
Exhibit 7 – Notice Deliver Confirmations

Cc:
Scott Shanley, as elected official, Town of Manchester
Gary Anderson Director of Planning and Development, Town of Manchester
EIP Communications I, LLC, Tower Owner
Southern New England Telephone Company, as Property Owner

EXHIBIT 1

PROJECT INFORMATION

SCOPE OF WORK: ROOFTOP: REMOVE EXISTING ANTENNA FROM POS 2 OF EACH SECTOR; REMOVE (3) EXISTING 700 BAND RADIOS; INSTALL NEW 6' ANTENNAS TO POSITIONS 1 AND 3 OF ALPHA AND BETA; INSTALL NEW 8' ANTENNA TO POSITIONS 1 AND 3 OF GAMMA; INSTALL (3) B14 4478 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4426 B66 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4449 RADIOS TO NEW ANTENNA IN POS 1; ADD (1) DC ONLY SQUID WITH (2) DC LINES AND (3) Y CABLES.

SHELTER: ADD (1) 6630; ADD (1) IDLe; CONFIRM BOOT IS REPLACED.

SITE ADDRESS: 52 EAST CENTER ST.
MANCHESTER, CT 06040

LATITUDE: 41° 46' 32.27" (NAD 83)*
LONGITUDE: 72° 31' 14.90" (NAD 83)*
* PER EXISTING PLANS

JURISDICTION: CITY OF HARTFORD

NAME OF APPLICANT: AT&T MOBILITY
550 COCHITUATE ROAD
SUITES 13&14
FRAMINGHAM, MA 01701

at&t Mobility

SITE NAME: MANCHESTER-EAST CENTER ST. LTE 4C, 5C, 5G, RETRO
SITE NUMBER: CT1070
PACE NO.: MRCTB047216 (4C), MRCTB047286 (5C), MRCTB047169 (5G NR), MRCTB047317 (RETRO)

DRAWING INDEX

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

STRUCTURAL NOTE:

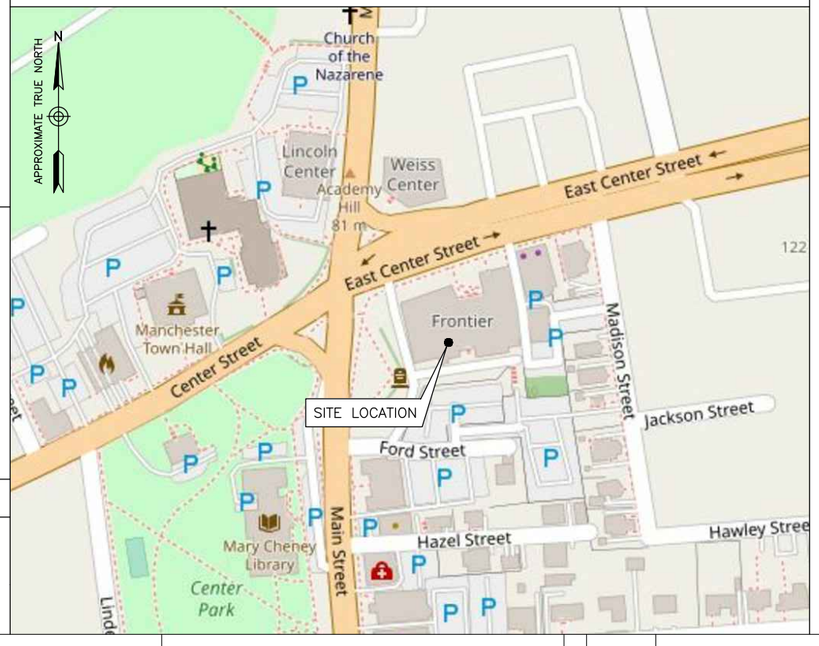
1. AS REQUIRED UNDER TIA/EIA 222G – STANDARD, CENTERLINE COMMUNICATIONS SHALL PROVIDE A STRUCTURAL ANALYSIS OF THE TOWER PREPARED BY A LICENSED CONNECTICUT STRUCTURAL ENGINEER CERTIFYING THAT, THE EXISTING TOWER AND ANY REQUIRED IMPROVEMENTS AND REINFORCEMENTS HAVE SUFFICIENT CAPACITY TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, SUPPORTS AND APPURTENANCES AND COMPLIES WITH THE CURRENT CONNECTICUT STATE BUILDING CODE AND EIA/TIA CRITERIA. THE CONTRACTOR IS RESPONSIBLE TO CONFIRM THAT ANY IMPROVEMENTS AND REINFORCEMENTS REQUIRED BY THE STRUCTURAL ANALYSIS CERTIFICATION ARE PROPERLY INSTALLED PRIOR TO THE ADDITION OF ANTENNAS, SUPPORTS AND APPURTENANCES PROPOSED ON THESE DRAWINGS OR OTHERWISE NOTED IN THE STRUCTURAL ANALYSIS.

CONTACT INFORMATION

CONTACT	CONTACT	COMPANY	PHONE NO.
ENGINEERING:	DAMIAN SCHMALZ, P.E.	DEWBERRY ENGINEERS INC.	(617) 531-0823
SAC:	DAVID FORD	CENTERLINE COMMUNICATIONS	(508) 821-6509

VICINITY MAP

DIRECTIONS: TAKE I-90 W. TAKE EXIT 9. TAKE I-84. TAKE EXIT 63 FOR CT-30 N. TOWARD CT-83/MANCHESTER. TURN RIGHT ONTO CT-30 N. TURN RIGHT ONTO CT-83 S. TURN RIGHT TO STAY ON CT-83 S. TURN LEFT ONTO CT-83 S. TURN LEFT ONTO CT-83 S/MAIN ST. TURN LEFT ONTO FORD ST. TURN LEFT. THE SITE WILL BE ON HE LEFT.



APPLICABLE BUILDING CODES AND STANDARDS

CONTRACTOR'S WORK SHALL COMPLY WITH PROJECT STANDARD NOTES, SYMBOLS & DETAILS (SEE DRAWING INDEX FOR STANDARD NOTES & DETAILS INCLUDED WITH TYPICAL DRAWING PACKAGE). CONTRACTOR WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, & LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES & STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE:
INTERNATIONAL BUILDING CODE (IBC)

ELECTRICAL CODE:
NATIONAL ELECTRICAL CODE (NEC)

CONTRACTOR'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, NINTH EDITION
TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-G, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER & ANTENNA SUPPORTING STRUCTURES:
TIA 607, COMMERCIAL BUILDING GROUNDING & BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, & EARTH SURFACE POTENTIALS OF A GROUND SYSTEM
IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING & GROUNDING OF ELECTRONIC EQUIPMENT

IEEE C62.41, RECOMMENDED PRACTICES ON SURGE VOLTAGES IN LOW VOLTAGE AC POWER CIRCUITS (FOR LOCATION CATEGORY "C3" & "HIGH SYSTEM EXPOSURE")

TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

ANSI T1.311, FOR TELECOM – DC POWER SYSTEMS – TELECOM, ENVIRONMENTAL PROTECTION

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

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

CENTERLINE COMMUNICATIONS
750 W. CENTER ST. SUITE #301
WEST BRIDGEWATER, MA 02379

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

MANCHESTER-EAST CENTER ST.
LTE 4C, 5C, 5G NR, RETRO
SITE NO. CT1070

52 EAST CENTER ST.
MANCHESTER, CT 06040

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/21	ISSUED FOR CONSTRUCTION	MR	CDH	DAS
B	11/17/20	ISSUED FOR REVIEW	MR	CDH	DAS
A	10/23/20	ISSUED FOR REVIEW	MR	CDH	DAS

SCALE: AS SHOWN | DESIGNED BY: CDH | DRAWN BY: MR

STATE OF CONNECTICUT 28971 LICENSED PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

TITLE SHEET

DEWBERRY NO.	DRAWING NUMBER	REV
50123198/50123221	T01	0

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – CENTERLINE COMMUNICATIONS
   CONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY
   OEM – ORIGINAL EQUIPMENT MANUFACTURER
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS & TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED & INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, & ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES & COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, & LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL & UTILITY COMPANY SPECIFICATIONS & LOCAL JURISDICTIONAL CODES, ORDINANCES & APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED & ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, & LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT & 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 CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER & T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING & TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
10. THE CONTRACTOR SHALL PROTECT EXISTING & PROPOSED IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING & STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR SHALL LEGALLY & PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES & OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE & DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, & PROCEDURES & FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
14. CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF & WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS & CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
16. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR 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.
17. 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.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR SITE SAFETY INCLUDING COMPLIANCE WITH ALL APPLICABLE OSHA STANDARDS & RECOMMENDATIONS & SHALL PROVIDE ALL NECESSARY SAFETY DEVICES INCLUDING PPE & PPM & CONSTRUCTION DEVICES SUCH AS WELDING & FIRE PREVENTION, TEMPORARY SHORING, SCAFFOLDING, TRENCH BOXES/SLOPING, BARRIERS, ETC.

SITE WORK GENERAL NOTES:

1. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, & OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, & WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:
   A) FALL PROTECTION
   B) CONFINED SPACE
   C) ELECTRICAL SAFETY
   D) TRENCHING & EXCAVATION.
3. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS & PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL & OTHER REFUSE SHALL BE REMOVED FROM THE SITE & DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC & OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
6. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE AT&T SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT & TOWER AREAS.
9. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
10. THE SUB GRADE SHALL BE COMPACTED & BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
11. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK & NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, & STABILIZED TO PREVENT EROSION.
12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION & SEDIMENT CONTROL.

CONCRETE & REINFORCING STEEL NOTES:

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 & THE DESIGN & CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" & ALL HOOKS SHALL BE STANDARD, UNO.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
   CONCRETE CAST AGAINST EARTH.....3 IN.
   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 & LARGER .....2 IN.
   #5 & SMALLER & WWF .....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB & WALL .....3/4 IN.
   BEAMS & COLUMNS .....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
7. CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER;
   (A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,
   (B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
   FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
8. AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY & THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
9. EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION & BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
2. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES & WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
3. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE 3/4"Ø CONNECTIONS & SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
4. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
5. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
7. ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

SOIL COMPACTION NOTES FOR SLAB ON GRADE:

1. EXCAVATE AS REQUIRED TO REMOVE VEGETATION & TOPSOIL EXPOSE UNDISTURBED NATURAL SUBGRADE & PLACE CRUSHED STONE AS REQUIRED.
2. COMPACTION CERTIFICATION: AN INSPECTION & WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
3. AS AN ALTERNATIVE TO INSPECTION & WRITTEN CERTIFICATION, THE "UNDISTURBED SOIL" BASE SHALL BE COMPACTED WITH "COMPACTION EQUIPMENT", LISTED BELOW, TO AT LEAST 90% MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557 METHOD C.
4. COMPACTED SUBBASE SHALL BE UNIFORM & LEVELED. PROVIDE 6" MINIMUM CRUSHED STONE OR GRAVEL COMPACTED IN 3" LIFTS ABOVE COMPACTED SOIL. GRAVEL SHALL BE NATURAL OR CRUSHED WITH 100% PASSING 1" SIEVE.
5. AS AN ALTERNATIVE TO ITEMS 2 & 3 PROOFROLL THE SUBGRADE SOILS WITH 5 PASSES OF A MEDIUM SIZED VIBRATORY PLATE COMPACTOR (SUCH AS BOMAG BPR 30/38) OR HAND-OPERATED SINGLE DRUM VIBRATORY ROLLER (SUCH AS BOMAG BW 55E). ANY SOFT AREAS THAT ARE ENCOUNTERED SHOULD BE REMOVED & REPLACED WITH A WELL-GRADED GRANULAR FILL, & COMPACTED AS STATED ABOVE.

COMPACTION EQUIPMENT:

1. HAND OPERATED DOUBLE DRUM, VIBRATORY ROLLER, VIBRATORY PLATE COMPACTOR OR JUMPING JACK COMPACTOR.

CONSTRUCTION NOTES:

1. FIELD VERIFICATION:
   CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, AT&T ANTENNA PLATFORM LOCATION & ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK & PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH & INSTALL CABLE LADDER RACK, CABLE TRAY, & CONDUIT AS REQUIRED TO SUPPORT CABLES TO ANY NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC & ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF & TRANSPORT CABLING TO NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
3. CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
4. WIRING, RACEWAY & SUPPORT METHODS & MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC & TELCORDIA.
5. ALL CIRCUITS SHALL BE SEGREGATED & MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC & TELCORDIA.
6. CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
7. EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, & T1 CONDUCTOR & CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, & MATCH EXISTING INSTALLATION REQUIREMENTS.
8. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, & BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD & CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) & INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
10. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
11. POWER, CONTROL, & EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90 °C (WET & DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION & RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
12. POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL.) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA & MATCH EXISTING INSTALLATION REQUIREMENTS.
13. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 6 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET & DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION & RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
14. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
15. POWER & CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET & DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER & POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS & WIRENUTS BY THOMAS & BETTS (OR EQUAL). LUGS & WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY & CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, & NEC.
18. NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
19. ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
20. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
21. GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
22. RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
23. LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS & OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT & TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE & APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, & WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, & NEC.
26. CABINETS, BOXES, & WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY-COATED (GRAY) & INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); & RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, & PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, & RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, & DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A & NEMA OS 1; & RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, & DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; & RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY & OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
32. THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES & DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES & STANDARDS TO SAFEGUARD AGAINST LIFE & PROPERTY.

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

CENTERLINE COMMUNICATIONS
750 W. CENTER ST. SUITE #301
WEST BRIDGEWATER, MA 02379

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

MANCHESTER-EAST CENTER ST.
LTE 4C, 5C, 5G NR, RETRO
SITE NO. CT1070

52 EAST CENTER ST.
MANCHESTER, CT 06040

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/21	ISSUED FOR CONSTRUCTION	MR	CDH	DAS
B	11/17/20	ISSUED FOR REVIEW	MR	CDH	DAS
A	10/23/20	ISSUED FOR REVIEW	MR	CDH	DAS

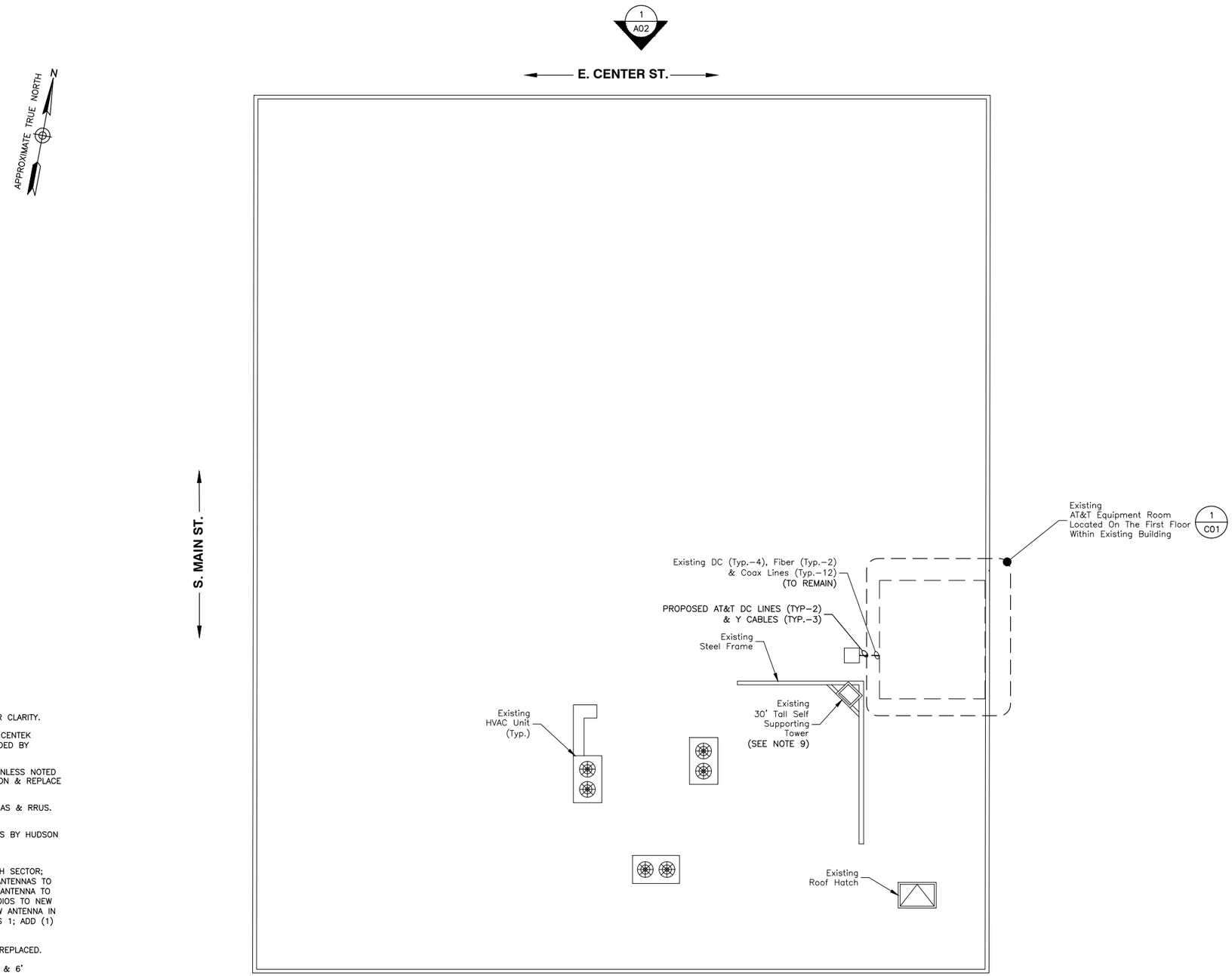
SCALE: AS SHOWN | DESIGNED BY: CDH | DRAWN BY: MR

STATE OF CONNECTICUT · BENJAMIN D. KNIGHT · 28971 · LICENSED PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

GENERAL NOTES

DEWBERRY NO.	DRAWING NUMBER	REV
50123198/50123221	G01	0



ROOF PLAN

SCALE: 1/16"=1' FOR 11"x17"
1/8"=1' FOR 22"x34"

1

0' 4' 8' 16'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. SOME PROPOSED & EXISTING INFORMATION NOT SHOWN FOR CLARITY.
3. ROOF PLAN BASED ON REV.0 CONSTRUCTION DRAWINGS BY CENTEK ENGINEERING DATED 12/19/18 & SITE AUDIT PHOTO PROVIDED BY CENTERLINE COMMUNICATIONS.
4. REUSE EXISTING PIPE MOUNTS FOR PROPOSED ANTENNAS UNLESS NOTED OTHERWISE. INSPECT MOUNTS FOR DAMAGE OR DETERIORATION & REPLACE AS NECESSARY.
5. ALL JUMPERS TO BE NEATLY BUNDLED BEHIND THE ANTENNAS & RRUS.
6. INSTALL ALL PROPOSED EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS & IN ACCORDANCE WITH MOUNT ANALYSIS BY HUDSON DESIGN GROUP, LLC. DATED 11/10/20.
7. SCOPE OF WORK:
   ROOFTOP: REMOVE EXISTING ANTENNA FROM POS 2 OF EACH SECTOR; REMOVE (3) EXISTING 700 BAND RADIOS; INSTALL NEW 6' ANTENNAS TO POSITIONS 1 AND 3 OF ALPHA AND BETA; INSTALL NEW 8' ANTENNA TO POSITIONS 1 AND 3 OF GAMMA; INSTALL (3) B14 4478 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4426 B66 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4449 RADIOS TO NEW ANTENNA IN POS 1; ADD (1) DC ONLY SQUID WITH (2) DC LINES AND (3) Y CABLES.

   SHELTER: ADD (1) 6630; ADD (1) IDLe; CONFIRM BOOT IS REPLACED.
8. 3' MINIMUM SEPARATION REQUIRED BETWEEN LTE ANTENNAS & 6' SEPARATION REQUIRED BETWEEN 700 BC & 700 DE.
9. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

CENTERLINE COMMUNICATIONS
750 W. CENTER ST. SUITE #301
WEST BRIDGEWATER, MA 02379

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

MANCHESTER-EAST CENTER ST.
LTE 4C, 5C, 5G NR, RETRO
SITE NO. CT1070

52 EAST CENTER ST.
MANCHESTER, CT 06040

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/21	ISSUED FOR CONSTRUCTION	MR	CDH	DAS
B	11/17/20	ISSUED FOR REVIEW	MR	CDH	DAS
A	10/23/20	ISSUED FOR REVIEW	MR	CDH	DAS

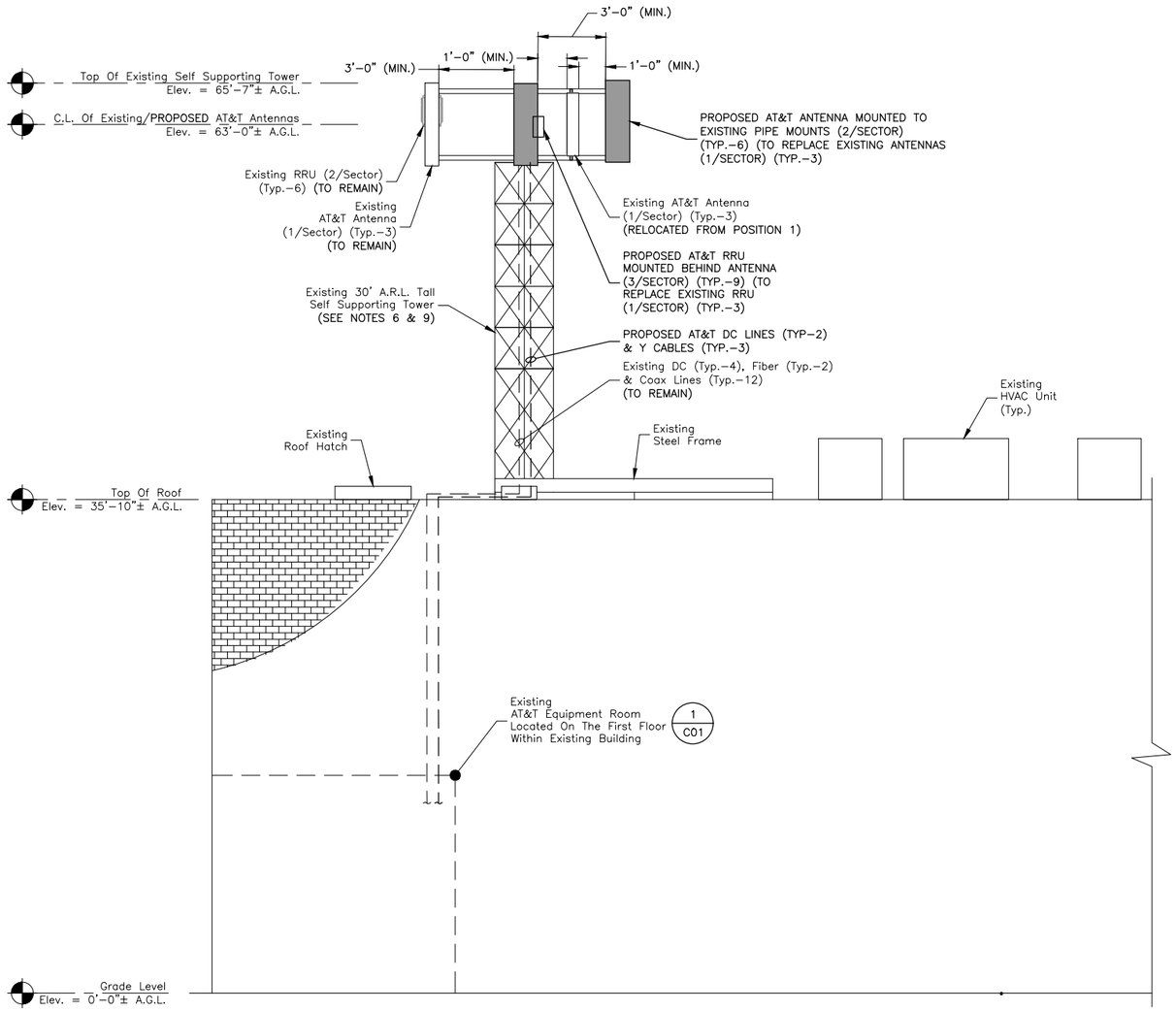
SCALE: AS SHOWN | DESIGNED BY: CDH | DRAWN BY: MR

STATE OF CONNECTICUT
BENJAMIN R. DEWBERRY
28971
LICENSED
PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

ROOF PLAN

DEWBERRY NO.	DRAWING NUMBER	REV
50123198/50123221	A01	0



NOTES:

1. ELEVATION SHOWN AS APPROXIMATE.
2. SOME PROPOSED & EXISTING INFORMATION NOT SHOWN FOR CLARITY.
3. ROOF PLAN BASED ON REV.0 CONSTRUCTION DRAWINGS BY CENTEK ENGINEERING DATED 12/19/18 & SITE AUDIT PHOTO PROVIDED BY CENTERLINE COMMUNICATIONS.
4. REUSE EXISTING PIPE MOUNTS FOR PROPOSED ANTENNAS UNLESS NOTED OTHERWISE. INSPECT MOUNTS FOR DAMAGE OR DETERIORATION & REPLACE AS NECESSARY.
5. ALL JUMPERS TO BE NEATLY BUNDLED BEHIND THE ANTENNAS & RRUS.
6. INSTALL ALL PROPOSED EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS & IN ACCORDANCE WITH MOUNT ANALYSIS BY HUDSON DESIGN GROUP, LLC. DATED 11/10/20.
7. SCOPE OF WORK:
   ROOFTOP: REMOVE EXISTING ANTENNA FROM POS 2 OF EACH SECTOR; REMOVE (3) EXISTING 700 BAND RADIOS; INSTALL NEW 6' ANTENNAS TO POSITIONS 1 AND 3 OF ALPHA AND BETA; INSTALL NEW 8' ANTENNA TO POSITIONS 1 AND 3 OF GAMMA; INSTALL (3) B14 4478 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4426 B66 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4449 RADIOS TO NEW ANTENNA IN POS 1; ADD (1) DC ONLY SQUID WITH (2) DC LINES AND (3) Y CABLES.

   SHELTER: ADD (1) 6630; ADD (1) IDLe; CONFIRM BOOT IS REPLACED.
8. 3' MINIMUM SEPARATION REQUIRED BETWEEN LTE ANTENNAS & 6' SEPARATION REQUIRED BETWEEN 700 BC & 700 DE.
9. DEWBERRY WAS NOT PROVIDED WITH OR CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THIS TOWER. TOWER RELATED IMPROVEMENTS ARE NOT TO BE INSTALLED WITHOUT A PASSING STRUCTURAL ANALYSIS. SEE STRUCTURAL NOTE ON SHEET T01.

PARTIAL SOUTH ELEVATION

1

SCALE: 3/32"=1' FOR 11"x17"
3/16"=1' FOR 22"x34"

0' 4' 8' 12'

LEGEND:	
A.R.L.	ABOVE ROOF LINE
A.G.L.	ABOVE GROUND LEVEL
C.L.	CENTER LINE

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

CENTERLINE COMMUNICATIONS
750 W. CENTER ST. SUITE #301
WEST BRIDGEWATER, MA 02379

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

MANCHESTER-EAST CENTER ST.
LTE 4C, 5C, 5G NR, RETRO
SITE NO. CT1070

52 EAST CENTER ST.
MANCHESTER, CT 06040

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/21	ISSUED FOR CONSTRUCTION	MR	CDH	DAS
B	11/17/20	ISSUED FOR REVIEW	MR	CDH	DAS
A	10/23/20	ISSUED FOR REVIEW	MR	CDH	DAS

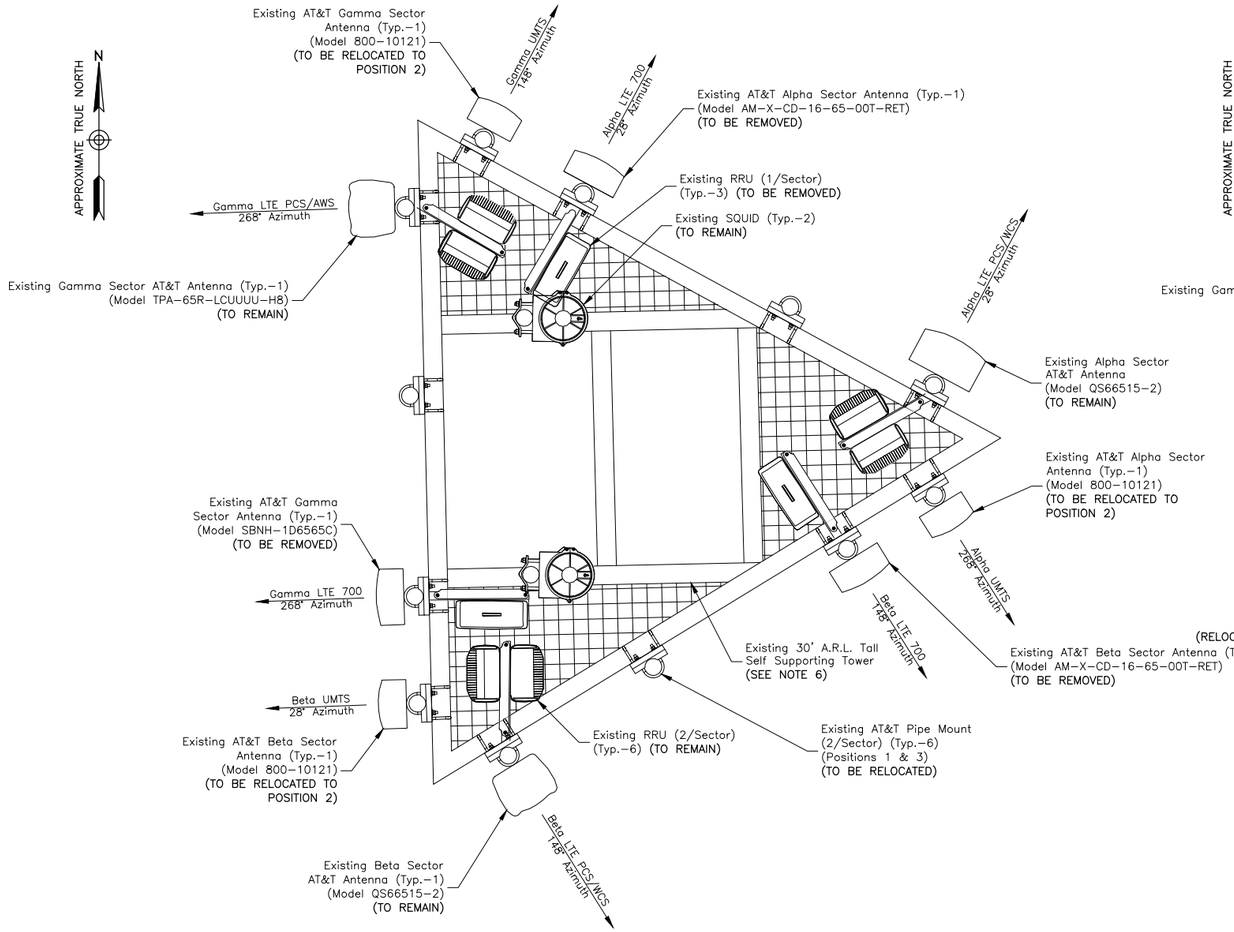
SCALE: AS SHOWN | DESIGNED BY: CDH | DRAWN BY: MR

STATE OF CONNECTICUT · BENJAMIN R. MARTIN · 28971 · LICENSED PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

PARTIAL SOUTH ELEVATION

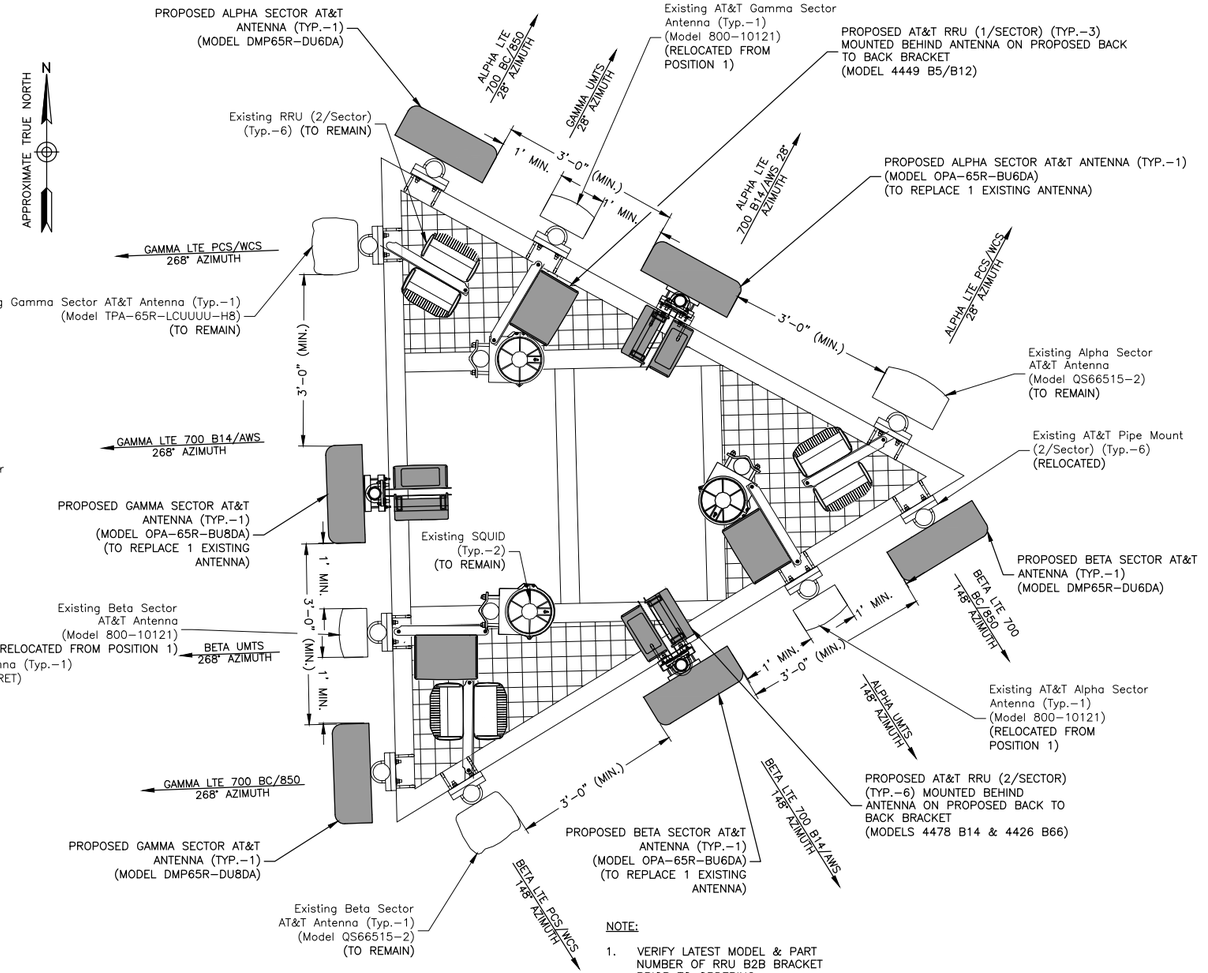
DEWBERRY NO.	DRAWING NUMBER	REV
50123198/50123221	A02	0



EXISTING ANTENNA PLAN 1

SCALE: 3/8"=1' FOR 11"x17"
3/4"=1' FOR 22"x34"

0' 1' 2' 3'



NOTE:

1. VERIFY LATEST MODEL & PART NUMBER OF RRU B2B BRACKET PRIOR TO ORDERING.

PROPOSED ANTENNA PLAN 2

SCALE: 3/8"=1' FOR 11"x17"
3/4"=1' FOR 22"x34"

0' 1' 2' 3'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. SOME PROPOSED & EXISTING INFORMATION NOT SHOWN FOR CLARITY.
3. ROOF PLAN BASED ON REV.0 CONSTRUCTION DRAWINGS BY CENTEK ENGINEERING DATED 12/19/18 & SITE AUDIT PHOTO PROVIDED BY CENTERLINE COMMUNICATIONS.
4. REUSE EXISTING PIPE MOUNTS FOR PROPOSED ANTENNAS UNLESS NOTED OTHERWISE. INSPECT MOUNTS FOR DAMAGE OR DETERIORATION & REPLACE AS NECESSARY.
5. ALL JUMPERS TO BE NEATLY BUNDLED BEHIND THE ANTENNAS & RRUS.
6. INSTALL ALL PROPOSED EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS & IN ACCORDANCE WITH MOUNT ANALYSIS BY HUDSON DESIGN GROUP, LLC. DATED 11/10/20.
7. SCOPE OF WORK:
   ROOFTOP: REMOVE EXISTING ANTENNA FROM POS 2 OF EACH SECTOR; REMOVE (3) EXISTING 700 BAND RADIOS; INSTALL NEW 6' ANTENNAS TO POSITIONS 1 AND 3 OF ALPHA AND BETA; INSTALL NEW 8' ANTENNA TO POSITIONS 1 AND 3 OF GAMMA; INSTALL (3) B14 4478 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4426 B66 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4449 RADIOS TO NEW ANTENNA IN POS 1; ADD (1) DC ONLY SQUID WITH (2) DC LINES AND (3) Y CABLES.

   SHELTER: ADD (1) 6630; ADD (1) IDLe; CONFIRM BOOT IS REPLACED.
8. 3' MINIMUM SEPARATION REQUIRED BETWEEN LTE ANTENNAS & 6' SEPARATION REQUIRED BETWEEN 700 BC & 700 DE.

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

CENTERLINE COMMUNICATIONS
750 W. CENTER ST. SUITE #301
WEST BRIDGEWATER, MA 02379

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

MANCHESTER-EAST CENTER ST.
LTE 4C, 5C, 5G NR, RETRO
SITE NO. CT1070

52 EAST CENTER ST.
MANCHESTER, CT 06040

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/21	ISSUED FOR CONSTRUCTION	MR	CDH	DAS
B	11/17/20	ISSUED FOR REVIEW	MR	CDH	DAS
A	10/23/20	ISSUED FOR REVIEW	MR	CDH	DAS

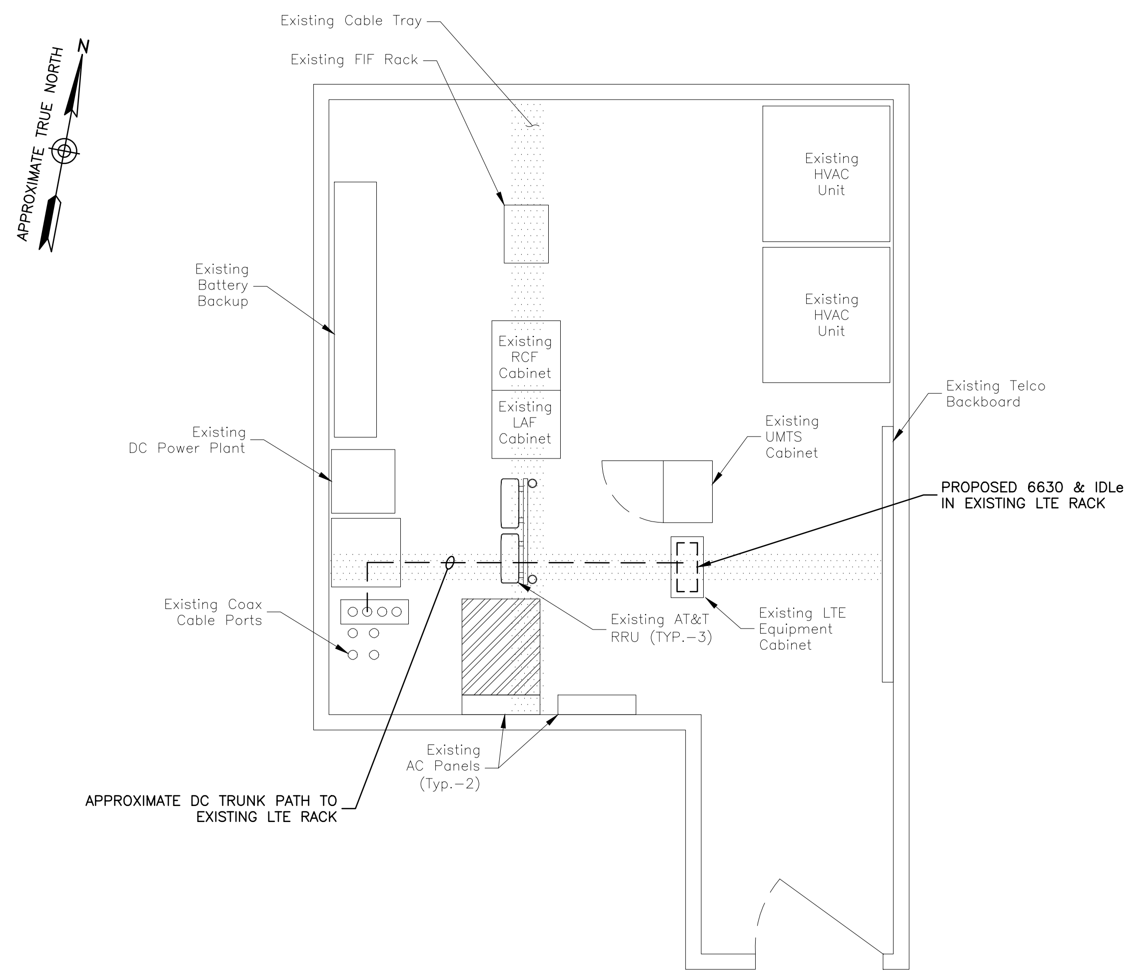
SCALE: AS SHOWN | DESIGNED BY: CDH | DRAWN BY: MR

STATE OF CONNECTICUT 28971 LICENSED PROFESSIONAL ENGINEER

AT&T MOBILITY
FRAMINGHAM, MA 01701

EQUIPMENT CONFIGURATION

DEWBERRY NO.	DRAWING NUMBER	REV
50123198/50123221	A03	0



SHELTER NOTES:

1. EXISTING ROTTED SHELTER FLOOR LOCATIONS ARE TO BE REPAIRED.
2. WEATHER–SEAL ALL COAX PORTS.

EQUIPMENT ROOM LAYOUT (1)

SCALE: 1/8"=1' FOR 11"x17"
1/4"=1' FOR 22"x34"

0' 2' 4' 8'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. SOME PROPOSED & EXISTING INFORMATION NOT SHOWN FOR CLARITY.
3. ROOF PLAN BASED ON REV.0 CONSTRUCTION DRAWINGS BY CENTEK ENGINEERING DATED 12/19/18 & SITE AUDIT PHOTO PROVIDED BY CENTERLINE COMMUNICATIONS.
4. REUSE EXISTING PIPE MOUNTS FOR PROPOSED ANTENNAS UNLESS NOTED OTHERWISE. INSPECT MOUNTS FOR DAMAGE OR DETERIORATION & REPLACE AS NECESSARY.
5. ALL JUMPERS TO BE NEATLY BUNDLED BEHIND THE ANTENNAS & RRUS.
6. INSTALL ALL PROPOSED EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS & IN ACCORDANCE WITH MOUNT ANALYSIS BY HUDSON DESIGN GROUP, LLC. DATED 11/10/20.
7. SCOPE OF WORK:
   ROOFTOP: REMOVE EXISTING ANTENNA FROM POS 2 OF EACH SECTOR; REMOVE (3) EXISTING 700 BAND RADIOS; INSTALL NEW 6' ANTENNAS TO POSITIONS 1 AND 3 OF ALPHA AND BETA; INSTALL NEW 8' ANTENNA TO POSITIONS 1 AND 3 OF GAMMA; INSTALL (3) B14 4478 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4426 B66 RADIOS TO NEW ANTENNA IN POS 3; INSTALL (3) 4449 RADIOS TO NEW ANTENNA IN POS 1; ADD (1) DC ONLY SQUID WITH (2) DC LINES AND (3) Y CABLES.

   SHELTER: ADD (1) 6630; ADD (1) IDLe; CONFIRM BOOT IS REPLACED.
8. 3' MINIMUM SEPARATION REQUIRED BETWEEN LTE ANTENNAS & 6' SEPARATION REQUIRED BETWEEN 700 BC & 700 DE.

FINAL EQUIPMENT CONFIGURATION

SECTOR	BAND	ANTENNA	SIZE (INCHES) (LxWxD)	RAD. CENTER	AZIMUTH	TMA	RRU	SIZE (INCHES) (LxWxD)
ALPHA	LTE 700 BC/850	(P) DMP65R–BU6DA	71.2x20.7x7.7	63'–0	28	—	(P) 4449 B5/B12 (700)	17.9 x 13.2 x 9.4
	UMTS 850	(E) 800–10121	54.5x10.3x5.9	63'–0	148	DTMABP7819VG12A	—	—
	LTE 700 B14/AWS	(P) OPA–65R–BU6DA	71.1x21.0x7.8	63'–0	28	—	(P) 4478 B14 (700) (P) 4426 B66 (AWS)	17.9 x 13.2 x 9.4 15.0 x 13.2 x 5.8
	LTE PCS/WCS	(E) QS66515–2	72.0x12.0x9.6	63'–0	28	—	(E) RRUS–12 B2 (1900) (E) RRUS–32 B30 (WCS)	20.4 x 18.5 x 7.5 27.2 x 12.1 x 7.0
BETA	LTE 700 BC/850	(P) DMP65R–BU6DA	71.2x20.7x7.7	63'–0	148	—	(P) 4449 B5/B12 (700)	17.9 x 13.2 x 9.4
	UMTS 850	(E) 800–10121	54.5x10.3x5.9	63'–0	268	DTMABP7819VG12A	—	—
	LTE 700 B14/AWS	(P) OPA–65R–BU6DA	71.1x21.0x7.8	63'–0	148	—	(P) 4478 B14 (700) (P) 4426 B66 (AWS)	17.9 x 13.2 x 9.4 15.0 x 13.2 x 5.8
	LTE PCS/WCS	(E) QS66515–2	72.0x12.0x9.6	63'–0	148	—	(E) RRUS–12 B2 (1900) (E) RRUS–32 B30 (WCS)	20.4 x 18.5 x 7.5 27.2 x 12.1 x 7.0
GAMMA	LTE 700 BC/850	(P) DMP65R–BU8DA	96.0x20.7x7.7	63'–0	268	—	(P) 4449 B5/B12 (700)	17.9 x 13.2 x 9.4
	UMTS 850	(E) 800–10121	54.5x10.3x5.9	63'–0	28	DTMABP7819VG12A	—	—
	LTE 700 B14/AWS	(P) OPA–65R–BU8DA	96.0x21.0x7.8	63'–0	268	—	(P) 4478 B14 (700) (P) 4426 B66 (AWS)	17.9 x 13.2 x 9.4 15.0 x 13.2 x 5.8
	LTE PCS/WCS	(E) TPA–65R–LCUUUU–H8	96.0x14.4x8.6	63'–0	268	—	(E) RRUS–12 B2 (1900) (E) RRUS–32 B30 (WCS)	20.4 x 18.5 x 7.5 27.2 x 12.1 x 7.0

NOTES:

1. EQUIPMENT CONFIGURATION TABLES BASED ON RFDS VERSION 2.00 DATED 09/04/20.
2. CONTRACTOR TO VERIFY FINAL EQUIPMENT CONFIGURATION AND SEPARATIONS WITH AT&T PRIOR TO CONSTRUCTION.

FINAL EQUIPMENT CONFIGURATION (1)

SCALE: N.T.S.

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

CENTERLINE COMMUNICATIONS
750 W. CENTER ST. SUITE #301
WEST BRIDGEWATER, MA 02379

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

MANCHESTER-EAST CENTER ST.
LTE 4C, 5C, 5G NR, RETRO
SITE NO. CT1070
52 EAST CENTER ST.
MANCHESTER, CT 06040

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/21	ISSUED FOR CONSTRUCTION	MR	CDH	DAS
B	11/17/20	ISSUED FOR REVIEW	MR	CDH	DAS
A	10/23/20	ISSUED FOR REVIEW	MR	CDH	DAS

SCALE: AS SHOWN | DESIGNED BY: CDH | DRAWN BY: MR

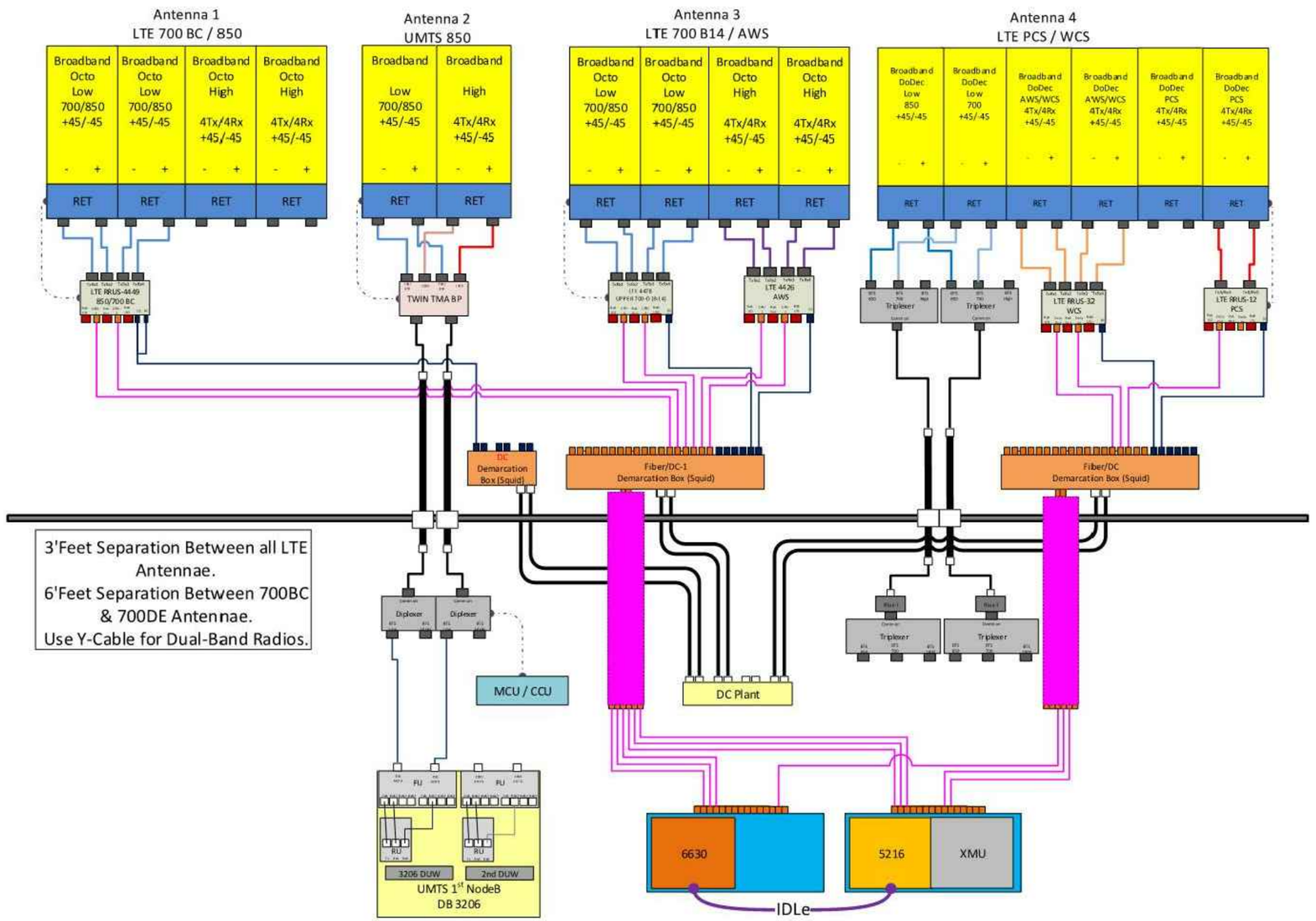
STATE OF CONNECTICUT LICENSED PROFESSIONAL ENGINEER 28971

AT&T MOBILITY
FRAMINGHAM, MA 01701

EQUIPMENT ROOM LAYOUT &
FINAL EQUIPMENT CONFIGURATION

DEWBERRY NO.	DRAWING NUMBER	REV
50123198/50123221	C01	0

Diagram - Sector	A	Diagram File Name - CT1070_ABC_850_B14_AWS_d4.vsd					
Atoll Site Name -	CTL01070	Location Name -	MANCHESTER-EAST CENTER ST	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments: Important Note: For detailed radio to antenna wiring refer to the latest field notice - Antenna_Radio Connection Drawings Playbook v6.0_Ericsson							



EQUIPMENT PLUMBING DIAGRAM

SCALE: N.T.S.

1

NOTES:

1. EQUIPMENT PLUMBING DIAGRAM PER RFDS VERSION 4.00 DATED 11/25/21.
2. CONTRACTOR TO VERIFY FINAL EQUIPMENT CONFIGURATION & SEPARATIONS WITH AT&T PRIOR TO CONSTRUCTION.

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

CENTERLINE COMMUNICATIONS
750 W. CENTER ST. SUITE #301
WEST BRIDGEWATER, MA 02379

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

MANCHESTER-EAST CENTER ST.
LTE 4C, 5C, 5G NR, RETRO
SITE NO. CT1070

52 EAST CENTER ST.
MANCHESTER, CT 06040

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/21	ISSUED FOR CONSTRUCTION	MR	CDH	DAS
B	11/17/20	ISSUED FOR REVIEW	MR	CDH	DAS
A	10/23/20	ISSUED FOR REVIEW	MR	CDH	DAS

SCALE: AS SHOWN | DESIGNED BY: CDH | DRAWN BY: MR

STATE OF CONNECTICUT BENJAMIN R. DEWBERRY 28971 LICENSED PROFESSIONAL ENGINEER

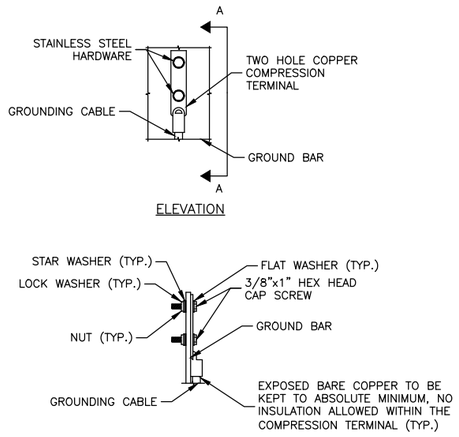
AT&T MOBILITY
FRAMINGHAM, MA 01701

EQUIPMENT PLUMBING DIAGRAM

DEWBERRY NO.	DRAWING NUMBER	REV
50123198/50123221	C02	0

GROUNDING NOTES:

1. THE CONTRACTOR 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 CONTRACTOR 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. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
3. THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY CONTRACTOR IN WRITING.
4. THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
6. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
7. 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 TRANSMISSION EQUIPMENT.
8. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
11. EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH 6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
12. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
13. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM CENTERLINE COMMUNICATIONS MARKET REPRESENTATIVE.
14. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
15. ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
16. ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.

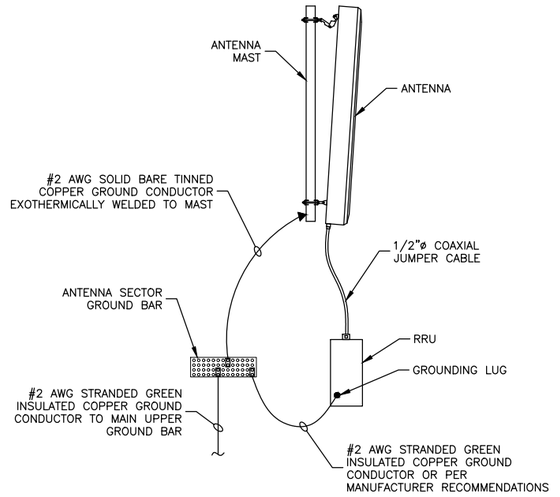


NOTES:

1. DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 1

SCALE: N.T.S.



NOTES:

1. VERIFY EXISTING GROUNDING SYSTEM IS INSTALLED PER AT&T STANDARDS.
2. BOND NEW EQUIPMENT INTO EXISTING GROUND SYSTEM IN ACCORDANCE WITH AT&T STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.

TYPICAL ANTENNA GROUNDING DETAIL 2

SCALE: N.T.S

Dewberry®
Dewberry Engineers Inc.
99 SUMMER STREET
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

CENTERLINE COMMUNICATIONS
750 W. CENTER ST. SUITE #301
WEST BRIDGEWATER, MA 02379

at&t Mobility
550 COCHITUATE ROAD
SUITES 13 & 14
FRAMINGHAM, MA 01701

MANCHESTER-EAST CENTER ST.
LTE 4C, 5C, 5G NR, RETRO
SITE NO. CT1070

52 EAST CENTER ST.
MANCHESTER, CT 06040

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	03/09/21	ISSUED FOR CONSTRUCTION	MR	CDH	DAS
B	11/17/20	ISSUED FOR REVIEW	MR	CDH	DAS
A	10/23/20	ISSUED FOR REVIEW	MR	CDH	DAS

SCALE: AS SHOWN | DESIGNED BY: CDH | DRAWN BY: MR

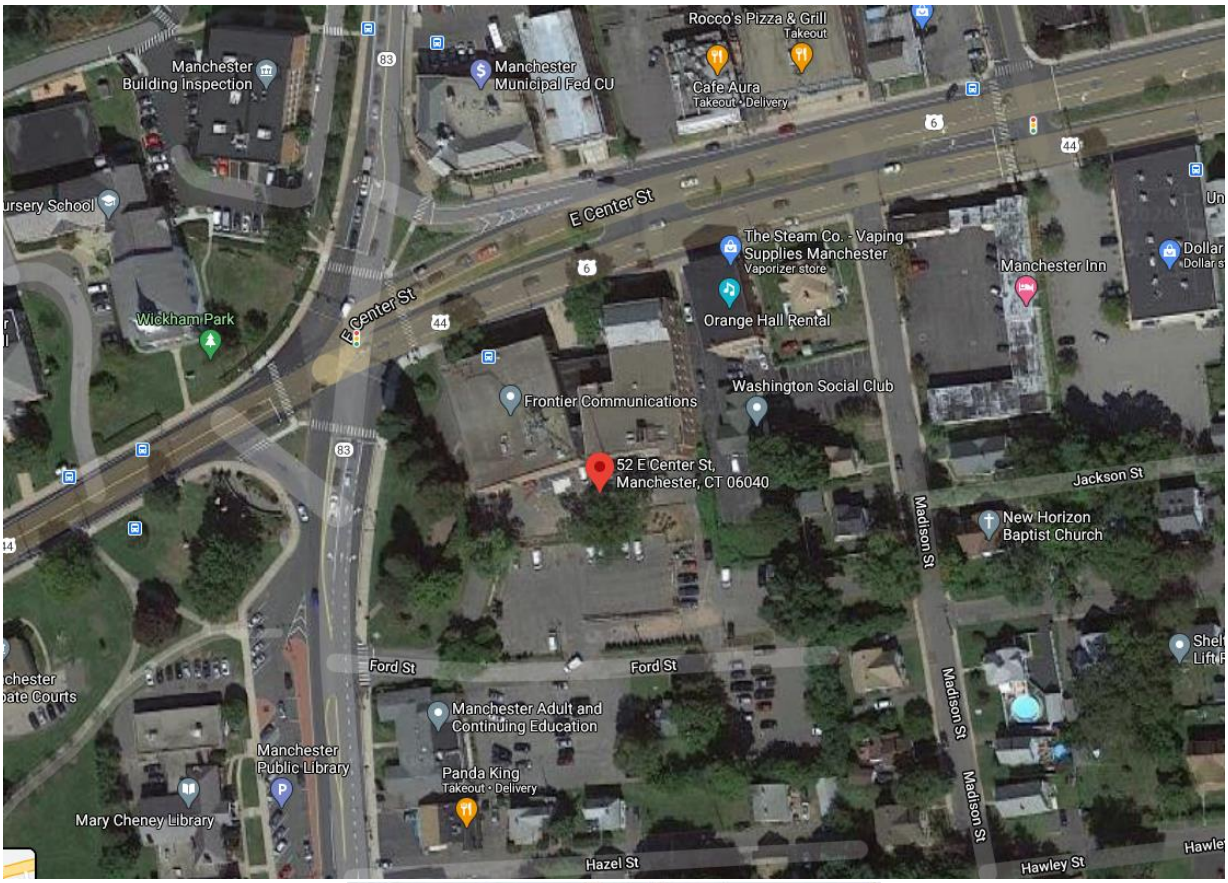
STATE OF CONNECTICUT · BENJAMIN R. DEWBERRY · 28971 · LICENSED PROFESSIONAL ENGINEER

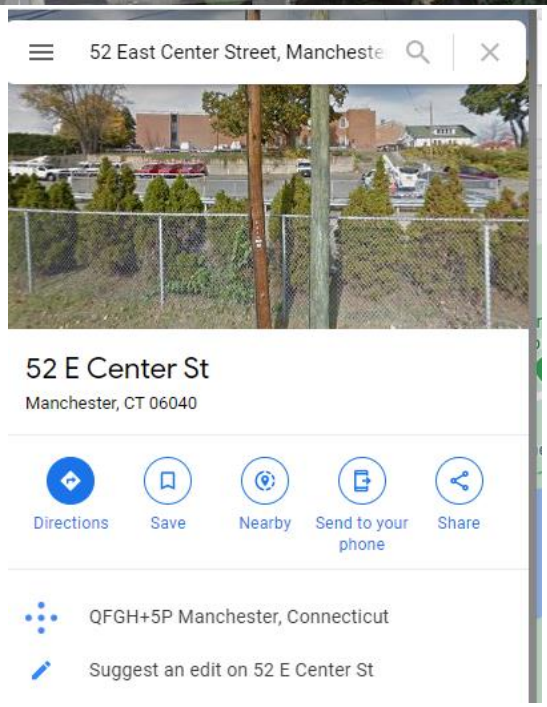
AT&T MOBILITY
FRAMINGHAM, MA 01701

GROUNDING NOTES & DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50123198/50123221	E01	0

EXHIBIT 2


Rocco's Pizza & Grill
Takeout
Manchester Building Inspection
Manchester Municipal Fed CU
Cafe Aura
Takeout • Delivery
E Center St
The Steam Co. - Vaping Supplies Manchester
Vaporizer store
Manchester Inn
Wickham Park
Orange Hall Rental
Frontier Communications
Washington Social Club
52 E Center St, Manchester, CT 06040
Jackson St
New Horizon Baptist Church
Madison St
Ford St
Manchester Adult and Continuing Education
Manchester Public Library
Panda King
Takeout • Delivery
Mary Cheney Library
Hazel St
Hawley St


52 East Center Street, Manchester
52 E Center St
Manchester, CT 06040
Directions
Save
Nearby
Send to your phone
Share
QFGH+5P Manchester, Connecticut
Suggest an edit on 52 E Center St

Town of Manchester, CT

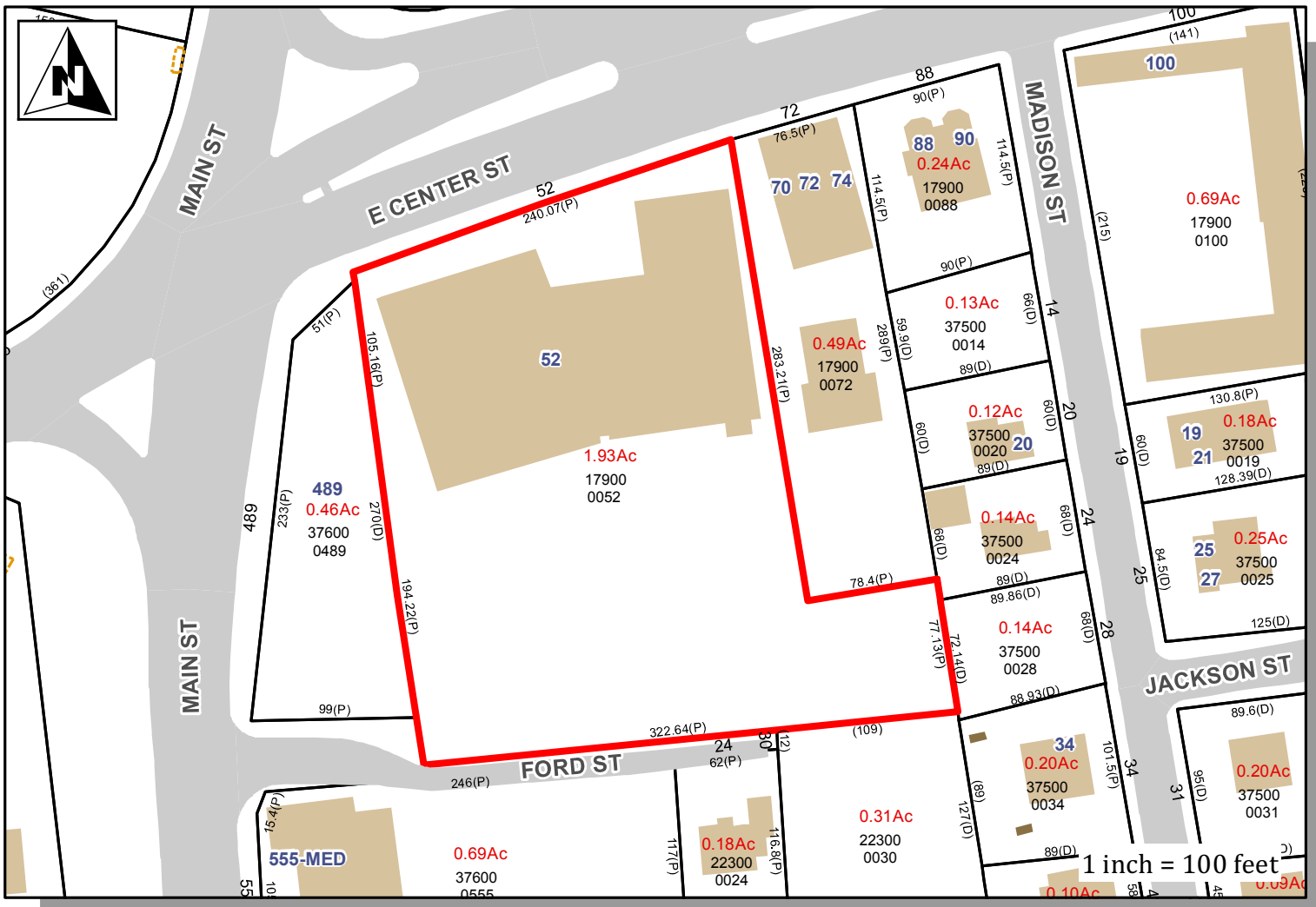
Address: 52 EAST CENTER STREET

RPKEY: 179000052

Property Information:

Mailing Address:	52 E CENTER ST MANCHESTER, CT
Owner Name:	SOUTHERN NEW ENGLAND TELEPHONE COMPANY
Owner Address:	1 SBC CTR UNIT 36-M-0 ST LOUIS, MO 63101
Land Class:	Pub Util 96
Land Use Code:	400
Zoning:	B3

Acreage:	1.93
Year Built:	1929
Appraisal:	1745700
Assessment:	1221900
Sale Price:	$0.00
Sale Date:	12/06/1961
Book/Page:	374/162



Report Created: 9/11/2020

EXHIBIT 3

February 19, 2021

Thomas L. Rigg Jr.
Everest Infrastructure Partners
Two Allegheny Center, Nova Tower 2, Suite 703
Pittsburgh, PA 15212
(603) 498-7462

Tower Engineering Professionals
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
SDD@tepgroup.net

Subject: Structural Modification Analysis Report

Carrier Designation:	***AT&T Mobility, LLC* Reconfiguration**	
	Site Number:	CT1070
	Site Name:	Manchester-East Center St.
Client Designation:	**Site Number:**	701816
	Site Name:	Manchester CO
Engineering Firm Designation:	**TEP Project Number:**	257649.494504
Site Data:	**52 East Center Street, Manchester, Hartford County, CT 06040** **Latitude *41° 46' 32.41 "*, Longitude *-72° 31' 15.09"*** **22.5 ± Foot - Self-Support Tower on 37.5 ± Foot Rooftop**	

Dear Thomas L. Rigg Jr.,

Tower Engineering Professionals is pleased to submit this **"Structural Modification Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

LC2: Existing + Proposed + Reserved Loading with Proposed Modifications **Sufficient Capacity**
Note: See Table 1 for the existing, proposed, and reserved loading

Tower Structure Capacity	Base Frame Capacity
89.1%	87.6%

The analysis has been performed in accordance with the ANSI/TIA-222-G-2-2009 Structural Standard for Antenna Supporting Structures and Antennas – Addendum 2 and the 2018 Connecticut State Building Code.

All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Table 1 and the attached drawings for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* appreciate the opportunity of providing our continuing professional services to you and *Everest Infrastructure Partners.* If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Brendan K. Orner, P.E. / ECL

Respectfully submitted by:

Aaron T. Rucker, P.E.

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

02/20/2021

TABLE OF CONTENTS

1) INTRODUCTION

The tower is a 22.5 ± Foot Self-Support Tower mapped by Hightower Solutions in August of 2017. The original design standard and wind speed were unavailable for review. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

TIA-222 Revision:	ANSI/TIA-222-G-2-2009
Type of Analysis:	Feasibility
Structure Class:	II
Wind Speed:	97 mph (Nominal)
Exposure Category:	C
Topographic Category:	1 (Kzt = 1.0)
Ice Thickness:	1.0 in
Wind Speed with Ice:	50 mph
Seismic Design Category:	B
Seismic Ss:	0.178
Seismic S1:	0.064
Service Wind Speed:	60 mph

Table 1 - Existing, Proposed, and Reserved Antenna and Cable Information

Existing/ Proposed/ Reserved	Mount Level (ft)	Ant CL (ft)	Qty	Antenna Model	Mount Type	Qty Coax	Coax Size	Coax Location	Owner/ Tenant
Proposed	***63.0***	***63.0***	***2***	***CCI DMP65R-BU6DA***	Platform	***2 1***	***DC .488***	***AB Face***	***AT&T***
			1	***CCI DMP65R-BU8DA***					
			2	***CCI OPA65R-BU6DA***					
			1	***CCI OPA65R-BU8DA***					
			3	***Ericsson 4449 B5/B12***					
			3	***Ericsson 4478 B14***					
			3	***Ericsson 4426 B66***					
			1	***Raycap DC6-48-60-0-8F***					
Existing	63.0	63.0	1	CCI TPA-65R-LCUUUU-H8		12 4 2	7/8 DC 3/8	AB Face	AT&T
			3	Kathrein 800 10121					
			2	Quintel QS66512-2					
			3	Ericsson RRUS 32 B30					
			3	Ericsson RRUS 12 B2					
			12	CCI TPX-070821					
			3	CCI DTMABP7819VG12A					
			2	Raycap DC6-48-60-18-8F					
To Be Removed	*63.0*	*63.0*	*2*	*KMW AM-X-CD-16-65-00R-RET*	-	-	-	-	*AT&T*
			1	*Andrew SBNH-1D6565C*					
			3	*Ericsson RRUS 11 B12*					

Notes:
1) Tower is on top of a 37.5-ft rooftop. All elevations are measured from ground level.

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Source
Tower Mapping Report	Hightower Solutions, dated August 22, 2017 Site No. CT1070 FA 10035030	Everest
Previous Structural Analysis	Malouf Engineering Intl., Inc., dated August 23, 2017 MEI Project ID: CT05236S-17V0	Everest
Preliminary Construction Drawings	Dewberry Engineers, Inc., Dewberry No. 50123198/50123221	Everest
Previous Structural Analysis	Tower Engineering Professionals, dated December 4, 2020 Project No. 257649.470413	TEP
Correspondence	Correspondence in reference to the existing, proposed, and reserved loading.	Everest

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

RISA-3D (version 17.0.4), a commercially available analysis software package, was used to model and analyze the foundation. Selected output from the analysis is included in Appendix B.

3.2) Analysis Assumptions

1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
2) The configuration of existing antennas, transmission cables, mounts and other appurtenances are as specified in the tower mapping report by TEP.
3) Unless specified by the client or tower mapping, the location of the existing and proposed coax is assumed by TEP and listed in Table 1.
4) All tower components are in sufficient condition to carry their full design capacity.
5) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
6) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not analyze antennas supporting mounts as part of this structural analysis report.
7) The following material grades were assumed:
   a) Connection bolts: A325N
   b) Tower Legs and Bracing: A36
   c) Tower Base Frame Beams: A992
   d) Tower Base Frame Bracing: A36
8) All connections between members of the base frame and connections of the base frame to the building columns were assumed to be sufficient to develop the capacity of the frame members.

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

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	ϕP_{allow} (lb)	% Capacity	Pass / Fail
T1	60 - 55	Leg	L3x3x5/16	1	-13404	33022	40.6	Pass
T2	55 - 50	Leg	L3x3x5/16	13	-19846	33022	60.1	Pass
T3	50 - 45	Leg	L3x3x5/16	25	-28573	33022	86.5	Pass
T4	45 - 40	Leg	L3x3x5/16	38	-25931	33022	78.5	Pass
T5	40 - 37.5	Leg	L3x3x5/16	53	-44716	50168	89.1	Pass
T1	60 - 55	Diagonal	L3x3x1/4	9	-10064	23754	42.4 77.3 (b)	Pass
T2	55 - 50	Diagonal	L3x3x1/4	21	-10530	23754	44.3 80.9 (b)	Pass
T3	50 - 45	Diagonal	L3x3x1/4	33	-10880	23754	45.8 83.3 (b)	Pass
T4	45 - 40	Diagonal	L3x3x1/4	45	-11038	43997	25.1 78.5 (b)	Pass
T5	40 - 37.5	Diagonal	L3x3x1/4	61	-7902	32442	24.4 60.4 (b)	Pass
T2	55 - 50	Horizontal	L2 1/2x2x3/16	17	-5306	15681	33.8 67.5 (b)	Pass
T3	50 - 45	Horizontal	L2 1/2x2x3/16	29	-5527	15681	35.2 70.2 (b)	Pass
T4	45 - 40	Horizontal	L2 1/2x2x3/16	42	-4713	15681	30.1 65.8 (b)	Pass
T1	60 - 55	Top Girt	L3x3x1/4	5	-2571	30946	8.3 24.9 (b)	Pass
T5	40 - 37.5	Top Girt	L2 1/2x2x3/16	58	-4767	15681	30.4 66.1 (b)	Pass
							Summary	
						Leg (T5)	89.1	Pass
						Diagonal (T3)	83.3	Pass
						Horizontal (T3)	70.2	Pass
						Top Girt (T5)	66.1	Pass
						Bolt Checks	83.3	Pass
						RATING =	**89.1**	**Pass**

Table 4 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Tower Leg-Base Frame Connection	-	87.6	Pass
1	Base Frame	-	85.1	Pass

Structure Rating (max from all components) =	89.1%

Notes:
1) See additional documentation in "Appendix B - Additional Calculations" for calculations supporting the % capacity listed.

Table 5 - Dish Twist/Sway Results for 60 mph Service Wind Speed

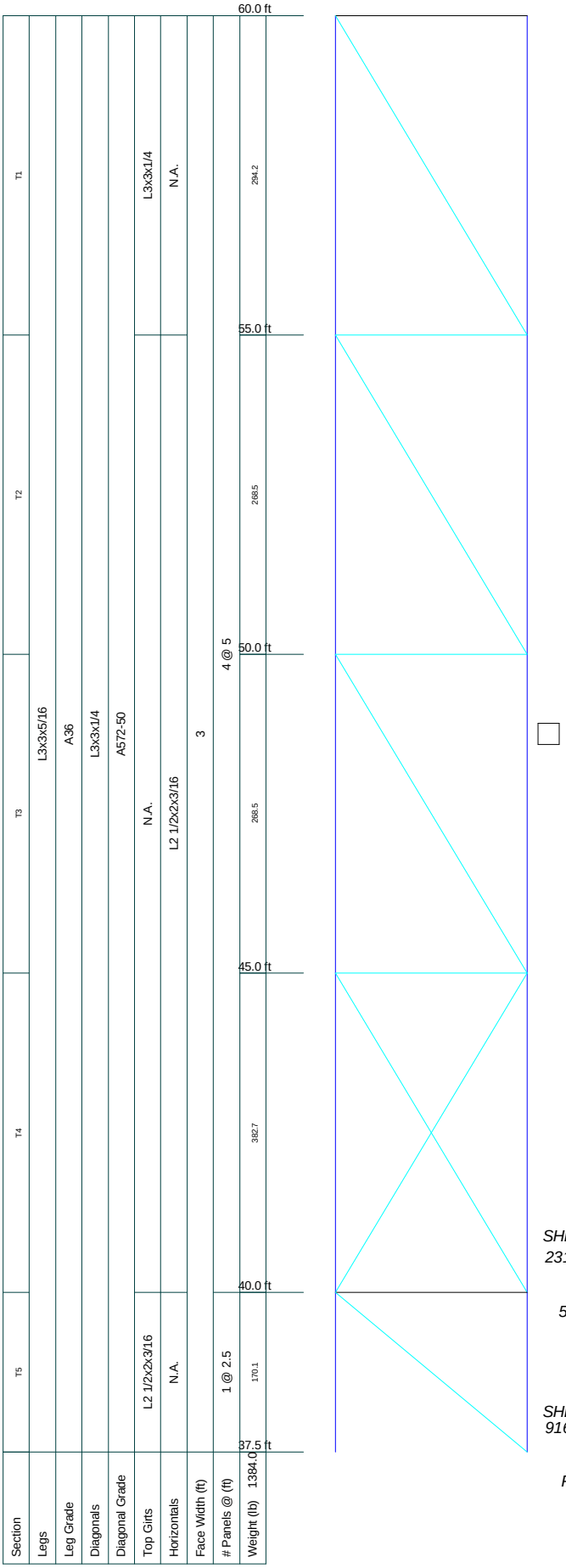
Elevation (ft)	Dish Model	Beam Deflection		
		Deflection (in)	Tilt (deg)	Twist (deg)
-	-	-	-	-

4.1) Recommendations

1) If the load differs from that in Table 1 of this report or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
2) The modifications depicted in "Appendix C – Structural Design Drawings" shall be installed and, upon completion, inspected. The tower has sufficient capacity to carry the existing, proposed, and reserved loading once the proposed modifications are installed.
3) There was not sufficient information available to analyze the connections between members of the base frame or the connections of the base frame to the building columns. TEP recommends a connection mapping be performed to obtain dimensions and quantities of all connection plates and hardware so that a rigorous analysis can be performed.
4) Prior to acceptance of changed configuration a rigorous structural analysis shall be performed in order to determine the overall stability and the adequacy of the structural members, connections and building structure.

APPENDIX A

TNX TOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
1" x 8' Lightning Rod	66.5	RRUS 4449 B5/B12	63
800 10121 w/ Mount Pipe	63	RRUS 4449 B5/B12	63
800 10121 w/ Mount Pipe	63	RRUS 4478 B14	63
800 10121 w/ Mount Pipe	63	RRUS 4478 B14	63
QS66512-2 w/ Mount Pipe	63	RRUS 4478 B14	63
QS66512-2 w/ Mount Pipe	63	RRUS 4426 B66	63
TPA-65R-LCUUUU-H8 w/ Mount Pipe	63	RRUS 4426 B66	63
RRUS 12 B2	63	RRUS 4426 B66	63
RRUS 12 B2	63	(4) TPX-070821	63
RRUS 12 B2	63	(4) TPX-070821	63
RRUS 32 B30	63	(4) TPX-070821	63
RRUS 32 B30	63	DTMABP7819VG12A	63
RRUS 32 B30	63	DTMABP7819VG12A	63
(2) DMP65R-BU6D w/ Mount Pipe	63	DTMABP7819VG12A	63
(2) OPA65R-BU6D w/ Mount Pipe	63	DC6-48-60-18-8F	63
DMP65R-BU8D w/ Mount Pipe	63	DC6-48-60-18-8F	63
OPA65R-BU8D w/ Mount Pipe	63	DC6-48-60-0-8F	63
RRUS 4449 B5/B12	63	Platform Mount [LP 603-1]	60

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

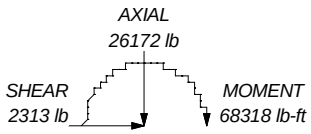
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 89.1%

ALL REACTIONS ARE FACTORED

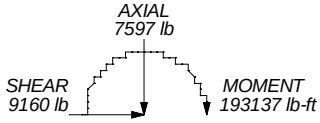
MAX. CORNER REACTIONS AT BASE:

DOWN: 47265 lb
SHEAR: 4381 lb

UPLIFT: -43939 lb
SHEAR: 2391 lb



TORQUE 2617 lb-ft
50 mph WIND - 1.0000 in ICE



TORQUE 10855 lb-ft
REACTIONS - 97 mph WIND

Tower Engineering Professionals

Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: ***701816 - Manchester CO***			
Project: ***TEP No. 257649.494504***			
Client: Everest	Drawn by: borner		App'd:
Code: TIA-222-G	Date: 02/18/21		Scale: NTS
Path: G:\Shared drives\257638 - 147770425764\9\P-251275_L-494504_701816_Manchester, CO_SDDtmx\701816 - Manchester CO.eri			Dwg No. E-1

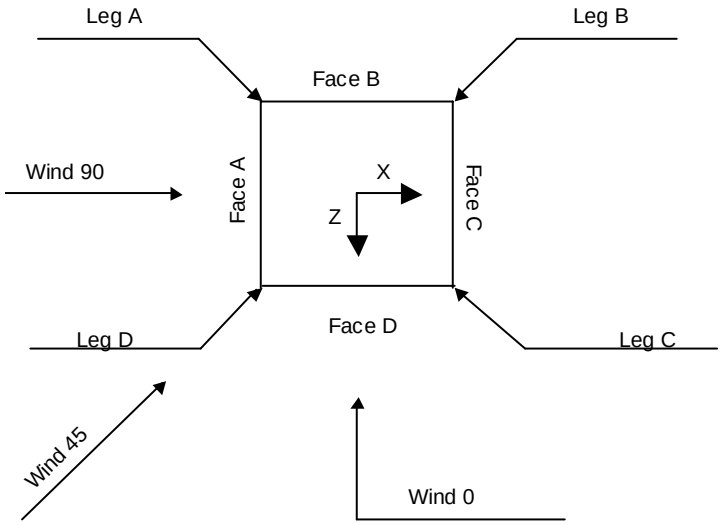
Tower Input Data

The main tower is a 4x free standing tower with an overall height of 60.00 ft above the ground line.
The base of the tower is set at an elevation of 37.50 ft above the ground line.
The face width of the tower is 3.00 ft at the top and 3.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Square Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	60.00-55.00			3.00	1	5.00
T2	55.00-50.00			3.00	1	5.00
T3	50.00-45.00			3.00	1	5.00
T4	45.00-40.00			3.00	1	5.00
T5	40.00-37.50			3.00	1	2.50

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	60.00-55.00	5.00	Diag Down	No	Yes	0.0000	0.0000
T2	55.00-50.00	5.00	Diag Down	No	Yes	0.0000	0.0000
T3	50.00-45.00	5.00	Diag Down	No	Yes	0.0000	0.0000
T4	45.00-40.00	5.00	X Brace	No	Yes	0.0000	0.0000
T5	40.00-37.50	2.50	Diag Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 60.00-55.00	Equal Angle	L3x3x5/16	A36 (36 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T2 55.00-50.00	Equal Angle	L3x3x5/16	A36 (36 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T3 50.00-45.00	Equal Angle	L3x3x5/16	A36 (36 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T4 45.00-40.00	Equal Angle	L3x3x5/16	A36 (36 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T5 40.00-37.50	Equal Angle	L3x3x5/16	A36 (36 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 60.00-55.00	Equal Angle	L3x3x1/4	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T5 40.00-37.50	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 60.00-55.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T2 55.00-50.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T3 50.00-45.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T4 45.00-40.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)
T5 40.00-37.50	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 60.00-55.00	0.00	0.3125	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 55.00-50.00	0.00	0.3125	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 50.00-45.00	0.00	0.3125	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 45.00-40.00	0.00	0.3125	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T5 40.00-37.50	0.00	0.3125	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	No	1	1	1	1	1	1	1	1
60.00-55.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
55.00-50.00				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
50.00-45.00				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
45.00-40.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
40.00-37.50				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 60.00-55.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 55.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 50.00-45.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 45.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 40.00-37.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 60.00-55.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T2 55.00-50.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T3 50.00-45.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T4 45.00-40.00	Flange	0.7500 A325N	0	0.6250 A325X	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T5 40.00-37.50	Flange	0.7500 A325N	4	0.6250 A325X	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
3/4" Rung (12" S, 16 3/8" W)	D	No	No	Ar (CaAa)	60.00 - 39.17	1	1	1.0230	1.0230		2.05
Ladder Rail PL 2 1/2" x 3/8" ****	D	No	No	Af (CaAa)	60.00 - 39.17	2	2	17.0000	0.3750		3.19
Rail L2 1/2x2 1/2x 1/4	B	No	No	Af (CaAa)	60.00 - 42.00	2	2	40.0000	2.5000		4.10
Rung L2.5x2.5x1/8 (36" wide 36" step)	B	No	No	Af (CaAa)	60.00 - 42.00	1	1	2.5000	2.5000		2.07
LDF5-50A(7/8)	B	No	No	Ar (CaAa)	60.00 - 42.00	12	10	0.5000	1.0900		0.33
3/4" DC	B	No	No	Ar (CaAa)	60.00 - 42.00	6	6	0.5000	0.7500		1.24
3/8" Fiber Cable	B	No	No	Ar (CaAa)	60.00 - 42.00	2	2	0.5000	0.3750		0.18
0.5" Fiber Cable	B	No	No	Ar (CaAa)	60.00 - 42.00	1	1	0.5000	0.5000		0.13

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	60.00-55.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	15.665	0.000	111
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	1.137	0.000	42
T2	55.00-50.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	15.665	0.000	111
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	1.137	0.000	42
T3	50.00-45.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	15.665	0.000	111
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	1.137	0.000	42
T4	45.00-40.00	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	9.399	0.000	66
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	1.137	0.000	42
T5	40.00-37.50	A	0.000	0.000	0.000	0.000	0
		B	0.000	0.000	0.000	0.000	0
		C	0.000	0.000	0.000	0.000	0
		D	0.000	0.000	0.189	0.000	7

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	60.00-55.00	A	2.114	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	40.111	0.000	670
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	7.479	0.000	196
T2	55.00-50.00	A	2.095	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	39.939	0.000	663
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	7.422	0.000	194
T3	50.00-45.00	A	2.074	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	39.751	0.000	656
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	7.359	0.000	191
T4	45.00-40.00	A	2.051	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	23.727	0.000	389
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	7.290	0.000	188
T5	40.00-37.50	A	2.032	0.000	0.000	0.000	0.000	0
		B		0.000	0.000	0.000	0.000	0
		C		0.000	0.000	0.000	0.000	0
		D		0.000	0.000	1.206	0.000	31

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	60.00-55.00	0.0000	-2.8808	0.0000	-3.4296
T2	55.00-50.00	0.0000	-2.9153	0.0000	-3.5040
T3	50.00-45.00	0.0000	-2.9153	0.0000	-3.5149
T4	45.00-40.00	0.0000	-1.3528	0.0000	-0.7522
T5	40.00-37.50	0.0000	0.3191	0.0000	0.4634

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	3/4" Rung (12" S, 16 3/8" W)	55.00 - 60.00	0.6000	0.3762
T1	2	Ladder Rail PL 2 1/2" x 3/8"	55.00 - 60.00	0.6000	0.3762
T1	4	Rail L2 1/2x2 1/2x 1/4	55.00 - 60.00	0.6000	0.3762
T1	5	Rung L2.5x2.5x1/8 (36" wide 36" step)	55.00 - 60.00	0.6000	0.3762
T1	6	LDF5-50A(7/8)	55.00 - 60.00	0.6000	0.3762
T1	7	3/4" DC	55.00 - 60.00	0.6000	0.3762
T1	8	3/8" Fiber Cable	55.00 - 60.00	0.6000	0.3762
T1	9	0.5" Fiber Cable	55.00 - 60.00	0.6000	0.3762
T2	1	3/4" Rung (12" S, 16 3/8" W)	50.00 - 55.00	0.6000	0.3855
T2	2	Ladder Rail PL 2 1/2" x 3/8"	50.00 - 55.00	0.6000	0.3855
T2	4	Rail L2 1/2x2 1/2x 1/4	50.00 - 55.00	0.6000	0.3855
T2	5	Rung L2.5x2.5x1/8 (36" wide 36" step)	50.00 - 55.00	0.6000	0.3855
T2	6	LDF5-50A(7/8)	50.00 - 55.00	0.6000	0.3855

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	7	3/4" DC	50.00 - 55.00	0.6000	0.3855
T2	8	3/8" Fiber Cable	50.00 - 55.00	0.6000	0.3855
T2	9	0.5" Fiber Cable	50.00 - 55.00	0.6000	0.3855
T3	1	3/4" Rung (12" S, 16 3/8" W)	45.00 - 50.00	0.6000	0.3885
T3	2	Ladder Rail PL 2 1/2" x 3/8"	45.00 - 50.00	0.6000	0.3885
T3	4	Rail L2 1/2x2 1/2x 1/4	45.00 - 50.00	0.6000	0.3885
T3	5	Rung L2.5x2.5x1/8 (36" wide 36" step)	45.00 - 50.00	0.6000	0.3885
T3	6	LDF5-50A(7/8)	45.00 - 50.00	0.6000	0.3885
T3	7	3/4" DC	45.00 - 50.00	0.6000	0.3885
T3	8	3/8" Fiber Cable	45.00 - 50.00	0.6000	0.3885
T3	9	0.5" Fiber Cable	45.00 - 50.00	0.6000	0.3885
T4	1	3/4" Rung (12" S, 16 3/8" W)	40.00 - 45.00	0.6000	0.2102
T4	2	Ladder Rail PL 2 1/2" x 3/8"	40.00 - 45.00	0.6000	0.2102
T4	4	Rail L2 1/2x2 1/2x 1/4	42.00 - 45.00	0.6000	0.2102
T4	5	Rung L2.5x2.5x1/8 (36" wide 36" step)	42.00 - 45.00	0.6000	0.2102
T4	6	LDF5-50A(7/8)	42.00 - 45.00	0.6000	0.2102
T4	7	3/4" DC	42.00 - 45.00	0.6000	0.2102
T4	8	3/8" Fiber Cable	42.00 - 45.00	0.6000	0.2102
T4	9	0.5" Fiber Cable	42.00 - 45.00	0.6000	0.2102
T5	1	3/4" Rung (12" S, 16 3/8" W)	39.17 - 40.00	0.6000	0.2467
T5	2	Ladder Rail PL 2 1/2" x 3/8"	39.17 - 40.00	0.6000	0.2467

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
1" x 8' Lightning Rod	C	From Leg	3.00	0.0000	66.50	No Ice	0.80	0.80	11
			0.00			1/2" Ice	1.62	1.62	18
			0.00			1" Ice	2.45	2.45	31
****									
800 10121 w/ Mount Pipe	B	From Face	0.00	0.0000	63.00	No Ice	5.39	4.60	66
			0.00			1/2" Ice	5.81	5.35	114
			0.00			1" Ice	6.23	6.05	168
800 10121 w/ Mount Pipe	C	From Leg	3.00	-15.0000	63.00	No Ice	5.39	4.60	66
			0.00			1/2" Ice	5.81	5.35	114
			0.00			1" Ice	6.23	6.05	168
800 10121 w/ Mount Pipe	D	From Leg	3.00	15.0000	63.00	No Ice	5.39	4.60	66
			0.00			1/2" Ice	5.81	5.35	114
			0.00			1" Ice	6.23	6.05	168
QS66512-2 w/ Mount Pipe	B	From Face	3.00	0.0000	63.00	No Ice	8.37	8.46	137
			0.00			1/2" Ice	8.93	9.66	212
			0.00			1" Ice	9.46	10.55	296
QS66512-2 w/ Mount Pipe	C	From Leg	3.00	-15.0000	63.00	No Ice	8.37	8.46	137
			0.00			1/2" Ice	8.93	9.66	212
			0.00			1" Ice	9.46	10.55	296
TPA-65R-LCUUUU-H8 w/ Mount Pipe	D	From Leg	3.00	15.0000	63.00	No Ice	13.54	10.96	114
			0.00			1/2" Ice	14.24	12.49	218
			0.00			1" Ice	14.95	14.04	331
RRUS 12 B2	B	From Face	0.00	0.0000	63.00	No Ice	3.15	1.29	49
			0.00			1/2" Ice	3.36	1.44	73
			0.00			1" Ice	3.59	1.60	99

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RRUS 12 B2	C	From Leg	3.00	-15.0000	63.00	No Ice	3.15	1.29	49
			0.00			1/2" Ice	3.36	1.44	73
			0.00			1" Ice	3.59	1.60	99
RRUS 12 B2	D	From Leg	3.00	15.0000	63.00	No Ice	3.15	1.29	49
			0.00			1/2" Ice	3.36	1.44	73
			0.00			1" Ice	3.59	1.60	99
RRUS 32 B30	B	From Face	0.00	0.0000	63.00	No Ice	2.73	1.67	53
			0.00			1/2" Ice	2.95	1.86	74
			0.00			1" Ice	3.18	2.05	98
RRUS 32 B30	C	From Leg	3.00	-15.0000	63.00	No Ice	2.73	1.67	53
			0.00			1/2" Ice	2.95	1.86	74
			0.00			1" Ice	3.18	2.05	98
RRUS 32 B30	D	From Leg	3.00	15.0000	63.00	No Ice	2.73	1.67	53
			0.00			1/2" Ice	2.95	1.86	74
			0.00			1" Ice	3.18	2.05	98
(2) DMP65R-BU6D w/ Mount Pipe	C	From Leg	3.00	-15.0000	63.00	No Ice	12.95	7.26	105
			0.00			1/2" Ice	13.55	8.43	197
			0.00			1" Ice	14.11	9.31	298
(2) OPA65R-BU6D w/ Mount Pipe	C	From Leg	3.00	-15.0000	63.00	No Ice	13.11	7.32	86
			0.00			1/2" Ice	13.71	8.49	179
			0.00			1" Ice	14.28	9.37	281
DMP65R-BU8D w/ Mount Pipe	D	From Leg	3.00	15.0000	63.00	No Ice	18.11	10.26	129
			0.00			1/2" Ice	18.84	11.78	250
			0.00			1" Ice	19.59	13.33	382
OPA65R-BU8D w/ Mount Pipe	D	From Leg	3.00	15.0000	63.00	No Ice	18.33	10.34	109
			0.00			1/2" Ice	19.06	11.86	232
			0.00			1" Ice	19.81	13.41	365
RRUS 4449 B5/B12	B	From Face	0.00	0.0000	63.00	No Ice	1.97	1.41	71
			0.00			1/2" Ice	2.14	1.56	90
			0.00			1" Ice	2.33	1.73	111
RRUS 4449 B5/B12	C	From Leg	3.00	-15.0000	63.00	No Ice	1.97	1.41	71
			0.00			1/2" Ice	2.14	1.56	90
			0.00			1" Ice	2.33	1.73	111
RRUS 4449 B5/B12	D	From Leg	3.00	15.0000	63.00	No Ice	1.97	1.41	71
			0.00			1/2" Ice	2.14	1.56	90
			0.00			1" Ice	2.33	1.73	111
RRUS 4478 B14	B	From Face	0.00	0.0000	63.00	No Ice	1.84	1.06	60
			0.00			1/2" Ice	2.01	1.20	76
			0.00			1" Ice	2.19	1.34	94
RRUS 4478 B14	C	From Leg	3.00	-15.0000	63.00	No Ice	1.84	1.06	60
			0.00			1/2" Ice	2.01	1.20	76
			0.00			1" Ice	2.19	1.34	94
RRUS 4478 B14	D	From Leg	3.00	15.0000	63.00	No Ice	1.84	1.06	60
			0.00			1/2" Ice	2.01	1.20	76
			0.00			1" Ice	2.19	1.34	94
RRUS 4426 B66	B	From Face	0.00	0.0000	63.00	No Ice	1.64	0.73	48
			0.00			1/2" Ice	1.80	0.84	61
			0.00			1" Ice	1.97	0.97	76
RRUS 4426 B66	C	From Leg	3.00	-15.0000	63.00	No Ice	1.64	0.73	48
			0.00			1/2" Ice	1.80	0.84	61
			0.00			1" Ice	1.97	0.97	76
RRUS 4426 B66	D	From Leg	3.00	15.0000	63.00	No Ice	1.64	0.73	48
			0.00			1/2" Ice	1.80	0.84	61
			0.00			1" Ice	1.97	0.97	76
(4) TPX-070821	B	From Face	0.00	0.0000	63.00	No Ice	0.47	0.10	8
			0.00			1/2" Ice	0.56	0.15	11
			0.00			1" Ice	0.66	0.20	16

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(4) TPX-070821	C	From Leg	3.00	-15.0000	63.00	No Ice	0.47	0.10	8
			0.00			1/2" Ice	0.56	0.15	11
			0.00			1" Ice	0.66	0.20	16
(4) TPX-070821	D	From Leg	3.00	15.0000	63.00	No Ice	0.47	0.10	8
			0.00			1/2" Ice	0.56	0.15	11
			0.00			1" Ice	0.66	0.20	16
DTMABP7819VG12A	B	From Face	0.00	0.0000	63.00	No Ice	0.98	0.34	19
			0.00			1/2" Ice	1.10	0.42	26
			0.00			1" Ice	1.23	0.51	36
DTMABP7819VG12A	C	From Leg	3.00	-15.0000	63.00	No Ice	0.98	0.34	19
			0.00			1/2" Ice	1.10	0.42	26
			0.00			1" Ice	1.23	0.51	36
DTMABP7819VG12A	D	From Leg	3.00	15.0000	63.00	No Ice	0.98	0.34	19
			0.00			1/2" Ice	1.10	0.42	26
			0.00			1" Ice	1.23	0.51	36
DC6-48-60-18-8F	B	From Face	0.00	0.0000	63.00	No Ice	1.21	1.21	33
			0.00			1/2" Ice	1.89	1.89	55
			0.00			1" Ice	2.11	2.11	80
DC6-48-60-18-8F	D	From Leg	1.50	15.0000	63.00	No Ice	1.21	1.21	33
			0.00			1/2" Ice	1.89	1.89	55
			0.00			1" Ice	2.11	2.11	80
DC6-48-60-0-8F	C	From Leg	1.50	-15.0000	63.00	No Ice	0.92	0.92	33
			0.00			1/2" Ice	1.46	1.46	51
			0.00			1" Ice	1.64	1.64	71
Platform Mount [LP 603-1]	C	None		0.0000	60.00	No Ice	40.62	40.62	2060
						1/2" Ice	47.28	47.28	2787
						1" Ice	54.60	54.60	3651

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 45 deg - No Ice
5	0.9 Dead+1.6 Wind 45 deg - No Ice
6	1.2 Dead+1.6 Wind 90 deg - No Ice
7	0.9 Dead+1.6 Wind 90 deg - No Ice
8	1.2 Dead+1.6 Wind 135 deg - No Ice
9	0.9 Dead+1.6 Wind 135 deg - No Ice
10	1.2 Dead+1.6 Wind 180 deg - No Ice
11	0.9 Dead+1.6 Wind 180 deg - No Ice
12	1.2 Dead+1.6 Wind 225 deg - No Ice
13	0.9 Dead+1.6 Wind 225 deg - No Ice
14	1.2 Dead+1.6 Wind 270 deg - No Ice
15	0.9 Dead+1.6 Wind 270 deg - No Ice
16	1.2 Dead+1.6 Wind 315 deg - No Ice
17	0.9 Dead+1.6 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	60 - 55	0.219	30	0.0669	0.0780
T2	55 - 50	0.147	30	0.0600	0.0559
T3	50 - 45	0.083	30	0.0481	0.0325
T4	45 - 40	0.033	30	0.0308	0.0099
T5	40 - 37.5	0.007	30	0.0142	0.0055

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
66.50	1" x 8' Lightning Rod	30	0.219	0.0669	0.0780	34253
63.00	800 10121 w/ Mount Pipe	30	0.219	0.0669	0.0780	34253
60.00	Platform Mount [LP 603-1]	30	0.219	0.0669	0.0780	34253

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	60 - 55	0.858	8	0.2525	0.2531
T2	55 - 50	0.580	8	0.2302	0.1818
T3	50 - 45	0.329	8	0.1868	0.1070
T4	45 - 40	0.132	8	0.1206	0.0358
T5	40 - 37.5	0.028	8	0.0560	0.0174

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
66.50	1" x 8' Lightning Rod	8	0.858	0.2525	0.2531	10792
63.00	800 10121 w/ Mount Pipe	8	0.858	0.2525	0.2531	10792
60.00	Platform Mount [LP 603-1]	8	0.858	0.2525	0.2531	10792

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	60	Diagonal	A325X	0.6250	1	10082	13050	0.773	1	Gusset Bearing
		Top Girt	A325N	0.6250	1	2600	10440	0.249	1	Member Bearing
T2	55	Diagonal	A325X	0.6250	1	10553	13050	0.809	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	5287	7830	0.675	1	Member Bearing
T3	50	Diagonal	A325X	0.6250	1	10866	13050	0.833	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	5499	7830	0.702	1	Member Bearing
T4	45	Diagonal	A325X	0.6250	1	10240	13050	0.785	1	Gusset Bearing
		Horizontal	A325N	0.6250	1	5154	7830	0.658	1	Member Bearing
T5	40	Leg	A325N	0.7500	4	10491	29821	0.352	1	Bolt Tension
		Diagonal	A325X	0.6250	1	7877	13050	0.604	1	Gusset Bearing
		Top Girt	A325N	0.6250	1	5173	7830	0.661	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	60 - 55	L3x3x5/16	5.00	5.00	102.9 K=1.00	1.7800	-13404	33022	0.406 [1]
T2	55 - 50	L3x3x5/16	5.00	5.00	102.9 K=1.00	1.7800	-19846	33022	0.601 [1]
T3	50 - 45	L3x3x5/16	5.00	5.00	102.9 K=1.00	1.7800	-28573	33022	0.865 [1]
T4	45 - 40	L3x3x5/16	5.00	5.00	102.9 K=1.00	1.7800	-25931	33022	0.785 [1]
T5	40 - 37.5	L3x3x5/16	2.50	2.50	51.5 K=1.00	1.7800	-44716	50168	0.891 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	60 - 55	L3x3x1/4	5.83	5.56	117.0 K=1.03	1.4400	-10064	23754	0.424 [1]
T2	55 - 50	L3x3x1/4	5.83	5.56	117.0 K=1.03	1.4400	-10530	23754	0.443 [1]
T3	50 - 45	L3x3x1/4	5.83	5.56	117.0 K=1.03	1.4400	-10880	23754	0.458 [1]
T4	45 - 40	L3x3x1/4	5.83	2.78	72.8 K=1.28	1.4400	-11038	43997	0.251 [1]
T5	40 - 37.5	L3x3x1/4	3.91	3.63	97.3 K=1.30	1.4400	-7902	32442	0.244 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	55 - 50	L2 1/2x2x3/16	3.00	2.76	98.8 K=1.27	0.8090	-5306	15681	0.338 [1]
T3	50 - 45	L2 1/2x2x3/16	3.00	2.76	98.8 K=1.27	0.8090	-5527	15681	0.352 [1]
T4	45 - 40	L2 1/2x2x3/16	3.00	2.76	98.8 K=1.27	0.8090	-4713	15681	0.301 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	60 - 55	L3x3x1/4	3.00	2.76	88.3 K=1.56	1.4400	-2571	30946	0.083 [1]
T5	40 - 37.5	L2 1/2x2x3/16	3.00	2.76	98.8 K=1.27	0.8090	-4767	15681	0.304 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	60 - 55	L3x3x5/16	5.00	5.00	65.4	1.7800	9463	57672	0.164 [1]
T2	55 - 50	L3x3x5/16	5.00	5.00	65.4	1.7800	16708	57672	0.290 [1]
T3	50 - 45	L3x3x5/16	5.00	5.00	65.4	1.7800	25332	57672	0.439 [1]
T4	45 - 40	L3x3x5/16	5.00	5.00	65.4	1.7800	23611	57672	0.409 [1]
T5	40 - 37.5	L3x3x5/16	2.50	2.50	32.7	1.7800	41965	57672	0.728 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	60 - 55	L3x3x1/4	5.83	5.56	75.6	0.9394	10082	45795	0.220 [1]
T2	55 - 50	L3x3x1/4	5.83	5.56	75.6	0.9394	10553	45795	0.230 [1]
T3	50 - 45	L3x3x1/4	5.83	5.56	75.6	0.9394	10866	45795	0.237 [1]
T4	45 - 40	L3x3x1/4	5.83	2.78	37.8	0.9394	10240	45795	0.224 [1]
T5	40 - 37.5	L3x3x1/4	3.91	3.63	50.6	0.9394	7877	45795	0.172 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	55 - 50	L2 1/2x2x3/16	3.00	2.76	60.0	0.5013	5287	21806	0.242 [1]
T3	50 - 45	L2 1/2x2x3/16	3.00	2.76	60.0	0.5013	5499	21806	0.252 [1]
T4	45 - 40	L2 1/2x2x3/16	3.00	2.76	60.0	0.5013	5154	21806	0.236 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	60 - 55	L3x3x1/4	3.00	2.76	38.9	0.9394	2600	40863	0.064 [1]
T5	40 - 37.5	L2 1/2x2x3/16	3.00	2.76	60.0	0.5013	5173	21806	0.237 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	60 - 55	Leg	L3x3x5/16	1	-13404	33022	40.6	Pass
T2	55 - 50	Leg	L3x3x5/16	13	-19846	33022	60.1	Pass
T3	50 - 45	Leg	L3x3x5/16	25	-28573	33022	86.5	Pass
T4	45 - 40	Leg	L3x3x5/16	38	-25931	33022	78.5	Pass
T5	40 - 37.5	Leg	L3x3x5/16	53	-44716	50168	89.1	Pass
T1	60 - 55	Diagonal	L3x3x1/4	9	-10064	23754	42.4	Pass
							77.3 (b)	
T2	55 - 50	Diagonal	L3x3x1/4	21	-10530	23754	44.3	Pass
							80.9 (b)	
T3	50 - 45	Diagonal	L3x3x1/4	33	-10880	23754	45.8	Pass
							83.3 (b)	
T4	45 - 40	Diagonal	L3x3x1/4	45	-11038	43997	25.1	Pass
							78.5 (b)	
T5	40 - 37.5	Diagonal	L3x3x1/4	61	-7902	32442	24.4	Pass
							60.4 (b)	
T2	55 - 50	Horizontal	L2 1/2x2x3/16	17	-5306	15681	33.8	Pass
							67.5 (b)	
T3	50 - 45	Horizontal	L2 1/2x2x3/16	29	-5527	15681	35.2	Pass
							70.2 (b)	
T4	45 - 40	Horizontal	L2 1/2x2x3/16	42	-4713	15681	30.1	Pass
							65.8 (b)	
T1	60 - 55	Top Girt	L3x3x1/4	5	-2571	30946	8.3	Pass
							24.9 (b)	
T5	40 - 37.5	Top Girt	L2 1/2x2x3/16	58	-4767	15681	30.4	Pass
							66.1 (b)	
							Summary	
						Leg (T5)	89.1	Pass
						Diagonal (T3)	83.3	Pass
						Horizontal (T3)	70.2	Pass
						Top Girt (T5)	66.1	Pass
						Bolt Checks	83.3	Pass
						RATING =	**89.1**	**Pass**

APPENDIX B

ADDITIONAL CALCULATIONS

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /G

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

Site #: *701816*
Site Name: *Manchester CO*
TEP #: *257649.494504*

Anchor Rod Data		
Eta Factor, η	0.5	TIA G (Fig. 4-4)
Qty:	4	
Diam:	0.75	in
Rod Material:	Other	
Yield, Fy:	92	ksi
Strength, Fu:	120	ksi
Bolt Circle:	8.5	in

Plate Data		
W=Side:	9	in
Thick:	0.385	in
Grade:	50	ksi
Clip Distance:	0	in

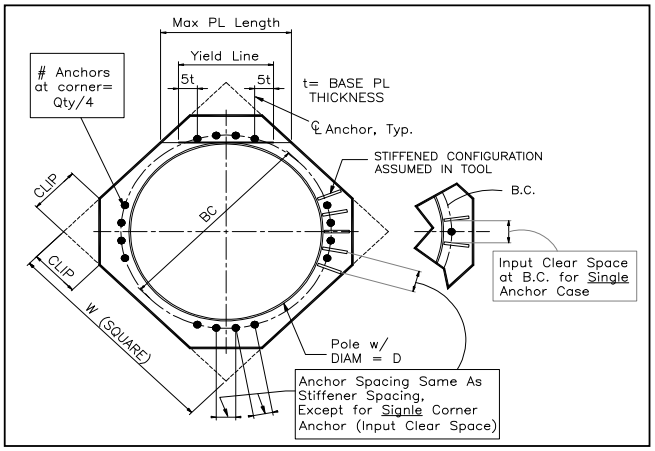
Stiffener Data (Welding at both sides)		
Configuration:	Stiffened	
Weld Type:	Fillet	**
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.1875	in
Fillet V. Weld:	0.1875	in
Width:	3	in
Height:	6	in
Thick:	0.375	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

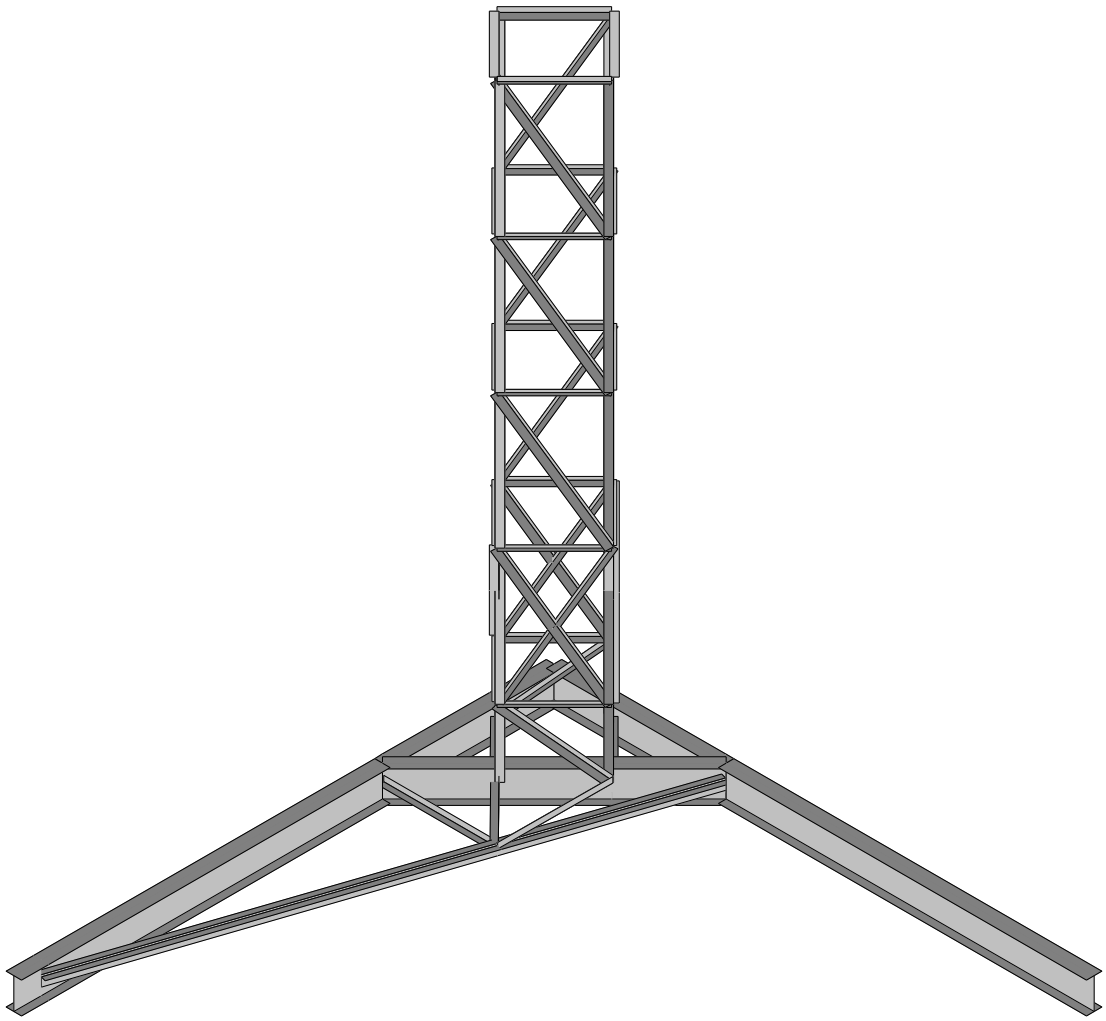
Base Reactions		
TIA Revision:	G	
Factored Moment, Mu:	0	ft-kips
Factored Axial, Pu:	44	kips
Factored Shear, Vu:	0	kips

Base Plate Results	Flexural Check	
Base Plate Stress:	39.4	ksi
PL Design Bending Strength, Φ*Fy:	45.0	ksi
Base Plate Stress Ratio:	87.6%	Pass

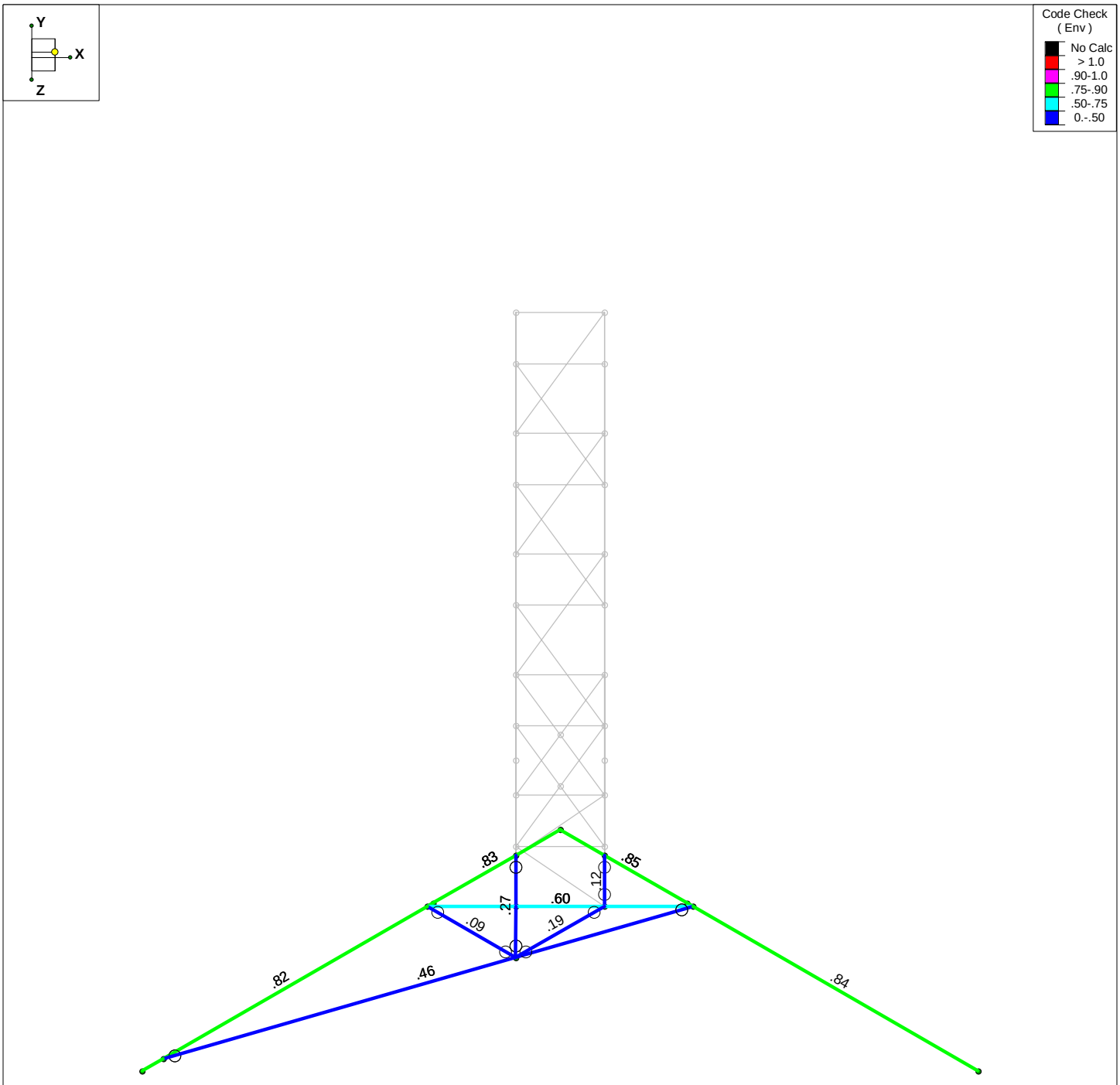
Stiffener Results		
Vertical Weld:	12.0%	Pass
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	4.3%	Pass
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	10.7%	Pass
Plate Comp. (AISC Bracket):	14.7%	Pass

PL Ref. Data
Yield Line (in):
N/A, Roark
Max PL Length:
9.96



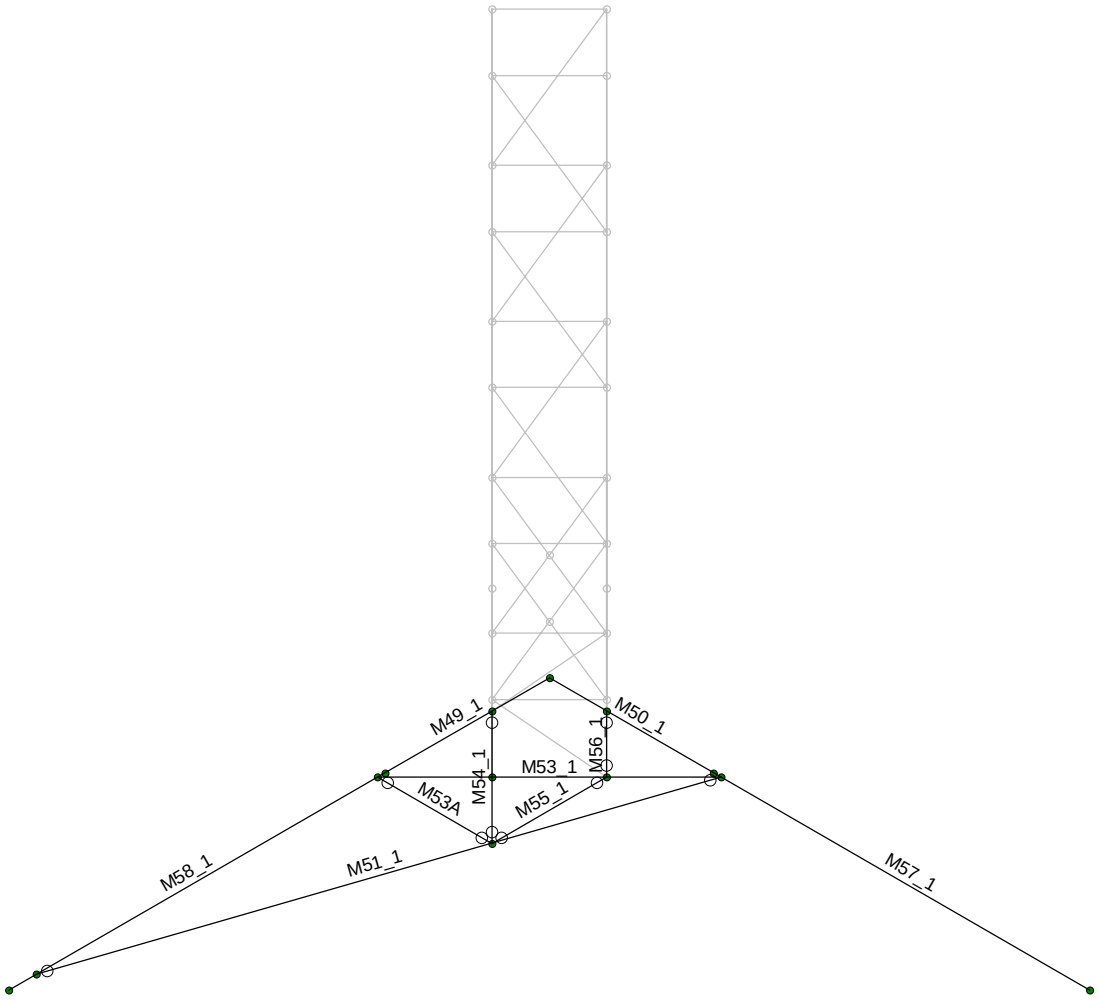


Tower Engineering Profess...	701816 - Manchester CO	SK - 3
borner		Feb 18, 2021 at 3:01 PM
TEP No. 257649.494504		Tower Only.rt3



Member Code Checks Displayed (Enveloped)
Results for LC 1, Dead Only

Tower Engineering Profess...	701816 - Manchester CO	SK - 1
borner		Feb 18, 2021 at 2:59 PM
TEP No. 257649.494504		Tower Only.rt3



Tower Engineering Profess...	701816 - Manchester CO	SK - 2
borner		Feb 18, 2021 at 2:59 PM
TEP No. 257649.494504		Tower Only.rt3

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	24
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Standard Solver

Hot Rolled Steel Code	AISC 3rd: LRFD
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	TMS 402-16: ASD
Aluminum Code	AA ADM1-15: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-16
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36	29000	11194	.295	.65	.49	36	1.5	58	1.2
2	A572-50	29000	11200	.295	.65	.49	50	1.1	58	1.2
3	A36_1	29000	11194	.3	.65	.49	36	1.5	58	1.2
4	A572 Gr. 50	29000	11154	.3	.65	.49	50	1.1	65	1.1

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	TWR_LEG_T1	L3x3x5/16	Column	Single Angle	A36	Typical	1.78	1.51	1.51	.061
2	TWR_TOP_GIRT_T1	L 3 x 3 x 1/4	Beam	Single Angle	A36	Typical	1.438	1.244	1.244	.03
3	TWR_DIAG_T1	L 3 x 3 x 1/4	Column	Single Angle	A572-50	Typical	1.438	1.244	1.244	.03
4	TWR_LEG_T2	L3x3x5/16	Column	Single Angle	A36	Typical	1.78	1.51	1.51	.061
5	TWR_HORZ_T2	L2 1/2x2x3...	Beam	Single Angle	A36	Typical	.809	.291	.509	.01
6	TWR_DIAG_T2	L 3 x 3 x 1/4	Column	Single Angle	A572-50	Typical	1.438	1.244	1.244	.03
7	TWR_LEG_T3	L3x3x5/16	Column	Single Angle	A36	Typical	1.78	1.51	1.51	.061
8	TWR_HORZ_T3	L2 1/2x2x3...	Beam	Single Angle	A36	Typical	.809	.291	.509	.01
9	TWR_DIAG_T3	L 3 x 3 x 1/4	Column	Single Angle	A572-50	Typical	1.438	1.244	1.244	.03
10	TWR_LEG_T4	L3x3x5/16	Column	Single Angle	A36	Typical	1.78	1.51	1.51	.061
11	TWR_HORZ_T4	L2 1/2x2x3...	Beam	Single Angle	A36	Typical	.809	.291	.509	.01
12	TWR_DIAG_T4	L 3 x 3 x 1/4	Column	Single Angle	A572-50	Typical	1.438	1.244	1.244	.03
13	TWR_LEG_T5	L3x3x5/16	Column	Single Angle	A36	Typical	1.78	1.51	1.51	.061
14	TWR_TOP_GIRT_T5	L2 1/2x2x3...	Beam	Single Angle	A36	Typical	.809	.291	.509	.01
15	TWR_DIAG_T5	L 3 x 3 x 1/4	Column	Single Angle	A572-50	Typical	1.438	1.244	1.244	.03
16	TWR_LEG_T1_1	L3x3x5/16	Column	Single Angle	A36_1	Typical	1.78	1.51	1.51	.061
17	TWR_TOP_GIRT_T1_1	L 3 x 3 x 1/4	Beam	Single Angle	A36_1	Typical	1.438	1.244	1.244	.03

Hot Rolled Steel Section Sets (Continued)

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
18	TWR_DIAG_T1_1	L2 1/2x2 1/...	Column	Single Angle	A36_1	Typical	.902	.547	.547	.011
19	TWR_HORZ_T1	L2 1/2x2x3...	Beam	Single Angle	A36_1	Typical	.809	.291	.509	.01
20	TWR_LEG_T2_1	L3x3x5/16	Column	Single Angle	A36_1	Typical	1.78	1.51	1.51	.061
21	TWR_TOP_GIRT_T2	L2 1/2x2x3...	Beam	Single Angle	A36_1	Typical	.809	.291	.509	.01
22	TWR_DIAG_T2_1	L2 1/2x2 1/...	Column	Single Angle	A36_1	Typical	.902	.547	.547	.011

Cold Formed Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	CF1A	8CU1.25X057	Beam	None	A653 SS Gr33	Typical	.581	.057	4.41	.00063

Material Takeoff

	Material	Size	Pieces	Length[ft]	Weight[K]
1	Hot Rolled Steel				
2	A36_1	L2.5x2.5x3	4	17.5	.054
3	A36_1	LL4x3x5x0	1	20	.285
4	A572 Gr. 50	W14X30	5	49	1.476
5	Total HR Steel		10	86.5	1.814

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N25						
2	N26						
3	N27						
4	N28						
5	N25_1	Reaction	Reaction	Reaction			
6	N26_1	Reaction	Reaction	Reaction			
7	N27_1	Reaction	Reaction	Reaction			
8	N28_1						
9	N29						
10	N30						

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design ...
1	M1	N2	N1		180	TWR_LEG_T1	Colu...	Single An...	A36	Typical
2	M2	N4	N3		270	TWR_LEG_T1	Colu...	Single An...	A36	Typical
3	M3	N6	N5			TWR_LEG_T1	Colu...	Single An...	A36	Typical
4	M4	N8	N7		90	TWR_LEG_T1	Colu...	Single An...	A36	Typical
5	M5	N1	N3		90	TWR_TOP_GIRT_T1	Beam	Single An...	A36	Typical
6	M6	N3	N5		90	TWR_TOP_GIRT_T1	Beam	Single An...	A36	Typical
7	M7	N5	N7		90	TWR_TOP_GIRT_T1	Beam	Single An...	A36	Typical
8	M8	N7	N1		90	TWR_TOP_GIRT_T1	Beam	Single An...	A36	Typical
9	M9	N4	N1		90	TWR_DIAG_T1	Colu...	Single An...	A572-50	Typical
10	M10	N6	N3		90	TWR_DIAG_T1	Colu...	Single An...	A572-50	Typical
11	M11	N8	N5		90	TWR_DIAG_T1	Colu...	Single An...	A572-50	Typical
12	M12	N2	N7		90	TWR_DIAG_T1	Colu...	Single An...	A572-50	Typical
13	M13	N9	N2		180	TWR_LEG_T2	Colu...	Single An...	A36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design ...
14	M14	N10	N4		270	TWR_LEG_T2	Colu...	Single An...	A36	Typical
15	M15	N11	N6			TWR_LEG_T2	Colu...	Single An...	A36	Typical
16	M16	N12	N8		90	TWR_LEG_T2	Colu...	Single An...	A36	Typical
17	M17	N2	N4		90	TWR_HORZ_T2	Beam	Single An...	A36	Typical
18	M18	N4	N6		90	TWR_HORZ_T2	Beam	Single An...	A36	Typical
19	M19	N6	N8		90	TWR_HORZ_T2	Beam	Single An...	A36	Typical
20	M20	N8	N2		90	TWR_HORZ_T2	Beam	Single An...	A36	Typical
21	M21	N10	N2		90	TWR_DIAG_T2	Colu...	Single An...	A572-50	Typical
22	M22	N11	N4		90	TWR_DIAG_T2	Colu...	Single An...	A572-50	Typical
23	M23	N12	N6		90	TWR_DIAG_T2	Colu...	Single An...	A572-50	Typical
24	M24	N9	N8		90	TWR_DIAG_T2	Colu...	Single An...	A572-50	Typical
25	M25	N13	N9		180	TWR_LEG_T3	Colu...	Single An...	A36	Typical
26	M26	N14	N10		270	TWR_LEG_T3	Colu...	Single An...	A36	Typical
27	M27	N15	N11			TWR_LEG_T3	Colu...	Single An...	A36	Typical
28	M28	N16	N12		90	TWR_LEG_T3	Colu...	Single An...	A36	Typical
29	M29	N9	N10		90	TWR_HORZ_T3	Beam	Single An...	A36	Typical
30	M30	N10	N11		90	TWR_HORZ_T3	Beam	Single An...	A36	Typical
31	M31	N11	N12		90	TWR_HORZ_T3	Beam	Single An...	A36	Typical
32	M32	N12	N9		90	TWR_HORZ_T3	Beam	Single An...	A36	Typical
33	M33	N14	N9		90	TWR_DIAG_T3	Colu...	Single An...	A572-50	Typical
34	M34	N15	N10		90	TWR_DIAG_T3	Colu...	Single An...	A572-50	Typical
35	M35	N16	N11		90	TWR_DIAG_T3	Colu...	Single An...	A572-50	Typical
36	M36	N13	N12		90	TWR_DIAG_T3	Colu...	Single An...	A572-50	Typical
37	M37	N17	N13		180	TWR_LEG_T4	Colu...	Single An...	A36	Typical
38	M38	N18	N14		270	TWR_LEG_T4	Colu...	Single An...	A36	Typical
39	M39	N19	N15			TWR_LEG_T4	Colu...	Single An...	A36	Typical
40	M40	N20	N16		90	TWR_LEG_T4	Colu...	Single An...	A36	Typical
41	M41	N13	N14		90	TWR_HORZ_T4	Beam	Single An...	A36	Typical
42	M42	N14	N15		90	TWR_HORZ_T4	Beam	Single An...	A36	Typical
43	M43	N15	N16		90	TWR_HORZ_T4	Beam	Single An...	A36	Typical
44	M44	N16	N13		90	TWR_HORZ_T4	Beam	Single An...	A36	Typical
45	M45	N17	N14		90	TWR_DIAG_T4	Colu...	Single An...	A572-50	Typical
46	M46	N18	N13		90	TWR_DIAG_T4	Colu...	Single An...	A572-50	Typical
47	M47	N18	N15		90	TWR_DIAG_T4	Colu...	Single An...	A572-50	Typical
48	M48	N19	N14		90	TWR_DIAG_T4	Colu...	Single An...	A572-50	Typical
49	M49	N19	N16		90	TWR_DIAG_T4	Colu...	Single An...	A572-50	Typical
50	M50	N20	N15		90	TWR_DIAG_T4	Colu...	Single An...	A572-50	Typical
51	M51	N20	N13		90	TWR_DIAG_T4	Colu...	Single An...	A572-50	Typical
52	M52	N17	N16		90	TWR_DIAG_T4	Colu...	Single An...	A572-50	Typical
53	M53	N25	N17		180	TWR_LEG_T5	Colu...	Single An...	A36	Typical
54	M54	N26	N18		270	TWR_LEG_T5	Colu...	Single An...	A36	Typical
55	M55	N27	N19			TWR_LEG_T5	Colu...	Single An...	A36	Typical
56	M56	N28	N20		90	TWR_LEG_T5	Colu...	Single An...	A36	Typical
57	M57	N17	N18		90	TWR_TOP_GIRT_T5	Beam	Single An...	A36	Typical
58	M58	N18	N19		90	TWR_TOP_GIRT_T5	Beam	Single An...	A36	Typical
59	M59	N19	N20		90	TWR_TOP_GIRT_T5	Beam	Single An...	A36	Typical
60	M60	N20	N17		90	TWR_TOP_GIRT_T5	Beam	Single An...	A36	Typical
61	M61	N26	N17		90	TWR_DIAG_T5	Colu...	Single An...	A572-50	Typical
62	M62	N27	N18		90	TWR_DIAG_T5	Colu...	Single An...	A572-50	Typical
63	M63	N28	N19		90	TWR_DIAG_T5	Colu...	Single An...	A572-50	Typical
64	M64	N25	N20		90	TWR_DIAG_T5	Colu...	Single An...	A572-50	Typical
65	M49_1	N25_1	N33			W14X30	Beam	Wide Flan..	A572 Gr. 50	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design ...
66	M50_1	N25_1	N34			W14X30	Beam	Wide Flan..	A572 Gr. 50	Typical
67	M51_1	N34	N29			LL4x3x5x0	None	None	A36_1	Typical
68	M53_1	N34	N33			W14X30	Beam	Wide Flan..	A572 Gr. 50	Typical
69	M53A	N33	N34A			L2.5x2.5x3	None	None	A36_1	Typical
70	M54_1	N28	N34A			L2.5x2.5x3	None	None	A36_1	Typical
71	M55_1	N26	N34A			L2.5x2.5x3	None	None	A36_1	Typical
72	M56_1	N26	N27			L2.5x2.5x3	None	None	A36_1	Typical
73	M57_1	N34	N26_1			W14X30	Beam	Wide Flan..	A572 Gr. 50	Typical
74	M58_1	N33	N27_1			W14X30	Beam	Wide Flan..	A572 Gr. 50	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra...	Analysis Offset[in]	Inactive	Seismi...
1	M1						Yes	** NA **			None
2	M2						Yes	** NA **			None
3	M3						Yes	** NA **			None
4	M4						Yes	** NA **			None
5	M5	AllPIN	BenPIN				Yes				None
6	M6	AllPIN	BenPIN				Yes				None
7	M7	AllPIN	BenPIN				Yes				None
8	M8	AllPIN	BenPIN				Yes				None
9	M9	AllPIN	BenPIN				Yes	** NA **			None
10	M10	AllPIN	BenPIN				Yes	** NA **			None
11	M11	AllPIN	BenPIN				Yes	** NA **			None
12	M12	AllPIN	BenPIN				Yes	** NA **			None
13	M13						Yes	** NA **			None
14	M14						Yes	** NA **			None
15	M15						Yes	** NA **			None
16	M16						Yes	** NA **			None
17	M17	AllPIN	BenPIN				Yes				None
18	M18	AllPIN	BenPIN				Yes				None
19	M19	AllPIN	BenPIN				Yes				None
20	M20	AllPIN	BenPIN				Yes				None
21	M21	AllPIN	BenPIN				Yes	** NA **			None
22	M22	AllPIN	BenPIN				Yes	** NA **			None
23	M23	AllPIN	BenPIN				Yes	** NA **			None
24	M24	AllPIN	BenPIN				Yes	** NA **			None
25	M25						Yes	** NA **			None
26	M26						Yes	** NA **			None
27	M27						Yes	** NA **			None
28	M28						Yes	** NA **			None
29	M29	AllPIN	BenPIN				Yes				None
30	M30	AllPIN	BenPIN				Yes				None
31	M31	AllPIN	BenPIN				Yes				None
32	M32	AllPIN	BenPIN				Yes				None
33	M33	AllPIN	BenPIN				Yes	** NA **			None
34	M34	AllPIN	BenPIN				Yes	** NA **			None
35	M35	AllPIN	BenPIN				Yes	** NA **			None
36	M36	AllPIN	BenPIN				Yes	** NA **			None
37	M37						Yes	** NA **			None
38	M38						Yes	** NA **			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Defl Ra...	Analysis Offset[in]	Inactive	Seismi...
39	M39						Yes	** NA **			None
40	M40						Yes	** NA **			None
41	M41	AllPIN	BenPIN				Yes				None
42	M42	AllPIN	BenPIN				Yes				None
43	M43	AllPIN	BenPIN				Yes				None
44	M44	AllPIN	BenPIN				Yes				None
45	M45	AllPIN	AllPIN				Yes	** NA **			None
46	M46	AllPIN	AllPIN				Yes	** NA **			None
47	M47	AllPIN	AllPIN				Yes	** NA **			None
48	M48	AllPIN	AllPIN				Yes	** NA **			None
49	M49	AllPIN	AllPIN				Yes	** NA **			None
50	M50	AllPIN	AllPIN				Yes	** NA **			None
51	M51	AllPIN	AllPIN				Yes	** NA **			None
52	M52	AllPIN	AllPIN				Yes	** NA **			None
53	M53						Yes	** NA **			None
54	M54						Yes	** NA **			None
55	M55						Yes	** NA **			None
56	M56						Yes	** NA **			None
57	M57	AllPIN	BenPIN				Yes				None
58	M58	AllPIN	BenPIN				Yes				None
59	M59	AllPIN	BenPIN				Yes				None
60	M60	AllPIN	BenPIN				Yes				None
61	M61	AllPIN	BenPIN				Yes	** NA **			None
62	M62	AllPIN	BenPIN				Yes	** NA **			None
63	M63	AllPIN	BenPIN				Yes	** NA **			None
64	M64	AllPIN	BenPIN				Yes	** NA **			None
65	M49_1						Yes				None
66	M50_1						Yes				None
67	M51_1	BenPIN	BenPIN				Yes	** NA **			None
68	M53_1						Yes				None
69	M53A	BenPIN	BenPIN				Yes	** NA **			None
70	M54_1	BenPIN	BenPIN				Yes	** NA **			None
71	M55_1	BenPIN	BenPIN				Yes	** NA **			None
72	M56_1	BenPIN	BenPIN				Yes	** NA **			None
73	M57_1						Yes				None
74	M58_1						Yes				None

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
1	M1	TWR_LE...	5	5	5	5	5	1	1						Lateral
2	M2	TWR_LE...	5	5	5	5	5	1	1						Lateral
3	M3	TWR_LE...	5	5	5	5	5	1	1						Lateral
4	M4	TWR_LE...	5	5	5	5	5	1	1						Lateral
5	M5	TWR_TO...	3	3	3	3	3	1	1						Lateral
6	M6	TWR_TO...	3	3	3	3	3	1	1						Lateral
7	M7	TWR_TO...	3	3	3	3	3	1	1						Lateral
8	M8	TWR_TO...	3	3	3	3	3	1	1						Lateral
9	M9	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
10	M10	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
11	M11	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
12	M12	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
13	M13	TWR_LE...	5	5	5	5	5	1	1						Lateral
14	M14	TWR_LE...	5	5	5	5	5	1	1						Lateral
15	M15	TWR_LE...	5	5	5	5	5	1	1						Lateral
16	M16	TWR_LE...	5	5	5	5	5	1	1						Lateral
17	M17	TWR_H...	3	3	3	3	3	1	1						Lateral
18	M18	TWR_H...	3	3	3	3	3	1	1						Lateral
19	M19	TWR_H...	3	3	3	3	3	1	1						Lateral
20	M20	TWR_H...	3	3	3	3	3	1	1						Lateral
21	M21	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
22	M22	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
23	M23	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
24	M24	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
25	M25	TWR_LE...	5	5	5	5	5	1	1						Lateral
26	M26	TWR_LE...	5	5	5	5	5	1	1						Lateral
27	M27	TWR_LE...	5	5	5	5	5	1	1						Lateral
28	M28	TWR_LE...	5	5	5	5	5	1	1						Lateral
29	M29	TWR_H...	3	3	3	3	3	1	1						Lateral
30	M30	TWR_H...	3	3	3	3	3	1	1						Lateral
31	M31	TWR_H...	3	3	3	3	3	1	1						Lateral
32	M32	TWR_H...	3	3	3	3	3	1	1						Lateral
33	M33	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
34	M34	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
35	M35	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
36	M36	TWR_DI...	5.831	5.831	5.831	5.831	5.831	1	1						Lateral
37	M37	TWR_LE...	5	5	5	5	5	1	1						Lateral
38	M38	TWR_LE...	5	5	5	5	5	1	1						Lateral
39	M39	TWR_LE...	5	5	5	5	5	1	1						Lateral
40	M40	TWR_LE...	5	5	5	5	5	1	1						Lateral
41	M41	TWR_H...	3	3	3	3	3	1	1						Lateral
42	M42	TWR_H...	3	3	3	3	3	1	1						Lateral
43	M43	TWR_H...	3	3	3	3	3	1	1						Lateral
44	M44	TWR_H...	3	3	3	3	3	1	1						Lateral
45	M45	TWR_DI...	5.831	2.915	2.915	2.915	2.915	1	1						Lateral
46	M46	TWR_DI...	5.831	2.915	2.915	2.915	2.915	1	1						Lateral
47	M47	TWR_DI...	5.831	2.915	2.915	2.915	2.915	1	1						Lateral
48	M48	TWR_DI...	5.831	2.915	2.915	2.915	2.915	1	1						Lateral
49	M49	TWR_DI...	5.831	2.915	2.915	2.915	2.915	1	1						Lateral
50	M50	TWR_DI...	5.831	2.915	2.915	2.915	2.915	1	1						Lateral
51	M51	TWR_DI...	5.831	2.915	2.915	2.915	2.915	1	1						Lateral
52	M52	TWR_DI...	5.831	2.915	2.915	2.915	2.915	1	1						Lateral
53	M53	TWR_LE...	2.5	2.5	2.5	2.5	2.5	1	1						Lateral
54	M54	TWR_LE...	2.5	2.5	2.5	2.5	2.5	1	1						Lateral
55	M55	TWR_LE...	2.5	2.5	2.5	2.5	2.5	1	1						Lateral
56	M56	TWR_LE...	2.5	2.5	2.5	2.5	2.5	1	1						Lateral
57	M57	TWR_TO...	3	3	3	3	3	1	1						Lateral
58	M58	TWR_TO...	3	3	3	3	3	1	1						Lateral
59	M59	TWR_TO...	3	3	3	3	3	1	1						Lateral
60	M60	TWR_TO...	3	3	3	3	3	1	1						Lateral
61	M61	TWR_DI...	3.905	3.905	3.905	3.905	3.905	1	1						Lateral
62	M62	TWR_DI...	3.905	3.905	3.905	3.905	3.905	1	1						Lateral
63	M63	TWR_DI...	3.905	3.905	3.905	3.905	3.905	1	1						Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
64	M64	TWR_DI...	3.905	3.905	3.905	3.905	3.905	1	1						Lateral
65	M49_1	W14X30	6.364					1	1						Lateral
66	M50_1	W14X30	6.364					1	1						Lateral
67	M51_1	LL4x3x5x0	20.037					1	1						Lateral
68	M53_1	W14X30	9					1	1						Lateral
69	M53A	L2.5x2.5x3	4.232					1	1						Lateral
70	M54_1	L2.5x2.5x3	5.992					1	1						Lateral
71	M55_1	L2.5x2.5x3	4.242					1	1						Lateral
72	M56_1	L2.5x2.5x3	3					1	1						Lateral
73	M57_1	W14X30	13.636					1	1						Lateral
74	M58_1	W14X30	13.636					1	1						Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Dead	None		-1		44	126	20		
2	No Ice Wind 0 deg	None				44	380	20		
3	No Ice Wind 45 deg	None				88	420	72		
4	No Ice Wind 90 deg	None				44	424	60		
5	No Ice Wind 135 deg	None				88	420	72		
6	No Ice Wind 180 deg	None				44	380	20		
7	No Ice Wind 225 deg	None				88	420	72		
8	No Ice Wind 270 deg	None				44	424	60		
9	No Ice Wind 315 deg	None				88	420	72		
10	Ice	None				44	126	84		
11	Temperature Drop	None						64		
12	Ice Wind 0 deg	None				44	380	20		
13	Ice Wind 45 deg	None				88	420	72		
14	Ice Wind 90 deg	None				44	420	52		
15	Ice Wind 135 deg	None				88	420	72		
16	Ice Wind 180 deg	None				44	380	20		
17	Ice Wind 225 deg	None				88	420	72		
18	Ice Wind 270 deg	None				44	420	52		
19	Ice Wind 315 deg	None				88	420	72		
20	Service Wind 0 deg	None				44	376	20		
21	Service Wind 45 deg	None				88	420	72		
22	Service Wind 90 deg	None				44	420	52		
23	Service Wind 135 deg	None				88	420	72		
24	Service Wind 180 deg	None				44	376	20		
25	Service Wind 225 deg	None				88	420	72		
26	Service Wind 270 deg	None				44	420	52		
27	Service Wind 315 deg	None				88	420	72		

Load Combinations

	Description	S...	PDelta	SRSS	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	Dead Only	Y...	Y		1	1	28	1	29	1	0		0		0		0		0		0					
2	1.2 Dead+1.6 Wind 0 deg ...	Y...	Y		1	1.2	2	1.6	28	1.2	29	1	0		0		0		0		0					
3	0.9 Dead+1.6 Wind 0 deg ...	Y...	Y		1	.9	2	1.6	28	.9	29	1	0		0		0		0		0					
4	1.2 Dead+1.6 Wind 45 deg...	Y...	Y		1	1.2	3	1.6	28	1.2	29	1	0		0		0		0		0					
5	0.9 Dead+1.6 Wind 45 deg...	Y...	Y		1	.9	3	1.6	28	.9	29	1	0		0		0		0		0					

Load Combinations (Continued)

	Description	S...	PDelta	SRSS	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
6	1.2 Dead+1.6 Wind 90 deg...	Y...	Y		1	1.2	4	1.6	28	1.2	29	1	0		0		0		0		0			
7	0.9 Dead+1.6 Wind 90 deg...	Y...	Y		1	.9	4	1.6	28	.9	29	1	0		0		0		0		0			
8	1.2 Dead+1.6 Wind 135 de...	Y...	Y		1	1.2	5	1.6	28	1.2	29	1	0		0		0		0		0			
9	0.9 Dead+1.6 Wind 135 de...	Y...	Y		1	.9	5	1.6	28	.9	29	1	0		0		0		0		0			
10	1.2 Dead+1.6 Wind 180 de...	Y...	Y		1	1.2	6	1.6	28	1.2	29	1	0		0		0		0		0			
11	0.9 Dead+1.6 Wind 180 de...	Y...	Y		1	.9	6	1.6	28	.9	29	1	0		0		0		0		0			
12	1.2 Dead+1.6 Wind 225 de...	Y...	Y		1	1.2	7	1.6	28	1.2	29	1	0		0		0		0		0			
13	0.9 Dead+1.6 Wind 225 de...	Y...	Y		1	.9	7	1.6	28	.9	29	1	0		0		0		0		0			
14	1.2 Dead+1.6 Wind 270 de...	Y...	Y		1	1.2	8	1.6	28	1.2	29	1	0		0		0		0		0			
15	0.9 Dead+1.6 Wind 270 de...	Y...	Y		1	.9	8	1.6	28	.9	29	1	0		0		0		0		0			
16	1.2 Dead+1.6 Wind 315 de...	Y...	Y		1	1.2	9	1.6	28	1.2	29	1	0		0		0		0		0			
17	0.9 Dead+1.6 Wind 315 de...	Y...	Y		1	.9	9	1.6	28	.9	29	1	0		0		0		0		0			
18	1.2 Dead+1.0 Ice+1.0 Temp	Y...	Y		1	1.2	10	1	11	1	28	1.2	29	1	0		0		0		0			
19	1.2 Dead+1.0 Wind 0 deg+...	Y...	Y		1	1.2	12	1	10	1	11	1	28	1.2	29	1	0		0		0			
20	1.2 Dead+1.0 Wind 45 deg...	Y...	Y		1	1.2	13	1	10	1	11	1	28	1.2	29	1	0		0		0			
21	1.2 Dead+1.0 Wind 90 deg...	Y...	Y		1	1.2	14	1	10	1	11	1	28	1.2	29	1	0		0		0			
22	1.2 Dead+1.0 Wind 135 de...	Y...	Y		1	1.2	15	1	10	1	11	1	28	1.2	29	1	0		0		0			
23	1.2 Dead+1.0 Wind 180 de...	Y...	Y		1	1.2	16	1	10	1	11	1	28	1.2	29	1	0		0		0			
24	1.2 Dead+1.0 Wind 225 de...	Y...	Y		1	1.2	17	1	10	1	11	1	28	1.2	29	1	0		0		0			
25	1.2 Dead+1.0 Wind 270 de...	Y...	Y		1	1.2	18	1	10	1	11	1	28	1.2	29	1	0		0		0			
26	1.2 Dead+1.0 Wind 315 de...	Y...	Y		1	1.2	19	1	10	1	11	1	28	1.2	29	1	0		0		0			
27	Dead+Wind 0 deg - Service	Y...	Y		1	1	20	1	28	1	29	1	0		0		0		0		0			
28	Dead+Wind 45 deg - Servi...	Y...	Y		1	1	21	1	28	1	29	1	0		0		0		0		0			
29	Dead+Wind 90 deg - Servi...	Y...	Y		1	1	22	1	28	1	29	1	0		0		0		0		0			
30	Dead+Wind 135 deg - Ser...	Y...	Y		1	1	23	1	28	1	29	1	0		0		0		0		0			
31	Dead+Wind 180 deg - Ser...	Y...	Y		1	1	24	1	28	1	29	1	0		0		0		0		0			
32	Dead+Wind 225 deg - Ser...	Y...	Y		1	1	25	1	28	1	29	1	0		0		0		0		0			
33	Dead+Wind 270 deg - Ser...	Y...	Y		1	1	26	1	28	1	29	1	0		0		0		0		0			
34	Dead+Wind 315 deg - Ser...	Y...	Y		1	1	27	1	28	1	29	1	0		0		0		0		0			
35	Dead Only APP	Y...	Y		1	1	28	1	29	1	0		0		0		0		0		0			
36	1.2 Dead+1.6 Wind 0 deg ...	Y...	Y		1	1.2	2	1.6	28	1.2	29	1	0		0		0		0		0			
37	0.9 Dead+1.6 Wind 0 deg ...	Y...	Y		1	.9	2	1.6	28	.9	29	1	0		0		0		0		0			
38	1.2 Dead+1.6 Wind 45 deg...	Y...	Y		1	1.2	3	1.6	28	1.2	29	1	0		0		0		0		0			
39	0.9 Dead+1.6 Wind 45 deg...	Y...	Y		1	.9	3	1.6	28	.9	29	1	0		0		0		0		0			
40	1.2 Dead+1.6 Wind 90 deg...	Y...	Y		1	1.2	4	1.6	28	1.2	29	1	0		0		0		0		0			
41	0.9 Dead+1.6 Wind 90 deg...	Y...	Y		1	.9	4	1.6	28	.9	29	1	0		0		0		0		0			
42	1.2 Dead+1.6 Wind 135 de...	Y...	Y		1	1.2	5	1.6	28	1.2	29	1	0		0		0		0		0			
43	0.9 Dead+1.6 Wind 135 de...	Y...	Y		1	.9	5	1.6	28	.9	29	1	0		0		0		0		0			
44	1.2 Dead+1.6 Wind 180 de...	Y...	Y		1	1.2	6	1.6	28	1.2	29	1	0		0		0		0		0			
45	0.9 Dead+1.6 Wind 180 de...	Y...	Y		1	.9	6	1.6	28	.9	29	1	0		0		0		0		0			
46	1.2 Dead+1.6 Wind 225 de...	Y...	Y		1	1.2	7	1.6	28	1.2	29	1	0		0		0		0		0			
47	0.9 Dead+1.6 Wind 225 de...	Y...	Y		1	.9	7	1.6	28	.9	29	1	0		0		0		0		0			
48	1.2 Dead+1.6 Wind 270 de...	Y...	Y		1	1.2	8	1.6	28	1.2	29	1	0		0		0		0		0			
49	0.9 Dead+1.6 Wind 270 de...	Y...	Y		1	.9	8	1.6	28	.9	29	1	0		0		0		0		0			
50	1.2 Dead+1.6 Wind 315 de...	Y...	Y		1	1.2	9	1.6	28	1.2	29	1	0		0		0		0		0			
51	0.9 Dead+1.6 Wind 315 de...	Y...	Y		1	.9	9	1.6	28	.9	29	1	0		0		0		0		0			
52	1.2 Dead+1.0 Ice+1.0 Tem...	Y...	Y		1	1.2	10	1	11	1	28	1.2	29	1	0		0		0		0			
53	1.2 Dead+1.0 Wind 0 deg+...	Y...	Y		1	1.2	12	1	10	1	11	1	28	1.2	29	1	0		0		0			
54	1.2 Dead+1.0 Wind 45 deg...	Y...	Y		1	1.2	13	1	10	1	11	1	28	1.2	29	1	0		0		0			
55	1.2 Dead+1.0 Wind 90 deg...	Y...	Y		1	1.2	14	1	10	1	11	1	28	1.2	29	1	0		0		0			
56	1.2 Dead+1.0 Wind 135 de...	Y...	Y		1	1.2	15	1	10	1	11	1	28	1.2	29	1	0		0		0			
57	1.2 Dead+1.0 Wind 180 de...	Y...	Y		1	1.2	16	1	10	1	11	1	28	1.2	29	1	0		0		0			

Load Combinations (Continued)

	Description	S...	PDelta	SRSS	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
58	1.2 Dead+1.0 Wind 225 de...	Y...	Y		1	1.2	17	1	10	1	11	1	28	1.2	29	1	0		0		0			
59	1.2 Dead+1.0 Wind 270 de...	Y...	Y		1	1.2	18	1	10	1	11	1	28	1.2	29	1	0		0		0			
60	1.2 Dead+1.0 Wind 315 de...	Y...	Y		1	1.2	19	1	10	1	11	1	28	1.2	29	1	0		0		0			
61	Dead+Wind 0 deg - Servic...	Y...	Y		1	1	20	1	28	1	29	1	0		0		0		0		0			
62	Dead+Wind 45 deg - Servi...	Y...	Y		1	1	21	1	28	1	29	1	0		0		0		0		0			
63	Dead+Wind 90 deg - Servi...	Y...	Y		1	1	22	1	28	1	29	1	0		0		0		0		0			
64	Dead+Wind 135 deg - Ser...	Y...	Y		1	1	23	1	28	1	29	1	0		0		0		0		0			
65	Dead+Wind 180 deg - Ser...	Y...	Y		1	1	24	1	28	1	29	1	0		0		0		0		0			
66	Dead+Wind 225 deg - Ser...	Y...	Y		1	1	25	1	28	1	29	1	0		0		0		0		0			
67	Dead+Wind 270 deg - Ser...	Y...	Y		1	1	26	1	28	1	29	1	0		0		0		0		0			
68	Dead+Wind 315 deg - Ser...	Y...	Y		1	1	27	1	28	1	29	1	0		0		0		0		0			

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N25 1	max	2.738	49	23.292	53	7.32	36	0	68	0	68	0	68
2		min	-2.741	7	-7.472	11	-7.387	10	0	1	0	1	0	1
3	N26 1	max	.996	51	11.023	42	.956	51	0	68	0	68	0	68
4		min	-.893	9	-8.381	17	-.862	9	0	1	0	1	0	1
5	N27 1	max	5.161	48	10.923	46	2.566	40	0	68	0	68	0	68
6		min	-5.151	6	-8.18	5	-2.576	14	0	1	0	1	0	1
7	Totals:	max	8.54	49	28.363	60	8.541	37						
8		min	-8.54	6	7.332	3	-8.541	10						

Envelope AISC 3rd: LRFD Steel Code Checks

	Mem...	Shape	Code Check	Loc[ft]	LC	Shear C...	Loc[ft]	...	LC	phi*Pnc ...	phi*Pnt [k]	phi*Mn y-y [k-ft]	phi...	...Eqn
1	M50_1	W14X30	.851	6.364	42	.376	2.121	y	40	310.25	398.25	32.764	177....	H...
2	M57_1	W14X30	.842	0	42	.110	13.636	y	42	155.389	398.25	32.764	177....	H...
3	M49_1	W14X30	.827	6.364	46	.377	2.121	y	48	310.25	398.25	32.764	177....	H...
4	M58_1	W14X30	.821	0	46	.109	13.636	y	46	155.389	398.25	32.764	177....	H...
5	M53_1	W14X30	.596	3	42	.350	3	y	42	255.913	398.25	32.764	177....	H...
6	M51_1	LL4x3x5x0	.462	6.888	48	.015	0	y	48	20.361	135.432	7.587	9.8....	H...
7	M54_1	L2.5x2.5x3	.272	0	37	.065	3.059	y	38	8.637	29.192	- Code check base...		
8	M55_1	L2.5x2.5x3	.185	0	46	.004	4.242	y	42	15.219	29.192	- Code check base...		
9	M56_1	L2.5x2.5x3	.122	0	46	.009	0	y	40	20.313	29.192	- Code check base...		
10	M53A	L2.5x2.5x3	.088	0	37	.004	0	y	38	15.26	29.192	- Code check base...		

APPENDIX C

STRUCTURAL DESIGN DRAWINGS

STRUCTURAL DESIGN DRAWINGS

SITE NAME:

MANCHESTER CO

SITE NUMBER:

701816

SITE ADDRESS:

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)
N 41°46'32.41", W 72°31'15.09"

MODIFICATION PROVISIONS

THE MODIFICATIONS DEPICTED ON THESE DRAWINGS ARE BASED ON THE RECOMMENDATIONS OUTLINED IN THE STRUCTURAL MODIFICATION ANALYSIS REPORT COMPLETED BY TOWER ENGINEERING PROFESSIONALS (TEP), JOB#: 257649.494504 DATED FEBRUARY 19, 2021 (REV 0) PER TIA-222-G. THIS REPORT IS BASED ON A SPECIFIC ANTENNA LOADING AND COAX CONFIGURATION. SEE THE REPORT FOR THE ANTENNA AND COAX LOADING INFORMATION. ANY OTHER ANTENNA OR COAX CONFIGURATION REQUIRES REVIEW BY TEP. SATISFACTORY COMPLETION OF THE MODIFICATIONS INDICATED ON THESE DRAWINGS WILL RESULT IN THE STRUCTURE MEETING THE REQUIREMENTS OF THE SPECIFICATIONS UNDER WHICH THE STRUCTURAL WAS COMPLETED.

CONTRACTOR SHALL FIELD VERIFY ALL: DIMENSIONS, QUANTITIES, PART NUMBERS AND COAX/ANTENNA PLACEMENTS PRIOR TO: BIDDING, ORDERING MATERIALS, AND CONSTRUCTION.

ATTENTION

QUALIFIED ENGINEERING SERVICES ARE AVAILABLE FROM TEP TO ASSIST CONTRACTORS IN CLASS IV RIGGING PLAN REVIEWS. FOR REQUESTED QUALIFIED ENGINEERING SERVICES, CONTACT TEP FOR QUOTE AT RIGGING@TEPGROUP.NET.

INDEX OF SHEETS

PROJECT TEAM

PROJECT CONTACT:

NAME	EVEREST INFRASTRUCTURE PARTNERS
ADDRESS	TWO ALLEGHENY CENTER NOVA TOWER 2, SUITE 703
CITY, STATE, ZIP	PITTSBURGH, PA 15212
CONTACT	THOMAS L. RIGG JR., P.E.
PHONE	(603) 498-7462
EMAIL	TOM.RIGG@EVERESTINFRASTRUCTURE.COM

ENGINEERING FIRM PROJECT MANAGER:

NAME	TOWER ENGINEERING PROFESSIONALS, INC.
ADDRESS	326 TRYON ROAD
CITY, STATE, ZIP	RALEIGH, NC 27603
CONTACT	ERIK LATTA, P.E.
PHONE	(919) 661-6351
EMAIL	SDD@TEPGROUP.NET

PLANS PREPARED FOR:

EVEREST
INFRASTRUCTURE PARTNERS

TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498-7462

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

SHEET TITLE:

TITLE SHEET

SHEET NUMBER: **T-1**

REVISION: **0**

TEP#:257649.494504

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
PRE-CONSTRUCTION		
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
NA	EOR APPROVED SHOP DRAWINGS	ONCE THE PRE-MODIFICATION MAPPING IS COMPLETE AND PRIOR TO FABRICATION, THE CONTRACTOR SHALL PROVIDE DETAILED ASSEMBLY DRAWINGS AND/OR SHOP DRAWINGS. THESE ARE TO INCLUDE, BUT ARE NOT LIMITED TO, A VISUAL LAYOUT OF NEW REINFORCEMENT, EXISTING REINFORCEMENT CONFIGURATION, PORTHOLES, MOUNTS, STEP PEGS, SAFETY CLIMBS AND ANY OTHER MISCELLANEOUS ITEMS WHICH MAY AFFECT SUCCESSFUL INSTALLATION OF MODIFICATIONS. THESE DRAWINGS SHALL BE SUBMITTED TO THE EOR FOR APPROVAL. APPROVED ASSEMBLY/SHOP DRAWINGS SHALL BE SUBMITTED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS, SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR CERTIFIED WELD INSPECTION	A CWI SHALL INSPECT ALL WELDING PERFORMED ON STRUCTURAL MEMBERS DURING FABRICATION. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORTS (MTR)	MATERIAL TEST REPORTS SHALL BE PROVIDED FOR MATERIAL USED. MTRS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	FABRICATOR NDE INSPECTION REPORT	CRITICAL SHOP WELDS THAT REQUIRE TESTING ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED NDT INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	NDE OF MONOPOLE BASE PLATE	A NDE OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
ADDITIONAL TESTING AND INSPECTIONS:		
NA		
CONSTRUCTION		
NA	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A VISUAL OBSERVATION OF THE REBAR SHALL BE PERFORMED BEFORE PLACING THE EPOXY. A SEALED WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED AS PART OF THE FOUNDATION REPORT.
NA	EARTHWORK	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY AN APPROVED FOUNDATION INSPECTOR AND RESULTS INCLUDED AS PART OF THE FOUNDATION REPORT.
NA	MICROPILE/ROCK ANCHOR	MICROPILES/ROCK ANCHORS SHALL BE INSPECTED BY THE FOUNDATION INSPECTION VENDOR AND SHALL BE INCLUDED AS PART OF THE FOUNDATION INSPECTION REPORT, ADDITIONAL TESTING AND/OR INSPECTION REQUIREMENTS ARE NOTED IN THESE CONTRACT DOCUMENTS.
NA	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
NA	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS REMOVED AND/OR INSTALLED IN ACCORDANCE WITH CONTRACTOR DOCUMENTS FOR INCLUSION IN THE MI REPORT.
X	FIELD CERTIFIED WELD INSPECTION	AN AWS CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST FIELD WELDS, IN ACCORDANCE WITH AWS D1.1/D1.1M: "STRUCTURAL WELDING CODE – STEEL". A REPORT SHALL BE PROVIDED. NDE OF FIELD WELDS SHALL BE PERFORMED AS REQUIRED PER CONTRACT DOCUMENTS. THE NDE REPORT SHALL BE INCLUDED IN THE CWI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE WRITTEN AND PHOTOGRAPHIC DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED PER MANUFACTURER SPECIFICATIONS AND APPLICABLE STANDARDS. THE COLD GALVANIZING COMPOUND TO BE APPROVED BY THE TOWER OWNER.
NA	TENSION TWIST AND PLUMB	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT IN ACCORDANCE WITH APPLICABLE STANDARDS DOCUMENTING TENSION TWIST AND PLUMB.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A LEGIBLE COPY OF THE ORIGINAL DESIGN DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD. EOR/RFI FORMS APPROVING ALL CHANGES SHALL BE SUBMITTED WHEN THE EOR IS SPECIFYING ADDITIONAL INSPECTIONS DESCRIPTION AND APPLICABLE STANDARDS SHALL BE APPLIED.
ADDITIONAL TESTING AND INSPECTIONS:		
NA		
POST-CONSTRUCTION		
X	CONSTRUCTION COMPLIANCE LETTER	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS, INCLUDING LISTING ADDITIONAL PARTIES TO THE MODIFICATION PROCESS.
NA	POST INSTALLED ANCHOR ROD PULL TESTS	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH CONTRACT DOCUMENTS AND A REPORT SHALL BE PROVIDED INDICATING TESTING RESULTS.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI. PHOTOS SHALL DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
X	BOLT INSTALLATION AND VERIFICATION REPORT	THE MI INSPECTOR SHALL VERIFY THE INSTALLATION AND TIGHTNESS 10% OF ALL NON PRE-TENSIONED BOLTS INSTALLED AS PART OF THE MODIFICATION. THE MI INSPECTOR SHALL LOOSEN THE NUT AND VERIFY THE BOLT HOLE SIZE AND CONDITION. THE MI REPORT SHALL CONTAIN THE COMPLETED BOLT INSTALLATION VERIFICATION REPORT, INCLUDING THE SUPPORTING PHOTOGRAPHS.
X	PUNCHLIST DEVELOPMENT AND CORRECTION DOCUMENTATION	FINAL PUNCHLIST INDICATING ALL NONCONFORMANCE(S) IDENTIFIED AND THE FINAL RESOLUTION AND APPROVAL.
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTOR'S REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
ADDITIONAL TESTING AND INSPECTIONS:		
NA		

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT
NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MI IS AN ON-SITE VISUAL AND HANDS-ON INSPECTION OF THE MODIFICATIONS INCLUDING A REVIEW OF CONSTRUCTION REPORTS AND ADDITIONAL PERTINENT DOCUMENTATION PROVIDED BY THE GENERAL CONTRACTOR (GC), AS WELL AS ANY INSPECTION DOCUMENTS PROVIDED BY 3RD PARTY INSPECTORS. THE MI IS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

NO DOCUMENT, CODE OR POLICY CAN ANTICIPATE EVERY SITUATION THAT MAY ARISE. ACCORDINGLY, THIS CHECKLIST IS INTENDED TO SERVE AS A SOURCE OF GUIDING PRINCIPLES IN ESTABLISHING GUIDELINES FOR MODIFICATION INSPECTION.

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, AND THE MI INSPECTOR DOES NOT TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES. THE MI INSPECTOR SHALL INSPECT AND NOTE CONFORMANCE/NONCONFORMANCE AND PROVIDE TO THE TOWER OWNER POINT OF CONTACT FOR EVALUATION.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PURCHASE ORDER (PO) IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN THE GC AND/OR INSPECTOR SHALL CONTACT THE OWNER POINT OF CONTACT.

SERVICE LEVEL COMMITMENT

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING AN MI REPORT:

- THE GC SHALL PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY MINOR DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION / ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN ONLY FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

PLANS PREPARED FOR:

EVEREST
– INFRASTRUCTURE PARTNERS –

TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498-7462

PROJECT INFORMATION:

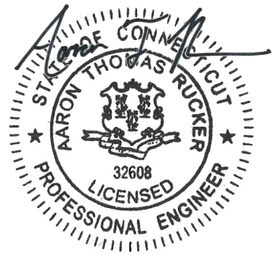
MANCHESTER CO
SITE #: 701816

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

SHEET TITLE:

MI CHECKLIST AND NOTES

SHEET NUMBER: **N-1**

REVISION: **0**

TEP#:257649.494504

GENERAL NOTES:

1. ALL REFERENCES TO THE OWNER IN THESE DOCUMENTS SHALL BE CONSIDERED EVEREST INFRASTRUCTURE PARTNERS OR ITS DESIGNATED REPRESENTATIVE.
2. ALL WORK PRESENTED ON THESE DESIGN DRAWINGS MUST BE COMPLETED BY THE GENERAL CONTRACTOR (GC) UNLESS NOTED OTHERWISE. THE GC MUST HAVE CONSIDERABLE EXPERIENCE IN PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE GC IS ATTESTING THAT HE HAS SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED AND THAT HE IS PROPERLY LICENSED AND PROPERLY REGISTERED TO DO THIS WORK IN THE STATE OF CONNECTICUT.
3. WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE 2018 CONNECTICUT STATE BULIDING CODE.
4. UNLESS SHOWN OR NOTED OTHERWISE ON THE DESIGN DRAWINGS, OR IN THE SPECIFICATIONS, THE FOLLOWING NOTES SHALL APPLY TO THE MATERIALS LISTED HEREIN, AND TO THE PROCEDURES TO BE USED ON THIS PROJECT.
5. ALL HARDWARE ASSEMBLY MANUFACTURER'S INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
6. ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE DESIGN DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD (EOR) PRIOR TO INSTALLATION. THE GC SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
7. THE GC SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE GC IS RESPONSIBLE FOR ENSURING THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK.
8. ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE GC SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIALS ACCESS, WITH THE RESIDENT LEASING AGENT FOR APPROVAL.
9. ALL PERMITS THAT MUST BE OBTAINED ARE THE RESPONSIBILITY OF THE GC. THE GC WILL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
10. IF APPLICABLE, ALL CONCRETE WORK SHALL COMPLY TO LOCAL CODES AND THE ACI 318-14, "BUILDING REQUIREMENTS FOR STRUCTURAL CONCRETE".
11. 24 HOURS PRIOR TO THE BEGINNING OF ANY CONSTRUCTION, THE GC MUST NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY OR CITY) ENGINEER.
12. ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR ONE YEAR FROM ACCEPTANCE DATE.
13. ALL DIMENSIONS SHALL BE VERIFIED WITH THE DESIGN DRAWINGS (LATEST REVISION) PRIOR TO COMMENCING CONSTRUCTION. NOTIFY THE EOR IMMEDIATELY IF ANY DISCREPANCIES ARE DISCOVERED. THE OWNER SHALL HAVE A SET OF APPROVED DESIGN DRAWINGS AVAILABLE AT THE SITE AT ALL TIMES WHILE WORK IS BEING PERFORMED. A DESIGNATED RESPONSIBLE EMPLOYEE SHALL BE AVAILABLE FOR CONTACT BY GOVERNING AGENCY INSPECTORS.
14. THE CLIMBING FACILITIES, SAFETY CLIMB AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE OWNER AND EOR. ALL ALTERATIONS TO A SAFETY CLIMB'S ORIGINAL MANUFACTURER'S CONFIGURATION MUST BE DESIGNED BY THE EOR. IF THE GC FINDS THAT THE CLIMBING FACILITIES ARE IMPEDED, EITHER DURING BIDDING, DURING PRE-FABRICATION MAPPING, OR WHILE ON-SITE, THE GC SHALL CONTACT THE OWNER AND EOR TO DETERMINE A METHOD OF RESOLUTION.
15. ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE GC AND/OR FABRICATOR.
16. IF DURING THE COURSE OF A FOUNDATION MODIFICATION, THE GC ENCOUNTERS EXISTING CONDUIT LOCATED WITHIN THE CONFINES OF THE EXISTING OR PROPOSED FOUNDATION CONCRETE, AND THIS CONDUIT IS NOT IN A LOCATION THAT IS SPECIFIED WITHIN THESE DESIGN DRAWINGS, THE GC SHALL IMMEDIATELY CONTACT THE EOR FOR GUIDANCE BEFORE PROCEEDING WITH THE INSTALLATION OF THE PROPOSED FOUNDATION MODIFICATIONS. IF CONDUIT IS TO BE INSTALLED THROUGH THE EXISTING FOUNDATION OR PROPOSED FOUNDATION MODIFICATION AND HASN'T BEEN SPECIFIED WITHIN THESE DESIGN DRAWINGS THEN THE GC SHALL IMMEDIATELY CONTACT THE EOR FOR GUIDANCE PRIOR TO PROCEEDING WITH THE INSTALLATION OF THE PROPOSED FOUNDATION MODIFICATIONS.

ATTENTION

ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GC RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION), FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).

STRUCTURAL STEEL NOTES:

1. THE FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AISC STEEL CONSTRUCTION MANUAL, LOAD AND RESISTANCE FACTOR DESIGN (LRFD), 15TH EDITION.
2. UNLESS OTHERWISE NOTED, ALL STRUCTURAL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS: STRUCTURAL STEEL:
   - ANGLE: ASTM A572-50
   - PIPE/TUBE (ROUND): ASTM A500 GR.C (Fy = 46 KSI)
   - PIPE/TUBE (SQUARE): ASTM A500 GR.C (Fy = 50 KSI)
   - PLATE: ASTM A572-50
   - SOLID ROD: ASTM A572-50
   - W-SHAPES: ASTM A992

   A. ALL BOLTS, ASTM A325 TYPE I GALVANIZED HIGH STRENGTH BOLTS.
   B. ALL U-BOLTS, ASTM A193 GRADE B7
   C. ALL NUTS, ASTM A563 GRADE DH OR A194 GRADE 2H CARBON AND ALLOY STEEL NUTS.
   D. ALL WASHERS, ASTM F436 HARDENED STEEL WASHERS.
3. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH AISC STEEL CONSTRUCTION MANUAL, LRFD, 15TH EDITION.
4. HOLES SHALL NOT BE FLAME CUT THROUGH STEEL UNLESS APPROVED BY THE ENGINEER.
5. HOT-DIP GALVANIZE ALL ITEMS UNLESS OTHERWISE NOTED, AFTER FABRICATION WHERE PRACTICABLE. GALVANIZING: ASTM A123, ASTM, A153/A153M OR ASTM A653/A653M, G90, AS APPLICABLE. ADDITIONALLY, ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING STEEL. CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION TO PROTECT STEEL BY ANY OTHER MEANS.
6. REPAIR DAMAGED SURFACES WITH GALVANIZING REPAIR METHOD AND PAINT CONFORMING TO ASTM A780 OR BY APPLICATION OF STICK OR THICK PASTED MATERIAL SPECIFICALLY DESIGNED FOR REPAIR OF GALVANIZING. CLEAN AREAS TO BE REPAIRED AND REMOVE SLAG FROM WELDS. HEAT SURFACES TO WHICH STICK OR PASTE MATERIAL IS APPLIED, WITH A TORCH TO A TEMPERATURE SUFFICIENT TO MELT THE METALLICS IN STICK OR PASTED; SPREAD MOLTEN MATERIAL UNIFORMLY OVER SURFACES TO BE COATED AND WIPE OFF EXCESS MATERIAL. AFTER REPAIR, STEEL SHALL BE REPAINTED TO MATCH EXISTING FINISH (IF APPLICABLE).
7. A NUT LOCKING DEVICE SHALL BE INSTALLED ON ALL PROPOSED AND/OR REPLACED BOLTS.
8. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXCLUDE THE THREADS FROM THE SHEAR PLANE.
9. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
10. GALVANIZED ASTM A325 BOLTS SHALL NOT BE REUSED.

WELDING NOTES:

1. ALL WELDING SHALL BE IN ACCORDANCE WITH THE AWS D1.1/D1.1M: 2015 "STRUCTURAL WELDING CODE-STEEL".
2. ALL WELDING SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.
3. CONTRACTOR SHALL RETAIN AN AWS CERTIFIED WELD INSPECTOR TO PERFORM VISUAL INSPECTIONS ON FIELD WELDS. A LETTER AND REPORT SHALL BE ISSUED TO THE CONTRACTOR. CONTRACTOR SHALL SUBMIT LETTER AND REPORT TO TOWER ENGINEERING PROFESSIONALS.
4. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. GRIND THE SURFACE OF THE ROD TO BE INSTALLED FOR A DISTANCE OF 2" MINIMUM ALL AROUND THE AREA TO BE WELDED. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING.
5. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. THE MINIMUM PREHEAT AND INTERPASS TEMPERATURE REQUIREMENTS SHALL COMPLY WITH SECTION 3.5.1 AND TABLE 3.2 OF THE AWS D1.1/D1.1M: 2015.
6. DO NOT WELD ON WET OR FROST-COVERED SURFACES & PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
7. FOR ALL WELDING, USE 70 KSI LOW HYDROGEN ELECTRODES. ELECTRODES SHALL BE APPROPRIATE FOR THE WELDING POSITION REQUIRED TO MAKE THE JOINT.
8. AFTER FINAL INSPECTION, THE AREA OF THE WELDS, THE INSTALLATION AND ALL SURFACES DAMAGED BY WELDING OR GRINDING SHALL RECEIVE A COLD-GALVANIZED COATING. THIS COATING SHALL BE APPLIED BY BRUSH. THE GALVANIZING COMPOUND SHALL CONTAIN A MINIMUM OF 95% ± PURE ZINC. THE FINISHED COATING SHALL BE A MINIMUM THICKNESS OF 3 MIL.
9. FOR MONOPOLE TOWERS FULL PENETRATION WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 100% NDE INSPECTED BY ULTRASONIC TESTING (UT) IN ACCORDANCE WITH AWS D1.1.
10. FOR MONOPOLE TOWERS PARTIAL PENETRATION AND FILLET WELDS IN THE VICINITY OF THE BASE OF THE TOWER ARE REQUIRED TO BE 50% NDE INSPECTED BY MAGNETIC PARTICLE (MT) IN ACCORDANCE WITH AWS D1.1.
11. PROVIDE WELDS ALL AROUND OR ADD SEAL WELDS WHERE STRUCTURAL WELDS ARE NOT SPECIFIED.

PLANS PREPARED FOR:

EVEREST
— INFRASTRUCTURE PARTNERS —
TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498-7462

PROJECT INFORMATION:

MANCHESTER CO
SITE #: 701816

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

SHEET TITLE:

PROJECT NOTES I

SHEET NUMBER: **N-2**

REVISION: **0**

TEP#: 257649.494504

BOLT TIGHTENING PROCEDURE:

1. UNLESS OTHERWISE NOTED, ALL BOLTED CONNECTIONS SHALL BE BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1 OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. ALL SNUG TIGHT BOLTS SHALL BE INSTALLED WITH A NUT–LOCKING DEVICE OR MECHANISM SUCH AS, BUT NOT LIMITIED TO, LOCK NUTS, LOCK WASHERS, OR PALNUTS, TO PREVENT LOOSENING.

2. WHEN SPECIFIED IN THE DRAWINGS, CONNECTION BOLTS SHALL BE INSTALLED AND TIGHTENED AS PER SECTION 8.2.1 OF THE AISC SPECIFICATION FOR STRUCTURAL JOINTS USING A325 OR A490 BOLTS, LOCATED IN THE AISC MANUAL OF STEEL CONSTRUCTION. THE INSTALLATION PROCEDURE IS PARAPHRASED AS FOLLOWS:

8.2.1 TURN-OF-THE-NUT TIGHTENING

BOLTS SHALL BE INSTALLED IN ALL HOLES OF THE CONNECTION AND BROUGHT TO A SNUG TIGHT CONDITION AS DEFINED IN SECTION 8.1, UNTIL ALL THE BOLTS ARE SIMULTANEOUSLY SNUG TIGHT AND THE CONNECTION IS FULLY COMPACTED. FOLLOWING THIS INITIAL OPERATION ALL BOLTS IN THE CONNECTION SHALL BE TIGHTENED FURTHER BY THE APPLICABLE AMOUNT OF ROTATION SPECIFIED BELOW. DURING THE TIGHTENING OPERATION THERE SHALL BE NO ROTATION OF THE PART NOT TURNED BY THE WRENCH. TIGHTENING SHALL PROGRESS SYSTEMATICALLY FROM THE MOST RIGID PART OF THE JOINT IN A MANNER THAT WILL MINIMIZE RELAXATION OF PREVIOUSLY PRETENSIONED BOLTS.

3. PRE–TENSIONED BOLTS AS SPECIFIED ON THE DRAWINGS SHALL BE TIGHTENED IN ACCORDANCE WITH AISC – "TURN OF THE NUT" METHOD, USING THE CHART BELOW.

BOLT LENGTHS UP TO AND INCLUDING FOUR DIA.

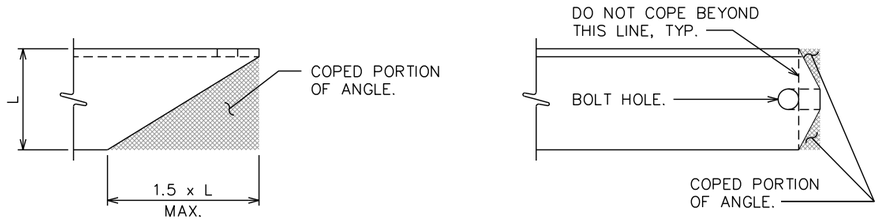
½"	BOLTS UP TO AND INCLUDING 2.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅝"	BOLTS UP TO AND INCLUDING 2.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
¾"	BOLTS UP TO AND INCLUDING 3.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
⅞"	BOLTS UP TO AND INCLUDING 3.5 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT
1"	BOLTS UP TO AND INCLUDING 4.0 INCH LENGTH	+⅓ TURN BEYOND SNUG TIGHT

BOLT LENGTHS OVER FOUR DIA. BUT NOT EXCEEDING EIGHT DIA.

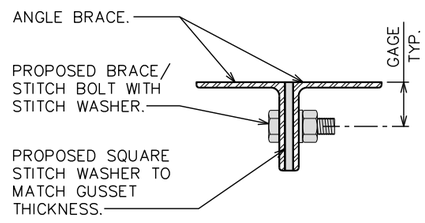
½"	BOLTS 2.25 TO 4.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅝"	BOLTS 2.75 TO 5.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
¾"	BOLTS 3.25 TO 6.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
⅞"	BOLTS 3.75 TO 7.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT
1"	BOLTS 4.25 TO 8.0 INCH LENGTH	+½ TURN BEYOND SNUG TIGHT

4. ALL ONE–SIDED BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

ALLOWABLE ANGLE COPE



SECTION AT CENTER AND STITCH CONNECTION

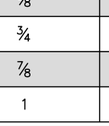


NOTE:

ALL STITCH WASHERS ARE TO BE NEW ASTM A36 MATERIAL AND BE OF EQUAL SIZE TO THE ANGLE LEG HEIGHT. THICKNESS TO MATCH EXISTING GUSSET/LEG THICKNESS.

WORKABLE GAGES

LEG	4	3½	3	2½	2	1¾
G	2	1¾	1½	1¼	1	⅞



– WORKABLE GAGES GIVEN IN INCHES

– MATCH EXISTING WHEN APPLICABLE

NOMINAL HOLE DIMENSIONS

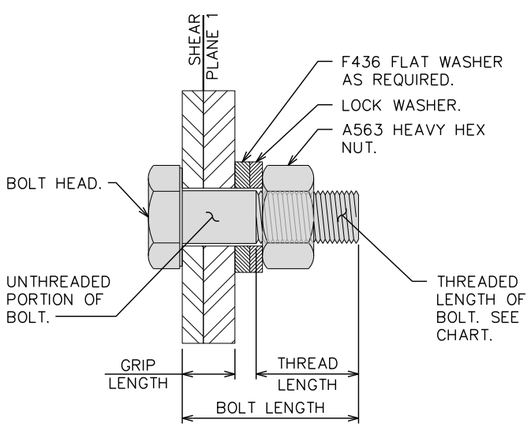
BOLT DIAMETER	STANDARD HOLE	SHORT SLOT
½	9⁄16	9⁄16 x 11⁄16
⅝	11⁄16	11⁄16 x ⅞
¾	13⁄16	13⁄16 x 1
⅞	15⁄16	15⁄16 x 1⅛
1	1 1⁄16	1 1⁄16 x 1 5⁄16

1. DIMENSIONS GIVEN IN INCHES.
2. ALL PROPOSED HOLES SHALL BE DRILLED OR PUNCHED.

BOLT DETAILS

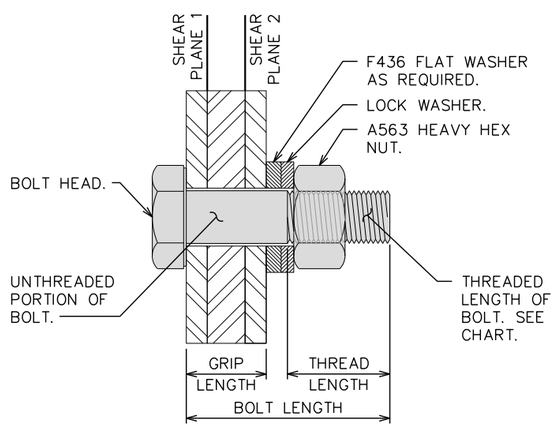
SINGLE SHEAR CONNECTIONS:

A325–X BOLT:
UNTHREADED LENGTH OF BOLT PASSES THROUGH SHEAR PLANE.



DOUBLE SHEAR CONNECTIONS:

A325–X BOLT:
UNTHREADED LENGTH OF BOLT PASSES THROUGH SHEAR PLANES.

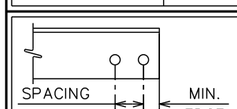


BOLT THREADS

BOLT DIAMETER	THREAD LENGTH
½"ø	1"
⅝"ø	1¼"
¾"ø	1⅜"
⅞"ø	1½"
1"ø	1¾"
1⅛"ø	2"
1¼"ø	2"

BOLT EDGE AND SPACING

BOLT DIAMETER	MIN. EDGE	SPACING
½	⅞	1½
⅝	1⅛	1⅞
¾	1¼	2¼
⅞	1½	2⅝
1	1¾	3



– DIMENSIONS GIVEN IN INCHES

PLANS PREPARED FOR:

EVEREST – INFRASTRUCTURE PARTNERS –
TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498–7462

PROJECT INFORMATION:

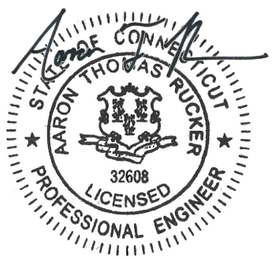
MANCHESTER CO
SITE #: 701816

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

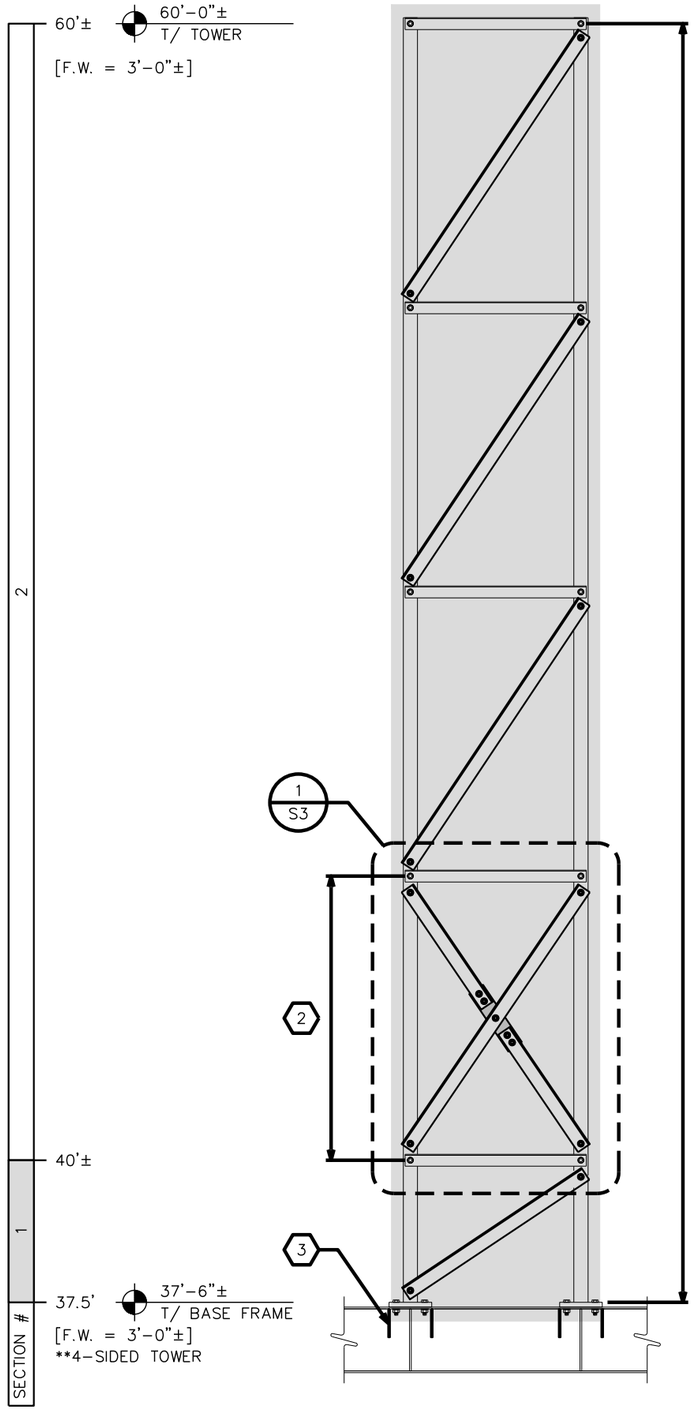
SHEET TITLE:

PROJECT NOTES II

SHEET NUMBER: **N-3**

REVISION: **0**

TEP #: 257649.494504



TOWER ELEVATION

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

MODIFICATION SCHEDULE

NO.	MODIFICATION DESCRIPTION	ELEVATION (FT.)	SHEET
1	REPLACE EXISTING SINGLE ANGLE DIAGONAL BRACING.	37.5 – 60	S-2
2	CONVERT EXISTING SINGLE DIAGONAL BRACING TO X-TYPE DIAGONAL BRACING.	40 – 45	S-3
3	INSTALL FLANGE STIFFENERS ON BASE FRAME BEAMS.	37 – 37.5	S-4, S-5
4	MODIFICATION INSPECTION BY TEP. CONTACT TEP FOR FEE: PMI@TEPGROUP.NET.	–	N-1

NOTES:

1. DIAGONAL BRACE ORIENTATION SHOWN IS TYPICAL OF TWO FACES OF THE TOWER. OTHER TWO FACES ARE SIMILAR WITH OPPOSITE DIAGONAL ORIENTATION.
2. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO PROVIDE THE MODIFICATION INSPECTOR/ ENGINEER OF RECORD WITH A SEALED CERTIFIED WELD INSPECTION REPORT. THIS REPORT SHALL DOCUMENT THE ENTIRE WELDING PROCESS (PRE/DURING/POST) WITH PROPER PHOTOS. WELDING SHALL CONFORM TO AWS D1.1/D1.1M: 2015 "STRUCTURAL WELDING CODE-STEEL", FOR ADDITIONAL NOTES, SEE WELDING NOTES.
3. DUE TO THE MODIFICATIONS REQUIRED, CONTINUOUS INSPECTIONS AND MATERIAL TESTING WILL NEED TO BE PERFORMED.
4. PRIOR TO FABRICATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. LENGTHS AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY AND SHALL NOT BE USED FOR FABRICATION.
5. ANTENNAS AND OTHER APPURTENANCES MAY NEED TO BE TEMPORARILY REMOVED OR MOVED DURING THE INSTALLATION OF THE MODIFICATIONS SHOWN ABOVE.
6. ALL BOLTS ARE TO BE GRADE A325 WITH THREADS EXCLUDED FROM SHEAR PLANE (A325-X) UNLESS NOTED OTHERWISE. SEE SHEET N-3 FOR BOLT DETAILS.

0 2 4

SCALE IN FEET

PLANS PREPARED FOR:

EVEREST
INFRASTRUCTURE PARTNERS

TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498-7462

PROJECT INFORMATION:

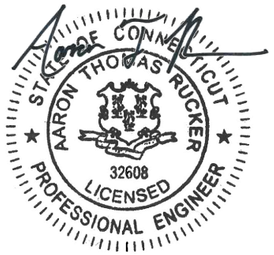
MANCHESTER CO
SITE #: 701816

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

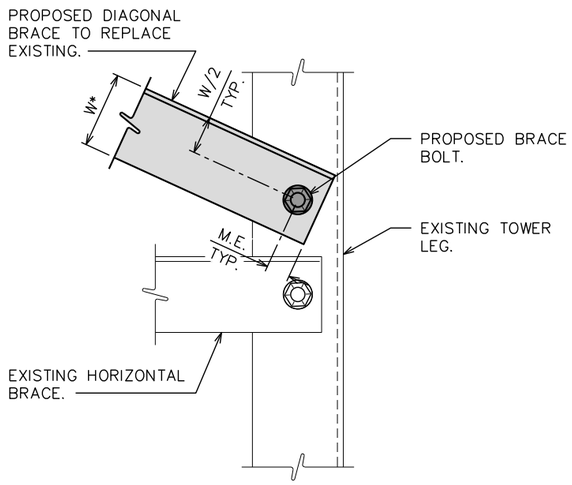
SHEET TITLE:

TOWER ELEVATION AND MODIFICATION SCHEDULE

SHEET NUMBER: **S-1**

REVISION: **0**

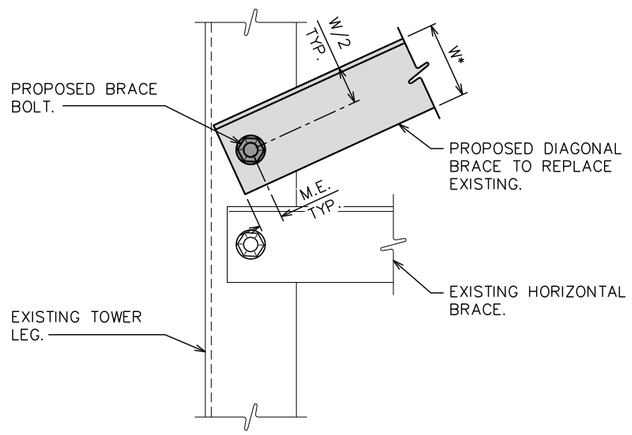
TEP#:257649.494504



*"W" = ANGLE LEG HEIGHT

TYP. CONNECTION ALONG LEG (ALT. 1)

SCALE: N.T.S.



*"W" = ANGLE LEG HEIGHT

TYP. CONNECTION ALONG LEG (ALT. 2)

SCALE: N.T.S.

DIAGONAL BRACE SCHEDULE

SEC. #	ELEVATION (FT.)	PANEL	DIAGONAL BRACE				BRACE BOLTS		CENTER BOLTS	
			EXISTING	PROPOSED (ASTM A572-50)	AVERAGE LENGTH	QTY	SIZE x LENGTH (A325-X)	QTY	SIZE x LENGTH (A325-X)	QTY
1	37.5 – 40	SEE SHEET S-1	L2-1/2x2-1/2x3/16	L3x3x1/4	3.9'	4	5/8"ø x 1 3/4"	8	–	–
2	40 – 60		L2-1/2x2-1/2x3/16	L3x3x1/4	5.8'	16	5/8"ø x 1 3/4"	32	–	–

1. DIAGONAL BRACE ORIENTATION VARIES BY TOWER FACE. PROPOSED MEMBER ORIENTATION SHALL MATCH EXISTING.
2. SEE SHEET N-3 FOR HOLE SIZE, GAGE, BOLT SPACING, MINIMUM EDGE DISTANCE, STITCH/CENTER CONNECTION, AND MAXIMUM ALLOWABLE ANGLE COPES.
3. PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. AVERAGE LENGTH AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.
4. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL. SEE SHEET N-2 FOR DETAILS.
5. ALL HOLES SHALL BE DRILLED OR PUNCHED.

PLANS PREPARED FOR:

EVEREST
– INFRASTRUCTURE PARTNERS –
TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498-7462

PROJECT INFORMATION:

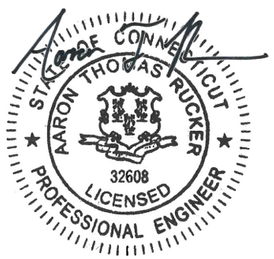
MANCHESTER CO
SITE #: 701816

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

SHEET TITLE:

DIAGONAL REPLACEMENT DETAILS

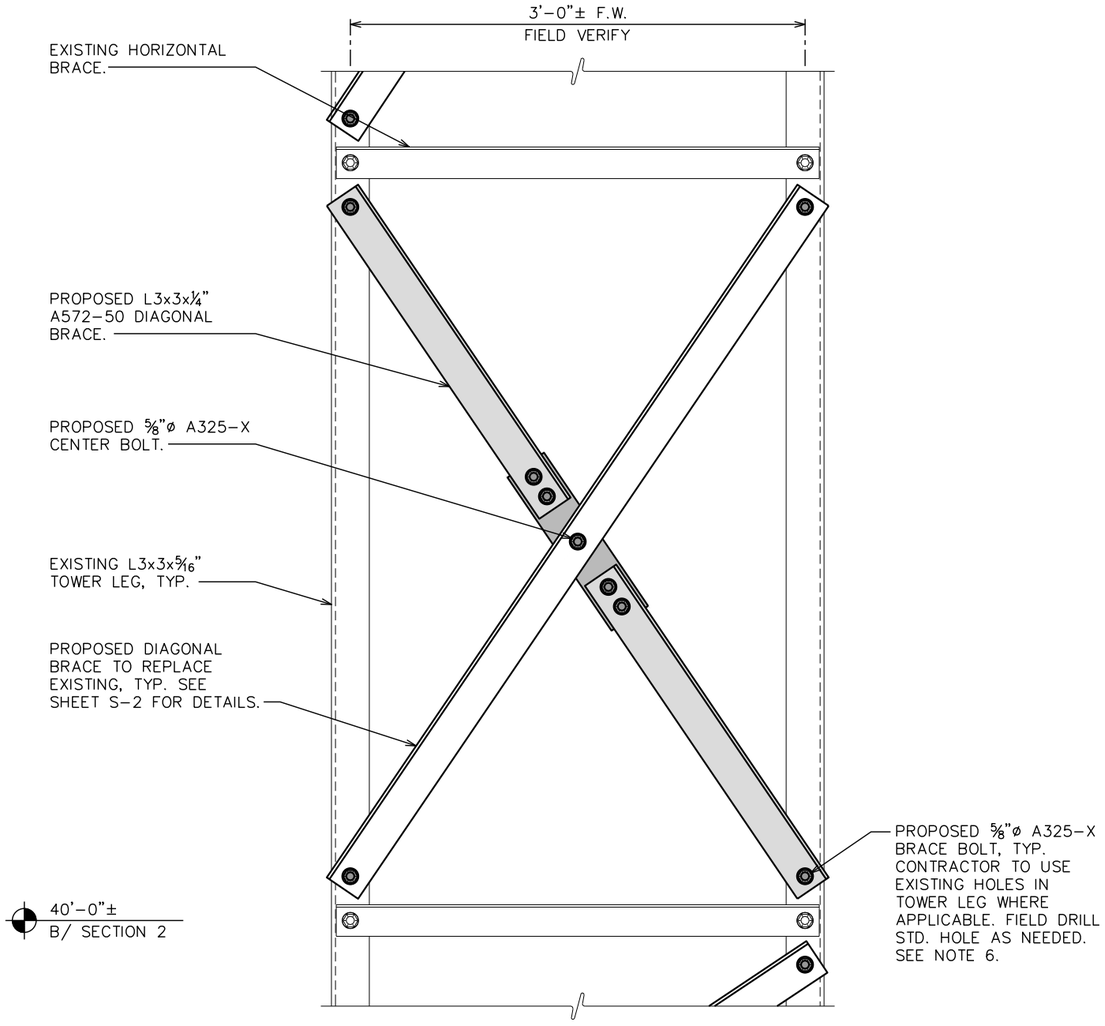
SHEET NUMBER: **S-2**

REVISION: **0**

TEP#:257649.494504

NOTES:

1. DIAGONAL BRACE ORIENTATION SHOWN IS TYPICAL OF TWO FACES OF THE TOWER. OTHER TWO FACES ARE SIMILAR WITH OPPOSITE DIAGONAL ORIENTATION.
2. SEE SHEET N-3 FOR HOLE SIZE, GAGE, BOLT SPACING, MINIMUM EDGE DISTANCE, STITCH/CENTER CONNECTION, AND MAXIMUM ALLOWABLE ANGLE COPES.
3. PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. AVERAGE LENGTH AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.
4. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL. SEE SHEET N-2 FOR DETAILS.
5. ALL HOLES SHALL BE DRILLED OR PUNCHED.
6. EXISTING BOLT HOLES IN LEG MAY BE USED FOR PROPOSED BRACE BOLTS IF THEY ARE STANDARD SIZE HOLES LOCATED AT LEAST 1" FROM TOE OF ANGLE. FIELD-DRILLED HOLES SHALL BE CENTERED AT LEAST 1½" FROM NEAREST EXISTING HOLE.

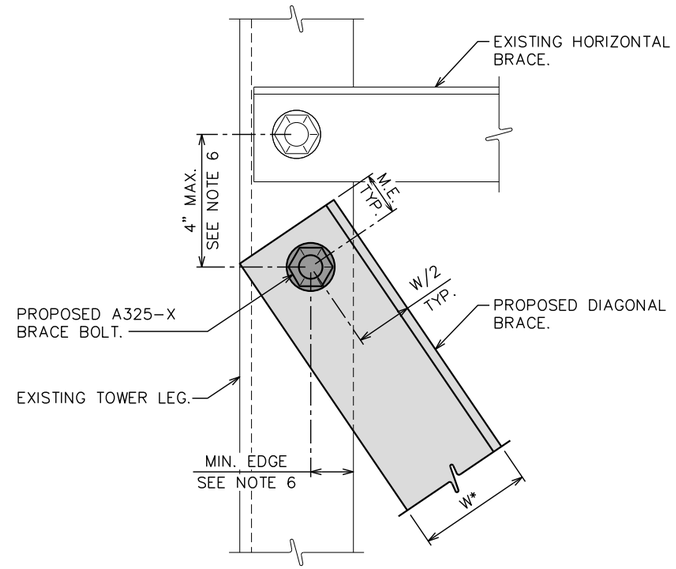


DETAIL 1

SCALE: 1" = 1'-0"

0 1 2

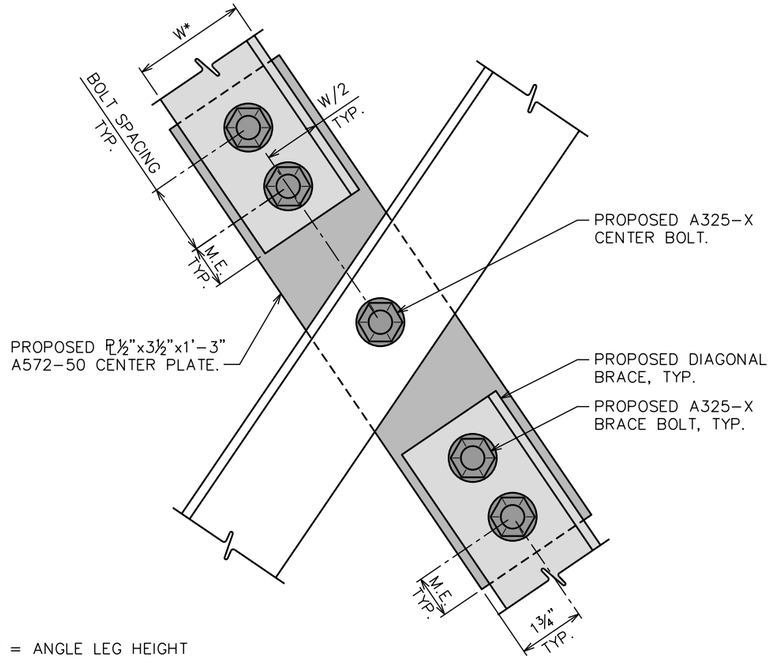
SCALE IN FEET



*W = ANGLE LEG HEIGHT

DIAGONAL CONNECTION AT TOWER LEG

SCALE: N.T.S.



*W = ANGLE LEG HEIGHT

DIAGONAL CENTER CONNECTION

SCALE: N.T.S.

PLANS PREPARED FOR:

EVEREST
INFRASTRUCTURE PARTNERS

TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498-7462

PROJECT INFORMATION:

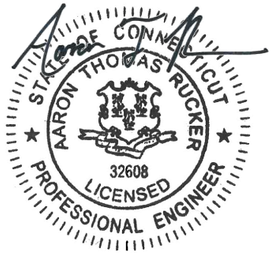
MANCHESTER CO
SITE #: 701816

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:



February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

SHEET TITLE:

DIAGONAL BRACING DETAILS

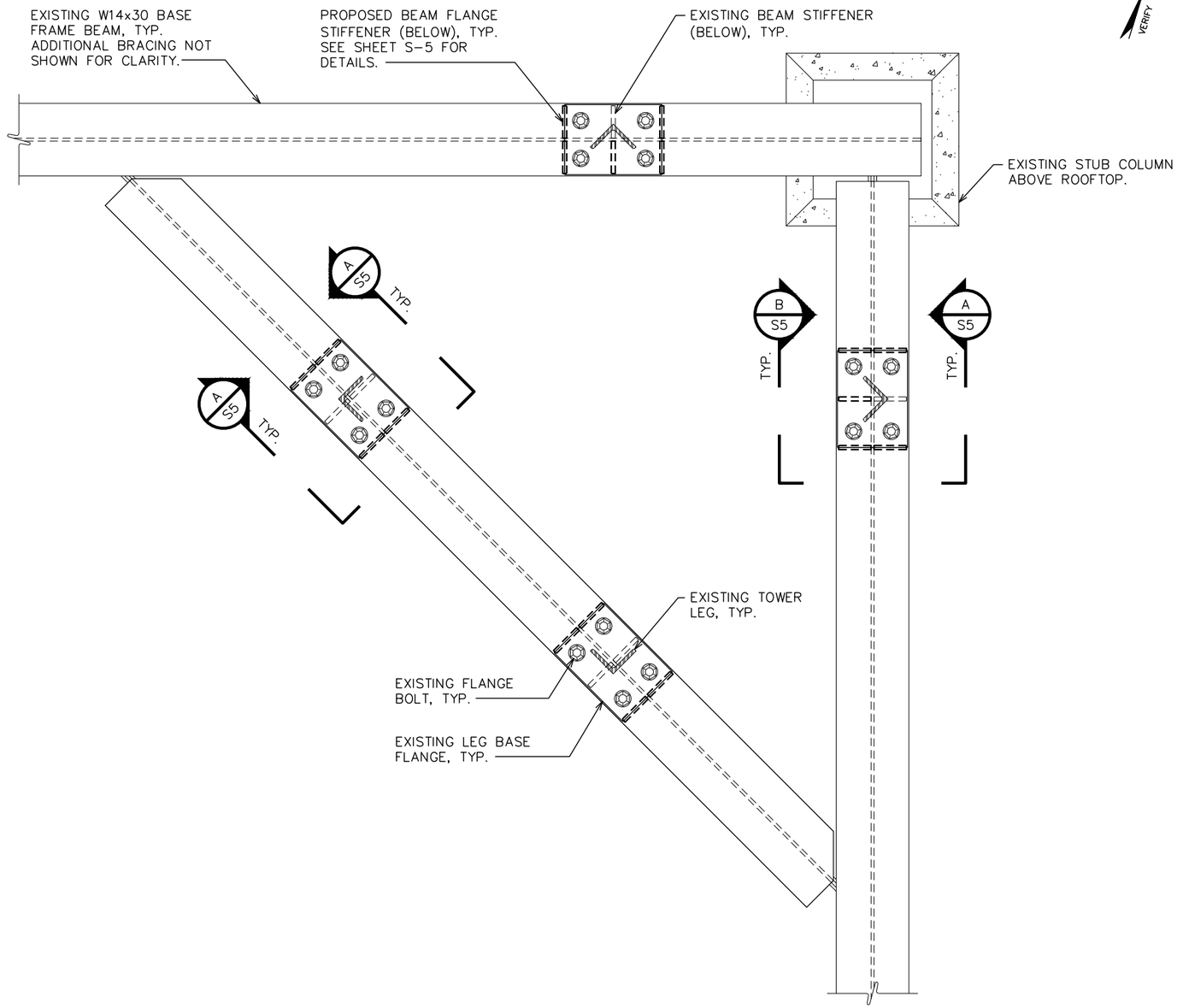
SHEET NUMBER: **S-3**

REVISION: **0**

TEP#: 257649.494504

NOTES:

1. SEE SHEET N-3 FOR HOLE SIZE, GAGE, BOLT SPACING, MINIMUM EDGE DISTANCE, STITCH/CENTER CONNECTION, AND MAXIMUM ALLOWABLE ANGLE COPES.
2. PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. AVERAGE LENGTH AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.
3. ALL CONNECTIONS NOT FULLY DETAILED ON THESE PLANS SHALL BE DETAILED BY THE STEEL FABRICATOR IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL. SEE SHEET N-2 FOR DETAILS.
4. ALL HOLES SHALL BE DRILLED OR PUNCHED.



BASE FRAME PLAN VIEW

SCALE: 1" = 1'-0"

0 1 2

SCALE IN FEET

PLANS PREPARED FOR:

EVEREST
INFRASTRUCTURE PARTNERS

TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498-7462

PROJECT INFORMATION:

MANCHESTER CO
SITE #: 701816

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

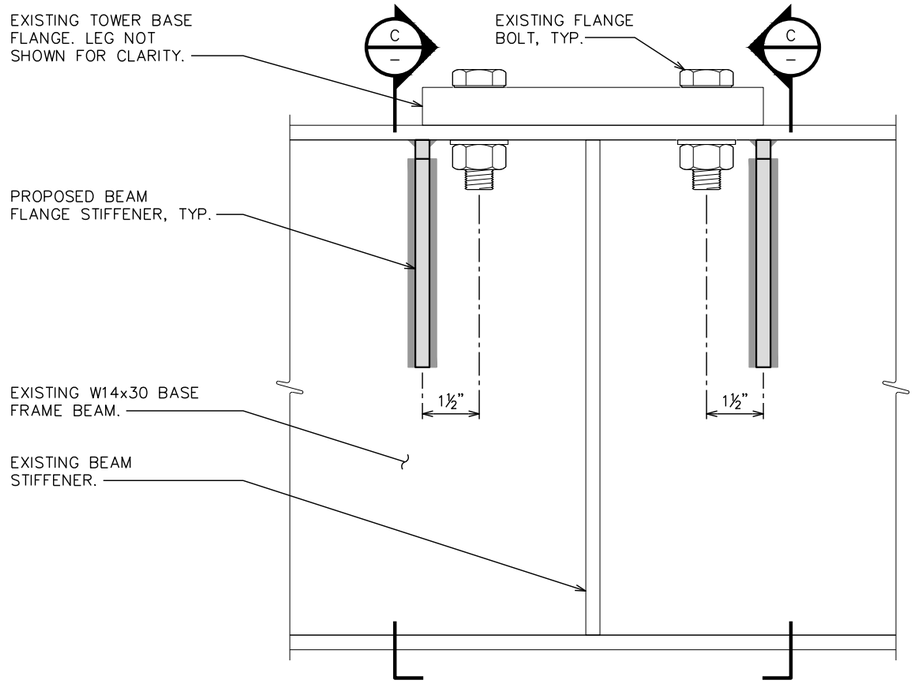
SHEET TITLE:

BASE FRAME REINFORCEMENT DETAILS I

SHEET NUMBER: **S-4**

REVISION: **0**

TEP#:257649.494504

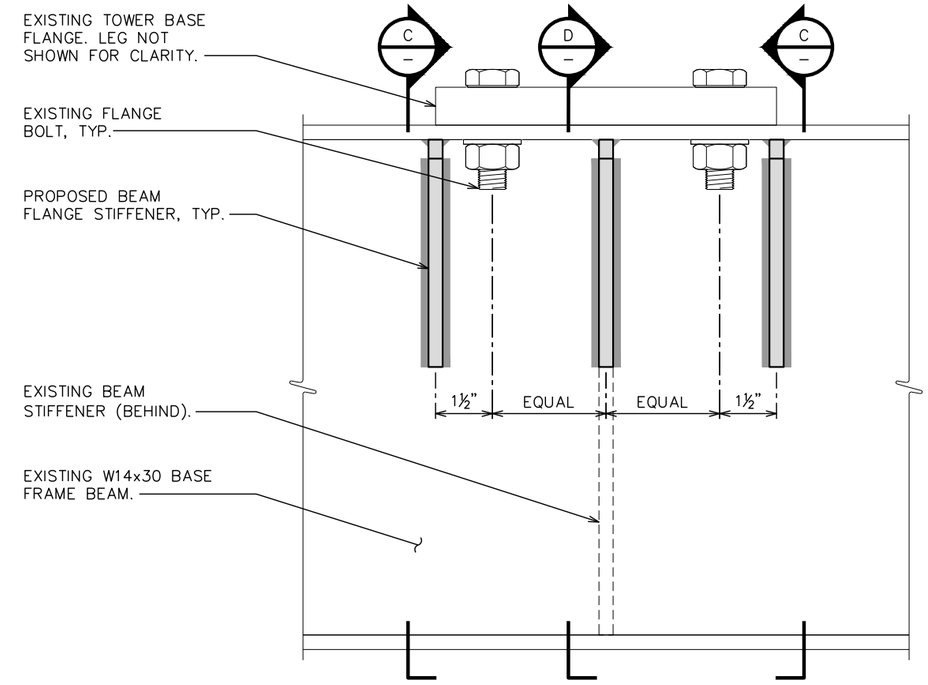


SECTION A

SCALE: 3" = 1'-0"

0 3" 6" 9" 12"

SCALE IN INCHES

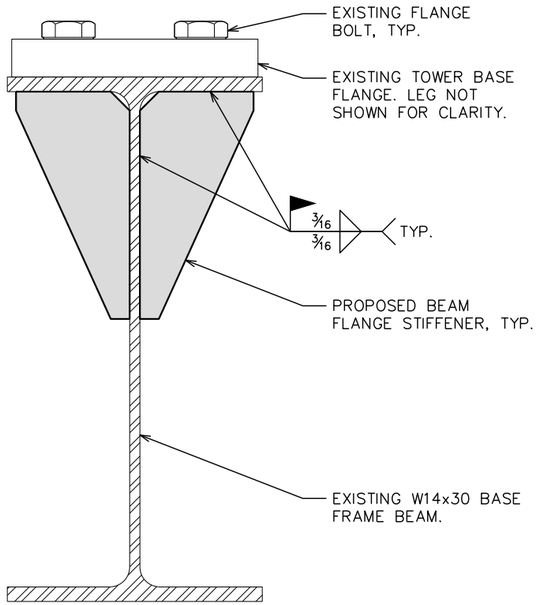


SECTION B

SCALE: 3" = 1'-0"

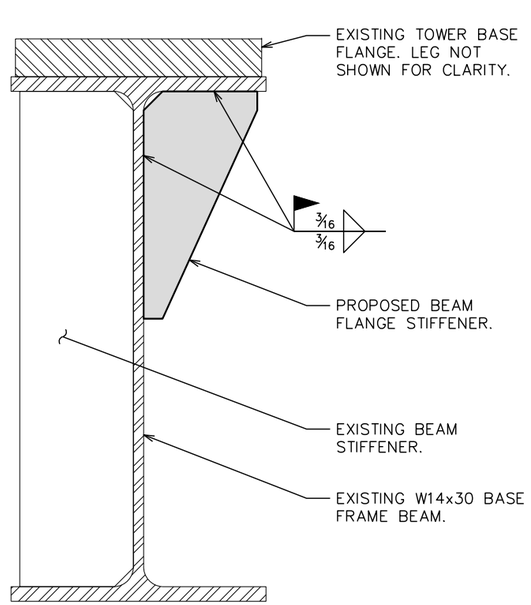
0 3" 6" 9" 12"

SCALE IN INCHES



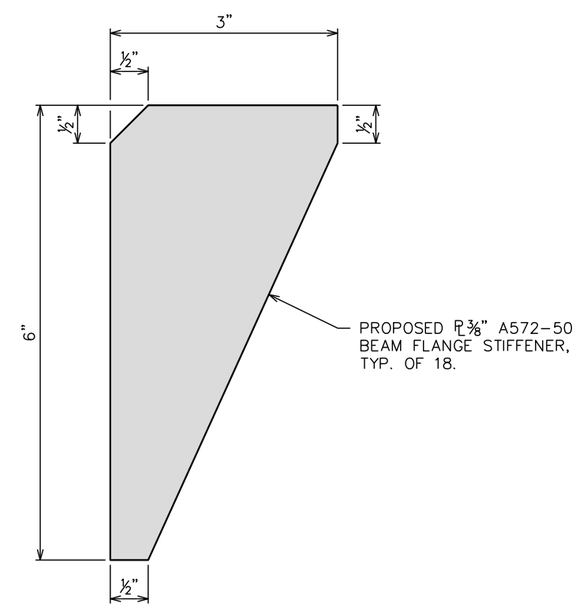
SECTION C

SCALE: 3" = 1'-0"



SECTION D

SCALE: 3" = 1'-0"



BEAM FLANGE STIFFENER DETAIL

SCALE: 6" = 1'-0"

PLANS PREPARED FOR:

EVEREST
INFRASTRUCTURE PARTNERS

TWO ALLEGHENY CENTER
NOVA TOWER 2, SUITE 703
PITTSBURGH, PA 15212
OFFICE: (603) 498-7462

PROJECT INFORMATION:

MANCHESTER CO
SITE #: 701816

52 EAST CENTER STREET
MANCHESTER, CT 06040
(HARTFORD COUNTY)

PLANS PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
OFFICE: (919) 661-6351
www.tepgroup.net

SEAL:

STATE OF CONNECTICUT
AARON THOMAS RUCKER
32608
LICENSED
PROFESSIONAL ENGINEER

February 19, 2021

REV	DATE	ISSUED FOR:
0	02-19-21	MODIFICATION DRAWINGS

DRAWN BY: EAJ | CHECKED BY: ECL

SHEET TITLE:

BASE FRAME REINFORCEMENT DETAILS II

SHEET NUMBER: **S-5**

REVISION: **0**

TEP#:257649.494504

EXHIBIT 4

October 9, 2020
October 22, 2020 (Rev.1)

Centerline Communications
750 West Center Street, Suite #301
West Bridgewater, MA 02379

RE:		
	Site Number:	CT1070 (LTE 4C/5C/ 5G NR)
	FA Number:	10035030
	PACE Number:	MRCTB047216
	PT Number:	2051A0VDAE
	Site Name:	MANCHESTER-EAST CENTER ST
	Site Address:	52 East Center Street Manchester, CT 06040

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by Centerline Communications to perform a mount analysis on the existing AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (3) 800-10121 Antennas (54.5"x10.3"x5.9"– Wt. = 47 lbs. /each)
- (3) QS66512-2 Antennas (72.0"x12.0"x9.6" – Wt. = 111 lbs. /each)
- (3) RRUS-32 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) RRUS-12 B2 RRH's (20.4"x18.5"x7.5" – Wt. = 58 lbs. /each)
- (3) DTMABP7819VG12A TMA's (10.7"x11.1"x3.8" - Wt. = 20 lbs. /each)
- (6) TPX-070821 Triplexers (5.9"x9.7"x2.1" – Wt. = 8 lbs. /each)
- (2) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each)
- **(2) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 80 lbs. /each)**
- **(1) DMP65R-BU8DA Antennas (96.0"x20.7"x7.7" – Wt. = 119 lbs. /each)**
- **(2) OPA65R-BU6DA Antennas (71.2"x21.0"x7.8" – Wt. = 64 lbs. /each)**
- **(1) OPA65R-BU8DA Antennas (96.0"x21.0"x7.8" – Wt. = 77 lbs. /each)**
- **(3) B5/B12 4449 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**
- **(3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)**
- **(3) 4426 B66 RRH's (14.9"x13.2"x5.8" – Wt. = 49 lbs. /each)**
- **(1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each)**

**Proposed equipment shown in bold*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing AT&T antenna mounts on July 2, 2020.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R13.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30-degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 125 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.60 in was used for this analysis.
- HDG considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- HDG considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.178 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.064.
- The mount has been analyzed with load combinations consisting of 250 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 2.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mount is secured to the existing tower with angles and bolts. The connection is considered OK by visual inspection.

Based on our evaluation, we have determined that the existing mount **IS CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing (LTE 4C/5C/ 5G NR) Mount Rating	6	LC9	97%	**PASS**

Reference Documents:

- Mount Structural Analysis prepared by Cenrek Engineering dated July 13, 2017

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

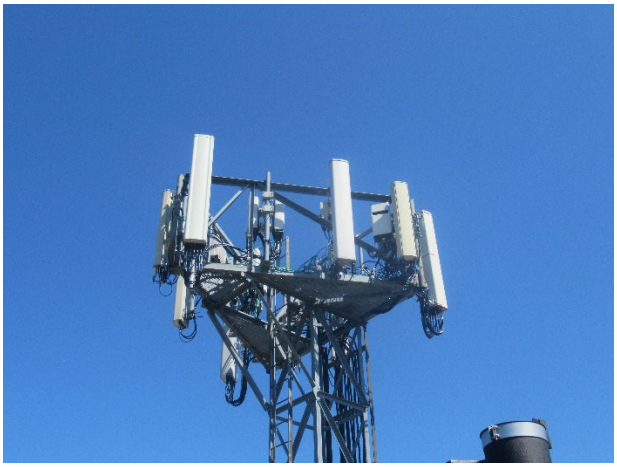
Please feel free to contact our office should you have any questions.

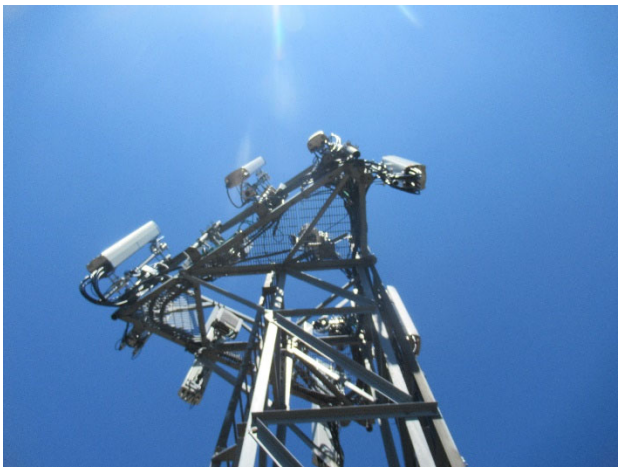
Respectfully Submitted,
Hudson Design Group LLC

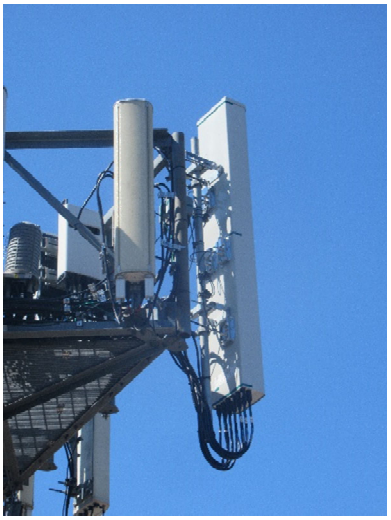
Michael Cabral
Vice President

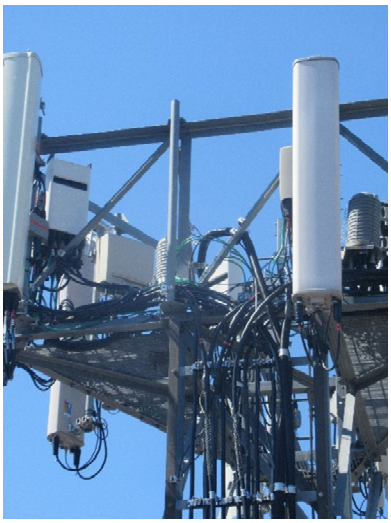
Daniel P. Hamm, PE
Principal

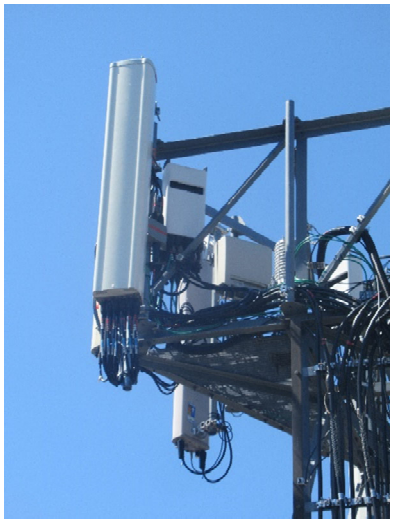
FIELD PHOTOS:



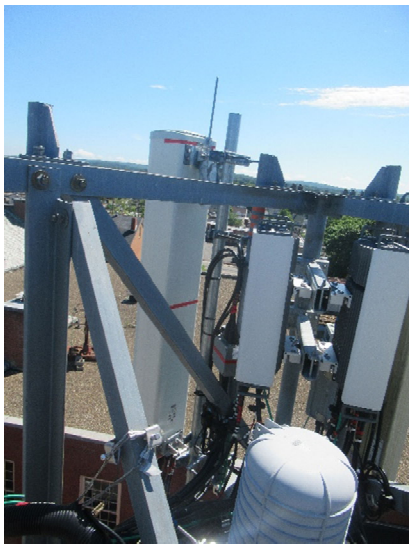













HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

z=	63	(ft)
z_g=	900	(ft)
α=	9.5	

K_z= 1.148

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c\ K_t/K_h)]^2$

$K_h = e^{(f*z/H)}$

K_{zt}= #DIV/0!

K_h= #DIV/0!

(If Category 1 then K_{zt}=1.0)

K_c=	1	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	63	
z_s=	273	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	0.99	(from 2.6.8)

Category= 1

2.6.10 Design Ice Thickness

Max Ice Thickness =	t_i = 1.50	in
Importance Factor =	I= 1.0	(from Table 2-3)
	K_{iz} = 1.07	(from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$

t_{iz} = 1.60 in

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	61.5	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

$F = q_z * G_h * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

		K_z=	1.148	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**38.66**	K_e=	0.99	(from 2.6.8)
$q_{z\ (ice)}$=	**6.19**	K_d=	0.85	(from Table 2-2)
$q_{z\ (30)}$=	**2.23**	V_{max}=	125	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 1.60 in | **Angle =** 0 (deg) | **Equivalent Angle =** 180 (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
800-10121 Antenna	54.5	10.3	5.9	3.90	5.29	1.32	200	44	11
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	491	95	28
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.39	1.24	498	96	29
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	4.64	1.30	691	132	40
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	4.57	1.29	699	133	40
QS66512-2 Antenna	72.0	12.0	9.6	6.00	6.00	1.36	314	67	18
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.36	1.20	76	18	4
B5/B12 4449 RRH (Side)	17.9	9.4	13.2	1.17	0.00	1.20	54	14	3
B14 4478 RRH	18.1	13.4	8.3	1.68	1.35	1.20	78	18	5
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	2.18	1.20	48	13	3
4426 B66 RRH	14.9	13.2	5.8	1.37	1.13	1.20	63	15	4
4426 B66 RRH (Side)	14.9	5.8	13.2	0.60	2.57	1.20	28	8	2
RRUS-32 RRH	27.2	12.1	7.0	2.29	2.25	1.20	106	24	6
RRUS-32 RRH (Side)	27.2	7.0	12.1	1.32	3.89	1.26	64	17	4
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.10	1.20	122	26	7
RRUS-12 B2 RRH (Side)	20.4	7.5	18.5	1.06	2.72	1.21	50	13	3
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.96	1.20	38	10	2
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.61	1.20	18	6	1
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	44	11	3
4x3 Angle	4.0	12.0		0.33	0.33	2.00	26		
3x3 Angle	3.0	12.0		0.25	0.25	2.00	19		
2-1/2x2-1/2 Angle	2.5	12.0		0.21	0.21	2.00	16		
3" Pipe	3.5	12.0		0.29	0.29	1.20	14		
2" Pipe	2.4	12.0		0.20	0.20	1.20	9		

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 30 (deg) | Ice Thickness = 1.60 in. | Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	200	127	181
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	491	217	423
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	498	219	428
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	691	314	597
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	699	317	604
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	314	263	302
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	76	54	71
B5/B12 4449 RRH (Side)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	38	76	48
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	78	48	71
B14 4478 RRH (Side)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	39	78	49
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	63	28	54
4426 B66 RRH (Side)	14.9	6.6	13.2	0.68	1.37	2.26	1.13	1.20	1.20	32	63	40
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	106	64	96
RRUS-32 RRH (Side)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	57	106	69
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	122	50	104
RRUS-12 B2 RRH (Side)	20.4	9.3	18.5	1.31	2.62	2.21	1.10	1.20	1.20	61	122	76
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	38	13	32
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	18	4	15

WIND LOADS WITH ICE:

800-10121 Antenna	57.7	13.5	9.1	5.41	3.65	4.27	6.34	1.28	1.37	43	31	40
DMP65R-BU6DA Antenna	74.4	23.9	10.9	12.35	5.63	3.11	6.83	1.23	1.39	94	48	82
OPA65R-BU6DA Antenna	74.4	24.2	11.0	12.50	5.68	3.07	6.76	1.23	1.39	95	49	83
DMP65R-BU8DA Antenna	99.2	23.9	10.9	16.46	7.51	4.15	9.10	1.27	1.47	130	68	114
OPA65R-BU8DA Antenna	99.2	24.2	11.0	16.67	7.58	4.10	9.02	1.27	1.47	131	69	115
QS66512-2 Antenna	75.2	15.2	12.8	7.94	6.68	4.95	5.87	1.31	1.35	64	56	62
B5/B12 4449 RRH	21.1	16.4	12.6	2.40	1.85	1.29	1.67	1.20	1.20	18	14	17
B5/B12 4449 RRH (Side)	21.1	8.2	16.4	1.20	2.40	2.57	1.29	1.20	1.20	9	18	11
B14 4478 RRH	21.3	16.6	11.5	2.46	1.70	1.28	1.85	1.20	1.20	18	13	17
B14 4478 RRH (Side)	21.3	8.3	16.6	1.23	2.46	2.57	1.28	1.20	1.20	9	18	11
4426 B66 RRH	18.1	16.4	9.0	2.06	1.13	1.10	2.01	1.20	1.20	15	8	14
4426 B66 RRH (Side)	18.1	8.2	16.4	1.03	2.06	2.21	1.10	1.20	1.20	8	15	10
RRUS-32 RRH	30.4	15.3	10.2	3.23	2.15	1.99	2.98	1.20	1.22	24	16	22
RRUS-32 RRH (Side)	30.4	7.7	15.3	1.62	3.23	3.97	1.99	1.27	1.20	13	24	15
RRUS-12 B2 RRH	23.6	21.7	10.7	3.56	1.75	1.09	2.21	1.20	1.20	26	13	23
RRUS-12 B2 RRH (Side)	23.6	10.9	21.7	1.78	3.56	2.18	1.09	1.20	1.20	13	26	16
DTMABP7819VG12A TMA	13.9	14.3	7.0	1.38	0.68	0.97	1.99	1.20	1.20	10	5	9
TPX-070821 Triplexer	9.1	12.9	5.3	0.82	0.33	0.71	1.72	1.20	1.20	6	2	5

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	11	7	10
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	28	13	24
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	29	13	25
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	40	18	34
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	40	18	35
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	18	15	17
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	4	3	4
B5/B12 4449 RRH (Side)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	2	4	3
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
B14 4478 RRH (Side)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	2	5	3
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	3
4426 B66 RRH (Side)	14.9	6.6	13.2	0.68	1.37	2.26	1.13	1.20	1.20	2	4	2
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	6
RRUS-32 RRH (Side)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	3	6	4
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	7	3	6
RRUS-12 B2 RRH (Side)	20.4	9.3	18.5	1.31	2.62	2.21	1.10	1.20	1.20	4	7	4
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	2	1	2
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	1	0	1

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 60 (deg) | Ice Thickness = 1.60 in. | Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	200	127	145
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	491	217	286
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	498	219	289
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	691	314	408
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	699	317	413
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	314	263	276
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	76	54	60
B5/B12 4449 RRH (Side)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	57	76	71
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	78	48	56
B14 4478 RRH (Side)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	59	78	73
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	63	28	37
4426 B66 RRH (Side)	14.9	9.9	13.2	1.02	1.37	1.51	1.13	1.20	1.20	48	63	59
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	106	64	75
RRUS-32 RRH (Side)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	81	106	100
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	122	50	68
RRUS-12 B2 RRH (Side)	20.4	13.9	18.5	1.97	2.62	1.47	1.10	1.20	1.20	91	122	114
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	38	13	20
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	18	4	8

WIND LOADS WITH ICE:

800-10121 Antenna	57.7	13.5	9.1	5.41	3.65	4.27	6.34	1.28	1.37	43	31	34
DMP65R-BU6DA Antenna	74.4	23.9	10.9	12.35	5.63	3.11	6.83	1.23	1.39	94	48	60
OPA65R-BU6DA Antenna	74.4	24.2	11.0	12.50	5.68	3.07	6.76	1.23	1.39	95	49	60
DMP65R-BU8DA Antenna	99.2	23.9	10.9	16.46	7.51	4.15	9.10	1.27	1.47	130	68	84
OPA65R-BU8DA Antenna	99.2	24.2	11.0	16.67	7.58	4.10	9.02	1.27	1.47	131	69	84
QS66512-2 Antenna	75.2	15.2	12.8	7.94	6.68	4.95	5.87	1.31	1.35	64	56	58
B5/B12 4449 RRH	21.1	16.4	12.6	2.40	1.85	1.29	1.67	1.20	1.20	18	14	15
B5/B12 4449 RRH (Side)	21.1	12.3	16.4	1.80	2.40	1.72	1.29	1.20	1.20	13	18	17
B14 4478 RRH	21.3	16.6	11.5	2.46	1.70	1.28	1.85	1.20	1.20	18	13	14
B14 4478 RRH (Side)	21.3	12.5	16.6	1.84	2.46	1.71	1.28	1.20	1.20	14	18	17
4426 B66 RRH	18.1	16.4	9.0	2.06	1.13	1.10	2.01	1.20	1.20	15	8	10
4426 B66 RRH (Side)	18.1	12.3	16.4	1.55	2.06	1.47	1.10	1.20	1.20	11	15	14
RRUS-32 RRH	30.4	15.3	10.2	3.23	2.15	1.99	2.98	1.20	1.22	24	16	18
RRUS-32 RRH (Side)	30.4	11.5	15.3	2.42	3.23	2.65	1.99	1.21	1.20	18	24	23
RRUS-12 B2 RRH	23.6	21.7	10.7	3.56	1.75	1.09	2.21	1.20	1.20	26	13	16
RRUS-12 B2 RRH (Side)	23.6	16.3	21.7	2.67	3.56	1.45	1.09	1.20	1.20	20	26	25
DTMABP7819VG12A TMA	13.9	14.3	7.0	1.38	0.68	0.97	1.99	1.20	1.20	10	5	6
TPX-070821 Triplexer	9.1	12.9	5.3	0.82	0.33	0.71	1.72	1.20	1.20	6	2	3

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	11	7	8
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	28	13	16
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	29	13	17
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	40	18	24
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	40	18	24
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	18	15	16
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	4	3	3
B5/B12 4449 RRH (Side)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	3	4	4
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Side)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	3	5	4
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	2
4426 B66 RRH (Side)	14.9	9.9	13.2	1.02	1.37	1.51	1.13	1.20	1.20	3	4	3
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 RRH (Side)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	5	6	6
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	7	3	4
RRUS-12 B2 RRH (Side)	20.4	13.9	18.5	1.97	2.62	1.47	1.10	1.20	1.20	5	7	7
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	2	1	1
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	1	0	0

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.60	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	200	127	127
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	491	217	217
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	498	219	219
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	691	314	314
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	699	317	317
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	314	263	263
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	76	54	54
B5/B12 4449 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	54	76	76
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	78	48	48
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	48	78	78
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	63	28	28
4426 B66 RRH (Side)	14.9	5.8	13.2	0.60	1.37	2.57	1.13	1.20	1.20	28	63	63
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	106	64	64
RRUS-32 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	64	106	106
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	122	50	50
RRUS-12 B2 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	50	122	122
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	38	13	13
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	18	4	4

WIND LOADS WITH ICE:

800-10121 Antenna	57.7	13.5	9.1	5.41	3.65	4.27	6.34	1.28	1.37	43	31	31
DMP65R-BU6DA Antenna	74.4	23.9	10.9	12.35	5.63	3.11	6.83	1.23	1.39	94	48	48
OPA65R-BU6DA Antenna	74.4	24.2	11.0	12.50	5.68	3.07	6.76	1.23	1.39	95	49	49
DMP65R-BU8DA Antenna	99.2	23.9	10.9	16.46	7.51	4.15	9.10	1.27	1.47	130	68	68
OPA65R-BU8DA Antenna	99.2	24.2	11.0	16.67	7.58	4.10	9.02	1.27	1.47	131	69	69
QS66512-2 Antenna	75.2	15.2	12.8	7.94	6.68	4.95	5.87	1.31	1.35	64	56	56
B5/B12 4449 RRH	21.1	16.4	12.6	2.40	1.85	1.29	1.67	1.20	1.20	18	14	14
B5/B12 4449 RRH (Side)	21.1	12.6	16.4	1.85	2.40	1.67	1.29	1.20	1.20	14	18	18
B14 4478 RRH	21.3	16.6	11.5	2.46	1.70	1.28	1.85	1.20	1.20	18	13	13
B14 4478 RRH (Side)	21.3	11.5	16.6	1.70	2.46	1.85	1.28	1.20	1.20	13	18	18
4426 B66 RRH	18.1	16.4	9.0	2.06	1.13	1.10	2.01	1.20	1.20	15	8	8
4426 B66 RRH (Side)	18.1	9.0	16.4	1.13	2.06	2.01	1.10	1.20	1.20	8	15	15
RRUS-32 RRH	30.4	15.3	10.2	3.23	2.15	1.99	2.98	1.20	1.22	24	16	16
RRUS-32 RRH (Side)	30.4	10.2	15.3	2.15	3.23	2.98	1.99	1.22	1.20	16	24	24
RRUS-12 B2 RRH	23.6	21.7	10.7	3.56	1.75	1.09	2.21	1.20	1.20	26	13	13
RRUS-12 B2 RRH (Side)	23.6	10.7	21.7	1.75	3.56	2.21	1.09	1.20	1.20	13	26	26
DTMABP7819VG12A TMA	13.9	14.3	7.0	1.38	0.68	0.97	1.99	1.20	1.20	10	5	5
TPX-070821 Triplexer	9.1	12.9	5.3	0.82	0.33	0.71	1.72	1.20	1.20	6	2	2

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	11	7	7
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	28	13	13
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	29	13	13
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	40	18	18
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	40	18	18
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	18	15	15
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	4	3	3
B5/B12 4449 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	4
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	5	5
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	2
4426 B66 RRH (Side)	14.9	5.8	13.2	0.60	1.37	2.57	1.13	1.20	1.20	2	4	4
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	6	6
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	7	3	3
RRUS-12 B2 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	7	7
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	2	1	1
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	1	0	0

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.60	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	200	127	145
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	491	217	286
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	498	219	289
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	691	314	408
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	699	317	413
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	314	263	276
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	76	54	60
B5/B12 4449 RRH (Side)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	57	76	71
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	78	48	56
B14 4478 RRH (Side)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	59	78	73
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	63	28	37
4426 B66 RRH (Side)	14.9	9.9	13.2	1.02	1.37	1.51	1.13	1.20	1.20	48	63	59
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	106	64	75
RRUS-32 RRH (Side)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	81	106	100
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	122	50	68
RRUS-12 B2 RRH (Side)	20.4	13.9	18.5	1.97	2.62	1.47	1.10	1.20	1.20	91	122	114
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	38	13	20
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	18	4	8

WIND LOADS WITH ICE:

800-10121 Antenna	57.7	13.5	9.1	5.41	3.65	4.27	6.34	1.28	1.37	43	31	34
DMP65R-BU6DA Antenna	74.4	23.9	10.9	12.35	5.63	3.11	6.83	1.23	1.39	94	48	60
OPA65R-BU6DA Antenna	74.4	24.2	11.0	12.50	5.68	3.07	6.76	1.23	1.39	95	49	60
DMP65R-BU8DA Antenna	99.2	23.9	10.9	16.46	7.51	4.15	9.10	1.27	1.47	130	68	84
OPA65R-BU8DA Antenna	99.2	24.2	11.0	16.67	7.58	4.10	9.02	1.27	1.47	131	69	84
QS66512-2 Antenna	75.2	15.2	12.8	7.94	6.68	4.95	5.87	1.31	1.35	64	56	58
B5/B12 4449 RRH	21.1	16.4	12.6	2.40	1.85	1.29	1.67	1.20	1.20	18	14	15
B5/B12 4449 RRH (Side)	21.1	12.3	16.4	1.80	2.40	1.72	1.29	1.20	1.20	13	18	17
B14 4478 RRH	21.3	16.6	11.5	2.46	1.70	1.28	1.85	1.20	1.20	18	13	14
B14 4478 RRH (Side)	21.3	12.5	16.6	1.84	2.46	1.71	1.28	1.20	1.20	14	18	17
4426 B66 RRH	18.1	16.4	9.0	2.06	1.13	1.10	2.01	1.20	1.20	15	8	10
4426 B66 RRH (Side)	18.1	12.3	16.4	1.55	2.06	1.47	1.10	1.20	1.20	11	15	14
RRUS-32 RRH	30.4	15.3	10.2	3.23	2.15	1.99	2.98	1.20	1.22	24	16	18
RRUS-32 RRH (Side)	30.4	11.5	15.3	2.42	3.23	2.65	1.99	1.21	1.20	18	24	23
RRUS-12 B2 RRH	23.6	21.7	10.7	3.56	1.75	1.09	2.21	1.20	1.20	26	13	16
RRUS-12 B2 RRH (Side)	23.6	16.3	21.7	2.67	3.56	1.45	1.09	1.20	1.20	20	26	25
DTMABP7819VG12A TMA	13.9	14.3	7.0	1.38	0.68	0.97	1.99	1.20	1.20	10	5	6
TPX-070821 Triplexer	9.1	12.9	5.3	0.82	0.33	0.71	1.72	1.20	1.20	6	2	3

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	11	7	8
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	28	13	16
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	29	13	17
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	40	18	24
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	40	18	24
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	18	15	16
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	4	3	3
B5/B12 4449 RRH (Side)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	3	4	4
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Side)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	3	5	4
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	2
4426 B66 RRH (Side)	14.9	9.9	13.2	1.02	1.37	1.51	1.13	1.20	1.20	3	4	3
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 RRH (Side)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	5	6	6
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	7	3	4
RRUS-12 B2 RRH (Side)	20.4	13.9	18.5	1.97	2.62	1.47	1.10	1.20	1.20	5	7	7
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	2	1	1
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	1	0	0

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.60	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	200	127	181
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	491	217	423
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	498	219	428
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	691	314	597
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	699	317	604
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	314	263	302
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	76	54	71
B5/B12 4449 RRH (Side)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	38	76	48
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	78	48	71
B14 4478 RRH (Side)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	39	78	49
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	63	28	54
4426 B66 RRH (Side)	14.9	6.6	13.2	0.68	1.37	2.26	1.13	1.20	1.20	32	63	40
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	106	64	96
RRUS-32 RRH (Side)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	57	106	69
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	122	50	104
RRUS-12 B2 RRH (Side)	20.4	9.3	18.5	1.31	2.62	2.21	1.10	1.20	1.20	61	122	76
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	38	13	32
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	18	4	15

WIND LOADS WITH ICE:

800-10121 Antenna	57.7	13.5	9.1	5.41	3.65	4.27	6.34	1.28	1.37	43	31	40
DMP65R-BU6DA Antenna	74.4	23.9	10.9	12.35	5.63	3.11	6.83	1.23	1.39	94	48	82
OPA65R-BU6DA Antenna	74.4	24.2	11.0	12.50	5.68	3.07	6.76	1.23	1.39	95	49	83
DMP65R-BU8DA Antenna	99.2	23.9	10.9	16.46	7.51	4.15	9.10	1.27	1.47	130	68	114
OPA65R-BU8DA Antenna	99.2	24.2	11.0	16.67	7.58	4.10	9.02	1.27	1.47	131	69	115
QS66512-2 Antenna	75.2	15.2	12.8	7.94	6.68	4.95	5.87	1.31	1.35	64	56	62
B5/B12 4449 RRH	21.1	16.4	12.6	2.40	1.85	1.29	1.67	1.20	1.20	18	14	17
B5/B12 4449 RRH (Side)	21.1	8.2	16.4	1.20	2.40	2.57	1.29	1.20	1.20	9	18	11
B14 4478 RRH	21.3	16.6	11.5	2.46	1.70	1.28	1.85	1.20	1.20	18	13	17
B14 4478 RRH (Side)	21.3	8.3	16.6	1.23	2.46	2.57	1.28	1.20	1.20	9	18	11
4426 B66 RRH	18.1	16.4	9.0	2.06	1.13	1.10	2.01	1.20	1.20	15	8	14
4426 B66 RRH (Side)	18.1	8.2	16.4	1.03	2.06	2.21	1.10	1.20	1.20	8	15	10
RRUS-32 RRH	30.4	15.3	10.2	3.23	2.15	1.99	2.98	1.20	1.22	24	16	22
RRUS-32 RRH (Side)	30.4	7.7	15.3	1.62	3.23	3.97	1.99	1.27	1.20	13	24	15
RRUS-12 B2 RRH	23.6	21.7	10.7	3.56	1.75	1.09	2.21	1.20	1.20	26	13	23
RRUS-12 B2 RRH (Side)	23.6	10.9	21.7	1.78	3.56	2.18	1.09	1.20	1.20	13	26	16
DTMABP7819VG12A TMA	13.9	14.3	7.0	1.38	0.68	0.97	1.99	1.20	1.20	10	5	9
TPX-070821 Triplexer	9.1	12.9	5.3	0.82	0.33	0.71	1.72	1.20	1.20	6	2	5

WIND LOADS AT 30 MPH:

800-10121 Antenna	54.5	10.3	5.9	3.90	2.23	5.29	9.24	1.32	1.47	11	7	10
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	28	13	24
OPA65R-BU6DA Antenna	71.2	21.0	7.8	10.38	3.86	3.39	9.13	1.24	1.47	29	13	25
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	40	18	34
OPA65R-BU8DA Antenna	96.0	21.0	7.8	14.00	5.20	4.57	12.31	1.29	1.58	40	18	35
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	18	15	17
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	4	3	4
B5/B12 4449 RRH (Side)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	2	4	3
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
B14 4478 RRH (Side)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	2	5	3
4426 B66 RRH	14.9	13.2	5.8	1.37	0.60	1.13	2.57	1.20	1.20	4	2	3
4426 B66 RRH (Side)	14.9	6.6	13.2	0.68	1.37	2.26	1.13	1.20	1.20	2	4	2
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	6
RRUS-32 RRH (Side)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	3	6	4
RRUS-12 B2 RRH	20.4	18.5	7.5	2.62	1.06	1.10	2.72	1.20	1.21	7	3	6
RRUS-12 B2 RRH (Side)	20.4	9.3	18.5	1.31	2.62	2.21	1.10	1.20	1.20	4	7	4
DTMABP7819VG12A TMA	10.7	11.1	3.8	0.82	0.28	0.96	2.82	1.20	1.21	2	1	2
TPX-070821 Triplexer	5.9	9.7	2.1	0.40	0.09	0.61	2.81	1.20	1.21	1	0	1

Date: 10/21/2020
Project Name: MANCHESTER-EAST CENTER ST
Project No.: CT1070
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.60 in.
Density of ice: 56 pcf

800-10121 Antenna

Weight of ice based on total radial SF area:

Height (in):	54.5	
Width (in):	10.3	
Depth (in):	5.9	
Total weight of ice on object:		120 lbs
Weight of object:	47.0 lbs	
Combined weight of ice and object:		167 lbs

DMP65R-BU6DA Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		275 lbs
Weight of object:	80.0 lbs	
Combined weight of ice and object:		355 lbs

DMP65R-BU8DA Antenna

Weight of ice based on total radial SF area:

Height (in):	96.0	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		370 lbs
Weight of object:	119.0 lbs	
Combined weight of ice and object:		489 lbs

OPA65R-BU6DA Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	21.0	
Depth (in):	7.8	
Total weight of ice on object:		278 lbs
Weight of object:	64.0 lbs	
Combined weight of ice and object:		342 lbs

OPA65R-BU8DA Antenna

Weight of ice based on total radial SF area:

Height (in):	96.0	
Width (in):	21.0	
Depth (in):	7.8	
Total weight of ice on object:		375 lbs
Weight of object:	77.0 lbs	
Combined weight of ice and object:		452 lbs

QS66512-2 Antenna

Weight of ice based on total radial SF area:

Height (in):	72.0	
Width (in):	12.0	
Depth (in):	9.6	
Total weight of ice on object:		199 lbs
Weight of object:	111.0 lbs	
Combined weight of ice and object:		310 lbs

B5/B12 4449 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.4	
Total weight of ice on object:		52 lbs
Weight of object:	73.0 lbs	
Combined weight of ice and object:		125 lbs

B14 4478 RRH

Weight of ice based on total radial SF area:

Height (in):	18.1	
Width (in):	13.4	
Depth (in):	8.3	
Total weight of ice on object:		51 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		111 lbs

4426 B66 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	5.8	
Total weight of ice on object:		39 lbs
Weight of object:	49.0 lbs	
Combined weight of ice and object:		88 lbs

RRUS-32 RRH

Weight of ice based on total radial SF area:

Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:		69 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		129 lbs

RRUS-12 B2 RRH

Weight of ice based on total radial SF area:

Height (in):	20.4	
Width (in):	18.5	
Depth (in):	7.5	
Total weight of ice on object:		72 lbs
Weight of object:	58.0 lbs	
Combined weight of ice and object:		130 lbs

DTMABP7819VG12A TMA

Weight of ice based on total radial SF area:

Height (in):	10.7	
Width (in):	11.1	
Depth (in):	3.8	
Total weight of ice on object:		23 lbs
Weight of object:	20.0 lbs	
Combined weight of ice and object:		43 lbs

TPX-070821 Triplexer

Weight of ice based on total radial SF area:

Height (in):	5.9	
Width (in):	9.7	
Depth (in):	2.1	
Total weight of ice on object:		11 lbs
Weight of object:	8.0 lbs	
Combined weight of ice and object:		19 lbs

Squid Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	24.0	
Diameter(in):	9.7	
Total weight of ice on object:		44 lbs
Weight of object:	33 lbs	
Combined weight of ice and object:		77 lbs

L 4x3 Angles

Weight of ice based on total radial SF area:

Height (in):	4	
Width (in):	3	
Per foot weight of ice on object:		13 plf

L 3x3 Angles

Weight of ice based on total radial SF area:

Height (in):	3	
Width (in):	3	
Per foot weight of ice on object:		11 plf

L 2-1/2x2-1/2 Angles

Weight of ice based on total radial SF area:

Height (in):	2.5	
Width (in):	2.5	
Per foot weight of ice on object:		10 plf

3" Pipe

Per foot weight of ice:

diameter (in):	3.5	
Per foot weight of ice on object:		10 plf

2" pipe

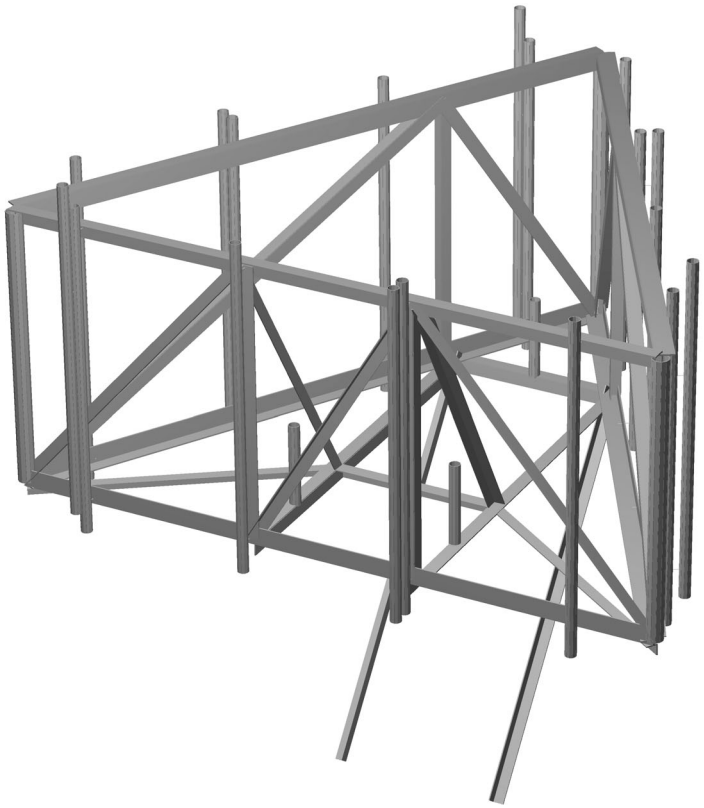
Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		8 plf

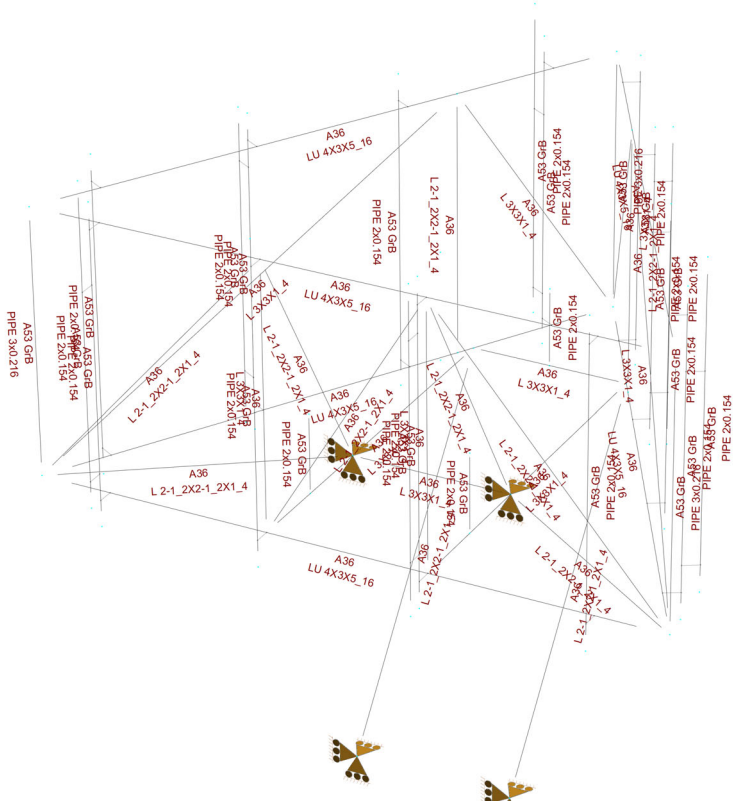
HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)

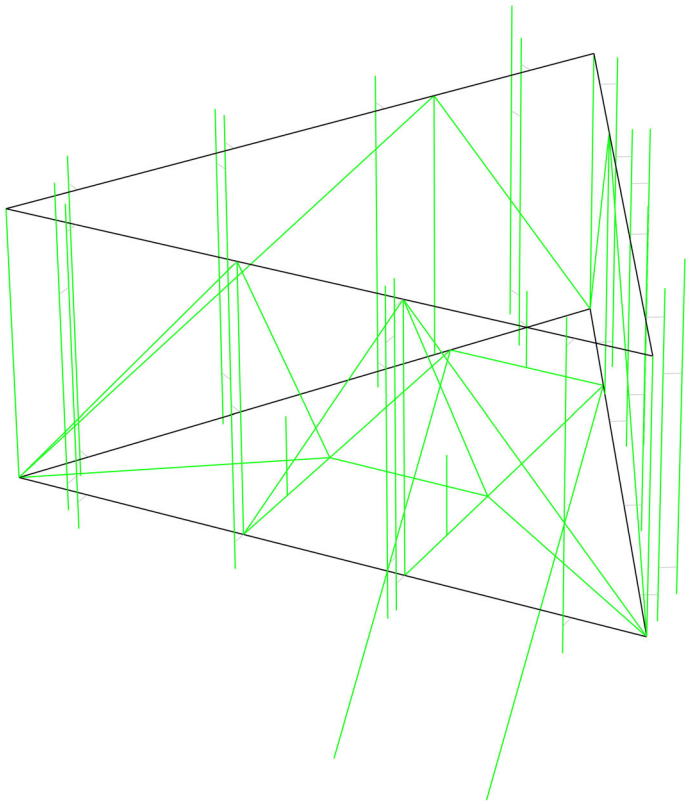
Current Date: 10/22/2020 11:59 AM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1070\Rev.1\CT1070 (Rev.1).retx



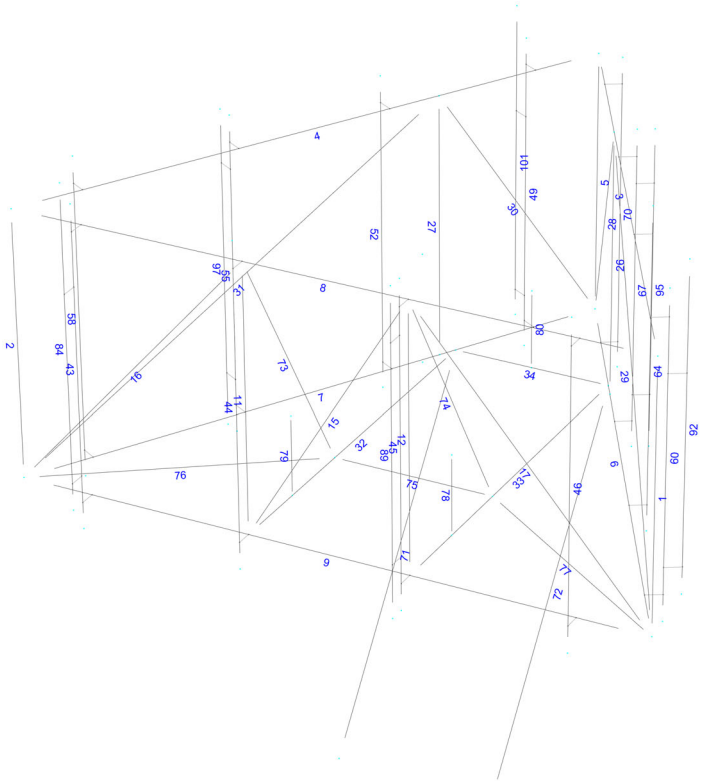
Current Date: 10/22/2020 12:00 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1070\Rev.1\CT1070 (Rev.1).retx



Current Date: 10/22/2020 12:00 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1070\Rev.1\CT1070 (Rev.1).retx



Current Date: 10/22/2020 12:00 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1070\Rev.1\CT1070 (Rev.1).retx



Current Date: 10/22/2020 11:58 AM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1070\Rev.1\CT1070 (Rev.1).retx

Load data

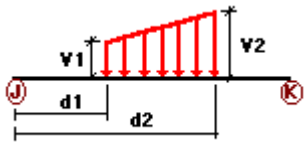
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL
LLa4	250 lb Live Load Antenna 4	No	LL

Distributed force on members

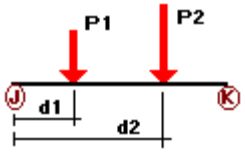


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	6	y	-0.01	0.00	0.00	No	0.00	No
	7	y	-0.01	0.00	0.00	No	0.00	No
	9	y	-0.01	0.00	0.00	No	0.00	No
	32	y	-0.01	0.00	0.00	No	0.00	No
	33	y	-0.01	0.00	0.00	No	0.00	No
	34	y	-0.01	0.00	0.00	No	0.00	No
	75	y	-0.01	0.00	0.00	No	0.00	No
	76	y	-0.01	0.00	0.00	No	0.00	No
	77	y	-0.01	0.00	0.00	No	0.00	No
W0	1	z	0.014	0.00	0.00	No	0.00	No
	2	z	0.014	0.00	0.00	No	0.00	No
	3	z	0.026	0.00	0.00	No	0.00	No
	4	z	0.026	0.00	0.00	No	0.00	No
	5	z	0.014	0.00	0.00	No	0.00	No
	6	z	0.026	0.00	0.00	No	0.00	No

	7	z	0.026	0.00	0.00	No	0.00	No
	8	z	0.026	0.00	0.00	No	0.00	No
	9	z	0.026	0.00	0.00	No	0.00	No
	11	z	0.019	0.00	0.00	No	0.00	No
	12	z	0.019	0.00	0.00	No	0.00	No
	15	z	0.016	0.00	0.00	No	0.00	No
	16	z	0.016	0.00	0.00	No	0.00	No
	17	z	0.016	0.00	0.00	No	0.00	No
	26	z	0.016	0.00	0.00	No	0.00	No
	27	z	0.016	0.00	0.00	No	0.00	No
	28	z	0.019	0.00	0.00	No	0.00	No
	29	z	0.019	0.00	0.00	No	0.00	No
	30	z	0.019	0.00	0.00	No	0.00	No
	31	z	0.019	0.00	0.00	No	0.00	No
	32	z	0.019	0.00	0.00	No	0.00	No
	33	z	0.019	0.00	0.00	No	0.00	No
	34	z	0.019	0.00	0.00	No	0.00	No
	71	z	0.016	0.00	0.00	No	0.00	No
	72	z	0.016	0.00	0.00	No	0.00	No
	73	z	0.016	0.00	0.00	No	0.00	No
	74	z	0.016	0.00	0.00	No	0.00	No
	75	z	0.019	0.00	0.00	No	0.00	No
	76	z	0.016	0.00	0.00	No	0.00	No
	77	z	0.016	0.00	0.00	No	0.00	No
W30	1	x	0.014	0.00	0.00	No	0.00	No
	2	x	0.014	0.00	0.00	No	0.00	No
	3	x	0.026	0.00	0.00	No	0.00	No
	4	x	0.026	0.00	0.00	No	0.00	No
	5	x	0.014	0.00	0.00	No	0.00	No
	6	x	0.026	0.00	0.00	No	0.00	No
	7	x	0.026	0.00	0.00	No	0.00	No
	8	x	0.026	0.00	0.00	No	0.00	No
	9	x	0.026	0.00	0.00	No	0.00	No
	11	x	0.019	0.00	0.00	No	0.00	No
	12	x	0.019	0.00	0.00	No	0.00	No
	15	x	0.016	0.00	0.00	No	0.00	No
	16	x	0.016	0.00	0.00	No	0.00	No
	17	x	0.016	0.00	0.00	No	0.00	No
	26	x	0.016	0.00	0.00	No	0.00	No
	27	x	0.016	0.00	0.00	No	0.00	No
	28	x	0.019	0.00	0.00	No	0.00	No
	29	x	0.019	0.00	0.00	No	0.00	No
	30	x	0.019	0.00	0.00	No	0.00	No
	31	x	0.019	0.00	0.00	No	0.00	No
	32	x	0.019	0.00	0.00	No	0.00	No
	33	x	0.019	0.00	0.00	No	0.00	No
	34	x	0.019	0.00	0.00	No	0.00	No
	71	x	0.016	0.00	0.00	No	0.00	No
	72	x	0.016	0.00	0.00	No	0.00	No
	73	x	0.016	0.00	0.00	No	0.00	No
	74	x	0.016	0.00	0.00	No	0.00	No
	75	x	0.019	0.00	0.00	No	0.00	No
	76	x	0.016	0.00	0.00	No	0.00	No
	77	x	0.016	0.00	0.00	No	0.00	No
Di	1	y	-0.01	0.00	0.00	No	0.00	No
	2	y	-0.01	0.00	0.00	No	0.00	No
	3	y	-0.013	0.00	0.00	No	0.00	No
	4	y	-0.013	0.00	0.00	No	0.00	No
	5	y	-0.01	0.00	0.00	No	0.00	No
	6	y	-0.013	0.00	0.00	No	0.00	No

7	y	-0.013	0.00	0.00	No	0.00	No
8	y	-0.013	0.00	0.00	No	0.00	No
9	y	-0.013	0.00	0.00	No	0.00	No
11	y	-0.011	0.00	0.00	No	0.00	No
12	y	-0.011	0.00	0.00	No	0.00	No
15	y	-0.01	0.00	0.00	No	0.00	No
16	y	-0.01	0.00	0.00	No	0.00	No
17	y	-0.01	0.00	0.00	No	0.00	No
26	y	-0.01	0.00	0.00	No	0.00	No
27	y	-0.01	0.00	0.00	No	0.00	No
28	y	-0.011	0.00	0.00	No	0.00	No
29	y	-0.011	0.00	0.00	No	0.00	No
30	y	-0.011	0.00	0.00	No	0.00	No
31	y	-0.011	0.00	0.00	No	0.00	No
32	y	-0.011	0.00	0.00	No	0.00	No
33	y	-0.011	0.00	0.00	No	0.00	No
34	y	-0.011	0.00	0.00	No	0.00	No
43	y	-0.008	0.00	0.00	No	0.00	No
44	y	-0.008	0.00	0.00	No	0.00	No
45	y	-0.008	0.00	0.00	No	0.00	No
46	y	-0.008	0.00	0.00	No	0.00	No
49	y	-0.008	0.00	0.00	No	0.00	No
52	y	-0.008	0.00	0.00	No	0.00	No
55	y	-0.008	0.00	0.00	No	0.00	No
58	y	-0.008	0.00	0.00	No	0.00	No
60	y	-0.008	0.00	0.00	No	0.00	No
64	y	-0.008	0.00	0.00	No	0.00	No
67	y	-0.008	0.00	0.00	No	0.00	No
70	y	-0.008	0.00	0.00	No	0.00	No
71	y	-0.01	0.00	0.00	No	0.00	No
72	y	-0.01	0.00	0.00	No	0.00	No
73	y	-0.01	0.00	0.00	No	0.00	No
74	y	-0.01	0.00	0.00	No	0.00	No
75	y	-0.011	0.00	0.00	No	0.00	No
76	y	-0.01	0.00	0.00	No	0.00	No
77	y	-0.01	0.00	0.00	No	0.00	No
78	y	-0.008	0.00	0.00	No	0.00	No
79	y	-0.008	0.00	0.00	No	0.00	No
80	y	-0.008	0.00	0.00	No	0.00	No
84	y	-0.008	0.00	0.00	No	0.00	No
89	y	-0.008	0.00	0.00	No	0.00	No
92	y	-0.008	0.00	0.00	No	0.00	No
95	y	-0.008	0.00	0.00	No	0.00	No
97	y	-0.008	0.00	0.00	No	0.00	No
101	y	-0.008	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	1	y	-0.058	2.50	No
		y	-0.06	2.50	No
	2	y	-0.058	2.50	No
		y	-0.06	2.50	No
	5	y	-0.058	2.50	No
		y	-0.06	2.50	No
	43	y	-0.016	3.00	No
	44	y	-0.032	0.75	No
		y	-0.032	5.25	No
		y	-0.06	1.50	No
		y	-0.046	3.50	No
	45	y	-0.073	3.00	No
	46	y	-0.024	1.00	No
		y	-0.024	5.00	No
		y	-0.02	3.00	No
	49	y	-0.016	3.00	No
	52	y	-0.032	0.75	No
		y	-0.032	5.25	No
		y	-0.06	1.50	No
		y	-0.046	3.50	No
	55	y	-0.073	3.00	No
	58	y	-0.024	1.00	No
		y	-0.024	5.00	No
		y	-0.02	3.00	No
	60	y	-0.016	3.00	No
	64	y	-0.039	0.75	No
		y	-0.039	5.25	No
		y	-0.06	1.50	No
		y	-0.046	3.50	No
	67	y	-0.073	3.00	No
	70	y	-0.024	1.00	No
		y	-0.024	5.00	No
		y	-0.02	3.00	No
	78	y	-0.033	50.00	Yes
	79	y	-0.033	50.00	Yes
	80	y	-0.033	50.00	Yes
	84	y	-0.056	1.00	No
		y	-0.056	4.50	No
	89	y	-0.04	0.50	No
		y	-0.04	5.50	No
	92	y	-0.056	1.00	No
		y	-0.056	4.50	No
	95	y	-0.06	0.50	No
		y	-0.06	5.50	No
	97	y	-0.04	0.50	No
		y	-0.04	5.50	No
	101	y	-0.056	1.00	No
		y	-0.056	4.50	No
W0	1	z	0.064	2.50	No
	2	z	0.064	2.50	No
	5	z	0.10	2.50	No
		z	0.10	2.50	No
	43	z	0.00	3.00	No
	44	z	0.249	0.75	No
		z	0.249	5.25	No
		z	0.048	1.50	No
		z	0.028	3.50	No
	45	z	0.054	3.00	No
	46	z	0.10	1.00	No
		z	0.10	5.00	No

		z	0.00	3.00	No
	49	z	0.016	3.00	No
	52	z	0.145	0.75	No
		z	0.145	5.25	No
		z	0.073	1.50	No
		z	0.059	3.50	No
	55	z	0.071	3.00	No
	58	z	0.073	1.00	No
		z	0.073	5.00	No
		z	0.02	3.00	No
	60	z	0.016	3.00	No
	64	z	0.207	0.75	No
		z	0.207	5.25	No
		z	0.073	1.50	No
		z	0.059	3.50	No
	67	z	0.071	3.00	No
	70	z	0.073	1.00	No
		z	0.073	5.00	No
		z	0.02	3.00	No
	78	z	0.044	50.00	Yes
	79	z	0.044	50.00	Yes
	80	z	0.044	50.00	Yes
	84	z	0.157	1.00	No
		z	0.157	4.50	No
	89	z	0.246	0.50	No
		z	0.246	5.50	No
	92	z	0.138	1.00	No
		z	0.138	4.50	No
	95	z	0.204	0.50	No
		z	0.204	5.50	No
	97	z	0.143	0.50	No
		z	0.143	5.50	No
	101	z	0.138	1.00	No
		z	0.138	4.50	No
W30	1	x	-0.122	2.50	No
		x	0.106	2.50	No
	2	x	-0.122	2.50	No
		x	0.106	2.50	No
	5	x	0.069	2.50	No
	43	x	0.008	3.00	No
	44	x	0.11	0.75	No
		x	0.11	5.25	No
		x	0.078	1.50	No
		x	0.063	3.50	No
	45	x	0.076	3.00	No
	46	x	0.064	1.00	No
		x	0.064	5.00	No
		x	0.013	3.00	No
	49	x	0.03	3.00	No
	52	x	0.214	0.75	No
		x	0.214	5.25	No
		x	0.049	1.50	No
		x	0.04	3.50	No
	55	x	0.048	3.00	No
	58	x	0.091	1.00	No
		x	0.091	5.00	No
		x	0.032	3.00	No
	60	x	0.03	3.00	No
	64	x	0.302	0.75	No
		x	0.302	5.25	No

		x	0.049	1.50	No
		x	0.04	3.50	No
	67	x	0.048	3.00	No
	70	x	0.091	1.00	No
		x	0.091	5.00	No
		x	0.032	3.00	No
	78	x	0.044	50.00	Yes
	79	x	0.044	50.00	Yes
	80	x	0.044	50.00	Yes
	84	x	0.132	1.00	No
		x	0.132	4.50	No
	89	x	0.109	0.50	No
		x	0.109	5.50	No
	92	x	0.151	1.00	No
		x	0.151	4.50	No
	95	x	0.299	0.50	No
		x	0.299	5.50	No
	97	x	0.212	0.50	No
		x	0.212	5.50	No
	101	x	0.151	1.00	No
		x	0.151	4.50	No
Di	1	y	-0.072	2.50	No
		y	-0.069	2.50	No
	2	y	-0.072	2.50	No
		y	-0.069	2.50	No
	5	y	-0.072	2.50	No
		y	-0.069	2.50	No
	43	y	-0.022	3.00	No
	44	y	-0.139	0.75	No
		y	-0.139	5.25	No
		y	-0.051	1.50	No
		y	-0.039	3.50	No
	45	y	-0.052	3.00	No
	46	y	-0.06	1.00	No
		y	-0.06	5.00	No
		y	-0.023	3.00	No
	49	y	-0.022	3.00	No
	52	y	-0.139	0.75	No
		y	-0.139	5.25	No
		y	-0.051	1.50	No
		y	-0.039	3.50	No
	55	y	-0.052	3.00	No
	58	y	-0.06	1.00	No
		y	-0.06	5.00	No
		y	-0.023	3.00	No
	60	y	-0.022	3.00	No
	64	y	-0.188	0.75	No
		y	-0.188	5.25	No
		y	-0.051	1.50	No
		y	-0.039	3.50	No
	67	y	-0.052	3.00	No
	70	y	-0.06	1.00	No
		y	-0.06	5.00	No
		y	-0.023	3.00	No
	78	y	-0.044	50.00	Yes
	79	y	-0.044	50.00	Yes
	80	y	-0.044	50.00	Yes
	84	y	-0.10	1.00	No
		y	-0.10	4.50	No
	89	y	-0.138	0.50	No

		y	-0.138	5.50	No
	92	y	-0.10	1.00	No
		y	-0.10	4.50	No
	95	y	-0.185	0.50	No
		y	-0.185	5.50	No
	97	y	-0.138	0.50	No
		y	-0.138	5.50	No
	101	y	-0.10	1.00	No
		y	-0.10	4.50	No
Wi0	1	z	0.017	2.50	No
	2	z	0.017	2.50	No
	5	z	0.023	2.50	No
		z	0.023	2.50	No
	43	z	0.00	3.00	No
	44	z	0.048	0.75	No
		z	0.048	5.25	No
		z	0.013	1.50	No
		z	0.008	3.50	No
	45	z	0.014	3.00	No
	46	z	0.022	1.00	No
		z	0.022	5.00	No
		z	0.00	3.00	No
	49	z	0.006	3.00	No
	52	z	0.03	0.75	No
		z	0.03	5.25	No
		z	0.017	1.50	No
		z	0.014	3.50	No
	55	z	0.017	3.00	No
	58	z	0.017	1.00	No
		z	0.017	5.00	No
		z	0.006	3.00	No
	60	z	0.006	3.00	No
	64	z	0.027	0.75	No
		z	0.027	5.25	No
		z	0.017	1.50	No
		z	0.014	3.50	No
	67	z	0.017	3.00	No
	70	z	0.017	1.00	No
		z	0.017	5.00	No
		z	0.006	3.00	No
	78	z	0.011	50.00	Yes
	79	z	0.011	50.00	Yes
	80	z	0.011	50.00	Yes
	84	z	0.034	1.00	No
		z	0.034	4.50	No
	89	z	0.048	0.50	No
		z	0.048	5.50	No
	92	z	0.029	1.00	No
		z	0.029	4.50	No
	95	z	0.042	0.50	No
		z	0.042	5.50	No
	97	z	0.03	0.50	No
		z	0.03	5.50	No
	101	z	0.029	1.00	No
		z	0.029	4.50	No
Wi30	1	x	0.026	2.50	No
		x	0.024	2.50	No
	2	x	0.026	2.50	No
		x	0.024	2.50	No
	5	x	0.015	2.50	No

	43	x	0.004	3.00	No
	44	x	0.025	0.75	No
		x	0.025	5.25	No
		x	0.018	1.50	No
		x	0.015	3.50	No
	45	x	0.018	3.00	No
	46	x	0.016	1.00	No
		x	0.016	5.00	No
		x	0.005	3.00	No
	49	x	0.01	3.00	No
	52	x	0.042	0.75	No
		x	0.042	5.25	No
		x	0.011	1.50	No
		x	0.01	3.50	No
	55	x	0.011	3.00	No
	58	x	0.02	1.00	No
		x	0.02	5.00	No
		x	0.009	3.00	No
	60	x	0.01	3.00	No
	64	x	0.058	0.75	No
		x	0.058	5.25	No
		x	0.011	1.50	No
		x	0.01	3.50	No
	67	x	0.011	3.00	No
	70	x	0.02	1.00	No
		x	0.02	5.00	No
		x	0.009	3.00	No
	78	x	0.011	50.00	Yes
	79	x	0.011	50.00	Yes
	80	x	0.011	50.00	Yes
	84	x	0.028	1.00	No
		x	0.028	4.50	No
	89	x	0.024	0.50	No
		x	0.024	5.50	No
	92	x	0.031	1.00	No
		x	0.031	4.50	No
	95	x	0.057	0.50	No
		x	0.057	5.50	No
	97	x	0.041	0.50	No
		x	0.041	5.50	No
	101	x	0.031	1.00	No
		x	0.031	4.50	No
WL0	1	z	0.004	2.50	No
	2	z	0.004	2.50	No
	5	z	0.006	2.50	No
		z	0.006	2.50	No
	43	z	0.00	3.00	No
	44	z	0.015	0.75	No
		z	0.015	5.25	No
		z	0.003	1.50	No
		z	0.002	3.50	No
	45	z	0.003	3.00	No
	46	z	0.006	1.00	No
		z	0.006	5.00	No
		z	0.00	3.00	No
	49	z	0.00	3.00	No
	52	z	0.009	0.75	No
		z	0.009	5.25	No
		z	0.004	1.50	No
		z	0.003	3.50	No

	55	z	0.004	3.00	No
	58	z	0.004	1.00	No
		z	0.004	5.00	No
		z	0.001	3.00	No
	60	z	0.00	3.00	No
	64	z	0.012	0.75	No
		z	0.012	5.25	No
		z	0.004	1.50	No
		z	0.003	3.50	No
	67	z	0.004	3.00	No
	70	z	0.004	1.00	No
		z	0.004	5.00	No
		z	0.001	3.00	No
	78	z	0.003	50.00	Yes
	79	z	0.003	50.00	Yes
	80	z	0.003	50.00	Yes
	84	z	0.009	1.00	No
		z	0.009	4.50	No
	89	z	0.014	0.50	No
		z	0.014	5.50	No
	92	z	0.008	1.00	No
		z	0.008	4.50	No
	95	z	0.012	0.50	No
		z	0.012	5.50	No
	97	z	0.008	0.50	No
		z	0.008	5.50	No
	101	z	0.008	1.00	No
		z	0.008	4.50	No
WL30	1	x	0.007	2.50	No
		x	0.006	2.50	No
	2	x	0.007	2.50	No
		x	0.006	2.50	No
	5	x	0.004	2.50	No
	43	x	0.00	3.00	No
	44	x	0.007	0.75	No
		x	0.007	5.25	No
		x	0.005	1.50	No
		x	0.004	3.50	No
	45	x	0.004	3.00	No
	46	x	0.004	1.00	No
		x	0.004	5.00	No
		x	0.001	3.00	No
	49	x	0.002	3.00	No
	52	x	0.013	0.75	No
		x	0.013	5.25	No
		x	0.003	1.50	No
		x	0.002	3.50	No
	55	x	0.003	3.00	No
	58	x	0.005	1.00	No
		x	0.005	5.00	No
		x	0.002	3.00	No
	60	x	0.002	3.00	No
	64	x	0.018	0.75	No
		x	0.018	5.25	No
		x	0.003	1.50	No
		x	0.002	3.50	No
	67	x	0.003	3.00	No
	70	x	0.005	1.00	No
		x	0.005	5.00	No
		x	0.002	3.00	No

	78	x	0.003	50.00	Yes
	79	x	0.003	50.00	Yes
	80	x	0.003	50.00	Yes
	84	x	0.008	1.00	No
		x	0.008	4.50	No
	89	x	0.007	0.50	No
		x	0.007	5.50	No
	92	x	0.009	1.00	No
		x	0.009	4.50	No
	95	x	0.017	0.50	No
		x	0.017	5.50	No
	97	x	0.012	0.50	No
		x	0.012	5.50	No
	101	x	0.009	1.00	No
		x	0.009	4.50	No
LL1	8	y	-0.25	50.00	Yes
LL2	8	y	-0.25	0.00	Yes
LLa1	46	y	-0.25	50.00	Yes
LLa2	45	y	-0.25	50.00	Yes
LLa3	44	y	-0.25	50.00	Yes
LLa4	43	y	-0.25	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00

WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

Current Date: 10/22/2020 11:59 AM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1070\Rev.1\CT1070 (Rev.1).retx

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.2DL
LC15=1.2DL+1.5LL1
LC16=1.2DL+1.5LL2
LC17=1.2DL+WL0+1.5LLa1
LC18=1.2DL+WL30+1.5LLa1
LC19=1.2DL-WL0+1.5LLa1
LC20=1.2DL-WL30+1.5LLa1
LC21=1.2DL+WL0+1.5LLa2
LC22=1.2DL+WL30+1.5LLa2
LC23=1.2DL-WL0+1.5LLa2
LC24=1.2DL-WL30+1.5LLa2
LC25=1.2DL+WL0+1.5LLa3
LC26=1.2DL+WL30+1.5LLa3
LC27=1.2DL-WL0+1.5LLa3
LC28=1.2DL-WL30+1.5LLa3
LC29=1.2DL+WL0+1.5LLa4
LC30=1.2DL+WL30+1.5LLa4
LC31=1.2DL-WL0+1.5LLa4
LC32=1.2DL-WL30+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 2-1_2X2-1_2X1_4	**15**	LC2 at 100.00%	0.63	OK	Eq. H2-1
		16	LC2 at 100.00%	0.17	OK	Eq. H2-1
		17	LC12 at 100.00%	0.16	OK	Eq. H2-1
		26	LC12 at 100.00%	0.37	OK	Eq. H2-1
		27	LC1 at 100.00%	0.30	OK	Eq. H2-1
		71	LC1 at 0.00%	0.53	OK	Eq. H2-1
		72	LC12 at 56.25%	0.50	OK	Eq. H2-1
		73	LC6 at 100.00%	0.28	OK	Eq. H2-1
		74	LC4 at 100.00%	0.29	OK	Eq. H2-1
		76	LC8 at 100.00%	**0.63**	**OK**	Eq. H2-1
		77	LC6 at 100.00%	0.63	OK	Eq. H2-1
	L 3X3X1_4	**11**	LC3 at 0.00%	0.25	OK	Eq. H2-1
		12	LC4 at 100.00%	0.41	OK	Eq. H2-1
		28	LC2 at 0.00%	0.28	OK	Eq. H2-1
		29	LC4 at 100.00%	0.37	OK	Eq. H2-1
		30	LC8 at 100.00%	0.28	OK	Eq. H2-1
		31	LC2 at 100.00%	0.43	OK	Eq. H2-1

	32	LC8 at 58.33%	**0.47**	**OK**	Eq. H2-1
	33	LC6 at 58.33%	0.46	OK	Eq. H2-1
	34	LC12 at 100.00%	0.19	OK	Eq. H2-1
	75	LC2 at 100.00%	0.46	OK	Sec. F1
LU 4X3X5_16	**3**	LC4 at 71.88%	0.71	With warnings	Eq. H2-1
	4	LC2 at 71.88%	0.65	With warnings	Eq. H2-1
	6	LC9 at 74.11%	**0.97**	**With warnings**	Eq. H3-8
	7	LC6 at 37.50%	0.82	With warnings	Eq. H2-1
	8	LC4 at 0.00%	0.62	With warnings	Eq. H2-1
	9	LC4 at 36.25%	0.73	With warnings	Eq. H2-1
PIPE 2x0.154	**43**	LC1 at 23.75%	0.12	OK	Eq. H1-1b
	44	LC4 at 8.33%	0.13	OK	Eq. H1-1b
	45	LC4 at 16.25%	0.14	OK	Eq. H1-1b
	46	LC20 at 89.58%	0.09	OK	Eq. H1-1b
	49	LC4 at 8.75%	0.15	OK	Eq. H1-1b
	52	LC12 at 8.33%	0.17	OK	Eq. H1-1b
	55	LC2 at 83.75%	0.14	OK	Eq. H1-1b
	58	LC9 at 89.58%	0.13	OK	Eq. H1-1b
	60	LC12 at 91.25%	0.23	OK	Eq. H1-1b
	64	LC2 at 58.33%	0.15	OK	Eq. H1-1b
	67	LC12 at 8.75%	**0.29**	**OK**	Eq. H1-1b
	70	LC2 at 8.33%	0.09	OK	Eq. H1-1b
	78	LC2 at 0.00%	0.03	OK	Eq. H1-1b
	79	LC1 at 0.00%	0.03	OK	Eq. H1-1b
	80	LC4 at 0.00%	0.03	OK	Eq. H1-1b
	84	LC1 at 66.67%	0.09	OK	Eq. H1-1b
	89	LC1 at 83.33%	0.14	OK	Eq. H1-1b
	92	LC2 at 66.67%	0.09	OK	Eq. H1-1b
	95	LC2 at 83.33%	0.17	OK	Eq. H1-1b
	97	LC2 at 83.33%	0.12	OK	Eq. H1-1b
	101	LC2 at 66.67%	0.09	OK	Eq. H1-1b
PIPE 3x0.216	**1**	LC2 at 100.00%	**0.32**	**OK**	Eq. H1-1b
	2	LC4 at 100.00%	0.29	OK	Eq. H1-1b
	5	LC1 at 100.00%	0.13	OK	Eq. H1-1b

Current Date: 10/22/2020 11:59 AM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1070\Rev.1\CT1070 (Rev.1).retx

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
36	0.00	0.00	0.00	0
37	0.00	5.00	0.00	0
38	11.6667	0.00	0.00	0
39	11.6667	5.00	0.00	0
41	5.8333	5.00	10.1036	0
42	5.8333	0.00	10.1036	0
47	5.8333	4.00	3.3679	0
48	5.8333	2.00	3.3679	0
75	7.50	5.00	7.2169	0
76	7.50	0.00	7.2169	0
79	4.1667	5.00	7.2169	0
80	4.1667	0.00	7.2169	0
82	4.3333	0.00	7.5056	0
84	7.3333	0.00	7.5056	0
93	7.3333	5.50	-0.30	0
94	4.3333	5.50	-0.30	0
95	1.3333	5.50	-0.30	0
96	10.3333	-0.50	-0.30	0
97	7.3333	-0.50	-0.30	0
98	4.3333	-0.50	-0.30	0
99	1.3333	-0.50	-0.30	0
100	10.3333	5.50	-0.30	0

103	6.7598	5.50	9.0989	0
104	0.4069	5.50	1.3047	0
107	6.7598	-0.50	9.0989	0
108	0.4069	-0.50	1.3047	0
109	8.2598	5.50	6.5009	0
110	1.9069	5.50	3.9028	0
115	8.2598	-0.50	6.5009	0
116	1.9069	-0.50	3.9028	0
119	9.7598	5.50	3.9028	0
120	3.4069	5.50	6.5009	0
123	9.7598	-0.50	3.9028	0
124	3.4069	-0.50	6.5009	0
125	11.2598	5.50	1.3047	0
126	4.9069	5.50	9.0989	0
131	11.2598	-0.50	1.3047	0
132	4.9069	-0.50	9.0989	0
133	4.3333	-6.00	3.00	0
134	7.3333	-6.00	3.00	0
135	7.3333	0.00	3.00	0
136	4.3333	0.00	3.00	0
137	4.3333	0.00	1.50	0
138	7.3333	0.00	1.50	0
139	4.3333	1.50	1.50	0
140	7.3333	1.50	1.50	0
141	5.8333	0.00	7.5056	0
151	10.3333	0.00	-0.60	0
152	10.3333	6.00	-0.60	0
161	4.3333	5.50	-0.60	0
171	10.0196	-0.50	4.0528	0
172	3.147	-0.50	6.6509	0
173	10.0196	5.50	4.0528	0
174	3.147	5.50	6.6509	0
185	7.0196	6.00	9.2489	0
186	0.147	6.00	1.4547	0
142	5.8333	1.50	7.5056	0
179	7.0196	0.00	9.2489	0
180	0.147	0.00	1.4547	0
162	4.3333	-0.50	-0.60	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
133	1	1	1	0	0	0
134	1	1	1	0	0	0
135	1	1	1	0	0	0
136	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	37	36		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
2	39	38		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
3	37	41		LU 4X3X5_16	A36	0.00	0.00	0.00
4	39	41		LU 4X3X5_16	A36	0.00	0.00	0.00
5	42	41		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
6	36	42		LU 4X3X5_16	A36	0.00	0.00	0.00
7	38	42		LU 4X3X5_16	A36	0.00	0.00	0.00
8	37	39		LU 4X3X5_16	A36	0.00	0.00	0.00
9	36	38		LU 4X3X5_16	A36	0.00	0.00	0.00
11	53	54		L 3X3X1_4	A36	0.00	0.00	0.00
12	51	52		L 3X3X1_4	A36	0.00	0.00	0.00
15	51	54		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
16	53	38		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
17	51	36		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
26	79	80		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
27	75	76		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
28	42	79		L 3X3X1_4	A36	0.00	0.00	0.00
29	79	36		L 3X3X1_4	A36	0.00	0.00	0.00
30	75	42		L 3X3X1_4	A36	0.00	0.00	0.00
31	75	38		L 3X3X1_4	A36	0.00	0.00	0.00
32	84	54		L 3X3X1_4	A36	0.00	0.00	0.00
33	82	52		L 3X3X1_4	A36	0.00	0.00	0.00
34	84	82		L 3X3X1_4	A36	0.00	0.00	0.00
43	100	96		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
44	97	93		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
45	94	98		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
46	95	99		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
49	107	103		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
52	115	109		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
55	119	123		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
58	131	125		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
60	104	108		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
64	116	110		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
67	120	124		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
70	132	126		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
71	84	134		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
72	82	133		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
73	53	135		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
74	51	136		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
75	135	136		L 3X3X1_4	A36	0.00	0.00	0.00
76	135	38		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
77	136	36		L 2-1_2X2-1_2X1_4	A36	0.00	0.00	0.00
78	137	139		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
79	138	140		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
80	141	142		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
84	151	152		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
89	161	162		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
92	180	186		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
95	172	174		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
97	173	171		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
101	179	185		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
3	90.00	0	0.00	0.00	0.00
4	180.00	0	0.00	0.00	0.00
6	270.00	0	0.00	0.00	0.00
8	180.00	0	0.00	0.00	0.00
11	90.00	0	0.00	0.00	0.00
15	180.00	0	0.00	0.00	0.00
16	270.00	0	0.00	0.00	0.00
17	90.00	0	0.00	0.00	0.00
26	150.00	0	0.00	0.00	0.00
27	30.00	0	0.00	0.00	0.00
28	180.00	0	0.00	0.00	0.00
29	180.00	0	0.00	0.00	0.00
30	180.00	0	0.00	0.00	0.00
31	90.00	0	0.00	0.00	0.00
32	90.00	0	0.00	0.00	0.00
33	180.00	0	0.00	0.00	0.00
34	180.00	0	0.00	0.00	0.00
44	315.00	0	0.00	0.00	0.00
46	315.00	0	0.00	0.00	0.00
52	315.00	0	0.00	0.00	0.00
58	315.00	0	0.00	0.00	0.00
64	315.00	0	0.00	0.00	0.00
70	315.00	0	0.00	0.00	0.00
72	270.00	0	0.00	0.00	0.00
73	180.00	0	0.00	0.00	0.00
74	90.00	0	0.00	0.00	0.00
75	90.00	0	0.00	0.00	0.00
76	180.00	0	0.00	0.00	0.00
77	90.00	0	0.00	0.00	0.00
84	315.00	0	0.00	0.00	0.00
89	315.00	0	0.00	0.00	0.00
92	315.00	0	0.00	0.00	0.00
95	315.00	0	0.00	0.00	0.00
97	315.00	0	0.00	0.00	0.00
101	315.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
32	0.00	-2.00	0.00	0.00	-2.00	0.00
33	0.00	-2.00	0.00	0.00	-2.00	0.00
34	0.00	-2.00	0.00	0.00	-2.00	0.00
73	1.50	0.00	0.00	0.00	-1.50	0.00
74	-1.50	0.00	0.00	0.00	-1.50	0.00
75	0.00	-2.00	0.00	0.00	-2.00	0.00
76	0.00	-2.00	0.00	0.00	-2.00	0.00
77	0.00	-2.00	0.00	0.00	-2.00	0.00
78	0.00	-1.50	0.00	0.00	-1.50	0.00
79	0.00	-1.50	0.00	0.00	-1.50	0.00
80	0.00	-1.50	0.00	0.00	-1.50	0.00

EXHIBIT 5

Radio Frequency Emissions Analysis Report

March 9, 2021

Centerline Communications on behalf of AT&T

Site Name: MANCHESTER-EAST CENTER ST
Site Address: 52 EAST CENTER STREET, MANCHESTER, CT 06040
FA#: 10035030
USID: 59362

Site Compliance Summary

Compliance Status:	Compliant
Carrier MPE% of FCC General Population Allowable Limit:	0.67824800%
Composite MPE% of FCC General Population Allowable Limit:	0.67824800%

March 9, 2021

AT&T New England
Attn: John Benedetto, RF Manager
5050 Cochituate Road Suite 550 - 13&14
Framingham, MA 01701

Emissions Analysis for Site: **MANCHESTER-EAST CENTER ST**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility to be located a rooftop near **52 EAST CENTER STREET, MANCHESTER CT 06040** for the purpose of determining whether the emissions from the proposed facility 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 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of µW/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 population 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 population 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (µW/cm^2). The general population exposure limits for the 700 MHz (LTE) band is 467µW/cm^2; 850 MHz (LTE) is 567µW/cm^2; 850 MHz (5G) is 567µW/cm^2; 1900 MHz (PCS), 2100 MHz (AWS) and 2300 (WCS) bands is 1000 µW/cm^2.

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, 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 performed for the proposed facility using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing focused omnidirectional 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. This is a very conservative estimate since the gain reduction in actual applications is typically greater than 10 dB in the direction of ground immediately surrounding the facility. Real world emissions values from this facility are expected to be lower than values listed in this report at ground level. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

RRH #	Frequency Band	Technology	Channel Count	Transmit Power per Channel (W)
1	700	LTE	2	40
1	850	LTE	2	40
1	850	5G	4	40
2	850	UMTS	1	40
3	700	LTE	4	40
3	2100	AWS	4	40
4	1900	PCS	4	40
4	2300	WCS	4	25

Table 1: Channel Data Table

The following antennas listed in Table 2 were used in the modeling for transmission in the 700 MHz (LTE), 850 MHz (LTE), 850 MHz (5G), 1900 MHz (PCS), 2100 MHz (AWS) and 2300 (WCS) frequency bands. This is based on information from the carrier with regard to anticipated antenna selection.

Sector	Antenna	Make / Model	Centerline (ft)
A	1	CCI DMP65R-BU6D	63
A	1	CCI DMP65R-BU6D	63
A	1	CCI DMP65R-BU6D	63
A	2	KATHREIN 80010121	63
A	3	CCI OPA65R-BU6D	63
A	3	CCI OPA65R-BU6D	63
A	4	QUINTEL QS66512-2	63
A	4	QUINTEL QS66512-2	63
B	5	CCI DMP65R-BU6D	63
B	5	CCI DMP65R-BU6D	63
B	5	CCI DMP65R-BU6D	63
B	6	KATHREIN 80010121	63
B	7	CCI OPA65R-BU6D	63
B	7	CCI OPA65R-BU6D	63
B	8	QUINTEL QS66512-2	63
B	8	QUINTEL QS66512-2	63
C	9	CCI DMP65R-BU8D	63
C	9	CCI DMP65R-BU8D	63
C	9	CCI DMP65R-BU8D	63
C	10	KATHREIN 80010121	63
C	11	CCI OPA65R-BU8D	63
C	11	CCI OPA65R-BU8D	63
C	12	CCI TPA-65R-LCUUUU-H8	63
C	12	CCI TPA-65R-LCUUUU-H8	63

Table 2: Antenna Data

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

Results

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

ID	Make / Model	Frequency Band	Gain (dBd)	Centerline (ft)	Channel Count	TX Power (W)	ERP (W)	MPE %
Alpha 1	CCI DMP65R-BU6D	700	11.25	63.0	2	40	1066.817	0.007069000
Alpha 1	CCI DMP65R-BU6D	850	11.35	63.0	2	40	1091.667	0.003313000
Alpha 1	CCI DMP65R-BU6D	850	11.35	63.0	4	40	2183.333	0.006622000
Alpha 2	KATHREIN 80010121	850	11.25	63.0	1	40	533.409	0.009143000
Alpha 3	CCI OPA65R-BU6D	700	11.25	63.0	4	40	2133.634	0.125837000
Alpha 3	CCI OPA65R-BU6D	2100	15.15	63.0	4	40	5237.451	0.051958000
Alpha 4	QUINTEL QS66512-2	1900	14.15	63.0	4	40	4160.255	0.021091000
Alpha 4	QUINTEL QS66512-2	2300	14.55	63.0	4	25	2851.018	0.010626000
Beta 5	CCI DMP65R-BU6D	700	11.25	63.0	2	40	1066.817	0.007085000
Beta 5	CCI DMP65R-BU6D	850	11.35	63.0	2	40	1091.667	0.002627000
Beta 5	CCI DMP65R-BU6D	850	11.35	63.0	4	40	2183.333	0.005251000
Beta 6	KATHREIN 80010121	850	11.15	63.0	1	40	521.267	0.009269000
Beta 7	CCI OPA65R-BU6D	700	11.15	63.0	4	40	2085.067	0.126728000
Beta 7	CCI OPA65R-BU6D	2100	15.15	63.0	4	40	5237.451	0.051914000
Beta 8	QUINTEL QS66512-2	1900	13.45	63.0	4	40	3540.952	0.026627000
Beta 8	QUINTEL QS66512-2	2300	14.55	63.0	4	25	2851.018	0.012249000
Gamma 9	CCI DMP65R-BU8D	700	12.15	63.0	2	40	1312.472	0.007414000
Gamma 9	CCI DMP65R-BU8D	850	12.65	63.0	2	40	1472.618	0.007944000
Gamma 9	CCI DMP65R-BU8D	850	12.65	63.0	4	40	2945.235	0.015883000
Gamma 10	KATHREIN 80010121	850	11.25	63.0	1	40	533.409	0.007364000
Gamma 11	CCI OPA65R-BU8D	700	12.85	63.0	4	40	3084.040	0.085669000
Gamma 11	CCI OPA65R-BU8D	2100	15.75	63.0	4	40	6013.398	0.040379000
Gamma 12	CCI TPA-65R-LCUUUU-H8	1900	13.95	63.0	4	40	3973.013	0.022947000
Gamma 12	CCI TPA-65R-LCUUUU-H8	2300	14.85	63.0	4	25	3054.921	0.013239000
AT&T MPE%								**0.67824800 %**

Table 3: AT&T Antenna Inventory & Power Level

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 4* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector (Beta Sector).

Frequency Band	Technology	Centerline (ft.)	# of Channels	ERP W (Per Channel)	Total Power Density ($\mu W/cm^2$)	Allowable MPE ($\mu W/cm^2$)	MPE %
700	LTE	63.0	2	533.4085729	0.0330650	467	0.00708500
850	LTE	63.0	2	545.8332546	0.0148850	567	0.00262700
850	5G	63.0	4	545.8332546	0.0297570	567	0.00525100
850	UMTS	63.0	1	521.2667114	0.0525220	567	0.00926900
700	LTE	63.0	4	521.2667114	0.5913950	467	0.12672800
2100	AWS	63.0	4	1309.36278	0.5191450	1000	0.05191400
1900	PCS	63.0	4	885.2378838	0.2662670	1000	0.02662700
2300	WCS	63.0	4	712.7545669	0.1224870	1000	0.01224900
						AT&T MPE%	**0.67824800 %**

Table 4: AT&T Maximum Sector MPE Power Values

Summary

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

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

Carrier	Predicted MPE %
AT&T	0.67824800%
Composite	**0.67824800%**

Table 5: Total Predicted MPE(%) by Carrier

Compliance Status:

The anticipated composite MPE value for this site assuming all carriers present is **0.67824800%** of the allowable FCC established general population limit sampled at the ground level.

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.

Dane Folie
RF Compliance Consultant
Centerline Communications, LLC
750 West Center St. Suite 301
West Bridgewater, MA 02379

EXHIBIT 6

TOWN OF MANCHESTER ZONING PERMIT

41 Center Street **Please Print or Type** Telephone: 647-3052

TO: ZONING ENFORCEMENT OFFICER

Certification of Zoning Approval is hereby requested for:

application of a Building Permit Other:

Decision is based on the following information:

1.) Location: (street and no. or lot no.) 52 East Center Street, Manchester, CT

2.) Owner's Name: SOUTHERN NEW ENGLAND TELEPHONE COMPANY

3.) Builder: CFM CONSTRUCTION CORPORATION

Address: 150 Sycamore Street, Glastonbury, CT 06033

4.) Check Type of Construction: /___/ New Building /___/ Addition /XXX/ Alteration /___/ Repair /___/ Miscellaneous

5.) Job Description* Alterations to existing second floor room as per drawings for new cellular site room. Electrical and mechanical work as per drawings. New tower installation as per drawings. Miscellaneous ~~carpentry, ceiling work, roof penetrations, painting, etc.~~

(*Plot Plan required for all additions to buildings and accessory structures).

6.) Other Buildings Not Shown: _____

7.) Merestones or Stakes Indicating Lot Boundaries? _____

8.) Distance from Street Line: _____

9.) Distance from Side Line: Left _____ Right _____

10.) Distance from Building to Rear Lot Line: _____

11.) Proposed Use: _____

(For example: manufacturing, office, storage, dwelling, school, bath, garage)

12.) /___/ Sewer /___/ Septic /___/ Water /___/ Well

THIS PERMIT SHALL NOT BE EFFECTIVE FOR 24 HOURS AFTER APPROVAL

I hereby certify that the above statements are true to the best of my knowledge and belief.

7/20/93 Date | Charles F Meyer Jr Signature | 203/633-7319 Telephone

---

FOR OFFICE USE ONLY

This is to certify that the above-stated information is a permitted and lawful use as controlled by the Zoning Regulations of the Town of Manchester, Connecticut, upon authorized signature of the Zoning Enforcement Officer.

Zoning Permit Issued: 7/26/93 Conditions: provide evidence of Zoning council approval if required

Zone: B-3 Approved By: _____ Zoning Enforcement Officer

ADDITIONAL APPROVAL FOR BUSINESS AND INDUSTRIAL USE

Date	Engineering	Date	Police	Date	Fire
/		/			

Comments: utility structure exempt from height requirements -

Additional Permits May Be Required From: _____ Dept(s).

for _____

EXHIBIT 7

UPS CampusShip: View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a Daily Pickup
   Your driver will pickup your shipment(s) as usual.

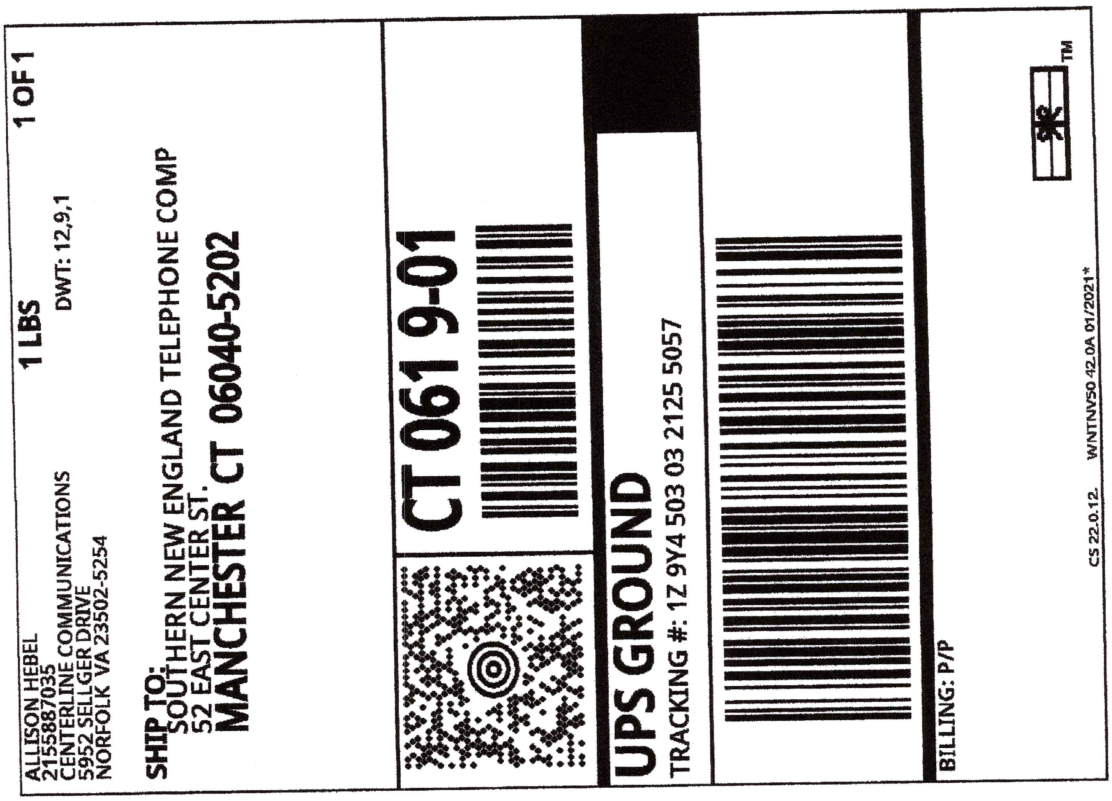
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.
   Schedule a same day or future day Pickup to have a UPS driver pickup all your CampusShip packages.
   Hand the package to any UPS driver in your area.

UPS Access Point™
CVS STORE # 3521
471 N MILITARY HWY
NORFOLK ,VA 23502

UPS Access Point™
ADVANCE AUTO PARTS STORE 7464
5741 E VIRGINIA BEACH BLVD
NORFOLK ,VA 23502

UPS Access Point™
CVS STORE # 6403
6678 E VIRGINIA BEACH BLVD
NORFOLK ,VA 23502

FOLD HERE



UPS CampusShip: View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a Daily Pickup
   Your driver will pickup your shipment(s) as usual.

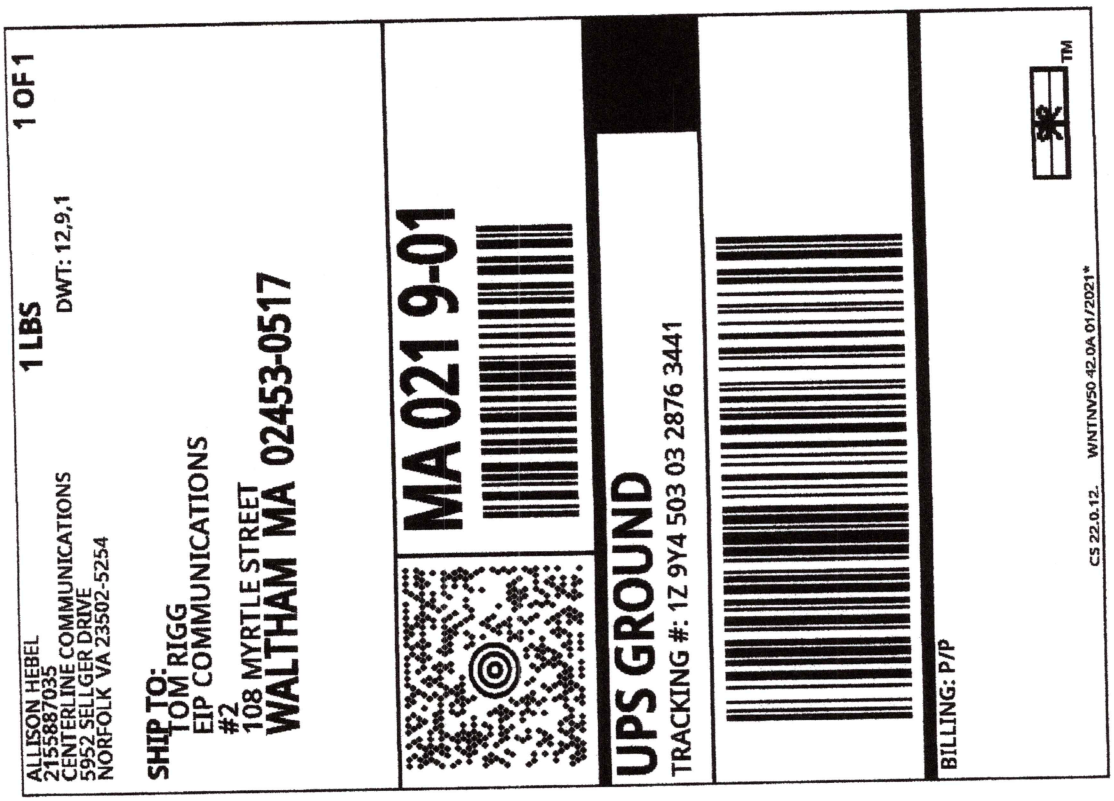
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.
   Schedule a same day or future day Pickup to have a UPS driver pickup all your CampusShip packages.
   Hand the package to any UPS driver in your area.

UPS Access Point™
CVS STORE # 3521
471 N MILITARY HWY
NORFOLK ,VA 23502

UPS Access Point™
ADVANCE AUTO PARTS STORE 7464
5741 E VIRGINIA BEACH BLVD
NORFOLK ,VA 23502

UPS Access Point™
CVS STORE # 6403
6678 E VIRGINIA BEACH BLVD
NORFOLK ,VA 23502

FOLD HERE



UPS CampusShip: View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a Daily Pickup
   Your driver will pickup your shipment(s) as usual.

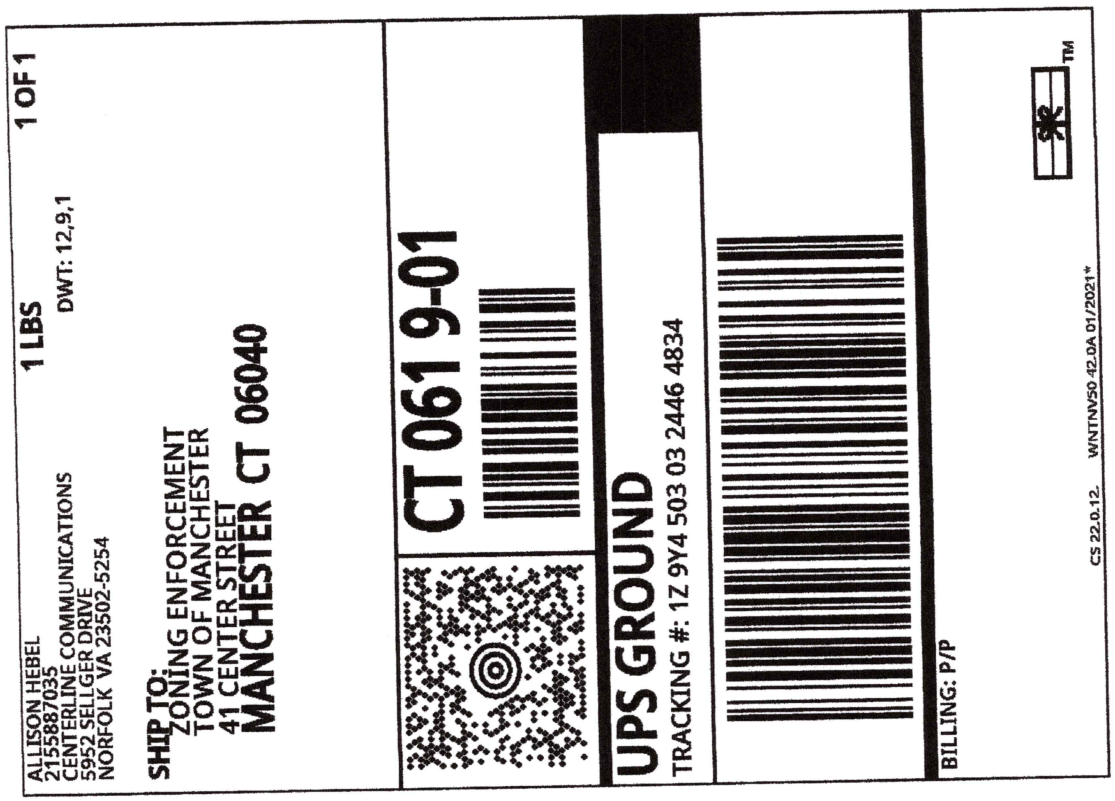
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.
   Schedule a same day or future day Pickup to have a UPS driver pickup all your CampusShip packages.
   Hand the package to any UPS driver in your area.

UPS Access Point™
CVS STORE # 3521
471 N MILITARY HWY
NORFOLK ,VA 23502

UPS Access Point™
ADVANCE AUTO PARTS STORE 7464
5741 E VIRGINIA BEACH BLVD
NORFOLK ,VA 23502

UPS Access Point™
CVS STORE # 6403
6678 E VIRGINIA BEACH BLVD
NORFOLK ,VA 23502

FOLD HERE



UPS CampusShip: View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a Daily Pickup
   Your driver will pickup your shipment(s) as usual.

   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the Resources area of CampusShip and select UPS Locations.
   Schedule a same day or future day Pickup to have a UPS driver pickup all your CampusShip packages.
   Hand the package to any UPS driver in your area.

UPS Access Point™
CVS STORE # 3521
471 N MILITARY HWY
NORFOLK ,VA 23502

UPS Access Point™
ADVANCE AUTO PARTS STORE 7464
5741 E VIRGINIA BEACH BLVD
NORFOLK ,VA 23502

UPS Access Point™
CVS STORE # 6403
6678 E VIRGINIA BEACH BLVD
NORFOLK ,VA 23502

FOLD HERE