QC Development
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Storrs, CT 06268
860-670-9068
Mark.Roberts@QCDevelopment.net

April 12, 2019

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT2128
3965 Congress Street, Fairfield, CT 06824
N 41.18834722
W 73.29907222

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 128-foot level of the existing 150-foot Monopole at 3965 Congress Street, Fairfield, CT. The tower and property are owned by the Town of Fairfield. AT&T now intends to remove three (3) Powerwave antennas and replace them with three (3) Kathrein 800-10965 antennas. AT&T will also swap (3) Ericsson RRUS-11 for (3) Ericsson 4449-B5/B12s and add (3) Ericsson 4415-B30 Remote Radio Units (RRU). The new antennas and RRUs will also be installed at the 128-foot level of the tower.

AT&T's use of this facility was approved by the Siting Council on March 9, 1999. This approval included no condition(s) that could feasibly be violated by this modification, including total facility height or mounting restrictions. This modification therefore complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 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 Michael Tetreau, First Selectman of the Town of Fairfield, and the Fairfield Town Plan & Zoning

Department as well as the property and tower 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).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the 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 replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

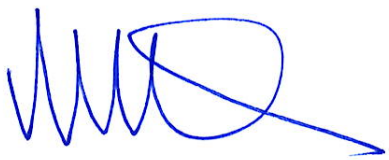
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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).

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,



Mark Roberts
QC Development
Consultant for AT&T

Attachments

Cc: Michael Tetreau - Elected Official, Property Owner & Tower Owner
Jim Wendt – Planning Director

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							14.03%
AT&T GSM	2	552	127	0.0271	850	0.5667	0.25%
AT&T UMTS	2	552	127	0.0271	850	0.5667	0.25%
AT&T UMTS	2	896	127	0.0440	1900	1.0000	0.22%
AT&T LTE	2	940	127	0.0462	700	0.4667	0.81%
AT&T LTE	2	1791	127	0.0880	1900	1.0000	0.66%
Site Total							17.29%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

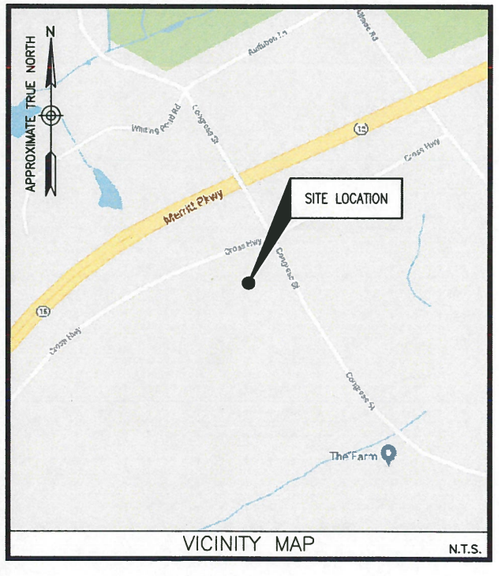
Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							14.03%
AT&T UMTS	1	252	128	0.0061	850	0.5667	0.11%
AT&T LTE	1	1476	128	0.0357	700	0.4667	0.76%
AT&T LTE	1	1000	128	0.0242	850	0.5667	0.43%
AT&T 5G	1	1000	128	0.0242	850	0.5667	0.43%
AT&T LTE	2	3664	128	0.1771	1900	1.0000	1.77%
AT&T LTE	1	1285	128	0.0310	2300	1.0000	0.31%
Site Total							17.83%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

SITE NAME: FAIRFIELD GREENFIELD HILL
SITE NUMBER: CT2128
3965 CONGRESS STREET
FAIRFIELD, CT 06824
FA CODE: 10035251
PACE ID: MRCTB035112, MRCTB035164, MRCTB035334
PROJECT: LTE 3C, 4C, 5C



VICINITY MAP N.T.S.

SITE COORDINATES:
LATITUDE: 41°–11'–18.16" N
LONGITUDE: 73°–17'–56.59" W
(PER EXISTING DRAWINGS PROVIDED)

ELEVATION DATA:
GRADE ELEVATION AT TOWER = 271'± A.M.S.L.
(PER EXISTING DRAWINGS PROVIDED)

SITE INFORMATION

- SWAP (3) EXISTING GSM ANTENNAS FOR (3) 6' 800–10965 OCTO ANTENNAS
- SWAP (3) EXISTING RRUS–11'S FOR (3) B5/B12 4449 RRU'S UP TOP
- ADD (3) B30 4415 RRU'S UP TOP
- ADD (1) DC/FIBER SQUID WITH (1) 2" CONDUIT FOR 2 DC/1 FIBER
- ADD HOMERUN RET TO UMTS ANTENNAS
- GROUND – SWAP BB FOR 6630, ADD 5G RBS 6630

PROJECT DESCRIPTION

SITE NAME:
FAIRFIELD GREENFIELD HILL

SITE NUMBER:
CT2128

SITE ADDRESS:
3965 CONGRESS STREET
FAIRFIELD, CT 06824

APPLICANT/LESSEE:
AT&T MOBILITY
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

PROJECT INFORMATION

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.

A.D.A. COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

SHEET NUMBER	DESCRIPTION
T–1	TITLE SHEET
G–1	GENERAL NOTES
C–1	COMPOUND PLAN
C–2	EXISTING & PROPOSED SHELTER LAYOUTS
C–3	EXISTING & PROPOSED WEST ELEVATIONS
C–4	EXISTING & PROPOSED ANTENNA LAYOUTS
C–5	CONSTRUCTION DETAILS I
C–6	CONSTRUCTION DETAILS II
C–7	PLUMBING DIAGRAM
E–1	GROUNDING NOTES & DETAILS

SHEET INDEX

at&t
500 ENTERPRISE DRIVE SUITE 3A
ROCKY HILL, CT 06067

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

CT2128
FAIRFIELD
GREENFIELD HILL

CONSTRUCTION DRAWINGS

0	04/01/19	ISSUED AS FINAL
B	03/22/19	REVISED PER COMMENTS
A	02/21/19	ISSUED FOR REVIEW

Dewberry
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

3965 CONGRESS STREET
FAIRFIELD, CT 06824

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T–1

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   PROJECT MANAGEMENT – SAI COMMUNICATIONS, INC.
   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 AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF PROJECT MANAGEMENT.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
4. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
5. DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
9. CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND 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 IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND 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 AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
15. CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND 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 LAND LORD. 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.

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, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND 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 AND PROJECT SPECIFICATIONS.
4. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
5. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND 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 AND 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 AND 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 AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
12. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

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 AND 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 AND 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 AND 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 AND PLACE CRUSHED STONE AS REQUIRED.
2. COMPACTION CERTIFICATION: AN INSPECTION AND WRITTEN CERTIFICATION BY A QUALIFIED GEOTECHNICAL TECHNICIAN OR ENGINEER IS ACCEPTABLE.
3. AS AN ALTERNATIVE TO INSPECTION AND 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 AND 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 AND REPLACED WITH A WELL-GRADED GRANULAR FILL, AND 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 AND ANTENNAS TO BE REPLACED.
2. COORDINATION OF WORK:
   CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
3. CABLE LADDER RACK:
   CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
2. CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLING TO THE 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 AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC.
5. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
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, AND T1 CONDUCTOR AND 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, AND 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, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
9. PANELBOARDS (ID NUMBERS) AND 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, AND 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 AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND 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 AND 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 AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND 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 AND 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 AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
16. ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
17. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND 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 AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
24. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
25. CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
26. CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
27. WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
28. EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
29. METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
30. NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
31. THE CONTRACTOR SHALL NOTIFY AND 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 AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

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FAIRFIELD
GREENFIELD HILL

CONSTRUCTION DRAWINGS

0	04/01/19	ISSUED AS FINAL
B	03/22/19	REVISED PER COMMENTS
A	02/21/19	ISSUED FOR REVIEW

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FAX: 973.739.9710

STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER

JIANG YU
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

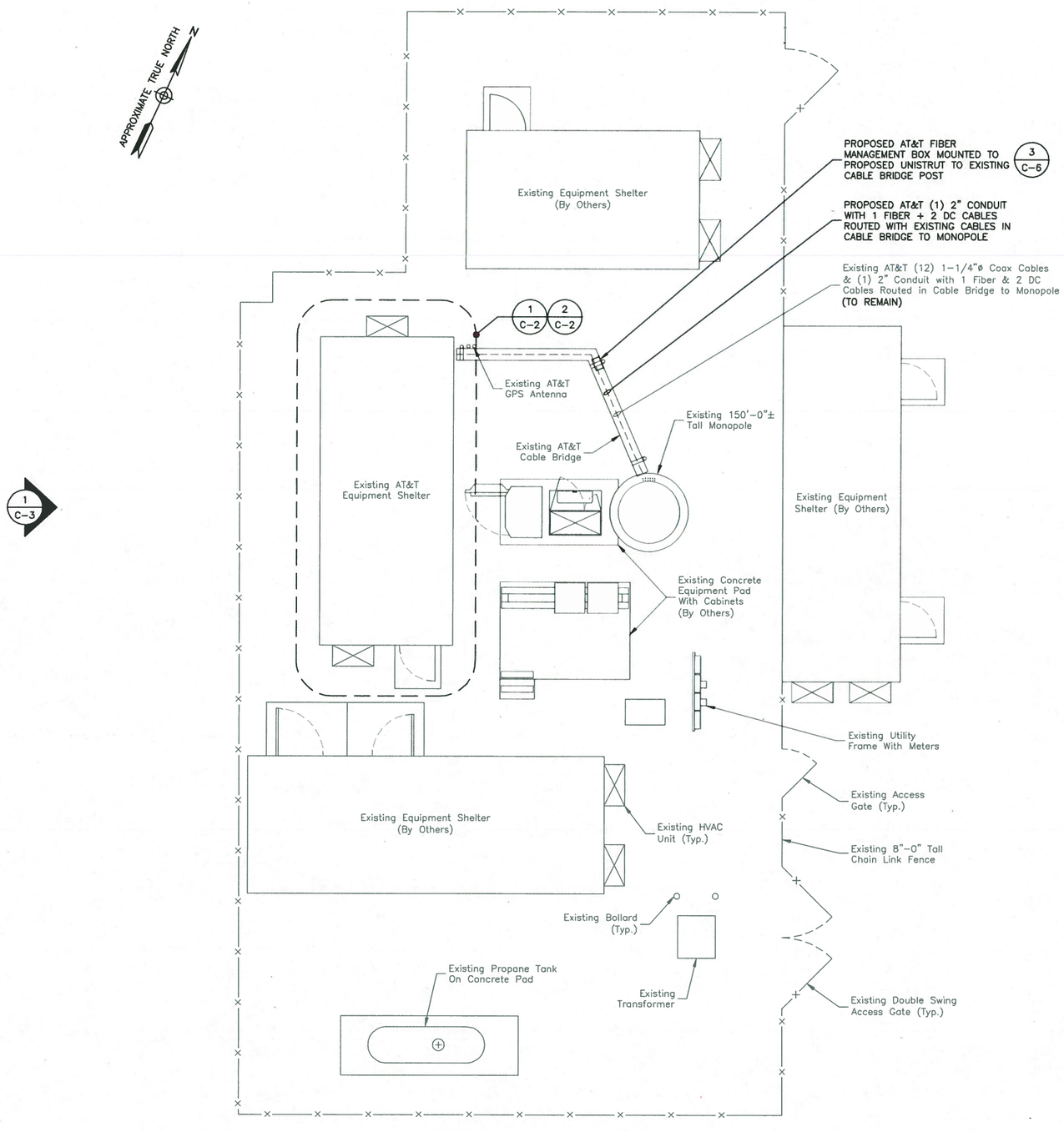
3965 CONGRESS STREET
FAIRFIELD, CT 06824

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G-1



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

0' 4' 8' 12'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, TMA'S, RRU'S, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY DEWBERRY ENGINEERS INC. DATED 01/29/19 & THE APPURTENANCE MOUNT ANALYSIS BY B+T GROUP DATED 02/08/19.
4. COMPOUND PLAN BASED ON EXISTING PLANS BY CENTEK ENGINEERING DATED 09/29/16 & A SITE VISIT CONDUCTED BY DEWBERRY ENGINEERS INC. ON 11/28/18.

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STATE OF CONNECTICUT JIANG LIU No. 23222 LICENSED PROFESSIONAL ENGINEER
JIANG LIU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

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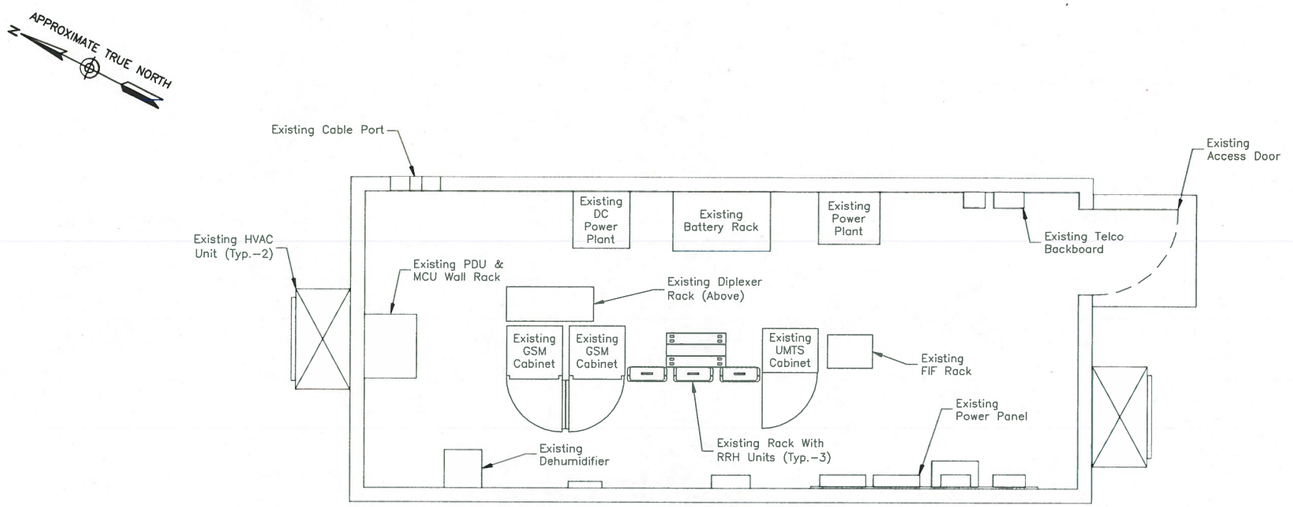
SHEET TITLE

COMPOUND PLAN

SHEET NUMBER

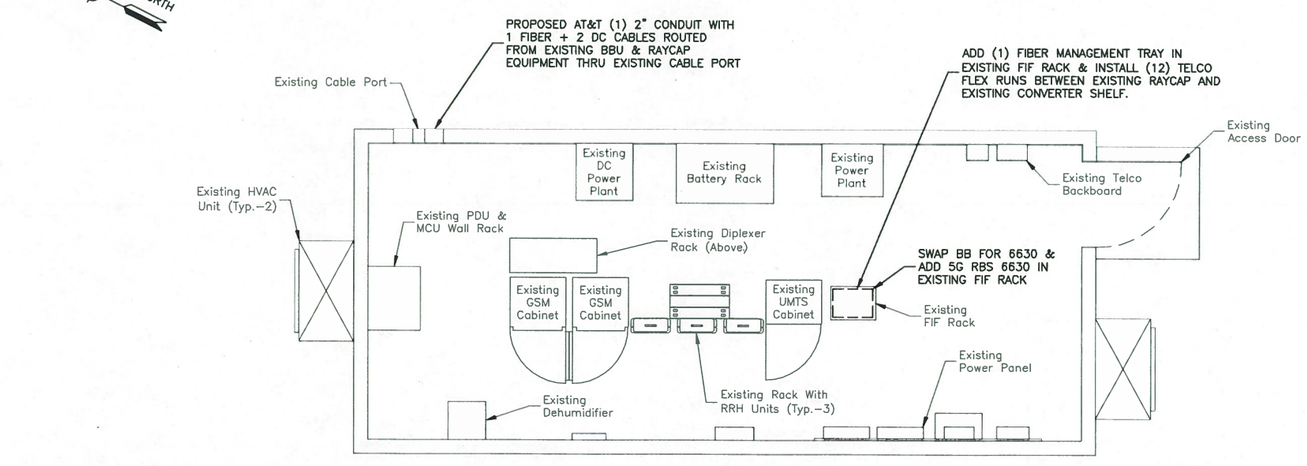
C-1



EXISTING SHELTER LAYOUT (1)

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

0' 2' 4' 6'



PROPOSED SHELTER LAYOUT (2)

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

0' 2' 4' 8'

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STATE OF CONNECTICUT
JIANG Y. HAN
No. 28222
LICENSED PROFESSIONAL ENGINEER
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

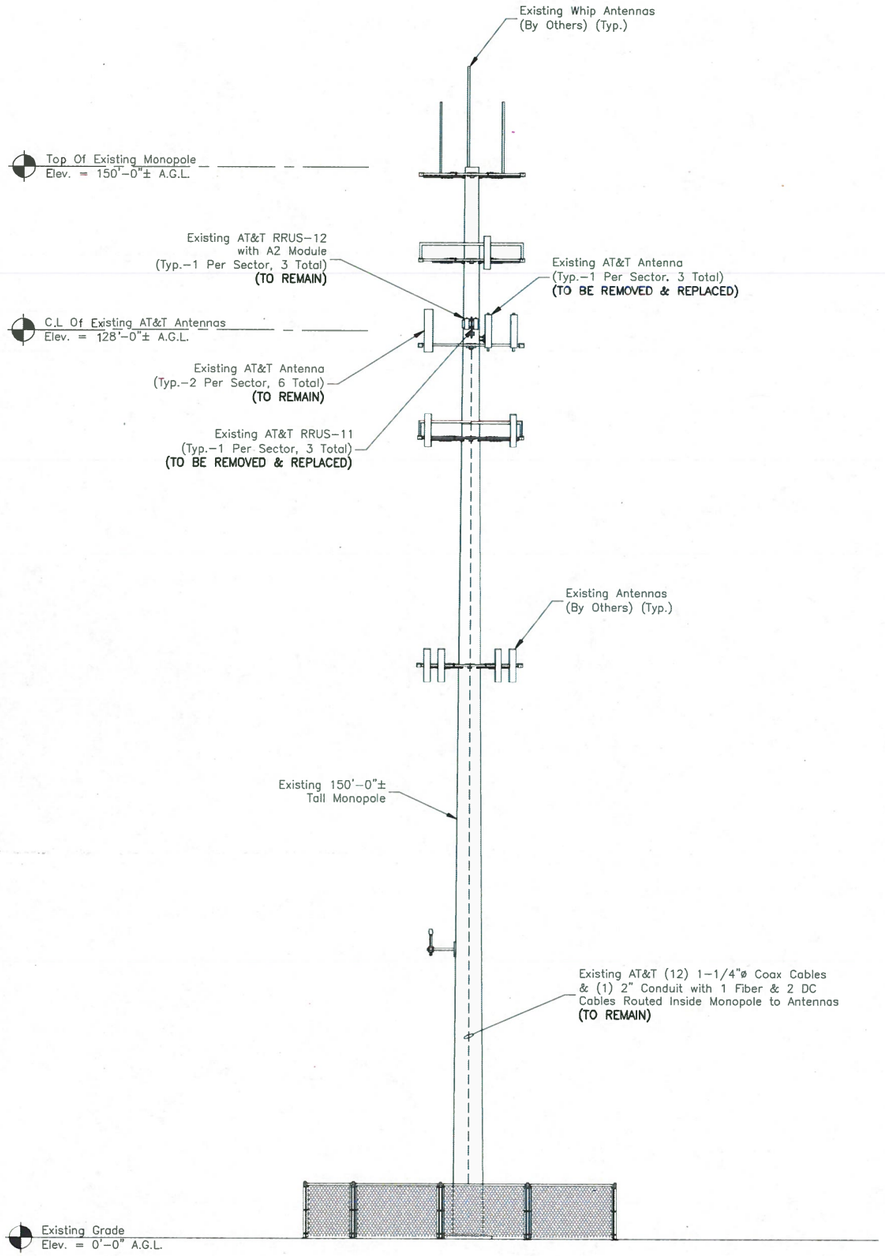
3965 CONGRESS STREET
FAIRFIELD, CT 06824

SHEET TITLE

EXISTING & PROPOSED SHELTER LAYOUTS

SHEET NUMBER

C–2



EXISTING WEST ELEVATION (1)

SCALE: 3/64"=1' FOR 11"x17"
3/32"=1' FOR 22"x34"

0' 8' 16' 24'

NOTES:

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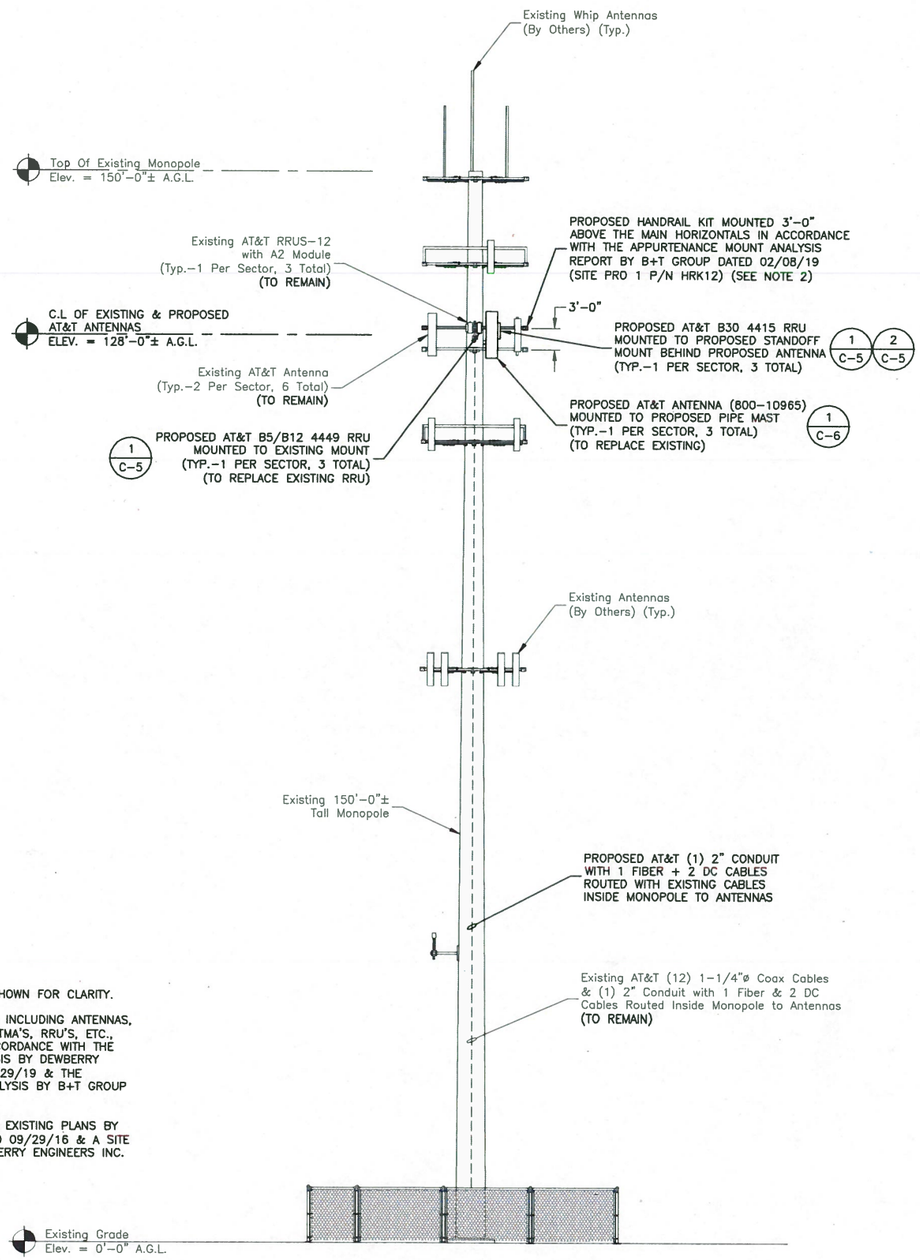
3. WEST ELEVATION BASED ON EXISTING PLANS BY CENTEK ENGINEERING DATED 09/29/16 & A SITE VISIT CONDUCTED BY DEWBERRY ENGINEERS INC. ON 11/28/18.



PROPOSED WEST ELEVATION (2)

SCALE: 3/64"=1' FOR 11"x17"
3/32"=1' FOR 22"x34"

0' 8' 16' 24'

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JIANG YU
No. 23222
LICENSED PROFESSIONAL ENGINEER
JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER TO ALTER THIS DOCUMENT.

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

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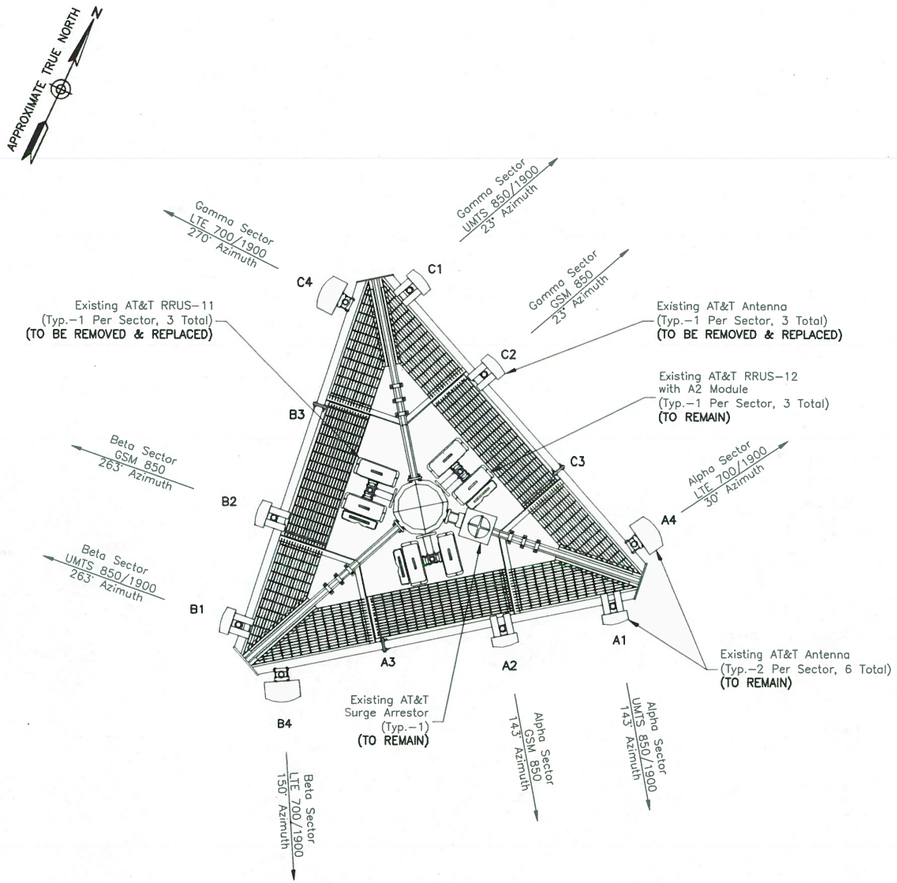
FAIRFIELD, CT 06824

SHEET TITLE

EXISTING & PROPOSED
WEST ELEVATIONS

SHEET NUMBER

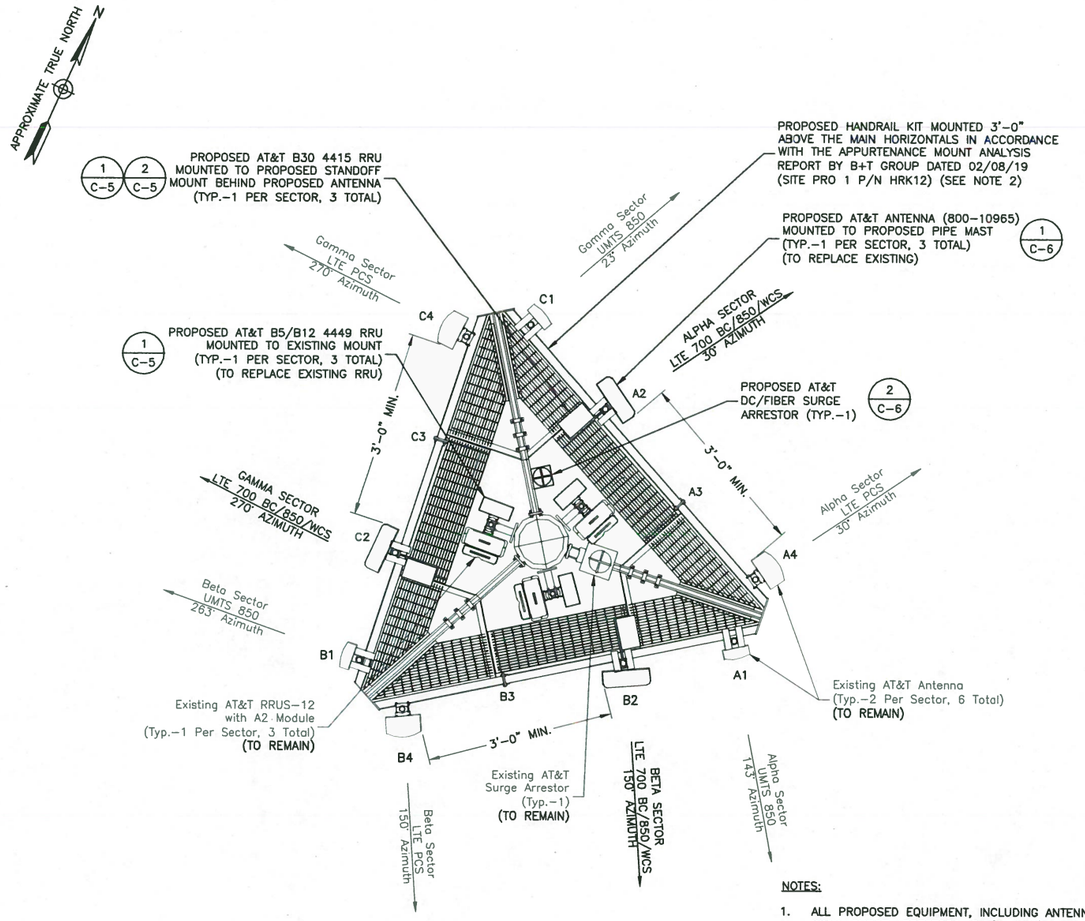
C-3



EXISTING ANTENNA LAYOUT 1

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

0' 2' 4' 6'



PROPOSED ANTENNA LAYOUT 1

SCALE: 3/16"=1' FOR 11"x17"
3/8"=1' FOR 22"x34"

0' 2' 4' 6'

NOTES:

1. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, TMA'S, RRU'S, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS BY DEWBERRY ENGINEERS INC. DATED 01/29/19 & THE APPURTENANCE MOUNT ANALYSIS BY B+T GROUP DATED 02/08/19.
2. ADD HOMERUN RET TO UMTS ANTENNAS.

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STATE OF CONNECTICUT
JIANG YU
No. 23222
LICENSED
PROFESSIONAL ENGINEER

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

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REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

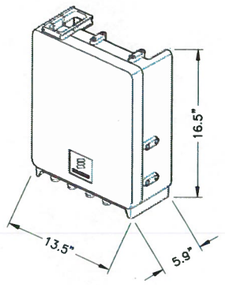
3965 CONGRESS STREET
FAIRFIELD, CT 06824

SHEET TITLE

EXISTING & PROPOSED
ANTENNA LAYOUTS

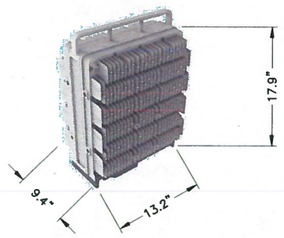
SHEET NUMBER

C-4



SPECIFICATIONS:
HEIGHT: 16.5"
WIDTH: 13.5"
DEPTH: 5.9"
WEIGHT: 44.1 LBS

ERICSSON RRUS B30 4415



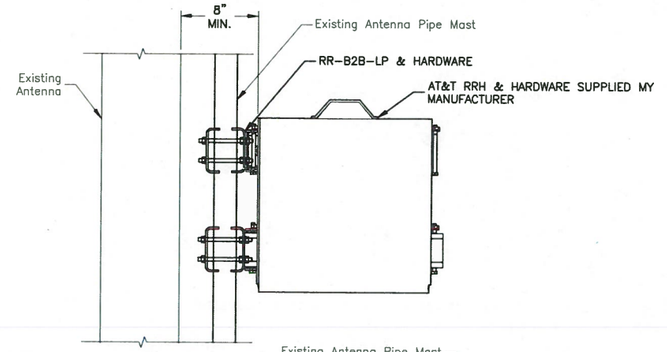
SPECIFICATIONS:
HEIGHT: 17.9"
WIDTH: 13.2"
DEPTH: 9.4"
WEIGHT: 70.4 LBS

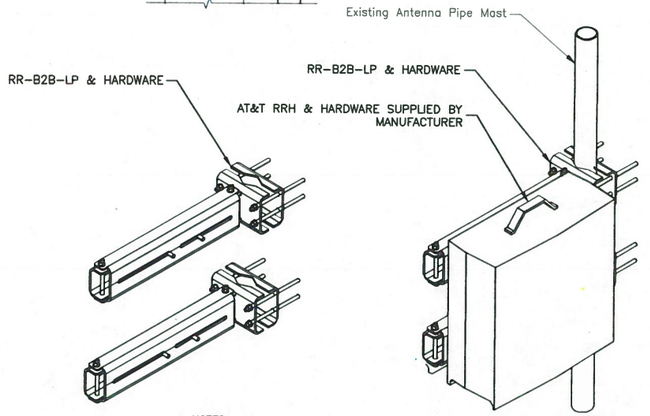
ERICSSON RRUS B5/B12 4449

RRU NOTES:

1. MOUNT EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
2. GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND AT&T STANDARDS.
3. CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

REMOTE RADIO UNIT DETAIL (1)
SCALE: N.T.S.





NOTES:

1. 8" MIN. BETWEEN BACK OF ANTENNA & RRH UNIT.
2. CONTRACTOR TO COMPLY WITH MANUFACTURER'S INSTRUCTIONS TO ENSURE THAT ALL RRH UNITS RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH UNITS IN THE RAIN.

RRH DUAL BRACKET MOUNT DETAIL (2)
SCALE: N.T.S.

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	ANTENNA CENTERLINE	AZIMUTH	TMA/DIPLEXER	RRU	FEEDER	SURGE ARRESTORS
A1	EXISTING	UMTS 850	POWERWAVE 7770	128'-0"±	143°	(2) POWERWAVE/LGP 21901 (2) 21401 (DB - 850 BYPASS)	-	(2) 1-1/4"ø COAX + HOMERUN RET	(E) (1) RAYCAP DC6-48-60-18-8C (P) (1) RAYCAP DC6-48-60-18-8C
A2	PROPOSED	LTE 700 BC/850/WCS	KATHREIN 800-10965	128'-0"±	30°	-	(P) ERICSSON RRUS B5/B12 4449 (P) ERICSSON RRUS-B30 4415	FIBER	
A3	-	-	-	-	-	-	-	-	
A4	EXISTING	LTE PCS	HPA-65R-BUU-H6	128'-0"±	30°		(E) ERICSSON RRUS-12 W/ A2 MODULE	FIBER/ (2) 1-1/4"ø COAX	
B1	EXISTING	UMTS 850	POWERWAVE 7770	128'-0"±	263°	(2) POWERWAVE/LGP 21901 (2) 21401 (DB - 850 BYPASS)	-	(2) 1-1/4"ø COAX + HOMERUN RET	
B2	PROPOSED	LTE 700 BC/850/WCS	KATHREIN 800-10965	128'-0"±	150°	-	(P) ERICSSON RRUS B5/B12 4449 (P) ERICSSON RRUS-B30 4415	FIBER	
B3	-	-	-	-	-	-	-	-	
B4	EXISTING	LTE PCS	HPA-65R-BUU-H6	128'-0"±	150°	-	(E) ERICSSON RRUS-12 W/ A2 MODULE	FIBER/ (2) 1-1/4"ø COAX	
C1	EXISTING	UMTS 850	POWERWAVE 7770	128'-0"±	23°	(2) POWERWAVE/LGP 21901 (2) 21401 (DB - 850 BYPASS)	-	(2) 1-1/4"ø COAX + HOMERUN RET	
C2	PROPOSED	LTE 700 BC/850/WCS	KATHREIN 800-10965	128'-0"±	270°	-	(P) ERICSSON RRUS B5/B12 4449 (P) ERICSSON RRUS-B30 4415	FIBER	
C3	-	-	-	-	-	-	-	-	
C4	EXISTING	LTE PCS	HPA-65R-BUU-H6	128'-0"±	270°	-	(E) ERICSSON RRUS-12 W/ A2 MODULE	FIBER/ (2) 1-1/4"ø COAX	

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STATE OF CONNECTICUT
JIANG XU
No. 23222
LICENSED PROFESSIONAL ENGINEER
JIANG XU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

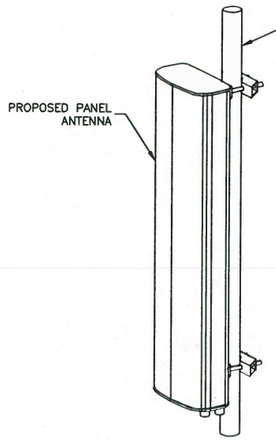
3965 CONGRESS STREET
FAIRFIELD, CT 06824

SHEET TITLE

CONSTRUCTION DETAILS I

SHEET NUMBER

C-5

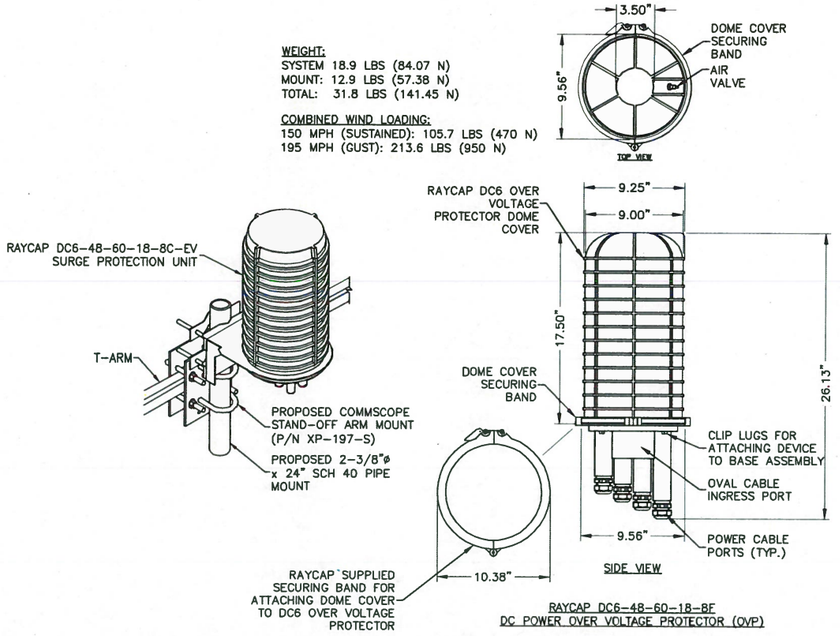


ANTENNA SPECIFICATIONS	
MANUFACTURER	KATHREIN
MODEL NUMBER	800-10965
DIMENSIONS (HxWxD)	78.7" x 20.0" x 6.9"
WEIGHT	108.6 LBS

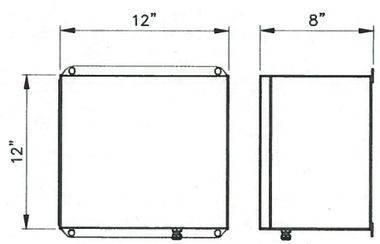
NOTES:

1. MOUNT ANTENNA PER MANUFACTURER'S RECOMMENDATIONS.
2. WEIGHT INCLUDES MOUNTING BRACKETS.

ANTENNA DETAIL (1)
SCALE: N.T.S.



TOWER MOUNTED SURGE ARRESTOR DETAIL (2)
SCALE: N.T.S.



J SOURCE FIBER BOX
PART # 12128FM4SEC
LxWxD: 12"x12"x8"
WEIGHT: 8.5 LBS

FIBER MANAGEMENT BOX DETAIL (3)
SCALE: N.T.S.

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STATE OF CONNECTICUT
JIANG HU
No. 23222
LICENSED PROFESSIONAL ENGINEER
JIANG HU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

3965 CONGRESS STREET
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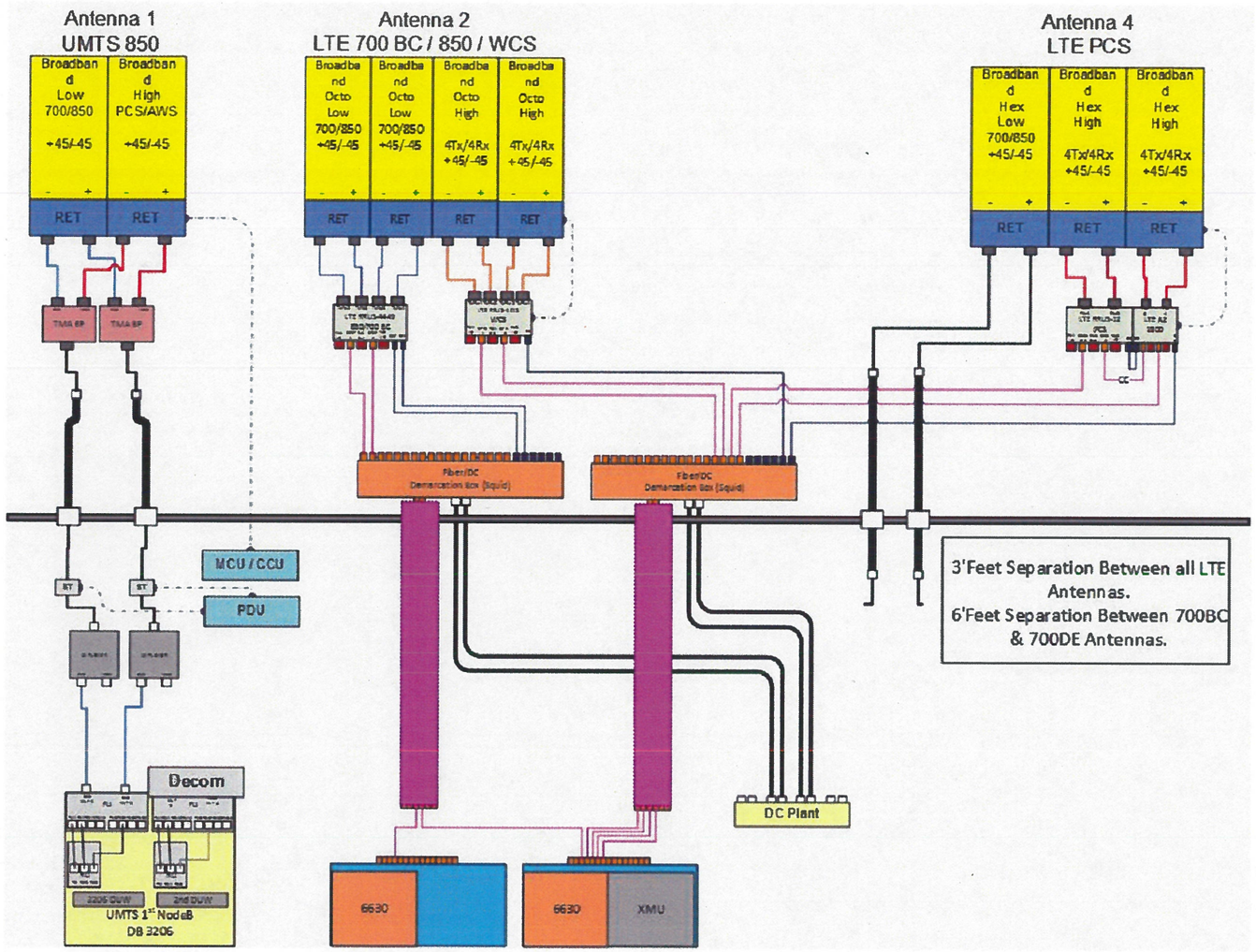
SHEET TITLE

CONSTRUCTION DETAILS II

SHEET NUMBER

C-6



PLUMBING DIAGRAM
SCALE: N.T.S.

1

NOTES:

1. PLUMBING DIAGRAM BASED ON RFDS V2.00 DATED 09/19/2018. CONFIRM FINAL PLUMBING DIAGRAM WITH THE LATEST RFDS.
2. ADD HOMERUN RET TO UMTS ANTENNAS.

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STATE OF CONNECTICUT
JIANG TU
No. 23222
LICENSED PROFESSIONAL ENGINEER

JIANG TU, P.E.
CONNECTICUT LICENSE NO. 0023222

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JOB NUMBER:	50093832
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3965 CONGRESS STREET
FAIRFIELD, CT 06824

SHEET TITLE

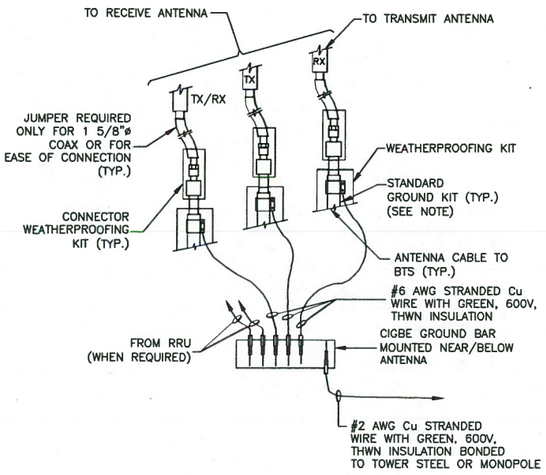
PLUMBING DIAGRAM

SHEET NUMBER

C-7

GROUNDING NOTES:

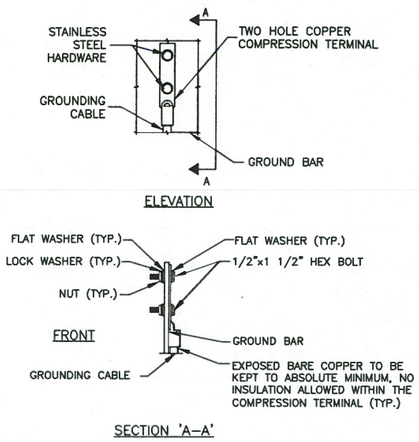
1. THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ). THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE ENGINEER 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 THE ENGINEER 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 SAI 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.



NOTE:

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

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE) — 1

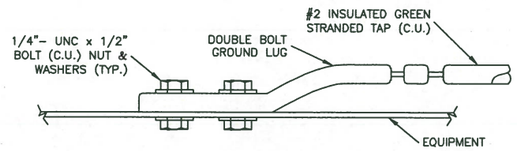


NOTES:

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

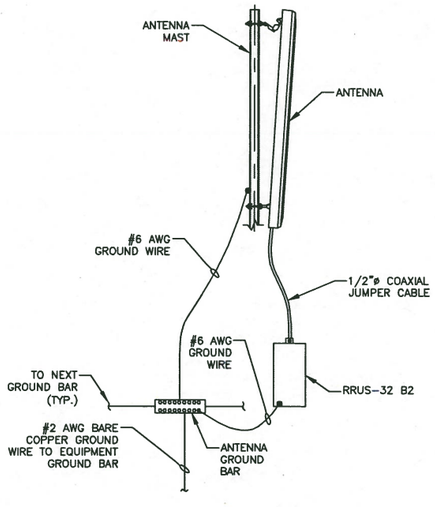
TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL — 2

SCALE: N.T.S.



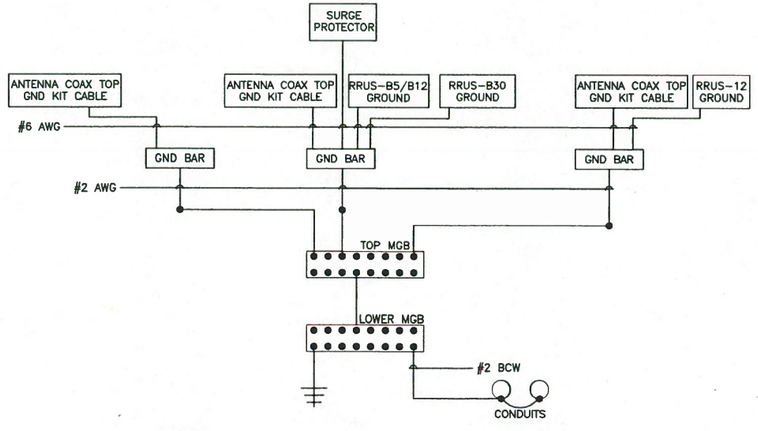
CONNECTION TO EQUIPMENT DETAIL — 3

SCALE: N.T.S.



TYPICAL ANTENNA GROUNDING DETAIL — 4

SCALE: N.T.S



NOTES:

1. BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
2. BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
3. SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.
4. GROUND ALL EQUIPMENT PER MANUFACTURER RECOMMENDATIONS.

SCHEMATIC GROUNDING DIAGRAM — 5

SCALE: N.T.S.

at&t

500 ENTERPRISE DRIVE SUITE 3A
ROCKY HILL, CT 06067

SAI

12 INDUSTRIAL WAY
SALEM, NH 03079

CT2128
FAIRFIELD
GREENFIELD HILL

CONSTRUCTION DRAWINGS

0	04/01/19	ISSUED AS FINAL
B	03/22/19	REVISED PER COMMENTS
A	02/21/19	ISSUED FOR REVIEW

Dewberry®
Dewberry Engineers Inc.
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STATE OF CONNECTICUT — YANG L. — No. 23222 — LICENSED PROFESSIONAL ENGINEER

YANG LI, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093832
SITE ADDRESS:	

3965 CONGRESS STREET
FAIRFIELD, CT 06824

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

Dewberry

Dewberry Engineers Inc.
4805 Lake Brook Drive, Suite 200
Glen Allen, VA 23060

804.290.7957
804.290.7928 fax
www.dewberry.com

Tower Analysis Report
For a 150 ft. Monopole Tower

Site Name: CT2128
Site Address: 3965 Congress Street
Fairfield, CT 06824

Prepared for:
SAI Communications, Inc.
12 Industrial Way
Salem, NH 03079

January 29, 2019

Prepared by:
Dewberry Engineers Inc.
600 Parsippany Road
Parsippany, NJ 07054
Dewberry Project Number: 50093832

Tower Controlling Member	% Capacity	Pass/Fail
Tower Shaft	62.4	Pass
Tower base Components	52.9	Pass
Tower Foundation	-	Pass

Tower/Foundation Previously Reinforced?	YES ☐ / NO ☒
Previous Reinforcement Verified?	YES ☐ / NO ☒ Date: **N/A**
Reinforcement Required?	YES ☐ / NO ☒

Prepared by:

Deep A. Patel
Graduate Engineer

Reviewed by:

Jiang Yu, P.E.
Connecticut Professional Engineer
License No.: 23222

TABLE OF CONTENTS

1.0 INTRODUCTION AND PROJECT SUMMARY

The objective of this report is to provide a structural analysis for the existing 150 ft. tall monopole located in Fairfield, Connecticut to determine the structural capacity of the structure with the existing & proposed equipment. The telecommunication upgrade is proposed by AT&T and managed by SAI Communications, Inc.

Please refer to the appendices for the structural package regarding the structural analysis.

2.0 CODES, STANDARDS, AND REFERENCES

The structure was analyzed and the proposed installation designed per the provisions of the following Codes and Standards:

- *2018 Connecticut State Building Code – Amendments to IBC 2015*
- *International Building Code (IBC) 2015, International Code Council.*
- *TIA-222-G-4, Structural Standard for Antenna Supporting Structures and Antennas*
- American Society of Civil Engineer*s ASCE 7-10 Minimum Design Loads for Buildings and Other Structure.*

The following site-specific design parameters were considered in this analysis per the provisions of *TIA-222-G:*

Risk Category:	II	
Exposure Category:	B	
Design Basic Wind Speed:	95 mph (converted from 122 mph)	*Eqn. 16-33, IBC 2015, NJ Edition*
Serviceability Wind Speed:	60 mph	*Sect. 2.8.3, TIA*

The tower geometry, member sizes, existing appurtenance loading, and foundation design loading were referenced from the following reports, all of which can be found in appendix B:

- *Structural Analysis by Centek Engineering Inc. dated August 30, 2016*
- *CT2128 Construction Drawings by Centek Engineering Inc. dated September 29, 2016*

3.0 EXISTING AND PROPOSED TOWER LOADING

3.1 Existing Antenna Loading & Cable Information:

CARRIER	ELEV. (ft.)	QTY.	APPURTENANCES DESCRIPTION	FEEDLINE
Town	149	2	10 ft Dipole	(3) 1-5/8" coax
		1	DB810K	
Nextel	149	3	DB844H90E-XY	(12) 1-5/8" coax
		3	Valmont T-Arm	
Sprint	138	3	APXVSPP18-C-A20	(3) Hyrbiflex cables
		3	FD-RRH 4x45 1900	
		3	FD-RRH 2x50 800	
		1	13' Platform w/Rails	
AT&T	129	3	RRUS-11	(12) 1-1/4" coax (1) Fiber cable
		3	RRUS-12	
		3	A2	
		1	DC6-48-60-18-8F Surge Arrestor	
		1	Valmont Uni-Tri Bracket	
	127	6	7770.00*	
		3	HPA-65R-BUU-H6	
		12	LGP214nn TMA**	
	125	1	Valmont 13' Low Profile Platform	
T-Mobile	113	3	APX16DWV-16DWV-S-E-ACU	(12) 1-1/4" coax
		6	10"x8"x3" TMA	
		1	13' Platform w/Rails	
Town	104	4	4'-6" Standoff	(4) 7/8" coax
		1	1142-2B	
		2	ASPA685	
		1	DB222	
Verizon	80	6	DB846F65ZAXY	(12) 1-5/8" coax (1) 1-5/8" fiber cable
		3	BXA-171063/8BF	
		3	BXA-70063/6CF	
		6	FD9R6004/2C-E3 Diplexer	
		3	BXA-171063/12CF	
		3	RRH2x40-AWS	
		1	DB-T1-6Z-8AB-0Z	
	78	1	Valmont 13' Low Profile Platform	
	40	1	Stand-off	
		1	GPS	

(*) 6 to be removed.
(**) 3 to be removed.

3.2 Proposed Antenna Loading & Cable Information (AT&T):

CARRIER	ELEV. (ft.)	QTY.	APPURTENANCES DESCRIPTION	FEEDLINE
AT&T	127	3	**800-10965**	(1) Fiber Cable
		3	**RRH B5/B12 4449**	
		3	**RRH 4415 B30**	
		1	**DC/Fiber Squid**	

3.3 Final Configuration of Antennas & Equipment Information (AT&T):

CARRIER	ELEV. (ft.)	QTY.	APPURTENANCES DESCRIPTION	FEEDLINE
AT&T	129	3	A2	(12) 1-1/4" coax **(2) Fiber cables**
		3	RRUS-11	
		3	RRUS-12	
		1	DC6-48-60-18-8F Surge Arrestor	
		1	Valmont Uni-Tri Bracket	
	127	6	7770.00*	
		3	HPA-65R-BUU-H6	
		12	LGP214nn TMA**	
		3	**800-10965**	
		3	**RRH B5/B12 4449**	
		3	**RRH 4415 B30**	
		1	**DC/Fiber Squid**	
	125	1	Valmont 13' Low Profile Platform	

3.4 Method:

tnxTower, a commercially available engineering software program, was used to create a theoretical mathematical model of the tower members and calculate primary member stresses under various loading conditions. Selected output from the analysis is included in Appendix A.

4.0 TOWER ANALYSIS RESULTS SUMMARY

4.1 Tower Structure Results

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	150 - 95.83	Pole	TP33.469x23.61x0.281	1	-17002.30	1938050.00	36.9	Pass
L2	95.83 - 47.83	Pole	TP41.644x31.9661x0.375	2	-31280.80	3318110.00	54.3	Pass
L3	47.83 - 30	Pole	TP41.139x39.7709x0.438	3	-40294.10	4142390.00	62.4	Pass
L4	30 - 0	Pole	TP49.6x41.139x0.58	4	-40321.20	5583380.00	46.6	Pass
							Summary	
						Pole (L3)	62.4	Pass
						Base Plate	52.9	Pass
						RATING =	**62.4**	**Pass**

Table above displays the summary of the ratio (as the percentage) of force in the member to their capacities. Values greater than 100% indicate the maximum force in the member exceeds its capacity.

*Note: Capacities up to 105% are considered acceptable (where applicable)

4.2 Foundation Results

The table below displays the previous foundation design reactions according to Centek Engineering Inc.

Reactions	Previous Reactions Centek Engineering Inc.**	Factored Reactions*
Axial	44 kip	59.4 kip
Shear	42 kip	56.7 kip
Moment	3989 kip-ft	5385.2 kip-ft

* Reactions obtained from Centek Engineering Inc analysis multiplied by a factor of 1.35

The table below displays the foundation design reactions obtained from this analysis.

Reactions	Current Analysis Reactions
Axial	101 kip
Shear	32.4 kip
Moment	3020.6 kip-ft

Previous Centek Engineering Caisson analysis determined the moment capacity of the tower foundation to be at 61.9%. The Dewberry Engineer's analysis determined the moment reaction to be 3020.6 kip-ft, which is less than the previous moment reaction calculated by Centek Engineering. Therefore, the foundation is adequate in moment capacity.

Previous Centek Engineering Caisson analysis determined the lateral deflection to be 0.37 in. The Dewberry analysis determined the shear force to be 32.5 kip and moment to be 3020.6 kip-ft, both of which are less than the previous shear force and moment calculated by Centek Engineering. Therefore, the foundation is adequate for lateral deflection.

5.0 CONCLUSIONS, COMMENTARY, AND RECOMMENDATIONS

After analysis, it was determined that the existing tower structure **is adequate** to support the proposed telecommunication upgrade. Additionally, the existing reinforced foundation **is adequate** to support the proposed installation.

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. Dewberry Engineers Inc. reserves the right to add to or modify this report if more information becomes available. The conclusions reached by Dewberry Engineers Inc. in this report are only applicable to the previously mentioned existing structural elements supporting the proposed wireless telecommunications installation. The results of this report are based on the assumption that existing structural elements have been installed per the original design documents, have been well maintained and are uncompromised. This report does not imply that a thorough inspection of the existing structure has been performed. Any deviation of the support condition, loading, location, placement, equipment configuration, etc, will require Dewberry Engineers Inc. to generate an additional structural analysis.

6.0 ASSUMPTIONS

This feasibility structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. Dewberry Engineers Inc. has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis**.**

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analysis of the tower only.
5. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
7. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and Dewberry Engineering Inc. should be allowed to review any new information to determine its effect on the structural integrity of the tower.

7.0 DISCLAIMER OF WARRANTIES

The engineering services rendered by Dewberry Engineers Inc. in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

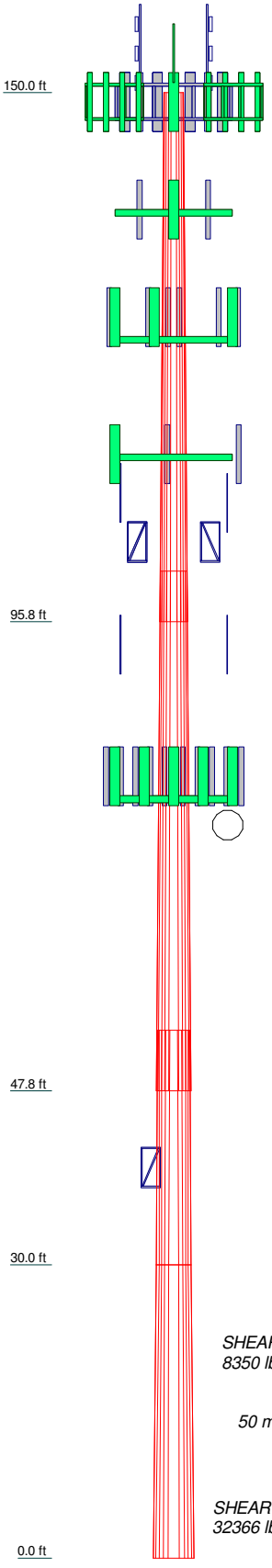
Dewberry Engineers Inc. does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. Dewberry Engineers Inc. provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to calculate the structural integrity for the existing tower under existing and proposed loadings.

Dewberry Engineers Inc. makes no warranties, expresses and/or implied in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. Dewberry will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of Dewberry pursuant to this report will be limited to the total fee received for preparation of this report

APPENDIX A

Section	1	2	3	4
Length (ft)	54.17	53.17	24.00	30.00
Number of Sides	12	12	12	12
Thickness (in)	0.2810	0.3750	0.4380	0.5800
Socket Length (ft)	5.17	6.17		
Top Dia (in)	23.6100	31.9661	39.7709	41.1390
Bot Dia (in)	33.4690	41.6440	41.1390	49.6000
Grade	A572-65			
Weight (lb)	4713.1	7958.8	4609.2	9393.1

Total Weight (lb): 26674.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION
10-ft Dipole (Town)	149
10-ft Dipole (Town)	149
DB810K (Town)	149
(4) DB844H90E-XY (Nextel Existing)	149
(4) DB844H90E-XY (Nextel Existing)	149
(4) DB844H90E-XY (Nextel Existing)	149
Valmont T-Arm (Nextel Existing)	149
Valmont T-Arm (Nextel Existing)	149
Valmont T-Arm (Nextel Existing)	149
APXVSPP18-C-A20 (Sprint Existing)	138
APXVSPP18-C-A20 (Sprint Existing)	138
APXVSPP18-C-A20 (Sprint Existing)	138
FD-RRH 4x45 1900 (Sprint Existing)	138
FD-RRH 4x45 1900 (Sprint Existing)	138
FD-RRH 4x45 1900 (Sprint Existing)	138
FD-RRH 2x50 800 (Sprint Existing)	138
FD-RRH 2x50 800 (Sprint Existing)	138
FD-RRH 2x50 800 (Sprint Existing)	138
13' Platform w/Rails (Sprint Existing)	138
RRUS-11 (AT⌶ Existing)	129
RRUS-11 (AT⌶ Existing)	129
RRUS-11 (AT⌶ Existing)	129
RRUS-12 (AT⌶ Existing)	129
RRUS-12 (AT⌶ Existing)	129
RRUS-12 (AT⌶ Existing)	129
A2 (AT⌶ Existing)	129
A2 (AT⌶ Existing)	129
A2 (AT⌶ Existing)	129
DC6-48-60-18-8F Surge Arrestor (AT⌶ Existing)	129
Valmont Uni-Tri Bracket (AT⌶ Existing)	129
7770.00 (AT⌶ Existing)	127
HPA-65R-BUU-H6 (AT⌶ Existing)	127
7770.00 (AT⌶ Existing)	127
HPA-65R-BUU-H6 (AT⌶ Existing)	127
7770.00 (AT⌶ Existing)	127
HPA-65R-BUU-H6 (AT⌶ Existing)	127
(2) LGP214nn TMA (AT⌶ Existing)	127
(2) LGP214nn TMA (AT⌶ Existing)	127
(2) LGP214nn TMA (AT⌶ Existing)	127
800-10965	127
RRH B5/B12 4449	127
RRH 4415 B30	127
DC/Fiber Squid	127
800-10965	127
RRH B5/B12 4449	127
RRH 4415 B30	127
800-10965	127
RRH B5/B12 4449	127
RRH 4415 B30	127

TYPE	ELEVATION
Valmont 13' Low Profile Platform (AT⌶ Existing)	125
APX16DWV-16DWV-S-E-ACU (T-Mobile Existing)	113
APX16DWV-16DWV-S-E-ACU (T-Mobile Existing)	113
APX16DWV-16DWV-S-E-ACU (T-Mobile Existing)	113
(2) 10"x8"x3" TMA (T-Mobile Existing)	113
(2) 10"x8"x3" TMA (T-Mobile Existing)	113
(2) 10"x8"x3" TMA (T-Mobile Existing)	113
13' Platform w/Rails (T-Mobile Existing)	113
4'-6" Standoff (Town - Exising)	104
4'-6" Standoff (Town - Exising)	104
1142-2B (Town - Existing)	104
ASPA685 (Town - Existing)	104
DB222 (Town - Existing)	104
ASPA685 (Town - Existing)	104
4'-6" Standoff (Town - Exising)	104
4'-6" Standoff (Town - Exising)	104
BXA-70063/6CF (Verizon - Existing)	80
DB846F65ZAXY (Verizon - Existing)	80
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	80
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	80
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	80
BXA-171063-12CF (Verizon - Existing)	80
BXA-171063-12CF (Verizon - Existing)	80
BXA-171063-12CF (Verizon - Existing)	80
RRH2x40-AWS (Verizon - Existing)	80
RRH2x40-AWS (Verizon - Existing)	80
RRH2x40-AWS (Verizon - Existing)	80
DB-T1-6Z-8AB-0Z (Verizon - Existing)	80
BXA-70063/6CF (Verizon - Existing)	80
DB846F65ZAXY (Verizon - Existing)	80
DB846F65ZAXY (Verizon - Existing)	80
BXA-171063/8BF (Verizon Existing)	80
BXA-70063/6CF (Verizon - Existing)	80
DB846F65ZAXY (Verizon - Existing)	80
DB846F65ZAXY (Verizon - Existing)	80
BXA-171063/8BF (Verizon Existing)	80
DB846F65ZAXY (Verizon - Existing)	80
BXA-171063/8BF (Verizon Existing)	80
Valmont 13' Low Profile Platform (Verizon - Existing)	78
GPS (Existing)	40
Standoff	40

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

ALL REACTIONS ARE FACTORED

AXIAL 101002 lb
SHEAR 8350 lb
TORQUE 892 lb
50 mph WIND - 0.750

AXIAL 54225 lb
SHEAR 32366 lb
TORQUE 1619 lb
REACTIONS - 95 mph WIND

TOWER DESIGN NOTES

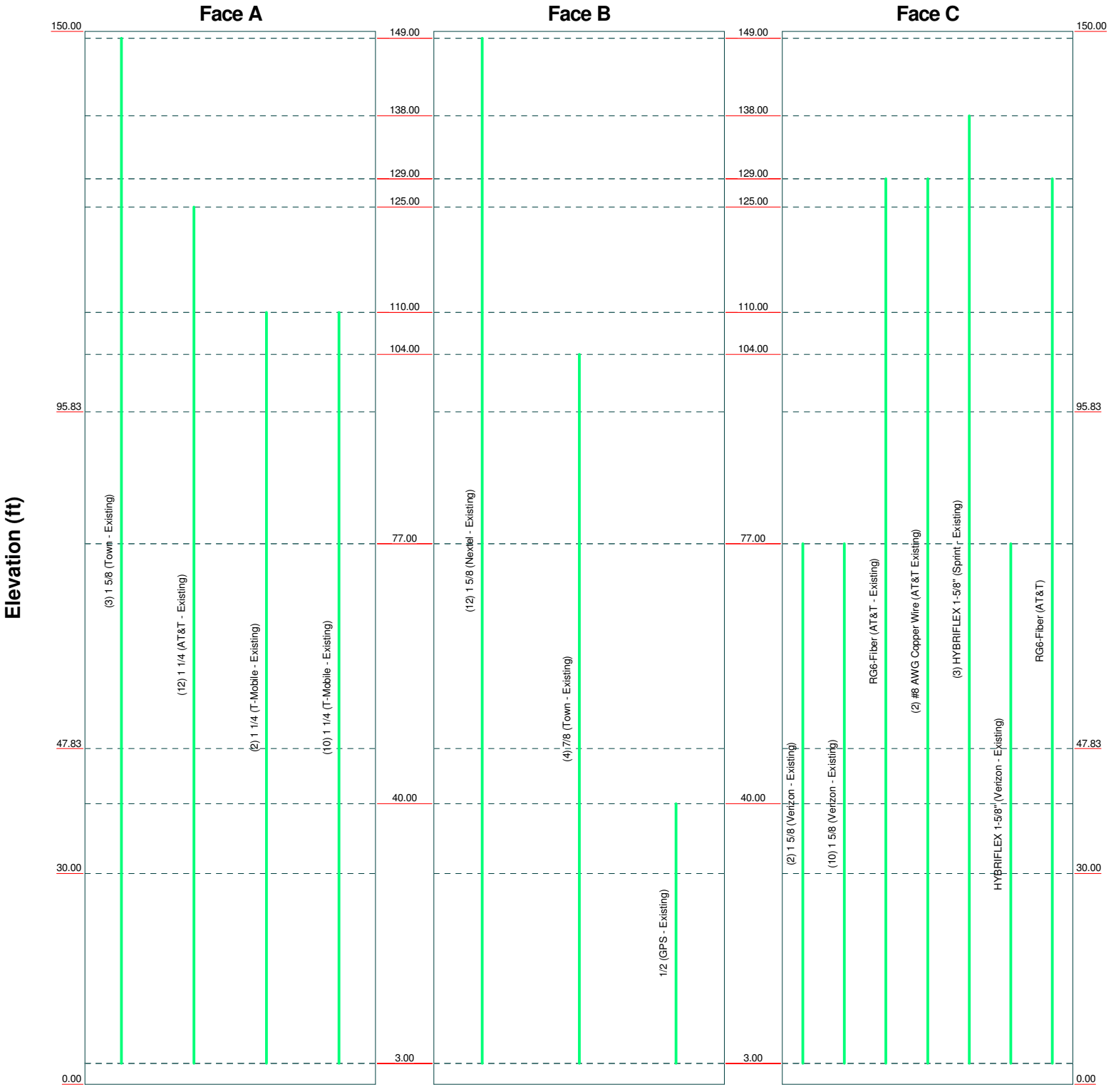
1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 95 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase 8 in 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. Weld together tower sections have flange connections.
9. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
10. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 30 Standards.
11. Welds are fabricated with ER-70S-6 electrodes.
12. TOWER RATING: 62.4%

Dewberry
600 Parsippany Road, Suite 301
Parsippany, NJ 07054
Phone: (973) 739-9400
FAX: (973) 739-9710

Job: **50093832**			
Project: **CT2128**			
Client: SAI/AT&T	Drawn by: DAP		App'd:
Code: TIA-222-G	Date: 01/25/19		Scale: NTS
Path: Q:\50055106\50093832\Adm\Reports\TA\tnx\50055106 - CT2128-TA.eri			Dwg No. E-1

Feed Line Distribution Chart
0' - 150'

Round | Flat | App In Face | App Out Face | Truss Leg



Dewberry
600 Parsippany Road, Suite 301
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Job: **50093832**			
Project: **CT2128**			
Client: SAI/AT&T	Drawn by: DAP		App'd:
Code: TIA-222-G	Date: 01/25/19		Scale: NTS
Path: Q:\50055106\50093832\Adm\Reports\TA\tnx\50055106 - CT2128-TA.eri			Dwg No. E-7

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 95 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole 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		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.00-95.83	54.17	5.17	12	23.6100	33.4690	0.2810	1.1250	A572-65 (65 ksi)
L2	95.83-47.83	53.17	6.17	12	31.9661	41.6440	0.3750	1.5000	A572-65 (65 ksi)
L3	47.83-30.00	24.00	0.00	12	39.7709	41.1390	0.4380	1.7500	A572-65 (65 ksi)
L4	30.00-0.00	30.00		12	41.1390	49.6000	0.5800	2.3200	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.4429	21.1085	1466.3462	8.3518	12.2300	119.8977	2971.2149	10.3890	5.5744	19.838
	34.6497	30.0292	4221.7391	11.8813	17.3369	243.5112	8554.3879	14.7794	8.2166	29.241
L2	34.0679	38.1462	4859.2074	11.3096	16.5584	293.4585	9846.0716	18.7744	7.5619	20.165
	43.1130	49.8323	10832.9048	14.7743	21.5716	502.1838	21950.4020	24.5260	10.1556	27.082
L3	41.5380	55.4736	10954.3159	14.0812	20.6013	531.7281	22196.4139	27.3024	9.4858	21.657
	42.5902	57.4031	12137.5539	14.5710	21.3100	569.5708	24593.9749	28.2520	9.8525	22.494
L4	42.5902	75.7480	15904.9216	14.5201	21.3100	746.3595	32227.6831	37.2809	9.4709	16.329
	51.3497	91.5498	28079.5237	17.5492	25.6928	1092.8946	56896.7277	45.0580	11.7384	20.239

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
L1 150.00-95.83				1	1	1			
L2 95.83-47.83				1	1	1			
L3 47.83-30.00				1	1	1			
L4 30.00-0.00				1.2	1	1.1			

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	√
Anchor bolt grade	A615-75
Anchor bolt size	2.2500 in
Number of bolts	16
Embedment length	60.0000 in
f'_c	4 ksi
Grout space	3.0000 in
Base plate grade	A633-60
Base plate thickness	2.7500 in
Bolt circle diameter	57.8500 in
Outer diameter	63.8500 in
Inner diameter	40.0000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8 (Town - Existing)	A	No	Inside Pole	149.00 - 3.00	3	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
1 5/8 (Nextel - Existing)	B	No	Inside Pole	149.00 - 3.00	12	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
1 1/4 (AT&T - Existing)	A	No	CaAa (Out Of Face)	125.00 - 3.00	12	No Ice	0.00	1.00
						1/2" Ice	0.00	2.00
						1" Ice	0.00	3.00
1 1/4 (T-Mobile - Existing)	A	No	CaAa (Out Of Face)	110.00 - 3.00	2	No Ice	0.16	1.00
						1/2" Ice	0.25	2.00
						1" Ice	0.35	3.00
1 1/4 (T-Mobile - Existing)	A	No	CaAa (Out Of Face)	110.00 - 3.00	10	No Ice	0.00	1.00
						1/2" Ice	0.00	2.00
						1" Ice	0.00	3.00
1 5/8 (Verizon - Existing)	C	No	CaAa (Out Of Face)	77.00 - 3.00	2	No Ice	0.20	1.00
						1/2" Ice	0.30	3.00
						1" Ice	0.40	5.00
1 5/8 (Verizon - Existing)	C	No	CaAa (Out Of Face)	77.00 - 3.00	10	No Ice	0.00	1.00
						1/2" Ice	0.00	3.00
						1" Ice	0.00	5.00
7/8 (Town - Existing)	B	No	Inside Pole	104.00 - 3.00	4	No Ice	0.00	1.00
						1/2" Ice	0.00	1.00
						1" Ice	0.00	1.00
1/2 (GPS - Existing)	B	No	CaAa (Out Of Face)	40.00 - 3.00	1	No Ice	0.06	1.00
						1/2" Ice	0.16	1.00
						1" Ice	0.26	1.00
RG6-Fiber (AT&T - Existing)	C	No	CaAa (Out Of Face)	129.00 - 3.00	1	No Ice	0.00	1.00
						1/2" Ice	0.00	2.00
						1" Ice	0.00	3.00
#8 AWG Copper Wire (AT&T Existing)	C	No	CaAa (Out Of Face)	129.00 - 3.00	2	No Ice	0.00	0.00
						1/2" Ice	0.00	0.00
						1" Ice	0.00	0.00
HYBRIFLEX 1-5/8" (Sprint - Existing)	C	No	Inside Pole	138.00 - 3.00	3	No Ice	0.00	2.00
						1/2" Ice	0.00	2.00
						1" Ice	0.00	2.00
HYBRIFLEX 1-5/8" (Verizon - Existing)	C	No	CaAa (Out Of Face)	77.00 - 3.00	1	No Ice	0.00	2.00
						1/2" Ice	0.00	3.00
						1" Ice	0.00	4.00
PROPOSED RG6-Fiber (AT&T)	C	No	CaAa (Out Of Face)	129.00 - 3.00	1	No Ice	0.00	1.00
						1/2" Ice	0.00	2.00
						1" Ice	0.00	3.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	150.00-95.83	A	0.000	0.000	0.000	4.393	679.59
		B	0.000	0.000	0.000	0.000	670.72
		C	0.000	0.000	0.000	0.000	319.36
L2	95.83-47.83	A	0.000	0.000	0.000	14.880	1296.00
		B	0.000	0.000	0.000	0.000	768.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	0.000	11.551	792.38
L3	47.83-30.00	A	0.000	0.000	0.000	5.527	481.41
		B	0.000	0.000	0.000	0.580	295.28
		C	0.000	0.000	0.000	7.061	392.26
L4	30.00-0.00	A	0.000	0.000	0.000	8.370	729.00
		B	0.000	0.000	0.000	1.566	459.00
		C	0.000	0.000	0.000	10.692	594.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	150.00-95.83	A	1.709	0.000	0.000	0.000	14.080	2457.45
		B		0.000	0.000	0.000	0.000	670.72
		C		0.000	0.000	0.000	0.000	546.14
L2	95.83-47.83	A	1.621	0.000	0.000	0.000	47.696	5234.04
		B		0.000	0.000	0.000	0.000	768.00
		C		0.000	0.000	0.000	31.494	3613.45
L3	47.83-30.00	A	1.525	0.000	0.000	0.000	17.084	1868.31
		B		0.000	0.000	0.000	3.821	295.28
		C		0.000	0.000	0.000	18.618	1952.52
L4	30.00-0.00	A	1.382	0.000	0.000	0.000	23.294	2519.95
		B		0.000	0.000	0.000	9.029	459.00
		C		0.000	0.000	0.000	25.616	2608.82

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

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
10-ft Dipole (Town)	A	From Face	3.00	0.0000	149.00	No Ice	3.15	3.15	32.00
			0.00			1/2" Ice	5.67	5.67	42.00
			5.00			1" Ice	8.19	8.19	52.00
10-ft Dipole (Town)	B	From Face	3.00	0.0000	149.00	No Ice	3.15	3.15	32.00
			0.00			1/2" Ice	5.67	5.67	42.00
			5.00			1" Ice	8.19	8.19	52.00
DB810K (Town)	C	From Face	3.00	0.0000	149.00	No Ice	4.08	4.08	35.00
			0.00			1/2" Ice	5.73	5.73	65.00
			5.00			1" Ice	7.39	7.39	95.00
(4) DB844H90E-XY (Nextel Existing)	A	From Face	3.00	0.0000	149.00	No Ice	2.87	3.73	10.00
			0.00			1/2" Ice	3.18	4.10	35.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	3.49	4.47	60.00
(4) DB844H90E-XY (Nextel Existing)	B	From Face	3.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	2.87 3.18 3.49	3.73 4.10 4.47	10.00 35.00 60.00
(4) DB844H90E-XY (Nextel Existing)	C	From Face	3.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice	2.87 3.18 3.49	3.73 4.10 4.47	10.00 35.00 60.00
Valmont T-Arm (Nextel Existing)	A	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice	10.54 14.45 18.36	10.54 14.45 18.36	336.00 412.00 488.00
Valmont T-Arm (Nextel Existing)	B	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice	10.54 14.45 18.36	10.54 14.45 18.36	336.00 412.00 488.00
Valmont T-Arm (Nextel Existing)	C	None		0.0000	149.00	No Ice 1/2" Ice 1" Ice	10.54 14.45 18.36	10.54 14.45 18.36	336.00 412.00 488.00
APXVSPP18-C-A20 (Sprint Existing)	A	From Face	3.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	8.26 8.81 9.35	5.28 5.74 6.19	57.00 107.00 157.00
APXVSPP18-C-A20 (Sprint Existing)	B	From Face	3.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	8.26 8.81 9.35	5.28 5.74 6.19	57.00 107.00 157.00
APXVSPP18-C-A20 (Sprint Existing)	C	From Face	3.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	8.26 8.81 9.35	5.28 5.74 6.19	57.00 107.00 157.00
FD-RRH 4x45 1900 (Sprint Existing)	A	From Face	1.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.71 2.94 3.18	2.78 3.02 3.26	60.00 84.00 108.00
FD-RRH 4x45 1900 (Sprint Existing)	B	From Face	1.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.71 2.94 3.18	2.78 3.02 3.26	60.00 84.00 108.00
FD-RRH 4x45 1900 (Sprint Existing)	C	From Face	1.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.71 2.94 3.18	2.78 3.02 3.26	60.00 84.00 108.00
FD-RRH 2x50 800 (Sprint Existing)	A	From Face	1.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.67	64.00 86.00 108.00
FD-RRH 2x50 800 (Sprint Existing)	B	From Face	1.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.67	64.00 86.00 108.00
FD-RRH 2x50 800 (Sprint Existing)	C	From Face	1.00 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice 1" Ice	2.40 2.61 2.83	2.25 2.46 2.67	64.00 86.00 108.00
13' Platform w/Rails (Sprint Existing)	C	None		0.0000	138.00	No Ice 1/2" Ice 1" Ice	17.20 22.30 27.40	17.20 22.30 27.40	2000.00 3000.00 4000.00
RRUS-11 (AT&T Existing)	A	From Face	0.50 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	2.99 3.23 3.46	1.25 1.41 1.58	50.00 70.00 90.00
RRUS-11 (AT&T Existing)	B	From Face	0.50 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	2.99 3.23 3.46	1.25 1.41 1.58	50.00 70.00 90.00
RRUS-11 (AT&T Existing)	C	From Face	0.50 0.00 0.00	0.0000	129.00	No Ice 1/2" Ice 1" Ice	2.99 3.23 3.46	1.25 1.41 1.58	50.00 70.00 90.00
RRUS-12 (AT&T Existing)	A	From Face	0.50 0.00	0.0000	129.00	No Ice 1/2" Ice	3.67 3.93	1.49 1.67	58.00 81.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	4.18	1.86	104.00
RRUS-12 (AT&T Existing)	B	From Face	0.50	0.0000	129.00	No Ice	3.67	1.49	58.00
			0.00			1/2" Ice	3.93	1.67	81.00
			0.00			1" Ice	4.18	1.86	104.00
RRUS-12 (AT&T Existing)	C	From Face	0.50	0.0000	129.00	No Ice	3.67	1.49	58.00
			0.00			1/2" Ice	3.93	1.67	81.00
			0.00			1" Ice	4.18	1.86	104.00
A2 (AT&T Existing)	A	From Face	0.50	0.0000	129.00	No Ice	2.42	0.54	22.00
			0.00			1/2" Ice	2.63	0.68	35.00
			0.00			1" Ice	2.84	0.81	48.00
A2 (AT&T Existing)	B	From Face	0.50	0.0000	129.00	No Ice	2.42	0.54	22.00
			0.00			1/2" Ice	2.63	0.68	35.00
			0.00			1" Ice	2.84	0.81	48.00
A2 (AT&T Existing)	C	From Face	0.50	0.0000	129.00	No Ice	2.42	0.54	22.00
			0.00			1/2" Ice	2.63	0.68	35.00
			0.00			1" Ice	2.84	0.81	48.00
DC6-48-60-18-8F Surge Arrestor (AT&T Existing)	C	From Face	0.50	0.0000	129.00	No Ice	2.23	2.23	20.00
			0.00			1/2" Ice	2.45	2.45	39.00
			0.00			1" Ice	2.67	2.67	58.00
Valmont Uni-Tri Bracket (AT&T Existing)	C	None		0.0000	129.00	No Ice	1.75	1.75	290.00
						1/2" Ice	1.94	1.94	306.00
						1" Ice	2.13	2.13	322.00
7770.00 (AT&T Existing)	A	From Face	3.00	0.0000	127.00	No Ice	5.88	2.93	35.00
			-6.00			1/2" Ice	6.31	3.27	68.00
			0.00			1" Ice	6.75	3.62	101.00
HPA-65R-BUU-H6 (AT&T Existing)	A	From Face	3.00	0.0000	127.00	No Ice	10.36	6.45	51.00
			6.00			1/2" Ice	10.93	6.91	114.00
			0.00			1" Ice	11.49	7.38	177.00
7770.00 (AT&T Existing)	B	From Face	3.00	0.0000	127.00	No Ice	5.88	2.93	35.00
			-6.00			1/2" Ice	6.31	3.27	68.00
			0.00			1" Ice	6.75	3.62	101.00
HPA-65R-BUU-H6 (AT&T Existing)	B	From Face	3.00	0.0000	127.00	No Ice	10.36	6.45	51.00
			6.00			1/2" Ice	10.93	6.91	114.00
			0.00			1" Ice	11.49	7.38	177.00
7770.00 (AT&T Existing)	C	From Face	3.00	0.0000	127.00	No Ice	5.88	2.93	35.00
			-6.00			1/2" Ice	6.31	3.27	68.00
			0.00			1" Ice	6.75	3.62	101.00
HPA-65R-BUU-H6 (AT&T Existing)	C	From Face	3.00	0.0000	127.00	No Ice	10.36	6.45	51.00
			6.00			1/2" Ice	10.93	6.91	114.00
			0.00			1" Ice	11.49	7.38	177.00
(2) LGP214nn TMA (AT&T Existing)	A	From Face	3.00	0.0000	127.00	No Ice	0.00	0.23	14.00
			0.00			1/2" Ice	0.00	0.31	21.00
			0.00			1" Ice	0.00	0.39	28.00
(2) LGP214nn TMA (AT&T Existing)	B	From Face	3.00	0.0000	127.00	No Ice	0.00	0.23	14.00
			0.00			1/2" Ice	0.00	0.31	21.00
			0.00			1" Ice	0.00	0.39	28.00
(2) LGP214nn TMA (AT&T Existing)	C	From Face	3.00	0.0000	127.00	No Ice	0.00	0.23	14.00
			0.00			1/2" Ice	0.00	0.31	21.00
			0.00			1" Ice	0.00	0.39	28.00
Valmont 13' Low Profile Platform (AT&T Existing)	C	None		0.0000	125.00	No Ice	15.70	15.70	1300.00
						1/2" Ice	20.10	20.10	1765.00
						1" Ice	24.50	24.50	2230.00
APX16DWV-16DWV-S-E-A CU (T-Mobile Existing)	A	From Face	3.00	0.0000	113.00	No Ice	6.70	2.00	40.00
			6.00			1/2" Ice	7.13	2.33	71.00
			0.00			1" Ice	7.56	2.65	102.00
APX16DWV-16DWV-S-E-A CU (T-Mobile Existing)	B	From Face	3.00	0.0000	113.00	No Ice	6.70	2.00	40.00
			6.00			1/2" Ice	7.13	2.33	71.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	7.56	2.65	102.00
APX16DWV-16DWV-S-E-A CU (T-Mobile Existing)	C	From Face	3.00 6.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	6.70 7.13 7.56	2.00 2.33 2.65	40.00 71.00 102.00
(2) 10"x8"x3" TMA (T-Mobile Existing)	A	From Face	3.00 6.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.29 0.38 0.47	15.00 20.00 25.00
(2) 10"x8"x3" TMA (T-Mobile Existing)	B	From Face	3.00 6.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.29 0.38 0.47	15.00 20.00 25.00
(2) 10"x8"x3" TMA (T-Mobile Existing)	C	From Face	3.00 6.00 0.00	0.0000	113.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.29 0.38 0.47	15.00 20.00 25.00
13' Platform w/Rails (T-Mobile Existing)	C	None		0.0000	113.00	No Ice 1/2" Ice 1" Ice	17.20 22.30 27.40	17.20 22.30 27.40	2000.00 3000.00 4000.00
4'-6" Standoff (Town - Exising)	A	From Face	3.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	2.10 2.48 2.86	0.16 0.21 0.27	40.00 57.00 74.00
4'-6" Standoff (Town - Exising)	A	From Face	3.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	2.10 2.48 2.86	0.16 0.21 0.27	40.00 57.00 74.00
4'-6" Standoff (Town - Exising)	B	From Face	3.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	2.10 2.48 2.86	0.16 0.21 0.27	40.00 57.00 74.00
4'-6" Standoff (Town - Exising)	C	From Face	3.00 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	2.10 2.48 2.86	0.16 0.21 0.27	40.00 57.00 74.00
1142-2B (Town - Existing)	B	From Face	5.00 0.00 4.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	1.12 2.54 3.95	1.12 2.54 3.95	10.00 21.00 32.00
ASPA685 (Town - Existing)	B	From Face	5.00 0.00 -10.50	0.0000	104.00	No Ice 1/2" Ice 1" Ice	5.25 7.38 9.51	5.25 7.38 9.51	22.00 60.00 98.00
DB222 (Town - Existing)	A	From Face	5.00 0.00 5.00	0.0000	104.00	No Ice 1/2" Ice 1" Ice	1.60 2.88 4.16	1.60 2.88 4.16	16.00 21.00 26.00
ASPA685 (Town - Existing)	A	From Face	5.00 0.00 -10.50	0.0000	104.00	No Ice 1/2" Ice 1" Ice	5.25 7.38 9.51	5.25 7.38 9.51	22.00 60.00 98.00
DB846F65ZAXY (Verizon - Existing)	A	From Face	3.00 -6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.03 7.54 8.04	6.16 6.62 7.08	21.00 70.00 119.00
BXA-171063/8BF (Verizon Existing)	A	From Face	3.00 -3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	2.94 3.25 3.57	2.16 2.46 2.76	11.00 29.00 47.00
BXA-70063/6CF (Verizon - Existing)	A	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.73 8.27 8.80	4.16 4.59 5.03	12.00 54.00 96.00
DB846F65ZAXY (Verizon - Existing)	A	From Face	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.03 7.54 8.04	6.16 6.62 7.08	21.00 70.00 119.00
DB846F65ZAXY (Verizon - Existing)	B	From Face	3.00 -6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.03 7.54 8.04	6.16 6.62 7.08	21.00 70.00 119.00
BXA-171063/8BF (Verizon Existing)	B	From Face	3.00 -3.00	0.0000	80.00	No Ice 1/2" Ice	2.94 3.25	2.16 2.46	11.00 29.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	3.57	2.76	47.00
BXA-70063/6CF (Verizon - Existing)	B	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.73 8.27 8.80	4.16 4.59 5.03	12.00 54.00 96.00
DB846F65ZAXY (Verizon - Existing)	B	From Face	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.03 7.54 8.04	6.16 6.62 7.08	21.00 70.00 119.00
DB846F65ZAXY (Verizon - Existing)	C	From Face	3.00 -6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.03 7.54 8.04	6.16 6.62 7.08	21.00 70.00 119.00
BXA-171063/8BF (Verizon Existing)	C	From Face	3.00 -3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	2.94 3.25 3.57	2.16 2.46 2.76	11.00 29.00 47.00
BXA-70063/6CF (Verizon - Existing)	C	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.73 8.27 8.80	4.16 4.59 5.03	12.00 54.00 96.00
DB846F65ZAXY (Verizon - Existing)	C	From Face	3.00 6.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	7.03 7.54 8.04	6.16 6.62 7.08	21.00 70.00 119.00
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	A	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.09 0.14 0.19	3.00 5.00 7.00
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	B	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.09 0.14 0.19	3.00 5.00 7.00
(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	C	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.09 0.14 0.19	3.00 5.00 7.00
BXA-171063-12CF (Verizon - Existing)	A	From Face	3.00 3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	4.79 5.24 5.69	3.62 4.06 4.50	15.00 42.00 69.00
BXA-171063-12CF (Verizon - Existing)	B	From Face	3.00 3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	4.79 5.24 5.69	3.62 4.06 4.50	15.00 42.00 69.00
BXA-171063-12CF (Verizon - Existing)	C	From Face	3.00 3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	4.79 5.24 5.69	3.62 4.06 4.50	15.00 42.00 69.00
RRH2x40-AWS (Verizon - Existing)	A	From Face	3.00 3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	2.52 2.75 2.98	1.59 1.79 2.00	44.00 61.00 78.00
RRH2x40-AWS (Verizon - Existing)	B	From Face	3.00 3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	2.52 2.75 2.98	1.59 1.79 2.00	44.00 61.00 78.00
RRH2x40-AWS (Verizon - Existing)	C	From Face	3.00 3.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	2.52 2.75 2.98	1.59 1.79 2.00	44.00 61.00 78.00
DB-T1-6Z-8AB-0Z (Verizon - Existing)	A	From Face	3.00 0.00 0.00	0.0000	80.00	No Ice 1/2" Ice 1" Ice	5.60 5.92 6.23	2.33 2.56 2.78	44.00 80.00 116.00
Valmont 13' Low Profile Platform (Verizon - Existing)	C	None		0.0000	78.00	No Ice 1/2" Ice 1" Ice	15.70 20.10 24.50	15.70 20.10 24.50	1300.00 1765.00 2230.00
Standoff	A	From Face	1.00 0.00 0.00	0.0000	40.00	No Ice 1/2" Ice 1" Ice	0.75 0.95 1.15	0.75 0.95 1.15	27.00 36.00 45.00
GPS (Existing)	A	From Face	2.00 0.00	0.0000	40.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.00 15.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	2.00	2.00	20.00
PROPOSED									
800-10965	A	From Face	3.00	0.0000	127.00	No Ice	5.46	1.89	108.60
			2.00			1/2" Ice	5.81	2.19	185.13
			0.00			1" Ice	6.16	2.49	261.67
RRH B5/B12 4449	A	From Face	0.50	0.0000	127.00	No Ice	1.86	0.87	47.40
			0.00			1/2" Ice	2.12	1.06	61.95
			0.00			1" Ice	2.37	1.26	76.51
RRH 4415 B30	A	From Face	0.50	0.0000	127.00	No Ice	2.69	1.57	60.00
			0.00			1/2" Ice	3.02	1.85	80.40
			0.00			1" Ice	3.36	2.13	100.80
DC/Fiber Squid	A	From Face	0.50	0.0000	127.00	No Ice	2.10	2.10	19.00
			0.00			1/2" Ice	2.39	2.39	39.65
			0.00			1" Ice	2.69	2.69	60.30
800-10965	B	From Face	3.00	0.0000	127.00	No Ice	5.46	1.89	108.60
			2.00			1/2" Ice	5.81	2.19	185.13
			0.00			1" Ice	6.16	2.49	261.67
RRH B5/B12 4449	B	From Face	0.50	0.0000	127.00	No Ice	1.97	1.40	70.40
			0.00			1/2" Ice	2.24	1.64	88.88
			0.00			1" Ice	2.50	1.87	107.35
RRH 4415 B30	B	From Face	0.50	0.0000	127.00	No Ice	2.69	1.57	60.00
			0.00			1/2" Ice	3.02	1.85	80.40
			0.00			1" Ice	3.36	2.13	100.80
800-10965	C	From Face	3.00	0.0000	127.00	No Ice	5.46	1.89	108.60
			2.00			1/2" Ice	5.81	2.19	185.13
			0.00			1" Ice	6.16	2.49	261.67
RRH B5/B12 4449	C	From Face	0.50	0.0000	127.00	No Ice	1.97	1.40	70.40
			0.00			1/2" Ice	2.24	1.64	88.88
			0.00			1" Ice	2.50	1.87	107.35
RRH 4415 B30	C	From Face	0.50	0.0000	127.00	No Ice	2.69	1.57	60.00
			0.00			1/2" Ice	3.02	1.85	80.40
			0.00			1" Ice	3.36	2.13	100.80

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	121.78	1.045	23	133.377	A	0.000	133.377	133.377	100.00	0.000	4.393
150.00-95.83					B	0.000	133.377		100.00	0.000	0.000
					C	0.000	133.377		100.00	0.000	0.000
L2 95.83-47.83	71.47	0.898	20	154.362	A	0.000	154.362	154.362	100.00	0.000	14.880
					B	0.000	154.362		100.00	0.000	0.000
					C	0.000	154.362		100.00	0.000	11.551
L3 47.83-30.00	38.88	0.754	17	62.500	A	0.000	62.500	62.500	100.00	0.000	5.527
					B	0.000	62.500		100.00	0.000	0.580
					C	0.000	62.500		100.00	0.000	7.061

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L4 30.00-0.00	14.53	0.7	15	117.425	A	0.000	117.425	117.425	100.00	0.000	8.370
					B	0.000	117.425		100.00	0.000	1.566
					C	0.000	117.425		100.00	0.000	10.692

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 150.00-95.83	121.78	1.045	6	1.7092	148.808	A	0.000	148.808	148.808	100.00	0.000	14.080
						B	0.000	148.808		100.00	0.000	0.000
						C	0.000	148.808		100.00	0.000	0.000
L2 95.83-47.83	71.47	0.898	5	1.6205	168.036	A	0.000	168.036	168.036	100.00	0.000	47.696
						B	0.000	168.036		100.00	0.000	0.000
						C	0.000	168.036		100.00	0.000	31.494
L3 47.83-30.00	38.88	0.754	5	1.5248	67.316	A	0.000	67.316	67.316	100.00	0.000	17.084
						B	0.000	67.316		100.00	0.000	3.821
						C	0.000	67.316		100.00	0.000	18.618
L4 30.00-0.00	14.53	0.7	4	1.3819	124.334	A	0.000	124.334	124.334	100.00	0.000	23.294
						B	0.000	124.334		100.00	0.000	9.029
						C	0.000	124.334		100.00	0.000	25.616

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	121.78	1.045	8	133.377	A	0.000	133.377	133.377	100.00	0.000	4.393
150.00-95.83					B	0.000	133.377		100.00	0.000	0.000
					C	0.000	133.377		100.00	0.000	0.000
L2 95.83-47.83	71.47	0.898	7	154.362	A	0.000	154.362	154.362	100.00	0.000	14.880
					B	0.000	154.362		100.00	0.000	0.000
					C	0.000	154.362		100.00	0.000	11.551
L3 47.83-30.00	38.88	0.754	6	62.500	A	0.000	62.500	62.500	100.00	0.000	5.527
					B	0.000	62.500		100.00	0.000	0.580
					C	0.000	62.500		100.00	0.000	7.061
L4 30.00-0.00	14.53	0.7	5	117.425	A	0.000	117.425	117.425	100.00	0.000	8.370
					B	0.000	117.425		100.00	0.000	1.566
					C	0.000	117.425		100.00	0.000	10.692

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	1669.67	4713.09	A	1	1	23	1	1	133.377	3469.69	64.05	C
150.00-95.83			B	1	1		1	1	133.377			
			C	1	1		1	1	133.377			
L2	2856.38	7958.82	A	1	1.128	20	1	1	154.362	4324.80	90.10	C
95.83-47.83			B	1	1.128		1	1	154.362			
			C	1	1.128		1	1	154.362			
L3	1168.95	4609.15	A	1	1.2	17	1	1	62.500	1606.01	90.07	C
47.83-30.00			B	1	1.2		1	1	62.500			
			C	1	1.2		1	1	62.500			
L4 30.00-0.00	1782.00	9393.11	A	1	1.139	15	1	1	117.425	2609.38	86.98	C
			B	1	1.139		1	1	117.425			
			C	1	1.139		1	1	117.425			
Sum Weight:	7477.00	26674.17						OTM	831998.57 lb-ft	12009.88		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	1669.67	4713.09	A	1	1	23	1	1	133.377	3469.69	64.05	C
150.00-95.83			B	1	1		1	1	133.377			
			C	1	1		1	1	133.377			
L2	2856.38	7958.82	A	1	1.128	20	1	1	154.362	4324.80	90.10	C
95.83-47.83			B	1	1.128		1	1	154.362			
			C	1	1.128		1	1	154.362			
L3	1168.95	4609.15	A	1	1.2	17	1	1	62.500	1606.01	90.07	C
47.83-30.00			B	1	1.2		1	1	62.500			
			C	1	1.2		1	1	62.500			
L4 30.00-0.00	1782.00	9393.11	A	1	1.139	15	1	1	117.425	2609.38	86.98	C
			B	1	1.139		1	1	117.425			
			C	1	1.139		1	1	117.425			
Sum Weight:	7477.00	26674.17						OTM	831998.57 lb-ft	12009.88		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	1669.67	4713.09	A	1	1	23	1	1	133.377	3469.69	64.05	C
150.00-95.83			B	1	1		1	1	133.377			
			C	1	1		1	1	133.377			
L2	2856.38	7958.82	A	1	1.128	20	1	1	154.362	4324.80	90.10	C
95.83-47.83			B	1	1.128		1	1	154.362			
			C	1	1.128		1	1	154.362			
L3	1168.95	4609.15	A	1	1.2	17	1	1	62.500	1606.01	90.07	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
47.83-30.00			B	1	1.2		1	1	62.500			
			C	1	1.2		1	1	62.500			
L4 30.00-0.00	1782.00	9393.11	A	1	1.139	15	1	1	117.425	2609.38	86.98	C
			B	1	1.139		1	1	117.425			
			C	1	1.139		1	1	117.425			
Sum Weight:	7477.00	26674.17						OTM	831998.57 lb-ft	12009.88		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	3674.31	8220.16	A	1	1.2	6	1	1	148.808	1344.00	24.81	C
150.00-95.83			B	1	1.2		1	1	148.808			
			C	1	1.2		1	1	148.808			
L2	9615.49	11747.44	A	1	1.2	5	1	1	168.036	1677.46	34.95	C
95.83-47.83			B	1	1.2		1	1	168.036			
			C	1	1.2		1	1	168.036			
L3	4116.11	6044.30	A	1	1.2	5	1	1	67.316	607.02	34.04	C
47.83-30.00			B	1	1.2		1	1	67.316			
			C	1	1.2		1	1	67.316			
L4 30.00-0.00	5587.76	11820.14	A	1	1.2	4	1	1	124.334	969.75	32.32	C
			B	1	1.2		1	1	124.334			
			C	1	1.2		1	1	124.334			
Sum Weight:	22993.67	37832.04						OTM	321255.74 lb-ft	4598.23		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	3674.31	8220.16	A	1	1.2	6	1	1	148.808	1344.00	24.81	C
150.00-95.83			B	1	1.2		1	1	148.808			
			C	1	1.2		1	1	148.808			
L2	9615.49	11747.44	A	1	1.2	5	1	1	168.036	1677.46	34.95	C
95.83-47.83			B	1	1.2		1	1	168.036			
			C	1	1.2		1	1	168.036			
L3	4116.11	6044.30	A	1	1.2	5	1	1	67.316	607.02	34.04	C
47.83-30.00			B	1	1.2		1	1	67.316			
			C	1	1.2		1	1	67.316			
L4 30.00-0.00	5587.76	11820.14	A	1	1.2	4	1	1	124.334	969.75	32.32	C
			B	1	1.2		1	1	124.334			
			C	1	1.2		1	1	124.334			
Sum Weight:	22993.67	37832.04						OTM	321255.74 lb-ft	4598.23		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	3674.31	8220.16	A	1	1.2	6	1	1	148.808	1344.00	24.81	C
150.00-95.83			B	1	1.2		1	1	148.808			
			C	1	1.2		1	1	148.808			
L2	9615.49	11747.44	A	1	1.2	5	1	1	168.036	1677.46	34.95	C
95.83-47.83			B	1	1.2		1	1	168.036			
			C	1	1.2		1	1	168.036			
L3	4116.11	6044.30	A	1	1.2	5	1	1	67.316	607.02	34.04	C
47.83-30.00			B	1	1.2		1	1	67.316			
			C	1	1.2		1	1	67.316			
L4 30.00-0.00	5587.76	11820.14	A	1	1.2	4	1	1	124.334	969.75	32.32	C
			B	1	1.2		1	1	124.334			
			C	1	1.2		1	1	124.334			
Sum Weight:	22993.67	37832.04						OTM	321255.74 lb-ft	4598.23		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	1669.67	4713.09	A	1	1	8	1	1	133.377	1238.34	22.86	C
150.00-95.83			B	1	1		1	1	133.377			
			C	1	1		1	1	133.377			
L2	2856.38	7958.82	A	1	1.128	7	1	1	154.362	1543.54	32.16	C
95.83-47.83			B	1	1.128		1	1	154.362			
			C	1	1.128		1	1	154.362			
L3	1168.95	4609.15	A	1	1.2	6	1	1	62.500	573.19	32.15	C
47.83-30.00			B	1	1.2		1	1	62.500			
			C	1	1.2		1	1	62.500			
L4 30.00-0.00	1782.00	9393.11	A	1	1.139	5	1	1	117.425	931.30	31.04	C
			B	1	1.139		1	1	117.425			
			C	1	1.139		1	1	117.425			
Sum Weight:	7477.00	26674.17						OTM	296943.07 lb-ft	4286.37		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	1669.67	4713.09	A	1	1	8	1	1	133.377	1238.34	22.86	C
150.00-95.83			B	1	1		1	1	133.377			
			C	1	1		1	1	133.377			
L2	2856.38	7958.82	A	1	1.128	7	1	1	154.362	1543.54	32.16	C
95.83-47.83			B	1	1.128		1	1	154.362			
			C	1	1.128		1	1	154.362			
L3	1168.95	4609.15	A	1	1.2	6	1	1	62.500	573.19	32.15	C
47.83-30.00			B	1	1.2		1	1	62.500			
			C	1	1.2		1	1	62.500			
L4 30.00-0.00	1782.00	9393.11	A	1	1.139	5	1	1	117.425	931.30	31.04	C
			B	1	1.139		1	1	117.425			
			C	1	1.139		1	1	117.425			
Sum Weight:	7477.00	26674.17						OTM	296943.07 lb-ft	4286.37		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	1669.67	4713.09	A	1	1	8	1	1	133.377	1238.34	22.86	C
150.00-95.83			B	1	1		1	1	133.377			
			C	1	1		1	1	133.377			
L2	2856.38	7958.82	A	1	1.128	7	1	1	154.362	1543.54	32.16	C
95.83-47.83			B	1	1.128		1	1	154.362			
			C	1	1.128		1	1	154.362			
L3	1168.95	4609.15	A	1	1.2	6	1	1	62.500	573.19	32.15	C
47.83-30.00			B	1	1.2		1	1	62.500			
			C	1	1.2		1	1	62.500			
L4 30.00-0.00	1782.00	9393.11	A	1	1.139	5	1	1	117.425	931.30	31.04	C
			B	1	1.139		1	1	117.425			
			C	1	1.139		1	1	117.425			
Sum Weight:	7477.00	26674.17						OTM	296943.07 lb-ft	4286.37		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	26674.17					
Bracing Weight	0.00					
Total Member Self-Weight	26674.17			-413.72	443.25	
Total Weight	45187.17			-413.72	443.25	
Wind 0 deg - No Ice		-50.61	-20171.20	-1807399.82	5031.84	-415.29
Wind 90 deg - No Ice		20229.64	50.61	4174.87	-1811841.30	-1016.10
Wind 180 deg - No Ice		50.61	20171.20	1806572.38	-4145.34	415.29

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Member Ice	11157.87					
Total Weight Ice	91060.21			-1501.09	1201.26	
Wind 0 deg - Ice		-17.45	-8330.61	-775482.71	2816.01	-159.22
Wind 90 deg - Ice		8350.76	17.45	113.66	-774644.92	-885.37
Wind 180 deg - Ice		17.45	8330.61	772480.52	-413.50	159.22
Total Weight	45187.17			-413.72	443.25	
Wind 0 deg - Service		-18.06	-7199.17	-645333.09	2080.93	-148.22
Wind 90 deg - Service		7220.03	18.06	1223.96	-646367.16	-362.65
Wind 180 deg - Service		18.06	7199.17	644505.65	-1194.43	148.22

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 90 deg - No Ice
5	0.9 Dead+1.6 Wind 90 deg - No Ice
6	1.2 Dead+1.6 Wind 180 deg - No Ice
7	0.9 Dead+1.6 Wind 180 deg - No Ice
8	1.2 Dead+1.0 Ice+1.0 Temp
9	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
10	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
11	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
12	Dead+Wind 0 deg - Service
13	Dead+Wind 90 deg - Service
14	Dead+Wind 180 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	150 - 95.83	Pole	Max Tension	2	0.12	-0.83	-0.02
			Max. Compression	8	-38438.51	398.79	1069.39
			Max. Mx	4	-16998.30	-458304.18	-8.62
			Max. My	2	-17002.31	507.97	458457.76
			Max. Vy	4	16010.02	-458304.18	-8.62
			Max. Vx	2	-15971.54	507.97	458457.76
			Max. Torque	4			1354.63
L2	95.83 - 47.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-66424.71	1063.21	1453.06
			Max. Mx	4	-31280.81	-1445200.10	-2708.26
			Max. My	2	-31286.29	3592.61	1442283.97
			Max. Vy	4	25749.49	-1445200.10	-2708.26
			Max. Vx	2	-25651.37	3592.61	1442283.97
			Max. Torque	4			1540.52
L3	47.83 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-81359.42	1290.11	1584.10
			Max. Mx	4	-40294.10	-2102660.0	-4632.59

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
						8	
			Max. My	2	-40297.15	5712.27	2097556.49
			Max. Vy	4	28931.18	-2102660.0	-4632.59
						8	
			Max. Vx	2	-28835.33	5712.27	2097556.49
			Max. Torque	4			1620.62
L4	30 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-101002.34	1290.19	1584.21
			Max. Mx	4	-54211.47	-3020617.0	-7091.04
						1	
			Max. My	2	-54211.42	8171.22	3012594.83
			Max. Vy	4	32387.93	-3020617.0	-7091.04
						1	
			Max. Vx	2	-32291.73	8171.22	3012594.83
			Max. Torque	4			1619.95

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	8	101002.34	0.00	0.00
	Max. H_x	3	40668.33	80.97	32271.19
	Max. H_z	3	40668.33	80.97	32271.19
	Max. M_x	2	3012594.83	80.97	32269.90
	Max. M_z	4	3020617.00	-32366.04	-80.97
	Max. Torsion	4	1619.39	-32366.04	-80.97
	Min. Vert	5	40668.33	-32364.69	-80.96
	Min. H_x	4	54224.54	-32366.04	-80.97
	Min. H_z	7	40668.33	-80.97	-32271.20
	Min. M_x	6	-3011539.29	-80.97	-32269.90
	Min. M_z	2	-8171.14	80.97	32269.90
	Min. Torsion	6	-661.99	-80.97	-32269.90

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	45187.17	-0.00	-0.00	-413.72	443.26	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	54224.42	-80.97	-32269.90	-3012594.83	8171.14	-664.04
0.9 Dead+1.6 Wind 0 deg - No Ice	40668.33	-80.97	-32271.19	-2980428.63	7953.71	-663.72
1.2 Dead+1.6 Wind 90 deg - No Ice	54224.54	32366.04	80.97	7091.23	-3020617.00	-1619.39
0.9 Dead+1.6 Wind 90 deg - No Ice	40668.33	32364.69	80.96	7155.64	-2988317.00	-1618.85
1.2 Dead+1.6 Wind 180 deg - No Ice	54224.42	80.97	32269.90	3011539.29	-7048.47	661.99
0.9 Dead+1.6 Wind 180 deg - No Ice	40668.33	80.97	32271.20	2979649.92	-7124.55	661.69
1.2 Dead+1.0 Ice+1.0 Temp	101002.34	-0.00	-0.00	-1584.21	1290.19	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	101002.33	-17.45	-8330.25	-851196.11	3224.25	-161.12
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	101002.33	8350.40	17.45	-71.34	-849917.92	-892.05
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	101002.33	17.45	8330.26	847544.96	-276.98	160.98
Dead+Wind 0 deg - Service	45187.16	-18.06	-7198.45	-668063.04	2153.98	-148.52
Dead+Wind 90 deg - Service	45187.16	7219.30	18.06	1251.55	-669109.07	-363.10
Dead+Wind 180 deg - Service	45187.16	18.06	7198.45	667189.73	-1221.77	148.41

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-45187.17	0.00	0.00	45187.17	0.00	0.000%
2	-80.97	-54224.60	-32273.92	80.97	54224.42	32269.90	0.006%
3	-80.97	-40668.45	-32273.92	80.97	40668.33	32271.19	0.005%
4	32367.42	-54224.60	80.97	-32366.04	54224.54	-80.97	0.002%
5	32367.42	-40668.45	80.97	-32364.69	40668.33	-80.96	0.005%
6	80.97	-54224.60	32273.92	-80.97	54224.42	-32269.90	0.006%
7	80.97	-40668.45	32273.92	-80.97	40668.33	-32271.20	0.005%
8	0.00	-101002.34	0.00	0.00	101002.34	0.00	0.000%
9	-17.45	-101002.34	-8330.61	17.45	101002.33	8330.25	0.000%
10	8350.76	-101002.34	17.45	-8350.40	101002.33	-17.45	0.000%
11	17.45	-101002.34	8330.61	-17.45	101002.33	-8330.26	0.000%
12	-18.06	-45187.17	-7199.17	18.06	45187.16	7198.45	0.002%
13	7220.03	-45187.17	18.06	-7219.30	45187.16	-18.06	0.002%
14	18.06	-45187.17	7199.17	-18.06	45187.16	-7198.45	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	12	0.00012362	0.00012403
3	Yes	12	0.00008241	0.00010806
4	Yes	13	0.00004356	0.00005847
5	Yes	12	0.00008240	0.00013133
6	Yes	12	0.00012362	0.00011706
7	Yes	12	0.00008241	0.00010265
8	Yes	6	0.00000001	0.00000001
9	Yes	14	0.00000001	0.00012320
10	Yes	14	0.00000001	0.00012285
11	Yes	14	0.00000001	0.00012238
12	Yes	12	0.00000001	0.00003014
13	Yes	12	0.00000001	0.00003072
14	Yes	12	0.00000001	0.00003005

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 95.83	17.755	13	0.9535	0.0004
L2	101 - 47.83	8.537	13	0.7783	0.0003
L3	54 - 30	2.405	13	0.4301	0.0002
L4	30 - 0	0.684	13	0.2253	0.0001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	10-ft Dipole (Town)	13	17.555	0.9508	0.0010	83650
138.00	APXVSPP18-C-A20 (Sprint Existing)	13	15.368	0.9212	0.0011	34854
129.00	RRUS-11 (AT&T Existing)	13	13.608	0.8945	0.0011	19916
127.00	7770.00 (AT&T Existing)	13	13.223	0.8881	0.0012	18184
125.00	Valmont 13' Low Profile Platform (AT&T Existing)	13	12.840	0.8815	0.0012	16729
113.00	APX16DWV-16DWV-S-E-ACU (T-Mobile Existing)	13	10.612	0.8362	0.0012	11303
104.00	4'-6" Standoff (Town - Exising)	13	9.039	0.7942	0.0012	9100
80.00	DB846F65ZAXY (Verizon - Existing)	13	5.386	0.6416	0.0009	7992
78.00	Valmont 13' Low Profile Platform (Verizon - Existing)	13	5.119	0.6266	0.0008	7944
40.00	Standoff	13	1.260	0.3090	0.0003	5853

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 95.83	80.304	4	4.3159	0.0017
L2	101 - 47.83	38.610	4	3.5231	0.0015
L3	54 - 30	10.871	4	1.9451	0.0007
L4	30 - 0	3.089	4	1.0181	0.0003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.00	10-ft Dipole (Town)	4	79.401	4.3040	0.0041	18670
138.00	APXVSPP18-C-A20 (Sprint Existing)	4	69.508	4.1699	0.0046	7778
129.00	RRUS-11 (AT&T Existing)	4	61.545	4.0492	0.0050	4443
127.00	7770.00 (AT&T Existing)	4	59.803	4.0202	0.0051	4056

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	Valmont 13' Low Profile Platform (AT&T Existing)	4	58.072	3.9903	0.0051	3731
113.00	APX16DWV-16DWV-S-E-ACU (T-Mobile Existing)	4	47.995	3.7851	0.0053	2519
104.00	4'-6" Standoff (Town - Exising)	4	40.879	3.5949	0.0052	2027
80.00	DB846F65ZAXY (Verizon - Existing)	4	24.352	2.9034	0.0039	1774
78.00	Valmont 13' Low Profile Platform (Verizon - Existing)	4	23.148	2.8355	0.0037	1763
40.00	Standoff	4	5.695	1.3969	0.0012	1295

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Concrete Stress ksi	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
2.7500	16	2.2500	118397.00 223654.40 0.53	2.124 4.080 0.52	28.516 54.000 0.53		Bolt T	0.53

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	150 - 95.83 (1)	TP33.469x23.61x0.281	54.17	0.00	0.0	29.1778	-17002.30	1938050.00	0.009
L2	95.83 - 47.83 (2)	TP41.644x31.9661x0.375	53.17	0.00	0.0	48.4762	-31280.80	3318110.00	0.009
L3	47.83 - 30 (3)	TP41.139x39.7709x0.438	24.00	0.00	0.0	57.4031	-40294.10	4142390.00	0.010
L4	30 - 0 (4)	TP49.6x41.139x0.58	30.00	0.00	0.0	75.7480	-40321.20	5583380.00	0.007

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	150 - 95.83 (1)	TP33.469x23.61x0.281	458458.33	1272216.67	0.360	0.00	1272216.67	0.000
L2	95.83 - 47.83 (2)	TP41.644x31.9661x0.375	1445200.00	2710000.00	0.533	0.00	2710000.00	0.000

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L3	47.83 - 30 (3)	TP41.139x39.7709x0.438	2102666.67	3425175.00	0.614	0.00	3425175.00	0.000
L4	30 - 0 (4)	TP49.6x41.139x0.58	2102666.67	4584516.67	0.459	0.00	4584516.67	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	150 - 95.83 (1)	TP33.469x23.61x0.281	15971.60	969023.00	0.016	196.33	2579658.33	0.000
L2	95.83 - 47.83 (2)	TP41.644x31.9661x0.375	25749.60	1659060.00	0.016	1538.48	5495041.67	0.000
L3	47.83 - 30 (3)	TP41.139x39.7709x0.438	28931.30	2071200.00	0.014	1620.02	6945183.33	0.000
L4	30 - 0 (4)	TP49.6x41.139x0.58	29093.70	2820810.00	0.010	1619.95	9296000.00	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 95.83 (1)	0.009	0.360	0.000	0.016	0.000	0.369	1.000	4.8.2
L2	95.83 - 47.83 (2)	0.009	0.533	0.000	0.016	0.000	0.543	1.000	4.8.2
L3	47.83 - 30 (3)	0.010	0.614	0.000	0.014	0.000	0.624	1.000	4.8.2
L4	30 - 0 (4)	0.007	0.459	0.000	0.010	0.000	0.466	1.000	4.8.2

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	150 - 95.83	Pole	TP33.469x23.61x0.281	1	-17002.30	1938050.00	36.9	Pass
L2	95.83 - 47.83	Pole	TP41.644x31.9661x0.375	2	-31280.80	3318110.00	54.3	Pass
L3	47.83 - 30	Pole	TP41.139x39.7709x0.438	3	-40294.10	4142390.00	62.4	Pass
L4	30 - 0	Pole	TP49.6x41.139x0.58	4	-40321.20	5583380.00	46.6	Pass
							Summary	
						Pole (L3)	62.4	Pass
						Base Plate	52.9	Pass
						RATING =	**62.4**	**Pass**

Element Map

Section No.	*Section Elevation ft*	*Component Type*	*Element List*
L1	150.00-95.83	Pole	1
L2	95.83-47.83	Pole	2
L3	47.83-30.00	Pole	3
L4	30.00-0.00	Pole	4
			Total number of elements: 4

APPENDIX B

⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

Hazards by Location

Search Information

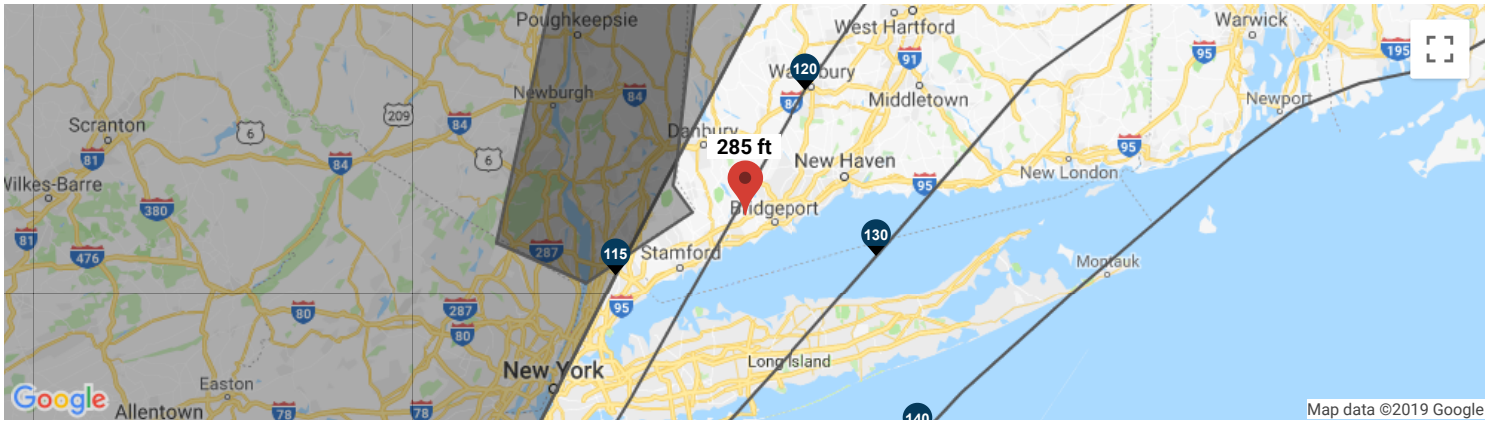
Address: 3965 Congress St, Fairfield, CT 06824, USA

Coordinates: 41.1884172, -73.29858009999998

Timestamp: 2019-01-23T15:12:15.866Z

Hazard Type: Wind

Map Results



Text Results

ASCE 7-16

MRI 10-Year	75 mph
MRI 25-Year	84 mph
MRI 50-Year	90 mph
MRI 100-Year	97 mph
Risk Category I	108 mph
Risk Category II	118 mph
Risk Category III	128 mph
Risk Category IV	⚠ 132 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

ASCE 7-10

MRI 10-Year	76 mph
MRI 25-Year	86 mph
MRI 50-Year	93 mph
MRI 100-Year	99 mph
Risk Category I	111 mph
Risk Category II	122 mph

Risk Category III-IV ⚠ 131 mph

If the structure under consideration is a healthcare facility, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed ⚠ 110 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

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8-Port Antenna	R1	R2	Y1	Y2
Frequency Range	698–960	698–960	1695–2690	1695–2690
Dual Polarization	X	X	X	X
HPBW	65°	65°	65°	65°
Adjust. Electr. DT	2°–12°	2°–12°	2.5°–12°	2.5°–12°

set by *FlexRET*

KATHREIN

AISG Antenna Interface Standards Group

8-Port Antenna 698–960/698–960/1695–2690/1695–2690 65°/65°/65°/65° 15.5/15.5/18/18dBi 2°–12°/2°–12°/2.5°–12°/2.5°–12°T

Type No.		80010965			
Left side, lowband		R1, connector 1–2			
		698–960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.4	15.6	15.9
Gain over all Tilts	dBi	14.8 ± 0.6	15.4 ± 0.4	15.6 ± 0.2	15.8 ± 0.2
Horizontal Pattern:					
Azimuth Beamwidth	°	62 ± 3.9	61 ± 3.2	60 ± 2.7	60 ± 2.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 27	> 25
Vertical Pattern:					
Elevation Beamwidth	°	11.9 ± 0.8	11.0 ± 0.8	10.5 ± 0.4	10.2 ± 0.4
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.7	< 0.7	< 0.7
First Upper Side Lobe Suppression	dB	> 14	> 14	> 15	> 14
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R1 // R2) > 30 (R1 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 1–2	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

936.5306/b.1 ngmn 04.24.02.03 Subject to alteration.

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Right side, lowband		R2, connector 3–4			
		698–960			
Frequency Range	MHz	698 – 806	790 – 862	824 – 894	880 – 960
Gain at mid Tilt	dBi	14.8	15.3	15.5	15.8
Gain over all Tilts	dBi	14.8 ± 0.6	15.3 ± 0.3	15.5 ± 0.3	15.7 ± 0.3
Horizontal Pattern:					
Azimuth Beamwidth	°	63 ± 3.6	62 ± 1.8	62 ± 2.1	60 ± 3.7
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 24	> 26	> 27
Vertical Pattern:					
Elevation Beamwidth	°	11.6 ± 0.7	11.0 ± 0.6	10.7 ± 0.4	10.2 ± 0.5
Electrical Downtilt continuously adjustable	°	2.0 – 12.0			
Tilt Accuracy	°	< 0.7	< 0.6	< 0.6	< 0.5
First Upper Side Lobe Suppression	dB	> 14	> 16	> 16	> 16
Cross Polar Isolation	dB	> 30			
Port to Port Isolation	dB	> 27 (R2 // R1) > 30 (R2 // Y1, Y2)			
Max. Effective Power per Port	W	400 (at 50 °C ambient temperature)			
Max. Effective Power Port 3–4	W	800 (at 50 °C ambient temperature)			

Values based on NGMN-P-BASTA (version 9.6) requirements.

Left side, highband		Y1, connector 5–6				
		1695–2690				
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.6	17.9	18.3	18.1	18.1
Gain over all Tilts	dBi	17.5 ± 0.4	17.8 ± 0.4	18.1 ± 0.5	18.0 ± 0.6	18.0 ± 0.4
Horizontal Pattern:						
Azimuth Beamwidth	°	62 ± 5.1	65 ± 4.1	62 ± 7.2	56 ± 4.1	57 ± 5.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 22	> 25	> 25	> 25	> 25
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.5	5.9 ± 0.3	5.5 ± 0.4	4.8 ± 0.3	4.4 ± 0.2
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.1	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 19	> 18	> 16	> 18	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y1 // R1, R2, Y2)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 5–6	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

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Right side, highband		Y2, connector 7–8				
				1695–2690		
Frequency Range	MHz	1695 – 1880	1850 – 1990	1920 – 2180	2300 – 2400	2490 – 2690
Gain at mid Tilt	dBi	17.5	18.0	18.3	18.2	17.9
Gain over all Tilts	dBi	17.4 ± 0.4	17.8 ± 0.4	18.1 ± 0.6	18.0 ± 0.7	17.8 ± 0.7
Horizontal Pattern:						
Azimuth Beamwidth	°	65 ± 4.7	66 ± 4.7	62 ± 7.8	57 ± 3.8	59 ± 7.1
Front-to-Back Ratio, Total Power, ± 30°	dB	> 24	> 26	> 26	> 25	> 24
Vertical Pattern:						
Elevation Beamwidth	°	6.4 ± 0.4	5.9 ± 0.3	5.5 ± 0.5	4.8 ± 0.3	4.4 ± 0.3
Electrical Downtilt continuously adjustable	°	2.5 – 12.0				
Tilt Accuracy	°	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2
First Upper Side Lobe Suppression	dB	> 18	> 18	> 15	> 17	> 16
Cross Polar Isolation	dB	> 28				
Port to Port Isolation	dB	> 30 (Y2 // R1, R2, Y1)				
Max. Effective Power per Port	W	200 (at 50 °C ambient temperature)				
Max. Effective Power Port 7–8	W	400 (at 50 °C ambient temperature)				

Values based on NGMN-P-BASTA (version 9.6) requirements.

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Electrical specifications, all systems		
Impedance	Ω	50
VSWR		< 1.5
Return Loss	dB	> 14
Interband Isolation	dB	> 27
Passive Intermodulation	dBc	< –153 (2 x 43 dBm carrier)
Polarization	°	+45, –45
Max. Effective Power for the Antenna	W	1200 (at 50 °C ambient temperature)

Values based on NGMN-P-BASTA (version 9.6) requirements.

Mechanical specifications		
Input		8 x 4.3-10 female
Connector Position		bottom
Adjustment Mechanism		FlexRET, continuously adjustable
Wind load (at Rated Wind Speed: 150 km/h) (93 mph)	N | lbf	Frontal: 1130 | 254 Maximal: 1140 | 256
Max. Wind Velocity	km/h mph	241 150
Height / Width / Depth	mm inches	1999 / 508 / 175 78.7 / 20.0 / 6.9
Category of Mounting Hardware		XH (X-Heavy)
Weight	kg lb	44.3 / 49.3 (clamps incl.) 97.6 / 108.6 (clamps incl.)
Packing Size	mm inches	2200 / 542 / 268 86.6 / 21.3 / 10.6
Scope of Supply		Panel, FlexRET and clamps for 55–115 mm | 2.2–4.5 inches diameter

Accessories (order separately if required)

Type No.	Description	Remarks mm | inches	Weight approx. kg | lb	Units per antenna
85010097	2 clamps	Mast diameter: 110 – 220 | 4.3 – 8.7	9.4 | 20.7	1
85010099	1 downtilt kit	Downtilt angle: 0° – 13°	10.6 | 23.4	1
86010154	Site Sharing Adapter	3-way (see figure below)	0.7 | 1.5	
86010155	Site Sharing Adapter	6-way (see figure below)	1.4 | 3.1	
86010162	Gender Adapter	Solely to be used in combination with the FlexRET module 86010153V01	0.045 | 0.099	1
86010163	Port Extender		0.16 | 0.35	1

Accessories (included in the scope of supply)

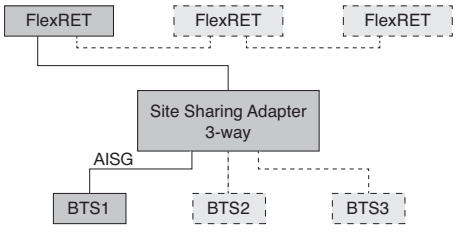
85010096	2 clamps	Mast diameter: 55 – 115 | 2.2 – 4.5	5.0 | 11.0	1
86010153V01	FlexRET			1

For downtilt mounting use the clamps for an appropriate mast diameter together with the downtilt kit.
Wall mounting: No additional mounting kit needed.

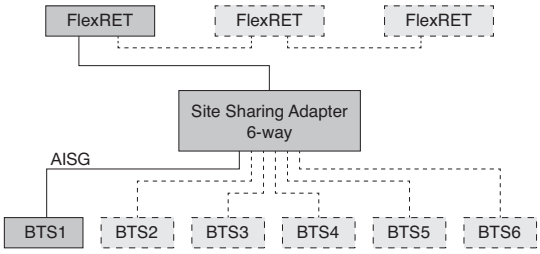
Material: **Reflector screen:** Aluminum.
Fiberglass housing: It covers totally the internal antenna components. The special design reduces the sealing areas to a minimum and guarantees the best weather protection. Fiberglass material guarantees optimum performance with regards to stability, stiffness, UV resistance and painting. The color of the radome is light grey.
All nuts and bolts: Stainless steel or hot-dip galvanized steel.

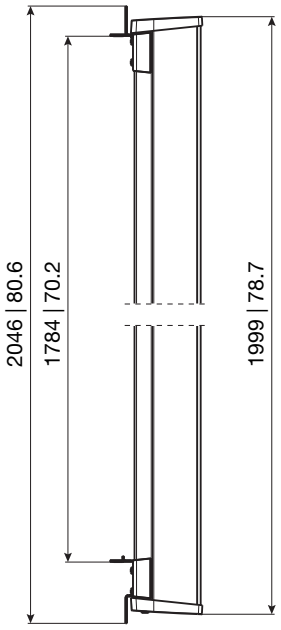
Grounding: The metal parts of the antenna including the mounting kit and the inner conductors are DC grounded.

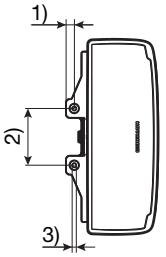
Configuration example with Site Sharing Adapter 86010154



Configuration example with Site Sharing Adapter 86010155







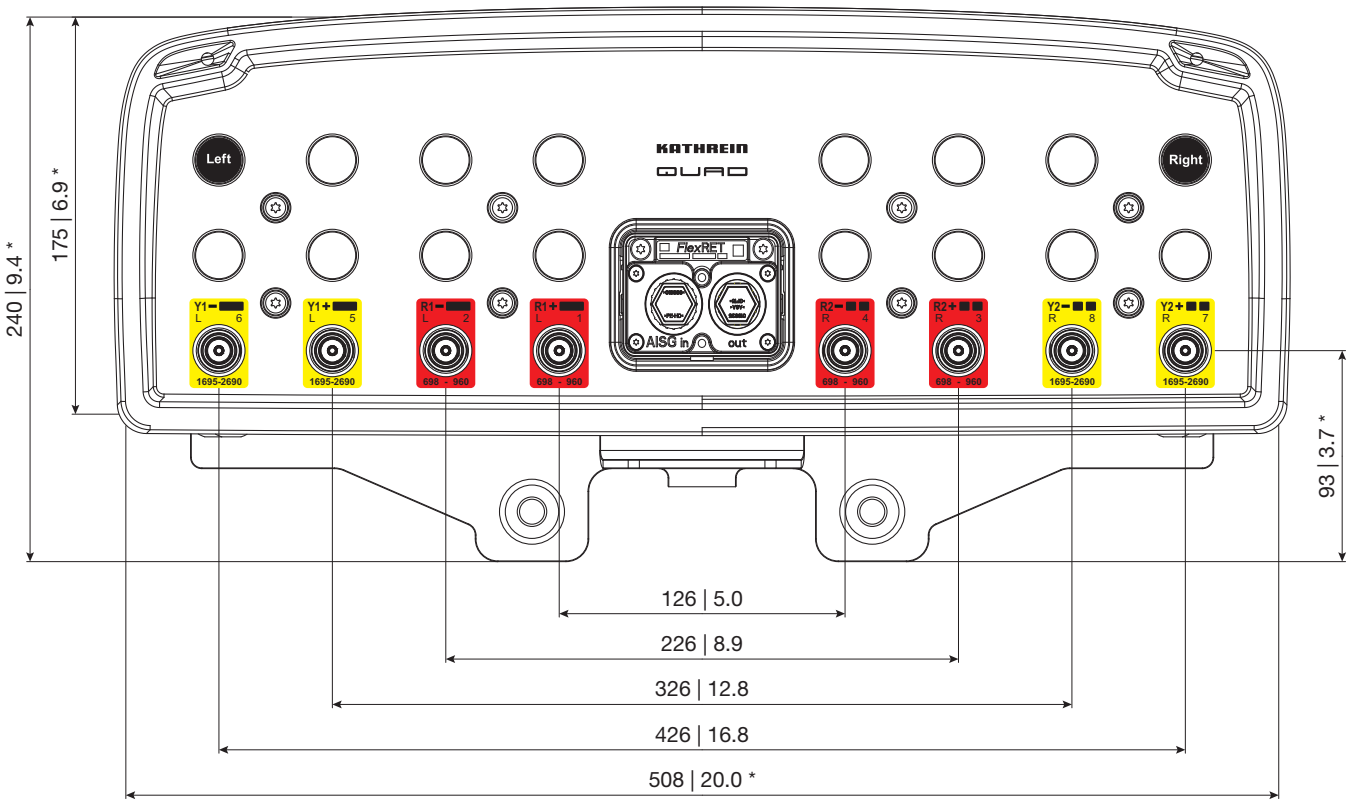
1) 22 | 0.9
2) 150 | 5.9
3) ∅ 11 | 0.4

All dimensions in mm | inches

936.5306/b.1 ngmn 04.24.02.03 Subject to alteration.

For more information please refer to the respective data sheets.

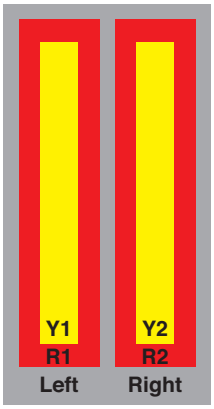
Layout of interface:



Bottom view
* Dimensions refer to radome
All dimensions in mm | inches

Correlation Table

Frequency range	Array	Connector
698– 960 MHz	R1	1–2
698– 960 MHz	R2	3–4
1695–2690 MHz	Y1	5–6
1695–2690 MHz	Y2	7–8



Order Information

Model	Description
80010965	8-Port antenna with mounting bracket
80010965K	8-Port antenna with mounting bracket and mechanical tilt bracket

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Any previous data sheet issues have now become invalid.

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Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CT2128	**DATE:**	9/19/2018	**RF DESIGN ENG:**	Mohammed Rahman	**RF PERF ENG:**		**RFDS PROGRAM TYPE:**	2019 LTE Next Carrier
ISSUE:	Bronze Standard	**Approved? (Y/N):**	Yes	**RF DESIGN PHONE:**	860-258-6350	**RF PERF PHONE:**		**RFDS TECHNOLOGY:**	LTE
REVISION:	Preliminary	**RF MANAGER:**	John Benedetto	**RF DESIGN EMAIL:**	mr673a@att.com	**RF PERF EMAIL:**		**STATE/STATUS:**	Preliminary/Approved
INITIATIVE / PROJECT:	LTE 3C[WCS], LTE 4C[850 B(U)], 4TX4RX Software Retrofit[700 B-C]					**RFDS VERSION**	1.00	**RFDS ID:**	2571812
						GSM FREQUENCY:		**Created By:** mr673a	**Updated By:** mr673a
						UMTS FREQUENCY:	850	**Created:** 9/19/2018	**Updated:** 10/18/2018
						LTE FREQUENCY:	700,850,1900,WCS		
						5G FREQUENCY:	850		
						IPLAN JOB # 1:	NER-RCTB-18-07131	**PRD || SUB GRP #1**	LTE Next Carrier || LTE 3C
						IPLAN JOB # 2:	NER-RCTB-18-07200	**PRD || SUB GRP #2**	LTE Next Carrier || LTE 4C
						IPLAN JOB # 3:	NER-RCTB-18-07467	**PRD || SUB GRP #3**	Antenna Modifications || 4TX4RX Software Retrofit
						IPLAN JOB # 4:		**PRD || SUB GRP #4**	
						IPLAN JOB # 5:		**PRD || SUB GRP #5**	
						IPLAN JOB # 6:		**PRD || SUB GRP #6**	
						IPLAN JOB # 7:		**PRD || SUB GRP #7**	
						IPLAN JOB # 8:		**PRD || SUB GRP #8**	

Section 2 - LOCATION INFORMATION

USID:	**5787**	**FA LOCATION CODE:**	**10035251**	**LOCATION NAME:**	FAIRFIELD GREENFIELD HILL	**ORACLE PRJT # 1:**	2051A0KPJV	**PACE JOB #1:**	MRCTB035112
REGION:	NORTHEAST	**MARKET CLUSTER:**	NEW ENGLAND	**MARKET:**	CONNECTICUT	**ORACLE PRJT # 2:**	2051A0KPH8	**PACE JOB #2:**	MRCTB035164
ADDRESS:	3965 CONGRESS STREET	**CITY:**	FAIRFIELD	**STATE:**	CT	**ORACLE PRJT # 3:**	2051A0KQB3	**PACE JOB #3:**	MRCTB035334
ZIP CODE:	06824	**COUNTY:**	FAIRFIELD	**LONG (DEC. DEG.):**	-73.2990550	**ORACLE PRJT # 4:**		**PACE JOB #4:**	
LATITUDE (D-M-S):	41d 11m 18.17196s	**LONGITUDE (D-M-S):**	-73d -17m -56.598s	**LAT (DEC. DEG.):**	41.1883811	**ORACLE PRJT # 5:**		**PACE JOB #5:**	
						ORACLE PRJT # 6:		**PACE JOB #6:**	
						ORACLE PRJT # 7:		**PACE JOB #7:**	
						ORACLE PRJT # 8:		**PACE JOB #8:**	
						BORDER CELL WITH CONTOUR COORD:		**SEARCH RING NAME:**	
						AM STUDY REQ'D (Y/N):	No	**SEARCH RING ID:**	
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	UPDATED 4/04 CT-083 FAIRFIELD-GREENFIELD HILL TAKE RT. 17 NORTH TO GARDEN STATE PARKWAY NORTH TO I-87 SOUTH. GO ACROSS TAPPAN ZEE BRIDGE; FOLLOW SIGNS TO I-287 EAST; ONCE ON I-287 YOU WILL GET OFF EXIT 9N FOR THE HUTCHINSON AND MERRITT PARKWAY YOU NEED TO					**FREQ COORD:**		**BTA:**	**MSA / RSA:**
						OPS DISTRICT:	CT-South	**LAC(GSM):**	
						OPS ZONE:	NE_CT_S_FRFD_CTL_CS	**LAC(UMTS):**	05989
						RF DISTRICT:	NPO Triage	**BSC(GSM):**	
						RF ZONE:	Hotseat	**RNC(UMTS):**	BRIDGEPORT RNC06 ERICSSON 3820
						PARENT NAME(GSM):		**MME POOL ID(LTE):**	FF01
						PARENT NAME(UMTS):	BRPTCT04CRBR06		

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	**CGSA LOSS:**		**PCS REDUCED - UPS ZIP:**		**CGSA CALL SIGNS:**	z_KNLB312,z_KNLB312,z_KNLB312
CGSA - MINOR FILING NEEDED (Yes/No):	No	**CGSA EXT AGMT NEEDED:**		**PCS POPS REDUCED:**			
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	**CGSA SCORECARD UPDATED:**					

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	**GROUND ELEVATION (ft):**		**STRUCTURE TYPE:**	MONOPOLE	**MARKET LOCATION 700 MHz Band:**	
ADDITIONAL REGULATORY?:	Yes	**HEIGHT OVERALL (ft):**	90.00	**FCC ASR NUMBER:**	NR	**MARKET LOCATION 850 MHz Band:**	
SUB-LEASE RIGHTS?:	Yes	**STRUCTURE HEIGHT (ft):**	90.00			**MARKET LOCATION 1900 MHz Band:**	
LIGHTING TYPE:	NOT REQUIRED					**MARKET LOCATION AWS Band:**	
						MARKET LOCATION WCS Band:	
						MARKET LOCATION Future Band:	

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911				INTRADO_MIAMI		0		
SECTOR B				INTRADO_MIAMI		0		
SECTOR C				INTRADO_MIAMI		0		
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911				INTRADO_MIAMI		0		
SECTOR B				INTRADO_MIAMI		0		
SECTOR C				INTRADO_MIAMI		0		
SECTOR D								
SECTOR E								

SECTOR F								
OMNI								

Section 6 - RBS GENERAL INFORMATION - existing																		
	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS													
RBS ID:	172438	222852	409056	362938														
CTS COMMON ID:	CTU2128	CTV2128	CTU6128	CTL02128														
CELL ID / BCF:	CTU2128	CTU2128	CTU6128	CTL02128														
BTA/TID:	321V	321U	321W	321L														
4-9 DIGIT SITE ID:	2128	9128	6128	02128														
COW OR TOY?:	No	No	No	No														
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED														
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL														
BTS LOCATION ID:	INTERNAL	INTERNAL	GROUND	INTERNAL														
BASE STATION TYPE:	BASE	OVERLAY	OVERLAY	BASE														
EQUIPMENT NAME:	FAIRFIELD GREENFIELD HILL	FAIRFIELD GREENFIELD HILL	CT2128 2ND NODE	FAIRFIELD GREENFIELD HILL														
DISASTER PRIORITY:	2	0	0	3														

Section 6 - RBS GENERAL INFORMATION - final																		
	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS													
RBS ID:	172438	222852	409056	362938	RFDS_40085580													
CTS COMMON ID:	CTU2128	CTV2128	CTU6128	CTL02128	CTN0002128													
CELL ID / BCF:	CTU2128	CTU2128	CTU6128	CTL02128	CTN0002128													
BTA/TID:	321V	321U	321W	321L	321L													
4-9 DIGIT SITE ID:	2128	9128	6128	02128	002128													
COW OR TOY?:	No	No	No	No	No													
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED													
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL													
BTS LOCATION ID:	INTERNAL	INTERNAL	GROUND	INTERNAL	INTERNAL													
BASE STATION TYPE:	BASE	OVERLAY	OVERLAY	BASE	BASE													
EQUIPMENT NAME:	FAIRFIELD GREENFIELD HILL	FAIRFIELD GREENFIELD HILL	CT2128 2ND NODE	FAIRFIELD GREENFIELD HILL	FAIRFIELD GREENFIELD HILL													
DISASTER PRIORITY:	2	0	0	3	3													

Section 7 - RBS SPECIFIC INFORMATION - existing																			
	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS														
RAC:																			
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON	ERICSSON															
EQUIPMENT TYPE:	3206 INDOOR	3206 INDOOR	6601 MAIN UNIT UMTS	6601 INDOOR MU															
BASEBAND CONFIGURATION:																			
LOCATION:																			
CABINET LOCATION:																			
MARKET STATE CODE:				CT															
AGPS:	Yes	Yes	Yes	Yes															
NODE B NUMBER:	0	0	0	2128															

Section 7 - RBS SPECIFIC INFORMATION - final																			
	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS														
RAC:																			
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON	ERICSSON	ERICSSON														
EQUIPMENT TYPE:	3206 INDOOR	3206 INDOOR	6601 MAIN UNIT UMTS	6601 INDOOR MU	6601 INDOOR MU														
BASEBAND CONFIGURATION:				1x6601 / 1x6630 / 1xXMU03	xxxxx / 1x6630 / xxxxx														
LOCATION:																			
CABINET LOCATION:																			
MARKET STATE CODE:				CT	CT														
AGPS:	Yes	Yes	Yes	Yes	Yes														
NODE B NUMBER:	0	0	0	2128	2128														

Section 8 - RBS/SECTOR ASSOCIATION - existing																			
	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS														
CTS Common ID	CTU2128	CTV2128	CTU6128	CTL02128															
Soft Sector IDs	CTU21287	CTV21281	CTV6128A	CTL02128_7A_1															
	CTU21288	CTV21282	CTV6128B	CTL02128_7B_1															
	CTU21289	CTV21283	CTV6128C	CTL02128_7C_1															
				CTL02128_9A_1															
				CTL02128_9A_2															
				CTL02128_9B_1															
				CTL02128_9B_2															
				CTL02128_9C_1															
				CTL02128_9C_2															

Section 8 - RBS/SECTOR ASSOCIATION - final																			
	UMTS 1ST RBS	UMTS 2ND RBS	UMTS 3RD RBS	LTE 1ST RBS	5G 1ST RBS														
CTS Common ID	CTU2128	CTV2128	CTU6128	CTL02128	CTN0002128														
Soft Sector IDs		CTV21281		CTL02128_3A_1	CTN0002128_F1N5A_1														
		CTV21282		CTL02128_3B_1	CTN0002128_F1N5B_1														
		CTV21283		CTL02128_3C_1	CTN0002128_F1N5C_1														
				CTL02128_7A_1															
				CTL02128_7B_1															
				CTL02128_7C_1															
				CTL02128_8A_1															
				CTL02128_8B_1															
				CTL02128_8C_1															
				CTL02128_9A_1															
				CTL02128_9A_2															
				CTL02128_9B_1															
				CTL02128_9B_2															
				CTL02128_9C_1															
				CTL02128_9C_2															

Section 9 - SOFT SECTOR ID - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850
USEID (excluding Hard Sector)	5787.850.3G.1	5787.1900.3G.1	5787.850.3G.2						
SECTOR A SOFT SECTOR ID	CTV21281	CTU21287	CTV6128A	CTL02128_7A_1		CTL02128_9A_1		CTL02128_9A_2	
SECTOR B	CTV21282	CTU21288	CTV6128B	CTL02128_7B_1		CTL02128_9B_1		CTL02128_9B_2	
SECTOR C	CTV21283	CTU21289	CTV6128C	CTL02128_7C_1		CTL02128_9C_1		CTL02128_9C_2	
SECTOR D									
SECTOR E									
SECTOR F									
OMNI									

Section 9 - SOFT SECTOR ID - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850
USEID (excluding Hard Sector)	5787.850.3G.1								
SECTOR A SOFT SECTOR ID	CTV21281			CTL02128_7A_1	CTL02128_8A_1	CTL02128_9A_1	CTL02128_3A_1	CTL02128_9A_2	CTN0002128_F1N5A_1
SECTOR B	CTV21282			CTL02128_7B_1	CTL02128_8B_1	CTL02128_9B_1	CTL02128_3B_1	CTL02128_9B_2	CTN0002128_F1N5B_1
SECTOR C	CTV21283			CTL02128_7C_1	CTL02128_8C_1	CTL02128_9C_1	CTL02128_3C_1	CTL02128_9C_2	CTN0002128_F1N5C_1
SECTOR D									
SECTOR E									
SECTOR F									
OMNI									

Section 9 - Cell Number - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850
USEID (excluding Hard Sector)	5787.850.3G.1	5787.1900.3G.1	5787.850.3G.2						
SECTOR A CELL NUMBER				15		8		178	
SECTOR B				16		9		179	
SECTOR C				17		10		180	
SECTOR D									
SECTOR E									
SECTOR F									
OMNI									

Section 9 - Cell Number - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850
USEID (excluding Hard Sector)	5787.850.3G.1								
SECTOR A CELL NUMBER				15	1	8	149	178	1
SECTOR B				16	2	9	150	179	2
SECTOR C				17	3	10	151	180	3
SECTOR D									
SECTOR E									
SECTOR F									
OMNI									

Section 10 - CID/SAC - existing																								
	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850															
SECTOR A CID/SAC	21281	21287	61281																					
SECTOR B	21282	21288	61282																					
SECTOR C	21283	21289	61283																					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 10 - CID/SAC - final																								
	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	5G 1ST 850															
SECTOR A CID/SAC	21281																							
SECTOR B	21282																							
SECTOR C	21283																							
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 11 - CURRENT RADIO COUNTS existing

Section 12 - CURRENT T1 COUNTS existing

Section 13 - NEW/PROPOSED RADIO COUNTS

Section 14 - NEW/PROPOSED T1 COUNTS

Section 15A - CURRENT TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	7770		HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave	Powerwave		CCI			
ANTENNA SIZE (H x W x D)	55X11X5	55X11X5		72X14.8X9			
ANTENNA WEIGHT	35	35		50.7			
AZIMUTH	143	143		30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	128.03	128.03		128.03			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	2 Powerwave 7020		Internal			
SURGE ARRESTOR (QTY/MODEL)				1 DC/Fiber Squid			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901	2 Powerwave / LGP 21901					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		1 Kathrein / 860-10006		LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 21401 (Dual Band - 850	2 21401 (Dual Band - 850					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860	2 Polyphaser 1000860					
PDU FOR TMAS (QTY/MODEL)	1 LGP 12104 (850 Bypass TMA)	1 LGP 12104 (850 Bypass TMA)					
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)				1 RRUS-11 (REUSE ONLY)			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1		5787.A.850.3G.1	CTV21281	CTV21281		UMTS 850	7770.00.850.07	13.5	143	7	None	Commscope 1-1/4 (850)	155.039685						252.35		1	
	PORT 2		5787.A.850.3G.1	CTV6128A	CTV6128A		UMTS 850	7770.00.850.07	13.5	143	7	None	Commscope 1-1/4 (850)	155.039685						252.35		1	
	PORT 3		5787.A.1900.3G.1	CTU21287	CTU21287		UMTS 1900	7770.00.1900.03	15.5	143	3	None	Commscope 1-1/4 (1900)	155.039685						323.59		2	
ANTENNA POSITION 2	PORT 1		5787.A.850.25G.1	321G21281	321G21281		GSM 850	7770.00.850.07	13.5	143	7	None	1-1/4 at 850 MHz	155.039685					11.22	131.21		3	
ANTENNA POSITION 4	PORT 1		5787.A.700.4G.1	CTL02128_7A_1	CTL02128_7A_1		LTE 700	H6_719MHz_02 DT	14.27	30	2	TOP	FIBER	0						1475.7065		7	
	PORT 3		5787.A.1900.4G.1	CTL02128_9A_1	CTL02128_9A_1		LTE 1900	H6_1930MHz_03 DT	17	30	3	TOP	FIBER	0						3664.3757		8	

	PORT 4		5787.A.1900.4G.2	CTL02128_9A_2	CTL02128_9A_2		LTE 1900	H6_1930MHz_03DT	17	30	3	TOP	FIBER	0						3664.3757		8	

Section 15B - CURRENT TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	7770		HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave	Powerwave		CCI			
ANTENNA SIZE (H x W x D)	55X11X5	55X11X5		72X14.8X9			
ANTENNA WEIGHT	35	35		50.7			
AZIMUTH	263	263		150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	128.03	128.03		128.03			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	2 Powerwave 7020		Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901	2 Powerwave / LGP 21901					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 21401 (Dual Band - 850	2 21401 (Dual Band - 850					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860	2 Polyphaser 1000860					
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1 RRUS-11 (REUSE ONLY)				
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)			1 RRUS-12+RRUS-A2				
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1		5787.B.850.3G.1	CTV21282	CTV21282		UMTS 850	7770.00.850.07	13.5	263	7	None	Commscope 1-1/4 (850)	155.039685						252.35		9	
	PORT 2		5787.B.850.3G.1	CTV6128B	CTV6128B		UMTS 850	7770.00.850.07	13.5	263	7	None	Commscope 1-1/4 (850)	155.039685						252.35		9	
	PORT 3		5787.B.1900.3G.1	CTU21288	CTU21288		UMTS 1900	7770.00.1900.06	15.5	263	6	None	Commscope 1-1/4 (1900)	155.039685						323.59		10	
ANTENNA POSITION 2	PORT 1		5787.B.850.25G.1	321G21282	321G21282		GSM 850	7770.00.850.07	13.5	263	7	None	1-1/4 at 850 MHz	155.039685					12.58	147.23		11	
ANTENNA POSITION 4	PORT 1		5787.B.700.4G.1	CTL02128_7B_1	CTL02128_7B_1		LTE 700	H6_719MHz_07DT	14.02	150	7	TOP	FIBER	0						1475.7065		15	
	PORT 3		5787.B.1900.4G.1	CTL02128_9B_1	CTL02128_9B_1		LTE 1900	H6_1930MHz_02DT	16.85	150	2	TOP	FIBER	0						3664.3757		16	

	PORT 4		5787.B.1900.4G.2	CTL02128_9B_2	CTL02128_9B_2		LTE 1900	H6_1930MHz_02 DT	16.85	150	2	TOP	FIBER	0						3664.3757		16	

Section 15C - CURRENT TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	7770		HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave	Powerwave		CCI			
ANTENNA SIZE (H x W x D)	55X11X5	55X11X5		72X14.8X9			
ANTENNA WEIGHT	35	35		50.7			
AZIMUTH	23	23		270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	128.03	128.03		128.03			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2	2					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	2 Powerwave 7020		Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901	2 Powerwave / LGP 21901					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 21401 (Dual Band - 850	2 21401 (Dual Band - 850					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860	2 Polyphaser 1000860					
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)			1	RRUS-11 (REUSE ONLY)			
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1		5787.C.850.3G.1	CTV21283	CTV21283		UMTS 850	7770.00.850.06	13.5	23	6	None	Commscope 1-1/4 (850)	155.039685						252.35		17	
	PORT 2		5787.C.850.3G.1	CTV6128C	CTV6128C		UMTS 850	7770.00.850.06	13.5	23	6	None	Commscope 1-1/4 (850)	155.039685						252.35		17	
	PORT 3		5787.C.1900.3G.1	CTU21289	CTU21289		UMTS 1900	7770.00.1900.02	15.5	23	2	None	Commscope 1-1/4 (1900)	155.039685						323.59		18	
ANTENNA POSITION 2	PORT 1		5787.C.850.25G.1	321G21283	321G21283		GSM 850	7770.00.850.06	13.5	23	6	None	1-1/4 at 850 MHz	155.039685					17.78	207.96		19	
ANTENNA POSITION 4	PORT 1		5787.C.700.4G.1	CTL02128_7C_1	CTL02128_7C_1		LTE 700	H6_719MHz_02 DT	14.27	270	2	TOP	FIBER	0						1475.7065		23	
	PORT 3		5787.C.1900.4G.1	CTL02128_9C_1	CTL02128_9C_1		LTE 1900	H6_1930MHz_02 DT	16.85	270	2	TOP	FIBER	0						3664.3757		24	

	PORT 4		5787.C.1900.4G.2	CTL02128_9C_2	CTL02128_9C_2		LTE 1900	H6_1930MHz_02DT	16.85	270	2	TOP	FIBER	0						3664.3757		24	

Section 16A - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL		800-10965					
ANTENNA VENDOR		Kathrein					
ANTENNA SIZE (H x W x D)		78.7X20X6.9					
ANTENNA WEIGHT		108.6					
AZIMUTH		30					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		128.03					
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT		0					
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Internal					
SURGE ARRESTOR (QTY/MODEL)		1 DC/Fiber Squid					
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 B5/B12 4449					
RRH - 850 band (QTY/MODEL)		RRH is shared with another band					
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)		1 4415 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	Radio positions according to PD						
Local Market Note 2							
Local Market Note 3	1xXMU03& xxxxx / 1x6630 / xxxxx						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 2		5787.A.850.4G.1	CTL02128_8A_1	CTL02128_8A_1		LTE 850	80010965_849MHz_02DT	15.4	30	2	TOP	FIBER	0						1000		3	
	PORT 3		5787.A.WCS.4G.1	CTL02128_3A_1	CTL02128_3A_1		LTE WCS	80010965_2355MHz_03DT	18.1	30	3	TOP	FIBER	0						1285.2866		4	
	PORT 5			CTN0002128_F1N5A_1	CTN0002128_F1N5A_1		5G 850	80010965_849MHz_02DT	15.4	30	2	TOP	FIBER	0						1000		3	

Section 16B - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL		800-10965					
ANTENNA VENDOR		Kathrein					
ANTENNA SIZE (H x W x D)		78.7X20X6.9					
ANTENNA WEIGHT		108.6					
AZIMUTH		150					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		128.03					
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT		0					
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Internal					
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 B5/B12 4449					
RRH - 850 band (QTY/MODEL)		RRH is shared with another band					
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)		1 4415 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Add Homerun RET to UMTS antenna - Replace GSM antenna with LTE 8 port						
Local Market Note 2							
Local Market Note 3	xxxxx / 1x6630 / 1xXMU03& xxxxx / 1x6630 / xxxxx						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 2		5787.B.850.4G.1	CTL02128_8B_1	CTL02128_8B_1		LTE 850	80010965_849MHz_07DT	15.5	150	7	TOP	FIBER	0						1000		11	
	PORT 3		5787.B.WCS.4G.1	CTL02128_3B_1	CTL02128_3B_1		LTE WCS	80010965_2355MHz_03DT	18.1	150	3	TOP	FIBER	0						1285.2866		12	
	PORT 5			CTN0002128_F1N5B_1	CTN0002128_F1N5B_1		5G 850	80010965_849MHz_07DT	15.5	150	7	TOP	FIBER	0						1000		11	

Section 16C - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL		800-10965					
ANTENNA VENDOR		Kathrein					
ANTENNA SIZE (H x W x D)		78.7X20X6.9					
ANTENNA WEIGHT		108.6					
AZIMUTH		270					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		128.03					
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT		0					
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Internal					
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 B5/B12 4449					
RRH - 850 band (QTY/MODEL)		RRH is shared with another band					
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)		1 4415 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Add Homerun RET to UMTS antenna - Replace GSM antenna with LTE 8 port						
Local Market Note 2							
Local Market Note 3	xxxxx / 1x6630 / 1xXMU03& xxxxx / 1x6630 / xxxxx						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (AtoII)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 2		5787.C.850.4G.1	CTL02128_8C_1	CTL02128_8C_1		LTE 850	80010965_849MHz_02DT	15.4	270	2	TOP	FIBER	0						1000		19	
	PORT 3		5787.C.WCS.4G.1	CTL02128_3C_1	CTL02128_3C_1		LTE WCS	80010965_2355MHz_03DT	18.1	270	3	TOP	FIBER	0						1285.2866		20	
	PORT 5			CTN0002128_F1N5C_1	CTN0002128_F1N5C_1		5G 850	80010965_849MHz_02DT	15.4	270	2	TOP	FIBER	0						1000		19	

Section 16.5A - SCOPING TOWER CONFIGURATION - SECTOR A (OR OMNI)

Section 17A - FINAL TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	800-10965		HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave	Kathrein		CCI			
ANTENNA SIZE (H x W x D)	55X11X5	78.7X20X6.9		72X14.8X9			
ANTENNA WEIGHT	35	108.6		50.7			
AZIMUTH	143	30		30			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	128.03	128.03		128.03			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2			Fiber + 2 Coax			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Internal		Internal			
SURGE ARRESTOR (QTY/MODEL)		1 DC/Fiber Squid		1 DC/Fiber Squid			
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901						
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1 Kathrein / 860-10006	LTE RRH		LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 21401 (Dual Band - 850						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)	1 LGP 12104 (850 Bypass TMA)						
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 B5/B12 4449					
RRH - 850 band (QTY/MODEL)		RRH is shared with another band					
RRH - 1900 band (QTY/MODEL)				1 RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)		1 4415 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Add Homerun RET to UMTS antenna - Replace GSM antenna with LTE 8 port						
Local Market Note 2							
Local Market Note 3	xxxxx / 1x6630 / 1xXMU03& xxxxx / 1x6630 / xxxxx						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1	5787.A.850.3G.1	5787.A.850.3G.1	CTV21281	CTV21281		UMTS 850	7770.00.850.07	13.5	143	7	None	Commscope 1-1/4 (850)	155.039685						252.35		1	
ANTENNA POSITION 2	PORT 1	5787.A.700.4G.1	5787.A.700.4G.1	CTL02128_7A_1	CTL02128_7A_1		LTE 700	80010965_716MHz_02DT	14.9	30	2	TOP	FIBER	0						1475.7065		3	
	PORT 2	5787.A.850.4G.tmp1	5787.A.850.4G.1	CTL02128_8A_1	CTL02128_8A_1		LTE 850	80010965_849MHz_02DT	15.4	30	2	TOP	FIBER	0						1000		3	
	PORT 3	5787.A.WCS.4G.tmp1	5787.A.WCS.4G.1	CTL02128_3A_1	CTL02128_3A_1		LTE WCS	80010965_2355MHz_03DT	18.1	30	3	TOP	FIBER	0						1285.2866		4	
	PORT 5	5787.A.850.5G.tmp1		CTN0002128_F1N5A_1	CTN0002128_F1N5A_1		5G 850	80010965_849MHz_02DT	15.4	30	2	TOP	FIBER	0						1000		3	

ANTENNA POSITION 4	**PORT 3**	5787.A.1900.4G.1	5787.A.1900.4G.1	CTL02128_9A_1	CTL02128_9A_1		LTE 1900	H6_1930MHz_03DT	17	30	3	TOP	FIBER	0						3664.3757		8	
	PORT 4	5787.A.1900.4G.2	5787.A.1900.4G.4	CTL02128_9A_2	CTL02128_9A_2		LTE 1900	H6_1930MHz_03DT	17	30	3	TOP	FIBER	0						3664.3757		8	

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	800-10965		HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave	Kathrein		CCI			
ANTENNA SIZE (H x W x D)	55X11X5	78.7X20X6.9		72X14.8X9			
ANTENNA WEIGHT	35	108.6		50.7			
AZIMUTH	263	150		150			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	128.03	128.03		128.03			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2			Fiber + 2 Coax			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Internal		Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901						
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH		LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 21401 (Dual Band - 850						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1 B5/B12 4449						
RRH - 850 band (QTY/MODEL)	RRH is shared with another band						
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)	1 4415 B30						
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Add Homerun RET to UMTS antenna - Replace GSM antenna with LTE 8 port						
Local Market Note 2							
Local Market Note 3	xxxxx / 1x6630 / 1xXMU03& xxxxx / 1x6630 / xxxxx						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1	5787.B.850.3G.1	5787.B.850.3G.1	CTV21282	CTV21282		UMTS 850	7770.00.850.07	13.5	263	7	None	Commscope 1-1/4 (850)	155.039685						252.35		9	
ANTENNA POSITION 2	PORT 1	5787.B.700.4G.1	5787.B.700.4G.1	CTL02128_7B_1	CTL02128_7B_1		LTE 700	80010965_716MHz_07DT	14.6	150	7	TOP	FIBER	0						1475.7065		11	
	PORT 2	5787.B.850.4G.tmp1	5787.B.850.4G.1	CTL02128_8B_1	CTL02128_8B_1		LTE 850	80010965_849MHz_07DT	15.5	150	7	TOP	FIBER	0						1000		11	
	PORT 3	5787.B.WCS.4G.tmp1	5787.B.WCS.4G.1	CTL02128_3B_1	CTL02128_3B_1		LTE WCS	80010965_2355MHz_03DT	18.1	150	3	TOP	FIBER	0						1285.2866		12	
	PORT 5	5787.B.850.5G.tmp1		CTN0002128_F1N5B_1	CTN0002128_F1N5B_1		5G 850	80010965_849MHz_07DT	15.5	150	7	TOP	FIBER	0						1000		11	
ANTENNA POSITION 4	PORT 3	5787.B.1900.4G.1	5787.B.1900.4G.1	CTL02128_9B_1	CTL02128_9B_1		LTE 1900	H6_1930MHz_02DT	16.85	150	2	TOP	FIBER	0						3664.3757		16	

ANTENNA POSITION 4	**PORT 4**	5787.B.1900.4G.2	5787.B.1900.4G.4	CTL02128_9B_2	CTL02128_9B_2		LTE 1900	H6_1930MHz_02DT	16.85	150	2	TOP	FIBER	0						3664.3757		16	

Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	800-10965		HPA-65R-BUU-H6			
ANTENNA VENDOR	Powerwave	Kathrein		CCI			
ANTENNA SIZE (H x W x D)	55X11X5	78.7X20X6.9		72X14.8X9			
ANTENNA WEIGHT	35	108.6		50.7			
AZIMUTH	23	270		270			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	128.03	128.03		128.03			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT	0	0		0			
FEEDER AMOUNT	2			Fiber + 2 Coax			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	2 Powerwave 7020	Internal		Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)	2 Powerwave / LGP 21901						
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH		LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 21401 (Dual Band - 850						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1000860						
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1 B5/B12 4449						
RRH - 850 band (QTY/MODEL)	RRH is shared with another band						
RRH - 1900 band (QTY/MODEL)			1	RRUS-12+RRUS-A2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)	1 4415 B30						
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Add Homerun RET to UMTS antenna - Replace GSM antenna with LTE 8 port						
Local Market Note 2							
Local Market Note 3	xxxxx / 1x6630 / 1xXMU03& xxxxx / 1x6630 / xxxxx						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1	5787.C.850.3G.1	5787.C.850.3G.1	CTV21283	CTV21283		UMTS 850	7770.00.850.06	13.5	23	6	None	Commscope 1-1/4 (850)	155.039685						252.35		17	
ANTENNA POSITION 2	PORT 1	5787.C.700.4G.1	5787.C.700.4G.1	CTL02128_7C_1	CTL02128_7C_1		LTE 700	80010965_716MHz_02DT	14.9	270	2	TOP	FIBER	0						1475.7065		19	
	PORT 2	5787.C.850.4G.tmp1	5787.C.850.4G.1	CTL02128_8C_1	CTL02128_8C_1		LTE 850	80010965_849MHz_02DT	15.4	270	2	TOP	FIBER	0						1000		19	
	PORT 3	5787.C.WCS.4G.tmp1	5787.C.WCS.4G.1	CTL02128_3C_1	CTL02128_3C_1		LTE WCS	80010965_2355MHz_03DT	18.1	270	3	TOP	FIBER	0						1285.2866		20	
	PORT 5	5787.C.850.5G.tmp1		CTN0002128_F1N5C_1	CTN0002128_F1N5C_1		5G 850	80010965_849MHz_02DT	15.4	270	2	TOP	FIBER	0						1000		19	
ANTENNA POSITION 4	PORT 3	5787.C.1900.4G.1	5787.C.1900.4G.1	CTL02128_9C_1	CTL02128_9C_1		LTE 1900	H6_1930MHz_02DT	16.85	270	2	TOP	FIBER	0						3664.3757		24	

ANTENNA POSITION 4	**PORT 4**	5787.C.1900.4G.2	5787.C.1900.4G.4	CTL02128_9C_2	CTL02128_9C_2		LTE 1900	H6_1930MHz_02 DT	16.85	270	2	TOP	FIBER	0						3664.3757		24	

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

150-ft Existing Valmont Monopole

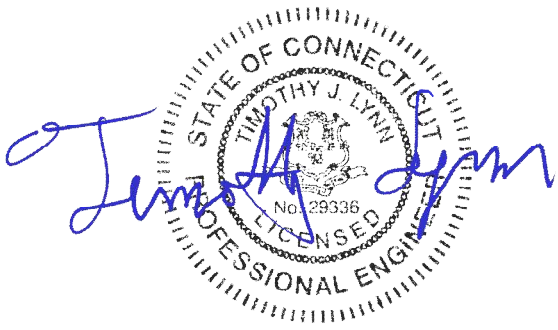
Proposed AT&T Mobility
Antenna Upgrade

AT&T Site Ref: CT2128

3965 Congress Street
Fairfield, CT

Centek Project No. 16071.42

Date: August 30, 2016



Prepared for:

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

Table of Contents

Introduction

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

The host tower is a 150-ft tall, three-section, twelve sided, tapered monopole, originally designed and manufactured by Valmont Structures. The manufacturer's drawings and calculations were unavailable for use in this report. The tower geometry, structure member sizes and foundation system information were obtained from a previous structural analysis report prepared by Centek Engineering job no; 13001.101, dated December 5, 2013.

Antenna and appurtenance information were obtained from the aforementioned Centek structural report, visual verification from grade conducted by Centek personnel on August 18, 2016 and a AT&T RF data sheet.

The tower is made up of three (3) tapered vertical sections consisting of A572-65 pole sections. The vertical tower sections are slip joint connected. The diameter of the pole (flat-flat) is 23.61-in at the top and 49.6-in at the base.

AT&T proposes the replacement of three (3) panel antennas and the installation of three (3) three (3) remote radio heads and one (1) main distribution box mounted to the existing low profile platform. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

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

- TOWN (Existing):
  Antennas: One (1) DB810K Omni-directional whip antenna and two (2) 10-ft Dipole antennas mounted on the Nextel T-Arms with respective RAD center elevations of 157-ft and 154-ft above grade.
  Coax Cables: Three (3) 1-5/8"∅ coax cables running on the inside of the existing tower.
- NEXTEL (Existing):
  Antennas: Twelve (12) Andrew DB844H90E-XY panel antennas mounted on three (3) 12-ft T-Arms with a RAD center elevation of 149-ft above grade.
  Coax Cables: Twelve (12) 1-5/8" coax cables running on the inside of the existing tower.
- SPRINT (Existing):
  Antennas: Three (3) RFS APXVSPP18-C-A20 panel antennas mounted on a 13-ft platform with hand rails with a RAD center elevation of 138-ft above grade. Three (3) ALU 1900 MHz RRH's and three (3) ALU 800 MHz RRH's mounted on a universal tr-bracket above the existing platform.
  Coax Cables: Three (3) 1-5/8" ∅ Hybriflex cables running on the inside of the existing tower.

- T-MOBILE (Existing):
  Antennas: Three (3) RFS APX16DWV-16DWV-S panel antennas and six (6) 10" by 8" by 3" TMA's mounted on a 13-ft platform with rails with a RAD center elevation of 113-ft above grade.
  Coax Cables: Twelve (12) 1-1/4" ∅ coax cables running on the exterior of the existing tower.
- TOWN (Existing):
  Antennas: Two (2) Andrew APSA685 Omni-directional whip antennas (inverted), one (1) DB-222 dipole antenna and one (1) PD1142-2B Omni-directional whip antenna mounted on two (2) standoffs with an elevation of 104-ft above grade.
  Coax Cables: Four (4) 1-5/8"∅ coax cables running on the inside of the existing tower.
- TOWN (Existing):
  Antennas: Two (2) empty standoffs with a RAD center elevation of 104-ft above grade.
- VERIZON (EXISTING TO REMAIN):
  Antennas: Three (3) Antel BXA-70063-6CF panel antennas, six (6) Andrew DB846F65ZAXY panel antennas, three (3) Antel BXA-171063-8BF panel antennas, three (3) BXA-171063-12CF panel antennas, three (3) Alcatel-Lucent RRH2x40-AWS Remote Radio Heads, six (6) RFS FD9R6004/2C-3L Diplexers and one (1) RFS DB-T1-6Z-8AB-0Z main distribution mounted on an existing low profile platform with a RAD center elevation of 80-ft above grade.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on the exterior of the existing tower.
- UNKNOWN (Existing):
  Antennas: One (1) GPS antenna on a GPS Stand-off mount with a RAD center elevation of 40-ft above grade.
  Coax Cables: One (1) 1/2"∅ coax cable running on the exterior of the existing tower.
- AT&T (Existing to Remain):
  Antennas: Six (6) Powerwave 7770 panel antennas and twelve (12) Powerwave LGP21401 TMA's mounted on an existing low profile platform with a RAD center elevation of 127-ft above grade.
  Appurtenances: Three (3) Ericsson RRUS-11 and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted to one (1) universal ring mount with a RAD center elevation of 129-ft above grade.
  Coax Cables: Twelve (12) 1-1/4" ∅ coax cables, one (1) fiber cable and two (2) dc control cables running on the exterior of the existing tower.
- AT&T (Existing to Remove):
  Antennas: Three (3) Powerwave P65-16-XLH-RR panel antennas a mounted on an existing low profile platform with a RAD center elevation of 127-ft above grade.

- **AT&T (Proposed):**
  Antennas: Three (3) CCI HPA-65R-BUU-H6 panel antennas mounted on an existing low profile platform with a RAD center elevation of 127-ft above grade.
  Appurtenances: Three (3) Ericsson RRUS-12 and three (3) Ericsson A2s mounted to one (1) universal ring mount with a RAD center elevation of 129-ft above grade.

Primary Assumptions Used in the Analysis

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

Analysis

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

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

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

Tower Loading

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

Basic Wind Speed:	New Haven; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Fairfield; v = 110 mph (3 second gust) equivalent to v = 90 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA wind speed controls.	
Load Cases:	Load Case 1; 90 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 78 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 78 mph wind speed velocity represents 75% of the wind pressure generated by the 90 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

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

Tower Capacity

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

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **99.6%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Pole Shaft (L3)	30.00'-47.83'	99.6%	**PASS**

Note 1: Equivalent thickness of 0.58" used for section L4 of pole shaft with reinforcement.

Foundation and Anchors

The existing foundation consists of a 6.6 ∅ x 26.6-ft long reinforced concrete caisson. The sub-grade conditions used in the analysis of the existing foundation were obtained from the design documents prepared by SAC, dated May 18, 1994. The base of the tower is connected to the foundation by means of (16) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 5-ft into the concrete foundation structure.

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

Location	Vector	Proposed Reactions
Base	Shear	42 kips
	Compression	44 kips
	Moment	3989 kip-ft

- The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	61.9%	**PASS**
	Lateral Deflection	0.37 in.(1)	**PASS**

(1) Lateral deflection typically limited to 1.0 in. for monopole tower structures. Based on service loads (V = 50 mph)

- The anchor bolts and base plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	90.8%	**PASS**
Base Plate	Bending	93.8%	**PASS**

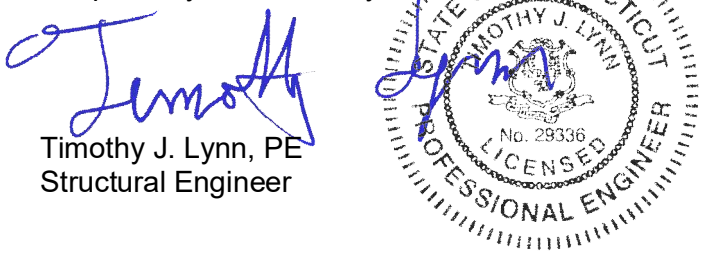
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

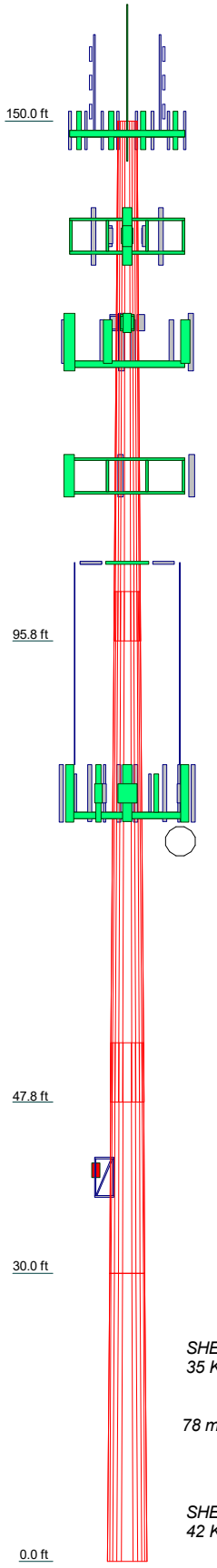
General Description of Structural Analysis Program

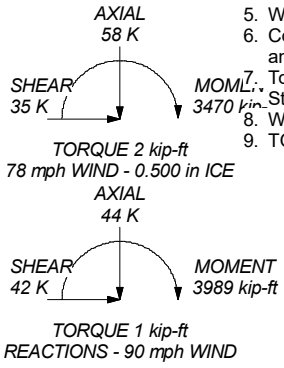
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

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

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	54.170	12	0.281	5.170	23.610	33.469		4.7
2	53.170	12	0.375	6.170	31.965	41.644	A572-65	8.0
3	24.000	12	0.438		39.771	44.139		4.8
4	30.000	12	0.580		44.139	49.600		9.7
								27.2





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10-ft Dipole (Town)	149	APX16DWV-16DWV-S-E-ACU (T-Mobile Existing)	113
10-ft Dipole (Town)	149	APX16DWV-16DWV-S-E-ACU (T-Mobile Existing)	113
DB810K (Town)	149	(2) 10"x8"x3" TMA (T-Mobile Existing)	113
(4) DB844H90E-XY (Nextel Existing)	149	(2) 10"x8"x3" TMA (T-Mobile Existing)	113
(4) DB844H90E-XY (Nextel Existing)	149	(2) 10"x8"x3" TMA (T-Mobile Existing)	113
(4) DB844H90E-XY (Nextel Existing)	149	13' Platform w/Rails (T-Mobile Existing)	113
Valmont T-Arm (1) (Nextel Existing)	149	4'-6" Standoff (Town - Existing)	104
Valmont T-Arm (1) (Nextel Existing)	149	4'-6" Standoff (Town - Existing)	104
Valmont T-Arm (1) (Nextel Existing)	149	4'-6" Standoff (Town - Existing)	104
APXVSPP18-C-A20 (Sprint Existing)	138	4'-6" Standoff (Town - Existing)	104
APXVSPP18-C-A20 (Sprint Existing)	138	1142-2B (Town - Existing)	104
APXVSPP18-C-A20 (Sprint Existing)	138	ASPA685 (Town - Existing)	104
FD-RRH 4x45 1900 (Sprint Existing)	138	DB222 (Town - Existing)	104
FD-RRH 4x45 1900 (Sprint Existing)	138	ASPA685 (Town - Existing)	104
FD-RRH 4x45 1900 (Sprint Existing)	138	DB846F65ZAXY (Verizon - Existing)	80
FD-RRH 2x50 800 (Sprint Existing)	138	BXA-171063/8BF (Verizon - Existing)	80
FD-RRH 2x50 800 (Sprint Existing)	138	BXA-70063/6CF (Verizon - Existing)	80
FD-RRH 2x50 800 (Sprint Existing)	138	DB846F65ZAXY (Verizon - Existing)	80
13' Platform w/Rails (Sprint Existing)	138	DB846F65ZAXY (Verizon - Existing)	80
RRUS-11 (ATI Existing)	129	BXA-171063/8BF (Verizon - Existing)	80
RRUS-11 (ATI Existing)	129	BXA-70063/6CF (Verizon - Existing)	80
RRUS-11 (ATI Existing)	129	DB846F65ZAXY (Verizon - Existing)	80
RRUS-12 (ATI Proposed)	129	DB846F65ZAXY (Verizon - Existing)	80
RRUS-12 (ATI Proposed)	129	BXA-171063/8BF (Verizon - Existing)	80
RRUS-12 (ATI Proposed)	129	BXA-70063/6CF (Verizon - Existing)	80
A2 (ATI Proposed)	129	DB846F65ZAXY (Verizon - Existing)	80
A2 (ATI Proposed)	129	(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	80
A2 (ATI Proposed)	129	(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	80
DC6-48-60-18-8F Surge Arrestor (ATI Existing)	129	(2) FD9R6004/2C-3L Diplexer (Verizon - Existing)	80
Valmont Uni-Tri Bracket (ATI Existing)	129	BXA-171063-12CF (Verizon - Existing)	80
7770.00 (ATI Existing)	127	BXA-171063-12CF (Verizon - Existing)	80
7770.00 (ATI Existing)	127	BXA-171063-12CF (Verizon - Existing)	80
HPA-65R-BUU-H6 (ATI Proposed)	127	RRH2x40-AWS (Verizon - Existing)	80
7770.00 (ATI Existing)	127	RRH2x40-AWS (Verizon - Existing)	80
7770.00 (ATI Existing)	127	RRH2x40-AWS (Verizon - Existing)	80
HPA-65R-BUU-H6 (ATI Proposed)	127	DB-T1-6Z-8AB-0Z (Verizon - Existing)	80
7770.00 (ATI Existing)	127	Valmont 13' Low Profile Platform (Verizon - Existing)	78
7770.00 (ATI Existing)	127	Stand-off	40
HPA-65R-BUU-H6 (ATI Proposed)	127	GPS (Existing)	40
(4) LGP214nn TMA (ATI Existing)	127		
(4) LGP214nn TMA (ATI Existing)	127		
(4) LGP214nn TMA (ATI Existing)	127		
Valmont 13' Low Profile Platform (ATI Existing)	125		
APX16DWV-16DWV-S-E-ACU (T-Mobile Existing)	113		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 78 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.
9. TOWER RATING: 99.6%

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

Job: *16071.42 - CT2128*			
Project: *150-ft Valmont Monopole - Fairfield, CT*			
Client: AT&T Mobility	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 08/30/16	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 90 mph.
Nominal ice thickness of 0.500 in.
Ice density of 56 pcf.
A wind speed of 78 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned		Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification		Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios		Use Clear Spans For KL/r		All Leg Panels Have Same Allowable
	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks		Consider Feed Line Torque
	Always Use Max Kz		Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component	√	Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric				

Tapered Pole Section Geometry

Section	*Elevation*	*Section Length*	*Splice Length*	*Number of Sides*	*Top Diameter*	*Bottom Diameter*	*Wall Thickness*	*Bend Radius*	*Pole Grade*
	ft	*ft*	*ft*		*in*	*in*	*in*	*in*	
L1	150.000-95.830	54.170	5.170	12	23.610	33.469	0.281	1.125	A572-65 (65 ksi)
L2	95.830-47.830	53.170	6.170	12	31.965	41.644	0.375	1.500	A572-65 (65 ksi)

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	47.830-30.000	24.000	0.000	12	39.771	44.139	0.438	1.750	A572-65 (65 ksi)
L4	30.000-0.000	30.000		12	44.139	49.600	0.580	2.320	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	24.443	21.131	1467.855	8.352	12.230	120.021	2974.272	10.400	5.574	19.814
	34.650	30.061	4226.132	11.881	17.337	243.765	8563.288	14.795	8.216	29.207
L2	34.067	38.145	4858.931	11.309	16.558	293.447	9845.511	18.774	7.562	20.165
	43.113	49.832	10832.905	14.774	21.572	502.184	21950.402	24.526	10.156	27.082
L3	42.336	55.411	10942.170	14.081	20.601	531.139	22171.804	27.272	9.486	21.683
	45.696	61.564	15007.519	15.645	22.864	656.382	30409.303	30.300	10.657	24.358
L4	45.696	81.351	19701.692	15.594	22.864	861.690	39920.969	40.038	10.275	17.715
	51.350	91.550	28079.524	17.549	25.693	1092.895	56896.728	45.058	11.738	20.239

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
L1 150.000-95.830				1	1	1			
L2 95.830-47.830				1	1	1			
L3 47.830-30.000				1	1	1			
L4 30.000-0.000				1.2	1	1.1			

Monopole Base Plate Data

Base Plate Data	
Base plate is square	
Base plate is grouted	√
Anchor bolt grade	A615-75
Anchor bolt size	2.250 in
Number of bolts	16
Embedment length	60.000 in
f'_c	4.000 ksi
Grout space	3.000 in
Base plate grade	A633-60
Base plate thickness	2.750 in
Bolt circle diameter	57.850 in
Outer diameter	63.850 in
Inner diameter	40.000 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
1 5/8	A	No	Inside Pole	149.000 - 3.000	3	No Ice	0.000	0.001
(Town - Existing)						1/2" Ice	0.000	0.001
1 5/8	B	No	Inside Pole	149.000 - 3.000	12	No Ice	0.000	0.001
(Nextel - Existing)						1/2" Ice	0.000	0.001
1 1/4	A	No	CaAa (Out Of	125.000 - 3.000	12	No Ice	0.000	0.001
(AT&T - Existing)			Face)			1/2" Ice	0.000	0.002
1 1/4	A	No	CaAa (Out Of	110.000 - 3.000	2	No Ice	0.155	0.001
(T-Mobile - Existing)			Face)			1/2" Ice	0.255	0.002
1 1/4	A	No	CaAa (Out Of	110.000 - 3.000	10	No Ice	0.000	0.001
(T-Mobile - Existing)			Face)			1/2" Ice	0.000	0.002
1 5/8	C	No	CaAa (Out Of	77.000 - 3.000	2	No Ice	0.198	0.001
(Verizon - Existing)			Face)			1/2" Ice	0.298	0.003
1 5/8	C	No	CaAa (Out Of	77.000 - 3.000	10	No Ice	0.000	0.001
(Verizon - Existing)			Face)			1/2" Ice	0.000	0.003
7/8	B	No	Inside Pole	104.000 - 3.000	4	No Ice	0.000	0.001
(Town - Existing)						1/2" Ice	0.000	0.001
1/2	B	No	CaAa (Out Of	40.000 - 3.000	1	No Ice	0.058	0.000
(GPS - Existing)			Face)			1/2" Ice	0.158	0.001
RG6-Fiber	C	No	CaAa (Out Of	129.000 - 3.000	1	No Ice	0.000	0.001
(AT&T - Existing)			Face)			1/2" Ice	0.000	0.002
#8 AWG Copper WIre	C	No	CaAa (Out Of	129.000 - 3.000	2	No Ice	0.000	0.000
(AT&T - Existing)			Face)			1/2" Ice	0.000	0.000
HYBRIFLEX 1-5/8"	C	No	Inside Pole	138.000 - 3.000	3	No Ice	0.000	0.002
(Sprint - Existing)						1/2" Ice	0.000	0.002
HYBRIFLEX 1-5/8"	C	No	CaAa (Out Of	77.000 - 3.000	1	No Ice	0.000	0.002
(Verizon - Existing)			Face)			1/2" Ice	0.000	0.003

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-95.830	A	0.000	0.000	0.000	4.393	0.509
		B	0.000	0.000	0.000	0.000	0.681
		C	0.000	0.000	0.000	0.000	0.277
L2	95.830-47.830	A	0.000	0.000	0.000	14.880	0.910
		B	0.000	0.000	0.000	0.000	0.703
		C	0.000	0.000	0.000	11.551	0.746
L3	47.830-30.000	A	0.000	0.000	0.000	5.527	0.338
		B	0.000	0.000	0.000	0.580	0.264
		C	0.000	0.000	0.000	7.061	0.378
L4	30.000-0.000	A	0.000	0.000	0.000	8.370	0.512
		B	0.000	0.000	0.000	1.566	0.402
		C	0.000	0.000	0.000	10.692	0.572

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	150.000-95.830	A	0.500	0.000	0.000	0.000	7.227	1.159

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	0.000	0.000	0.681
		C		0.000	0.000	0.000	0.000	0.323
L2	95.830-47.830	A	0.500	0.000	0.000	0.000	24.480	2.350
		B		0.000	0.000	0.000	0.000	0.703
		C		0.000	0.000	0.000	17.385	1.385
L3	47.830-30.000	A	0.500	0.000	0.000	0.000	9.093	0.873
		B		0.000	0.000	0.000	1.580	0.270
		C		0.000	0.000	0.000	10.627	0.752
L4	30.000-0.000	A	0.500	0.000	0.000	0.000	13.770	1.322
		B		0.000	0.000	0.000	4.266	0.420
		C		0.000	0.000	0.000	16.092	1.139

Discrete Tower Loads

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 K
10-ft Dipole	A	From Face	3.000	0.000	149.000	No Ice	3.150	3.150	0.032
(Town)			0.000			1/2" Ice	5.670	5.670	0.042
			5.000						
10-ft Dipole	B	From Face	3.000	0.000	149.000	No Ice	3.150	3.150	0.032
(Town)			0.000			1/2" Ice	5.670	5.670	0.042
			5.000						
DB810K	C	From Face	3.000	0.000	149.000	No Ice	4.075	4.075	0.035
(Town)			0.000			1/2" Ice	5.734	5.734	0.065
			5.000						
(4) DB844H90E-XY	A	From Face	3.000	0.000	149.000	No Ice	2.867	3.733	0.010
(Nextel Existing)			0.000			1/2" Ice	3.177	4.101	0.035
			0.000						
(4) DB844H90E-XY	B	From Face	3.000	0.000	149.000	No Ice	2.867	3.733	0.010
(Nextel Existing)			0.000			1/2" Ice	3.177	4.101	0.035
			0.000						
(4) DB844H90E-XY	C	From Face	3.000	0.000	149.000	No Ice	2.867	3.733	0.010
(Nextel Existing)			0.000			1/2" Ice	3.177	4.101	0.035
			0.000						
Valmont T-Arm (1)	A	None		0.000	149.000	No Ice	10.540	10.540	0.336
(Nextel Existing)						1/2" Ice	14.450	14.450	0.412
Valmont T-Arm (1)	B	None		0.000	149.000	No Ice	10.540	10.540	0.336
(Nextel Existing)						1/2" Ice	14.450	14.450	0.412
Valmont T-Arm (1)	C	None		0.000	149.000	No Ice	10.540	10.540	0.336
(Nextel Existing)						1/2" Ice	14.450	14.450	0.412
APXVSPP18-C-A20	A	From Face	3.000	0.000	138.000	No Ice	8.260	5.283	0.057
(Sprint Existing)			0.000			1/2" Ice	8.807	5.736	0.107
			0.000						
APXVSPP18-C-A20	B	From Face	3.000	0.000	138.000	No Ice	8.260	5.283	0.057
(Sprint Existing)			0.000			1/2" Ice	8.807	5.736	0.107
			0.000						
APXVSPP18-C-A20	C	From Face	3.000	0.000	138.000	No Ice	8.260	5.283	0.057
(Sprint Existing)			0.000			1/2" Ice	8.807	5.736	0.107
			0.000						
FD-RRH 4x45 1900	A	From Face	1.000	0.000	138.000	No Ice	2.705	2.781	0.060
(Sprint Existing)			0.000			1/2" Ice	2.944	3.022	0.084
			0.000						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
FD-RRH 4x45 1900	B	From Face	1.000	0.000	138.000	No Ice	2.705	2.781	0.060
(Sprint Existing)			0.000			1/2" Ice	2.944	3.022	0.084
			0.000						
FD-RRH 4x45 1900	C	From Face	1.000	0.000	138.000	No Ice	2.705	2.781	0.060
(Sprint Existing)			0.000			1/2" Ice	2.944	3.022	0.084
			0.000						
FD-RRH 2x50 800	A	From Face	1.000	0.000	138.000	No Ice	2.401	2.254	0.064
(Sprint Existing)			0.000			1/2" Ice	2.613	2.460	0.086
			0.000						
FD-RRH 2x50 800	B	From Face	1.000	0.000	138.000	No Ice	2.401	2.254	0.064
(Sprint Existing)			0.000			1/2" Ice	2.613	2.460	0.086
			0.000						
FD-RRH 2x50 800	C	From Face	1.000	0.000	138.000	No Ice	2.401	2.254	0.064
(Sprint Existing)			0.000			1/2" Ice	2.613	2.460	0.086
			0.000						
13' Platform w/Rails	C	None		0.000	138.000	No Ice	17.200	17.200	2.000
(Sprint Existing)						1/2" Ice	22.300	22.300	3.000
RRUS-11	A	From Face	0.500	0.000	129.000	No Ice	2.994	1.246	0.050
(AT&T Existing)			0.000			1/2" Ice	3.226	1.412	0.070
			0.000						
RRUS-11	B	From Face	0.500	0.000	129.000	No Ice	2.994	1.246	0.050
(AT&T Existing)			0.000			1/2" Ice	3.226	1.412	0.070
			0.000						
RRUS-11	C	From Face	0.500	0.000	129.000	No Ice	2.994	1.246	0.050
(AT&T Existing)			0.000			1/2" Ice	3.226	1.412	0.070
			0.000						
RRUS-12	A	From Face	0.500	0.000	129.000	No Ice	3.669	1.488	0.058
(AT&T Proposed)			0.000			1/2" Ice	3.926	1.673	0.081
			0.000						
RRUS-12	B	From Face	0.500	0.000	129.000	No Ice	3.669	1.488	0.058
(AT&T Proposed)			0.000			1/2" Ice	3.926	1.673	0.081
			0.000						
RRUS-12	C	From Face	0.500	0.000	129.000	No Ice	3.669	1.488	0.058
(AT&T Proposed)			0.000			1/2" Ice	3.926	1.673	0.081
			0.000						
A2	A	From Face	0.500	0.000	129.000	No Ice	2.424	0.542	0.022
(AT&T Proposed)			0.000			1/2" Ice	2.633	0.675	0.035
			0.000						
A2	B	From Face	0.500	0.000	129.000	No Ice	2.424	0.542	0.022
(AT&T Proposed)			0.000			1/2" Ice	2.633	0.675	0.035
			0.000						
A2	C	From Face	0.500	0.000	129.000	No Ice	2.424	0.542	0.022
(AT&T Proposed)			0.000			1/2" Ice	2.633	0.675	0.035
			0.000						
DC6-48-60-18-8F Surge	C	From Face	0.500	0.000	129.000	No Ice	2.228	2.228	0.020
Arrestor			0.000			1/2" Ice	2.447	2.447	0.039
(AT&T Existing)			0.000						
Valmont Uni-Tri Bracket	C	None		0.000	129.000	No Ice	1.750	1.750	0.290
(AT&T Existing)						1/2" Ice	1.940	1.940	0.306
7770.00	A	From Face	3.000	0.000	127.000	No Ice	5.882	2.928	0.035
(AT&T Existing)			-6.000			1/2" Ice	6.314	3.273	0.068
			0.000						
7770.00	A	From Face	3.000	0.000	127.000	No Ice	5.882	2.928	0.035
(AT&T Existing)			2.000			1/2" Ice	6.314	3.273	0.068
			0.000						
HPA-65R-BUU-H6	A	From Face	3.000	0.000	127.000	No Ice	10.360	6.450	0.051
(AT&T Proposed)			6.000			1/2" Ice	10.927	6.913	0.114

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 K
			0.000						
7770.00	B	From Face	3.000	0.000	127.000	No Ice	5.882	2.928	0.035
(AT&T Existing)			-6.000			1/2" Ice	6.314	3.273	0.068
			0.000						
7770.00	B	From Face	3.000	0.000	127.000	No Ice	5.882	2.928	0.035
(AT&T Existing)			2.000			1/2" Ice	6.314	3.273	0.068
			0.000						
HPA-65R-BUU-H6	B	From Face	3.000	0.000	127.000	No Ice	10.360	6.450	0.051
(AT&T Proposed)			6.000			1/2" Ice	10.927	6.913	0.114
			0.000						
7770.00	C	From Face	3.000	0.000	127.000	No Ice	5.882	2.928	0.035
(AT&T Existing)			-6.000			1/2" Ice	6.314	3.273	0.068
			0.000						
7770.00	C	From Face	3.000	0.000	127.000	No Ice	5.882	2.928	0.035
(AT&T Existing)			2.000			1/2" Ice	6.314	3.273	0.068
			0.000						
HPA-65R-BUU-H6	C	From Face	3.000	0.000	127.000	No Ice	10.360	6.450	0.051
(AT&T Proposed)			6.000			1/2" Ice	10.927	6.913	0.114
			0.000						
(4) LGP214nn TMA	A	From Face	3.000	0.000	127.000	No Ice	0.000	0.233	0.014
(AT&T Existing)			0.000			1/2" Ice	0.000	0.313	0.021
			0.000						
(4) LGP214nn TMA	B	From Face	3.000	0.000	127.000	No Ice	0.000	0.233	0.014
(AT&T Existing)			0.000			1/2" Ice	0.000	0.313	0.021
			0.000						
(4) LGP214nn TMA	C	From Face	3.000	0.000	127.000	No Ice	0.000	0.233	0.014
(AT&T Existing)			0.000			1/2" Ice	0.000	0.313	0.021
			0.000						
Valmont 13' Low Profile Platform	C	None		0.000	125.000	No Ice	15.700	15.700	1.300
(AT&T Existing)						1/2" Ice	20.100	20.100	1.765
APX16DWV-16DWV-S-E-A CU	A	From Face	3.000	0.000	113.000	No Ice	6.699	2.003	0.040
(T-Mobile Existing)			6.000			1/2" Ice	7.131	2.326	0.071
			0.000						
APX16DWV-16DWV-S-E-A CU	B	From Face	3.000	0.000	113.000	No Ice	6.699	2.003	0.040
(T-Mobile Existing)			6.000			1/2" Ice	7.131	2.326	0.071
			0.000						
APX16DWV-16DWV-S-E-A CU	C	From Face	3.000	0.000	113.000	No Ice	6.699	2.003	0.040
(T-Mobile Existing)			6.000			1/2" Ice	7.131	2.326	0.071
			0.000						
(2) 10"x8"x3" TMA	A	From Face	3.000	0.000	113.000	No Ice	0.000	0.292	0.015
(T-Mobile Existing)			6.000			1/2" Ice	0.000	0.380	0.020
			0.000						
(2) 10"x8"x3" TMA	B	From Face	3.000	0.000	113.000	No Ice	0.000	0.292	0.015
(T-Mobile Existing)			6.000			1/2" Ice	0.000	0.380	0.020
			0.000						
(2) 10"x8"x3" TMA	C	From Face	3.000	0.000	113.000	No Ice	0.000	0.292	0.015
(T-Mobile Existing)			6.000			1/2" Ice	0.000	0.380	0.020
			0.000						
13' Platform w/Rails	C	None		0.000	113.000	No Ice	17.200	17.200	2.000
(T-Mobile Existing)						1/2" Ice	22.300	22.300	3.000
4'-6" Standoff	A	From Face	3.000	0.000	104.000	No Ice	2.100	0.156	0.040
(Town - Existing)			0.000			1/2" Ice	2.480	0.212	0.057
			0.000						
4'-6" Standoff	A	From Face	3.000	0.000	104.000	No Ice	2.100	0.156	0.040
(Town - Existing)			0.000			1/2" Ice	2.480	0.212	0.057
			0.000						

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 K
4'-6" Standoff	B	From Face	3.000	0.000	104.000	No Ice	2.100	0.156	0.040
(Town - Existing)			0.000			1/2" Ice	2.480	0.212	0.057
			0.000						
4'-6" Standoff	C	From Face	3.000	0.000	104.000	No Ice	2.100	0.156	0.040
(Town - Existing)			0.000			1/2" Ice	2.480	0.212	0.057
			0.000						
1142-2B	B	From Face	5.000	0.000	104.000	No Ice	1.120	1.120	0.010
(Town - Existing)			0.000			1/2" Ice	2.535	2.535	0.021
			4.000						
ASPA685	B	From Face	5.000	0.000	104.000	No Ice	5.250	5.250	0.022
(Town - Existing)			0.000			1/2" Ice	7.379	7.379	0.060
			-10.500						
DB222	A	From Face	5.000	0.000	104.000	No Ice	1.600	1.600	0.016
(Town - Existing)			0.000			1/2" Ice	2.880	2.880	0.021
			5.000						
ASPA685	A	From Face	5.000	0.000	104.000	No Ice	5.250	5.250	0.022
(Town - Existing)			0.000			1/2" Ice	7.379	7.379	0.060
			-10.500						
DB846F65ZAXY	A	From Face	3.000	0.000	80.000	No Ice	7.033	6.158	0.021
(Verizon - Existing)			-6.000			1/2" Ice	7.536	6.619	0.070
			0.000						
BXA-171063/8BF	A	From Face	3.000	0.000	80.000	No Ice	2.941	2.156	0.011
(Verizon - Existing)			-3.000			1/2" Ice	3.255	2.458	0.029
			0.000						
BXA-70063/6CF	A	From Face	3.000	0.000	80.000	No Ice	7.731	4.158	0.012
(Verizon - Existing)			0.000			1/2" Ice	8.268	4.595	0.054
			0.000						
DB846F65ZAXY	A	From Face	3.000	0.000	80.000	No Ice	7.033	6.158	0.021
(Verizon - Existing)			6.000			1/2" Ice	7.536	6.619	0.070
			0.000						
DB846F65ZAXY	B	From Face	3.000	0.000	80.000	No Ice	7.033	6.158	0.021
(Verizon - Existing)			-6.000			1/2" Ice	7.536	6.619	0.070
			0.000						
BXA-171063/8BF	B	From Face	3.000	0.000	80.000	No Ice	2.941	2.156	0.011
(Verizon - Existing)			-3.000			1/2" Ice	3.255	2.458	0.029
			0.000						
BXA-70063/6CF	B	From Face	3.000	0.000	80.000	No Ice	7.731	4.158	0.012
(Verizon - Existing)			0.000			1/2" Ice	8.268	4.595	0.054
			0.000						
DB846F65ZAXY	B	From Face	3.000	0.000	80.000	No Ice	7.033	6.158	0.021
(Verizon - Existing)			6.000			1/2" Ice	7.536	6.619	0.070
			0.000						
DB846F65ZAXY	C	From Face	3.000	0.000	80.000	No Ice	7.033	6.158	0.021
(Verizon - Existing)			-6.000			1/2" Ice	7.536	6.619	0.070
			0.000						
BXA-171063/8BF	C	From Face	3.000	0.000	80.000	No Ice	2.941	2.156	0.011
(Verizon - Existing)			-3.000			1/2" Ice	3.255	2.458	0.029
			0.000						
BXA-70063/6CF	C	From Face	3.000	0.000	80.000	No Ice	7.731	4.158	0.012
(Verizon - Existing)			0.000			1/2" Ice	8.268	4.595	0.054
			0.000						
DB846F65ZAXY	C	From Face	3.000	0.000	80.000	No Ice	7.033	6.158	0.021
(Verizon - Existing)			6.000			1/2" Ice	7.536	6.619	0.070
			0.000						
(2) FD9R6004/2C-3L	A	From Face	3.000	0.000	80.000	No Ice	0.000	0.085	0.003
Diplexer			0.000			1/2" Ice	0.000	0.136	0.005
(Verizon - Existing)			0.000						

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 K
(2) FD9R6004/2C-3L	B	From Face	3.000	0.000	80.000	No Ice	0.000	0.085	0.003
Diplexer			0.000			1/2" Ice	0.000	0.136	0.005
(Verizon - Existing)			0.000						
(2) FD9R6004/2C-3L	C	From Face	3.000	0.000	80.000	No Ice	0.000	0.085	0.003
Diplexer			0.000			1/2" Ice	0.000	0.136	0.005
(Verizon - Existing)			0.000						
BXA-171063-12CF	A	From Face	3.000	0.000	80.000	No Ice	4.791	3.618	0.015
(Verizon - Existing)			3.000			1/2" Ice	5.242	4.058	0.042
			0.000						
BXA-171063-12CF	B	From Face	3.000	0.000	80.000	No Ice	4.791	3.618	0.015
(Verizon - Existing)			3.000			1/2" Ice	5.242	4.058	0.042
			0.000						
BXA-171063-12CF	C	From Face	3.000	0.000	80.000	No Ice	4.791	3.618	0.015
(Verizon - Existing)			3.000			1/2" Ice	5.242	4.058	0.042
			0.000						
RRH2x40-AWS	A	From Face	3.000	0.000	80.000	No Ice	2.522	1.589	0.044
(Verizon - Existing)			3.000			1/2" Ice	2.753	1.795	0.061
			0.000						
RRH2x40-AWS	B	From Face	3.000	0.000	80.000	No Ice	2.522	1.589	0.044
(Verizon - Existing)			3.000			1/2" Ice	2.753	1.795	0.061
			0.000						
RRH2x40-AWS	C	From Face	3.000	0.000	80.000	No Ice	2.522	1.589	0.044
(Verizon - Existing)			3.000			1/2" Ice	2.753	1.795	0.061
			0.000						
DB-T1-6Z-8AB-0Z	C	From Face	3.000	0.000	80.000	No Ice	5.600	2.333	0.044
(Verizon - Existing)			0.000			1/2" Ice	5.915	2.558	0.080
			0.000						
Valmont 13' Low Profile	C	None		0.000	78.000	No Ice	15.700	15.700	1.300
Platform						1/2" Ice	20.100	20.100	1.765
(Verizon - Existing)									
Stand-off	A	From Face	1.000	0.000	40.000	No Ice	0.750	0.750	0.027
			0.000			1/2" Ice	0.950	0.950	0.036
			0.000						
GPS	A	From Face	2.000	0.000	40.000	No Ice	1.000	1.000	0.010
(Existing)			0.000			1/2" Ice	1.500	1.500	0.015
			0.000						

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1	121.781	1.452	0.030	128.832	A	0.000	128.832	128.832	100.00	0.000	4.393
150.000-95.83					B	0.000	128.832		100.00	0.000	0.000
0					C	0.000	128.832		100.00	0.000	0.000
L2	71.470	1.247	0.026	149.101	A	0.000	149.101	149.101	100.00	0.000	14.880
95.830-47.830					B	0.000	149.101		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	149.101		100.00	0.000	11.551
L3	38.802	1.047	0.022	63.172	A	0.000	63.172	63.172	100.00	0.000	5.527
47.830-30.000					B	0.000	63.172		100.00	0.000	0.580
					C	0.000	63.172		100.00	0.000	7.061
L4	14.709	1	0.021	117.174	A	0.000	117.174	117.174	100.00	0.000	8.370
30.000-0.000					B	0.000	117.174		100.00	0.000	1.566
					C	0.000	117.174		100.00	0.000	10.692

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z ksf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	121.781	1.452	0.023	0.500	133.346	A	0.000	133.346	133.346	100.00	0.000	7.227
150.000-95.830						B	0.000	133.346		100.00	0.000	0.000
						C	0.000	133.346		100.00	0.000	0.000
L2	71.470	1.247	0.019	0.500	153.101	A	0.000	153.101	153.101	100.00	0.000	24.480
95.830-47.830						B	0.000	153.101		100.00	0.000	0.000
						C	0.000	153.101		100.00	0.000	17.385
L3	38.802	1.047	0.016	0.500	64.658	A	0.000	64.658	64.658	100.00	0.000	9.093
47.830-30.000						B	0.000	64.658		100.00	0.000	1.580
						C	0.000	64.658		100.00	0.000	10.627
L4 30.000-0.000	14.709	1	0.016	0.500	119.674	A	0.000	119.674	119.674	100.00	0.000	13.770
						B	0.000	119.674		100.00	0.000	4.266
						C	0.000	119.674		100.00	0.000	16.092

Tower Pressure - Service

$G_H = 1.690$

Section Elevation ft	z ft	K_Z	q_z ksf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1	121.781	1.452	0.009	128.832	A	0.000	128.832	128.832	100.00	0.000	4.393
150.000-95.83					B	0.000	128.832		100.00	0.000	0.000
0					C	0.000	128.832		100.00	0.000	0.000
L2	71.470	1.247	0.008	149.101	A	0.000	149.101	149.101	100.00	0.000	14.880
95.830-47.830					B	0.000	149.101		100.00	0.000	0.000
					C	0.000	149.101		100.00	0.000	11.551
L3	38.802	1.047	0.007	63.172	A	0.000	63.172	63.172	100.00	0.000	5.527
47.830-30.000					B	0.000	63.172		100.00	0.000	0.580
					C	0.000	63.172		100.00	0.000	7.061
L4	14.709	1	0.006	117.174	A	0.000	117.174	117.174	100.00	0.000	8.370
30.000-0.000					B	0.000	117.174		100.00	0.000	1.566
					C	0.000	117.174		100.00	0.000	10.692

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.467	4.718	A	1	1.03	1	1	1	128.832	6.961	0.128	C
150.000-95.83			B	1	1.03	1	1	1	128.832			
0			C	1	1.03	1	1	1	128.832			
L2	2.359	7.959	A	1	1.03	1	1	1	149.101	7.826	0.163	C
95.830-47.830			B	1	1.03	1	1	1	149.101			
			C	1	1.03	1	1	1	149.101			
L3	0.979	4.777	A	1	1.03	1	1	1	63.172	2.872	0.161	C
47.830-30.000			B	1	1.03	1	1	1	63.172			
			C	1	1.03	1	1	1	63.172			
L4	1.486	9.708	A	1	1.03	1	1	1	117.174	4.952	0.165	C
30.000-0.000			B	1	1.03	1	1	1	117.174			
			C	1	1.03	1	1	1	117.174			
Sum Weight:	6.291	27.161						OTM	1591.247 kip-ft	22.610		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.467	4.718	A	1	1.03	1	1	1	128.832	6.961	0.128	C
150.000-95.83			B	1	1.03	1	1	1	128.832			
0			C	1	1.03	1	1	1	128.832			
L2	2.359	7.959	A	1	1.03	1	1	1	149.101	7.826	0.163	C
95.830-47.830			B	1	1.03	1	1	1	149.101			
			C	1	1.03	1	1	1	149.101			
L3	0.979	4.777	A	1	1.03	1	1	1	63.172	2.872	0.161	C
47.830-30.000			B	1	1.03	1	1	1	63.172			
			C	1	1.03	1	1	1	63.172			
L4	1.486	9.708	A	1	1.03	1	1	1	117.174	4.952	0.165	C
30.000-0.000			B	1	1.03	1	1	1	117.174			
			C	1	1.03	1	1	1	117.174			
Sum Weight:	6.291	27.161						OTM	1591.247 kip-ft	22.610		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.467	4.718	A	1	1.03	1	1	1	128.832	6.961	0.128	C
150.000-95.83			B	1	1.03	1	1	1	128.832			
0			C	1	1.03	1	1	1	128.832			
L2	2.359	7.959	A	1	1.03	1	1	1	149.101	7.826	0.163	C
95.830-47.830			B	1	1.03	1	1	1	149.101			
			C	1	1.03	1	1	1	149.101			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L3	0.979	4.777	A	1	1.03	1	1	1	63.172	2.872	0.161	C
47.830-30.000			B	1	1.03	1	1	1	63.172			
			C	1	1.03	1	1	1	63.172			
L4	1.486	9.708	A	1	1.03	1	1	1	117.174	4.952	0.165	C
30.000-0.000			B	1	1.03	1	1	1	117.174			
			C	1	1.03	1	1	1	117.174			
Sum Weight:	6.291	27.161						OTM	1591.247 kip-ft	22.610		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.467	4.718	A	1	1.03	1	1	1	128.832	6.961	0.128	C
150.000-95.83			B	1	1.03	1	1	1	128.832			
0			C	1	1.03	1	1	1	128.832			
L2	2.359	7.959	A	1	1.03	1	1	1	149.101	7.826	0.163	C
95.830-47.830			B	1	1.03	1	1	1	149.101			
			C	1	1.03	1	1	1	149.101			
L3	0.979	4.777	A	1	1.03	1	1	1	63.172	2.872	0.161	C
47.830-30.000			B	1	1.03	1	1	1	63.172			
			C	1	1.03	1	1	1	63.172			
L4	1.486	9.708	A	1	1.03	1	1	1	117.174	4.952	0.165	C
30.000-0.000			B	1	1.03	1	1	1	117.174			
			C	1	1.03	1	1	1	117.174			
Sum Weight:	6.291	27.161						OTM	1591.247 kip-ft	22.610		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	2.163	5.703	A	1	1.03	1	1	1	133.346	5.506	0.102	C
150.000-95.83			B	1	1.03	1	1	1	133.346			
0			C	1	1.03	1	1	1	133.346			
L2	4.438	9.094	A	1	1.03	1	1	1	153.101	6.507	0.136	C
95.830-47.830			B	1	1.03	1	1	1	153.101			
			C	1	1.03	1	1	1	153.101			
L3	1.895	5.257	A	1	1.03	1	1	1	64.658	2.420	0.136	C
47.830-30.000			B	1	1.03	1	1	1	64.658			
			C	1	1.03	1	1	1	64.658			
L4	2.881	10.597	A	1	1.03	1	1	1	119.674	4.137	0.138	C
30.000-0.000			B	1	1.03	1	1	1	119.674			
			C	1	1.03	1	1	1	119.674			
Sum Weight:	11.377	30.651						OTM	1290.244 kip-ft	18.569		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	2.163	5.703	A	1	1.03	1	1	1	133.346	5.506	0.102	C
150.000-95.83			B	1	1.03	1	1	1	133.346			
0			C	1	1.03	1	1	1	133.346			
L2	4.438	9.094	A	1	1.03	1	1	1	153.101	6.507	0.136	C
95.830-47.830			B	1	1.03	1	1	1	153.101			
			C	1	1.03	1	1	1	153.101			
L3	1.895	5.257	A	1	1.03	1	1	1	64.658	2.420	0.136	C
47.830-30.000			B	1	1.03	1	1	1	64.658			
			C	1	1.03	1	1	1	64.658			
L4	2.881	10.597	A	1	1.03	1	1	1	119.674	4.137	0.138	C
30.000-0.000			B	1	1.03	1	1	1	119.674			
			C	1	1.03	1	1	1	119.674			
Sum Weight:	11.377	30.651						OTM	1290.244 kip-ft	18.569		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	2.163	5.703	A	1	1.03	1	1	1	133.346	5.506	0.102	C
150.000-95.83			B	1	1.03	1	1	1	133.346			
0			C	1	1.03	1	1	1	133.346			
L2	4.438	9.094	A	1	1.03	1	1	1	153.101	6.507	0.136	C
95.830-47.830			B	1	1.03	1	1	1	153.101			
			C	1	1.03	1	1	1	153.101			
L3	1.895	5.257	A	1	1.03	1	1	1	64.658	2.420	0.136	C
47.830-30.000			B	1	1.03	1	1	1	64.658			
			C	1	1.03	1	1	1	64.658			
L4	2.881	10.597	A	1	1.03	1	1	1	119.674	4.137	0.138	C
30.000-0.000			B	1	1.03	1	1	1	119.674			
			C	1	1.03	1	1	1	119.674			
Sum Weight:	11.377	30.651						OTM	1290.244 kip-ft	18.569		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	2.163	5.703	A	1	1.03	1	1	1	133.346	5.506	0.102	C
150.000-95.83			B	1	1.03	1	1	1	133.346			
0			C	1	1.03	1	1	1	133.346			
L2	4.438	9.094	A	1	1.03	1	1	1	153.101	6.507	0.136	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
95.830-47.830			B	1	1.03	1	1	1	153.101			
			C	1	1.03	1	1	1	153.101			
L3	1.895	5.257	A	1	1.03	1	1	1	64.658	2.420	0.136	C
47.830-30.000			B	1	1.03	1	1	1	64.658			
			C	1	1.03	1	1	1	64.658			
L4	2.881	10.597	A	1	1.03	1	1	1	119.674	4.137	0.138	C
30.000-0.000			B	1	1.03	1	1	1	119.674			
			C	1	1.03	1	1	1	119.674			
Sum Weight:	11.377	30.651						OTM	1290.244 kip-ft	18.569		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.467	4.718	A	1	1.03	1	1	1	128.832	2.148	0.040	C
150.000-95.83			B	1	1.03	1	1	1	128.832			
0			C	1	1.03	1	1	1	128.832			
L2	2.359	7.959	A	1	1.03	1	1	1	149.101	2.415	0.050	C
95.830-47.830			B	1	1.03	1	1	1	149.101			
			C	1	1.03	1	1	1	149.101			
L3	0.979	4.777	A	1	1.03	1	1	1	63.172	0.886	0.050	C
47.830-30.000			B	1	1.03	1	1	1	63.172			
			C	1	1.03	1	1	1	63.172			
L4	1.486	9.708	A	1	1.03	1	1	1	117.174	1.528	0.051	C
30.000-0.000			B	1	1.03	1	1	1	117.174			
			C	1	1.03	1	1	1	117.174			
Sum Weight:	6.291	27.161						OTM	491.126 kip-ft	6.978		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
L1	1.467	4.718	A	1	1.03	1	1	1	128.832	2.148	0.040	C
150.000-95.83			B	1	1.03	1	1	1	128.832			
0			C	1	1.03	1	1	1	128.832			
L2	2.359	7.959	A	1	1.03	1	1	1	149.101	2.415	0.050	C
95.830-47.830			B	1	1.03	1	1	1	149.101			
			C	1	1.03	1	1	1	149.101			
L3	0.979	4.777	A	1	1.03	1	1	1	63.172	0.886	0.050	C
47.830-30.000			B	1	1.03	1	1	1	63.172			
			C	1	1.03	1	1	1	63.172			
L4	1.486	9.708	A	1	1.03	1	1	1	117.174	1.528	0.051	C
30.000-0.000			B	1	1.03	1	1	1	117.174			
			C	1	1.03	1	1	1	117.174			
Sum Weight:	6.291	27.161						OTM	491.126	6.978		

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
									kip-ft			

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.467	4.718	A	1	1.03	1	1	1	128.832	2.148	0.040	C
150.000-95.83			B	1	1.03	1	1	1	128.832			
0			C	1	1.03	1	1	1	128.832			
L2	2.359	7.959	A	1	1.03	1	1	1	149.101	2.415	0.050	C
95.830-47.830			B	1	1.03	1	1	1	149.101			
			C	1	1.03	1	1	1	149.101			
L3	0.979	4.777	A	1	1.03	1	1	1	63.172	0.886	0.050	C
47.830-30.000			B	1	1.03	1	1	1	63.172			
			C	1	1.03	1	1	1	63.172			
L4	1.486	9.708	A	1	1.03	1	1	1	117.174	1.528	0.051	C
30.000-0.000			B	1	1.03	1	1	1	117.174			
			C	1	1.03	1	1	1	117.174			
Sum Weight:	6.291	27.161						OTM	491.126 kip-ft	6.978		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
L1	1.467	4.718	A	1	1.03	1	1	1	128.832	2.148	0.040	C
150.000-95.83			B	1	1.03	1	1	1	128.832			
0			C	1	1.03	1	1	1	128.832			
L2	2.359	7.959	A	1	1.03	1	1	1	149.101	2.415	0.050	C
95.830-47.830			B	1	1.03	1	1	1	149.101			
			C	1	1.03	1	1	1	149.101			
L3	0.979	4.777	A	1	1.03	1	1	1	63.172	0.886	0.050	C
47.830-30.000			B	1	1.03	1	1	1	63.172			
			C	1	1.03	1	1	1	63.172			
L4	1.486	9.708	A	1	1.03	1	1	1	117.174	1.528	0.051	C
30.000-0.000			B	1	1.03	1	1	1	117.174			
			C	1	1.03	1	1	1	117.174			
Sum Weight:	6.291	27.161						OTM	491.126 kip-ft	6.978		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	27.161					
Bracing Weight	0.000					
Total Member Self-Weight	27.161			-0.122	0.280	
Total Weight	43.964			-0.122	0.280	
Wind 0 deg - No Ice		-0.041	-41.689	-3869.746	4.540	-0.346
Wind 30 deg - No Ice		20.759	-36.083	-3349.185	-1927.405	-0.927
Wind 45 deg - No Ice		29.379	-29.449	-2733.347	-2728.083	-1.132
Wind 60 deg - No Ice		35.996	-20.809	-1931.245	-3342.828	-1.259
Wind 90 deg - No Ice		41.589	0.041	4.138	-3862.468	-1.254
Wind 120 deg - No Ice		36.037	20.880	1938.379	-3347.088	-0.913
Wind 135 deg - No Ice		29.437	29.507	2739.128	-2734.107	-0.642
Wind 150 deg - No Ice		20.830	36.124	3353.201	-1934.783	-0.327
Wind 180 deg - No Ice		0.041	41.689	3869.502	-3.979	0.346
Wind 210 deg - No Ice		-20.759	36.083	3348.941	1927.965	0.927
Wind 225 deg - No Ice		-29.379	29.449	2733.104	2728.644	1.132
Wind 240 deg - No Ice		-35.996	20.809	1931.001	3343.388	1.259
Wind 270 deg - No Ice		-41.589	-0.041	-4.382	3863.028	1.254
Wind 300 deg - No Ice		-36.037	-20.880	-1938.623	3347.648	0.913
Wind 315 deg - No Ice		-29.437	-29.507	-2739.372	2734.668	0.642
Wind 330 deg - No Ice		-20.830	-36.124	-3353.445	1935.343	0.327
Member Ice	3.490					
Total Weight Ice	57.968			-0.197	0.345	
Wind 0 deg - Ice		-0.036	-35.477	-3321.914	4.072	-0.299
Wind 30 deg - Ice		17.672	-30.706	-2875.025	-1654.892	-1.191
Wind 45 deg - Ice		25.010	-25.061	-2346.370	-2342.443	-1.529
Wind 60 deg - Ice		30.644	-17.708	-1657.827	-2870.337	-1.763
Wind 90 deg - Ice		35.405	0.036	3.531	-3316.584	-1.863
Wind 120 deg - Ice		30.680	17.770	1663.890	-2874.064	-1.464
Wind 135 deg - Ice		25.061	25.112	2351.248	-2347.714	-1.106
Wind 150 deg - Ice		17.734	30.742	2878.359	-1661.348	-0.673
Wind 180 deg - Ice		0.036	35.477	3321.521	-3.382	0.299
Wind 210 deg - Ice		-17.672	30.706	2874.631	1655.582	1.191
Wind 225 deg - Ice		-25.010	25.061	2345.977	2343.133	1.529
Wind 240 deg - Ice		-30.644	17.708	1657.434	2871.027	1.763
Wind 270 deg - Ice		-35.405	-0.036	-3.924	3317.275	1.863
Wind 300 deg - Ice		-30.680	-17.770	-1664.283	2874.754	1.464
Wind 315 deg - Ice		-25.061	-25.112	-2351.641	2348.404	1.106
Wind 330 deg - Ice		-17.734	-30.742	-2878.752	1662.038	0.673
Total Weight	43.964			-0.122	0.280	
Wind 0 deg - Service		-0.013	-12.867	-1194.450	1.595	-0.107
Wind 30 deg - Service		6.407	-11.137	-1033.783	-594.684	-0.286
Wind 45 deg - Service		9.067	-9.089	-843.710	-841.807	-0.349
Wind 60 deg - Service		11.110	-6.423	-596.148	-1031.543	-0.389
Wind 90 deg - Service		12.836	0.013	1.193	-1191.926	-0.387
Wind 120 deg - Service		11.123	6.444	598.181	-1032.858	-0.282
Wind 135 deg - Service		9.085	9.107	845.325	-843.667	-0.198
Wind 150 deg - Service		6.429	11.149	1034.854	-596.961	-0.101
Wind 180 deg - Service		0.013	12.867	1194.206	-1.035	0.107
Wind 210 deg - Service		-6.407	11.137	1033.539	595.245	0.286
Wind 225 deg - Service		-9.067	9.089	843.466	842.368	0.349
Wind 240 deg - Service		-11.110	6.423	595.904	1032.104	0.389
Wind 270 deg - Service		-12.836	-0.013	-1.437	1192.486	0.387
Wind 300 deg - Service		-11.123	-6.444	-598.425	1033.418	0.282
Wind 315 deg - Service		-9.085	-9.107	-845.569	844.227	0.198
Wind 330 deg - Service		-6.429	-11.149	-1035.098	597.522	0.101

Load Combinations

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

Maximum Member Forces

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

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	150 - 95.83	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-20.059	0.210	0.479
			Max. Mx	14	-12.603	633.997	0.338
			Max. My	2	-12.606	0.332	633.951
			Max. Vy	14	-21.591	633.997	0.338
			Max. Vx	2	-21.544	0.332	633.951
			Max. Torque	31			-2.142
L2	95.83 - 47.83	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-35.523	0.210	0.119
			Max. Mx	14	-24.265	1943.395	2.196
			Max. My	2	-24.259	2.329	1944.808
			Max. Vy	14	-33.691	1943.395	2.196
			Max. Vx	2	-33.792	2.329	1944.808
			Max. Torque	31			-2.141
L3	47.83 - 30	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-44.489	0.345	0.197
			Max. Mx	14	-31.968	2796.863	3.264
			Max. My	2	-31.965	3.432	2800.668
			Max. Vy	14	-37.339	2796.863	3.264
			Max. Vx	2	-37.440	3.432	2800.668
			Max. Torque	31			-1.859
L4	30 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-57.968	0.345	0.197
			Max. Mx	14	-43.942	3980.291	4.504
			Max. My	2	-43.942	4.674	3987.119
			Max. Vy	14	-41.612	3980.291	4.504
			Max. Vx	2	-41.712	4.674	3987.119
			Max. Torque	31			-1.858

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	19	57.968	0.036	35.477
	Max. H_x	14	43.964	41.589	0.041
	Max. H_z	2	43.964	0.041	41.689
	Max. M_x	2	3987.119	0.041	41.689
	Max. M_z	6	3979.709	-41.589	-0.041
	Max. Torsion	23	1.856	-35.405	-0.036
	Min. Vert	1	43.964	0.000	0.000
	Min. H_x	6	43.964	-41.589	-0.041
	Min. H_z	10	43.964	-0.041	-41.689
	Min. M_x	10	-3986.864	-0.041	-41.689
	Min. M_z	14	-3980.291	41.589	0.041
	Min. Torsion	31	-1.857	35.405	0.036

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	43.964	0.000	0.000	-0.122	0.280	0.000

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 0 deg - No Ice	43.964	-0.041	-41.689	-3987.119	4.674	-0.346
Dead+Wind 30 deg - No Ice	43.964	20.759	-36.083	-3450.786	-1985.921	-0.922
Dead+Wind 45 deg - No Ice	43.964	29.379	-29.449	-2816.269	-2810.908	-1.125
Dead+Wind 60 deg - No Ice	43.964	35.996	-20.809	-1989.834	-3444.314	-1.251
Dead+Wind 90 deg - No Ice	43.964	41.589	0.041	4.262	-3979.709	-1.244
Dead+Wind 120 deg - No Ice	43.964	36.037	20.880	1997.170	-3448.674	-0.905
Dead+Wind 135 deg - No Ice	43.964	29.437	29.507	2822.203	-2817.083	-0.636
Dead+Wind 150 deg - No Ice	43.964	20.830	36.124	3454.900	-1993.497	-0.324
Dead+Wind 180 deg - No Ice	43.964	0.041	41.689	3986.864	-4.092	0.344
Dead+Wind 210 deg - No Ice	43.964	-20.759	36.083	3450.534	1986.497	0.921
Dead+Wind 225 deg - No Ice	43.964	-29.379	29.449	2816.021	2811.483	1.124
Dead+Wind 240 deg - No Ice	43.964	-35.996	20.809	1989.589	3444.890	1.251
Dead+Wind 270 deg - No Ice	43.964	-41.589	-0.041	-4.503	3980.291	1.246
Dead+Wind 300 deg - No Ice	43.964	-36.037	-20.880	-1997.415	3449.262	0.906
Dead+Wind 315 deg - No Ice	43.964	-29.437	-29.507	-2822.452	2817.673	0.637
Dead+Wind 330 deg - No Ice	43.964	-20.830	-36.124	-3455.152	1994.085	0.324
Dead+Ice+Temp	57.968	0.000	0.000	-0.197	0.345	0.000
Dead+Wind 0 deg+Ice+Temp	57.968	-0.036	-35.477	-3467.791	4.246	-0.299
Dead+Wind 30 deg+Ice+Temp	57.968	17.672	-30.706	-3001.286	-1727.623	-1.188
Dead+Wind 45 deg+Ice+Temp	57.968	25.010	-25.061	-2449.416	-2445.389	-1.525
Dead+Wind 60 deg+Ice+Temp	57.968	30.644	-17.708	-1730.634	-2996.477	-1.757
Dead+Wind 90 deg+Ice+Temp	57.968	35.405	0.036	3.684	-3462.318	-1.856
Dead+Wind 120 deg+Ice+Temp	57.968	30.680	17.770	1736.949	-3000.334	-1.458
Dead+Wind 135 deg+Ice+Temp	57.968	25.061	25.112	2454.487	-2450.853	-1.101
Dead+Wind 150 deg+Ice+Temp	57.968	17.734	30.742	3004.740	-1734.327	-0.670
Dead+Wind 180 deg+Ice+Temp	57.968	0.036	35.477	3467.369	-3.517	0.298
Dead+Wind 210 deg+Ice+Temp	57.968	-17.672	30.706	3000.871	1728.340	1.187
Dead+Wind 225 deg+Ice+Temp	57.968	-25.010	25.061	2449.008	2446.104	1.524
Dead+Wind 240 deg+Ice+Temp	57.968	-30.644	17.708	1730.233	2997.194	1.757
Dead+Wind 270 deg+Ice+Temp	57.968	-35.405	-0.036	-4.079	3463.048	1.857
Dead+Wind 300 deg+Ice+Temp	57.968	-30.680	-17.770	-1737.351	3001.077	1.459
Dead+Wind 315 deg+Ice+Temp	57.968	-25.061	-25.112	-2454.895	2451.597	1.102
Dead+Wind 330 deg+Ice+Temp	57.968	-17.734	-30.742	-3005.156	1735.069	0.669
Dead+Wind 0 deg - Service	43.964	-0.013	-12.867	-1232.234	1.647	-0.107
Dead+Wind 30 deg - Service	43.964	6.407	-11.137	-1066.486	-613.507	-0.287
Dead+Wind 45 deg - Service	43.964	9.067	-9.089	-870.401	-868.452	-0.350
Dead+Wind 60 deg - Service	43.964	11.110	-6.423	-615.008	-1064.193	-0.389
Dead+Wind 90 deg - Service	43.964	12.836	0.013	1.226	-1229.651	-0.387
Dead+Wind 120 deg - Service	43.964	11.123	6.444	617.097	-1065.546	-0.282
Dead+Wind 135 deg - Service	43.964	9.085	9.107	872.059	-870.366	-0.198
Dead+Wind 150 deg - Service	43.964	6.429	11.149	1067.582	-615.851	-0.101
Dead+Wind 180 deg - Service	43.964	0.013	12.867	1231.976	-1.061	0.107
Dead+Wind 210 deg - Service	43.964	-6.407	11.137	1066.229	614.092	0.286
Dead+Wind 225 deg - Service	43.964	-9.067	9.089	870.144	869.037	0.350
Dead+Wind 240 deg - Service	43.964	-11.110	6.423	614.752	1064.779	0.389
Dead+Wind 270 deg - Service	43.964	-12.836	-0.013	-1.482	1230.237	0.388
Dead+Wind 300 deg - Service	43.964	-11.123	-6.444	-617.353	1066.133	0.282
Dead+Wind 315 deg - Service	43.964	-9.085	-9.107	-872.316	870.952	0.198
Dead+Wind 330 deg - Service	43.964	-6.429	-11.149	-1067.840	616.438	0.101

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-43.964	0.000	0.000	43.964	0.000	0.000%
2	-0.041	-43.964	-41.689	0.041	43.964	41.689	0.000%
3	20.759	-43.964	-36.083	-20.759	43.964	36.083	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
4	29.379	-43.964	-29.449	-29.379	43.964	29.449	0.000%
5	35.996	-43.964	-20.809	-35.996	43.964	20.809	0.000%
6	41.589	-43.964	0.041	-41.589	43.964	-0.041	0.000%
7	36.037	-43.964	20.880	-36.037	43.964	-20.880	0.000%
8	29.437	-43.964	29.507	-29.437	43.964	-29.507	0.000%
9	20.830	-43.964	36.124	-20.830	43.964	-36.124	0.000%
10	0.041	-43.964	41.689	-0.041	43.964	-41.689	0.000%
11	-20.759	-43.964	36.083	20.759	43.964	-36.083	0.000%
12	-29.379	-43.964	29.449	29.379	43.964	-29.449	0.000%
13	-35.996	-43.964	20.809	35.996	43.964	-20.809	0.000%
14	-41.589	-43.964	-0.041	41.589	43.964	0.041	0.000%
15	-36.037	-43.964	-20.880	36.037	43.964	20.880	0.000%
16	-29.437	-43.964	-29.507	29.437	43.964	29.507	0.000%
17	-20.830	-43.964	-36.124	20.830	43.964	36.124	0.000%
18	0.000	-57.968	0.000	0.000	57.968	0.000	0.000%
19	-0.036	-57.968	-35.477	0.036	57.968	35.477	0.000%
20	17.672	-57.968	-30.706	-17.672	57.968	30.706	0.000%
21	25.010	-57.968	-25.061	-25.010	57.968	25.061	0.000%
22	30.644	-57.968	-17.708	-30.644	57.968	17.708	0.000%
23	35.405	-57.968	0.036	-35.405	57.968	-0.036	0.000%
24	30.680	-57.968	17.770	-30.680	57.968	-17.770	0.000%
25	25.061	-57.968	25.112	-25.061	57.968	-25.112	0.000%
26	17.734	-57.968	30.742	-17.734	57.968	-30.742	0.000%
27	0.036	-57.968	35.477	-0.036	57.968	-35.477	0.000%
28	-17.672	-57.968	30.706	17.672	57.968	-30.706	0.000%
29	-25.010	-57.968	25.061	25.010	57.968	-25.061	0.000%
30	-30.644	-57.968	17.708	30.644	57.968	-17.708	0.000%
31	-35.405	-57.968	-0.036	35.405	57.968	0.036	0.000%
32	-30.680	-57.968	-17.770	30.680	57.968	17.770	0.000%
33	-25.061	-57.968	-25.112	25.061	57.968	25.112	0.000%
34	-17.734	-57.968	-30.742	17.734	57.968	30.742	0.000%
35	-0.013	-43.964	-12.867	0.013	43.964	12.867	0.000%
36	6.407	-43.964	-11.137	-6.407	43.964	11.137	0.000%
37	9.067	-43.964	-9.089	-9.067	43.964	9.089	0.000%
38	11.110	-43.964	-6.423	-11.110	43.964	6.423	0.000%
39	12.836	-43.964	0.013	-12.836	43.964	-0.013	0.000%
40	11.123	-43.964	6.444	-11.123	43.964	-6.444	0.000%
41	9.085	-43.964	9.107	-9.085	43.964	-9.107	0.000%
42	6.429	-43.964	11.149	-6.429	43.964	-11.149	0.000%
43	0.013	-43.964	12.867	-0.013	43.964	-12.867	0.000%
44	-6.407	-43.964	11.137	6.407	43.964	-11.137	0.000%
45	-9.067	-43.964	9.089	9.067	43.964	-9.089	0.000%
46	-11.110	-43.964	6.423	11.110	43.964	-6.423	0.000%
47	-12.836	-43.964	-0.013	12.836	43.964	0.013	0.000%
48	-11.123	-43.964	-6.444	11.123	43.964	6.444	0.000%
49	-9.085	-43.964	-9.107	9.085	43.964	9.107	0.000%
50	-6.429	-43.964	-11.149	6.429	43.964	11.149	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00024531
3	Yes	5	0.00000001	0.00032979
4	Yes	5	0.00000001	0.00037148

5	Yes	5	0.00000001	0.00033948
6	Yes	4	0.00000001	0.00034531
7	Yes	5	0.00000001	0.00033095
8	Yes	5	0.00000001	0.00037261
9	Yes	5	0.00000001	0.00033671
10	Yes	4	0.00000001	0.00023299
11	Yes	5	0.00000001	0.00033763
12	Yes	5	0.00000001	0.00037155
13	Yes	5	0.00000001	0.00032851
14	Yes	4	0.00000001	0.00038182
15	Yes	5	0.00000001	0.00033969
16	Yes	5	0.00000001	0.00037278
17	Yes	5	0.00000001	0.00033334
18	Yes	4	0.00000001	0.00000001
19	Yes	5	0.00000001	0.00041612
20	Yes	5	0.00000001	0.00090824
21	Yes	6	0.00000001	0.00005488
22	Yes	5	0.00000001	0.00092742
23	Yes	5	0.00000001	0.00041756
24	Yes	5	0.00000001	0.00090940
25	Yes	6	0.00000001	0.00005502
26	Yes	5	0.00000001	0.00092344
27	Yes	5	0.00000001	0.00041601
28	Yes	5	0.00000001	0.00092294
29	Yes	6	0.00000001	0.00005488
30	Yes	5	0.00000001	0.00090504
31	Yes	5	0.00000001	0.00041793
32	Yes	5	0.00000001	0.00092970
33	Yes	6	0.00000001	0.00005505
34	Yes	5	0.00000001	0.00091436
35	Yes	4	0.00000001	0.00010806
36	Yes	4	0.00000001	0.00049962
37	Yes	4	0.00000001	0.00058778
38	Yes	4	0.00000001	0.00053032
39	Yes	4	0.00000001	0.00011522
40	Yes	4	0.00000001	0.00050114
41	Yes	4	0.00000001	0.00058983
42	Yes	4	0.00000001	0.00051971
43	Yes	4	0.00000001	0.00010782
44	Yes	4	0.00000001	0.00052478
45	Yes	4	0.00000001	0.00058817
46	Yes	4	0.00000001	0.00049554
47	Yes	4	0.00000001	0.00011612
48	Yes	4	0.00000001	0.00052953
49	Yes	4	0.00000001	0.00059101
50	Yes	4	0.00000001	0.00050948

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 95.83	31.290	50	1.728	0.001
L2	101 - 47.83	14.694	50	1.382	0.001
L3	54 - 30	4.026	50	0.717	0.000
L4	30 - 0	1.182	50	0.377	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.000	10-ft Dipole	50	30.928	1.723	0.001	42894
138.000	APXVSPP18-C-A20	50	26.972	1.665	0.001	17872
129.000	RRUS-11	50	23.793	1.613	0.001	10212
127.000	7770.00	50	23.098	1.600	0.001	9324
125.000	Valmont 13' Low Profile Platform	50	22.408	1.587	0.001	8578
113.000	APX16DWV-16DWV-S-E-ACU	50	18.401	1.497	0.001	5795
104.000	4'-6" Standoff	50	15.587	1.414	0.001	4665
80.000	DB846F65ZAXY	50	9.138	1.110	0.001	4168
78.000	Valmont 13' Low Profile Platform	50	8.674	1.081	0.001	4149
40.000	Stand-off	50	2.129	0.513	0.000	3492

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 95.83	100.973	2	5.583	0.007
L2	101 - 47.83	47.465	17	4.465	0.006
L3	54 - 30	13.017	17	2.319	0.002
L4	30 - 0	3.825	17	1.218	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
149.000	10-ft Dipole	2	99.809	5.566	0.007	13503
138.000	APXVSPP18-C-A20	17	87.053	5.379	0.007	5625
129.000	RRUS-11	17	76.804	5.211	0.007	3212
127.000	7770.00	17	74.564	5.170	0.007	2932
125.000	Valmont 13' Low Profile Platform	17	72.340	5.128	0.007	2697
113.000	APX16DWV-16DWV-S-E-ACU	17	59.423	4.838	0.007	1820
104.000	4'-6" Standoff	17	50.348	4.568	0.007	1463
80.000	DB846F65ZAXY	17	29.533	3.587	0.004	1301
78.000	Valmont 13' Low Profile Platform	17	28.035	3.493	0.004	1295
40.000	Stand-off	17	6.886	1.661	0.001	1082

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual / Allowable Ratio Bolt Tension K	Actual / Allowable Ratio Concrete Stress ksi	Actual / Allowable Ratio Plate Stress ksi	Actual / Allowable Ratio Stiffener Stress ksi	Controlling Condition	Critical Ratio
2.750	16	2.250	158.398 131.211 1.21	2.804 2.800 1.00	56.468 45.000 1.25		Plate	1.25 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	150 - 95.83 (1)	TP33.469x23.61x0.281	54.170	0.000	0.0	39.000	29.209	-12.599	1139.140	0.011
L2	95.83 - 47.83 (2)	TP41.644x31.965x0.375	53.170	0.000	0.0	39.000	48.476	-24.258	1890.570	0.013
L3	47.83 - 30 (3)	TP44.139x39.771x0.438	24.000	0.000	0.0	39.000	61.564	-31.964	2401.020	0.013
L4	30 - 0 (4)	TP49.6x44.139x0.58	30.000	0.000	0.0	39.000	91.550	-43.942	3570.440	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	150 - 95.83 (1)	TP33.469x23.61x0.281	634.217	33.078	39.000	0.848	0.000	0.000	39.000	0.000
L2	95.83 - 47.83 (2)	TP41.644x31.965x0.375	1946.358	49.160	39.000	1.261	0.000	0.000	39.000	0.000
L3	47.83 - 30 (3)	TP44.139x39.771x0.438	2802.525	51.236	39.000	1.314	0.000	0.000	39.000	0.000
L4	30 - 0 (4)	TP49.6x44.139x0.58	3989.292	43.803	39.000	1.123	0.000	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	150 - 95.83 (1)	TP33.469x23.61x0.281	21.610	0.740	26.000	0.058	1.030	0.025	26.000	0.001
L2	95.83 - 47.83 (2)	TP41.644x31.965x0.375	33.804	0.697	26.000	0.054	0.431	0.005	26.000	0.000
L3	47.83 - 30 (3)	TP44.139x39.771x0.438	37.451	0.608	26.000	0.048	0.324	0.003	26.000	0.000
L4	30 - 0 (4)	TP49.6x44.139x0.58	41.723	0.456	26.000	0.036	0.324	0.002	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 95.83 (1)	0.011	0.848	0.000	0.058	0.001	0.860 ✔	1.333	H1-3+VT ✔
L2	95.83 - 47.83 (2)	0.013	1.261	0.000	0.054	0.000	1.274 ✔	1.333	H1-3+VT ✔
L3	47.83 - 30 (3)	0.013	1.314	0.000	0.048	0.000	1.328 ✔	1.333	H1-3+VT ✔
L4	30 - 0 (4)	0.012	1.123	0.000	0.036	0.000	1.136 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	150 - 95.83	Pole	TP33.469x23.61x0.281	1	-12.599	1518.474	64.5	Pass
L2	95.83 - 47.83	Pole	TP41.644x31.965x0.375	2	-24.258	2520.130	95.6	Pass
L3	47.83 - 30	Pole	TP44.139x39.771x0.438	3	-31.964	3200.560	99.6	Pass
L4	30 - 0	Pole	TP49.6x44.139x0.58	4	-43.942	4759.396	85.2	Pass
							Summary	
						Pole (L3)	99.6	Pass
						Base Plate	94.1	Pass
						RATING =	**99.6**	**Pass**

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Branford, CT 06405 F: (203) 488-8587

Subject:	CAISSON FOUNDATION ANALYSIS
Location:	Fairfield, CT
Rev. 0: 8/30/16	Prepared by: TJL Checked by: C.F.C. Job No. 16071.42

Caisson Foundation:

Input Data:

Shear Force =	$S := 42k$	*USER INPUT-FROM RisaTower*
Overturning Moment =	$M := 3989ft \cdot k$	*USER INPUT-FROM RisaTower*
Applied Axial Load =	$A1 := 44k$	*USER INPUT-FROM RisaTower*
Bending Moment =	$Mu := 4112ft \cdot k$	*USER INPUT--FROM LPILE*
Moment Capacity =	$Mn := 9378ft \cdot k$	*USER INPUT--FROM LPILE*
Foundation Diameter =	$d := 6.6ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 26.5ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 1ft$	*USER INPUT*
Number of Rebar =	$n := 40$	*USER INPUT*
Area of Rebar =	$Ar := 1.56in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 3.0ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety = $FS := \frac{0.9Mn}{Mu} = 2.1$

Factor of Safety Required = $FS_{reqd} := 1.3$

$FOSCheck := if(FS \geq FS_{reqd}, "OK", "NO GOOD")$

FOSCheck = "OK"

LPILE Plus for Windows, Version 5.0 (5.0.47)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

This program is licensed to:

TJL
Centek Engineering

Files Used for Analysis

Path to file locations: J:\Jobs\1607100.WI\42_Fairfield Greenfield Hill\04_Structural\Backup Documentation\Calcs\Foundation\
Name of input data file: Caisson Analysis.lpd
Name of output file: Caisson Analysis.lpo
Name of plot output file: Caisson Analysis.lpp
Name of runtime file: Caisson Analysis.lpr

Time and Date of Analysis

Date: August 30, 2016 Time: 10:48:31

Problem Title

16071.42 - CT2128

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output pile response for full length of pile
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Values of pile-head deflection, bending moment, shear force, and soil reaction are printed for full length of pile.
- Printing Increment (spacing of output points) = 8

Pile Structural Properties and Geometry

Pile Length = 318.00 in

Depth of ground surface below top of pile = 12.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	78.00000000	1816972.	4778.4000	3122018.
2	318.0000	78.00000000	1816972.	4778.4000	3122018.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness

that the above values of moment of inertia and modulus of are not used
for any computations other than total stress due to combined axial
loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 3 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   12.000 in
Distance from top of pile to bottom of layer =   48.000 in
p-y subgrade modulus k for top of soil layer =   10.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   10.000 lbs/in**3

Layer 2 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   48.000 in
Distance from top of pile to bottom of layer =   114.000 in
p-y subgrade modulus k for top of soil layer =   90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   90.000 lbs/in**3

Layer 3 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   114.000 in
Distance from top of pile to bottom of layer =   318.000 in
p-y subgrade modulus k for top of soil layer =   27.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   27.000 lbs/in**3

(Depth of lowest layer extends   0.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 6 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	12.00	0.05700
2	48.00	0.05700
3	48.00	0.06900
4	114.00	0.06900
5	114.00	0.06100
6	318.00	0.06100

Shear Strength of Soils

Shear strength parameters with depth defined using 6 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	12.000	0.00000	30.00	------	------
2	48.000	0.00000	30.00	------	------
3	48.000	0.00000	35.00	------	------
4	114.000	0.00000	35.00	------	------
5	114.000	0.00000	30.00	------	------
6	318.000	0.00000	30.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 2

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 42000.000 lbs
Bending moment at pile head = 47868000.000 in-lbs
Axial load at pile head = 44000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head
may rotate under the applied pile-head loading, but is not a free-head
(zero moment) condition.

Load Case Number 2

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head   =   13000.000 lbs
Bending moment at pile head =   14796000.000 in-lbs
Axial load at pile head   =   44000.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head
may rotate under the applied pile-head loading, but is not a free-head
(zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter   =   78.0000 in

Material Properties:

Compressive Strength of Concrete   =   3.000 kip/in**2
Yield Stress of Reinforcement   =   60. kip/in**2
Modulus of Elasticity of Reinforcement =   29000. kip/in**2
Number of Reinforcing Bars   =   40
Area of Single Bar   =   1.56000 in**2
Number of Rows of Reinforcing Bars   =   21
Area of Steel   =   62.400 in**2
Area of Shaft   =   4778.362 in**2
Percentage of Steel Reinforcement   =   1.306 percent
Cover Thickness (edge to bar center)   =   4.000 in

Unfactored Axial Squash Load Capacity   =   15769.70 kip

Distribution and Area of Steel Reinforcement

 Row   Area of   Distance to

Number	Reinforcement in**2	Centroidal Axis in
1	1.560	35.000
2	3.120	34.569
3	3.120	33.287
4	3.120	31.185
5	3.120	28.316
6	3.120	24.749
7	3.120	20.572
8	3.120	15.890
9	3.120	10.816
10	3.120	5.475
11	3.120	0.000
12	3.120	-5.475
13	3.120	-10.816
14	3.120	-15.890
15	3.120	-20.572
16	3.120	-24.749
17	3.120	-28.316
18	3.120	-31.185
19	3.120	-33.287
20	3.120	-34.569
21	1.560	-35.000

Axial Thrust Force = 44000.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
5671609.	6.805931E+12	8.333333E-07	0.00003525	42.29798439	108.13396	925.53462
11278189.	6.766913E+12	0.00000167	0.00006787	40.72204855	206.00102	1774.89901
16820316.	6.728126E+12	0.00000250	0.00010053	40.21376958	301.99249	2625.49829
22296606.	6.688982E+12	0.00000333	0.00013316	39.94675192	395.85287	3474.85269
22296606.	5.351185E+12	0.00000417	0.00010050	24.12084773	298.69647	6027.06423
22296606.	4.459321E+12	0.00000500	0.00011911	23.82194844	351.83587	7275.81748
22296606.	3.822275E+12	0.00000583	0.00013775	23.61385891	404.43178	

```
 8523.65553
   22296606.  3.344491E+12    0.00000667    0.00015642   23.46256819     456.48168
 9770.57015
   22296606.  2.972881E+12    0.00000750    0.00017537   23.38323721     508.70279
11009.14591
   22296606.  2.675593E+12    0.00000833    0.00019410   23.29158130     559.61073
12254.53452
   22296606.  2.432357E+12    0.00000917    0.00021285   23.22035381     609.97060
13498.92261
   22296606.  2.229661E+12    0.00001000    0.00023164   23.16448250     659.77969
14742.30007
   22790768.  2.103763E+12    0.00001083    0.00025047   23.12045494     709.03519
15984.65707
   24464552.  2.096962E+12    0.00001167    0.00026933   23.08576754     757.73441
17225.98198
   26135262.  2.090821E+12    0.00001250    0.00028823   23.05857459     805.87427
18466.26671
   27802879.  2.085216E+12    0.00001333    0.00030717   23.03750226     853.45200
19705.49913
   29467377.  2.080050E+12    0.00001417    0.00032614   23.02149752     900.46468
20943.66810
   31128726.  2.075248E+12    0.00001500    0.00034515   23.00973746     946.90918
22180.76420
   32786901.  2.070752E+12    0.00001583    0.00036419   23.00157818     992.78254
23416.77535
   34441875.  2.066512E+12    0.00001667    0.00038328   22.99650362    1038.08169
24651.68992
   36093620.  2.062493E+12    0.00001750    0.00040240   22.99409536    1082.80348
25885.49661
   37742108.  2.058660E+12    0.00001833    0.00042156   22.99401167    1126.94470
27118.18380
   39387309.  2.054990E+12    0.00001917    0.00044076   22.99597129    1170.50213
28349.73929
   41029193.  2.051460E+12    0.00002000    0.00045999   22.99973944    1213.47247
29580.15113
   42667734.  2.048051E+12    0.00002083    0.00047927   23.00512084    1255.85243
30809.40616
   44302896.  2.044749E+12    0.00002167    0.00049859   23.01194814    1297.63854
32037.49259
   45934653.  2.041540E+12    0.00002250    0.00051795   23.02008185    1338.82744
33264.39659
   47562975.  2.038413E+12    0.00002333    0.00053735   23.02940342    1379.41571
34490.10369
   49187819.  2.035358E+12    0.00002417    0.00055680   23.03980359    1419.39949
35714.60431
   50809168.  2.032367E+12    0.00002500    0.00057628   23.05120102    1458.77556
36937.87926
   52426977.  2.029431E+12    0.00002583    0.00059581   23.06351200    1497.53993
38159.91893
```

54041215.	2.026546E+12	0.00002667	0.00061538	23.07667145	1535.68896
39380.70741					
55651848.	2.023704E+12	0.00002750	0.00063499	23.09062126	1573.21889
40600.22954					
57258839.	2.020900E+12	0.00002833	0.00065465	23.10530797	1610.12573
41818.47195					
58862157.	2.018131E+12	0.00002917	0.00067435	23.12068972	1646.40573
43035.41661					
60461761.	2.015392E+12	0.00003000	0.00069410	23.13672468	1682.05477
44251.04953					
62057616.	2.012679E+12	0.00003083	0.00071390	23.15337798	1717.06879
45465.35452					
63649678.	2.009990E+12	0.00003167	0.00073374	23.17061707	1751.44355
46678.31665					
65237914.	2.007320E+12	0.00003250	0.00075362	23.18841639	1785.17493
47889.91755					
68402746.	2.002032E+12	0.00003417	0.00079354	23.22560039	1850.69022
50308.96761					
71551773.	1.996794E+12	0.00003583	0.00083365	23.26476261	1913.57902
52722.36752					
74684666.	1.991591E+12	0.00003750	0.00087397	23.30577984	1973.80487
55129.96442					
77801052.	1.986410E+12	0.00003917	0.00091448	23.34854516	2031.32918
57531.61078					
80900567.	1.981238E+12	0.00004083	0.00095521	23.39298418	2086.11240
59927.14123					
83472928.	1.964069E+12	0.00004250	0.00099377	23.38280252	2135.08247
60000.00000					
85599826.	1.938109E+12	0.00004417	0.00103042	23.33034602	2179.04155
60000.00000					
87359822.	1.906032E+12	0.00004583	0.00106542	23.24547789	2218.65749
60000.00000					
88990574.	1.873486E+12	0.00004750	0.00109989	23.15565839	2255.48271
60000.00000					
90402656.	1.838698E+12	0.00004917	0.00113334	23.05106387	2289.10690
60000.00000					
91788236.	1.805670E+12	0.00005083	0.00116680	22.95351747	2320.70273
60000.00000					
92891535.	1.769363E+12	0.00005250	0.00119872	22.83278802	2348.89818
60000.00000					
93988620.	1.735175E+12	0.00005417	0.00123075	22.72150335	2375.33454
60000.00000					
95079397.	1.702915E+12	0.00005583	0.00126289	22.61885217	2399.99358
60000.00000					
95934310.	1.668423E+12	0.00005750	0.00129357	22.49680004	2421.74953
60000.00000					
96762584.	1.635424E+12	0.00005917	0.00132420	22.38081971	2441.77097
60000.00000					
97585613.	1.604147E+12	0.00006083	0.00135493	22.27283826	2460.15338

60000.00000					
98403314.	1.574453E+12	0.00006250	0.00138576	22.17223969	2476.88025
60000.00000					
99263122.	1.546958E+12	0.00006417	0.00141808	22.10000101	2492.58936
60000.00000					
99734738.	1.514958E+12	0.00006583	0.00144816	21.99739400	2505.47366
60000.00000					
1.003254E+08	1.486302E+12	0.00006750	0.00147710	21.88299438	2516.31220
60000.00000					
1.009119E+08	1.458967E+12	0.00006917	0.00150614	21.77546391	2525.67037
60000.00000					
1.014941E+08	1.432858E+12	0.00007083	0.00153527	21.67433766	2533.53324
60000.00000					
1.020720E+08	1.407890E+12	0.00007250	0.00156449	21.57919720	2539.88555
60000.00000					
1.025497E+08	1.382693E+12	0.00007417	0.00159282	21.47623685	2544.56787
60000.00000					
1.029582E+08	1.357690E+12	0.00007583	0.00162056	21.36998489	2547.75136
60000.00000					
1.033631E+08	1.333717E+12	0.00007750	0.00164838	21.26942351	2549.55689
60000.00000					
1.037637E+08	1.310700E+12	0.00007917	0.00167629	21.17420635	2549.03904
60000.00000					
1.041588E+08	1.288562E+12	0.00008083	0.00170429	21.08401957	2544.86234
60000.00000					
1.045511E+08	1.267286E+12	0.00008250	0.00173238	20.99857262	2547.77391
60000.00000					
1.049407E+08	1.246820E+12	0.00008417	0.00176057	20.91760513	2549.48952
60000.00000					
1.053273E+08	1.227114E+12	0.00008583	0.00178885	20.84091720	2549.62886
60000.00000					
1.055803E+08	1.206632E+12	0.00008750	0.00182000	20.79999992	2544.73421
60000.00000					
1.060158E+08	1.188962E+12	0.00008917	0.00184946	20.74157390	2546.53561
60000.00000					
1.062692E+08	1.169936E+12	0.00009083	0.00187576	20.65059909	2548.53620
60000.00000					
1.065210E+08	1.151578E+12	0.00009250	0.00190214	20.56368300	2549.69065
60000.00000					
1.067710E+08	1.133851E+12	0.00009417	0.00192860	20.48072335	2549.43778
60000.00000					
1.070180E+08	1.116709E+12	0.00009583	0.00195518	20.40188983	2545.72565
60000.00000					
1.072638E+08	1.100141E+12	0.00009750	0.00198182	20.32637581	2543.59522
60000.00000					
1.075084E+08	1.084118E+12	0.00009917	0.00200852	20.25402090	2546.25745
60000.00000					
1.079939E+08	1.053599E+12	0.00010250	0.00206212	20.11820725	2549.45790
60000.00000					

1.084730E+08	1.024942E+12	0.00010583	0.00211602	19.99384680	2547.34798
60000.00000					
1.089068E+08	9.976198E+11	0.00010917	0.00216945	19.87286165	2542.37954
60000.00000					
1.092152E+08	9.708014E+11	0.00011250	0.00222069	19.73949346	2546.86437
60000.00000					
1.095209E+08	9.455045E+11	0.00011583	0.00227211	19.61533526	2549.39866
60000.00000					
1.095209E+08	9.190568E+11	0.00011917	0.00232375	19.49999884	2548.72474
60000.00000					
1.101868E+08	8.994841E+11	0.00012250	0.00238525	19.47142741	2541.35765
60000.00000					
1.104724E+08	8.779268E+11	0.00012583	0.00243579	19.35725793	2543.25677
60000.00000					
1.107567E+08	8.574710E+11	0.00012917	0.00248646	19.25000176	2546.90278
60000.00000					
1.110394E+08	8.380332E+11	0.00013250	0.00253726	19.14914981	2549.15575
60000.00000					
1.113206E+08	8.195384E+11	0.00013583	0.00258820	19.05425110	2549.99466
60000.00000					
1.115912E+08	8.018528E+11	0.00013917	0.00263976	18.96835783	2545.55047
60000.00000					
1.118202E+08	7.847031E+11	0.00014250	0.00269117	18.88542143	2540.71344
60000.00000					
1.119503E+08	7.676591E+11	0.00014583	0.00274177	18.80069974	2538.26009
60000.00000					
1.120704E+08	7.513098E+11	0.00014917	0.00279301	18.72410014	2542.67351
60000.00000					
1.121896E+08	7.356693E+11	0.00015250	0.00284437	18.65157786	2546.06503
60000.00000					
1.123079E+08	7.206922E+11	0.00015583	0.00289583	18.58288416	2548.41978
60000.00000					
1.124252E+08	7.063366E+11	0.00015917	0.00294741	18.51778892	2549.72243
60000.00000					
1.125394E+08	6.925502E+11	0.00016250	0.00299928	18.45710573	2548.80721
60000.00000					
1.126217E+08	6.791260E+11	0.00016583	0.00305338	18.41233662	2544.25842
60000.00000					
1.127033E+08	6.662265E+11	0.00016917	0.00310758	18.36994556	2539.69142
60000.00000					
1.127841E+08	6.538211E+11	0.00017250	0.00316189	18.32980236	2535.10597
60000.00000					
1.128642E+08	6.418816E+11	0.00017583	0.00321631	18.29179314	2536.59239
60000.00000					
1.129434E+08	6.303820E+11	0.00017917	0.00327083	18.25580862	2541.15055
60000.00000					
1.130219E+08	6.192980E+11	0.00018250	0.00332547	18.22175118	2544.78116
60000.00000					
1.131580E+08	6.089218E+11	0.00018583	0.00338217	18.20000008	2547.65936

```
  60000.00000
  1.134064E+08  5.995052E+11    0.00018917    0.00344283   18.20000008    2549.57550
  60000.00000
  1.136443E+08  5.903599E+11    0.00019250    0.00350350   18.20000008    2548.72471
  60000.00000
  1.138690E+08  5.814588E+11    0.00019583    0.00356417   18.20000008    2543.78409
  60000.00000
  1.140886E+08  5.728299E+11    0.00019917    0.00362483   18.20000008    2538.84346
  60000.00000
  1.140886E+08  5.634006E+11    0.00020250    0.00368480   18.19653413    2534.02595
  60000.00000
  1.140886E+08  5.542767E+11    0.00020583    0.00374265   18.18290046    2529.57959
  60000.00000
  1.140886E+08  5.454436E+11    0.00020917    0.00379781   18.15686515    2532.84163
  60000.00000
  1.140886E+08  5.368877E+11    0.00021250    0.00385194   18.12677810    2537.01904
  60000.00000
```

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 = 112540.50458 in-kip

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Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 1

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head = 42000.000 lbs
Specified moment at pile head = 47868000.000 in-lbs
Specified axial load at pile head = 44000.000 lbs

Depth X	Deflect. y	Moment M	Shear V	Slope S	Total Stress	Flx. Rig. EI	Soil Res. Es*h p
in	in	lbs-in	lbs	Rad.	lbs/in**2	lbs-in**2	lbs/in F/L
0.000	2.028	4.79E+07	42000.	-0.011970	1036.660	2.04E+12	0.000 0.000
25.440	1.731	4.89E+07	40376.	-0.011365	1059.721	2.04E+12	-232.653 427.392
50.880	1.450	4.99E+07	28627.	-0.010747	1079.585	2.03E+12	-1399.986 3070.824
76.320	1.184	5.00E+07	-23386.	-0.010121	1082.804	2.03E+12	-2683.732 7206.078

101.760	0.934741	4.84E+07	-1.07E+05	-0.009503	1048.901	2.04E+12	-3826.926
13019.							
127.200	0.700492	4.46E+07	-1.86E+05	-0.008921	966.443	2.04E+12	-2342.177
10633.							
152.640	0.480323	3.92E+07	-2.41E+05	-0.008400	849.601	2.06E+12	-1935.940
12817.							
178.080	0.272449	3.25E+07	-2.82E+05	-0.007957	706.131	2.07E+12	-1285.246
15001.							
203.520	0.074699	2.50E+07	-3.04E+05	-0.007606	545.060	2.10E+12	-403.692
17186.							
228.960	-0.116678	1.72E+07	-3.01E+05	-0.007480	378.637	6.72E+12	710.699
19370.							
254.400	-0.306266	9.93E+06	-2.66E+05	-0.007429	222.371	6.77E+12	2075.874
21554.							
279.840	-0.494894	4.01E+06	-1.93E+05	-0.007404	95.230	6.81E+12	3694.328
23738.							
305.280	-0.683121	4.89E+05	-75904.	-0.007396	19.700	6.81E+12	5568.650
25923.							

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 1:

Pile-head deflection	=	2.02789291 in
Computed slope at pile head	=	-0.01196952
Maximum bending moment	=	50120832. lbs-in
Maximum shear force	=	-306385.08079 lbs
Depth of maximum bending moment	=	66.78000000 in
Depth of maximum shear force	=	213.06000 in
Number of iterations	=	21
Number of zero deflection points	=	1

Computed Values of Load Distribution and Deflection
for Lateral Loading for Load Case Number 2

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head = 13000.000 lbs
Specified moment at pile head = 14796000.000 in-lbs
Specified axial load at pile head = 44000.000 lbs

Depth X in	Deflect. y in	Moment M lbs-in	Shear V lbs	Slope S Rad.	Total Stress lbs/in**2	Flx. Rig. EI lbs-in**2	Soil Res. p lbs/in	Es*h F/L
0.000	0.373013	1.48E+07	13000.	-0.002086	326.794	6.74E+12	0.000	0.000
25.440	0.320649	1.51E+07	12700.	-0.002030	333.913	6.74E+12	-43.095	427.392
50.880	0.269739	1.54E+07	9615.875	-0.001972	340.441	6.74E+12	-827.025	9749.945
76.320	0.220308	1.54E+07	-16371.	-0.001914	339.065	6.74E+12	-1179.888	17031.
101.760	0.172348	1.46E+07	-48579.	-0.001857	321.541	6.74E+12	-1317.641	24312.
127.200	0.125779	1.30E+07	-69493.	-0.001805	287.805	6.75E+12	-420.556	10633.
152.640	0.080452	1.11E+07	-79089.	-0.001760	247.166	6.77E+12	-324.260	12817.
178.080	0.036183	8.99E+06	-85502.	-0.001722	202.087	6.78E+12	-170.689	15001.
203.520	-0.007228	6.78E+06	-87293.	-0.001692	154.700	6.79E+12	39.064	17186.
228.960	-0.049994	4.60E+06	-83039.	-0.001671	107.918	6.81E+12	304.517	19370.
254.400	-0.092320	2.62E+06	-71323.	-0.001658	65.430	6.81E+12	625.745	21554.
279.840	-0.134394	1.05E+06	-50720.	-0.001651	31.698	6.81E+12	1003.237	23738.
305.280	-0.176363	1.29E+05	-19791.	-0.001649	11.968	6.81E+12	1437.674	25923.

Please note that because this analysis makes computations of ultimate moment capacity and pile response using nonlinear bending stiffness that the above values of total stress due to combined axial stress and bending may not be representative of actual conditions.

Output Verification:

Computed forces and moments are within specified convergence limits.

Output Summary for Load Case No. 2:

Pile-head deflection	=	0.37301266 in
Computed slope at pile head	=	-0.00208645
Maximum bending moment	=	15484522. lbs-in
Maximum shear force	=	-87370.88607 lbs
Depth of maximum bending moment	=	60.42000000 in
Depth of maximum shear force	=	200.34000 in
Number of iterations	=	5
Number of zero deflection points	=	1

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment,	y = pile-head displacment in
Type 2 = Shear and Slope,	M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness,	V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment,	S = Pile-head Slope, radians
Type 5 = Deflection and Slope,	R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 42000.	M= 4.79E+07	44000.0000	2.0279	5.0121E+07	-306385.
1	V= 13000.	M= 1.48E+07	44000.0000	0.3730127	1.5485E+07	-87370.8861

Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

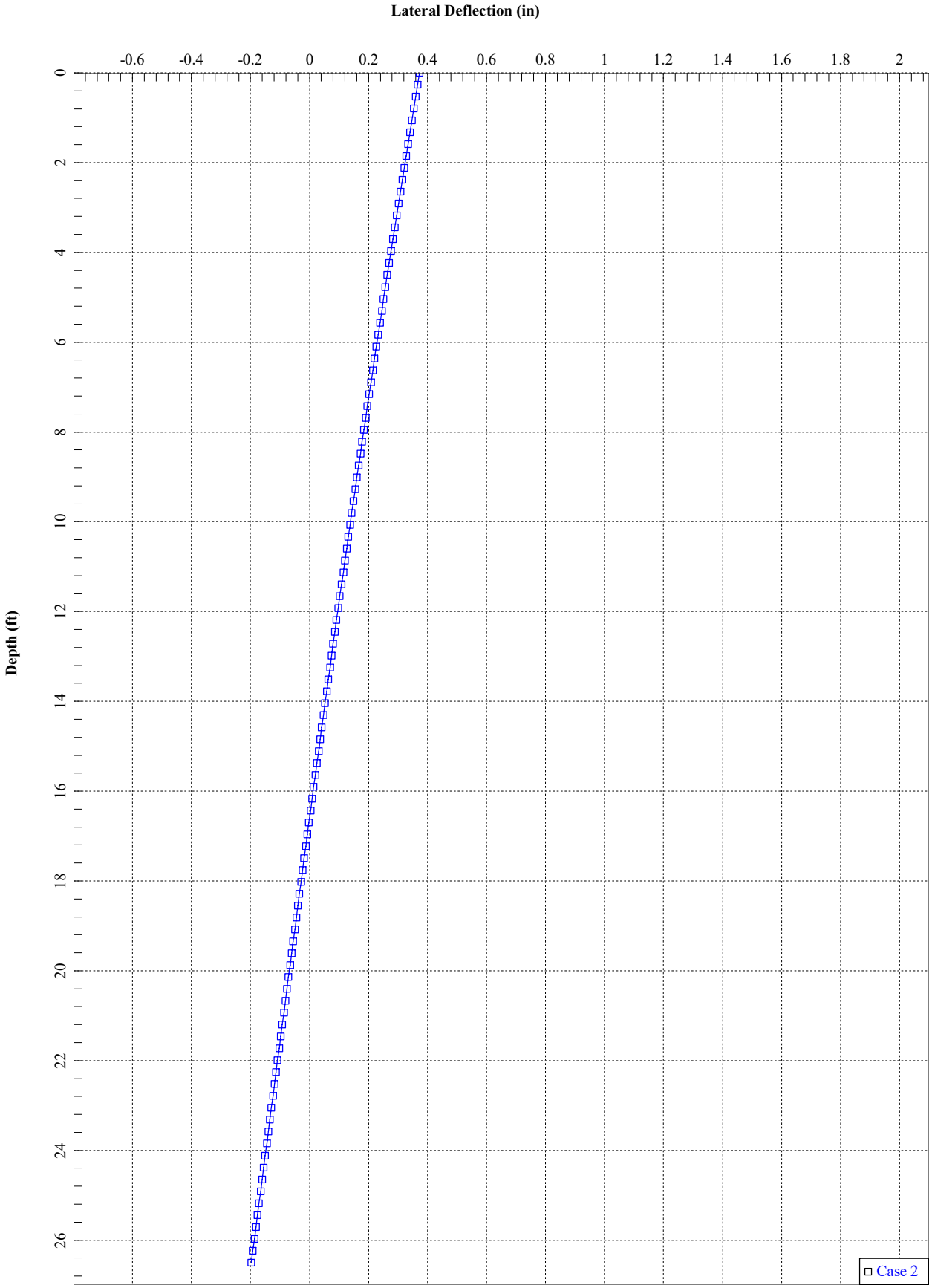
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00410508	4200.00006	725989.75631	1023123.	1.768516E+08
0.01235752	12643.25982	2185447.	1023123.	1.768516E+08
0.01958620	20039.09270	3463851.	1023123.	1.768516E+08
0.02471503	25286.51964	4370894.	1023123.	1.768516E+08
0.02869327	29356.74018	5074451.	1023123.	1.768516E+08

0.03194372	32682.35252	5649298.	1023123.	1.768516E+08
0.03469286	35494.11768	6135280.	1023096.	1.768456E+08
0.03707551	37929.77945	6556194.	1023041.	1.768335E+08
0.03917790	40078.18540	6927426.	1022979.	1.768197E+08
0.04105904	42000.00000	7259476.	1022917.	1.768058E+08

Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00012353	21846.36785	4786800.	1.768516E+08	3.875030E+10
0.00037278	65773.60589	14409704.	1.764398E+08	3.865450E+10
0.00059320	104270.04511	22838840.	1.757767E+08	3.850133E+10
0.00108054	133229.68904	28819408.	1.232992E+08	2.667131E+10
0.00140527	156978.75645	33458296.	1.117073E+08	2.380918E+10
0.00164047	176425.28223	37248544.	1.075454E+08	2.270599E+10
0.00183931	193108.26864	40453153.	1.049895E+08	2.199365E+10
0.00200008	207349.54639	43229111.	1.036707E+08	2.161370E+10
0.00214211	219970.05671	45677680.	1.026887E+08	2.132372E+10
0.00227051	231341.85862	47868000.	1.018899E+08	2.108250E+10

K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.


Lateral Deflection (in)
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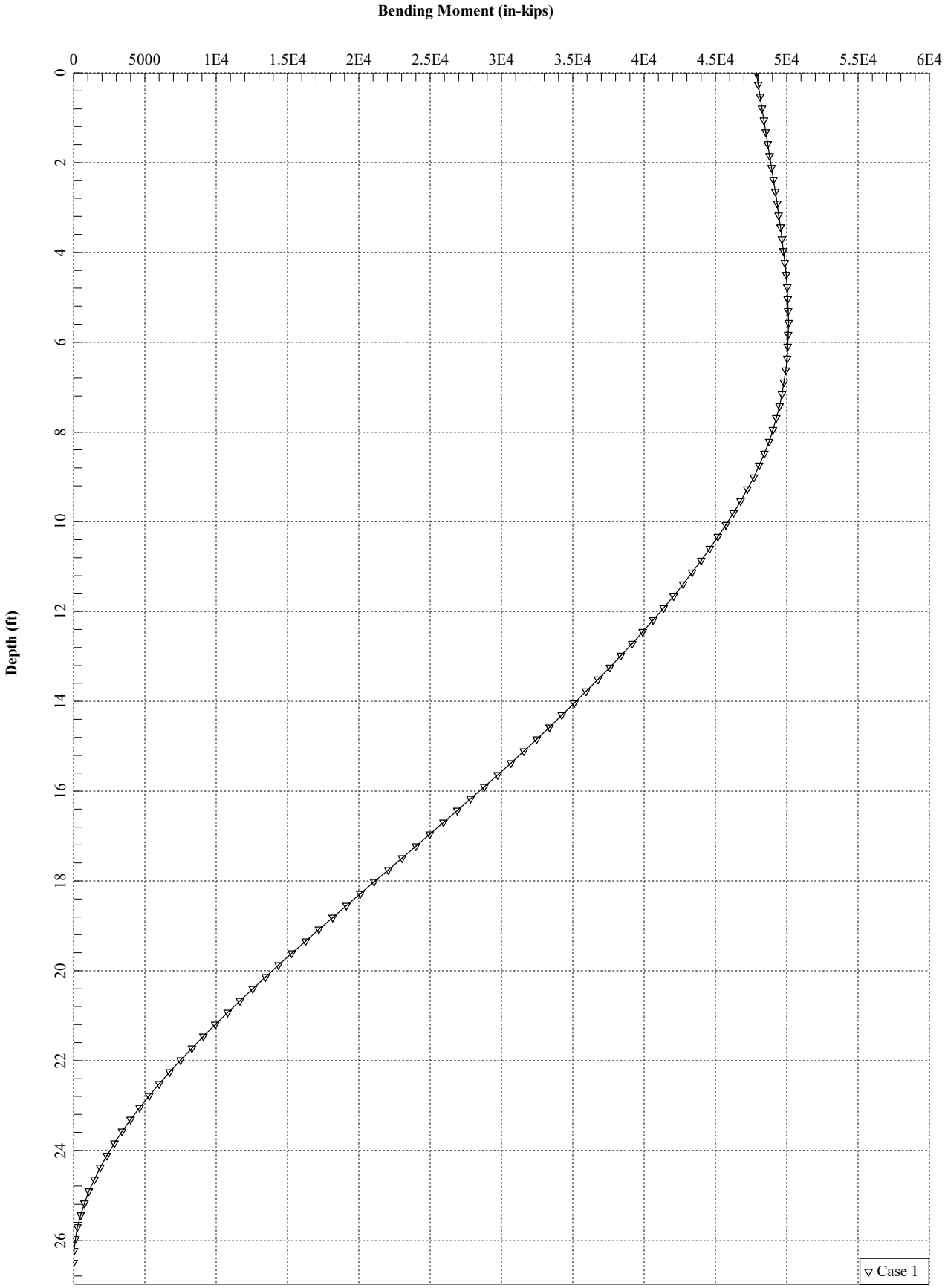
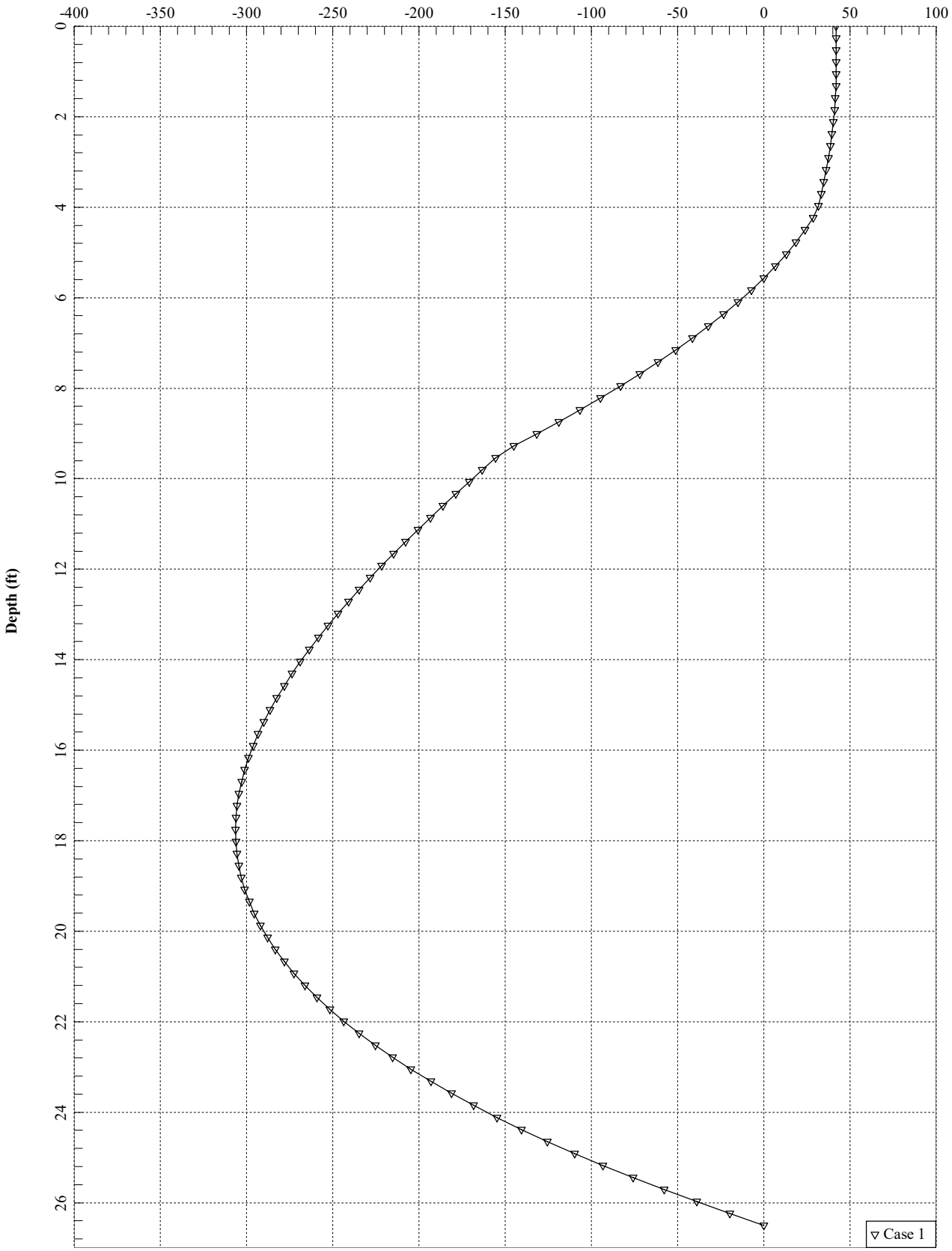
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
Case 2


Bending Moment (in-kips)
0
5000
1E4
1.5E4
2E4
2.5E4
3E4
3.5E4
4E4
4.5E4
5E4
5.5E4
6E4
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
Case 1


Shear Force (kips)
-400
-350
-300
-250
-200
-150
-100
-50
0
50
100
Depth (ft)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
Case 1

February 8, 2019

Angie Bruce
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Subject:	**Appurtenance Mount Analysis Report**	
Carrier Designation:	**Site Number:**	CT2128
	FA Number:	10035251
	Site Name:	Fairfield Greenfield Hill
Engineering Firm Designation:	**B+T Group Project Number:**	130656.002.01
Site Data:	**3965 Congress Street, Fairfield, CT, 06824, Fairfield County** **Latitude *41.18838*°, Longitude *-73.29905*°** **Monopole** **13' Platform Mount**	

Dear Angie Bruce,

B+T Group is pleased to submit this **"Appurtenance Mount Analysis Report"** to determine the structural integrity of the antenna mount on the above-mentioned structure.

The purpose of the analysis is to determine acceptability of the mount's stress level. Based on our analysis we have determined the stress level for the mount under the following load case to be:

Existing + Proposed Equipment Note: See Table 1 for the final loading configuration	**Sufficient Capacity** **(Failing AS IS over 150%)** **(Passing at 58.2% with Recommendations in Section 5)**

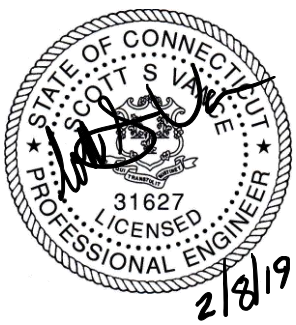
This analysis has been performed in accordance with the 2018 International Building Code based upon an ultimate 3-second gust wind speed of 118 mph. Exposure Category C and Risk Category II were used in this analysis.

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

We at *B+T Group* appreciate the opportunity of providing our continuing professional services to you and *SAI Communications, Inc.* If you have any questions or need further assistance on this or any other projects, please give us a call.

Mount structural analysis prepared by: Siva Tellakula, E.I.T.

Respectfully submitted by: B&T Engineering, Inc.
COA: PEC.0001564 Expires: 02/10/2020



Scott S. Vance, P.E.

TABLE OF CONTENTS

1) INTRODUCTION

The appurtenance mount consists of platform mount at 126ft., attached to monopole at 3965 Congress Street, Fairfield, CT, 06824, Fairfield County. The proposed antenna loading information was obtained from SAI Communications, Inc. All information provided to B+T Group was assumed accurate and complete.

2) ANALYSIS CRITERIA

The structural analysis was performed for this mount in accordance with the ANSI/TIA-222-H-2017 Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures using a 3-second gust wind speed of 118 mph with no ice and 50 mph with 1inch escalated ice thickness Exposure Category C with topographic factor 1 and Risk Category II were used in this analysis. In addition, the platform mount has been analyzed for various live loading conditions consisting of a 250-lb man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 250-pound man live load applied individually at mount pipe locations using a 3-second gust of 30mph. The mount was analyzed under 30º increments in the wind direction. The analyzed loading is detailed in Table 1.

Table 1 – Proposed and Existing Equipment Information

Loading	RAD Center Elev. (ft.)	Position	Qty.	Manufacturer	Model / Type	Note
Proposed	127	2	3	Kathrein	800-10965	1
			3	Ericsson	B5/B12 4449	2
			3	Ericsson	4415 B30	
		-	1	Raycap	DC6-48-60-18-8F	3
Existing	127	1	3	Powerwave	7770	4
		5	3	CCI	HPA-65R-BUU-H6	
		1	6	Powerwave	LGP 21401	
		-	3	Ericsson	RRUS-12+RRUS-A2	5
			1	Raycap	DC6-48-60-18-8F	

Note:
(1) Proposed Antenna to be installed on the existing Mount Pipe.
(2) Proposed Equipment to be installed side by side with RRUS Support, directly behind the Antenna
(3) Proposed Equipment to be installed on the mount
(4) Existing Equipment installed on the Mount.
(5) Existing Equipment installed on the Tower

Table 2 - Documents Provided

Documents	Remarks	Reference	Source
RFDS	Existing Loading Proposed Loading	Date: 10/18/2018	SAI Communications, Inc.
Scoping Details	Existing Loading Proposed Loading	Date: 01/07/2019	SAI Communications, Inc.
Mount Mapping	B+T Group	Date: 12/12/2018	On File

3) ANALYSIS PROCEDURE

3.1) Analysis Method

RISA-3D (Version 17.0.2), a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses and deflections for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1. The mount was built in accordance with the manufacturer's specifications.
2. The mount has been maintained in accordance with the manufacturer's specifications and is free of damage.
3. The configuration of antennas and other appurtenances are as specified in Table 1.
4. All mount components have been assumed to be in sufficient condition to carry their full design capacity for the analysis.
5. Mount areas and weights are determined from field measurements, standard material properties, and/or manufacturer product data.
6. 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.
7. All prior structural modifications, if any are assumed to be correctly installed and fully effective.
8. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
9. The following material grades were assumed (Unless Noted Otherwise):
   a) Connection Bolts : ASTM A325
   b) Steel Pipe : ASTM A53 (GR. 35)
   c) HSS (Round) : ASTM 500 (GR. B-42)
   d) HSS (Rectangular) : ASTM 500 (GR. B-46)
   e) Channel : ASTM A36 (GR. 36)
   f) Steel Solid Rod : ASTM A36 (GR. 36)
   g) Steel Plate : ASTM A36 (GR. 36)
   h) Steel Angle : ASTM A36 (GR. 36)
   i) UNISTRUT : ASTM A570 (GR. 33)

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 (a)– (AS IS) Mount Component Stresses vs. Capacity

Notes	Component	Elevation (ft.)	% Capacity*	Pass / Fail
-	Main Horizontals	126	Over 150	Fail
-	Supporting Tubes	126	35.1	Pass
-	Supporting Angles	126	99.0	Pass
-	Connection Angles	126	36.3	Pass
-	Mount Pipes	126	82.1	Pass

Table 3 (b)– Mount Component Stresses vs. Capacity

Notes	Component	Elevation (ft.)	% Capacity*	Pass / Fail
-	Main Horizontals	126	42.4	Pass
-	Supporting Tubes	126	35.1	Pass
-	Supporting Angles	126	23.8	Pass
-	Connection Angles	126	10.7	Pass
-	Mount Pipes	126	58.2	Pass
Proposed	Additional Site Pro Handrail Kit (HRK12)	126	34.8	Pass

Note: *Member Capacity based on Recommended Modification on Section 5

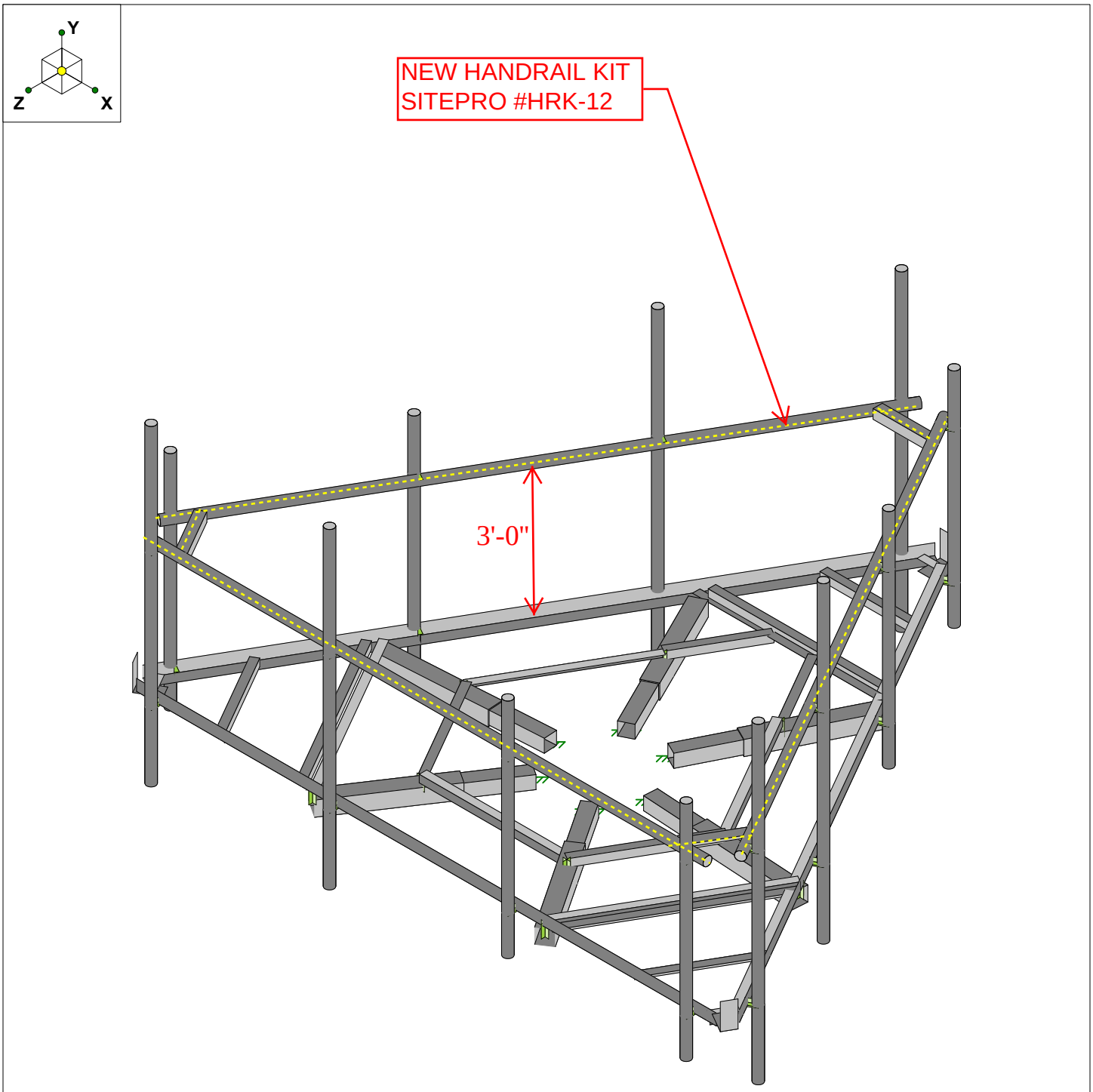
5) RECOMMENDATIONS

The mount will have sufficient capacity to carry the existing and proposed loads and be in compliance with the ANSI/TIA-222-H Standard for the proposed and existing loading, with the modifications described below. (Refer to the RISA output for the specific members).

Install (1) Site Pro handrail kit (HRK12), 3ft. above the main horizontals as shown in SK-1 of APPENDIX A

APPENDIX A

(RISA-3D Output)



Envelope Only Solution

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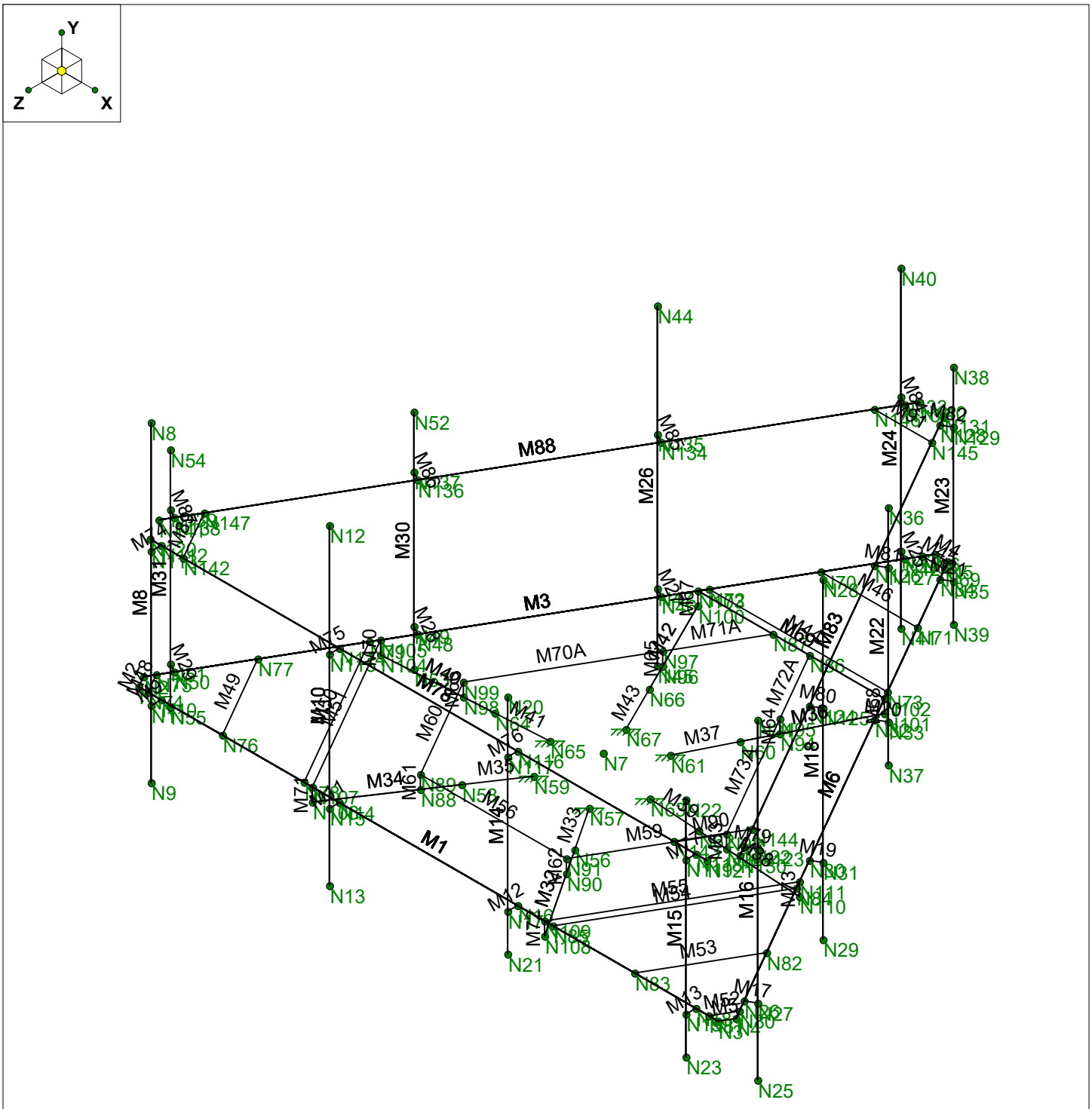

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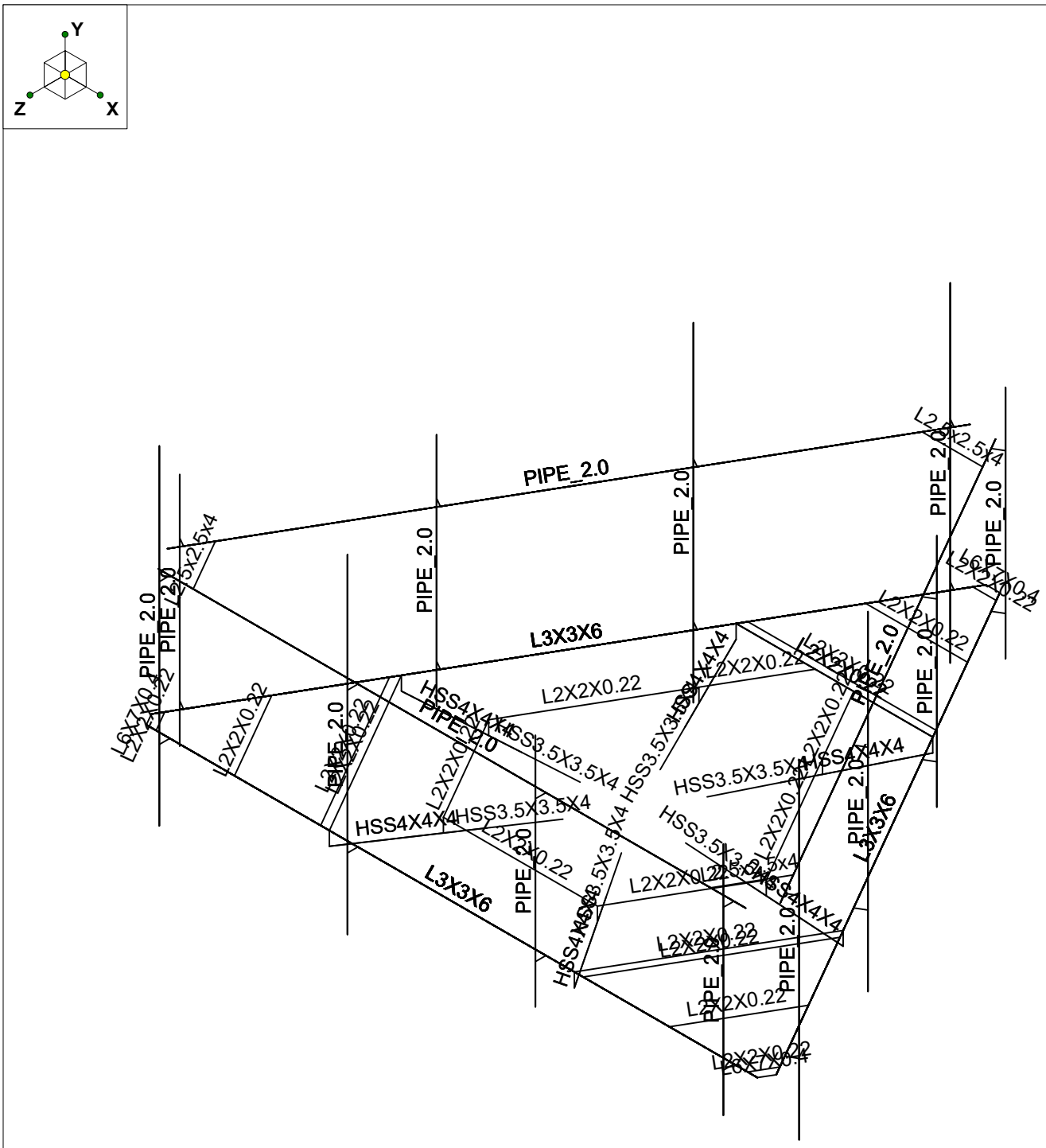

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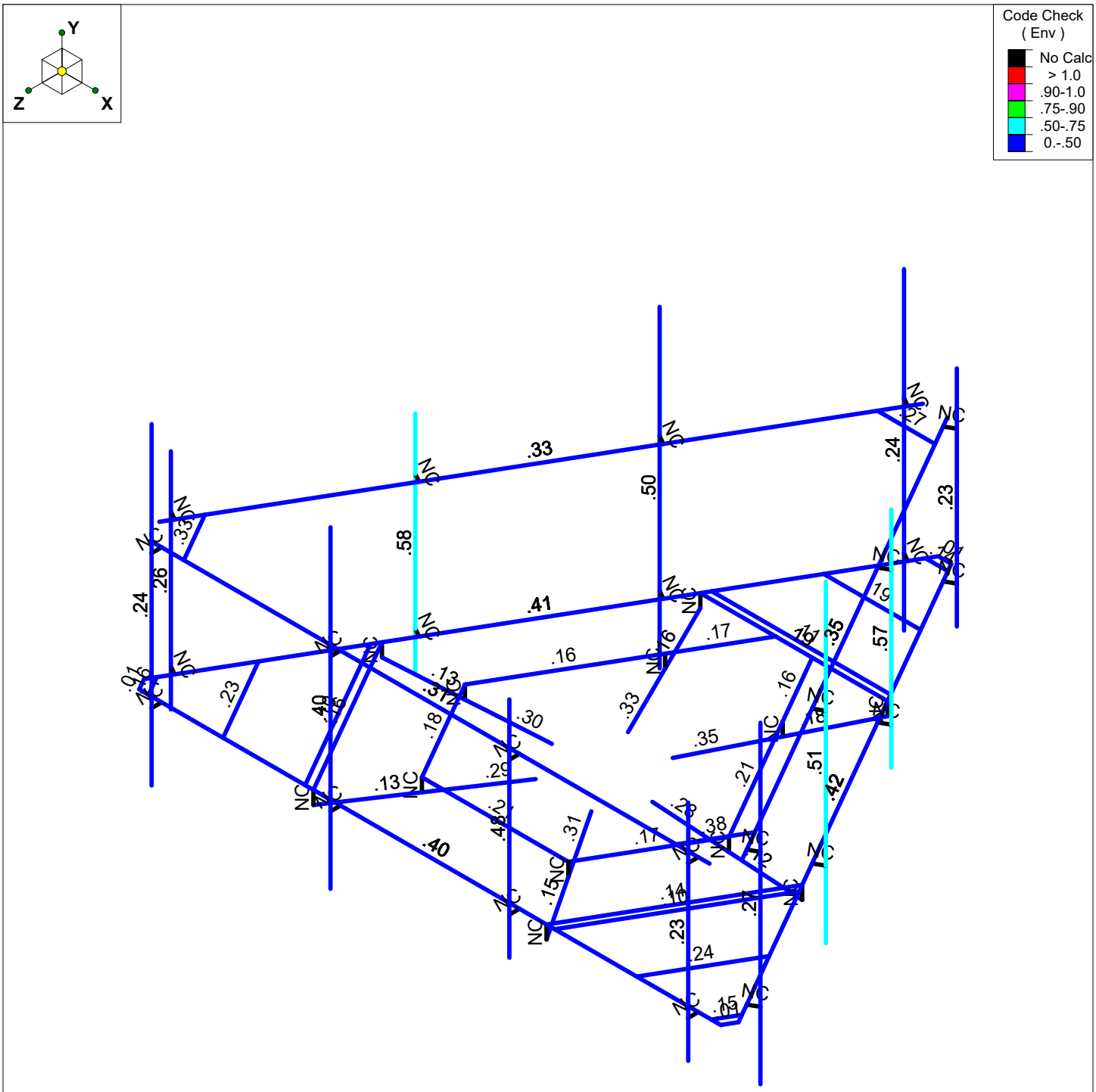

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Envelope Only Solution

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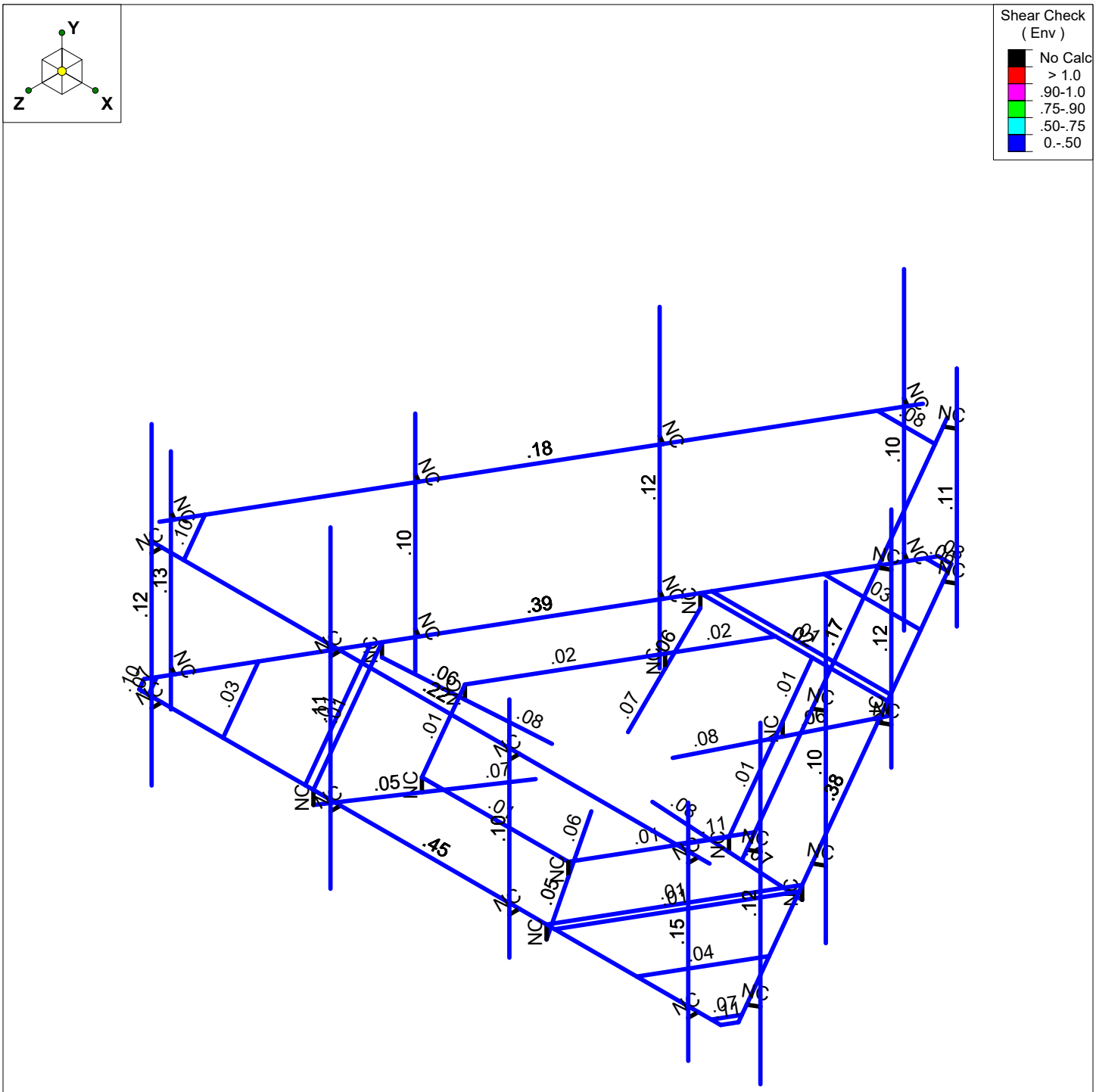

Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

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Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	MF-H1	L3X3X6	Beam	Single Angle	A36 Gr.36	Typical	2.11	1.75	1.75	.101
2	F1-ST1	HSS4X4X4	Beam	Tube	A500 Gr.B Rect	Typical	3.37	7.8	7.8	12.8
3	F1-ST2	HSS3.5X3....	Beam	Tube	A500 Gr.B Rect	Typical	2.91	5.04	5.04	8.35
4	F1-SA1	L2X2X0.22	Beam	Single Angle	A36 Gr.36	Typical	.832	.312	.312	.012
5	F1-CA1	L6X7X0.4	Beam	Single Angle	A36 Gr.36	Typical	5.04	17.091	25.015	.258
6	MF-P1	PIPE 2.0	Column	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	NEW HAN...	PIPE 2.0	Beam	Pipe	A53 Gr.B	Typical	1.02	.627	.627	1.25
8	AHCP	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	-6.5	0	3.921132	0	
2	N2	-6.6458	0	3.668599	0	
3	N3	6.5	0	3.921132	0	
4	N4	6.6458	0	3.668599	0	
5	N5	0.1458	0	-7.589731	0	
6	N6	-0.1458	0	-7.589731	0	
7	N7	0	0	0	0	
8	N8	-6	5.5	4.145298	0	
9	N9	-6	-1.5	4.145298	0	
10	N10	-6	0	3.921132	0	
11	N11	-6	0	4.145298	0	
12	N12	-2	5.5	4.145298	0	
13	N13	-2	-1.5	4.145298	0	
14	N14	-2	0	3.921132	0	
15	N15	-2	0	4.145298	0	
16	N16	2	0	3.921132	0	
17	N17	2	0	4.145298	0	
18	N18	6	0	3.921132	0	
19	N19	6	0	4.145298	0	
20	N20	2	4.166667	4.145298	0	
21	N21	2	-0.833333	4.145298	0	
22	N22	6	4.166667	4.145298	0	
23	N23	6	-0.833333	4.145298	0	
24	N24	6.589933	5.5	3.123503	0	
25	N25	6.589933	-1.5	3.123503	0	
26	N26	6.3958	0	3.235586	0	
27	N27	6.589933	0	3.123503	0	
28	N28	4.589933	5.5	-0.340598	0	
29	N29	4.589933	-1.5	-0.340598	0	
30	N30	4.3958	0	-0.228515	0	
31	N31	4.589933	0	-0.340598	0	
32	N32	2.3958	0	-3.692617	0	
33	N33	2.589933	0	-3.8047	0	
34	N34	0.3958	0	-7.156718	0	
35	N35	0.589933	0	-7.268801	0	
36	N36	2.589933	4.166667	-3.8047	0	
37	N37	2.589933	-0.833333	-3.8047	0	
38	N38	0.589933	4.166667	-7.268801	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
39	N39	0.589933	-0.833333	-7.268801	0	
40	N40	-0.589933	5.5	-7.268801	0	
41	N41	-0.589933	-1.5	-7.268801	0	
42	N42	-0.3958	-4e-16	-7.156718	0	
43	N43	-0.589933	-4e-16	-7.268801	0	
44	N44	-2.589933	5.5	-3.8047	0	
45	N45	-2.589933	-1.5	-3.8047	0	
46	N46	-2.3958	-4e-16	-3.692617	0	
47	N47	-2.589933	-4e-16	-3.8047	0	
48	N48	-4.3958	-4e-16	-0.228515	0	
49	N49	-4.589933	-4e-16	-0.340598	0	
50	N50	-6.3958	-4e-16	3.235586	0	
51	N51	-6.589933	-4e-16	3.123503	0	
52	N52	-4.589933	4.166667	-0.340598	0	
53	N53	-4.589933	-0.833333	-0.340598	0	
54	N54	-6.589933	4.166667	3.123503	0	
55	N55	-6.589933	-0.833333	3.123503	0	
56	N56	1.26858	-0.2916	1.908514	0	
57	N57	0.622758	-0.2916	0.936908	0	
58	N58	-1.26858	-0.2916	1.908514	0	
59	N59	-0.622758	-0.2916	0.936908	0	
60	N60	1.018532	-0.2916	-2.052879	0	
61	N61	0.500007	-0.2916	-1.007779	0	
62	N62	2.287112	-0.2916	0.144365	0	
63	N63	1.122766	-0.2916	0.07087	0	
64	N64	-2.287112	-0.2916	0.144365	0	
65	N65	-1.122766	-0.2916	0.07087	0	
66	N66	-1.018532	-0.2916	-2.052879	0	
67	N67	-0.500007	-0.2916	-1.007779	0	
68	N68	-.25	0	-7.409251	0	
69	N69	.25	0	-7.409251	0	
70	N70	-1.083333	0	-5.965876	0	
71	N71	1.083333	0	-5.965876	0	
72	N72	-2	0	-4.378163	0	
73	N73	2	0	-4.378163	0	
74	N74	-6.2916	0	3.921132	0	
75	N75	-6.5416	0	3.488119	0	
76	N76	-4.624933	0	3.921132	0	
77	N77	-5.708267	0	2.044744	0	
78	N78	-2.7916	0	3.921132	0	
79	N79	-4.7916	0	0.45703	0	
80	N80	6.5416	0	3.488119	0	
81	N81	6.2916	0	3.921132	0	
82	N82	5.708267	0	2.044744	0	
83	N83	4.624933	0	3.921132	0	
84	N84	4.7916	0	0.45703	0	
85	N85	2.7916	0	3.921132	0	
86	N86	0.409746	0	-4.217737	0	
87	N87	-0.409746	0	-4.217737	0	
88	N88	-1.637622	-0.2916	2.463719	0	
89	N89	-1.637622	0	2.463719	0	
90	N90	1.637622	-0.2916	2.463719	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
91	N91	1.637622	0	2.463719	0	
92	N92	2.952454	-0.2916	0.186362	0	
93	N93	2.952454	0	0.186362	0	
94	N94	1.314833	-0.2916	-2.650081	0	
95	N95	1.314833	0	-2.650081	0	
96	N96	-1.314833	-0.2916	-2.650081	0	
97	N97	-1.314833	0	-2.650081	0	
98	N98	-2.952454	-0.2916	0.186362	0	
99	N99	-2.952454	0	0.186362	0	
100	N100	-2.092622	-0.2916	-4.217737	0	
101	N101	2.092622	-0.2916	-4.217737	0	
102	N102	2.092622	0	-4.217737	0	
103	N103	-2.092622	0	-4.217737	0	
104	N104	-4.698978	-0.2916	0.296605	0	
105	N105	-4.698978	0	0.296605	0	
106	N106	-2.606357	-0.2916	3.921132	0	
107	N107	-2.606357	0	3.921132	0	
108	N108	2.606357	-0.2916	3.921132	0	
109	N109	2.606357	0	3.921132	0	
110	N110	4.698978	-0.2916	0.296605	0	
111	N111	4.698978	0	0.296605	0	
112	N112	-6	3	3.921132	0	
113	N113	-6	3	4.145298	0	
114	N114	-2	3	3.921132	0	
115	N115	-2	3	4.145298	0	
116	N116	2	3	3.921132	0	
117	N117	2	3	4.145298	0	
118	N118	6	3	3.921132	0	
119	N119	6	3	4.145298	0	
120	N120	-6.25	3	3.921132	0	
121	N121	6.25	3	3.921132	0	
122	N122	6.3958	3	3.235586	0	
123	N123	6.589933	3	3.123503	0	
124	N124	4.3958	3	-0.228515	0	
125	N125	4.589933	3	-0.340598	0	
126	N126	2.3958	3	-3.692617	0	
127	N127	2.589933	3	-3.8047	0	
128	N128	0.3958	3	-7.156718	0	
129	N129	0.589933	3	-7.268801	0	
130	N130	6.5208	3	3.452093	0	
131	N131	0.2708	3	-7.373225	0	
132	N132	-0.3958	3	-7.156718	0	
133	N133	-0.589933	3	-7.268801	0	
134	N134	-2.3958	3	-3.692617	0	
135	N135	-2.589933	3	-3.8047	0	
136	N136	-4.3958	3	-0.228515	0	
137	N137	-4.589933	3	-0.340598	0	
138	N138	-6.3958	3	3.235586	0	
139	N139	-6.589933	3	3.123503	0	
140	N140	-0.2708	3	-7.373225	0	
141	N141	-6.5208	3	3.452093	0	
142	N142	-5.504167	3	3.921132	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
143	N143	5.504167	3	3.921132	0	
144	N144	6.147883	3	2.806182	0	
145	N145	0.643717	3	-6.727314	0	
146	N146	-0.643717	3	-6.727314	0	
147	N147	-6.147883	3	2.806182	0	

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N1	N3		270	MF-H1	Beam	Single Angle	A36 Gr.36	Typical
2	M2	N1	N2			F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
3	M3	N2	N6			MF-H1	Beam	Single Angle	A36 Gr.36	Typical
4	M4	N6	N5			F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
5	M5	N4	N3			F1-CA1	Beam	Single Angle	A36 Gr.36	Typical
6	M6	N4	N5		270	MF-H1	Beam	Single Angle	A36 Gr.36	Typical
7	M8	N8	N9			MF-P1	Column	Pipe	A53 Gr.B	Typical
8	M9	N10	N11			RIGID	None	None	RIGID	Typical
9	M10	N12	N13			MF-P1	Column	Pipe	A53 Gr.B	Typical
10	M11	N14	N15			RIGID	None	None	RIGID	Typical
11	M12	N16	N17			RIGID	None	None	RIGID	Typical
12	M13	N18	N19			RIGID	None	None	RIGID	Typical
13	M14	N20	N21			MF-P1	Column	Pipe	A53 Gr.B	Typical
14	M15	N22	N23			MF-P1	Column	Pipe	A53 Gr.B	Typical
15	M16	N24	N25			MF-P1	Column	Pipe	A53 Gr.B	Typical
16	M17	N26	N27			RIGID	None	None	RIGID	Typical
17	M18	N28	N29			MF-P1	Column	Pipe	A53 Gr.B	Typical
18	M19	N30	N31			RIGID	None	None	RIGID	Typical
19	M20	N32	N33			RIGID	None	None	RIGID	Typical
20	M21	N34	N35			RIGID	None	None	RIGID	Typical
21	M22	N36	N37			MF-P1	Column	Pipe	A53 Gr.B	Typical
22	M23	N38	N39			MF-P1	Column	Pipe	A53 Gr.B	Typical
23	M24	N40	N41			MF-P1	Column	Pipe	A53 Gr.B	Typical
24	M25	N42	N43			RIGID	None	None	RIGID	Typical
25	M26	N44	N45			MF-P1	Column	Pipe	A53 Gr.B	Typical
26	M27	N46	N47			RIGID	None	None	RIGID	Typical
27	M28	N48	N49			RIGID	None	None	RIGID	Typical
28	M29	N50	N51			RIGID	None	None	RIGID	Typical
29	M30	N52	N53			MF-P1	Column	Pipe	A53 Gr.B	Typical
30	M31	N54	N55			MF-P1	Column	Pipe	A53 Gr.B	Typical
31	M32	N108	N56			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
32	M33	N56	N57			F1-ST2	Beam	Tube	A500 Gr.B...	Typical
33	M34	N106	N58			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
34	M35	N58	N59			F1-ST2	Beam	Tube	A500 Gr.B...	Typical
35	M36	N101	N60			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
36	M37	N60	N61			F1-ST2	Beam	Tube	A500 Gr.B...	Typical
37	M38	N110	N62			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
38	M39	N62	N63			F1-ST2	Beam	Tube	A500 Gr.B...	Typical
39	M40	N104	N64			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
40	M41	N64	N65			F1-ST2	Beam	Tube	A500 Gr.B...	Typical
41	M42	N100	N66			F1-ST1	Beam	Tube	A500 Gr.B...	Typical
42	M43	N66	N67			F1-ST2	Beam	Tube	A500 Gr.B...	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
43	M44	N72	N73		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
44	M45	N68	N69		90	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
45	M46	N70	N71		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
46	M48	N74	N75		90	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
47	M49	N76	N77		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
48	M50	N78	N79		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
49	M51	N107	N105		90	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
50	M52	N80	N81		90	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
51	M53	N82	N83		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
52	M54	N84	N85		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
53	M55	N111	N109		90	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
54	M56	N91	N89		90	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
55	M59	N91	N93		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
56	M60	N99	N89		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
57	M61	N88	N89			RIGID	None	None	RIGID	Typical
58	M62	N90	N91			RIGID	None	None	RIGID	Typical
59	M63	N92	N93			RIGID	None	None	RIGID	Typical
60	M64	N94	N95			RIGID	None	None	RIGID	Typical
61	M65	N96	N97			RIGID	None	None	RIGID	Typical
62	M66	N98	N99			RIGID	None	None	RIGID	Typical
63	M67	N100	N103			RIGID	None	None	RIGID	Typical
64	M68	N101	N102			RIGID	None	None	RIGID	Typical
65	M69	N102	N103		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
66	M70	N104	N105			RIGID	None	None	RIGID	Typical
67	M71	N106	N107			RIGID	None	None	RIGID	Typical
68	M72	N108	N109			RIGID	None	None	RIGID	Typical
69	M73	N110	N111			RIGID	None	None	RIGID	Typical
70	M70A	N99	N97		90	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
71	M71A	N97	N87		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
72	M72A	N86	N95		180	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
73	M73A	N95	N93		90	F1-SA1	Beam	Single Angle	A36 Gr.36	Typical
74	M74	N112	N113			RIGID	None	None	RIGID	Typical
75	M75	N114	N115			RIGID	None	None	RIGID	Typical
76	M76	N116	N117			RIGID	None	None	RIGID	Typical
77	M77	N118	N119			RIGID	None	None	RIGID	Typical
78	M78	N120	N121			NEW HANDR...	Beam	Pipe	A53 Gr.B	Typical
79	M79	N122	N123			RIGID	None	None	RIGID	Typical
80	M80	N124	N125			RIGID	None	None	RIGID	Typical
81	M81	N126	N127			RIGID	None	None	RIGID	Typical
82	M82	N128	N129			RIGID	None	None	RIGID	Typical
83	M83	N130	N131			NEW HANDR...	Beam	Pipe	A53 Gr.B	Typical
84	M84	N132	N133			RIGID	None	None	RIGID	Typical
85	M85	N134	N135			RIGID	None	None	RIGID	Typical
86	M86	N136	N137			RIGID	None	None	RIGID	Typical
87	M87	N138	N139			RIGID	None	None	RIGID	Typical
88	M88	N140	N141			NEW HANDR...	Beam	Pipe	A53 Gr.B	Typical
89	M89	N142	N147		180	AHCP	Beam	Single Angle	A36 Gr.36	Typical
90	M90	N144	N143		180	AHCP	Beam	Single Angle	A36 Gr.36	Typical
91	M91	N146	N145		180	AHCP	Beam	Single Angle	A36 Gr.36	Typical

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Mem...	Surface(P...
1	Dead	DL		-1			50		10	
2	0 Wind - No Ice	WLZ					50	55		
3	90 Wind - No Ice	WLX					50	55		
4	0 Wind - Ice	WLZ					50	55		
5	90 Wind - Ice	WLX					50	55		
6	0 Wind - Service	WLZ					50	55		
7	90 Wind - Service	WLX					50	55		
8	Ice	OL1					50	55	10	
9	Live Load a	LL				3				
10	Live Load b	LL				3				
11	Live Load c	LL				3				
12	Live Load d	LL				3				
13	Maint LL 1	LL					1			
14	Maint LL 2	LL					1			
15	Maint LL 3	LL					1			
16	Maint LL 4	LL					1			
17	Maint LL 5	LL					1			
18	Maint LL 6	LL					1			
19	Maint LL 7	LL					1			
20	Maint LL 8	LL					1			
21	Maint LL 9	LL					1			
22	Maint LL 10	LL					1			
23	Maint LL 11	LL					1			
24	Maint LL 12	LL					1			
25	Maint LL 13	LL								
26	Maint LL 14	LL								
27	Maint LL 15	LL								
28	BLC 1 Transient Area ...	None						109		
29	BLC 8 Transient Area ...	None						109		

Load Combinations

	Description	Sol...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4 Dead	Yes	Y		1	1.4																				
2	1.2 D + 1.0 - 0 W	Yes	Y		1	1.2	2	1																		
3	1.2 D + 1.0 - 30 W	Yes	Y		1	1.2	2	.866	3	.5																
4	1.2 D + 1.0 - 60 W	Yes	Y		1	1.2	3	.866	2	.5																
5	1.2 D + 1.0 - 90 W	Yes	Y		1	1.2	3	1																		
6	1.2 D + 1.0 - 120 W	Yes	Y		1	1.2	3	.866	2	-.5																
7	1.2 D + 1.0 - 150 W	Yes	Y		1	1.2	2	-.8...	3	.5																
8	1.2 D + 1.0 - 180 W	Yes	Y		1	1.2	2	-1																		
9	1.2 D + 1.0 - 210 W	Yes	Y		1	1.2	2	-.8...	3	-.5																
10	1.2 D + 1.0 - 240 W	Yes	Y		1	1.2	3	-.8...	2	-.5																
11	1.2 D + 1.0 - 270 W	Yes	Y		1	1.2	3	-1																		
12	1.2 D + 1.0 - 300 W	Yes	Y		1	1.2	3	-.8...	2	.5																
13	1.2 D + 1.0 - 330 W	Yes	Y		1	1.2	2	.866	3	-.5																
14	1.2 D + 1.0 - 0 W/Ice	Yes	Y		1	1.2	4	1			8	1														
15	1.2 D + 1.0 - 30 W/Ice	Yes	Y		1	1.2	4	.866	5	.5	8	1														
16	1.2 D + 1.0 - 60 W/Ice	Yes	Y		1	1.2	5	.866	4	.5	8	1														
17	1.2 D + 1.0 - 90 W/Ice	Yes	Y		1	1.2	5	1			8	1														

Load Combinations (Continued)

	Description	Sol...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
18	1.2 D + 1.0 - 120 W/Ice	Yes	Y		1	1.2	5	.866	4	-.5	8	1														
19	1.2 D + 1.0 - 150 W/Ice	Yes	Y		1	1.2	4	-.8...	5	.5	8	1														
20	1.2 D + 1.0 - 180 W/Ice	Yes	Y		1	1.2	4	-1			8	1														
21	1.2 D + 1.0 - 210 W/Ice	Yes	Y		1	1.2	4	-.8...	5	-.5	8	1														
22	1.2 D + 1.0 - 240 W/Ice	Yes	Y		1	1.2	5	-.8...	4	-.5	8	1														
23	1.2 D + 1.0 - 270 W/Ice	Yes	Y		1	1.2	5	-1			8	1														
24	1.2 D + 1.0 - 300 W/Ice	Yes	Y		1	1.2	5	-.8...	4	.5	8	1														
25	1.2 D + 1.0 - 330 W/Ice	Yes	Y		1	1.2	4	.866	5	-.5	8	1														
26	1.2 D + 1.5 LL a + Service - 0 W	Yes	Y		1	1.2	6	1			9	1.5														
27	1.2 D + 1.5 LL a + Service - 30 W	Yes	Y		1	1.2	6	.866	7	.5	9	1.5														
28	1.2 D + 1.5 LL a + Service - 60 W	Yes	Y		1	1.2	7	.866	6	.5	9	1.5														
29	1.2 D + 1.5 LL a + Service - 90 W	Yes	Y		1	1.2	7	1			9	1.5														
30	1.2 D + 1.5 LL a + Service - 120 W	Yes	Y		1	1.2	7	.866	6	-.5	9	1.5														
31	1.2 D + 1.5 LL a + Service - 150 W	Yes	Y		1	1.2	6	-.8...	7	.5	9	1.5														
32	1.2 D + 1.5 LL a + Service - 180 W	Yes	Y		1	1.2	6	-1			9	1.5														
33	1.2 D + 1.5 LL a + Service - 210 W	Yes	Y		1	1.2	6	-.8...	7	-.5	9	1.5														
34	1.2 D + 1.5 LL a + Service - 240 W	Yes	Y		1	1.2	7	-.8...	6	-.5	9	1.5														
35	1.2 D + 1.5 LL a + Service - 270 W	Yes	Y		1	1.2	7	-1			9	1.5														
36	1.2 D + 1.5 LL a + Service - 300 W	Yes	Y		1	1.2	7	-.8...	6	.5	9	1.5														
37	1.2 D + 1.5 LL a + Service - 330 W	Yes	Y		1	1.2	6	.866	7	-.5	9	1.5														
38	1.2 D + 1.5 LL b + Service - 0 W	Yes	Y		1	1.2	6	1			10	1.5														
39	1.2 D + 1.5 LL b + Service - 30 W	Yes	Y		1	1.2	6	.866	7	.5	10	1.5														
40	1.2 D + 1.5 LL b + Service - 60 W	Yes	Y		1	1.2	7	.866	6	.5	10	1.5														
41	1.2 D + 1.5 LL b + Service - 90 W	Yes	Y		1	1.2	7	1			10	1.5														
42	1.2 D + 1.5 LL b + Service - 120 W	Yes	Y		1	1.2	7	.866	6	-.5	10	1.5														
43	1.2 D + 1.5 LL b + Service - 150 W	Yes	Y		1	1.2	6	-.8...	7	.5	10	1.5														
44	1.2 D + 1.5 LL b + Service - 180 W	Yes	Y		1	1.2	6	-1			10	1.5														
45	1.2 D + 1.5 LL b + Service - 210 W	Yes	Y		1	1.2	6	-.8...	7	-.5	10	1.5														
46	1.2 D + 1.5 LL b + Service - 240 W	Yes	Y		1	1.2	7	-.8...	6	-.5	10	1.5														
47	1.2 D + 1.5 LL b + Service - 270 W	Yes	Y		1	1.2	7	-1			10	1.5														
48	1.2 D + 1.5 LL b + Service - 300 W	Yes	Y		1	1.2	7	-.8...	6	.5	10	1.5														
49	1.2 D + 1.5 LL b + Service - 330 W	Yes	Y		1	1.2	6	.866	7	-.5	10	1.5														
50	1.2 D + 1.5 LL c + Service - 0 W	Yes	Y		1	1.2	6	1			11	1.5														
51	1.2 D + 1.5 LL c + Service - 30 W	Yes	Y		1	1.2	6	.866	7	.5	11	1.5														
52	1.2 D + 1.5 LL c + Service - 60 W	Yes	Y		1	1.2	7	.866	6	.5	11	1.5														
53	1.2 D + 1.5 LL c + Service - 90 W	Yes	Y		1	1.2	7	1			11	1.5														
54	1.2 D + 1.5 LL c + Service - 120 W	Yes	Y		1	1.2	7	.866	6	-.5	11	1.5														
55	1.2 D + 1.5 LL c + Service - 150 W	Yes	Y		1	1.2	6	-.8...	7	.5	11	1.5														
56	1.2 D + 1.5 LL c + Service - 180 W	Yes	Y		1	1.2	6	-1			11	1.5														
57	1.2 D + 1.5 LL c + Service - 210 W	Yes	Y		1	1.2	6	-.8...	7	-.5	11	1.5														
58	1.2 D + 1.5 LL c + Service - 240 W	Yes	Y		1	1.2	7	-.8...	6	-.5	11	1.5														
59	1.2 D + 1.5 LL c + Service - 270 W	Yes	Y		1	1.2	7	-1			11	1.5														
60	1.2 D + 1.5 LL c + Service - 300 W	Yes	Y		1	1.2	7	-.8...	6	.5	11	1.5														
61	1.2 D + 1.5 LL c + Service - 330 W	Yes	Y		1	1.2	6	.866	7	-.5	11	1.5														
62	1.2 D + 1.5 LL d + Service - 0 W	Yes	Y		1	1.2	6	1			12	1.5														
63	1.2 D + 1.5 LL d + Service - 30 W	Yes	Y		1	1.2	6	.866	7	.5	12	1.5														
64	1.2 D + 1.5 LL d + Service - 60 W	Yes	Y		1	1.2	7	.866	6	.5	12	1.5														
65	1.2 D + 1.5 LL d + Service - 90 W	Yes	Y		1	1.2	7	1			12	1.5														
66	1.2 D + 1.5 LL d + Service - 120 W	Yes	Y		1	1.2	7	.866	6	-.5	12	1.5														
67	1.2 D + 1.5 LL d + Service - 150 W	Yes	Y		1	1.2	6	-.8...	7	.5	12	1.5														
68	1.2 D + 1.5 LL d + Service - 180 W	Yes	Y		1	1.2	6	-1			12	1.5														
69	1.2 D + 1.5 LL d + Service - 210 W	Yes	Y		1	1.2	6	-.8...	7	-.5	12	1.5														

Load Combinations (Continued)

	Description	Sol...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
70	1.2 D + 1.5 LL d + Service - 240 W	Yes	Y		1	1.2	7	-.8...	6	-.5	12	1.5														
71	1.2 D + 1.5 LL d + Service - 270 W	Yes	Y		1	1.2	7	-1			12	1.5														
72	1.2 D + 1.5 LL d + Service - 300 W	Yes	Y		1	1.2	7	-.8...	6	.5	12	1.5														
73	1.2 D + 1.5 LL d + Service - 330 W	Yes	Y		1	1.2	6	.866	7	-.5	12	1.5														
74	1.2 D + 1.5 LL Maint (1)	Yes	Y		1	1.2					13	1.5														
75	1.2 D + 1.5 LL Maint (2)	Yes	Y		1	1.2					14	1.5														
76	1.2 D + 1.5 LL Maint (3)	Yes	Y		1	1.2					15	1.5														
77	1.2 D + 1.5 LL Maint (4)	Yes	Y		1	1.2					16	1.5														
78	1.2 D + 1.5 LL Maint (5)	Yes	Y		1	1.2					17	1.5														
79	1.2 D + 1.5 LL Maint (6)	Yes	Y		1	1.2					18	1.5														
80	1.2 D + 1.5 LL Maint (7)	Yes	Y		1	1.2					19	1.5														
81	1.2 D + 1.5 LL Maint (8)	Yes	Y		1	1.2					20	1.5														
82	1.2 D + 1.5 LL Maint (9)	Yes	Y		1	1.2					21	1.5														
83	1.2 D + 1.5 LL Maint (10)	Yes	Y		1	1.2					22	1.5														
84	1.2 D + 1.5 LL Maint (11)	Yes	Y		1	1.2					23	1.5														
85	1.2 D + 1.5 LL Maint (12)	Yes	Y		1	1.2					24	1.5														
86	1.2 D + 1.5 LL Maint (13)	Yes	Y		1	1.2					25	1.5														
87	1.2 D + 1.5 LL Maint (14)	Yes	Y		1	1.2					26	1.5														
88	1.2 D + 1.5 LL Maint (15)	Yes	Y		1	1.2					27	1.5														

Member Point Loads (BLC 1 : Dead)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M15	Y	-.018	%5
2	M15	Y	-.018	%95
3	M15	Y	-.028	%65
4	M15	Y	0	0
5	M15	Y	0	0
6	M14	Y	-.054	%5
7	M14	Y	-.054	%95
8	M14	Y	-.073	%50
9	M14	Y	-.047	%50
10	M14	Y	0	0
11	M8	Y	-.025	%30
12	M8	Y	-.025	%85
13	M8	Y	0	0
14	M8	Y	0	0
15	M8	Y	0	0
16	M35	Y	-.033	%50
17	M35	Y	0	0
18	M35	Y	0	0
19	M35	Y	0	0
20	M35	Y	0	0
21	M31	Y	-.018	%5
22	M31	Y	-.018	%95
23	M31	Y	-.028	%65
24	M31	Y	0	0
25	M31	Y	0	0
26	M30	Y	-.054	%5
27	M30	Y	-.054	%95
28	M30	Y	-.073	%50

Member Point Loads (BLC 1 : Dead) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
29	M30	Y	-.047	%50
30	M30	Y	0	0
31	M24	Y	-.025	%30
32	M24	Y	-.025	%85
33	M24	Y	0	0
34	M24	Y	0	0
35	M24	Y	0	0
36	M23	Y	-.018	%5
37	M23	Y	-.018	%95
38	M23	Y	-.028	%65
39	M23	Y	0	0
40	M23	Y	0	0
41	M22	Y	-.054	%5
42	M22	Y	-.054	%95
43	M22	Y	-.073	%50
44	M22	Y	-.047	%50
45	M22	Y	0	0
46	M16	Y	-.025	%30
47	M16	Y	-.025	%85
48	M16	Y	0	0
49	M16	Y	0	0
50	M16	Y	0	0

Member Point Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M15	Z	-.124	%5
2	M15	Z	-.124	%95
3	M15	Z	-.031	%65
4	M15	Z	0	0
5	M15	Z	0	0
6	M14	Z	-.312	%5
7	M14	Z	-.312	%95
8	M14	Z	-.059	%50
9	M14	Z	-.034	%50
10	M14	Z	0	0
11	M8	Z	-.218	%30
12	M8	Z	-.218	%85
13	M8	Z	0	0
14	M8	Z	0	0
15	M8	Z	0	0
16	M35	Z	-.055	%50
17	M35	Z	0	0
18	M35	Z	0	0
19	M35	Z	0	0
20	M35	Z	0	0
21	M31	Z	-.124	%5
22	M31	Z	-.124	%95
23	M31	Z	-.031	%65
24	M31	Z	0	0
25	M31	Z	0	0
26	M30	Z	-.312	%5

Member Point Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
27	M30	Z	-.312	%95
28	M30	Z	-.059	%50
29	M30	Z	-.034	%50
30	M30	Z	0	0
31	M24	Z	-.218	%30
32	M24	Z	-.218	%85
33	M24	Z	0	0
34	M24	Z	0	0
35	M24	Z	0	0
36	M23	Z	-.124	%5
37	M23	Z	-.124	%95
38	M23	Z	-.031	%65
39	M23	Z	0	0
40	M23	Z	0	0
41	M22	Z	-.312	%5
42	M22	Z	-.312	%95
43	M22	Z	-.059	%50
44	M22	Z	-.034	%50
45	M22	Z	0	0
46	M16	Z	-.218	%30
47	M16	Z	-.218	%85
48	M16	Z	0	0
49	M16	Z	0	0
50	M16	Z	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M15	X	-.066	%5
2	M15	X	-.066	%95
3	M15	X	-.1	%65
4	M15	X	0	0
5	M15	X	0	0
6	M14	X	-.132	%5
7	M14	X	-.132	%95
8	M14	X	-.074	%50
9	M14	X	-.084	%50
10	M14	X	0	0
11	M8	X	-.146	%30
12	M8	X	-.146	%85
13	M8	X	0	0
14	M8	X	0	0
15	M8	X	0	0
16	M35	X	-.055	%50
17	M35	X	0	0
18	M35	X	0	0
19	M35	X	0	0
20	M35	X	0	0
21	M31	X	-.066	%5
22	M31	X	-.066	%95
23	M31	X	-.1	%65
24	M31	X	0	0

Member Point Loads (BLC 3 : 90 Wind - No Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
25	M31	X	0	0
26	M30	X	-.132	%5
27	M30	X	-.132	%95
28	M30	X	-.074	%50
29	M30	X	-.084	%50
30	M30	X	0	0
31	M24	X	-.146	%30
32	M24	X	-.146	%85
33	M24	X	0	0
34	M24	X	0	0
35	M24	X	0	0
36	M23	X	-.066	%5
37	M23	X	-.066	%95
38	M23	X	-.1	%65
39	M23	X	0	0
40	M23	X	0	0
41	M22	X	-.132	%5
42	M22	X	-.132	%95
43	M22	X	-.074	%50
44	M22	X	-.084	%50
45	M22	X	0	0
46	M16	X	-.146	%30
47	M16	X	-.146	%85
48	M16	X	0	0
49	M16	X	0	0
50	M16	X	0	0

Member Point Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M15	Z	-.022	%5
2	M15	Z	-.022	%95
3	M15	Z	-.005	%65
4	M15	Z	0	0
5	M15	Z	0	0
6	M14	Z	-.055	%5
7	M14	Z	-.055	%95
8	M14	Z	-.011	%50
9	M14	Z	-.006	%50
10	M14	Z	0	0
11	M8	Z	-.038	%30
12	M8	Z	-.038	%85
13	M8	Z	0	0
14	M8	Z	0	0
15	M8	Z	0	0
16	M35	Z	-.01	%50
17	M35	Z	0	0
18	M35	Z	0	0
19	M35	Z	0	0
20	M35	Z	0	0
21	M31	Z	-.022	%5
22	M31	Z	-.022	%95

Member Point Loads (BLC 4 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
23	M31	Z	-.005	%65
24	M31	Z	0	0
25	M31	Z	0	0
26	M30	Z	-.055	%5
27	M30	Z	-.055	%95
28	M30	Z	-.011	%50
29	M30	Z	-.006	%50
30	M30	Z	0	0
31	M24	Z	-.038	%30
32	M24	Z	-.038	%85
33	M24	Z	0	0
34	M24	Z	0	0
35	M24	Z	0	0
36	M23	Z	-.022	%5
37	M23	Z	-.022	%95
38	M23	Z	-.005	%65
39	M23	Z	0	0
40	M23	Z	0	0
41	M22	Z	-.055	%5
42	M22	Z	-.055	%95
43	M22	Z	-.011	%50
44	M22	Z	-.006	%50
45	M22	Z	0	0
46	M16	Z	-.038	%30
47	M16	Z	-.038	%85
48	M16	Z	0	0
49	M16	Z	0	0
50	M16	Z	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M15	X	-.012	%5
2	M15	X	-.012	%95
3	M15	X	-.018	%65
4	M15	X	0	0
5	M15	X	0	0
6	M14	X	-.024	%5
7	M14	X	-.024	%95
8	M14	X	-.013	%50
9	M14	X	-.015	%50
10	M14	X	0	0
11	M8	X	-.026	%30
12	M8	X	-.026	%85
13	M8	X	0	0
14	M8	X	0	0
15	M8	X	0	0
16	M35	X	-.01	%50
17	M35	X	0	0
18	M35	X	0	0
19	M35	X	0	0
20	M35	X	0	0

Member Point Loads (BLC 5 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
21	M31	X	-.012	%5
22	M31	X	-.012	%95
23	M31	X	-.018	%65
24	M31	X	0	0
25	M31	X	0	0
26	M30	X	-.024	%5
27	M30	X	-.024	%95
28	M30	X	-.013	%50
29	M30	X	-.015	%50
30	M30	X	0	0
31	M24	X	-.026	%30
32	M24	X	-.026	%85
33	M24	X	0	0
34	M24	X	0	0
35	M24	X	0	0
36	M23	X	-.012	%5
37	M23	X	-.012	%95
38	M23	X	-.018	%65
39	M23	X	0	0
40	M23	X	0	0
41	M22	X	-.024	%5
42	M22	X	-.024	%95
43	M22	X	-.013	%50
44	M22	X	-.015	%50
45	M22	X	0	0
46	M16	X	-.026	%30
47	M16	X	-.026	%85
48	M16	X	0	0
49	M16	X	0	0
50	M16	X	0	0

Member Point Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M15	Z	-.008	%5
2	M15	Z	-.008	%95
3	M15	Z	-.002	%65
4	M15	Z	0	0
5	M15	Z	0	0
6	M14	Z	-.02	%5
7	M14	Z	-.02	%95
8	M14	Z	-.004	%50
9	M14	Z	-.002	%50
10	M14	Z	0	0
11	M8	Z	-.014	%30
12	M8	Z	-.014	%85
13	M8	Z	0	0
14	M8	Z	0	0
15	M8	Z	0	0
16	M35	Z	-.004	%50
17	M35	Z	0	0
18	M35	Z	0	0

Member Point Loads (BLC 6 : 0 Wind - Service) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
19	M35	Z	0	0
20	M35	Z	0	0
21	M31	Z	-.008	%5
22	M31	Z	-.008	%95
23	M31	Z	-.002	%65
24	M31	Z	0	0
25	M31	Z	0	0
26	M30	Z	-.02	%5
27	M30	Z	-.02	%95
28	M30	Z	-.004	%50
29	M30	Z	-.002	%50
30	M30	Z	0	0
31	M24	Z	-.014	%30
32	M24	Z	-.014	%85
33	M24	Z	0	0
34	M24	Z	0	0
35	M24	Z	0	0
36	M23	Z	-.008	%5
37	M23	Z	-.008	%95
38	M23	Z	-.002	%65
39	M23	Z	0	0
40	M23	Z	0	0
41	M22	Z	-.02	%5
42	M22	Z	-.02	%95
43	M22	Z	-.004	%50
44	M22	Z	-.002	%50
45	M22	Z	0	0
46	M16	Z	-.014	%30
47	M16	Z	-.014	%85
48	M16	Z	0	0
49	M16	Z	0	0
50	M16	Z	0	0

Member Point Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M15	X	-.004	%5
2	M15	X	-.004	%95
3	M15	X	-.006	%65
4	M15	X	0	0
5	M15	X	0	0
6	M14	X	-.009	%5
7	M14	X	-.009	%95
8	M14	X	-.005	%50
9	M14	X	-.005	%50
10	M14	X	0	0
11	M8	X	-.009	%30
12	M8	X	-.009	%85
13	M8	X	0	0
14	M8	X	0	0
15	M8	X	0	0
16	M35	X	-.004	%50

Member Point Loads (BLC 7 : 90 Wind - Service) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
17	M35	X	0	0
18	M35	X	0	0
19	M35	X	0	0
20	M35	X	0	0
21	M31	X	-.004	%5
22	M31	X	-.004	%95
23	M31	X	-.006	%65
24	M31	X	0	0
25	M31	X	0	0
26	M30	X	-.009	%5
27	M30	X	-.009	%95
28	M30	X	-.005	%50
29	M30	X	-.005	%50
30	M30	X	0	0
31	M24	X	-.009	%30
32	M24	X	-.009	%85
33	M24	X	0	0
34	M24	X	0	0
35	M24	X	0	0
36	M23	X	-.004	%5
37	M23	X	-.004	%95
38	M23	X	-.006	%65
39	M23	X	0	0
40	M23	X	0	0
41	M22	X	-.009	%5
42	M22	X	-.009	%95
43	M22	X	-.005	%50
44	M22	X	-.005	%50
45	M22	X	0	0
46	M16	X	-.009	%30
47	M16	X	-.009	%85
48	M16	X	0	0
49	M16	X	0	0
50	M16	X	0	0

Member Point Loads (BLC 8 : Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M15	Y	-.042	%5
2	M15	Y	-.042	%95
3	M15	Y	-.036	%65
4	M15	Y	0	0
5	M15	Y	0	0
6	M14	Y	-.102	%5
7	M14	Y	-.102	%95
8	M14	Y	-.031	%50
9	M14	Y	-.03	%50
10	M14	Y	0	0
11	M8	Y	-.077	%30
12	M8	Y	-.077	%85
13	M8	Y	0	0
14	M8	Y	0	0

Member Point Loads (BLC 8 : Ice) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
15	M8	Y	0	0
16	M35	Y	-.044	%50
17	M35	Y	0	0
18	M35	Y	0	0
19	M35	Y	0	0
20	M35	Y	0	0
21	M31	Y	-.042	%5
22	M31	Y	-.042	%95
23	M31	Y	-.036	%65
24	M31	Y	0	0
25	M31	Y	0	0
26	M30	Y	-.102	%5
27	M30	Y	-.102	%95
28	M30	Y	-.031	%50
29	M30	Y	-.03	%50
30	M30	Y	0	0
31	M24	Y	-.077	%30
32	M24	Y	-.077	%85
33	M24	Y	0	0
34	M24	Y	0	0
35	M24	Y	0	0
36	M23	Y	-.042	%5
37	M23	Y	-.042	%95
38	M23	Y	-.036	%65
39	M23	Y	0	0
40	M23	Y	0	0
41	M22	Y	-.102	%5
42	M22	Y	-.102	%95
43	M22	Y	-.031	%50
44	M22	Y	-.03	%50
45	M22	Y	0	0
46	M16	Y	-.077	%30
47	M16	Y	-.077	%85
48	M16	Y	0	0
49	M16	Y	0	0
50	M16	Y	0	0

Member Point Loads (BLC 13 : Maint LL 1)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.25	%5

Member Point Loads (BLC 14 : Maint LL 2)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.25	%95

Member Point Loads (BLC 15 : Maint LL 3)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M3	Y	-.25	%95

Member Point Loads (BLC 16 : Maint LL 4)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M3	Y	-.25	%5

Member Point Loads (BLC 17 : Maint LL 5)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	Y	-.25	%5

Member Point Loads (BLC 18 : Maint LL 6)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M6	Y	-.25	%95

Member Point Loads (BLC 19 : Maint LL 7)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M40	Y	-.25	%5

Member Point Loads (BLC 20 : Maint LL 8)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M42	Y	-.25	%5

Member Point Loads (BLC 21 : Maint LL 9)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M36	Y	-.25	%5

Member Point Loads (BLC 22 : Maint LL 10)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M38	Y	-.25	%5

Member Point Loads (BLC 23 : Maint LL 11)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M32	Y	-.25	%5

Member Point Loads (BLC 24 : Maint LL 12)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M34	Y	-.25	%5

Joint Loads and Enforced Displacements (BLC 9 : Live Load a)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N10	L	Y	-.25
2	N42	L	Y	-.25
3	N26	L	Y	-.25

Joint Loads and Enforced Displacements (BLC 10 : Live Load b)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N14	L	Y	-.25
2	N46	L	Y	-.25
3	N30	L	Y	-.25

Joint Loads and Enforced Displacements (BLC 11 : Live Load c)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N16	L	Y	-.25
2	N48	L	Y	-.25
3	N32	L	Y	-.25

Joint Loads and Enforced Displacements (BLC 12 : Live Load d)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
1	N50	L	Y	-.25
2	N18	L	Y	-.25
3	N34	L	Y	-.25

Member Distributed Loads (BLC 2 : 0 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.023	-.023	0	0
2	M2	Z	-.032	-.032	0	0
3	M3	Z	-.023	-.023	0	0
4	M4	Z	-.032	-.032	0	0
5	M5	Z	-.032	-.032	0	0
6	M6	Z	-.023	-.023	0	0
7	M8	Z	-.011	-.011	0	0
8	M10	Z	-.011	-.011	0	0
9	M14	Z	-.011	-.011	0	0
10	M15	Z	-.011	-.011	0	0
11	M16	Z	-.011	-.011	0	0
12	M18	Z	-.011	-.011	0	0
13	M22	Z	-.011	-.011	0	0
14	M23	Z	-.011	-.011	0	0
15	M24	Z	-.011	-.011	0	0
16	M26	Z	-.011	-.011	0	0
17	M30	Z	-.011	-.011	0	0
18	M31	Z	-.011	-.011	0	0
19	M32	Z	-.021	-.021	0	0
20	M33	Z	-.017	-.017	0	0
21	M34	Z	-.021	-.021	0	0
22	M35	Z	-.017	-.017	0	0
23	M36	Z	-.021	-.021	0	0
24	M37	Z	-.017	-.017	0	0
25	M38	Z	-.021	-.021	0	0
26	M39	Z	-.017	-.017	0	0
27	M40	Z	-.021	-.021	0	0
28	M41	Z	-.017	-.017	0	0
29	M42	Z	-.021	-.021	0	0
30	M43	Z	-.017	-.017	0	0
31	M44	Z	-.015	-.015	0	0
32	M45	Z	-.009	-.009	0	0
33	M46	Z	-.012	-.012	0	0
34	M48	Z	-.009	-.009	0	0
35	M49	Z	-.012	-.012	0	0
36	M50	Z	-.015	-.015	0	0
37	M51	Z	-.015	-.015	0	0
38	M52	Z	-.009	-.009	0	0

Member Distributed Loads (BLC 2 : 0 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
39	M53	Z	-.012	-.012	0	0
40	M54	Z	-.015	-.015	0	0
41	M55	Z	-.015	-.015	0	0
42	M56	Z	-.014	-.014	0	0
43	M59	Z	-.013	-.013	0	0
44	M60	Z	-.013	-.013	0	0
45	M69	Z	-.015	-.015	0	0
46	M70A	Z	-.014	-.014	0	0
47	M71A	Z	-.011	-.011	0	0
48	M72A	Z	-.011	-.011	0	0
49	M73A	Z	-.014	-.014	0	0
50	M78	Z	-.011	-.011	0	0
51	M83	Z	-.011	-.011	0	0
52	M88	Z	-.011	-.011	0	0
53	M89	Z	-.01	-.01	0	0
54	M90	Z	-.01	-.01	0	0
55	M91	Z	-.01	-.01	0	0

Member Distributed Loads (BLC 3 : 90 Wind - No Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.023	-.023	0	0
2	M2	X	-.032	-.032	0	0
3	M3	X	-.023	-.023	0	0
4	M4	X	-.032	-.032	0	0
5	M5	X	-.032	-.032	0	0
6	M6	X	-.023	-.023	0	0
7	M8	X	-.011	-.011	0	0
8	M10	X	-.011	-.011	0	0
9	M14	X	-.011	-.011	0	0
10	M15	X	-.011	-.011	0	0
11	M16	X	-.011	-.011	0	0
12	M18	X	-.011	-.011	0	0
13	M22	X	-.011	-.011	0	0
14	M23	X	-.011	-.011	0	0
15	M24	X	-.011	-.011	0	0
16	M26	X	-.011	-.011	0	0
17	M30	X	-.011	-.011	0	0
18	M31	X	-.011	-.011	0	0
19	M32	X	-.021	-.021	0	0
20	M33	X	-.017	-.017	0	0
21	M34	X	-.021	-.021	0	0
22	M35	X	-.017	-.017	0	0
23	M36	X	-.021	-.021	0	0
24	M37	X	-.017	-.017	0	0
25	M38	X	-.021	-.021	0	0
26	M39	X	-.017	-.017	0	0
27	M40	X	-.021	-.021	0	0
28	M41	X	-.017	-.017	0	0
29	M42	X	-.021	-.021	0	0
30	M43	X	-.017	-.017	0	0
31	M44	X	-.015	-.015	0	0

Member Distributed Loads (BLC 3 : 90 Wind - No Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
32	M45	X	-.009	-.009	0	0
33	M46	X	-.012	-.012	0	0
34	M48	X	-.009	-.009	0	0
35	M49	X	-.012	-.012	0	0
36	M50	X	-.015	-.015	0	0
37	M51	X	-.015	-.015	0	0
38	M52	X	-.009	-.009	0	0
39	M53	X	-.012	-.012	0	0
40	M54	X	-.015	-.015	0	0
41	M55	X	-.015	-.015	0	0
42	M56	X	-.014	-.014	0	0
43	M59	X	-.013	-.013	0	0
44	M60	X	-.013	-.013	0	0
45	M69	X	-.015	-.015	0	0
46	M70A	X	-.014	-.014	0	0
47	M71A	X	-.011	-.011	0	0
48	M72A	X	-.011	-.011	0	0
49	M73A	X	-.014	-.014	0	0
50	M78	X	-.011	-.011	0	0
51	M83	X	-.011	-.011	0	0
52	M88	X	-.011	-.011	0	0
53	M89	X	-.01	-.01	0	0
54	M90	X	-.01	-.01	0	0
55	M91	X	-.01	-.01	0	0

Member Distributed Loads (BLC 4 : 0 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.007	-.007	0	0
2	M2	Z	-.012	-.012	0	0
3	M3	Z	-.007	-.007	0	0
4	M4	Z	-.012	-.012	0	0
5	M5	Z	-.012	-.012	0	0
6	M6	Z	-.007	-.007	0	0
7	M8	Z	-.002	-.002	0	0
8	M10	Z	-.002	-.002	0	0
9	M14	Z	-.002	-.002	0	0
10	M15	Z	-.002	-.002	0	0
11	M16	Z	-.002	-.002	0	0
12	M18	Z	-.002	-.002	0	0
13	M22	Z	-.002	-.002	0	0
14	M23	Z	-.002	-.002	0	0
15	M24	Z	-.002	-.002	0	0
16	M26	Z	-.002	-.002	0	0
17	M30	Z	-.002	-.002	0	0
18	M31	Z	-.002	-.002	0	0
19	M32	Z	-.006	-.006	0	0
20	M33	Z	-.006	-.006	0	0
21	M34	Z	-.006	-.006	0	0
22	M35	Z	-.006	-.006	0	0
23	M36	Z	-.006	-.006	0	0
24	M37	Z	-.006	-.006	0	0

Member Distributed Loads (BLC 4 : 0 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
25	M38	Z	-.006	-.006	0	0
26	M39	Z	-.006	-.006	0	0
27	M40	Z	-.006	-.006	0	0
28	M41	Z	-.006	-.006	0	0
29	M42	Z	-.006	-.006	0	0
30	M43	Z	-.006	-.006	0	0
31	M44	Z	-.006	-.006	0	0
32	M45	Z	-.005	-.005	0	0
33	M46	Z	-.005	-.005	0	0
34	M48	Z	-.005	-.005	0	0
35	M49	Z	-.005	-.005	0	0
36	M50	Z	-.006	-.006	0	0
37	M51	Z	-.006	-.006	0	0
38	M52	Z	-.005	-.005	0	0
39	M53	Z	-.005	-.005	0	0
40	M54	Z	-.006	-.006	0	0
41	M55	Z	-.006	-.006	0	0
42	M56	Z	-.005	-.005	0	0
43	M59	Z	-.005	-.005	0	0
44	M60	Z	-.005	-.005	0	0
45	M69	Z	-.006	-.006	0	0
46	M70A	Z	-.005	-.005	0	0
47	M71A	Z	-.005	-.005	0	0
48	M72A	Z	-.005	-.005	0	0
49	M73A	Z	-.005	-.005	0	0
50	M78	Z	-.002	-.002	0	0
51	M83	Z	-.002	-.002	0	0
52	M88	Z	-.002	-.002	0	0
53	M89	Z	-.005	-.005	0	0
54	M90	Z	-.005	-.005	0	0
55	M91	Z	-.005	-.005	0	0

Member Distributed Loads (BLC 5 : 90 Wind - Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.007	-.007	0	0
2	M2	X	-.012	-.012	0	0
3	M3	X	-.007	-.007	0	0
4	M4	X	-.012	-.012	0	0
5	M5	X	-.012	-.012	0	0
6	M6	X	-.007	-.007	0	0
7	M8	X	-.002	-.002	0	0
8	M10	X	-.002	-.002	0	0
9	M14	X	-.002	-.002	0	0
10	M15	X	-.002	-.002	0	0
11	M16	X	-.002	-.002	0	0
12	M18	X	-.002	-.002	0	0
13	M22	X	-.002	-.002	0	0
14	M23	X	-.002	-.002	0	0
15	M24	X	-.002	-.002	0	0
16	M26	X	-.002	-.002	0	0
17	M30	X	-.002	-.002	0	0

Member Distributed Loads (BLC 5 : 90 Wind - Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
18	M31	X	-.002	-.002	0	0
19	M32	X	-.006	-.006	0	0
20	M33	X	-.006	-.006	0	0
21	M34	X	-.006	-.006	0	0
22	M35	X	-.006	-.006	0	0
23	M36	X	-.006	-.006	0	0
24	M37	X	-.006	-.006	0	0
25	M38	X	-.006	-.006	0	0
26	M39	X	-.006	-.006	0	0
27	M40	X	-.006	-.006	0	0
28	M41	X	-.006	-.006	0	0
29	M42	X	-.006	-.006	0	0
30	M43	X	-.006	-.006	0	0
31	M44	X	-.006	-.006	0	0
32	M45	X	-.005	-.005	0	0
33	M46	X	-.005	-.005	0	0
34	M48	X	-.005	-.005	0	0
35	M49	X	-.005	-.005	0	0
36	M50	X	-.006	-.006	0	0
37	M51	X	-.006	-.006	0	0
38	M52	X	-.005	-.005	0	0
39	M53	X	-.005	-.005	0	0
40	M54	X	-.006	-.006	0	0
41	M55	X	-.006	-.006	0	0
42	M56	X	-.005	-.005	0	0
43	M59	X	-.005	-.005	0	0
44	M60	X	-.005	-.005	0	0
45	M69	X	-.006	-.006	0	0
46	M70A	X	-.005	-.005	0	0
47	M71A	X	-.005	-.005	0	0
48	M72A	X	-.005	-.005	0	0
49	M73A	X	-.005	-.005	0	0
50	M78	X	-.002	-.002	0	0
51	M83	X	-.002	-.002	0	0
52	M88	X	-.002	-.002	0	0
53	M89	X	-.005	-.005	0	0
54	M90	X	-.005	-.005	0	0
55	M91	X	-.005	-.005	0	0

Member Distributed Loads (BLC 6 : 0 Wind - Service)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	-.002	-.002	0	0
2	M2	Z	-.002	-.002	0	0
3	M3	Z	-.002	-.002	0	0
4	M4	Z	-.002	-.002	0	0
5	M5	Z	-.002	-.002	0	0
6	M6	Z	-.002	-.002	0	0
7	M8	Z	-.0003	-.0003	0	0
8	M10	Z	-.0003	-.0003	0	0
9	M14	Z	-.0003	-.0003	0	0
10	M15	Z	-.0003	-.0003	0	0

Member Distributed Loads (BLC 6 : 0 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
11	M16	Z	-.0003	-.0003	0	0
12	M18	Z	-.0003	-.0003	0	0
13	M22	Z	-.0003	-.0003	0	0
14	M23	Z	-.0003	-.0003	0	0
15	M24	Z	-.0003	-.0003	0	0
16	M26	Z	-.0003	-.0003	0	0
17	M30	Z	-.0003	-.0003	0	0
18	M31	Z	-.0003	-.0003	0	0
19	M32	Z	-.001	-.001	0	0
20	M33	Z	-.001	-.001	0	0
21	M34	Z	-.001	-.001	0	0
22	M35	Z	-.001	-.001	0	0
23	M36	Z	-.001	-.001	0	0
24	M37	Z	-.001	-.001	0	0
25	M38	Z	-.001	-.001	0	0
26	M39	Z	-.001	-.001	0	0
27	M40	Z	-.001	-.001	0	0
28	M41	Z	-.001	-.001	0	0
29	M42	Z	-.001	-.001	0	0
30	M43	Z	-.001	-.001	0	0
31	M44	Z	-.001	-.001	0	0
32	M45	Z	-.0006	-.0006	0	0
33	M46	Z	-.0008	-.0008	0	0
34	M48	Z	-.0006	-.0006	0	0
35	M49	Z	-.0008	-.0008	0	0
36	M50	Z	-.001	-.001	0	0
37	M51	Z	-.001	-.001	0	0
38	M52	Z	-.0006	-.0006	0	0
39	M53	Z	-.0008	-.0008	0	0
40	M54	Z	-.001	-.001	0	0
41	M55	Z	-.001	-.001	0	0
42	M56	Z	-.0009	-.0009	0	0
43	M59	Z	-.0008	-.0008	0	0
44	M60	Z	-.0008	-.0008	0	0
45	M69	Z	-.001	-.001	0	0
46	M70A	Z	-.0009	-.0009	0	0
47	M71A	Z	-.0007	-.0007	0	0
48	M72A	Z	-.0007	-.0007	0	0
49	M73A	Z	-.0009	-.0009	0	0
50	M78	Z	-.0003	-.0003	0	0
51	M83	Z	-.0003	-.0003	0	0
52	M88	Z	-.0003	-.0003	0	0
53	M89	Z	-.0007	-.0007	0	0
54	M90	Z	-.0007	-.0007	0	0
55	M91	Z	-.0007	-.0007	0	0

Member Distributed Loads (BLC 7 : 90 Wind - Service)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	-.002	-.002	0	0
2	M2	X	-.002	-.002	0	0
3	M3	X	-.002	-.002	0	0

Member Distributed Loads (BLC 7 : 90 Wind - Service) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
4	M4	X	-.002	-.002	0	0
5	M5	X	-.002	-.002	0	0
6	M6	X	-.002	-.002	0	0
7	M8	X	-.0003	-.0003	0	0
8	M10	X	-.0003	-.0003	0	0
9	M14	X	-.0003	-.0003	0	0
10	M15	X	-.0003	-.0003	0	0
11	M16	X	-.0003	-.0003	0	0
12	M18	X	-.0003	-.0003	0	0
13	M22	X	-.0003	-.0003	0	0
14	M23	X	-.0003	-.0003	0	0
15	M24	X	-.0003	-.0003	0	0
16	M26	X	-.0003	-.0003	0	0
17	M30	X	-.0003	-.0003	0	0
18	M31	X	-.0003	-.0003	0	0
19	M32	X	-.001	-.001	0	0
20	M33	X	-.001	-.001	0	0
21	M34	X	-.001	-.001	0	0
22	M35	X	-.001	-.001	0	0
23	M36	X	-.001	-.001	0	0
24	M37	X	-.001	-.001	0	0
25	M38	X	-.001	-.001	0	0
26	M39	X	-.001	-.001	0	0
27	M40	X	-.001	-.001	0	0
28	M41	X	-.001	-.001	0	0
29	M42	X	-.001	-.001	0	0
30	M43	X	-.001	-.001	0	0
31	M44	X	-.001	-.001	0	0
32	M45	X	-.0006	-.0006	0	0
33	M46	X	-.0008	-.0008	0	0
34	M48	X	-.0006	-.0006	0	0
35	M49	X	-.0008	-.0008	0	0
36	M50	X	-.001	-.001	0	0
37	M51	X	-.001	-.001	0	0
38	M52	X	-.0006	-.0006	0	0
39	M53	X	-.0008	-.0008	0	0
40	M54	X	-.001	-.001	0	0
41	M55	X	-.001	-.001	0	0
42	M56	X	-.0009	-.0009	0	0
43	M59	X	-.0008	-.0008	0	0
44	M60	X	-.0008	-.0008	0	0
45	M69	X	-.001	-.001	0	0
46	M70A	X	-.0009	-.0009	0	0
47	M71A	X	-.0007	-.0007	0	0
48	M72A	X	-.0007	-.0007	0	0
49	M73A	X	-.0009	-.0009	0	0
50	M78	X	-.0003	-.0003	0	0
51	M83	X	-.0003	-.0003	0	0
52	M88	X	-.0003	-.0003	0	0
53	M89	X	-.0007	-.0007	0	0
54	M90	X	-.0007	-.0007	0	0
55	M91	X	-.0007	-.0007	0	0

Member Distributed Loads (BLC 8 : Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.008	-.008	0	0
2	M2	Y	-.014	-.014	0	0
3	M3	Y	-.008	-.008	0	0
4	M4	Y	-.014	-.014	0	0
5	M5	Y	-.014	-.014	0	0
6	M6	Y	-.008	-.008	0	0
7	M8	Y	-.005	-.005	0	0
8	M10	Y	-.005	-.005	0	0
9	M14	Y	-.005	-.005	0	0
10	M15	Y	-.005	-.005	0	0
11	M16	Y	-.005	-.005	0	0
12	M18	Y	-.005	-.005	0	0
13	M22	Y	-.005	-.005	0	0
14	M23	Y	-.005	-.005	0	0
15	M24	Y	-.005	-.005	0	0
16	M26	Y	-.005	-.005	0	0
17	M30	Y	-.005	-.005	0	0
18	M31	Y	-.005	-.005	0	0
19	M32	Y	-.01	-.01	0	0
20	M33	Y	-.009	-.009	0	0
21	M34	Y	-.01	-.01	0	0
22	M35	Y	-.009	-.009	0	0
23	M36	Y	-.01	-.01	0	0
24	M37	Y	-.009	-.009	0	0
25	M38	Y	-.01	-.01	0	0
26	M39	Y	-.009	-.009	0	0
27	M40	Y	-.01	-.01	0	0
28	M41	Y	-.009	-.009	0	0
29	M42	Y	-.01	-.01	0	0
30	M43	Y	-.009	-.009	0	0
31	M44	Y	-.006	-.006	0	0
32	M45	Y	-.006	-.006	0	0
33	M46	Y	-.006	-.006	0	0
34	M48	Y	-.006	-.006	0	0
35	M49	Y	-.006	-.006	0	0
36	M50	Y	-.006	-.006	0	0
37	M51	Y	-.006	-.006	0	0
38	M52	Y	-.006	-.006	0	0
39	M53	Y	-.006	-.006	0	0
40	M54	Y	-.006	-.006	0	0
41	M55	Y	-.006	-.006	0	0
42	M56	Y	-.006	-.006	0	0
43	M59	Y	-.006	-.006	0	0
44	M60	Y	-.006	-.006	0	0
45	M69	Y	-.006	-.006	0	0
46	M70A	Y	-.006	-.006	0	0
47	M71A	Y	-.006	-.006	0	0
48	M72A	Y	-.006	-.006	0	0
49	M73A	Y	-.006	-.006	0	0
50	M78	Y	-.005	-.005	0	0
51	M83	Y	-.005	-.005	0	0
52	M88	Y	-.005	-.005	0	0

Member Distributed Loads (BLC 8 : Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
53	M89	Y	-.006	-.006	0	0
54	M90	Y	-.006	-.006	0	0
55	M91	Y	-.006	-.006	0	0

Member Distributed Loads (BLC 28 : BLC 1 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M3	Y	-1.6e-5	-.000552	7.8	8.84
2	M3	Y	-.000552	-.004	8.84	9.88
3	M3	Y	-.004	-.004	9.88	10.92
4	M3	Y	-.004	-.002	10.92	11.96
5	M3	Y	-.002	-.002	11.96	13
6	M6	Y	-3.6e-5	-.000571	7.8	8.84
7	M6	Y	-.000571	-.004	8.84	9.88
8	M6	Y	-.004	-.005	9.88	10.92
9	M6	Y	-.005	-.003	10.92	11.96
10	M6	Y	-.003	-.002	11.96	13
11	M25	Y	-.005	-.005	0	.224
12	M44	Y	-.001	-.006	0	.8
13	M44	Y	-.006	-.008	.8	1.6
14	M44	Y	-.008	-.008	1.6	2.4
15	M44	Y	-.008	-.006	2.4	3.2
16	M44	Y	-.006	-.001	3.2	4
17	M45	Y	-.002	-.002	0	.5
18	M46	Y	-.002	-.006	0	.433
19	M46	Y	-.006	-.015	.433	.867
20	M46	Y	-.015	-.015	.867	1.3
21	M46	Y	-.015	-.007	1.3	1.733
22	M46	Y	-.007	-.002	1.733	2.167
23	M69	Y	-.000723	-.000761	0	.837
24	M69	Y	-.000761	-.000779	.837	1.674
25	M69	Y	-.000779	-.000814	1.674	2.511
26	M69	Y	-.000814	-.000794	2.511	3.348
27	M69	Y	-.000794	-.00068	3.348	4.185
28	M69	Y	-.004	-.004	3.175	4.175
29	M71A	Y	-.007	-.007	.246	1.599
30	M69	Y	-.004	-.004	.01	1.01
31	M72A	Y	-.007	-.007	.21	1.562
32	M3	Y	-.004	-.006	3.9	5.633
33	M3	Y	-.006	-.007	5.633	7.367
34	M3	Y	-.007	-.008	7.367	9.1
35	M60	Y	-.009	-.009	0	.501
36	M70A	Y	-.008	-.008	.238	3.275
37	M6	Y	-.008	-.007	3.9	5.633
38	M6	Y	-.007	-.006	5.633	7.367
39	M6	Y	-.006	-.004	7.367	9.1
40	M72A	Y	-.009	-.009	1.308	1.81
41	M73A	Y	-.008	-.008	.238	3.275
42	M51	Y	-.009	-.007	0	1.395
43	M51	Y	-.007	-.005	1.395	2.79
44	M51	Y	-.005	-.006	2.79	4.185
45	M60	Y	-.014	-.01	0	1.315

Member Distributed Loads (BLC 28 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
46	M60	Y	-.01	-.006	1.315	2.63
47	M1	Y	-.004	-.003	0	1.04
48	M1	Y	-.003	-.004	1.04	2.08
49	M1	Y	-.004	-.004	2.08	3.12
50	M1	Y	-.004	-.000493	3.12	4.16
51	M1	Y	-.000493	4.1e-5	4.16	5.2
52	M3	Y	-.002	-.004	0	1.04
53	M3	Y	-.004	-.005	1.04	2.08
54	M3	Y	-.005	-.003	2.08	3.12
55	M3	Y	-.003	-.000642	3.12	4.16
56	M3	Y	-.000642	-8.8e-5	4.16	5.2
57	M48	Y	-.002	-.002	0	.5
58	M49	Y	-.001	-.008	0	.433
59	M49	Y	-.008	-.015	.433	.867
60	M49	Y	-.015	-.014	.867	1.3
61	M49	Y	-.014	-.006	1.3	1.733
62	M49	Y	-.006	-.000737	1.733	2.167
63	M50	Y	-.001	-.006	0	.8
64	M50	Y	-.006	-.008	.8	1.6
65	M50	Y	-.008	-.008	1.6	2.4
66	M50	Y	-.008	-.006	2.4	3.2
67	M50	Y	-.006	-.000943	3.2	4
68	M51	Y	-.000719	-.000759	0	.837
69	M51	Y	-.000759	-.000821	.837	1.674
70	M51	Y	-.000821	-.000839	1.674	2.511
71	M51	Y	-.000839	-.000742	2.511	3.348
72	M51	Y	-.000742	-.000598	3.348	4.185
73	M55	Y	-.006	-.005	0	1.395
74	M55	Y	-.005	-.007	1.395	2.79
75	M55	Y	-.007	-.009	2.79	4.185
76	M59	Y	-.006	-.01	0	1.315
77	M59	Y	-.01	-.014	1.315	2.63
78	M1	Y	-2.2e-5	-.000557	7.8	8.84
79	M1	Y	-.000557	-.004	8.84	9.88
80	M1	Y	-.004	-.004	9.88	10.92
81	M1	Y	-.004	-.003	10.92	11.96
82	M1	Y	-.003	-.002	11.96	13
83	M6	Y	-.002	-.004	0	1.04
84	M6	Y	-.004	-.005	1.04	2.08
85	M6	Y	-.005	-.003	2.08	3.12
86	M6	Y	-.003	-.00063	3.12	4.16
87	M6	Y	-.00063	-7.7e-5	4.16	5.2
88	M13	Y	-.005	-.005	0	.224
89	M52	Y	-.002	-.002	0	.5
90	M53	Y	-.000597	-.006	0	.433
91	M53	Y	-.006	-.015	.433	.867
92	M53	Y	-.015	-.015	.867	1.3
93	M53	Y	-.015	-.007	1.3	1.733
94	M53	Y	-.007	-.003	1.733	2.167
95	M54	Y	-.000869	-.006	0	.8
96	M54	Y	-.006	-.009	.8	1.6
97	M54	Y	-.009	-.008	1.6	2.4

Member Distributed Loads (BLC 28 : BLC 1 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
98	M54	Y	-.008	-.006	2.4	3.2
99	M54	Y	-.006	-.001	3.2	4
100	M55	Y	-.000667	-.000742	0	.837
101	M55	Y	-.000742	-.000821	.837	1.674
102	M55	Y	-.000821	-.000839	1.674	2.511
103	M55	Y	-.000839	-.000759	2.511	3.348
104	M55	Y	-.000759	-.00065	3.348	4.185
105	M1	Y	-.008	-.007	3.9	5.633
106	M1	Y	-.007	-.006	5.633	7.367
107	M1	Y	-.006	-.004	7.367	9.1
108	M56	Y	-.012	-.009	0	1.638
109	M56	Y	-.009	-.006	1.638	3.275

Member Distributed Loads (BLC 29 : BLC 8 Transient Area Loads)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M3	Y	-9e-6	-.000303	7.8	8.84
2	M3	Y	-.000303	-.002	8.84	9.88
3	M3	Y	-.002	-.002	9.88	10.92
4	M3	Y	-.002	-.001	10.92	11.96
5	M3	Y	-.001	-.001	11.96	13
6	M6	Y	-2e-5	-.000313	7.8	8.84
7	M6	Y	-.000313	-.002	8.84	9.88
8	M6	Y	-.002	-.003	9.88	10.92
9	M6	Y	-.003	-.002	10.92	11.96
10	M6	Y	-.002	-.001	11.96	13
11	M25	Y	-.003	-.003	0	.224
12	M44	Y	-.000627	-.003	0	.8
13	M44	Y	-.003	-.005	.8	1.6
14	M44	Y	-.005	-.005	1.6	2.4
15	M44	Y	-.005	-.003	2.4	3.2
16	M44	Y	-.003	-.000559	3.2	4
17	M45	Y	-.001	-.001	0	.5
18	M46	Y	-.001	-.003	0	.433
19	M46	Y	-.003	-.008	.433	.867
20	M46	Y	-.008	-.008	.867	1.3
21	M46	Y	-.008	-.004	1.3	1.733
22	M46	Y	-.004	-.001	1.733	2.167
23	M69	Y	-.000396	-.000417	0	.837
24	M69	Y	-.000417	-.000427	.837	1.674
25	M69	Y	-.000427	-.000446	1.674	2.511
26	M69	Y	-.000446	-.000435	2.511	3.348
27	M69	Y	-.000435	-.000373	3.348	4.185
28	M69	Y	-.002	-.002	3.176	4.176
29	M71A	Y	-.003	-.003	.248	1.6
30	M69	Y	-.002	-.002	.01	1.01
31	M72A	Y	-.003	-.003	.21	1.562
32	M3	Y	-.002	-.003	3.9	5.633
33	M3	Y	-.003	-.004	5.633	7.367
34	M3	Y	-.004	-.004	7.367	9.1
35	M60	Y	-.005	-.005	0	.501
36	M70A	Y	-.004	-.004	.238	3.275

Member Distributed Loads (BLC 29 : BLC 8 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
37	M6	Y	-.004	-.004	3.9	5.633
38	M6	Y	-.004	-.003	5.633	7.367
39	M6	Y	-.003	-.002	7.367	9.1
40	M72A	Y	-.005	-.005	1.308	1.81
41	M73A	Y	-.004	-.004	.238	3.275
42	M51	Y	-.004	-.003	0	1.395
43	M51	Y	-.003	-.003	1.395	2.79
44	M51	Y	-.003	-.003	2.79	4.185
45	M60	Y	-.007	-.005	0	1.315
46	M60	Y	-.005	-.003	1.315	2.63
47	M1	Y	-.002	-.001	0	1.04
48	M1	Y	-.001	-.002	1.04	2.08
49	M1	Y	-.002	-.002	2.08	3.12
50	M1	Y	-.002	-.000247	3.12	4.16
51	M1	Y	-.000247	2e-5	4.16	5.2
52	M3	Y	-.001	-.002	0	1.04
53	M3	Y	-.002	-.003	1.04	2.08
54	M3	Y	-.003	-.002	2.08	3.12
55	M3	Y	-.002	-.000321	3.12	4.16
56	M3	Y	-.000321	-4.4e-5	4.16	5.2
57	M48	Y	-.001	-.001	0	.5
58	M49	Y	-.000613	-.004	0	.433
59	M49	Y	-.004	-.007	.433	.867
60	M49	Y	-.007	-.007	.867	1.3
61	M49	Y	-.007	-.003	1.3	1.733
62	M49	Y	-.003	-.000369	1.733	2.167
63	M50	Y	-.000563	-.003	0	.8
64	M50	Y	-.003	-.004	.8	1.6
65	M50	Y	-.004	-.004	1.6	2.4
66	M50	Y	-.004	-.003	2.4	3.2
67	M50	Y	-.003	-.000471	3.2	4
68	M51	Y	-.000359	-.000379	0	.837
69	M51	Y	-.000379	-.000411	.837	1.674
70	M51	Y	-.000411	-.000419	1.674	2.511
71	M51	Y	-.000419	-.000371	2.511	3.348
72	M51	Y	-.000371	-.000299	3.348	4.185
73	M55	Y	-.003	-.003	0	1.395
74	M55	Y	-.003	-.003	1.395	2.79
75	M55	Y	-.003	-.004	2.79	4.185
76	M59	Y	-.003	-.005	0	1.315
77	M59	Y	-.005	-.007	1.315	2.63
78	M1	Y	-1.1e-5	-.000279	7.8	8.84
79	M1	Y	-.000279	-.002	8.84	9.88
80	M1	Y	-.002	-.002	9.88	10.92
81	M1	Y	-.002	-.001	10.92	11.96
82	M1	Y	-.001	-.001	11.96	13
83	M6	Y	-.001	-.002	0	1.04
84	M6	Y	-.002	-.002	1.04	2.08
85	M6	Y	-.002	-.002	2.08	3.12
86	M6	Y	-.002	-.000315	3.12	4.16
87	M6	Y	-.000315	-3.9e-5	4.16	5.2
88	M13	Y	-.002	-.002	0	.224

Member Distributed Loads (BLC 29 : BLC 8 Transient Area Loads) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
89	M52	Y	-.001	-.001	0	.5
90	M53	Y	-.000298	-.003	0	.433
91	M53	Y	-.003	-.007	.433	.867
92	M53	Y	-.007	-.007	.867	1.3
93	M53	Y	-.007	-.003	1.3	1.733
94	M53	Y	-.003	-.001	1.733	2.167
95	M54	Y	-.000435	-.003	0	.8
96	M54	Y	-.003	-.004	.8	1.6
97	M54	Y	-.004	-.004	1.6	2.4
98	M54	Y	-.004	-.003	2.4	3.2
99	M54	Y	-.003	-.000598	3.2	4
100	M55	Y	-.000334	-.000371	0	.837
101	M55	Y	-.000371	-.000411	.837	1.674
102	M55	Y	-.000411	-.000419	1.674	2.511
103	M55	Y	-.000419	-.000379	2.511	3.348
104	M55	Y	-.000379	-.000325	3.348	4.185
105	M1	Y	-.004	-.004	3.9	5.633
106	M1	Y	-.004	-.003	5.633	7.367
107	M1	Y	-.003	-.002	7.367	9.1
108	M56	Y	-.006	-.004	0	1.638
109	M56	Y	-.004	-.003	1.638	3.275

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	N59	max	-.409	6	1.205	19	4.885	25	1.307	13	.547	4	.98	12
2		min	-3.346	24	.05	13	.609	7	-2.67	7	-.632	10	-1.974	6
3	N65	max	-.723	5	1.24	18	.478	2	.539	13	.501	2	.898	12
4		min	-5.635	23	.186	12	-.465	8	-.691	7	-.752	8	-3.131	5
5	N67	max	.387	3	1.079	14	-.262	2	3.354	2	.125	12	.571	9
6		min	-1.605	9	-.051	8	-4.946	20	-1.815	8	-.844	18	-1.458	3
7	N61	max	1.726	7	1.211	14	-.065	2	3.552	2	.838	22	1.662	13
8		min	-.498	13	.032	8	-5.015	20	-1.612	8	-.138	4	-.437	7
9	N63	max	5.6	17	1.108	22	.472	2	.52	3	.747	8	2.875	10
10		min	.867	11	.102	4	-.471	8	-.756	9	-.501	2	-1.175	4
11	N57	max	3.355	16	1.256	21	4.902	15	1.1	3	.603	6	2.054	10
12		min	.343	10	.091	3	.452	9	-2.932	9	-.529	12	-.892	4
13	Totals:	max	6.12	5	6.588	16	7.584	2						
14		min	-6.12	11	3.233	10	-7.584	8						

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[..Dir		LC	phi*Pn...	phi*Pnt..	phi*Mn...	phi*Mn..	Cb	Eqn
1	M30	PIPE_2.0	.582	4.167	13	.101	4.167		12	23.809	32.13	1.872	1.872	1...	H1-1b
2	M22	PIPE_2.0	.566	4.167	9	.120	4.167		8	23.809	32.13	1.872	1.872	1...	H1-1b
3	M18	PIPE_2.0	.514	5.469	3	.101	5.469		13	17.855	32.13	1.872	1.872	2...	H1-1b
4	M26	PIPE_2.0	.499	5.469	13	.119	5.469		2	17.855	32.13	1.872	1.872	2...	H1-1b
5	M14	PIPE_2.0	.476	4.167	5	.101	4.167		4	23.809	32.13	1.872	1.872	1...	H1-1b
6	M6	L3X3X6	.424	.542	2	.378	3.927	y	13	6.612	68.364	2.307	4.722	1...	H2-1
7	M3	L3X3X6	.414	.542	2	.389	3.927	z	3	6.612	68.364	2.307	4.679	1...	H2-1
8	M10	PIPE_2.0	.403	5.469	11	.107	5.469		8	17.855	32.13	1.872	1.872	2...	H1-1b

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[..	Dir	LC	phi*Pn...	phi*Pnt..	phi*Mn...	phi*Mn...	Cb	Eqn
9	M1	L3X3X6	.398	.542	9	.450	9.073	y	8	6.612	68.364	2.307	4.479	1...	H2-1
10	M90	L2.5x2.5x4	.379	1.287	2	.105	0	y	13	36.526	38.556	1.114	2.537	2...	H2-1
11	M37	HSS3.5X...	.351	1.167	13	.079	1.167	z	10	119.56	120.474	12.075	12.075	1...	H1-1b
12	M83	PIPE_2.0	.348	.651	2	.166	4.167		13	6.295	32.13	1.872	1.872	3...	H1-1b
13	M88	PIPE_2.0	.330	11.849	2	.175	11.7...		9	6.295	32.13	1.872	1.872	3...	H1-1b
14	M43	HSS3.5X...	.330	1.167	3	.073	1.167	z	6	119.56	120.474	12.075	12.075	1...	H1-1b
15	M89	L2.5x2.5x4	.326	0	2	.103	0	y	9	36.526	38.556	1.114	2.537	2...	H2-1
16	M78	PIPE_2.0	.312	.651	9	.219	11.7...		2	6.295	32.13	1.872	1.872	2...	H1-1b
17	M33	HSS3.5X...	.310	1.167	9	.064	1.167	y	11	119.56	120.474	12.075	12.075	1...	H1-1b
18	M41	HSS3.5X...	.296	1.167	6	.078	1.167	y	7	119.56	120.474	12.075	12.075	1...	H1-1b
19	M35	HSS3.5X...	.290	1.167	7	.069	1.167	y	5	119.56	120.474	12.075	12.075	1...	H1-1b
20	M39	HSS3.5X...	.276	1.167	10	.084	1.167	y	9	119.56	120.474	12.075	12.075	1...	H1-1b
21	M91	L2.5x2.5x4	.275	1.287	6	.080	0	y	5	36.526	38.556	1.114	2.537	2...	H2-1
22	M16	PIPE_2.0	.274	5.469	2	.121	5.469		13	17.855	32.13	1.872	1.872	2...	H1-1b
23	M31	PIPE_2.0	.260	4.167	2	.132	4.167		3	23.809	32.13	1.872	1.872	1...	H1-1b
24	M8	PIPE_2.0	.239	5.469	10	.121	5.469		9	17.855	32.13	1.872	1.872	2...	H1-1b
25	M53	L2X2X0.22	.238	2.167	13	.035	2.167	z	13	21.38	26.944	.631	1.423	2...	H2-1
26	M24	PIPE_2.0	.237	5.469	6	.098	5.469		5	17.855	32.13	1.872	1.872	1...	H1-1b
27	M49	L2X2X0.22	.234	2.167	9	.035	0	z	9	21.38	26.944	.631	1.423	2...	H2-1
28	M23	PIPE_2.0	.234	4.167	10	.113	4.167		12	23.809	32.13	1.872	1.872	1...	H1-1b
29	M15	PIPE_2.0	.233	4.167	6	.145	4.167		7	23.809	32.13	1.872	1.872	1...	H1-1b
30	M56	L2X2X0.22	.207	3.275	19	.013	0	z	11	15.883	26.944	.631	1.422	1...	H2-1
31	M73A	L2X2X0.22	.205	3.275	22	.015	3.275	z	9	15.883	26.944	.631	1.423	2...	H2-1
32	M69	L2X2X0.22	.192	2.485	24	.021	1.875	z	11	11.368	26.944	.631	1.357	1...	H2-1
33	M46	L2X2X0.22	.191	2.167	5	.028	0	z	5	21.38	26.944	.631	1.423	2...	H2-1
34	M60	L2X2X0.22	.175	2.63	19	.010	0	y	3	19.165	26.944	.631	1.423	1...	H2-1
35	M36	HSS4X4X4	.175	2.417	2	.061	2.417	z	10	136.149	139.518	16.181	16.181	1...	H1-1b
36	M71A	L2X2X0.22	.171	0	2	.016	0	z	23	22.927	26.944	.631	1.423	1...	H2-1
37	M59	L2X2X0.22	.166	0	21	.009	0	y	7	19.165	26.944	.631	1.423	1...	H2-1
38	M70A	L2X2X0.22	.164	0	18	.015	0	z	7	15.883	26.944	.631	1.416	1...	H2-1
39	M42	HSS4X4X4	.163	2.417	2	.057	2.417	z	6	136.149	139.518	16.181	16.181	1...	H1-1b
40	M48	L2X2X0.22	.161	.5	9	.072	0	z	9	26.614	26.944	.631	1.423	2...	H2-1
41	M51	L2X2X0.22	.157	0	24	.009	0	z	3	11.368	26.944	.631	1.423	2...	H2-1
42	M72A	L2X2X0.22	.155	1.81	2	.012	1.81	z	17	22.927	26.944	.631	1.423	1...	H2-1
43	M52	L2X2X0.22	.152	.5	13	.072	0	z	13	26.614	26.944	.631	1.423	2...	H2-1
44	M32	HSS4X4X4	.146	2.417	9	.050	2.417	y	11	136.149	139.518	16.181	16.181	1...	H1-1b
45	M55	L2X2X0.22	.143	0	16	.008	0	z	7	11.368	26.944	.631	1.417	2...	H2-1
46	M45	L2X2X0.22	.139	.5	5	.059	0	z	5	26.614	26.944	.631	1.423	2...	H2-1
47	M34	HSS4X4X4	.134	2.417	7	.053	2.417	y	5	136.149	139.518	16.181	16.181	1...	H1-1b
48	M40	HSS4X4X4	.133	2.417	5	.061	2.417	y	7	136.149	139.518	16.181	16.181	1...	H1-1b
49	M38	HSS4X4X4	.122	2.417	11	.065	2.417	y	9	136.149	139.518	16.181	16.181	1...	H1-1b
50	M44	L2X2X0.22	.110	0	14	.008	4	y	11	12.25	26.944	.631	1.423	2...	H2-1
51	M50	L2X2X0.22	.102	0	17	.009	4	z	2	12.25	26.944	.631	1.423	3...	H2-1
52	M54	L2X2X0.22	.098	0	22	.009	4	y	7	12.25	26.944	.631	1.423	2...	H2-1
53	M5	L6X7X0.4	.009	0	8	.107	.292	y	13	133.892	163.296	12.408	28.001	2...	H2-1
54	M2	L6X7X0.4	.008	.292	9	.105	.292	y	9	133.892	163.296	12.408	28.001	2...	H2-1
55	M4	L6X7X0.4	.007	0	12	.083	.292	y	5	133.892	163.296	12.408	28.001	2...	H2-1

APPENDIX B

(Force calculation tables

PROJECT	**130656.002.01 - FAIRFIELD GREENFIE SP**				
SUBJECT	**Platform Mount - Mount Analysis**				
DATE	**02/08/19**	PAGE	1	OF	5

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

INPUT

[REF: ANSI/TIA-222-H]

Tower Type		:	MP		
Tower Height		:	150	ft	
Mount Elevation		:	126	ft	
Antenna Elevation		:	127	ft	
Crest Height		:	0	ft	
Risk Category		:	II		[Table 2-1]
Exposure Category		:	C		[Sec. 2.6.5.1.2]
Topography Category		:	1		[Sec. 2.6.6.2]
Wind Velocity	V	:	118	mph	[Annex B]
Ice wind Velocity	V_i	:	50	mph	[Annex B]
Service Velocity	V_s	:	30	mph	[Annex B]
Base Ice thickness	t_i	:	1	in	[Annex B]

ANTENNAS

	Manufacturer	Model	Height (in)	Front Width (in)	Side Width (in)	Weight (lbs)	Shape	Quantity	Location (%)
Mount Pipe **M15**									
	Powerwave	7770	55.00	11.00	5.00	35.00	Flat	0.5	5
	Powerwave	7770	55.00	11.00	5.00	35.00	Flat	0.5	95
	Powerwave	LGP 21401	14.40	2.60	9.20	14.10	Flat	2	65
Mount Pipe **M14**									
	Kathrein	800-10965	78.70	20.00	6.90	108.60	Flat	0.5	5
	Kathrein	800-10965	78.70	20.00	6.90	108.60	Flat	0.5	95
	ERICSSON	B5/B12 4449	14.96	10.43	13.19	73.00	Flat	1	50
	ERICSSON	4415 B30	16.54	5.39	13.47	47.40	Flat	1	50
Mount Pipe **M8**									
	CCI	HPA-65R-BUU-H6	72.00	14.80	9.00	50.70	Flat	0.5	30
	CCI	HPA-65R-BUU-H6	72.00	14.80	9.00	50.70	Flat	0.5	85
Mount Pipe **M35**									
	RAYCAP	DC6-48-60-18-8F	31.25	11.00	11.00	32.80	Round	1	50
Mount Pipe **M31**									
	Powerwave	7770	55.00	11.00	5.00	35.00	Flat	0.5	5
	Powerwave	7770	55.00	11.00	5.00	35.00	Flat	0.5	95
	Powerwave	LGP 21401	14.40	2.60	9.20	14.10	Flat	2	65
Mount Pipe **M30**									
	Kathrein	800-10965	78.70	20.00	6.90	108.60	Flat	0.5	5
	Kathrein	800-10965	78.70	20.00	6.90	108.60	Flat	0.5	95
	ERICSSON	B5/B12 4449	14.96	10.43	13.19	73.00	Flat	1	50
	ERICSSON	4415 B30	16.54	5.39	13.47	47.40	Flat	1	50

PROJECT	**130656.002.01 - FAIRFIELD G**		**SP**
SUBJECT	**Platform Mount - Mount Analysis**		
DATE	**02/08/19**	PAGE	OF

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Manufacturer	Model	Qty	Aspect Ratio	C_a flat/round	A_A (ft^2) Normal	A_A (ft^2) Trans.	$A_{A\text{-}Ice}$ (ft^2) Normal	$A_{A\text{-}ice}$ (ft^2) Trans.	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$
Powerwave	7770	0.5	5.00	1.31	2.10	0.95	2.64	1.45	0.12	0.07	0.02	0.01
Powerwave	7770	0.5	5.00	1.31	2.10	0.95	2.64	1.45	0.12	0.07	0.02	0.01
Powerwave	LGP 21401	2	5.54	1.34	0.52	1.84	1.13	2.66	0.03	0.10	0.01	0.02
Kathrein	800-10965	0.5	3.94	1.26	5.47	1.89	6.27	2.58	0.31	0.13	0.06	0.02
Kathrein	800-10965	0.5	3.94	1.26	5.47	1.89	6.27	2.58	0.31	0.13	0.06	0.02
ERICSSON	B5/B12 4449	1	1.43	1.20	1.08	1.37	1.52	1.85	0.06	0.07	0.01	0.01
ERICSSON	4415 B30	1	3.07	1.23	0.62	1.55	1.00	2.06	0.03	0.08	0.01	0.02
CCI	HPA-65R-BUU-H6	0.5	4.86	1.31	3.70	2.25	4.41	2.91	0.22	0.15	0.04	0.03
CCI	HPA-65R-BUU-H6	0.5	4.86	1.31	3.70	2.25	4.41	2.91	0.22	0.15	0.04	0.03
RAYCAP	DC6-48-60-18-8F	1	2.84	0.51	2.39	2.39	3.09	3.09	0.05	0.05	0.01	0.01
Powerwave	7770	0.5	5.00	1.31	2.10	0.95	2.64	1.45	0.12	0.07	0.02	0.01
Powerwave	7770	0.5	5.00	1.31	2.10	0.95	2.64	1.45	0.12	0.07	0.02	0.01
Powerwave	LGP 21401	2	5.54	1.34	0.52	1.84	1.13	2.66	0.03	0.10	0.01	0.02
Kathrein	800-10965	0.5	3.94	1.26	5.47	1.89	6.27	2.58	0.31	0.13	0.06	0.02
Kathrein	800-10965	0.5	3.94	1.26	5.47	1.89	6.27	2.58	0.31	0.13	0.06	0.02
ERICSSON	B5/B12 4449	1	1.43	1.20	1.08	1.37	1.52	1.85	0.06	0.07	0.01	0.01
ERICSSON	4415 B30	1	3.07	1.23	0.62	1.55	1.00	2.06	0.03	0.08	0.01	0.02

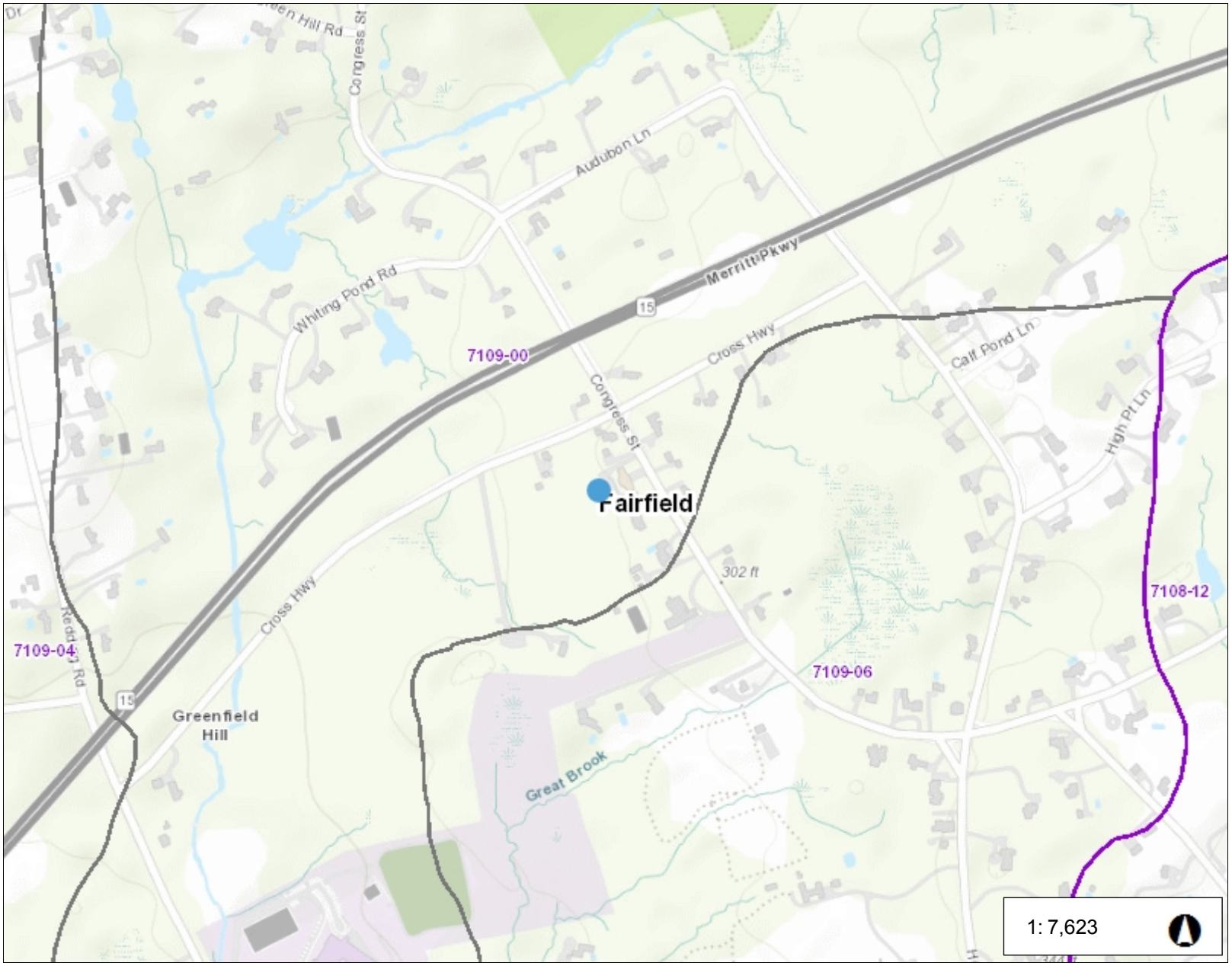
PROJECT	**130656.002.01 - FAIRFIELD G**		**SP**
SUBJECT	**Platform Mount - Mount Analysis**		
DATE	**02/08/19**	PAGE	OF

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630

Manufacturer	Model	Qty	Aspect Ratio	C_a flat/round	A_A (ft^2) Normal	A_A (ft^2) Trans.	$A_{A\text{-}Ice}$ (ft^2) Normal	$A_{A\text{-}ice}$ (ft^2) Trans.	$F_{A\ No\ Ice\ (N)}$	$F_{A\ No\ Ice\ (T)}$	$F_{A\ Ice\ (N)}$	$F_{A\ Ice\ (T)}$
CCI	HPA-65R-BUU-H6	0.5	4.86	1.31	3.70	2.25	4.41	2.91	0.00	0.15	0.04	0.03
CCI	HPA-65R-BUU-H6	0.5	4.86	1.31	3.70	2.25	4.41	2.91	0.00	0.15	0.04	0.03
Powerwave	7770	0.5	5.00	1.31	2.10	0.95	2.64	1.45	0.00	0.07	0.02	0.01
Powerwave	7770	0.5	5.00	1.31	2.10	0.95	2.64	1.45	0.00	0.07	0.02	0.01
Powerwave	LGP 21401	2	5.54	1.34	0.52	1.84	1.13	2.66	0.00	0.10	0.01	0.02
Kathrein	800-10965	0.5	3.94	1.26	5.47	1.89	6.27	2.58	0.00	0.13	0.06	0.02
Kathrein	800-10965	0.5	3.94	1.26	5.47	1.89	6.27	2.58	0.00	0.13	0.06	0.02
ERICSSON	B5/B12 4449	1	1.43	1.20	1.08	1.37	1.52	1.85	0.00	0.07	0.01	0.01
ERICSSON	4415 B30	1	3.07	1.23	0.62	1.55	1.00	2.06	0.00	0.08	0.01	0.02
CCI	HPA-65R-BUU-H6	0.5	4.86	1.31	3.70	2.25	4.41	2.91	0.00	0.15	0.04	0.03
CCI	HPA-65R-BUU-H6	0.5	4.86	1.31	3.70	2.25	4.41	2.91	0.00	0.15	0.04	0.03

Town of Fairfield

3965 CONGRESS ST



1: 7,623

Legend

- Local Basin Boundary
  - Major
  - Regional
  - Subregional
  - Local
- Local Basin Area
- Town Boundary

1,270.5 0 635.23 1,270.5 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Created by Greater Bridgeport Regional Council

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

METROCOG
Connecticut Metropolitan Council of Governments

3965 CONGRESS STREET

Location	3965 CONGRESS STREET	**Mblu**	170/ 41/ / /
Acct#	05308	**Owner**	FAIRFIELD TOWN OF
Assessment	$939,330	**Appraisal**	$1,341,900
PID	14189	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$508,400	$833,500	$1,341,900
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$355,880	$583,450	$939,330

Owner of Record

Owner	FAIRFIELD TOWN OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	725 OLD POST ROAD FAIRFIELD, CT 06824	**Book & Page**	395/ 523
		Sale Date	

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
FAIRFIELD TOWN OF	$0		395/ 523	

Building Information

Building 1 : Section 1

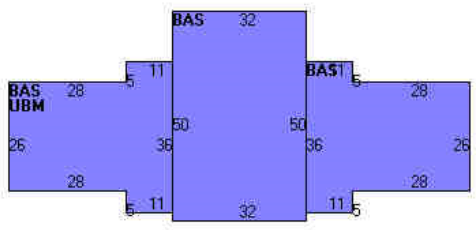
Year Built:	1959
Living Area:	3,848
Replacement Cost:	$670,756
Building Percent Good:	60
Replacement Cost Less Depreciation:	$402,500

Building Attributes	
Field	**Description**
STYLE	Fire Station
MODEL	Ind/Comm
Stories:	1
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	Brick/Masonry
Roof Structure	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Minim/Masonry
Interior Wall 2	Plywood Panel
Interior Floor 1	Concr-Finished
Interior Floor 2	Vinyl/Asphalt
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	None
Bldg Use	Fire Dept
Total Rooms	
Total Bedrms	00
Total Baths	0
Liv Area	
Effect Area	
1st Floor Use:	9032
Heat/AC	None
Frame Type	Masonry
Baths/Plumbing	Average

Building Photo

(http://images.vgsi.com/photos2/FairfieldCTPhotos//\02\03\13/91.jpg)

Building Layout



(http://images.vgsi.com/photos2/FairfieldCTPhotos//Sketches/14

Building Sub-Areas (sq ft)			
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	3,848	3,848
UBM	Basement, Unfinished	1,124	0
		4,972	3,848

Extra Features

Extra Features				
Code	**Description**	**Size**	**Value**	**Bldg #**

SPR1	SPRINKLERS-WET	4972 S.F.	$6,900	1

Land

Land Use

Use Code	9032
Description	Fire Dept
Zone	
Neighborhood	C6
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	1.2
Depth	0
Assessed Value	$583,450
Appraised Value	$833,500

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	PAVING-ASPHALT			5000 S.F.	$15,800	1
LT1	LIGHTS-IN W/PL			1 UNITS	$700	1
SHD2	W/LIGHTS ETC			80 S.F.	$1,200	1
GEN1	GENERATOR			1 UNITS	$10,000	1
SHD5	CELL SHED			300 SF	$16,200	1
SHD5	CELL SHED			300 SF	$16,200	1
SHD5	CELL SHED			300 SF	$16,200	1
SHD5	CELL SHED			300 SF	$16,200	1
FN4	FENCE-8' CHAIN			600 L.F.	$6,500	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$508,400	$833,500	$1,341,900
2017	$508,400	$833,500	$1,341,900
2016	$508,400	$833,500	$1,341,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2018	$355,880	$583,450	$939,330
2017	$355,880	$583,450	$939,330
2016	$355,880	$583,450	$939,330

UNITED STATES POSTAL SERVICE®

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$7.35
US POSTAGE
Flat Rate Env

04/13/2019 Mailed from 06268 062S0000000315

P

PRIORITY MAIL 2-DAY™

Expected Delivery Date: 04/15/19

MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

0004

Carrier -- Leave if No Response

C005

SHIP TO: MICHAEL TETREAU
TOWN OF FAIRFIELD
725 OLD POST RD
CC: JIM WENDT - PLANNING DIRECTOR
FAIRFIELD CT 06824-6684

USPS TRACKING #

9405 5036 9930 0476 1838 79

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0476 1838 79

Trans. #:	461509641
Print Date:	04/12/2019
Ship Date:	04/13/2019
Expected Delivery Date:	04/15/2019

Priority Mail® Postage:	**$7.35**
Total	**$7.35**

From: MARK J ROBERTS
QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: MICHAEL TETREAU
TOWN OF FAIRFIELD
725 OLD POST RD
CC: JIM WENDT - PLANNING DIRECTOR
FAIRFIELD CT 06824-6684

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE®

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