QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
Mark.Roberts@QCDevelopment.net

September 27, 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) – CT2490
886 Main Street, East Hartford, CT 06108
N 41.76944444
W 72.64277778

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the rooftop level (112' and 120' AGL) of the 11-story apartment building at 886 Main Street, East Hartford, CT. The property is owned by Hartford East Associates. AT&T now intends to add three (3) CCI HPA-65R-BU66A antennas and (3) Ericsson B25 4415 Remote Radio Units (RRU).

This facility was approved by the Connecticut Siting Council in Petition # 324 on August 9, 1994 and AT&T's shared use of the facility was approved on September 19, 2014 (TS-CING-043-140822). These approvals included no conditions that could feasibly be violated by this proposed modification, including total facility height and mounting restrictions. This modification therefore complies with the aforementioned approvals.

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 Ms. Marcia LeClerc, Mayor of the Town of East Hartford, and the East Hartford Development & Planning Department as well as the property owner.

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

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: Mayor Marcia LeClerc - Elected Official
Jeffrey Cormier – Town Planner
Hartford East Associates - Property Owner

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*							5.85%
AT&T LTE	1	1476	107	0.0520	700	0.4667	1.12%
AT&T LTE	1	1000	107	0.0353	850	0.5667	0.62%
AT&T 5G	1	1000	107	0.0353	850	0.5667	0.62%
AT&T LTE	2	3664	107	0.2583	1900	1.0000	2.58%
AT&T LTE	1	3837	107	0.1353	2100	1.0000	1.35%
AT&T LTE	1	1285	107	0.0453	2300	1.0000	0.45%
Site Total							12.60%

*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

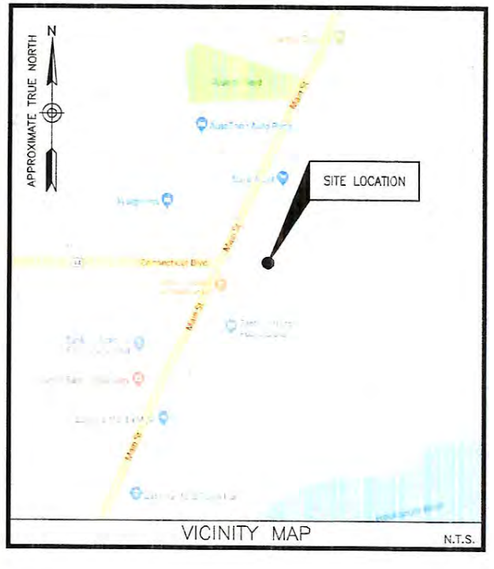
Proposed Loading on Tower

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*							5.85%
AT&T LTE	1	1476	112	0.0472	700	0.4667	1.01%
AT&T LTE	1	1000	112	0.0320	850	0.5667	0.56%
AT&T 5G	1	1000	112	0.0320	850	0.5667	0.56%
AT&T LTE	2	3664	112	0.2345	1900	1.0000	2.35%
AT&T LTE	1	4842	112	0.1550	1900	1.0000	1.55%
AT&T LTE	1	3837	112	0.1228	2100	1.0000	1.23%
AT&T LTE	1	1285	112	0.0411	2300	1.0000	0.41%
Site Total							13.53%

*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: EAST HARTFORD MAIN STREET
SITE NO.: CT2490
886 MAIN STREET
EAST HARTFORD, CT 06108
FA CODE: 10553970
PACE ID: MRCTB038215
PROJECT: LTE 1900 BWE



VICINITY MAP N.T.S.

SITE COORDINATES:
LATITUDE: 41° 46' 09.99" N
LONGITUDE: 72° 38' 34.00" W
*BASED ON PROVIDED RFDS

ELEVATION DATA:
GRADE ELEVATION AT BUILDING = 38'±
*BASED ON GOOGLE EARTH PRO

SITE INFORMATION

- ADD (3) NEW ANTENNA PIPE MASTS & MOUNTING HARDWARE
- ADD (3) NEW 6' HPA-65R-BU6AA HEX ANTENNAS
- ADD (3) NEW B25-4415 RRUS UP TOP

PROJECT DESCRIPTION

SITE NAME:
EAST HARTFORD MAIN STREET

SITE NUMBER:
CT2490

PROPERTY OWNER:
TOWN OF EAST HARTFORD
740 MAIN STREET
EAST HARTFORD, CT 06108

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	ROOF PLAN
C-2	NORTH ELEVATION & EQUIPMENT PLAN
C-3	EXISTING & PROPOSED ANTENNA LAYOUTS
C-4	CONSTRUCTION DETAILS I
C-5	CONSTRUCTION DETAILS II
C-6	PLUMBING DIAGRAM
E-1	GROUNDING NOTES & DETAILS

SHEET INDEX

at&t Mobility

500 ENTERPRISE DRIVE SUITE 3A
ROCKY HILL, CT 06067

12 INDUSTRIAL WAY
SALEM, NH 03079

CT2490
EAST HARTFORD
MAIN STREET

CONSTRUCTION DRAWINGS

0	09/23/19	ISSUED AS FINAL
B	09/17/19	REVISED PER COMMENTS
A	08/13/19	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
BENJAMIN J. RIVERA
28971
LICENSED
PROFESSIONAL ENGINEER

BENJAMIN J. RIVERA, PE
CONNECTICUT LICENSE NO. 28971

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093847

SITE ADDRESS:
886 MAIN STREET
EAST HARTFORD, CT
06108
HARTFORD COUNTY

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.
18. CONTRACTOR, SUBCONTRACTORS AND ANY SITE SPECIFIC PART/ PRODUCT/ CONCEALMENT MANUFACTURER TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO MANUFACTURING, FABRICATION OR CONSTRUCTION.

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 95% 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.

at&t Mobility

500 ENTERPRISE DRIVE SUITE 3A
ROCKY HILL, CT 06067

SAI

12 INDUSTRIAL WAY
SALEM, NH 03079

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EAST HARTFORD
MAIN STREET

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A	08/13/19	ISSUED FOR REVIEW

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Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
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STATE OF CONNECTICUT
BENJAMIN J. ROMANO
28971
LICENSED
PROFESSIONAL ENGINEER
BENJAMIN J. ROMANO
CONNECTICUT LICENSE NO. 28971

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093847

SITE ADDRESS:

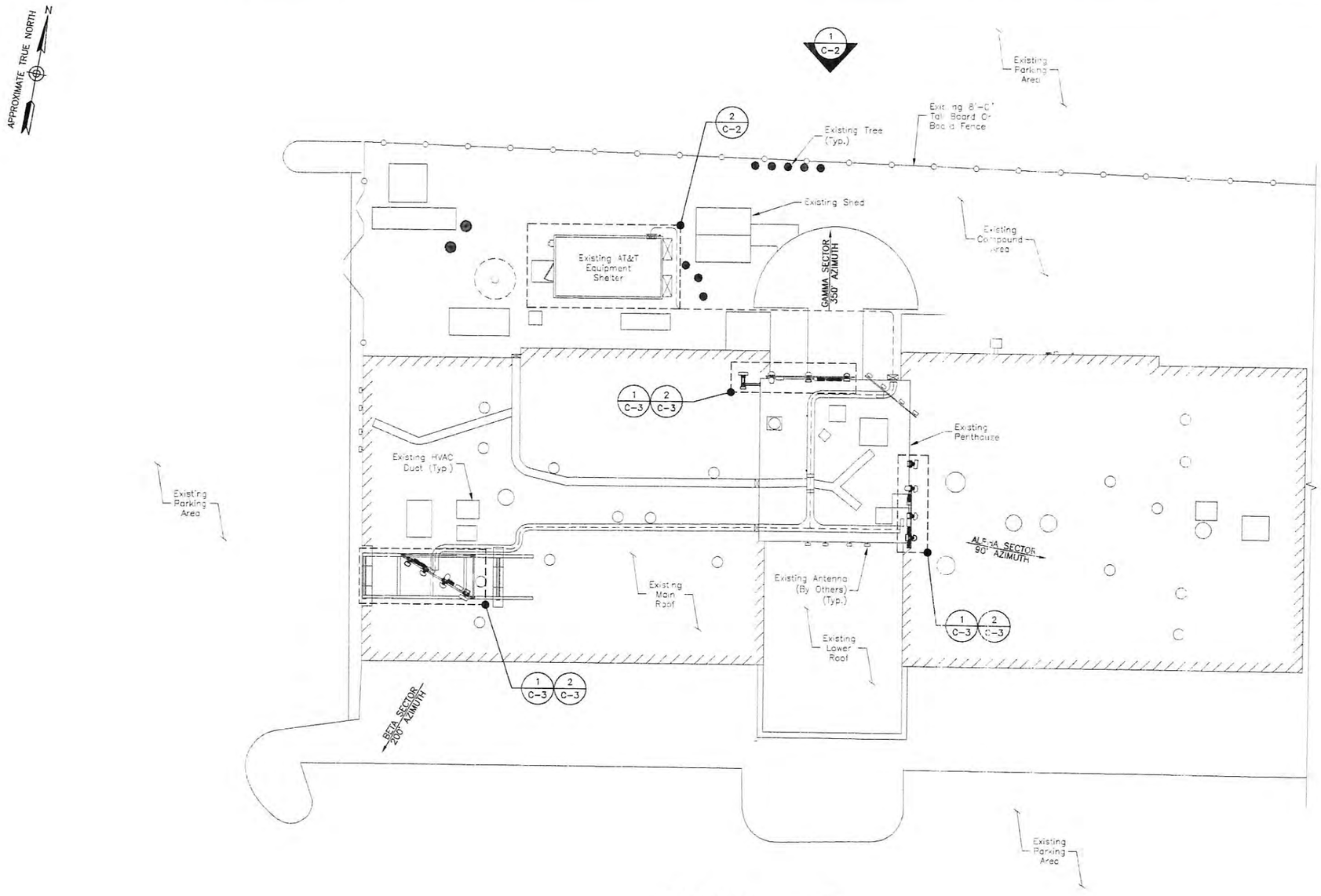
886 MAIN STREET
EAST HARTFORD, CT
06108
HARTFORD COUNTY

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

G-1



ROOF PLAN

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

1

0' 8' 16' 24'

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. NOT ALL EXISTING & PROPOSED INFORMATION SHOWN FOR CLARITY.
3. ROOF PLAN BASED ON SITE VISIT BY CONDUCTED BY DEWBERRY ENGINEERS INC. ON 12/10/18 AND EXISTING DRAWINGS BY HUDSON DESIGN GROUP LLC DATED 11/08/16 & EXISTING DRAWINGS BY DEWBERRY ENGINEERS INC. REV 0 DATED 04/24/19.
4. 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 09/16/19.
5. CONTRACTOR TO VERIFY THE ANTENNA FRAMES MATCH THE EXISTING CONSTRUCTION DRAWINGS BY HUDSON DESIGN GROUP LLC DATED 11/08/16.

at&t Mobility
500 ENTERPRISE DRIVE SUITE 3A
ROCKY HILL, CT 06067
SAI
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SALEM, NH 03079

CT2490
EAST HARTFORD
MAIN STREET

CONSTRUCTION DRAWINGS

0	09/23/19	ISSUED AS FINAL
B	09/17/19	REVISED PER COMMENTS
A	08/13/19	ISSUED FOR REVIEW

Dewberry
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STATE OF CONNECTICUT
BENJAMIN S. HEATH
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PROFESSIONAL ENGINEER

BENJAMIN S. HEATH, PE
CONNECTICUT LICENSE NO. 28971

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093847

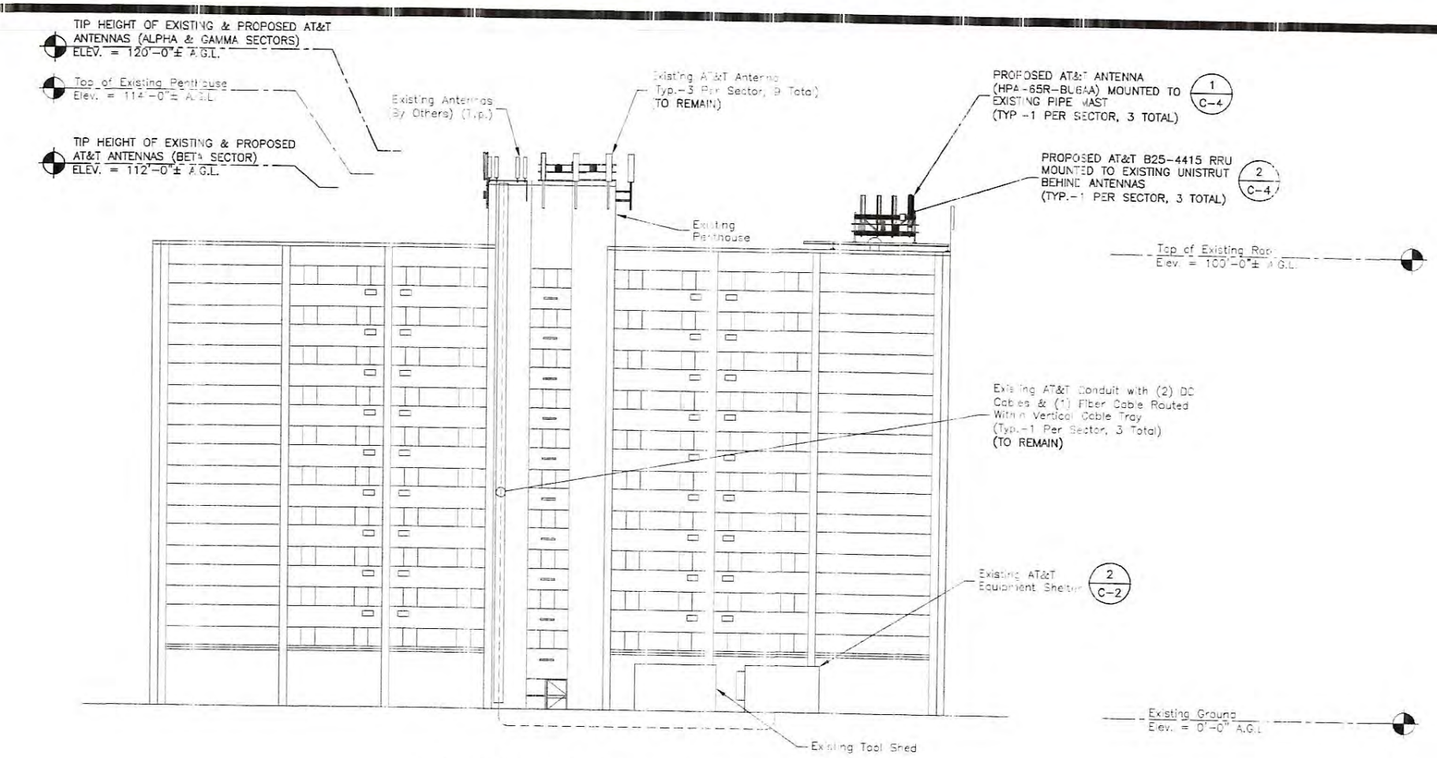
SITE ADDRESS:
886 MAIN STREET
EAST HARTFORD, CT
06108
HARTFORD COUNTY

SHEET TITLE
ROOF PLAN

SHEET NUMBER
C-1

NOTES:

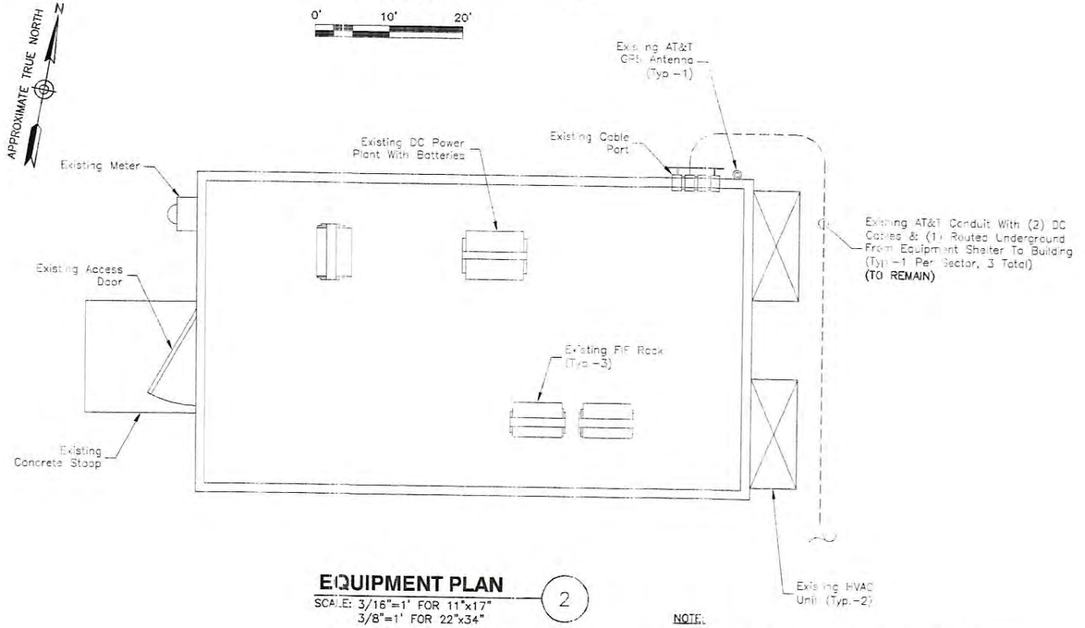
1. NOT ALL EXISTING & PROPOSED INFORMATION SHOWN FOR CLARITY.
2. ELEVATION BASED ON SITE VISIT BY CONDUCTED BY DEWBERRY ENGINEERS INC. ON 07/26/19 AND EXISTING DRAWINGS BY HUDSON DESIGN GROUP LLC DATED 11/08/16.
3. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, TMA'S, RRU'S, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS & MODIFICATION DRAWINGS BY DEWBERRY ENGINEERS INC. DATED 09/16/19.



NORTH ELEVATION

SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"

0' 10' 20'



EQUIPMENT PLAN

2

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

0' 2' 4' 6'

NOTE:

1. NO WORK IS PROPOSED WITH THE EQUIPMENT SHELTER

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BENJAMIN J. RAMSEY, P.E.
CONNECTICUT LICENSE NO. 28971

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093847

SITE ADDRESS:

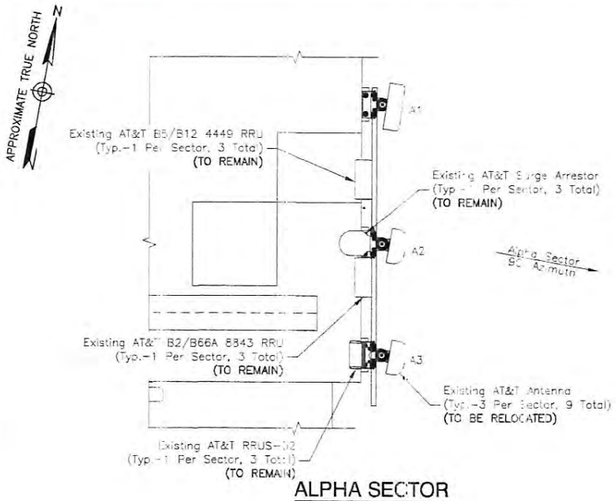
886 MAIN STREET
EAST HARTFORD, CT
06108
HARTFORD COUNTY

SHEET TITLE

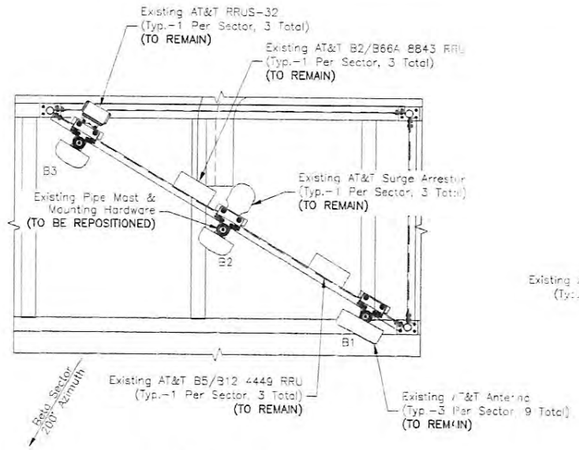
NORTH ELEVATION & EQUIPMENT PLAN

SHEET NUMBER

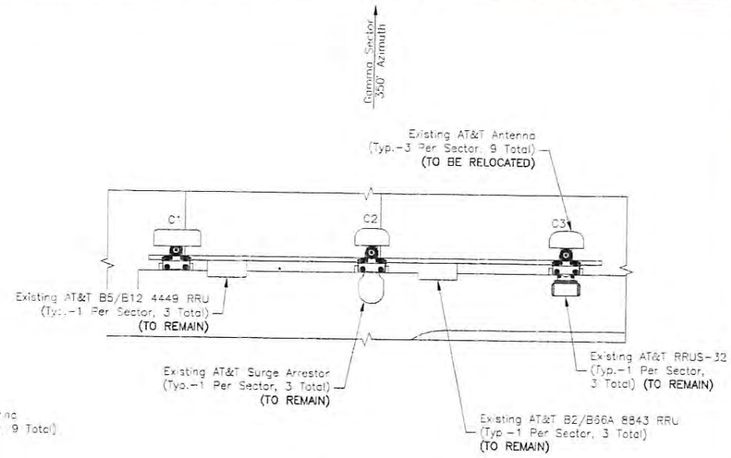
C-2



ALPHA SECTOR



BETA SECTOR



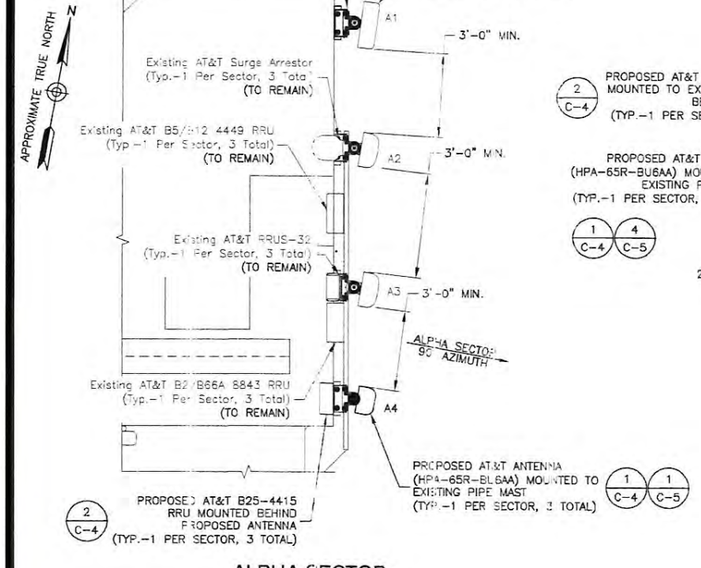
GAMMA SECTOR

EXISTING ANTENNA PLAN

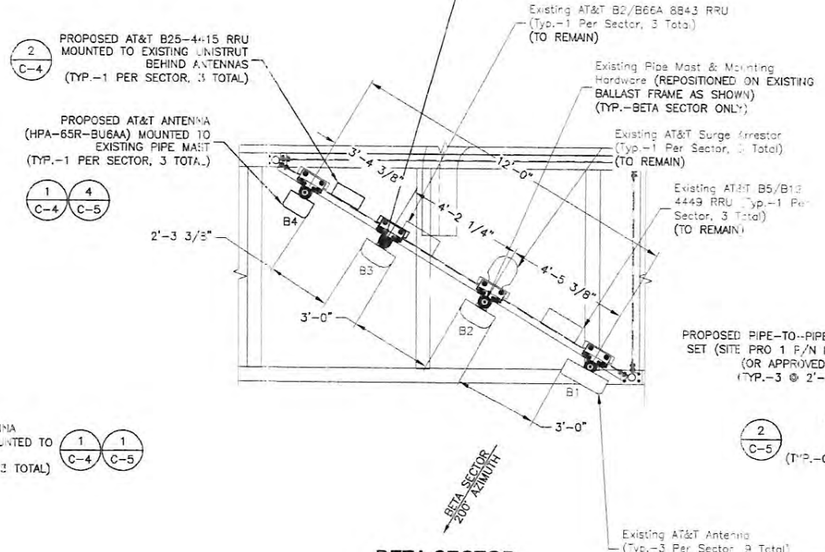
1

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

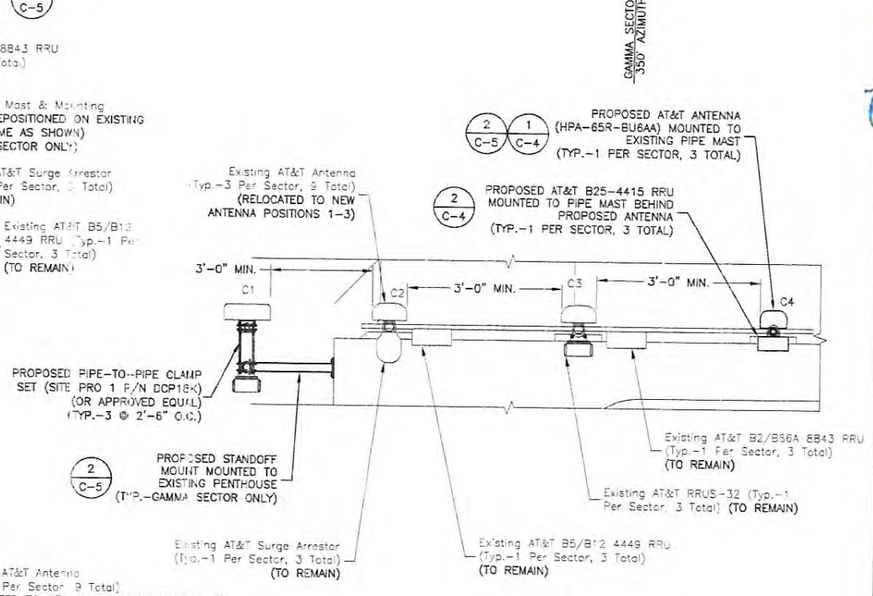
0' 2' 4' 6'



ALPHA SECTOR



BETA SECTOR



GAMMA SECTOR

PROPOSED ANTENNA PLAN

2

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

0' 2' 4' 6'

NOTES:

1. MAINTAIN A MINIMUM 3'-0" SEPARATION BETWEEN ALL EXISTING & PROPOSED ANTENNAS.
2. ALL PROPOSED EQUIPMENT, INCLUDING ANTENNAS, COAX, SURGE ARRESTORS, TMA'S, RRU'S, ETC., SHALL BE MOUNTED IN ACCORDANCE WITH THE TOWER STRUCTURAL ANALYSIS & MODIFICATION DRAWINGS BY DEWBERRY ENGINEERS INC. DATED 09/16/19.
3. ALL EXISTING ALPHA & GAMMA SECTOR ANTENNAS TO BE SHIFTED OVER 1 POSITION TO THE NEW ANTENNA POSITIONS 1-3 AS SHOWN TO ALLOW FOR PROPOSED ANTENNA TO BE INSTALLED AT POSITION 4.
4. EXISTING BETA SECTOR ANTENNAS AT POSITIONS 2 & 3 TO BE RELOCATED AS SHOWN TO ACCOMMODATE AT&T SPACING REQUIREMENTS. PROPOSED BETA SECTOR ANTENNA TO BE INSTALLED AT POSITION 4 AS SHOWN.

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STATE OF CONNECTICUT
BENJAMIN J. REVERE
28971
LICENSED
PROFESSIONAL ENGINEER

BENJAMIN J. REVERE
CONNECTICUT LICENSE NO. 28971

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093847
SITE ADDRESS:	

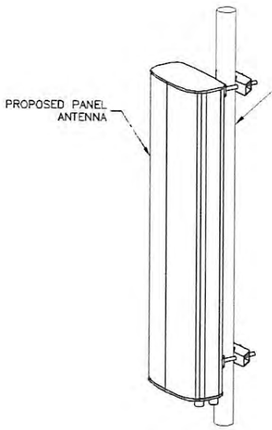
886 MAIN STREET
EAST HARTFORD, CT
06108
HARTFORD COUNTY

SHEET TITLE

EXISTING & PROPOSED ANTENNA LAYOUTS

SHEET NUMBER

C-3

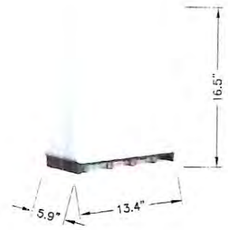


ANTENNA SPECIFICATIONS	
MANUFACTURER	CCI
MODEL NUMBER	HPA-65R-BU6AA
DIMENSIONS (HxWxD)	71.0" x 11.7" x 7.6"
WEIGHT	51.0 LBS

NOTES:

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

ANTENNA DETAIL 1
SCALE: N.T.S.



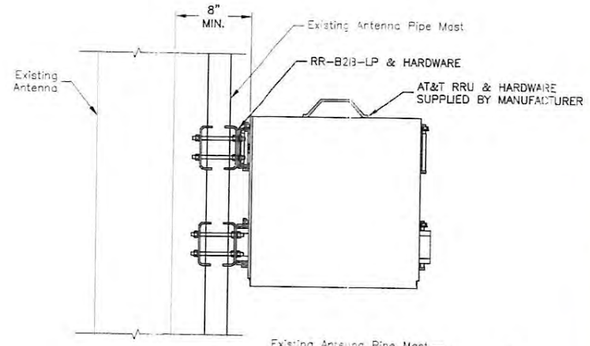
SPECIFICATIONS:
HEIGHT: 16.5"
WIDTH: 13.4"
DEPTH: 5.9"
WEIGHT: 48 LBS

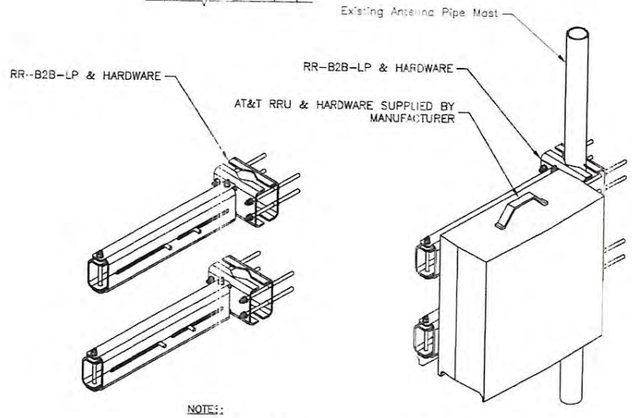
ERICSSON RRUS B25 4415

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 2
SCALE: N.T.S.





NOTES:

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

RRH DUAL BRACKET MOUNT DETAIL 3
SCALE: N.T.S.

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	ANTENNA TIP HEIGHT	AZIMUTH	TMA/DIPLEXER	RRU	FEEDER	RAYCAP
A1	EXISTING	LTE 700 BC/850/AWS	KATHREIN 800-10965	120'-0"	90°	-	(E) ERICSSON RRUS B5/B12 4449	FIBER	(E) (1) RAYCAP DC6-48-60-18-8C
A2	EXISTING	LTE PCS	CCI OPA-65R-LCUU-H6	120'-0"	90°	-	(E) ERICSSON RRUS B2/B66A 8843	FIBER	
A3	EXISTING	LTE WCS	CCI OPA-65R-LCUU-H6	120'-0"	90°	-	(E) ERICSSON RRUS 32	FIBER	
A4	PROPOSED	LTE PCS E & C5	CCI HPA-65R-BU66A	120'-0"	90°	-	(P) ERICSSON RRUS B25 4415	FIBER	
B1	EXISTING	LTE 700 BC/850/AWS	KATHREIN 800-10965	112'-0"	200°	-	(E) ERICSSON RRUS B5/B12 4449	FIBER	(E) (1) RAYCAP DC6-48-60-18-8C
B2	EXISTING	LTE PCS	CCI OPA-65R-LCUU-H6	112'-0"	200°	-	(E) ERICSSON RRUS B2/B66A 8843	FIBER	
B3	EXISTING	LTE WCS	CCI OPA-65R-LCUU-H6	112'-0"	200°	-	(E) ERICSSON RRUS 32	FIBER	
B4	PROPOSED	LTE PCS E & C5	CCI HPA-65R-BU66A	112'-0"	200°	-	(P) ERICSSON RRUS B25 4415	FIBER	
C1	EXISTING	LTE 700 BC/850/AWS	KATHREIN 800-10965	120'-0"	350°	-	(E) ERICSSON RRUS B5/B12 4449	FIBER	(E) (1) RAYCAP DC6-48-60-18-8C
C2	EXISTING	LTE PCS	CCI OPA-65R-LCUU-H6	120'-0"	350°	-	(E) ERICSSON RRUS B2/B66A 8843	FIBER	
C3	EXISTING	LTE WCS	CCI OPA-65R-LCUU-H6	120'-0"	350°	-	(E) ERICSSON RRUS 32	FIBER	
C4	PROPOSED	LTE PCS E & C5	CCI HPA-65R-BU66A	120'-0"	350°	-	(P) ERICSSON RRUS B25 4415	FIBER	

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STATE OF CONNECTICUT
BENJAMIN J. RIZZO
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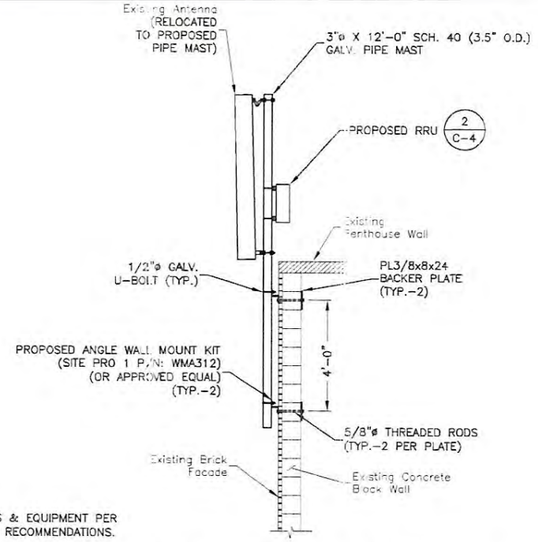
BENJAMIN J. RIZZO, P.E.
CONNECTICUT LICENSE NO. 28971

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093847

SITE ADDRESS:
886 MAIN STREET
EAST HARTFORD, CT
06108
HARTFORD COUNTY

SHEET TITLE
CONSTRUCTION DETAILS 1

SHEET NUMBER
C-4



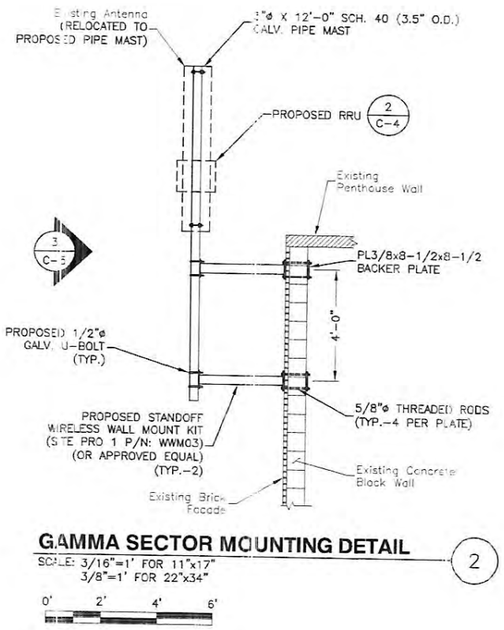
NOTE:

1. MOUNT ANTENNAS & EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.

ALPHA SECTOR MOUNTING DETAIL 1

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

0' 2' 4' 6'



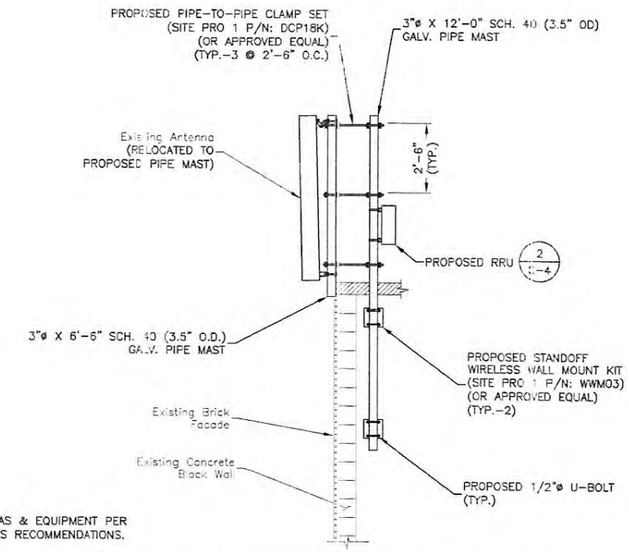
NOTE:

1. MOUNT ANTENNAS & EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.

GAMMA SECTOR MOUNTING DETAIL 2

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

0' 2' 4' 6'



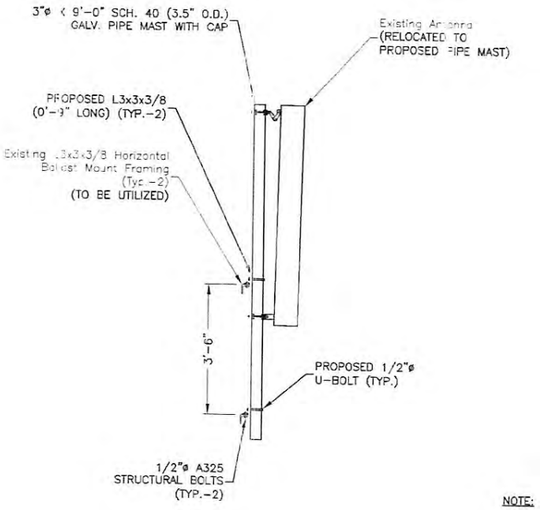
NOTE:

1. MOUNT ANTENNAS & EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.

GAMMA SECTOR MOUNTING DETAIL II 3

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

0' 2' 4' 6'



NOTE:

1. MOUNT ANTENNAS & EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.

BETA SECTOR MOUNTING DETAIL 4

SCALE: 1/4"=1' FOR 11"x17"
1/2"=1' FOR 22"x34"

0' 1' 2' 4'

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STATE OF CONNECTICUT BENJAMIN J. RAMOS 28971 LICENSED PROFESSIONAL ENGINEER

BENJAMIN J. RAMOS, P.E.
CONNECTICUT LICENSE NO. 28971

DRAWN BY:	BJR
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JOB NUMBER:	50093847

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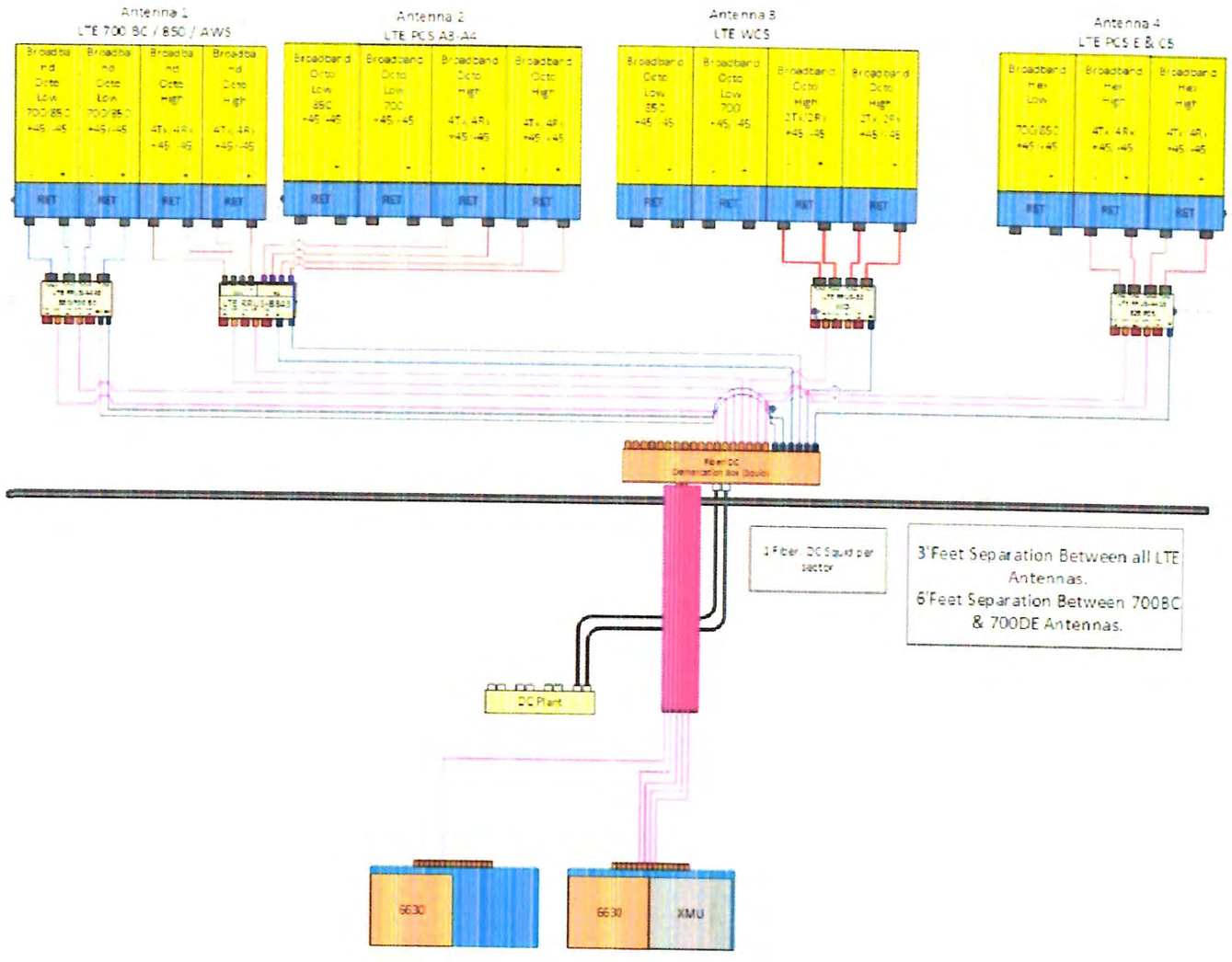
06108
HARTFORD COUNTY

SHEET TITLE
CONSTRUCTION DETAILS II

SHEET NUMBER
C-5



PLUMBING DIAGRAM
SCALE: N.T.S. 1

NOTE:

1. PLUMBING DIAGRAM BASED ON RFDS V1.00 DATED 02/25/19. CONFIRM FINAL PLUMBING DIAGRAM WITH THE LATEST RFDS.

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STATE OF CONNECTICUT
BENJAMIN J. REMPE
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LICENSED
PROFESSIONAL ENGINEER

BENJAMIN J. REMPE, PE
CONNECTICUT LICENSE NO. 28971

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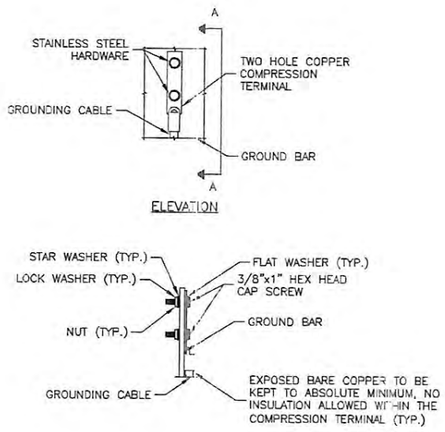
HARTFORD COUNTY

SHEET TITLE
PLUMBING DIAGRAM

SHEET NUMBER
C-6

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 CRIP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTORS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
17. COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
18. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
19. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
20. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
21. BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
22. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.

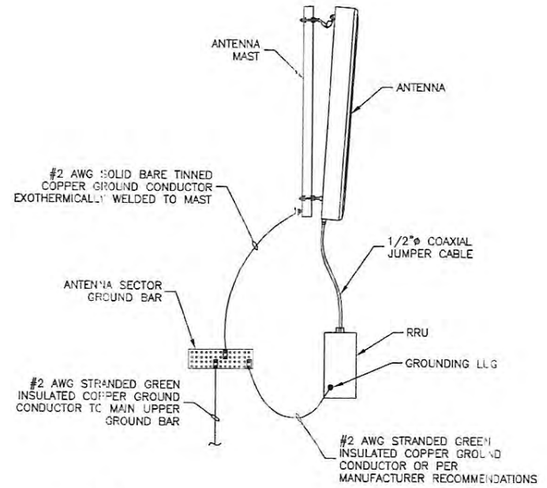


NOTES:

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

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL 1

SCALE: N.T.S.



NOTES:

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

TYPICAL ANTENNA GROUNDING DETAIL 2

SCALE: N.T.S

at&t Mobility

500 ENTERPRISE DRIVE SUITE 3A
ROCKY HILL, CT 06067

SAI

12 INDUSTRIAL WAY
SALEM, NH 03079

CT2490
EAST HARTFORD
MAIN STREET

CONSTRUCTION DRAWINGS

0	09/23/19	ISSUED AS FINAL
B	09/17/19	REVISED PER COMMENTS
A	08/13/19	ISSUED FOR REVIEW

Dewberry®

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STATE OF CONNECTICUT
BENJAMIN J. RAUTIO
28971
LICENSED PROFESSIONAL ENGINEER

BENJAMIN J. RAUTIO
CONNECTICUT LICENSE NO. 28971

DRAWN BY:	BJR
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50055106
JOB NUMBER:	50093847

SITE ADDRESS:

886 MAIN STREET
EAST HARTFORD, CT
06108
HARTFORD COUNTY

SHEET TITLE

GROUNDING NOTES & DETAILS

SHEET NUMBER

E-1

Dewberry

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Structural Analysis Report and Design Calculations For a Wireless Telecommunications facility

Site ID #: CT2490
Site Address: 886 Main Street
Hartford, CT 06108

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

Rev. 1

September 16, 2019

Prepared by:
Dewberry Engineers Inc.
600 Parsippany Road
Parsippany, NJ 07054
Dewberry Project Number: 50093847

Analysis Condition	Utilization	Pass/Fail
Existing Mount (Alpha)	24.4% (Strength)	Pass
Existing Mount (Beta)	N/A	Pass
Existing Mount (Gamma)	24.4% (Strength)	Pass
Proposed Mount (Gamma)	37.8% (Strength)	Pass

Prepared by:

Cory Senney
Graduate Engineer

Reviewed by:

Sahnoune Abed
Structural Project Engineer

Reviewed by:

Benjamin B. Revette, P.E.
Connecticut Professional Engineer
License No.: 28971

TABLE OF CONTENTS

1.0 INTRODUCTION AND PROJECT SUMMARY

The objective of this report is to assess the structural integrity of the installation of new antennas and associated equipment on existing cantilevered mast pipe mounts in the Alpha and Gamma Sectors, and on a proposed mast pipe mount attached to an existing ballast platform in the Beta Sector. Additionally, the structural integrity of a proposed stand-off mount supporting a relocated antenna will be assessed in this report.

The existing structure is 100 ft tall building located in East Hartford, CT. There are currently existing antennas and support equipment mounted to cantilevered pipe mounts in the Alpha and Gamma Sectors, and to a ballast steel frame in the Beta Sector. The proposed Alpha and Gamma equipment will be attached at an approximate antenna centerline of 117 ft A.G.L. and the proposed Beta equipment will be attached at an approximate antenna centerline of 109 ft A.G.L. The telecommunication upgrade is proposed by AT&T and managed by SAI Communications, Inc.

The installation of all antennas, equipment, cables and accessories are to be performed in accordance with construction drawings prepared by Dewberry Engineers Inc.

2.0 EXISTING AND PROPOSED ANTENNAS & EQUIPMENT

Currently, each sector contains the following equipment:

- Two (2) CCI OPA-65R-LCUU-H6 panel antennas measuring 72"H x 14.8"W x 7.4"D weighing 73 lbs each **to remain**
- One (1) Kathrein 800-10965 panel antenna measuring 78.7"H x 20.0"W x 6.9"D weighing 108.6 lbs **to remain**
- One (1) RRUS B5/B12 4449 measuring 17.9"H x 13.2"W x 9.4"D weighing 71 lbs **to remain**
- One (1) RRUS B2/B66A 8843 measuring 14.9"H x 13.2"W x 10.9"D weighing 72 lbs **to be remain**
- One (1) RRUS-32 measuring 26.7"H x 12.1" W x 6.7"D weighing 60 lbs each **to remain**
- One (1) Raycap DC6-48-60-18-8C measuring 26.0"Hx 9.0"D weighing 31.8 lbs **to remain**

The following equipment is proposed at each sector:

- One (1) CCI HPA-65R-BU6AA measuring 71"H x 11.7"W x 7.6"D weighing 51 lbs
- One (1) RRUS B25 4415 measuring 16.5"H x 13.4"W x 5.9"D weighing 46 lbs

Table 1: Appurtenance Loading at Rooftop		
Elev.	Status	Appurtenance Description
109'	Final	(2) CCI OPA-65R-LCUU-H6
109'	Final	(1) Kathrein 800-10965
109'	Final	**(1) CCI HPA-65R-BU6AA**
109'	Final	**(1) RRUS B25 4415**
109'	Final	(1) RRUS-32
109'	Final	(1) Raycap DC6-48-60-18-8C
109'	Final	(1) RRUS B5/B12 4449
109'	Final	(1) RRUS B2/B66A 8843
117'	Final	(4) CCI OPA-65R-LCUU-H6
117'	Final	(2) Kathrein 800-10965
117'	Final	**(2) CCI HPA-65R-BU6AA**
117'	Final	**(2) RRUS B25 4415**
117'	Final	(2) RRUS-32
117'	Final	(2) Raycap DC6-48-60-18-8C
117'	Final	(2) RRUS B5/B12 4449
117'	Final	(2) RRUS B2/B66A 8843

3.0 CODES, STANDARDS, AND REFERENCES

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

- *International Building Code (IBC) 2015, International Council*
- *2018 Connecticut State Building Code – Amendments to IBC 2015*
- *TIA-222-H, Structural Standard for Antenna Supporting Structures and Antennas*
- *Steel Construction Manual 14th Edition, American Institute of Steel Construction*
- *ASCE 7-10 Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers*
- *TMS 402-11/ACI530-11/ASCE 5-11 Building Code Requirements for Masonry Structures*
- *Construction Drawings by Hudson Design Group , dated November 8th, 2016*
- *Structural Analysis by Hudson Design Group, dated February 14, 2014*
- *Radio Frequency Data Sheet (RFDS) by AT&T, dated September 19th, 2018*

4.0 LOADING AND PERFORMANCE CRITERIA

The following Code-specified strength limit state load combinations were considered in the analysis of the antenna mounts *(TIA-222-H)*:

1. 1.2D + 1.0W
2. 1.2D + 1.0D_i + 1.0W_i
3. 1.4D

The following Code-specified serviceability load combination was considered in the deflection of the antenna mounts *(TIA-222-H)*:

4. 1.0D + 1.0$W_{service}$

The following load combination was considered for the stability of the Beta Sector Ballast Mount *(ASCE 7-10)*:

1. 1.0D + 0.6W

Where:

D = Dead Load
D_i = Ice Dead Load
W = Wind Load
W_i = Ice Wind Load
$W_{service}$ = Service Wind Load

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

- Class: II
- Exposure: B
- Design Wind Speed: 123 mph — *ATC Wind Speed*
- Design Ice Wind Speed: 50 mph
- Design Ice Thickness: 1.5 in
- Gust Effect Factor: 0.85 — *Section 2.6.9.1*
- Wind Direction Probability Factor: 0.95 — *Table 2-2*
- Serviceability Wind Speed: 60 mph — *Sect. 2.8.3*

5.0 CALCULATIONS

Calculations for this analysis and the design of the installation are included in the Appendices of this report.

6.0 CONCLUSIONS, COMMENTARY, AND RECOMMENDATIONS

The analysis concludes that the proposed antennas and associated equipment are **adequate** for the proposed installation with the most unfavorable loading condition.

The existing cantilever pipe mounts used to support the proposed and existing equipment at the Alpha and Gamma sectors are loaded to **24.4%** of their strength capacity. The proposed stand-off frame in the Gamma sector is loaded to **37.8%** of its strength capacity. The existing steel ballast frame used to support the proposed and existing equipment at the Beta sector passes stability checks, based on a **minimum Factor of Safety of 1.5**. Based on engineering judgement, the overall stability of the Beta sector governs the design of the ballast frame, not the strength of the steel members.

Existing roof structure appears to be in fair condition at the locations of the proposed equipment.

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.

APPENDIX A

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SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. A-1
By: CS 9/16/2019
Chk: SA 09/17/2019

Analysis of Alpha and Gamma Sector Mast Pipe Mount

Overview

The Alpha and Gamma Sector antenna frames are composed of three cantilevered pipes, thru-bolted into the existing penthouse wall. The pipes are attached with horizontal unistrut members, which support antenna equipment. Since the unistrut is not a structural member, only the cantilevered pipes shall be checked, with the equipment loads from the unistrut being applied to the cantilevered pipe.

Design Criteria and References

1. International Building Code (IBC) 2015, International Code Council
2. 2018 Connecticut State Building Code - Amendments to IBC 2015
3. TIA-222-H, Structural Standard for Antenna Supporting Structures and Antennas
4. Steel Construction Manual 14th Edition, American Institute of Steel Construction
5. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers
6. Existing building plans by The Robinson Green Baretta Corporation, dated December 1982
7. Construction Drawings by Hudson Design Group, dated November 8th, 2016
8. Radio Frequency Data Sheet (RFDS) by AT&T, dated December 24th, 2018

Equipment Dead Loads

	Description	Dimensions (in)			Weight (lb)
		W	D	H	
Antennas/RRHs	**CCI HPA-65R-BU6AA**	**11.70**	**7.60**	**71.00**	**51.00**
	Ericsson RRUS B25 4415	**13.40**	**5.90**	**16.50**	**46.00**
	Ericsson RRUS B2/B66A 8843	13.20	10.90	14.90	72.00

***Bold = Proposed**

Structural Members

Member	Dimensions (in)						Weight (lb/ft)
	d	b_f	t_f	t_w	I.D.	O.D.	
3" XS Pipe					3.07	3.50	7.55

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Job No. 50093847
Sheet No. A-1
By: CS 9/16/2019
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Analysis of Alpha and Gamma Sector Mast Pipe Mount

Wind Load Design Criteria (Per TIA-222-H)

Notation	Value	Description	Reference
V_{max} =	123.00	Design Wind Speed	ASCE 7-10, Appendix D
V_i =	50.00	Design Ice Wind Speed	TIA-222-H, Annex B-9
K_d =	0.95	Wind Direction Probability Factor	TIA-222-H, Table 2-2
Class	II	Risk Category	TIA-222-H, Table 2-1
I =	1.00	Importance Factor (Without Ice)	TIA-222-H, Table 2-3
$I_{ice\ thick}$ =	1.00	Importance Factor (Ice Thickness)	TIA-222-H, Table 2-3
z = h =	117.00	A.G.L. Elevation (ft)	Max. Center of Appurtenance
Exp. Cat.	B	Exposure Category	TIA-222-H, Section 2.6.5.1.2
z_g =	1200.00	Nominal Height of Atmospheric Boundary Layer	TIA-222-H, Table 2-4
a =	7.00	3-Second Gust Wind Speed Power Law Exponent	TIA-222-H, Table 2-4
$K_{z\ (min)}$ =	0.70	Minimum Value for K_z	TIA-222-H, Table 2-4
K_c =	0.90	Terrain Constant	TIA-222-H, Table 2-4
K_t =	N/A	Topographic Constant	TIA-222-H, Table 2-5
K_z =	1.03	Velocity Pressure Coefficient	TIA-222-H, Section 2.6.5.2
Topo. Cat.	1.00	Topographic Category	TIA-222-H, Section 2.6.5.2
e =	2.72	Natural Logarithmic Base	TIA-222-H, Section 2.6.2
f =	N/A	Height Attenuation Factor	TIA-222-H, Table 2-5
H =	N/A	Height of Crest Above Surrounding Terrain (ft)	TIA-222-H, Section 2.6.6.2.1
K_h =	N/A	$e^{((f*z)/H)}$ Height Reduction Factor	TIA-222-H, Section 2.6.6.2.1
K_{zt} =	1.00	$= [1+((K_c*K_t)/K_h)]^2$ Topographic Factor	TIA-222-H, Section 2.6.6.2.1
K_{iz} =	1.13	$= (z/33)^{0.10} \leq 1.4$ Height Escalation Factor	TIA-222-H, Section 2.6.10
G_h =	1.0	Gust Effect Factor	TIA-222-H, Section 2.6.9.1
K_a =	0.9	Shielding Factor	TIA-222-H, Section 16.6
t_i =	1.50	Design Ice Thickness (in)	TIA-222-H, Annex B-9
t_{iz} =	3.40	$2\ t_i(I_{ice\ thick})K_{iz}(K_{zt})^{0.35}$ Thickness of Radial Glaze Ice	TIA-222-H, Section 2.6.10
$q_{z\ design}$ =	34.23	$= 0.00256(K_z)(K_{zt})(K_d)(K_a)(V_{max}^2)(I)$	TIA-222-H, Section 2.6.11.6
$q_{z\ ice}$ =	5.66	$= 0.00256(K_z)(K_{zt})(K_d)(K_a)(V_i^2)$	TIA-222-H, Section 2.6.11.6

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Job No. 50093847
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By: CS 9/16/2019
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Analysis of Alpha and Gamma Sector Mast Pipe Mount

Wind Service Load and Maintenance Load Design Criteria (Per TIA-222-H)

Notation	Value	Description	Reference
$V_{service}$ =	60.00	Design Service Wind Speed	TIA-222-H, Section 2.8.3
$V_{maintenance}$ =	30.00	Design Maintenance Wind Speed	TIA-222-H, Section 16.3
K_d =	0.95	Wind Direction Probability Factor	TIA-222-H, Table 2-2
Class	II	Risk Category	TIA-222-H, Table 2-1
I =	1.00	Importance Factor (Without Ice)	TIA-222-H, Table 2-3
z = h =	117.00	A.G.L. Elevation (ft)	Max. Center of Appurtenance
Exp. Cat.	B	Exposure Category	TIA-222-H, Section 2.6.5.1.2
z_g =	1200.00	Nominal Height of Atmospheric Boundary Layer	TIA-222-H, Table 2-4
a =	7.00	3-Second Gust Wind Speed Power Law Exponent	TIA-222-H, Table 2-4
$K_{z\,(min)}$ =	0.70	Minimum Value for K_z	TIA-222-H, Table 2-4
K_c =	0.90	Terrain Constant	TIA-222-H, Table 2-4
K_t =	N/A	Topographic Constant	TIA-222-H, Table 2-5
K_z =	1.03	Velocity Pressure Coefficient	TIA-222-H, Section 2.6.5.2
Topo. Cat.	1.00	Topographic Category	TIA-222-H, Section 2.6.5.2
e =	2.72	Natural Logarithmic Base	TIA-222-H, Section 2.6.2
f =	N/A	Height Attenuation Factor	TIA-222-H, Table 2-5
H =	N/A	Height of Crest Above Surrounding Terrain (ft)	TIA-222-H, Section 2.6.6.2.1
K_h =	N/A	$e^{((f*z)/H)}$ Height Reduction Factor	TIA-222-H, Section 2.6.6.2.1
K_{zt} =	1.00	$= [1+((K_c*K_t)/K_h)]^2$ Topographic Factor	TIA-222-H, Section 2.6.6.2.1
G_h =	1.0	Gust Effect Factor	TIA-222-H, Section 2.6.9.1
K_a =	0.9	Shielding Factor	TIA-222-H, Section 16.6
$q_{z\ service}$ =	8.14	$= 0.00256(K_z)(K_{zt})(K_d)(K_a)(V_{service}^2)(I)$	TIA-222-H, Section 2.6.11.6
$q_{z\ maintenance}$ =	2.04	$= 0.00256(K_z)(K_{zt})(K_d)(K_a)(V_{maintenance}^2)(I)$	TIA-222-H, Section 2.6.11.6

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Analysis of Alpha and Gamma Sector Mast Pipe Mount

Force Coefficients for Appurtenances, Without Ice (TIA-222-H)

	Equipment	Dimensions (ft)			Area $(A_a)_n$ *(Normal)* *(sf)*	Area $(A_a)_t$ *(Tangent)* *(sf)*	Aspect Ratio *(Normal)*	Aspect Ratio *(Tangent)*	C *Table 2-9*	C_{an} *(Normal)* *Table 2-9*	C_{at} *(Tangent)* *Table 2-9*
		Width *(Normal)*	Length *(tangent)*	0							
Antennas/RRHs	CCI HPA-65R-BU6AA	0.98	0.63	5.92	5.77	3.75	6.07	9.34		1.36	1.48
	Ericsson RRUS B25 4415	1.12	0.49	1.38	1.54	0.68	1.23	2.80		1.20	1.21
	Ericsson RRUS B2/B66A 8843	1.10	0.91	1.24	1.37	1.13	1.13	1.37		1.20	1.20

Force Coefficients for Appurtenances, With Ice (TIA-222-H)

	Equipment	Dimensions (ft)			Area $(A_a)_n$ *(Normal)* *(sf)*	Area $(A_a)_t$ *(Tangent)* *(sf)*	Aspect Ratio *(Normal)*	Aspect Ratio *(Tangent)*	C *Table 2-9*	C_{an} *(Normal)* *Table 2-9*	C_{at} *(Tangent)* *Table 2-9*
		Width *(Normal)*	Length *(tangent)*	Height *(Or Span)*							
Antennas/RRHs	CCI HPA-65R-BU6AA	1.23	0.88	6.17	7.55	5.45	5.03	6.98		1.31	1.40
	Ericsson RRUS B25 4415	1.37	0.74	1.63	2.22	1.21	1.19	2.19		1.20	1.20
	Ericsson RRUS B2/B66A 8843	1.35	1.16	1.49	2.01	1.73	1.10	1.29		1.20	1.20

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SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. A-1
By: CS 9/16/2019
Chk: SA 09/17/2019

Analysis of Alpha and Gamma Sector Mast Pipe Mount

Equipment Wind Loads (TIA-222-H)

$F_A = q_{z\ design} G_h (EPA)_A$ — TIA-222-H, Section 2.6.11.2, Applies to Strength, Service & Maintenance Conditions

$(EPA)_A = C_a A_a$

$F_A = q_{z\ ice} G_h (EPA)_{A\ ice}$ — Ice Condition

$(EPA)_{A\ ice} = C_a A_{a\ ice}$

		No Ice (sf)		Ice (sf)		Strength (lbs)		Ice (lbs)		Service (lbs)			
	Equipment	$(EPA)_A$ (Normal)	$(EPA)_A$ (Tangent)	$(EPA)_A$ (Normal)	$(EPA)_A$ (Tangent)	F_A (Normal)	F_A (Tangent)	F_A (Normal)	F_A (Tangent)	F_A (Normal)	F_A (Tangent)		
Antennas/RRHs	CCI HPA-65R-BU6AA	7.84	5.54	9.92	7.62	268.24	189.57	56.08	43.11	63.83	45.11		
	Ericsson RRUS B25 4415	1.84	0.82	2.67	1.45	63.06	28.07	15.07	8.18	15.01	6.68		
	Ericsson RRUS B2/B66A 8843	1.64	1.35	2.42	2.07	56.10	46.32	13.67	11.73	13.35	11.02		

The proposed antenna frame layout consists of two RRH's, one of which is mounted directly behind the proposed antenna, and the other to unistrut spanning in between the antennas. For simplicity, the loads of 1.5 RRUS will be applied to the pipe STAAD model

Structure Wind Loads (TIA-222-H)

Wind loads on structural elements will be applied linearly: $\omega_{wind} = q_{z\ design} C_a G_h d$, with d being the structure depth or diameter. A conservative Ca value of 1.2 will be used for pipes. This same equation will be used for the service condition, with the service wind load being used, and ice condition, with the ice wind load and ice structure depth/diameter being used.

Member	d (ft)	d_{ice} (ft)	C_a	ω_{wind} (lb/ft)	$\omega_{wind\ ice}$ (lb/ft)	$\omega_{wind\ ser}$ (lb/ft)	
3" XS Pipe	0.38	0.63	1.2	15.40	4.24	3.66	

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SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. A-1
By: CS 9/16/2019
Chk: SA 09/17/2019

Analysis of Alpha and Gamma Sector Mast Pipe Mount

Ice Dead Loads

Equipment	Volume (cf)	$Volume_{w/ice}$ (cf)	$Volume_{ice}$ (cf)	W_{ice} (lb)
CCI HPA-65R-BU6AA	3.65	6.67	3.02	169.08
Ericsson RRUS B25 4415	0.75	1.65	0.89	49.96
Ericsson RRUS B2/B66A 8843	1.24	2.33	1.09	61.15

Structural Member	Perimeter (lf)	$Perimeter_{w/ice}$ (lf)	$Area_{ice}$ (sf)	W_{ice} (lb/ft)
3" XS Pipe	1.18	1.96	0.20	11.00

Load Combinations (TIA-222-H)

1.	$1.2D + 1.0W_o$	Strength Limit State
2.	$1.2D + 1.0D_i + 1.0W_i$	Strength Limit State
3.	$1.4D$	Strength Limit State
4.	$1.0D + 1.0W_s$	Service Limit State

Job Information

	Engineer	Checked	Approved
Name:	CS	SA	
Date:	9/16/2019	9/17/2019	

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	7	Highest Node	7
Number of Elements	6	Highest Beam	6

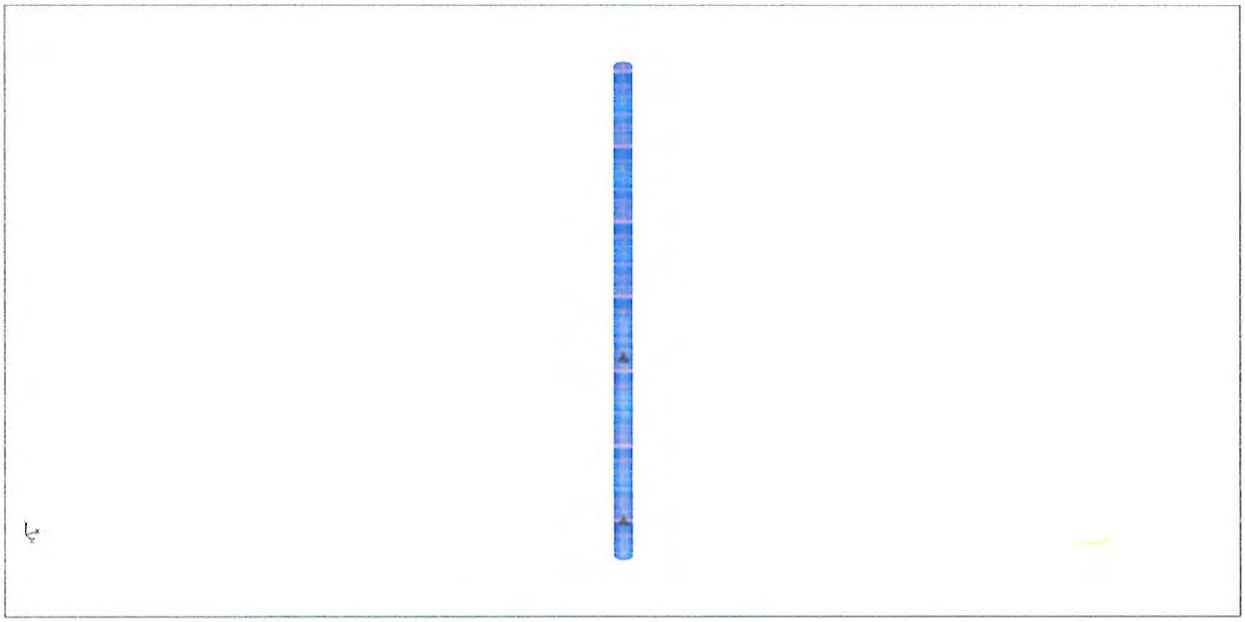
Number of Basic Load Cases	8
Number of Combination Load Cases	7

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

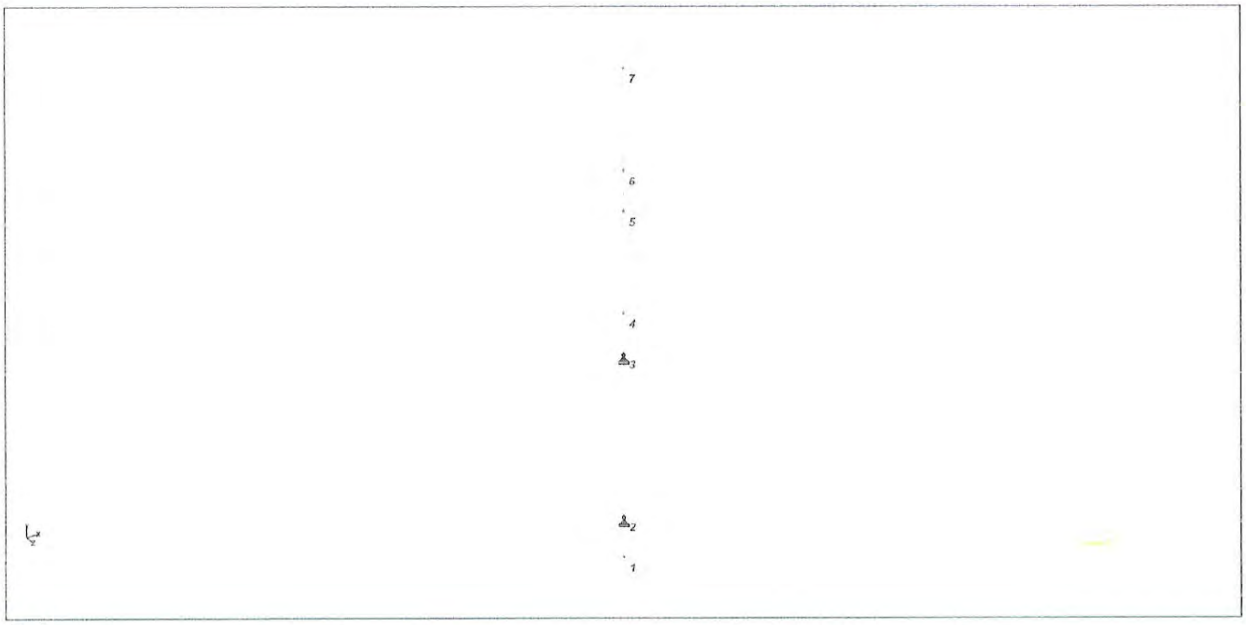
Type	L/C	Name
Primary	1	DL
Primary	2	DI
Primary	3	W(X)O
Primary	4	W(Z)O
Primary	5	W(X)I
Primary	6	W(Z)I
Primary	7	W(X)S
Primary	8	W(Z)S
Combination	9	1.2D + 1.0W(X)O
Combination	10	1.2D + 1.0W(Z)O
Combination	11	1.2D + 1.0DI + 1.0W(X)I
Combination	12	1.2D + 1.0DI + 1.0W(Z)I
Combination	13	1.4D
Combination	14	1.0D + 1.0W(X)S
Combination	15	1.0D + 1.0W(Z)S



Model

Nodes

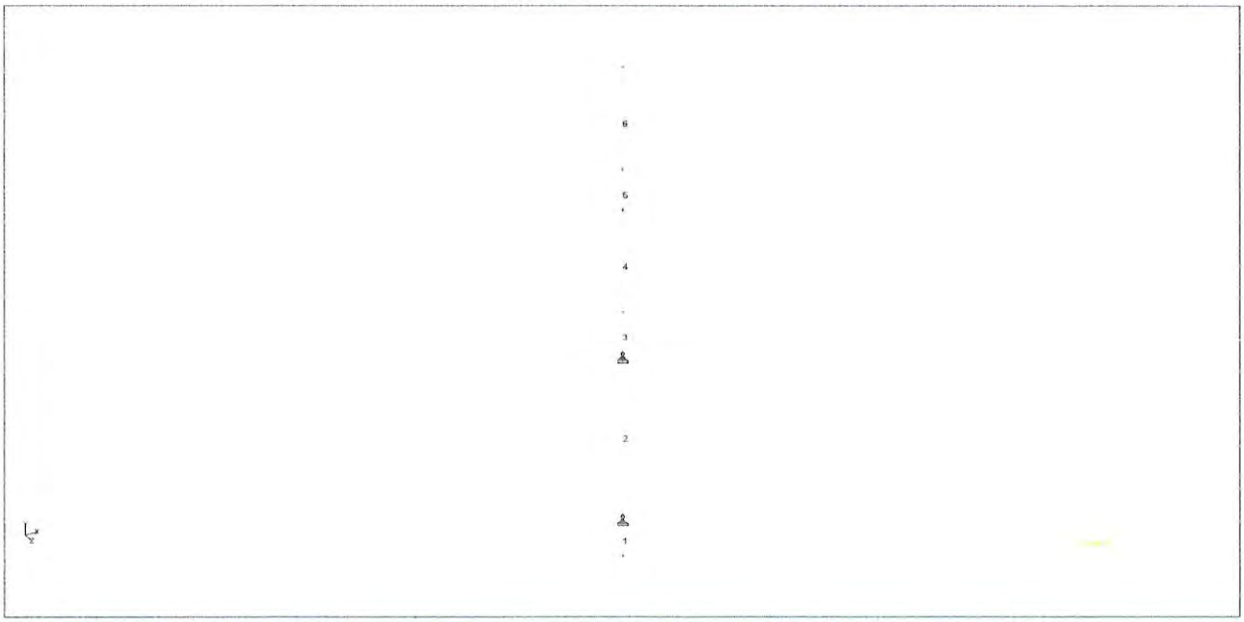
Node	X (ft)	Y (ft)	Z (ft)
1	0	0	0
2	0	1.000	0
3	0	5.000	0
4	0	6.000	0
5	0	8.500	0
6	0	9.500	0
7	0	12.000	0



Nodes

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	2	1.000	1	0
2	2	3	4.000	1	0
3	3	4	1.000	1	0
4	4	5	2.500	1	0
5	5	6	1.000	1	0
6	6	7	2.500	1	0



Members

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
1	PIPS30	2.100	2.850	2.850	5.689	STEEL

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	CONCRETE	3.15E+3	0.170	8.68e-05	5.5E -6
2	ALUMINUM	10E+3	0.330	9.8e-05	12.8E -6
3	STEEL_50_KSI	29E+3	0.300	0.000283	6.5E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000283	9.9E -6
5	STEEL_36_KSI	29E+3	0.300	0.000283	6.5E -6
6	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
7	STEEL	29E+3	0.300	0.000283	6E -6
8	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip-ft/deg)	rY (kip-ft/deg)	rZ (kip-ft/deg)
2	Fixed	Fixed	Fixed	-	-	-
3	Fixed	Fixed	Fixed	-	-	-

Releases

There is no data of this type.

Primary Load Cases

Number	Name	Type
1	DL	Dead
2	DI	Dead
3	W(X)O	Wind
4	W(Z)O	Wind
5	W(X)I	Wind
6	W(Z)I	Wind
7	W(X)S	Wind
8	W(Z)S	Wind

1 DL : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
4	-	-0.0255	-	-	-	-
5	-	-0.059	-	-	-	-
6	-	-0.059	-	-	-	-
7	-	-0.0255	-	-	-	-

1 DL : Selfweight

Direction	Factor	Assigned Geometry
Y	-1.000	ALL

2 DI : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
4	-	-0.08454	-	-	-	-
5	-	-0.0556	-	-	-	-
6	-	-0.0556	-	-	-	-
7	-	-0.08454	-	-	-	-

2 DI : Beam Loads

Beam	Type	Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
1	UNI lbf/ft	GY	-1.100	-	-	-	-
2	UNI lbf/ft	GY	-1.100	-	-	-	-
3	UNI lbf/ft	GY	-1.100	-	-	-	-
4	UNI lbf/ft	GY	-1.100	-	-	-	-
5	UNI lbf/ft	GY	-1.100	-	-	-	-
6	UNI lbf/ft	GY	-1.100	-	-	-	-

3 W(X)O : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
4	0.095	-	-	-	-	-
5	0.0372	-	-	-	-	-
6	0.0372	-	-	-	-	-
7	0.095	-	-	-	-	-

3 W(X)O : Beam Loads

Beam	Type	Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
1	UNI lbf/ft	GX	15.400	-	-	-	-
2	UNI lbf/ft	GX	15.400	-	-	-	-
3	UNI lbf/ft	GX	15.400	-	-	-	-
4	UNI lbf/ft	GX	15.400	-	-	-	-
5	UNI lbf/ft	GX	15.400	-	-	-	-
6	UNI lbf/ft	GX	15.400	-	-	-	-

4 W(Z)O : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
4	-	-	-0.134	-	-	-
7	-	-	-0.134	-	-	-

5 W(X)I : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
4	0.02156	-	-	-	-	-
5	0.01	-	-	-	-	-
6	0.01	-	-	-	-	-
7	0.02156	-	-	-	-	-

5 W(X)I : Beam Loads

Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
1	UNI	lbf/ft	GX	4.240	-	-	-	-
2	UNI	lbf/ft	GX	4.240	-	-	-	-
3	UNI	lbf/ft	GX	4.240	-	-	-	-
4	UNI	lbf/ft	GX	4.240	-	-	-	-
5	UNI	lbf/ft	GX	4.240	-	-	-	-
6	UNI	lbf/ft	GX	4.240	-	-	-	-

6 W(Z)I : Node Loads

Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
4	-	-	-0.02804	-	-	-
7	-	-	-0.02804	-	-	-

7 W(X)S : Node Loads

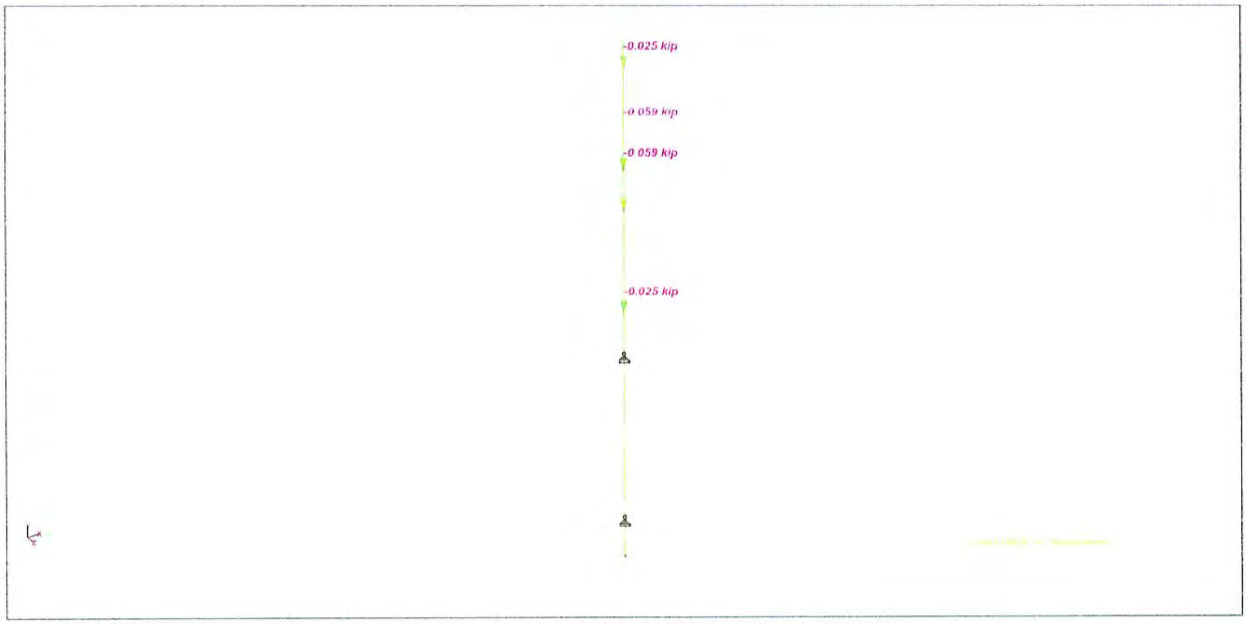
Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
4	0.02256	-	-	-	-	-
5	0.00885	-	-	-	-	-
6	0.00885	-	-	-	-	-
7	0.02256	-	-	-	-	-

7 W(X)S : Beam Loads

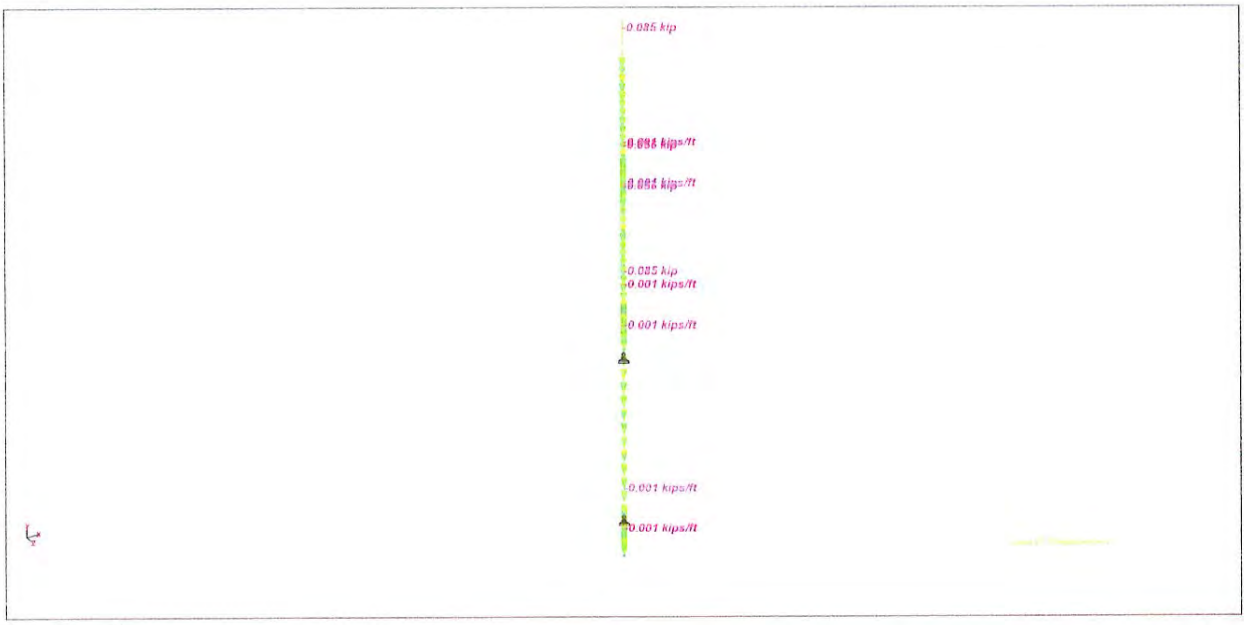
Beam	Type		Direction	Fa	Da (ft)	Fb	Db	Ecc. (ft)
1	UNI	lbf/ft	GX	3.660	-	-	-	-
2	UNI	lbf/ft	GX	3.660	-	-	-	-
3	UNI	lbf/ft	GX	3.660	-	-	-	-
4	UNI	lbf/ft	GX	3.660	-	-	-	-
5	UNI	lbf/ft	GX	3.660	-	-	-	-
6	UNI	lbf/ft	GX	3.660	-	-	-	-

8 W(Z)S : Node Loads

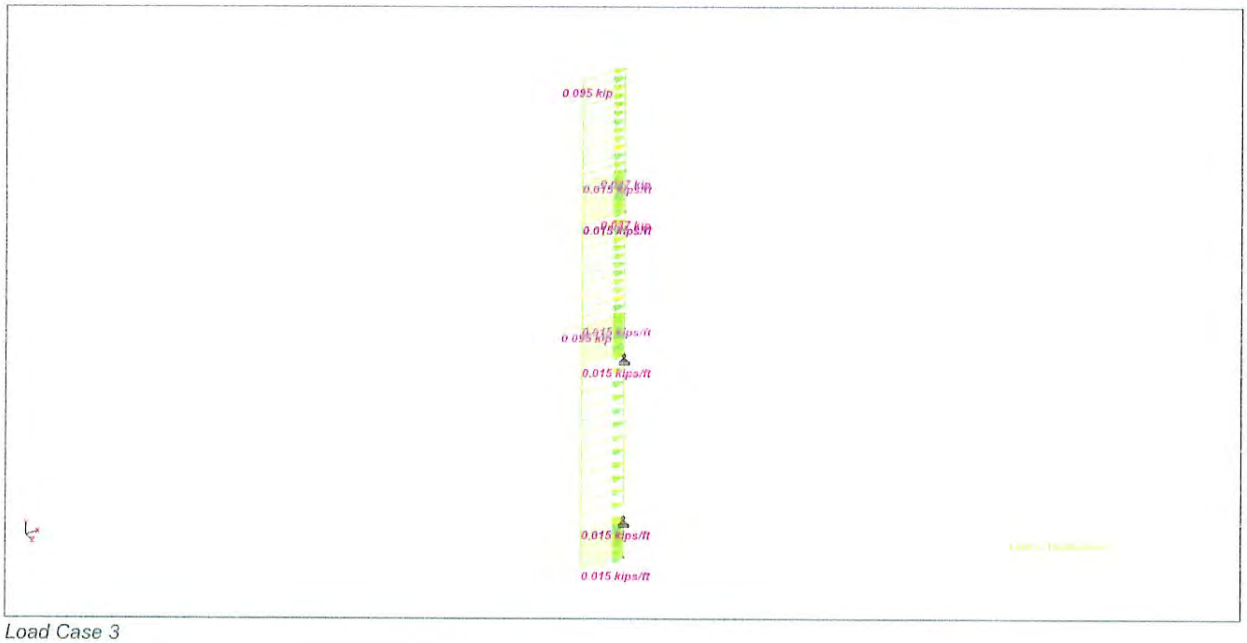
Node	FX (kip)	FY (kip)	FZ (kip)	MX (kip-in)	MY (kip-in)	MZ (kip-in)
4	-	-	-0.03192	-	-	-
7	-	-	-0.03192	-	-	-



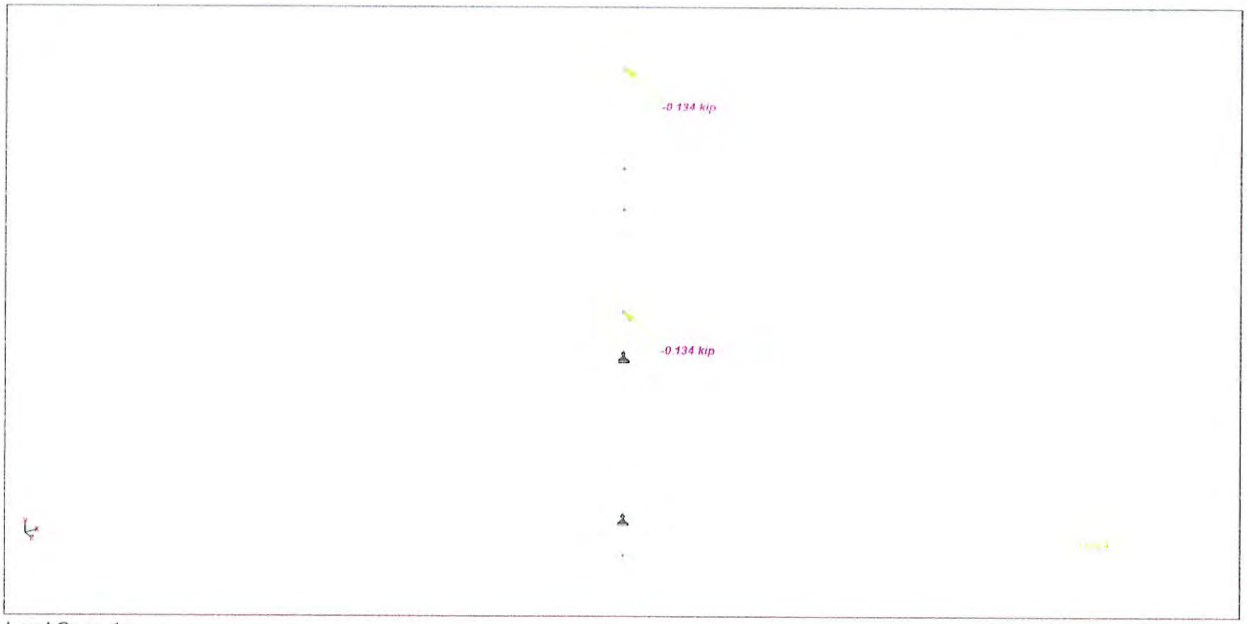
Load Case 1



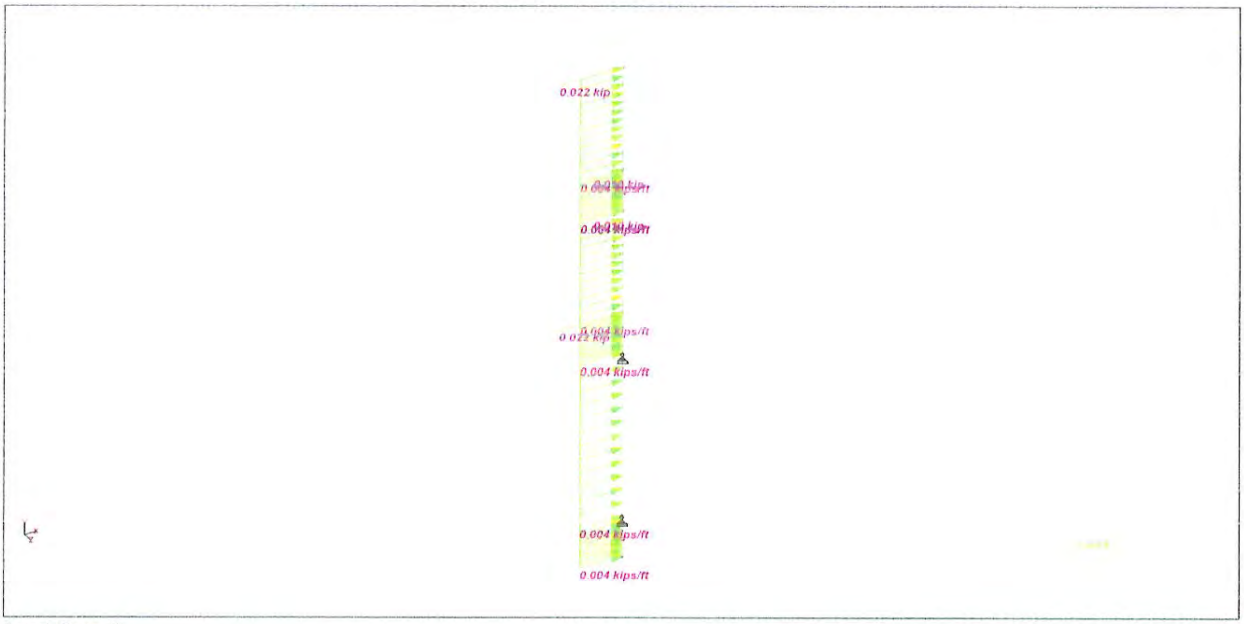
Load Case 2



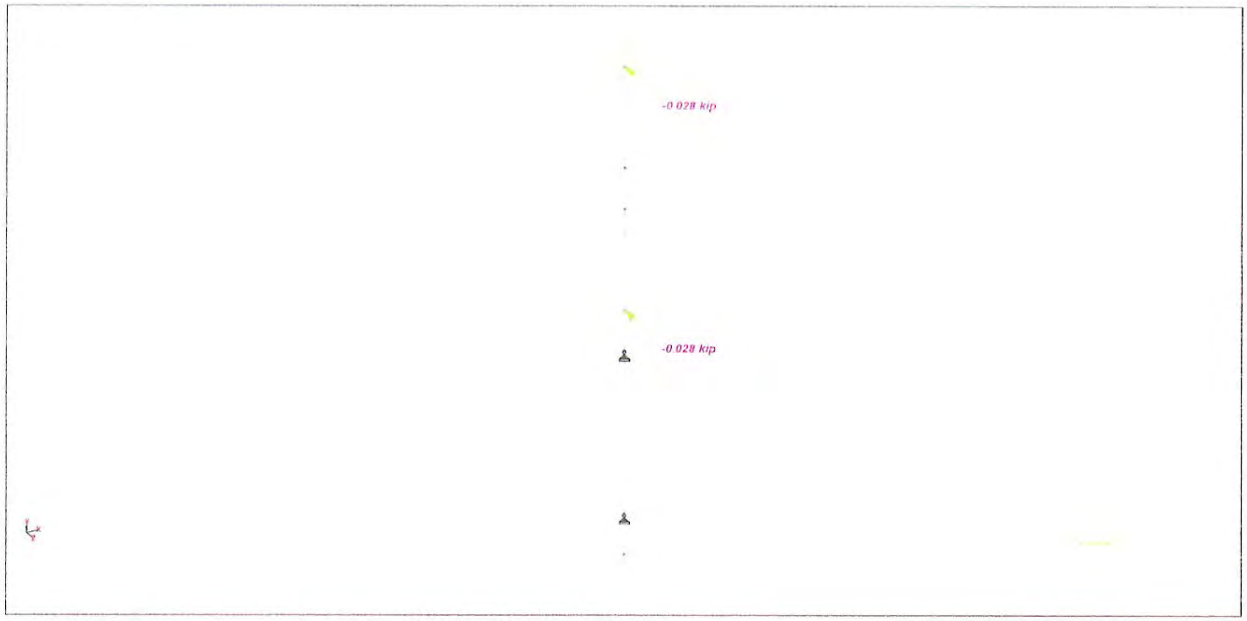
Load Case 3



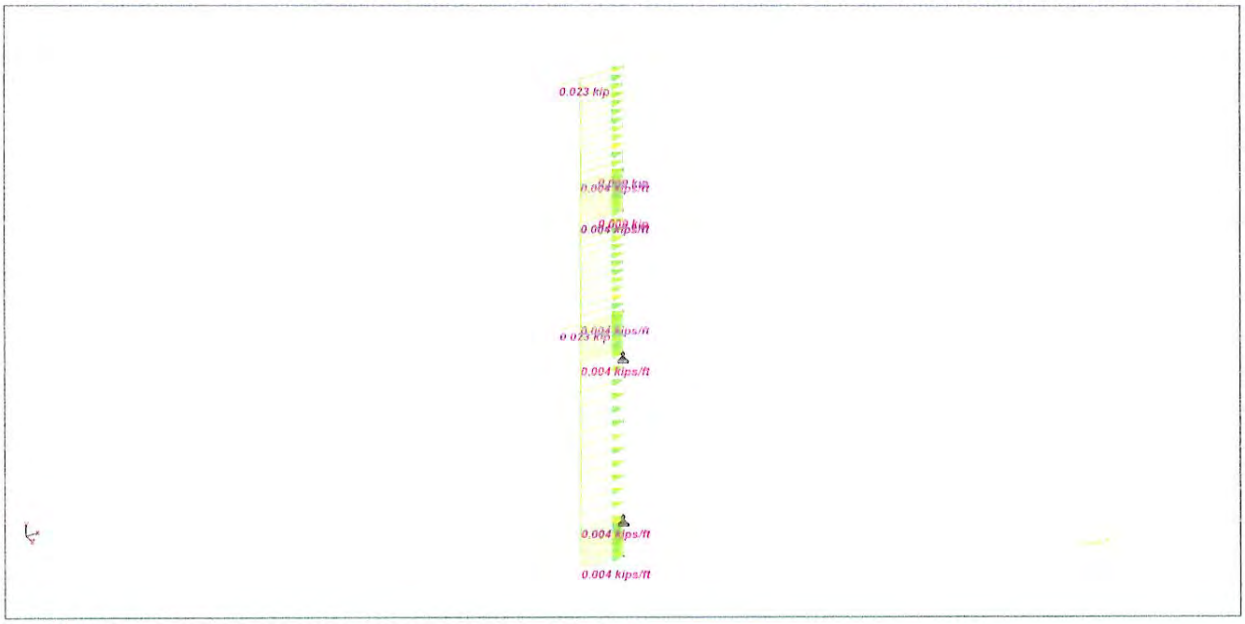
Load Case 4



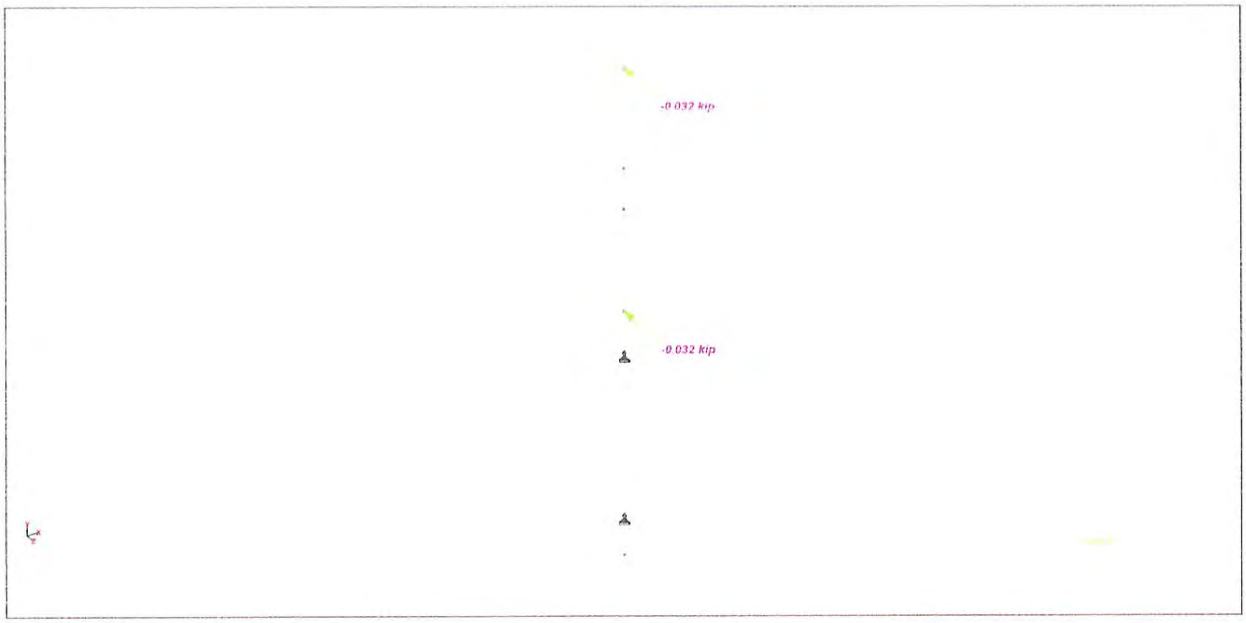
Load Case 5



Load Case 6



Load Case 7



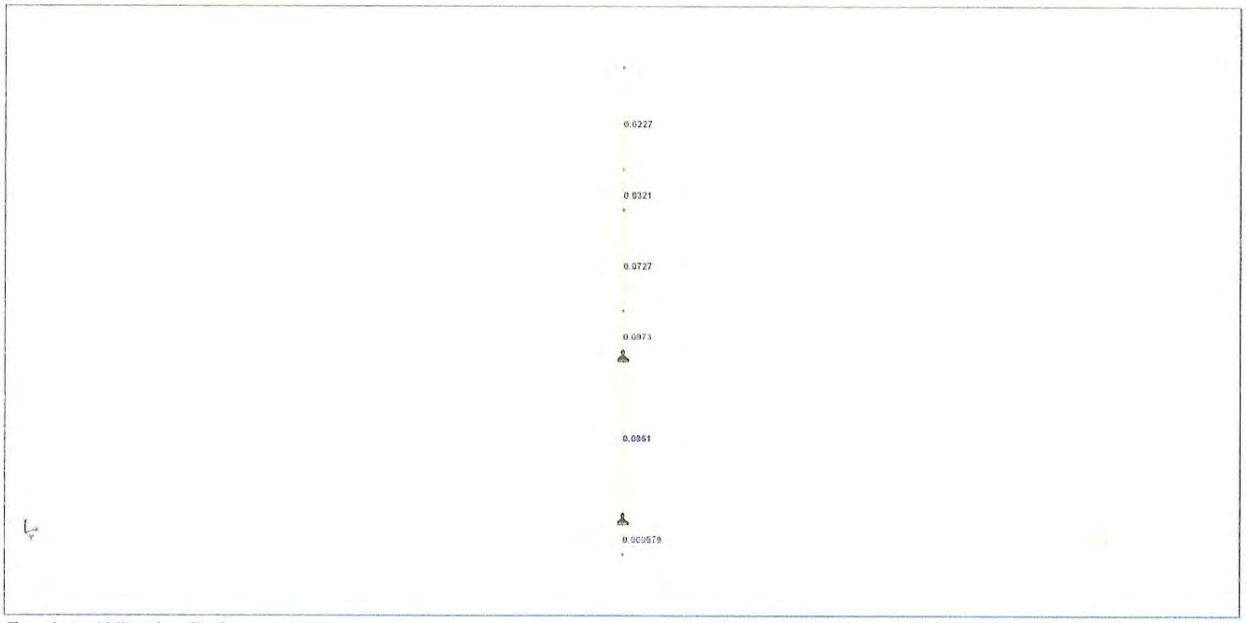
Load Case 8

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	PIPS30	PIPS30	0.001	1.000	0.001	LRFD-H1-1B-	9	2.100	2.850	2.850	5.700
2	PIPS30	PIPS30	0.243	1.000	0.243	LRFD-H1-1B-	9	2.100	2.850	2.850	5.700
3	PIPS30	PIPS30	0.244	1.000	0.244	LRFD-H1-1B-	9	2.100	2.850	2.850	5.700
4	PIPS30	PIPS30	0.183	1.000	0.183	LRFD-H1-1B-	9	2.100	2.850	2.850	5.700
5	PIPS30	PIPS30	0.080	1.000	0.080	LRFD-H1-1B-	10	2.100	2.850	2.850	5.700
6	PIPS30	PIPS30	0.057	1.000	0.057	LRFD-H1-1B-	10	2.100	2.850	2.850	5.700

Failed Members

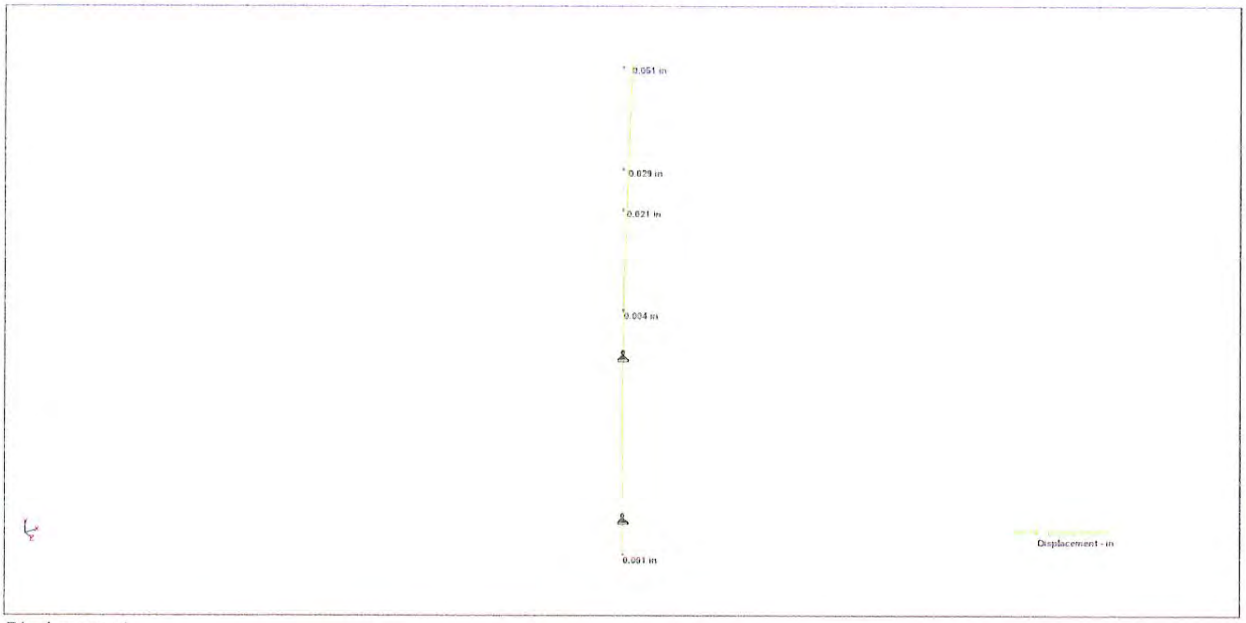
There is no data of this type.



Envelope Utilization Ratio

Node Displacement Summary

	Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
Max X	7	3:W(X)O	**0.679**	0	0	0.679	0	0	-0.010
Min X	1	1:DL	**0**	-0.000	0	0.000	0	0	0
Max Y	2	1:DL	0	**0**	0	0	0	0	0
Min Y	7	11:1.2D + 1.0D	0.168	**-0.000**	0	0.168	0	0	-0.002
Max Z	1	1:DL	0	-0.000	**0**	0.000	0	0	0
Min Z	7	4:W(Z)O	0	0	**-0.542**	0.542	-0.008	0	0
Max rX	1	4:W(Z)O	0	0	-0.015	0.015	**0.001**	0	0
Min rX	7	4:W(Z)O	0	0	-0.542	0.542	**-0.008**	0	0
Max rY	1	1:DL	0	-0.000	0	0.000	0	**0**	0
Min rY	1	1:DL	0	-0.000	0	0.000	0	**0**	0
Max rZ	1	3:W(X)O	0.019	0	0	0.019	0	0	**0.002**
Min rZ	7	3:W(X)O	0.679	0	0	0.679	0	0	**-0.010**
Max Rst	7	3:W(X)O	0.679	0	0	**0.679**	0	0	-0.010



Displacement

Displacement Check
Antenna Pipe Mast (3 1/2" O.D. Pipe):
Max Displacement = 0.679"
(Node 7)
Allowable Displacement = 1.5% cantilever = 1.08"
0.697" < 1.26" -- OK

Reaction Summary

	Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	Moment MY (kip-in)	Moment MZ (kip-in)
Max FX	2	3:W(X)O	**0.310**	0	0	0	0	0
Min FX	3	3:W(X)O	**-0.759**	0	0	0	0	0
Max FY	3	11:1.2D + 1.0D	-0.190	**0.570**	0	0	0	0
Min FY	2	3:W(X)O	0.310	**0**	0	0	0	0
Max FZ	3	4:W(Z)O	0	0	**0.536**	0	0	0
Min FZ	2	4:W(Z)O	0	0	**-0.268**	0	0	0
Max MX	2	1:DL	0	0.021	0	**0**	0	0
Min MX	2	1:DL	0	0.021	0	**0**	0	0
Max MY	2	1:DL	0	0.021	0	0	**0**	0
Min MY	2	1:DL	0	0.021	0	0	**0**	0
Max MZ	2	1:DL	0	0.021	0	0	0	**0**
Min MZ	2	1:DL	0	0.021	0	0	0	**0**

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East Hartford Main Street

Job No. 50093847
Sheet No. A-29
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Alpha and Gamma Sector Mast Pipe Mount

Design Criteria

1. TMS 402-11/ACI 530-11/ASCE 5-11 Building Code Requirements for Masonry Structures
2. ACI -318-11 Building Code Requirements for Structural Concrete
3. AISC 360-10 Specifications for Structural Steel Buildings

References

Refer to construction drawings by Hudson Design Group, dated November 8, 2016 for pipe mount connection details (Bolt diameter field verified by Dewberry Engineers Inc. on 07/26/2019)

Thru Bolt Check

M =	2.28	kip-in	Fx * (1/2 Angle depth), See Appendix A-28 for Fx
d =	9.50	in	Spacing of Thru Bolts
T =	0.24	kip	Tension in 5/8" Thru Bolt
$f_{y\ thru\ bolt}$ =	0.78	ksi	Tensile Stress in Thru Bolt --> **OK BY INSPECTION**
F_x =	0.759		See Appendix A-28
$V_{thru\ bolt}$ =	0.38	kip	Shear at 5/8" Thru Bolt
$f_{v\ thru\ bolt}$ =	1.24	ksi	Shear Stress in Thru Bolt --> **OK BY INSPECTION**

Penthouse Wall Global Check

Based on Engineering Judgement, the loads produced by the antenna mounting pipes is negligible on the penthouse CMU and steel stud walls

APPENDIX B

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SAI Communications
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East Hartford Main Street

Job No. 50093847
Sheet No. B-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Gamma Sector Stand-off Frame

Overview

The existing C1 position antenna in the gamma sector is going to be relocated to a proposed 3'-0" stand-off frame. The antenna will be mounted to a 3" diameter sch. 40 pipe, which will be U-bolted to the proposed stand-off frame, and proposed stand-off frame will be thru-bolted to the existing penthouse wall. Only the 4" diameter pipe will be checked for strength.

Design Criteria and References

1. International Building Code (IBC) 2015, International Code Council
2. 2018 Connecticut State Building Code - Amendments to IBC 2015
3. TIA-222-H, Structural Standard for Antenna Supporting Structures and Antennas
4. Steel Construction Manual 14th Edition, American Institute of Steel Construction
5. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers
6. Existing building plans by The Robinson Green Baretta Corporation, dated December 1982
7. Construction Drawings by Hudson Design Group, dated November 8th, 2016
8. Radio Frequency Data Sheet (RFDS) by AT&T, dated December 24th, 2018

Equipment Dead Loads

	Description	Dimensions (in)			Weight (lb)
		W	D	H	
Antennas/RRHs	Kathrein 800-10965	20.00	6.90	78.70	108.60
	RRU 4415 B25	13.40	5.90	16.50	46.00

***Bold = Proposed**

Structural Members

Member	Dimensions (in)						Weight (lb/ft)
	d	b_f	t_f	t_w	I.D.	O.D.	
3" STD Pipe					3.07	3.50	7.58
HSS4X4X1/4*	4.00	4.00		0.233			12.21

*Approximate member size for Site Pro 1 Standoff Arm

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Job No. 50093847
Sheet No. B-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Gamma Sector Stand-off Frame

Wind Load Design Criteria (Per TIA-222-H)

Notation	Value	Description	Reference
V_{max} =	123.00	Design Wind Speed	ASCE 7-10, Appendix D
V_i =	50.00	Design Ice Wind Speed	TIA-222-H, Annex B-9
K_d =	0.95	Wind Direction Probability Factor	TIA-222-H, Table 2-2
Class	II	Risk Category	TIA-222-H, Table 2-1
I =	1.00	Importance Factor (Without Ice)	TIA-222-H, Table 2-3
$I_{ice\ thick}$ =	1.00	Importance Factor (Ice Thickness)	TIA-222-H, Table 2-3
z = h =	117.00	A.G.L. Elevation (ft)	Max. Center of Appurtenance
Exp. Cat.	B	Exposure Category	TIA-222-H, Section 2.6.5.1.2
z_g =	1200.00	Nominal Height of Atmospheric Boundary Layer	TIA-222-H, Table 2-4
a =	7.00	3-Second Gust Wind Speed Power Law Exponent	TIA-222-H, Table 2-4
$K_{z\ (min)}$ =	0.70	Minimum Value for K_z	TIA-222-H, Table 2-4
K_c =	0.90	Terrain Constant	TIA-222-H, Table 2-4
K_t =	N/A	Topographic Constant	TIA-222-H, Table 2-5
K_z =	1.03	Velocity Pressure Coefficient	TIA-222-H, Section 2.6.5.2
Topo. Cat.	1.00	Topographic Category	TIA-222-H, Section 2.6.5.2
e =	2.72	Natural Logarithmic Base	TIA-222-H, Section 2.6.2
f =	N/A	Height Attenuation Factor	TIA-222-H, Table 2-5
H =	N/A	Height of Crest Above Surrounding Terrain (ft)	TIA-222-H, Section 2.6.6.2.1
K_h =	N/A	$e^{((f*z)/H)}$ Height Reduction Factor	TIA-222-H, Section 2.6.6.2.1
K_{zt} =	1.00	$= [1+((K_c*K_t)/K_h)]^2$ Topographic Factor	TIA-222-H, Section 2.6.6.2.1
K_{iz} =	1.13	$= (z/33)^{0.10} \leq 1.4$ Height Escalation Factor	TIA-222-H, Section 2.6.10
G_h =	1.0	Gust Effect Factor	TIA-222-H, Section 2.6.9.1
K_a =	0.9	Shielding Factor	TIA-222-H, Section 16.6
t_i =	1.50	Design Ice Thickness (in)	TIA-222-H, Annex B-9
t_{iz} =	3.40	$2\ t_i(I_{ice\ thick})K_{iz}(K_{zt})^{0.35}$ Thickness of Radial Glaze Ice	TIA-222-H, Section 2.6.10
$q_{z\ design}$ =	34.23	$= 0.00256(K_z)(K_{zt})(K_d)(K_a)(V_{max}^2)(I)$	TIA-222-H, Section 2.6.11.6
$q_{z\ ice}$ =	5.66	$= 0.00256(K_z)(K_{zt})(K_d)(K_a)(V_i^2)$	TIA-222-H, Section 2.6.11.6

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SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. B-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Gamma Sector Stand-off Frame

Wind Service Load and Maintenance Load Design Criteria (Per TIA-222-H)

Notation	Value	Description	Reference
$V_{service}$ =	60.00	Design Service Wind Speed	TIA-222-H, Section 2.8.3
$V_{maintenance}$ =	30.00	Design Maintenance Wind Speed	TIA-222-H, Section 16.3
K_d =	0.95	Wind Direction Probability Factor	TIA-222-H, Table 2-2
Class	II	Risk Category	TIA-222-H, Table 2-1
I =	1.00	Importance Factor (Without Ice)	TIA-222-H, Table 2-3
z = h =	117.00	A.G.L. Elevation (ft)	Max. Center of Appurtenance
Exp. Cat.	B	Exposure Category	TIA-222-H, Section 2.6.5.1.2
z_g =	1200.00	Nominal Height of Atmospheric Boundary Layer	TIA-222-H, Table 2-4
a =	7.00	3-Second Gust Wind Speed Power Law Exponent	TIA-222-H, Table 2-4
$K_{z\,(min)}$ =	0.70	Minimum Value for K_z	TIA-222-H, Table 2-4
K_c =	0.90	Terrain Constant	TIA-222-H, Table 2-4
K_t =	N/A	Topographic Constant	TIA-222-H, Table 2-5
K_z =	1.03	Velocity Pressure Coefficient	TIA-222-H, Section 2.6.5.2
Topo. Cat.	1.00	Topographic Category	TIA-222-H, Section 2.6.5.2
e =	2.72	Natural Logarithmic Base	TIA-222-H, Section 2.6.2
f =	N/A	Height Attenuation Factor	TIA-222-H, Table 2-5
H =	N/A	Height of Crest Above Surrounding Terrain (ft)	TIA-222-H, Section 2.6.6.2.1
K_h =	N/A	$e^{((f*z)/H)}$ Height Reduction Factor	TIA-222-H, Section 2.6.6.2.1
K_{zt} =	1.00	$= [1+((K_c*K_t)/K_h)]^2$ Topographic Factor	TIA-222-H, Section 2.6.6.2.1
G_h =	1.0	Gust Effect Factor	TIA-222-H, Section 2.6.9.1
K_a =	0.9	Shielding Factor	TIA-222-H, Section 16.6
$q_{z\,service}$ =	8.14	$= 0.00256(K_z)(K_{zt})(K_d)(K_a)(V_{service}^2)(I)$	TIA-222-H, Section 2.6.11.6
$q_{z\,maintenance}$ =	2.04	$= 0.00256(K_z)(K_{zt})(K_d)(K_a)(V_{maintenance}^2)(I)$	TIA-222-H, Section 2.6.11.6

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East Hartford Main Street

Job No. 50093847
Sheet No. B-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Gamma Sector Stand-off Frame

Force Coefficients for Appurtenances, Without Ice (TIA-222-H)

	Equipment	Dimensions (ft)			Area $(A_a)_n$ (Normal) (sf)	Area $(A_a)_t$ (Tangent) (sf)	Aspect Ratio (Normal)	Aspect Ratio (Tangent)	C Table 2-9	C_{an} (Normal) Table 2-9	C_{at} (Tangent) Table 2-9
		Width (Normal)	Length (tangent)	0							
Antennas/RRHs	Kathrein 800-10965	1.67	0.58	6.56	10.93	3.77	3.94	11.41		1.26	1.55
	RRU 4415 B25	1.12	0.49	1.38	1.54	0.68	1.23	2.80		1.14	1.26

Force Coefficients for Appurtenances, With Ice (TIA-222-H)

	Equipment	Dimensions (ft)			Area $(A_a)_n$ (Normal) (sf)	Area $(A_a)_t$ (Tangent) (sf)	Aspect Ratio (Normal)	Aspect Ratio (Tangent)	C Table 2-9	C_{an} (Normal) Table 2-9	C_{at} (Tangent) Table 2-9
		Width (Normal)	Length (tangent)	Height (Or Span)							
Antennas/RRHs	Kathrein 800-10965	1.92	0.83	6.81	13.05	5.62	3.55	8.25		1.25	1.46
	RRU 4415 B25	1.37	0.74	1.63	2.22	1.21	1.19	2.19		1.14	1.19

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SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. B-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Gamma Sector Stand-off Frame

Equipment Wind Loads (TIA-222-H)

$F_A = q_{z\ design} G_h (EPA)_A$ — TIA-222-H, Section 2.6.11.2, Applies to Strength, Service & Maintenance Conditions

$(EPA)_A = C_a A_a$

$F_A = q_{z\ ice} G_h (EPA)_{A\ ice}$ — Ice Condition

$(EPA)_{A\ ice} = C_a A_{a\ ice}$

		No Ice (sf)		Ice (sf)		Strength (lbs)		Ice (lbs)		Service (lbs)			
	Equipment	$(EPA)_A$ (Normal)	$(EPA)_A$ (Tangent)	$(EPA)_A$ (Normal)	$(EPA)_A$ (Tangent)	F_A (Normal)	F_A (Tangent)	F_A (Normal)	F_A (Tangent)	F_A (Normal)	F_A (Tangent)		
Antennas/RRHs	Kathrein 800-10965	13.81	5.83	16.27	8.18	472.79	199.65	92.01	46.24	112.50	47.51		
	RRU 4415 B25	1.76	0.85	2.54	1.43	60.10	29.15	14.34	8.09	14.30	6.94		

Structure Wind Loads (TIA-222-H)

Wind loads on structural elements will be applied linearly: $\omega_{wind} = q_{z\ design} C_a G_h d$, with d being the structure depth or diameter. A conservative Ca value of 1.2 will be used for pipes and 2.0 for HSS. This same equation will be used for the service condition, with the service wind load being used, and ice condition, with the ice wind load and ice structure depth/diameter being used.

Member	d (ft)	d_{ice} (ft)	C_a	ω_{wind} (lb/ft)	$\omega_{wind\ ice}$ (lb/ft)	$\omega_{wind\ ser}$ (lb/ft)	
3" STD Pipe	0.29	0.54	1.2	11.98	3.68	2.85	
HSS4X4X1/4*	0.33	0.58	2.0	22.82	6.60	5.43	

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SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. B-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Gamma Sector Stand-off Frame

Ice Dead Loads

Equipment	Volume (cf)	$Volume_{w/ice}$ (cf)	$Volume_{ice}$ (cf)	W_{ice} (lb)
Kathrein 800-10965	6.29	10.77	4.48	250.91
RRU 4415 B25	0.75	1.65	0.89	49.96

Structural Member	Perimeter (lf)	$Perimeter_{w/ice}$ (lf)	$Area_{ice}$ (sf)	W_{ice} (lb/ft)
3" STD Pipe	0.92	1.70	0.16	9.16
HSS4X4X1/4*	1.33	2.33	0.23	12.83

Load Combinations (TIA-222-H)

1. $1.2D + 1.0W_o$ — Strength Limit State
2. $1.2D + 1.0D_i + 1.0W_i$ — Strength Limit State
3. $1.4D$ — Strength Limit State
4. $1.0D + 1.0W_s$ — Service Limit State

Job Information

	Engineer	Checked	Approved
Name:	CS	BK	
Date:	9/10/2019	9/12/2019	8/15/2019

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	9	Highest Node	12
Number of Elements	6	Highest Beam	10

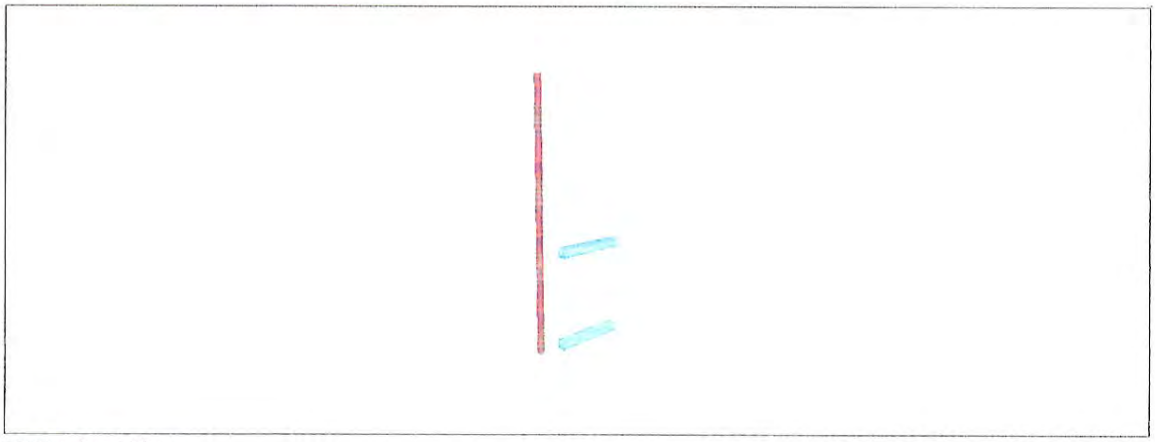
Number of Basic Load Cases	5
Number of Combination Load Cases	5

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

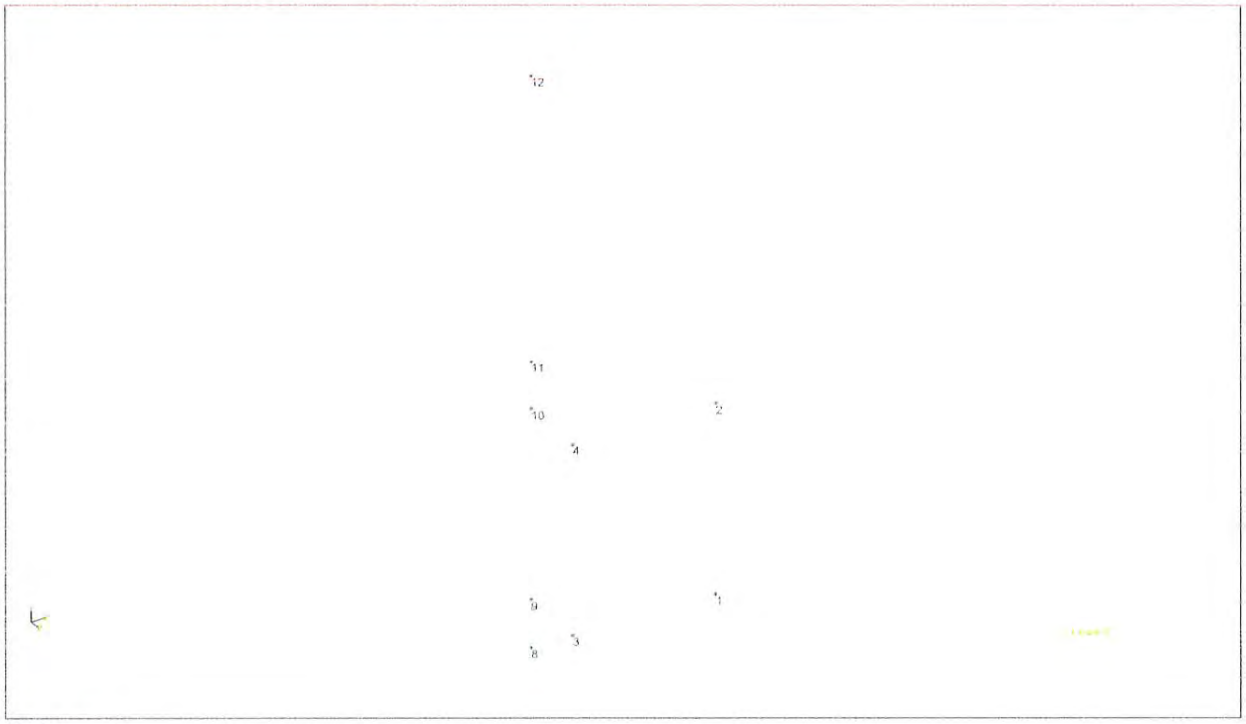
Type	L/C	Name
Primary	1	DL
Primary	2	DI
Primary	3	W
Primary	4	W(I)
Primary	5	W(S)
Combination	6	1.2D + 1.0W
Combination	7	1.2D + 1.0DI + 1.0W(I)
Combination	8	1.4D
Combination	9	1.0D + 1.0W(S)



3D Rendered View

Nodes

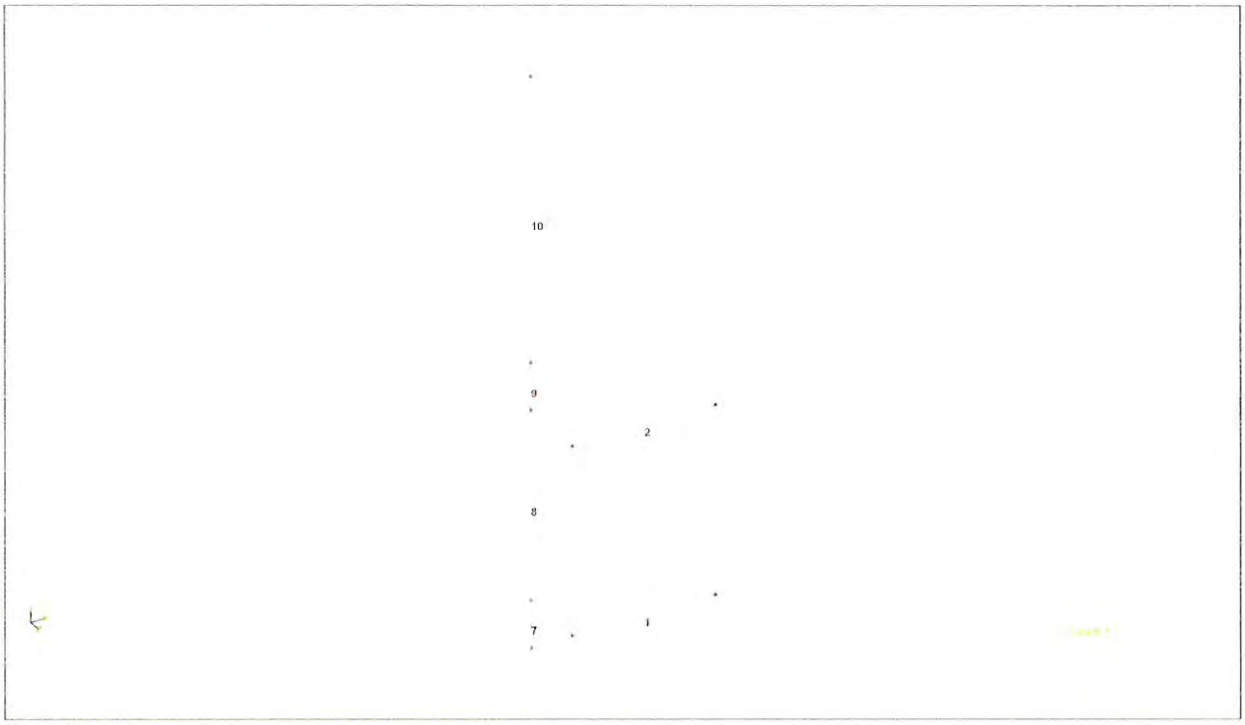
Node	X (ft)	Y (ft)	Z (ft)
1	0	0	0
2	0	4.000	0
3	-3.000	0	0
4	-3.000	4.000	0
8	-3.000	-1.000	-1.500
9	-3.000	0	-1.500
10	-3.000	4.000	-1.500
11	-3.000	5.000	-1.500
12	-3.000	11.000	-1.500



Node Layout

Beams

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	3	3.000	2	0
2	2	4	3.000	2	0
7	8	9	1.000	1	0
8	9	10	4.000	1	0
9	10	11	1.000	1	0
10	11	12	6.000	1	0



Beam Layout

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
1	PIPS30	2.100	2.850	2.850	5.689	STEEL
2	HSST4X4X0.125	1.770	4.400	4.400	6.797	STEEL

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	CONCRETE	3.15E+3	0.170	8.68e-05	5.5E -6
2	ALUMINUM	10E+3	0.330	9.8e-05	12.8E -6
3	STEEL_50_KSI	29E+3	0.300	0.000283	6.5E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000283	9.9E -6
5	STEEL_36_KSI	29E+3	0.300	0.000283	6.5E -6
6	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
7	STEEL	29E+3	0.300	0.000283	6E -6
8	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip˚ft/deg)	rY (kip˚ft/deg)	rZ (kip˚ft/deg)
1	Fixed	Fixed	Fixed	-	Fixed	-
2	Fixed	Fixed	Fixed	-	Fixed	-

Releases

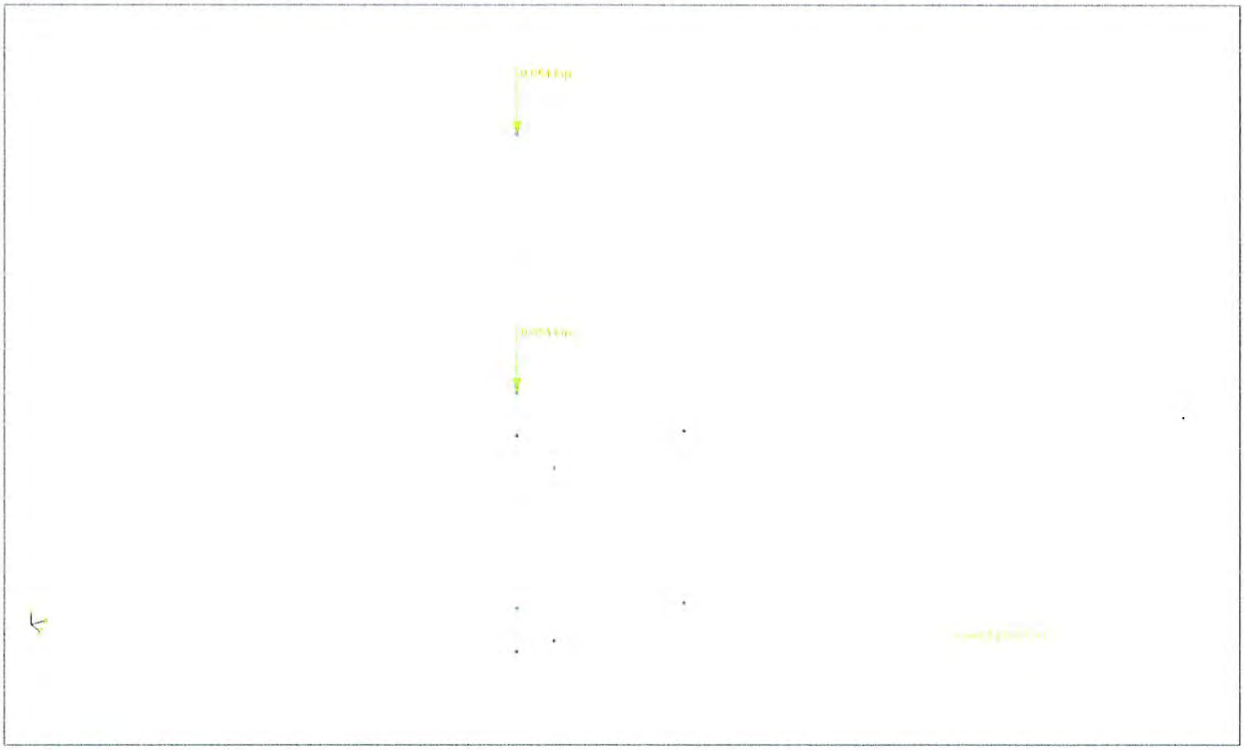
There is no data of this type.

Primary Load Cases

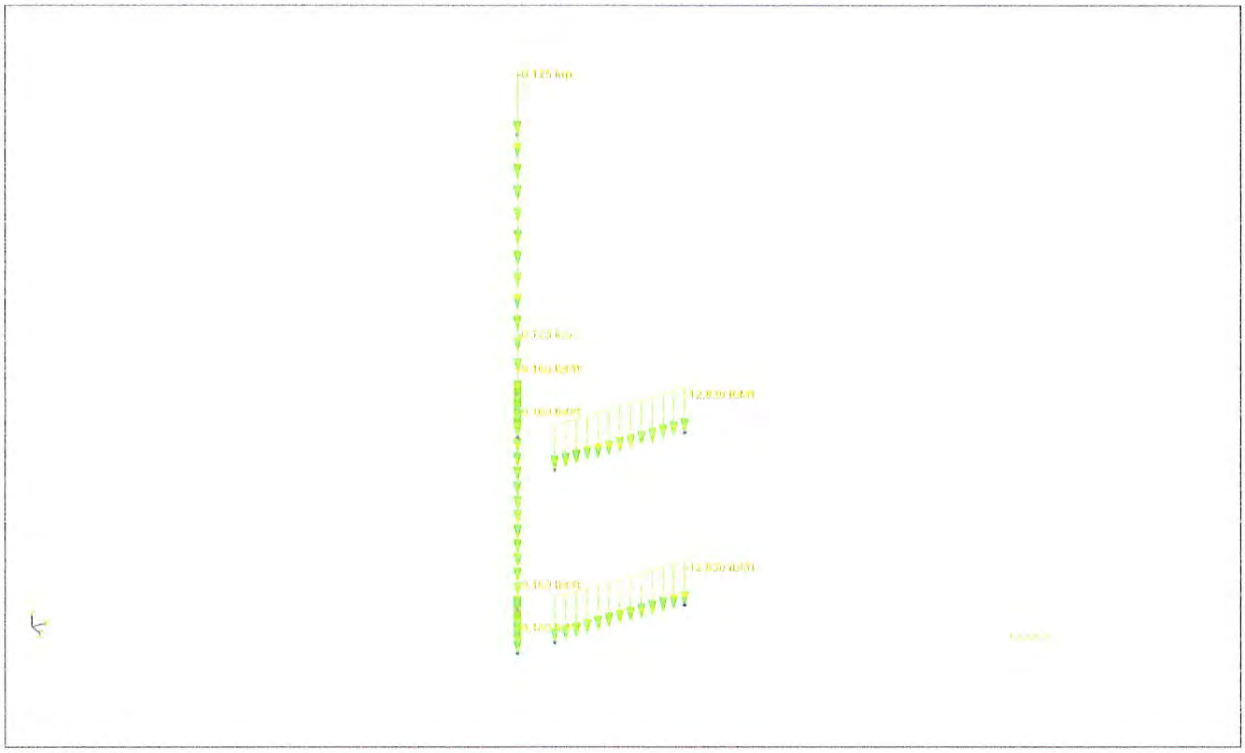
Number	Name	Type
1	DL	Dead
2	DI	Dead
3	W	Wind
4	W(I)	Wind
5	W(S)	Wind

Combination Load Cases

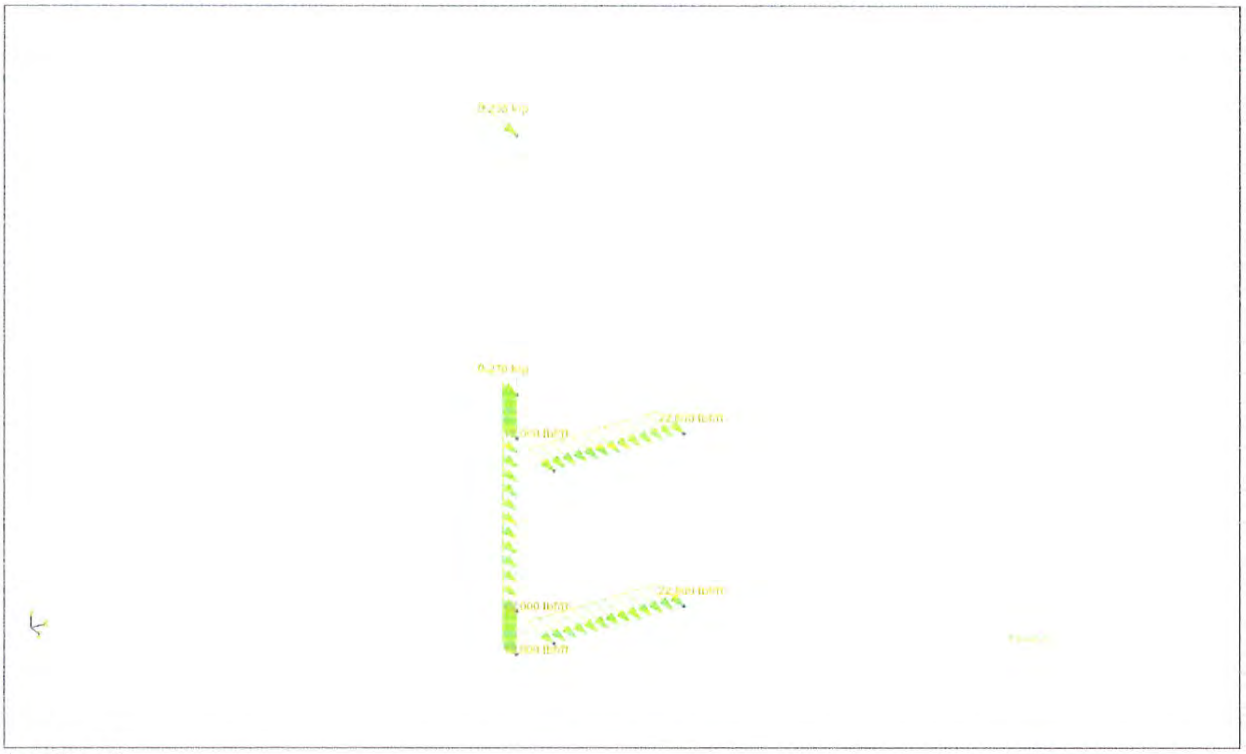
Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
6	1.2D + 1.0W	1	DL	1.20
		3	W	1.00
7	1.2D + 1.0DI + 1.0W(I)	1	DL	1.20
		2	DI	1.00
		4	W(I)	1.00
8	1.4D	1	DL	1.40
9	1.0D + 1.0W(S)	1	DL	1.00
		5	W(S)	1.00
10	1D+1WL(Z)	1	DL	1.00
		3	W	1.00



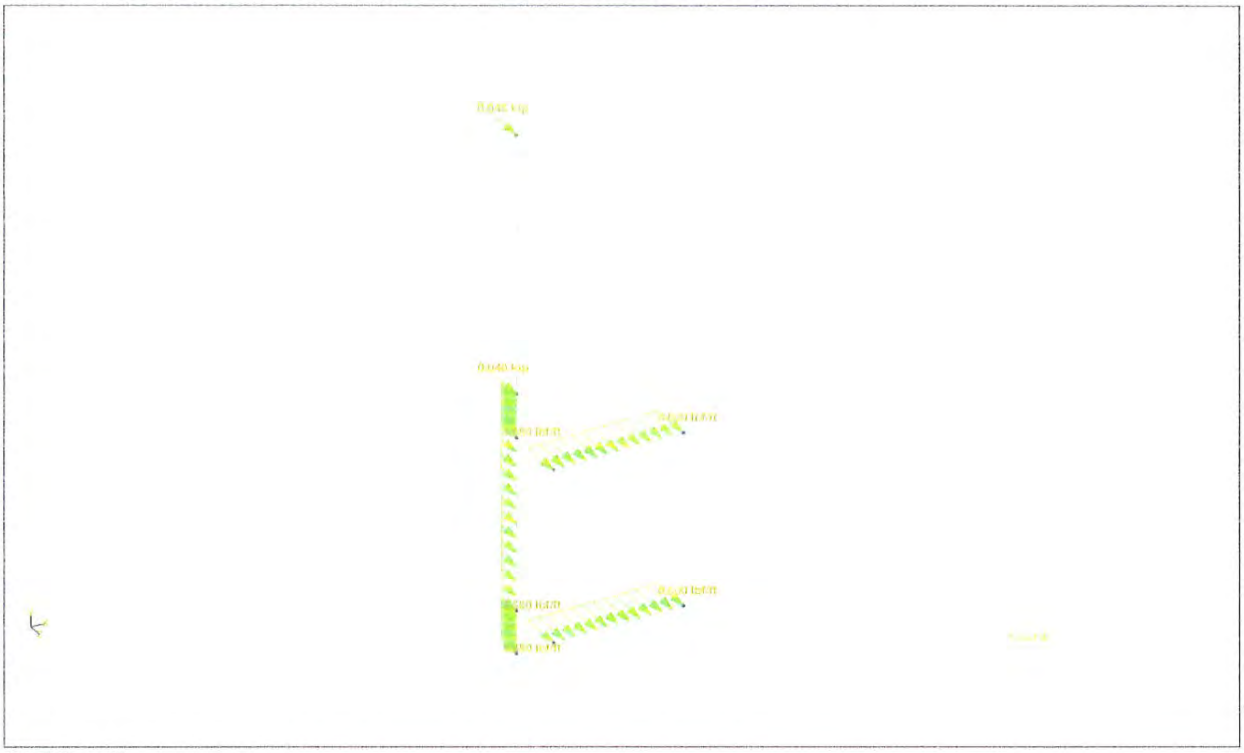
Load Case 1



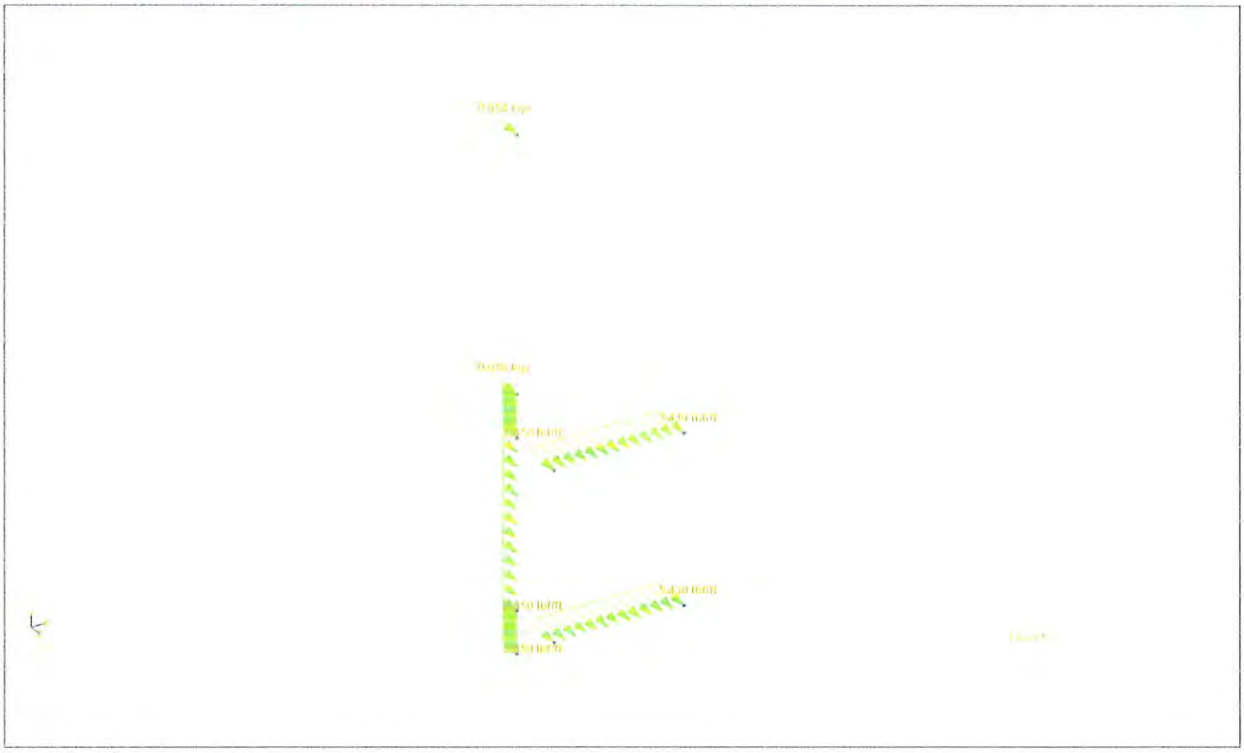
Load Case 2



Load Case 3



Load Case 4



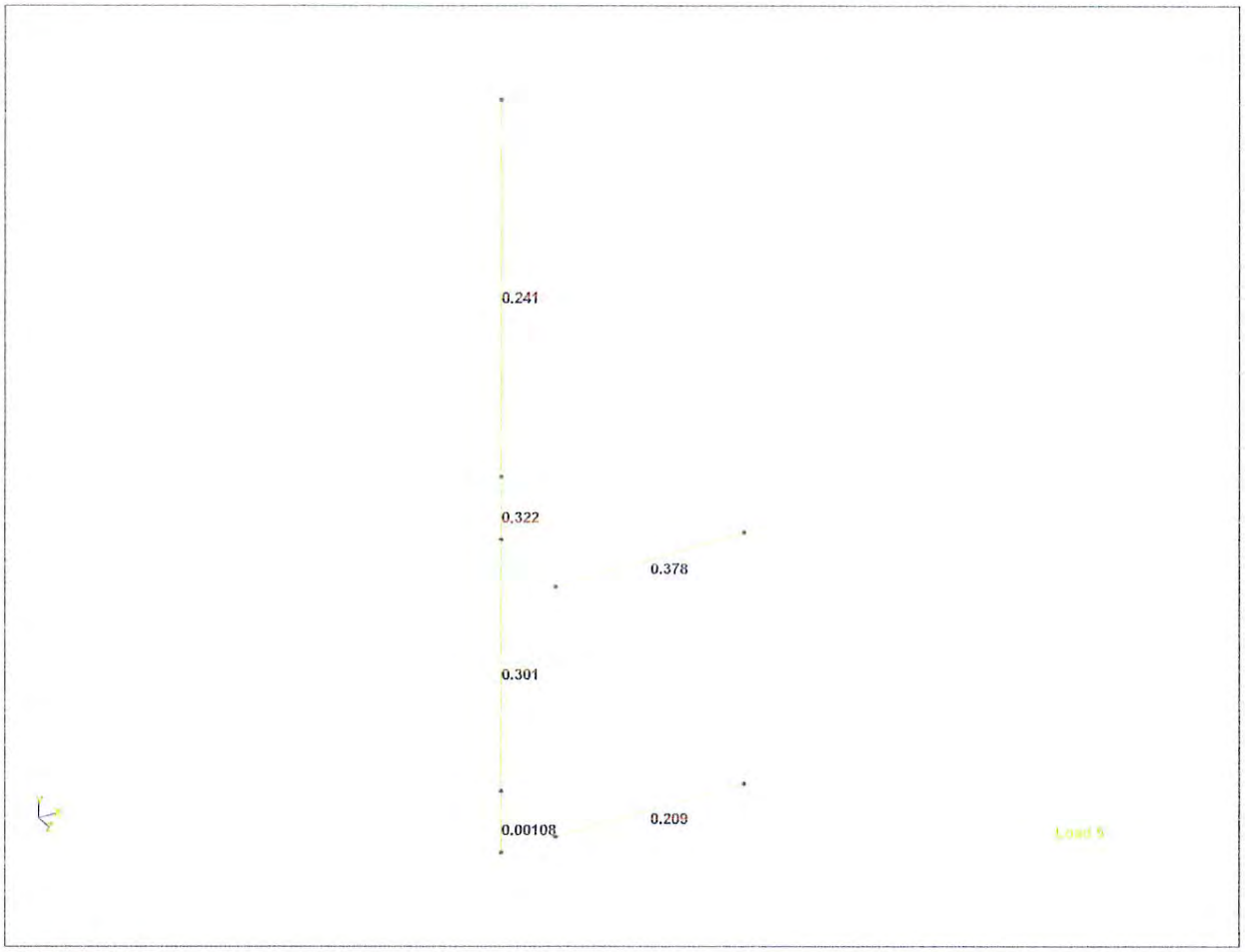
Load Case 5

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST4X4X0	HSST4X4X0	0.209	1.000	0.209	HSS FLEX+A	7	1.770	4.400	4.400	6.910
2	HSST4X4X0	HSST4X4X0	0.378	1.000	0.378	HSS BEND Y	3	1.770	4.400	4.400	6.910
7	PIPS30	PIPS30	0.001	1.000	0.001	LRFD-H1-1B-	6	2.100	2.850	2.850	5.700
8	PIPS30	PIPS30	0.301	1.000	0.301	LRFD-H1-1B-	3	2.100	2.850	2.850	5.700
9	PIPS30	PIPS30	0.322	1.000	0.322	LRFD-H1-1B-	6	2.100	2.850	2.850	5.700
10	PIPS30	PIPS30	0.241	1.000	0.241	LRFD-H1-1B-	6	2.100	2.850	2.850	5.700

Failed Members

There is no data of this type.



Utilization Ratio

Node Displacements

Node	L/C	X (in)	Y (in)	Z (in)	Resultant (in)	rX (rad)	rY (rad)	rZ (rad)
11	1:DL	-0.012	-0.036	0.001	0.038	-0.000	0.000	0.001
	2:DI	-0.022	-0.068	0.002	0.07118	-0.000	0.000	0.001
	3:W	-0.095	0.011	0.194	0.217	0.009	0.004	0.003
	4:W(I)	-0.019	0.002	0.038596	0.043	0.002	0.001	0.000
	5:W(S)	-0.023	0.003	0.046	0.052	0.002	0.001	0.001
	6:1.2D + 1.0W	-0.109	-0.032	0.196	0.226	0.009	0.004	0.003
	7:1.2D + 1.0DI	-0.055	-0.109	0.042	0.129	0.002	0.002	0.002
	8:1.4D	-0.016	-0.050	0.001	0.053	-0.000	0.000	0.001
	9:1.0D + 1.0W(	-0.034	-0.033	0.047	0.067	0.002	0.001	0.001
12	1:DL	-0.053	-0.036	-0.006	0.064	-0.000	0.000	0.001
	2:DI	-0.100	-0.068	-0.009	0.121	-0.000	0.000	0.001
	3:W	-0.280	0.011	1.222	1.254	0.017	0.004	0.003
	4:W(I)	-0.055	0.002	0.238	0.245	0.003	0.001	0.000
	5:W(S)	-0.067	0.003	0.291	0.298	0.004	0.001	0.001
	6:1.2D + 1.0W	-0.344	-0.033	1.216	1.264	0.017	0.004	0.003
	7:1.2D + 1.0DI	-0.219	-0.109	0.222	0.330	0.003	0.002	0.002
	8:1.4D	-0.074	-0.050	-0.008	0.090	-0.000	0.000	0.001
	9:1.0D + 1.0W(	-0.120	-0.034	0.285	0.311	0.004	0.001	0.001

Relative Displacement Check
Antenna Pipe Mast (3 1/2" O.D. Pipe):
Max Displacement = 1.038"
(Node 12 with respect to 11)
Allowable Displacement = 1.5% cantilever = 1.260"
1.038" < 1.26" -- OK

Displacement

Reactions

Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
1	1:DL	-0.159	0.115	-0.073	0	-0.421	0
	2:DI	-0.300	0.219	-0.135	0	-0.745	0
	3:W	0.000	-0.098	0.368	0	9.034	0
	4:W(I)	0.000	-0.019	0.06116	0	1.496	0
	5:W(S)	0.000	-0.023	0.08766	0	2.150	0
	6:1.2D + 1.0W	-0.191	0.040	0.281	0	8.528	0
	7:1.2D + 1.0DI	-0.491	0.338	-0.162	0	0.246	0
	8:1.4D	-0.223	0.161	-0.102	0	-0.590	0
	9:1.0D + 1.0W(	-0.159	0.092	0.015	0	1.729	0
2	1:DL	0.159	0.115	0.073	0	0.421	0
	2:DI	0.300	0.219	0.135	0	0.745	0
	3:W	-0.000	0.098	-1.050	0	-31.109	0
	4:W(I)	-0.000	0.019	-0.215	0	-6.315	0
	5:W(S)	0	0.023	-0.250	0	-7.402	0
	6:1.2D + 1.0W	0.191	0.237	-0.963	0	-30.603	0
	7:1.2D + 1.0DI	0.491	0.376	0.008	0	-5.065	0
	8:1.4D	0.223	0.161	0.102	0	0.590	0
	9:1.0D + 1.0W(	0.159	0.139	-0.177	0	-6.981	0

Analysis of Gamma Sector Stand-off Frame

Design Criteria

1. TMS 402-11/ACI 530-11/ASCE 5-11 Building Code Requirements for Masonry Structures
2. ACI -318-11 Building Code Requirements for Structural Concrete
3. AISC 360-10 Specifications for Structural Steel Buildings

References

Refer to construction drawings by Dewberry Engineers Inc.

Thru Bolt Check

M_y =	2.59 kip-ft	Max moment at thru-bolt connection (4 Bolts)
d =	6.00 in	Bolt Spacing
F_x =	0.19 kip	Tensile Reaction at thru-bolt connection (4 Bolts)
T =	2.64 Kip	Tension at critical bolt (5/8"dia)
F_y =	0.24 kip	Vertical Shear Reaction at thru-Bolt connection (4 bolts)
F_z =	0.98 kip	Hor. Shear Reaction at thru-Bolt connection (4 bolts)
V =	1.00 kip	Shear at critical bolt (5/8"dia)
f_t =	8.61 ksi	Tensile Stress at critical bolt (5/8"dia)
f_v =	3.27 ksi	Shear Stress at critical bolt (5/8"dia)

Thru-Bolts OK by Inspection

Penthouse Wall Check

Based on Engineering Judgement, the loads produced by the antenna mounting pipes is negligible on the penthouse CMU and steel stud walls

APPENDIX C

Dewberry

Dewberry

SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. C-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Beta Sector Ballast Frame

Overview

The existing equipment on the ballast frame consists of (3) antennas, (3) RRUS and (1) surge arrestor. New equipment, which consists of (1) antenna and (1) RRU, will be mounted to a new 3" diameter pipe, which will be attached to the existing ballast frame.

Design Criteria and References

1. International Building Code (IBC) 2015, International Code Council
2. 2018 Connecticut State Building Code - Amendments to IBC 2015
3. TIA-222-H, Structural Standard for Antenna Supporting Structures and Antennas
4. Steel Construction Manual 14th Edition, American Institute of Steel Construction
5. ASCE 7-10 Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers
6. Existing building plans by The Robinson Green Baretta Corporation, dated December 1982
7. Construction Drawings by Hudson Design Group, dated November 8th, 2016
8. Radio Frequency Data Sheet (RFDS) by AT&T, dated December 24th, 2018

STAAD Model Assumptions

1. Wind pressure applied normal to the short and long sides of the ballast frame governs for sliding and overturning
2. Although the antenna frame is oriented roughly 30° from the direction of wind, the calculated wind forces will be applied normal to the longspan side of the frame for simplicity (slightly conservative)
3. Since the proposed pipe mast that the new antenna and RRU are going to be mounted to is braced in two directions, and the weight of the additional equipment and new steel is negligible with regard to the strength and serviceability of the ballast frame, only the global stability needs to be investigated.
4. The RAD center for the Beta Sector is 109', which is 8 feet lower than the Alpha/Gamma Sector RAD centers (117'). Since the difference in wind pressure is less than 1 psf, the design wind pressures calculated in Appendices A & B will be used for the Beta Sector Analysis:

$q_{z\,design}$ = 34.23 psf — See Appendices A&B

Use ASCE 7-10 ASD Load Combo 1.0D + 0.6W for stability check:

$q_{z\,design}$ = 20.54 psf — 0.6*W, to be used for Beta Sector Stability Check

Minimum F.S. = 1.5 for Overturning and Sliding

Existing frame rests on load bearing walls. Based on engineering judgement, the existing load bearing walls are OK

Dewberry

SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. C-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Beta Sector Ballast Frame

Equipment Dead Loads

	Description	Dimensions (in)			Weight (lb)
		W	D	H	
Antennas/RRHs	**CCI HPA-65R-BU6AA**	**11.70**	**7.60**	**71.00**	**51.00**
	Kathrein 800-10965	20.00	6.90	78.70	108.60
	CCI OPA-65R-LCUU-H6	14.80	7.40	72.00	73.00
	RRUS B25 4415	**13.40**	**5.90**	**16.50**	**46.00**
	RRUS B2/B12 4449	13.20	9.40	17.90	71.00
	RRUS B2/B66A 8843	13.20	10.90	14.90	72.00
	RRUS-32	12.10	6.70	26.70	60.00
	Raycap DC6-48-60-18-8C		9.00	26.00	31.80

***Bold = Proposed**

Structural Members

Member	Dimensions (in)						Weight (lb/ft)
	d	b_f	t_f	t_w	I.D.	O.D.	
W12X19	12.2	4.01	0.35	0.235			19.00
W6X25	6.38	6.08	0.455	0.32			25.00
L3X3X3/8	3	3	0.375	0.375			7.20
3" STD Pipe					3.07	3.50	7.58

***Bold = Proposed**

Analysis of Beta Sector Ballast Frame

Force Coefficients for Appurtenances, Without Ice (TIA-222-H)

	Equipment	Dimensions (ft)			Area $(A_a)_n$ *(Normal)* *(sf)*	Area $(A_a)_t$ *(Tangent)* *(sf)*	Aspect Ratio *(Normal)*	Aspect Ratio *(Tangent)*	C *Table 2-9*	C_{an} *(Normal)* *Table 2-9*	C_{at} *(Tangent)* *Table 2-9*
		Width *(Normal)*	Length *(tangent)*	Height *(or Span)*							
Antennas/RRHs	CCI HPA-65R-BU6AA	0.98	0.63	5.92	5.77	3.75	6.07	9.34		1.36	1.48
	Kathrein 800-10965	1.67	0.58	6.56	10.93	3.77	3.94	11.41		1.26	1.55
	CCI OPA-65R-LCUU-H6	1.23	0.62	6.00	7.40	3.70	4.86	9.73		1.31	1.49
	RRUS B25 4415	1.12	0.49	1.38	1.54	0.68	1.23	2.80		1.20	1.21
	RRUS B2/B12 4449	1.10	0.78	1.49	1.64	1.17	1.36	1.90		1.20	1.20
	RRUS B2/B66A 8843	1.10	0.91	1.24	1.37	1.13	1.13	1.37		1.20	1.20
	RRUS-32	1.01	0.56	2.23	2.24	1.24	2.21	3.99		1.20	1.27
	Raycap DC6-48-60-18-8C		0.75	2.17		1.63		2.89			1.22

Dewberry

SAI Communications
CT2490
East Hartford Main Street

Job No. 50093847
Sheet No. C-1
By: CS 09/16/2019
Chk: SA 09/17/2019

Analysis of Beta Sector Ballast Frame

Equipment Wind Loads (TIA-222-H)

$F_A = q_{z\,design} G_h (EPA)_A$

$(EPA)_A = C_a A_a$

TIA-222-H, Section 2.6.11.2,

G_h = 1.0 (See Appendices A & B)

		No Ice (sf)		Ice (sf)		Strength (lbs)		Ice (lbs)		Service (lbs)		Maintenance (lbs)	
	Equipment	$(EPA)_A$ *(Normal)*	$(EPA)_A$ *(Tangent)*	$(EPA)_A$ *(Normal)*	$(EPA)_A$ *(Tangent)*	F_A *(Normal)*	F_A *(Tangent)*	F_A *(Normal)*	F_A *(Tangent)*	F_A *(Normal)*	F_A *(Tangent)*	F_A *(Normal)*	F_A *(Tangent)*
Antennas/RRHs	CCI HPA-65R-BU6AA	7.84	5.54			160.96	113.75						
	Kathrein 800-10965	13.81	5.83			283.71	119.80						
	CCI OPA-65R-LCUU-H6	9.66	5.52			198.35	113.30						
	RRUS B25 4415	1.84	0.82			37.84	16.84						
	RRUS B2/B12 4449	1.97	1.40			40.44	28.80						
	RRUS B2/B66A 8843	1.64	1.35			33.66	27.80						
	RRUS-32	2.69	1.57			55.29	32.30						
	Raycap DC6-48-60-18-8C		1.98				40.63						

***Wind loads shown reflect 0.6*W**

Analysis of Beta Sector Ballast Frame

Structure Wind Loads (TIA-222-H)

Wind loads on structural elements will be applied linearly: $\omega_{wind} = q_{z\ design} C_a G_h d$, with d being the structure depth or diameter. A conservative Ca value of 1.2 will be used for pipes, and 2/0 for W-Shapes and Angles.

Member	d (ft)	d_{ice} (ft)	C_a	ω_{wind} (lb/ft)	$\omega_{wind\ ice}$ (lb/ft)	$\omega_{wind\ ser}$ (lb/ft)	$\omega_{wind\ m}$ (lb/ft)
W12X19	1.02		2.0	41.76			
W6X25	0.53		2.0	21.84			
L3X3X3/8	0.25		2.0	10.27			
3" STD Pipe	0.29		1.2	7.19			

***Wind loads shown reflect 0.6*W**

Job Information

	Engineer	Checked	Approved
Name:	CS	BK	
Date:	9/10/2019	9/12/2019	

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	61	Highest Node	66
Number of Elements	92	Highest Beam	102

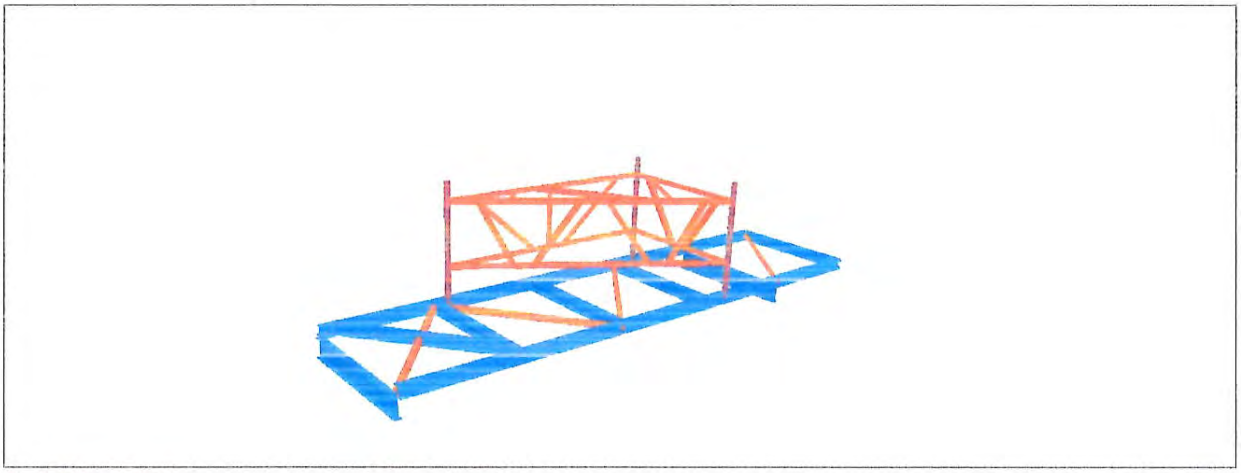
Number of Basic Load Cases	3
Number of Combination Load Cases	2

Included in this printout are data for:

All	The Whole Structure

Included in this printout are results for load cases:

Type	L/C	Name
Primary	1	DL
Primary	2	WIND(Z)
Primary	3	WIND(X)
Combination	4	1.0D + 1.5W(Z)
Combination	5	1.0D + 1.5W(X)



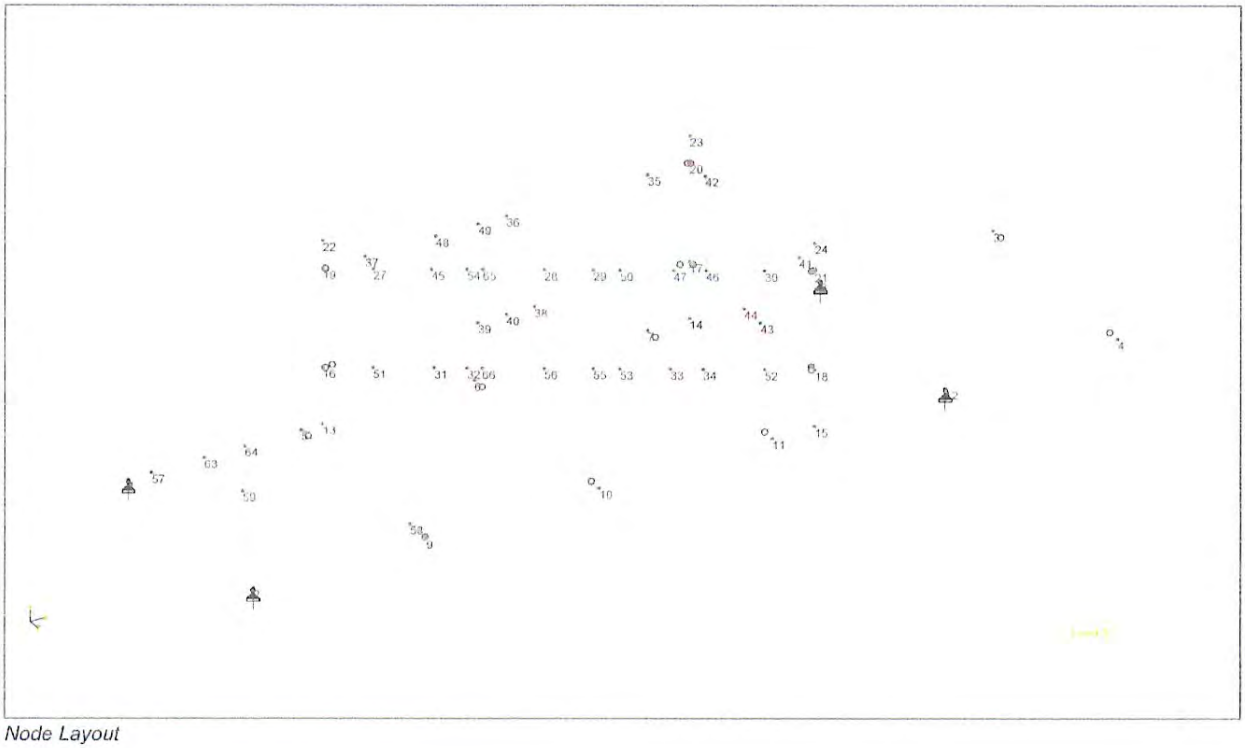
3D Rendered View

Nodes

Node	X (ft)	Y (ft)	Z (ft)
1	0	0	0
2	0	0	7.667
3	30.625	0	0
4	30.625	0	7.667
5	6.125	0	0
6	12.250	0	0
7	18.375	0	0
8	24.500	0	0
9	6.125	0	7.667
10	12.250	0	7.667
11	18.375	0	7.667
12	24.500	0	7.667
13	6.875	0	0
14	19.875	0	0
15	19.875	0	7.667
16	6.875	2.000	0
17	19.875	2.000	0
18	19.875	2.000	7.667
19	6.875	5.500	0
20	19.875	5.500	0
21	19.875	5.500	7.667
22	6.875	6.500	0
23	19.875	6.500	0
24	19.875	6.500	7.667
27	8.207	5.500	0.785
28	12.729	5.500	3.452
29	14.021	5.500	4.214
30	18.543	5.500	6.881
31	9.822	2.000	1.738
32	10.683	2.000	2.246
33	16.067	2.000	5.421
34	16.928	2.000	5.929
35	18.375	5.500	0
36	13.375	5.500	0
37	8.375	5.500	0
38	14.375	2.000	0
39	12.375	2.000	0
40	13.375	2.000	0
41	19.875	5.500	6.708
42	19.875	5.500	0.958
43	19.875	2.000	4.333
44	19.875	2.000	3.333
45	9.746	5.500	1.693
46	17.004	5.500	5.973
47	16.142	5.500	5.465

Nodes Cont...

Node	X (ft)	Y (ft)	Z (ft)
48	10.875	5.500	0
49	12.375	5.500	0
50	14.721	5.500	4.627
51	8.207	2.000	0.785
52	18.543	2.000	6.881
53	14.721	2.000	4.627
54	10.683	5.500	2.246
55	14.021	2.000	4.214
56	12.729	2.000	3.453
57	0.830	0	0
58	6.125	0	6.667
59	2.696	0	2.349
63	2.696	0	0
64	4.125	0	0
65	11.105	5.500	2.495
66	11.087	2.000	2.484



Node Layout

Beams

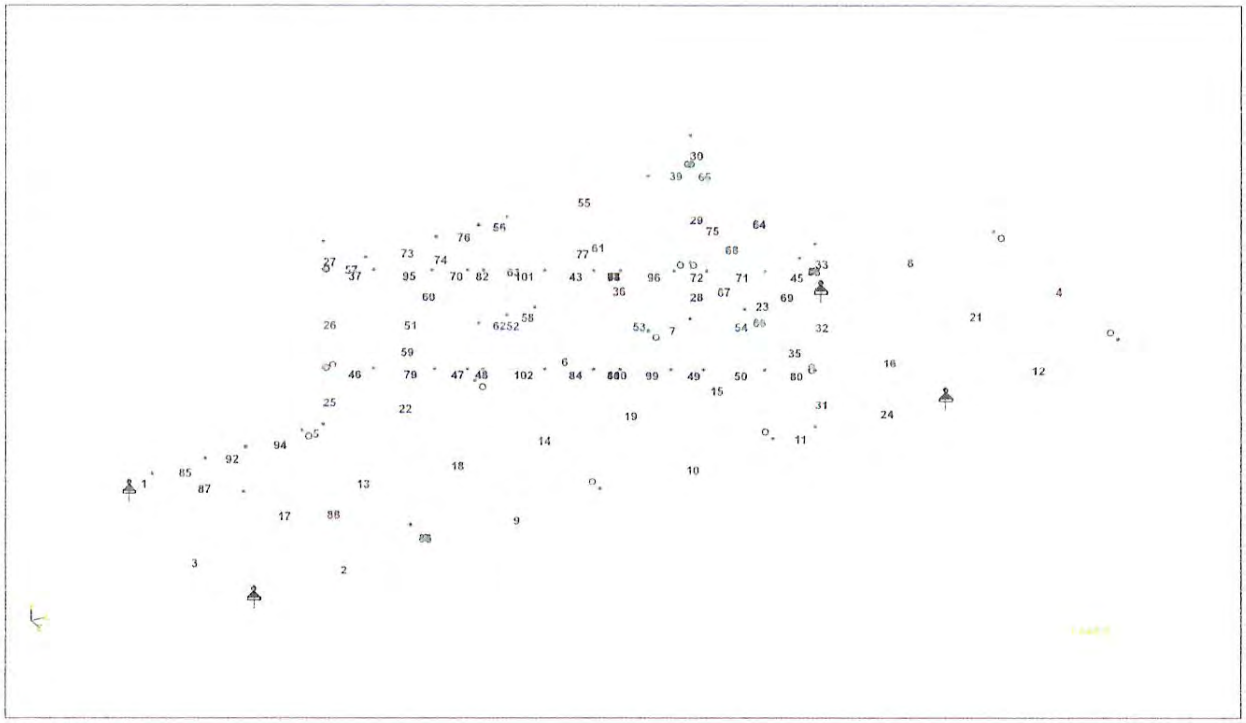
Beam	Node A	Node B	Length (ft)	Property	β (degrees)
1	1	57	0.830	1	0
2	2	9	6.125	1	0
3	1	2	7.667	2	0
4	3	4	7.667	1	0
5	5	13	0.750	1	0
6	6	7	6.125	1	0
7	7	14	1.500	1	0
8	8	3	6.125	1	0
9	9	10	6.125	1	0
10	10	11	6.125	1	0
11	11	15	1.500	1	0
12	12	4	6.125	1	0
13	5	58	6.667	1	0
14	6	10	7.667	1	0
15	7	11	7.667	1	0
16	8	12	7.667	2	0
17	2	5	9.813	3	45
18	5	10	9.813	3	45
19	10	7	9.813	3	45
21	12	3	9.813	3	45
22	13	6	5.375	1	0
23	14	8	4.625	1	0
24	15	12	4.625	1	0
25	13	16	2.000	4	0
26	16	19	3.500	4	0
27	19	22	1.000	4	0
28	14	17	2.000	4	0
29	17	20	3.500	4	0
30	20	23	1.000	4	0
31	15	18	2.000	4	0
32	18	21	3.500	4	0
33	21	24	1.000	4	0
35	18	43	3.333	3	45
36	17	38	5.500	3	45
37	19	27	1.546	3	45
38	21	41	0.958	3	45
39	20	35	1.500	3	45
43	28	29	1.500	3	45
44	29	50	0.813	3	45
45	30	21	1.546	3	45
46	16	51	1.546	3	45
47	31	32	1.000	3	45
48	32	66	0.469	3	45
49	33	34	1.000	3	45
50	34	52	1.875	3	45

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
51	27	31	3.971	3	45
52	32	28	4.230	3	45
53	29	33	4.230	3	45
54	34	30	3.971	3	45
55	35	36	5.000	3	45
56	36	49	1.000	3	45
57	37	19	1.500	3	45
58	38	40	1.000	3	45
59	39	16	5.500	3	45
60	37	39	5.315	3	45
61	35	38	5.315	3	45
62	40	39	1.000	3	45
63	36	40	3.500	3	45
64	41	42	5.750	3	45
65	42	20	0.958	3	45
66	43	44	1.000	3	45
67	44	17	3.333	3	45
68	42	44	4.230	3	45
69	41	43	4.230	3	45
70	45	54	1.088	3	45
71	46	30	1.787	3	45
72	47	46	1.000	3	45
73	48	37	2.500	3	45
74	45	48	2.035	3	45
75	46	42	5.779	3	45
76	49	48	1.500	3	45
77	49	47	6.638	3	45
78	50	29	0.813	3	45
79	51	31	1.875	3	0
80	52	18	1.546	3	0
81	53	55	0.813	3	0
82	54	65	0.490	3	45
83	55	53	0.813	3	0
84	56	55	1.499	3	45
85	57	63	1.866	1	0
86	58	9	1.000	1	0
87	57	59	3.000	5	0
88	59	58	5.514	5	0
92	63	64	1.429	1	0
94	64	5	2.000	1	0
95	27	45	1.787	3	45
96	50	47	1.650	3	45
97	29	50	0.813	3	45
99	53	33	1.563	3	0
100	55	53	0.813	3	45

Beams Cont...

Beam	Node A	Node B	Length (ft)	Property	β (degrees)
101	65	28	1.885	3	45
102	66	56	1.907	3	45



Beam Layout

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
1	W6X25	7.340	17.100	53.400	0.461	STEEL
2	W12X19	5.570	3.760	130.000	0.180	STEEL
3	L30306	2.110	2.793	0.727	0.102	STEEL
4	PIPS30	2.100	2.850	2.850	5.689	STEEL
5	W6X15	4.430	9.320	29.100	0.101	STEEL

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	CONCRETE	3.15E+3	0.170	8.68e-05	5.5E -6
2	ALUMINUM	10E+3	0.330	9.8e-05	12.8E -6
3	STEEL_50_KSI	29E+3	0.300	0.000283	6.5E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000283	9.9E -6
5	STEEL_36_KSI	29E+3	0.300	0.000283	6.5E -6
6	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
7	STEEL	29E+3	0.300	0.000283	6E -6
8	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip˙ft/deg)	rY (kip˙ft/deg)	rZ (kip˙ft/deg)
1	Fixed	Fixed	Fixed	-	-	-
2	Fixed	Fixed	Fixed	-	-	-
8	Fixed	Fixed	Fixed	-	-	-
12	Fixed	Fixed	Fixed	-	-	-

Releases

Beam ends not shown in this table are fixed in all directions.

Beam	Node	x	y	z	rx	ry	rz
4	3	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
4	4	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
13	5	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
14	6	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
14	10	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
15	7	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
15	11	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
35	18	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
36	17	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
37	19	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
38	21	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
39	20	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
45	21	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
46	16	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
57	19	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
59	16	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
65	20	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
67	17	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
80	18	Fixed	Fixed	Fixed	Pin	Fixed	Fixed
86	9	Fixed	Fixed	Fixed	Pin	Fixed	Fixed

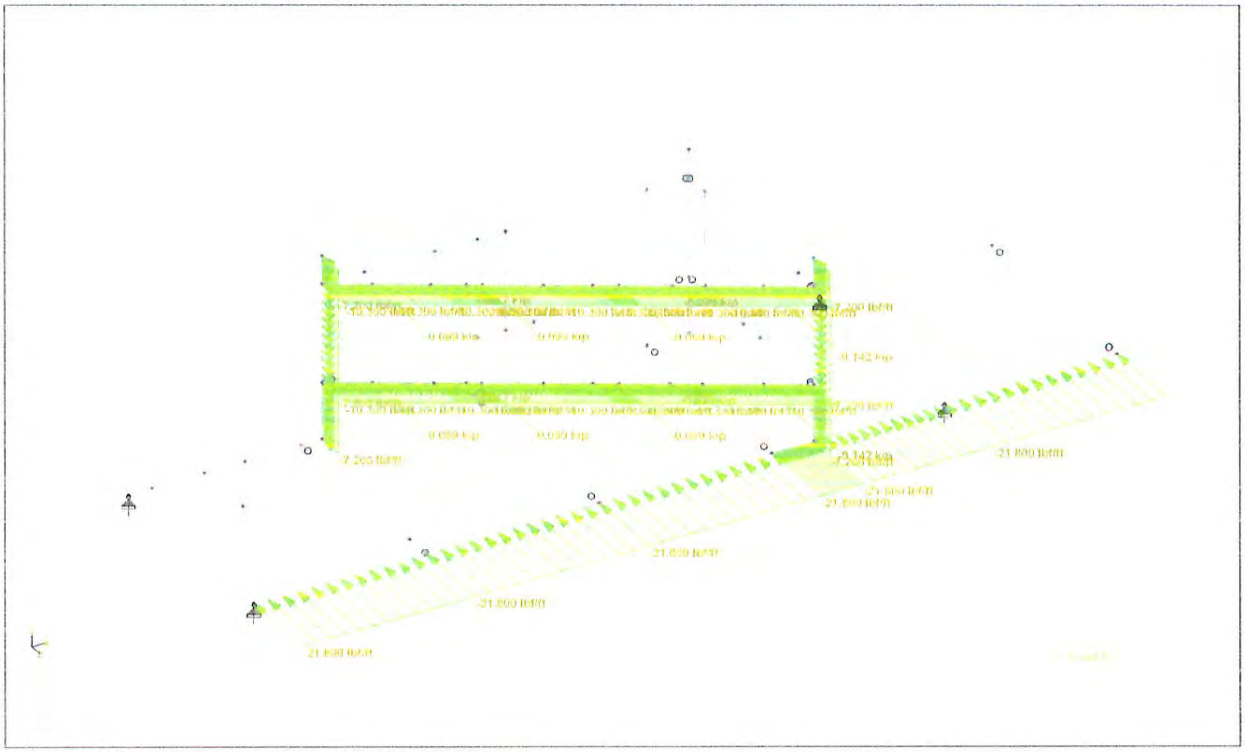
Primary Load Cases

Number	Name	Type
1	DL	Dead
2	WIND(Z)	Wind
3	WIND(X)	Wind

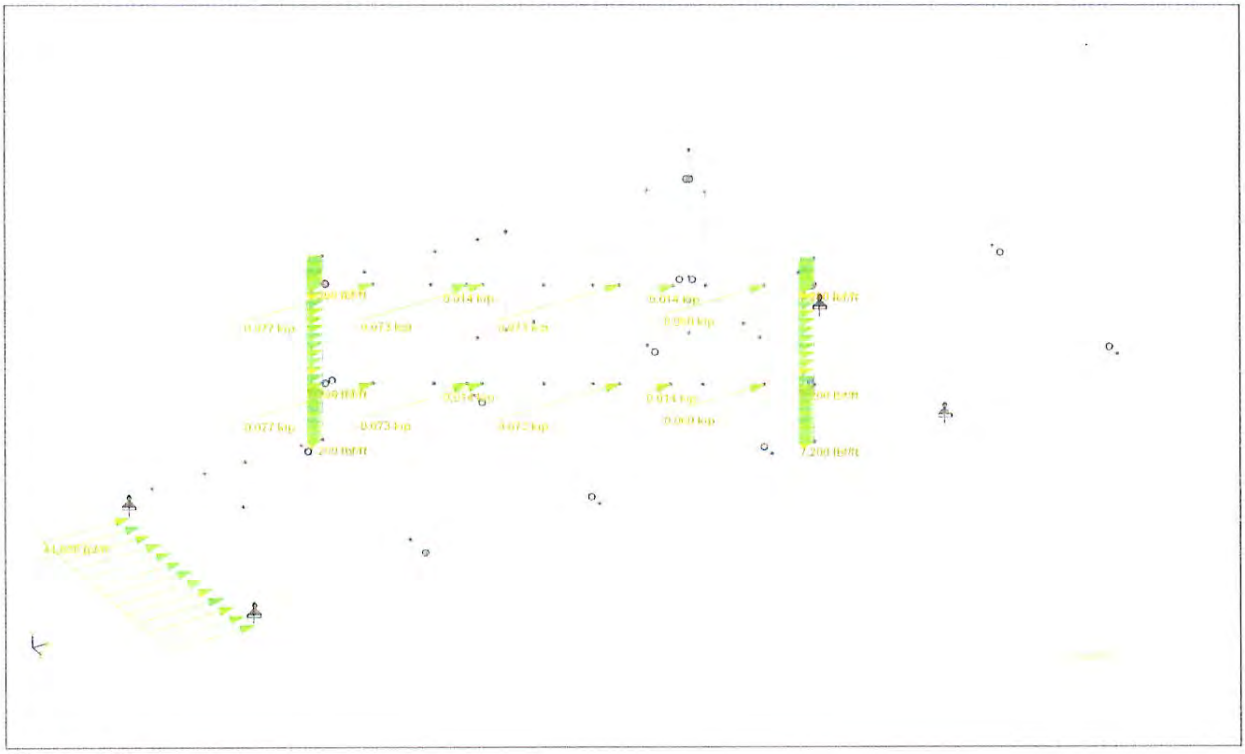
Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
4	1.0D + 1.5W(Z)	1	DL	1.00
		2	WIND(Z)	1.50
5	1.0D + 1.5W(X)	1	DL	1.00
		3	WIND(X)	1.50

Dead Loads


7.200 lb/ft
21.600 lb/ft
21.600 lb/ft
21.600 lb/ft
21.600 lb/ft
21.600 lb/ft

Wind Load (Z)



Wind Load (X)

Reactions

Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
1	1:DL	0.683	1.213	-0.110	0	0	0
	2:WIND(Z)	1.722	0.107	0.448	0	0	0
	3:WIND(X)	-0.381	-0.088	-0.096	0	0	0
	4:1.0D + 1.5W(	3.266	1.373	0.562	0	0	0
	5:1.0D + 1.5W(	0.111	1.080	-0.253	0	0	0
2	1:DL	-0.012	0.669	0.163	0	0	0
	2:WIND(Z)	-1.788	-0.107	1.110	0	0	0
	3:WIND(X)	-0.250	-0.009	0.090	0	0	0
	4:1.0D + 1.5W(	-2.693	0.509	1.828	0	0	0
	5:1.0D + 1.5W(	-0.387	0.655	0.297	0	0	0
8	1:DL	-0.513	1.314	-0.164	0	0	0
	2:WIND(Z)	0.479	0.567	0.287	0	0	0
	3:WIND(X)	-0.179	0.088	0.014	0	0	0
	4:1.0D + 1.5W(	0.205	2.165	0.267	0	0	0
	5:1.0D + 1.5W(	-0.782	1.446	-0.142	0	0	0
12	1:DL	-0.158	1.447	0.111	0	0	0
	2:WIND(Z)	-0.414	-0.567	0.213	0	0	0

Reactions Cont...

Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	Moment MY (kip-in)	Moment MZ (kip-in)
	3:WIND(X)	-0.225	0.009	-0.008	0	0	0
	4:1.0D + 1.5W(	-0.778	0.596	0.431	0	0	0
	5:1.0D + 1.5W(	-0.496	1.461	0.098	0	0	0

Z-Direction Wind governs for Sliding and Overturning

Per Construction Drawings by Hudson Design Group dated 11/08/2016, ballast is adhered to roof paver

Coef. of Friction = 0.8
Total weight 4.643 kip
Total sliding force = 3.088 kip (Sum of Fz Reactions)

0.8)*(4.643) = 3.715 > 3.088 kip --> Sliding OK

APPENDIX D

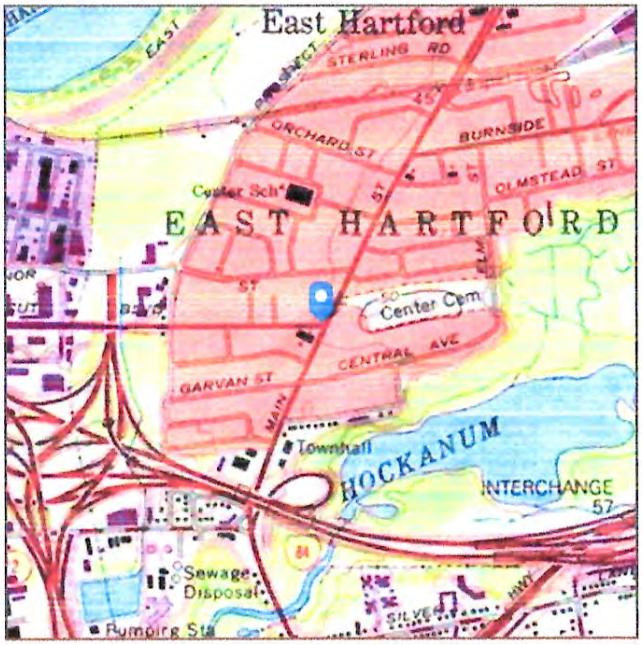
Dewberry

ASCE 7 Hazards Report

Address:
886 Main St
East Hartford, Connecticut
06108

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class:

Elevation: 40.7 ft (NAVD 88)
Latitude: 41.769404
Longitude: -72.64371



Wind

Results:

Wind Speed:	123 Vmph
10-year MRI	77 Vmph
25-year MRI	86 Vmph
50-year MRI	93 Vmph
100-year MRI	100 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Wed Sep 11 2019

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CT2490	DATE:	12/24/2018	RF DESIGN ENG:	Parminder Singh	RF PERF ENG:	
ISSUE:	Evidence Statement	Approved? (Y/N)	Yes	RF DESIGN PHONE:	860 358-6350	RF PERF PHONE:	
REVISION:	Preliminary	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	[redacted]	RF PERF EMAIL:	
INITIATIVE / PROJECT:	LTE 1900 RWE 1900 A3 A4 & 5 & Q5					RFDS VERSION:	1.00
						GSM FREQUENCY:	
						UMTS FREQUENCY:	
						LTE FREQUENCY:	700,850,1900,AWS,WCS
						5G FREQUENCY:	850
						IPLAN JOB # 1:	NCR RDTS-19-30467
						IPLAN JOB # 2:	
						IPLAN JOB # 3:	
						IPLAN JOB # 4:	
						IPLAN JOB # 5:	
						IPLAN JOB # 6:	
						IPLAN JOB # 7:	
						IPLAN JOB # 8:	

RFDS PROGRAM TYPE:	2019 LTE Densified Carrier		
RFDS TECHNOLOGY:	LTE		
STATE/STATUS:	Preliminary/Approved		
RFDS ID:	2751546		
Created By:	dp056b	Updated By:	dp056b
Created:	12/24/2018	Updated:	1/16/2019
PRID / SUB GRP #1:	7C Additional Radio / BWE Swap Top RRH Add		
PRID / SUB GRP #2:			
PRID / SUB GRP #3:			
PRID / SUB GRP #4:			
PRID / SUB GRP #5:			
PRID / SUB GRP #6:			
PRID / SUB GRP #7:			
PRID / SUB GRP #8:			

Section 2 - LOCATION INFORMATION

USID:	131344	FA LOCATION CODE:	10552070	LOCATION NAME:	EAST HARTFORD MAIN STREET	ORACLE PRJT # 1:	3551 AIM/95
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PRJT # 2:	
ADDRESS:	806 MAIN STREET	CITY:	EAST HARTFORD	STATE:	CT	ORACLE PRJT # 3:	
ZIP CODE:	06108	COUNTY:	HARTFORD	LONG (DEC. DEG.):	-72.6427778	ORACLE PRJT # 4:	
LATITUDE (D-M-S):	41 d 46m 9.0984s	LONGITUDE (D-M-S):	72d 38m 34.0008s	LAT (DEC. DEG.):	41.7692444	ORACLE PRJT # 5:	
						ORACLE PRJT # 6:	
						ORACLE PRJT # 7:	
						ORACLE PRJT # 8:	
						BORDER CELL WITH CONTOUR COORD:	
						AM STUDY REQ'D (Y/N):	No
						FREQ COORD:	
						OPS DISTRICT:	
						OPS ZONE:	
						RF DISTRICT:	
						RF ZONE:	
						PARENT NAME(GSM):	
						PARENT NAME(UMTS):	

DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	HARTFORD EAST ELDERLY APARTMENTS		
PACE JOB #1:	MRCT8038015		
PACE JOB #2:			
PACE JOB #3:			
PACE JOB #4:			
PACE JOB #5:			
PACE JOB #6:			
PACE JOB #7:			
PACE JOB #8:			
SEARCH RING NAME:			
SEARCH RING ID:			
BTA:		MSA / RSA:	
LAC(GSM):			
LAC(UMTS):			
BSC(GSM):			
RNC(UMTS):			
MME POOL ID(LTE):	0701		

Section 3 - LICENSE COVERAGE FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		FCS REDUCED - UPS ZIP:	
CGSA - MINOR FILING NEEDED (Yes/No):	No	CGSA EXT AGMT NEEDED:		FCS POPS REDUCED:	
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:			

CGSA CALL SIGNS:	

Section 4 - TOWER REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):	0	STRUCTURE TYPE:	
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:	
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):			
LIGHTING TYPE:					

MARKET LOCATION 700 MHz Band:	
MARKET LOCATION 850 MHz Band:	
MARKET LOCATION 1900 MHz Band:	
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		
	LTE 1ST RBS	5G 1ST RBS
RBS ID	[illegible]	[illegible]
CTB COMMON ID	[illegible]	[illegible]
CELL ID : BCF	[illegible]	[illegible]
BTA/TID	[illegible]	[illegible]
4-9 DIGIT SITE ID	[illegible]	[illegible]
COW OR TOY?	[illegible]	[illegible]
CELL SITE TYPE	[illegible]	[illegible]
SITE TYPE	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL
BTS LOCATION ID		
BASE STATION TYPE	[illegible]	[illegible]
EQUIPMENT NAME	[illegible]	[illegible]
DISASTER PRIORITY	[illegible]	[illegible]

Section 6 - RBS GENERAL INFORMATION - final		
	LTE 1ST RBS	5G 1ST RBS
RBS ID	[illegible]	[illegible]
CTB COMMON ID	[illegible]	[illegible]
CELL ID : BCF	[illegible]	[illegible]
BTA/TID	[illegible]	[illegible]
4-9 DIGIT SITE ID	[illegible]	[illegible]
COW OR TOY?	[illegible]	[illegible]
CELL SITE TYPE	[illegible]	[illegible]
SITE TYPE	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL
BTS LOCATION ID		
BASE STATION TYPE	[illegible]	[illegible]
EQUIPMENT NAME	[illegible]	[illegible]
DISASTER PRIORITY	[illegible]	[illegible]

Section 7 - RBS SPECIFIC INFORMATION - existing		
	LTE 1ST RBS	5G 1ST RBS
RAC:		
EQUIPMENT VENDOR:	ERICSSON	ERICSSON
EQUIPMENT TYPE:	6651 INDOOR MU	6651 INDOOR MU
BASEBAND CONFIGURATION:	1x6631 / 1x6630 / 1x1VMJC3	1x6631 / 1x6630 / 1x1VMJC3
LOCATION:		
CABINET LOCATION:		
MARKET STATE CODE:	CT	CT
AGPS:	Yes	Yes
NODE B NUMBER:	2490	2490

Section 7 - RBS SPECIFIC INFORMATION - final		
	LTE 1ST RBS	5G 1ST RBS
RAC:		
EQUIPMENT VENDOR:	ERICSSON	ERICSSON
EQUIPMENT TYPE:	6651 INDOOR MU	6651 INDOOR MU
BASEBAND CONFIGURATION:	1x6631 / 1x6630 / 1x1VMJC3	1x6631 / 1x6630 / 1x1VMJC3
LOCATION:		
CABINET LOCATION:		
MARKET STATE CODE:	CT	CT
AGPS:	Yes	Yes
NODE B NUMBER:	2490	2490

Section 8 - RBS SECTOR ASSOCIATION - existing

	LTE 1ST RBS	5G 1ST RBS
CTS Common ID	CTL03490	CTN00249C
Soft Sector ID	CTL03490_3A_2	CTN00249C_FMCA_1
	CTL03490_3B_2	CTN00249C_FMSB_1
	CTL03490_3C_2	CTN00249C_FMSC_1
	CTL03490_3A_1	
	CTL03490_1B_1	
	CTL03490_1C_1	
	CTL03490_7A_1	
	CTL03490_7B_1	
	CTL03490_7C_1	
	CTL03490_4A_1	
	CTL03490_4B_1	
	CTL03490_4C_1	
	CTL03490_9A_1	
	CTL03490_9A_2	
	CTL03490_9B_1	
	CTL03490_9B_2	
	CTL03490_9C_1	
	CTL03490_9C_2	

Section 8 - RBS SECTOR ASSOCIATION - final

	LTE 1ST RBS	5G 1ST RBS
CTS Common ID	CTL03490	CTN00249C
Soft Sector ID	CTL03490_3A_2	CTN00249C_N001A_1
	CTL03490_3B_2	CTN00249C_N001B_1
	CTL03490_3C_2	CTN00249C_N001C_1
	CTL03490_1A_1	
	CTL03490_1B_1	
	CTL03490_1C_1	
	CTL03490_7A_1	
	CTL03490_7B_1	
	CTL03490_7C_1	
	CTL03490_4A_1	
	CTL03490_4B_1	
	CTL03490_4C_1	
	CTL03490_9A_1	
	CTL03490_9A_2	
	CTL03490_9A_3	
	CTL03490_9B_1	
	CTL03490_9B_2	
	CTL03490_9B_3	
	CTL03490_9C_1	
	CTL03490_9C_2	
	CTL03490_9C_3	

Section 9 - SOFT SECTOR ID - existing

	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	LTE 5TH 1900	5G 1ST 850
LOI/ID (excluding Nord Sector)								
SECTOR A SOFT SECTOR ID	CTLG2490_7A_1	CTLG2490_8A_1	CTLG2490_9A_1	CTLG2490_1A_1	CTLG2490_4A_2	CTLG2490_5A_2		CTNG2490_N2A_1
SECTOR_B	CTLG2490_7B_1	CTLG2490_8B_1	CTLG2490_9B_1	CTLG2490_1B_1	CTLG2490_4B_2	CTLG2490_5B_2		CTNG2490_N2B_1
SECTOR_C	CTLG2490_7C_1	CTLG2490_8C_1	CTLG2490_9C_1	CTLG2490_1C_1	CTLG2490_4C_2	CTLG2490_5C_2		CTNG2490_N2C_1
SECTOR_D								
SECTOR_E								
SECTOR_F								
OMNI								

Section 9 - SOFT SECTOR ID - final

	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	LTE 5TH 1900	5G 1ST 850
LOI/ID (excluding Nord Sector)								
SECTOR A SOFT SECTOR ID	CTLG2490_7A_1	CTLG2490_8A_1	CTLG2490_9A_1	CTLG2490_1A_1	CTLG2490_4A_2	CTLG2490_5A_2	CTLG2490_6A_2	CTNG2490_N2A_1
SECTOR_B	CTLG2490_7B_1	CTLG2490_8B_1	CTLG2490_9B_1	CTLG2490_1B_1	CTLG2490_4B_2	CTLG2490_5B_2	CTLG2490_6B_2	CTNG2490_N2B_1
SECTOR_C	CTLG2490_7C_1	CTLG2490_8C_1	CTLG2490_9C_1	CTLG2490_1C_1	CTLG2490_4C_2	CTLG2490_5C_2	CTLG2490_6C_2	CTNG2490_N2C_1
SECTOR_D								
SECTOR_E								
SECTOR_F								
OMNI								

Section 9 - Cell Number - existing

	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	LTE 5TH 1900	5G 1ST 850
LIDAR (excluding Hard Sector)								
SECTOR A CELL NUMBER	72	73	74	140	175	176		73
SECTOR B	71	72	73	139	174	175		72
SECTOR C	70	71	72	141	180	174		71
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 9 - Cell Number - final

	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	LTE 5TH 1900	5G 1ST 850
LIDAR (excluding Hard Sector)								
SECTOR A CELL NUMBER	72	73	74	140	175	176	177	73
SECTOR B	71	72	73	139	174	175	176	72
SECTOR C	70	71	72	141	180	174	175	71
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 10 - CID SAC - existing								
	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	LTE 5TH 1900	5G 1ST 850
SECTOR A CID/SAC								
SECTOR B								
SECTOR C								
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 10 - CID SAC - final								
	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	LTE 5TH 1900	5G 1ST 850
SECTOR A CID/SAC								
SECTOR B								
SECTOR C								
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 11 - CURRENT RADIO COUNTS existing																										
	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																							
SECTOR A RADIO COUNTS																										
SECTOR B																										
SECTOR C																										
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 12 - CURRENT T1 COUNTS existing																		
	LTE SIT Cabinet																	
# T1s																		
LINK PROFILE																		
RF COMBINING																		
FIBER or ETHERNET?	ETHERNET																	
Tx Board Model																		
Tx Board QTY																		
RAX/ECU Board Model																		
RAX/ECU Board QTY																		
BBU Board Model																		
BBU Board QTY																		
RRU - location	SIT																	
FIBER JUMPER	FIBER																	
DC CABLE	DC																	
DC/Fiber Dom. Box	RAYCAP																	
Bundled Fiber Cable	FIT																	
Bundled DC Cable	FIT																	

Section 13 - NEW PROPOSED RADIO COUNTS																										
	LTE 1ST 700	LTE 1ST 1900	LTE 1ST WCS																							
SECTOR A RADIO COUNTS																										
SECTOR B																										
SECTOR C																										
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 14 - NEW/PROPOSED T1 COUNTS																	
	LTE 10T Cabinet																
# T1s																	
LINK PROFILE																	
RF COMBINING																	
FIBER or ETHERNET?	ETHERNET																
Tx Board Model																	
Tx Board QTY																	
RAX/ECU Board Model																	
RAX/ECU Board QTY																	
BBU Board Model																	
BBU Board QTY																	
RRU - location																	
FIBER JUMPER																	
DC CABLE																	
DC/Fiber Dstr. Box																	
Bundled Fiber Cable																	
Bundled DC Cable																	

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	800-10967	OPA-65R-LCUU-H6	OPA-65R-LCUU-H6				
ANTENNA VENDOR	Kathrein	CCI Products	CCI Products				
ANTENNA SIZE (H x W x D)	78.7X20X8.9	72X14.8X7.4	72X14.8X7.4				
ANTENNA WEIGHT	158.6	73	73				
AZIMUTH	90	90	90				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	140	140	140				
ANTENNA TIP HEIGHT	120	120	120				
MECHANICAL DOWNTILT	0	0	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)		Built In	Built In	Built In			
SURGE ARRESTOR (QTY/MODEL)			1	DC Fiber Squid			
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		iLTE RRH	iLTE RRH	iLTE 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	B53123449					
RRH - 850 band (QTY/MODEL)		RRH is shared with another band					
RRH - 1900 band (QTY/MODEL)		1	B13B66A 0643				
RRH - AWS band (QTY/MODEL)		RRH is shared with another band					
RRH - WCS band (QTY/MODEL)			1	RTMS-32			
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 / AloII	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)	RXAT 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(csang)
ANTENNA POSITION 1	PORT 1		131344 A 700 4G 1	CTL02490_7A_1	CTL02490_7A_1		iLTE 700	80010965_716M Hz_06DT	14.7	90	8	Top	FIBER	0						1475.7065			
	PORT 2		131344 A 850 4G 1	CTL02490_8A_1	CTL02490_8A_1		iLTE 850	80010965_849M Hz_06DT	15.5	90	8	Top	FIBER	0						1000		1	
	PORT 3		131344 A AWS 4G 4	CTL02490_2A_2	CTL02490_2A_2		iLTE AWS	80010965_2172 MHz_06DT	18.3	90	8	Top	FIBER	0						3607.6704		2	
	PORT 5		131344 A 850 5G smp1	CTCN002490_NC_05A_1	CTCN002490_NC_05A_1		5G 850	80010965_849M Hz_06DT	15.5	90	8	Top	FIBER	0						1000			
ANTENNA POSITION 2	PORT 2		131344 A 1900 4G	CTL02490_8A_1	CTL02490_8A_1		iLTE 1900	H5_1930MHz_06DT	17.4	90	8 (or 12 or 4)	Top	FIBER	0						3664.375		4	

ANTENNA POSITION 2	PORT 4		131344 A 1900 4 G 4	CTL02490_6A_2	CTL02490_6A_2		LTE 1900	H6 1930MHz_08 D7	17.4	90	8	Tec	FIXED	0							3664.3757		4	
ANTENNA POSITION 3	PORT 5		131344 A WCS 4 G 1	CTL02490_3A_1	CTL02490_3A_1		LTE WCS	H6 2250MHz_08 D7	17.6	90	9	Tec	FIXED	0							1282.2866		6	

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	RFS 10960	CPA-65R-LCUU-H6	CPA-65R-LCUU-H6				
ANTENNA VENDOR	Kathrein	CCI Products	CCI Products				
ANTENNA SIZE (H x W x D)	78.7X20X0.9	72X14.8X7.4	72X14.8X7.4				
ANTENNA WEIGHT	138.6	73	73				
AZIMUTH	200	200	200				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109	109				
ANTENNA TIP HEIGHT	112	112	112				
MECHANICAL DOWNTILT	0	0	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)	Built In	Built In	Built In				
SURGE ARRESTOR (QTY/MODEL)			1 DCTiger Squid				
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	LTE RRH	LTE RRH	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)	B53/12 4449						
RRH - 850 band (QTY/MODEL)	RRH is shared w/ another band						
RRH - 1900 band (QTY/MODEL)	1 B2 B66A 8843						
RRH - AWS band (QTY/MODEL)	RRH is shared w/ another band						
RRH - WCS band (QTY/MODEL)			1 RRUS-32				
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)	FIXAIT 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(casing)
ANTENNA POSITION 1	PORT 1		131344 B 700 4G 1	C"L02490_7B_1	C"L02490_7B_1		LTE 700	802 10965_716M Hz_06DT	14.7	200	8	Top	FIBER	0						475.7065		0	
	PORT 2		131344 B 850 4G 1	C"L02490_8B_1	C"L02490_8B_1		LTE 850	802 10965_849M Hz_06DT	15.5	200	8	Top	FIBER	0						1000		0	
	PORT 3		131344 B AWS 4G 4	C"L02490_2B_2	C"L02490_2B_2		LTE AWS	802 10965_2170 MHz_08DT	18.3	200	8	Top	FIBER	0						380.6724		0	
	PORT 5		131344 B 850 5G 1 rrp1	C"CN002490_NC_05B_1	C"CN002490_NC_05B_1		5G 850	802 10965_849M Hz_08DT	15.5	200	8	Top	FIBER	0						1000		0	
ANTENNA POSITION 2	PORT 6		131344 B 1900 4G	C"L02490_9B_1	C"L02490_9B_1		LTE 1900	H6 1930MHz_08DT	17.4	200	8 (at 12 of 12)	Top	FIBER	0						3664.8757		0	

ANTENNA POSITION 2	PORT 4		131344.B 1900.4 G 4	CTL02490_8B_2	C_L02490_8B_2		LTE 1900	Hi 1930MHz 08 D1	17.4	200	8	Tac	FBGA	0						3664.3757		12	
ANTENNA POSITION 3	PORT 3		131344.B WCS 4 G 1	CTL02490_3B_1	CTL02490_3B_1		LTE WCS	Hi 2350MHz 08 D1	17.8	200	8	Tac	FBGA	0						1282.2666		14	

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	800-12965	CPA-65R-LCUU-H6	CPA-65R-LCUU-H6				
ANTENNA VENDOR	Kathrein	CCI Products	CCI Products				
ANTENNA SIZE (H x W x D)	79.7X20X8.9	72X14.8X7.4	72X14.8X7.4				
ANTENNA WEIGHT	108.6	73	73				
AZIMUTH	050	270	500				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	140	140	140				
ANTENNA TIP HEIGHT	120	120	120				
MECHANICAL DOWNTILT	0	0	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)	Built In	Built In	Built In				
SURGE ARRESTOR (QTY/MODEL)			1 DC Fiber Squid				
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	LTE RRH	LTE RRH	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 w/1 another band						
RRH - 1900 band (QTY/MODEL)		1 B2/B66A 8843					
RRH - AWS band (QTY/MODEL)	RRH is shared w/1 another band						
RRH - WCS band (QTY/MODEL)			1 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							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Aloll)	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)	RXAT 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(cpang)
ANTENNA POSITION 1	PORT 1		131344 C 700 4G	CTL02490_7C_1	CTL02490_7C_1		LTE 700	800 12965_716M Hz_04ST	14.9	050	3	Top	FIBER	0						4767.7065		17	
	PORT 2		131344 C 800 4G	CTL02490_8C_1	CTL02490_8C_1		LTE 850	800 12965_849M Hz_04ST	15.4	050	4	Top	FIBER	0						1000		17	
	PORT 3		131344 C AWS 4G	CTL02490_2C_2	CTL02490_2C_3		LTE AWS	800 12965_2175 MHz_04ST	16.5	050	4	Top	FIBER	0						3837.0704		18	
	PORT 5		131344 C 850 5G	CTGN002490_N0 05C_1	CTGN002490_N0 05C_1		5G 850	800 12965_849M Hz_04ST	15.4	050	4	Top	FIBER	0						1000		17	
ANTENNA POSITION 2	PORT 5		131344 C 1900 4G	CTL02490_9C_1	CTL02490_9C_1		LTE 1900	H6 1880MHz_04ST	17.4	050	4	Top	FIBER	0						3664.3757		20	

ANTENNA POSITION 2	PORT 4		131344 C 1900 4 G 4		C1L02490_9C_2	C_L02490_9C_2		LTE 1900	H6 1930MHz 04 DT	17.4	350	4	Tpc	FBLR	0						3664.3757		20	
ANTENNA POSITION 3	PORT 3		131344 C WCS 4 G 4		C1L02490_3C_1	C1L02490_3C_1		LTE WCS	H6 2350MHz 04 DT	17.8	350	4	Tpc	FBLR	0						1265.2666		20	

Section 18A - 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				HPA-65R-BUEAA			
ANTENNA VENDOR				CCI			
ANTENNA SIZE (H x W x D)				71X11.7X7.9			
ANTENNA WEIGHT				51			
AZIMUTH				90			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				140			
ANTENNA TIP HEIGHT				143			
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)				Built In			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				ILTE 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)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 4415.B25			
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	antenna. Add RQS radio 4415.B						
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)	RXAT 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 4	PORT 3		131344 A 1900 4 G 1	C_L02490_9A_2	C_L02490_9A_2		LTE 1900	BUEA 1900MHz 0837	17.6	90	8	Top	FIBER	0						4642.058		0	
	PORT 4		131344 A 1900 4 G 5	C_L02490_9A_3	C_L02490_9A_3		LTE 1900	BUEA 1900MHz 0837	17.6	90	8	Top	FIBER	0						4642.058		0	

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				HPA-65R-BUU-A			
ANTENNA VENDOR				CCI			
ANTENNA SIZE (H x W x D)				71X11.7X7.6			
ANTENNA WEIGHT				51			
AZIMUTH				200			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				109			
ANTENNA TIP HEIGHT				112			
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)				Built In			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				ILTE 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)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 4415 B25			
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	Adh height antenna. A33 R35 ranio 4415 B 25						
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)	RXAT 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 4	PORT 3		131344 B 1900 4 G 1	CTL02490_9B_2	CTL02490_9B_2		LTE 1900	BUUA 1900MHz 2DOT	17.6	200	0	Top	FIBER	0						4642.058		16	
	PORT 4		131344 B 1900 4 G 5	CTL02490_9B_3	CTL02490_9B_3		LTE 1900	BUUA 1900MHz 2DOT	17.6	200	0	Top	FIBER	0						4642.058		6	

Section 15C - 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				HPA-65R-BUU-A			
ANTENNA VENDOR				CCI			
ANTENNA SIZE (H x W x D)				71X11.7X7.9			
ANTENNA WEIGHT				51			
AZIMUTH				350			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				140			
ANTENNA TIP HEIGHT				142			
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)				BIAS In			
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)							
RRH - 850 band (QTY MODEL)							
RRH - 1900 band (QTY MODEL)				1 4415 B25			
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	Add height antenna Adz POS radio 4415 B 25						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USGID (CGSng)	USGID (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)	FIXAT 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(csang)
ANTENNA POSITION 4	PORT 3		131344 C 1900 4 G 4	CTLO0490 9C 2	CTLO0490 9C 2		LTE 1900	BUAA 1900MHz 24DT	17.2	350	4	Top	FIBER	0						4842.058		24	
	PORT 4		131344 C 1900 4 G 5	CTLO0490 9C 3	CTLO0490 9C 3		LTE 1900	BUAA 1900MHz 24DT	17.2	350	4	Top	FIBER	0						4842.058		24	

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	800-10965	OPA-65R-LCUU4-H6	OPA-65R-LCUU4-H6	HPA-65R-BUU4A			
ANTENNA VENDOR	Kaelus	CCI Products	CCI Products	CCI			
ANTENNA SIZE (H x W x D)	78.7X20X8.9	72X14.8X7.4	72X14.8X7.4	71X11.7X7.6			
ANTENNA WEIGHT	108.6	72	72	51			
AZIMUTH	90	90	90	90			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	140	140	140	140			
ANTENNA TIP HEIGHT	143	143	143	143			
MECHANICAL DOWNTILT	0	0	0	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)	Built In	Built In	Built In	Built In			
SURGE ARRESTOR (QTY:MODEL)			1 DC Fiber Squid				
DIPLEXER (QTY:MODEL)							
DUPLEXER (QTY:MODEL)							
Antenna RET CONTROL UNIT (QTY:MODEL)	LTE RRH	LTE RRH	LTE RRH	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 w/1 another band						
RRH - 1900 band (QTY:MODEL)		1 B2/B66A 4843		1 4415B25			
RRH - AWS band (QTY:MODEL)	RRH is shared w/1 another band						
RRH - WCS band (QTY:MODEL)			1 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 new ant antenna A65/B25/radio 4415 B25						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TX/D	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(csang)
ANTENNA POSITION 1	PORT 1	131344.A.700.4G 1	131344.A.700.4G 1	CTL00490_7A_1	CTL00490_7A_1		LTE 700	800010965_716M Hz_06DT	14.7	90	6	Top	FIBER	0						1479.7065		1	
	PORT 2	131344.A.850.4G 1	131344.A.850.4G 1	CTL00490_8A_1	CTL00490_8A_1		LTE 850	800010965_849M Hz_06DT	15.5	90	8	Top	FIBER	0						1000			
	PORT 3	131344.A.AWS.4G 4	131344.A.AWS.4G 4	CTL00490_2A_2	CTL00490_2A_2		LTE AWS	800010965_2170 MHz_06DT	18.3	90	8	Top	FIBER	0						3837.0724		2	
	PORT 5	131344.A.850.5G 1mp1	131344.A.850.5G 1	CTCN002490_N0 05A_1	CTCN002490_N0 05A_1		5G 850	800010965_849M Hz_06DT	15.5	90	8	Top	FIBER	0						1000			

ANTENNA POSITION 2	PORT 2	121344 A 1900 4 G 1	131344 A 1900 4 G 1	CTL02490_9A_1	CTL02490_9A_1		LTE 1900	HS 1930MHz 09 DT	17.4	90	8	Tec	FIBER	0						3664.3757		4	
ANTENNA POSITION 3	PORT 3	131344 A WCS 4 G 1	131344 A WCS 4 G 1	CTL02490_3A_1	CTL02490_3A_1		LTE WCS	HS 2350MHz 09 DT	17.6	90	8	Tec	FIBER	0						1267.2988		6	
ANTENNA POSITION 4	PORT 3	G 1 131344 A 1900 4	131344 A 1900 4 G 1	CTL02490_9A_2	CTL02490_9A_2		LTE 1900	BUSA 1900MHz DEOT	17.6	90	8	Tec	FIBER	0						4842.058		8	
	PORT 4	121244 A 1900 4 Qdmp5	131344 A 1900 4 G 5	CTL02490_9A_3	CTL02490_9A_2		LTE 1900	BUSA 1900MHz DEOT	17.6	90	8	Tec	FIBER	0						4842.058		8	

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION (s 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	800 10965	CPA 65R LCUU H6	CPA 65R LCUU H6	HPA 65R BUBAA			
ANTENNA VENDOR	Kathrein	CCI Products	CCI Products	CCI			
ANTENNA SIZE (H x W x D)	78.7X20X8.9	72X14.8X7.4	72X14.8X7.4	71X11.7X7.6			
ANTENNA WEIGHT	138.6	73	73	51			
AZIMUTH	200	200	200	200			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109	109	109			
ANTENNA TIP HEIGHT	112	112	112	112			
MECHANICAL DOWNTILT	0	0	0	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)		Built In	Built In	Built In	Built In		
SURGE ARRESTOR (QTY/MODEL)			1 DC/Fiber Squid				
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH	LTE RRH	LTE RRH	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 w/ another band						
RRH - 1900 band (QTY/MODEL)		1 B2 B66A 8843		1 4415 B25			
RRH - AWS band (QTY/MODEL)	RRH is shared with another band						
RRH - WCS band (QTY/MODEL)			1 RTUS-32				
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 hardport antenna. Add POS radio 4415 B-25						
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(csang)
ANTENNA POSITION 1	PORT 1	131344.B.700.4G.1	131344.B.700.4G.1	GTL02490_7B_1			LTE 700	80010965_716M Hz_06DT	14.7	200	8	Top	FIBER	0						4767.7063		0	
	PORT 2	131344.B.850.4G.1	131344.B.850.4G.1	GTL02490_8B_1			LTE 850	80010965_840M Hz_06DT	15.5	200	8	Top	FIBER	0						7000		0	
	PORT 3	131344.B.AWS.4G.mp4	131344.B.AWS.4G.2	GTL02490_2B_2			LTE AWS	80010965_2172 MHz_06DT	18.3	200	8	Top	FIBER	0						3607.6704		0	
	PORT 5	131344.B.850.5G.tmo1	131344.B.850.5G.1	GTCN002490_N0058_1	GTCN002490_N0058_1		5G 850	80010965_840M Hz_06DT	15.5	200	8	Top	FIBER	0						7000		0	
ANTENNA POSITION 2	PORT 3	131344.B.1900.4G.1	131344.B.1900.4G.1	GTL02490_9B_1			LTE 1900	H6 1930MHz 06DT	17.4	200	8 [illegible]	Top	FIBER	0						3664.3757		12	

ANTENNA POSITION 3	PORT 3	131344.B.WCS.4 G.1	131344.B.WCS.4 G.1		CTL02490_3B_1	CTL02490_3B_1		ILTE WCS	HE 2300MHz 0B 07	17.6	200	3	Tec	FIBER	0						1265.2966		14	
ANTENNA POSITION 4	PORT 3	Q.1 131344.B.1900.4	131344.B.1900.4 G.1		CTL02490_9B_2	CTL02490_9B_2		ILTE 1900	BUKA 1900MHz 68DT	17.6	200	3	Tec	FIBER	0						4842.058		16	
	PORT 4	131344.B.1900.4 G.tmp5	131344.B.1900.4 G.5		CTL02490_9B_3	CTL02490_9B_3		ILTE 1900	BUKA 1900MHz 68DT	17.6	200	3	Tec	FIBER	0						4842.058		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	800-10965	CPA-65R-LCUU-H6	CPA-65R-LCUU-H6	HPA-65R-BUU-A			
ANTENNA VENDOR	Kathrein	CCI Products	CCI Products	CCI			
ANTENNA SIZE (H x W x D)	79.7X20X6.9	72X14.8X7.4	72X14.8X7.4	71X11.7X7.6			
ANTENNA WEIGHT	108.6	73	73	51			
AZIMUTH	350	210	350	350			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	140	140	140	140			
ANTENNA TIP HEIGHT	143	143	143	143			
MECHANICAL DOWNTILT	0	0	0	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)	Built In	Built In	Built In	Built In			
SURGE ARRESTOR (QTY/MODEL)			1 / DCP fiber Squid				
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	LTE RRH	LTE RRH	LTE RRH	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 / B2/B12 4449						
RRH - 850 band (QTY/MODEL)	RRH is shared w/ another band						
RRH - 1900 band (QTY/MODEL)	1 / B2 B66A 8843			1 / 4415 B25			
RRH - AWS band (QTY/MODEL)	RRH is shared w/ another band						
RRH - WCS band (QTY/MODEL)			1 / RUG 30				
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 passport antenna. Add PCS radio 4415 B-25						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USSID (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(casing)
ANTENNA POSITION 1	PORT 1	131344 C 700 4G 1	131344 C 700 4G 1	C7L02490_7C_1	C7L02490_7C_1		LTE 700	800 10965_716M Hz_02DT	14.7	350	1	Top	FIBER	0						475.7065		7	
	PORT 2	131344 C 850 4G 1	131344 C 850 4G 1	C7L02490_8C_1	C7L02490_8C_1		LTE 850	800 10965_849M Hz_04DT	15.4	350	4	Top	FIBER	0						1000		7	
	PORT 3	131344 C AWS 4G tmp4	131344 C AWS 4G	C7L02490_2C_2	C7L02490_2C_2		LTE AWS	800 10965_2175 MHz_04DT	15.5	350	4	Top	FIBER	0						903.7674		8	
	PORT 5	131344 C 850 5G tmp1	131344 C 850 5G 1	C7CN002490_N5GC_1	C7CN002490_N5GC_1		5G 850	800 10965_849M Hz_04DT	15.4	350	4	Top	FIBER	0						1000		7	
ANTENNA POSITION 2	PORT 3	131344 C 1900 4G 1	131344 C 1900 4G	C7L02490_9C_1	C7L02490_9C_1		LTE 1900	H6 1880MHz_04DT	11.4	350	4	Top	FIBER	0						3664.2757		10	

ANTENNA POSITION 3	PORT 2	131344 C WCS 4 G 1	131344 C WCS 4 G 1	C TL02490_3C_1	C TL02490_3C_1		LTE WCS	H6_2350MHz_64 QT	17.8	350	4	Tcc	FIBER	0						1265.2866		02	
ANTENNA POSITION 4	PORT 3	G 1 131344 C 1900 4	131344 C 1900 4 G 1	C TL02490_9C_2	C TL02490_9C_2		LTE 1900	BUKA 1900MHz 64QT	17.2	350	4	Tcc	FIBER	0						4842.058		24	
	PORT 4	131344 C 1900 4 G tmo5	131344 C 1900 4 G 5	C TL02490_9C_3	C TL02490_9C_3		LTE 1900	BUKA 1900MHz 64QT	17.2	350	4	Tcc	FIBER	0						4842.058		24	

RRUS 4415 B25

- B25
  - TX = 1930 – 1995 MHz
  - RX = 1850 – 1915 MHz
- CPRI 2 ports x 2.5/4.9/9.8/10.1 Gbps. Install 2 SFPs and connect 2 fiber pair to the RRUS 4415 during initial install
- Only use Ericsson supplied and approved SFPs RDH10265/25
  - Exception: SFP7 RDH 102 65/3 for CPRI 1.4km to 10km
  - Exception: SFP7 (pair): RDH 102 70/1 and RDH 102 70/2 for CPRI > 10km
- 2 external alarm inputs
- Max wind load @ 50m/sec = 260N
- Breaker size = 25A, DC Power Consumption = 670 W (for dimensioning)
- 200mm horizontal separation required for side by side mounting
- 200mm separation required from antenna backplane to radio
- 400mm vertical outdoor/indoor separation required between 2 radios
- 500mm vertical separation below antenna
- Min, Max DC cable size from squid to radio = 10,8 AWG
  - Adapter is required for 2-wire connection
  - Shielded DC cable is required
- Ground cable size = 2AWG
- Dimensions (incl. handles, feet and sunshield, w/o fan unit)
  - Height:16.5" (420 mm)
  - Width: 13.4" (342 mm)
  - Depth: 5.9" (149 mm)
- Weight, excl. mounting hardware = 46 lbs (21 kg)

MultiPort

SPECIFICATIONS

OctoPort Multi-Band Antenna

OPA-65R-LCUU-H6

Electrical

Ports	2 x Low Band Ports for 698-787 MHz	2 x Low Band Ports for 824-894 MHz	4 x High Band Ports for 1710-2360 MHz			
Frequency Range	698-787 MHz	824-894 MHz	1850-1990 MHz	1710-1755/2110-2170 MHz	2305-2360 MHz	
Gain	13.8 dBi	14.6 dBi	17.0 dBi	16.3 dBi	17.4 dBi	17.6 dBi
Azimuth Beamwidth (-3dB)	66°	61°	60°	68°	64°	60°
Elevation Beamwidth (-3dB)	12.2°	10.3°	5.7°	6.3°	5.1°	4.5°
Electrical Downtilt	0° to 10°	0° to 10°	0° to 8°	0° to 8°	0° to 8°	0° to 8°
Elevation Sidelobes (1st Upper)	< -17 dB	< -18 dB	< -19 dB	< -19 dB	< -18 dB	< -18 dB
Front-to-Back Ratio @180°	> 30 dB	> 27 dB	> 32 dB	> 32 dB	> 35 dB	> 35 dB
Front-to-Back Ratio over ± 20°	> 27 dB	> 25 dB	> 27 dB	> 27 dB	> 28 dB	> 28 dB
Cross-Polar Discrimination (at Peak)	> 22 dB	> 22 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Cross-Polar Discrimination (at ± 60°)	> 16 dB	> 14 dB	> 17 dB	> 17 dB	> 17 dB	> 17 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Voltage Standing Wave Ratio (VSWR)	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts	300 watts	300 watts	300 watts	300 watts
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical

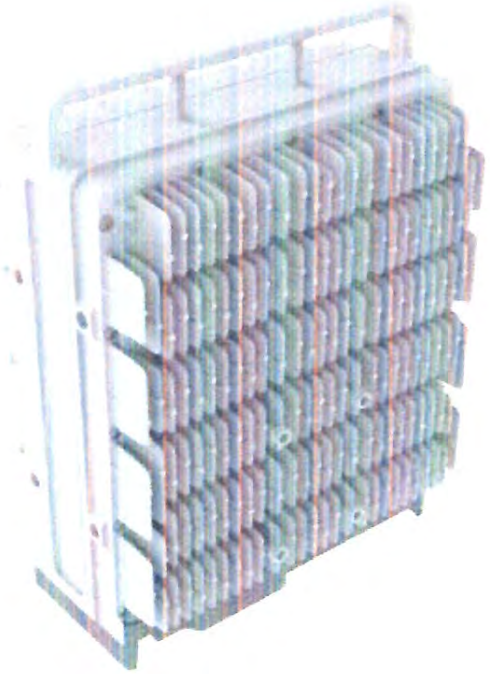
Dimensions (LxWxD)	72.3x14.4x7.3 in (1836x366x185 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	243 lbs (1081 N) @ 100 mph (161 kph)
Side Wind Load	140 lbs (622 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	9.5 ft^2 (0.9 m^2)
Weight *	56.9 lbs (25.8 kg)
RET System Weight	6.6 lbs (3.0 kg)
Connector	8 x 7-16 DIN female long neck
Mounting Pole	2 to 5 in (5 to 12 cm)

** Weight excludes mounting and RET*

RRUS 4449 B5, B12

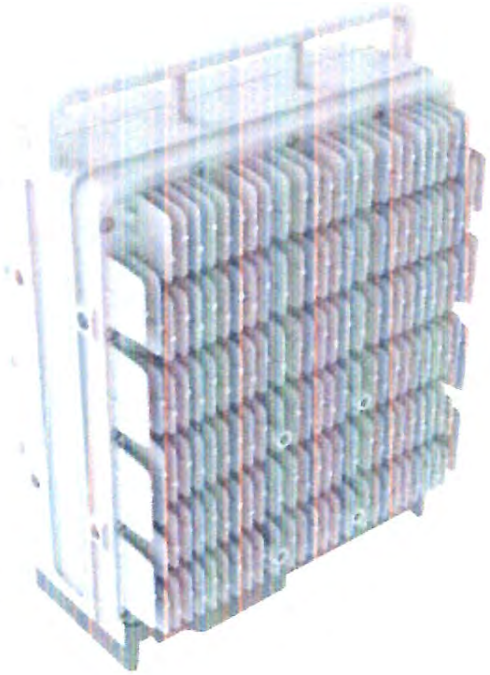
- B5, B12
  - B5 TX = 869 – 894 MHz, B12 TX = 729 – 746 MHz
  - B5 RX = 824 – 849 MHz, B12 RX = 699 – 716 MHz

  Both frequency bands are combined to transmit/receive out the same RF connectors.
- CPRI 2 ports x 2.5/4.9/9.8/10.1 Gbps. Install 2 SFP7s and connect 2 fiber pair to the RRUS 4449 during initial install. 2nd CPRI is reserved for 5G NR deployment later. Do not connect SFP7 to DUL20.
- Only use Ericsson supplied and approved SFP7s RDH10265/25
  - Install 2 SFP RDH 10265/3 for CPRI length 1.4 km – 10 km
  - Install SFP7 (pair) RDH 102 70/1 and RDH 102 70/2 (bi-directional SFP7 for CPRI length > 10 km
- 2 external alarm inputs
- Max wind load @ 50m/sec = 260 N
- Breaker size = 2x25A, DC Power Consumption = 1440 W (for dimensioning). Both DC power connections must be connected and operational for the radio to operate. Each power feed must support 720W. A single DC trunk cable capable of supporting 1440W with a 40AMP breaker can connected to a #10AWG Y DC split jumper cable connected from the surge suppressor to the 4449 DC power connections.
- 40mm horizontal separation required for side by side mounting
- 200mm separation required from antenna backplane to radio
- 400mm vertical outdoor/indoor separation required between 2 radios
- 500mm vertical separation below antenna
- Min, Max DC cable size from squid to radio = 10,8 AWG
  - Adapter is required for 2-wire connection
  - Shielded DC cable is required
- Ground cable size = 2AWG
- Dimensions (incl. handles, feet and sunshield, w/o fan unit)
  - Height: 17.9" (455 mm)
  - Width: 13.19" (335 mm)
  - Depth: 9.44" (240 mm)
- Weight, excl. mounting hardware = 71 lbs (32 kg)



RRUS 8843 B2, B66A

- B2, B66A
  - B2 TX =1930 - 1990 MHz, B66A TX =2110 - 2180 MHz
  - B2 RX = 1850 – 1910 MHz, B66A RX = 1710-1780 MHz
- CPRI 2 ports x 2.5/4.9/9.8/10.1 Gbps. Install 2 SFP7s and connect 2 fiber pair to the RRUS 8843 during initial install. 2nd CPRI is reserved for 5G NR deployment later. Do not connect SFP7 to DUL20.
- Only use Ericsson supplied and approved SFP7s RDH10265/25.
  - Install 2 SFP RDH 10265/3 for CPRI length 1.4 km – 10 km
  - Install SFP7 (pair) RDH 102 70/1 and RDH 102 70/2 (bi-directional SFP7 for CPRI length > 10 km
- 2 external alarm inputs
- Max wind load @ 50m/sec = 260 N
- Breaker size = 2x30A. DC Power Consumption = 1520 W (for dimensioning). Both DC power connections must be connected and operational for the radio to operate. Each DC Feed must support 1100W individually for cable size, voltage drop engineering. A single DC trunk cable that can handle 1520W and #10AWG Y DC splitter cable from the surge suppressor to the 2 DC power connections can be used with a single 40A breaker.
- 40 mm horizontal separation required between radios mounted side by side
- 200mm separation required from antenna backplane to radio
- 400mm vertical outdoor/indoor separation required between 2 radios
- 500mm vertical separation below antenna
- 200mm horizontal separation between radio and side edge of antenna
- Min, Max DC cable size from squid to radio = 10,8 AWG
  - Adapter is required for 2-wire connection
  - Shielded DC cable is required
- Ground cable size = 2AWG
- Dimensions (incl. handles, feet and sunshield, w/o fan unit)
  - Height: 14.9" (380 mm)
  - Width: 13.2" (335 mm)
  - Depth: 10.9" (277 mm)
- Weight, excl. mounting hardware = 72 lbs (32.6 kg)



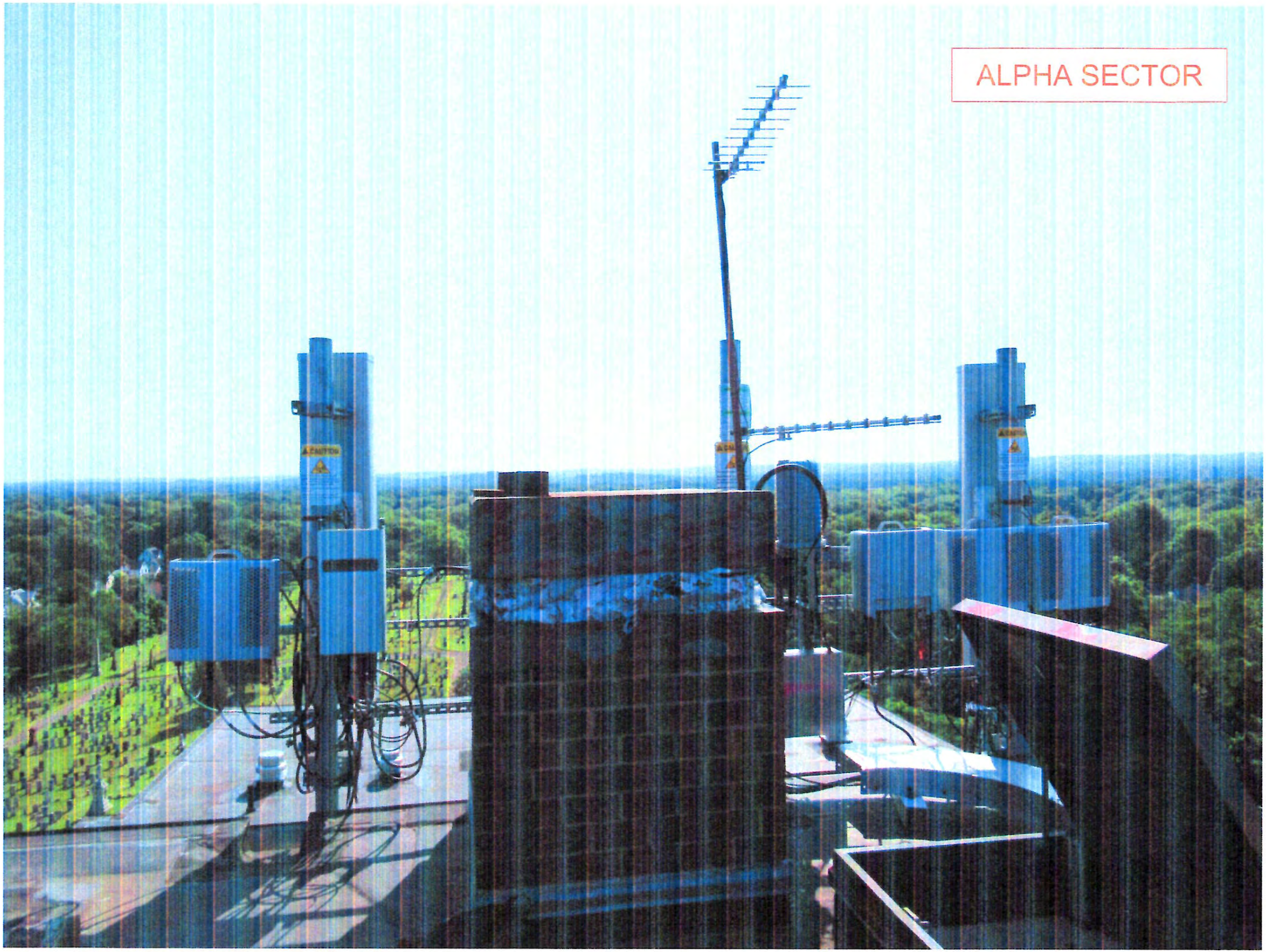
RRUS 32 B30

PRELIMINARY

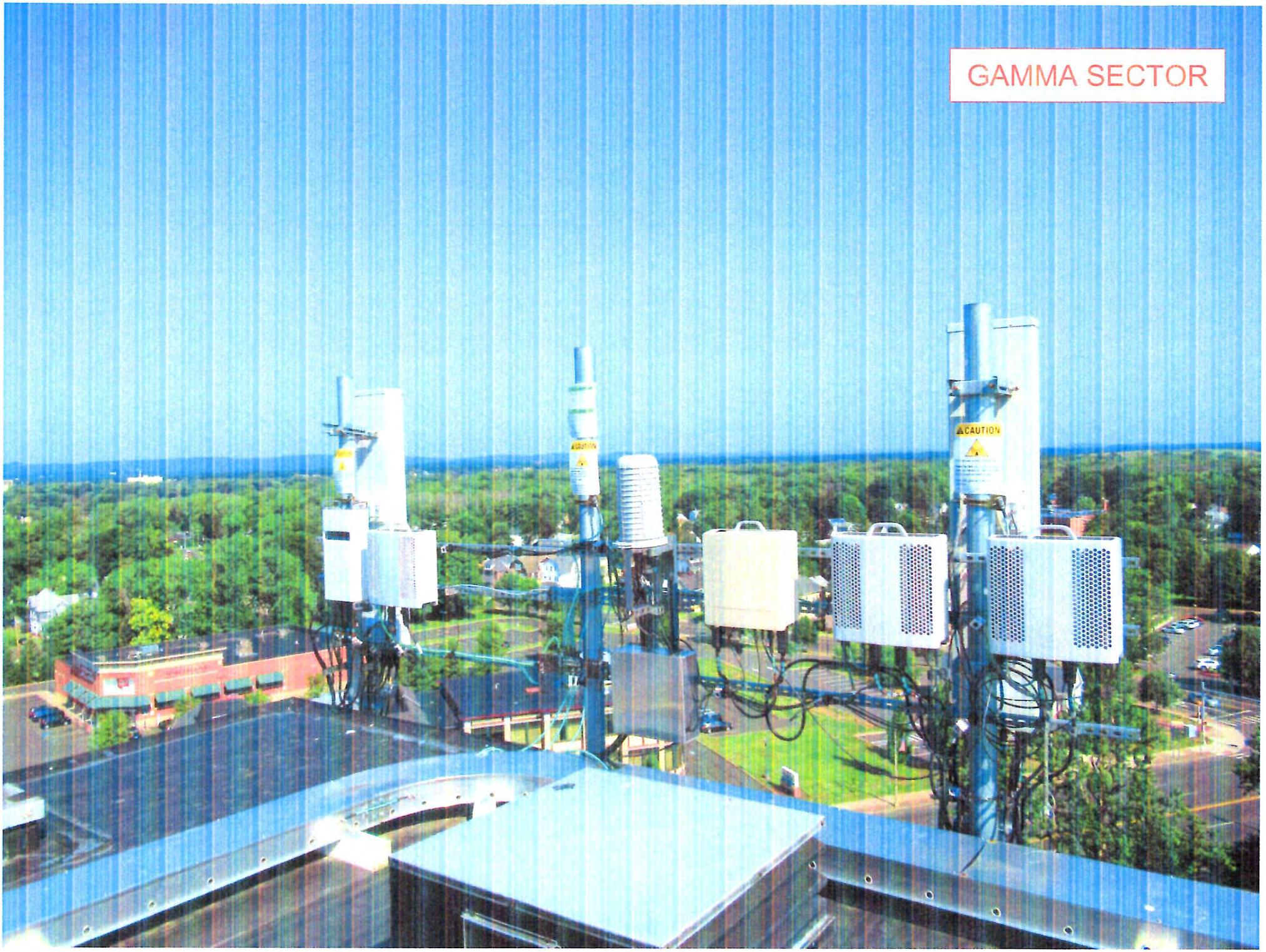
- WCS A+B blocks
  - TX = 2350 – 2360 MHz
  - RX = 2305 – 2315 MHz
- RF output 4 x 25 Watts
- 4T4R FDD
- 10 MHz IBW for LTE
- CPRI 2 ports x 10 Gbps
- Dimensions (incl. feet and sunshield)
  - Height: 26.7" (678 mm)
  - Width: 12.1" (306 mm)
  - Depth: 6.7" (171 mm)
- Weight, excl. mounting hardware
  - 60 lbs (23 kg)

APPENDIX E

Dewberry


ALPHA SECTOR


BETA SECTOR


GAMMA SECTOR
CAUTION

Town of East Hartford Property Summary Report

886 MAIN ST

MAP LOT:	13-332	**CAMA PID:**	8733
LOCATION:	886 MAIN ST		
OWNER NAME:	HARTFORD EAST ASSOCIATION		

8733 03/27/2016

OWNER OF RECORD
HARTFORD EAST ASSOCIATION 954 WARWICK AVE WARWICK, RI 02888

LIVING AREA:	97981	**ZONING:**	B5	**ACREAGE:**	1.19

SALES HISTORY

OWNER	BOOK / PAGE	SALE DATE	SALE PRICE
HARTFORD EAST ASSOCIATION	27/ 37	01-Jan-1900	$0.00

CURRENT PARCEL ASSESSMENT

TOTAL:	$6,440,000.00	**IMPROVEMENTS:**	$6,076,700.00	**LAND:**	$363,300.00

ASSESSING HISTORY

FISCAL YEAR	TOTAL VALUE	IMPROVEMENT VALUE	LAND VALUE
2018	$6,440,000.00	$6,076,700.00	$363,300.00
2017	$5,390,000.00	$5,026,700.00	$363,300.00
2016	$4,760,000.00	$4,396,700.00	$363,300.00
2015	$4,760,000.00	$4,396,700.00	$363,300.00
2014	$5,943,560.00	$5,580,260.00	$363,300.00

Town of East Hartford Property Summary Report

886 MAIN ST

MAP LOT:	13-332	**CAMA PID:**	8733
LOCATION:	886 MAIN ST		
OWNER NAME:	HARTFORD EAST ASSOCIATION		

BUILDING # 1

YEAR BUILT	1983	**EXT WALL 1**	Brick
STYLE	High Rise	**INT WALLS 1**	Drywall
MODEL	Comm/Ind	**HEAT FUEL**	Gas
STORIES	11	**HEAT TYPE**	Forced Hot Air
OCCUPANCY	Apt w/ Elevator	**AC TYPE**	Unit
ROOF	Flat	**BEDROOMS**	
ROOF COVER	Rubber	**FULL BATHS**	0
FLOOR COVER 1	Mixed	**HALF BATHS**	
% BSMT	null	**TOTAL ROOMS**	120
% FIN BSMT	null	**% REC RM**	null
% SEMI FIN	null	**% ATTIC FINISH**	null
BSMT GARAGE	null	**FIREPLACES**	null

8733 03/27/2016

EXTRA FEATURES

DESCRIPTION	CODE	UNITS
Sprinklers-Wet	SPR1	97981 S.F.
Elevator Pass	ELV1	2 UNITS

OUTBUILDINGS

DESCRIPTION	CODE	UNITS
FR/SHED		90 SF

0 730 1460 ft

Printed on 04/26/2019 at 05:42 PM

East Hartford MapsOnline

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL
136 Main Street, Suite 401
New Britain, Connecticut 06051-4225
Phone: 827-7682

Petition No. 324

Metro Mobile CTS of Hartford, Inc.
886 Main Street
East Hartford, CT

Staff Report
August 9, 1994

On July 29, 1994, Connecticut Siting Council (Council) member Daniel P. Lynch, Jr., Council staff member Stephen M. Howard, and Thomas Krummenacker representing Metro Mobile CTS of Hartford, Inc. (Metro Mobile), met at the site of the proposed cellular telecommunications facility at 886 Main Street, East Hartford, Connecticut.

Metro Mobile is proposing to install nine panel antennas, three each at three locations on the building. Each antenna is approximately 35 inches in height, 12 inches wide, and five inches deep. Three of the nine antennas would be attached to the building facade just below the roof line. Three additional antennas would be attached to the facade of the elevator penthouse on the roof of the building, below the penthouse roof line. The remaining three antennas would be mounted on pipes, approximately five feet in length, to be attached to the top of the elevator penthouse. Equipment associated with antennas would be located inside an 18-foot by 25-foot equipment room which would be constructed within a leased area on the ground floor of the building. The antennas would be attached at levels ranging from 99 feet above ground level to approximately 117 feet above ground level. The antennas would not extend beyond the height of the existing chimneys, vents, and television antennas on the penthouse roof. The building is not listed on any historical or architectural register, nor would it require any structural modification to support the proposed installations.

The maximum (i.e., "worst case") radio frequency power density calculations, assuming 19 channels operating simultaneously at 100 watts effective radiated power in an omni directional pattern, at the closest occupied floor of the building which is approximately 15 feet below the lowest antenna mounting point, indicate that the cellular antennas would emit 0.1186 milliwatts per square centimeter or 20.3 percent of the current ANSI standard. This calculation does not take into account the directional nature of the proposed antennas, which would likely result in a lower actual radio frequency power density at this occupied level.

Metro Mobile contends that the proposed construction would not have a substantial adverse environmental effect and therefore would not require a Certificate of Environmental Compatibility and Public Need from the Council.

Stephen M. Howard
Siting Analyst

SMH:mmb
SP324sr.doc

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US POSTAGE
Flat Rate Env

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PRIORITY MAIL 1-DAY™

Expected Delivery Date: 09/30/19

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

Carrier -- Leave if No Response

C066

0024

SHIP TO: MAYOR MARCIA LECLERC
TOWN OF EAST HARTFORD
740 MAIN ST
CC: JEFFREY CORMIER - TOWN PLANNER
EAST HARTFORD CT 06108-3140

USPS TRACKING #

9405 5036 9930 0120 2732 08

Electronic Rate Approved #038555749

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Instructions

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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 0120 2732 08

Trans. #:	473274652
Print Date:	09/25/2019
Ship Date:	09/28/2019
Expected Delivery Date:	09/30/2019

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

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

To: MAYOR MARCIA LECLERC
TOWN OF EAST HARTFORD
740 MAIN ST
CC: JEFFREY CORMIER - TOWN PLANNER
EAST HARTFORD CT 06108-3140

* 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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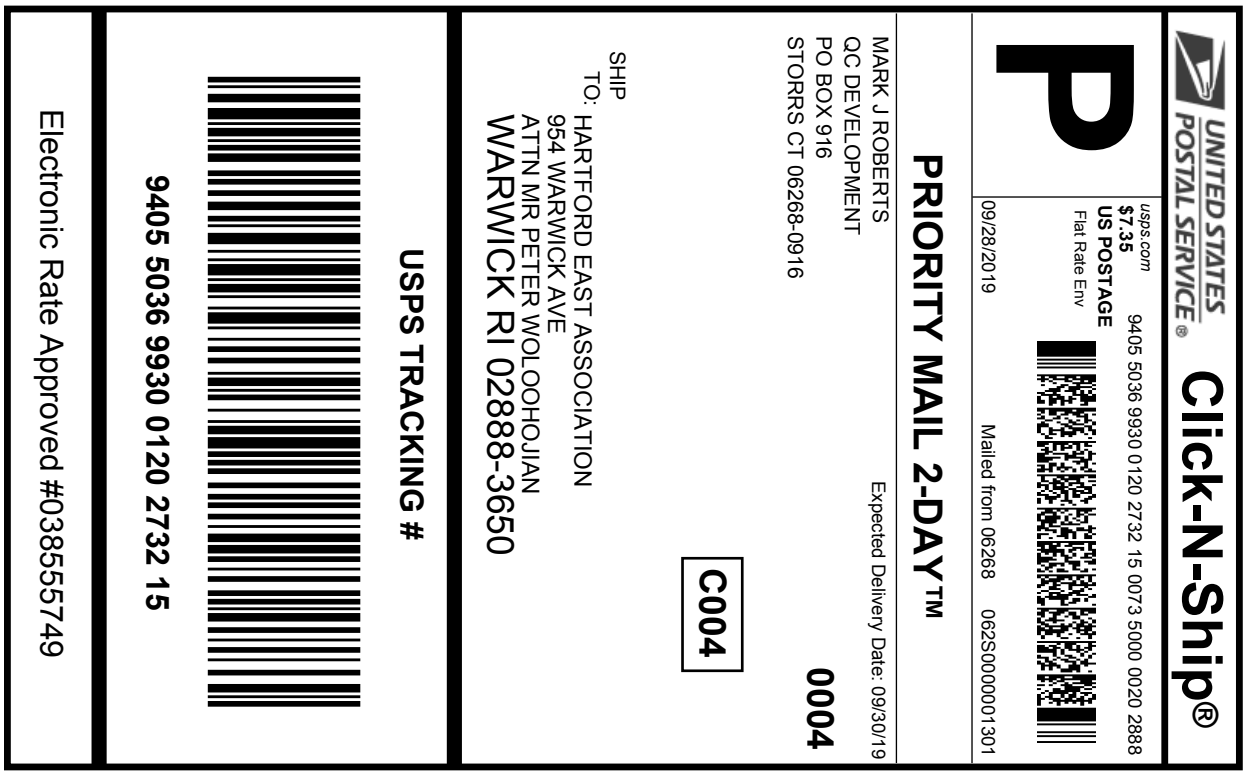

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Instructions

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 0120 2732 15

Trans. #:	473274652
Print Date:	09/25/2019
Ship Date:	09/28/2019
Expected Delivery Date:	09/30/2019

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

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

To: HARTFORD EAST ASSOCIATION
954 WARWICK AVE
ATTN MR PETER WOLOOHOJIAN
WARWICK RI 02888-3650

* 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.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com

UNITED STATES POSTAL SERVICE®

Shipment Confirmation Acceptance Notice

A. Mailer Action

Note To Mailer: The labels and volume associated to this form online, **must** match the labeled packages being presented to the USPS® employee with this form.

Shipment Date: 09/25/19

Shipped From:

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

Type of Mail	Volume
Priority Mail®	2
Priority Mail Express™*	0
International Mail*	0
Other	0
Total Volume	2

*Start time for products with service guarantees will begin when mail arrives at the local Post Office™ and items receive individual processing and acceptance scans.

B. USPS Action

- USPS EMPLOYEE: Please scan upon pickup or receipt of mail. Leave form with customer or in customer's mail receptacle.
- Employee verifies the package volume count on the Package Pickup Carrier Manifest.
  - If the volume on the manifest matches the volume being collected from the customer, the employee should make the **1:YES** selection by pressing the number 1 on the keypad of the handheld scanner, or on the keyboard of the POS ONE terminal.
  - If the volume on the manifest does not match the volume being collected from the customer, the employee should make the **2:NO** selection**.** The mail should still be collected and dispatched as normal.

USPS SCAN

9475 7036 9930 0327 6300 12