SAI Group
12 Industrial Way
Salem, NH 03079
603-421-0470

June 24, 2022

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 twelve (12) antennas at the rooftop level (109' and 119' AGL) of the 11-story apartment building at 886 Main Street, East Hartford, CT. The property is owned by Hartford East Association. AT&T now intends to replace nine (9) antennas. This modification may include B2, B5, B17, B14, B29, B30, B66 & n77 hardware that is 4G(LTE) and/or 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

AT&T Planned Modifications:

Remove: None

Remove and Replace:

(3) CCI Antennas	(REMOVE)	-	(3) Ericsson AIR 6419 B77G Antennas	(REPLACE)
(3) CCI Antennas	(REMOVE)	-	(3) Ericsson AIR 6449 B77 Antennas	(REPLACE)
(3) CCI Antennas	(REMOVE)	-	(2) CCI DMP65R-BU6EAK Antennas	(REPLACE)
(3) Ericsson 4415 B25 RRU	(REMOVE)	-	(3) Ericsson 4478 B14 RRU	(REPLACE)
(3) Fiber & (2) DC Lines	(REMOVE)	-	(3) Fiber (18-Pair) & (2) DC Lines	(REPLACE)

Install New: None

Existing to Remain:
(3) KATHREIN Antennas
(9) ERICSSON RRU
(3) RAYCAP Surge Units
(4) DC Lines

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 Mayor Michael Walsh and Eileen Buckheit, Development Director for the Town of East Hartford, 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

Mark Roberts
Consultant for SAI
Mark.Roberts@QCDevelopment.net

Attachments

Cc: Mayor Michael Walsh - Elected Official
Eileen Buckheit - Development Director
Hartford East Association - Property Owner

Exhibit A

Original Facility Approval

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

Exhibit B

Property Card

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

Exhibit C

Construction Drawings

PROJECT INFORMATION

SCOPE OF WORK:	ITEMS TO BE MOUNTED ON THE EXISTING ROOF TOP: • NEW AT&T ANTENNAS: AIR6419 B77G (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T ANTENNAS: AIR6449 B77 (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T ANTENNAS: DMP65R-BU6EA-K (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T RRUS: 4478 B14 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T (6) Y-CABLES. • NEW AT&T 6AWG6 DC POWER CABLE (TYP. OF 1 PER ALPHA & BETA SECTOR, TOTAL OF 2) • NEW AT&T (3) 18 PAIR FIBER LINES. (TO REPLACE EXISTING) • PROPOSED NEW BALLAST MOUNT SITE PRO 1, P/N RT-RRU5HD (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2). ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION: • ADD 6673 FHG. • ADD (3) VERTIV RECTIFIERS • ADD VERTIV UPCONVERTERS (TYP. OF 6 PER ALPHA SECTOR, 8 PER BETA & GAMMA SECTOR, TOTAL OF 22) ITEMS TO BE REMOVED: • EXISTING AT&T ANTENNA: OPA-65R-LCUU-H6 (TYP. OF 2 PER SECTOR, TOTAL OF 6). • EXISTING AT&T ANTENNA: HPA-65R-BU6AA (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T RRUS: RRUS 4415 B25 (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING DC POWER CABLES. (TYP. OF 1 PER ALPHA & BETA, TOTAL OF 2). • EXISTING (3) FIBER LINES. ITEMS TO REMAIN: (3) ANTENNAS, (9) RRU'S, (3) SURGE ARRESTOR, (6) 7/8" COAX CABLE, (4) DC POWER CABLES.
SITE ADDRESS:	886 MAIN STREET EAST HARTFORD, CT 06108
LATITUDE:	41.769444° N 41° 46' 09.99" N
LONGITUDE:	72.642833° W 72° 38' 34.19" W
TYPE OF SITE:	ROOF TOP / INDOOR EQUIPMENT
STRUCTURE HEIGHT:	100'-0"±
RAD CENTER:	BETA SECTOR: 109'-0"± (LTE), 110'-10"± (DoD), 107'-2"± (Cband) ALPHA & GAMMA SECTORS: 118'-9"± (LTE), 120'-7"± (DoD), 116'-10"± (Cband)
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	ROOFTOP & EQUIPMENT PLANS	1
A-2	ANTENNA LAYOUT PLANS	1
A-3	ELEVATION	1
A-4	DETAILS	1
A-5	DETAILS	1
G-1	GROUNDING DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1

SITE NUMBER: CT2490

SITE NAME: EAST HARTFORD MAIN STREET

FA CODE: 10553970

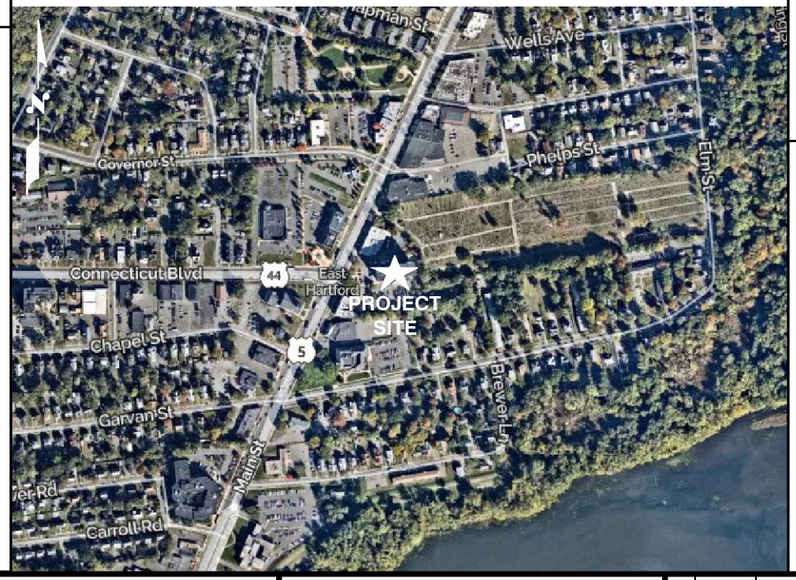
PACE ID: MRCTB052304, MRCTB050770, MRCTB050997

PROJECT: 5G NR 1SR C-BAND AND LTE 6C

VICINITY MAP

DIRECTIONS TO SITE:

DEPART ENTERPRISE DR TOWARD CAPITOL BLVD. 0.1 MI. TURN LEFT ONTO CAPITOL BLVD. 0.2 MI. TURN LEFT ONTO WEST ST. 0.2 MI. TAKE RAMP LEFT FOR I-91 N. 7.8 MI. AT EXIT 29, TAKE RAMP RIGHT FOR US-5 NORTH / CT-15 NORTH TOWARD BOSTON / E. HARTFORD. 0.6 MI. AT EXIT 90, TAKE RAMP RIGHT FOR US-5 NORTH TOWARD E. RIVER DR / NORWICH. 0.5 MI. TURN LEFT ONTO US-5 / MAIN ST. 0.9 MI. TURN RIGHT ONTO LOCUST CT. 161 FT. ARRIVE AT ENTRANCE TO SITE ON THE LEFT.



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2490
SITE NAME: EAST HARTFORD MAIN STREET

886 MAIN STREET
EAST HARTFORD, CT 06108
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	05/17/22	ISSUED FOR CONSTRUCTION	AM	HC	DPH
0	01/18/22	ISSUED FOR REVIEW	AM	HC	DPH
A	09/30/21	ISSUED FOR REVIEW	GA	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

AT&T
TITLE SHEET
5G NR 1SR C-BAND AND LTE 6C

SITE NUMBER	DRAWING NUMBER	REV
CT2490	T-1	1

GROUNDING NOTES

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

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81 STANDARDS) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS AND #2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

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

   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. **APPLICABLE BUILDING CODES:**
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

    BUILDING CODE: IBC 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70-2017)

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

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

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

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

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

ABBREVIATIONS

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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2490
SITE NAME: EAST HARTFORD MAIN STREET

886 MAIN STREET
EAST HARTFORD, CT 06108
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	05/17/22	ISSUED FOR CONSTRUCTION	AM	HC	DPH
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A	09/30/21	ISSUED FOR REVIEW	GA	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT — RADIATION CENTER — DANIEL R. HAMM — No. 24178 — LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES

5G NR 1SR C-BAND AND LTE 6C

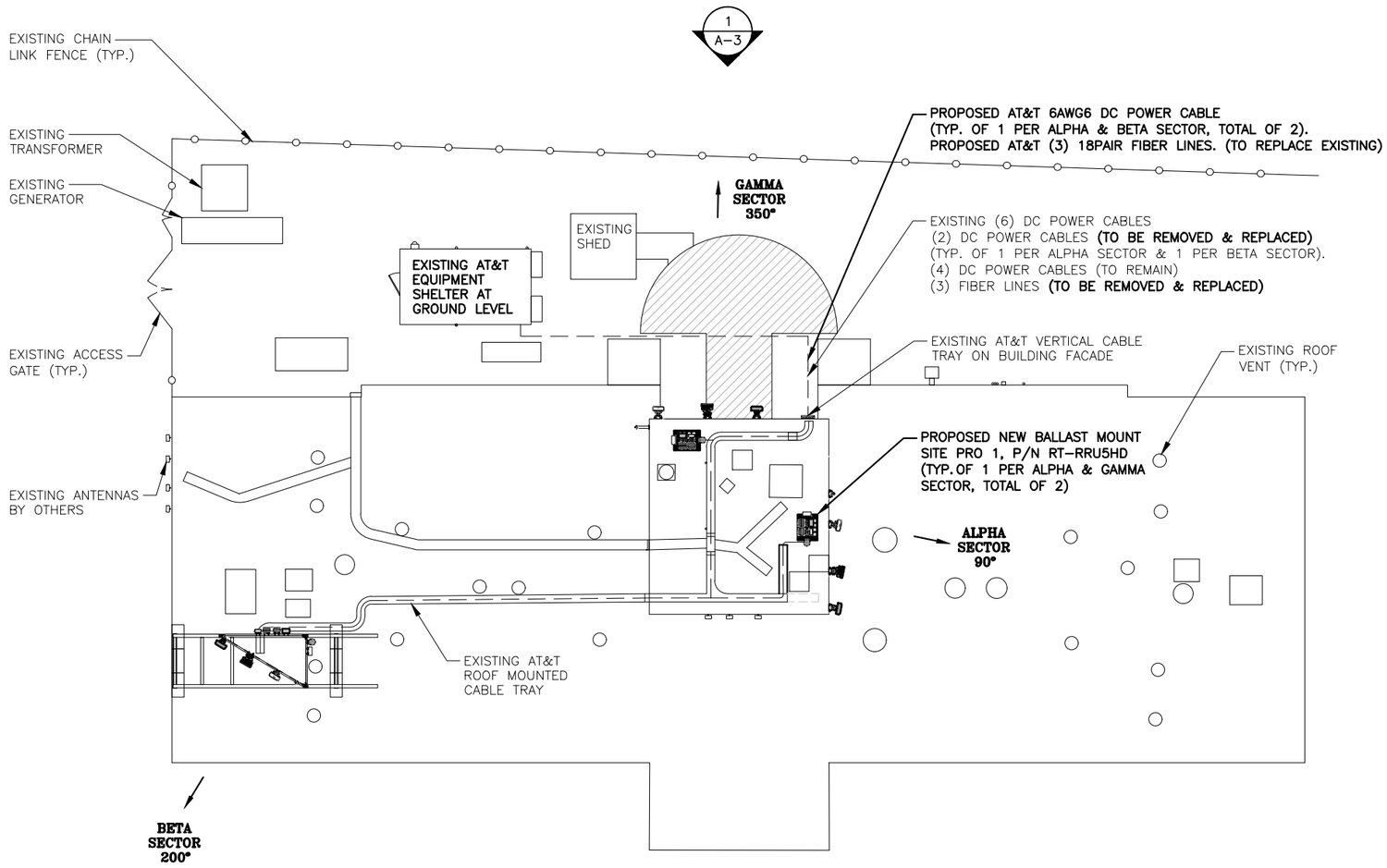
SITE NUMBER	DRAWING NUMBER	REV
CT2490	GN-1	1

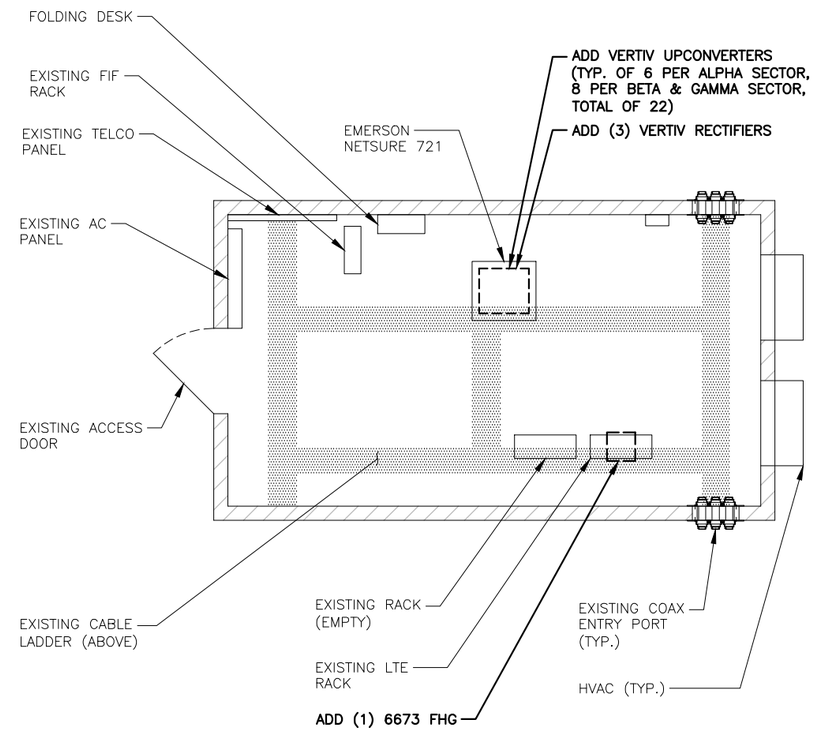
NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

REFER TO STRUCTURAL ANALYSIS BY: HUDSON DESIGN GROUP, LLC, DATED: MAY 4, 2022 (REV. 2) FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.





ROOF PLAN (1 / A-1)
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

0 5'-4" 10'-8" 21'-4" 32'-0"

EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 3/8"=1'-0"
11x17 SCALE: 3/16"=1'-0"

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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2490
SITE NAME: EAST HARTFORD MAIN STREET

886 MAIN STREET
EAST HARTFORD, CT 06108
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
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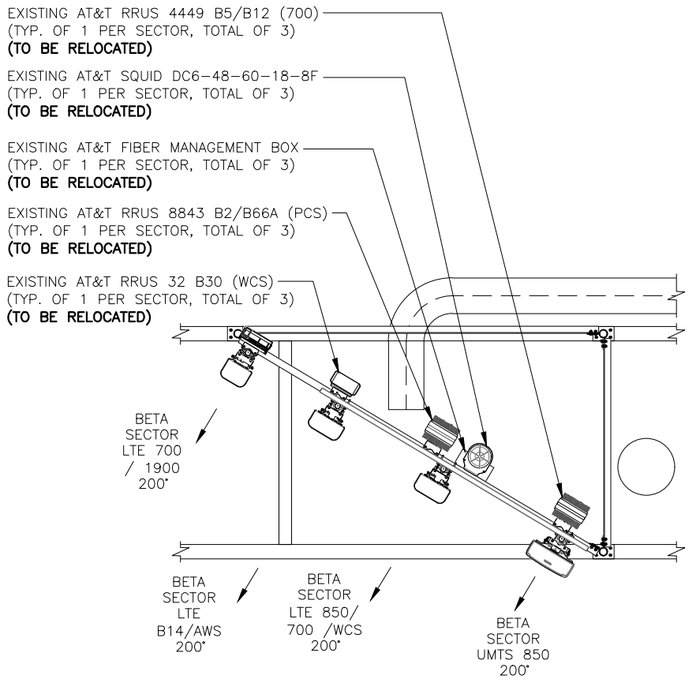
A	09/30/21	ISSUED FOR REVIEW	GA	HC	DPH

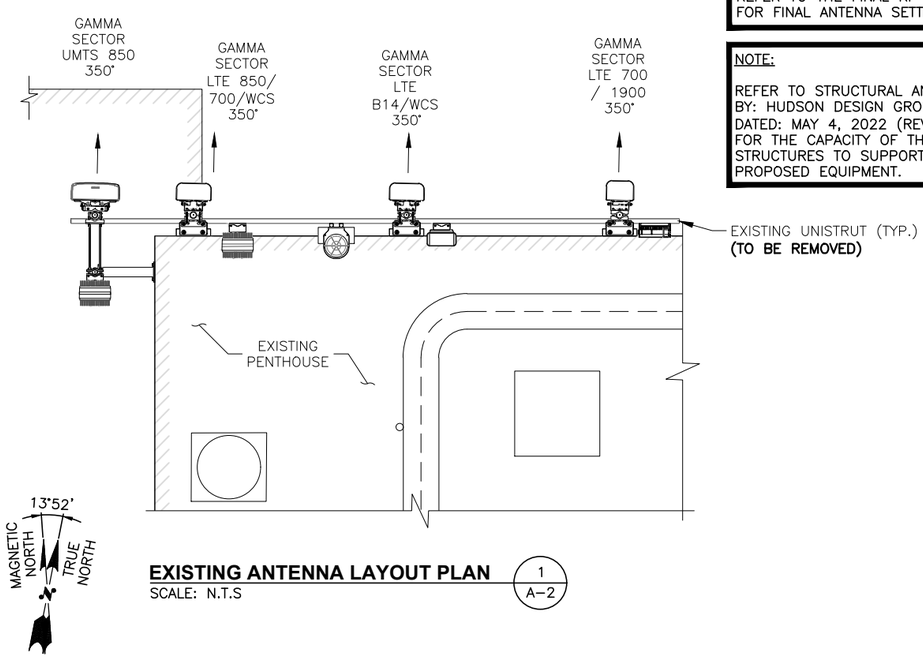
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T
ROOFTOP & EQUIPMENT PLANS
5G NR 1SR C-BAND AND LTE 6C

SITE NUMBER	DRAWING NUMBER	REV
CT2490	A-1	1





EXISTING ANTENNA LAYOUT PLAN (1 / A-2)
SCALE: N.T.S

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

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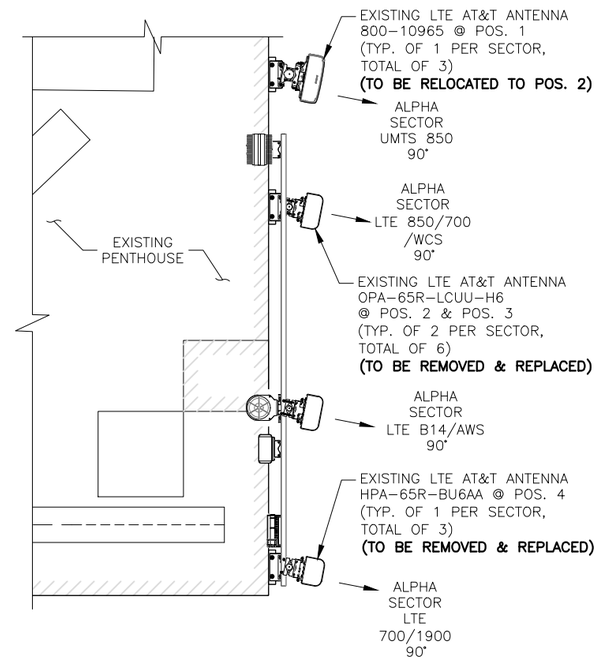
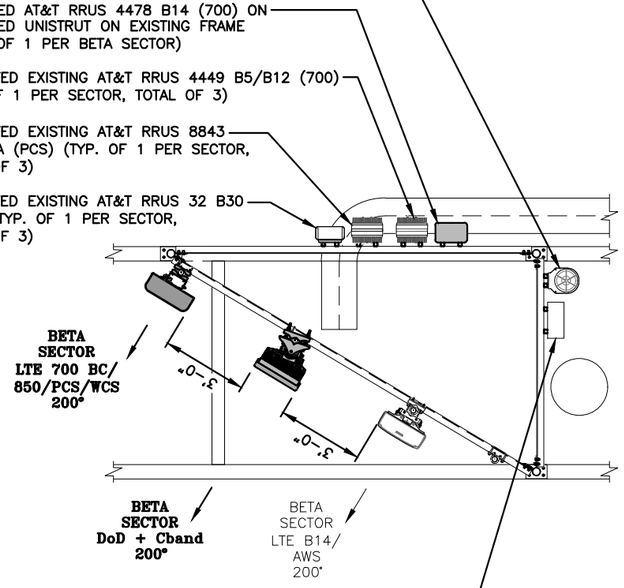
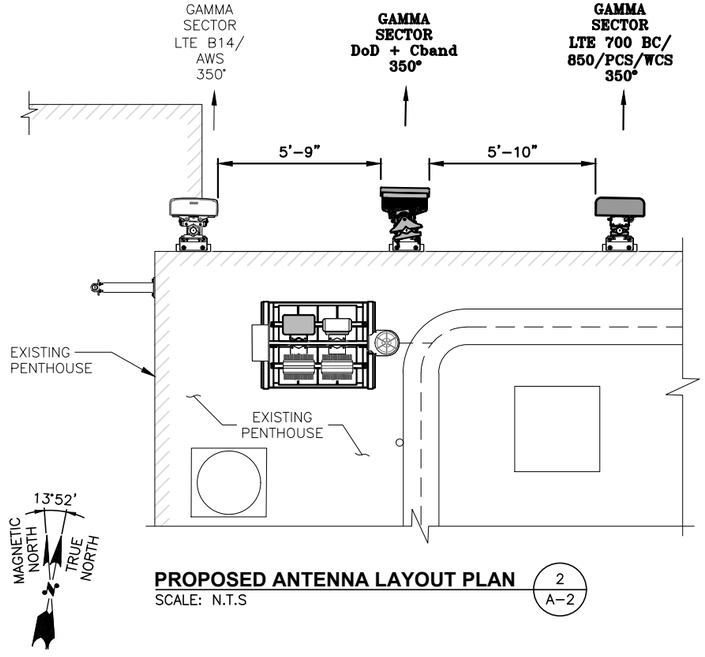
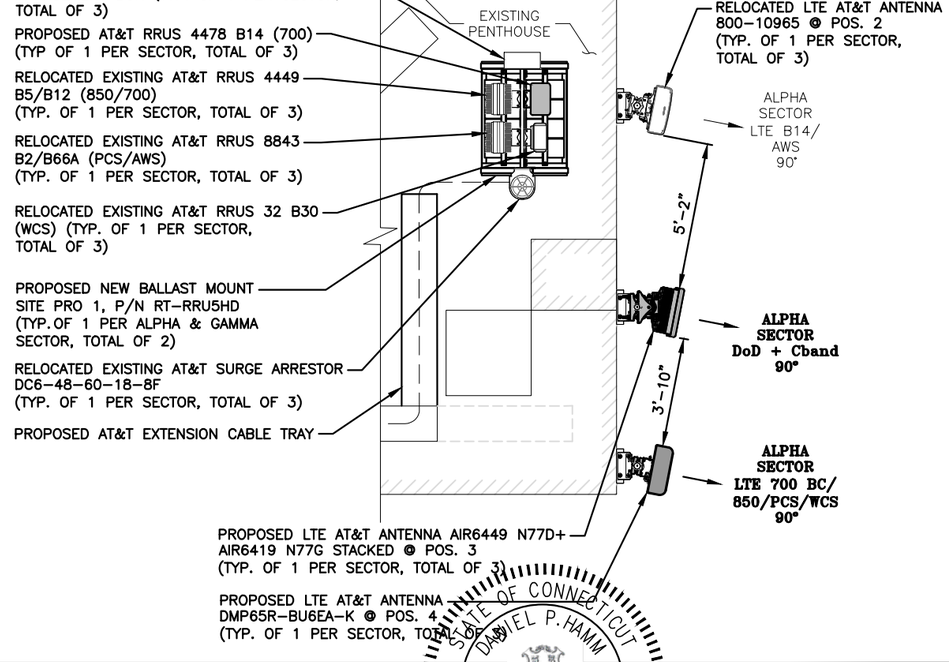






PROPOSED ANTENNA LAYOUT PLAN (2 / A-2)
SCALE: N.T.S



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500 ENTERPRISE DRIVE, SUITE 3A
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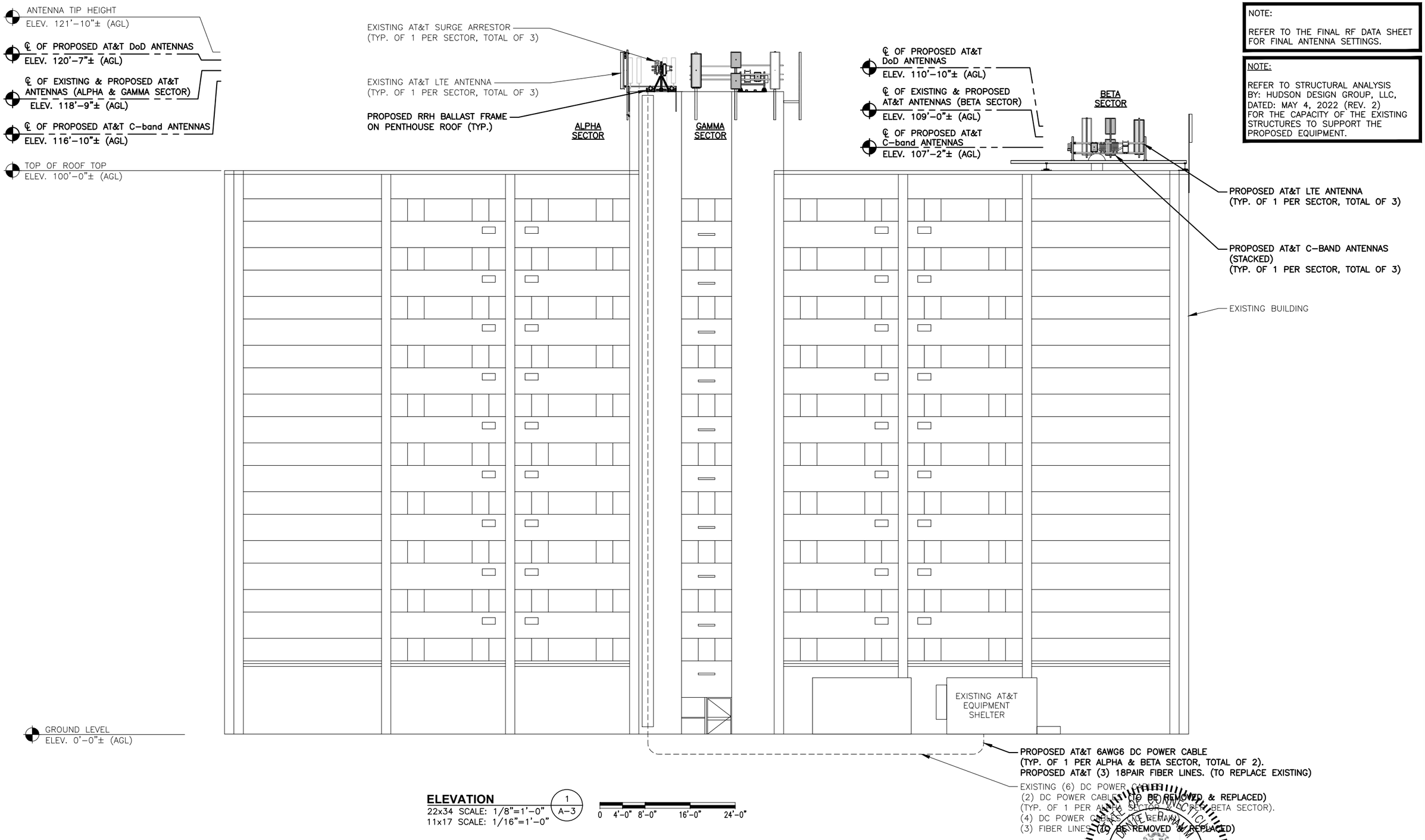
ANTENNA LAYOUT PLANS
5G NR 1SR C-BAND AND LTE 6C

SITE NUMBER	DRAWING NUMBER	REV
CT2490	A-2	1



NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

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

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STATE OF CONNECTICUT — No. 24178 — LICENSED PROFESSIONAL ENGINEER

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ELEVATION

5G NR 1SR C-BAND AND LTE 6C

SITE NUMBER	DRAWING NUMBER	REV
CT2490	A-3	1

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	–	–	–	–	–	–	–	–	–	(E)(1) DC LINE **(P)(1) DC LINE** **(P)(1) FIBER LINE**	(E)(1) RAYCAP DC6-48-60-18-8F
A2	EXISTING	LTE 850/ 700 /WCS	800-10965	78.7X20X6.9	118'-9"±	90°	–	**(P)(1) 4478 B14 (700)**	–	–	
A3	**PROPOSED**	**DOD+C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**30.4X15.9X8.1**	**120'-7"± 116'-10"±**	**90°**	–	–	–	–	
A4	**PROPOSED**	**850/ PCS/ WCS**	**DMP65R-BU6EA-K**	**71.2X20.7X9.7**	**118'-9"±**	**90°**	–	(E)(1) 4449 B5/B12 (700) (E)(1) 8843 B2/B66A (1900) (E)(1) RRUS-32 B30 (WCS)	–	–	
B1	–	–	–	–	–	–	–	–	–	(E)(1) DC LINE **(P)(1) DC LINE** **(P)(1) FIBER LINE**	(E)(1) RAYCAP DC6-48-60-18-8F
B2	EXISTING	LTE 850/ 700 /WCS	800-10965	78.7X20X6.9	109'-0"±	200°	–	**(P)(1) 4478 B14 (700)**	–	–	
B3	**PROPOSED**	**DOD+C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**30.4X15.9X8.1**	**110'-10"± 107'-2"±**	**200°**	–	–	–	–	
B4	**PROPOSED**	**850/ PCS/ WCS**	**DMP65R-BU6EA-K**	**71.2X20.7X9.7**	**109'-0"±**	**200°**	–	(E)(1) 4449 B5/B12 (700) (E)(1) 8843 B2/B66A (1900) (E)(1) RRUS-32 B30 (WCS)	–	–	
C1	–	–	–	–	–	–	–	–	–	(2) DC LINES **(P)(1) FIBER LINE**	(E)(1) RAYCAP DC6-48-60-18-8F
C2	EXISTING	LTE 850/ 700 /WCS	800-10965	78.7X20X6.9	118'-9"±	350°	–	**(P)(1) 4478 B14 (700)**	–	–	
C3	**PROPOSED**	**DOD+C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**30.4X15.9X8.1**	**120'-7"± 116'-10"±**	**350°**	–	–	–	–	
C4	**PROPOSED**	**850/ PCS/ WCS**	**DMP65R-BU6EA-K**	**71.2X20.7X9.7**	**118'-9"±**	**350°**	–	(E)(1) 4449 B5/B12 (700) (E)(1) 8843 B2/B66A (1900) (E)(1) RRUS-32 B30 (WCS)	–	–	

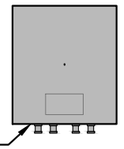
RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
P(3)	**4478 B14 (700)**	**18.1"x13.4"x8.3"**
E(3)	4449 B5/B12 (700)	17.9"x13.2"x10.4"
E(3)	8843 B2/B66A (1900)	14.9"x13.2"x10.9"
E(3)	RRUS-32 B30 (WCS)	27.2"x12.1"x7.0"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:

SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (2 / A-4)
SCALE: N.T.S

NOTE:

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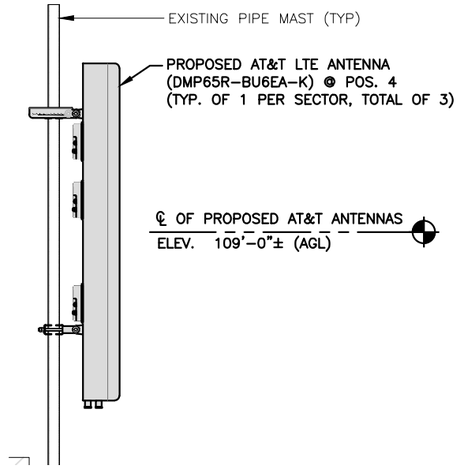
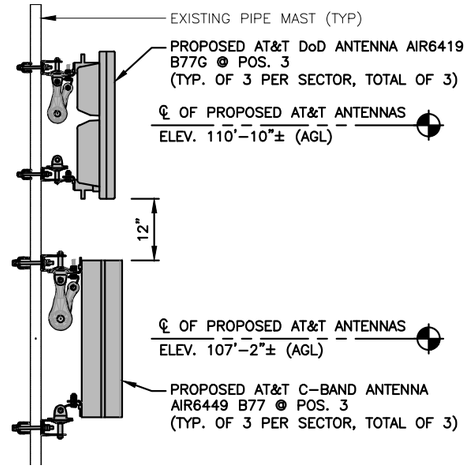
FINAL ANTENNA SCHEDULE (1 / A-5)
SCALE: N.T.S



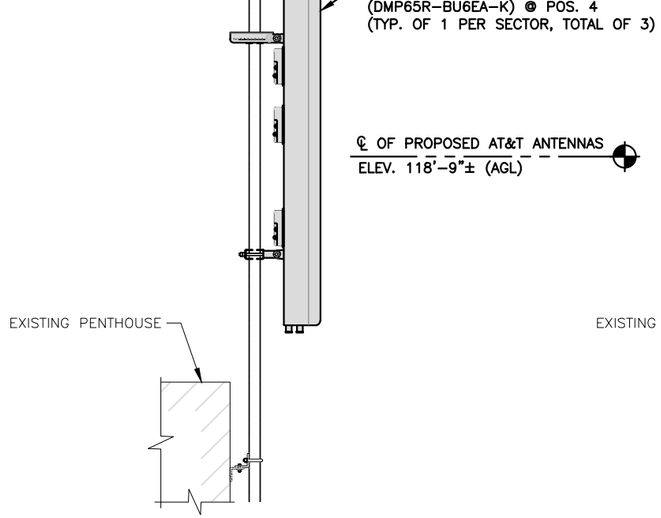
PROPOSED LTE ANTENNA (BETA SECTOR) MOUNTING DETAIL (3 / A-4)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

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



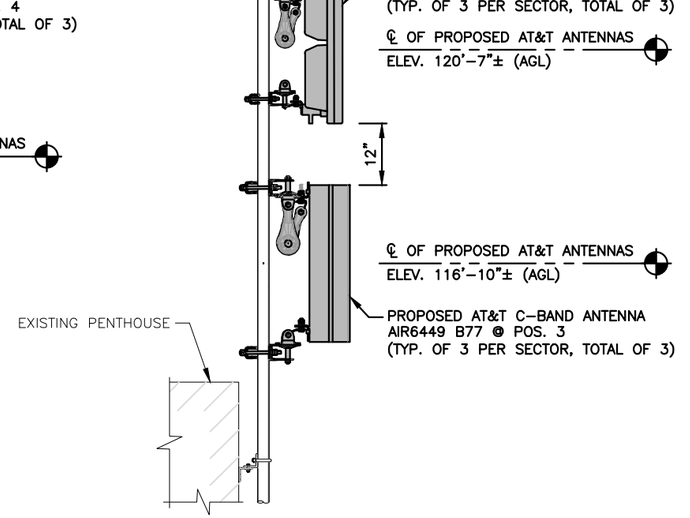
PROPOSED C-BAND ANTENNA (BETA SECTOR) MOUNTING DETAIL (4 / A-4)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

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



PROPOSED LTE ANTENNA (ALPHA & GAMMA SECTORS) MOUNTING DETAIL (5 / A-4)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

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



PROPOSED C-BAND ANTENNA (ALPHA & GAMMA SECTORS) MOUNTING DETAIL (6 / A-4)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

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

HUDSON Design Group LLC
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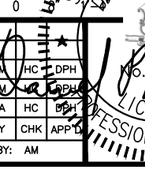

AT&T

DETAILS
5G NR 1SR C-BAND AND LTE 6C

SITE NUMBER	DRAWING NUMBER	REV
CT2490	A-4	1

NOTE:

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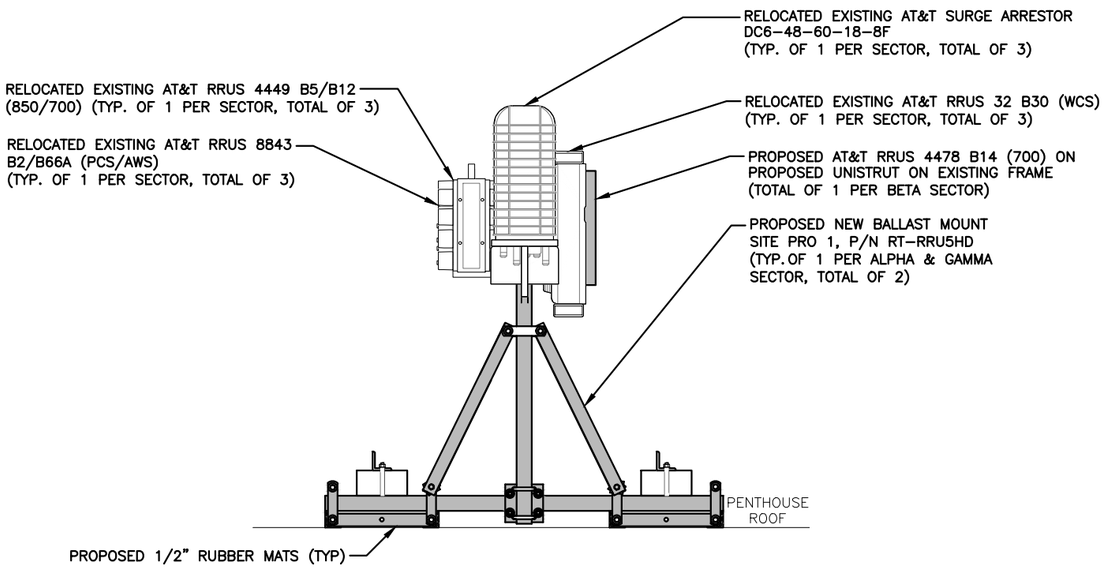
MINIMUM BALLAST REQUIREMENTS			
SIDE	EXISTING (PER SIDE)	PROPOSED (PER SIDE)	TOTAL
NUMBER OF BLOCKS	0	3	6
SIZE OF BLOCKS	–	4"X8"X16" SOLID	4"X8"X16" SOLID
WEIGHT OF BLOCKS	0 lbs.	33 lbs./each	33 lbs./each
TOTAL BALLAST WEIGHT	0 lbs.	99 lbs.	198 lbs.

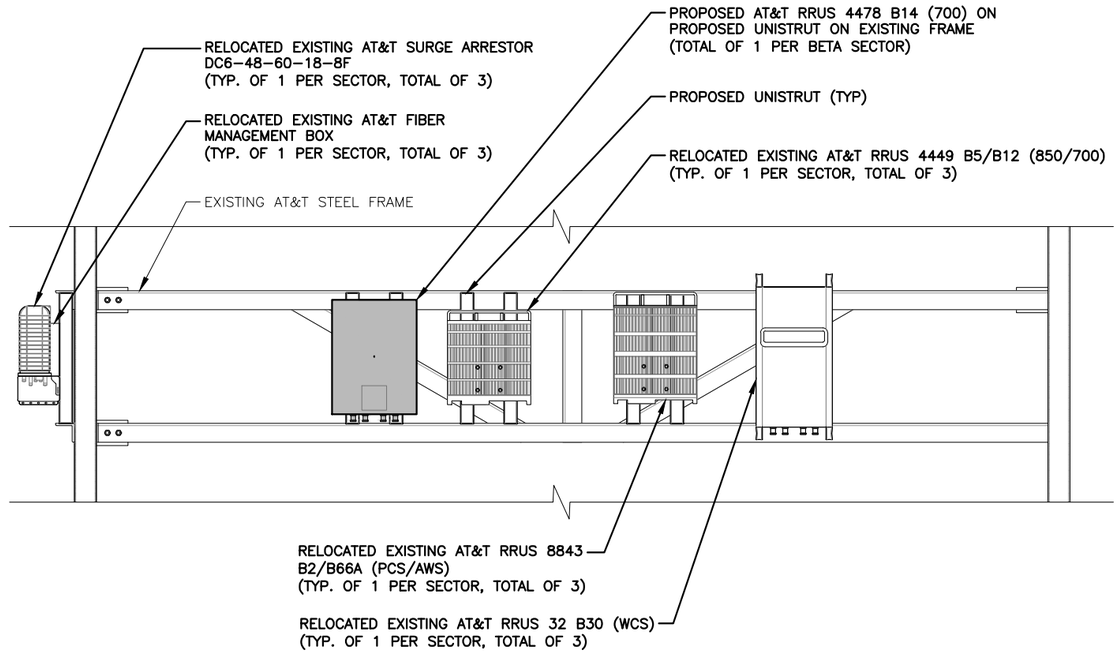


RRUS MOUNTING DETAIL ON PROPOSED BALLAST FRAME (ALPHA & GAMMA SECTOR)

1 / A-5

22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"



RRUS MOUNTING DETAIL ON EXISTING FRAME (BETA SECTOR)

2 / A-5

22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

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STATE OF CONNECTICUT
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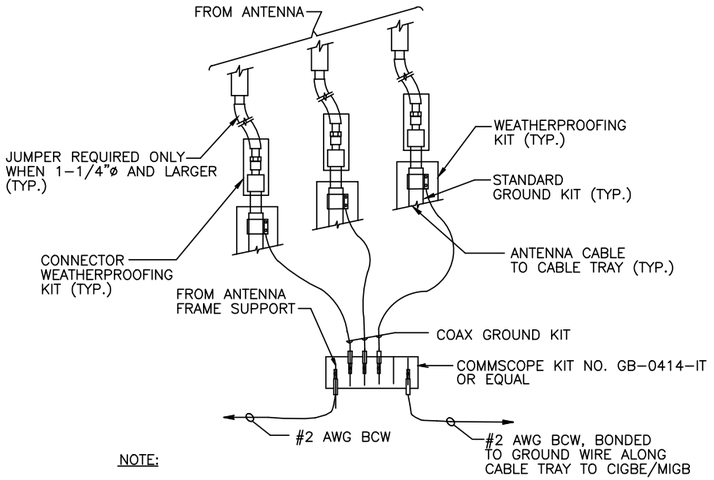
LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS

5G NR 1SR C-BAND AND LTE 6C

SITE NUMBER	DRAWING NUMBER	REV
CT2490	A-5	1



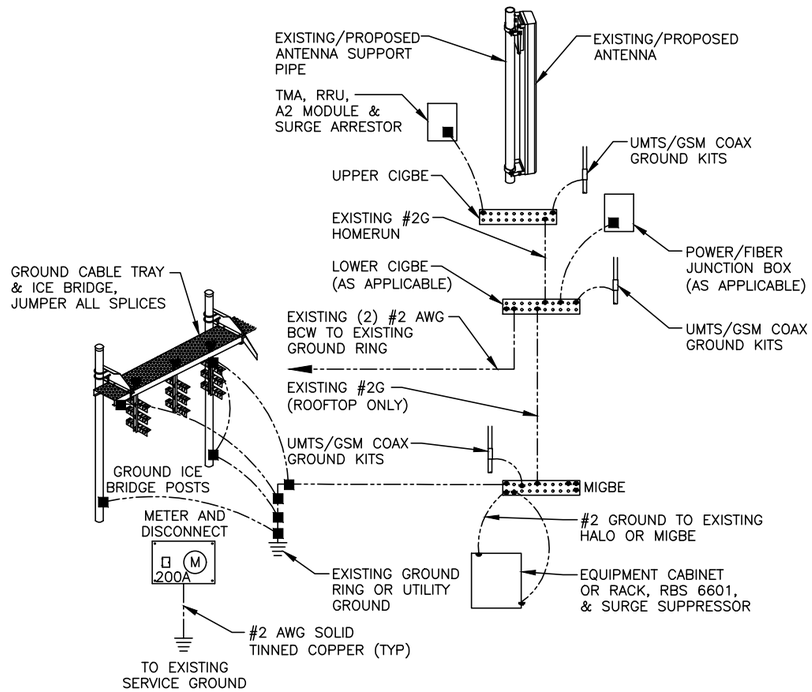
NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

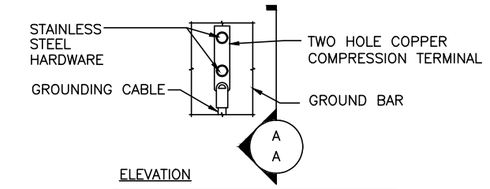
1 / G–1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / G–1



NOTES:

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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

3 / G–1

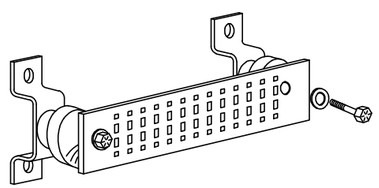
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2 AWG)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2 AWG)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2 AWG)
+24V POWER SUPPLY RETURN BAR (#2 AWG)
–48V POWER SUPPLY RETURN BAR (#2 AWG)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2 AWG)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2 AWG)
BUILDING STEEL (IF AVAILABLE) (#2 AWG)



GROUND BAR - DETAIL (AS REQUIRED)

SCALE: N.T.S

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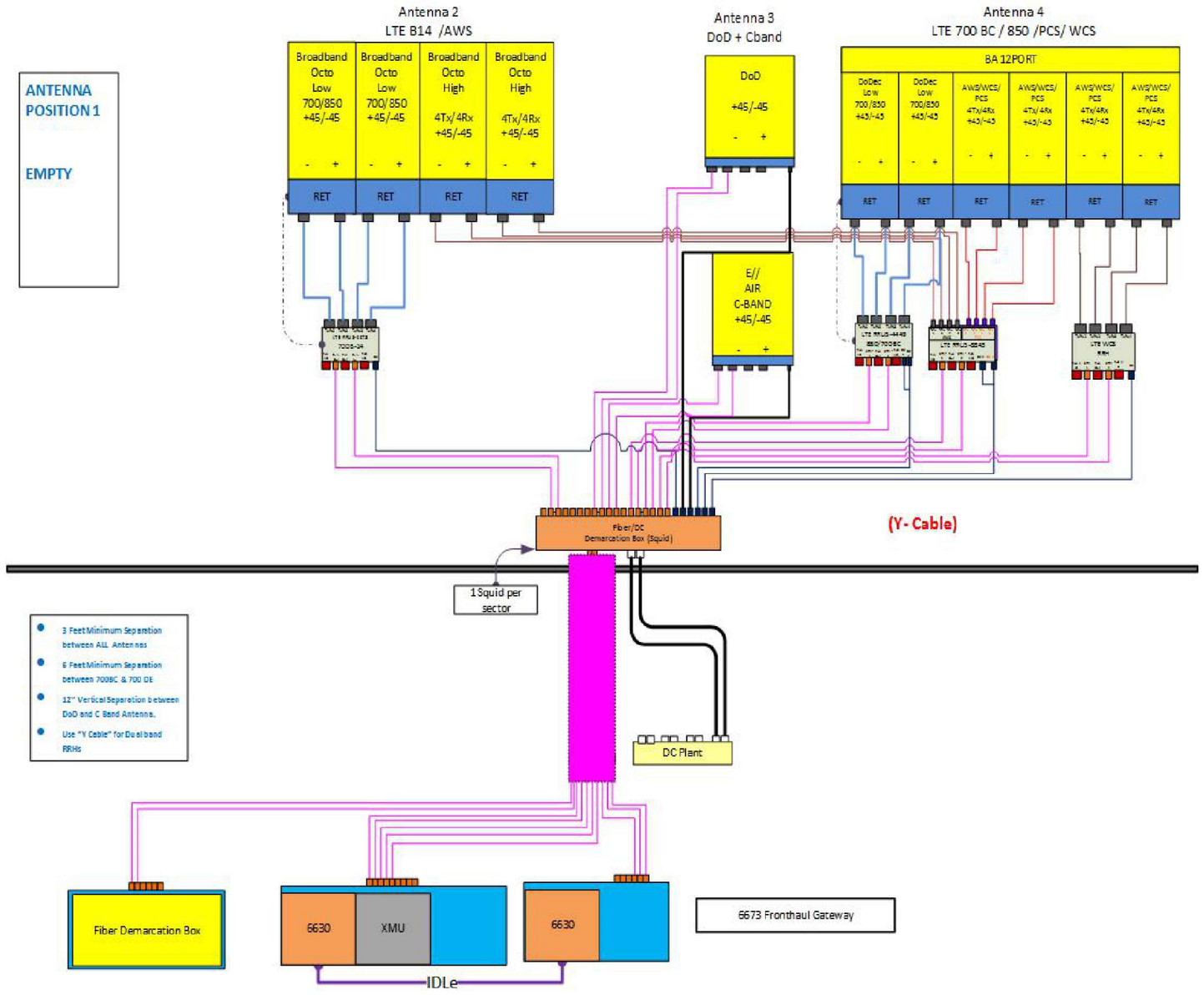
GROUNDING DETAILS

5G NR 1SR C–BAND AND LTE 6C

SITE NUMBER	DRAWING NUMBER	REV
CT2490	G–1	1



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:

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45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2490
SITE NAME: EAST HARTFORD MAIN STREET

886 MAIN STREET
EAST HARTFORD, CT 06108
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	05/17/22	ISSUED FOR CONSTRUCTION	AM	HC	DPH
0	01/18/22	ISSUED FOR REVIEW	AM	HC	DPH
A	09/30/21	ISSUED FOR REVIEW	GA	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

AT&T

RF PLUMBING DIAGRAM
5G NR 1SR C–BAND AND LTE 6C

SITE NUMBER	DRAWING NUMBER	REV
CT2490	RF–1	1

Exhibit D

Structural Analysis Report

(REVISED)
STRUCTURAL ANALYSIS REPORT

For

CT2490
EAST HARTFORD MAIN STREET
886 Main Street
East Hartford, CT 06108

Antennas Mounted on Steel Frame on Roof

Prepared for:

SAI at&t

Dated: May 4, 2022 (Rev.2)
January 31, 2022 (Rev.1)
September 22, 2021

Prepared by:

HDG **HUDSON** Design Group LLC

45 Beechwood Drive
North Andover, MA 01845
(P) 978.557.5553 (F) 978.336.5586
www.hudsondesigngroupllc.com

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by AT&T to conduct a structural evaluation of the structure supporting the proposed equipment located in the areas depicted in the latest HDG construction drawings.

This report represents this office's findings, conclusions and recommendations pertaining to the support of AT&T's proposed antennas listed below.

This office conducted an on-site visual survey of the above site on April 15, 2021. Attendees included Beau Birmingham (HDG – Project Manager).

The following documents were used for our reference:

- Previous HDG Construction Drawings dated November 8, 2016.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing structure **IS CAPABLE** of supporting the proposed equipment loading.

Based on our evaluation, we have determined that the existing mounts **ARE CAPABLE** of supporting the proposed equipment loading.

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Alpha & Gamma Sector Mount	4	LC1	28%	**PASS**
Beta Sector Mount	77	LC1	99%	**PASS**

Based on our evaluation, we have determined that the existing connections **ARE CAPABLE** of supporting the proposed equipment loading.

	Member	Stress Ratio	Pass/Fail
Existing Alpha & Gamma Sector Connection	3/4" Thru Bolts	20%	**PASS**

Reference the table below for the minimum ballast requirements:

MINIMUM BALLAST REQUIREMENTS			
	Existing (Per Side)	**Proposed (Per Side)**	**Total**
Number of Blocks	0	3	6
Size of Blocks	-	4"x8"x16" Solid	4"x8"x16" Solid
Weight of Blocks	0 lbs.	33 lbs. /each	33 lbs. /each
Total Ballast Weight	0 lbs.	99 lbs.	198 lbs.

HDG did not perform a condition assessment of the entire roof but did perform an inspection of the existing roof members and structural bearing walls below the area where the equipment is proposed to be located.

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APPURTENANCE CONFIGURATION:

Appurtenances	Dimensions	Weight	**Elevation	Mount
(2) 800-10965 Antennas	78.7"x20.0"x6.9"	109 lbs	118'-9"	Wall Mount
(1) 800-10965 Antennas	78.7"x20.0"x6.9"	109 lbs	109'	Steel Frame
(3) RRUS-32 B30 RRH's	27.2"x12.1"x7.0"	60 lbs	-	Ballast Mount/ Steel Frame
(3) 4449 B5/B12 RRH's	17.9"x13.2"x9.4"	73 lbs	-	Ballast Mount/ Steel Frame
(3) B2/B66A 8843 RRH's	14.9"x13.2"x10.9"	72 lbs	-	Ballast Mount/ Steel Frame
(3) Squid Surge Arrestors	24.0"x9.7" Ø	33 lbs	-	Ballast Mount/ Steel Frame
(2) AIR 6449 Antennas	30.4"x15.9"x8.1"	82 lbs	116'-10"	Wall Mount
(1) AIR 6449 Antennas	30.4"x15.9"x8.1"	82 lbs	107'-2"	Steel Frame
(2) AIR 6419 Antennas	28.0"x15.7"x6.7"	66 lbs	120'-7"	Wall Mount
(1) AIR 6419 Antennas	28.0"x15.7"x6.7"	66 lbs	110'-10"	Steel Frame
(2) DMP65R-BU6EA-K Antennas	71.2"x20.7"x9.7"	104 lbs	118'-9"	Wall Mount
(1) DMP65R-BU6EA-K Antennas	71.2"x20.7"x9.7"	104 lbs	109'	Steel Frame
(3) 4478 B14 RRH's	18.1"x13.4"x8.3"	60 lbs	-	Ballast Mount/ Steel Frame

** Proposed equipment shown in bold.*
*** Elevation to antenna centerline.*

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DESIGN CRITERIA

International Building Code (IBC) 2015 with 2018 Connecticut State Building Code Amendments, and ASCE 7-10 (Minimum Design Loads for Buildings and Other Structures).		
Wind		
Reference Wind Speed:	125 mph	(2018 CSBC Appendix N)
Exposure Category:	C	(ASCE 7-10 Chapter 26)
Risk Category:	II	(ASCE 7-10 Table 1.5-1)
Snow		
Ground Snow, P_g:	30	(2018 CSBC Appendix N)
Importance Factor (I_s):	1.0	(ASCE 7-10 Table 1.5-2)
Exposure Factor (C_e):	1.0	(Partially Exposed, Table 7-2)
Thermal Factor (C_t):	1.0	(ASCE 7-10 Table 7-3)
Flat Roof Snow Load:	21 psf	(ASCE 7-10 Equation 7.3-1)
Min. Flat Roof Snow Load:	30 psf	
EIA/TIA-222-H Structural Standards for Steel Antenna Towers and Antenna Supporting Structures		
Wind		
City/Town:	East Hartford	
County:	Hartford	
Wind Load:	125 mph	(TIA-222-H Figure B-2)
Ice		
Design Ice Thickness (t_i):	1.5 in	(TIA-222-H Figure B-9)
Structure Class:	II	(TIA-222-H Table 2-1)
Importance Factor (I_i):	1.0	(TIA-222-H Table 2-3)
Factored Thickness of Radial Ice (t_{iz}):	1.7 in	(TIA-222-H Sec. 2.6.10)

EXISTING ROOF CONSTRUCTION:

The existing roof construction consists of a roofing membrane over rigid insulation over concrete hollow core planks supported by CMU bearing walls.

Contractor to verify that the existing steel frame is supported by existing CMU bearing walls. If field conditions differ from what is assumed in this report, then the engineer of record is to be notified immediately.

EXISTING PENTHOUSE CONSTRUCTION:

The existing penthouse construction consists of masonry brick over CMU bearing walls and cold formed steel studs.

ANTENNA SUPPORT RECOMMENDATIONS:

- The new Alpha and Gamma sector antennas to be mounted on existing pipe masts secured to existing penthouse with thru bolts.
- The new Beta sector antennas to be mounted on existing pipe masts installed on existing steel frames located on the roof.

RRH SUPPORT RECOMMENDATIONS:

- The new Alpha and Gamma sector RRH's to be mounted on new ballast mounts on penthouse roof. Reference the table on page 2 for the minimum ballast requirements.
- The new Beta sector RRH's to be mounted on unistruts supported by existing steel frame.

Limitations and Assumptions:

1. Reference the latest HDG construction drawings for all the equipment locations and details.
2. All detail requirements will be designed and furnished in the construction drawings.
3. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
4. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
5. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer requirements.
6. If field conditions differ from what is assumed in this report, then the engineer of record is to be notified as soon as possible.

FIELD PHOTOS:

Photo 1: Sample photo illustrating the location of the Alpha sector.

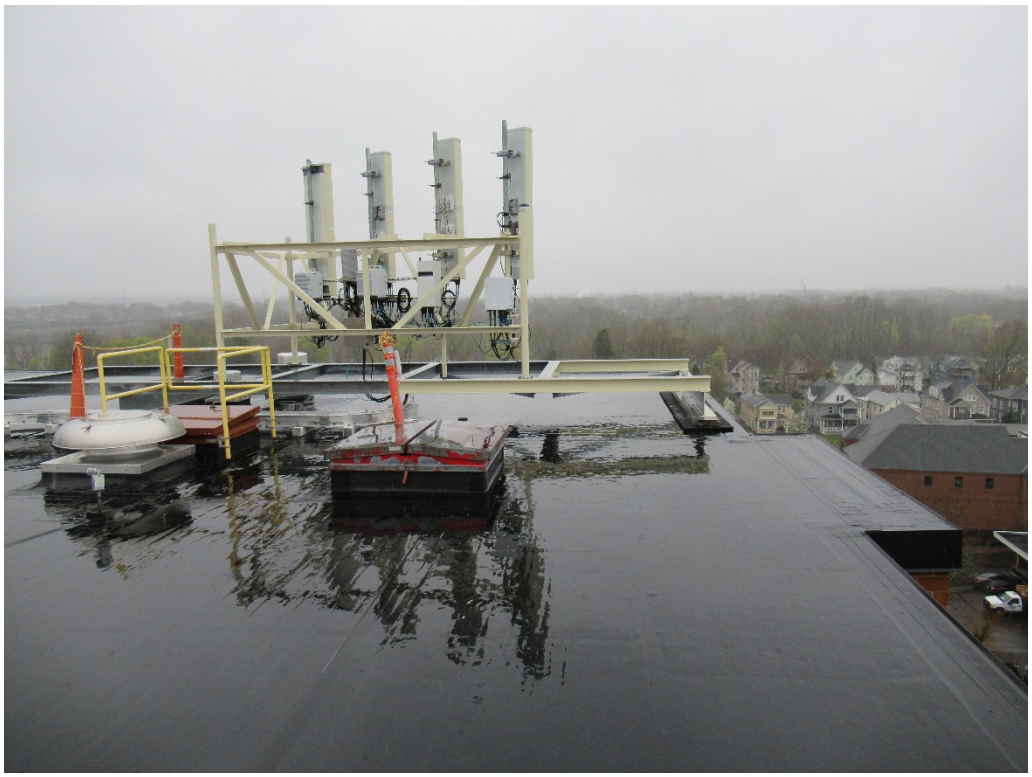

Photo 2: Sample photo illustrating the location of the Beta sector.

FIELD PHOTOS (CONT.):

Photo 3: Sample photo illustrating the location of the Gamma sector.

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Design Group LLC

Alpha & Gamma Sector Calculations

Date: 5/4/2022
Project Name: EAST HARTFORD MAIN STREET
Project No.: CT2490
Designed By: ID **Checked By:** MSC

HUDSON Design Group LLC

Alpha & Gamma Sector

2.6.5.2 Velocity Pressure Coeff:

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

z=	118.75	(ft)
z_g=	900	(ft)
α=	9.5	

K_z= 1.308

Kzmin ≤ Kz ≤ 2.01

Table 2-4

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

2.6.6.2 Topographic Factor:

Table 2-5

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

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

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

K_{zt}= 1

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

Category= 1

K_h=	1	
K_c=	1	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	118.75	
z_s=	30	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	1.00	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i = 1.50 in
Importance Factor = I= 1.0 (from Table 2-3)
K_{iz} = 1.13 (from Sec. 2.6.10)

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

t_{iz} = 1.70 in

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2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

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

h=	100	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

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

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

2.6.11.2 Design Wind Force on Appurtenances

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

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

q_z=	**49.66**	K_z=	1.308	(from 2.6.5.2)
$q_{z\ (ice)}$=	**7.94**	K_{zt}=	1.0	(from 2.6.6.2.1)
$q_{z\ (30)}$=	**2.86**	K_s=	1.0	(from 2.6.7)
		K_e=	1.00	(from 2.6.8)
		K_d=	0.95	(from Table 2-2)
		V_{max}=	125	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

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

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Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		**Aspect Ratio ≤ 2.5**	**Aspect Ratio = 7**	**Aspect Ratio ≥ 25**
		Ca	**Ca**	**Ca**
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	**C < 39** (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6
Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction. (Aspect ratio is independent of the spacing between support points of a linear appurtenance, Note: Linear interpolation may be used for aspect ratios other than those shown.				

Ice Thickness = **1.70** **in** | **Angle =** **0 (deg)** | **Equivalent Angle =** **180 (deg)**

Appurtenances	**Height**	**Width**	**Depth**	**Flat Area**	**Aspect Ratio**	**Ca**	**Force (lbs)**	**Force (lbs) (w/ Ice)**
800-10965 Antenna	78.7	20.0	6.9	10.93	3.94	1.26	**686**	**134**
AIR 6449 Antenna	30.4	15.9	8.1	3.36	1.91	1.20	**200**	**43**
AIR 6419 Antenna	28.0	15.7	6.7	3.05	1.78	1.20	**182**	**40**
DMP65R-BU6EA-K Antenna	71.2	20.7	9.7	10.24	3.44	1.24	**631**	**123**
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	**136**	**31**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.36	1.20	**98**	**23**
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.20	**81**	**20**
4478 B14 RRH	18.1	13.4	8.3	1.68	1.35	1.20	**100**	**24**
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	**56**	**14**
Fiber Management Box	12.0	12.0	6.0	1.00	1.00	1.20	**60**	**16**
4" Pipe	4.5	12.0		0.38	0.38	1.20	**22**	**8**
Unistrut	1.6	12.0		0.14	0.14	2.00	**13**	**9**

Date: 5/4/2022
Project Name: EAST HARTFORD MAIN STREET
Project No.: CT2490
Designed By: ID Checked By: MSC

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WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.70	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs)	Force (lbs)	Force (lbs)
800-10965 Antenna	78.7	20.0	6.9	10.93	3.77	3.94	11.41	1.26	1.55	686	290	290
AIR 6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	200	107	107
AIR 6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	182	82	82
DMP65R-BU6EA-K Antenna	71.2	20.7	9.7	10.24	4.80	3.44	7.34	1.24	1.41	631	336	336
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	136	83	83
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	98	70	70
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	81	67	67
4478 B14 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	100	62	62

WIND LOADS WITH ICE:

800-10965 Antenna	82.1	23.4	10.3	13.34	5.88	3.51	7.97	1.24	1.43	132	67	67
AIR 6449 Antenna	33.8	19.3	11.5	4.53	2.70	1.75	2.94	1.20	1.22	43	26	26
AIR 6419 Antenna	31.4	19.1	10.1	4.17	2.20	1.64	3.11	1.20	1.23	40	21	21
DMP65R-BU6EA-K Antenna	74.6	24.1	13.1	12.49	6.79	3.10	5.69	1.23	1.34	122	72	72
RRUS-32 B30 RRH	30.6	15.5	10.4	3.30	2.21	1.97	2.94	1.20	1.22	31	21	21
4449 B5/B12 RRH	21.3	16.6	12.8	2.46	1.89	1.28	1.66	1.20	1.20	23	18	18
B2/B66A 8843 RRH	18.3	16.6	14.3	2.11	1.82	1.10	1.28	1.20	1.20	20	17	17
4478 B14 RRH	21.5	16.8	11.7	2.51	1.75	1.28	1.84	1.20	1.20	24	17	17

Date: 5/4/2022
Project Name: EAST HARTFORD MAIN STREET
Project No.: CT2490
Designed By: ID **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS (ALPHA & GAMMA SECTOR)

Thickness of ice: 1.70 in.
Density of ice: 56 pcf

800-10965 Antenna
Weight of ice based on total radial SF area:
Height (in): 78.7
Width (in): 20.0
Depth (in): 6.9
Total weight of ice on object: 311 lbs
Weight of object: 109.0 lbs
Combined weight of ice and object: 420 lbs

AIR 6449 Antenna
Weight of ice based on total radial SF area:
Height (in): 30.4
Width (in): 15.9
Depth (in): 8.1
Total weight of ice on object: 103 lbs
Weight of object: 82.0 lbs
Combined weight of ice and object: 185 lbs

AIR 6419 Antenna
Weight of ice based on total radial SF area:
Height (in): 28.0
Width (in): 15.7
Depth (in): 6.7
Total weight of ice on object: 91 lbs
Weight of object: 66.0 lbs
Combined weight of ice and object: 157 lbs

DMP65R-BU6EA-K Antenna
Weight of ice based on total radial SF area:
Height (in): 71.2
Width (in): 20.7
Depth (in): 9.7
Total weight of ice on object: 303 lbs
Weight of object: 104.0 lbs
Combined weight of ice and object: 407 lbs

RRUS-32 B30 RRH
Weight of ice based on total radial SF area:
Height (in): 27.2
Width (in): 12.1
Depth (in): 7.0
Total weight of ice on object: 74 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 134 lbs

4449 B5/B12 RRH
Weight of ice based on total radial SF area:
Height (in): 17.9
Width (in): 13.2
Depth (in): 9.4
Total weight of ice on object: 55 lbs
Weight of object: 73.0 lbs
Combined weight of ice and object: 128 lbs

B2/B66A 8843 RRH
Weight of ice based on total radial SF area:
Height (in): 14.9
Width (in): 13.2
Depth (in): 10.9
Total weight of ice on object: 49 lbs
Weight of object: 72.0 lbs
Combined weight of ice and object: 121 lbs

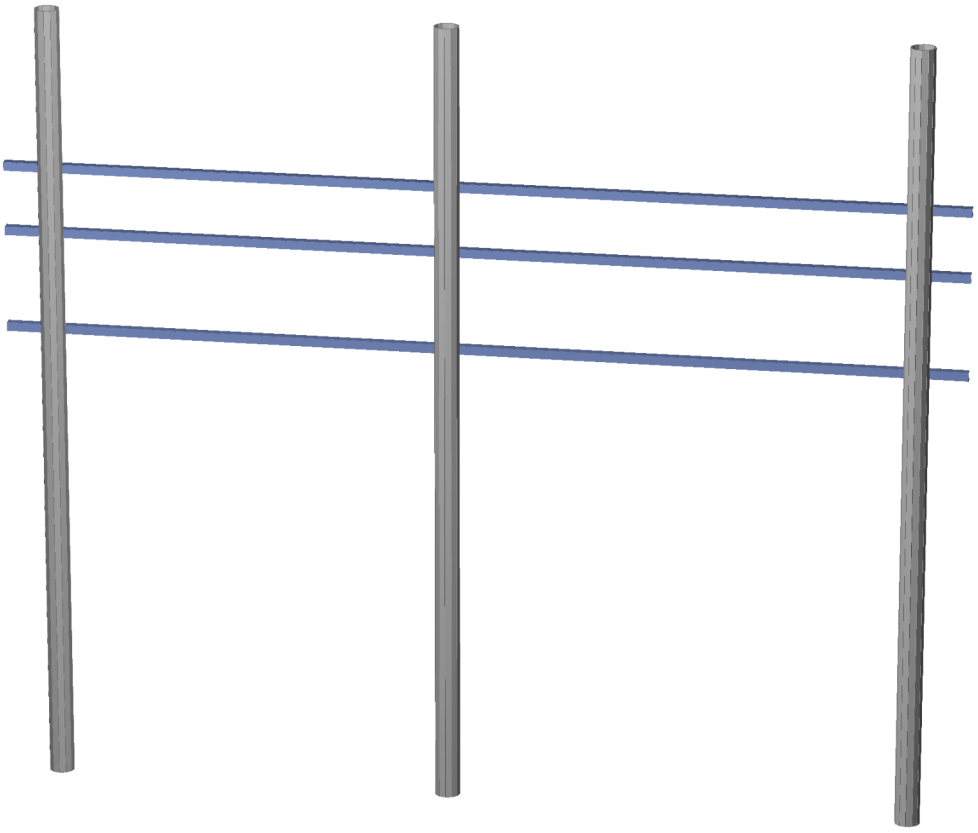
4478 B14 RRH
Weight of ice based on total radial SF area:
Height (in): 18.1
Width (in): 13.4
Depth (in): 8.3
Total weight of ice on object: 55 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 115 lbs

Squid Surge Arrestor
Weight of ice based on total radial SF area:
Depth (in): 24.0
Diameter(in): 9.7
Total weight of ice on object: 47 lbs
Weight of object: 33 lbs
Combined weight of ice and object: 80 lbs

Fiber Management Box
Weight of ice based on total radial SF area:
Height (in): 12.0
Width (in): 12.0
Depth (in): 6.0
Total weight of ice on object: 31 lbs
Weight of object: 50.0 lbs
Combined weight of ice and object: 81 lbs

Unistrut
Weight of ice based on total radial SF area:
Height (in): 1.625
Width (in): 1.625
Per foot weight of ice on object: 8 plf

4" Pipe
Per foot weight of ice:
diameter (in): 4.5
Per foot weight of ice on object: 13 plf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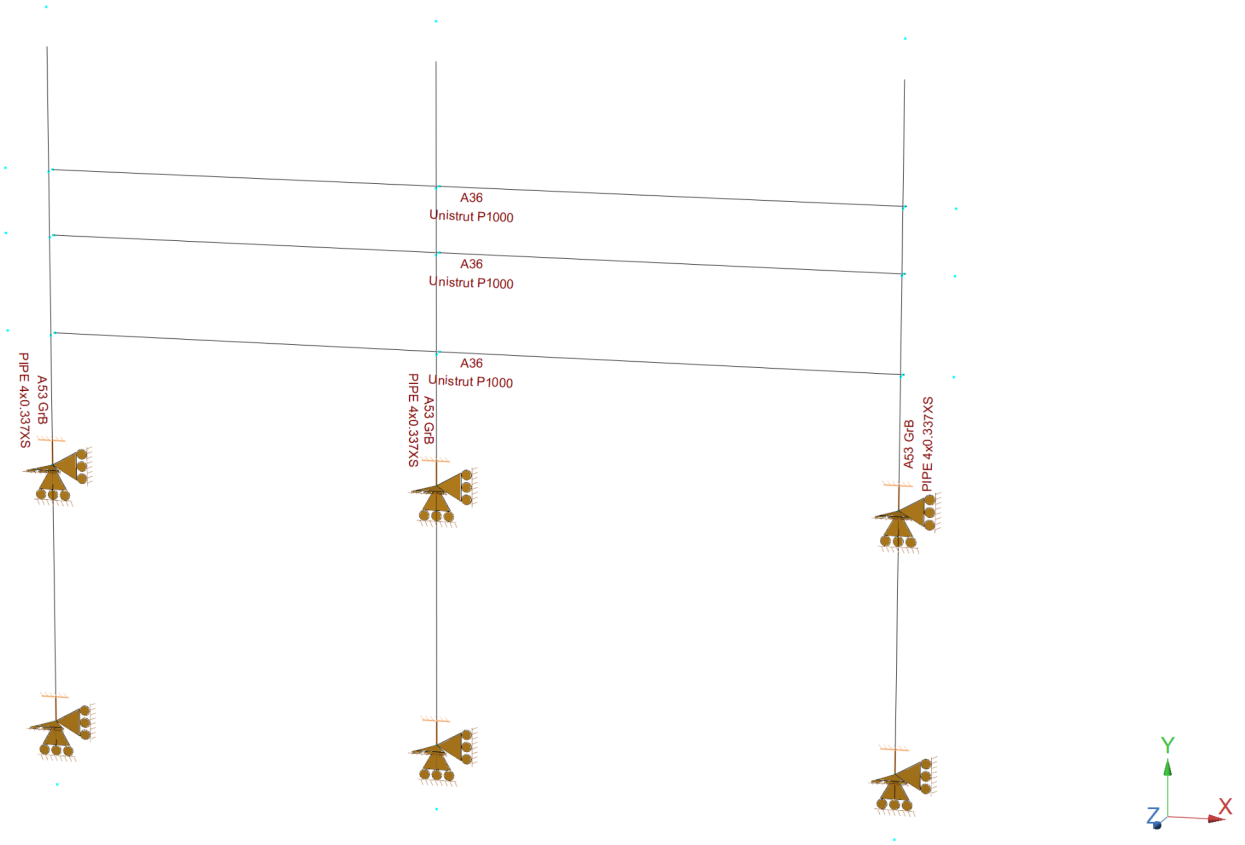
X
Z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Unistrut P1000
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A36
Unistrut P1000
A53 GrB
PIPE 4x0.337XS
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A53 GrB
PIPE 4x0.337XS
Y
Z
X

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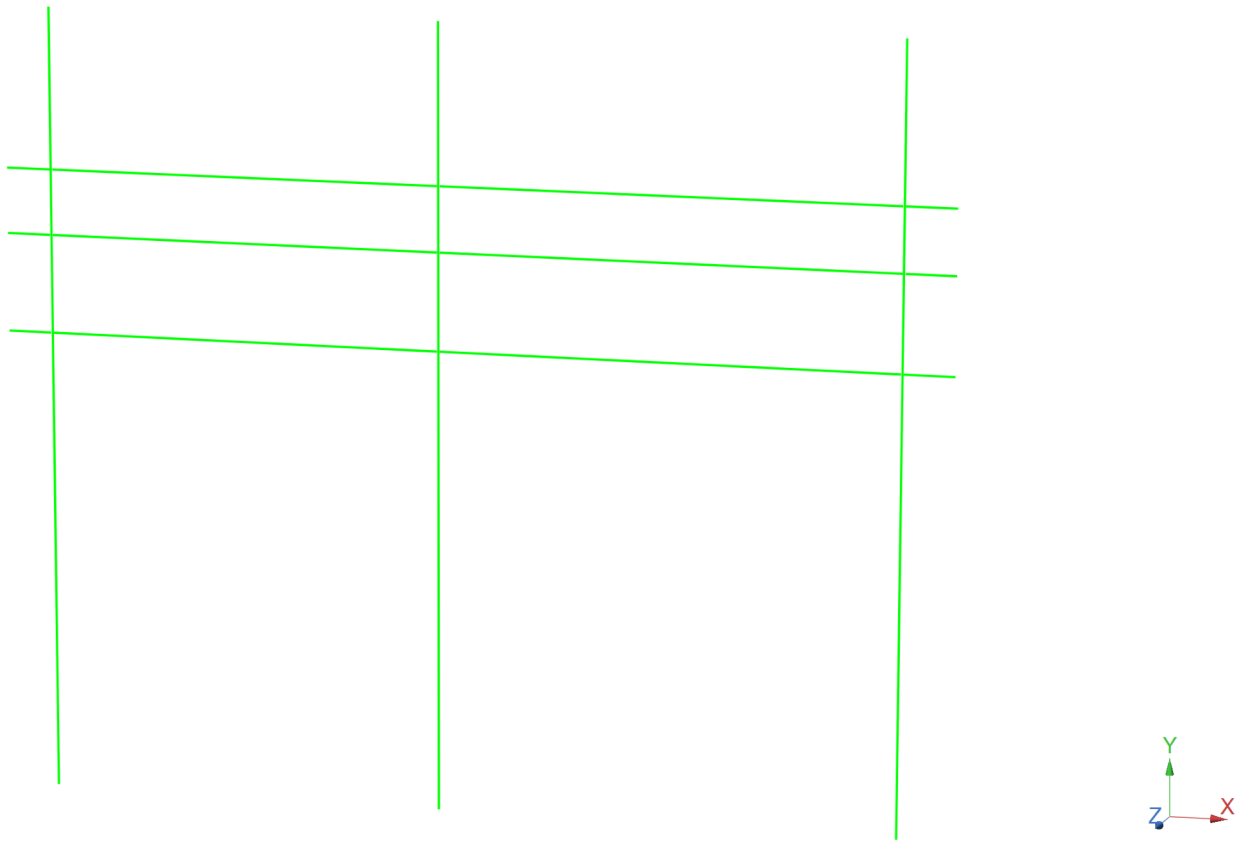

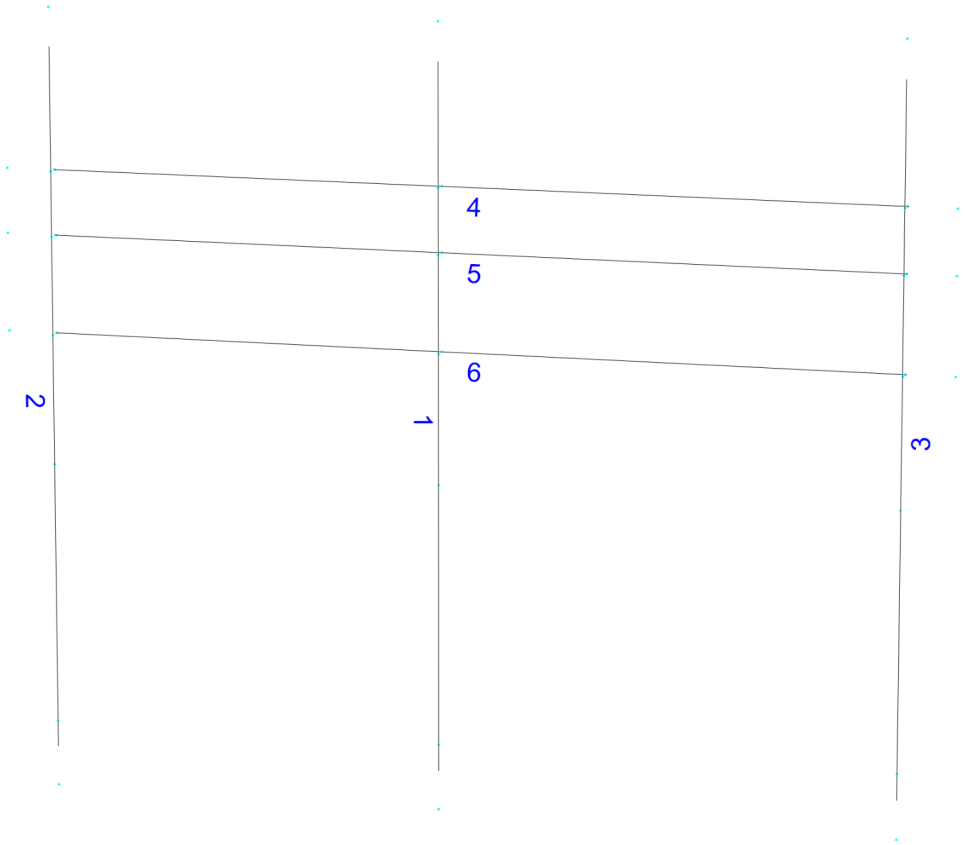
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2
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Current Date: 2/1/2022 9:15 AM
Units system: English

Load data

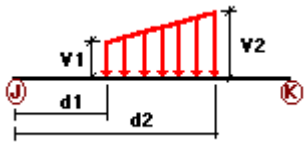
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

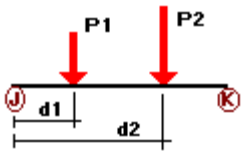
Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wf	Wind Load (FRONT)	No	WIND
Ws	Wind Load (SIDE)	No	WIND
Wfice	Wind ICE (FRONT)	No	WIND
Wsice	Wind ICE (SIDE)	No	WIND
Di	Ice Load	No	LL

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wf	1	z	-0.022	0.00	0.00	No	0.00	No
	2	z	-0.022	0.00	0.00	No	0.00	No
	3	z	-0.022	0.00	0.00	No	0.00	No
	4	z	-0.013	0.00	0.00	No	0.00	No
	5	z	-0.013	0.00	0.00	No	0.00	No
	6	z	-0.013	0.00	0.00	No	0.00	No
Ws	1	x	-0.022	0.00	0.00	No	0.00	No
	2	x	-0.022	0.00	0.00	No	0.00	No
	3	x	-0.022	0.00	0.00	No	0.00	No
Di	1	y	-0.013	0.00	0.00	No	0.00	No
	2	y	-0.013	0.00	0.00	No	0.00	No
	3	y	-0.013	0.00	0.00	No	0.00	No
	4	y	-0.008	0.00	0.00	No	0.00	No
	5	y	-0.008	0.00	0.00	No	0.00	No
	6	y	-0.008	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	1	y	-0.041	1.00	No
		y	-0.041	4.00	No
		y	-0.033	5.00	No
		y	-0.033	8.00	No
	2	y	-0.052	0.50	No
		y	-0.052	5.50	No
	3	y	-0.055	0.50	No
		y	-0.055	5.50	No
Wf	1	z	-0.101	1.00	No
		z	-0.101	4.00	No
		z	-0.091	5.00	No
		z	-0.091	8.00	No
	2	z	-0.316	0.50	No
		z	-0.316	5.50	No
	3	z	-0.343	0.50	No
		z	-0.343	5.50	No
Ws	1	x	-0.054	1.00	No
		x	-0.054	4.00	No
		x	-0.042	5.00	No
		x	-0.042	8.00	No
	2	x	-0.169	0.50	No
		x	-0.169	5.50	No
	3	x	-0.145	0.50	No
		x	-0.145	5.50	No
Wfice	1	z	-0.022	1.00	No
		z	-0.022	4.00	No
		z	-0.02	5.00	No
		z	-0.02	8.00	No
	2	z	-0.062	0.50	No
		z	-0.062	5.50	No
	3	z	-0.067	0.50	No
		z	-0.067	5.50	No
Wsice	1	x	-0.014	1.00	No
		x	-0.014	4.00	No
		x	-0.011	5.00	No
		x	-0.011	8.00	No
	2	x	-0.037	0.50	No
		x	-0.037	5.50	No
	3	x	-0.034	0.50	No
		x	-0.034	5.50	No
Di	1	y	-0.052	1.00	No
		y	-0.052	4.00	No
		y	-0.046	5.00	No
		y	-0.046	8.00	No
	2	y	-0.152	0.50	No
		y	-0.152	5.50	No
	3	y	-0.156	0.50	No
		y	-0.156	5.50	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wf	Wind Load (FRONT)	No	0.00	0.00	0.00
Ws	Wind Load (SIDE)	No	0.00	0.00	0.00
Wfice	Wind ICE (FRONT)	No	0.00	0.00	0.00
Wsice	Wind ICE (SIDE)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wf	0.00	0.00	0.00
Ws	0.00	0.00	0.00
Wfice	0.00	0.00	0.00
Wsice	0.00	0.00	0.00
Di	0.00	0.00	0.00

Current Date: 2/1/2022 9:15 AM
Units system: English

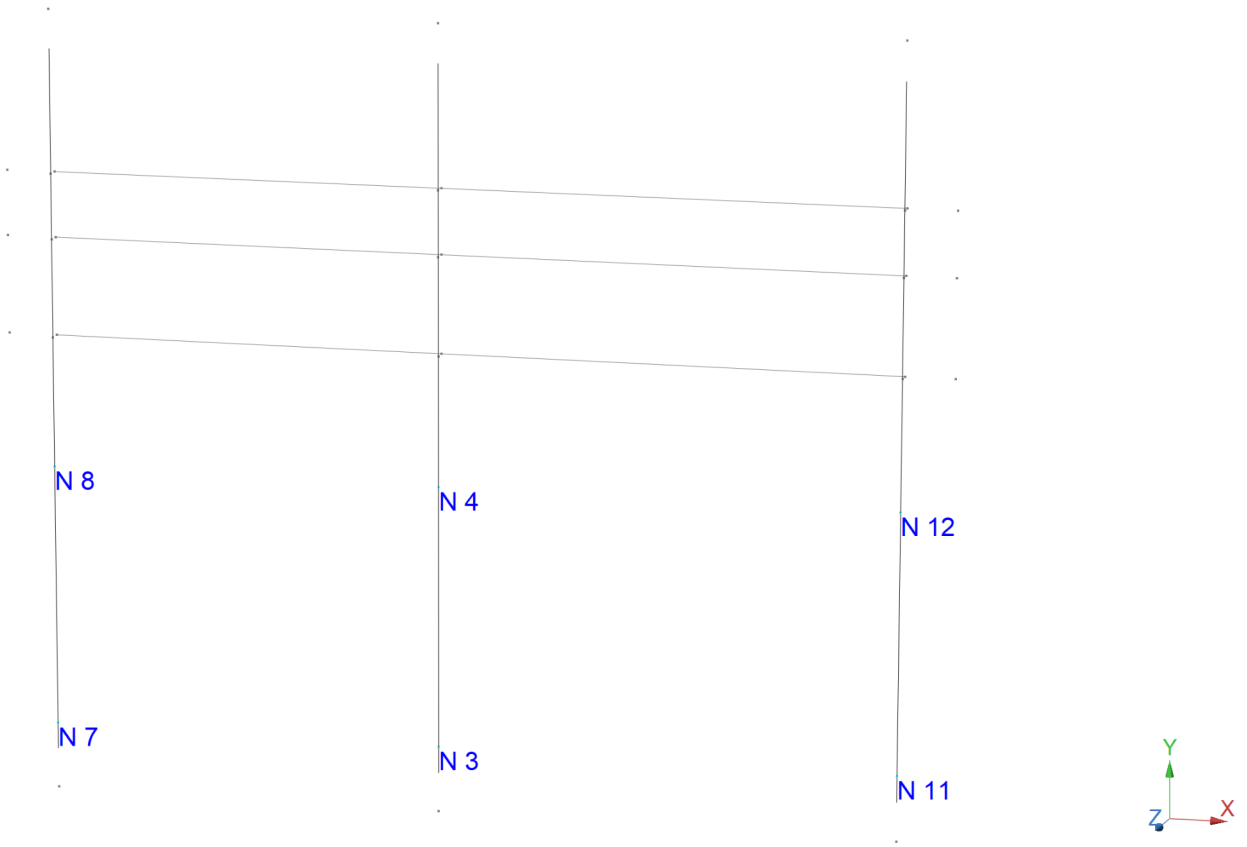
Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+Wf
LC2=1.2DL+Ws
LC3=0.9DL+Wf
LC4=0.9DL+Ws
LC5=1.2DL+Wfice+Di
LC6=1.2DL+Wsice+Di
LC7=1.4DL
LC8=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	PIPE 4x0.337XS	**1**	LC1 at 58.33%	0.18	OK	
		2	LC1 at 58.33%	0.24	OK	
		3	LC1 at 58.33%	**0.26**	**OK**	
	Unistrut P1000	**4**	LC1 at 53.13%	**0.28**	**OK**	Eq. H1.2-1
		5	LC1 at 53.13%	0.24	OK	Eq. H1.2-1
		6	LC1 at 53.13%	0.20	OK	Eq. H1.2-1

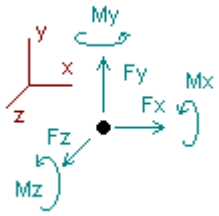

N 8
N 4
N 12
N 7
N 3
N 11
Y
Z
X

Current Date: 2/1/2022 9:15 AM
Units system: English

Analysis result

Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :
LC1=1.2DL+Wf
LC2=1.2DL+Ws
LC3=0.9DL+Wf
LC4=0.9DL+Ws
LC5=1.2DL+Wfice+Di
LC6=1.2DL+Wsice+Di
LC7=1.4DL
LC8=0.9DL

		Forces						Moments					
Node		**Fx** [Kip]	**Ic**	**Fy** [Kip]	**Ic**	**Fz** [Kip]	**Ic**	**Mx** [Kip*ft]	**Ic**	**My** [Kip*ft]	**Ic**	**Mz** [Kip*ft]	**Ic**
3	Max	0.001	LC3	0.072	LC5	-0.001	LC4	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.238	LC2	0.045	LC3	-0.575	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
4	Max	0.791	LC2	0.712	LC5	1.524	LC1	0.00000	LC1	0.00046	LC5	0.00000	LC1
	Min	-0.005	LC3	0.255	LC4	0.001	LC4	0.00000	LC1	-0.03219	LC1	0.00000	LC1
7	Max	0.001	LC3	0.059	LC7	-0.001	LC8	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.246	LC2	0.038	LC3	-0.796	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
8	Max	0.785	LC2	0.711	LC6	1.812	LC1	0.00000	LC1	0.01309	LC4	0.00000	LC1
	Min	-0.005	LC3	0.227	LC3	0.001	LC8	0.00000	LC1	-0.02598	LC1	0.00000	LC1
11	Max	0.002	LC5	0.059	LC7	0.001	LC4	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.244	LC4	0.038	LC3	-0.872	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
12	Max	0.765	LC4	0.729	LC5	1.966	LC1	0.00000	LC1	0.06821	LC1	0.00000	LC1
	Min	-0.018	LC5	0.176	LC4	-0.001	LC4	0.00000	LC1	-0.01018	LC5	0.00000	LC1

Date: 2/1/2022
Project Name: EAST HARTFORD MAIN STREET
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Designed By: ID **Checked By:** MSC

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CHECK CONNECTION CAPACITY (Alpha & Gamma Sector Worst Case)

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Bolt Type = A36 3/4" Thru Bolts

Allowable Tensile Load =

F_{Tall} = 9609 lbs.

Allowable Shear Load =

F_{Vall} = 5765 lbs.

TENSILE FORCES

Reaction **F =** 1966 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 765 lbs. (See Bentley Output)
Reactions in Y direction: 729 lbs. (See Bentley Output)

Resultant: 1057 lbs.

No. of Supports = 1
No. of Bolts / Support = 2

Tension Design Load /Bolts =

f_t = 983.00 lbs. < 9609 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v = 528.36 lbs. < 5765 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.102	+	0.092	=	0.194	<	1.0	**Therefore, OK !**

Date: 2/1/2022
Project Name: EAST HARTFORD MAIN STREET
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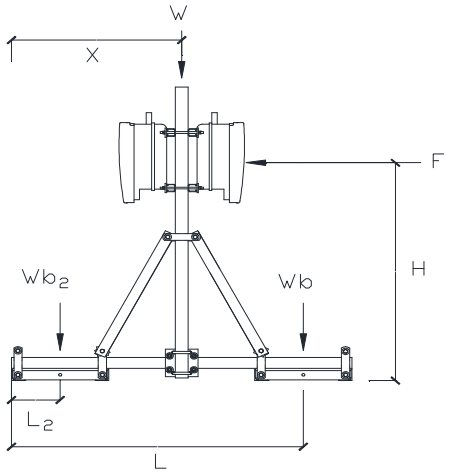
Calculate Total Ballast Required for Ballast Mount (Alpha and Gamma Sector)



Force (F) =	322	lbs.
Height (H) =	4	ft
Weight of Appurtenances (W) =	298	lbs.
Frame Width/2 (X) =	2.625	ft
Length (L) =	4.5	ft
Length (L_2) =	0.83	ft
Ballast (Wb_2) =	0	
Safety Factor (SF) =	1.5	

Overturning at Ballast

$\Sigma M = 0 = (F * H) - (W * X) - (Wb * L)$ ---> $Wb = [(F*H*SF-W*X-Wb_2*L_2)/L]=$ **91 lbs.**

Determine Number of Blocks Required
(assume 4"x8"x16" solid blocks @ 33 lbs. each)

Number of Blocks Required = 3 BLOCKS PER SIDE

Number of Existing Blocks = 0 BLOCKS PER SIDE

Number of Proposed Blocks = 3 BLOCKS PER SIDE

Load on Roof

Total Weight of Fully Loaded Frame = 778 lbs.

Footprint Area Under Ballast Frame = 22.7 ft^2

Distributed Load Under Ballast Frame = 34 psf

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Design Group LLC

Beta Sector
Calculations

Date: 5/4/2022
Project Name: EAST HARTFORD MAIN STREET
Project No.: CT2490
Designed By: ID **Checked By:** MSC

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Beta Sector

2.6.5.2 Velocity Pressure Coeff:

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

z=	109	(ft)
z_g=	900	(ft)
α=	9.5	

K_z= 1.281

Kzmin ≤ Kz ≤ 2.01

Table 2-4

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

2.6.6.2 Topographic Factor:

Table 2-5

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

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

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

K_{zt}= 1

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

Category= **1**

K_h=	1	
K_c=	1	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	109	
z_s=	30	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	1.00	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i = 1.50 in
Importance Factor = I= 1.0 (from Table 2-3)
K_{iz} = 1.12 (from Sec. 2.6.10)

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

t_{iz} = 1.69 in

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Designed By: ID Checked By: MSC

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2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

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

h=	100	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

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

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

2.6.11.2 Design Wind Force on Appurtenances

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

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

		K_z=	1.281	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**48.63**	K_e=	1.00	(from 2.6.8)
$q_{z\ (ice)}$=	**7.78**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.80**	V_{max}=	125	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

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

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Determine Ca:

Table 2-9

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

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

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

Ice Thickness = **1.69** in | **Angle =** **0** (deg) | **Equivalent Angle =** **180** (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)
800-10965 Antenna	78.7	20.0	6.9	10.93	3.94	1.26	**672**	**131**
AIR 6449 Antenna	30.4	15.9	8.1	3.36	1.91	1.20	**196**	**42**
AIR 6419 Antenna	28.0	15.7	6.7	3.05	1.78	1.20	**178**	**39**
DMP65R-BU6EA-K Antenna	71.2	20.7	9.7	10.24	3.44	1.24	**618**	**120**
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	**133**	**31**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.36	1.20	**96**	**23**
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.20	**80**	**20**
4478 B14 RRH	18.1	13.4	8.3	1.68	1.35	1.20	**98**	**23**
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	**55**	**14**
Fiber Management Box	12.0	12.0	6.0	1.00	1.00	1.20	**58**	**15**
3" Pipe	3.5	12.0		0.29	0.29	1.20	**17**	**7**
Unistrut	1.6	12.0		0.14	0.14	2.00	**13**	**8**
L 3x3 Angles	3.0	12.0		0.25	0.25	2.00	**24**	**11**
W6x25	6.4	12.0		0.53	0.53	1.20	**31**	**10**
W12x19	12.2	12.0		1.02	1.02	1.20	**59**	**16**

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Beta Sector

2.6.5.2 Velocity Pressure Coeff:

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

z=	106	(ft)
z_g=	900	(ft)
α=	9.5	

K_z= 1.281

Kzmin ≤ Kz ≤ 2.01

Table 2-4

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

2.6.6.2 Topographic Factor:

Table 2-5

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

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

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

K_{zt}= 1

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

Category= **1**

K_h=	1	
K_c=	1	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	106	
z_s=	30	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	1.00	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i = 1.50 in
Importance Factor = I= 1.0 (from Table 2-3)
K_{iz} = 1.12 (from Sec. 2.6.10)

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

t_{iz} = 1.69 in

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Designed By: ID Checked By: MSC

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2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

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

h=	100	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

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

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

2.6.11.2 Design Wind Force on Appurtenances

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

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

		K_z=	1.281	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**48.63**	K_e=	1.00	(from 2.6.8)
$q_{z\ (ice)}$=	**7.78**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.80**	V_{max}=	125	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

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

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Determine Ca:

Table 2-9

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

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

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

Ice Thickness = **1.69** in | **Angle =** **0** (deg) | **Equivalent Angle =** **180** (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)
800-10965 Antenna	78.7	20.0	6.9	10.93	3.94	1.26	**672**	**131**
AIR 6449 Antenna	30.4	15.9	8.1	3.36	1.91	1.20	**196**	**42**
AIR 6419 Antenna	28.0	15.7	6.7	3.05	1.78	1.20	**178**	**39**
DMP65R-BU6EA-K Antenna	71.2	20.7	9.7	10.24	3.44	1.24	**618**	**120**
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	**133**	**31**
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.36	1.20	**96**	**23**
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.20	**80**	**20**
4478 B14 RRH	18.1	13.4	8.3	1.68	1.35	1.20	**98**	**23**
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	**55**	**14**
Fiber Management Box	12.0	12.0	6.0	1.00	1.00	1.20	**58**	**15**
3" Pipe	3.5	12.0		0.29	0.29	1.20	**17**	**7**
Unistrut	1.6	12.0		0.14	0.14	2.00	**13**	**8**
L 3x3 Angles	3.0	12.0		0.25	0.25	2.00	**24**	**11**
W6x25	6.4	12.0		0.53	0.53	1.20	**31**	**10**
W12x19	12.2	12.0		1.02	1.02	1.20	**59**	**16**

Date: 5/4/2022
Project Name: EAST HARTFORD MAIN STREET
Project No.: CT2490
Designed By: ID **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS (BETA SECTOR)

Thickness of ice: 1.69 in.
Density of ice: 56 pcf

800-10965 Antenna
Weight of ice based on total radial SF area:
Height (in): 78.7
Width (in): 20.0
Depth (in): 6.9
Total weight of ice on object: 309 lbs
Weight of object: 109.0 lbs
Combined weight of ice and object: 418 lbs

AIR 6449 Antenna
Weight of ice based on total radial SF area:
Height (in): 30.4
Width (in): 15.9
Depth (in): 8.1
Total weight of ice on object: 102 lbs
Weight of object: 82.0 lbs
Combined weight of ice and object: 184 lbs

AIR 6419 Antenna
Weight of ice based on total radial SF area:
Height (in): 28.0
Width (in): 15.7
Depth (in): 6.7
Total weight of ice on object: 90 lbs
Weight of object: 66.0 lbs
Combined weight of ice and object: 156 lbs

DMP65R-BU6EA-K Antenna
Weight of ice based on total radial SF area:
Height (in): 71.2
Width (in): 20.7
Depth (in): 9.7
Total weight of ice on object: 301 lbs
Weight of object: 104.0 lbs
Combined weight of ice and object: 405 lbs

RRUS-32 B30 RRH
Weight of ice based on total radial SF area:
Height (in): 27.2
Width (in): 12.1
Depth (in): 7.0
Total weight of ice on object: 73 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 133 lbs

4449 B5/B12 RRH
Weight of ice based on total radial SF area:
Height (in): 17.9
Width (in): 13.2
Depth (in): 9.4
Total weight of ice on object: 55 lbs
Weight of object: 73.0 lbs
Combined weight of ice and object: 128 lbs

B2/B66A 8843 RRH
Weight of ice based on total radial SF area:
Height (in): 14.9
Width (in): 13.2
Depth (in): 10.9
Total weight of ice on object: 48 lbs
Weight of object: 72.0 lbs
Combined weight of ice and object: 120 lbs

4478 B14 RRH
Weight of ice based on total radial SF area:
Height (in): 18.1
Width (in): 13.4
Depth (in): 8.3
Total weight of ice on object: 54 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 114 lbs

Squid Surge Arrestor
Weight of ice based on total radial SF area:
Depth (in): 24.0
Diameter(in): 9.7
Total weight of ice on object: 47 lbs
Weight of object: 33 lbs
Combined weight of ice and object: 80 lbs

Fiber Management Box
Weight of ice based on total radial SF area:
Height (in): 12.0
Width (in): 12.0
Depth (in): 6.0
Total weight of ice on object: 31 lbs
Weight of object: 50.0 lbs
Combined weight of ice and object: 81 lbs

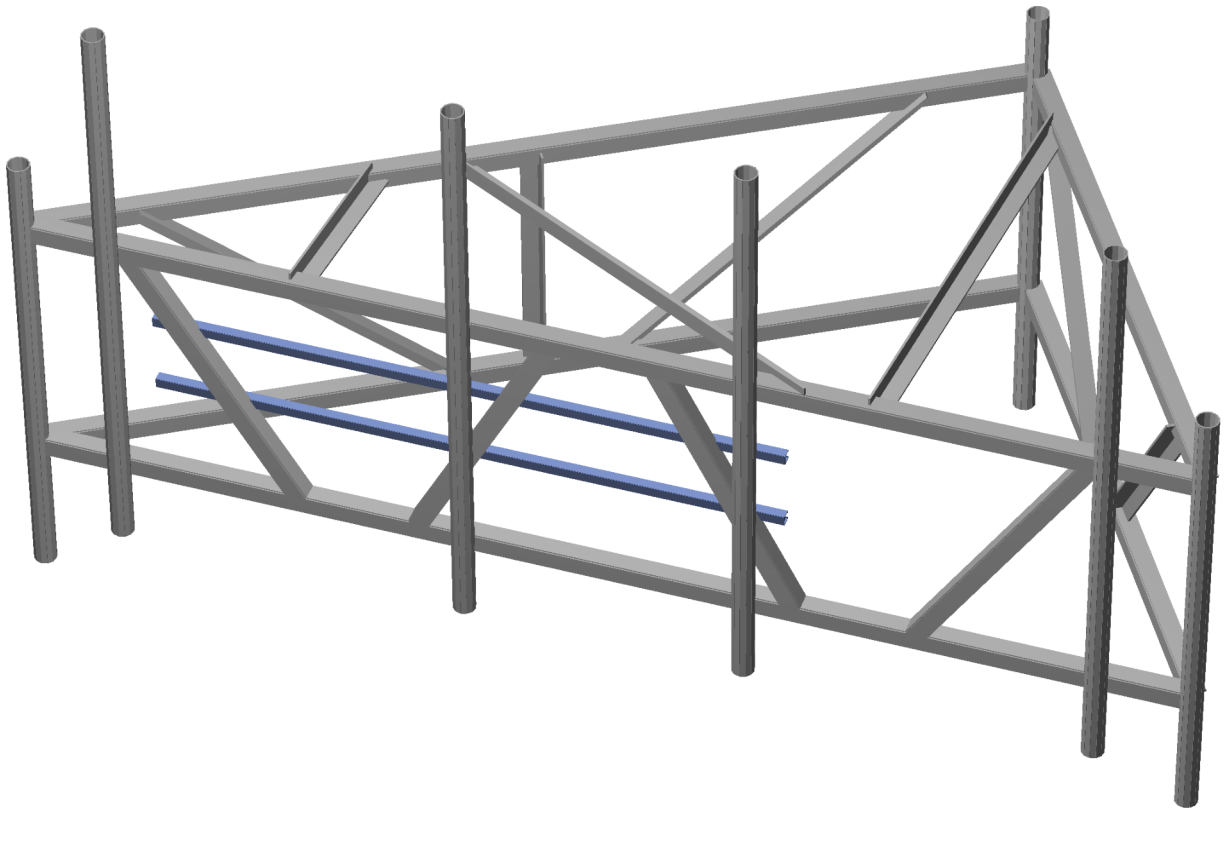
Unistrut
Weight of ice based on total radial SF area:
Height (in): 1.625
Width (in): 1.625
Per foot weight of ice on object: 8 plf

L 3x3 Angles
Weight of ice based on total radial SF area:
Height (in): 3
Width (in): 3
Per foot weight of ice on object: 12 plf

3" Pipe
Per foot weight of ice:
diameter (in): 3.5
Per foot weight of ice on object: 11 plf

W6x25
Weight of ice based on total radial SF area:
Height (in): 6.38
Width (in): 6.08
Per foot weight of ice on object: 22 plf

W12x19
Weight of ice based on total radial SF area:
Height (in): 12.2
Width (in): 4.01
Per foot weight of ice on object: 30 plf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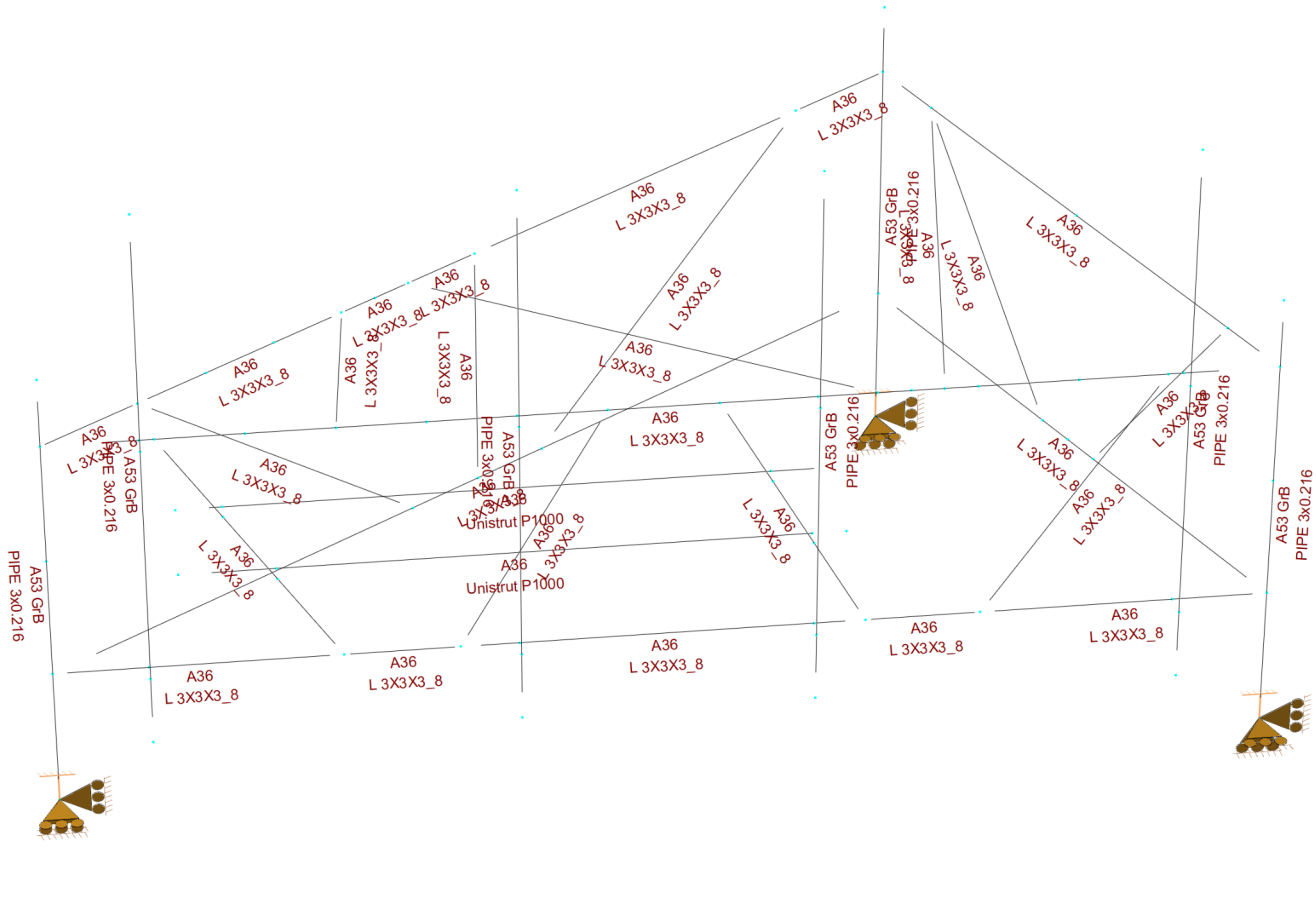

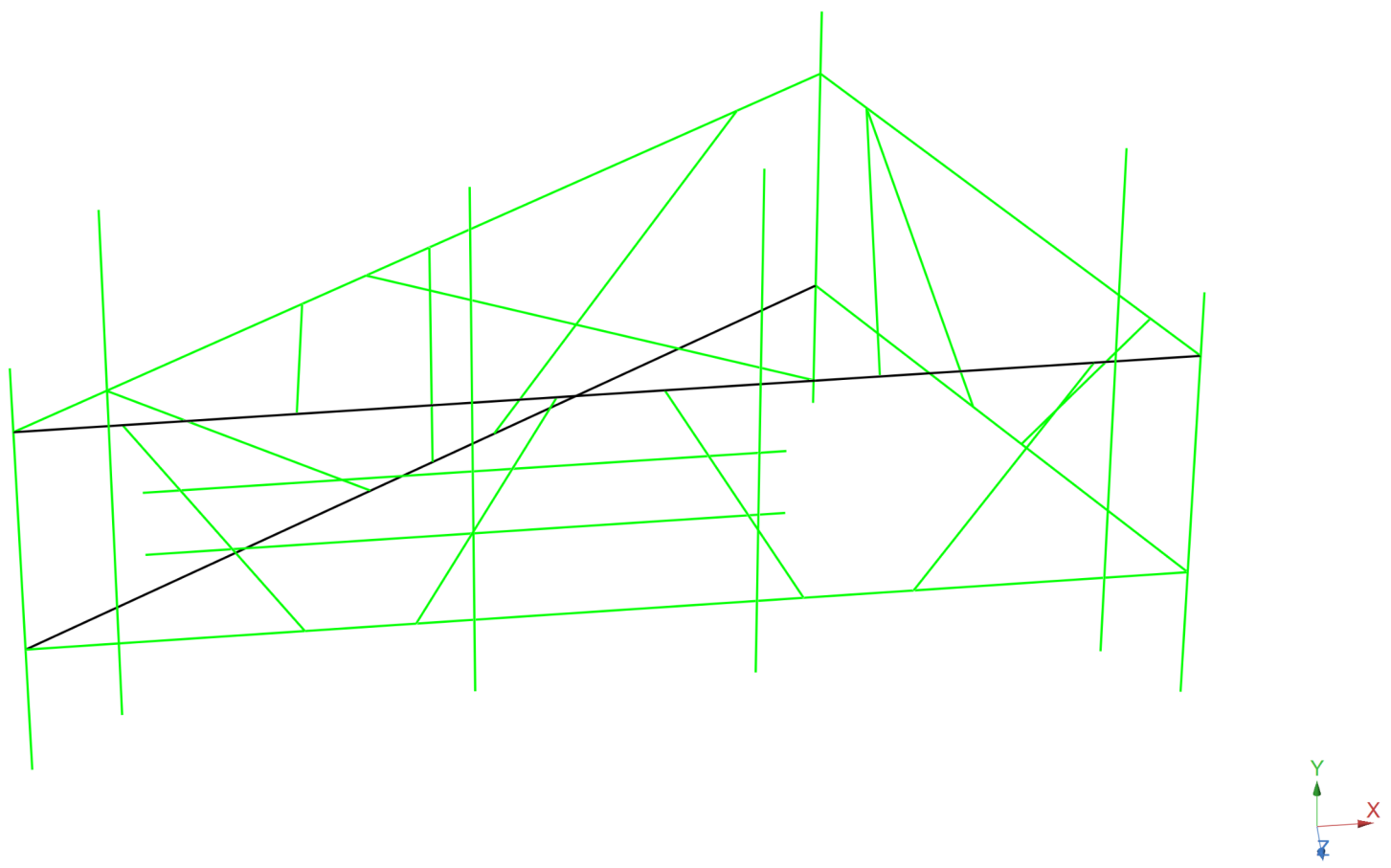
Design status
Not designed
Error on design
Design O.K.
With warnings
Y
X
Z

Current Date: 9/20/2021 2:59 PM
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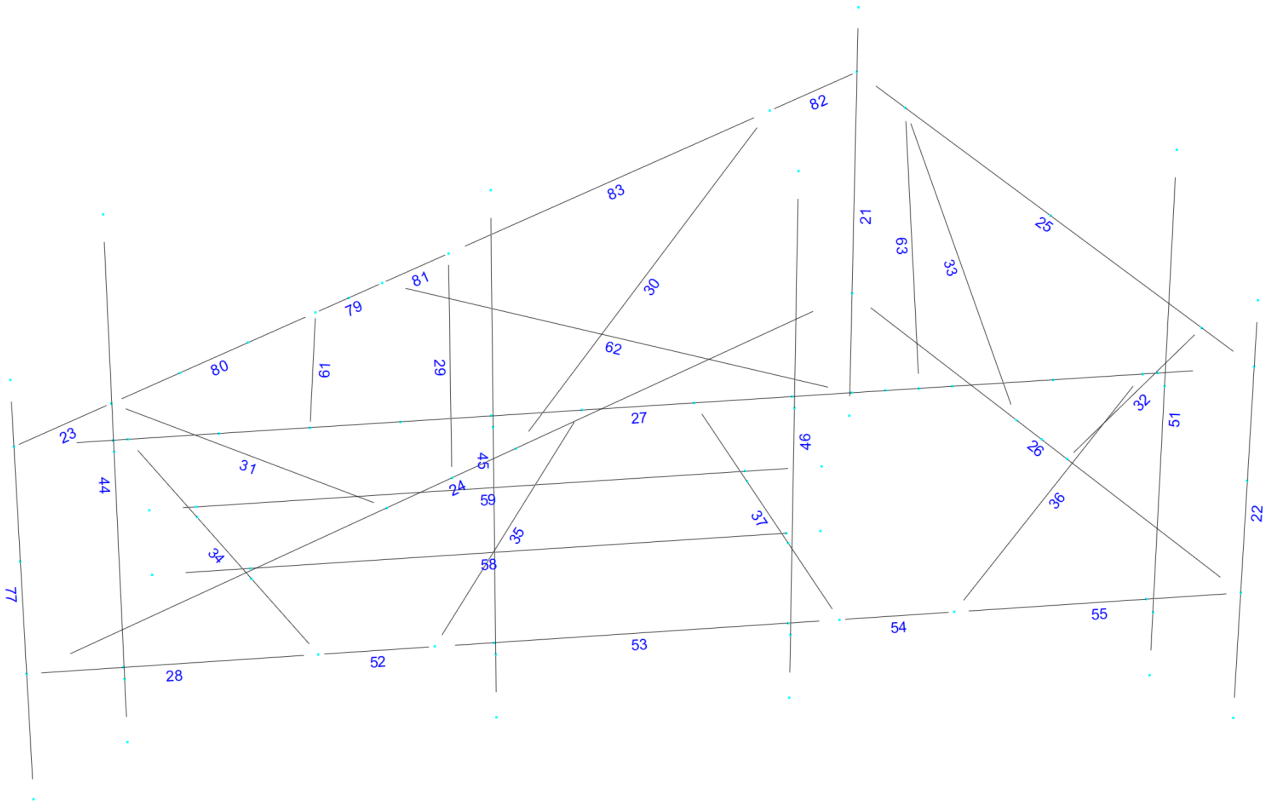

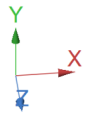

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Load data

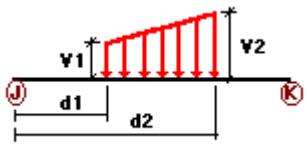
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wf	Wind Load (FRONT)	No	WIND
Ws	Wind Load (SIDE)	No	WIND
Wfice	Wind ICE (FRONT)	No	WIND
Wsice	Wind ICE (SIDE)	No	WIND
Di	Ice Load	No	LL

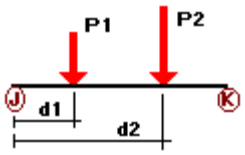
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wf	21	z	-0.017	0.00	0.00	No	0.00	No
	22	z	-0.017	0.00	0.00	No	0.00	No
	23	Z	-0.025	-0.025	0.00	No	100.00	Yes
	24	z	-0.025	0.00	0.00	No	0.00	No
	25	z	-0.025	0.00	0.00	No	0.00	No
	27	z	-0.025	0.00	0.00	No	0.00	No
	28	z	-0.025	0.00	0.00	No	0.00	No
	29	z	-0.025	0.00	0.00	No	0.00	No
	30	z	-0.025	0.00	0.00	No	0.00	No
	31	z	-0.025	0.00	0.00	No	0.00	No
	34	z	-0.025	0.00	0.00	No	0.00	No
	35	z	-0.025	0.00	0.00	No	0.00	No
	36	z	-0.025	0.00	0.00	No	0.00	No
	37	z	-0.025	0.00	0.00	No	0.00	No
	51	z	-0.017	0.00	0.00	No	0.00	No
	52	z	-0.025	0.00	0.00	No	0.00	No
	53	z	-0.025	0.00	0.00	No	0.00	No
	54	z	-0.025	0.00	0.00	No	0.00	No
	55	z	-0.025	0.00	0.00	No	0.00	No
	77	z	-0.017	0.00	0.00	No	0.00	No
	79	Z	-0.025	-0.025	0.00	No	100.00	Yes
	80	Z	-0.025	-0.025	0.00	No	100.00	Yes

	81	Z	-0.025	-0.025	0.00	No	100.00	Yes
	82	Z	-0.025	-0.025	0.00	No	100.00	Yes
	83	Z	-0.025	-0.025	0.00	No	100.00	Yes
Ws	21	x	-0.017	0.00	0.00	No	0.00	No
	22	x	-0.017	0.00	0.00	No	0.00	No
	25	x	-0.025	0.00	0.00	No	0.00	No
	26	x	-0.025	0.00	0.00	No	0.00	No
	27	x	-0.025	0.00	0.00	No	0.00	No
	28	x	-0.025	0.00	0.00	No	0.00	No
	32	x	-0.025	0.00	0.00	No	0.00	No
	33	x	-0.025	0.00	0.00	No	0.00	No
	34	x	-0.025	0.00	0.00	No	0.00	No
	35	x	-0.025	0.00	0.00	No	0.00	No
	36	x	-0.025	0.00	0.00	No	0.00	No
	37	x	-0.025	0.00	0.00	No	0.00	No
	44	x	-0.017	0.00	0.00	No	0.00	No
	45	x	-0.017	0.00	0.00	No	0.00	No
	46	x	-0.017	0.00	0.00	No	0.00	No
	51	x	-0.017	0.00	0.00	No	0.00	No
	52	x	-0.025	0.00	0.00	No	0.00	No
	53	x	-0.025	0.00	0.00	No	0.00	No
	54	x	-0.025	0.00	0.00	No	0.00	No
	55	x	-0.025	0.00	0.00	No	0.00	No
	77	x	-0.017	0.00	0.00	No	0.00	No
Di	21	y	-0.011	0.00	0.00	No	0.00	No
	22	y	-0.011	0.00	0.00	No	0.00	No
	23	y	-0.012	0.00	0.00	No	0.00	No
	24	y	-0.012	0.00	0.00	No	0.00	No
	25	y	-0.012	0.00	0.00	No	0.00	No
	26	y	-0.012	0.00	0.00	No	0.00	No
	27	y	-0.012	0.00	0.00	No	0.00	No
	28	y	-0.012	0.00	0.00	No	0.00	No
	29	y	-0.012	0.00	0.00	No	0.00	No
	30	y	-0.012	0.00	0.00	No	0.00	No
	31	y	-0.012	0.00	0.00	No	0.00	No
	32	y	-0.012	0.00	0.00	No	0.00	No
	33	y	-0.012	0.00	0.00	No	0.00	No
	34	y	-0.012	0.00	0.00	No	0.00	No
	35	y	-0.012	0.00	0.00	No	0.00	No
	36	y	-0.012	0.00	0.00	No	0.00	No
	37	y	-0.012	0.00	0.00	No	0.00	No
	44	y	-0.011	0.00	0.00	No	0.00	No
	45	y	-0.011	0.00	0.00	No	0.00	No
	46	y	-0.011	0.00	0.00	No	0.00	No
	51	y	-0.011	0.00	0.00	No	0.00	No
	52	y	-0.012	0.00	0.00	No	0.00	No
	53	y	-0.012	0.00	0.00	No	0.00	No
	54	y	-0.012	0.00	0.00	No	0.00	No
	55	y	-0.012	0.00	0.00	No	0.00	No
	58	y	-0.012	0.00	0.00	No	0.00	No
	59	y	-0.012	0.00	0.00	No	0.00	No
	77	y	-0.011	0.00	0.00	No	0.00	No
	79	y	-0.012	0.00	0.00	No	0.00	No
	80	y	-0.012	0.00	0.00	No	0.00	No
	81	y	-0.012	0.00	0.00	No	0.00	No
	82	y	-0.012	0.00	0.00	No	0.00	No
	83	y	-0.012	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	44	y	-0.052	1.50	No
		y	-0.052	6.50	No
		y	-0.06	50.00	Yes
	45	y	-0.041	1.00	No
		y	-0.041	4.00	No
		y	-0.033	5.00	No
		y	-0.033	8.00	No
	46	y	-0.055	1.50	No
		y	-0.055	6.50	No
	58	y	-0.037	10.00	Yes
		y	-0.036	20.00	Yes
		y	-0.03	85.00	Yes
		y	-0.017	95.00	Yes
		y	-0.025	100.00	Yes
	59	y	-0.037	10.00	Yes
		y	-0.036	20.00	Yes
		y	-0.03	85.00	Yes
		y	-0.017	95.00	Yes
		y	-0.025	100.00	Yes
Wf	44	z	-0.31	1.50	No
		z	-0.31	6.50	No
		z	-0.133	50.00	Yes
	45	z	-0.098	1.00	No
		z	-0.098	4.00	No
		z	-0.09	5.00	No
		z	-0.09	8.00	No
	46	z	-0.336	1.50	No
		z	-0.336	6.50	No
	58	z	-0.048	10.00	Yes
		z	-0.04	20.00	Yes
		z	-0.049	85.00	Yes
		z	-0.028	95.00	Yes
		z	-0.029	100.00	Yes
	59	z	-0.048	10.00	Yes
		z	-0.04	20.00	Yes
		z	-0.049	85.00	Yes
		z	-0.028	95.00	Yes
		z	-0.029	100.00	Yes
Ws	44	x	-0.165	1.50	No
		x	-0.165	6.50	No
		x	-0.081	50.00	Yes
	45	x	-0.053	1.00	No
		x	-0.053	4.00	No
		x	-0.041	5.00	No
		x	-0.041	8.00	No
	46	x	-0.142	1.50	No
		x	-0.142	6.50	No
	58	x	-0.041	50.00	Yes
		x	-0.034	20.00	Yes
		x	-0.031	85.00	Yes
		x	-0.028	95.00	Yes
		x	-0.015	100.00	Yes
	59	x	-0.041	50.00	Yes
		x	-0.034	20.00	Yes

		x	-0.031	85.00	Yes
		x	-0.028	95.00	Yes
		x	-0.015	100.00	Yes
Wfice	44	z	-0.061	1.50	No
		z	-0.061	6.50	No
		z	-0.031	50.00	Yes
	45	z	-0.022	1.00	No
		z	-0.022	4.00	No
		z	-0.02	5.00	No
		z	-0.02	8.00	No
	46	z	-0.066	1.50	No
		z	-0.066	6.50	No
	58	z	-0.012	10.00	Yes
		z	-0.01	20.00	Yes
		z	-0.012	85.00	Yes
		z	-0.007	95.00	Yes
		z	-0.008	100.00	Yes
	59	z	-0.012	10.00	Yes
		z	-0.01	20.00	Yes
		z	-0.012	85.00	Yes
		z	-0.007	95.00	Yes
		z	-0.008	100.00	Yes
Wsice	44	x	-0.036	1.50	No
		x	-0.036	6.50	No
		x	-0.021	50.00	Yes
	45	x	-0.013	1.00	No
		x	-0.013	4.00	No
		x	-0.011	5.00	No
		x	-0.011	8.00	No
	46	x	-0.033	1.50	No
		x	-0.033	6.50	No
	58	x	-0.009	50.00	Yes
		x	-0.009	20.00	Yes
		x	-0.008	85.00	Yes
		x	-0.007	95.00	Yes
		x	-0.004	100.00	Yes
	59	x	-0.009	50.00	Yes
		x	-0.009	20.00	Yes
		x	-0.008	85.00	Yes
		x	-0.007	95.00	Yes
		x	-0.004	100.00	Yes
Di	44	y	-0.151	1.50	No
		y	-0.151	6.50	No
		y	-0.073	50.00	Yes
	45	y	-0.051	1.00	No
		y	-0.051	4.00	No
		y	-0.045	5.00	No
		y	-0.045	8.00	No
	46	y	-0.155	1.50	No
		y	-0.155	6.50	No
	58	y	-0.027	10.00	Yes
		y	-0.024	20.00	Yes
		y	-0.027	85.00	Yes
		y	-0.024	95.00	Yes
		y	-0.016	100.00	Yes
	59	y	-0.027	10.00	Yes
		y	-0.024	20.00	Yes
		y	-0.027	85.00	Yes
		y	-0.024	95.00	Yes
		y	-0.016	100.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wf	Wind Load (FRONT)	No	0.00	0.00	0.00
Ws	Wind Load (SIDE)	No	0.00	0.00	0.00
Wfice	Wind ICE (FRONT)	No	0.00	0.00	0.00
Wsice	Wind ICE (SIDE)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wf	0.00	0.00	0.00
Ws	0.00	0.00	0.00
Wfice	0.00	0.00	0.00
Wsice	0.00	0.00	0.00
Di	0.00	0.00	0.00

Current Date: 9/20/2021 2:59 PM
Units system: English
File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT2490\New folder\CT2490 (Beta Sector) (Antenna Frame).retx

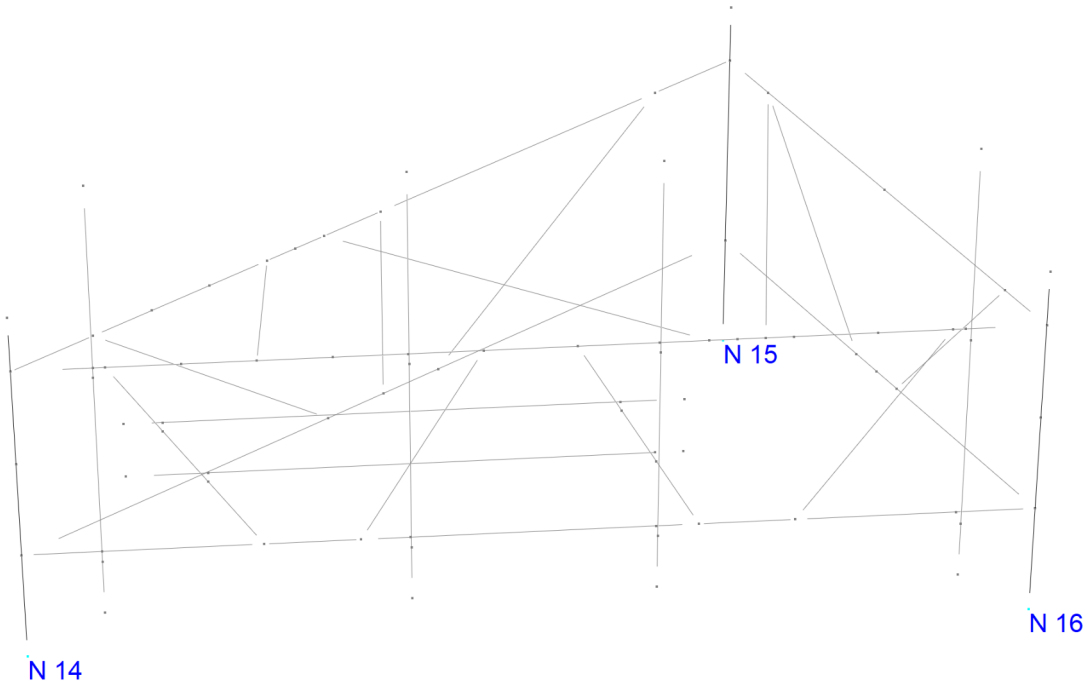
Steel Code Check

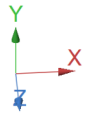
Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+Wf
LC2=1.2DL+Ws
LC3=0.9DL+Wf
LC4=0.9DL+Ws
LC5=1.2DL+Wfice+Di
LC6=1.2DL+Wsice+Di
LC7=1.4DL
LC8=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 3X3X3_8	**23**	LC3 at 0.00%	0.75	OK	
		24	LC1 at 57.81%	0.77	With warnings	
		25	LC1 at 0.00%	0.50	OK	
		26	LC1 at 0.00%	0.39	OK	
		27	LC1 at 0.00%	0.55	With warnings	
		28	LC2 at 0.00%	0.58	OK	
		29	LC1 at 50.00%	0.02	OK	
		30	LC1 at 100.00%	0.05	OK	
		31	LC3 at 50.00%	0.10	OK	
		32	LC1 at 50.00%	0.04	OK	
		33	LC1 at 50.00%	0.03	OK	
		34	LC1 at 54.17%	0.11	OK	
		35	LC1 at 50.00%	0.07	OK	
		36	LC3 at 50.00%	0.03	OK	
		37	LC1 at 64.58%	0.11	OK	
		52	LC1 at 0.00%	0.40	OK	
		53	LC1 at 0.00%	0.39	OK	
		54	LC6 at 100.00%	0.31	OK	
		55	LC3 at 100.00%	0.42	OK	
		61	LC1 at 50.00%	0.02	OK	
		62	LC1 at 50.00%	0.04	OK	
		63	LC1 at 50.00%	0.06	OK	
		79	LC3 at 0.00%	0.29	OK	
		80	LC3 at 100.00%	0.29	OK	
		81	LC1 at 0.00%	0.15	OK	
		82	LC1 at 100.00%	**0.89**	**OK**	
		83	LC1 at 100.00%	0.44	OK	
	PIPE 3x0.216	**21**	LC1 at 70.83%	0.73	OK	
		22	LC1 at 73.44%	0.52	OK	
		44	LC1 at 43.75%	0.24	OK	
		45	LC2 at 43.75%	0.07	OK	
		46	LC3 at 43.75%	0.17	OK	
		51	LC6 at 43.75%	0.13	OK	
		77	LC1 at 70.31%	**0.99**	**OK**	
	Unistrut P1000	**58**	LC5 at 16.67%	0.19	OK	Sec. G5
		59	LC6 at 8.33%	**0.20**	**OK**	Eq. H1.2-1


N 15
N 16
N 14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X
Z

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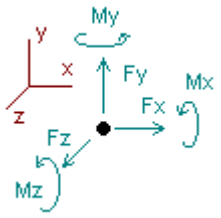
Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **DL=Dead Load**						
14	0.06931	0.99495	0.00393	0.00000	-0.00784	0.00000
15	0.00021	0.29158	-0.00784	0.00000	-0.00544	0.00000
16	-0.06952	0.72746	0.00391	0.00000	-0.01329	0.00000
SUM	0.00000	2.01399	0.00000	0.00000	-0.02657	0.00000
Condition **Wf=Wind Load (FRONT)**						
14	-0.10567	-0.81637	2.14230	0.00000	-0.83836	0.00000
15	-0.25512	3.06523	1.43899	0.00000	0.43355	0.00000
16	0.36097	-2.24886	1.20158	0.00000	1.37433	0.00000
SUM	0.00019	0.00000	4.78286	0.00000	0.96952	0.00000
Condition **Ws=Wind Load (SIDE)**						
14	1.12206	0.84311	0.12775	0.00000	0.20506	0.00000
15	0.69596	-0.00003	-0.01251	0.00000	0.23372	0.00000
16	1.11654	-0.84307	-0.11527	0.00000	0.07521	0.00000
SUM	2.93456	0.00000	-0.00004	0.00000	0.51400	0.00000
Condition **Wfice=Wind ICE (FRONT)**						
14	0.00075	-0.08779	0.23381	0.00000	-0.06653	0.00000
15	-0.04732	0.33017	0.13958	0.00000	0.02745	0.00000
16	0.04658	-0.24239	0.09361	0.00000	0.15375	0.00000
SUM	0.00001	0.00000	0.46700	0.00000	0.11468	0.00000
Condition **Wsice=Wind ICE (SIDE)**						
14	0.11148	0.08679	0.02519	0.00000	0.02492	0.00000
15	0.05805	0.00003	-0.00610	0.00000	0.01567	0.00000
16	0.11147	-0.08682	-0.01910	0.00000	0.02185	0.00000
SUM	0.28100	0.00000	-0.00001	0.00000	0.06244	0.00000

Condition **Di=Ice Load**

14	0.09144	1.27102	0.00291	0.00000	-0.01310	0.00000
15	-0.00374	0.30545	-0.00748	0.00000	-0.00696	0.00000
16	-0.08770	0.83180	0.00457	0.00000	-0.01884	0.00000
SUM	0.00000	2.40827	0.00000	0.00000	-0.03890	0.00000

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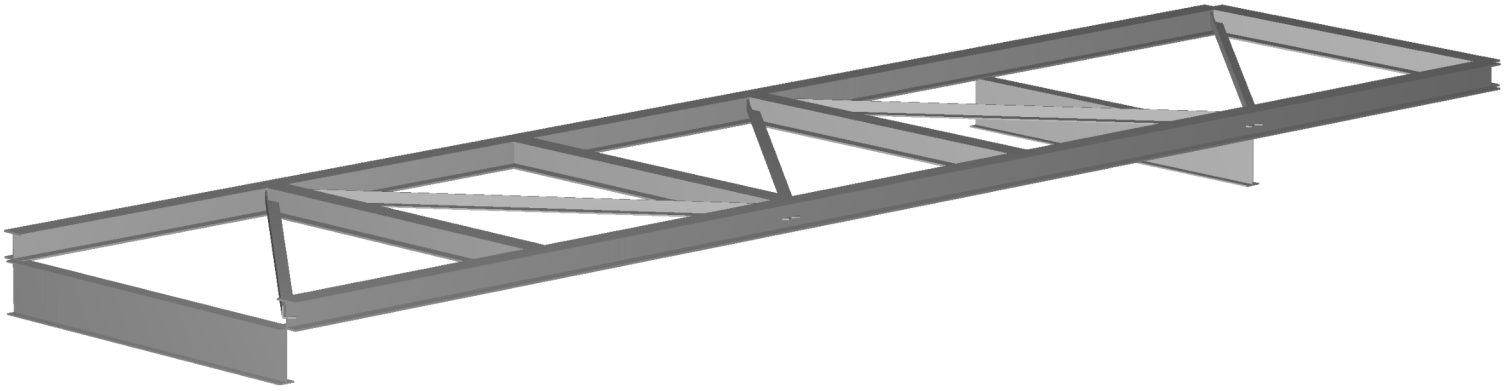
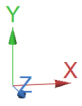
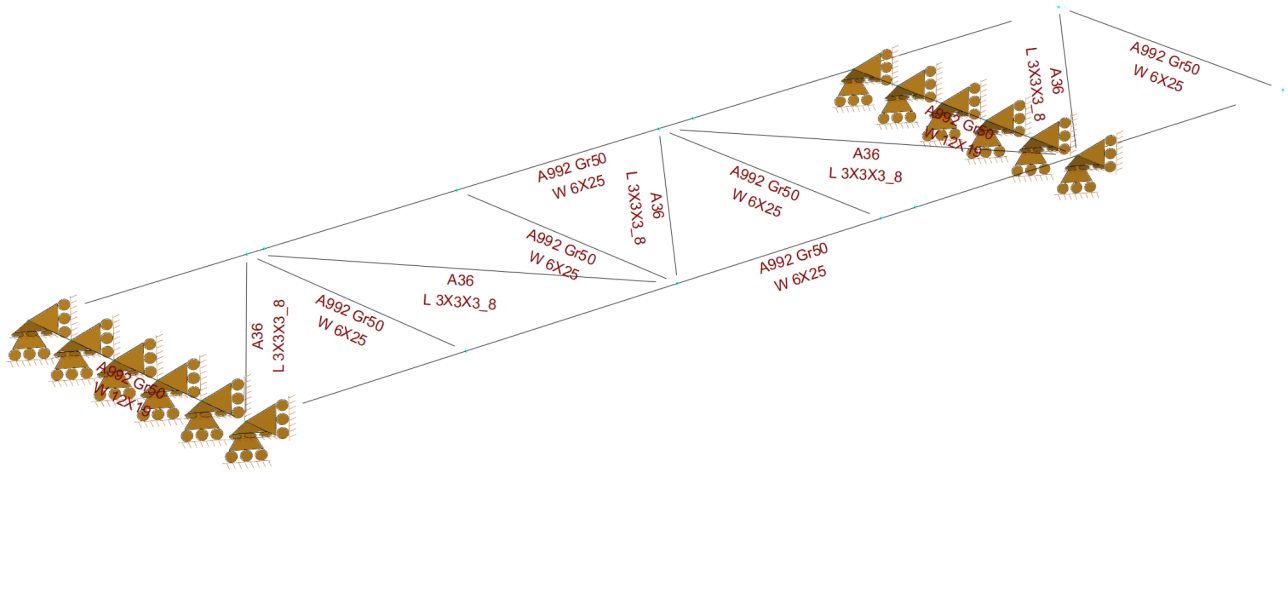
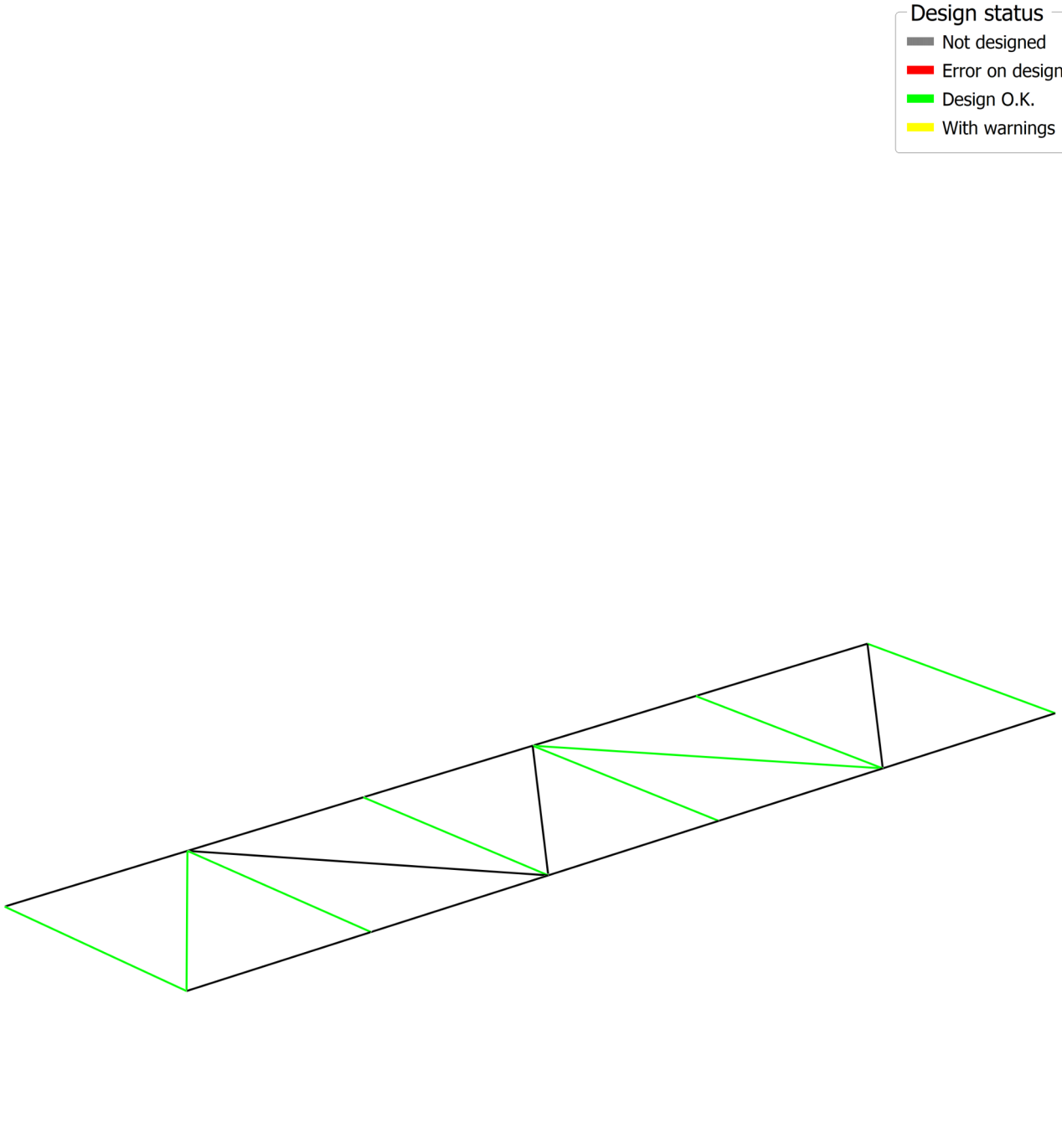





A992 Gr50
W 6X25
A36
L 3X3X3_8
A992 Gr50
W 6X25
A36
L 3X3X3_8
A992 Gr50
W 6X25
A36
L 3X3X3_8
A992 Gr50
W 6X25
A992 Gr50
W 6X25
A36
L 3X3X3_8
A992 Gr50
W 6X25
A992 Gr50
W 6X25
Y
X
Z


Design status
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Error on design
Design O.K.
With warnings
Y
X
Z

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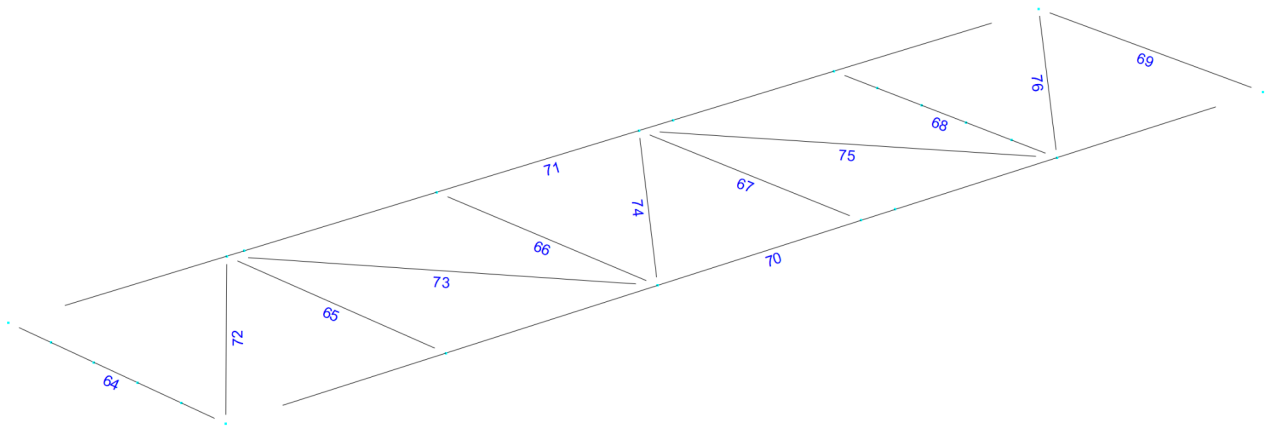

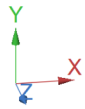

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Load data

GLOSSARY

Comb : Indicates if load condition is a load combination

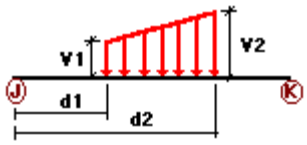
Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wf	Wind Load (FRONT)	No	WIND
Ws	Wind Load (SIDE)	No	WIND
Wfice	Wind ICE (FRONT)	No	WIND
Wsice	Wind ICE (SIDE)	No	WIND
Di	Ice Load	No	LL

Load on nodes

Condition	Node	FX [Kip]	FY [Kip]	FZ [Kip]	MX [Kip*ft]	MY [Kip*ft]	MZ [Kip*ft]
DL	14	-0.0693	-0.995	-0.0039	0.00	0.0078	0.00
	15	-0.0002	-0.2916	0.0078	0.00	0.0054	0.00
	16	0.0695	-0.7275	-0.0039	0.00	0.0133	0.00
Wf	14	0.1057	0.8164	-2.1423	0.00	0.8384	0.00
	15	0.2551	-3.0652	-1.439	0.00	-0.4336	0.00
	16	-0.361	2.2489	-1.2016	0.00	-1.3743	0.00
Ws	14	-1.1221	-0.8431	-0.1278	0.00	-0.2051	0.00
	15	-0.696	3.00E-05	0.0125	0.00	-0.2337	0.00
	16	-1.1165	0.8431	0.1153	0.00	-0.0752	0.00
Wfice	14	-0.0008	0.0878	-0.2338	0.00	0.0665	0.00
	15	0.0473	-0.3302	-0.1396	0.00	-0.0275	0.00
	16	-0.0466	0.2424	-0.0936	0.00	-0.1538	0.00
Wsice	14	-0.1115	-0.0868	-0.0252	0.00	-0.0249	0.00
	15	-0.0581	-3.00E-05	0.0061	0.00	-0.0157	0.00
	16	-0.1115	0.0868	0.0191	0.00	-0.0219	0.00
Di	14	-0.0914	-1.271	-0.0029	0.00	0.0131	0.00
	15	0.0037	-0.3055	0.0075	0.00	0.007	0.00
	16	0.0877	-0.8318	-0.0046	0.00	0.0188	0.00

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wf	70	z	-0.031	0.00	0.00	No	0.00	No
Ws	64	x	-0.059	0.00	0.00	No	0.00	No
	68	x	-0.059	0.00	0.00	No	0.00	No
	69	x	-0.031	0.00	0.00	No	0.00	No
Di	64	y	-0.03	0.00	0.00	No	0.00	No
	65	y	-0.022	0.00	0.00	No	0.00	No
	66	y	-0.022	0.00	0.00	No	0.00	No
	67	y	-0.022	0.00	0.00	No	0.00	No
	68	y	-0.03	0.00	0.00	No	0.00	No
	69	y	-0.022	0.00	0.00	No	0.00	No
	70	y	-0.022	0.00	0.00	No	0.00	No
	71	y	-0.022	0.00	0.00	No	0.00	No
	72	y	-0.012	0.00	0.00	No	0.00	No
	73	y	-0.012	0.00	0.00	No	0.00	No
	74	y	-0.012	0.00	0.00	No	0.00	No
	75	y	-0.012	0.00	0.00	No	0.00	No
	76	y	-0.012	0.00	0.00	No	0.00	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wf	Wind Load (FRONT)	No	0.00	0.00	0.00
Ws	Wind Load (SIDE)	No	0.00	0.00	0.00
Wfice	Wind ICE (FRONT)	No	0.00	0.00	0.00
Wsice	Wind ICE (SIDE)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wf	0.00	0.00	0.00
Ws	0.00	0.00	0.00
Wfice	0.00	0.00	0.00
Wsice	0.00	0.00	0.00
Di	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+Wf
LC2=1.2DL+Ws
LC3=0.9DL+Wf
LC4=0.9DL+Ws
LC5=1.2DL+Wfice+Di
LC6=1.2DL+Wsice+Di
LC7=1.4DL
LC8=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 3X3X3_8	**72**	LC5 at 50.00%	**0.12**	**OK**	
		73	LC6 at 50.00%	0.11	With warnings	
		74	LC5 at 50.00%	0.10	With warnings	
		75	LC5 at 50.00%	0.11	OK	
		76	LC6 at 50.00%	0.12	With warnings	
	W 12X19	**64**	LC2 at 0.00%	0.04	OK	
		68	LC1 at 0.00%	**0.06**	**OK**	
	W 6X25	**65**	LC5 at 50.00%	0.01	OK	
		66	LC6 at 50.00%	0.01	OK	
		67	LC1 at 50.00%	0.01	OK	
		69	LC5 at 50.00%	0.01	OK	
		70	LC6 at 40.63%	0.23	With warnings	
		71	LC5 at 21.43%	**0.38**	**With warnings**	

Date: 9/22/2021
Project Name: EAST HARTFORD MAIN STREET
Project No.: CT2490
Designed By: ID **Checked By:** MSC

HUDSON Design Group LLC

Check Antenna Frame:

Dead Loads

Sum of Forces $\Sigma F_y =$ 4973.7 **lbs.** **(See Bentley Output)**

Wind Loads:

Item	Lbs.	Qty.	Length (Ft.)	Total (Lbs.)
Antenna	1664	1	-	1664
RRH & Surge	520	1	-	520
		Total, T_{wind}		**2184** **lbs**

Check Sliding:

Friction Factor= 1.16 (Rubber on Rubber - Adhere rubber mats on the underside of the steel frame)

Sliding = T_w / Friction Factor =

= **1882.76 lbs.** < **4973.70 lbs.** **O.K!**

Safety Factor= Total Wt./ Sliding

= **2.6 O.K!**

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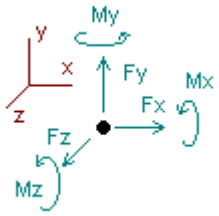
Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **DL=Dead Load**						
130	0.01566	0.63271	0.03516	0.00000	0.00000	0.00000
135	-0.03014	1.45540	0.01235	0.00000	0.00000	0.00000
136	0.00458	1.25870	-0.03345	0.00000	0.00000	0.00000
138	0.00982	1.38848	-0.01402	0.00000	0.00000	0.00000
145	-0.00344	0.02996	0.00007	0.00000	0.00000	0.00000
146	-0.00107	0.02960	0.00009	0.00000	0.00000	0.00000
147	0.00109	0.02960	-0.00011	0.00000	0.00000	0.00000
148	0.00346	0.02996	-0.00010	0.00000	0.00000	0.00000
149	0.00035	0.03002	-0.00233	0.00000	0.00000	0.00000
150	0.00016	0.02964	-0.00068	0.00000	0.00000	0.00000
151	-0.00015	0.02964	0.00068	0.00000	0.00000	0.00000
152	-0.00033	0.03002	0.00232	0.00000	0.00000	0.00000
SUM	0.00000	4.97372	0.00000	0.00000	0.00000	0.00000

Exhibit E

Power Density/RF Emissions Report

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
603-644-2800
support@csquaredsystems.com

Calculated Radio Frequency Exposure

CT2490

886 Main Street, East Hartford, CT

June 20, 2022

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of the AT&T antenna arrays on an existing building located at 886 Main Street, East Hartford, CT. The coordinates of the building are 41° 46' 10.0" N, 72° 38' 34.2" W.

AT&T is proposing the following:

1) Install twelve (12) multi-band antennas (four (4) per sector) to support its commercial wireless network and the FirstNet National Public Safety Broadband Network ("NPSBN").

This report considers the planned antenna configuration for AT&T[1] to derive the resulting % Maximum Permissible Exposure of its proposed installation.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to AT&T's Radio Frequency Design Sheet dated 1/19/22.

3. RF Exposure Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65, and Connecticut Siting Council recommendations:

$$\text{Power Density} = \left(\frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

ERP = Effective Radiated Power

R = Radial Distance = $\sqrt{\left(H^2 + V^2\right)}$

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all antenna channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not consider actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Calculation Results

Table 1 below outlines the cumulative power density information for the AT&T modification on the existing building at the site. The proposed antennas are directional in nature; therefore, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the building. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	% MPE
Verizon	103	869	9	414	0.1424	0.5793	2.46%
Verizon	103	1970	11	456	0.1917	1.0000	1.92%
Verizon	103	2145	1	1750	0.0669	1.0000	0.67%
Verizon	103	746	1	1050	0.0401	0.4973	0.81%
AT&T	109	739	1	2507	0.0085	0.4927	1.73%
AT&T	109	763	1	2945	0.0100	0.5087	1.96%
AT&T	109	885	1	2813	0.0095	0.5900	1.62%
AT&T	109	1900	4	6013	0.0816	1.0000	8.16%
AT&T	109	2100	2	9890	0.0671	1.0000	6.71%
AT&T	109	2300	1	6594	0.0224	1.0000	2.24%
AT&T	110.83	3500	1	24286	0.0795	1.0000	7.95%
AT&T	107.16	3500	1	24286	0.0854	1.0000	8.54%
						Total	**44.74%**

Table 1: Carrier Information[2]

[2] The existing record in the CSC Power Density Table for AT&T should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for Verizon was taken directly from the CSC database dated 01/21/2022. Please note that % MPE values listed are rounded to two decimal points and the total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

5. Conclusion

The above analysis concludes that RF exposure at ground level from the proposed site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using conservative calculation methods, the highest expected percent of Maximum Permissible Exposure at ground level is **44.74% of the FCC General Population/Uncontrolled limit**.

As noted previously, the calculated % MPE levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in FCC OET Bulletin 65 Edition 97-01, ANSI/IEEE Std. C95.1 and ANSI/IEEE Std. C95.3.

June 20, 2022
Date

Reviewed/Approved By: Martin J. Lavin
Senior RF Engineer
C Squared Systems, LLC

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[3]

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

(B) Limits for General Population/Uncontrolled Exposure[4]

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

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[3] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

[4] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

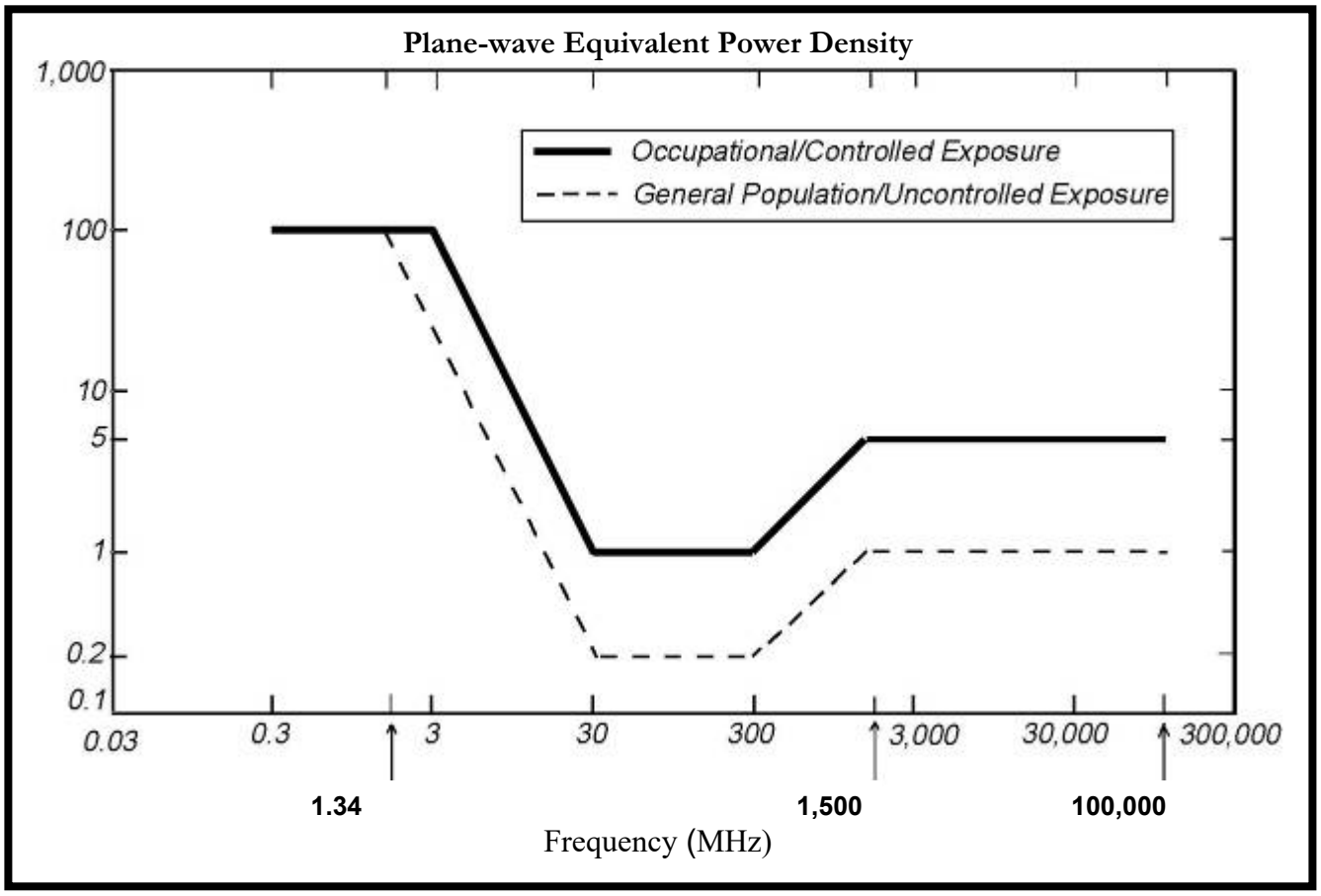
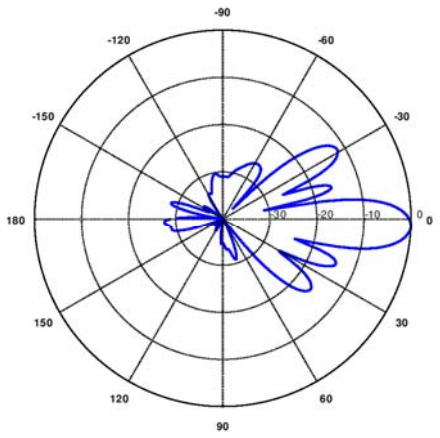
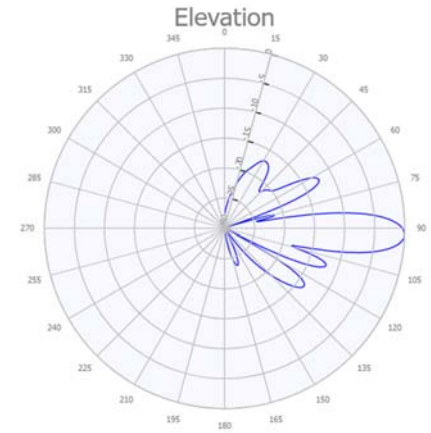
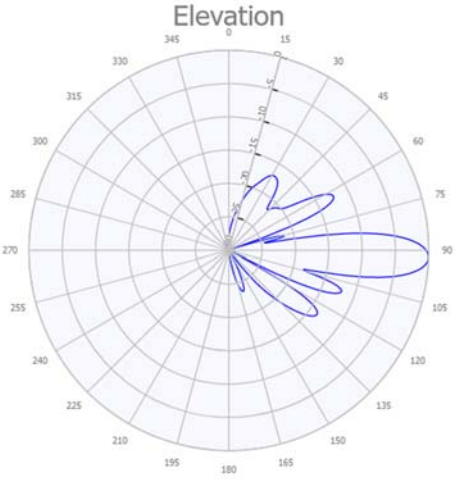


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

700 MHz Manufacturer: Kathrein Model #: 80010965 Frequency Band: 698-798 MHz Gain: 14.8 dBi Vertical Beamwidth: 11.9° Horizontal Beamwidth: 62° Polarization: Dual Linear 45° Size L x W x D: 78.7” x 20.0” x 6.9”	
700 MHz Manufacturer: CCI Model #: DMP65R-BU6E Frequency Band: 698 - 806MHz Gain: 14.1 dBi Vertical Beamwidth: 12.8° Horizontal Beamwidth: 73° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 9.7”	
885 MHz Manufacturer: CCI Model #: DMP65R-BU6E Frequency Band: 824 - 896 MHz Gain: 14.6 dBi Vertical Beamwidth: 11.1° Horizontal Beamwidth: 62° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 9.7”	

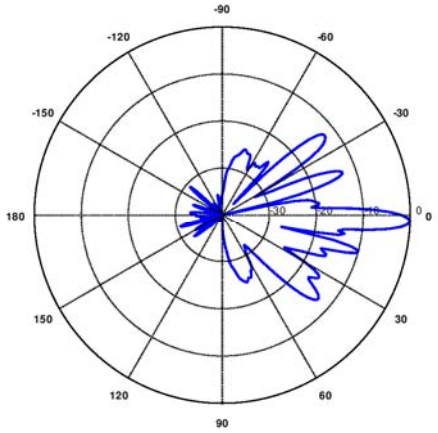
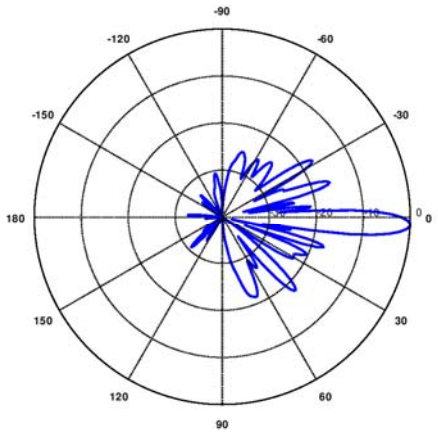
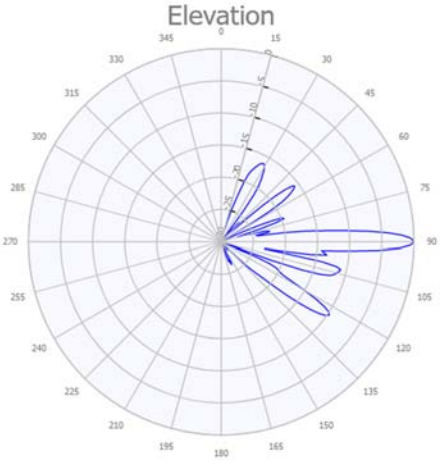
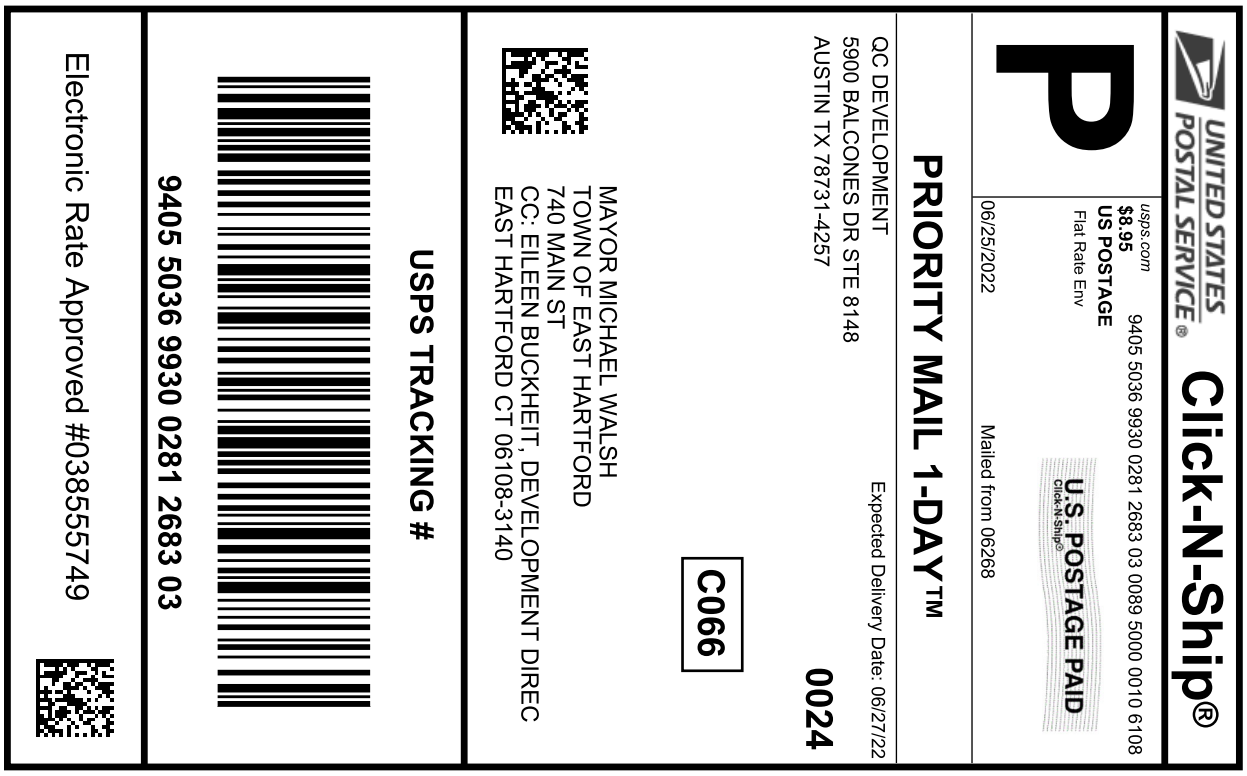
1900 MHz Manufacturer: CCI Model #: DMP65R-BU6E Frequency Band: 1920-1990 MHz Gain: 17.9 dBi Vertical Beamwidth: 5.1° Horizontal Beamwidth: 71° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 9.7”	
2100 MHz Manufacturer: Kathrein Model #: 80010965 Frequency Band: 1920-2180 MHz Gain: 18.3 dBi Vertical Beamwidth: 5.5° Horizontal Beamwidth: 62° Polarization: Dual Linear 45° Size L x W x D: 78.7” x 20.0” x 6.9”	
2300 MHz Manufacturer: CCI Model #: DMP65R-BU6E Frequency Band: 2300-2400 MHz Gain: 18.3 dBi Vertical Beamwidth: 4.1° Horizontal Beamwidth: 52° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 9.7”	

Exhibit F

Recipient Mailings



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0281 2683 03

Trans. #:	566283092
Print Date:	06/24/2022
Ship Date:	06/25/2022
Expected Delivery Date:	06/27/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: QC DEVELOPMENT
5900 BALCONES DR STE 8148
AUSTIN TX 78731-4257

To: MAYOR MICHAEL WALSH
TOWN OF EAST HARTFORD
740 MAIN ST
CC: EILEEN BUCKHEIT, DEVELOPMENT DIREC
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.

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

USPS Tracking®

FAQs >

Track Another Package +

Remove ×

Tracking Number: 9405503699300281268303

Expected Delivery by

SATURDAY

25 JUNE 2022 ⓘ

by **9:00pm** ⓘ

USPS Tracking Plus® Available ⌄

Feedback

Departed Post Office

June 24, 2022 at 4:52 pm
STORRS MANSFIELD, CT 06268

Change Delivery Instructions ⌄

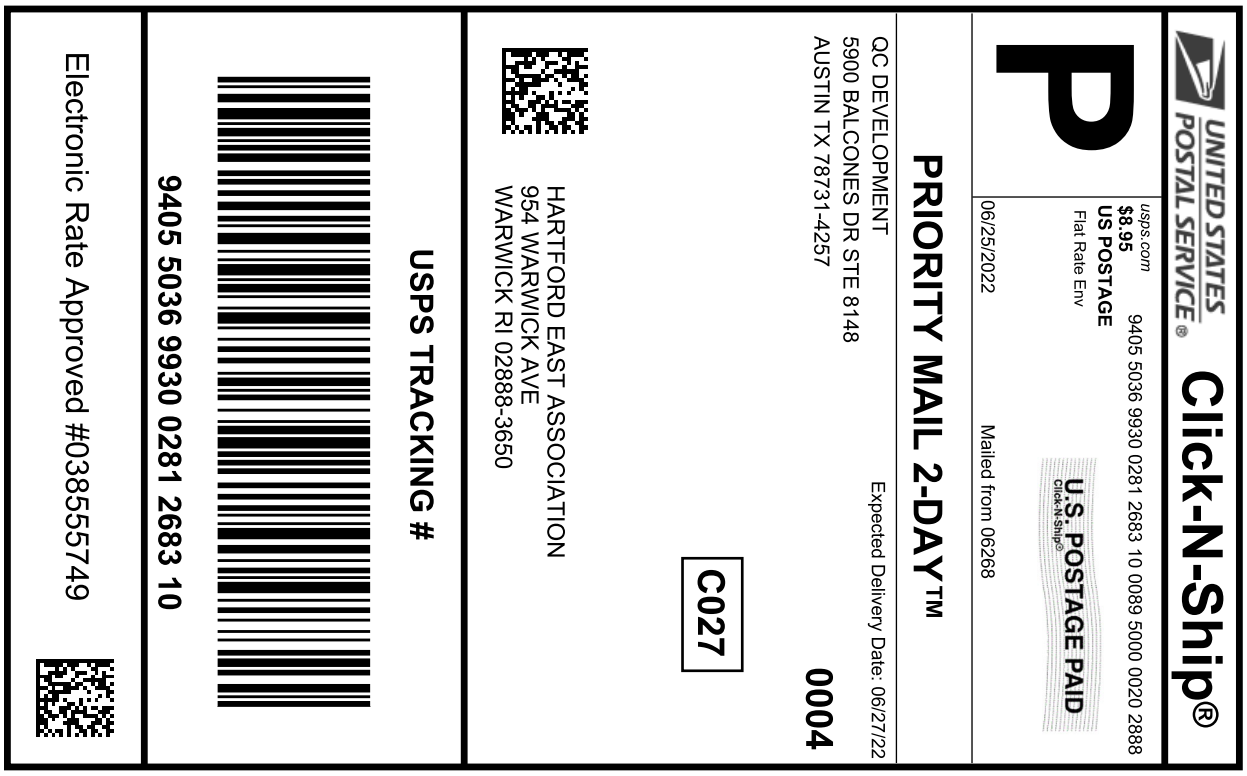
Text & Email Updates ⌄

Delivery Instructions ⌄

Tracking History ⌄

USPS Tracking Plus® ⌄

Product Information ⌄



Cut on dotted line.

Instructions

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

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0281 2683 10

Trans. #:	566283092
Print Date:	06/24/2022
Ship Date:	06/25/2022
Expected Delivery Date:	06/27/2022

Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

From: QC DEVELOPMENT
5900 BALCONES DR STE 8148
AUSTIN TX 78731-4257

To: HARTFORD EAST ASSOCIATION
954 WARWICK AVE
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

USPS Tracking®

FAQs >

Track Another Package +

Remove ×

Tracking Number: 9405503699300281268310

Expected Delivery by

MONDAY

27 JUNE 2022 ⓘ

by **9:00pm** ⓘ

USPS Tracking Plus® Available ⌄

Feedback

USPS in possession of item

June 24, 2022 at 4:28 pm
STORRS MANSFIELD, CT 06268

Change Delivery Instructions ⌄

Text & Email Updates ⌄

Delivery Instructions ⌄

Tracking History ⌄

USPS Tracking Plus® ⌄

Product Information ⌄