



QC Development

PO Box 916

Storrs, CT 06268

860-670-9068

Mark.Roberts@QCDevelopment.net

March 26, 2021

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) – CT5317

1 Circular Avenue, Hamden, CT 06514

N 41.34689190

W 72.93409890

Dear Ms. Bachman:

AT&T currently maintains three (3) antennas at 39-feet above ground level (AGL) on the existing Rooftop Flagpole at 1 Circular Avenue, Hamden, CT. The property is owned by Chima Enterprise, Inc.. This modification replaces EM-CING-062-191028 due to a change in the proposed tower loading. AT&T now intends to swap the (3) existing Kathrein 80010798 antennas for (3) Kathrein 800372991 antennas. The existing 28” canister will remain, and the antennas will be installed at the 39-foot level. AT&T also intends to remove (3) Ericsson RRUS-11 and (3) RRUS-12/A2 Remote Radio Units (RRU) and install (3) Ericsson 4449 B5/B12, (3) 4415 B25 and (3) 4415 B30 RRUs. The new RRUs will all be installed on the existing support frame at rooftop level. This modification/proposal includes B2, B5, and B12 hardware that is both 4G (LTE) and 5G NR capable through remote software configuration and either or both services may be turned on or off at various times.

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 The Honorable Curt B. Leng, Mayor of the Town of Hamden, and to the Hamden Planning and Zoning

Department, as well as to the property owner.

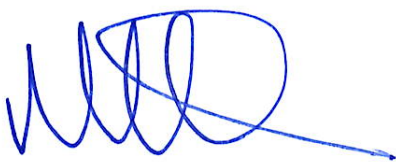
The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

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

Sincerely,



Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Honorable Curt B. Leng - Elected Official
Mark Austin. – Acting Town Planner
CHIMA Enterprise, Inc. - Property Owner

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm ²)	Freq. Band (MHz ^{**})	Limit S (mW/cm ²)	%MPE
Other Carriers*							0%
AT&T UMTS	2	809	39	0.5343	850	0.5667	9.43%
AT&T UMTS	1	398	39	0.1314	1900	1.0000	1.31%
AT&T LTE	1	1476	39	0.4874	737	0.4913	9.92%
AT&T LTE	2	1067	39	0.7047	1900	1.0000	7.05%
AT&T LTE	1	2421	39	0.7995	1900	1.0000	7.99%
Site Total							35.71%

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

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

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm ²)	Freq. Band (MHz ^{**})	Limit S (mW/cm ²)	%MPE
Other Carriers*							0%
AT&T UMTS	1	809	39	0.2672	850	0.5667	4.71%
AT&T LTE	1	1476	39	0.4874	700	0.4667	10.44%
AT&T LTE	1	1000	39	0.3302	850	0.5667	5.83%
AT&T 5G	1	1000	39	0.3302	850	0.5667	5.83%
AT&T LTE	2	4842	39	3.1979	1900	1.0000	31.98%
AT&T LTE	1	1285	39	0.42443	2300	1.0000	4.24%
Site Total							63.04%

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

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

Note: Proposed Loading may also include corrections to certain Existing Loading values

PROJECT INFORMATION

SCOPE OF WORK: **ITEMS TO BE MOUNTED ON THE EXISTING ROOFTOP:**

- NEW AT&T ANTENNAS: 800372991 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4449 B5/B12 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4415 B25 (PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4415 B30 (WCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T SQUARE SUPPRESSOR (DC6-48-60-18) (TOTAL OF 2) WITH (4) DC TRUNKS & (2) FIBER RUNS (TO FOLLOW EXISTING ROUTE).
- NEW AT&T FIBER BOX (TOTAL OF 2).
- NEW AT&T SURGE ARRESTOR (TSXDC-4310FM) (TYP. OF 12 PER SECTOR, TOTAL OF 36).

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:

- SWAP BASEBAND FOR (1) 6630.
- ADD (1) 6630 FOR 5G.
- ADD IDLe.
- ADD (1) OUTDOOR DC12.
- ADD CONDUIT FOR TELCO WIRE FEED FOR THE DC12.
- ADD DIPLEXERS (DBCT108F1V92-1) (TOTAL OF 6).
- PROPOSE 701 RECTIFIER SHELF AND BREAKER BUS BAR.
- PROPOSE RXAIT WITH LLC'S.
- NEW AT&T COAX CABLE (TYP. OF 2 PER SECTOR, TOTAL OF 6).

ITEMS TO BE REMOVED FROM LOCATION:

- EXISTING AT&T ANTENNAS (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS-11 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS-12+A2 (TYP. OF 1 PER SECTOR, TOTAL OF 3).

SITE ADDRESS: 1 CIRCULAR AVENUE
HAMDEN, CT 06514

LATITUDE: 41.346891° N, 41° 20' 48.81" N
LONGITUDE: 72.934098° W, 72° 56' 02.75" W
TYPE OF SITE: ROOFTOP / OUTDOOR
STRUCTURE HEIGHT: 42'-6"±
RAD CENTER: 40'-0"±
CURRENT USE: TELECOMMUNICATIONS FACILITY
PROPOSED USE: TELECOMMUNICATIONS FACILITY



SITE NUMBER: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE
FA CODE: 10071066

PACE ID: MRCTB041766, MRCTB041734, MRCTB041382, MRCTB041659

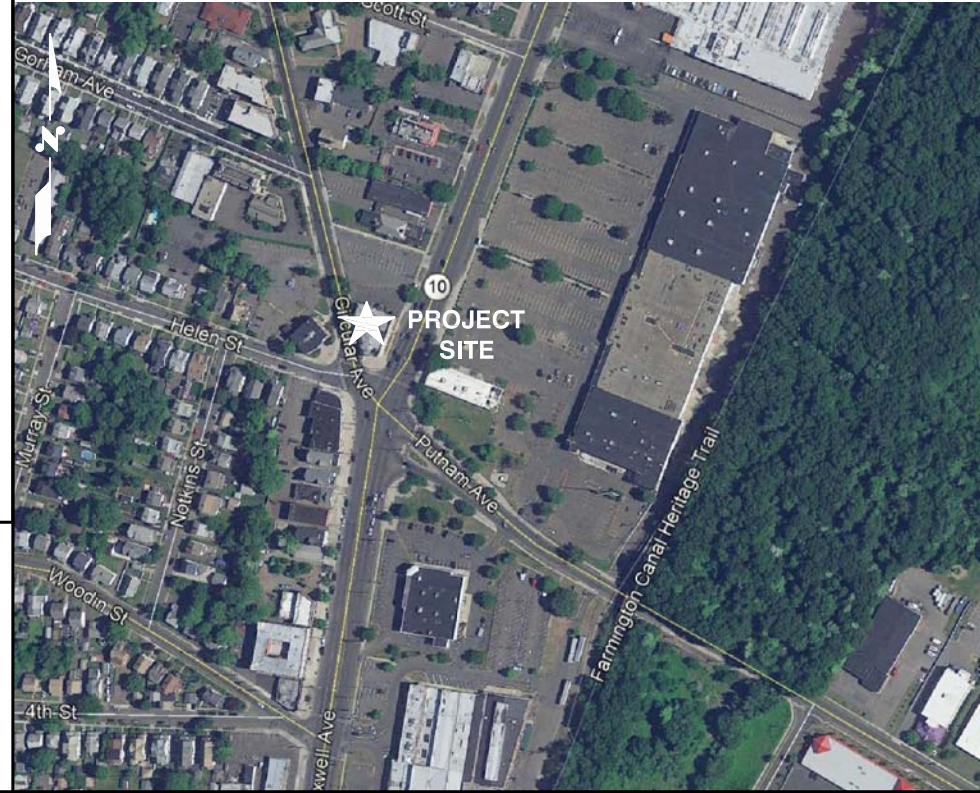
PROJECT: LTE 3C_4C_RETRO 2019 UPGRADE

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	4
GN-1	GENERAL NOTES	4
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VICINITY MAP

DIRECTIONS TO SITE:
MERRITT PARKWAY NORTH. GET OFF AT EXIT 60 IN HAMDEN. MAKE RIGHT AND CONTINUE HEADING SOUTH ON RTE 10 (DIXWELL AVE.) YOU WILL SEE A NEWALLIANCE BANK ON THE RIGHT AFTER MCDONALDS. ENTER INTO BANK PARKING LOT AND PARK TOWARDS THE FENCE FACING THE RADIO STATION BUILDING. WALK TOWARDS CIRCULAR AVE, WHICH SHOULD BE TO YOUR RIGHT AROUND FENCE AND TOWARDS SIDE ENTRANCE DOOR



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

H2G 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: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE

1 CIRCULAR AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
4	01/14/21	ISSUED FOR CONSTRUCTION	ET	AT	DPH
3	11/05/20	ISSUED FOR CONSTRUCTION	SF	AT	DPH
2	10/06/20	ISSUED FOR CONSTRUCTION	AM	AT	DPH
1	11/12/19	ISSUED FOR CONSTRUCTION	VP	AT	DPH
0	10/03/19	ISSUED FOR REVIEW	ET/AM	AT	DPH

SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: ET

Professional Engineer
Daniel P. Hamm
No. 24178
STATE OF CONNECTICUT
LICENSED PROFESSIONAL ENGINEER

AT&T
TITLE SHEET
LTE 3C_4C_RETRO 2019 UPGRADE
SITE NUMBER: CT5317 DRAWING NUMBER: T-1 REV: 4

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	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

HDG 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: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE

1 CIRCULAR AVENUE HAMDEN, CT 06514 NEW HAVEN COUNTY

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

4	01/14/21	ISSUED FOR CONSTRUCTION	GC	AT	DPH
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1	11/12/19	ISSUED FOR CONSTRUCTION	VP	AT	DPH
0	10/03/19	ISSUED FOR REVIEW	ET/AM	AT	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: ET		

Handwritten Signature: Daniel P. Hamm
 No. 24178
 LICENSED PROFESSIONAL ENGINEER
 STATE OF CONNECTICUT

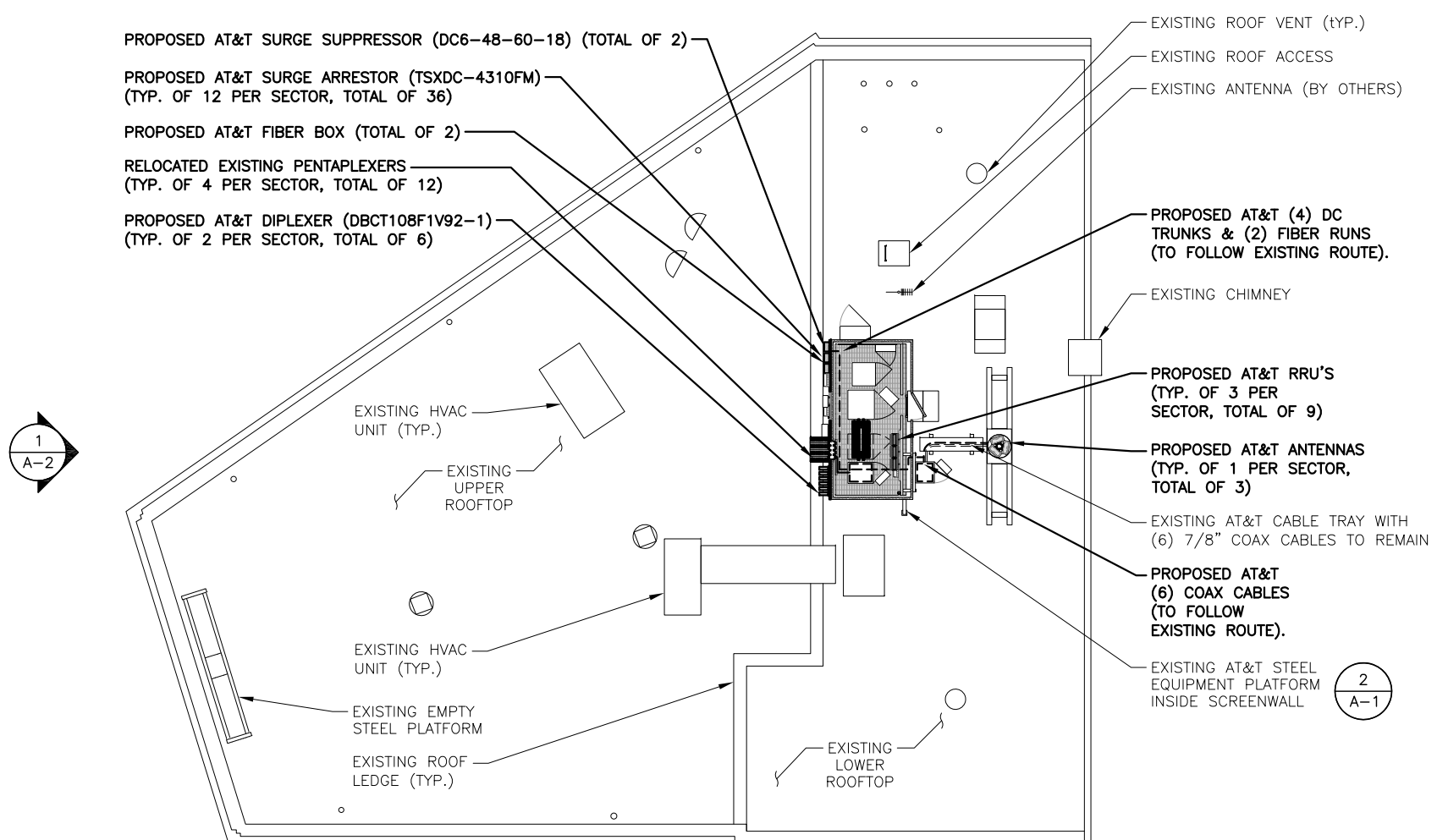
AT&T

GENERAL NOTES
LTE 3C_4C_RETRO 2019 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5317	GN-1	4

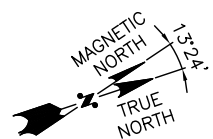
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
REFER TO **STRUCTURAL ANALYSIS** BY: HUDSON DESIGN GROUP, LLC. DATED: DECEMBER 1, 2020 (REV. 3). FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



1
A-2

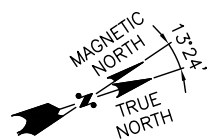
2
A-1



ROOF PLAN

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

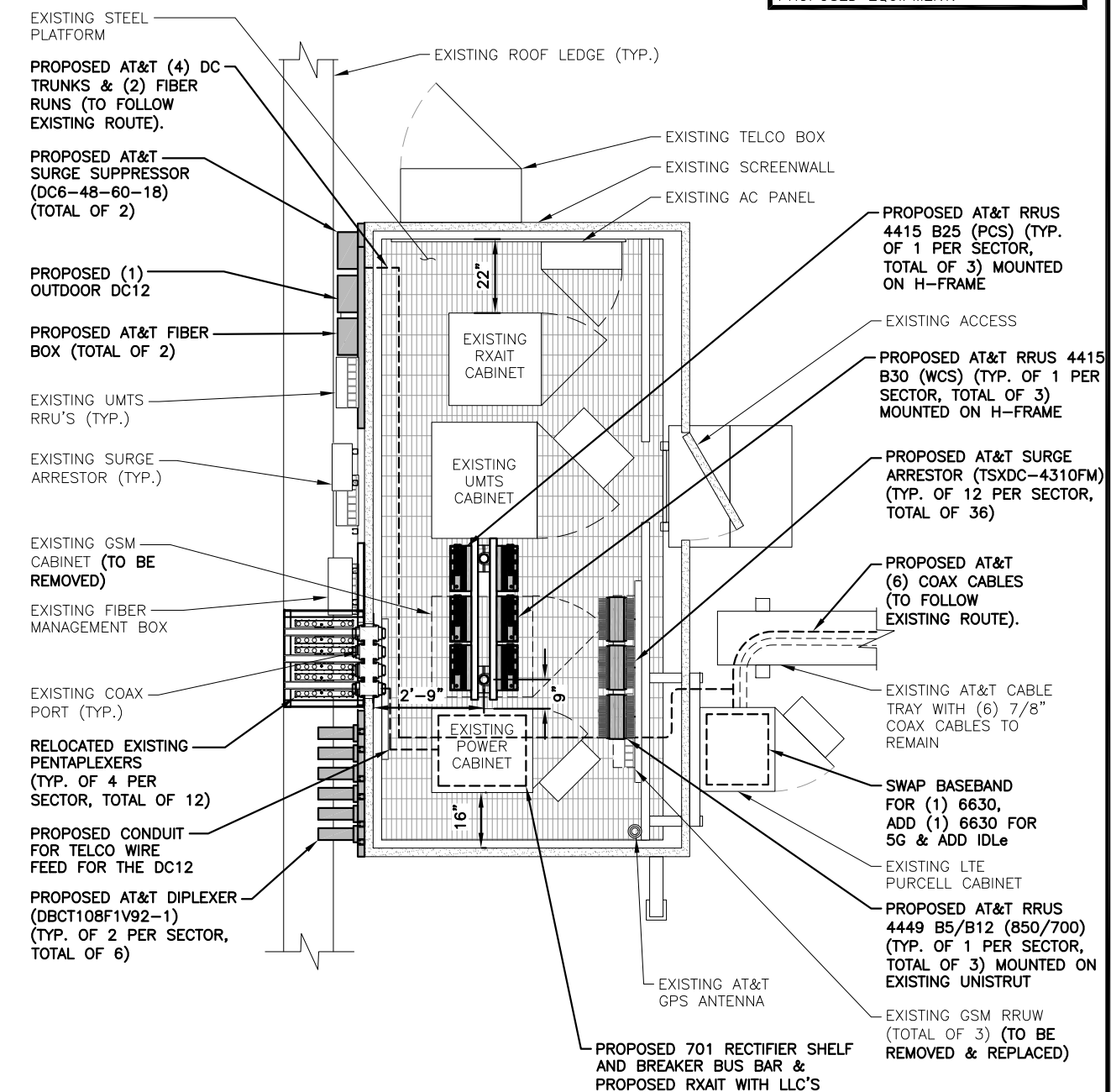
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A-1



EQUIPMENT PLAN

22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

2
A-1



HDG 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: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE
1 CIRCULAR AVENUE HAMDEN, CT 06514 NEW HAVEN COUNTY

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

4	01/14/21	ISSUED FOR CONSTRUCTION	SG	AT	DPH
3	11/05/20	ISSUED FOR CONSTRUCTION	SF	AT	DPH
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0	10/03/19	ISSUED FOR REVIEW	ET/AM	AT	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: ET		



AT&T
ROOF & EQUIPMENT PLANS
LTE 3C_4C_RETRO 2019 UPGRADE
SITE NUMBER: CT5317
DRAWING NUMBER: A-1
REV: 4

TOP OF EXISTING FLAG MONOPOLE
ELEV. 42'-6"± (AGL)

☐ OF PROPOSED AT&T ANTENNAS
ELEV. 40'-0"± (AGL)

TOP OF EXISTING PAREAPET
ELEV. 27'-10"± (AGL)

GROUND LEVEL
ELEV. 0'-0"± (AGL)

EXISTING 28"Ø RADOME (TO REMAIN)

PROPOSED AT&T ANTENNAS (800372991)
(TYP. OF 1 PER SECTOR, TOTAL OF 3)

EXISTING FLAG MONOPOLE MAST

EXISTING AT&T TMA'S
(TYP. OF 2 PER SECTOR, TOTAL OF 6)
(TO REMAIN)

EXISTING HVAC UNIT (TYP.)

EXISTING BUILDING

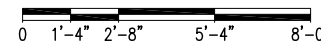
NOTE:
REFER TO THE FINAL RF DATA SHEET
FOR FINAL ANTENNA SETTINGS.

NOTE:
REFER TO **STRUCTURAL ANALYSIS**
BY: HUDSON DESIGN GROUP, LLC.
DATED: DECEMBER 1, 2020 (REV. 3).
FOR THE CAPACITY OF THE EXISTING
STRUCTURES TO SUPPORT THE
PROPOSED EQUIPMENT.



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

1
A-2



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

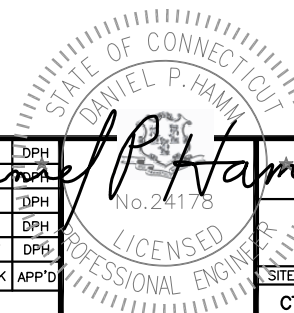
SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE

1 CIRCULAR AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY

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

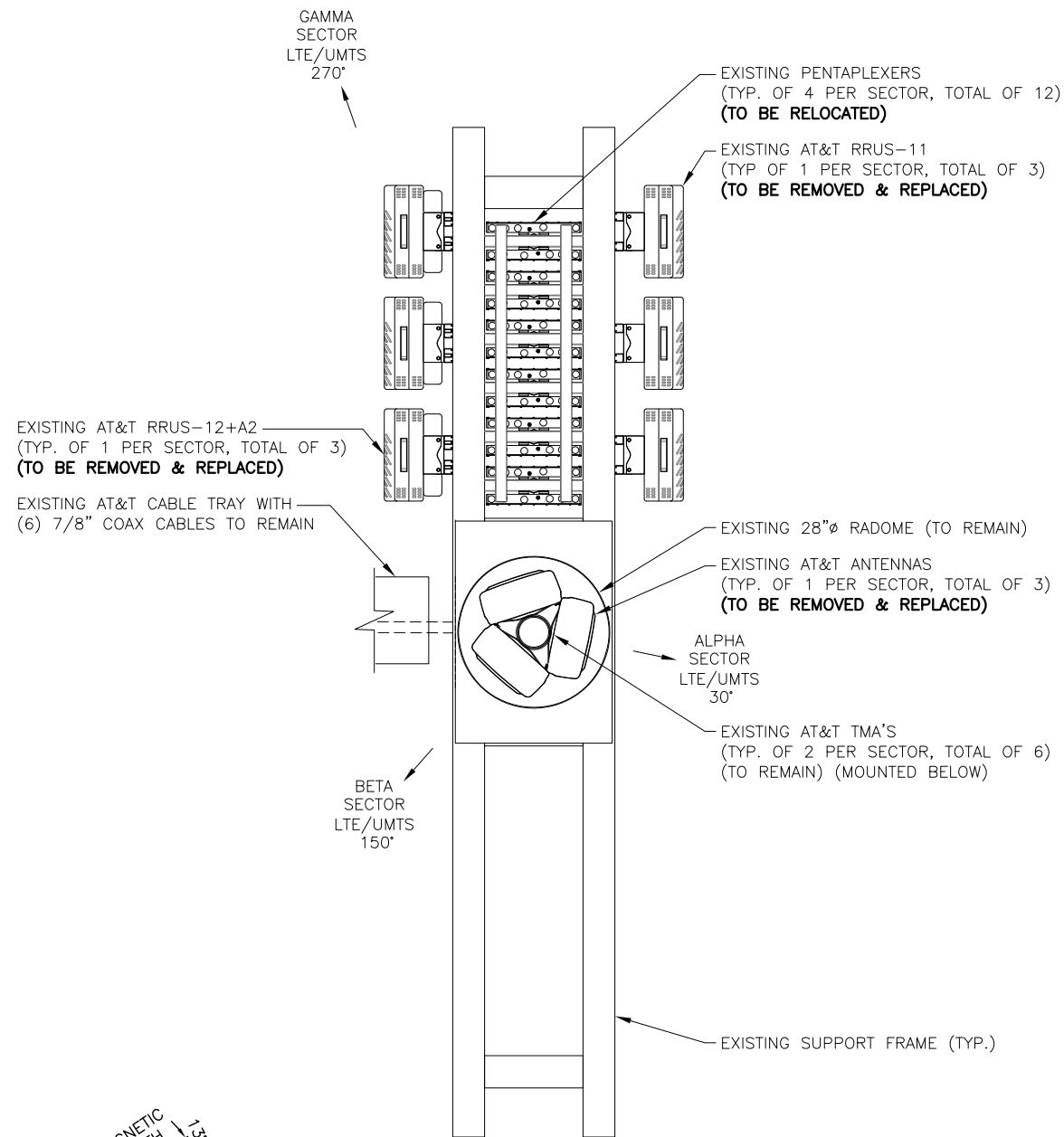
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3	11/05/20	ISSUED FOR CONSTRUCTION	SF	AT	DPH
2	10/06/20	ISSUED FOR CONSTRUCTION	AM	AT	DPH
1	11/12/19	ISSUED FOR CONSTRUCTION	VP	AT	DPH
0	10/03/19	ISSUED FOR REVIEW	ET/AM	AT	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: ET		



AT&T		
PARTIAL ELEVATION		
LTE 3C_4C_RETRO 2019 UPGRADE		
SITE NUMBER	DRAWING NUMBER	REV
CT5317	A-2	4

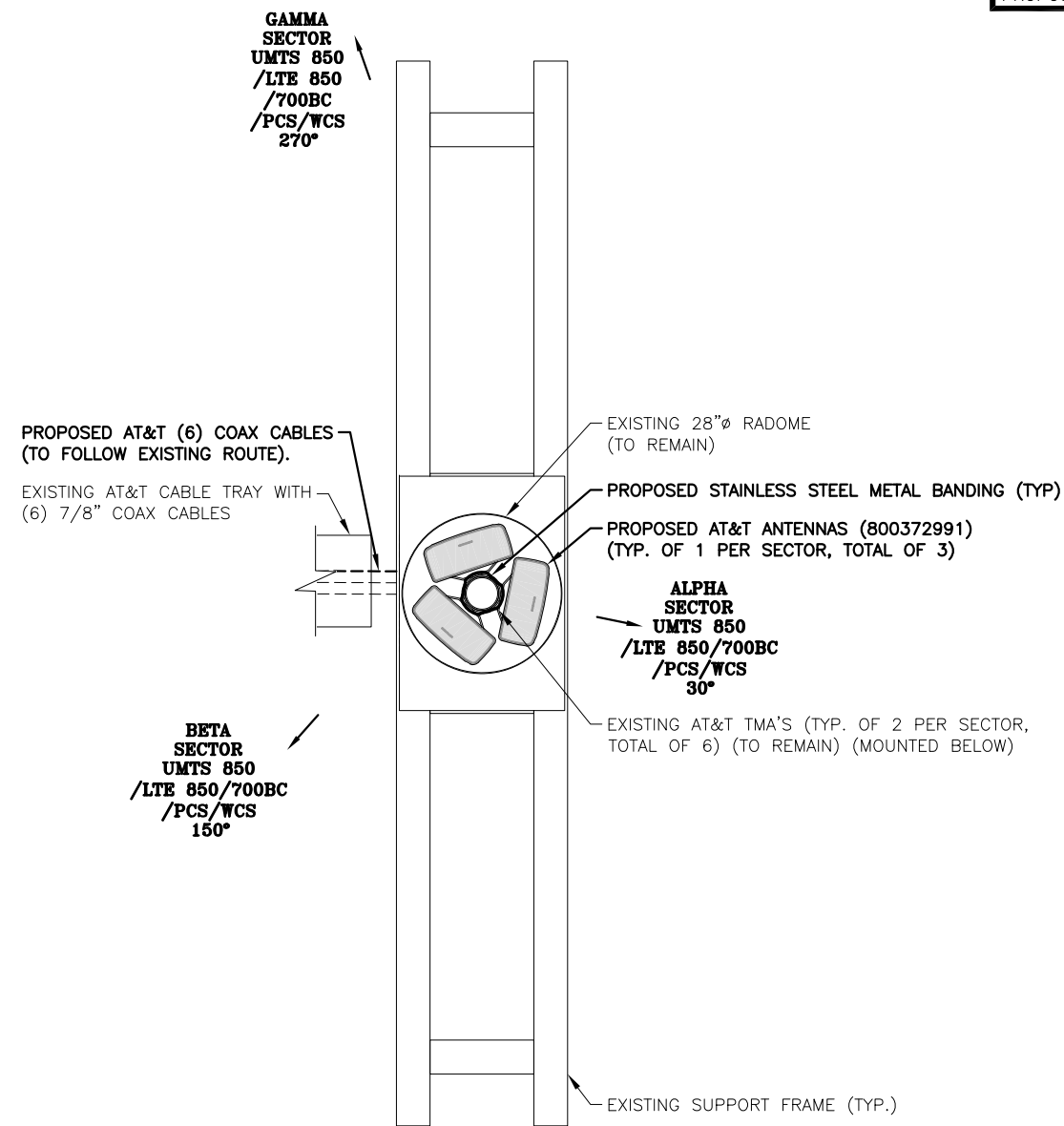
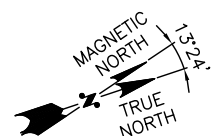
NOTE:
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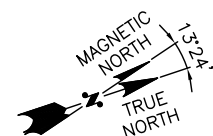
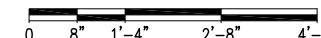
EXISTING ANTENNA LAYOUT
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

1
A-3

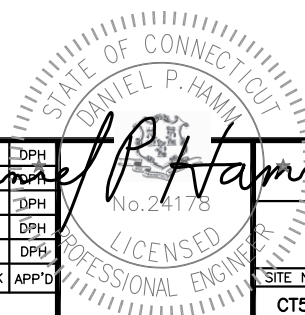


PROPOSED ANTENNA LAYOUT
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

2
A-3



4	01/14/21	ISSUED FOR CONSTRUCTION	SG	AT	DPH
3	11/05/20	ISSUED FOR CONSTRUCTION	SF	AT	DPH
2	10/06/20	ISSUED FOR CONSTRUCTION	AM	AT	DPH
1	11/12/19	ISSUED FOR CONSTRUCTION	VP	AT	DPH
0	10/03/19	ISSUED FOR REVIEW	ET/AM	AT	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: ET		



ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (LxWxD)	ANTENNA CL HEIGHT	AZIMUTH	TMA/DIPLEXER	RRU	SIZE (INCHES) (LxWxD)	SURGE ARRESTOR	FEEDER	RAYCAP
A1	PROPOSED	UMTS 850/LTE 850/700BC/PCS/WCS	800372991	77.9X14.9X6.5	40'-0"±	30°	(2)(E) TMA2117F00V11 (4)(E) 5PX-0726-0 (P)(2) DBCT108F1V92-1	(P)(1) 4449 B5/B12 (850/700) (P)(1) 4415 B25 (PCS) (P)(1) 4415 B30 (WCS)	14.9"x13.2"x10.4" 16.5"x13.4"x5.9" 16.5"x13.4"x5.9"	(P)(G)(12) TSXDC-4310FM	(2) 7/8" COAX (65'± LENGTH) (2) 7/8" COAX (65'± LENGTH)	(E)(1) RAYCAP SURGE PROTECTOR
B1	PROPOSED	UMTS 850/LTE 850/700BC/PCS/WCS	800372991	77.9X14.9X6.5	40'-0"±	150°	(2)(E) TMA2117F00V11 (4)(E) 5PX-0726-0 (P)(2) DBCT108F1V92-1	(P)(1) 4449 B5/B12 (850/700) (P)(1) 4415 B25 (PCS) (P)(1) 4415 B30 (WCS)	14.9"x13.2"x10.4" 16.5"x13.4"x5.9" 16.5"x13.4"x5.9"	(P)(G)(12) TSXDC-4310FM	(2) 7/8" COAX (65'± LENGTH) (2) 7/8" COAX (65'± LENGTH)	(P)(1) RAYCAP DC6-48-60-18
C1	PROPOSED	UMTS 850/LTE 850/700BC/PCS/WCS	800372991	77.9X14.9X6.5	40'-0"±	270°	(2)(E) TMA2117F00V11 (4)(E) 5PX-0726-0 (P)(2) DBCT108F1V92-1	(P)(1) 4449 B5/B12 (850/700) (P)(1) 4415 B25 (PCS) (P)(1) 4415 B30 (WCS)	14.9"x13.2"x10.4" 16.5"x13.4"x5.9" 16.5"x13.4"x5.9"	(P)(G)(12) TSXDC-4310FM	(2) 7/8" COAX (65'± LENGTH) (2) 7/8" COAX (65'± LENGTH)	(P)(1) RAYCAP DC6-48-60-18

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

NOTE:
REFER TO **STRUCTURAL ANALYSIS**
BY: HUDSON DESIGN GROUP, LLC.
DATED: DECEMBER 1, 2020 (REV. 3).
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FINAL ANTENNA SCHEDULE

SCALE: N.T.S

1
A-4

TOP OF EXISTING FLAG MONOPOLE
ELEV. 42'-6"± (AGL)

CL OF PROPOSED AT&T ANTENNAS
ELEV. 40'-0"± (AGL)

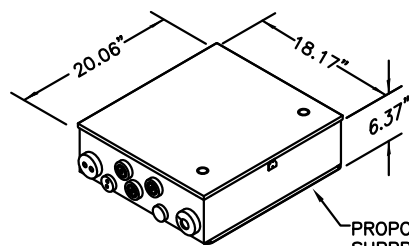
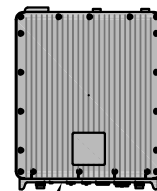
RRU CHART		
QUANTITY	MODEL	SIZE (L x W x D)
P(3)	4449 (850/700)	14.9"x13.2"x10.4"
P(3)	4415 B25 (PCS)	16.5"x13.4"x5.9"
P(3)	4415 B30 (WCS)	16.5"x13.4"x5.9"

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.



NOTE:
MOUNT PER MANUFACTURER'S
SPECIFICATIONS.

PROPOSED SURGE
SUPPRESSOR
MODEL NUMBER:
DC6-48-60-18
DIMENSIONS:
H20.06"xW18.17"xD6.37"

PROPOSED SURGE SUPPRESSOR DETAIL

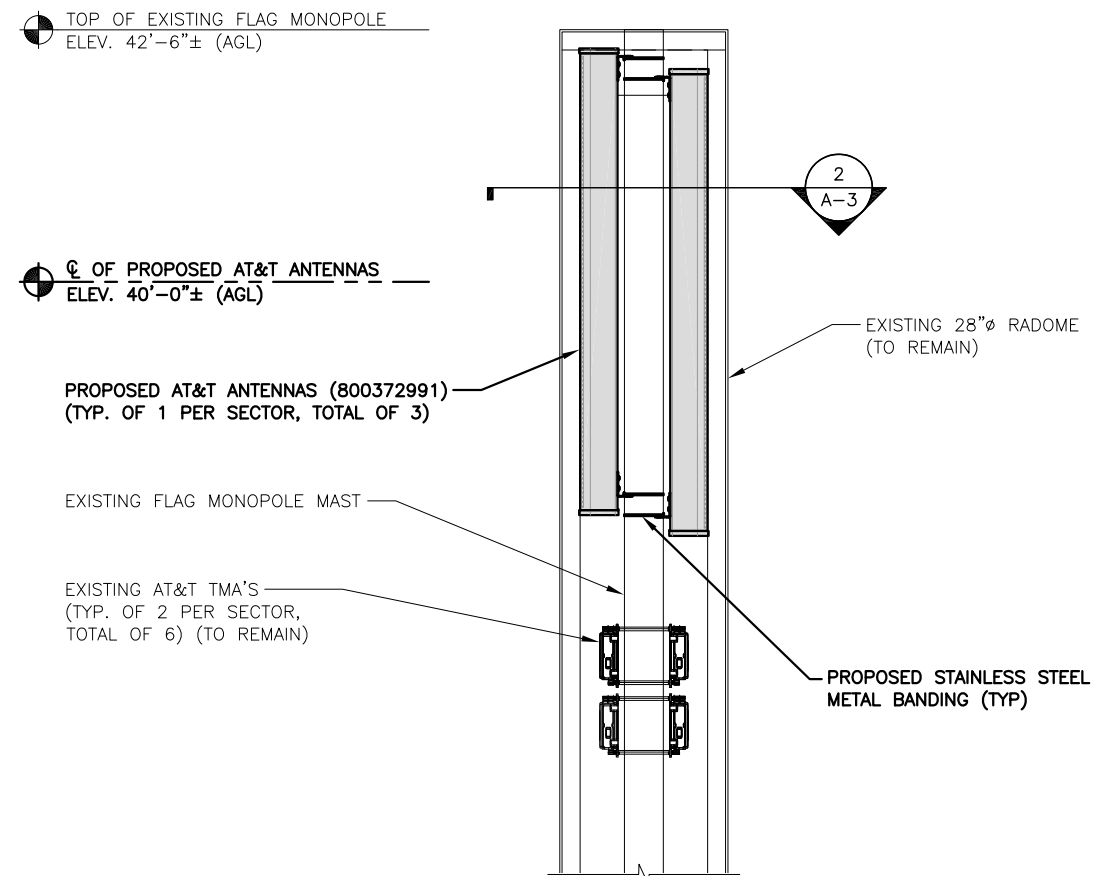
SCALE: N.T.S

2
A-4

PROPOSED RRUS DETAIL

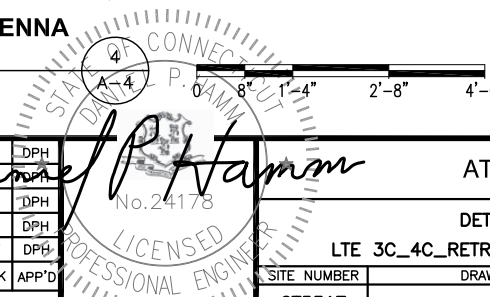
SCALE: N.T.S

3
A-4



PROPOSED LTE ANTENNA MOUNTING DETAIL

22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"



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



12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE

1 CIRCULAR AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY



500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

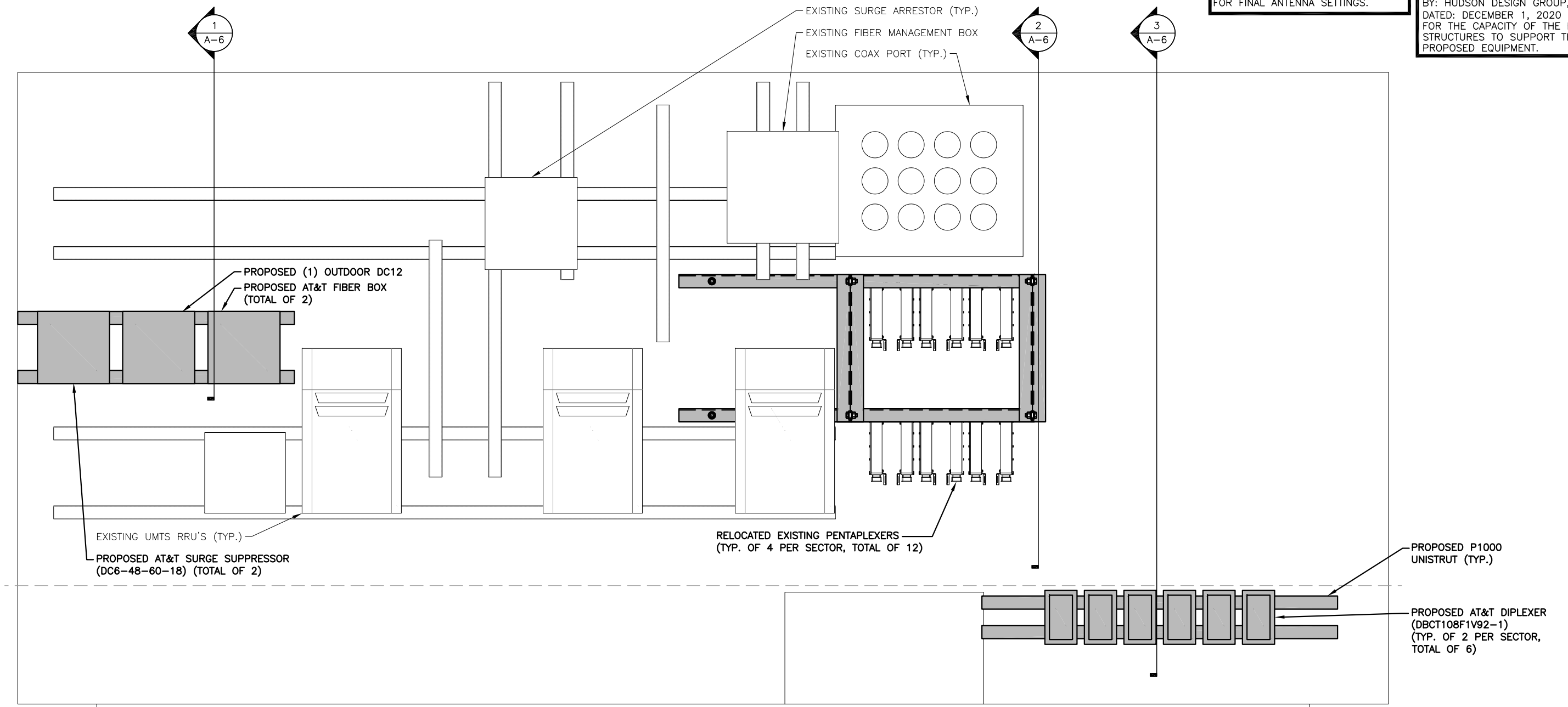
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3	11/05/20	ISSUED FOR CONSTRUCTION	SF	DPH	
2	10/06/20	ISSUED FOR CONSTRUCTION	AM	DPH	
1	11/12/19	ISSUED FOR CONSTRUCTION	VP	DPH	
0	10/03/19	ISSUED FOR REVIEW	ET/AM	DPH	

SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: ET

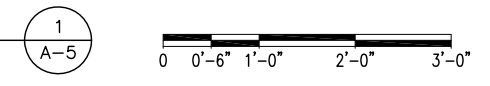
AT&T		
DETAILS		
LTE 3C_4C_RETRO 2019 UPGRADE		
SITE NUMBER	DRAWING NUMBER	REV
CT5317	A-4	4

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

NOTE:
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PROPOSED EQUIPMENT MOUNTING ELEVATION
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"



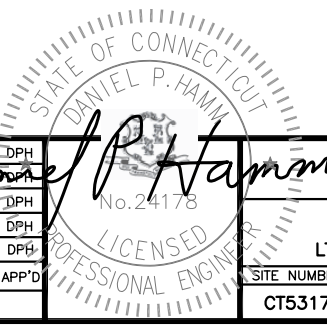
HGD HUDSON Design Group LLC
45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE
1 CIRCULAR AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY

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

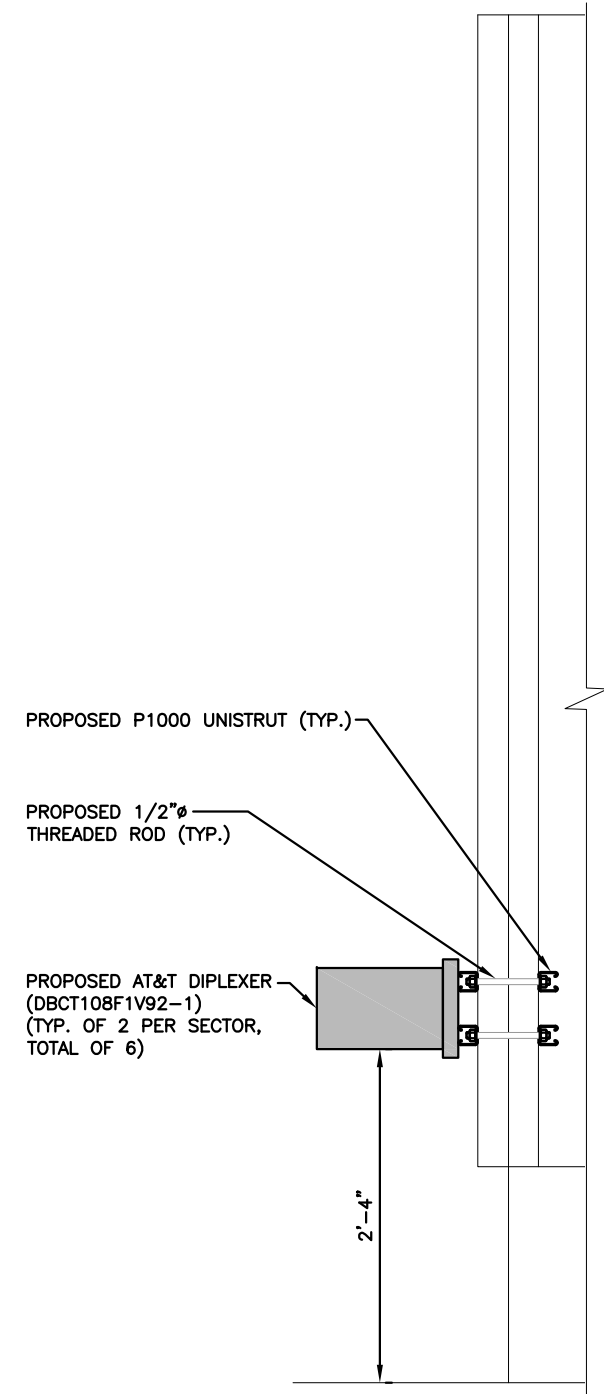
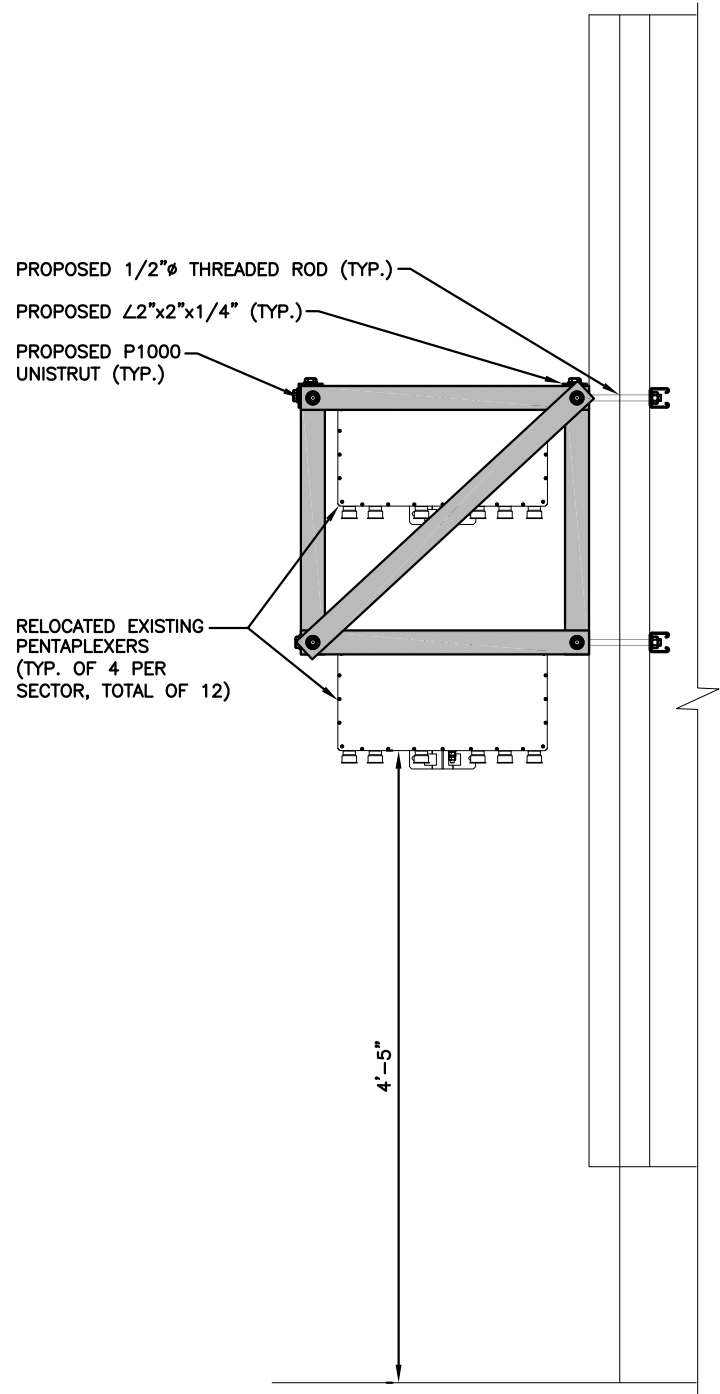
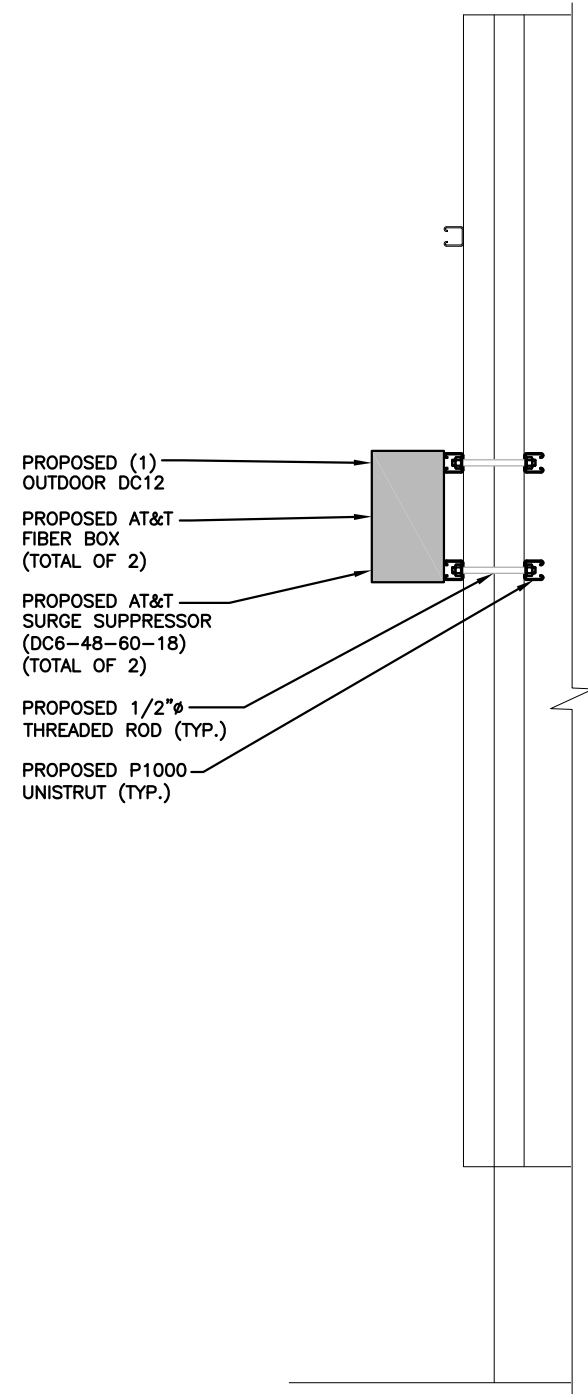
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NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: ET		



AT&T
DETAILS
LTE 3C_4C_RETRO 2019 UPGRADE
SITE NUMBER: CT5317
DRAWING NUMBER: A-5
REV: 4

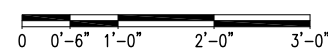
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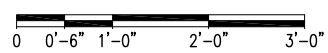
PROPOSED EQUIPMENT MOUNTING DETAIL

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



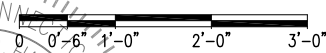
PROPOSED EQUIPMENT MOUNTING DETAIL

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



PROPOSED EQUIPMENT MOUNTING DETAIL

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



HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
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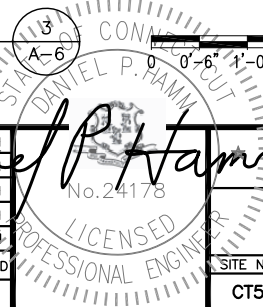
SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE
1 CIRCULAR AVENUE
HAMDEN, CT 06514
NEW HAVEN COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
4	01/14/21	ISSUED FOR CONSTRUCTION	AT	DPH	
3	11/05/20	ISSUED FOR CONSTRUCTION	SF	DPH	
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1	11/12/19	ISSUED FOR CONSTRUCTION	VP	DPH	
0	10/03/19	ISSUED FOR REVIEW	ET/AM	DPH	

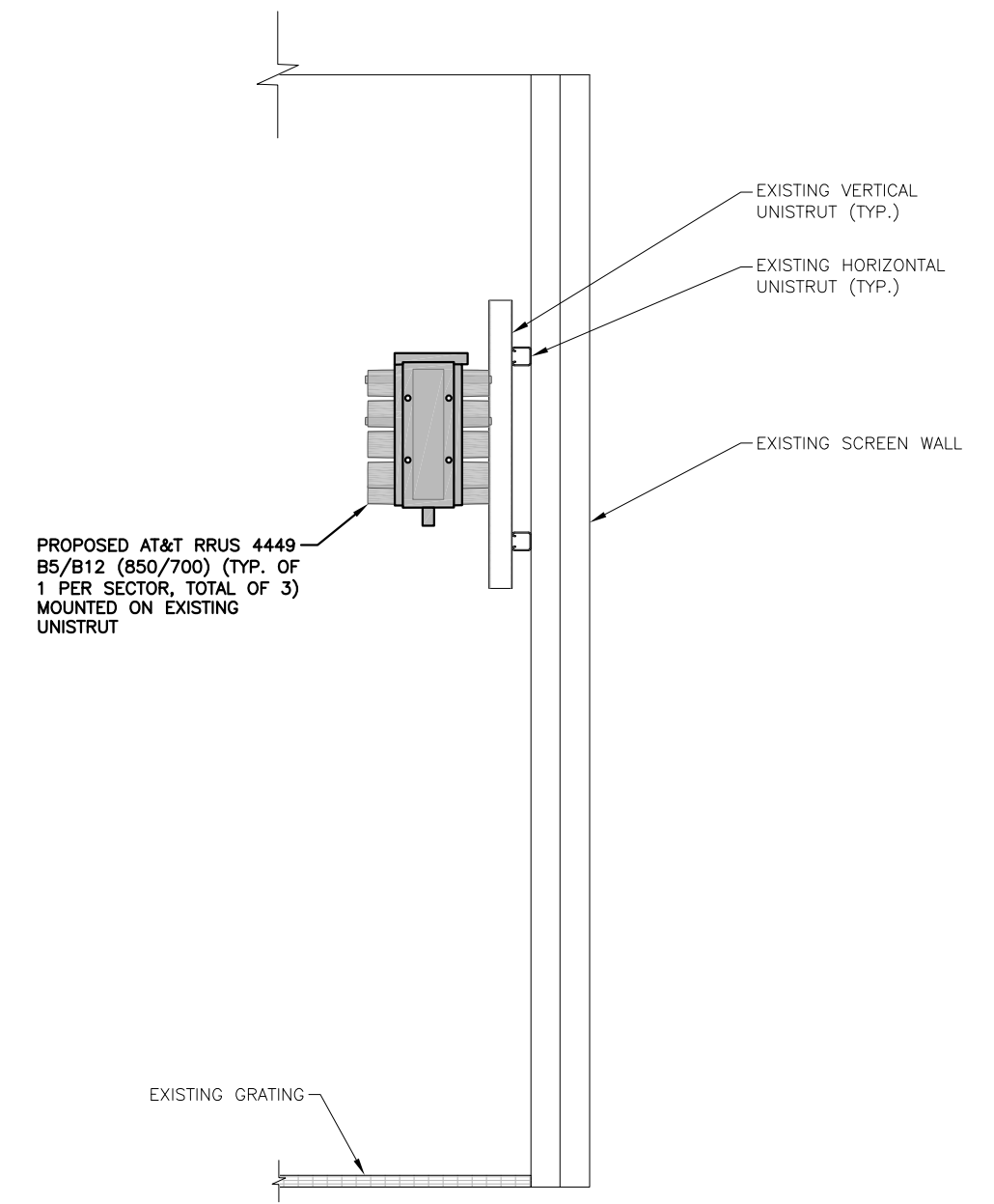
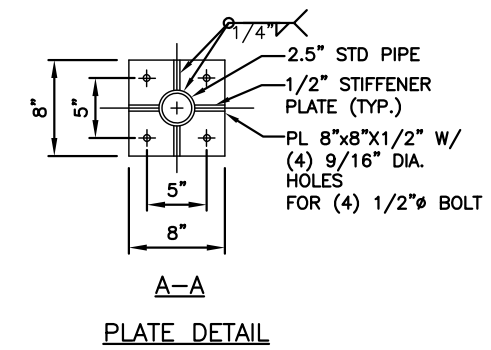
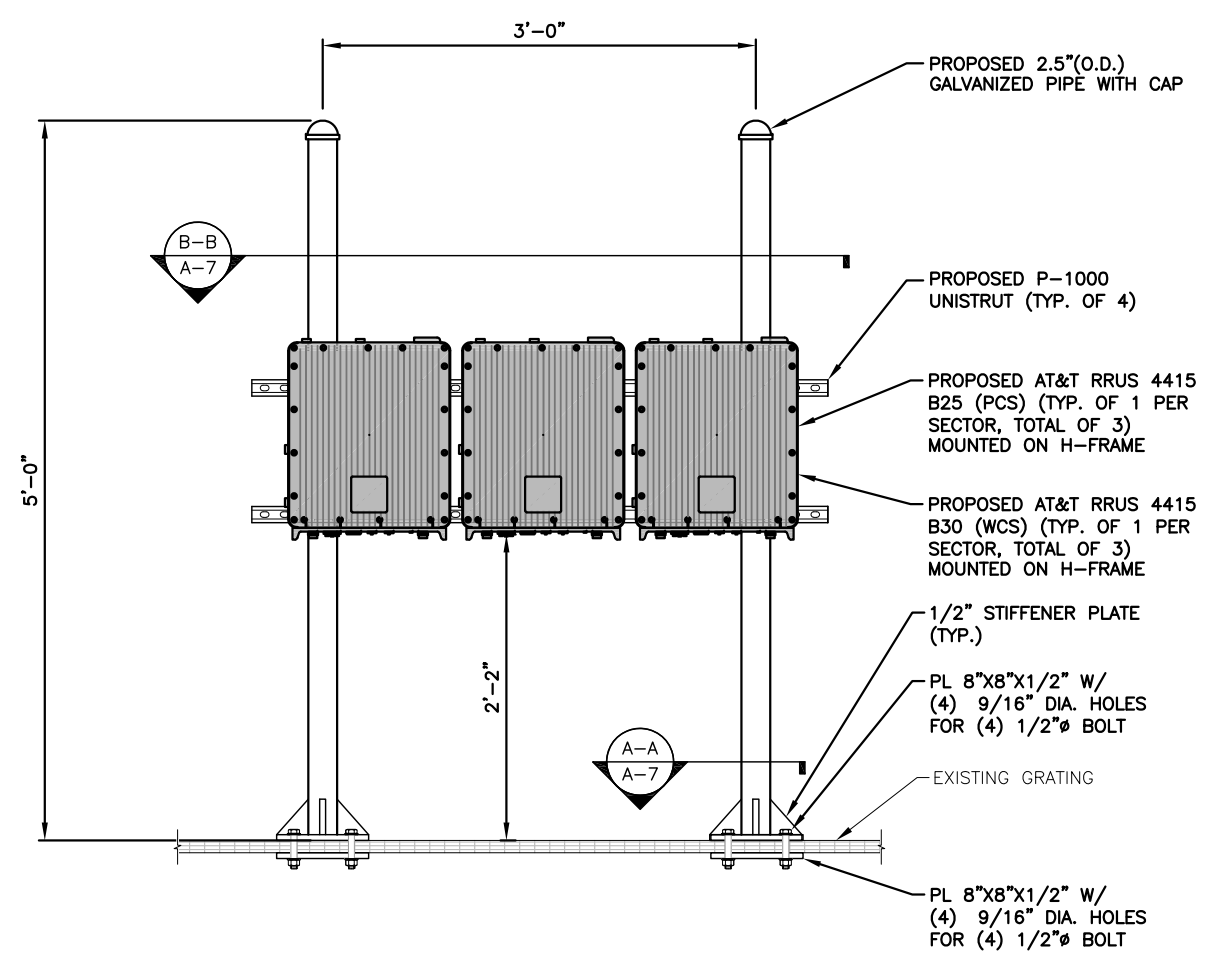
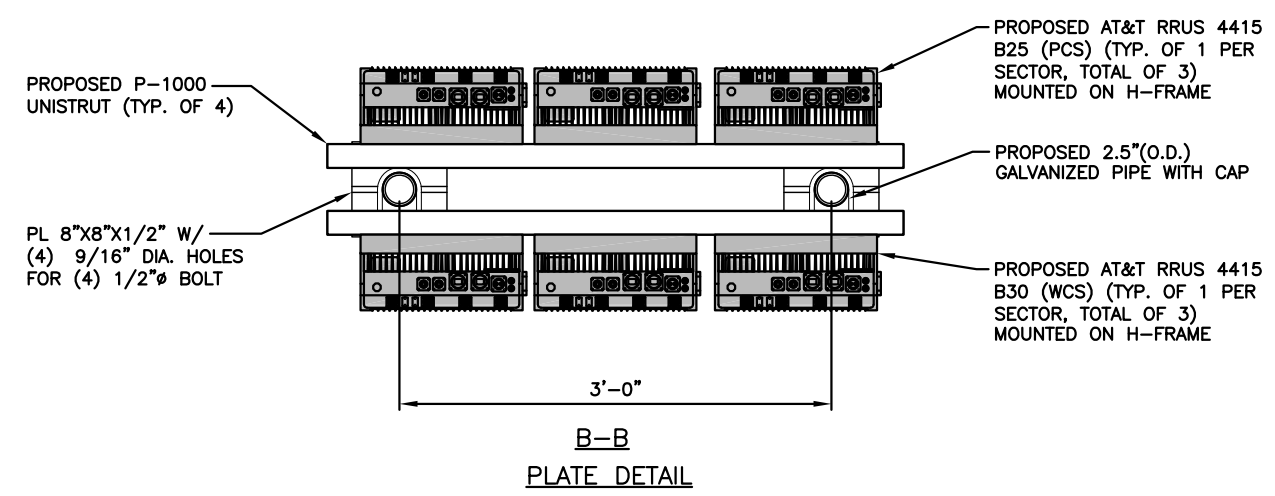
SCALE: AS SHOWN DESIGNED BY: AT DRAWN BY: ET



AT&T
DETAILS
LTE 3C_4C_RETRO 2019 UPGRADE
SITE NUMBER: CT5317 DRAWING NUMBER: A-6 REV: 4

NOTE:
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NOTE:
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H-FRAME DETAIL 1
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"
0 0'-4" 0'-8" 1'-4" 2'-0"

EQUIPMENT MOUNTING DETAIL 2
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"
0 0'-4" 0'-8" 1'-4" 2'-0"

HDG 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: CT5317
SITE NAME: HAMDEN-WHITNEYVILLE
1 CIRCULAR AVENUE HAMDEN, CT 06514 NEW HAVEN COUNTY

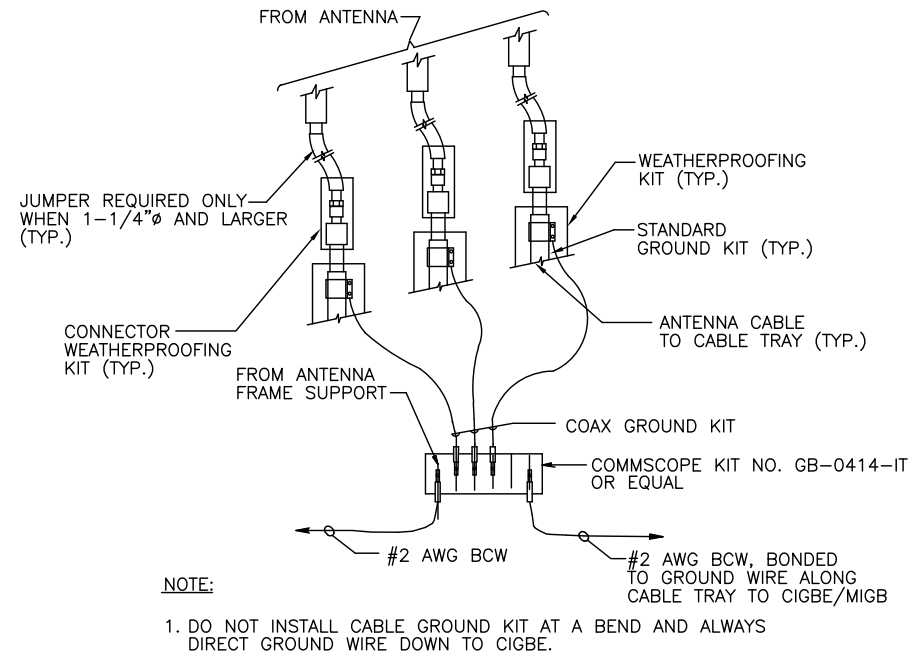
at&t
500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067

4	01/14/21	ISSUED FOR CONSTRUCTION	SG	AT	DPH
3	11/05/20	ISSUED FOR CONSTRUCTION	SF	AT	DPH
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1	11/12/19	ISSUED FOR CONSTRUCTION	VP	AT	DPH
0	10/03/19	ISSUED FOR REVIEW	ET/AM	AT	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: ET		

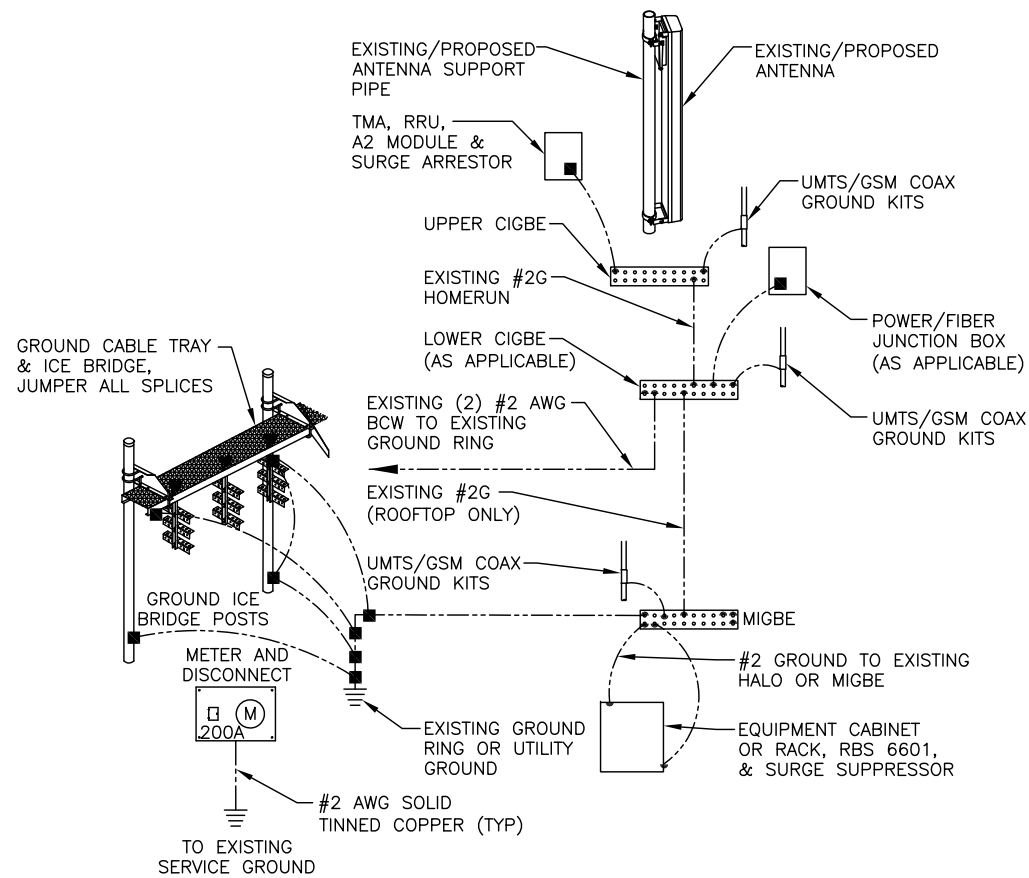
Daniel P. Hamm
STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T
DETAILS
LTE 3C_4C_RETRO 2019 UPGRADE

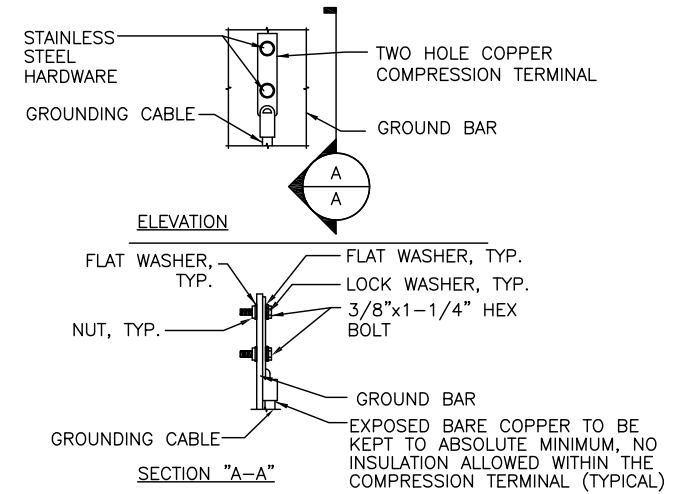
SITE NUMBER	DRAWING NUMBER	REV
CT5317	A-7	4



GROUND WIRE TO GROUND BAR CONNECTION DETAIL 1
SCALE: N.T.S. G-1



GROUNDING RISER DIAGRAM 2
SCALE: N.T.S. 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 3
SCALE: N.T.S. G-1

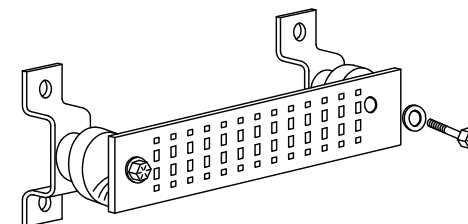
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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.

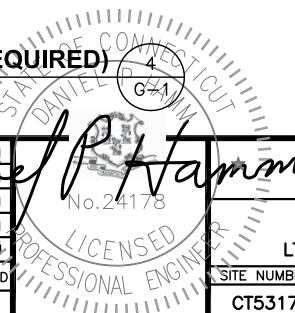
SECTION "A" - SURGE ABSORBERS

- 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)

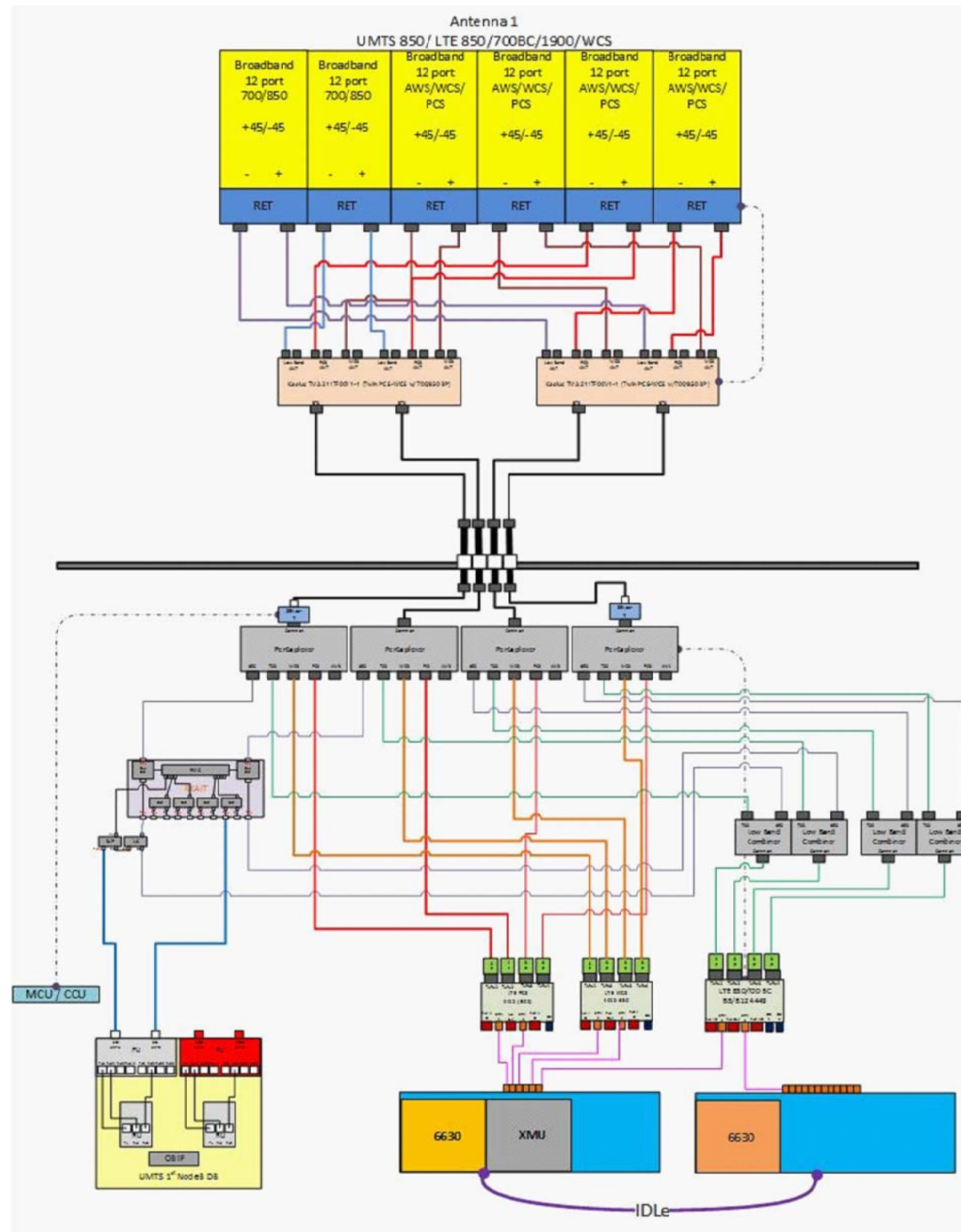


GROUND BAR - DETAIL (AS REQUIRED)
SCALE: N.T.S.

4	01/14/21	ISSUED FOR CONSTRUCTION	SG	AT	DPH
3	11/05/20	ISSUED FOR CONSTRUCTION	SF	AT	DPH
2	10/06/20	ISSUED FOR CONSTRUCTION	AM	AT	DPH
1	11/12/19	ISSUED FOR CONSTRUCTION	VP	AT	DPH
0	10/03/19	ISSUED FOR REVIEW	ET/AM	AT	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: ET		



AT&T		
GROUNDING DETAILS		
LTE 3C_4C_RETRO 2019 UPGRADE		
SITE NUMBER	DRAWING NUMBER	REV
CT5317	G-1	4



RF PLUMBING DIAGRAM
SCALE: N.T.S.

1
RF-1

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

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

4	01/14/21	ISSUED FOR CONSTRUCTION	SG	AT	DPH
3	11/05/20	ISSUED FOR CONSTRUCTION	SF	AT	DPH
2	10/06/20	ISSUED FOR CONSTRUCTION	AM	AT	DPH
1	11/12/19	ISSUED FOR CONSTRUCTION	VP	AT	DPH
0	10/03/19	ISSUED FOR REVIEW	ET/AM	AT	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: AT	DRAWN BY: ET		

AT&T		
RF PLUMBING DIAGRAM LTE 3C_4C_RETRO 2019 UPGRADE		
SITE NUMBER	DRAWING NUMBER	REV
CT5317	RF-1	4

(REVISED)
STRUCTURAL ANALYSIS REPORT

For

CT5317 (LTE 3C/4C/RETRO)

HAMDEN-WHITNEYVILLE

1 Circular Avenue
Hamden, CT 06514

**Antennas Mounted within FRP Enclosure
on Steel Frame on Rooftop**



Prepared for:



Dated: December 1, 2020 (Rev.3)

October 12, 2020 (Rev. 2)

November 11, 2019 (Rev.1)

October 15, 2019

Prepared by:



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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 May 13, 2020. Attendees included Patrick Barrett (HDG – Field Technician).

The following documents were used for our reference:

- Structural Analysis Report prepared by Destek Engineering dated March 31, 2017.

CONCLUSION SUMMARY:

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

	Member	Stress Ratio	Pass/Fail
Roof Beam	W16x31	77%	PASS

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

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Steel Frame (Existing)	1	LC7	51%	PASS
Unistrut Frame (Proposed)	8	LC2	30%	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
Steel Frame Connection	3/4" Thru Bolts	4%	PASS
Unistrut Frame Connection	1/2" Thru Bolts	25%	PASS

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.

*Reference documents attached.



APPURTENANCE CONFIGURATION:

Appurtenances	Dimensions	Weight	**Elevation	Mount
(6) TMA2117F00V1-1 TMA's	11.9"x9.9"x4.7"	26 lbs.	-	FRP Enclosure
(12) CCI Pentaplexers 5PX-0726-O	19.0"x9.2"x1.8"	13 lbs.	-	Unistrut
(1) DC6 Surge Arrestor	20.1"x18.2"x6.4"	44 lbs.	-	Unistrut
(3) 800372991 Antennas	77.9"x14.9"x6.5"	75 lbs.	40'-0"	FRP Enclosure
(3) 4449 B5/B12 RRH's	14.9"x13.2"x10.4"	73 lbs.	-	Unistrut
(3) 4415 B25 RRH's	16.5"x13.4"x5.9"	46 lbs.	-	Unistrut
(3) 4415 B30 RRH's	16.5"x13.4"x5.9"	46 lbs.	-	Unistrut
(6) DBCT108F1V92-1 Diplexers	10.7"x6.8"x7.2"	29 lbs.	-	Unistrut
(1) DC6 Surge Arrestor	20.1"x18.2"x6.4"	44 lbs.	-	Unistrut
(1) DC12 Surge Arrestor	24.0"x24.0"x8.0"	57 lbs.	-	Unistrut

* Proposed equipment shown in bold.

** Elevation to antenna centerline.

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:	B	(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:	Hamden	
County:	New Haven	
Wind Load:	125 mph	(TIA-222-H Figure B-2)
Ice		
Design Ice Thickness (t _i):	1.0 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}):	1.02 in	(TIA-222-H Sec. 2.6.10)



EXISTING ROOF CONSTRUCTION:

The existing roof construction consists of a roofing membrane over rigid insulation over plywood sheathing over wood joists supported by steel beams and columns.

The existing roof structure was not accessible during the inspection. If field conditions differ from what is assumed in this report, then the engineer of record is to be notified immediately.

ANTENNA/TMA SUPPORT RECOMMENDATIONS:

The new antennas and TMA's are proposed to be mounted within the existing FRP enclosure on an existing pipe masts installed on the existing steel frame secured to the existing roof framing.

RRH/SURGE ARRESTOR SUPPORT RECOMMENDATIONS:

The new RRH's and surge arrestors are proposed to be mounted on new Unistrut components secured to the existing steel frame secured to the existing roof framing.

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:

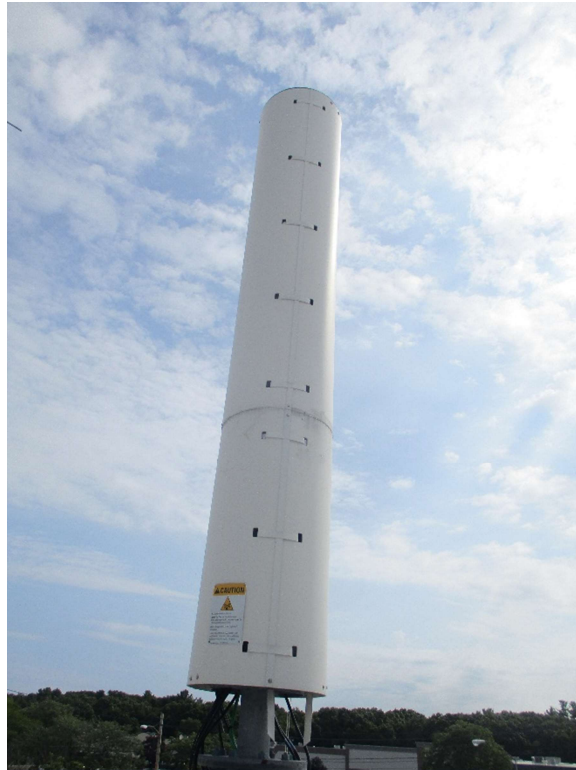


Photo 1: Sample photo illustrating the existing FRP enclosure.



Photo 2: Sample photo illustrating the existing RRH's.

FIELD PHOTOS (CONT.):



Photo 3: Sample photo illustrating the existing antennas and TMA's.



Photo 4: Sample photo illustrating the existing equipment cabinets.



HUDSON
Design Group LLC

Antenna Mount Calculations

Date: 11/30/2020
Project Name: HAMDEN-WHITNEYVILLE
Project No.: CT5317
Designed By: CL Checked By: MSC



Calculate Weight of Antenna Enclosure FRP

FRP Weight - Cylinder

Height	14.67	ft
Diameter	2.33	ft
thickness	0.25	in
Volume	3831.225962	in ³
FRP Weight	0.062	pci
Total weight =	237.5	lbs

Date: 11/30/2020
Project Name: HAMDEN-WHITNEYVILLE
Project No.: CT5317
Designed By: CL **Checked By:** MSC



Wind Analysis → Antenna Enclosure

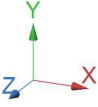
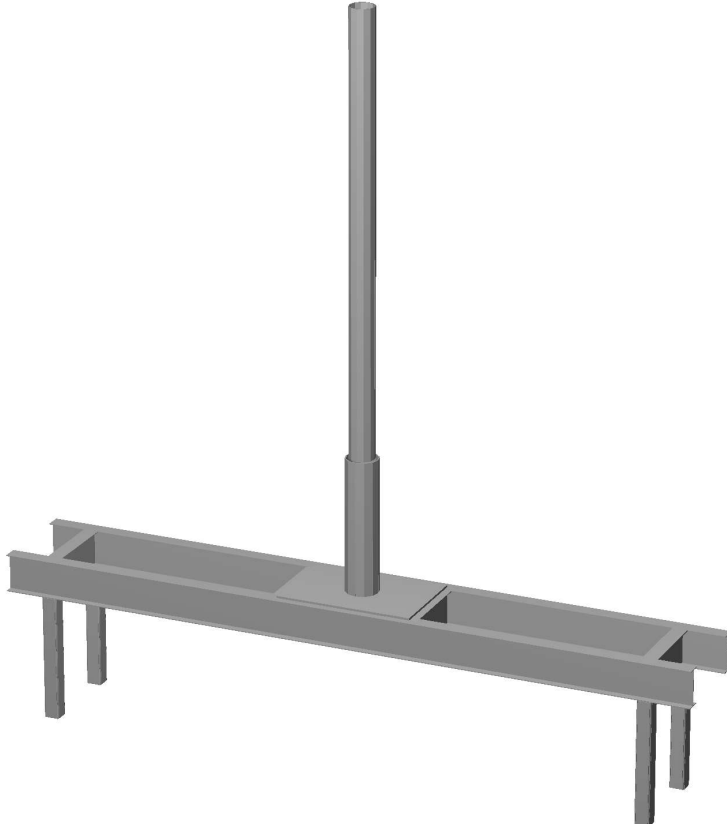
Reference Codes:

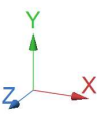
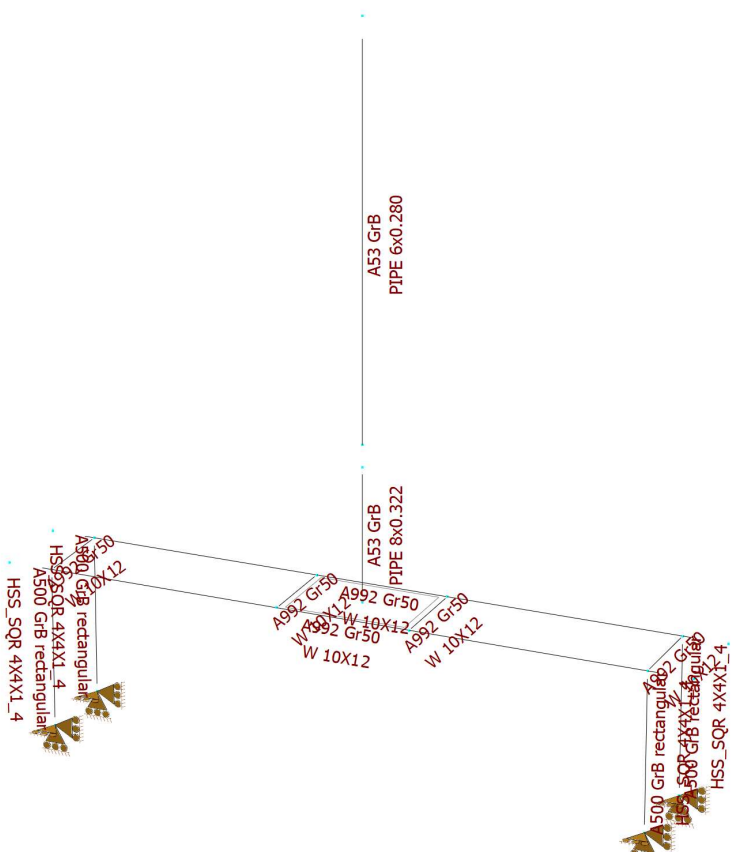
-2018 Connecticut State Building Code Amendments

-International Building Code 2015 (IBC 2015)

-Minimum Design Loads for Buildings and Other Structures (ASCE 7-10)

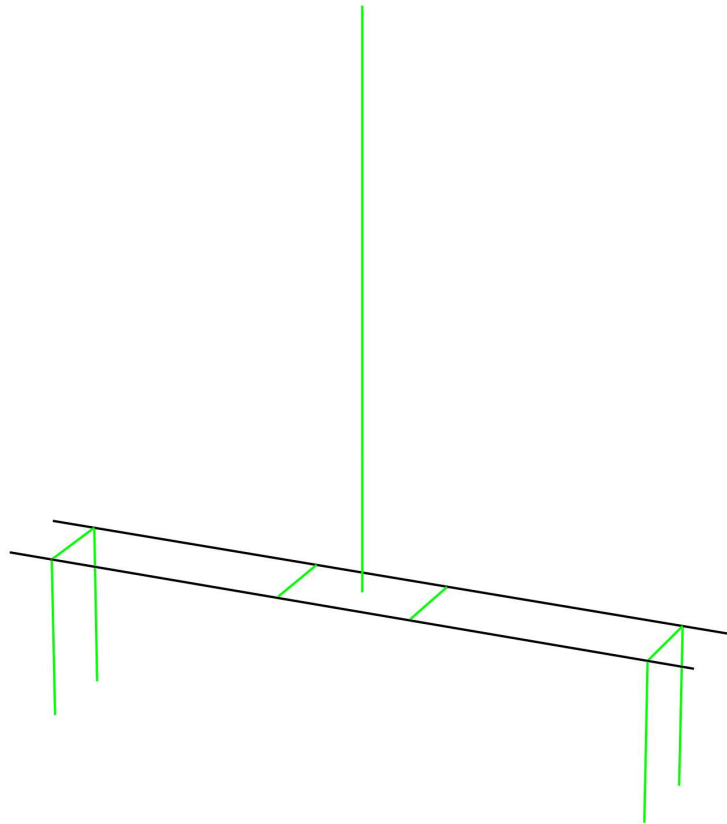
Structure Classification	II	(ASCE 7-10 Table 1.5-1)
Basic Wind Speed, V	125 mph	(CT Building Code Appendix N)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	40 ft	(Center of Enclosure)
Exposure Coefficient, K_z	0.76	(ASCE 7-10 Table 29.3-1)
Wind Directionality Coef., K_d	0.95	(ASCE 7-10 Table 26.6-1)
Topographic Factor, K_{zt}	1.00	(ASCE 7-10 Section 26.8.2)
Velocity Pressure, q_z	$= 0.00256K_zK_{zt}K_dV^2$	(ASCE 7-10 Equation 29.3-1)
	= 28.88 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Enclosure Shape:	Round	
Net Force Coefficient, C_f	0.59	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A_f	34 ft ²	(14.7 ft x 2.3 ft W)
Wind Force, F	$= q_zGC_fA_f$	(ASCE 7-10 Equation 29.5-2)
	= 493.60 lbs	

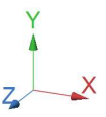
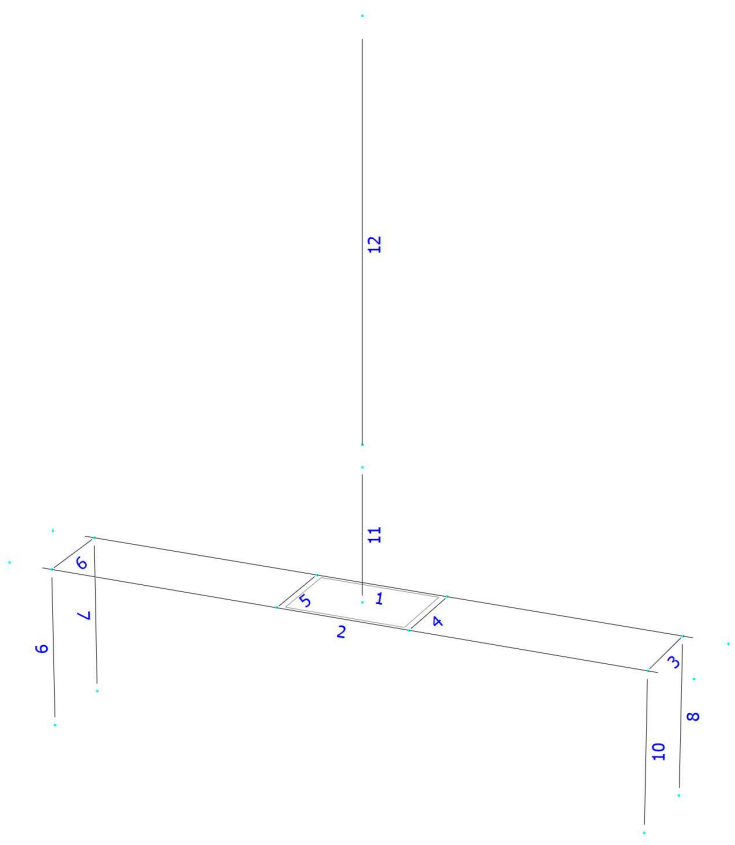


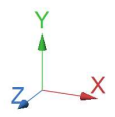
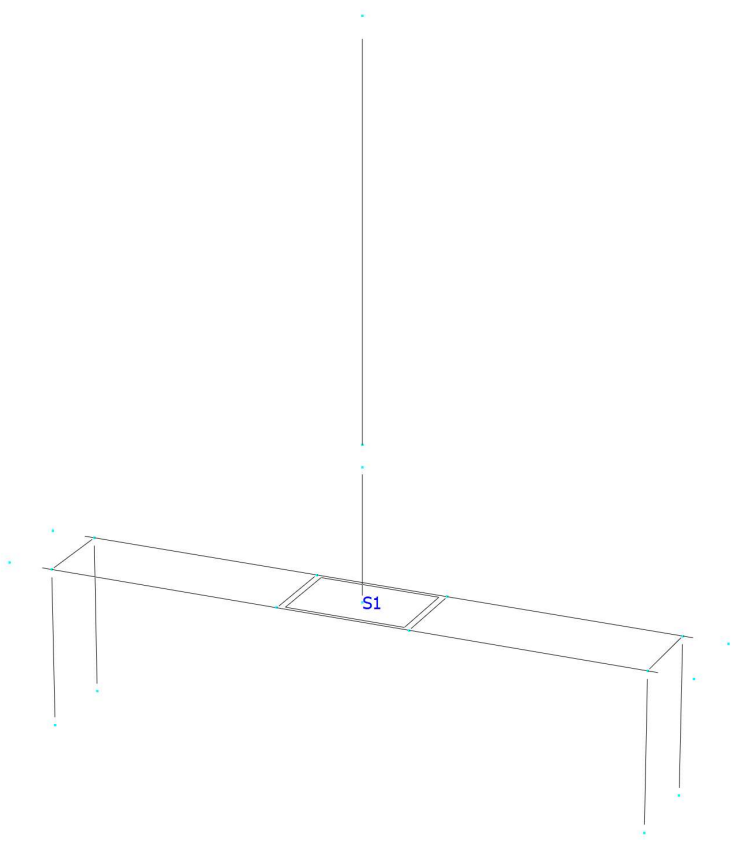


Design status

- Not designed
- Error on design
- Design O.K.
- With warnings







Current Date: 11/30/2020 10:17 AM

Units system: English

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Load data

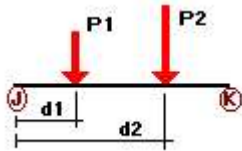
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
WL1	Wind Load Side 1	No	WIND
WL2	Wind Load Side 2	No	WIND
WL3	Wind Load Side 3	No	WIND
WL4	Wind Load Side 4	No	WIND

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	12	y	-0.038	0.50	No
		y	-0.038	1.00	No
		y	-0.038	1.50	No
		y	-0.038	5.50	No
		y	-0.038	6.00	No
		y	-0.038	6.50	No
		y	-0.026	8.00	No
		y	-0.026	8.00	No
		y	-0.026	8.00	No
		y	-0.026	9.00	No
		y	-0.026	9.00	No
		y	-0.026	9.00	No
		y	-0.119	0.50	No
		y	-0.119	9.00	No
WL1	12	z	-0.247	0.00	No
		z	-0.247	9.00	No
WL2	12	x	-0.247	0.00	No
		x	-0.247	9.00	No
WL3	12	z	0.247	0.00	No
		z	0.247	9.00	No
WL4	12	x	0.247	0.00	No
		x	0.247	9.00	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
WL1	Wind Load Side 1	No	0.00	0.00	0.00
WL2	Wind Load Side 2	No	0.00	0.00	0.00
WL3	Wind Load Side 3	No	0.00	0.00	0.00
WL4	Wind Load Side 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
WL1	0.00	0.00	0.00
WL2	0.00	0.00	0.00
WL3	0.00	0.00	0.00
WL4	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=1.4DL
- LC2=1.2DL
- LC3=1.2DL+0.5WL1
- LC4=1.2DL+0.5WL2
- LC5=1.2DL+0.5WL3
- LC6=1.2DL+0.5WL4
- LC7=1.2DL+WL1
- LC8=1.2DL+WL2
- LC9=1.2DL+WL3
- LC10=1.2DL+WL4
- LC11=0.9DL+WL1
- LC12=0.9DL+WL2
- LC13=0.9DL+WL3
- LC14=0.9DL+WL4
- LC15=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
<i>HSS_SQR 4X4X1_4</i>		7	LC7 at 0.00%	0.19	OK	
		8	LC7 at 0.00%	0.19	OK	
		9	LC9 at 0.00%	0.19	OK	
		10	LC9 at 0.00%	0.19	OK	
<i>PIPE 6x0.280</i>		12	LC10 at 100.00%	0.10	OK	
<i>PIPE 8x0.322</i>		11	LC10 at 100.00%	0.08	OK	
<i>W 10X12</i>		1	LC7 at 60.42%	0.51	With warnings	
		2	LC9 at 39.58%	0.51	With warnings	
		3	LC1 at 0.00%	0.00	OK	
		4	LC10 at 50.00%	0.11	OK	
		5	LC8 at 50.00%	0.11	OK	
		6	LC1 at 0.00%	0.00	OK	



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Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	13.50	0.00	0.00	0
3	0.00	0.00	2.00	0
4	13.50	0.00	2.00	0
5	0.00	3.583	0.00	0
6	13.50	3.583	0.00	0
7	0.00	3.583	2.00	0
8	13.50	3.583	2.00	0
9	-1.00	3.583	0.00	0
10	-1.00	3.583	2.00	0
11	14.50	3.583	0.00	0
12	14.50	3.583	2.00	0
13	8.25	3.583	0.00	0
14	8.25	3.583	2.00	0
15	5.25	3.583	0.00	0
16	5.25	3.583	2.00	0
17	6.75	3.583	1.00	0
18	6.75	6.583	1.00	0
19	6.75	16.253	1.00	0
20	6.75	7.083	1.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
1	1	1	1	0	0	0
2	1	1	1	0	0	0
3	1	1	1	0	0	0
4	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	9	11		W 10X12	A992 Gr50	0.00	0.00	0.00
2	10	12		W 10X12	A992 Gr50	0.00	0.00	0.00
3	6	8		W 10X12	A992 Gr50	0.00	0.00	0.00
4	13	14		W 10X12	A992 Gr50	0.00	0.00	0.00
5	15	16		W 10X12	A992 Gr50	0.00	0.00	0.00
6	5	7		W 10X12	A992 Gr50	0.00	0.00	0.00
7	5	1		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
8	6	2		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
9	7	3		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
10	8	4		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
11	18	17		PIPE 8x0.322	A53 GrB	0.00	0.00	0.00
12	19	18		PIPE 6x0.280	A53 GrB	0.00	0.00	0.00

Rigid end offsets

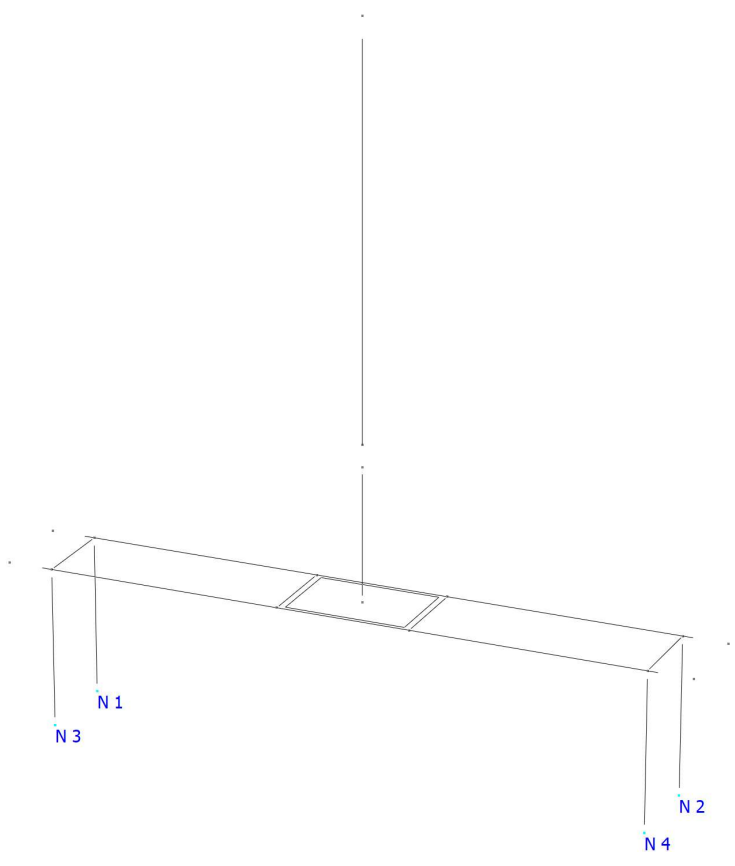
Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
1	0.00	-5.00	0.00	0.00	-5.00	0.00
2	0.00	-5.00	0.00	0.00	-5.00	0.00
3	0.00	-5.00	0.00	0.00	-5.00	0.00
4	0.00	-5.00	0.00	0.00	-5.00	0.00
5	0.00	-5.00	0.00	0.00	-5.00	0.00
6	0.00	-5.00	0.00	0.00	-5.00	0.00
7	0.00	-10.00	0.00	0.00	0.00	0.00
8	0.00	-10.00	0.00	0.00	0.00	0.00
9	0.00	-10.00	0.00	0.00	0.00	0.00
10	0.00	-10.00	0.00	0.00	0.00	0.00

Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
3	1	1	0	0	1	1	0	0	0	0	Full
4	1	1	0	0	1	1	0	0	0	0	Full
5	1	1	0	0	1	1	0	0	0	0	Full
6	1	1	0	0	1	1	0	0	0	0	Full

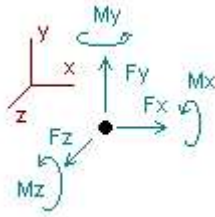
Shells

Shell	Description	Material	Thickness [in]	Center of gravity [ft]	Area [ft ²]	N1, N2, ..., Nn
1		A36	1.00	(6.75, 3.58, 1.00)	6.00	15, 13, 14, 16



Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition DL=Dead Load						
1	0.18094	0.42747	0.00000	0.00000	0.00000	0.00000
3	0.18094	0.42747	0.00000	0.00000	0.00000	0.00000
2	-0.18094	0.42747	0.00000	0.00000	0.00000	0.00000
4	-0.18094	0.42747	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	1.70989	0.00000	0.00000	0.00000	0.00000
Condition WL1=Wind Load Side 1						
1	0.76344	1.45148	0.12350	0.00000	0.00000	0.00000
3	-0.76344	-1.45148	0.12350	0.00000	0.00000	0.00000
2	-0.76345	1.45149	0.12350	0.00000	0.00000	0.00000
4	0.76345	-1.45149	0.12350	0.00000	0.00000	0.00000
SUM	0.00000	0.00000	0.49399	0.00000	0.00000	0.00000
Condition WL2=Wind Load Side 2						
1	0.12350	0.21504	0.00000	0.00000	0.00000	0.00000
3	0.12350	0.21504	0.00000	0.00000	0.00000	0.00000
2	0.12350	-0.21504	0.00000	0.00000	0.00000	0.00000
4	0.12350	-0.21504	0.00000	0.00000	0.00000	0.00000
SUM	0.49400	0.00000	0.00000	0.00000	0.00000	0.00000
Condition WL3=Wind Load Side 3						
1	-0.76345	-1.45148	-0.12350	0.00000	0.00000	0.00000
3	0.76345	1.45148	-0.12350	0.00000	0.00000	0.00000
2	0.76344	-1.45148	-0.12350	0.00000	0.00000	0.00000
4	-0.76344	1.45148	-0.12350	0.00000	0.00000	0.00000
SUM	0.00000	0.00000	-0.49398	0.00000	0.00000	0.00000

Condition **WL4=Wind Load Side 4**

1	-0.12350	-0.21504	0.00000	0.00000	0.00000	0.00000
3	-0.12350	-0.21504	0.00000	0.00000	0.00000	0.00000
2	-0.12350	0.21504	0.00000	0.00000	0.00000	0.00000
4	-0.12350	0.21504	0.00000	0.00000	0.00000	0.00000

SUM -0.49400 0.00000 0.00000 0.00000 0.00000 0.00000

Condition **LC1=1.4DL**

1	0.25332	0.59846	0.00000	0.00000	0.00000	0.00000
3	0.25332	0.59846	0.00000	0.00000	0.00000	0.00000
2	-0.25332	0.59846	0.00000	0.00000	0.00000	0.00000
4	-0.25332	0.59846	0.00000	0.00000	0.00000	0.00000

SUM 0.00000 2.39385 0.00000 0.00000 0.00000 0.00000

Condition **LC2=1.2DL**

1	0.21713	0.51297	0.00000	0.00000	0.00000	0.00000
3	0.21713	0.51297	0.00000	0.00000	0.00000	0.00000
2	-0.21713	0.51297	0.00000	0.00000	0.00000	0.00000
4	-0.21713	0.51297	0.00000	0.00000	0.00000	0.00000

SUM 0.00000 2.05187 0.00000 0.00000 0.00000 0.00000

Condition **LC3=1.2DL+0.5WL1**

1	0.59885	1.23871	0.06175	0.00000	0.00000	0.00000
3	-0.16459	-0.21277	0.06175	0.00000	0.00000	0.00000
2	-0.59886	1.23871	0.06175	0.00000	0.00000	0.00000
4	0.16460	-0.21278	0.06175	0.00000	0.00000	0.00000

SUM 0.00000 2.05187 0.24700 0.00000 0.00000 0.00000

Condition **LC4=1.2DL+0.5WL2**

1	0.27888	0.62049	0.00000	0.00000	0.00000	0.00000
3	0.27888	0.62049	0.00000	0.00000	0.00000	0.00000
2	-0.15538	0.40545	0.00000	0.00000	0.00000	0.00000
4	-0.15538	0.40545	0.00000	0.00000	0.00000	0.00000

SUM 0.24700 2.05187 0.00000 0.00000 0.00000 0.00000

Condition **LC5=1.2DL+0.5WL3**

1	-0.16459	-0.21277	-0.06175	0.00000	0.00000	0.00000
3	0.59885	1.23871	-0.06175	0.00000	0.00000	0.00000
2	0.16459	-0.21277	-0.06175	0.00000	0.00000	0.00000
4	-0.59885	1.23871	-0.06175	0.00000	0.00000	0.00000

SUM 0.00000 2.05187 -0.24699 0.00000 0.00000 0.00000

Condition **LC6=1.2DL+0.5WL4**

1	0.15538	0.40545	0.00000	0.00000	0.00000	0.00000
3	0.15538	0.40545	0.00000	0.00000	0.00000	0.00000
2	-0.27888	0.62049	0.00000	0.00000	0.00000	0.00000
4	-0.27888	0.62049	0.00000	0.00000	0.00000	0.00000

SUM -0.24700 2.05187 0.00000 0.00000 0.00000 0.00000

Condition LC7=1.2DL+WL1						
1	0.98057	1.96445	0.12350	0.00000	0.00000	0.00000
3	-0.54631	-0.93851	0.12350	0.00000	0.00000	0.00000
2	-0.98059	1.96446	0.12350	0.00000	0.00000	0.00000
4	0.54632	-0.93852	0.12350	0.00000	0.00000	0.00000

SUM	0.00000	2.05187	0.49399	0.00000	0.00000	0.00000
Condition LC8=1.2DL+WL2						
1	0.34063	0.72800	0.00000	0.00000	0.00000	0.00000
3	0.34063	0.72800	0.00000	0.00000	0.00000	0.00000
2	-0.09363	0.29793	0.00000	0.00000	0.00000	0.00000
4	-0.09363	0.29793	0.00000	0.00000	0.00000	0.00000

SUM	0.49400	2.05187	0.00000	0.00000	0.00000	0.00000
Condition LC9=1.2DL+WL3						
1	-0.54631	-0.93851	-0.12350	0.00000	0.00000	0.00000
3	0.98058	1.96445	-0.12349	0.00000	0.00000	0.00000
2	0.54631	-0.93851	-0.12350	0.00000	0.00000	0.00000
4	-0.98057	1.96445	-0.12349	0.00000	0.00000	0.00000

SUM	0.00000	2.05187	-0.49398	0.00000	0.00000	0.00000
Condition LC10=1.2DL+WL4						
1	0.09363	0.29793	0.00000	0.00000	0.00000	0.00000
3	0.09363	0.29793	0.00000	0.00000	0.00000	0.00000
2	-0.34063	0.72800	0.00000	0.00000	0.00000	0.00000
4	-0.34063	0.72800	0.00000	0.00000	0.00000	0.00000

SUM	-0.49400	2.05187	0.00000	0.00000	0.00000	0.00000
Condition LC11=0.9DL+WL1						
1	0.92629	1.83621	0.12350	0.00000	0.00000	0.00000
3	-0.60059	-1.06676	0.12350	0.00000	0.00000	0.00000
2	-0.92630	1.83622	0.12350	0.00000	0.00000	0.00000
4	0.60061	-1.06677	0.12350	0.00000	0.00000	0.00000

SUM	0.00000	1.53891	0.49399	0.00000	0.00000	0.00000
Condition LC12=0.9DL+WL2						
1	0.28635	0.59976	0.00000	0.00000	0.00000	0.00000
3	0.28635	0.59976	0.00000	0.00000	0.00000	0.00000
2	-0.03935	0.16969	0.00000	0.00000	0.00000	0.00000
4	-0.03935	0.16969	0.00000	0.00000	0.00000	0.00000

SUM	0.49400	1.53891	0.00000	0.00000	0.00000	0.00000
Condition LC13=0.9DL+WL3						
1	-0.60060	-1.06676	-0.12350	0.00000	0.00000	0.00000
3	0.92629	1.83621	-0.12349	0.00000	0.00000	0.00000
2	0.60059	-1.06675	-0.12350	0.00000	0.00000	0.00000
4	-0.92629	1.83620	-0.12349	0.00000	0.00000	0.00000

SUM	0.00000	1.53891	-0.49398	0.00000	0.00000	0.00000

Condition **LC14=0.9DL+WL4**

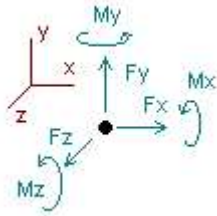
1	0.03935	0.16969	0.00000	0.00000	0.00000	0.00000
3	0.03935	0.16969	0.00000	0.00000	0.00000	0.00000
2	-0.28635	0.59976	0.00000	0.00000	0.00000	0.00000
4	-0.28635	0.59976	0.00000	0.00000	0.00000	0.00000
SUM	-0.49400	1.53891	0.00000	0.00000	0.00000	0.00000

Condition **LC15=0.9DL**

1	0.16285	0.38473	0.00000	0.00000	0.00000	0.00000
3	0.16285	0.38473	0.00000	0.00000	0.00000	0.00000
2	-0.16285	0.38473	0.00000	0.00000	0.00000	0.00000
4	-0.16285	0.38473	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	1.53891	0.00000	0.00000	0.00000	0.00000

Envelope for nodal reactions

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



Direction of positive forces and moments

Envelope of nodal reactions for :

- DL=Dead Load
- WL1=Wind Load Side 1
- WL2=Wind Load Side 2
- WL3=Wind Load Side 3
- WL4=Wind Load Side 4
- LC1=1.4DL
- LC2=1.2DL
- LC3=1.2DL+0.5WL1
- LC4=1.2DL+0.5WL2
- LC5=1.2DL+0.5WL3
- LC6=1.2DL+0.5WL4
- LC7=1.2DL+WL1
- LC8=1.2DL+WL2
- LC9=1.2DL+WL3
- LC10=1.2DL+WL4
- LC11=0.9DL+WL1
- LC12=0.9DL+WL2
- LC13=0.9DL+WL3
- LC14=0.9DL+WL4
- LC15=0.9DL

Node	Forces									Moments					
	Fx			Fy			Fz			Mx		My		Mz	
	[Kip]	lc		[Kip]	lc		[Kip]	lc		[Kip*ft]	lc		[Kip*ft]	lc	
1	Max	0.981	LC7	1.964	LC7	0.123	WL1	0.00000	DL	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.763	WL3	-1.451	WL3	-0.123	LC9	0.00000	DL	0.00000	DL	0.00000	DL	0.00000	DL
3	Max	0.981	LC9	1.964	LC9	0.123	LC7	0.00000	DL	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.763	WL1	-1.451	WL1	-0.123	WL3	0.00000	DL	0.00000	DL	0.00000	DL	0.00000	DL
2	Max	0.763	WL3	1.964	LC7	0.123	WL1	0.00000	DL	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.981	LC7	-1.451	WL3	-0.123	LC9	0.00000	DL	0.00000	DL	0.00000	DL	0.00000	DL
4	Max	0.763	WL1	1.964	LC9	0.123	LC7	0.00000	DL	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.981	LC9	-1.451	WL1	-0.123	WL3	0.00000	DL	0.00000	DL	0.00000	DL	0.00000	DL

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Project No.: CT5317
Designed By: CL Checked By: MSC



CHECK CONNECTION CAPACITY (Worst Case)

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

Bolt Type = **A325 3/4"** Threaded Rod

Allowable Tensile Load =

$F_{Tall} =$ 19880 lbs.

Allowable Shear Load =

$F_{vall} =$ 11928 lbs.

TENSILE FORCES

Reaction **F =** 1451 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 981 lbs. (See Bentley Output)

Reactions in Z direction: 123 lbs. (See Bentley Output)

Resultant: 989 lbs.

No. of Supports = 1

No. of Bolts / Support = 4

Tension Design Load / Bolts =

$f_t =$ 362.75 lbs. < 19880 lbs. **Therefore, OK !**

Shear Design Load / Bolts =

$f_v =$ 247.17 lbs. < 11928 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T + f_v / F_v ≤ 1.0
0.018 + 0.021 = 0.039 < 1.0 **Therefore, OK !**



HUDSON
Design Group LLC

Unistrut Frame Calculations

Date: 11/30/2020
 Project Name: HAMDEN-WHITNEYVILLE
 Project No.: CT5317
 Designed By: CL Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

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

$K_z =$ **0.761**

$z =$ 40 (ft)
 $z_g =$ 1200 (ft)
 $\alpha =$ 7.0

$K_{zmin} \leq K_z \leq 2.01$

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

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

$K_{zt} =$ **1**

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

Category = **1**

$$K_h = e^{(fz/H)}$$

$K_h =$ 1
 $K_c =$ **1** (from Table 2-4)
 $K_t =$ **0** (from Table 2-5)
 $f =$ **0** (from Table 2-5)
 $z =$ 40
 $z_s =$ **67** (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 =
 Importance Factor =

$t_i =$ **1.00** in
 $I =$ **1.0** (from Table 2-3)
 $K_{iz} =$ **1.02** (from Sec. 2.6.10)

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

$t_{iz} =$ **1.02** 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

$h =$ 27.83

$G_h =$ 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

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

$G_h =$ 1.35

$G_h =$ 1.00

2.6.11.2 Design Wind Force on Appurtenances

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

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

$q_z =$	25.80
$q_z (ice) =$	4.13
$q_z (30) =$	1.49

$K_z =$	0.761 (from 2.6.5.2)
$K_{zt} =$	1.0 (from 2.6.6.2.1)
$K_s =$	1.0 (from 2.6.7)
$K_e =$	1.00 (from 2.6.8)
$K_d =$	0.85 (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 = **1.02 in** Angle = **0 (deg)** Equivalent Angle = **180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
CCI Pentaplexers 5PX-0726-O	9.2	1.8	19.0	0.12	5.11	1.32	4	2	0
CCI Pentaplexers 5PX-0726-O (Side)	9.2	19.0	1.8	1.21	0.48	1.20	38	8	2
Unistrut P1000	1.6	12.0		0.14	0.14	1.20	4	2	0
L 2x2 Angle	2.0	12.0		0.17	0.17	1.20	5	2	0

Date: 11/30/2020

Project Name: HAMDEN-WHITNEYVILLE

Project No.: CT5317

Designed By: CL Checked By: MSC



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ICE WEIGHT CALCULATIONS

Thickness of ice: 1.02 in.

Density of ice: 56 pcf

CCI Pentaplexers 5PX-0726-O

Weight of ice based on total radial SF area:

Height (in): 9.2

Width (in): 1.8

Depth (in): 19.0

Total weight of ice on object: 19 lbs

Weight of object: 13.0 lbs

Combined weight of ice and object:	32 lbs
------------------------------------	--------

Unistrut P1000

Weight of ice based on total radial SF area:

Height (in): 1.625

Width (in): 1.625

Per foot weight of ice on object:	4 plf
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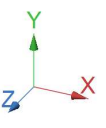
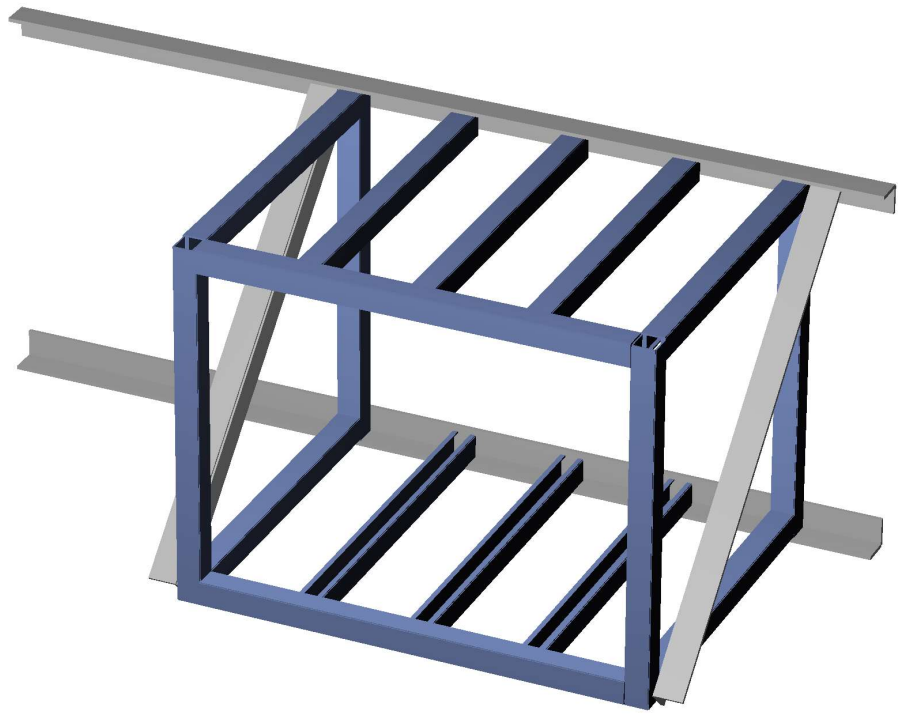
L 2x2 Angles

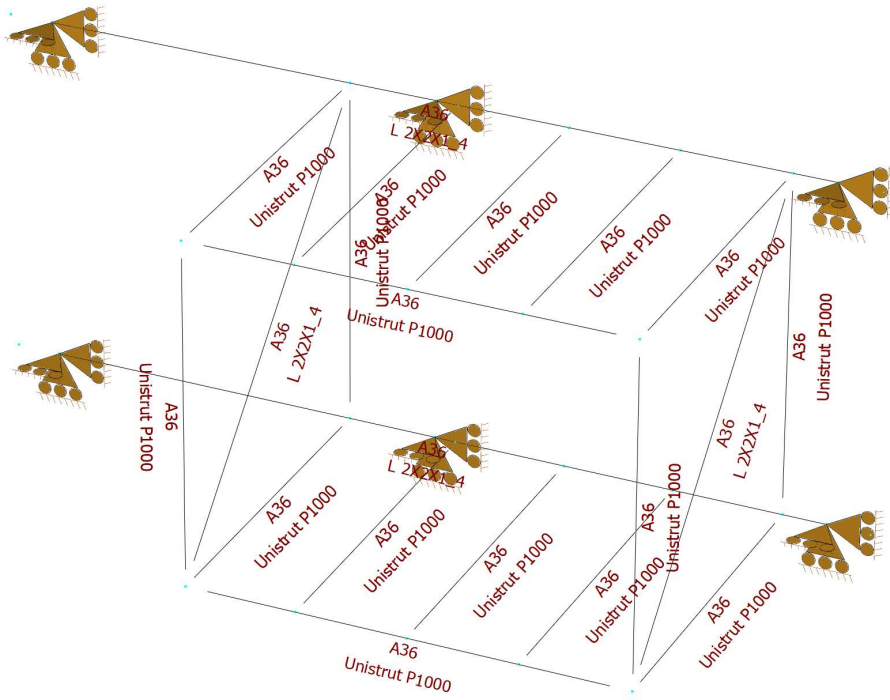
Weight of ice based on total radial SF area:

Height (in): 2





Width (in): 2

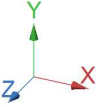
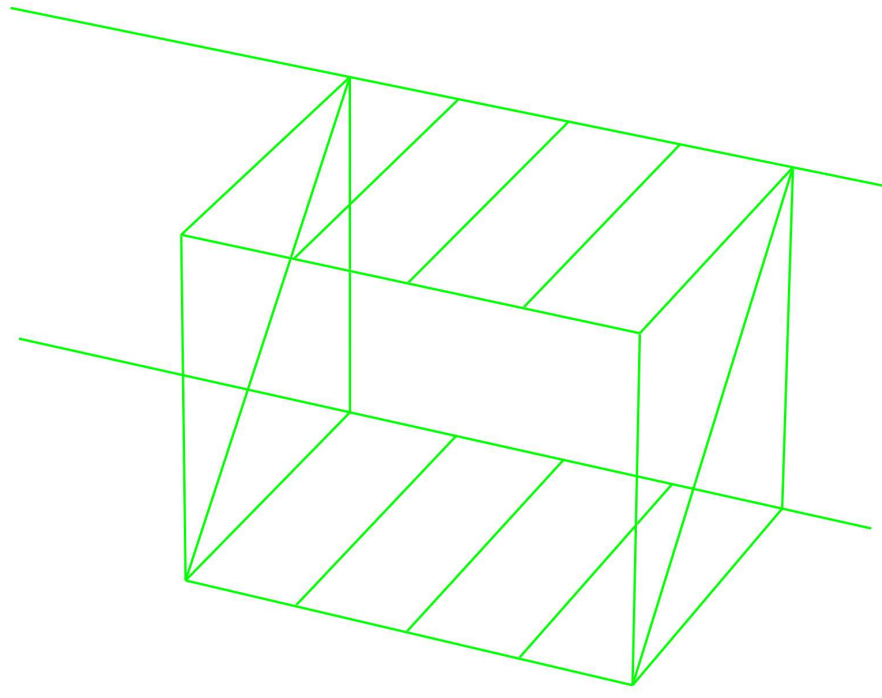
Per foot weight of ice on object:	5 plf
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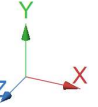
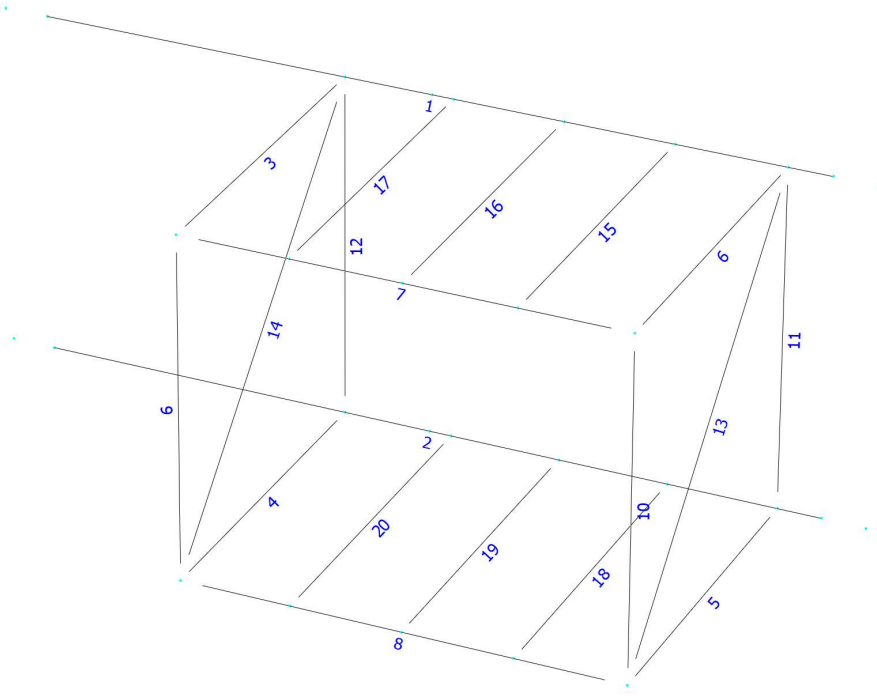




Design status

-  Not designed
-  Error on design
-  Design O.K.
-  With warnings





Load data

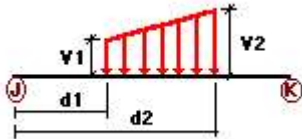
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
WL1	Wind Load (Side 1)	No	WIND
WL2	Wind Load (Side 2)	No	WIND
WL3	Wind Load (Side 3)	No	WIND
WL4	Wind Load (Side 4)	No	WIND
DI	Ice Load	No	LL

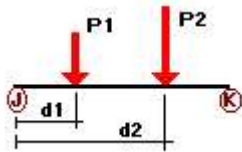
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%	
WL1	1	z	-0.005	-0.005	0.00	No	100.00	Yes	
	2	z	-0.005	-0.005	0.00	No	100.00	Yes	
	7	z	-0.004	-0.004	0.00	No	100.00	Yes	
	8	z	-0.004	-0.004	0.00	No	100.00	Yes	
	9	z	-0.004	-0.004	0.00	No	100.00	Yes	
	10	z	-0.004	-0.004	0.00	No	100.00	Yes	
	11	z	-0.004	-0.004	0.00	No	100.00	Yes	
	12	z	-0.004	-0.004	0.00	No	100.00	Yes	
	13	z	-0.005	-0.005	0.00	No	100.00	Yes	
	14	z	-0.005	-0.005	0.00	No	100.00	Yes	
	WL2	5	x	-0.004	-0.004	0.00	No	100.00	Yes
		6	x	-0.004	-0.004	0.00	No	100.00	Yes
		10	x	-0.004	-0.004	0.00	No	100.00	Yes
		11	x	-0.004	-0.004	0.00	No	100.00	Yes
WL4	13	x	-0.005	-0.005	0.00	No	100.00	Yes	
	3	x	0.004	0.004	0.00	No	100.00	Yes	
	4	x	0.004	0.004	0.00	No	100.00	Yes	
	9	x	0.004	0.004	0.00	No	100.00	Yes	
DI	12	x	0.004	0.004	0.00	No	100.00	Yes	
	14	x	0.005	0.005	0.00	No	100.00	Yes	
	1	y	-0.005	-0.005	0.00	No	100.00	Yes	
	2	y	-0.005	-0.005	0.00	No	100.00	Yes	

3	y	-0.004	-0.004	0.00	No	100.00	Yes
4	y	-0.004	-0.004	0.00	No	100.00	Yes
5	y	-0.004	-0.004	0.00	No	100.00	Yes
6	y	-0.004	-0.004	0.00	No	100.00	Yes
7	y	-0.004	-0.004	0.00	No	100.00	Yes
8	y	-0.004	-0.004	0.00	No	100.00	Yes
9	y	-0.004	-0.004	0.00	No	100.00	Yes
10	y	-0.004	-0.004	0.00	No	100.00	Yes
11	y	-0.004	-0.004	0.00	No	100.00	Yes
12	y	-0.004	-0.004	0.00	No	100.00	Yes
13	y	-0.005	-0.005	0.00	No	100.00	Yes
14	y	-0.005	-0.005	0.00	No	100.00	Yes
15	y	-0.004	-0.004	0.00	No	100.00	Yes
16	y	-0.004	-0.004	0.00	No	100.00	Yes
17	y	-0.004	-0.004	0.00	No	100.00	Yes
18	y	-0.004	-0.004	0.00	No	100.00	Yes
19	y	-0.004	-0.004	0.00	No	100.00	Yes
20	y	-0.004	-0.004	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%	
DL	15	y	-0.013	1.00	No	
		y	-0.013	1.00	No	
	16	y	-0.013	1.00	No	
		y	-0.013	1.00	No	
	17	y	-0.013	1.00	No	
		y	-0.013	1.00	No	
	18	y	-0.013	1.00	No	
		y	-0.013	1.00	No	
	19	y	-0.013	1.00	No	
		y	-0.013	1.00	No	
	WL1	20	y	-0.013	1.00	No
			y	-0.013	1.00	No
15		z	-0.004	1.00	No	
		z	-0.004	1.00	No	
16		z	-0.004	1.00	No	
		z	-0.004	1.00	No	
17		z	-0.004	1.00	No	
		z	-0.004	1.00	No	
18		z	-0.004	1.00	No	
		z	-0.004	1.00	No	
19	z	-0.004	1.00	No		
	z	-0.004	1.00	No		
WL2	15	x	-0.038	1.00	No	
		x	-0.038	1.00	No	
WL4	17	x	0.038	1.00	No	

	20	x	0.038	1.00	No
DI	15	y	-0.032	1.00	No
		y	-0.032	1.00	No
	16	y	-0.032	1.00	No
		y	-0.032	1.00	No
	17	y	-0.032	1.00	No
		y	-0.032	1.00	No
	18	y	-0.032	1.00	No
		y	-0.032	1.00	No
	19	y	-0.032	1.00	No
		y	-0.032	1.00	No
	20	y	-0.032	1.00	No
		y	-0.032	1.00	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
WL1	Wind Load (Side 1)	No	0.00	0.00	0.00
WL2	Wind Load (Side 2)	No	0.00	0.00	0.00
WL3	Wind Load (Side 3)	No	0.00	0.00	0.00
WL4	Wind Load (Side 4)	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
WL1	0.00	0.00	0.00
WL2	0.00	0.00	0.00
WL3	0.00	0.00	0.00
WL4	0.00	0.00	0.00
DI	0.00	0.00	0.00



Current Date: 12/1/2020 9:14 AM

Units system: English

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

- LC1=1.4DL
- LC2=1.2DL+1.6DI
- LC3=1.2DL+0.5WL1
- LC4=1.2DL+0.5WL2
- LC5=1.2DL+0.5WL3
- LC6=1.2DL+0.5WL4
- LC7=1.2DL+WL1
- LC8=1.2DL+WL2
- LC9=1.2DL+WL3
- LC10=1.2DL+WL4
- LC11=1.2DL+WL1+DI
- LC12=1.2DL+WL2+DI
- LC13=1.2DL+WL3+DI
- LC14=1.2DL+WL4+DI
- LC15=0.9DL+WL1
- LC16=0.9DL+WL2
- LC17=0.9DL+WL3
- LC18=0.9DL+WL4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 2X2X1_4	1	LC2 at 50.00%	0.12	OK	
		2	LC2 at 50.00%	0.11	OK	
		13	LC2 at 50.00%	0.02	OK	
		14	LC2 at 50.00%	0.02	OK	
	Unistrut P1000	3	LC2 at 50.00%	0.02	OK	Eq. H1.2-1
		4	LC2 at 50.00%	0.03	OK	Eq. H1.2-1
		5	LC2 at 50.00%	0.04	OK	Eq. H1.2-1
		6	LC12 at 50.00%	0.01	OK	Eq. H1.1-1
		7	LC2 at 23.44%	0.23	OK	Eq. H1.1-1
		8	LC2 at 23.44%	0.30	OK	Eq. H1.1-1
		9	LC11 at 50.00%	0.01	OK	Eq. H1.2-1
		10	LC11 at 50.00%	0.01	OK	Eq. H1.2-1
		11	LC11 at 50.00%	0.01	OK	Eq. H1.2-1
		12	LC2 at 100.00%	0.07	OK	Eq. H1.2-1
		15	LC2 at 50.00%	0.15	OK	Eq. H1.2-1
		16	LC2 at 50.00%	0.15	OK	Eq. H1.2-1
		17	LC2 at 50.00%	0.14	OK	Eq. H1.1-1
		18	LC2 at 50.00%	0.13	OK	Eq. H1.2-1
		19	LC2 at 50.00%	0.14	OK	Eq. H1.2-1
		20	LC2 at 50.00%	0.15	OK	Eq. H1.2-1



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Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	2.50	0.00	0.00	0
3	0.00	2.00	0.00	0
4	2.50	2.00	0.00	0
5	0.00	0.00	-2.00	0
6	2.50	0.00	-2.00	0
7	0.00	2.00	-2.00	0
8	2.50	2.00	-2.00	0
9	3.00	0.00	-2.00	0
10	3.00	2.00	-2.00	0
11	-2.00	0.00	-2.00	0
12	-2.00	2.00	-2.00	0
13	1.875	2.00	0.00	0
14	1.25	2.00	0.00	0
15	0.625	2.00	0.00	0
16	1.875	2.00	-2.00	0
17	1.25	2.00	-2.00	0
18	0.625	2.00	-2.00	0
19	1.875	0.00	0.00	0
20	1.25	0.00	0.00	0
21	0.625	0.00	0.00	0

22	1.875	0.00	-2.00	0
23	1.25	0.00	-2.00	0
24	0.625	0.00	-2.00	0
54	2.75	2.00	-2.00	0
55	2.75	0.00	-2.00	0
51	-1.75	0.00	-2.00	0
50	-1.75	2.00	-2.00	0
52	0.50	2.00	-2.00	0
53	0.50	0.00	-2.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
54	1	1	1	0	0	0
55	1	1	1	0	0	0
51	1	1	1	0	0	0
50	1	1	1	0	0	0
52	1	1	1	0	0	0
53	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	12	10		L 2X2X1_4	A36	0.00	0.00	0.00
2	11	9		L 2X2X1_4	A36	0.00	0.00	0.00
3	3	7		Unistrut P1000	A36	0.00	0.00	0.00
4	1	5		Unistrut P1000	A36	0.00	0.00	0.00
5	2	6		Unistrut P1000	A36	0.00	0.00	0.00
6	4	8		Unistrut P1000	A36	0.00	0.00	0.00
7	3	4		Unistrut P1000	A36	0.00	0.00	0.00
8	1	2		Unistrut P1000	A36	0.00	0.00	0.00
9	1	3		Unistrut P1000	A36	0.00	0.00	0.00
10	2	4		Unistrut P1000	A36	0.00	0.00	0.00
11	6	8		Unistrut P1000	A36	0.00	0.00	0.00
12	5	7		Unistrut P1000	A36	0.00	0.00	0.00
13	2	8		L 2X2X1_4	A36	0.00	0.00	0.00
14	1	7		L 2X2X1_4	A36	0.00	0.00	0.00
15	13	16		Unistrut P1000	A36	0.00	0.00	0.00
16	14	17		Unistrut P1000	A36	0.00	0.00	0.00
17	15	18		Unistrut P1000	A36	0.00	0.00	0.00
18	19	22		Unistrut P1000	A36	0.00	0.00	0.00
19	20	23		Unistrut P1000	A36	0.00	0.00	0.00
20	21	24		Unistrut P1000	A36	0.00	0.00	0.00

Orientation of local axes

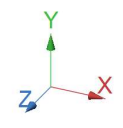
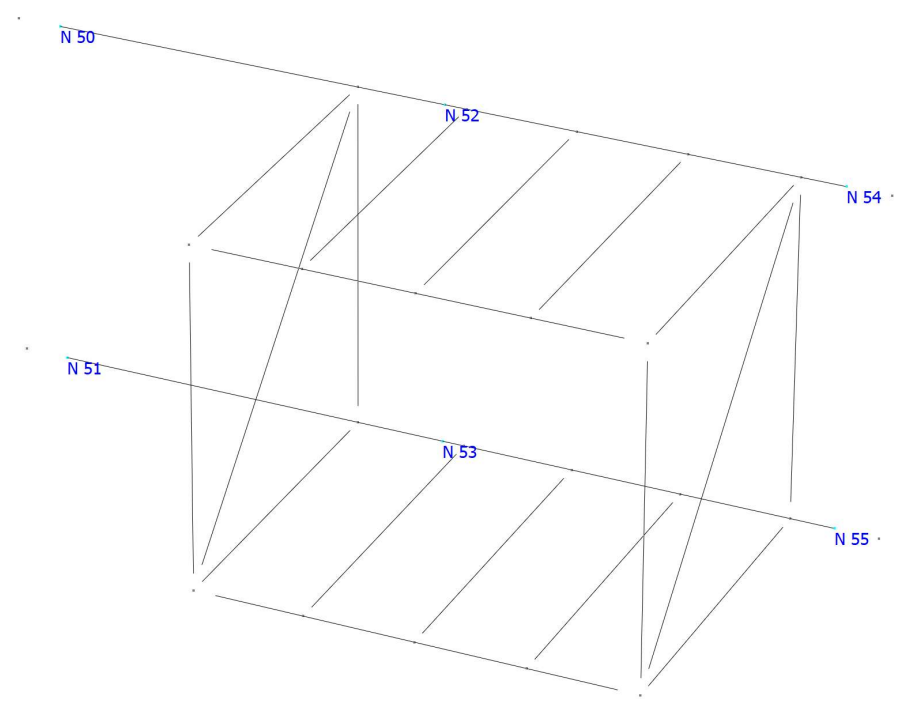
Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	90.00	0	0.00	0.00	0.00
3	90.00	0	0.00	0.00	0.00
4	90.00	0	0.00	0.00	0.00
5	90.00	0	0.00	0.00	0.00
6	90.00	0	0.00	0.00	0.00
7	90.00	0	0.00	0.00	0.00
8	90.00	0	0.00	0.00	0.00
9	180.00	0	0.00	0.00	0.00
10	180.00	0	0.00	0.00	0.00
11	180.00	0	0.00	0.00	0.00
12	180.00	0	0.00	0.00	0.00
13	90.00	0	0.00	0.00	0.00
14	180.00	0	0.00	0.00	0.00
15	90.00	0	0.00	0.00	0.00
16	90.00	0	0.00	0.00	0.00
17	90.00	0	0.00	0.00	0.00
18	270.00	0	0.00	0.00	0.00
19	270.00	0	0.00	0.00	0.00
20	270.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
2	0.00	-0.25	0.00	0.00	-0.25	0.00
3	0.00	-0.50	-0.75	0.00	-0.50	0.75
4	0.00	0.50	-0.75	0.00	0.50	0.75
5	0.00	0.50	-0.75	0.00	0.50	0.75
6	0.00	-0.50	-0.75	0.00	-0.50	0.75
7	0.75	-0.50	0.00	-0.75	-0.50	0.00
8	0.75	0.50	0.00	-0.75	0.50	0.00
9	0.00	-0.50	0.00	0.00	0.00	0.00
10	0.00	-0.50	0.00	0.00	0.00	0.00
11	0.00	-0.50	0.75	0.00	0.00	0.75
12	0.00	-0.50	0.75	0.00	0.00	0.75
13	1.50	0.00	0.00	1.50	0.00	0.00
14	-1.50	0.00	0.00	-1.50	0.00	0.00
15	0.00	-0.75	-0.75	0.00	-0.75	0.00
16	0.00	-0.75	-0.75	0.00	-0.75	0.00
17	0.00	-0.75	-0.75	0.00	-0.75	0.00
18	0.00	0.00	-0.75	0.00	0.00	0.00
19	0.00	0.00	-0.75	0.00	0.00	0.00
20	0.00	0.00	-0.75	0.00	0.00	0.00

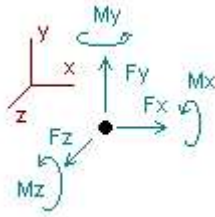
Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
3	1	1	0	0	1	1	0	0	0	0	Full
4	1	1	0	0	1	1	0	0	0	0	Full
5	1	1	0	0	1	1	0	0	0	0	Full
6	1	1	0	0	1	1	0	0	0	0	Full
9	1	1	0	0	1	1	0	0	0	0	Full
10	1	1	0	0	1	1	0	0	0	0	Full
11	1	1	0	0	1	1	0	0	0	0	Full
13	1	1	0	0	1	1	0	0	0	0	Full
14	1	1	0	0	1	1	0	0	0	0	Full



Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition DL=Dead Load						
50	0.00195	0.00393	-0.00597	0.00000	0.00000	0.00000
51	-0.01397	0.00250	0.00565	0.00000	0.00000	0.00000
52	0.00868	0.08114	-0.06459	0.00000	0.00000	0.00000
53	-0.04802	0.08487	0.06523	0.00000	0.00000	0.00000
54	-0.00187	0.05373	-0.04477	0.00000	0.00000	0.00000
55	0.05323	0.03782	0.04445	0.00000	0.00000	0.00000
SUM	0.00000	0.26398	0.00000	0.00000	0.00000	0.00000
Condition WL1=Wind Load (Side 1)						
50	0.00001	0.00021	0.00588	0.00000	0.00000	0.00000
51	-0.00169	-0.00001	0.00572	0.00000	0.00000	0.00000
52	0.00092	-0.00106	0.05213	0.00000	0.00000	0.00000
53	-0.01229	0.00061	0.05445	0.00000	0.00000	0.00000
54	-0.00088	-0.00054	0.02548	0.00000	0.00000	0.00000
55	0.01393	0.00079	0.02601	0.00000	0.00000	0.00000
SUM	0.00000	0.00000	0.16967	0.00000	0.00000	0.00000
Condition WL2=Wind Load (Side 2)						
50	0.00002	0.00102	0.00178	0.00000	0.00000	0.00000
51	-0.00281	-0.00119	0.00224	0.00000	0.00000	0.00000
52	0.02576	0.00350	0.01918	0.00000	0.00000	0.00000
53	0.04959	-0.00444	0.02488	0.00000	0.00000	0.00000
54	0.03503	-0.00324	-0.02096	0.00000	0.00000	0.00000
55	0.01388	0.00435	-0.02712	0.00000	0.00000	0.00000
SUM	0.12148	0.00000	0.00000	0.00000	0.00000	0.00000
Condition WL3=Wind Load (Side 3)						
SUM	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

Condition **WL4=Wind Load (Side 4)**

50	-0.00330	-0.00079	-0.00165	0.00000	0.00000	0.00000
51	0.00175	0.00122	-0.00226	0.00000	0.00000	0.00000
52	-0.04657	-0.00931	-0.01942	0.00000	0.00000	0.00000
53	-0.06859	0.00959	-0.02487	0.00000	0.00000	0.00000
54	-0.01079	-0.00012	0.02107	0.00000	0.00000	0.00000
55	0.00603	-0.00058	0.02713	0.00000	0.00000	0.00000

SUM	-0.12148	0.00000	0.00000	0.00000	0.00000	0.00000
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Condition **DI=Ice Load**

50	0.00370	0.00536	-0.01305	0.00000	0.00000	0.00000
51	-0.01687	0.00212	0.01258	0.00000	0.00000	0.00000
52	0.01667	0.17324	-0.13755	0.00000	0.00000	0.00000
53	-0.12603	0.18000	0.13851	0.00000	0.00000	0.00000
54	-0.00372	0.10908	-0.09592	0.00000	0.00000	0.00000
55	0.12626	0.07969	0.09544	0.00000	0.00000	0.00000

SUM	0.00000	0.54950	0.00000	0.00000	0.00000	0.00000
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Condition **LC1=1.4DL**

50	0.00272	0.00550	-0.00836	0.00000	0.00000	0.00000
51	-0.01956	0.00350	0.00791	0.00000	0.00000	0.00000
52	0.01215	0.11359	-0.09042	0.00000	0.00000	0.00000
53	-0.06723	0.11882	0.09132	0.00000	0.00000	0.00000
54	-0.00261	0.07522	-0.06268	0.00000	0.00000	0.00000
55	0.07452	0.05295	0.06223	0.00000	0.00000	0.00000

SUM	0.00000	0.36957	0.00000	0.00000	0.00000	0.00000
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Condition **LC2=1.2DL+1.6DI**

50	0.00825	0.01329	-0.02805	0.00000	0.00000	0.00000
51	-0.04375	0.00640	0.02690	0.00000	0.00000	0.00000
52	0.03708	0.37456	-0.29758	0.00000	0.00000	0.00000
53	-0.25927	0.38984	0.29988	0.00000	0.00000	0.00000
54	-0.00819	0.23901	-0.20720	0.00000	0.00000	0.00000
55	0.26589	0.17289	0.20604	0.00000	0.00000	0.00000

SUM	0.00000	1.19598	0.00000	0.00000	0.00000	0.00000
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Condition **LC3=1.2DL+0.5WL1**

50	0.00234	0.00482	-0.00423	0.00000	0.00000	0.00000
51	-0.01761	0.00299	0.00964	0.00000	0.00000	0.00000
52	0.01087	0.09683	-0.05144	0.00000	0.00000	0.00000
53	-0.06377	0.10215	0.10550	0.00000	0.00000	0.00000
54	-0.00268	0.06420	-0.04098	0.00000	0.00000	0.00000
55	0.07084	0.04578	0.06634	0.00000	0.00000	0.00000

SUM	0.00000	0.31678	0.08483	0.00000	0.00000	0.00000
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Condition **LC4=1.2DL+0.5WL2**

50	0.00234	0.00522	-0.00628	0.00000	0.00000	0.00000
51	-0.01817	0.00241	0.00790	0.00000	0.00000	0.00000
52	0.02329	0.09912	-0.06791	0.00000	0.00000	0.00000
53	-0.03282	0.09962	0.09072	0.00000	0.00000	0.00000
54	0.01528	0.06285	-0.06420	0.00000	0.00000	0.00000
55	0.07082	0.04756	0.03977	0.00000	0.00000	0.00000

SUM	0.06074	0.31678	0.00000	0.00000	0.00000	0.00000
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Condition **LC5=1.2DL+0.5WL3**

50	0.00234	0.00471	-0.00717	0.00000	0.00000	0.00000
51	-0.01676	0.00300	0.00678	0.00000	0.00000	0.00000
52	0.01041	0.09737	-0.07750	0.00000	0.00000	0.00000
53	-0.05762	0.10184	0.07828	0.00000	0.00000	0.00000
54	-0.00224	0.06447	-0.05372	0.00000	0.00000	0.00000
55	0.06388	0.04538	0.05334	0.00000	0.00000	0.00000
SUM	0.00000	0.31678	0.00000	0.00000	0.00000	0.00000

Condition **LC6=1.2DL+0.5WL4**

50	0.00069	0.00432	-0.00799	0.00000	0.00000	0.00000
51	-0.01589	0.00361	0.00565	0.00000	0.00000	0.00000
52	-0.01287	0.09271	-0.08721	0.00000	0.00000	0.00000
53	-0.09192	0.10664	0.06584	0.00000	0.00000	0.00000
54	-0.00764	0.06441	-0.04319	0.00000	0.00000	0.00000
55	0.06689	0.04509	0.06690	0.00000	0.00000	0.00000
SUM	-0.06074	0.31678	0.00000	0.00000	0.00000	0.00000

Condition **LC7=1.2DL+WL1**

50	0.00235	0.00492	-0.00129	0.00000	0.00000	0.00000
51	-0.01845	0.00299	0.01250	0.00000	0.00000	0.00000
52	0.01133	0.09630	-0.02538	0.00000	0.00000	0.00000
53	-0.06991	0.10246	0.13273	0.00000	0.00000	0.00000
54	-0.00312	0.06393	-0.02824	0.00000	0.00000	0.00000
55	0.07780	0.04618	0.07935	0.00000	0.00000	0.00000
SUM	0.00000	0.31678	0.16967	0.00000	0.00000	0.00000

Condition **LC8=1.2DL+WL2**

50	0.00235	0.00574	-0.00539	0.00000	0.00000	0.00000
51	-0.01957	0.00181	0.00902	0.00000	0.00000	0.00000
52	0.03617	0.10087	-0.05833	0.00000	0.00000	0.00000
53	-0.00803	0.09740	0.10316	0.00000	0.00000	0.00000
54	0.03279	0.06123	-0.07468	0.00000	0.00000	0.00000
55	0.07776	0.04973	0.02621	0.00000	0.00000	0.00000
SUM	0.12148	0.31678	0.00000	0.00000	0.00000	0.00000

Condition **LC9=1.2DL+WL3**

50	0.00234	0.00471	-0.00717	0.00000	0.00000	0.00000
51	-0.01676	0.00300	0.00678	0.00000	0.00000	0.00000
52	0.01041	0.09737	-0.07750	0.00000	0.00000	0.00000
53	-0.05762	0.10184	0.07828	0.00000	0.00000	0.00000
54	-0.00224	0.06447	-0.05372	0.00000	0.00000	0.00000
55	0.06388	0.04538	0.05334	0.00000	0.00000	0.00000
SUM	0.00000	0.31678	0.00000	0.00000	0.00000	0.00000

Condition **LC10=1.2DL+WL4**

50	-0.00096	0.00392	-0.00881	0.00000	0.00000	0.00000
51	-0.01502	0.00422	0.00452	0.00000	0.00000	0.00000
52	-0.03616	0.08805	-0.09693	0.00000	0.00000	0.00000
53	-0.12621	0.11143	0.05341	0.00000	0.00000	0.00000
54	-0.01303	0.06435	-0.03265	0.00000	0.00000	0.00000
55	0.06991	0.04480	0.08047	0.00000	0.00000	0.00000
SUM	-0.12148	0.31678	0.00000	0.00000	0.00000	0.00000

Condition **LC11=1.2DL+WL1+DI**

50	0.00604	0.01029	-0.01434	0.00000	0.00000	0.00000
51	-0.03532	0.00511	0.02508	0.00000	0.00000	0.00000
52	0.02800	0.26955	-0.16293	0.00000	0.00000	0.00000
53	-0.19594	0.28245	0.27123	0.00000	0.00000	0.00000
54	-0.00684	0.17301	-0.12416	0.00000	0.00000	0.00000
55	0.20406	0.12587	0.17479	0.00000	0.00000	0.00000

SUM 0.00000 0.86628 0.16967 0.00000 0.00000 0.00000

Condition **LC12=1.2DL+WL2+DI**

50	0.00605	0.01110	-0.01844	0.00000	0.00000	0.00000
51	-0.03644	0.00393	0.02160	0.00000	0.00000	0.00000
52	0.05284	0.27411	-0.19588	0.00000	0.00000	0.00000
53	-0.13406	0.27740	0.24166	0.00000	0.00000	0.00000
54	0.02907	0.17031	-0.17060	0.00000	0.00000	0.00000
55	0.20402	0.12942	0.12165	0.00000	0.00000	0.00000

SUM 0.12148 0.86628 0.00000 0.00000 0.00000 0.00000

Condition **LC13=1.2DL+WL3+DI**

50	0.00603	0.01007	-0.02022	0.00000	0.00000	0.00000
51	-0.03363	0.00512	0.01936	0.00000	0.00000	0.00000
52	0.02708	0.27061	-0.21505	0.00000	0.00000	0.00000
53	-0.18365	0.28184	0.21678	0.00000	0.00000	0.00000
54	-0.00596	0.17356	-0.14964	0.00000	0.00000	0.00000
55	0.19013	0.12508	0.14878	0.00000	0.00000	0.00000

SUM 0.00000 0.86628 0.00000 0.00000 0.00000 0.00000

Condition **LC14=1.2DL+WL4+DI**

50	0.00274	0.00929	-0.02187	0.00000	0.00000	0.00000
51	-0.03188	0.00634	0.01710	0.00000	0.00000	0.00000
52	-0.01950	0.26130	-0.23448	0.00000	0.00000	0.00000
53	-0.25224	0.29142	0.19191	0.00000	0.00000	0.00000
54	-0.01675	0.17343	-0.12857	0.00000	0.00000	0.00000
55	0.19616	0.12449	0.17591	0.00000	0.00000	0.00000

SUM -0.12148 0.86628 0.00000 0.00000 0.00000 0.00000

Condition **LC15=0.9DL+WL1**

50	0.00176	0.00375	0.00050	0.00000	0.00000	0.00000
51	-0.01426	0.00224	0.01081	0.00000	0.00000	0.00000
52	0.00873	0.07196	-0.00600	0.00000	0.00000	0.00000
53	-0.05551	0.07700	0.11316	0.00000	0.00000	0.00000
54	-0.00256	0.04781	-0.01481	0.00000	0.00000	0.00000
55	0.06183	0.03483	0.06601	0.00000	0.00000	0.00000

SUM 0.00000 0.23758 0.16967 0.00000 0.00000 0.00000

Condition **LC16=0.9DL+WL2**

50	0.00177	0.00456	-0.00360	0.00000	0.00000	0.00000
51	-0.01538	0.00106	0.00733	0.00000	0.00000	0.00000
52	0.03357	0.07653	-0.03895	0.00000	0.00000	0.00000
53	0.00638	0.07194	0.08359	0.00000	0.00000	0.00000
54	0.03335	0.04511	-0.06125	0.00000	0.00000	0.00000
55	0.06179	0.03839	0.01288	0.00000	0.00000	0.00000

SUM 0.12148 0.23758 0.00000 0.00000 0.00000 0.00000

Condition **LC17=0.9DL+WL3**

50	0.00175	0.00353	-0.00538	0.00000	0.00000	0.00000
51	-0.01257	0.00225	0.00509	0.00000	0.00000	0.00000
52	0.00781	0.07302	-0.05813	0.00000	0.00000	0.00000
53	-0.04322	0.07638	0.05871	0.00000	0.00000	0.00000
54	-0.00168	0.04836	-0.04029	0.00000	0.00000	0.00000
55	0.04791	0.03404	0.04000	0.00000	0.00000	0.00000

SUM	0.00000	0.23758	0.00000	0.00000	0.00000	0.00000
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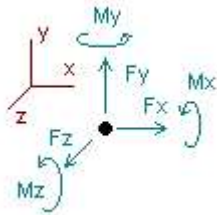
Condition **LC18=0.9DL+WL4**

50	-0.00154	0.00275	-0.00702	0.00000	0.00000	0.00000
51	-0.01082	0.00347	0.00283	0.00000	0.00000	0.00000
52	-0.03876	0.06371	-0.07755	0.00000	0.00000	0.00000
53	-0.11181	0.08597	0.03384	0.00000	0.00000	0.00000
54	-0.01247	0.04823	-0.01922	0.00000	0.00000	0.00000
55	0.05394	0.03345	0.06713	0.00000	0.00000	0.00000

SUM	-0.12148	0.23758	0.00000	0.00000	0.00000	0.00000
-----	----------	---------	---------	---------	---------	---------

Envelope for nodal reactions

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



Direction of positive forces and moments

Envelope of nodal reactions for :

- DL=Dead Load
- WL1=Wind Load (Side 1)
- WL2=Wind Load (Side 2)
- WL3=Wind Load (Side 3)
- WL4=Wind Load (Side 4)
- DI=Ice Load
- LC1=1.4DL
- LC2=1.2DL+1.6DI
- LC3=1.2DL+0.5WL1
- LC4=1.2DL+0.5WL2
- LC5=1.2DL+0.5WL3
- LC6=1.2DL+0.5WL4
- LC7=1.2DL+WL1
- LC8=1.2DL+WL2
- LC9=1.2DL+WL3
- LC10=1.2DL+WL4
- LC11=1.2DL+WL1+DI
- LC12=1.2DL+WL2+DI
- LC13=1.2DL+WL3+DI
- LC14=1.2DL+WL4+DI
- LC15=0.9DL+WL1
- LC16=0.9DL+WL2
- LC17=0.9DL+WL3

LC18=0.9DL+WL4

Node		Forces						Moments					
		Fx [Kip]	lc	Fy [Kip]	lc	Fz [Kip]	lc	Mx [Kip*ft]	lc	My [Kip*ft]	lc	Mz [Kip*ft]	lc
50	Max	0.008	LC2	0.013	LC2	0.006	WL1	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.003	WL4	-0.001	WL4	-0.028	LC2	0.00000	DL	0.00000	DL	0.00000	DL
51	Max	0.002	WL4	0.006	LC2	0.027	LC2	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.044	LC2	-0.001	WL2	-0.002	WL4	0.00000	DL	0.00000	DL	0.00000	DL
52	Max	0.053	LC12	0.375	LC2	0.052	WL1	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.047	WL4	-0.009	WL4	-0.298	LC2	0.00000	DL	0.00000	DL	0.00000	DL
53	Max	0.050	WL2	0.390	LC2	0.300	LC2	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.259	LC2	-0.004	WL2	-0.025	WL4	0.00000	DL	0.00000	DL	0.00000	DL
54	Max	0.035	WL2	0.239	LC2	0.025	WL1	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-0.017	LC14	-0.003	WL2	-0.207	LC2	0.00000	DL	0.00000	DL	0.00000	DL
55	Max	0.266	LC2	0.173	LC2	0.206	LC2	0.00000	DL	0.00000	DL	0.00000	DL
	Min	0.000	WL3	-0.001	WL4	-0.027	WL2	0.00000	DL	0.00000	DL	0.00000	DL

Date: 12/1/2020
 Project Name: HAMDEN-WHITNEYVILLE
 Project No.: CT5317
 Designed By: CL Checked By: MSC



CHECK CONNECTION CAPACITY (Worst Case)

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

Bolt Type = **A36 1/2"** Threaded Rod

Allowable Tensile Load =

$F_{Tall} = 4271$ lbs.

Allowable Shear Load =

$F_{vall} = 2562$ lbs.

TENSILE FORCES

Reaction **F = 300** lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: **259** lbs. (See Bently Output)

Reactions in Y direction: **390** lbs. (See Bently Output)

Resultant: **468** lbs.

No. of Supports = **1**

No. of Bolts / Support = **1**

Tension Design Load / Bolts =

$f_t = 300.00$ lbs. $<$ 4270.6 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

$f_v = 468.17$ lbs. $<$ 2562.4 lbs. **Therefore, OK !**

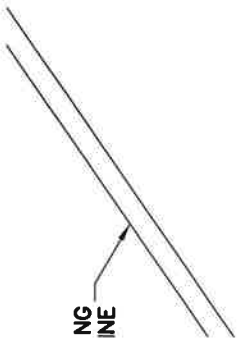
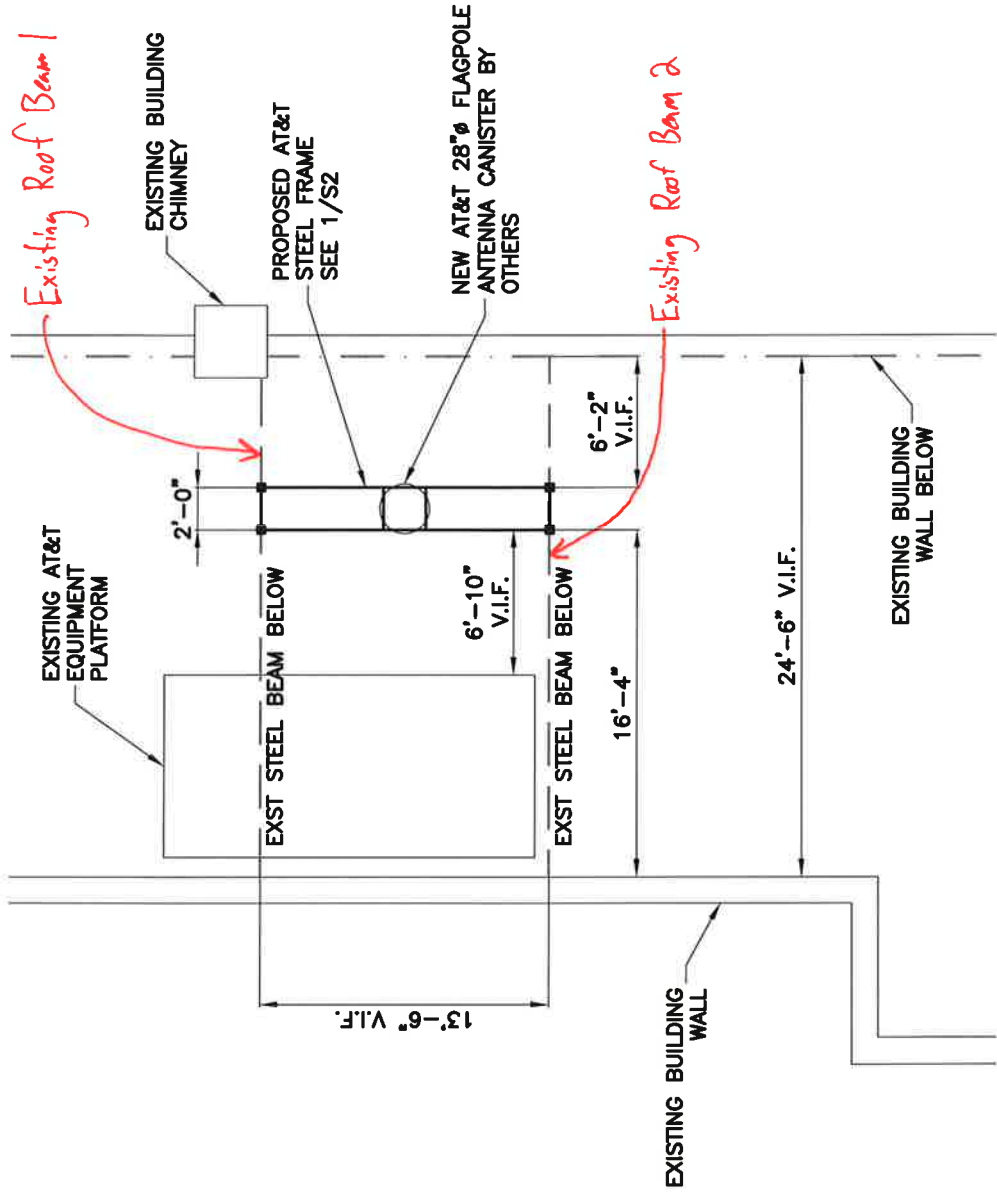
CHECK COMBINED TENSION AND SHEAR

f_t / F_T + f_v / F_v \leq 1.0
 0.070 + 0.183 = 0.253 $<$ 1.0 **Therefore, OK !**



HUDSON
Design Group LLC

Roof Framing Calculations



Steel Beam

Lic. #: KW-06013026

File: CT5317 (LTE 3C-4C-RETRO)(Rev.3).ec6
 Software copyright ENERCALC, INC. 1983-2020, Build:12.20.8.17
 Hudson Design Group LLC

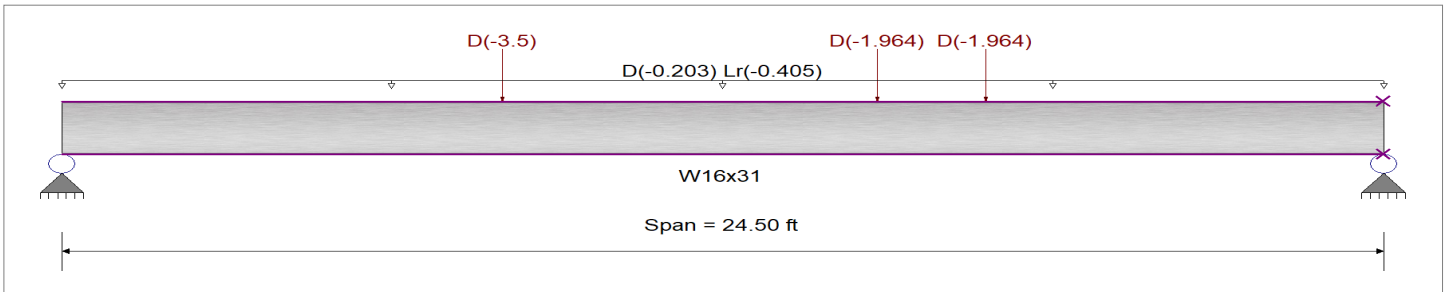
DESCRIPTION: CT5317 - Existing Roof Beam

CODE REFERENCES

Calculations per AISC 360-10, IBC 2015, CBC 2016, ASCE 7-10
 Load Combination Set : ASCE 7-10

Material Properties

Analysis Method : **Allowable Strength Design** Fy : Steel Yield : **36.0 ksi**
 Beam Bracing : **Beam is Fully Braced against lateral-torsional buckling** E: Modulus : **29,000.0 ksi**
 Bending Axis : **Major Axis Bending**



Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Beam self weight calculated and added to loading

Load(s) for Span Number 1

Point Load : D = -3.50 k @ 8.170 ft, (Equipment Platform (Support 1 of 4))

Point Load : D = -1.964 k @ 15.130 ft, (Enclosure Mount Platform)

Point Load : D = -1.964 k @ 17.130 ft, (Enclosure Mount Platform)

Uniform Load : D = -0.2030, Lr = -0.4050 k/ft, Tributary Width = 1.0 ft, (Ultimate Distributed Load)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.763 : 1	Maximum Shear Stress Ratio =	0.172 : 1
Section used for this span	W16x31	Section used for this span	W16x31
Ma : Applied	74.050 k-ft	Va : Applied	10.821 k
Mn / Omega : Allowable	97.006 k-ft	Vn/Omega : Allowable	62.964 k
Load Combination	+D+Lr	Load Combination	+D+Lr
Location of maximum on span	12.530ft	Location of maximum on span	24.500 ft
Span # where maximum occurs	Span # 1	Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.000 in	Ratio =	0 <360
Max Upward Transient Deflection	-0.303 in	Ratio =	969 >=360
Max Downward Total Deflection	0.000 in	Ratio =	0 <240.0
Max Upward Total Deflection	-0.743 in	Ratio =	396 >=240.

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values					Summary of Shear Values				
			M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx	Vnx/Omega
D Only	Dsgn. L = 24.50 ft	1	0.451	0.093		-43.72	43.72	162.00	97.01	1.00	1.00	5.86	94.45	62.96
+D+Lr	Dsgn. L = 24.50 ft	1	0.763	0.172		-74.05	74.05	162.00	97.01	1.00	1.00	10.82	94.45	62.96
+D+0.750Lr	Dsgn. L = 24.50 ft	1	0.685	0.152		-66.46	66.46	162.00	97.01	1.00	1.00	9.58	94.45	62.96
+0.60D	Dsgn. L = 24.50 ft	1	0.270	0.056		-26.23	26.23	162.00	97.01	1.00	1.00	3.52	94.45	62.96

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+Lr	-0.7428	12.320

Project Title: **HAMDEN-WHITNEYVILLE**
Engineer: **Connor J. Leavitt**
Project ID: **CT5317**
Project Descr:

Printed: 30 NOV 2020, 11:12AM

Steel Beam

File: CT5317 (LTE 3C-4C-RETRO)(Rev.3).ec6
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Hudson Design Group LLC

Lic. # : KW-06013026

DESCRIPTION: **CT5317 - Existing Roof Beam**

Vertical Reactions

Support notation : Far left is #1

Values in KIPS

Load Combination	Support 1	Support 2
Overall MAXimum	-10.742	-10.820
Overall MINimum	-3.468	-3.516
D Only	-5.781	-5.859
+D+Lr	-10.742	-10.820
+D+0.750Lr	-9.502	-9.580
+0.60D	-3.468	-3.516
Lr Only	-4.961	-4.961



HUDSON
Design Group LLC

Reference Documents

CHECK ROOF STRUCTURE UNDER PLATFORM

Load Combinations (reference ASCE 7-10)

- 1) DL
- 2) DL + LLr
- 3) DL+ SL

Roof Dead Load

For Roof: Roof Planks - 3 psf
 Roofing - 2 psf
 Mech & Miscl - 5 psf

Roof Dead Load: $DL_R := 10\text{psf}$

Ceiling Dead Load

For Dropped Ceiling: Ceiling Drywall - 4 psf
 Framing - 1 psf

Ceiling Dead Load: $DL_C := 5.0\text{psf}$

Equipment Platform Dead Load

Total Weight:
 includes equipment & platform

$$P_{\text{platform}} := \frac{14000\text{lb}}{4} = 3500\text{lb}$$

Roof Live Load

Per ASCE7-10: $LL_r := 20\text{psf}$ ASCE 7-10 Table 4-1

Snow Load

Ground Snow Loads: $p_g := 30\text{psf}$ ASCE 7-10: Figure 7-1

Thermal factor $C_t := 1.0$ ASCE 7-10: Table 7-3

Exposure Factor $C_e := 0.9$ ASCE 7-10: Table 7-2
 Upper Level, Fully exposed

Importance factor: $I_s := 1.0$ ASCE 7-10: Table 1.5-1
 Risk Category II
 Table 7-4

Flat Roof Snow Loads: $P_f := 0.7 \cdot C_e \cdot C_t \cdot I_s \cdot p_g$ ASCE 7-10: Eq 7-1
 $P_f = 18.9 \cdot \text{psf}$

Rain on Snow Surcharge: $P_f := P_f + 0\text{psf}$ ASCE 7-10: Section 7.10
 $P_f = 18.9 \cdot \text{psf}$

Minimum Roof Snow Load: $P_{f_min} := 20 \cdot I_s \cdot \text{psf} = 20 \cdot \text{psf}$ ASCE 7-10: Section 7.3
 $P_f := \max(P_f, P_{f_min})$
 $P_f = 20 \cdot \text{psf}$

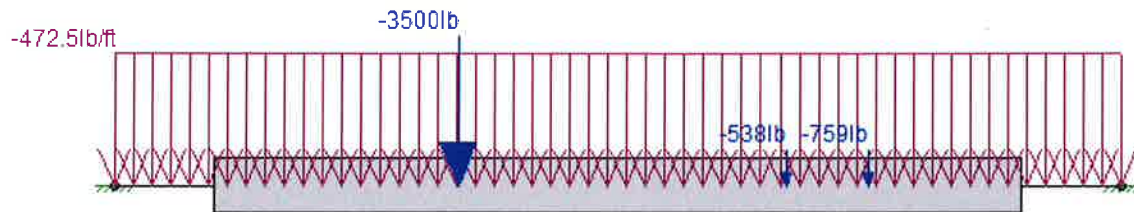
CALCULATION SHEET



Loads on Roof Beam

- Beam Tributary Width: $W_{Trib} := 13\text{ft} + 6\text{in}$
- Beam Dead Load: $w_{DLr} := (DL_R + DL_C) \cdot W_{Trib} = 202.5 \cdot \text{plf}$
- Beam Live Load: $w_{LL} := LL_r \cdot W_{Trib} = 270 \cdot \text{plf}$
- Beam Snow Load: $w_{SL} := P_f \cdot W_{Trib} = 270 \cdot \text{plf}$

Load Configuration: (shown for DL+SL+Platform+Flagpole Frame)



Bending Check:



Shear Check:



Code Check	
Black	No Calc
Red	> 1.0
Pink	.90-1.0
Green	.75-.90
Blue	.50-.75
Dark Blue	0-.50

Beam: **M1**

Shape: **W16X31**
 Material: **A36 Gr.36**
 Length: **294 in**
 I Joint: **N1**
 J Joint: **N2**

LC 3: **DL + Addition + SL**
 Code Check: **0.844 (bending)**
 Report Based On 97 Sections

AISC 14th(360-10): ASD Code Check Direct Analysis Method

Max Bending Check	0.844	Max Shear Check	0.141 (y)
Location	128.625 in	Location	0 in
Equation	H1-1b	Max Defl Ratio	L/412
Bending Flange	Compact	Compression Flange	Non-Slender Qs=1
Bending Web	Compact	Compression Web	Slender Qa=1

Fy	36 ksi	y-y	Lb	147 in	z-z	Lb	147 in
Pnc/om	85171.073 lb	KL/r	126.137			22.937	
Pnt/om	196814.371 lb						
Mny/om	12.629 k-ft						
Mnz/om	68.219 k-ft	L Comp Flange	147 in				
Vny/om	62964 lb	Warp Length	NC				
Vnz/om	62942.659 lb	L-torque	294 in				
Cb	1	Tau_b	1				



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

CERTIFIED MAIL RETURN RECEIPT REQUESTED

July 21, 2017

Daniel M. Laub, Esq.,
Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, NY 10601

RE: **PETITION NO. 1300** - New Cingular Wireless PCS, LLC (AT&T) petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed replacement and relocation of an existing rooftop telecommunications facility installed at the front of the building with a new rooftop telecommunications facility to be installed at the rear of the building located at 1 Circular Avenue, Hamden, Connecticut.

Dear Attorney Laub:

At a public meeting held on July 20, 2017, the Connecticut Siting Council (Council) considered and ruled that the above-referenced proposal would not have a substantial adverse environmental effect, and pursuant to Connecticut General Statutes § 16-50k, would not require a Certificate of Environmental Compatibility and Public Need with the following conditions:

1. AT&T shall implement the RF safety recommendations as identified in Section 5.2 of SiteSafe report dated March 8, 2017;
2. AT&T shall install the steel frame in accordance with Section 6.0 of the Structural Analysis Report prepared by Com EX Consultants, LLC and stamped by Ahmet Colakoglu, P.E. on March 31, 2017;
3. Approval of any minor project changes be delegated to Council staff;
4. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as is practicable.
5. Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the Town of Hamden.

6. Unless otherwise approved by the Council, the existing rooftop flagpole tower shall be removed within 180 days of the installation of the new flagpole tower;
7. If the facility ceases to provide wireless services for a period of one year, the petitioner shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council within 90 days from the one year period of cessation of service. The petitioner may submit a written request for an extension of the 90 day period no later than 60 days prior to expiration of the 90 day period;
8. The Council shall be notified in writing within 45 days of when the existing flagpole tower is removed and the new flagpole tower is operational unless a written request for an extension is submitted to the Council within that timeframe;
9. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by the Petitioner shall be removed within 60 days of the date the antenna ceased to function;
10. The facility owner/operator shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v;
11. This Declaratory Ruling may be transferred, provided the facility owner/operator/transferor is current with payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v and the transferee provides written confirmation that the transferee agrees to comply with the terms, limitations and conditions contained in the Declaratory Ruling, including timely payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v; and
12. If the facility owner/operator is a wholly owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the facility within 30 days of the sale and/or transfer.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition dated April 24, 2017, and additional information received on May 30, and June 16, 2017.

Enclosed for your information is a copy of the staff report on this project.

Very truly yours,



Robert Stein
Chairman

RS/MP/bm

Enclosure: Staff Report dated July 20, 2017

- c: The Honorable Curt B. Leng, Mayor, Town of Hamden
Dan Kops, Town Planner, Town of Hamden
Christopher Fisher, Cuddy & Feder
Martin McCarthy, Building/Property Owner

1 CIRCULAR AVE

Location 1 CIRCULAR AVE

Mblu 2225/ 603/ / /

Acct#

Owner CHIMA ENTERPRISE INC

Assessment \$595,070

Appraisal \$850,100

PID 20331

Building Count 1

Current Value

Appraisal					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2020	\$371,400	\$0	\$258,300	\$220,400	\$850,100

Assessment					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2020	\$259,980	\$0	\$180,810	\$154,280	\$595,070

Owner of Record

Owner CHIMA ENTERPRISE INC
Co-Owner BRUNO CHIMA
Address 1 CIRCULAR AVE
HAMDEN, CT 06514

Sale Price \$725,000
Certificate
Book & Page 4676/ 265
Sale Date 02/13/2020
Instrument 00

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
CHIMA ENTERPRISE INC	\$725,000		4676/ 265	00	02/13/2020
SEVENTEEN MILE REAL ESTATE LLC	\$850,500		4615/ 247	00	06/25/2019
MARTIN MCCARTHY (MARTIN-MCCARTHY)	\$0		825/ 30	00	07/13/1987

Building Information

Building 1 : Section 1

Year Built: 1926
Living Area: 9,344
Building Percent Good: 25

Building Attributes

Field	Description
STYLE	Office Bldg
MODEL	Comm/Ind
Grade	B
Stories:	2
Occupancy	1
Exterior Wall 1	Stone
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Drywall
Interior Wall 2	
Interior Floor 1	Carpet
Interior Floor 2	
Heating Fuel	Gas
Heating Type	Hot Water
AC Type	Central
Bldg Use	OFFICE BLD M94
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	3400
Heat/AC	HEAT/AC SPLIT
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
Ceiling/Wall	SUS-CEIL & WL
Rooms/Prtns	AVERAGE
Wall Height	10
% Comn Wall	0

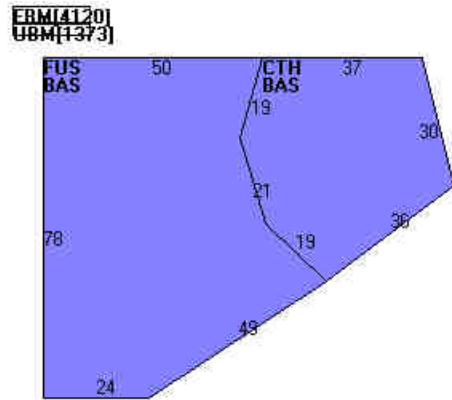
Building Photo



2225-603-00-0000 04/27/2015

(<http://images.vgsi.com/photos/HamdenCTPhotos/\00\04\43\68.JPG>)

Building Layout



(http://images.vgsi.com/photos/HamdenCTPhotos//Sketches/20331_20331)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	5,574	5,574
FUS	Upper Story, Finished	3,770	3,770
CTH	Cathedral Ceiling	1,804	0
FBM	Basement, Finished	4,120	0
UBM	Basement, Unfinished	1,373	0
		16,641	9,344

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 3400
Description OFFICE BLD M94
Zone T5
Neighborhood R
Alt Land Appr No
Category

Land Line Valuation

Size (Acres) 0.34
Frontage 0
Depth 0
Assessed Value \$154,280
Appraised Value \$220,400

Outbuildings

Outbuildings						<u>Legend</u>
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	PAVING-ASPHALT			7500 S.F.	\$8,300	1
CELL	CELL SITE			1 UNITS	\$250,000	1

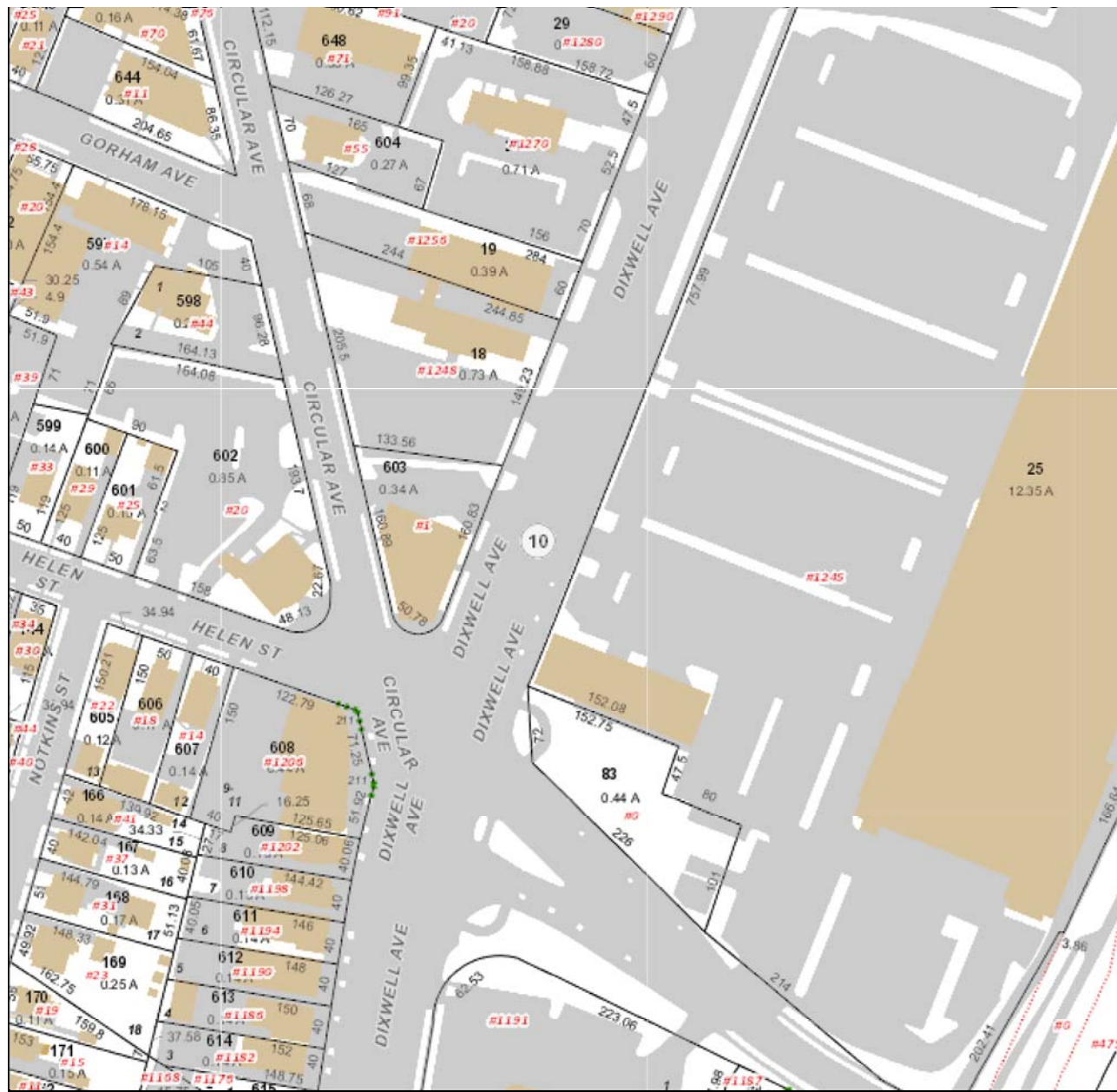
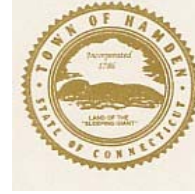
Valuation History

Appraisal					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2019	\$276,000	\$0	\$155,100	\$202,200	\$633,300
2018	\$276,000	\$0	\$155,100	\$202,200	\$633,300
2017	\$276,000	\$0	\$155,100	\$202,200	\$633,300

Assessment					
Valuation Year	Building	Extra Features	Outbuildings	Land	Total
2019	\$193,200	\$0	\$108,570	\$141,540	\$443,310
2018	\$193,200	\$0	\$108,570	\$141,540	\$443,310
2017	\$193,200	\$0	\$108,570	\$141,540	\$443,310

Town of Hamden

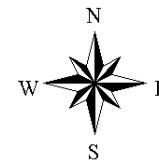
Geographic Information System (GIS)




MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Hamden and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 150 feet





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 TOWN OF HAMDEN
 2750 DIXWELL AVE
 CC: MR MARK AUSTIN - ACTING TOWN PLAN
 HAMDEN CT 06518-3320

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Ship Date: 03/27/2021	
Expected Delivery Date: 03/29/2021	

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To: MAYOR CURT B LENG
 TOWN OF HAMDEN
 2750 DIXWELL AVE
 CC: MR MARK AUSTIN - ACTING TOWN PLAN
 HAMDEN CT 06518-3320

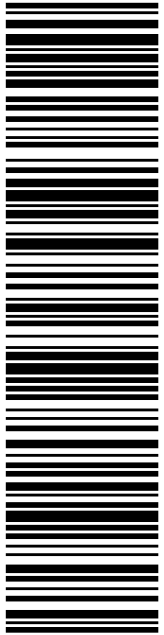
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 1 CIRCULAR AVE
 HAMDEN CT 06514-4002

USPS TRACKING #



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

To: CHIMA ENTERPRISE, INC.
 1 CIRCULAR AVE
 HAMDEN CT 06514-4002

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