

CONNECTICUT SITING COUNCIL

SUB-PETITION OF NEW CINGULAR WIRELESS)
PCS, LLC ("AT&T") TO THE CONNECTICUT)
SITING COUNCIL FOR MODIFICATION OF AN)
EXISTING WIRELESS TELECOMMUNICATIONS) SUB-PETITION NO. _____
FACILITY AT 1389 WEST MAIN STREET)
WATERBURY, CONNECTICUT) MARCH 4, 2020
)

SUB-PETITION FOR DECLARATORY RULING TO
APPROVE ELIGIBLE FACILITIES REQUEST FOR MODIFICATION OF AN EXISTING
WIRELESS TELECOMMUNICATIONS FACILITY
WITHOUT SUBSTANTIAL PHYSICAL CHANGE TO EXISTING BASE STATION AT
1389 WEST MAIN STREET, WATERBURY, CONNECTICUT

I. Introduction

On behalf of New Cingular Wireless PCS, LLC ("AT&T"), we respectfully submit this letter and enclosures seeking administrative approval of a needed modification of an existing facility pursuant to Section 6409 of the Federal Middle-Class Tax Relief and Job Creation Act of 2012 ("Section 6409"). AT&T hereby petitions the Connecticut Siting Council ("Council") to modify the existing rooftop tower facility ("Facility") at 1389 West Main Street, Waterbury, Connecticut (the "Premises"). More specifically AT&T is proposing to modify the Facility by replacing the existing 18'4" flagpole in the southern corner of the rooftop and the 10'8" stealth chimney in the northern corner of the rooftop with three (3) new 13'6" stealth chimneys in the southern, northern, and western corners of the rooftop. AT&T also proposes to replace and install new RRHs within the stealth enclosures, replace equipment within the existing equipment cabinet, and replace cables and other electrical equipment. None of this work represents a substantial change to the existing Facility.

II. Existing Facility and Site Background

The Premises is currently owned by JME Services, Inc. and is improved with the 3-story, 38'-6" tall (with additional 1'-8" tall parapet) Waterbury Medical Center building. AT&T's Facility was originally approved by the City of Waterbury Zoning Board of Appeals in 2002 as shown in Attachment 6 and AT&T currently maintains its 18'4" flagpole and 10'8" stealth chimney facility pursuant to the Council's approval of AT&T's Petition Number 1258 in 2016. AT&T maintains its equipment on a rooftop platform.

AT&T's Facility currently consists of 6 panel antennas total. The existing 18'4" roof-mounted flagpole in the southern corner of the rooftop supports 2 panel antennas at the centerline height of 46' and 2 panel antennas at the centerline height of 54'. The existing 10'8" roof-mounted stealth chimney in the northern corner of the rooftop includes 2 panel antennas at the centerline height of 48'.

III. Proposed Modification

AT&T proposes to modify its Facility by replacing the existing 18'4" flagpole in the southern corner of the rooftop and the 10'6" stealth chimney in the northern corner of the rooftop with three (3) new 13'6" stealth chimneys in the southern, northern, and western corners of the rooftop. AT&T also proposes to replace and install new RRHs within the stealth enclosures, replace equipment within the existing equipment cabinet, and replace cables and other electrical equipment. None of this work represents a substantial change to the existing Facility. Construction Drawings prepared by Hudson Design Group LLC last updated February 25, 2020 illustrating the proposed modification are included in Attachment 1. A Structural Analysis Report prepared by Hudson Design Group LLP last updated May 29, 2019 confirming that the existing structure can accommodate AT&T's proposed modification is included in Attachment 2.¹

IV. The Modification Does Not Represent a Substantial Change to the Physical Dimensions of the Existing Base Station and is an Eligible Facilities Request

Section 6409 requires that within 60 days of submission, a state or local agency must approve an "eligible facilities request for a modification of an existing wireless tower or base station that does not substantially change the physical dimensions of such tower or base station."² Section 6409 and the FCC Regulations provide that a modification does not constitute a "substantial change" of the physical dimensions of a base station if it meets the following criteria:³

- A. Modification does not increase the height by more than the greater of 10% of the structure height or by 10'. AT&T's proposed modifications will decrease the height of the existing Facility. AT&T's existing Facility extends to a height of 58'6" above grade level at its highest point. AT&T proposes to replace this existing equipment with new stealth enclosures that will only extend to 52' above grade level. Thus, AT&T's proposed modifications will reduce the overall height of the rooftop tower facility.
- B. Modification does not add an appurtenance to the body of the base station that would protrude from the edge of the structure by more than 6'. AT&T's proposed replacement equipment will not be located on the edge of the building.
- C. Modification does not involve installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets. AT&T proposes only to replace an existing equipment cabinet with a new equipment cabinet. AT&T does not propose to install any additional equipment cabinets.
- D. Modification does not require excavation or deployment outside the current site of the tower or base station. No excavation is proposed or required for this modification.
- E. The collocation does not defeat the existing concealment elements of the tower or base station. AT&T's modification will not defeat the existing concealment elements of its Facility. AT&T proposes to incorporate new concealment elements into the Facility through its implementation of stealth chimneys that will match the existing color and design of the building. Photosimulations prepared by Hudson Design Group LLC dated August 28, 2019 are included as Attachment 3.

¹ The calculations included in the Structural Analysis Report are being filed as a bulk filing given the volume of these calculations.

² 47 USCA § 1455(a)(1).

³ 47 CFR § 1.6100(b)(7).

- F. The proposal complies with conditions associated with the prior approval of the tower or base station and any non-compliance is due to an increase in height, increase in width, addition of cabinets, or new excavation that does not exceed the corresponding “substantial change” thresholds. The proposed modifications comply with all conditions or prior approvals and the parameters of Section 6409.

In light of the foregoing, AT&T’s proposal constitutes an “eligible facilities request” under Section 6409 as it is a “replacement of transmission equipment” at the existing Facility which does not constitute a “substantial change” to the physical dimensions of the existing Facility.

V. Compliance with FCC MPE Limits

The Facility will be within 31.03% of the Federal and State emission standards for the general public. A copy of the Maximum Permissible Exposure Report completed by SAI Communications, Inc. dated January 27, 2020 is included in Attachment 4. As such, the total radio frequency power density will be well within standards adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and the Maximum Permissible Exposure (“MPE”) limits established by the Federal Communications Commission for the public.

VI. Notice

Pursuant to Petition 1133, a notice letter and a copy of this Sub-Petition was provided to the City of Waterbury and the abutting property owners. Copies of this correspondence may be found in Attachment 5.

VII. Conclusion

It is respectfully submitted that AT&T’s proposal satisfies the criteria of Section 6409, while also enhancing wireless communication services to the community and enabling users to access a state-of-the-art, digital system for voice communications, messaging, and data transmission and reception.

Respectfully Submitted,



Lucia Chiochio
On behalf of AT&T

cc: City of Waterbury
Abutting Property Owners
AT&T
SAI Communications, Inc.
Daniel Patrick, Esq.

1

PROJECT INFORMATION

SCOPE OF WORK: TELECOMMUNICATIONS FACILITY UPGRADE (LTE 3C/4C/ANT MOD 2019 UPGRADE);

SITE ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708

LANDOWNER: MULTIPLE

APPLICANT: AT&T MOBILITY-NEW ENGLAND
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

LATITUDE: 41.549191 N, 41° 32' 57.09" N

LONGITUDE: 73.065298 W, 73° 03' 55.07" W

TYPE OF SITE: ROOFTOP / OUTDOOR EQUIPMENT

BUILDING HEIGHT: 38'-6"±

RAD CENTER: 48'-0"±

CURRENT USE: TELECOMMUNICATIONS FACILITY

PROPOSED USE: TELECOMMUNICATIONS FACILITY



SITE NUMBER: CT5440

SITE NAME: WATERBURY WEST

FA CODE: 10071305

PACE ID: MRCTB035288, MRCTB035310, MRCTB035295

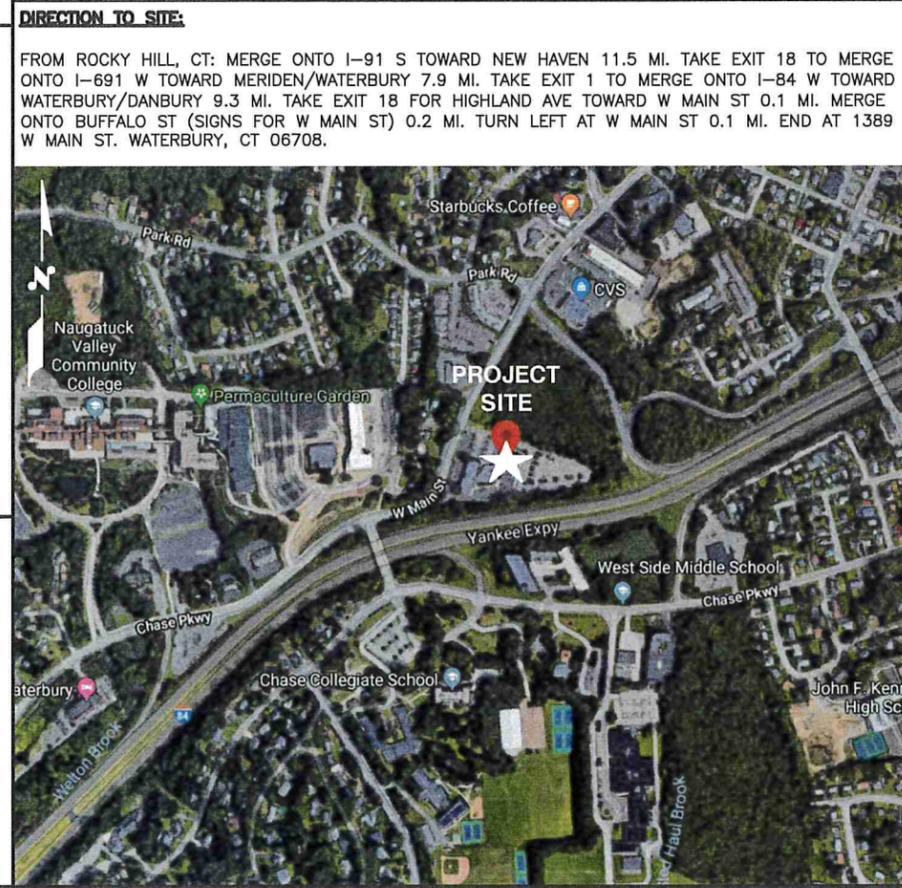
PROJECT: LTE 3C/4C/ANT MOD 2019 UPGRADE

ISSUED FOR ZONING

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
C-1	PLOT PLAN	1
C-2	ABUTTERS LIST	1
C-3	ABUTTERS LIST	1
A-1	ROOF & EQUIPMENT PLAN	1
A-2	EXISTING ELEVATION	1
A-3	PROPOSED ELEVATION	1
A-4	EXISTING ANTENNA LAYOUTS	1
A-5	PROPOSED ANTENNA LAYOUTS	1
A-6	DETAILS	1

VICINITY MAP



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.

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5440
SITE NAME: WATERBURY WEST

1389 WEST MAIN STREET
WATERBURY, CT 06708
NEW HAVEN COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	02/25/20	ISSUED FOR ZONING	GA	HC	DPH
0	02/20/20	ISSUED FOR REVIEW	GA	HC	DPH
A	01/28/20	ISSUED FOR REVIEW	GA	HC	DPH

SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: GA



AT&T	
TITLE SHEET (LTE 3C_4C_ANT MOD)	
SITE NUMBER	DRAWING NUMBER
CT5440	T-1
REV	1

0315-0047-0001 1389 WEST MAIN ST N/F PECK BRIAN M D 1389 WEST MAIN ST WATERBURY CT 06708-3104	0315-0045-0039 MOHICAN AVE N/F CITY OF WATERBURY 235 GRAND ST WATERBURY, CT 06702	0316-0624-0034 47 VERNON ST N/F 47 VERNON STREET LLC 47 VERNON ST WATERBURY, CT 06708	0341-0625-0014 109 PONHAM ST N/F APONTE JAIME 109 PONHAM ST WATERBURY, CT 06708	0341-0625-0033 396 CHASE PARKWAY N/F KALWARA WALTER I 396 CHASE PARKWAY WATERBURY CT 06708-3342	0339-0066-0010 50 COUNTRY CLUB RD N/F MAISTO WILLIAM D & KATHLEEN SURV 50 COUNTRY CLUB RD WATERBURY CT 06708-3313	0315-0046-1312 1312 WEST MAIN ST UNIT 101 N/F CSM REALTY LLC ROBERT LEVENTHAL, M.D. 166 WATERBURY RD., SUITE 104 PROSPECT CT 06712
0315-0047-0015 WEST MAIN ST N/F VILEISIS PETER J 370 WATERTOWN RD MIDDLEBURY, CT 06762	0315-0045-0331 25 QUINSIGAMOND AVE N/F CUEVAS PRISCILLA E 25 QUINSIGAMOND AVE WATERBURY, CT 06708-0000	0316-0048-0023 69 VERNON ST N/F NUNEZ CARLOS G 69 VERNON ST WATERBURY, CT 06708-3008	0341-0625-0015 115 PONHAM ST N/F BAUTISTA FREDY & LENOR SURV 115 PONHAM ST WATERBURY, CT 06708	0341-0625-0032 CHASE PARKWAY N/F KALWARA WALTER I 396 CHASE PARKWAY WATERBURY CT 06708-3342	0363-0066-0001 60 COUNTRY CLUB RD N/F WALSH WILLIAM & LUNINGNING SURV 60 COUNTRY CLUB RD WATERBURY, CT 06708	0314-0046-0076 55 DOUGLAS AVE N/F SIMPSON SCOTT 55 DOUGLAS AVE WATERBURY, CT 06708
0315-0042-0016 1279 WEST MAIN ST N/F SI WATERBURY LLC C/O JRI ADVISORS LLC AGENT FOR SHERWOOD 10 EXECUTIVE DR FARMINGTON CT 06032	0315-0045-0034 QUINSIGAMOND AVE N/F CUEVAS PRISCILLA E 25 QUINSIGAMOND AVE WATERBURY, CT 06708	0316-0048-0024 75 VERNON ST N/F BERNARDI CARMINE 77 VERNON ST WATERBURY, CT 06708-3008	0340-0051-0004 123 PONHAM ST N/F ALBINI ASSOCIATES LLC 430 CHASE PARKWAY WATERBURY, CT 06708	0341-0625-0031 CHASE PARKWAY N/F ALBINI ASSOCIATES LLC 430 CHASE PARKWAY WATERBURY, CT 06708-3342	0339-0065-0650 650 CHASE PARKWAY N/F RF OTHO LLC 650 CHASE PARKWAY WATERBURY, CT 06708	0314-0046-0075 49 DOUGLAS AVE N/F CLOUSE HANS & INGRID SURV 49 DOUGLAS AVENUE WATERBURY, CT 06708-2726
0315-0042-0019 1249 WEST MAIN ST N/F 84 WATERBURY LLC 109 NICHOLS DR WATERBURY CT 06708-4799	0315-0045-0035 37 QUINSIGAMOND AVE N/F JAGOE PATRICE A 37 QUINSIGAMOND AVE WATERBURY, CT 06708	0316-0048-0025 83 VERNON ST N/F BREIVE SCOTT M 83 VERNON ST WATERBURY, CT 06708	0340-0051-0003 430 CHASE PARKWAY N/F ALBINI ASSOCIATES LLC 430 CHASE PARKWAY WATERBURY CT 06708-3342	0341-0050-0060 185 BIRCHWOOD ST N/F MOREL JOSE T & RINA SURV 185 BIRCHWOOD ST WATERBURY CT 06708	0314-0065-0008 1460 WEST MAIN ST N/F STATE OF CONNECTICUT NAUGATUCK VALLEY COMMUNITY 1460 WEST MAIN ST WATERBURY, CT 06708	0314-0046-0074 43 DOUGLAS AVE N/F CHOWANSKY EDWARD & GLORIA O'CONNOR 43 DOUGLAS AVE WATERBURY, CT 06708-2726
0315-0044-0026 SUSSEX AVE N/F CORONEL CARLOS A & CARMEN E 74 BALMFORTH AVE # 2 DANBURY, CT 06710	0315-0045-0351 43 QUINSIGAMOND AVE N/F WILLIS JENNIFER 33 PEARL ST 1ST FL WATERBURY CT 06704	0341-0625-0008 61 PONHAM ST N/F TULACRO WILLIAM J & SANDRA PISCATELLI (TC) 6 WRIGHT ST WATERBURY CT 06708-3037	0341-0625-0027 WRIGHT ST N/F TULACRO WILLIAM J & SANDRA PISCATELLI (TC) 6 WRIGHT ST WATERBURY CT 06708-3037	0341-0050-0113 483 CHASE PARKWAY N/F CITY OF WATERBURY WEST SIDE MIDDLE SCHOOL 235 GRAND ST WATERBURY CT 06702	0339-0046-0008 1404 WEST MAIN ST N/F BATISTA MICHAEL & ALEXANDER ALICKI JR & ADAM SEBASTIAN (TC) 54 HILLSIDE AVE WATERBURY CT 06710	0314-0046-0073 37 DOUGLAS AVE N/F MCARDLE MARY ROSE 37 DOUGLAS AVE WATERBURY, CT 06708
0315-0044-0027 SUSSEX AVE N/F CORONEL CARMEN E & CARLOS A SURV 74 BALMFORTH AVE #2 DANBURY CT 06810-5625	0315-0045-0036 88 VERNON ST MANCINI PELLEGRINO & MARGHERITA SURV 88 VERNON ST WATERBURY CT 06708-3032	0341-0625-0019 68 ELK AVE N/F LAWRIE AVINASH S & SUSAN SURV 68 ELK AVE WATERBURY, CT 06708	0341-0626-0035 87 ELK AVE N/F NIELE STEVEN M 87 ELK AVE WATERBURY, CT 06708-3025	0340-0050-0006 455 CHASE PARKWAY N/F CHCT CONNECTICUT LLC 3326 ASPEN GROVE DR SUITE 150 FRANKLIN TN 37067	0339-0046-0007 1392 WEST MAIN ST N/A BATISTA MICHAEL & ALEXANDER ALICKI JR & ADAM SEBASTIAN (TC) 54 HILLSIDE AVE WATERBURY CT 06710	0314-0046-0072 31 DOUGLAS AVE N/F MOREIRA ARMANDO & ORIALYS AMER-HERNANDEZ SURV 31 DOUGLAS AVE WATERBURY CT 06708
0315-0044-0271 SUSSEX AVE N/A CORONEL MIRIAN J 44 QUINSIGAMOND AVE WATERBURY, CT 06708	0315-0045-0038 53 MOHICAN AVE N/F CALABRESE MARK 38 FAIRLAWN ST FARMINGTON CT 06032	0341-0625-0181 70 ELK AVE N/F COLE WALTER A & ELSIE B SURV 261 MAGNOLIA HILL RD BETHLEHEM, CT 06751-0000	0341-0626-0036 6 FULTON ST N/F COX WILLIAM A JR & MERILYNN M COX & DAVID A COX FITZ-HENRY SURV 960 WEST WHEATGRASS PLACE TUCSON AZ 85737	0340-0050-0005 475 CHASE PARKWAY N/F 500 CHASE PARKWAY CONDOMINIUM ASSOCIATION INC 500 CHASE PARKWAY % NORMAN DRUBNER WATERBURY CT 06708	0339-0046-0131 WEST MAIN ST N/F STEVENS CLARA F TRUSTEE OF THE RITA C FRANCISCO TRUST FBO PAUL D FRANCISCO P O BOX 110552 BRADENTON FL 34211	0314-0046-0071 25 DOUGLAS AVE N/F PARKS MICHELE R 25 DOUGLAS AVE WATERBURY CT 06708
0315-0044-0261 26 QUINSIGAMOND AVE N/F CORONEL CARLOS A & CARMEN E 74 BALMFORTH AVE # 2 DANBURY, CT 06810	0315-0045-0381 MOHICAN AVE N/F CALABRESE MARK 38 FAIRLAWN ST FARMINGTON CT 06032	0341-0625-0009 69 PONHAM ST N/F CANALES IVETTE M 60 PONHAM ST WATERBURY CT 06708	0341-0626-0351 19 WRIGHT ST N/F CORNEAU DAVID T 15 ROLLING RIDGE PROSPECT, CT 06712	0364-0050-0011 503 CHASE PARKWAY N/F SAINT JOHN'S EVANGELICAL LUTHERAN CHURCH 503 CHASE PARKWAY WATERBURY, CT 06708	0315-0046-0013 1376 WEST MAIN ST N/F STEVENS CLARA F TRUSTEE OF THE RITA C FRANCISCO TRUST FBO PAUL D FRANCISCO P O BOX 110552 BRADENTON FL 34211	0314-0046-0070 17 DOUGLAS AVE N/F GARCIA NILSA M 17 DOUGLAS AVE WATERBURY, CT 06708
0315-0044-0030 38 QUINSIGAMOND AVE N/F CORONEL CARMEN E & CARLOS A SURV 74 BALMFORTH AVE DANBURY, CT 06810	0316-0045-0001 78 VERNON ST N/F BANNO BARBARA J 78 VERNON ST WATERBURY, CT 06708-3032	0341-0625-0017 90 ELK AVE N/F CYR AUSTIN M 90 ELK ST WATERBURY CT 06708	0341-0626-0341 WRIGHT ST N/F MUANDA-NZUZI FRANCINE 380 CHASE PKWY WATERBURY CT 06708-3342	0340-0050-0001 565 CHASE PARKWAY N/F CHASE COLLEGIATE LAND LLC 3090 INDEPENDENCE DR LIVERMORE CA 94551	0315-0046-0012 1374 WEST MAIN ST N/F MULHALL PATRICK G & DONNA S SURV 1374 WEST MAIN ST WATERBURY CT 06708	0314-0046-0691 PARK RD N/F PALOMBA CAMILLE T (LU), CHARLES A, ANTHONY A, ETAL 71 PARK RD WATERBURY, CT 06708-2753
0315-0044-0272 44 QUINSIGAMOND AVE N/F CORONEL MIRIAN J 44 QUINSIGAMOND AVE WATERBURY, CT 06708	0316-0045-0002 68 VERNON ST N/F MANBODH NALINI & MERVYN NELENNON (TC) 68 VERNON ST WATERBURY CT 06708	0341-0625-0017 90 ELK AVE N/F CYR AUSTIN M 90 ELK ST WATERBURY CT 06708	0341-0625-0028 16 WRIGHT ST N/F ROSARIO RAYMOND 16 WRIGHT ST WATERBURY CT 06708	0340-0049-0005 CHASE PARKWAY N/F J S D PARTNERS CHASE PARKWAY WATERBURY, CT 06708-3343	0315-0046-0011 1336 WEST MAIN ST N/F PATRICIAN PROPERTIES LLC 21673 JUEGO CIRCLE #3B BOCA RATON FL 33433	0314-0046-0069 71 PARK RD N/F PALOMBA CAMILLE T (LU) & CHARLES ANTHONY & ANTHONY ARTHUR & ANDREANA PALOMBA ETAL 71 PARK RD WATERBURY CT 06708
0315-0044-0029 52 QUINSIGAMOND AVE N/F MONTALVO ESTHER P 52 QUINSIGAMOND AVE WATERBURY, CT 06708	0316-0042-0006 90 MOHICAN AVE N/F GUGLIOTTI ROCCO & MELANIE SURV 125 EVELYN ST OAKVILLE CT 06779	0341-0625-0016 ELK AVE N/F CYR AUSTIN M 90 ELK ST WATERBURY CT 06708	0341-0625-0029 WRIGHT ST N/F KALWARA WALTER I 396 CHASE PARKWAY WATERBURY CT 06708-3342	0340-0049-0500 500 CHASE PARKWAY N/F PHYSICAL THERAPY REALTY LLC 500 CHASE PARKWAY WATERBURY, CT 06708-3343	0315-0046-1320 1320 WEST MAIN ST N/F PARK WEST LLC 1320 WEST MAIN ST WATERBURY, CT 06708	0314-0065-0050 48 DOUGLAS AVE N/F PERFECT HOMES LLC PO BOX 4400 WATERBURY, CT 06704
0315-0045-0001 111 MOHICAN AVE N/F SPERA ANTONIO 111 MOHICAN AVE WATERBURY, CT 06708	0316-0042-0007 56 VERNON ST N/F ZISI PIRO 56 VERNON ST WATERBURY CT 06708-3033	0341-0625-0013 105 PONHAM ST N/F TAGGETT CAROL A & MARGARET E SURV 1250 NEW HAVEN AVE NAUGATUCK, CT 06770	0341-0625-0030 WRIGHT ST N/F KALWARA WALTER I 396 CHASE PARKWAY WATERBURY CT 06708-3342	0339-0066-0009 22 COUNTRY CLUB RD N/F KEATING EST MARY G C/O ROSEMARY K LEITZ 211 FERN ST WEST HARTFORD CT 06119		0314-0065-0051 44 DOUGLAS AVE N/F CROSBY SHARON M 580 HORTON HILL RD NAUGATUCK, CT 06770

45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
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12 INDUSTRIAL WAY
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SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: GA

AT&T	
ABUTTERS LIST (LTE 3C_4C_ANT MOD)	
SITE NUMBER	DRAWING NUMBER
CT5440	C-2
REV	1

0314-0065-0052
38 DOUGLAS AVE
N/F
LEPORE HARMONY
38 DOUGLAS AVE
WATERBURY CT 06708

0314-0065-0053
32 DOUGLAS AVE
N/F
RYAN JOHN P & LORRAINE SURV
32 DOUGLAS AVE
WATERBURY, CT 06708-2727

0314-0065-0054
28 DOUGLAS AVE
N/F
PAVAN ANDREW L & JUDITH A SURV
28 DOUGLAS AVE
WATERBURY, CT 06708-2727

0314-0065-0055
22 DOUGLAS AVE
N/F
JONES DONTE & STACEY HATZIKOSTAS SURV
22 DOUGLAS AVE
WATERBURY CT 06708

0314-0065-0541
DOUGLAS AVE
N/F
PAVAN ANDREW L & JUDITH A SURV
28 DOUGLAS AVE
WATERBURY, CT 06708-2727

0314-0065-0056
16 DOUGLAS AVE
N/F
LIOTUS LINDA
16 DOUGLAS AVE
WATERBURY, CT 06708

0314-0065-0571
12 DOUGLAS AVE
N/F
SPELLMAN DAWN
12 DOUGLAS AVE
WATERBURY, CT 06708

0314-0065-0057
DOUGLAS AVE
N/F
SPELLMAN DAWN
12 DOUGLAS AVE
WATERBURY, CT 06708

0314-0065-0058
91 PARK RD
N/F
GIUDITTA YOLANDA G
91 PARK RD
WATERBURY, CT 06708-2740

0314-0065-0059
91 PARK RD
N/F
GIUDITTA ALFRED E & YOLANDA A
91 PARK RD
WATERBURY, CT 06708-2740

0314-0065-0060
97 PARK RD
N/F
GANCHER DEBRA G & JOHN W RENDER SURV
97 PARK RD
WATERBURY, CT 06708

0314-0065-0063
101 PARK RD
N/F
THOMAS LAKIAH & NINA SURV
101 PARK RD
WATERBURY, CT 06708

0314-0065-0062
129 PARK RD
N/F
BENCHMARK PROPERTY MANAGEMENT LLC
100 MAIN ST SOUTH # 257
SOUTHURY, CT 06488

0314-0065-0622
ANDREW LANE
N/F
MACDONALD SUSAN A & CHRISTOPHER
M ARMSTRONG SURV
81 HILLSIDE AVE
PLYMOUTH, CT 06782-0000

0314-0065-0621
28 ANDREW LANE
N/F
KULLA XHANI & ARTA SURV
28 ANDREW LANE
WATERBURY, CT 06708

0314-0065-0612
26 ANDREW LANE
N/F
DERY SANDRA LOIS
26 ANDREW LANE
WATERBURY, CT 06708-2725

0314-0065-0422
17 JOYCROFT RD
N/F
SALVUCCI GREGG L & KRISTINE
MURPHY-SALVUCCI SURV
17 JOYCROFT RD
WATERBURY, CT 06708

0314-0065-0043
25 JOYCROFT RD
N/F
LOFASO SARAH
25 JOYCROFT RD
WATERBURY, CT 06708

0314-0065-0044
33 JOYCROFT RD
N/F
VELEZ SOPHIA
33 JOYCROFT RD
WATERBURY, CT 06708

0314-0065-0045
39 JOYCROFT RD
N/F
CHILES WANDA
39 JOYCROFT RD
WATERBURY, CT 06708-2309

0314-0065-0046
45 JOYCROFT RD
N/F
FORTIN ROLAND P & DONNA D ETAL SURV
45 JOYCROFT ROAD
WATERBURY, CT 06708-2309

0314-0065-0047
53 JOYCROFT RD
N/F
SECRETARY OF HOUSING AND URBAN
DEVELOPMENT
C/O ISN CUSTOMER SERVICE
2401 NW 23RD ST SUITE 1D
OKLAHOMA CITY OK 73107

0314-0065-0048
61 JOYCROFT RD
N/F
MANNING PATRICK BURKE
340 PLATT RD
WATERTOWN, CT 06795

0314-0065-0009
56 JOYCROFT RD
N/F
CRUZ WALTER
56 JOYCROFT RD
WATERBURY CT 06708-2341

0314-0065-0010
50 JOYCROFT RD
N/F
MADDEN MICHAEL F & SUZZANE SURV
50 JOYCROFT RD
WATERBURY, CT 06708-2341

0314-0065-0011
42 JOYCROFT RD
N/F
ESPOSITO ANNE M
42 JOYCROFT RD
WATERBURY, CT 06708-2341

0314-0065-0012
15 CARDINAL LANE
N/F
MERCADO JOHANNA & JULIO TORRES SURV
15 CARDINAL LANE
WATERBURY CT 06708

0314-0065-0013
21 CARDINAL LANE
N/F
ROSS EDWARD J & MYRTLEE SURV
21 CARDINAL LANE
WATERBURY CT 06708-2307

0289-0617-0791
110 PARK RD
N/F
RICCIARDI MARTHA P
110 PARK RD
WATERBURY, CT 06708-2739

0314-0617-0064
92 PARK RD
N/F
ALBUQUERQUE SERGIO G & ANNA A SURV
92 PARK RD
WATERBURY, CT 06708

0314-0617-0065
86 PARK RD
N/F
SILVA LAURA
86 PARK RD
WATERBURY, CT 06708

0289-0617-0061
37 ROBINWOOD RD
N/F
MARINO-TURRELL JANICE
37 ROBINWOOD RD
WATERBURY CT 06708

0289-0617-0060
27 ROBINWOOD RD
N/F
BOLINSKI MARY L
27 ROBINWOOD RD
WATERBURY, CT 06708-2407

0314-0617-0066
23 ROBINWOOD RD
N/F
SHEPPARD MARVIN E & MARIA ROSADO-SHEPPAR
SURV
23 ROBINWOOD RD
WATERBURY CT 06708-

0314-0617-0067
ROBINWOOD RD
N/F
SHEPPARD MARVIN E & MARIA ROSADO-SHEPPAR
SURV
23 ROBINWOOD RD
WATERBURY, CT 06708

0315-0040-0001
134 FERN CIRCLE
N/F
LUDDY MARGARET N
134 FERN CIRCLE
WATERBURY CT 06708-2745

0290-0040-0050
128 FERN CIRCLE
N/F
BRADSHAW CHERYL GUERTIN
52 TROY ST
WEST HARTFORD, CT 06119

0290-0040-0027
52 ROBINWOOD RD
N/F
SUMMA KARA J
52 ROBINWOOD RD
WATERBURY, CT 06708

0290-0040-0049
FERN CIRCLE
N/F
HARLOW EST RUSSELL M
C/O LISA J HARLOW
47 UCONN DR
BRISTOL CT 06010

0290-0040-0048
112 FERN CIRCLE
N/F
HARLOW EST RUSSELL M
C/O LISA J HARLOW
47 UCONN DR
BRISTOL CT 06010

0315-0041-0003
133 FERN CIRCLE
N/F
DEPAOLA DAVID
133 FERN CIRCLE
WATERBURY, CT 06708-0000

0315-0041-0004
28 PARK RD
N/F
MIRANDA WILSON
28 PARK RD
WATERBURY, CT 06708

0315-0041-0005
22 PARK RD
N/F
TRACEY DALEILA
22 PARK RD
WATERBURY, CT 06708

0315-0041-0006
1262 WEST MAIN ST
N/F
LAUREN INVESTMENT CORPORATION (THE)
C/O TD BANK LEASE & TAX DEPT
10B -380 WELLINGTON ST
LONDON, ONTARIO N6A 4S4 CANADA N6A 4S4

0290-0041-0051
FERN CIRCLE
N/F
PUZACKE TARA
115 FERN CIRCLE
WATERBURY, CT 06708

0290-0041-0052
115 FERN CIRCLE
N/F
PUZACKE TARA
115 FERN CIRCLE
WATERBURY, CT 06708

0290-0041-0053
FERN CIRCLE
N/F
PUZACKE TARA
115 FERN CIRCLE
WATERBURY, CT 06708

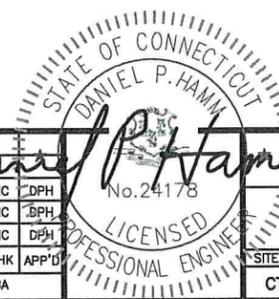
0315-0464-0007
WEST MAIN ST
N/F
CITY OF WATERBURY
235 GRAND ST
WATERBURY, CT 06702



SITE NUMBER: CT5440
SITE NAME: WATERBURY WEST
1389 WEST MAIN STREET
WATERBURY, CT 06708
NEW HAVEN COUNTY



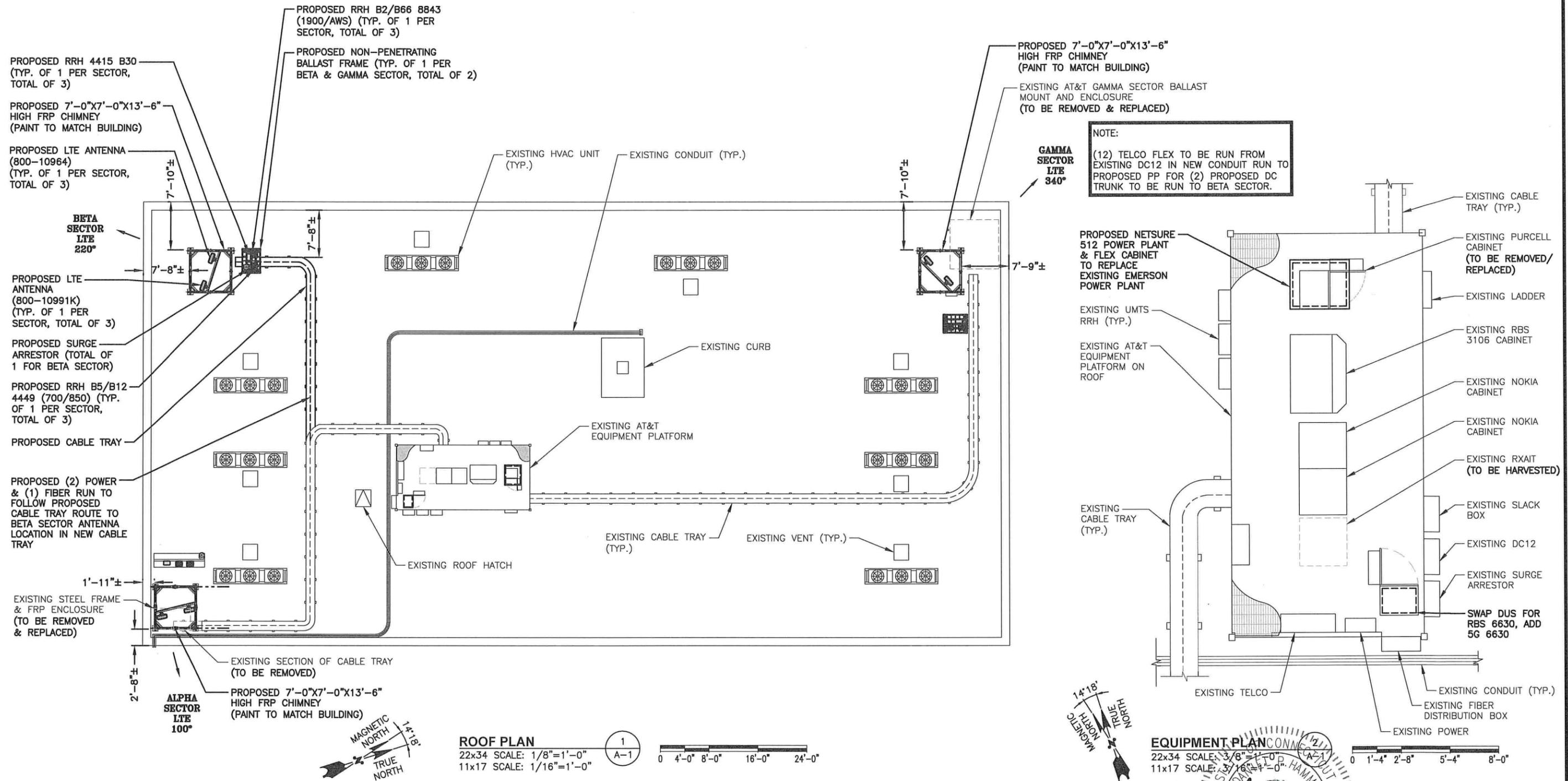
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0	02/20/20	ISSUED FOR REVIEW	GA	HC	DPH
A	01/28/20	ISSUED FOR REVIEW	GA	HC	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: HC	DRAWN BY: GA		



AT&T	
ABUTTERS LIST (LTE 3C_4C_ANT MOD)	
SITE NUMBER	DRAWING NUMBER
CT5440	C-3
REV	1

NOTE:
REFER TO STRUCTURAL ANALYSIS
BY: HUDSON DESIGN GROUP, LLC,
DATED: MAY 28, 2019,
FOR THE CAPACITY OF THE
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NOTE:
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FOR FINAL ANTENNA SETTINGS.



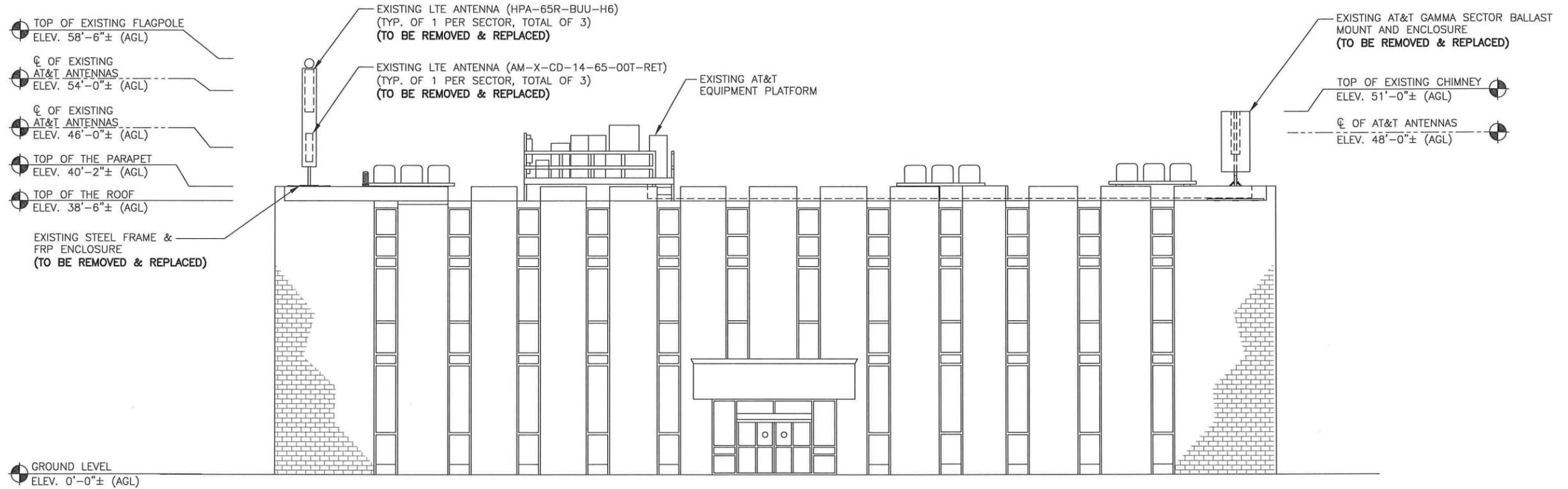
ROOF PLAN
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

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

<p>45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586</p>	<p>12 INDUSTRIAL WAY SALEM, NH 03079</p>	<p>SITE NUMBER: CT5440 SITE NAME: WATERBURY WEST</p> <p>1389 WEST MAIN STREET WATERBURY, CT 06708 NEW HAVEN COUNTY</p>	<p>500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067</p>	<table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>REVISIONS</th> <th>BY</th> <th>CHK</th> <th>APP'D</th> </tr> <tr> <td>1</td> <td>02/25/20</td> <td>ISSUED FOR ZONING</td> <td>GA</td> <td>HC</td> <td>DPH</td> </tr> <tr> <td>0</td> <td>02/20/20</td> <td>ISSUED FOR REVIEW</td> <td>GA</td> <td>HC</td> <td>DPH</td> </tr> <tr> <td>A</td> <td>01/28/20</td> <td>ISSUED FOR REVIEW</td> <td>GA</td> <td>HC</td> <td>DPH</td> </tr> </table>	NO.	DATE	REVISIONS	BY	CHK	APP'D	1	02/25/20	ISSUED FOR ZONING	GA	HC	DPH	0	02/20/20	ISSUED FOR REVIEW	GA	HC	DPH	A	01/28/20	ISSUED FOR REVIEW	GA	HC	DPH	<p>AT&T</p> <p>Roof & Equipment Plan (LTE 3C_4C_ANT MOD)</p>
				NO.	DATE	REVISIONS	BY	CHK	APP'D																				
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0	02/20/20	ISSUED FOR REVIEW	GA	HC	DPH																								
A	01/28/20	ISSUED FOR REVIEW	GA	HC	DPH																								
<p>SCALE: AS SHOWN</p>	<p>DESIGNED BY: HC</p>	<p>DRAWN BY: GA</p>	<p>SITE NUMBER: CT5440</p>	<p>DRAWING NUMBER: A-1</p>	<p>REV: 1</p>																								

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

1
A-2

0 4'-0" 8'-0" 16'-0" 24'-0"

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

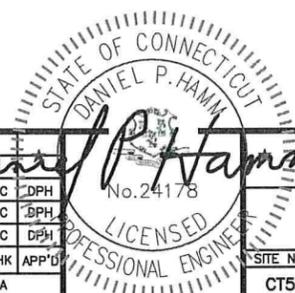
SAI
12 INDUSTRIAL WAY SALEM, NH 03079

SITE NUMBER: CT5440
SITE NAME: WATERBURY WEST
1389 WEST MAIN STREET WATERBURY, CT 06708 NEW HAVEN COUNTY

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

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SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: GA



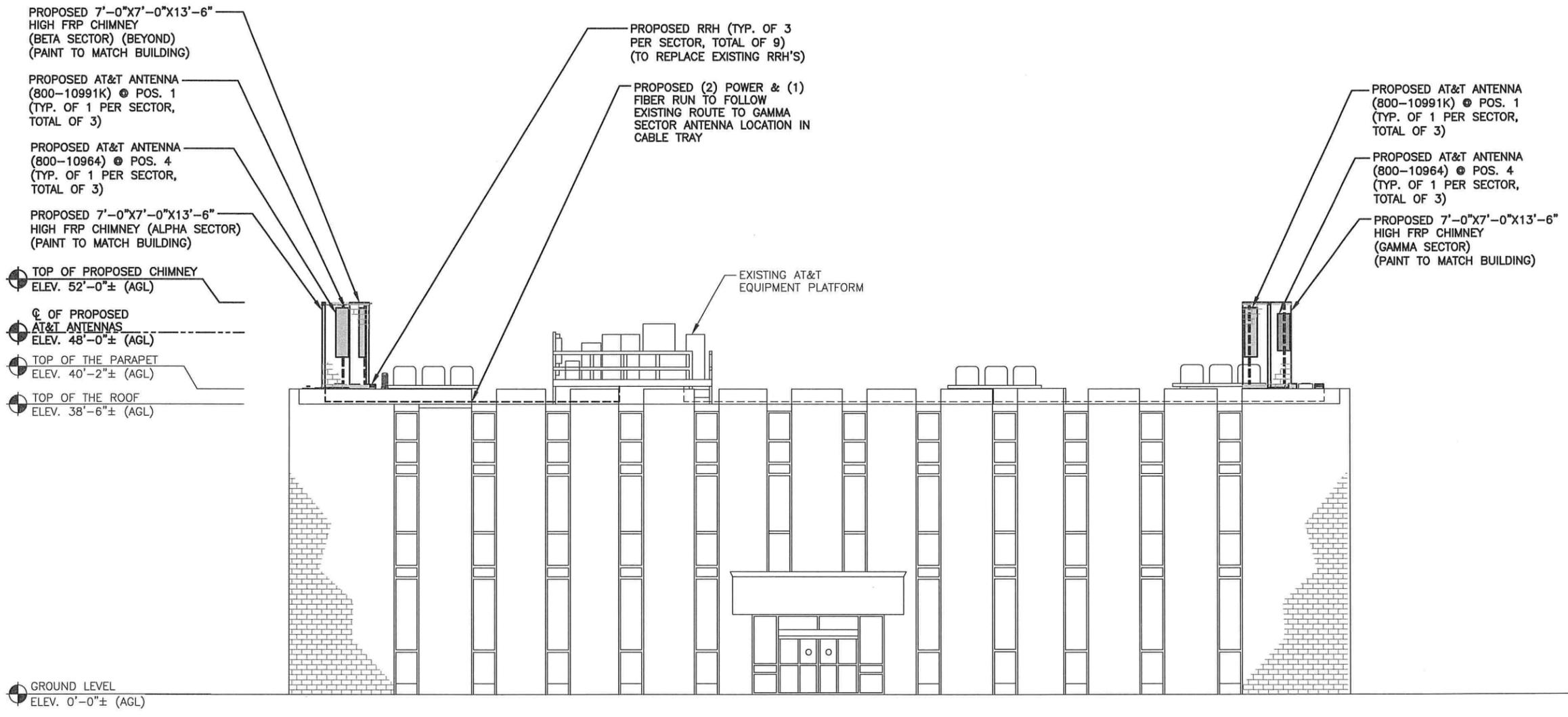
AT&T

EXISTING ELEVATION (LTE 3C_4C_ANT MOD)

SITE NUMBER	DRAWING NUMBER	REV
CT5440	A-2	1

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PROPOSED ELEVATION 1
A-3
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-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

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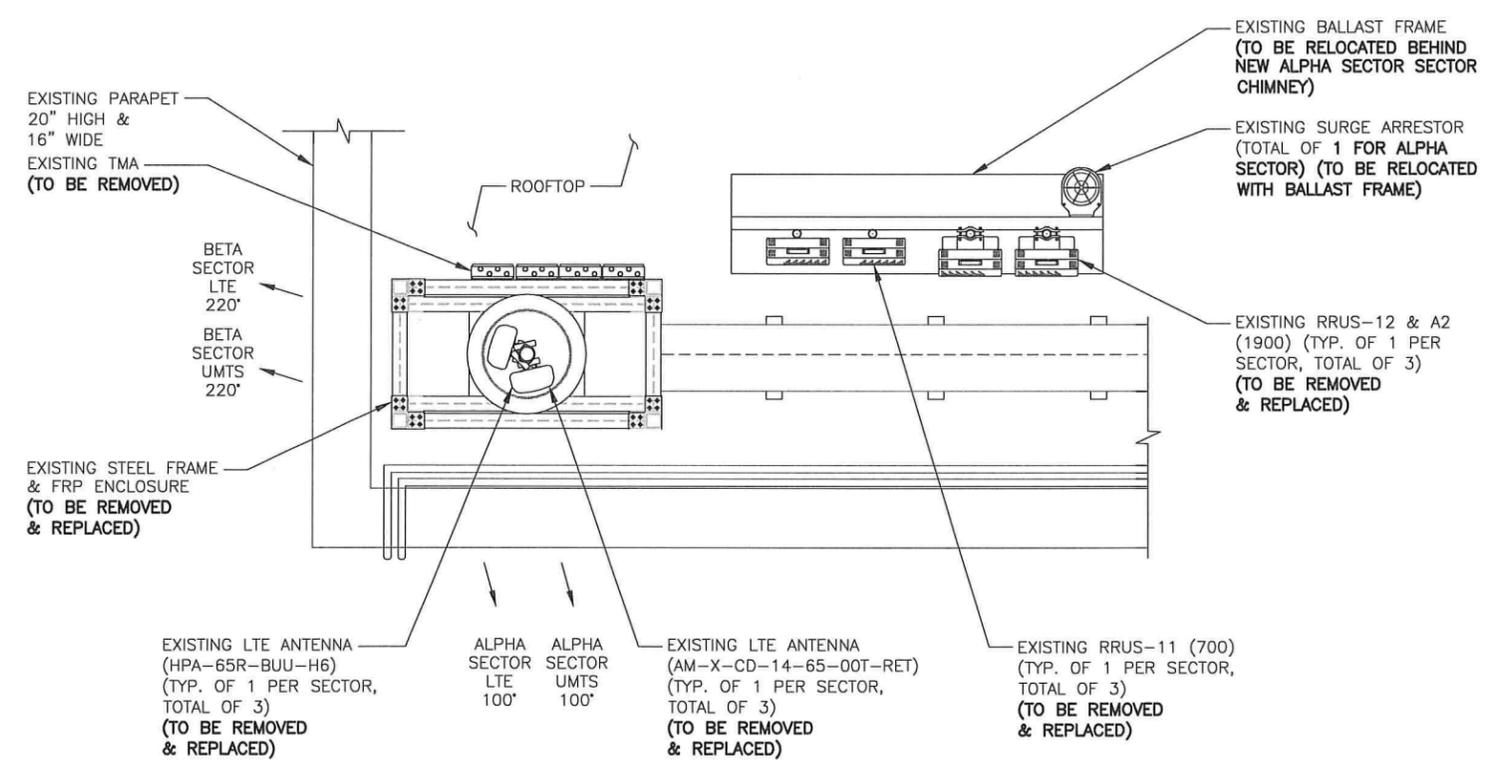
SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: GA

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

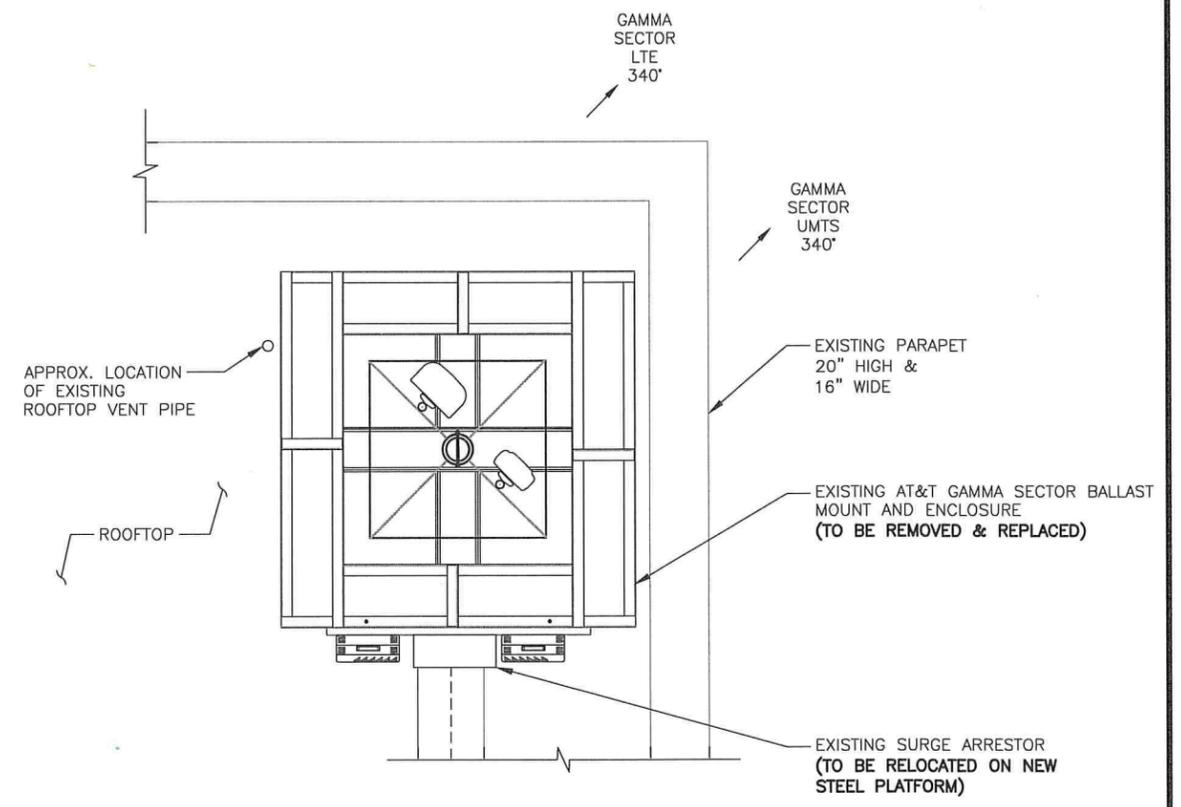
AT&T	
PROPOSED ELEVATION (LTE 3C_4C_ANT MOD)	
SITE NUMBER	DRAWING NUMBER
CT5440	A-3
REV	1

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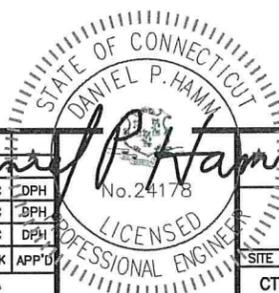


ALPHA/BETA SECTOR



GAMMA SECTOR

EXISTING ANTENNA LAYOUTS 1
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-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: CT5440
SITE NAME: WATERBURY WEST

1389 WEST MAIN STREET
WATERBURY, CT 06708
NEW HAVEN COUNTY

at&t

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

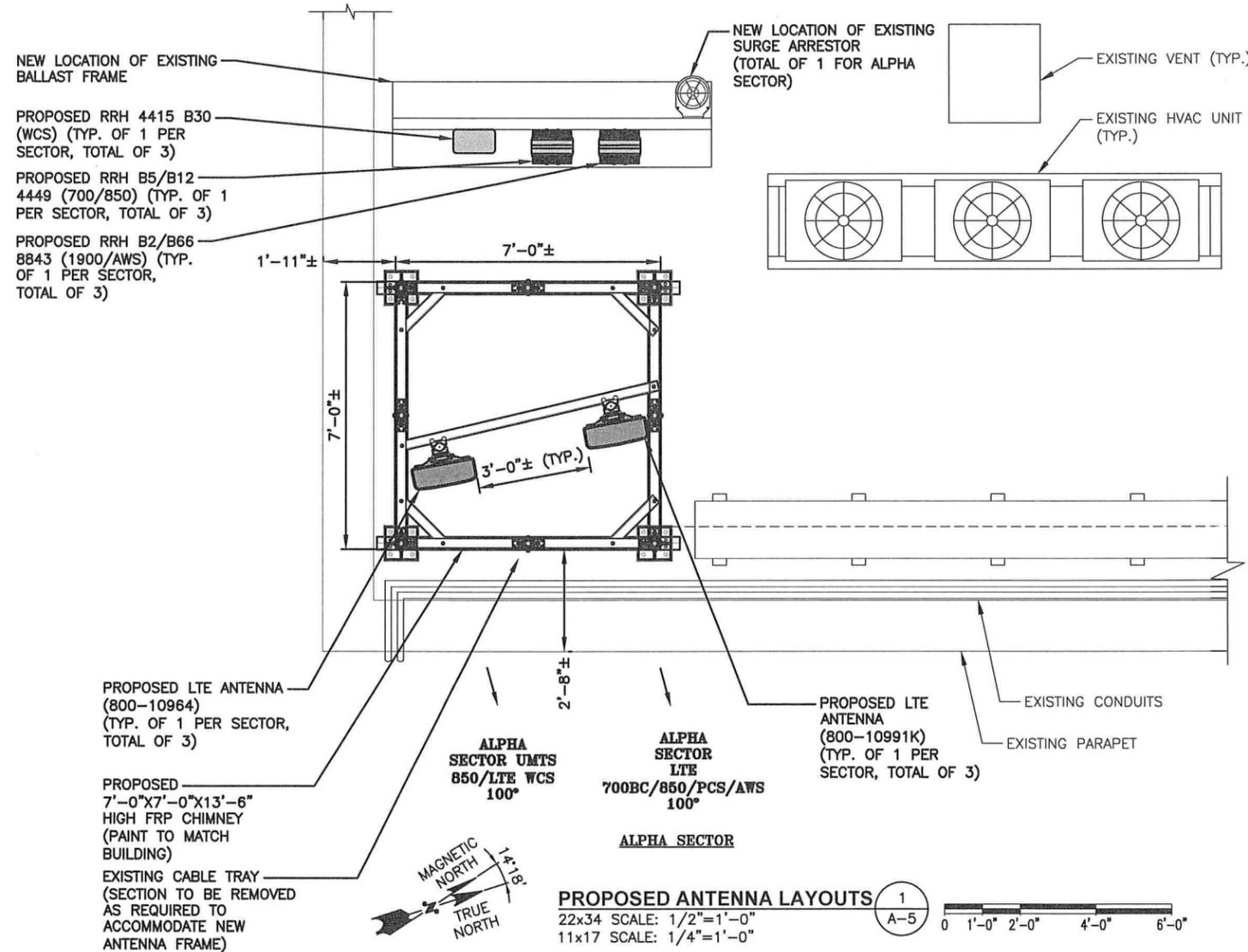
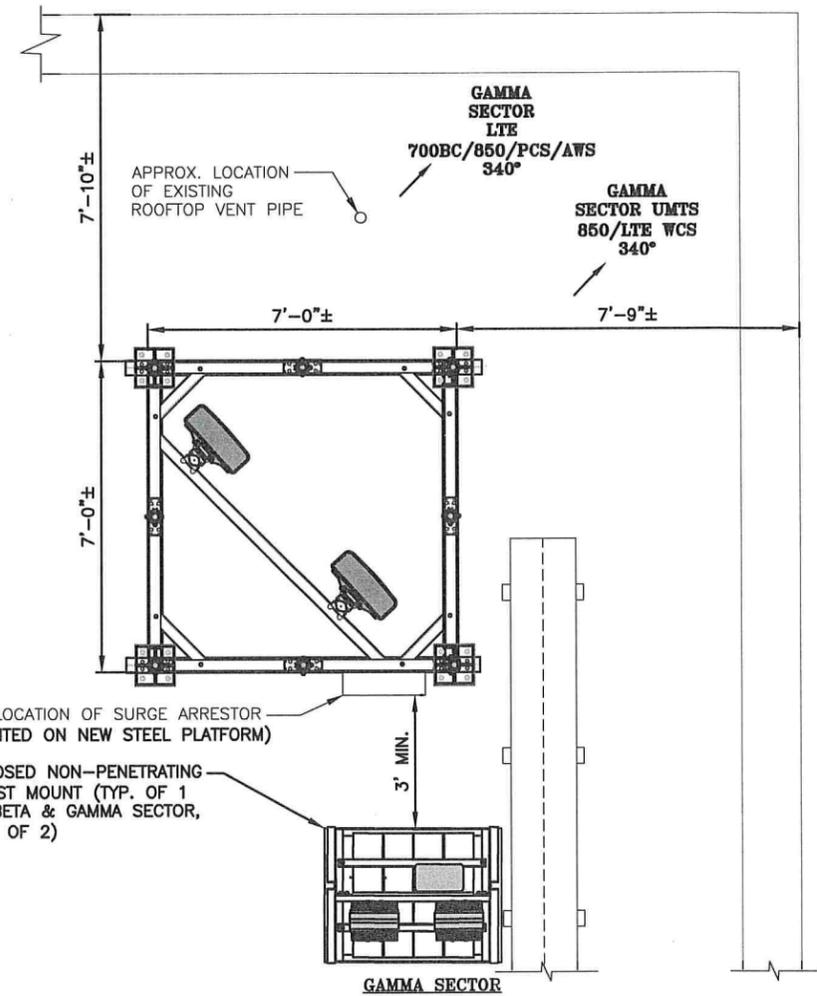
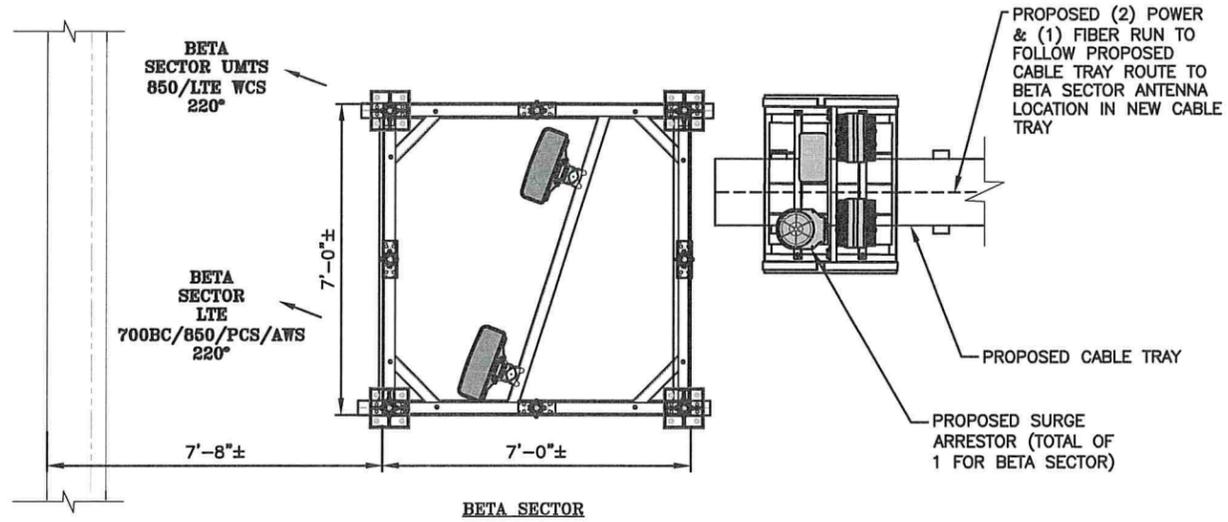
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SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: GA

AT&T

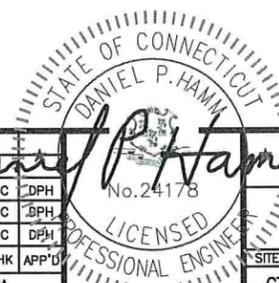
EXISTING ANTENNA LAYOUTS
(LTE 3C_4C_ANT MOD)

SITE NUMBER	DRAWING NUMBER	REV
CT5440	A-4	1



NOTE:
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NOTE:
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A	01/28/20	ISSUED FOR REVIEW	GA	HC	DPH

SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: GA

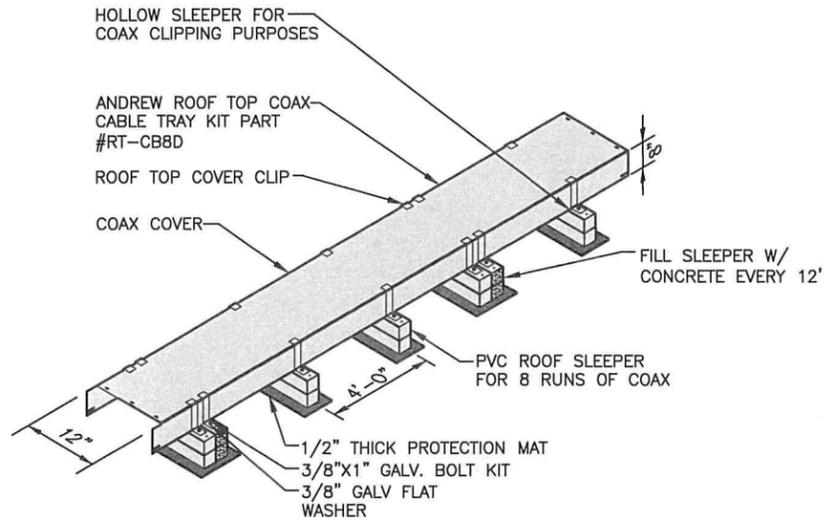
AT&T

PROPOSED ANTENNA LAYOUTS
(LTE 3C_4C_ANT MOD)

SITE NUMBER	DRAWING NUMBER	REV
CT5440	A-5	1

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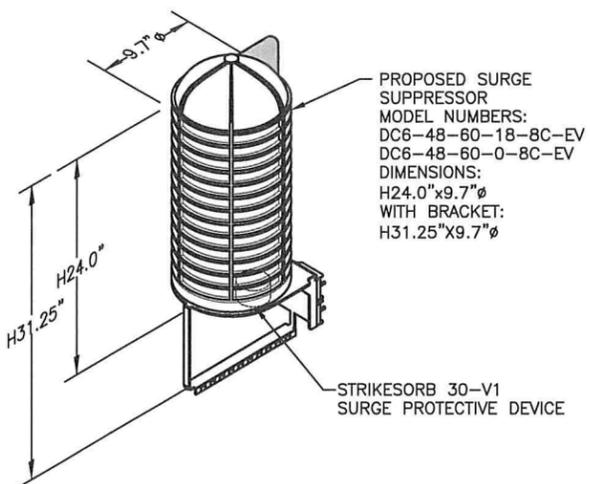
NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.



CABLE TRAY DETAIL
22x34 SCALE: N.T.S. 1 A-6

ANTENNA SCHEDULE											
SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA E HEIGHT	AZIMUTH	TMA/DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	PROPOSED	LTE 700 BC/850/PCS/AWS	800-10991K	78.7X20X6.9	±48'	100°	-	(P)(1) B5/B12 4449 (700/850) (P)(1) B2/B66A 8843 (1900/AWS)	14.9X13.2X10.4 14.9X13.2X10.9	-	(E) (1) RAYCAP DC6-48-60-18-8C
A4	PROPOSED	UMTS 850/LTE WCS	800-10964	59X20X6.9	±48'	100°	-	(P)(1) 4415 B30 (WCS)	14.9X13.2X5.4	(2) 7/8" (100'±)	(E) (1) RAYCAP DC6-48-60-18-8C
B1	PROPOSED	LTE 700 BC/850/PCS/AWS	800-10991K	78.7X20X6.9	±48'	220°	-	(P)(1) B5/B12 4449 (700/850) (P)(1) B2/B66A 8843 (1900/AWS)	14.9X13.2X10.4 14.9X13.2X10.9	-	(1)(P) RAYCAP DC6-48-60-18-8C
B4	PROPOSED	UMTS 850/LTE WCS	800-10964	59X20X6.9	±48'	220°	-	(P)(1) 4415 B30 (WCS)	14.9X13.2X5.4	(2) 7/8" (70'±)	(1)(P) RAYCAP DC6-48-60-18-8C
C1	PROPOSED	LTE 700 BC/850/PCS/AWS	800-10991K	78.7X20X6.9	±48'	340°	-	(P)(1) B5/B12 4449 (700/850) (P)(1) B2/B66A 8843 (1900/AWS)	14.9X13.2X10.4 14.9X13.2X10.9	-	(E) (1) RAYCAP DC6-48-60-18-8C
C4	PROPOSED	UMTS 850/LTE WCS	800-10964	59X20X6.9	±48'	340°	-	(P)(1) 4415 B30 (WCS)	14.9X13.2X5.4	(2) 7/8" (115'±)	(E) (1) RAYCAP DC6-48-60-18-8C

FINAL ANTENNA SCHEDULE
SCALE: N.T.S. 6 A-6



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL
SCALE: N.T.S. 2 A-6

RRU CHART				
QUANTITY	MODEL	L	W	D
3(P)	B2/B66 8843 (1900/AWS)	14.9"	13.2"	10.9"
3(P)	B5/B12 4449 (700/850)	14.9"	13.2"	10.4"
3(P)	4415 B30 (WCS)	14.9"	13.2"	5.4"

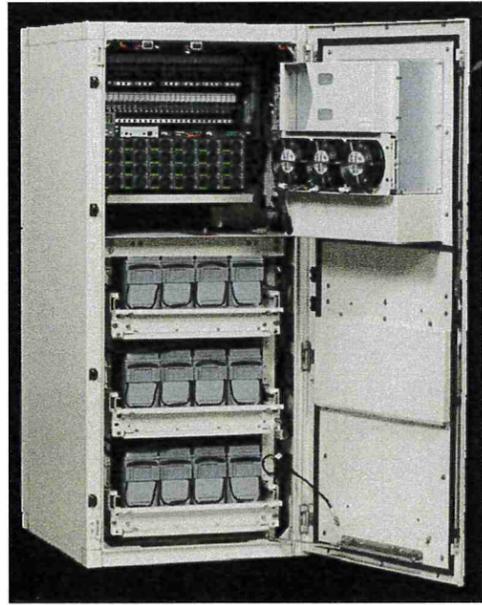
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:
SEE RFDS FOR RRU FREQUENCY AND MODEL NUMBER

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

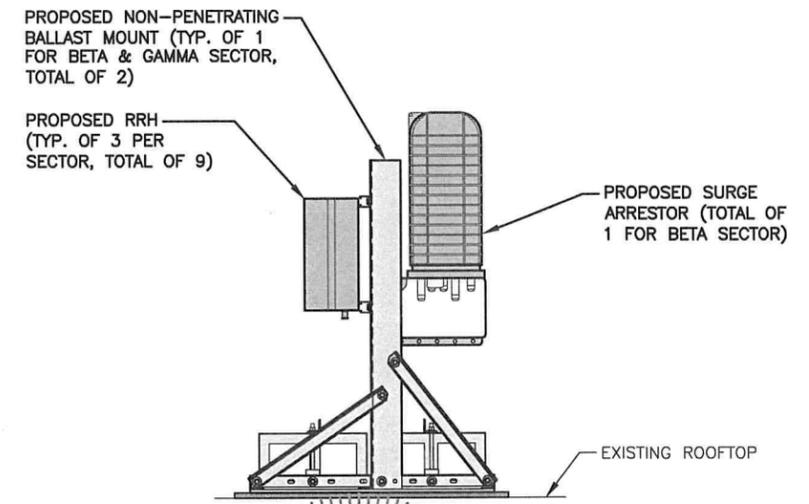
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL
SCALE: N.T.S. 3 A-6



PROPOSED NETSURE 512 POWER PLANT & FLEX CABINET TO REPLACE EXISTING EMERSON POWER PLANT

PROPOSED NETSURE 512 POWER PLANT DETAIL
SCALE: N.T.S. 4 A-6



PROPOSED NON-PENETRATING BALLAST MOUNT (TYP. OF 1 FOR BETA & GAMMA SECTOR, TOTAL OF 2)

PROPOSED RRU (TYP. OF 3 PER SECTOR, TOTAL OF 9)

PROPOSED SURGE ARRESTOR (TOTAL OF 1 FOR BETA SECTOR)

EXISTING ROOFTOP

PROPOSED RRU BALLAST MOUNT
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0" 5 A-6



HG 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: CT5440
SITE NAME: WATERBURY WEST
1389 WEST MAIN STREET WATERBURY, CT 06708 NEW HAVEN COUNTY

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

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A	01/28/20	ISSUED FOR REVIEW	GA	HC	DPH

PROFESSIONAL ENGINEER
No. 24178
DAVID P. HAMM

SITE NUMBER	DRAWING NUMBER	REV
CT5440	A-6	1

2

**(REVISED)
STRUCTURAL ANALYSIS REPORT**

For

CT5440 (LTE 3C/4C/5C)

WATERBURY WEST

1389 West Main Street
Waterbury, CT 06708

**Antennas Mounted on Pipe masts within FRP Enclosures
located on the Roof**



Prepared for:



Dated: May 28, 2019 (Rev.1)

May 3, 2019 (Rev.1)

February 28, 2019

Prepared by:



45 Beechwood Drive

North Andover, MA 01845

(P) 978.557.5553 (F) 978.336.5586

www.hudsondesigngroupllc.com





SCOPE OF WORK:

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

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

This office conducted an on-site visual survey of the above site on February 22, 2019. Attendees included Manuel Tejada (HDG – Field Technician).

The following documents were used for our reference:

- Building Plans prepared by Arthur P. D'Oliveira dated December 29, 1986.
- Previous HDG Structural Analysis dated July 16, 2010.

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 5)	W16x26	90%	PASS

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

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
FRP Enclosure Frame	3	LC4	6%	PASS

Based on our evaluation, we have determined that the existing steel platform **IS NOT CAPABLE** of supporting the proposed equipment loading. HDG recommends the following modifications:

- Reinforce the existing W14x22 steel beams supporting the new and existing cabinets with new W8x18 steel beams. Reference the latest HDG construction drawings for details.

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Steel Platform	5	LC10	151%	FAIL
Modified Steel Platform	31	LC9	95%	PASS

Reference the chart below for the minimum ballast requirements.

MINIMUM BALLAST REQUIREMENTS	
Number of Blocks per Side	3
Size of Blocks	4"x8"x16" Solid
Weight of Blocks	38 lbs. /each
Total Ballast Weight	228 lbs.

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

*Reference documents attached.



APPURTENANCE CONFIGURATION:

Appurtenances	Dimensions	Weight	**Elevation	Mount
(2) Squid Surge Arrestors	24.0"Φx9.7"	33 lbs	42'	Ballast Mount
(3) 800-10991K Antennas	78.7"x20.0"x6.9"	101 lbs	52'	Enclosure
(3) 800-10964 Antennas	59.0"x20.0"x6.9"	84 lbs	52'	Enclosure
(3) B5/B12 4449 RRH's	14.9"x13.2"x10.4"	73 lbs	42'	Ballast Mount
(3) B2/B66A 8843 RRH's	14.9"x13.2"x10.9"	72 lbs	42'	Ballast Mount
(3) 4415 B30 RRH's	14.9"x13.2"x5.4"	44 lbs	42'	Ballast Mount
(1) Squid Surge Arrestor	24.0"Φx9.7"	33 lbs	42'	Ballast Mount
(2) Nokia GSM Cabinets	76.4"x30.0"x29.5"	770 lbs		Equipment Platform
(1) RXAIT Cabinets	80.0"x30.0"x30.0"	300 lbs		Equipment Platform
(1) 3106 Cabinets	64.0"x51.2"x28.0"	1930 lbs		Equipment Platform
(1) Purcell Cabinet	30.0"x24.0"x24.0"	200 lbs		Equipment Platform
(1) Telco Cabinet	66.0"x30.0"x10.0"	200 lbs		Equipment Platform
(1) Power Panel	48.0"x24.0"x12.3"	200 lbs		Equipment Platform
(3) RRUW RRH's	23.6"x13.8"x4.4"	45 lbs		Equipment Platform
(3) Surge Arrestors	20.1"x18.2"x6.4"	44 lbs		Equipment Platform
(1) Fiber Management Box	21.0"x26.0"x7.5"	44 lbs		Equipment Platform
(1) NetSure 512 Power Plant and Flex Cabinet	72.0"x37.8"x30.0"	2300 lbs		Equipment Platform

* Proposed equipment shown in bold.

** Elevation to top of enclosure



DESIGN CRITERIA:

International Building Code (IBC) 2015 with 2018 Connecticut State Building Code, and ASCE-10 (Minimum Design Loads for Buildings and Other Structures).		
Wind		
Reference Wind Speed:	125 mph	(2018 CTSBC 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 :	35	(2018 CTSBC 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:	25 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:	Waterbury	
County:	New Haven	
Wind Load:	117 mph	(TIA-222-H Annex B)
Ice		
Design Ice Thickness (t_i):	1.5 in	(TIA-222-H Annex B)
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}):	1.57 in	(TIA-222-H Sec. 2.6.10)



HUDSON
Design Group LLC

EXISTING ROOF CONSTRUCTION:

The existing roof construction consists of a roofing membrane over rigid insulation over concrete metal decking supported by steel beams and columns.

ANTENNA SUPPORT RECOMMENDATIONS:

The new antennas are proposed to be installed within new FRP enclosures on new pipe masts secured to the proposed FRP enclosure framing located on the roof 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 and existing non-penetrating ballast mounts located on the roof. Reference the table on page 2 for minimum ballast requirements.

EQUIPMENT SUPPORT RECOMMENDATIONS:

The new equipment cabinet is proposed to be mounted on the existing equipment platform located on the roof.

Limitations and Assumptions:

1. Reference the latest HDG construction drawings for all the equipment locations.
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.



HUDSON
Design Group LLC

FIELD PHOTOS:



Photo 1: Sample photo illustrating the proposed location of the Alpha sector.
Existing mount to be removed and replaced.



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



HUDSON
Design Group LLC

FIELD PHOTOS (CONT.):

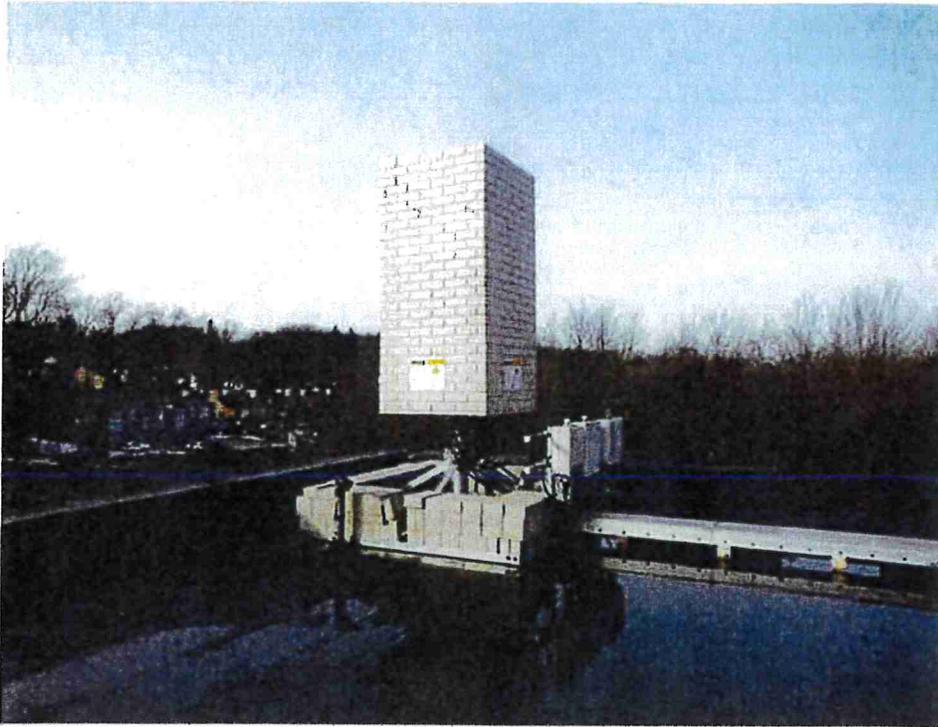
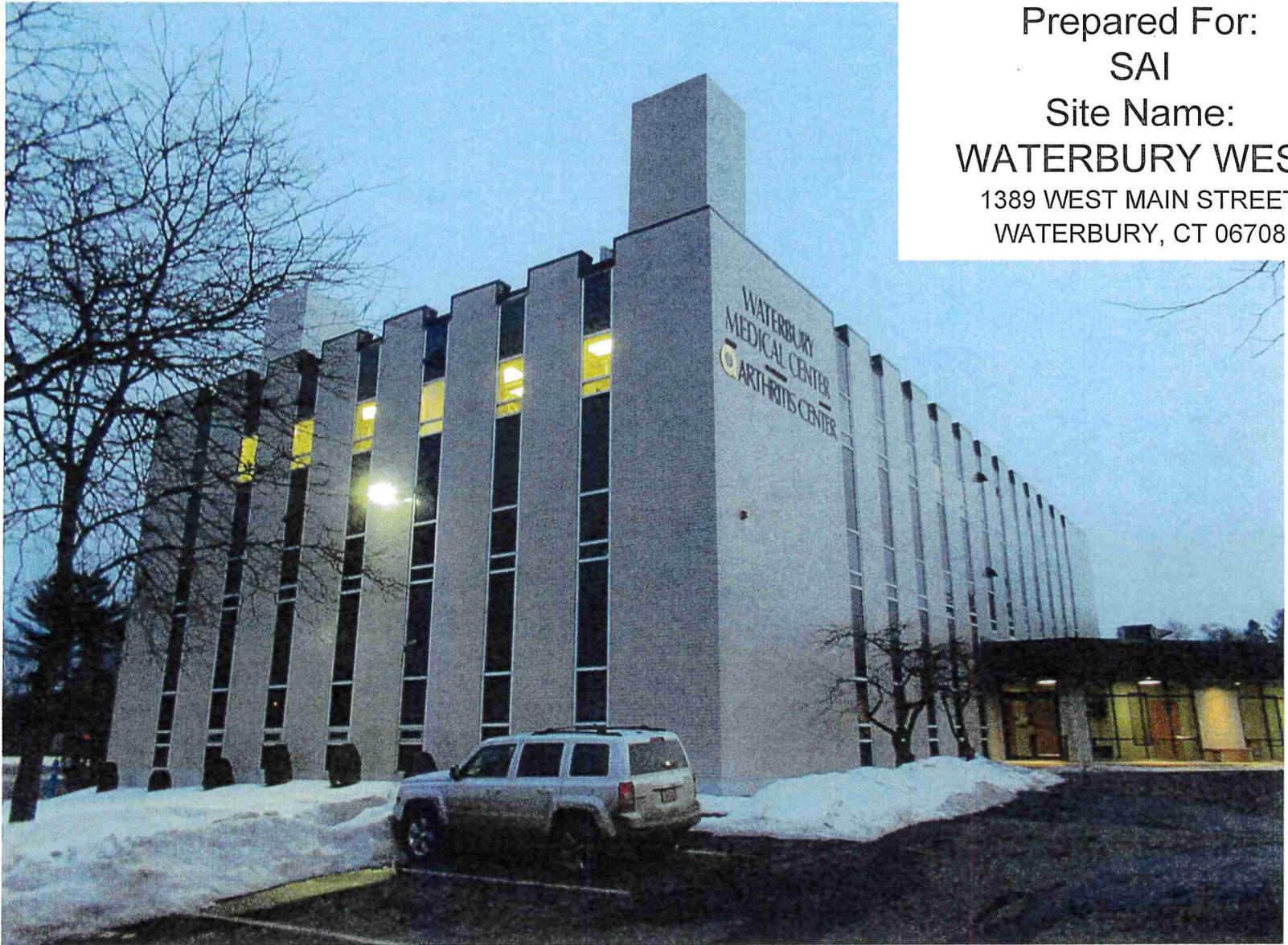


Photo 3: Sample photo illustrating the proposed location of the Gamma sector. Existing mount to be removed and replaced.



Photo 4: Sample photo illustrating the existing equipment platform.

3



Prepared For:
SAI
 Site Name:
WATERBURY WEST
 1389 WEST MAIN STREET
 WATERBURY, CT 06708

SITE NUMBER: CT5440
SITE NAME: WATERBURY WEST
ADDRESS: 1389 WEST MAIN STREET
 WATERBURY, CT 06708



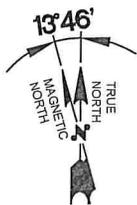
SITE TYPE: ROOFTOP
DATE: 08/28/2019 **REV:** 2
DRAWN BY: KAM
SCALE: N.T.S.

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PAGE 1 OF 12

LOCUS MAP

TAKEN FROM GOOGLE.COM ON 08-28-19



LEGEND: ← DIRECTION OF VIEW # PHOTO LOCATION

SITE NUMBER: CT5440
SITE NAME: WATERBURY WEST
ADDRESS: 1389 WEST MAIN STREET
 WATERBURY, CT 06708



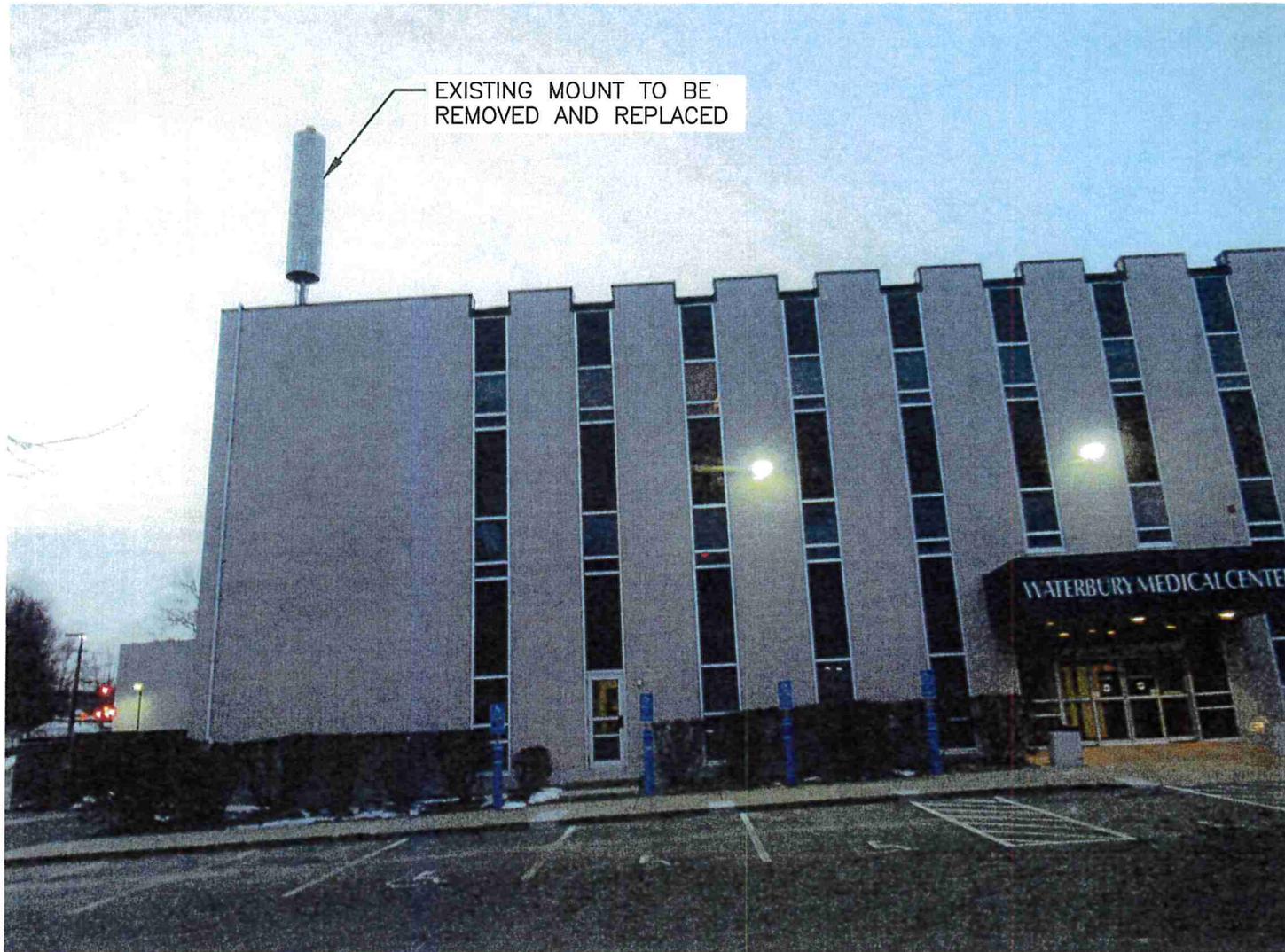
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EXISTING CONDITIONS

LOCATION # 1

DATE OF PHOTO: 02/22/2019



VIEW NORTHWEST FACING BUILDING FROM PARKING LOT

SITE NUMBER: CT5440

SITE NAME: WATERBURY WEST

ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



12 INDUSTRIAL WAY
SALEM, NH 03079



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

SITE TYPE: ROOFTOP

DATE: 08/28/2019 **REV:** 2

DRAWN BY: KAM

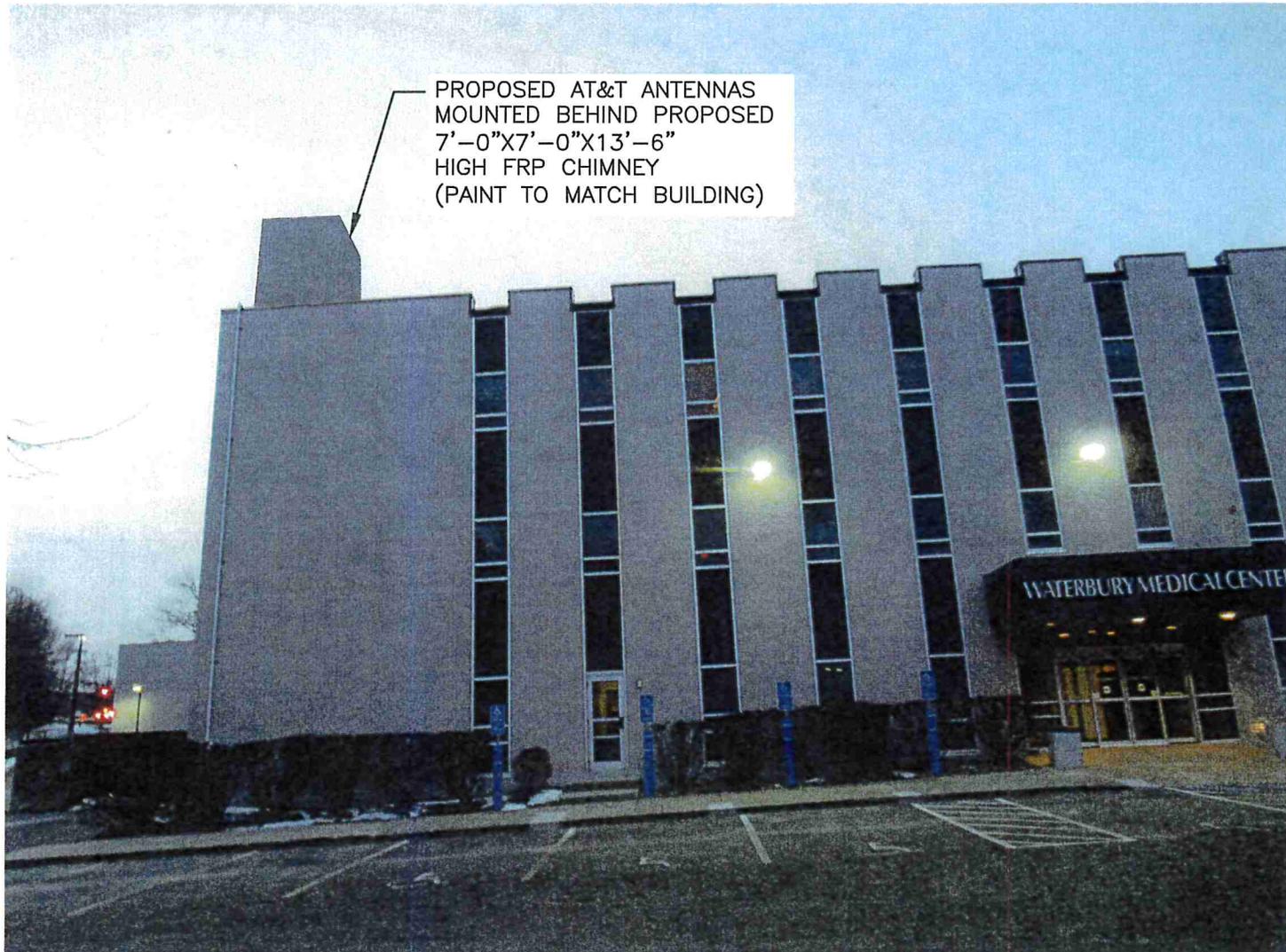
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PROPOSED CONDITIONS

LOCATION # 1

DATE OF PHOTO: 02/22/2019



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SITE NAME: WATERBURY WEST

ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



12 INDUSTRIAL WAY
SALEM, NH 03079



45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5556

SITE TYPE: ROOFTOP

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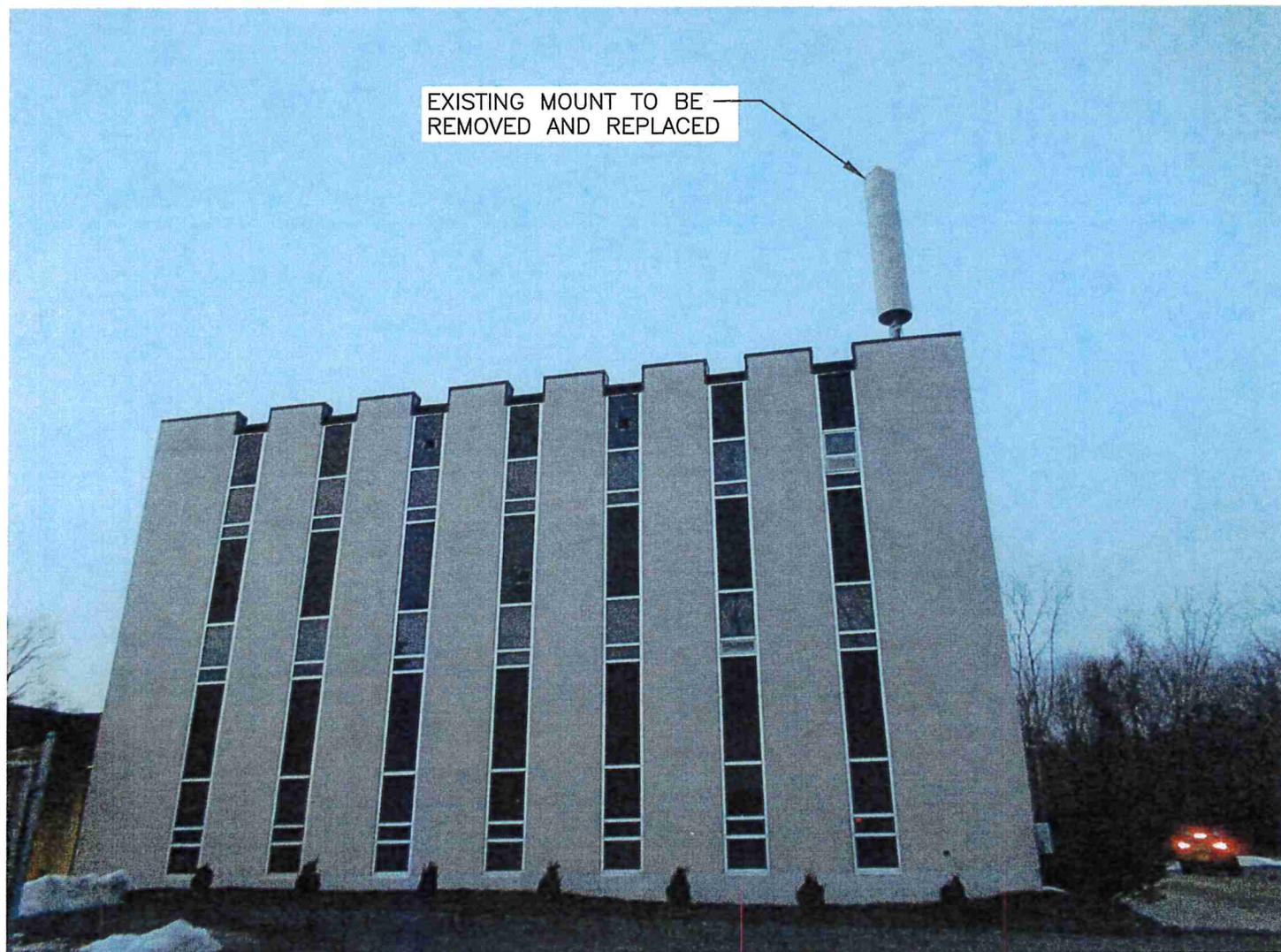
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EXISTING CONDITIONS

LOCATION # 2

DATE OF PHOTO: 02/22/2019



EXISTING MOUNT TO BE
REMOVED AND REPLACED

VIEW NORTH FACING BUILDING FROM PARKING LOT

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ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



12 INDUSTRIAL WAY
SALEM, NH 03079



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TEL: (978) 557-5553
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SITE TYPE: ROOFTOP

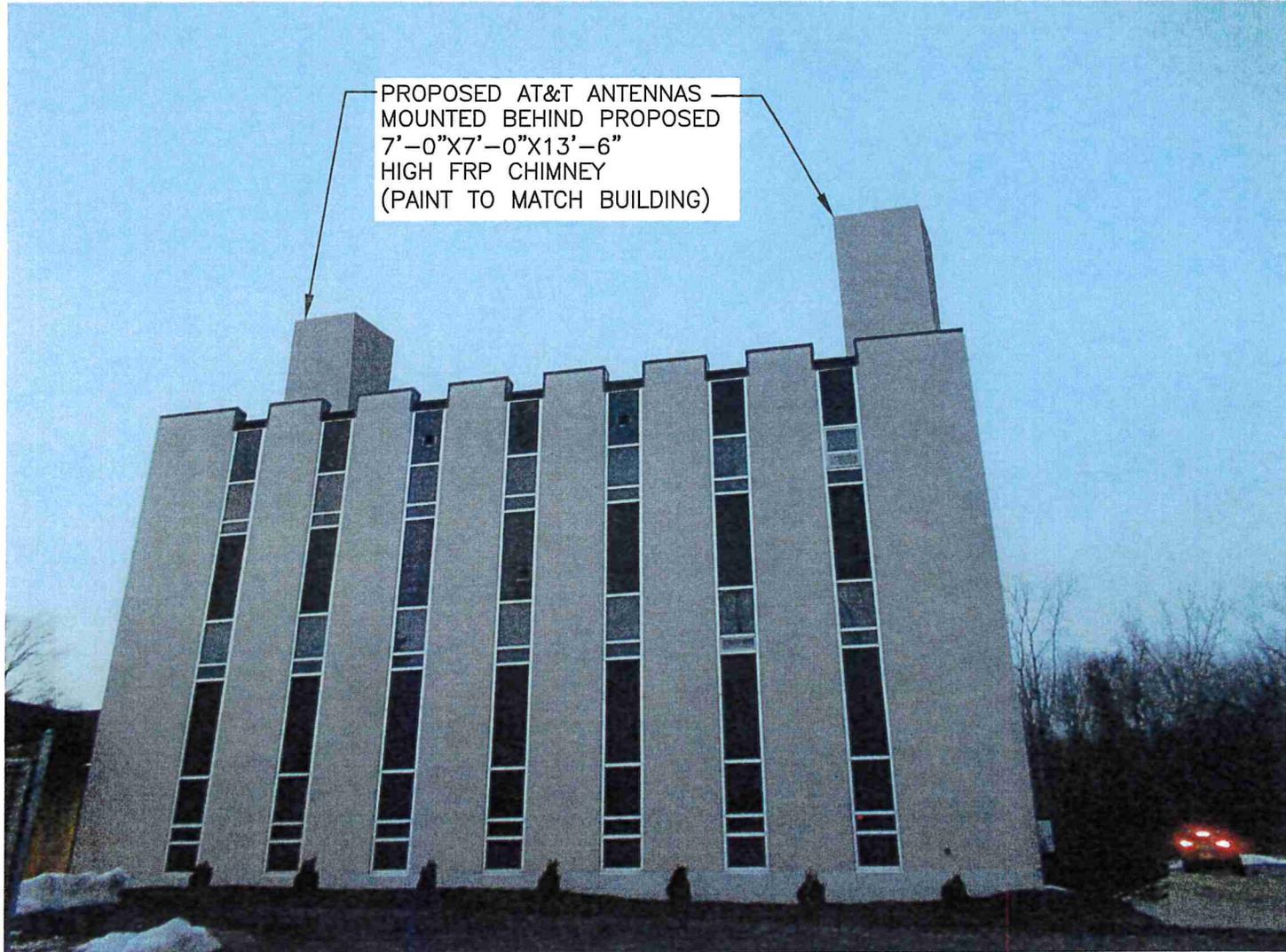
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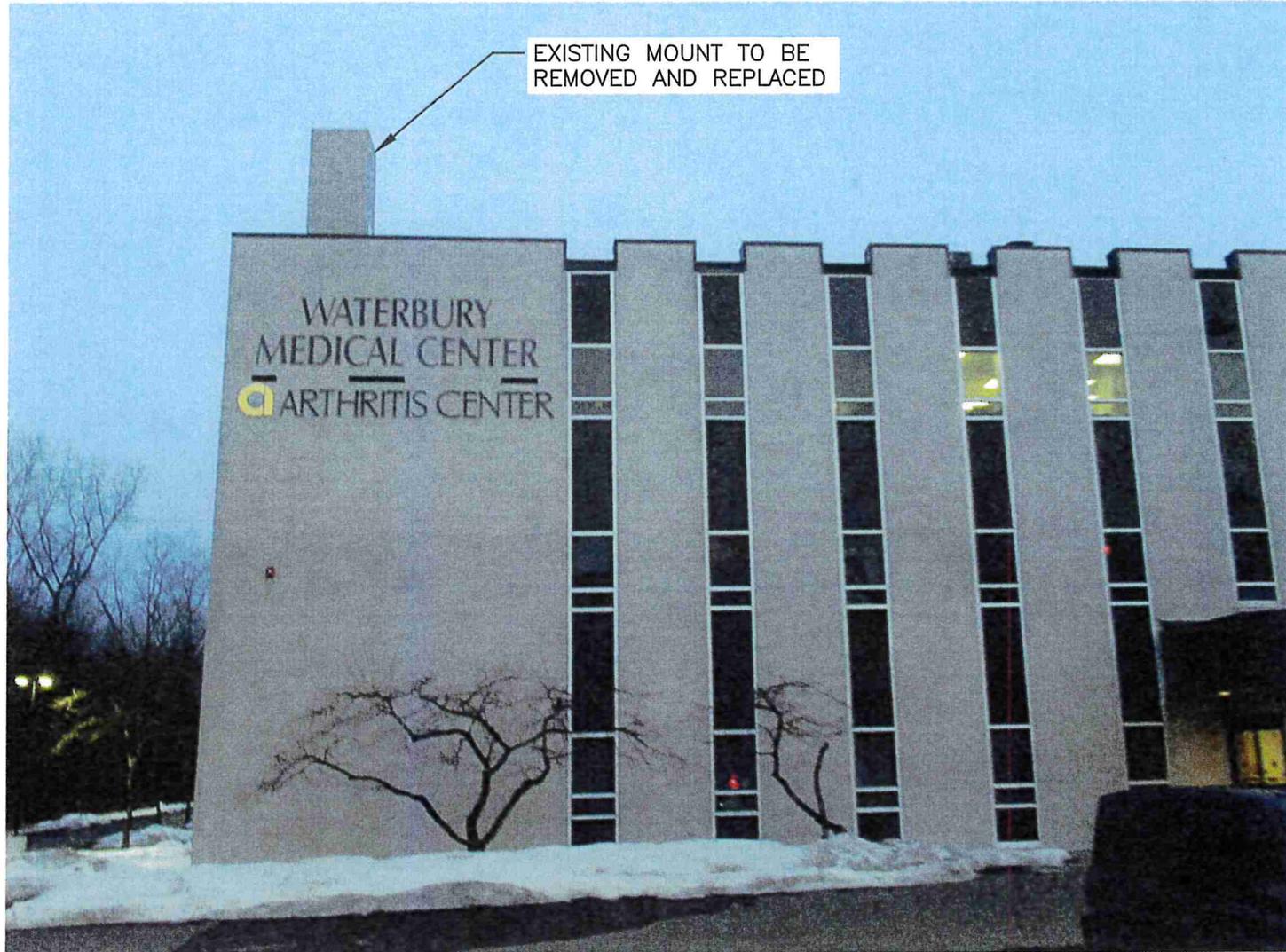
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EXISTING CONDITIONS

LOCATION # 3

DATE OF PHOTO: 02/22/2019



VIEW SOUTHEAST FACING BUILDING FROM PARKING LOT

SITE NUMBER: CT5440
SITE NAME: WATERBURY WEST
ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



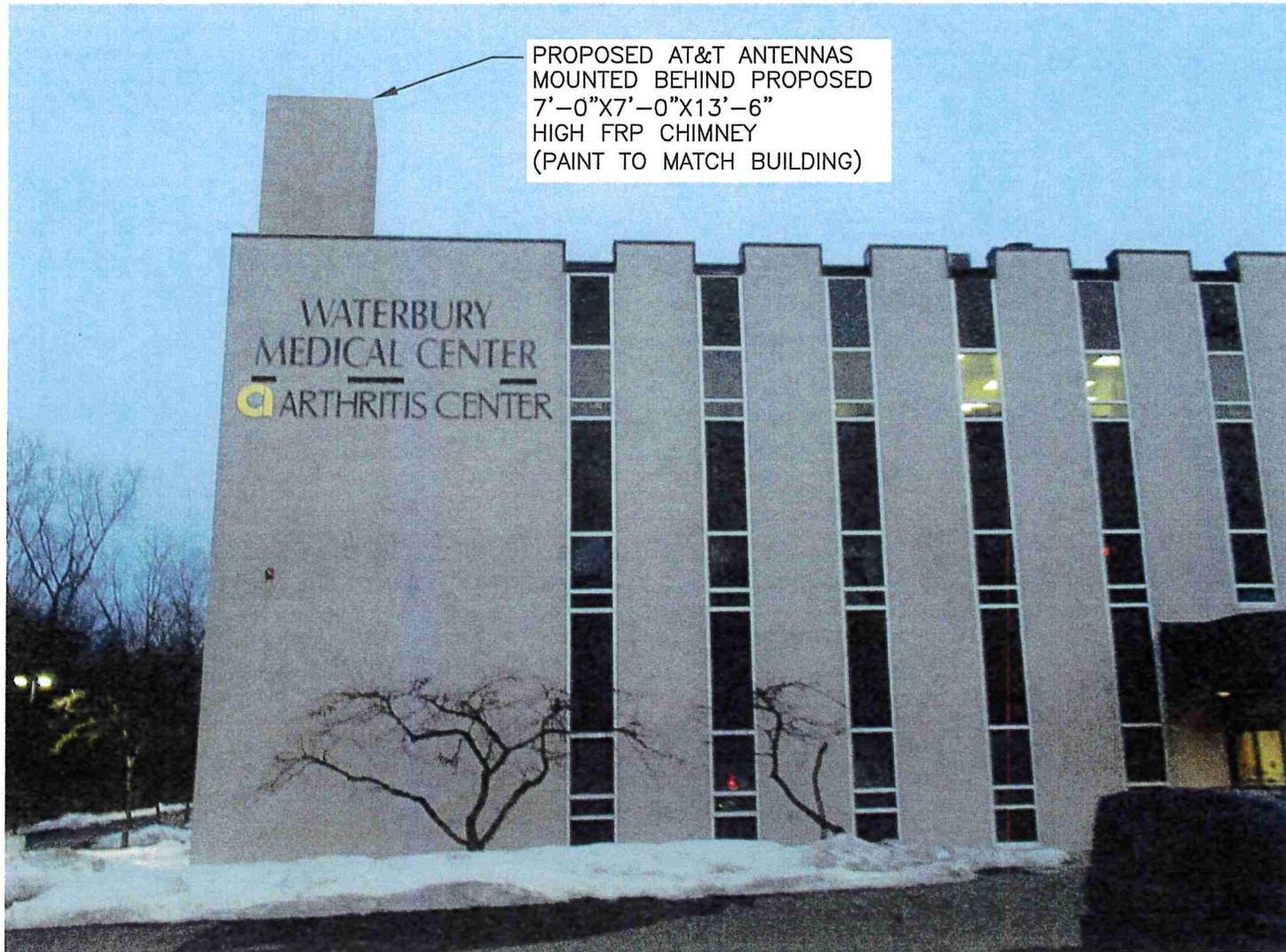
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DATE: 08/28/2019 **REV:** 2
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PROPOSED CONDITIONS

LOCATION # 3

DATE OF PHOTO: 02/22/2019



VIEW SOUTHEAST FACING BUILDING FROM PARKING LOT

SITE NUMBER: CT5440

SITE NAME: WATERBURY WEST

ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



12 INDUSTRIAL WAY
SALEM, NH 03079



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

SITE TYPE: ROOFTOP

DATE: 08/28/2019

REV: 2

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EXISTING CONDITIONS

LOCATION # 4

DATE OF PHOTO: 02/22/2019



VIEW SOUTH FACING BUILDING FROM PARKING LOT

SITE NUMBER: CT5440

SITE NAME: WATERBURY WEST

ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



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SALEM, NH 03079



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

SITE TYPE: ROOFTOP

DATE: 08/28/2019

REV: 2

DRAWN BY: KAM

SCALE: N.T.S.

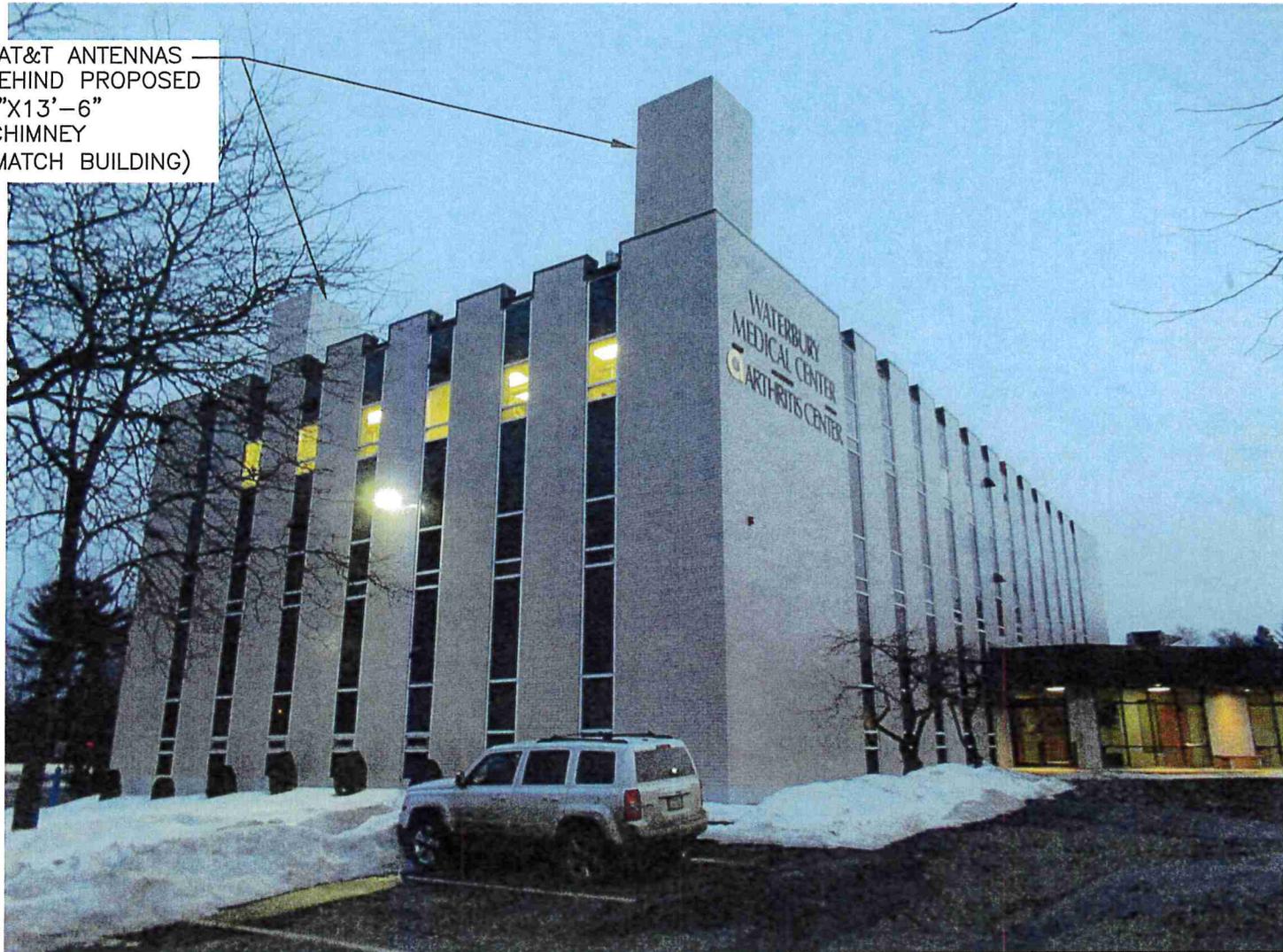
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PROPOSED CONDITIONS

LOCATION # 4

DATE OF PHOTO: 02/22/2019

PROPOSED AT&T ANTENNAS
MOUNTED BEHIND PROPOSED
7'-0"X7'-0"X13'-6"
HIGH FRP CHIMNEY
(PAINT TO MATCH BUILDING)



VIEW SOUTH FACING BUILDING FROM PARKING LOT

SITE NUMBER: CT5440

SITE NAME: WATERBURY WEST

ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



12 INDUSTRIAL WAY
SALEM, NH 03079



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

SITE TYPE: ROOFTOP

DATE: 08/28/2019 **REV:** 2

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EXISTING CONDITIONS

LOCATION # 5

DATE OF PHOTO: 08/2019



VIEW SOUTHEAST FACING BUILDING FROM PARKING LOT

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ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



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SALEM, NH 03079



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TEL: (978) 557-5553
FAX: (978) 336-5586

SITE TYPE: ROOFTOP

DATE: 08/28/2019

REV: 2

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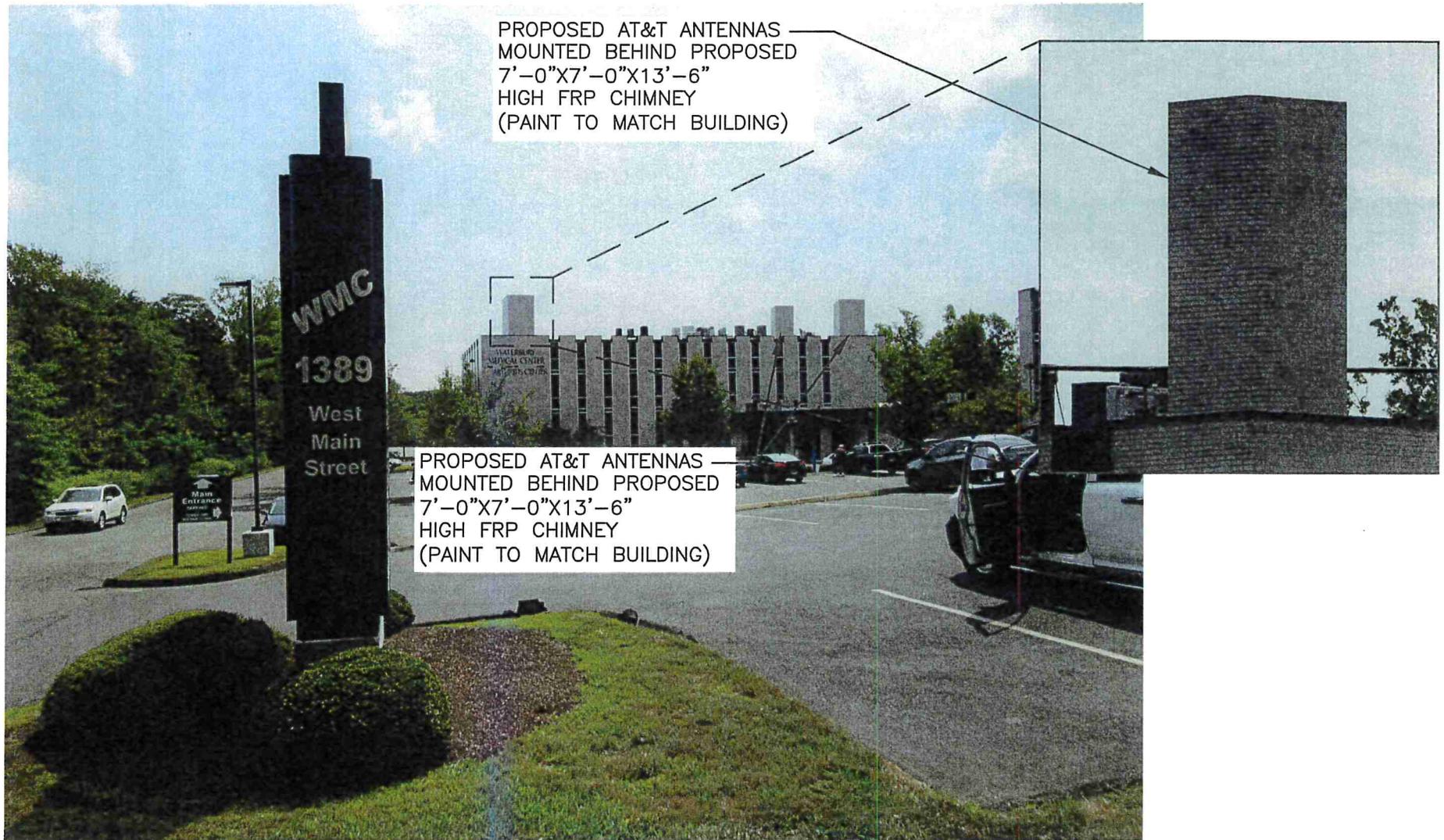
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PROPOSED CONDITIONS

LOCATION # 5

DATE OF PHOTO: 08/2019



VIEW SOUTHEAST FACING BUILDING FROM PARKING LOT

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PREPARED FOR:



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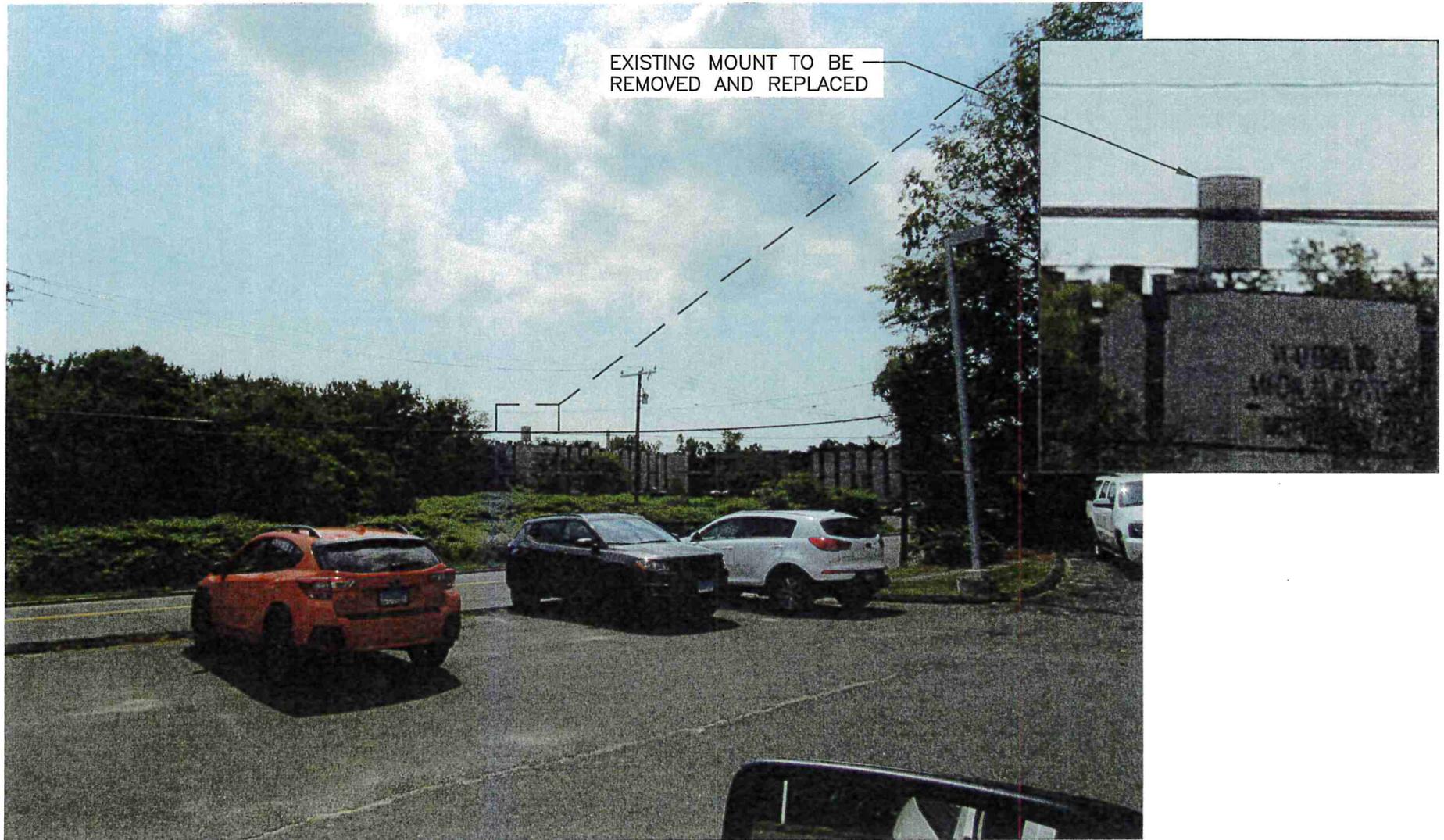
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EXISTING CONDITIONS

LOCATION # 6

DATE OF PHOTO: 08/2019



**VIEW SOUTHEAST FACING BUILDING FROM PARKING LOT
NEXT TO WEST MAIN STREET**

SITE NUMBER: CT5440

SITE NAME: WATERBURY WEST

ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



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DATE: 08/28/2019

REV: 2

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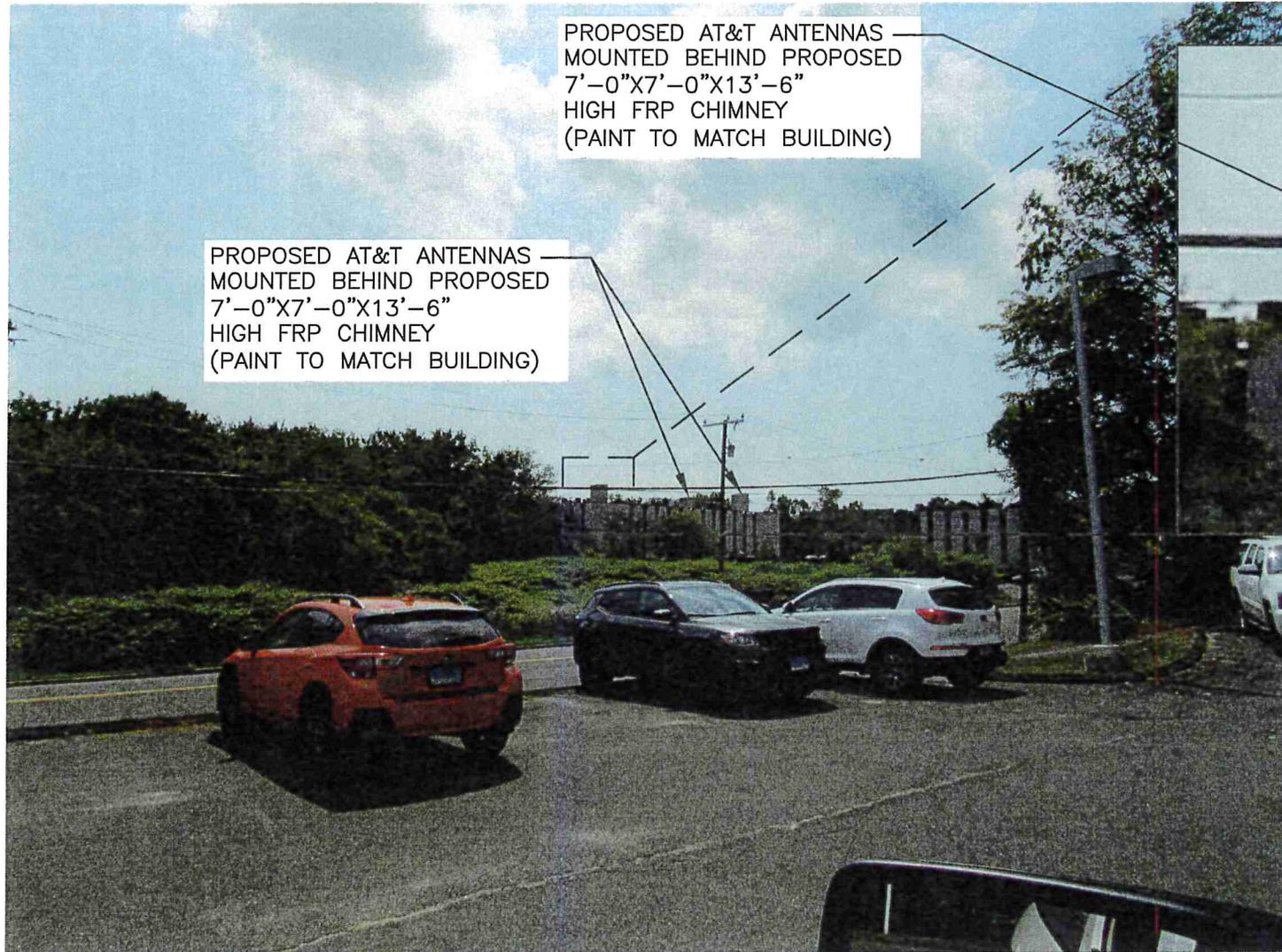
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EXISTING CONDITIONS

LOCATION # 6

DATE OF PHOTO: 08/2019



PROPOSED AT&T ANTENNAS
MOUNTED BEHIND PROPOSED
7'-0"X7'-0"X13'-6"
HIGH FRP CHIMNEY
(PAINT TO MATCH BUILDING)

PROPOSED AT&T ANTENNAS
MOUNTED BEHIND PROPOSED
7'-0"X7'-0"X13'-6"
HIGH FRP CHIMNEY
(PAINT TO MATCH BUILDING)

**VIEW SOUTHEAST FACING BUILDING FROM PARKING LOT
NEXT TO WEST MAIN STREET**

SITE NUMBER: CT5440

SITE NAME: WATERBURY WEST

ADDRESS: 1389 WEST MAIN STREET
WATERBURY, CT 06708



550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

PREPARED FOR:



12 INDUSTRIAL WAY
SALEM, NH 03079



45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 356-5366

SITE TYPE: ROOFTOP

DATE: 08/28/2019 **REV:** 2

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4



Sanket Joshi
 SAI Group
 12 Industrial Way
 Salem, NH 03079
sjoshi@saigrp.com

January 27, 2020

Connecticut Siting Council

Subject: AT&T Wireless, CT5440 – Waterbury, CT

Dear Connecticut Siting Council:

At the request of AT&T Wireless, SAI Group has performed an assessment of the RF Power Density at the proposed site located at 1389 West Main Street, Waterbury, CT. Calculations were done in compliance with FCC OET Bulletin 65 and incorporating an additional 10 dB Off-Beam Pattern Adjustment which results in a number that is 10 percent of the standard "Worst-Case" calculation. This report provides an FCC compliance assessment based on an analysis that all transmitters are simultaneously operating at full power and pointing directly at the ground.

Power Density formula:

$$S = \frac{2.56 * 1.64 * ERP * 0.1}{4 * \pi * R^2}$$

Transmission Mode	Antenna Centerline AGL (ft)	Frequency (MHz)	Number of Channels	Effective Radiated Power per Channel (Watts)	Power Density (mW/cm ²)	Standard Limits (mW/cm ²)	% MPE (Uncontrolled/General Public)
AT&T UMTS	48	850	1	1,104	0.0172	0.5667	3.04%
AT&T LTE	48	700	1	1,472	0.0230	0.4667	4.92%
AT&T LTE	48	850	1	1,000	0.0156	0.5667	2.75%
AT&T LTE	48	1900	2	2,265	0.0707	1	7.07%
AT&T LTE	48	2100	1	2,600	0.0406	1	4.06%
AT&T LTE	48	2300	1	4,121	0.0643	1	6.43%
AT&T 5G	48	850	1	1,000	0.0156	0.5667	2.75%
Total							31.03%

Conclusion: AT&T's proposed antenna installation is calculated to be within 31.03% of FCC Standard for General Public/Uncontrolled Maximum Permissible Exposure (MPE).

Sincerely,

Sanket Y Joshi
 SAI Group

5



445 Hamilton Avenue, 14th Floor
White Plains, New York 10601
T 914 761 1300
F 914 761 5372
cuddyfeder.com

Lucia Chiocchio
lchiocchio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

Neil M. O'Leary, Mayor
City Hall Building
235 Grand Street
Waterbury, CT 06702

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Facility
1389 West Main Street, Waterbury, Connecticut

Dear Mayor O'Leary:

We are writing to you on behalf of our client New Cingular Wireless PCS, LLC ("AT&T") with respect to the above referenced matter and the filing today of a sub-petition for declaratory ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") to allow a modification of the existing rooftop tower facility at the above-referenced location. AT&T plans to replace the existing 18'4" flagpole in the southern corner of the rooftop and the 10'8" stealth chimney in the northern corner of the rooftop with three (3) new 13'6" stealth chimneys in the southern, northern, and western corners of the rooftop.

AT&T is submitting this Sub-Petition as an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation Act of 2012 (codified at 47 USC Sec. 1455(a)) and as further clarified by the Federal Communications Commission in regulations found at 47 CFR 1.6100.

This notice and the enclosed copy of the Sub-Petition are provided to you in keeping with the Council's ruling in Petition 1133. Any comments regarding this proposal should be provided to the Council within thirty (30) days of the date of this submission.

Should you have any questions please feel free to contact me at the address above or the Council at 860.827.2935.

Very truly yours,

A handwritten signature in cursive script that reads 'Lucia Chiocchio'.

Lucia Chiocchio
Enclosure



445 Hamilton Avenue, 14th Floor
White Plains, New York 10601
T 914 761 1300
F 914 761 5372
cuddyfeder.com

Lucia Chiocchio
lchiocchio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

Robert Nerney, City Planner
185 South Main Street, 5th Floor
(1 Jefferson Square)
Waterbury, CT 06706

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Facility
1389 West Main Street, Waterbury, Connecticut

Dear Mr. Nerney:

We are writing to you on behalf of our client New Cingular Wireless PCS, LLC ("AT&T") with respect to the above referenced matter and the filing today of a sub-petition for declaratory ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") under Petition 1133 to allow a modification of the existing rooftop tower facility at the above-referenced location. AT&T plans to replace the existing 18'4" flagpole in the southern corner of the rooftop and the 10'8" stealth chimney in the northern corner of the rooftop with three (3) new 13'6" stealth chimneys in the southern, northern, and western corners of the rooftop.

AT&T is submitting this Sub-Petition as an eligible facility request pursuant to Section 6409(a) of the Federal Middle Class Tax Relief and Job Creation Act of 2012 (codified at 47 USC Sec. 1455(a)) and as further clarified by the Federal Communications Commission in regulations found at 47 CFR 1.6100.

This notice and the enclosed copy of the Sub-Petition are provided to you in keeping with the Council's ruling in Petition 1133. Any comments regarding this proposal should be provided to the Council within thirty (30) days of the date of this submission.

Should you have any questions please feel free to contact me at the address above or the Council at 860.827.2935.

Very truly yours,

A handwritten signature in cursive script that reads 'Lucia Chiocchio'. The ink is dark and the signature is fluid and legible.

Lucia Chiocchio
Enclosure



445 Hamilton Avenue, 14th Floor
White Plains, New York 10601
T 914 761 1300
F 914 761 5372
cuddyfeder.com

Lucia Chiocchio
lchiocchio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

Peter Vileisis
370 Watertown Road
Middlebury, CT 06762

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Wireless Facility
1389 West Main Street, Waterbury, Connecticut

Dear Sir or Madam:

We are writing to you on behalf of our client New Cingular Wireless PCS, LLC ("AT&T") with respect to the above referenced matter and the filing today of a sub-petition for declaratory ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") to allow a modification of the existing rooftop tower facility at the above-referenced location. AT&T plans to replace the existing 18'4" flagpole in the southern corner of the rooftop and the 10'8" stealth chimney in the northern corner of the rooftop with three (3) new 13'6" stealth chimneys in the southern, northern, and western corners of the rooftop.

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Lucia Chiochio
lchiochio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

Clara F. Stevens
P.O. Box 110552
Bradenton, FL 34211

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Wireless Facility
1389 West Main Street, Waterbury, Connecticut

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Lucia Chiochio
Enclosure



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Lucia Chiochio
lchiochio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

Brian Peck M.D.
1389 West Main Street
Waterbury, CT 06708

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Wireless Facility
1389 West Main Street, Waterbury, Connecticut

Dear Sir or Madam:

We are writing to you on behalf of our client New Cingular Wireless PCS, LLC ("AT&T") with respect to the above referenced matter and the filing today of a sub-petition for declaratory ruling ("Sub-Petition") with the Connecticut Siting Council ("Council") to allow a modification of the existing rooftop tower facility at the above-referenced location. AT&T plans to replace the existing 18'4" flagpole in the southern corner of the rooftop and the 10'8" stealth chimney in the northern corner of the rooftop with three (3) new 13'6" stealth chimneys in the southern, northern, and western corners of the rooftop.

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lchiochio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

Michael Batista & Alicki Alexander Jr. & Sebastian Adam
54 Hillside Avenue
Waterbury, CT 06710

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Wireless Facility
1389 West Main Street, Waterbury, Connecticut

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lchiocchio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

State of Connecticut
Naugatuck Valley Community
1460 West Main Street
Waterbury, CT 06708

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Wireless Facility
1389 West Main Street, Waterbury, Connecticut

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Lucia Chiocchio
lchiocchio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

500 Chase Parkway Condominium Association, Inc
500 Chase Parkway / Norman Drubner
Waterbury, CT 06708

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Wireless Facility
1389 West Main Street, Waterbury, Connecticut

Dear Sir or Madam:

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Lucia Chiocchio
Enclosure



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White Plains, New York 10601
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cuddyfeder.com

Lucia Chiocchio
lchiocchio@cuddyfeder.com

March 4, 2020

CERTIFICATE OF MAILING

Physical Therapy Realty, LLC
500 Chase Parkway
Waterbury, CT 06708

Re: Connecticut Siting Council Sub-Petition
Modification and Extension of an Existing Rooftop Tower Wireless Facility
1389 West Main Street, Waterbury, Connecticut

Dear Sir or Madam:

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Enclosure

Sender Name and Address of Sender
 CUDDY & FEDER LLP
 HAMILTON AVENUE, 14TH FLOOR
 WHITE PLAINS, NY 10601

- Check type of mail or service
- Adult Signature Required
 - Adult Signature Restricted Delivery
 - Certified Mail
 - Certified Mail Restricted Delivery
 - Collect on Delivery (COD)
 - Insured Mail
 - Priority Mail
 - Priority Mail Express
 - Registered Mail
 - Return Receipt for Merchandise
 - Signature Confirmation
 - Signature Confirmation Restricted Delivery

USPS Tracking/Affirmation Number

Addressee (Name, Street, City, State, & ZIP Code™)

Physical Therapy Realty, LLC
 500 Chase Parkway
 Waterbury, CT 06708

Clara F. Stevens
 P.O. Box 110552
 Bradenton, FL 34211

Michael Batista & Alicki Alexander Jr.
 & Sebastian Adam
 54 Hillside Avenue
 Waterbury, CT 06710

Number of Pieces Received by Office

Postmaster, Per (Name of receiving employee)

Form 3877, April 2015 (Part 1 of 2)
 7530-02-000-9090

184M-3522 Complete in Ink

Privacy Notice: For more information on USPS privacy policies, visit usps.com/privacypolicy.

Affix Stamp Here
 (If issued as an international certificate of mailing or for additional copies of this receipt),
 Postmark with Date of Receipt.

Postage	(Extra Service) Fee	Handling Charge	Actual Value If Registered	Insured Value	Duo Sender If COD	ASR Fee	ASRD Fee	RD Fee	RR Fee	SC Fee	SCRD Fee	SIH Fee
		Handling Charge - Registered and over \$50,000 in value				Adult Signature Restricted Delivery	Adult Signature Restricted Delivery	Registered Delivery	Return Receipt	Signature Confirmation	Signature Confirmation Restricted Delivery	Special Handling

CERTIFICATION OF SERVICE

I hereby certify that on the 4th day of March, 2020, a copy of the following letter and notice of intended filing of a Sub-Petition with the Connecticut Siting Council for a declaratory ruling was sent by certificate of mailing to the attached list of abutting property:

Dated: 3/4/20



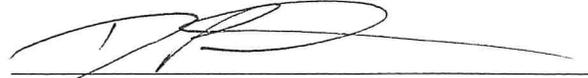
Cuddy & Feder LLP
 45 Hamilton Avenue, 14th Floor
 White Plains, New York 10601
 Attorneys for: New Cingular Wireless
 PCS, LLC (AT&T)

Peter Vileisis 370 Watertown Road Middlebury, CT 06762	Clara F. Stevens P.O. Box 110552 Bradenton, FL 34211
Brian Peck M.D. 1389 West Main Street Waterbury, CT 06708	Michael Batista & Alicki Alexander Jr. & Sebastian Adam 54 Hillside Avenue Waterbury, CT 06710
State of Connecticut Naugatuck Valley Community 1460 West Main Street Waterbury, CT 06708	500 Chase Parkway Condominium Association, Inc 500 Chase Parkway / Norman Drubner Waterbury, CT 06708
Physical Therapy Realty, LLC 500 Chase Parkway Waterbury, CT 06708	

CERTIFICATION OF SERVICE

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Dated: 3/4/20



Cuddy & Feder LLP
45 Hamilton Avenue, 14th Floor
White Plains, New York 10601
Attorneys for:
New Cingular Wireless PCS, LLC (AT&T)

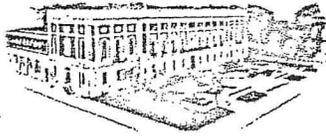
CITY OF WATERBURY

Neil M. O'Leary, Mayor City Hall Building 235 Grand Street Waterbury, CT 06702	Robert Nerney, City Planner 185 South Main Street, 5 th Floor (1 Jefferson Square) Waterbury, CT 06706
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6

V4523 PG184

GEORGE F. FLAHERTY JR.
CITY CLERK



MICHAEL J. JARJURA
MAYOR

CT-440

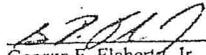
OFFICE OF THE CITY CLERK
THE CITY OF WATERBURY
CONNECTICUT

November 19, 2002

To Whom It May Concern:

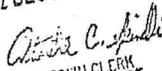
THIS IS TO CERTIFY THAT at a regular meeting of the Zoning Board of Appeals held on Monday, November 18, 2002, the Board voted unanimously to GRANT AT&T Wireless PCS LLC a Certificate of Approval for a Special Exception per Sections 5.12-12 and 5.13-9 of the City of Waterbury Zoning Ordinance to permit the installation of a wireless telecommunications facility at the premises, for property located at 1389 West Main Street, an RO Zone. Owner: Waterbury Medical Center Condo.

ATTEST:


George F. Flaherty, Jr.
City Clerk

GFFJr./amk

RECEIVED FOR RECORD
2002 DEC 12 PM 1:15


CHRISTINE C. SPINDLE
TOWN CLERK
WATERBURY, CT.

19959

(REVISED)
STRUCTURAL ANALYSIS REPORT

For

CT5440 (LTE 3C/4C/5C)

WATERBURY WEST

1389 West Main Street
Waterbury, CT 06708

**Antennas Mounted on Pipe masts within FRP Enclosures
located on the Roof**



Prepared for:



Dated: May 28, 2019 (Rev.1)

May 3, 2019 (Rev.1)

February 28, 2019

Prepared by:



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





SCOPE OF WORK:

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

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

This office conducted an on-site visual survey of the above site on February 22, 2019. Attendees included Manuel Tejada (HDG – Field Technician).

The following documents were used for our reference:

- Building Plans prepared by Arthur P. D'Oliveira dated December 29, 1986.
- Previous HDG Structural Analysis dated July 16, 2010.

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 5)	W16x26	90%	PASS

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

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
FRP Enclosure Frame	3	LC4	6%	PASS

Based on our evaluation, we have determined that the existing steel platform **IS NOT CAPABLE** of supporting the proposed equipment loading. HDG recommends the following modifications:

- **Reinforce the existing W14x22 steel beams supporting the new and existing cabinets with new W8x18 steel beams. Reference the latest HDG construction drawings for details.**

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Steel Platform	5	LC10	151%	FAIL
Modified Steel Platform	31	LC9	95%	PASS

Reference the chart below for the minimum ballast requirements.

MINIMUM BALLAST REQUIREMENTS	
Number of Blocks per Side	3
Size of Blocks	4"x8"x16" Solid
Weight of Blocks	38 lbs. /each
Total Ballast Weight	228 lbs.

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

*Reference documents attached.



APPURTENANCE CONFIGURATION:

Appurtenances	Dimensions	Weight	**Elevation	Mount
(2) Squid Surge Arrestors	24.0"Φx9.7"	33 lbs	42'	Ballast Mount
(3) 800-10991K Antennas	78.7"x20.0"x6.9"	101 lbs	52'	Enclosure
(3) 800-10964 Antennas	59.0"x20.0"x6.9	84 lbs	52'	Enclosure
(3) B5/B12 4449 RRH's	14.9"x13.2"x10.4"	73 lbs	42'	Ballast Mount
(3) B2/B66A 8843 RRH's	14.9"x13.2"x10.9"	72 lbs	42'	Ballast Mount
(3) 4415 B30 RRH's	14.9"x13.2"x5.4"	44 lbs	42'	Ballast Mount
(1) Squid Surge Arrestor	24.0"Φx9.7"	33 lbs	42'	Ballast Mount
(2) Nokia GSM Cabinets	76.4"x30.0"x29.5"	770 lbs		Equipment Platform
(1) RXAIT Cabinets	80.0"x30.0"x30.0"	300 lbs		Equipment Platform
(1) 3106 Cabinets	64.0"x51.2"x28.0"	1930 lbs		Equipment Platform
(1) Purcell Cabinet	30.0"x24.0"x24.0"	200 lbs		Equipment Platform
(1) Telco Cabinet	66.0"x30.0"x10.0"	200 lbs		Equipment Platform
(1) Power Panel	48.0"x24.0"x12.3"	200 lbs		Equipment Platform
(3) RRUW RRH's	23.6"x13.8"x4.4"	45 lbs		Equipment Platform
(3) Surge Arrestors	20.1"x18.2"x6.4"	44 lbs		Equipment Platform
(1) Fiber Management Box	21.0"x26.0"x7.5"	44 lbs		Equipment Platform
(1) NetSure 512 Power Plant and Flex Cabinet	72.0"x37.8"x30.0"	2300 lbs		Equipment Platform

* Proposed equipment shown in bold.

** Elevation to top of enclosure



DESIGN CRITERIA:

International Building Code (IBC) 2015 with 2018 Connecticut State Building Code, and ASCE-10 (Minimum Design Loads for Buildings and Other Structures).		
Wind		
Reference Wind Speed:	125 mph	(2018 CTSBC 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 :	35	(2018 CTSBC 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:	25 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:	Waterbury	
County:	New Haven	
Wind Load:	117 mph	(TIA-222-H Annex B)
Ice		
Design Ice Thickness (t_i):	1.5 in	(TIA-222-H Annex B)
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_{i2}):	1.57 in	(TIA-222-H Sec. 2.6.10)



EXISTING ROOF CONSTRUCTION:

The existing roof construction consists of a roofing membrane over rigid insulation over concrete metal decking supported by steel beams and columns.

ANTENNA SUPPORT RECOMMENDATIONS:

The new antennas are proposed to be installed within new FRP enclosures on new pipe masts secured to the proposed FRP enclosure framing located on the roof 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 and existing non-penetrating ballast mounts located on the roof. Reference the table on page 2 for minimum ballast requirements.

EQUIPMENT SUPPORT RECOMMENDATIONS:

The new equipment cabinet is proposed to be mounted on the existing equipment platform located on the roof.

Limitations and Assumptions:

1. Reference the latest HDG construction drawings for all the equipment locations.
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 proposed location of the Alpha sector.
Existing mount to be removed and replaced.



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

FIELD PHOTOS (CONT.):



Photo 3: Sample photo illustrating the proposed location of the Gamma sector. Existing mount to be removed and replaced.



Photo 4: Sample photo illustrating the existing equipment platform.



HUDSON
Design Group LLC

Antenna Mount Calculations

Date: 02/28/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



Wind Analysis → Antenna Enclosure

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K_z	0.82	(ASCE 7-10 Table 29.3.1)
Wind Directionality Coef., K_d	0.90	(ASCE 7-10 Table 26.6-1)
Topographic Factor, K_{zt}	1.00	(ASCE 7-10 Section 26.8.2)
Velocity Pressure, q_z	$= 0.00256K_zK_{zt}K_dV^2$ $= \underline{\underline{29.44 \text{ psf}}}$	(ASCE 7-10 Equation 29.3-1)
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C_f	1.31	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A_f	77 ft ²	(7 ft. W x 11 ft. H)
Wind Force, F	$= q_zGC_fA_f$ $= \underline{\underline{2518.74 \text{ lbs}}}$	(ASCE 7-10 Equation 29.5-2)

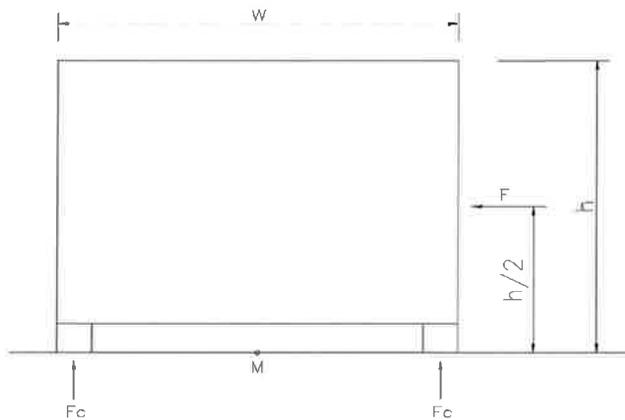
Date: 02/28/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



HUDSON
 Design Group LLC

Calculate Overturning Moment of Proposed Antenna Enclosure

Dimensions (ft)	Wide, w	Depth, d	Height, h
	7	7	13.5



Moment, M = $F \times h/2$
 = **17001.48** **lb-ft**

Calculate Force Couple

Force Couple, F_c = M / d
 = **2428.78** **lbs.**

Number of Supports in Tension:

F_c per Support = **809.59** **lbs.**

Date: 02/28/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



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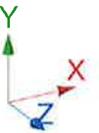
Load Breakdown - Antenna Enclosure

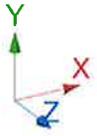
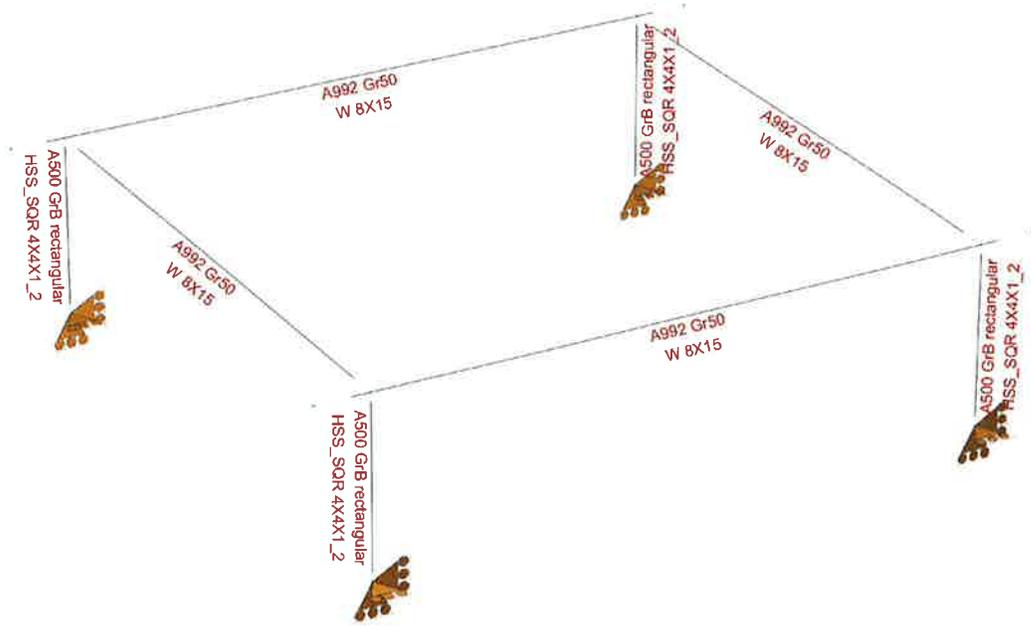
<u>Item</u>	<u>Wt. (Lbs.)</u>	<u>Linear ft.</u>	<u>Qty.</u>	<u>Total (Lbs.)</u>
3x3x1/4 FRP Tube (V)	2.2	12.33	8	217.0
3x3x1/4 FRP Tube (H)	2.2	3.09	24	163.4
4x1/4 FRP diagonal	0.75	6	32	144.0
FRP Panel	687		1	687.0
Antenna	101		1	101.0
Antenna	84		1	84.0
2" Pipe	3.66	8	2	58.6
L3x3x3/8	7.2	7	2	100.8
HSS2x2x1/4	5.41	14	2	151.5
Miscellaneous	50		1	50.0

Total, T_{weight} **1757.2**

Number of Supports: 8

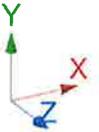
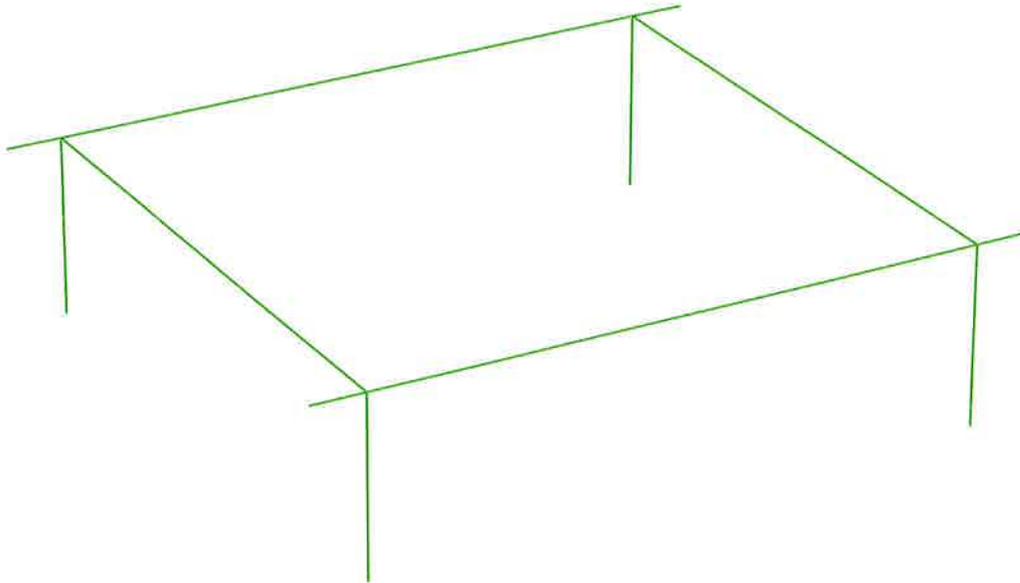
Weight per Supports = **219.65 lbs.**

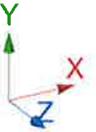
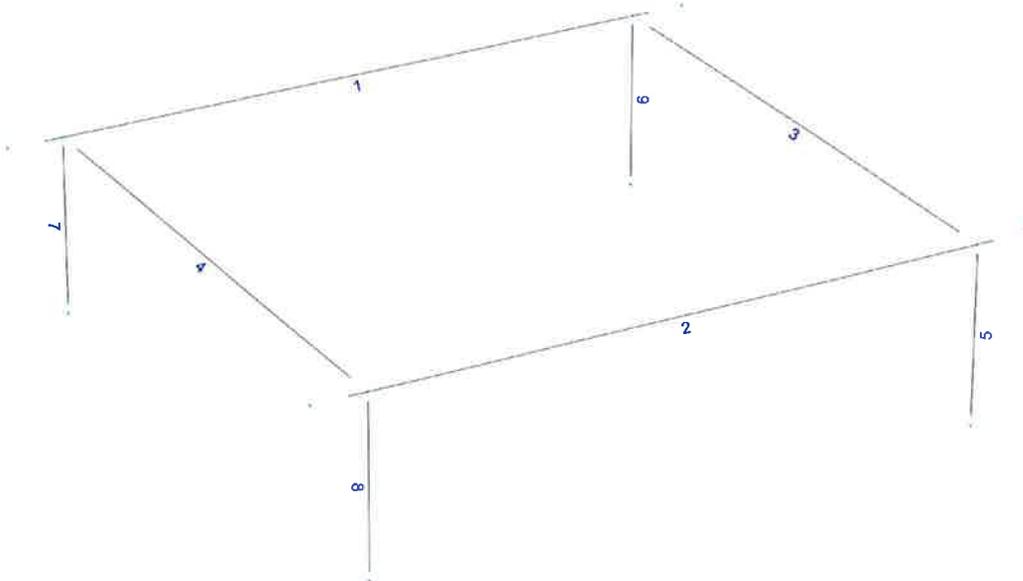




Design status

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





Current Date: 2/28/2019 8:34 AM

Units system: English

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Load data

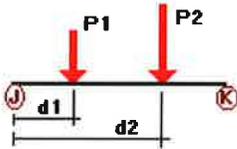
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wf	Wind Load (FRONT)	No	WIND
Ws	Wind Load (SIDE)	No	WIND

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%	
DL	1	y	-0.22	0.60	No	
		y	-0.22	4.00	No	
		y	-0.22	7.40	No	
		y	-0.22	7.40	No	
	2	y	-0.22	0.60	No	
		y	-0.22	4.00	No	
		y	-0.22	7.40	No	
		y	-0.22	7.40	No	
3	y	-0.22	3.3958	No		
	y	-0.22	3.3958	No		
	Wf	1	y	-0.81	0.60	No
			y	-0.81	4.00	No
y			-0.81	7.40	No	
2	y	y	0.81	0.60	No	
		y	0.81	4.00	No	
		y	0.81	7.40	No	
	Ws	1	y	0.81	0.60	No
			y	-0.81	7.40	No
			y	-0.81	7.40	No
2	y	y	0.81	0.60	No	
		y	-0.81	7.40	No	
		y	0.81	3.3958	No	
		y	-0.81	3.3958	No	

Self weight multipliers for load conditions

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

Earthquake (Dynamic analysis only)

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

Current Date: 2/28/2019 8:35 AM

Units system: English

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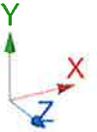
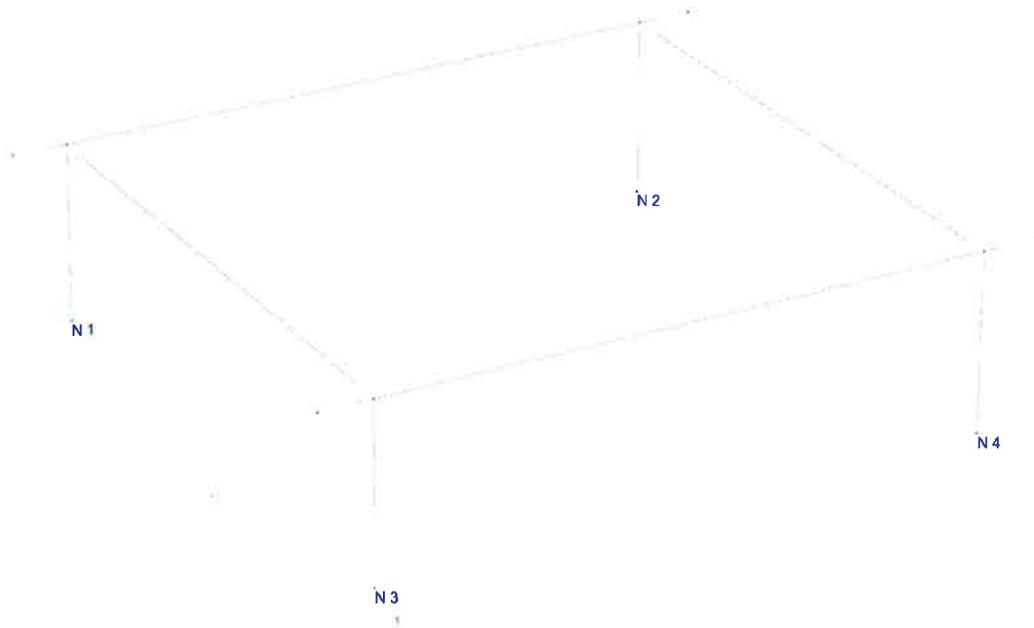
Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

- LC1=1.2DL+Wf
- LC2=1.2DL+Ws
- LC3=1.2DL-Wf
- LC4=1.2DL-Ws
- LC5=0.9DL+Wf
- LC6=0.9DL+Ws
- LC7=0.9DL-Wf
- LC8=0.9DL-Ws
- LC9=1.2DL
- LC10=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 4X4X1_2	5	LC3 at 0.00%	0.04	OK	Eq. H1-1b
		6	LC1 at 0.00%	0.04	OK	Eq. H1-1b
		7	LC1 at 0.00%	0.04	OK	Eq. H1-1b
		8	LC3 at 0.00%	0.04	OK	Eq. H1-1b
	W 8X15	1	LC1 at 50.00%	0.04	OK	Eq. H1-1b
		2	LC3 at 50.00%	0.04	OK	Eq. H1-1b
		3	LC4 at 50.00%	0.06	OK	Sec. F1
		4	LC2 at 50.00%	0.06	OK	Sec. F1



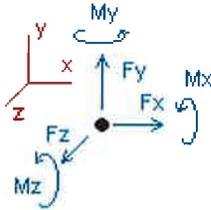
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Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition LC1=1.2DL+Wf						
1	0.32305	1.91696	0.00000	0.00000	0.00000	0.00000
2	-0.32305	1.91696	0.00000	0.00000	0.00000	0.00000
3	-0.13116	-0.51304	0.00000	0.00000	0.00000	0.00000
4	0.13116	-0.51304	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	2.80785	0.00000	0.00000	0.00000	0.00000
Condition LC2=1.2DL+Ws						
1	0.09595	1.91796	0.00000	0.00000	0.00000	0.00000
2	-0.09595	-0.51403	0.00000	0.00000	0.00000	0.00000
3	0.09595	1.91796	0.00000	0.00000	0.00000	0.00000
4	-0.09595	-0.51403	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	2.80785	0.00000	0.00000	0.00000	0.00000
Condition LC3=1.2DL-Wf						
1	-0.13116	-0.51304	0.00000	0.00000	0.00000	0.00000
2	0.13116	-0.51304	0.00000	0.00000	0.00000	0.00000
3	0.32305	1.91696	0.00000	0.00000	0.00000	0.00000
4	-0.32305	1.91696	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	2.80785	0.00000	0.00000	0.00000	0.00000
Condition LC4=1.2DL-Ws						
1	0.09595	-0.51403	0.00000	0.00000	0.00000	0.00000
2	-0.09595	1.91796	0.00000	0.00000	0.00000	0.00000
3	0.09595	-0.51403	0.00000	0.00000	0.00000	0.00000
4	-0.09595	1.91796	0.00000	0.00000	0.00000	0.00000
SUM	0.00000	2.80785	0.00000	0.00000	0.00000	0.00000

Condition LC5=0.9DL+Wf

1	0.29907	1.74147	0.00000	0.00000	0.00000	0.00000
2	-0.29907	1.74147	0.00000	0.00000	0.00000	0.00000
3	-0.15514	-0.68853	0.00000	0.00000	0.00000	0.00000
4	0.15514	-0.68853	0.00000	0.00000	0.00000	0.00000

SUM	0.00000	2.10589	0.00000	0.00000	0.00000	0.00000
-----	---------	---------	---------	---------	---------	---------

Condition LC6=0.9DL+Ws

1	0.07196	1.74247	0.00000	0.00000	0.00000	0.00000
2	-0.07196	-0.68952	0.00000	0.00000	0.00000	0.00000
3	0.07196	1.74247	0.00000	0.00000	0.00000	0.00000
4	-0.07196	-0.68952	0.00000	0.00000	0.00000	0.00000

SUM	0.00000	2.10589	0.00000	0.00000	0.00000	0.00000
-----	---------	---------	---------	---------	---------	---------

Condition LC7=0.9DL-Wf

1	-0.15514	-0.68853	0.00000	0.00000	0.00000	0.00000
2	0.15514	-0.68853	0.00000	0.00000	0.00000	0.00000
3	0.29907	1.74147	0.00000	0.00000	0.00000	0.00000
4	-0.29907	1.74147	0.00000	0.00000	0.00000	0.00000

SUM	0.00000	2.10589	0.00000	0.00000	0.00000	0.00000
-----	---------	---------	---------	---------	---------	---------

Condition LC8=0.9DL-Ws

1	0.07196	-0.68952	0.00000	0.00000	0.00000	0.00000
2	-0.07196	1.74247	0.00000	0.00000	0.00000	0.00000
3	0.07196	-0.68952	0.00000	0.00000	0.00000	0.00000
4	-0.07196	1.74246	0.00000	0.00000	0.00000	0.00000

SUM	0.00000	2.10589	0.00000	0.00000	0.00000	0.00000
-----	---------	---------	---------	---------	---------	---------

Condition LC9=1.2DL

1	0.09595	0.70196	0.00000	0.00000	0.00000	0.00000
2	-0.09595	0.70196	0.00000	0.00000	0.00000	0.00000
3	0.09595	0.70196	0.00000	0.00000	0.00000	0.00000
4	-0.09595	0.70196	0.00000	0.00000	0.00000	0.00000

SUM	0.00000	2.80785	0.00000	0.00000	0.00000	0.00000
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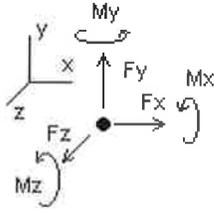
Condition LC10=0.9DL

1	0.07196	0.52647	0.00000	0.00000	0.00000	0.00000
2	-0.07196	0.52647	0.00000	0.00000	0.00000	0.00000
3	0.07196	0.52647	0.00000	0.00000	0.00000	0.00000
4	-0.07196	0.52647	0.00000	0.00000	0.00000	0.00000

SUM	0.00000	2.10589	0.00000	0.00000	0.00000	0.00000
-----	---------	---------	---------	---------	---------	---------

Envelope for nodal reactions

Note.- I_c is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

- LC1=1.2DL+Wf
- LC2=1.2DL+Ws
- LC3=1.2DL-Wf
- LC4=1.2DL-Ws
- LC5=0.9DL+Wf
- LC6=0.9DL+Ws
- LC7=0.9DL-Wf
- LC8=0.9DL-Ws
- LC9=1.2DL
- LC10=0.9DL

Node		Forces						Moments					
		Fx	I_c	Fy	I_c	Fz	I_c	Mx	I_c	My	I_c	Mz	I_c
		[Kip]		[Kip]		[Kip]		[Kip*ft]		[Kip*ft]		[Kip*ft]	
1	Max	0.323	LC1	1.918	LC2	0.000	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.155	LC7	-0.690	LC8	0.000	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
2	Max	0.155	LC7	1.918	LC4	0.000	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.323	LC1	-0.690	LC6	0.000	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
3	Max	0.323	LC3	1.918	LC2	0.000	LC3	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.155	LC5	-0.690	LC8	0.000	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
4	Max	0.155	LC5	1.918	LC4	0.000	LC3	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.323	LC3	-0.690	LC6	0.000	LC5	0.00000	LC1	0.00000	LC1	0.00000	LC1



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**Equipment Platform Calculations
(Existing Conditions)**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



Wind Analysis → NetSure 512 Power Plant

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K _z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K _d	0.90	(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 _z K _{zt} K _d V ²	(ASCE 7-10 Equation 29.3-1)
	= <u>29.44 psf</u>	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C _f	1.32	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A _f	19 ft ²	(3.15 ft. W x 6 ft. H)
Wind Force, F	= q _z GC _f A _f	(ASCE 7-10 Equation 29.5-2)
	= <u>625.63 lbs</u>	

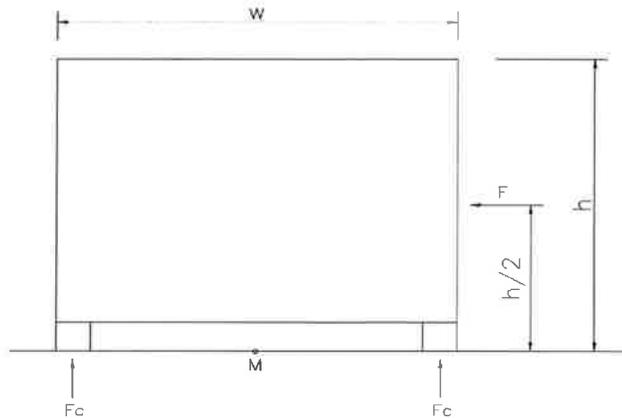
Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



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Calculate Overturning Moment of Proposed NetSure 512 Power Plant

Dimensions (ft)	Wide, w	Depth, d	Height, h
	3.15	2.5	6



Moment, M = $F \times h/2$
 = **1876.88** **lb-ft**

Calculate Force Couple

Force Couple, F_c = M / d
 = **750.75** **lbs.**

Number of Supports in Tension:

F_c per Support = **375.38 lbs.**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



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 Design Group LLC

Wind Analysis → Nokia GSM Cabinet

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K_z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K_d	0.90	(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)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C_f	1.33	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A_f	16 ft ²	(2.5 ft. W x 6.37 ft. H)
Wind Force, F	$= q_zGC_fA_f$	(ASCE 7-10 Equation 29.5-2)
	= 529.22 lbs	

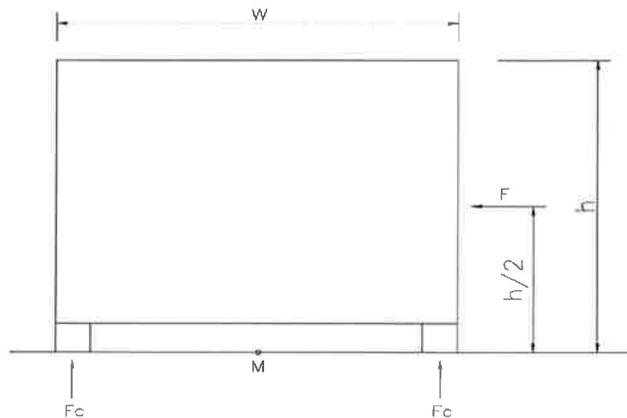
Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



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Calculate Overturning Moment of Existing Nokia GSM Cabinet

Dimensions (ft)	Wide, w	Depth, d	Height, h
	2.5	2.46	6.37



Moment, M = $F \times h/2$
 = **1685.57** **lb-ft**

Calculate Force Couple

Force Couple, F_c = M / d
 = **685.66** **lbs.**

Number of Supports in Tension:

F_c per Support = **342.83** **lbs.**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



Wind Analysis → RAIT Cabinet

Reference Codes:

- 2018 Connecticut State Building Code
- 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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K _z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K _d	0.90	(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 _z K _{zt} K _d V ²	(ASCE 7-10 Equation 29.3-1)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C _f	1.33	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A _f	17 ft ²	(2.5 ft. W x 6.67 ft. H)
Wind Force, F	= q _z GC _f A _f	(ASCE 7-10 Equation 29.5-2)
	= 553.98 lbs	

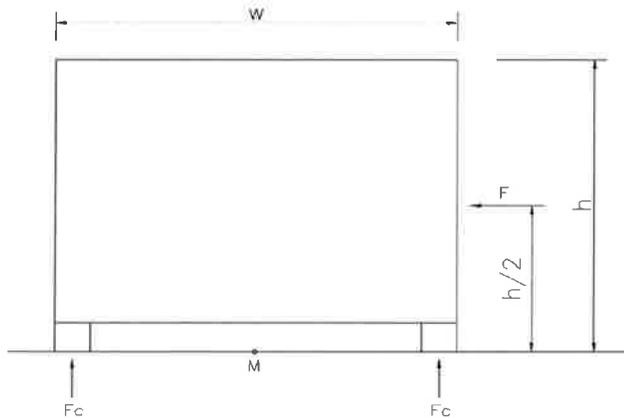
Date: 05/02/2019
 Project Name: WATERBURY WEST
 Project No.: CT5440
 Designed By: JN Checked By: MSC



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 Design Group LLC

Calculate Overturning Moment of Existing RXAIT Cabinet

Dimensions (ft)	Wide, w	Depth, d	Height, h
	2.5	2.50	6.67



Moment, M = $F \times h/2$
 = 1847.52 **lb-ft**

Calculate Force Couple

Force Couple, F_c = M / d
 = 739.01 **lbs.**

Number of Supports in Tension:

F_c per Support = **369.50 lbs.**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



HUDSON
 Design Group LLC

Wind Analysis → 3106 Cabinet

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K_z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K_d	0.90	(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)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C_f	1.30	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A_f	23 ft ²	(4.27 ft. W x 5.33 ft. H)
Wind Force, F	$= q_zGC_fA_f$	(ASCE 7-10 Equation 29.5-2)
	= 741.53 lbs	

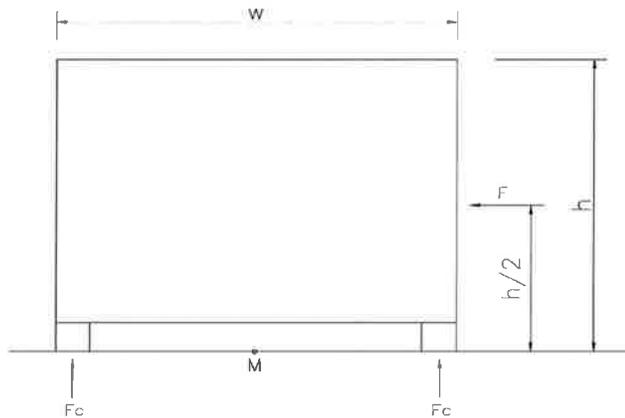
Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



HUDSON
 Design Group LLC

Calculate Overturning Moment of Existing 3106 Cabinet

Dimensions (ft)	Wide, w	Depth, d	Height, h
	4.27	2.33	5.33



Moment, M = $F \times h/2$
 = **1976.19** **lb-ft**

Calculate Force Couple

Force Couple, F_c = M / d
 = **848.15** **lbs.**

Number of Supports in Tension:

F_c per Support = **424.07 lbs.**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



Wind Analysis → Purcell Cabinet

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K_z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K_d	0.90	(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)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C_f	1.30	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A_f	5 ft ²	(2 ft. W x 2.5 ft. H)
Wind Force, F	$= q_zGC_fA_f$	(ASCE 7-10 Equation 29.5-2)
	= 162.90 lbs	

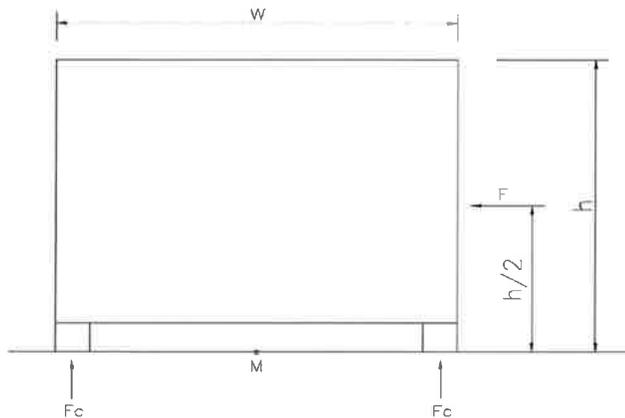
Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



HUDSON
 Design Group LLC

Calculate Overturning Moment of Existing Purcell Cabinet

Dimensions (ft)	Wide, w	Depth, d	Height, h
	2	2.00	2.5



Moment, M = $F \times h/2$
 = **203.63** **lb-ft**

Calculate Force Couple

Force Couple, F_c = M / d
 = **101.81** **lbs.**

Number of Supports in Tension:

F_c per Support = **50.91 lbs.**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



HUDSON
 Design Group LLC

Wind Analysis → Telco Cabinet

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K_z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K_d	0.90	(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)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C_f	1.40	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A_f	14 ft ²	(2.5 ft. W x 5.5 ft. H)
Wind Force, F	$= q_zGC_fA_f$	(ASCE 7-10 Equation 29.5-2)
	= 480.24 lbs	

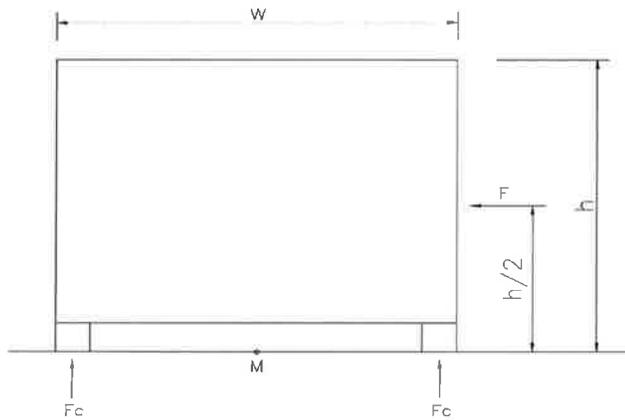
Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN Checked By: MSC



HUDSON
Design Group LLC

Calculate Overturning Moment of Existing Telco Cabinet

Dimensions (ft)	Wide, w	Depth, d	Height, h
	2.5	0.83	5.5



Moment, M = $F \times h/2$
= **1320.65** **lb-ft**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



Wind Analysis → Power Panel

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K _z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K _d	0.90	(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 _z K _{zt} K _d V ²	(ASCE 7-10 Equation 29.3-1)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C _f	1.35	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A _f	8 ft ²	(2 ft. W x 4 ft. H)
Wind Force, F	= q _z GC _f A _f	(ASCE 7-10 Equation 29.5-2)
	= 270.03 lbs	

Date: 05/02/2019

Project Name: WATERBURY WEST

Project No.: CT5440

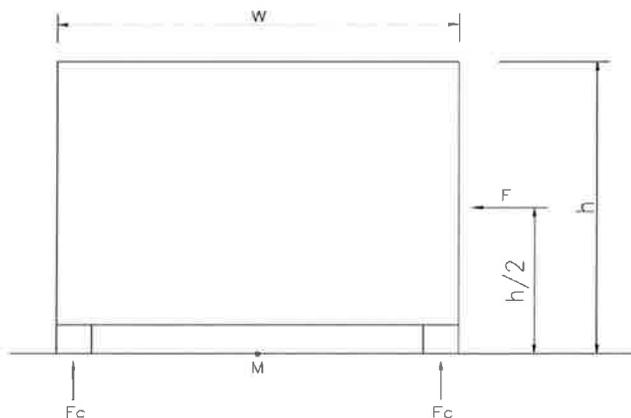
Designed By: JN Checked By: MSC



HUDSON
Design Group LLC

Calculate Overturning Moment of Existing Power Panel

Dimensions (ft)	Wide, w	Depth, d	Height, h
	2	1.03	4



Moment, M = $F \times h/2$
= **540.06** **lb-ft**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



Wind Analysis → RRUW RRH

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K_z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K_d	0.90	(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)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C_f	1.38	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A_f	2 ft ²	(1.15 ft. W x 1.97 ft. H)
Wind Force, F	$= q_zGC_fA_f$	(ASCE 7-10 Equation 29.5-2)
	= 77.76 lbs	

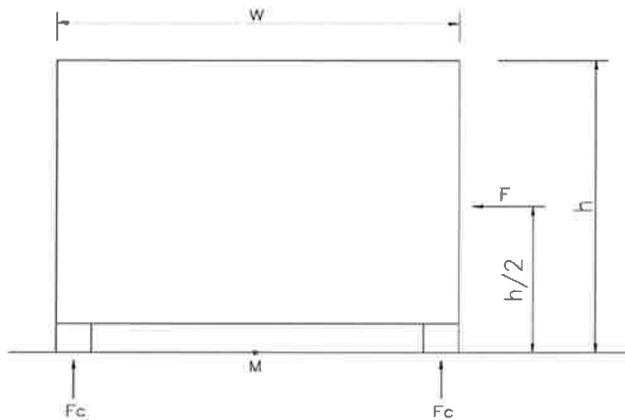
Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN Checked By: MSC



HUDSON
Design Group LLC

Calculate Overturning Moment of Existing RRW RRH

Dimensions (ft)	Wide, w	Depth, d	Height, h
	1.15	0.37	1.97



Moment, M = $F \times h/2$
 = **76.59** **lb-ft**

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC



Wind Analysis → Surge Arrestor

Reference Codes:

-2018 Connecticut State Building Code

-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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K_z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K_d	0.90	(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)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C_f	1.33	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A_f	3 ft ²	(1.52 ft. W x 1.68 ft. H)
Wind Force, F	$= q_zGC_fA_f$	(ASCE 7-10 Equation 29.5-2)
	= 84.74 lbs	

Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN **Checked By:** MSC

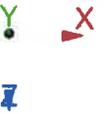
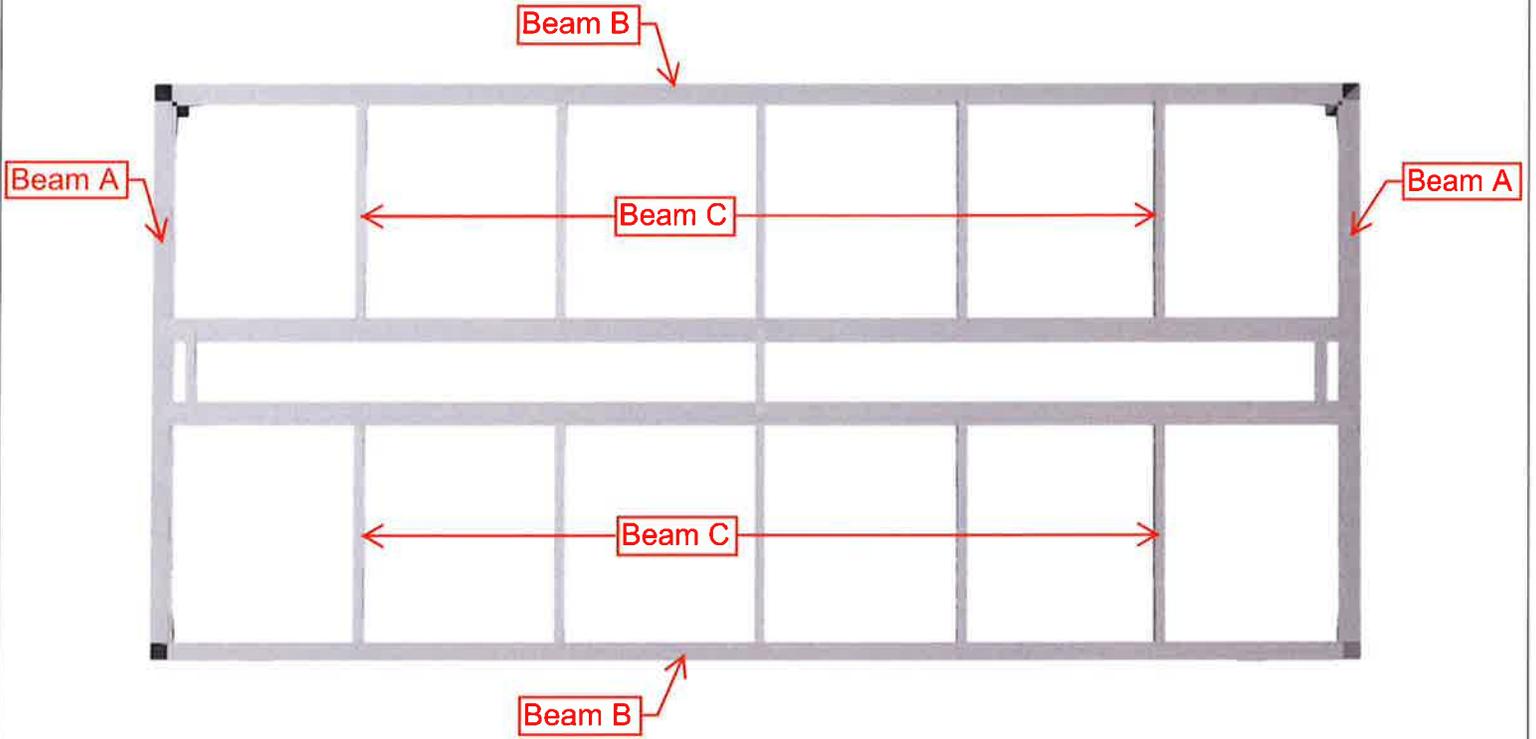


Wind Analysis → Fiber Management Box

Reference Codes:

- 2018 Connecticut State Building Code
- 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	(2018 CTSBC Appendix N)
Importance Factor, I	1	(ASCE 7-10 Table 1.5-2)
Exposure Category	B	(ASCE 7-10 Section 26.7)
Height Above Ground Level, z	52 ft	(Center of Enclosure)
Exposure Coefficient, K _z	0.82	(ASCE 7-10 Table 29-3.1)
Wind Directionality Coef., K _d	0.90	(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 _z K _{zt} K _d V ²	(ASCE 7-10 Equation 29.3-1)
	= 29.44 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Net Force Coefficient, C _f	1.33	(ASCE 7-10 Figure 29.5-1)
Projected Area Normal to Wind, A _f	4 ft ²	(2.17 ft. W x 1.68 ft. H)
Wind Force, F	= q _z GC _f A _f	(ASCE 7-10 Equation 29.5-2)
	= 120.97 lbs	



Date: 05/02/2019
Project Name: WATERBURY WEST
Project No.: CT5440
Designed By: JN Checked By: MSC



Load Breakdown:

Live Loads:

Service 25 psf

Dead Loads:

Grating 15 psf

Handrail 10 plf

● **Beam A**

Live Load

→ Service 25 psf x 1.8 ft. (Tributary Width)
= **43.8 plf**

Dead Load

→ Grating 15 psf x 1.8 ft. (Tributary Width)
26.3 plf

→ Handrail 10 plf

● **Beam B**

Dead Load

→ Handrail 10 plf

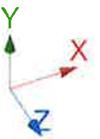
● **Beam C**

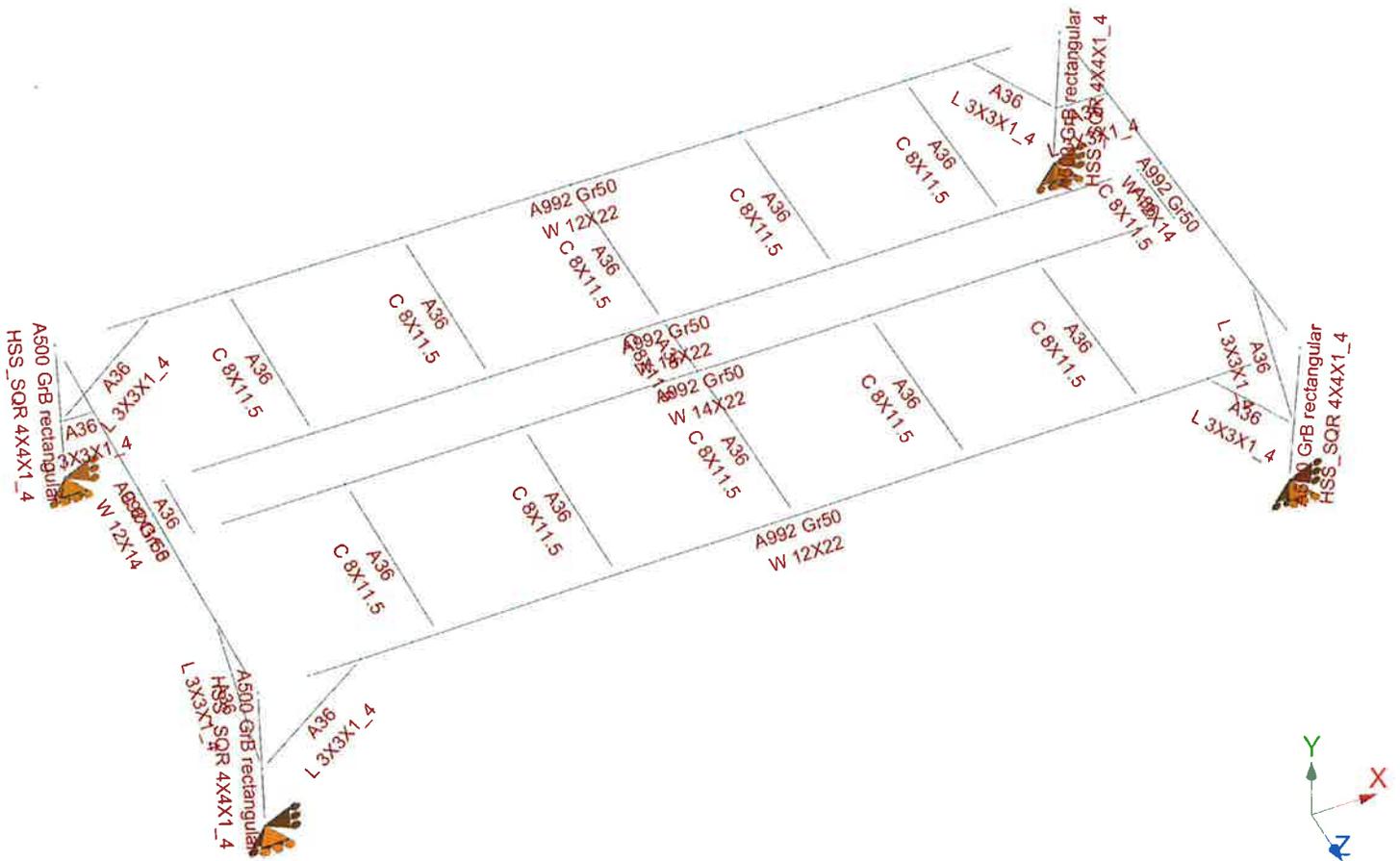
Live Load

→ Service 25 psf x 3.6 ft. (Tributary Width)
= **89.6 plf**

Dead Load

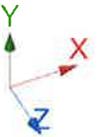
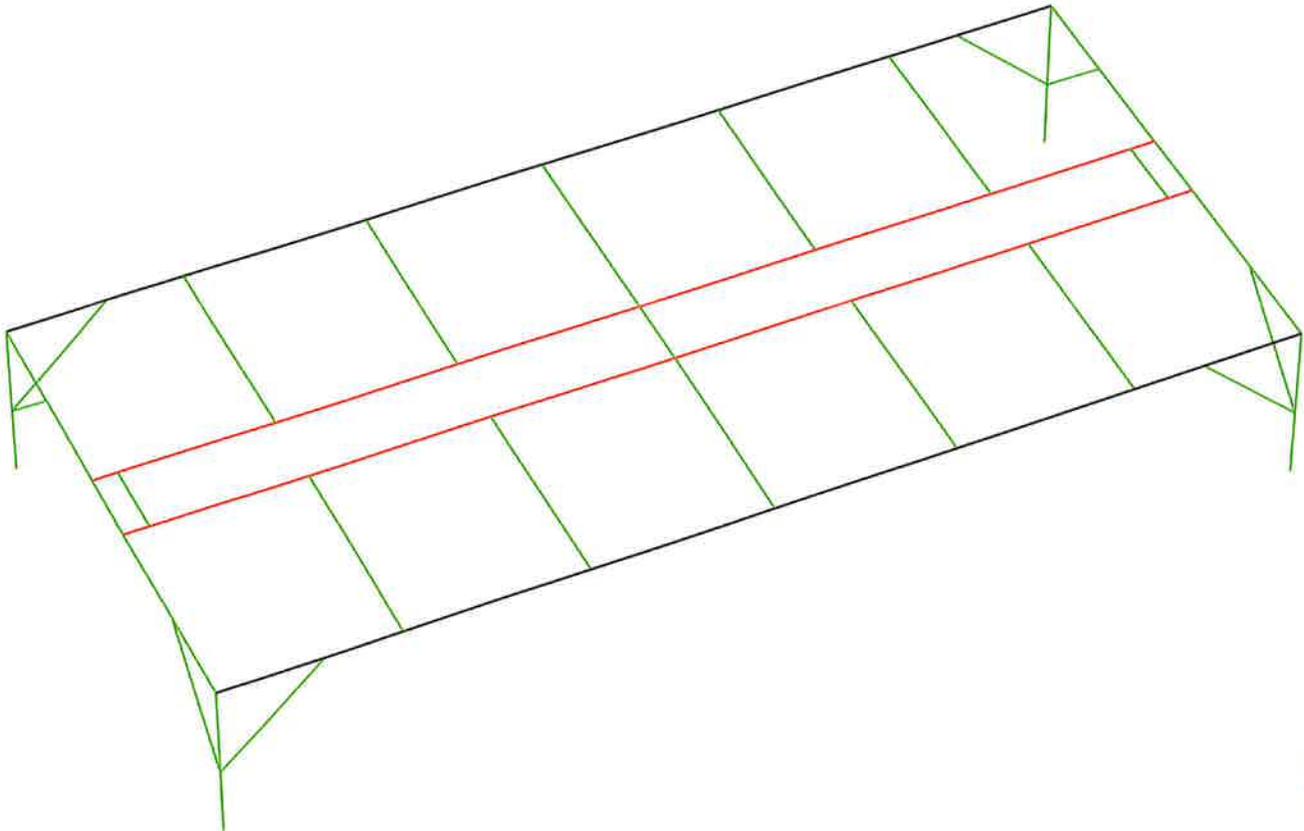
→ Grating 15 psf x 3.6 ft. (Tributary Width)
53.7 plf

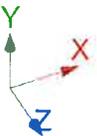
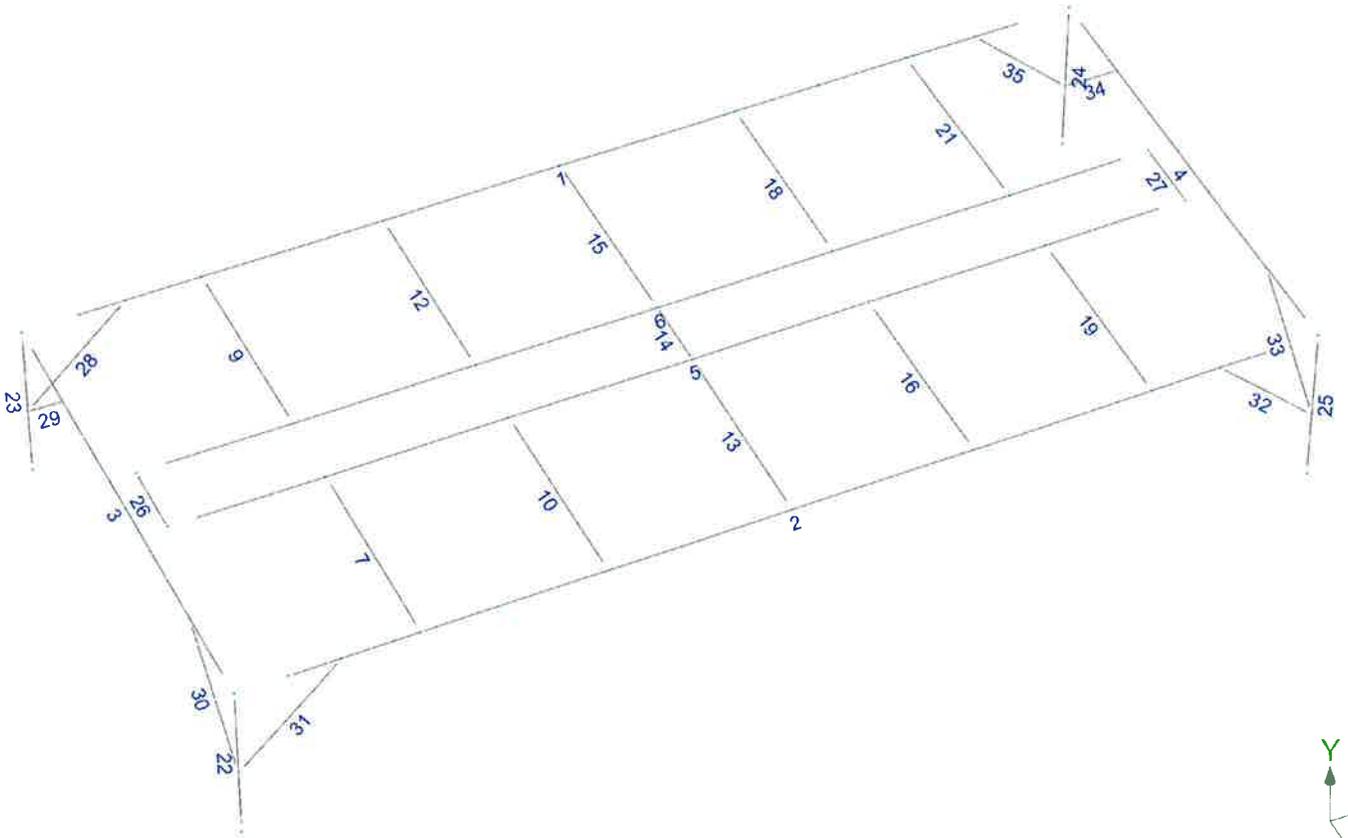




Design status

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





Current Date: 5/3/2019 8:44 AM

Units system: English

File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT5440\LTE 3C-4C-5C\CT5440 (LTE 3C-4C-5C) - Equipment Platform.etz\

Load data

GLOSSARY

Comb : Indicates if load condition is a load combination

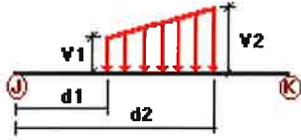
Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
WLf	Wind Load (Front)	No	WIND
WLs	Wind Load (Side)	No	WIND
LL	Live Load	No	LL

Load on nodes

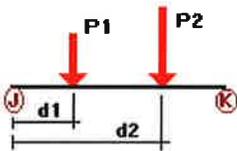
Condition	Node	FX [Kip]	FY [Kip]	FZ [Kip]	MX [Kip*ft]	MY [Kip*ft]	MZ [Kip*ft]
DL	49	0.00	-0.045	0.00	0.00	0.00	0.00
	50	0.00	-0.045	0.00	0.00	0.00	0.00
	51	0.00	-0.045	0.00	0.00	0.00	0.00
	52	0.00	-0.044	0.00	0.00	0.00	0.00
	53	0.00	-0.044	0.00	0.00	0.00	0.00
	54	0.00	-0.044	0.00	0.00	0.00	0.00
	55	0.00	-0.044	0.00	0.00	0.00	0.00
	56	0.00	-0.20	0.00	0.00	0.00	0.00
WLf	57	0.00	-0.20	0.00	0.00	0.00	0.00
	58	0.00	-0.045	0.00	0.00	0.00	0.00
	49	0.00	0.00	0.00	-0.077	0.00	0.00
	50	0.00	0.00	0.00	-0.077	0.00	0.00
	51	0.00	0.00	0.00	-0.077	0.00	0.00
	52	0.00	0.00	0.00	-0.072	0.00	0.00
	53	0.00	0.00	0.00	-0.072	0.00	0.00
	54	0.00	0.00	0.00	-0.072	0.00	0.00
WLs	55	0.00	0.00	0.00	-0.102	0.00	0.00
	56	0.00	0.00	0.00	-0.541	0.00	0.00
	57	0.00	0.00	0.00	-1.321	0.00	0.00
	58	0.00	0.00	0.00	-0.102	0.00	0.00
	49	0.00	0.00	0.00	0.00	0.00	-0.077
	50	0.00	0.00	0.00	0.00	0.00	-0.077
	51	0.00	0.00	0.00	0.00	0.00	-0.077
	52	0.00	0.00	0.00	0.00	0.00	-0.072
53	0.00	0.00	0.00	0.00	0.00	-0.072	
54	0.00	0.00	0.00	0.00	0.00	-0.072	
55	0.00	0.00	0.00	0.00	0.00	-0.102	
56	0.00	0.00	0.00	0.00	0.00	-0.541	
57	0.00	0.00	0.00	0.00	0.00	-1.321	
58	0.00	0.00	0.00	0.00	0.00	-0.102	

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	1	y	-0.01	0.00	0.00	No	0.00	No
	2	y	-0.01	0.00	0.00	No	0.00	No
	3	y	-0.037	0.00	0.00	No	0.00	No
	4	y	-0.037	0.00	0.00	No	0.00	No
	7	y	-0.054	0.00	0.00	No	0.00	No
	9	y	-0.054	0.00	0.00	No	0.00	No
	10	y	-0.054	0.00	0.00	No	0.00	No
	12	y	-0.054	0.00	0.00	No	0.00	No
	13	y	-0.054	0.00	0.00	No	0.00	No
	15	y	-0.054	0.00	0.00	No	0.00	No
	16	y	-0.054	0.00	0.00	No	0.00	No
	18	y	-0.054	0.00	0.00	No	0.00	No
	19	y	-0.054	0.00	0.00	No	0.00	No
	LL	21	y	-0.054	0.00	0.00	No	0.00
3		y	-0.044	0.00	0.00	No	0.00	No
4		y	-0.044	0.00	0.00	No	0.00	No
7		y	-0.09	0.00	0.00	No	0.00	No
9		y	-0.09	0.00	0.00	No	0.00	No
10		y	-0.09	0.00	0.00	No	0.00	No
12		y	-0.09	0.00	0.00	No	0.00	No
13		y	-0.09	0.00	0.00	No	0.00	No
15		y	-0.09	0.00	0.00	No	0.00	No
16		y	-0.09	0.00	0.00	No	0.00	No
18		y	-0.09	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	3	y	-0.05	0.50	No
		y	-0.05	2.50	No
	5	y	-0.075	3.50	No
		y	-0.075	6.00	No
		y	-0.193	6.50	No
		y	-0.193	8.50	No
		y	-0.193	8.50	No
		y	-0.193	11.00	No
		y	-0.483	11.75	No
y	-0.483	16.00	No		

		y	-0.575	17.50	No
		y	-0.575	20.00	No
	6	y	-0.075	3.50	No
		y	-0.075	6.00	No
		y	-0.193	6.50	No
		y	-0.193	8.50	No
		y	-0.193	8.50	No
		y	-0.193	11.00	No
		y	-0.483	11.75	No
		y	-0.483	16.00	No
		y	-0.575	17.50	No
		y	-0.575	20.00	No
	7	y	-0.05	0.50	No
		y	-0.05	2.50	No
WLf	3	y	0.051	0.50	No
		y	-0.051	2.50	No
	5	y	0.37	3.50	No
		y	0.37	6.00	No
		y	0.343	6.50	No
		y	0.343	8.50	No
		y	0.343	8.50	No
		y	0.343	11.00	No
		y	0.425	11.75	No
		y	0.425	16.00	No
		y	0.376	17.50	No
		y	0.376	20.00	No
	6	y	-0.37	3.50	No
		y	-0.37	6.00	No
		y	-0.343	6.50	No
		y	-0.343	8.50	No
		y	-0.343	8.50	No
		y	-0.343	11.00	No
		y	-0.425	11.75	No
		y	-0.425	16.00	No
		y	-0.376	17.50	No
		y	-0.376	20.00	No
	7	y	0.051	0.50	No
		y	-0.051	2.50	No
WLs	3	y	0.051	0.50	No
		y	0.051	2.50	No
	5	y	0.37	3.50	No
		y	-0.37	6.00	No
		y	0.343	6.50	No
		y	-0.343	8.50	No
		y	0.343	8.50	No
		y	-0.343	11.00	No
		y	0.425	11.75	No
		y	-0.425	16.00	No
		y	0.376	17.50	No
		y	-0.376	20.00	No
	6	y	0.37	3.50	No
		y	-0.37	6.00	No
		y	0.343	6.50	No
		y	-0.343	8.50	No
		y	0.343	8.50	No
		y	-0.343	11.00	No
		y	0.425	11.75	No
		y	-0.425	16.00	No
		y	0.376	17.50	No
		y	-0.376	20.00	No

7	y	-0.051	0.50	No
	y	-0.051	2.50	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
WLf	Wind Load (Front)	No	0.00	0.00	0.00
WLS	Wind Load (Side)	No	0.00	0.00	0.00
LL	Live 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
WLf	0.00	0.00	0.00
WLS	0.00	0.00	0.00
LL	0.00	0.00	0.00

Current Date: 5/3/2019 8:44 AM

Units system: English

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Steel Code Check

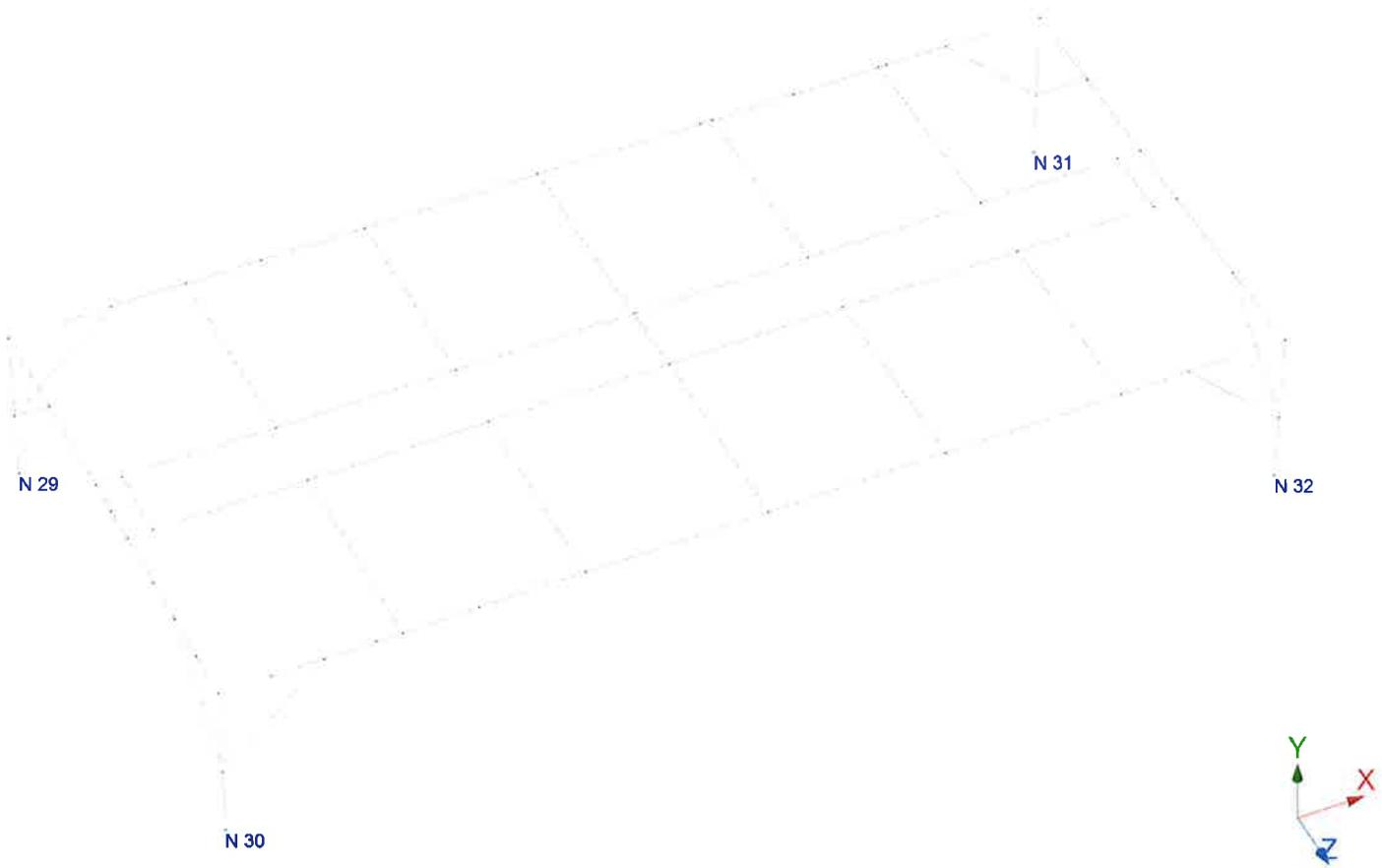
Report: Summary - Group by member

Load conditions to be included in design :

- LC1=1.4DL
- LC2=1.2DL+1.6LL
- LC3=1.2DL+LL
- LC4=1.2DL+0.5Wlf
- LC5=1.2DL+0.5WLS
- LC6=1.2DL-0.5Wlf
- LC7=1.2DL-0.5WLS
- LC8=1.2DL+Wlf+LL
- LC9=1.2DL+WLS+LL
- LC10=1.2DL-Wlf+LL
- LC11=1.2DL-WLS+LL
- LC12=0.9DL+Wlf
- LC13=0.9DL+WLS
- LC14=0.9DL-Wlf
- LC15=0.9DL-WLS
- LC16=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	C 8X11.5	7	LC9 at 56.25%	0.04	OK	Eq. H1-1b
		9	LC9 at 50.00%	0.03	OK	Eq. H1-1b
		10	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		12	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		13	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		14	LC11 at 0.00%	0.00	OK	Eq. Sec. D2
		15	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		16	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		18	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		19	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		21	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		26	LC9 at 0.00%	0.01	OK	Sec. E1
		27	LC9 at 0.00%	0.00	OK	Sec. E1
	HSS_SQR 4X4X1_4	22	LC2 at 62.50%	0.49	OK	Eq. H1-1b
		23	LC2 at 62.50%	0.50	OK	Eq. H1-1b
		24	LC2 at 62.50%	0.57	OK	Eq. H1-1b
		25	LC2 at 62.50%	0.56	OK	Eq. H1-1b
	L 3X3X1_4	28	LC9 at 0.00%	0.65	OK	Eq. H3-8
		29	LC9 at 100.00%	0.73	OK	Eq. H3-8
		30	LC9 at 0.00%	0.96	OK	Eq. H3-8
		31	LC9 at 100.00%	0.84	OK	Eq. H3-8
		32	LC9 at 0.00%	0.26	OK	Eq. H3-8
		33	LC11 at 100.00%	0.37	OK	Eq. H3-8
		34	LC11 at 0.00%	0.29	OK	Eq. H3-8
		35	LC9 at 100.00%	0.21	OK	Eq. H3-8
	W 12X14	3	LC11 at 42.19%	0.75	OK	Eq. H1-1b
		4	LC9 at 42.50%	0.84	OK	Eq. H1-1b
	W 12X22	1	LC11 at 50.52%	0.30	With warnings	Eq. H1-1b

	2	LC9 at 15.91%	0.31	With warnings	Eq. H1-1b
W 14X22	5	LC10 at 51.56%	1.51	N.G.	Eq. H1-1b
	6	LC8 at 51.56%	1.51	N.G.	Eq. H1-1b



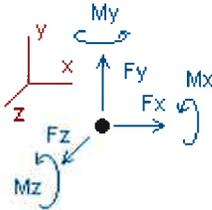
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Units system: English

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Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition LC1=1.4DL						
29	0.91128	4.05381	1.56008	0.00000	0.00000	0.00000
30	0.88556	4.45414	-1.56008	0.00000	0.00000	0.00000
31	-0.91128	5.18147	2.10424	0.00000	0.00000	0.00000
32	-0.88556	5.06656	-2.10424	0.00000	0.00000	0.00000
SUM	0.00000	18.75599	0.00000	0.00000	0.00000	0.00000
Condition LC2=1.2DL+1.6LL						
29	1.46259	5.33897	1.87890	0.00000	0.00000	0.00000
30	1.44054	5.68211	-1.87891	0.00000	0.00000	0.00000
31	-1.46259	6.31752	2.34864	0.00000	0.00000	0.00000
32	-1.44054	6.21902	-2.34863	0.00000	0.00000	0.00000
SUM	0.00000	23.55763	0.00000	0.00000	0.00000	0.00000
Condition LC3=1.2DL+LL						
29	1.20703	4.63987	1.67577	0.00000	0.00000	0.00000
30	1.18498	4.98301	-1.67577	0.00000	0.00000	0.00000
31	-1.20703	5.61392	2.14426	0.00000	0.00000	0.00000
32	-1.18498	5.51543	-2.14426	0.00000	0.00000	0.00000
SUM	0.00000	20.75223	0.00000	0.00000	0.00000	0.00000
Condition LC4=1.2DL+0.5Wlf						
29	0.78239	3.73128	1.36240	0.00000	0.00000	0.00000
30	0.75378	3.56125	-1.36246	0.00000	0.00000	0.00000
31	-0.78251	4.59908	1.79647	0.00000	0.00000	0.00000
32	-0.75366	4.18495	-1.79642	0.00000	0.00000	0.00000
SUM	0.00000	16.07656	0.00000	0.00000	0.00000	0.00000

Condition LC5=1.2DL+0.5WLS

29	0.81328	3.32232	1.26384	0.00000	0.00000	0.00000
30	0.82932	3.65728	-1.26450	0.00000	0.00000	0.00000
31	-0.81467	4.59279	1.86885	0.00000	0.00000	0.00000
32	-0.82793	4.50417	-1.86819	0.00000	0.00000	0.00000
SUM	0.00000	16.07656	0.00000	0.00000	0.00000	0.00000

Condition LC6=1.2DL-0.5WLF

29	0.77980	3.21811	1.31202	0.00000	0.00000	0.00000
30	0.76433	4.07442	-1.31197	0.00000	0.00000	0.00000
31	-0.77969	4.28345	1.81080	0.00000	0.00000	0.00000
32	-0.76444	4.50058	-1.81085	0.00000	0.00000	0.00000
SUM	0.00000	16.07656	0.00000	0.00000	0.00000	0.00000

Condition LC7=1.2DL-0.5WLS

29	0.74891	3.62707	1.41058	0.00000	0.00000	0.00000
30	0.68879	3.97839	-1.40993	0.00000	0.00000	0.00000
31	-0.74753	4.28974	1.73842	0.00000	0.00000	0.00000
32	-0.69017	4.18136	-1.73907	0.00000	0.00000	0.00000
SUM	0.00000	16.07656	0.00000	0.00000	0.00000	0.00000

Condition LC8=1.2DL+WLF+LL

29	1.20962	5.15304	1.72615	0.00000	0.00000	0.00000
30	1.17443	4.46983	-1.72627	0.00000	0.00000	0.00000
31	-1.20985	5.92955	2.12994	0.00000	0.00000	0.00000
32	-1.17419	5.19980	-2.12982	0.00000	0.00000	0.00000
SUM	0.00000	20.75223	0.00000	0.00000	0.00000	0.00000

Condition LC9=1.2DL+WLS+LL

29	1.27140	4.33512	1.52903	0.00000	0.00000	0.00000
30	1.32551	4.66190	-1.53034	0.00000	0.00000	0.00000
31	-1.27417	5.91698	2.27468	0.00000	0.00000	0.00000
32	-1.32274	5.83824	-2.27338	0.00000	0.00000	0.00000
SUM	0.00000	20.75223	0.00000	0.00000	0.00000	0.00000

Condition LC10=1.2DL-WLF+LL

29	1.20444	4.12670	1.62538	0.00000	0.00000	0.00000
30	1.19554	5.49618	-1.62528	0.00000	0.00000	0.00000
31	-1.20421	5.29830	2.15858	0.00000	0.00000	0.00000
32	-1.19577	5.83106	-2.15869	0.00000	0.00000	0.00000
SUM	0.00000	20.75223	0.00000	0.00000	0.00000	0.00000

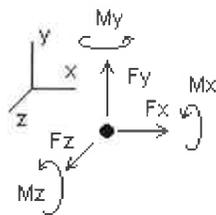
Condition LC11=1.2DL-WLS+LL

29	1.14266	4.94462	1.82251	0.00000	0.00000	0.00000
30	1.04446	5.30412	-1.82121	0.00000	0.00000	0.00000
31	-1.13989	5.31087	2.01384	0.00000	0.00000	0.00000
32	-1.04722	5.19262	-2.01514	0.00000	0.00000	0.00000
SUM	0.00000	20.75223	0.00000	0.00000	0.00000	0.00000

Condition LC12=0.9DL+WLf						
29	0.58841	3.11919	1.05329	0.00000	0.00000	0.00000
30	0.55874	2.35020	-1.05341	0.00000	0.00000	0.00000
31	-0.58865	3.64658	1.33840	0.00000	0.00000	0.00000
32	-0.55850	2.94145	-1.33829	0.00000	0.00000	0.00000
SUM	0.00000	12.05742	0.00000	0.00000	0.00000	0.00000
Condition LC13=0.9DL+WLS						
29	0.65019	2.30127	0.85617	0.00000	0.00000	0.00000
30	0.70982	2.54227	-0.85748	0.00000	0.00000	0.00000
31	-0.65297	3.63400	1.48315	0.00000	0.00000	0.00000
32	-0.70704	3.57988	-1.48184	0.00000	0.00000	0.00000
SUM	0.00000	12.05742	0.00000	0.00000	0.00000	0.00000
Condition LC14=0.9DL-WLf						
29	0.58323	2.09285	0.95252	0.00000	0.00000	0.00000
30	0.57984	3.37655	-0.95241	0.00000	0.00000	0.00000
31	-0.58300	3.01532	1.36705	0.00000	0.00000	0.00000
32	-0.58007	3.57270	-1.36716	0.00000	0.00000	0.00000
SUM	0.00000	12.05742	0.00000	0.00000	0.00000	0.00000
Condition LC15=0.9DL-WLS						
29	0.52145	2.91077	1.14965	0.00000	0.00000	0.00000
30	0.42876	3.18448	-1.14834	0.00000	0.00000	0.00000
31	-0.51868	3.02790	1.22230	0.00000	0.00000	0.00000
32	-0.43153	2.93427	-1.22361	0.00000	0.00000	0.00000
SUM	0.00000	12.05742	0.00000	0.00000	0.00000	0.00000
Condition LC16=0.9DL						
29	0.58582	2.60602	1.00291	0.00000	0.00000	0.00000
30	0.56929	2.86338	-1.00291	0.00000	0.00000	0.00000
31	-0.58582	3.33095	1.35273	0.00000	0.00000	0.00000
32	-0.56929	3.25707	-1.35272	0.00000	0.00000	0.00000
SUM	0.00000	12.05742	0.00000	0.00000	0.00000	0.00000

Envelope for nodal reactions

Note.- I_c is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

- LC1=1.4DL
- LC2=1.2DL+1.6LL
- LC3=1.2DL+LL
- LC4=1.2DL+0.5Wlf
- LC5=1.2DL+0.5Wls
- LC6=1.2DL-0.5Wlf
- LC7=1.2DL-0.5Wls
- LC8=1.2DL+Wlf+LL
- LC9=1.2DL+Wls+LL
- LC10=1.2DL-Wlf+LL
- LC11=1.2DL-Wls+LL
- LC12=0.9DL+Wlf
- LC13=0.9DL+Wls
- LC14=0.9DL-Wlf
- LC15=0.9DL-Wls
- LC16=0.9DL

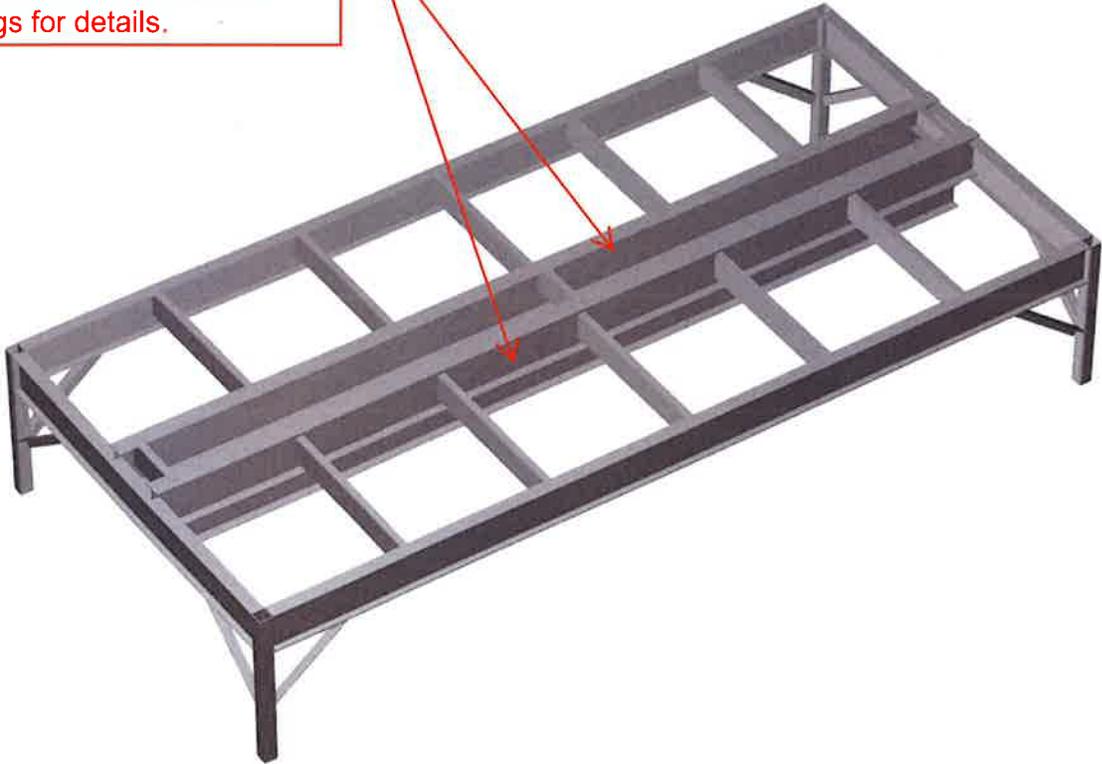
Node		Forces						Moments					
		Fx	lc	Fy	lc	Fz	lc	Mx	lc	My	lc	Mz	lc
		[Kip]		[Kip]		[Kip]		[Kip*ft]		[Kip*ft]		[Kip*ft]	
29	Max	1.463	LC2	5.339	LC2	1.879	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	0.521	LC15	2.093	LC14	0.856	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
30	Max	1.441	LC2	5.682	LC2	-0.857	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	0.429	LC15	2.350	LC12	-1.879	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1
31	Max	-0.519	LC15	6.318	LC2	2.349	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-1.463	LC2	3.015	LC14	1.222	LC15	0.00000	LC1	0.00000	LC1	0.00000	LC1
32	Max	-0.432	LC15	6.219	LC2	-1.224	LC15	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-1.441	LC2	2.934	LC15	-2.349	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1

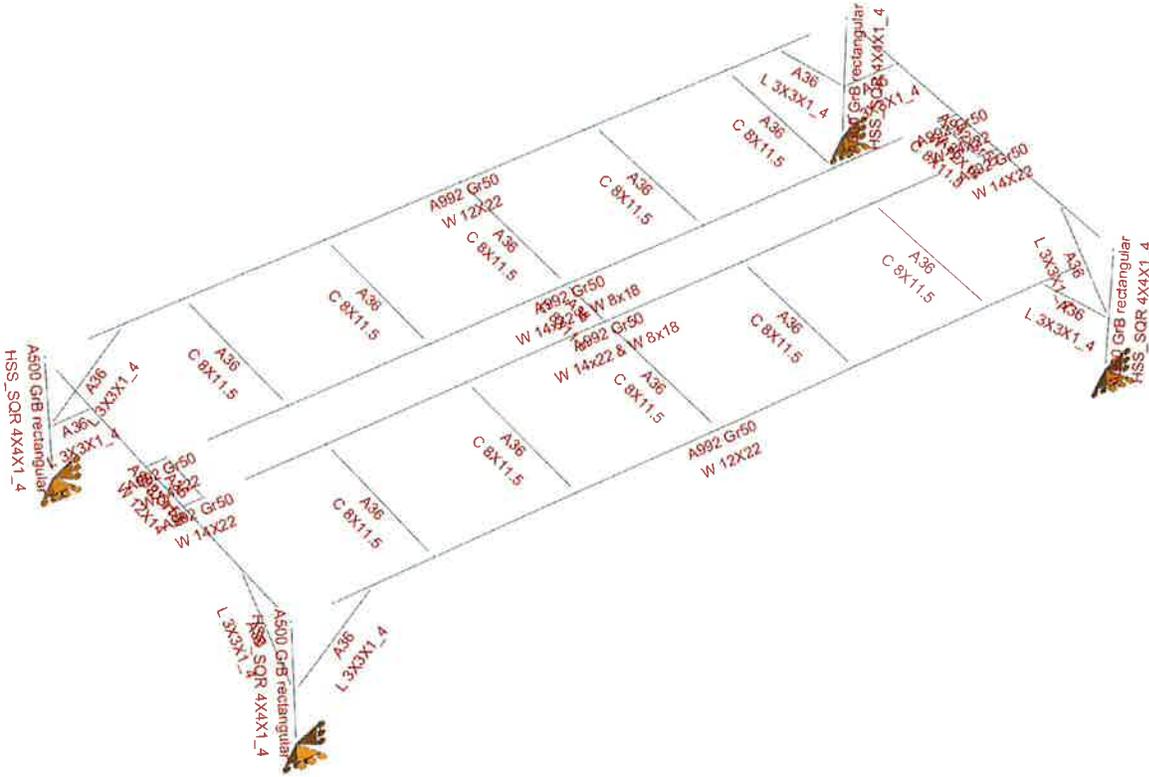


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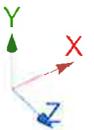
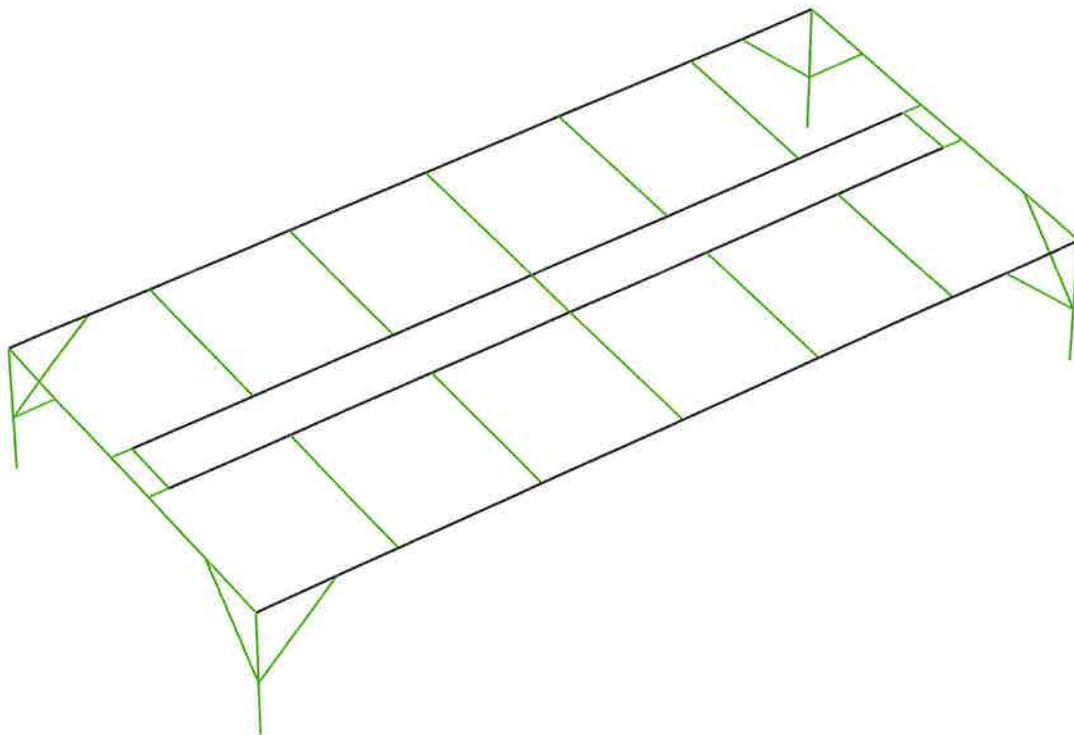
**Equipment Platform Calculations
(Modified Conditions)**

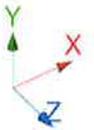
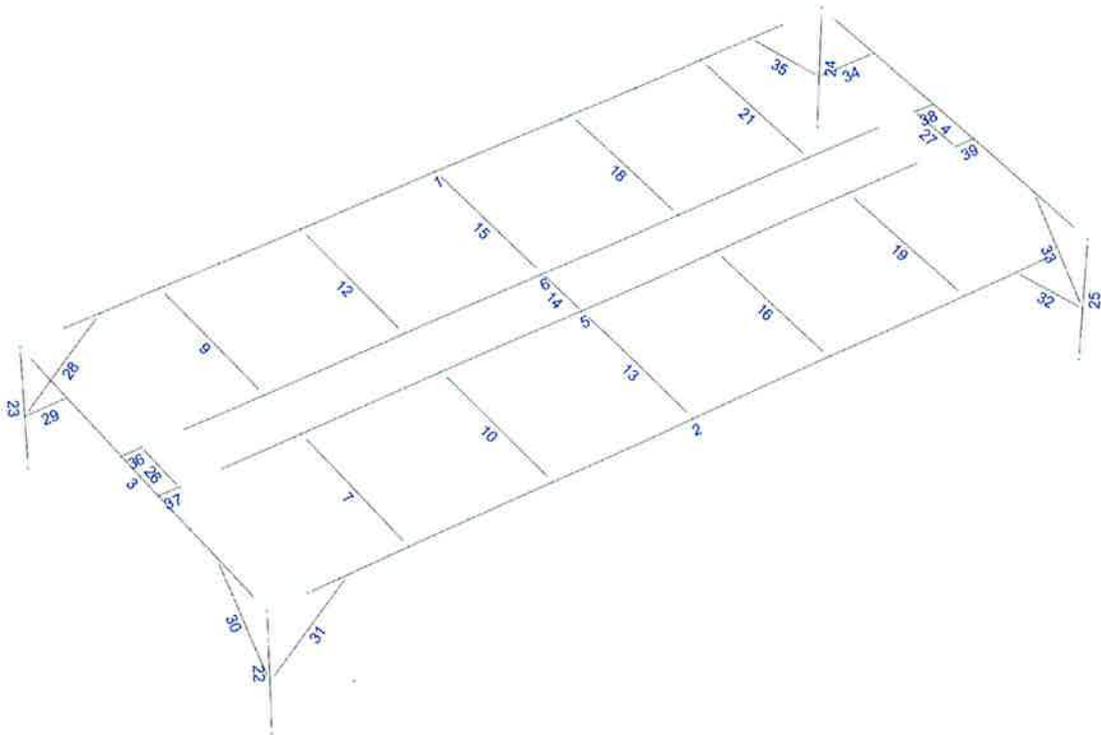
Reinforce the existing W14x22 steel beams supporting the new and existing cabinets with new W8x18 steel beams. Reference the latest HDG construction drawings for details.





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





Current Date: 5/28/2019 11:06 AM

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Load data

GLOSSARY

Comb : Indicates if load condition is a load combination

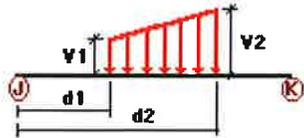
Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
WLf	Wind Load (Front)	No	WIND
WLs	Wind Load (Side)	No	WIND
LL	Live Load	No	LL

Load on nodes

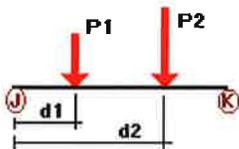
Condition	Node	FX [Kip]	FY [Kip]	FZ [Kip]	MX [Kip*ft]	MY [Kip*ft]	MZ [Kip*ft]
DL	49	0.00	-0.045	0.00	0.00	0.00	0.00
	50	0.00	-0.045	0.00	0.00	0.00	0.00
	51	0.00	-0.045	0.00	0.00	0.00	0.00
	52	0.00	-0.044	0.00	0.00	0.00	0.00
	53	0.00	-0.044	0.00	0.00	0.00	0.00
	54	0.00	-0.044	0.00	0.00	0.00	0.00
	55	0.00	-0.044	0.00	0.00	0.00	0.00
	56	0.00	-0.20	0.00	0.00	0.00	0.00
	57	0.00	-0.20	0.00	0.00	0.00	0.00
	58	0.00	-0.045	0.00	0.00	0.00	0.00
WLf	49	0.00	0.00	0.00	-0.077	0.00	0.00
	50	0.00	0.00	0.00	-0.077	0.00	0.00
	51	0.00	0.00	0.00	-0.077	0.00	0.00
	52	0.00	0.00	0.00	-0.072	0.00	0.00
	53	0.00	0.00	0.00	-0.072	0.00	0.00
	54	0.00	0.00	0.00	-0.072	0.00	0.00
	55	0.00	0.00	0.00	-0.102	0.00	0.00
	56	0.00	0.00	0.00	-0.541	0.00	0.00
	57	0.00	0.00	0.00	-1.321	0.00	0.00
	58	0.00	0.00	0.00	-0.102	0.00	0.00
WLs	49	0.00	0.00	0.00	0.00	0.00	-0.077
	50	0.00	0.00	0.00	0.00	0.00	-0.077
	51	0.00	0.00	0.00	0.00	0.00	-0.077
	52	0.00	0.00	0.00	0.00	0.00	-0.072
	53	0.00	0.00	0.00	0.00	0.00	-0.072
	54	0.00	0.00	0.00	0.00	0.00	-0.072
	55	0.00	0.00	0.00	0.00	0.00	-0.102
	56	0.00	0.00	0.00	0.00	0.00	-0.541
	57	0.00	0.00	0.00	0.00	0.00	-1.321
	58	0.00	0.00	0.00	0.00	0.00	-0.102

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	1	y	-0.01	0.00	0.00	No	0.00	No
	2	y	-0.01	0.00	0.00	No	0.00	No
	3	y	-0.037	0.00	0.00	No	0.00	No
	4	y	-0.037	0.00	0.00	No	0.00	No
	7	y	-0.054	0.00	0.00	No	0.00	No
	9	y	-0.054	0.00	0.00	No	0.00	No
	10	y	-0.054	0.00	0.00	No	0.00	No
	12	y	-0.054	0.00	0.00	No	0.00	No
	13	y	-0.054	0.00	0.00	No	0.00	No
	15	y	-0.054	0.00	0.00	No	0.00	No
	16	y	-0.054	0.00	0.00	No	0.00	No
	18	y	-0.054	0.00	0.00	No	0.00	No
	19	y	-0.054	0.00	0.00	No	0.00	No
	21	y	-0.054	0.00	0.00	No	0.00	No
LL	3	y	-0.044	0.00	0.00	No	0.00	No
	4	y	-0.044	0.00	0.00	No	0.00	No
	7	y	-0.09	0.00	0.00	No	0.00	No
	9	y	-0.09	0.00	0.00	No	0.00	No
	10	y	-0.09	0.00	0.00	No	0.00	No
	12	y	-0.09	0.00	0.00	No	0.00	No
	13	y	-0.09	0.00	0.00	No	0.00	No
	15	y	-0.09	0.00	0.00	No	0.00	No
	16	y	-0.09	0.00	0.00	No	0.00	No
	18	y	-0.09	0.00	0.00	No	0.00	No
	19	y	-0.09	0.00	0.00	No	0.00	No
21	y	-0.09	0.00	0.00	No	0.00	No	

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	3	y	-0.05	0.50	No
		y	-0.05	2.50	No
	5	y	-0.075	3.50	No
		y	-0.075	6.00	No
		y	-0.193	6.50	No
		y	-0.193	8.50	No
		y	-0.193	8.50	No
		y	-0.193	11.00	No
		y	-0.483	11.75	No
y	-0.483	16.00	No		

		y	-0.575	17.50	No
		y	-0.575	20.00	No
	6	y	-0.075	3.50	No
		y	-0.075	6.00	No
		y	-0.193	6.50	No
		y	-0.193	8.50	No
		y	-0.193	8.50	No
		y	-0.193	11.00	No
		y	-0.483	11.75	No
		y	-0.483	16.00	No
		y	-0.575	17.50	No
		y	-0.575	20.00	No
	7	y	-0.05	0.50	No
		y	-0.05	2.50	No
WLf	3	y	0.051	0.50	No
		y	-0.051	2.50	No
	5	y	0.37	3.50	No
		y	0.37	6.00	No
		y	0.343	6.50	No
		y	0.343	8.50	No
		y	0.343	8.50	No
		y	0.343	11.00	No
		y	0.425	11.75	No
		y	0.425	16.00	No
		y	0.376	17.50	No
		y	0.376	20.00	No
	6	y	-0.37	3.50	No
		y	-0.37	6.00	No
		y	-0.343	6.50	No
		y	-0.343	8.50	No
		y	-0.343	8.50	No
		y	-0.343	11.00	No
		y	-0.425	11.75	No
		y	-0.425	16.00	No
		y	-0.376	17.50	No
		y	-0.376	20.00	No
	7	y	0.051	0.50	No
		y	-0.051	2.50	No
WLS	3	y	0.051	0.50	No
		y	0.051	2.50	No
	5	y	0.37	3.50	No
		y	-0.37	6.00	No
		y	0.343	6.50	No
		y	-0.343	8.50	No
		y	0.343	8.50	No
		y	-0.343	11.00	No
		y	0.425	11.75	No
		y	-0.425	16.00	No
		y	0.376	17.50	No
		y	-0.376	20.00	No
	6	y	0.37	3.50	No
		y	-0.37	6.00	No
		y	0.343	6.50	No
		y	-0.343	8.50	No
		y	0.343	8.50	No
		y	-0.343	11.00	No
		y	0.425	11.75	No
		y	-0.425	16.00	No
		y	0.376	17.50	No
		y	-0.376	20.00	No

7	y	-0.051	0.50	No
	y	-0.051	2.50	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
WLf	Wind Load (Front)	No	0.00	0.00	0.00
WLs	Wind Load (Side)	No	0.00	0.00	0.00
LL	Live 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
WLf	0.00	0.00	0.00
WLs	0.00	0.00	0.00
LL	0.00	0.00	0.00

Current Date: 5/28/2019 11:06 AM

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Steel Code Check

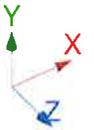
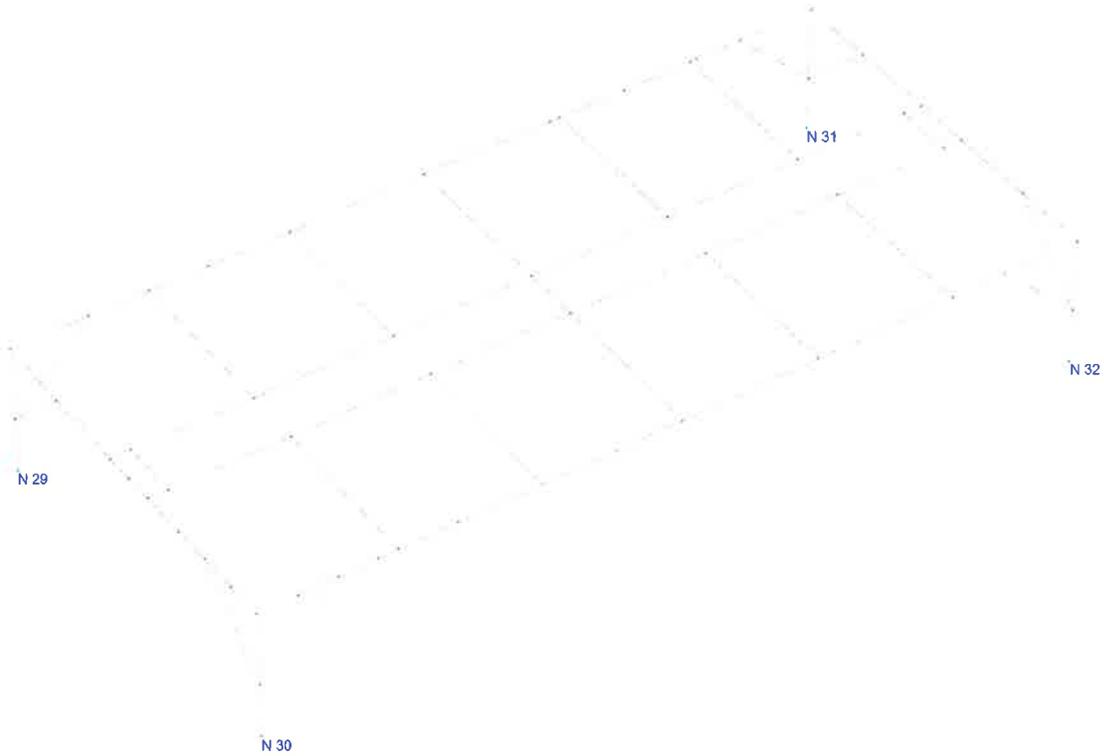
Report: Summary - Group by member

Load conditions to be included in design :

- LC1=1.4DL
- LC2=1.2DL+1.6LL
- LC3=1.2DL+LL
- LC4=1.2DL+0.5Wlf
- LC5=1.2DL+0.5Wls
- LC6=1.2DL-0.5Wlf
- LC7=1.2DL-0.5Wls
- LC8=1.2DL+Wlf+LL
- LC9=1.2DL+Wls+LL
- LC10=1.2DL-Wlf+LL
- LC11=1.2DL-Wls+LL
- LC12=0.9DL+Wlf
- LC13=0.9DL+Wls
- LC14=0.9DL-Wlf
- LC15=0.9DL-Wls
- LC16=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
C 8X11.5		7	LC9 at 56.25%	0.04	OK	Eq. H1-1b
		9	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		10	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		12	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		13	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		14	LC11 at 0.00%	0.00	OK	Eq. Sec. D2
		15	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		16	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		18	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		19	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		21	LC2 at 50.00%	0.03	OK	Eq. H1-1b
		26	LC9 at 0.00%	0.00	OK	Sec. E1
		27	LC9 at 0.00%	0.00	OK	Sec. E1
		HSS_SQR 4X4X1_4		22	LC2 at 62.50%	0.51
23	LC2 at 62.50%			0.51	OK	Eq. H1-1b
24	LC2 at 62.50%			0.59	OK	Eq. H1-1b
25	LC2 at 62.50%			0.59	OK	Eq. H1-1b
L 3X3X1_4		28	LC9 at 0.00%	0.73	OK	Eq. H3-8
		29	LC9 at 100.00%	0.67	OK	Eq. H3-8
		30	LC9 at 0.00%	0.88	OK	Eq. H3-8
		31	LC9 at 100.00%	0.95	OK	Eq. H3-8
		32	LC9 at 0.00%	0.29	OK	Eq. H3-8
		33	LC11 at 100.00%	0.40	OK	Eq. H3-8
		34	LC11 at 0.00%	0.31	OK	Eq. H3-8
		35	LC9 at 100.00%	0.24	OK	Eq. H3-8
W 12X14		3	LC11 at 42.19%	0.75	OK	Eq. H1-1b
		4	LC9 at 42.50%	0.85	OK	Eq. H1-1b
W 12X22		1	LC11 at 50.52%	0.30	With warnings	Eq. H1-1b

	2	LC11 at 50.00%	0.28	With warnings	Eq. H1-1b
W 14X22	36	LC8 at 0.00%	0.07	OK	Sec. G2.1(a)
	37	LC10 at 0.00%	0.07	OK	Sec. G2.1(a)
	38	LC8 at 0.00%	0.09	OK	Sec. G2.1(a)
	39	LC10 at 0.00%	0.09	OK	Sec. G2.1(a)
W 14x22 & W 8x18	5	LC10 at 52.08%	0.53	With warnings	Eq. H1-1b
	6	LC8 at 54.17%	0.53	With warnings	Eq. H1-1b



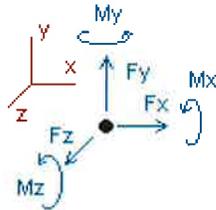
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Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition LC1=1.4DL						
29	0.91117	4.21118	1.64567	0.00000	0.00000	0.00000
30	0.88545	4.61150	-1.64568	0.00000	0.00000	0.00000
31	-0.91117	5.53899	2.29859	0.00000	0.00000	0.00000
32	-0.88545	5.42408	-2.29858	0.00000	0.00000	0.00000
SUM	0.00000	19.78574	0.00000	0.00000	0.00000	0.00000
Condition LC2=1.2DL+1.6LL						
29	1.46231	5.47386	1.95229	0.00000	0.00000	0.00000
30	1.44027	5.81699	-1.95229	0.00000	0.00000	0.00000
31	-1.46232	6.62396	2.51524	0.00000	0.00000	0.00000
32	-1.44027	6.52547	-2.51524	0.00000	0.00000	0.00000
SUM	0.00000	24.44028	0.00000	0.00000	0.00000	0.00000
Condition LC3=1.2DL+LL						
29	1.20682	4.77475	1.74915	0.00000	0.00000	0.00000
30	1.18478	5.11789	-1.74915	0.00000	0.00000	0.00000
31	-1.20683	5.92036	2.31085	0.00000	0.00000	0.00000
32	-1.18478	5.82187	-2.31085	0.00000	0.00000	0.00000
SUM	0.00000	21.63488	0.00000	0.00000	0.00000	0.00000
Condition LC4=1.2DL+0.5WLF						
29	0.78219	3.85962	1.43586	0.00000	0.00000	0.00000
30	0.75379	3.70267	-1.43591	0.00000	0.00000	0.00000
31	-0.78229	4.91206	1.96304	0.00000	0.00000	0.00000
32	-0.75369	4.48485	-1.96299	0.00000	0.00000	0.00000
SUM	0.00000	16.95921	0.00000	0.00000	0.00000	0.00000

Condition LC5=1.2DL+0.5WLs

29	0.81333	3.45727	1.34073	0.00000	0.00000	0.00000
30	0.82923	3.79210	-1.34135	0.00000	0.00000	0.00000
31	-0.81466	4.89917	2.03623	0.00000	0.00000	0.00000
32	-0.82790	4.81067	-2.03561	0.00000	0.00000	0.00000
SUM	0.00001	16.95921	0.00000	0.00000	0.00000	0.00000

Condition LC6=1.2DL-0.5WLf

29	0.77981	3.35954	1.38529	0.00000	0.00000	0.00000
30	0.76413	4.20276	-1.38525	0.00000	0.00000	0.00000
31	-0.77972	4.58334	1.97739	0.00000	0.00000	0.00000
32	-0.76422	4.81357	-1.97743	0.00000	0.00000	0.00000
SUM	0.00000	16.95921	0.00000	0.00000	0.00000	0.00000

Condition LC7=1.2DL-0.5WLs

29	0.74867	3.76190	1.48043	0.00000	0.00000	0.00000
30	0.68868	4.11333	-1.47981	0.00000	0.00000	0.00000
31	-0.74736	4.59624	1.90420	0.00000	0.00000	0.00000
32	-0.69001	4.48775	-1.90482	0.00000	0.00000	0.00000
SUM	-0.00001	16.95921	0.00000	0.00000	0.00000	0.00000

Condition LC8=1.2DL+WLf+LL

29	1.20920	5.27484	1.79972	0.00000	0.00000	0.00000
30	1.17444	4.61781	-1.79981	0.00000	0.00000	0.00000
31	-1.20940	6.24908	2.29650	0.00000	0.00000	0.00000
32	-1.17425	5.49315	-2.29641	0.00000	0.00000	0.00000
SUM	0.00000	21.63488	0.00000	0.00000	0.00000	0.00000

Condition LC9=1.2DL+WLS+LL

29	1.27149	4.47012	1.60945	0.00000	0.00000	0.00000
30	1.32533	4.79666	-1.61069	0.00000	0.00000	0.00000
31	-1.27413	6.22329	2.44289	0.00000	0.00000	0.00000
32	-1.32267	6.14480	-2.44164	0.00000	0.00000	0.00000
SUM	0.00001	21.63488	0.00000	0.00000	0.00000	0.00000

Condition LC10=1.2DL-WLf+LL

29	1.20444	4.27467	1.69858	0.00000	0.00000	0.00000
30	1.19511	5.61797	-1.69849	0.00000	0.00000	0.00000
31	-1.20426	5.59165	2.32520	0.00000	0.00000	0.00000
32	-1.19530	6.15059	-2.32529	0.00000	0.00000	0.00000
SUM	0.00000	21.63488	0.00000	0.00000	0.00000	0.00000

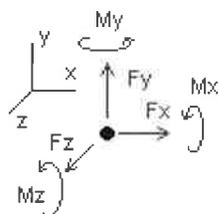
Condition LC11=1.2DL-WLS+LL

29	1.14216	5.07938	1.88885	0.00000	0.00000	0.00000
30	1.04423	5.43911	-1.88761	0.00000	0.00000	0.00000
31	-1.13953	5.61743	2.17882	0.00000	0.00000	0.00000
32	-1.04688	5.49894	-2.18006	0.00000	0.00000	0.00000
SUM	-0.00001	21.63488	0.00000	0.00000	0.00000	0.00000

Condition LC12=0.9DL+WLf						
29	0.58813	3.20727	1.10850	0.00000	0.00000	0.00000
30	0.55888	2.46445	-1.10859	0.00000	0.00000	0.00000
31	-0.58833	3.88950	1.46331	0.00000	0.00000	0.00000
32	-0.55869	3.15819	-1.46322	0.00000	0.00000	0.00000
SUM	0.00000	12.71941	0.00000	0.00000	0.00000	0.00000
Condition LC13=0.9DL+WLS						
29	0.65042	2.40256	0.91823	0.00000	0.00000	0.00000
30	0.70977	2.64331	-0.91948	0.00000	0.00000	0.00000
31	-0.65306	3.86371	1.60970	0.00000	0.00000	0.00000
32	-0.70711	3.80983	-1.60845	0.00000	0.00000	0.00000
SUM	0.00001	12.71941	0.00000	0.00000	0.00000	0.00000
Condition LC14=0.9DL-WLf						
29	0.58337	2.20710	1.00737	0.00000	0.00000	0.00000
30	0.57955	3.46462	-1.00728	0.00000	0.00000	0.00000
31	-0.58318	3.23206	1.49201	0.00000	0.00000	0.00000
32	-0.57974	3.81563	-1.49210	0.00000	0.00000	0.00000
SUM	0.00000	12.71941	0.00000	0.00000	0.00000	0.00000
Condition LC15=0.9DL-WLS						
29	0.52109	3.01182	1.19763	0.00000	0.00000	0.00000
30	0.42867	3.28576	-1.19639	0.00000	0.00000	0.00000
31	-0.51845	3.25785	1.34563	0.00000	0.00000	0.00000
32	-0.43132	3.16398	-1.34687	0.00000	0.00000	0.00000
SUM	-0.00001	12.71941	0.00000	0.00000	0.00000	0.00000
Condition LC16=0.9DL						
29	0.58575	2.70719	1.05793	0.00000	0.00000	0.00000
30	0.56922	2.96454	-1.05793	0.00000	0.00000	0.00000
31	-0.58576	3.56078	1.47766	0.00000	0.00000	0.00000
32	-0.56922	3.48691	-1.47766	0.00000	0.00000	0.00000
SUM	0.00000	12.71941	0.00000	0.00000	0.00000	0.00000

Envelope for nodal reactions

Note.- I_c is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for

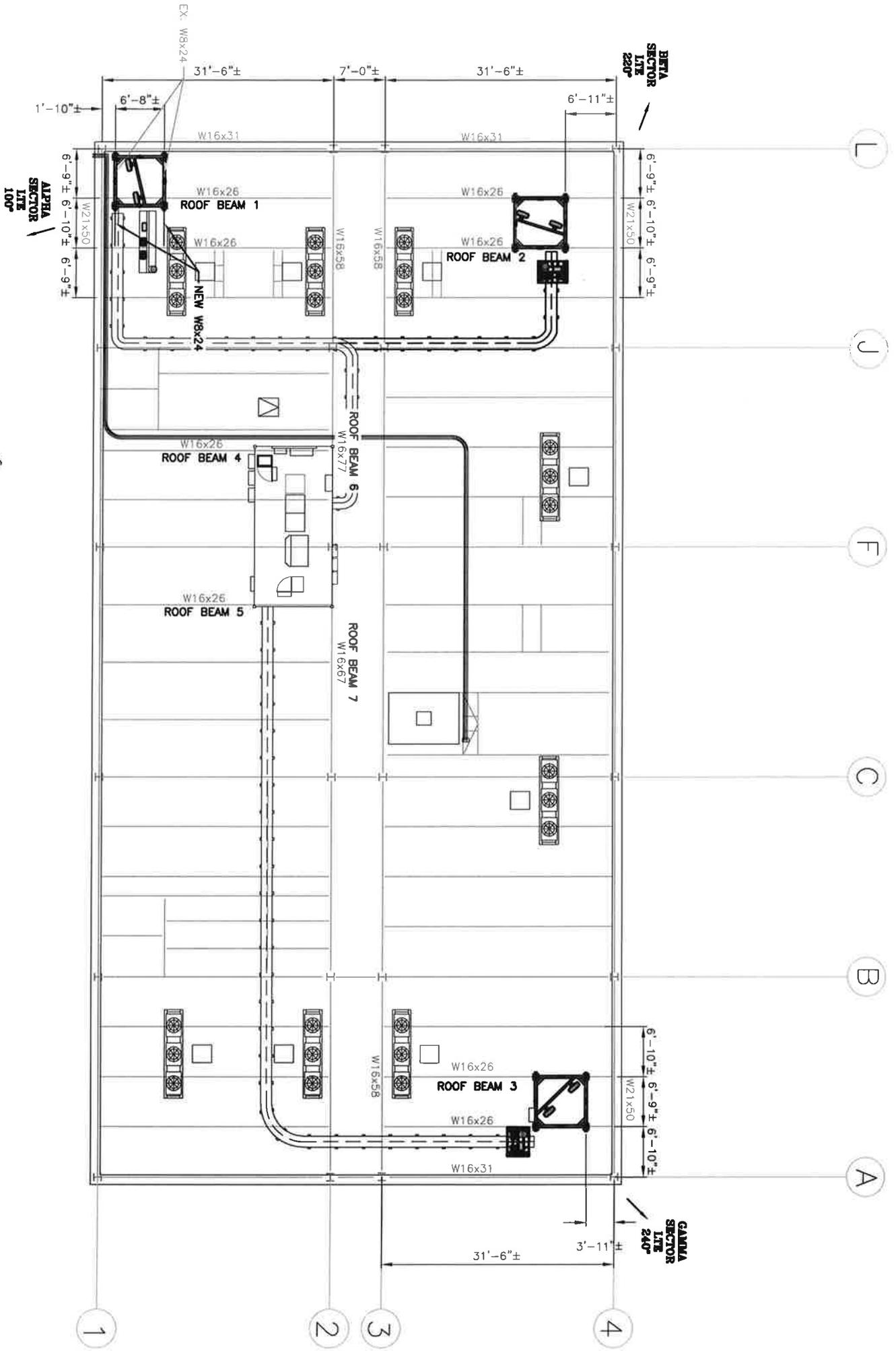
- LC1=1.4DL
- LC2=1.2DL+1.6LL
- LC3=1.2DL+LL
- LC4=1.2DL+0.5WLf
- LC5=1.2DL+0.5WLS
- LC6=1.2DL-0.5WLf
- LC7=1.2DL-0.5WLS
- LC8=1.2DL+WLf+LL
- LC9=1.2DL+WLS+LL
- LC10=1.2DL-WLf+LL
- LC11=1.2DL-WLS+LL
- LC12=0.9DL+WLf
- LC13=0.9DL+WLS
- LC14=0.9DL-WLf
- LC15=0.9DL-WLS
- LC16=0.9DL

Node		Forces						Moments					
		Fx [Kip]	lc	Fy [Kip]	lc	Fz [Kip]	lc	Mx [Kip*ft]	lc	My [Kip*ft]	lc	Mz [Kip*ft]	lc
29	Max	1.462	LC2	5.474	LC2	1.952	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	0.521	LC15	2.207	LC14	0.918	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
30	Max	1.440	LC2	5.817	LC2	-0.919	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	0.429	LC15	2.464	LC12	-1.952	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1
31	Max	-0.518	LC15	6.624	LC2	2.515	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-1.462	LC2	3.232	LC14	1.346	LC15	0.00000	LC1	0.00000	LC1	0.00000	LC1
32	Max	-0.431	LC15	6.525	LC2	-1.347	LC15	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-1.440	LC2	3.158	LC12	-2.515	LC2	0.00000	LC1	0.00000	LC1	0.00000	LC1



HUDSON
Design Group LLC

Roof Framing Calculations



ROOF PLAN VIEW
 SCALE: N.T.S

Project: CT5440 (LTE 3C-4C-5C) (Rev.1)

Location: Existing Roof Beam 1
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(AISC 14th Ed ASD)]
 A992-50 W16x26 x 31.5 FT
 Section Adequate By: 66.6%
 Controlling Factor: Deflection

	Jared Nash
	Hudson Design Group LLC
	45 Beechwood Drive
	North Andover, MA 01845

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DEFLECTIONS		Center
Live Load	0.76	IN L/495
Dead Load	0.50	in
Total Load	1.26	IN L/300
Live Load Deflection Criteria:		L/240
Total Load Deflection Criteria:		L/180

REACTIONS		A	B
Live Load	6686 lb	3904 lb	
Dead Load	3087 lb	3087 lb	
Total Load	9773 lb	6991 lb	
Bearing Length	0.75 in	0.75 in	

BEAM DATA		Center
Span Length	31.5	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	31.5	ft

STEEL PROPERTIES
 W16x26 - A992-50

Properties:

Yield Stress:	Fy =	50	ksi
Modulus of Elasticity:	E =	29000	ksi
Depth:	d =	15.7	in
Web Thickness:	tw =	0.25	in
Flange Width:	bf =	5.5	in
Flange Thickness:	tf =	0.35	in
Distance to Web Toe of Fillet:	k =	0.75	in
Moment of Inertia About X-X Axis:	Ix =	301	in ⁴
Section Modulus About X-X Axis:	Sx =	38.4	in ³
Plastic Section Modulus About X-X Axis:	Zx =	44.2	in ³

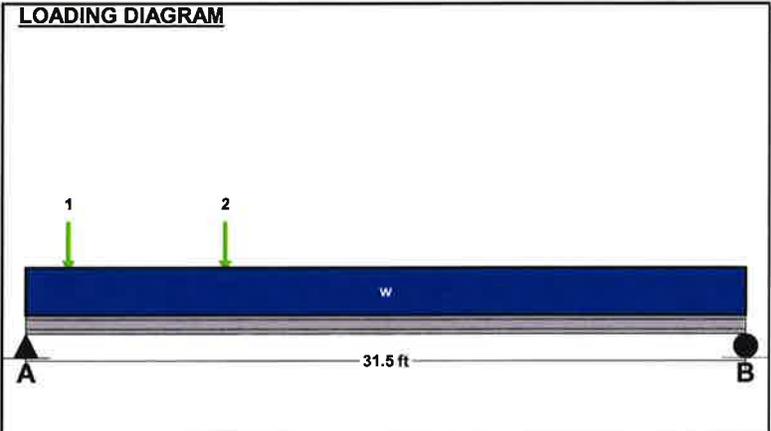
Design Properties per AISC 14th Edition Steel Manual:

Flange Buckling Ratio:	FBR =	7.97
Allowable Flange Buckling Ratio:	AFBR =	9.15
Web Buckling Ratio:	WBR =	56.82
Allowable Web Buckling Ratio:	AWBR =	90.55
Controlling Unbraced Length:	Lb =	0 ft
Limiting Unbraced Length - for lateral-torsional buckling:	Lp =	3.96 ft
Nominal Flexural Strength w/ safety factor:	Mn =	110279 ft-lb
Controlling Equation:	F2-1	
Web height to thickness ratio:	h/tw =	56.82
Limiting height to thickness ratio for eqn. G2-2:	h/tw-limit =	53.95
Cv Factor:	Cv =	1
Controlling Equation:	G2-3	
Nominal Shear Strength w/ safety factor:	Vn =	70509 lb

Controlling Moment: 61094 ft-lb
 14.18 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2

Controlling Shear: 9773 lb
 At left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s)

Comparisons with required sections:	Req'd	Provided
Moment of Inertia (deflection):	180.71 in ⁴	301 in ⁴
Moment:	61094 ft-lb	110279 ft-lb
Shear:	9773 lb	70509 lb



UNIFORM LOADS		Center
Uniform Live Load	204	plf
Uniform Dead Load	170	plf
Beam Self Weight	26	plf
Total Uniform Load	400	plf

POINT LOADS - CENTER SPAN		
Load Number	One	Two
Live Load	2082 lb	2082 lb
Dead Load	0 lb	0 lb
Location	1.83 ft	8.63 ft

NOTES

Load Breakdown:

Dead Load = 25 psf x 6.8 ft = 170 plf
 Snow Load = 30 psf x 6.8 ft = 204 plf

FRP Enclosure = 1918 lbs

Project: CT5440 (LTE 3C-4C-5C) (Rev.1)

Location: Existing Roof Beam 2
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(AISC 14th Ed ASD)]
 A992-50 W16x26 x 31.5 FT
 Section Adequate By: 49.0%
 Controlling Factor: Deflection



Jared Nash
 Hudson Design Group LLC
 45 Beechwood Drive
 North Andover, MA 01845

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DEFLECTIONS		Center
Live Load	0.91	IN L/414
Dead Load	0.50	in
Total Load	1.41	IN L/268
Live Load Deflection Criteria: L/240 Total Load Deflection Criteria: L/180		

REACTIONS		A	B
Live Load	5792 lb	4470 lb	
Dead Load	3087 lb	3087 lb	
Total Load	8879 lb	7557 lb	
Bearing Length	0.75 in	0.75 in	

BEAM DATA		Center
Span Length	31.5	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	31.5	ft

STEEL PROPERTIES
 W16x26 - A992-50

Properties:

Yield Stress:	Fy =	50	ksi
Modulus of Elasticity:	E =	29000	ksi
Depth:	d =	15.7	in
Web Thickness:	tw =	0.25	in
Flange Width:	bf =	5.5	in
Flange Thickness:	tf =	0.35	in
Distance to Web Toe of Fillet:	k =	0.75	in
Moment of Inertia About X-X Axis:	Ix =	301	in ⁴
Section Modulus About X-X Axis:	Sx =	38.4	in ³
Plastic Section Modulus About X-X Axis:	Zx =	44.2	in ³

Design Properties per AISC 14th Edition Steel Manual:

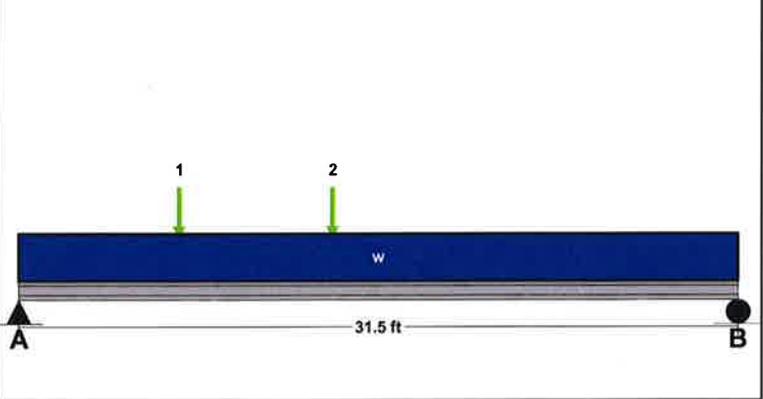
Flange Buckling Ratio:	FBR =	7.97
Allowable Flange Buckling Ratio:	AFBR =	9.15
Web Buckling Ratio:	WBR =	56.82
Allowable Web Buckling Ratio:	AWBR =	90.55
Controlling Unbraced Length:	Lb =	0 ft
Limiting Unbraced Length - for lateral-torsional buckling:	Lp =	3.96 ft
Nominal Flexural Strength w/ safety factor:	Mn =	110279 ft-lb
Controlling Equation:	F2-1	
Web height to thickness ratio:	h/tw =	56.82
Limiting height to thickness ratio for eqn. G2-2: h/tw-limit =		53.95
Cv Factor:	Cv =	1
Controlling Equation:	G2-3	
Nominal Shear Strength w/ safety factor:	Vn =	70509 lb

Controlling Moment: 71067 ft-lb
 13.86 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2

Controlling Shear: 8879 lb
 At left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s)

Comparisons with required sections:	Req'd	Provided
Moment of Inertia (deflection):	202.02 in ⁴	301 in ⁴
Moment:	71067 ft-lb	110279 ft-lb
Shear:	8879 lb	70509 lb

LOADING DIAGRAM



UNIFORM LOADS		Center
Uniform Live Load	204	plf
Uniform Dead Load	170	plf
Beam Self Weight	26	plf
Total Uniform Load	400	plf

POINT LOADS - CENTER SPAN		
Load Number	One	Two
Live Load	1918 lb	1918 lb
Dead Load	0 lb	0 lb
Location	6.92 ft	13.72 ft

NOTES

Load Breakdown:
 Dead Load = 25 psf x 6.8 ft = 170 plf
 Snow Load = 30 psf x 6.8 ft = 204 plf
 FRP Enclosure = 1918 lbs

Project: CT5440 (LTE 3C-4C-5C) (Rev.1)

Location: Existing Roof Beam 3
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(AISC 14th Ed ASD)]
 A992-50 W16x26 x 31.5 FT
 Section Adequate By: 59.1%
 Controlling Factor: Deflection



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DEFLECTIONS		Center
Live Load	0.82	IN L/459
Dead Load	0.50	in
Total Load	1.32	IN L/286
Live Load Deflection Criteria: L/240		Total Load Deflection Criteria: L/180

REACTIONS		A	B
Live Load	6158 lb	4104 lb	
Dead Load	3087 lb	3087 lb	
Total Load	9245 lb	7191 lb	
Bearing Length	0.75 in	0.75 in	

BEAM DATA		Center
Span Length	31.5	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	31.5	ft

STEEL PROPERTIES
 W16x26 - A992-50

Properties:

Yield Stress:	Fy =	50	ksi
Modulus of Elasticity:	E =	29000	ksi
Depth:	d =	15.7	in
Web Thickness:	tw =	0.25	in
Flange Width:	bf =	5.5	in
Flange Thickness:	tf =	0.35	in
Distance to Web Toe of Fillet:	k =	0.75	in
Moment of Inertia About X-X Axis:	Ix =	301	in ⁴
Section Modulus About X-X Axis:	Sx =	38.4	in ³
Plastic Section Modulus About X-X Axis:	Zx =	44.2	in ³

Design Properties per AISC 14th Edition Steel Manual:

Flange Buckling Ratio:	FBR =	7.97
Allowable Flange Buckling Ratio:	AFBR =	9.15
Web Buckling Ratio:	WBR =	56.82
Allowable Web Buckling Ratio:	AWBR =	90.55
Controlling Unbraced Length:	Lb =	0 ft
Limiting Unbraced Length -		
for lateral-torsional buckling:	Lp =	3.96 ft
Nominal Flexural Strength w/ safety factor:	Mn =	110279 ft-lb
Controlling Equation:	F2-1	
Web height to thickness ratio:	h/tw =	56.82
Limiting height to thickness ratio for eqn. G2-2:	h/tw-limit =	53.95
Cv Factor:	Cv =	1
Controlling Equation:	G2-3	
Nominal Shear Strength w/ safety factor:	Vn =	70509 lb

Controlling Moment:

64645 ft-lb
 13.54 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2

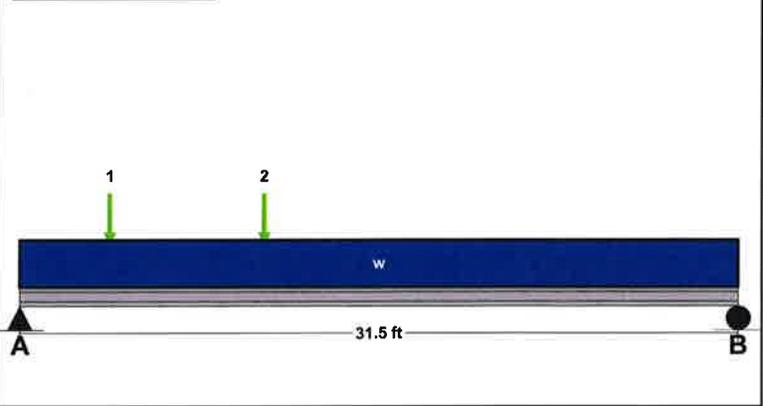
Controlling Shear:

9245 lb
 At left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s)

Comparisons with required sections:

	Req'd	Provided
Moment of Inertia (deflection):	189.15 in ⁴	301 in ⁴
Moment:	64645 ft-lb	110279 ft-lb
Shear:	9245 lb	70509 lb

LOADING DIAGRAM



UNIFORM LOADS

	Center
Uniform Live Load	204 plf
Uniform Dead Load	170 plf
Beam Self Weight	26 plf
Total Uniform Load	400 plf

POINT LOADS - CENTER SPAN

Load Number	One	Two
Live Load	1918 lb	1918 lb
Dead Load	0 lb	0 lb
Location	3.92 ft	10.72 ft

NOTES

Load Breakdown:

Dead Load = 25 psf x 6.8 ft = 170 plf
 Snow Load = 30 psf x 6.8 ft = 204 plf

FRP Enclosure = 1918 lbs



DEFLECTIONS		Center
Live Load	1.01	IN L/376
Dead Load	0.37	in
Total Load	1.37	IN L/275
Live Load Deflection Criteria: L/240		Total Load Deflection Criteria: L/180

REACTIONS		A	B
Live Load	6130 lb	4191 lb	
Dead Load	2284 lb	2284 lb	
Total Load	8414 lb	6475 lb	
Bearing Length	0.75 in	0.75 in	

BEAM DATA		Center
Span Length	31.5	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	31.5	ft

STEEL PROPERTIES
 W16x26 - A992-50

Properties:

Yield Stress:	Fy =	50	ksi
Modulus of Elasticity:	E =	29000	ksi
Depth:	d =	15.7	in
Web Thickness:	tw =	0.25	in
Flange Width:	bf =	5.5	in
Flange Thickness:	tf =	0.35	in
Distance to Web Toe of Fillet:	k =	0.75	in
Moment of Inertia About X-X Axis:	Ix =	301	in ⁴
Section Modulus About X-X Axis:	Sx =	38.4	in ³
Plastic Section Modulus About X-X Axis:	Zx =	44.2	in ³

Design Properties per AISC 14th Edition Steel Manual:

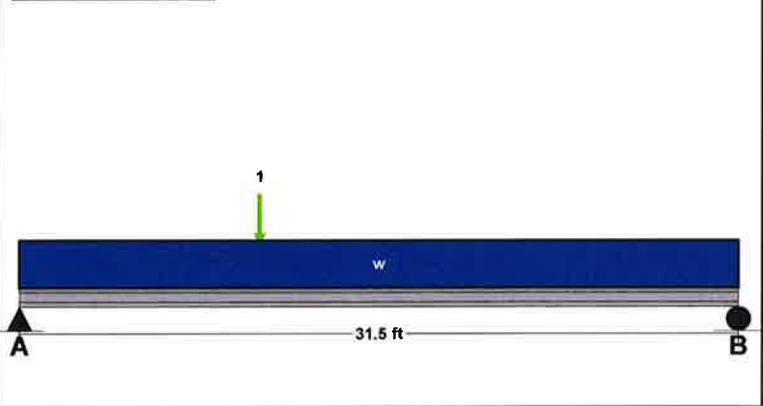
Flange Buckling Ratio:	FBR =	7.97
Allowable Flange Buckling Ratio:	AFBR =	9.15
Web Buckling Ratio:	WBR =	56.82
Allowable Web Buckling Ratio:	AWBR =	90.55
Controlling Unbraced Length:	Lb =	0 ft
Limiting Unbraced Length - for lateral-torsional buckling:	Lp =	3.96 ft
Nominal Flexural Strength w/ safety factor:	Mn =	110279 ft-lb
Controlling Equation:	F2-1	
Web height to thickness ratio:	h/tw =	56.82
Limiting height to thickness ratio for eqn. G2-2:	h/tw-limit =	53.95
Cv Factor:	Cv =	1
Controlling Equation:	G2-3	
Nominal Shear Strength w/ safety factor:	Vn =	70509 lb

Controlling Moment: 72375 ft-lb
 10.71 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2

Controlling Shear: 8414 lb
 At left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s)

Comparisons with required sections:	Req'd	Provided
Moment of Inertia (deflection):	196.7 in ⁴	301 in ⁴
Moment:	72375 ft-lb	110279 ft-lb
Shear:	8414 lb	70509 lb

LOADING DIAGRAM



UNIFORM LOADS		Center
Uniform Live Load	143	plf
Uniform Dead Load	119	plf
Beam Self Weight	26	plf
Total Uniform Load	288	plf

POINT LOADS - CENTER SPAN	
Load Number	One
Live Load	5817 lb
Dead Load	0 lb
Location	10.5 ft

NOTES

Load Breakdown:
 Dead Load = 25 psf x 4.75 ft = 119 plf
 Snow Load = 30 psf x 4.75 ft = 143 plf
 Platform = 5817 lbs

Project: CT5440 (LTE 3C-4C-5C) (Rev.2) - (MOD)

Location: Existing Roof Beam 5
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(AISC 14th Ed ASD)]
 A992-50 W16x26 x 31.5 FT
 Section Adequate By: 11.8%
 Controlling Factor: Deflection



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DEFLECTIONS		Center
Live Load	1.32	IN L/287
Dead Load	0.56	in
Total Load	1.88	IN L/201
Live Load Deflection Criteria: L/240		Total Load Deflection Criteria: L/180

REACTIONS		A	B
Live Load	8051 lb	5876 lb	
Dead Load	3497 lb	3497 lb	
Total Load	11548 lb	9373 lb	
Bearing Length	0.75 in	0.75 in	

BEAM DATA		Center
Span Length	31.5	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	31.5	ft

STEEL PROPERTIES
 W16x26 - A992-50

Properties:

Yield Stress:	Fy =	50	ksi
Modulus of Elasticity:	E =	29000	ksi
Depth:	d =	15.7	in
Web Thickness:	tw =	0.25	in
Flange Width:	bf =	5.5	in
Flange Thickness:	tf =	0.35	in
Distance to Web Toe of Fillet:	k =	0.75	in
Moment of Inertia About X-X Axis:	Ix =	301	in ⁴
Section Modulus About X-X Axis:	Sx =	38.4	in ³
Plastic Section Modulus About X-X Axis:	Zx =	44.2	in ³

Design Properties per AISC 14th Edition Steel Manual:

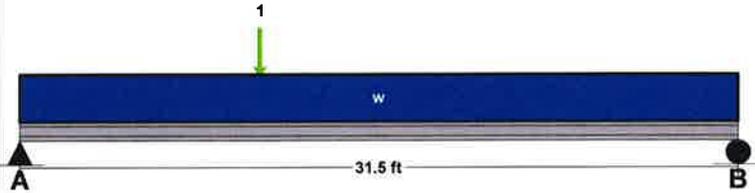
Flange Buckling Ratio:	FBR =	7.97
Allowable Flange Buckling Ratio:	AFBR =	9.15
Web Buckling Ratio:	WBR =	56.82
Allowable Web Buckling Ratio:	AWBR =	90.55
Controlling Unbraced Length:	Lb =	0 ft
Limiting Unbraced Length - for lateral-torsional buckling:	Lp =	3.96 ft
Nominal Flexural Strength w/ safety factor:	Mn =	110279 ft-lb
Controlling Equation:	F2-1	
Web height to thickness ratio:	h/tw =	56.82
Limiting height to thickness ratio for eqn. G2-2:	h/tw-limit =	53.95
Cv Factor:	Cv =	1
Controlling Equation:	G2-3	
Nominal Shear Strength w/ safety factor:	Vn =	70509 lb

Controlling Moment: 96114 ft-lb
 11.03 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2

Controlling Shear: 11548 lb
 At left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s)

Comparisons with required sections:	Req'd	Provided
Moment of Inertia (deflection):	269.27 in ⁴	301 in ⁴
Moment:	96114 ft-lb	110279 ft-lb
Shear:	11548 lb	70509 lb

LOADING DIAGRAM



UNIFORM LOADS Center

Uniform Live Load	235	plf
Uniform Dead Load	196	plf
Beam Self Weight	26	plf
Total Uniform Load	457	plf

POINT LOADS - CENTER SPAN

Load Number	One
Live Load	6525 lb
Dead Load	0 lb
Location	10.5 ft

NOTES

Load Breakdown:

Dead Load = 25 psf x 7.83 ft = 196 plf
 Snow Load = 30 psf x 7.83 ft = 235 plf

Platform = 6525 lbs

Location: Existing Roof Beam 6
 Multi-Loaded Multi-Span Beam
 [2015 International Building Code(AISC 14th Ed ASD)]
 A992-50 W16x77 x 27.2 FT
 Section Adequate By: 122.4%
 Controlling Factor: Moment



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DEFLECTIONS		Center
Live Load	0.43	IN L/757
Dead Load	0.21	in
Total Load	0.64	IN L/506
Live Load Deflection Criteria: L/240		Total Load Deflection Criteria: L/180

REACTIONS		A	B
Live Load	12709 lb	12365 lb	
Dead Load	7602 lb	7602 lb	
Total Load	20311 lb	19967 lb	
Bearing Length	1.16 in	1.16 in	

BEAM DATA		Center
Span Length	27.2	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	27.2	ft

STEEL PROPERTIES
 W16x77 - A992-50

Properties:

Yield Stress:	Fy =	50	ksi
Modulus of Elasticity:	E =	29000	ksi
Depth:	d =	16.5	in
Web Thickness:	tw =	0.46	in
Flange Width:	bf =	10.3	in
Flange Thickness:	tf =	0.76	in
Distance to Web Toe of Fillet:	k =	1.16	in
Moment of Inertia About X-X Axis:	Ix =	1110	in ⁴
Section Modulus About X-X Axis:	Sx =	134	in ³
Plastic Section Modulus About X-X Axis:	Zx =	150	in ³

Design Properties per AISC 14th Edition Steel Manual:

Flange Buckling Ratio:	FBR =	6.78
Allowable Flange Buckling Ratio:	AFBR =	9.15
Web Buckling Ratio:	WBR =	31.16
Allowable Web Buckling Ratio:	AWBR =	90.55
Controlling Unbraced Length:	Lb =	0 ft
Limiting Unbraced Length - for lateral-torsional buckling:	Lp =	8.72 ft
Nominal Flexural Strength w/ safety factor:	Mn =	374252 ft-lb
Controlling Equation:	F2-1	
Web height to thickness ratio:	h/tw =	31.16
Limiting height to thickness ratio for eqn. G2-2: h/tw-limit =		53.95
Cv Factor:	Cv =	1
Controlling Equation:	G2-2	
Nominal Shear Strength w/ safety factor:	Vn =	150150 lb

Controlling Moment:

168276 ft-lb

13.06 Ft from left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s) 2

Controlling Shear:

20311 lb

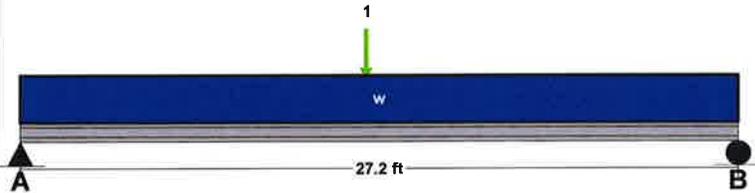
At left support of span 2 (Center Span)

Created by combining all dead loads and live loads on span(s)

Comparisons with required sections:

	Req'd	Provided
Moment of Inertia (deflection):	394.8 in ⁴	1110 in ⁴
Moment:	168276 ft-lb	374252 ft-lb
Shear:	20311 lb	150150 lb

LOADING DIAGRAM



UNIFORM LOADS

	Center
Uniform Live Load	578 plf
Uniform Dead Load	482 plf
Beam Self Weight	77 plf
Total Uniform Load	1137 plf

POINT LOADS - CENTER SPAN

Load Number	One	Two
Live Load	5474 lb	3878 lb
Dead Load	0 lb	0 lb
Location	13.1 ft	13.1 ft

NOTES

Load Breakdown:

Dead Load = 25 psf x 19.25 ft = 482 plf

Snow Load = 30 psf x 19.25 ft = 578 plf

Platform Load 1 = 5474 lbs

Platform Load 2 = (5817 lbs x 21 ft)/31.5 ft = 3878 lbs

DEFLECTIONS		Center
Live Load	0.76	IN L/497
Dead Load	0.43	in
Total Load	1.19	IN L/317
Live Load Deflection Criteria: L/240		Total Load Deflection Criteria: L/180

REACTIONS		A	B
Live Load	17286 lb	11797 lb	
Dead Load	8600 lb	8600 lb	
Total Load	25886 lb	20397 lb	
Bearing Length	1.07 in	1.07 in	

BEAM DATA		Center
Span Length	31.33	ft
Unbraced Length-Top	0	ft
Unbraced Length-Bottom	31.33	ft

STEEL PROPERTIES
 W16x67 - A992-50

Properties:

Yield Stress:	Fy =	50	ksi
Modulus of Elasticity:	E =	29000	ksi
Depth:	d =	16.3	in
Web Thickness:	tw =	0.4	in
Flange Width:	bf =	10.2	in
Flange Thickness:	tf =	0.67	in
Distance to Web Toe of Fillet:	k =	1.07	in
Moment of Inertia About X-X Axis:	Ix =	954	in ⁴
Section Modulus About X-X Axis:	Sx =	117	in ³
Plastic Section Modulus About X-X Axis:	Zx =	130	in ³

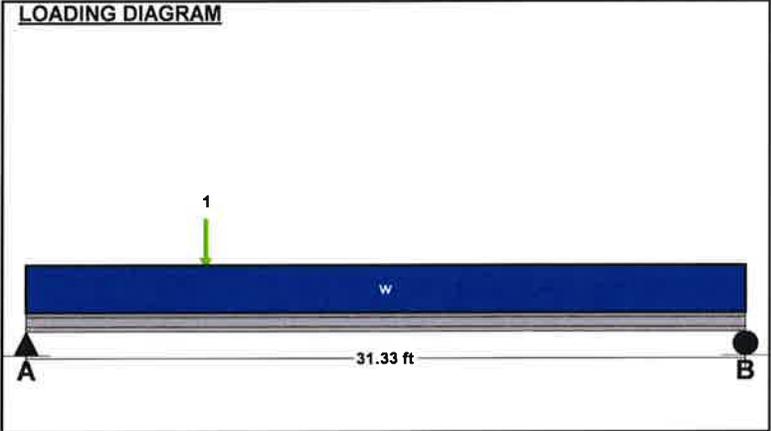
Design Properties per AISC 14th Edition Steel Manual:

Flange Buckling Ratio:	FBR =	7.67
Allowable Flange Buckling Ratio:	AFBR =	9.15
Web Buckling Ratio:	WBR =	35.85
Allowable Web Buckling Ratio:	AWBR =	90.55
Controlling Unbraced Length:	Lb =	0 ft
Limiting Unbraced Length -		
for lateral-torsional buckling:	Lp =	8.69 ft
Nominal Flexural Strength w/ safety factor:	Mn =	324351 ft-lb
Controlling Equation:	F2-1	
Web height to thickness ratio:	h/tw =	35.85
Limiting height to thickness ratio for eqn. G2-2:	h/tw-limit =	53.95
Cv Factor:	Cv =	1
Controlling Equation:	G2-2	
Nominal Shear Strength w/ safety factor:	Vn =	128770 lb

Controlling Moment: 184576 ft-lb
 13.16 Ft from left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s) 2

Controlling Shear: 25886 lb
 At left support of span 2 (Center Span)
 Created by combining all dead loads and live loads on span(s)

Comparisons with required sections:	Req'd	Provided
Moment of Inertia (deflection):	541.63 in ⁴	954 in ⁴
Moment:	184576 ft-lb	324351 ft-lb
Shear:	25886 lb	128770 lb



UNIFORM LOADS		Center
Uniform Live Load	578	plf
Uniform Dead Load	482	plf
Beam Self Weight	67	plf
Total Uniform Load	1127	plf

POINT LOADS - CENTER SPAN		
Load Number	One	Two
Live Load	6624 lb	4350 lb
Dead Load	0 lb	0 lb
Location	7.83 ft	7.83 ft

NOTES

Load Breakdown:

Dead Load = 25 psf x 19.25 ft = 482 plf
 Snow Load = 30 psf x 19.25 ft = 578 plf

Platform Load 1 = 6624 lbs
 Platform Load 2 = (6525 lbs x 21 ft)/31.5 ft = 4350 lbs



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RRH Ballast Mount Calculations

Date: 2/28/2019
 Project Name: WATERBURY WEST
 Project No.: CT5440
 Designed By: JN Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

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

$K_z =$ **0.771** $z =$ 42 (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

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

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

$K_{zt} =$ **#DIV/0!**

$K_h =$ **#DIV/0!**

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

$K_c =$ 0 (from Table 2-4)

$K_t =$ 0 (from Table 2-5)

$f =$ 0 (from Table 2-5)

$z =$ 42

$z_s =$ 450 (Mean elevation of base of structure above sea level)

$H =$ 0 (Ht. of the crest above surrounding terrain)

$K_{zt} =$ 1.00 (from 2.6.6.2.1)

$K_e =$ 0.98 (from 2.6.8)

Category = 1

2.6.10 Design Ice Thickness

Max Ice Thickness =

$t_i =$ 1.50 in

Importance Factor =

$I =$ 1.0 (from Table 2-3)

$K_{iz} =$ 1.02 (from Sec. 2.6.10)

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

$t_{iz} =$ 1.54 in

Date: 2/28/2019
 Project Name: WATERBURY WEST
 Project No.: CT5440
 Designed By: JN Checked By: MSC



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

$h = 38.5$ $G_h = 0.85$

2.6.9.2 Guyed Masts

$G_h = 0.85$

2.6.9.3 Pole Structures

$G_h = 1.1$

2.6.9 Appurtenances

$G_h = 1.0$

2.6.9.4 Structures Supported on Other Structures

(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

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

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

$q_z = 28.84$

$q_z (ice) = 4.61$

$q_z (30) = 1.66$

$K_z = 0.771$ (from 2.6.5.2)

$K_{zt} = 1.0$ (from 2.6.6.2.1)

$K_s = 1.0$ (from 2.6.7)

$K_e = 0.98$ (from 2.6.8)

$K_d = 0.95$ (from Table 2-2)

$V_{max} = 125$ mph (Ultimate Wind Speed)

$V_{max (ice)} = 50$ mph

$V_{30} = 30$ mph

Table 2-2

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

Date: 2/28/2019
 Project Name: WATERBURY WEST
 Project No.: CT5440
 Designed By: JN Checked By: MSC



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.

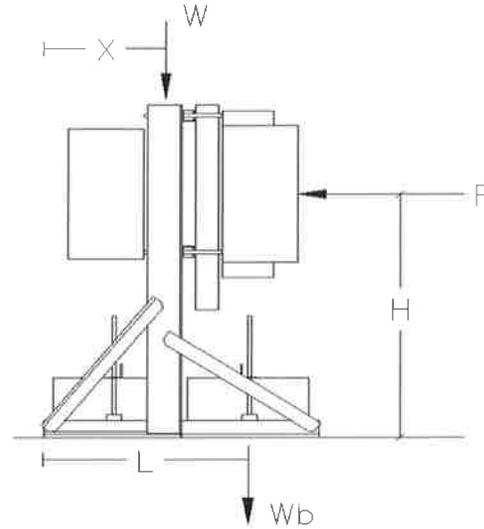
Ice Thickness = **1.54 in** Angle = **0 (deg)** Equivalent Angle = **180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)
B5/B12 4449 RRH	14.9	13.2	10.4	1.37	1.13	1.20	47	11
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.20	47	11
4415 B30 RRH	14.9	13.2	5.4	1.37	1.13	1.20	47	11
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	33	8

Date: 02/28/2019
 Project Name: WATERBURY WEST
 Project No.: CT5440
 Designed By: JN Checked By: MSC

Calculate Total Ballast Required for Ballast Mount

Assume (2) RRH's and (1) Surge as projected area



Force (F) = 197 lbs.

Height (H) = 2.5 ft

Weight of Appurtenances (W) = 222 lbs.

Frame Width/2 (X) = 1.3 ft

Length (L) = 2.2 ft

Ballast (Wb) = TBD

Safety Factor (SF) = 1.5

Overturning at Ballast

$$\Sigma M = 0 = (F * H) - (W * X) - (Wb * L) \text{ ---> } Wb = [(F * H * SF - W * X) / L] = \mathbf{98 \text{ lbs.}}$$

Determine Number of Blocks Required

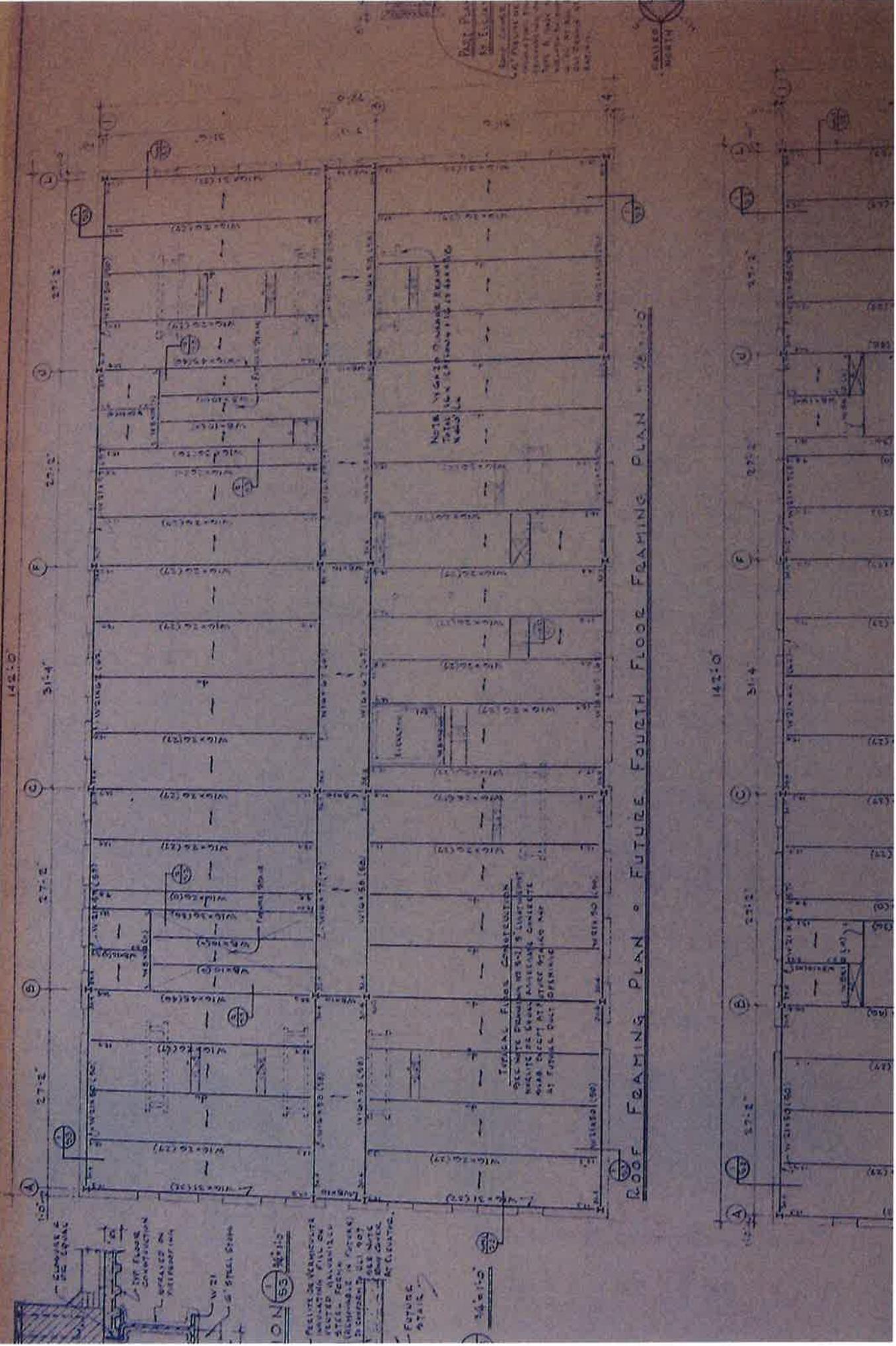
(assume 4"x8"x16" solid blocks @ 38 lbs. each)

Number of Blocks Required = 3 BLOCKS PER SIDE

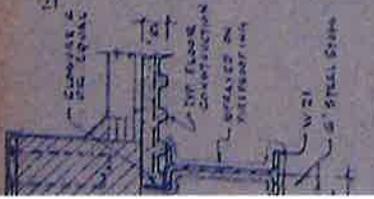


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Design Group LLC

Reference Documents



ROOF FRAMING PLAN - FUTURE FOURTH FLOOR FRAMING PLAN - 142'-0"

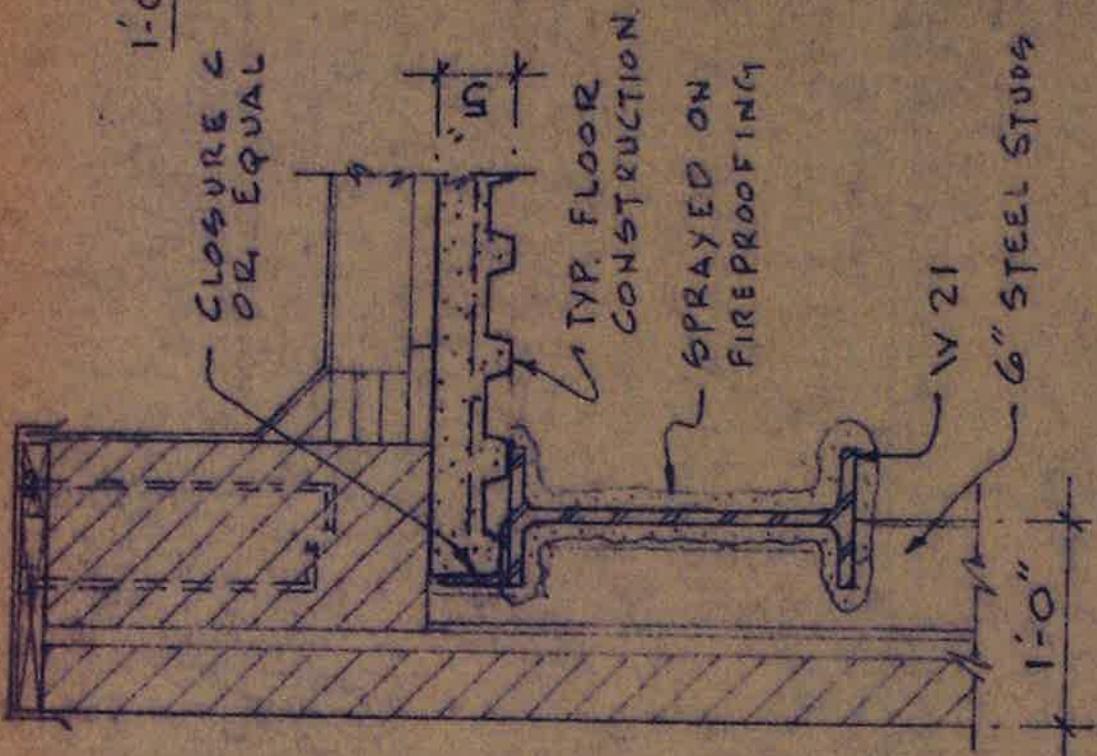


W10 x 50 (60)
 FUTURE DATE DETERMINED BY ENGINEER

W10 x 40 (27)
 W10 x 30 (15)
 W10 x 20 (7)
 W10 x 15 (5)
 W10 x 12 (3)
 W10 x 10 (2)
 W10 x 8 (1)
 W10 x 6 (1)
 W10 x 4 (1)
 W10 x 3 (1)
 W10 x 2 (1)
 W10 x 1 (1)

PAST DATE
 BY ENGINEER

SCALE
 NORTH



A

1'-0"

CLOSURE C
OR EQUAL

TYP. FLOOR
CONSTRUCTION

SPRAYED ON
FIREPROOFING

W 21

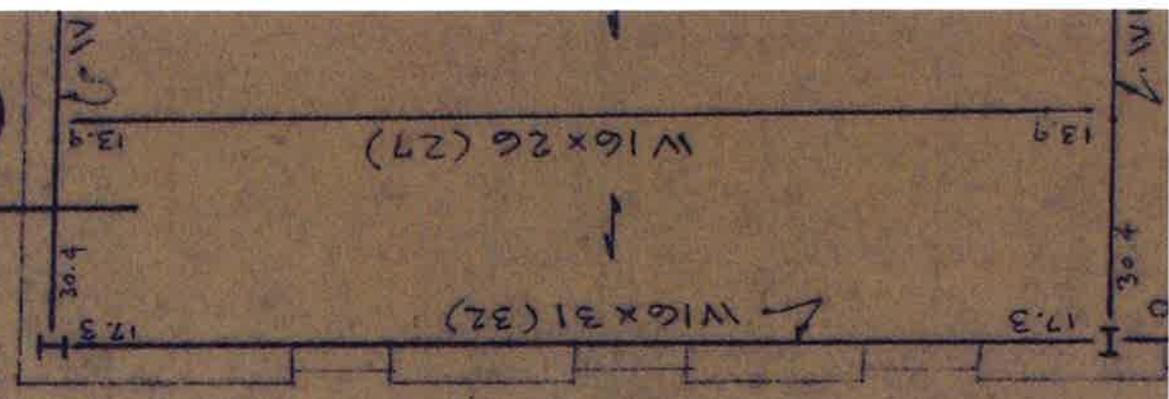
6" STEEL STUDS

1'-0"

SECTION 1/S3 3/4" 1'-0"

OF 3/4" x 3"
STEEL STUD
CONNECTORS

LIGHTWEIGHT, NORLITE
OR EQUAL AGGREGATE
PERLITE OR VERMICULITE
INSULATING FILL ON



30.4

13.9

W 16 x 26 (27)

W 16 x 31 (32)

17.3

30.4

13.9

SECTION 2/55
3/4" = 1'-0"

ROOF CONSTRUCTION
 4" INSULATING FILL 1:6 MIX
 REINFORCING ON 1 1/2" DEEP
 TYPE B, GALVANIZED STEEL DECK VENTED
 TO SUPPORTS FOLLOW ULI DESIGN
 OR 2 HOUR RATING ALL STEEL
 MAY FIREPROOFED.



ROOF CONSTRUCTION
1" = 1'-0"

STRUCTL. SUPPORTS
 5x 3 1/2" x 5 1/4" GS, VERT. LEG DOWN
TYP. ANGLE FRAME ROOF OPENING
 No SCALE

BEAM'S	EL 106'-8"	EL 106'-3 1/2"	EL 106'-8"	EL 105'-9 1/2"	EL 106'-5 1/2"	EL 106'-1 1/4"	EL 106'-8"	EL 132'-2 1/2"
8x8x5/8 ALL WELDED	8x8x3/4 7N LEVEL	8x8x3/4 7N LEVEL	8x8x3/4 7N LEVEL	8x8x3/4 150 SLOPING 100 LEVEL				
W6x15	W6x15	W6x15	W6x15	A-36	A-36	A-36	A-36	W8x58 4L-V50 STEEL
12x12x1	12x12x1	12x12x1	12x12x1	2x12x1 SEE DETAILS CUT 150	12x12x1 SEE DETAILS CUT 150	12x12x1	12x12x1	17x19x1/2 V50
1/4" LEVELING PLATE + 1 1/4" NON SHRINK.	6E 9P 13H	7M 13K	13Q	15Q 16Q	7K 11K	11M	14M	1A, 1L 1C, 1F 2B, 2O 3B, 3I 2C, 2E 2L, 3L 4B, 4C 2F, 4D
COLUMNS	5D, 5M 7G, 7N, 11G, 11P 12A	5A 5K					SEE 10EE	

SEE ARCHITECTURAL DRAWINGS

ROOFING AND INSULATION - SEE ARCHITECTURAL DWGS.