

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE: :
: :
A PETITION OF CELLCO PARTNERSHIP : PETITION NO. ____
D/B/A VERIZON WIRELESS FOR A :
DECLARATORY RULING ON THE NEED :
TO OBTAIN A SITING COUNCIL :
CERTIFICATE FOR THE INSTALLATION :
OF A WIRELESS TELECOMMUNICATIONS :
FACILITY AT 300 SUMMIT STREET, :
HARTFORD, CONNECTICUT : NOVEMBER 7, 2022

PETITION FOR A DECLARATORY RULING:
INSTALLATION HAVING NO
SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT

I. Introduction

Pursuant to Sections 16-50j-38 and 16-50j-39 of the Regulations of Connecticut State Agencies (“R.C.S.A.”), Cellco Partnership d/b/a Verizon Wireless (“Cellco”) hereby petitions the Connecticut Siting Council (the “Council”) for a declaratory ruling (“Petition”) that no Certificate of Environmental Compatibility and Public Need (“Certificate”) is required under Section 16-50k(a) of the Connecticut General Statutes (“C.G.S.”) for the installation of a wireless telecommunications facility on the roof of a three-story building on the southwest portion of the Trinity College campus, at 300 Summit Street in Hartford, Connecticut (the “Property”). *See* Site Schematic Map (Aerial Photograph) included as Attachment 1. The Property is owned by The Trustees of Trinity College (“Trinity”).

The Property, the 78-acre Trinity College campus, is surrounded by multi-family residential land uses to the east, west and south. To the west of the Property is Rocky Ridge Park. Cellco refers to the proposed facility as its “Hartford South 7 Facility”.

II. Proposed Construction Activity

A. Cellco's Proposed Hartford South 7 Facility

The Hartford South 7 Facility will consist of the installation of six (6) panel-type antennas and nine (9) remote radio heads ("RRHs") attached to a metal frame lattice tower structure, in the western portion of the roof of the Roy Nutt academic building. The three-sided tower structure will be surrounded by radio frequency ("RF") transparent screening enclosures. Equipment associated with the antennas will be located on a steel platform on the roof of the building to the east of the lattice tower and an existing mechanical penthouse. The rooftop radio equipment will also be installed behind a screen wall. The tower and antenna screening enclosures will be designed to match the existing architecture style, texture and color of the Roy Nutt building. (See Cellco's Project Plans included in Attachment 2).

Cellco will provide wireless telecommunications services in its 700 MHz, 850 MHz, 1900 MHz, 2100 MHz and C-Band (3730 MHz and 3625 MHz) frequency ranges from the Hartford South 7 Facility. Specifications for Cellco's antennas and remote radio heads are included in Attachment 3. The Hartford South 7 Facility will be capable of providing 5G wireless service.

In cooperation with its engineering consultant TEP North, a Structural Analysis ("SA"), which includes an evaluation of the proposed antenna mounts, has been performed and confirms that the host-building, the rooftop tower and proposed antenna mounting system will be capable of supporting the proposed Hartford South 7 Facility improvements. Copies of the SA referenced above are included in Attachment 4.

III. Discussion

A. The Proposed Facility Will Not Have A Substantial Adverse Environmental Effect

The Public Utility Environmental Standards Act (the “Act”), C.G.S. § 16-50g et seq., provides for the orderly and environmentally compatible development of telecommunications facilities in the state to avoid “a significant impact on the environment and ecology of the State of Connecticut.” C.G.S. § 16-50g. To achieve these goals, the Act established the Council, and requires a Certificate of Environmental Compatibility and Public Need for the construction of cellular telecommunication towers “that may, as determined by the council, have a substantial adverse environmental effect”. C.G.S. § 16-50k(a).

1. Physical Environmental Effects

Cellco respectfully submits that the facility will not involve a significant impact on the physical and environmental characteristics of the Property or the surrounding community. All improvements associated with the Hartford South 7 Facility will be located on the roof of the existing three-story academic building on the existing Trinity College campus. No ground disturbance, tree removal or site grading is required to develop and maintain the Hartford South 7 Facility.

2. Visual Effects

Given its location on the roof of an existing academic building, the limited height of the proposed lattice tower structure and equipment, and Cellco’s proposed use of screening enclosures, any visual effects associated with the proposed Hartford South 7 Facility will be minimal and will not detract from the general appearance and characteristics of the building or the Property. Photo Simulations of the proposed rooftop tower and equipment with their respective screening enclosures are included in Attachment 5. The top portions of the equipment

and tower screening enclosures would be visible from several locations on the Trinity College campus and from adjacent roadways to the south. These visual effects, however, are minor and will not adversely impact any of these surrounding areas.

3. FCC Compliance

Radio frequency (“RF”) emissions from the Hartford South 7 Facility will not exceed the maximum permissible exposure limits established by the Federal Communications Commission (“FCC”). Included in Attachment 6 are far field approximation tables confirming the proposed Hartford South 7 Facility will operate within the FCC safety standards.

4. FAA Notification Not Required

Cellco prepared a Federal Airways and Airspace Summary Report (“Summary Report”) for the proposed Hartford South 7 Facility. According to the Summary Report, the proposed Hartford South 7 Facility will not constitute an obstruction to air navigation and, therefore, notice of the FAA is not required. A copy of the Summary Report is included in Attachment 7.

B. Notice to the Town, Property Owner and Abutting Landowners

On November 7, 2022, a copy of this Petition was sent to Hartford’s Mayor, Luke Bronin; Aimee Chambers, Hartford’s Director of Planning; and The Trustees of Trinity College, the Owner of the Property. Copies of the letters sent to public officials and the Property owner are included in Attachment 8.

A copy of this Petition was also sent to the owners of land that abuts the Property. A sample abutter’s letter and the list of those abutting landowners to whom notice was sent is included in Attachment 9.


IV. Conclusion

Based on the information provided above, Cellco respectfully requests that the Council issue a determination, in the form of a declaratory ruling, that the installation of the proposed

rooftop telecommunications tower described above, will not have a substantial adverse environmental effect and does not require the issuance of a Certificate of Environmental Compatibility and Public Need pursuant to § 16-50k of the General Statutes.

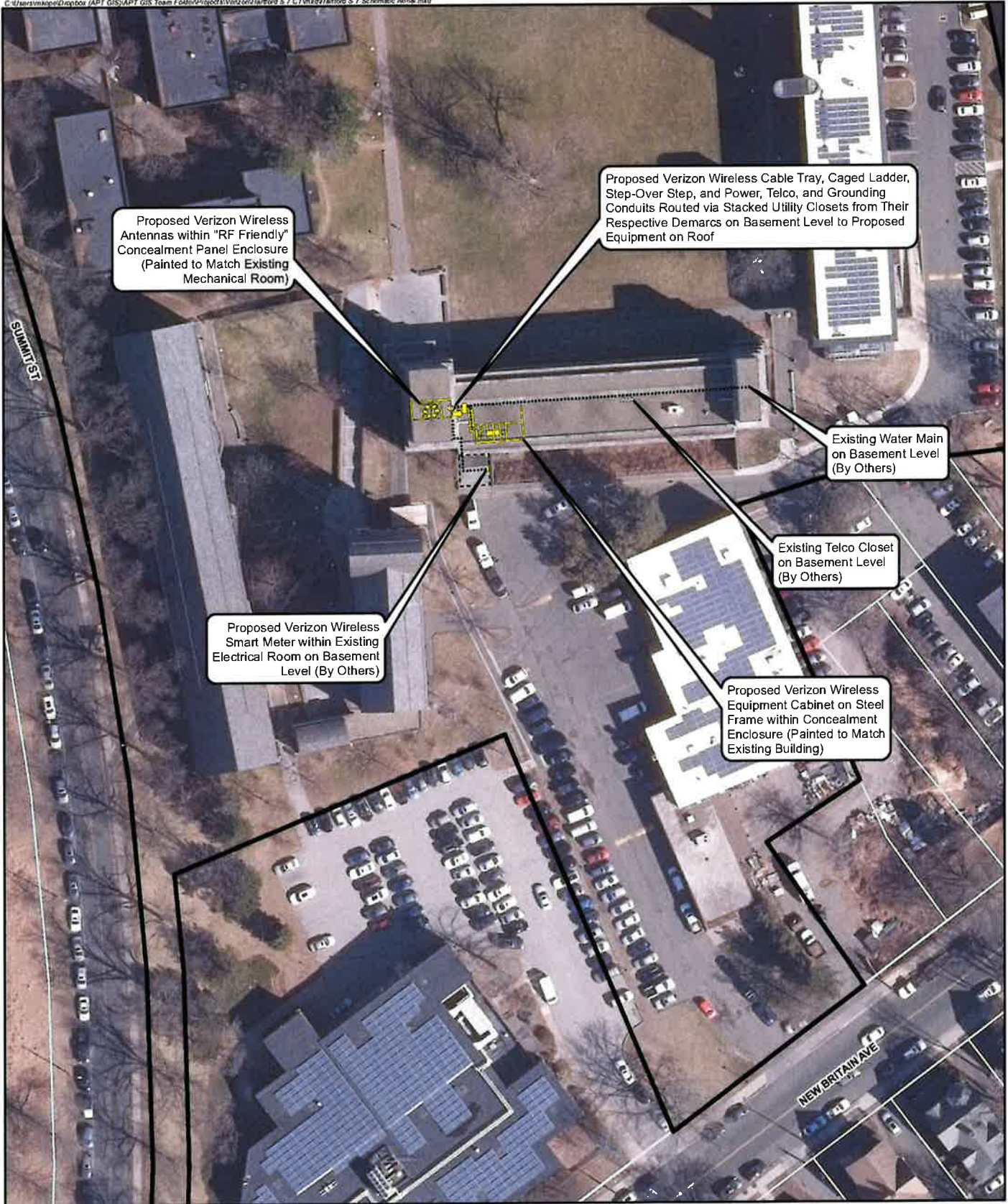
Respectfully submitted,

CELLCO PARTNERSHIP d/b/a VERIZON
WIRELESS

By 

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597
(860) 275-8200
Its Attorneys

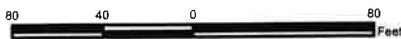
ATTACHMENT 1



Legend

- Proposed Verizon Wireless Equipment
- Subject Property
- Existing Electrical Room (By Others)
- Approximate Parcel Boundary
- Existing Telco Closet (By Others)
- Existing Utility Closet (By Others)
- Proposed Verizon Wireless Conduit

Map Notes:
 Base Map Source: 2019 CT ECO Imagery
 Map Scale: 1 inch = 80 feet
 Map Date: November 2022



Site Schematic

Proposed Wireless
 Telecommunications Facility
 Hartford S 7 CT
 300 Summit Street
 Hartford, Connecticut



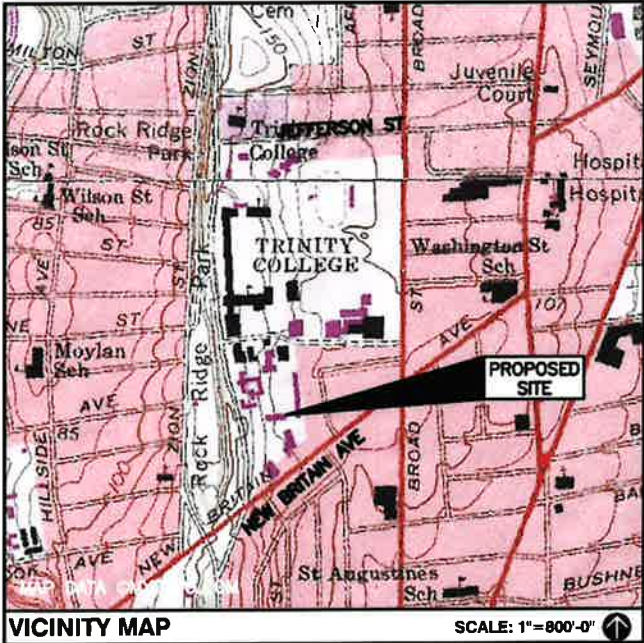
ATTACHMENT 2

CELLCO PARTNERSHIP



WIRELESS COMMUNICATIONS FACILITY

HARTFORD S 7 CT
300 SUMMIT STREET
HARTFORD CT, 06106



DIRECTIONS TO SITE:
 FROM VERIZON'S WALLINGFORD CT OFFICE
 HEAD SOUTH TOWARD ALEXANDER DR
 TURN RIGHT, TURN RIGHT TOWARD ALEXANDER DR
 TURN RIGHT TOWARD ALEXANDER DR, TURN RIGHT ONTO ALEXANDER DR
 TURN RIGHT ONTO BARNES INDUSTRIAL PARK RD
 TURN RIGHT ONTO CT-68 E., CONTINUE STRAIGHT TO STAY ON CT-68 E
 SHARP LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD
 FOLLOW I-91 N TO WHITEHEAD HWY IN HARTFORD. TAKE EXIT 29A
 FROM I-91 N., MERGE ONTO I-91 N
 USE THE LEFT 2 LANES TO TAKE EXIT 29A TOWARD CAPITOL AREA
 CONTINUE ON WHITEHEAD HWY TO YOUR DESTINATION
 CONTINUE ONTO WHITEHEAD HWY., CONTINUE STRAIGHT TO STAY ON
 WHITEHEAD HWY., AT THE TRAFFIC CIRCLE, TAKE THE 3RD EXIT ONTO
 HUDSON ST., CONTINUE STRAIGHT TO STAY ON HUDSON ST
 TURN RIGHT ONTO JEFFERSON ST., TURN LEFT ONTO BROAD ST
 TURN RIGHT ONTO FERRIS ROADWAY
 TURN RIGHT

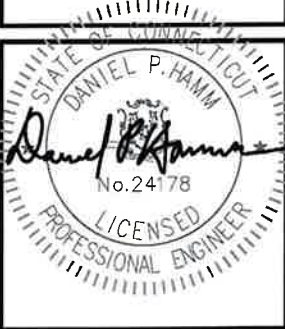
CONSULTANT TEAM	
PROJECT ENGINEER	
TOWER ENGINEERING PROFESSIONALS NORTHEAST 45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845 TEL: 1-(978)-557-5553 FAX: 1-(978)-336-5586	
MEP ENGINEER	
TOWER ENGINEERING PROFESSIONALS NORTHEAST 45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845 TEL: 1-(978)-557-5553 FAX: 1-(978)-336-5586	

PROJECT SUMMARY	
SITE NAME:	HARTFORD S 7 CT
SITE ADDRESS:	300 SUMMIT STREET HARTFORD CT, 06106
PROPERTY OWNER:	TRINITY COLLEGE TRUSTEES 300 SUMMIT STREET HARTFORD, CT 06106
APPLICANT:	TIM PARKS CELLCO PARTNERSHIP d/b/a VERIZON 20 ALEXANDER DRIVE WALLINGFORD, CT 06108
SITE ACQUISITION CONTACT:	CHRISTINA GLASS SAI COMMUNICATIONS, LLC 12 INDUSTRIAL WAY SALEM, NH 03079
LEGAL/REGULATORY COUNSEL:	KENNETH C. BALDWIN ESQ. ROBINSON + COLE LLP (860)275-8345
LATITUDE:	N41° 44' 40.15"
LONGITUDE:	W72° 41' 29.09"

SCOPE OF WORK INFO.	
VERIZON WIRELESS IS PROPOSING TO INSTALL THE FOLLOWING IMPROVEMENTS ON PROPOSED TELECOMMUNICATION SITE:	
• NEW CABINETS:	(2) CABINETS MOUNTED TO STEEL FRAME WITH CONCEALMENT ENCLOSURE
• NEW PANEL ANTENNAS:	(2) ANTENNAS PER SECTOR, FOR A TOTAL OF (6)
• NEW ANTENNAS W/RRHs:	(1) ANTENNA WITH CLIP-ON RRH PER SECTOR FOR A TOTAL (3)
• NEW RRHs:	(3) RRHs PER SECTOR, FOR A TOTAL OF (9)
• NEW OVP:	(2) OVPs IN TOTAL
ITEMS LISTED ABOVE TO BE MOUNTED WITHIN (2) PROPOSED CONCEALMENT ENCLOSURES ON EXISTING ROOFTOP	
• NEW TELCO & POWER SERVICES WILL BE ROUTED THROUGH UTILITY CLOSETS FROM FIBER CLOSET AND ELECTRICAL ROOM ON THE BASEMENT LEVEL RESPECTIVELY TO PROPOSED INTEGRATED LOAD CENTER AND HOFFMAN BOX ON ROOF.	
• FINAL UTILITY ROUTING TO BE DETERMINED/VERIFIED BY UTILITY COMPANIES DURING CONSTRUCTION PHASE.	

SHEET INDEX	
SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
C-1	ABUTTERS PLAN
A-1	KEY PLAN AND PARTIAL ROOF PLAN
A-2	ELEVATION
A-3	EQUIPMENT AND ANTENNA PLANS
A-4	EQUIPMENT AND ANTENNA FRAME SECTIONS
A-5	FRAME TO ROOF CONNECTION DETAILS

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



CHECKED BY: JX

APPROVED BY: DPH

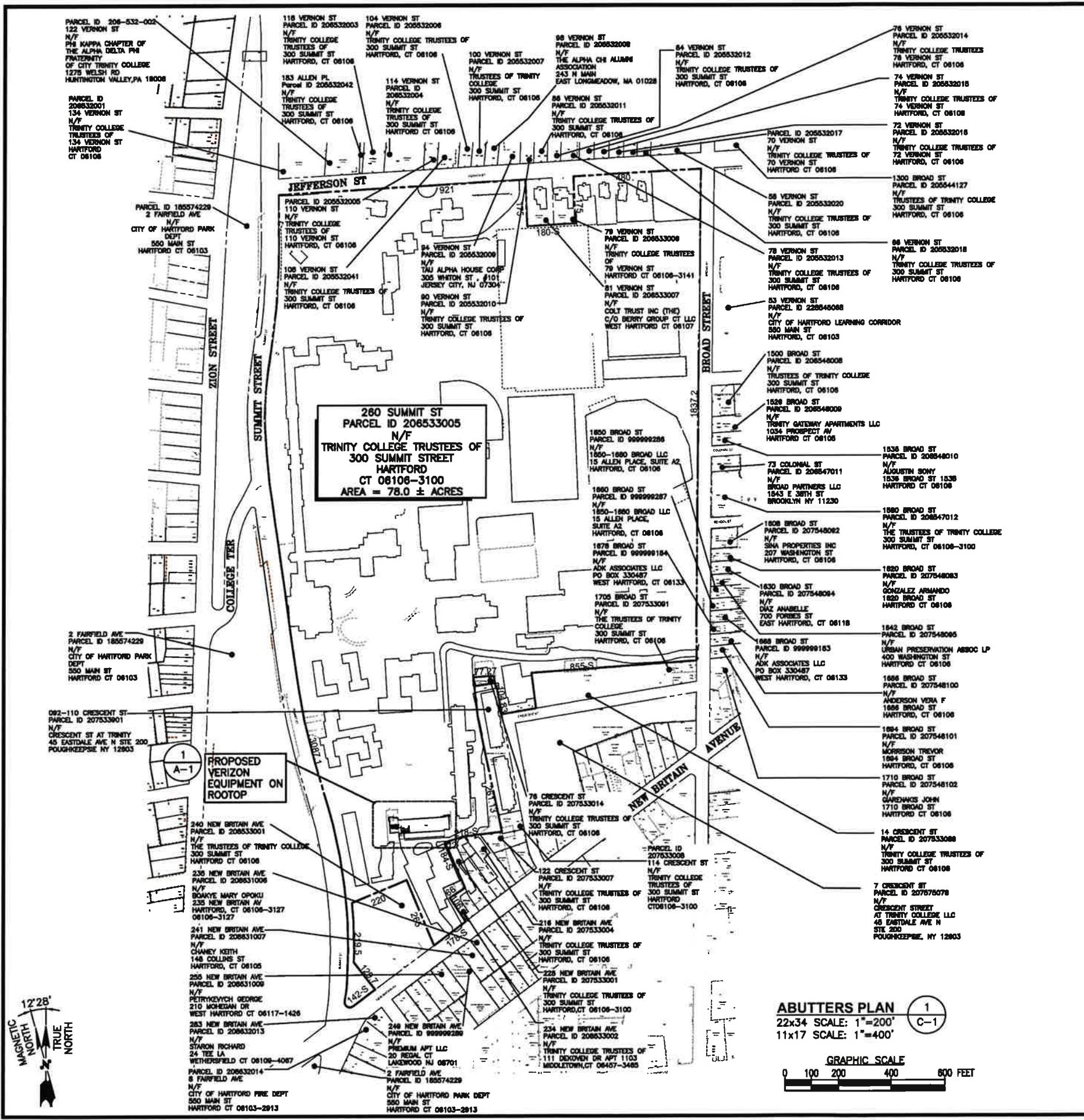
SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
0	11/03/22	ISSUED FOR REVIEW	SLY

SITE NAME:
HARTFORD S 7 CT

SITE ADDRESS:
 300 SUMMIT STREET
 HARTFORD CT, 06106

SHEET TITLE
 TITLE SHEET

SHEET NUMBER
T-1

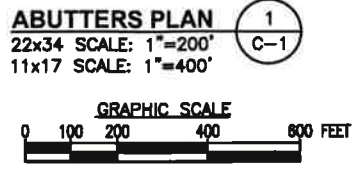
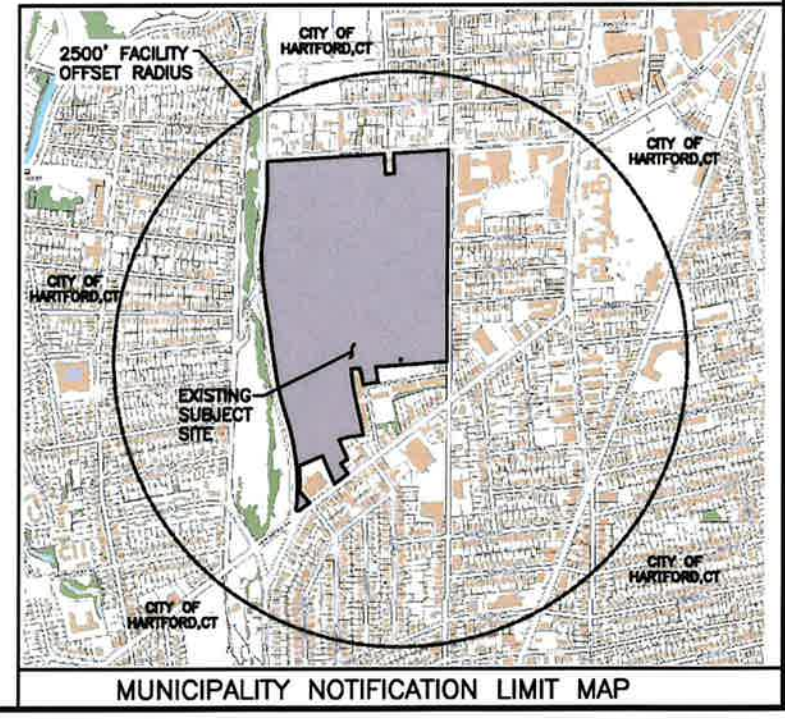


LEGEND

- PROPERTY LINE - SUBJECT PARCEL
- ABUTTERS PROPERTY LINE
- EXISTING CONTOUR LINE
- TREE LINE
- BARBED WIRE FENCE REMAINS
- OVERHEAD WIRE (TRANSMISSION LINE)
- EXISTING CHAIN LINK FENCE
- EXISTING UNDERGROUND SEWER LINE
- DELINEATED WETLAND LINE
- EXISTING BUILDING
- PROPOSED EQUIPMENT CONCRETE PAD
- CATCH BASIN
- CONIFEROUS TREE
- DECIDUOUS TREE
- EXISTING GROUND WELL
- EXISTING SEWER MANHOLE
- STONEWALL
- WELL
- EXISTING UTILITY POLE
- PROPOSED UTILITY POLE
- PROPOSED CONTOUR LINE
- PROPOSED CONSTRUCTION SILT SOCK
- PROPOSED TOWER

SOURCE:

- ONLINE ASSESSORS, TAX AND GIS MAPS FROM THE CITY OF HARTFORD CT ACCESSED ON OCTOBER 24, 2022
- PROPERTY LINE INFORMATION IS COMPILED FROM ASSESSORS PLAN AND RECORD DOCUMENTS AND IS NOT TO BE CONSTRUED AS HAVING BEEN OBTAINED AS THE RESULT OF A FIELD BOUNDARY SURVEY, AND IS SUBJECT TO CHANGE AS AN ACCURATE FIELD SURVEY MAY DISCLOSE. A FULL BOUNDARY SURVEY WAS NOT PERFORMED.



PREPARED FOR: CELCO PARTNERSHIP D.B.A.

45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 537-5553

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

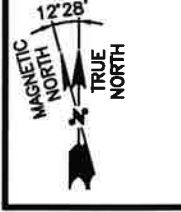
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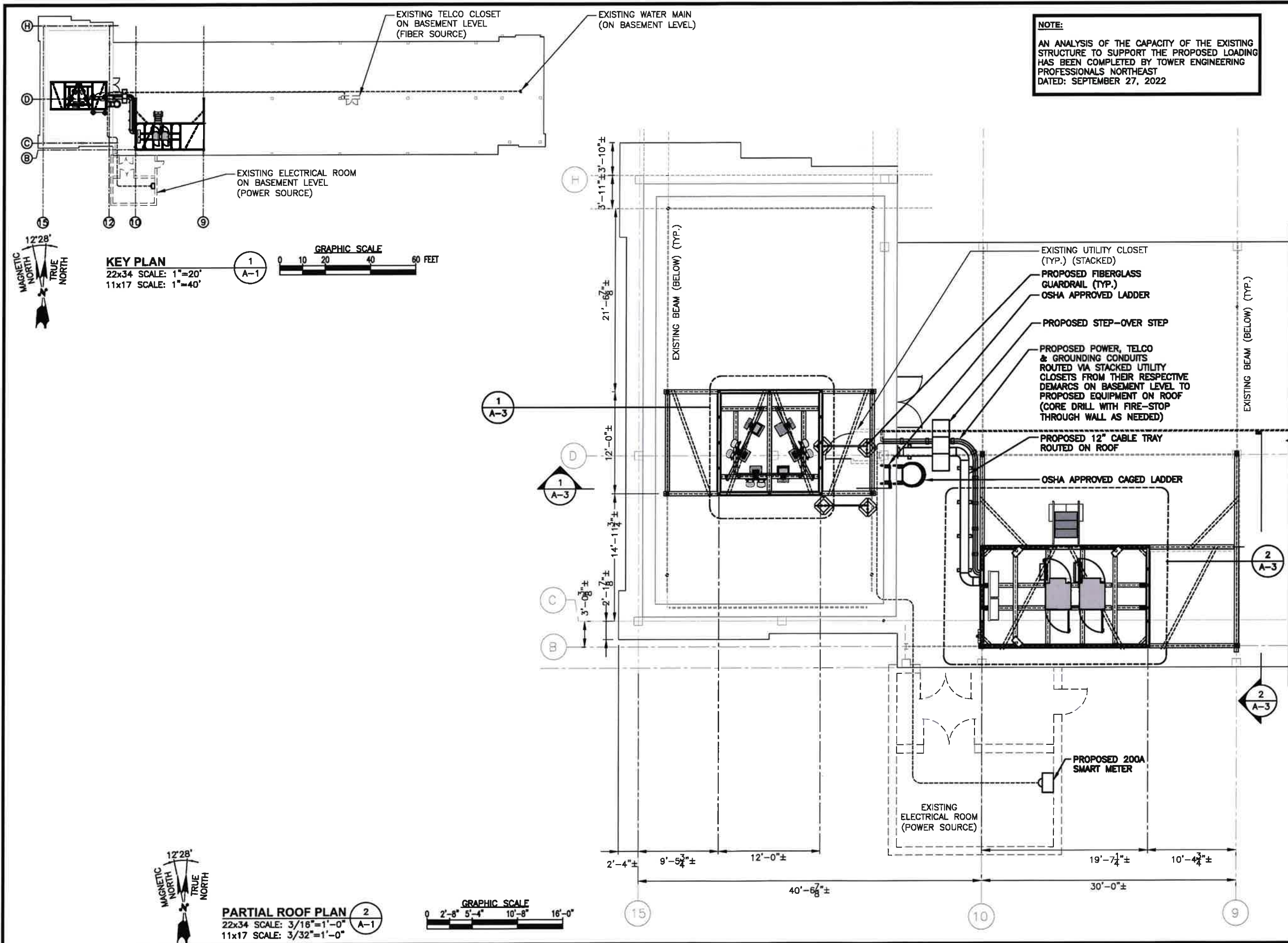
SITE NAME:
HARTFORD S 7 CT

SITE ADDRESS:
300 SUMMIT STREET
HARTFORD CT, 06106

SHEET TITLE
ABUTTERS PLAN

SHEET NUMBER
C-1





NOTE:
 AN ANALYSIS OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY TOWER ENGINEERING PROFESSIONALS NORTHEAST DATED: SEPTEMBER 27, 2022

KEY PLAN
 22x34 SCALE: 1"=20'
 11x17 SCALE: 1"=40'

PARTIAL ROOF PLAN
 22x34 SCALE: 3/16"=1'-0"
 11x17 SCALE: 3/32"=1'-0"

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 APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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SITE NAME:
 HARTFORD S 7 CT

SITE ADDRESS:
 300 SUMMIT STREET
 HARTFORD CT, 06106

SHEET TITLE
 KEY PLAN AND
 PARTIAL ROOF PLAN

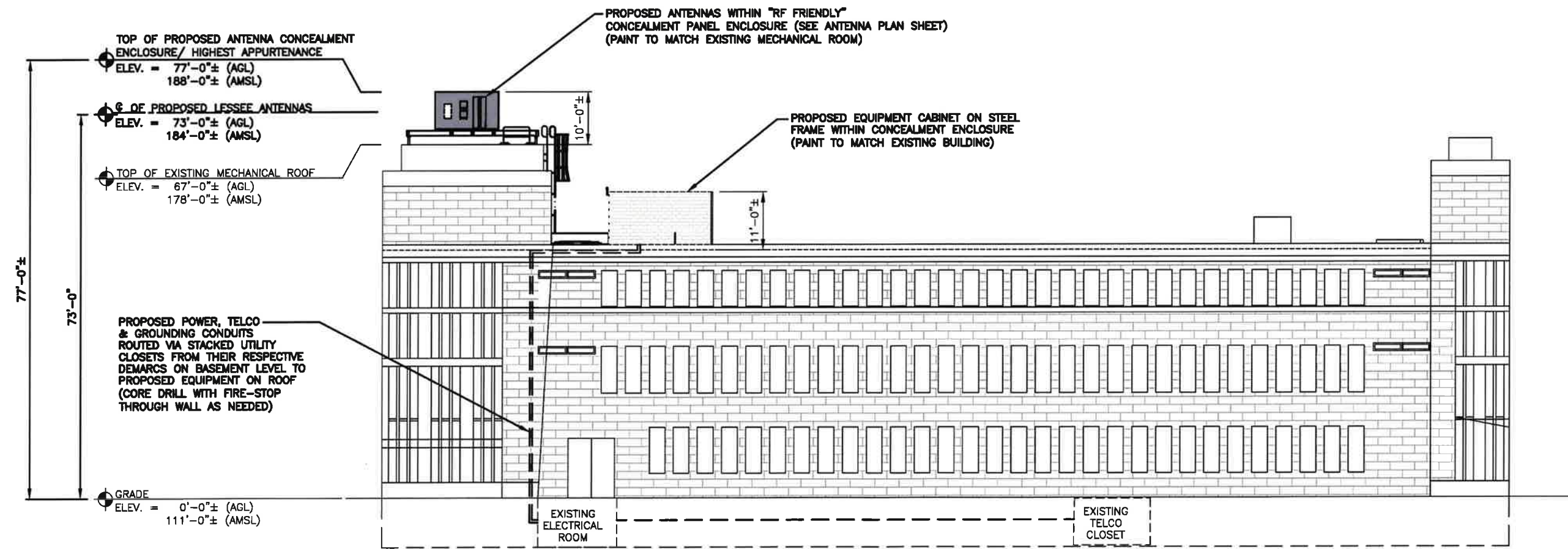
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NOTE:
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45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
 TEL: (978) 557-5553




DANIEL P. HAMM
 No. 24178
 LICENSED PROFESSIONAL ENGINEER

CHECKED BY: JX
 APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	11/03/22	ISSUED FOR REVIEW	SLY

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 HARTFORD S 7 CT

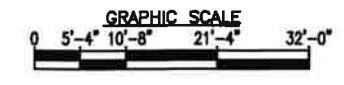
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 300 SUMMIT STREET
 HARTFORD CT, 06106

SHEET TITLE
 ELEVATION

SHEET NUMBER
 A-2

ELEVATION
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 11x17 SCALE: 3/64"=1'-0"

1
 A-2



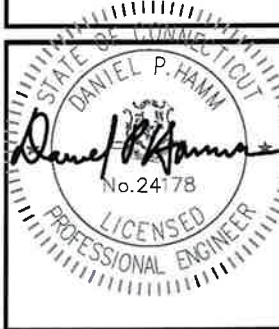
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NOTE:
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PREPARED FOR: CELCO PARTNERSHIP D.B.A.



TEP
NORTHEAST
 45 BECHWOOD DRIVE, NORTH ANDOVER, MA 01845
 TEL: (978) 557-5553



CHECKED BY: JX

APPROVED BY: DPH

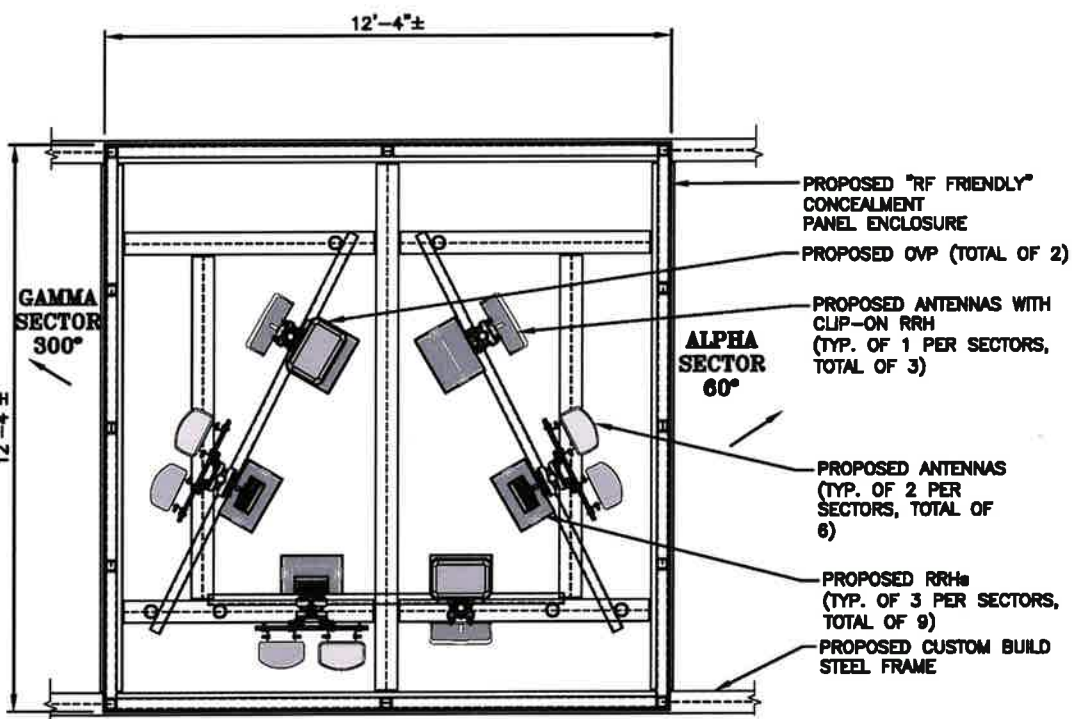
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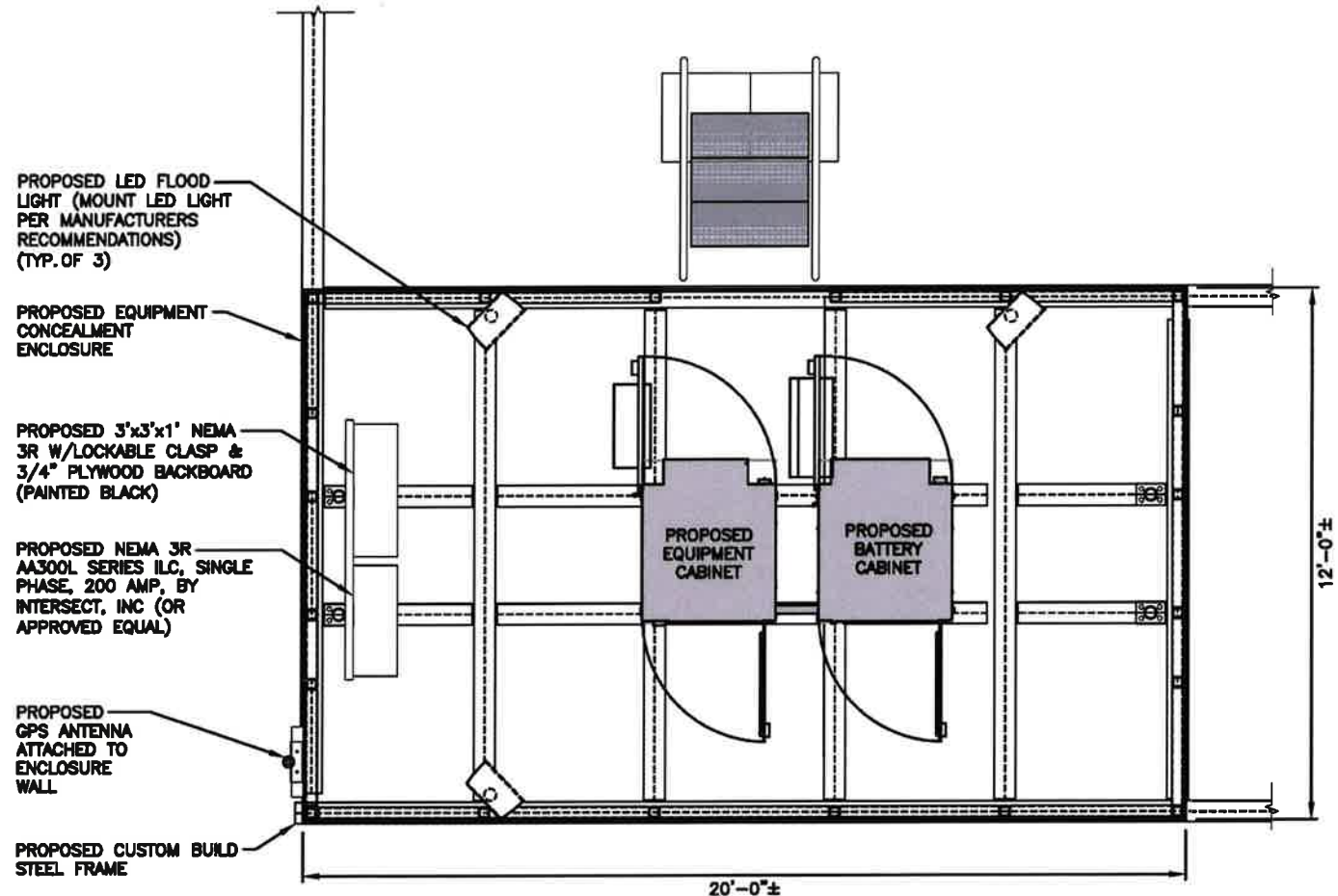
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 300 SUMMIT STREET
 HARTFORD CT, 06106

SHEET TITLE
ANTENNA AND EQUIPMENT PLANS

SHEET NUMBER
A-3



ANTENNA PLAN 1
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 11x17 SCALE: 1/4"=1'-0"
 GRAPHIC SCALE 0 1 2 4 6 FEET

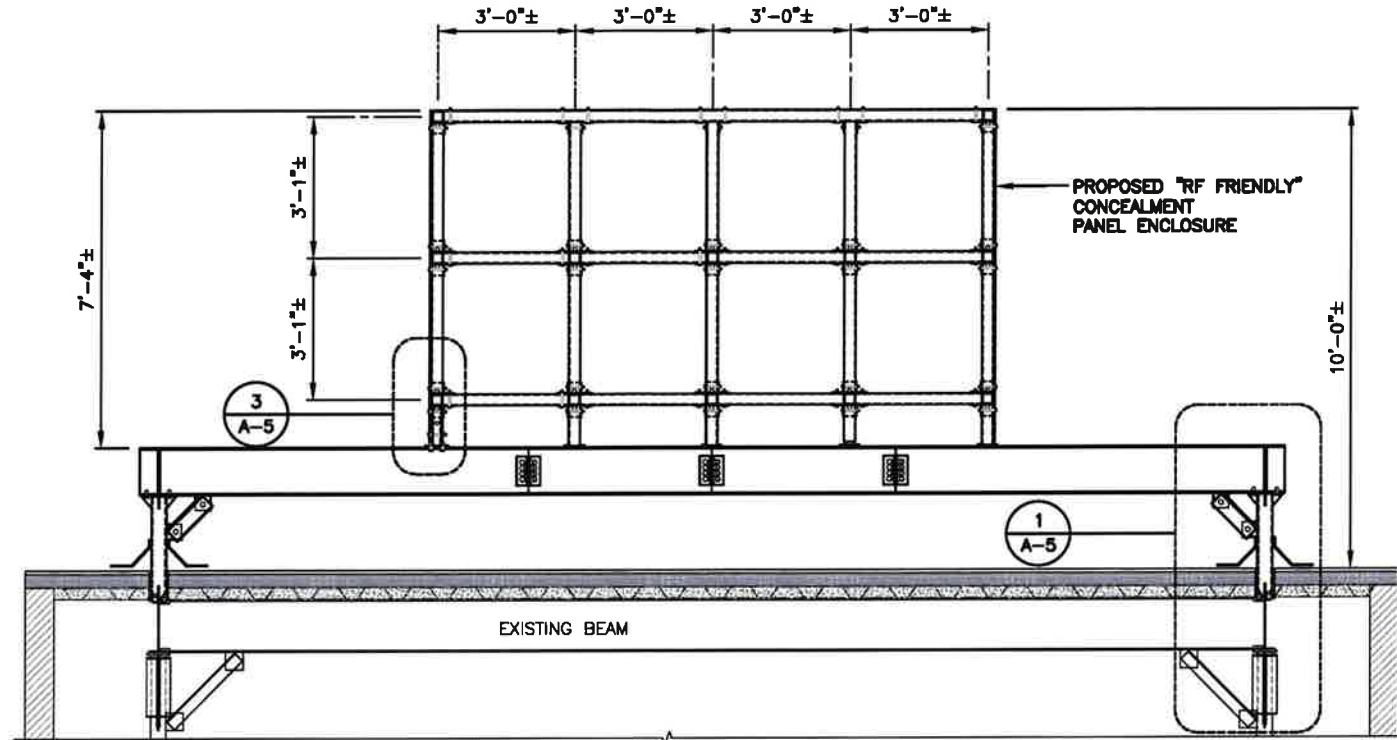


EQUIPMENT PLAN 2
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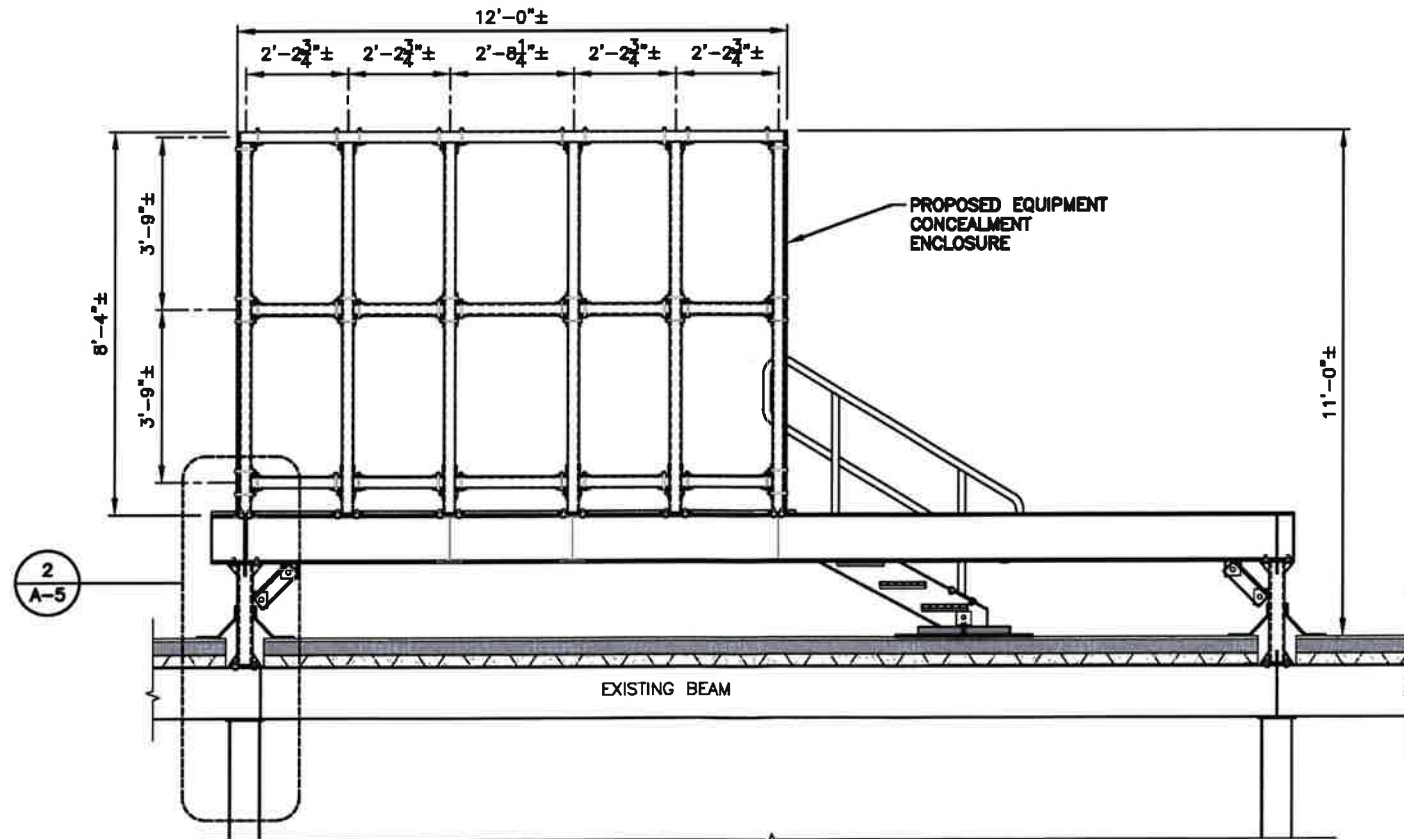
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ANTENNA FRAME SECTION 1
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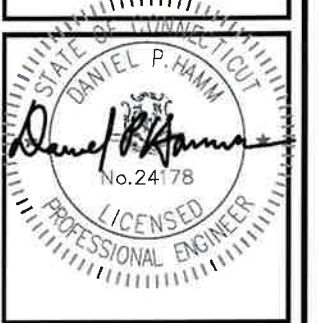


EQUIPMENT FRAME SECTION 2
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 11x17 SCALE: 1/4"=1'-0"
 GRAPHIC SCALE 0 2 4 6 FEET

PREPARED FOR: CELCO PARTNERSHIP D.B.A.



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 TEL: (978) 557-5553



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APPROVED BY: DPH

SUBMITTALS

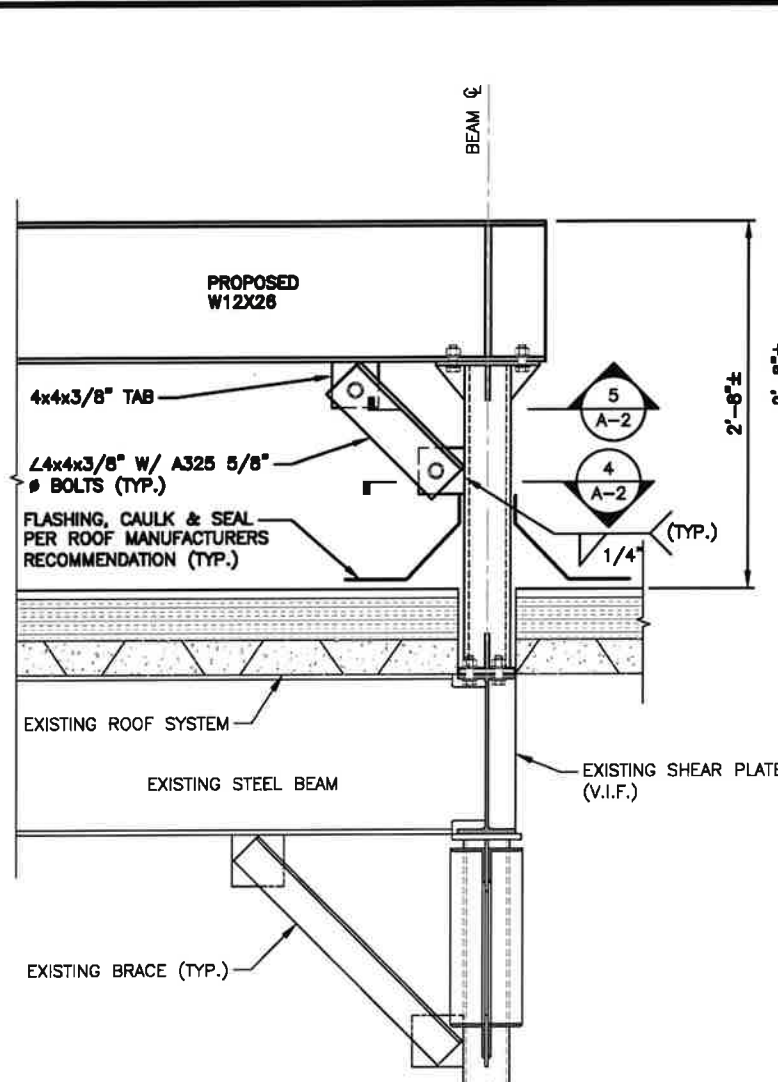
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HARTFORD S 7 CT

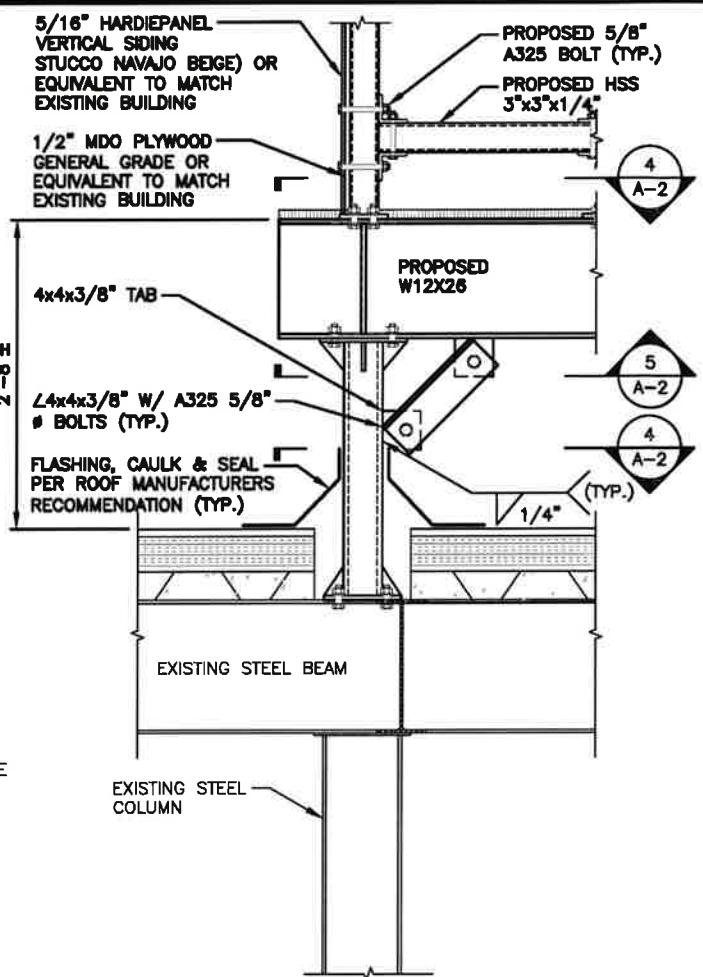
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 300 SUMMIT STREET
 HARTFORD CT, 06106

SHEET TITLE
**EQUIPMENT AND
 ANTENNA FRAME
 SECTIONES**

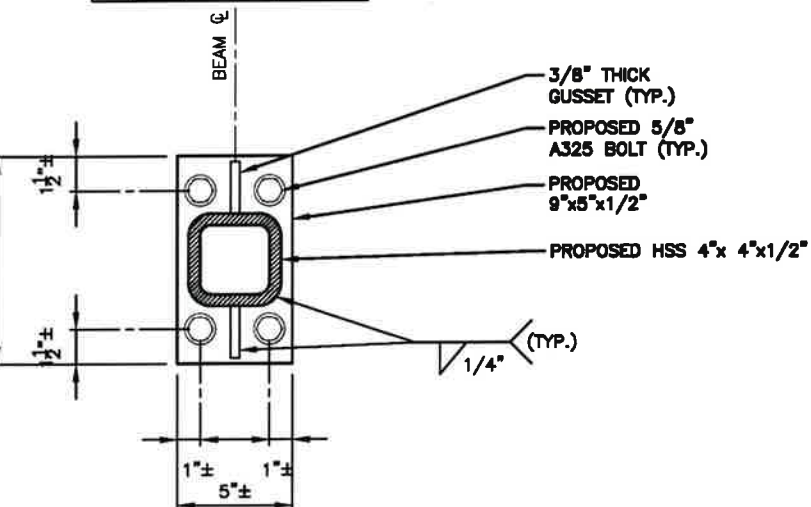
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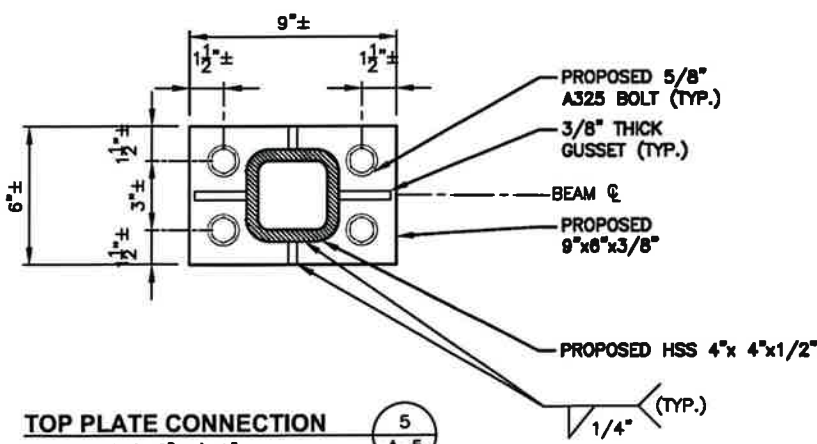
ANTENNA FRAME CONNECTION DETAIL 1
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 11x17 SCALE: 3/4"=1'-0"
 GRAPHIC SCALE



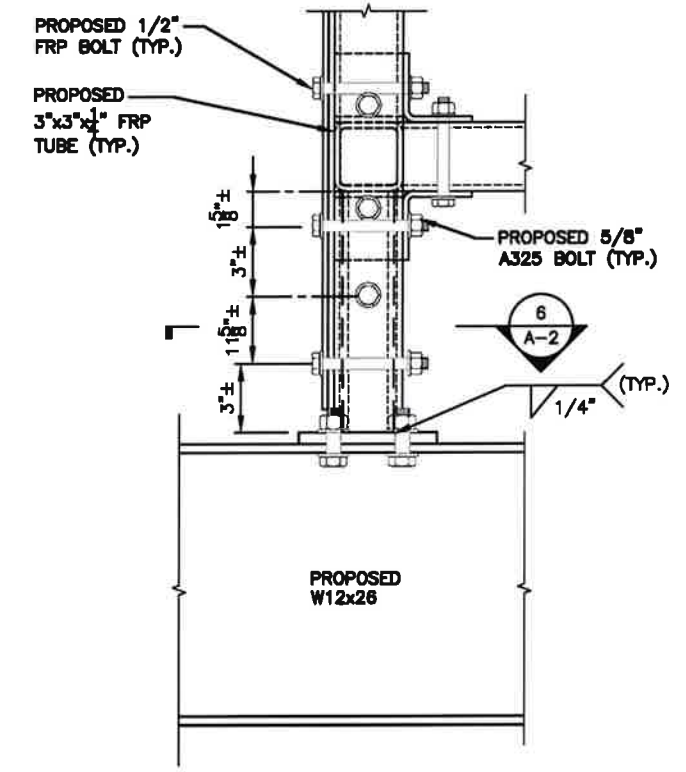
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 11x17 SCALE: 3/4"=1'-0"
 GRAPHIC SCALE



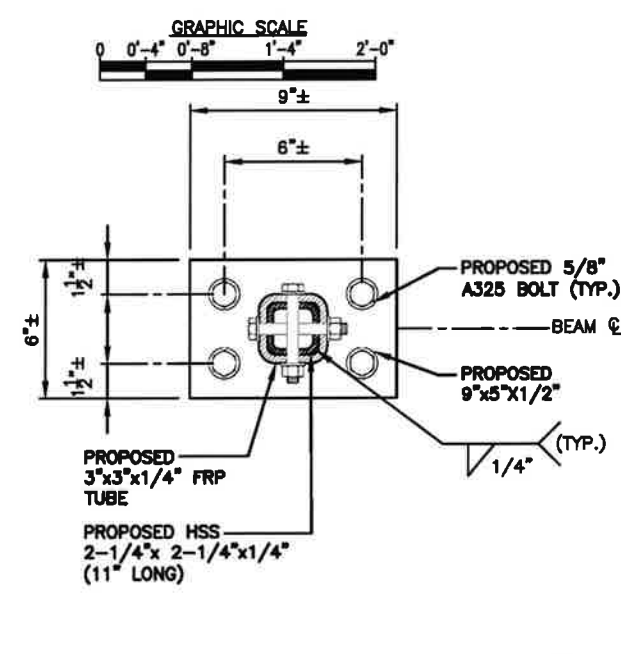
BASE PLATE CONNECTION 4
 22x34 SCALE: 3"=1'-0"
 11x17 SCALE: 1-1/2"=1'-0"
 GRAPHIC SCALE



TOP PLATE CONNECTION 5
 22x34 SCALE: 3"=1'-0"
 11x17 SCALE: 1-1/2"=1'-0"
 GRAPHIC SCALE



EQUIPMENT FRAME SECTION 3
 22x34 SCALE: 1/2"=1'-0"
 11x17 SCALE: 1/4"=1'-0"
 GRAPHIC SCALE

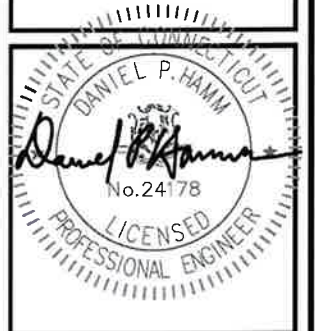


BASE PLATE @ ANTENNA ENCLOSURE 6
 22x34 SCALE: 3"=1'-0"
 11x17 SCALE: 1-1/2"=1'-0"
 GRAPHIC SCALE

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.



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



CHECKED BY: JX

APPROVED BY: DPH

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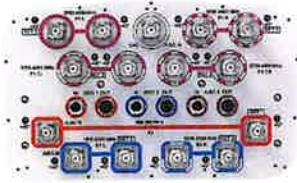
SITE ADDRESS:
 300 SUMMIT STREET
 HARTFORD CT, 06106

SHEET TITLE
**FRAME TO ROOF
 CONNECTION
 DETAILS**

SHEET NUMBER
A-5

ATTACHMENT 3

NHHS4-65B-R3B



14 Port Sector Antenna, 2x698-896 MHz, 4x1695-2200 MHz 65° HPBW, and 8x3700-4000 MHz Beamformer, 3XRET

General Specifications

Antenna Type	Sector- and beamforming
Band	Multiband
Calibration Connector Interface	4.3-10 Female
Calibration Connector Quantity	1
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	Fiberglass, UV resistant
Radiator Material	Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	8
RF Connector Quantity, mid band	4
RF Connector Quantity, low band	2
RF Connector Quantity, total	14

Remote Electrical Tilt (RET) Information

RET Hardware	CommRET v2
RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	3 female 3 male
Input Voltage	10–30 Vdc
Internal Bias Tee	Cal Port Port 1 Port 3
Internal RET	High band (1) Low band (1) Mid band (1)
Protocol	3GPP/AISG 2.0 (Single RET)

NHHS4-65B-R3B

Dimensions

Width	350 mm 13.78 in
Depth	208 mm 8.189 in
Length	1828 mm 71.969 in
Net Weight, without mounting kit	27 kg 59.525 lb

Array Layout

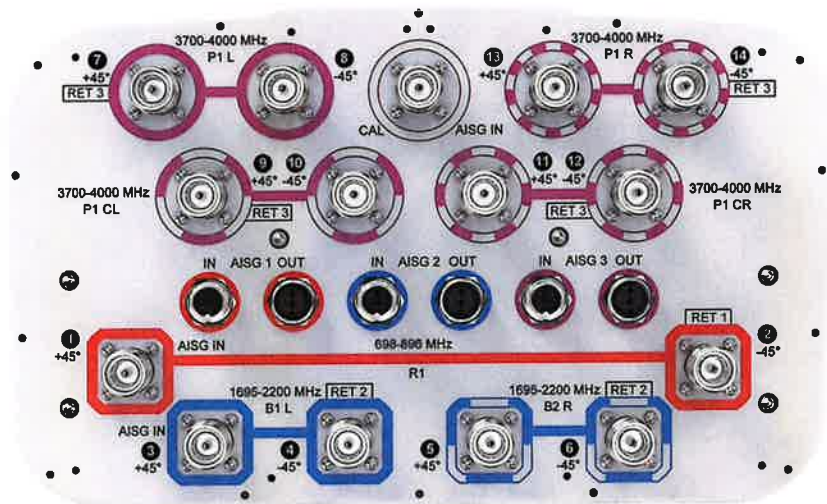


Array ID	Frequency (MHz)	RF Connector	RET (SRET)	AISG RET UID
R1	698-896	1 - 2	1	CPxxxxxxxxxxxxR1
B1	1695-2200	3 - 4	2	CPxxxxxxxxxxxxB1
B2	1695-2200	5 - 6		
P1	3700-4000	7 - 14	3	CPxxxxxxxxxxxxP1

(Sizes of colored boxes are not true depictions of array sizes)

Port Configuration

NHHS4-65B-R3B



Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2200 MHz 3700 – 4000 MHz 698 – 896 MHz
Polarization	±45°
Total Input Power, maximum	1,000 W @ 50 °C

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	3700–4000
Gain, dBi	15	15.1	17.7	18.1	18.2	15.9
Beamwidth, Horizontal, degrees	66	64	63	61	64	85
Beamwidth, Vertical, degrees	11.5	10.4	5.6	5.3	5	5.7
USLS (First Lobe), dB	15	15	17	20	21	13
Front-to-Back Ratio at 180°, dB	37	34	34	35	33	30
Coupling level, Amp, Antenna port to Cal port, dB						26
Coupling level, max Amp Δ,						±2

NHHS4-65B-R3B

Antenna port to Cal port, dB						
Coupler, max Amp Δ, Antenna port to Cal port, dB						0.5
Coupler, max Phase Δ, Antenna port to Cal port, degrees						5
Isolation, Cross Polarization, dB	25	25	25	25	25	25
Isolation, Inter-band, dB	25	25	25	25	25	25
Isolation, Co-polarization, dB						19
VSWR Return loss, dB	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-145
Input Power per Port at 50°C, maximum, watts	300	300	250	250	250	75

Electrical Specifications, BASTA

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	3700–4000
Gain by all Beam Tilts, average, dBi	14.7	14.9	17.4	17.9	17.9	15.2
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.3	±0.7	±0.2	±0.3	±0.9
Beamwidth, Horizontal Tolerance, degrees	±3.3	±1.2	±4.1	±3.2	±5.2	±19
Beamwidth, Vertical Tolerance, degrees	±0.7	±0.7	±0.3	±0.2	±0.3	±0.5
Front-to-Back Total Power at 180° ± 30°, dB	27	25	26	28	27	22
CPR at Boresight, dB	23	19	18	21	23	14
CPR at Sector, dB	14	9	11	11	11	5

Electrical Specifications, Broadcast 65°

Frequency Band, MHz	3700–4000
Gain, dBi	16.8
Beamwidth, Horizontal, degrees	65
Beamwidth, Vertical, degrees	5.7
Beamwidth, Vertical Tolerance, degrees	±0.3
Front-to-Back Total Power at 180° ± 30°, dB	25

NHHS4-65B-R3B

USLS (First Lobe), dB 15

Electrical Specifications, Envelope Pattern

Frequency Band, MHz 3700–4000

Gain, dBi 20.5

Electrical Specifications, Service Beam

Frequency Band, MHz 3700–4000

Steered 0° Gain, dBi 20.5

Steered 0° Gain Tolerance, dBi ±0.5

Steered 0° Beamwidth, Horizontal, degrees 22

Steered 0° Front-to-Back Total Power at 180° ± 30°, dB 29

Steered 0° Horizontal Sidelobe, dB 12

Steered 30° Gain, dBi 19.5

Steered 30° Gain Tolerance, dBi ±0.9

Steered 30° Beamwidth, Horizontal, degrees 28

Steered 30° Front-to-Back Total Power at 180° ± 30°, dB 26

Electrical Specifications, Soft Split

Frequency Band, MHz 3700–4000

Gain, dBi 18.9

Beamwidth, Horizontal, degrees 32

Front-to-Back Total Power at 180° ± 30°, dB 26

Horizontal Sidelobe, dB 16

Mechanical Specifications

Wind Loading @ Velocity, frontal 301.0 N @ 150 km/h (67.7 lbf @ 150 km/h)

Wind Loading @ Velocity, lateral 254.0 N @ 150 km/h (57.1 lbf @ 150 km/h)

Wind Loading @ Velocity, maximum 638.0 N @ 150 km/h (143.4 lbf @ 150 km/h)

Wind Loading @ Velocity, rear 319.0 N @ 150 km/h (71.7 lbf @ 150 km/h)

Wind Speed, maximum 241 km/h | 149.75 mph

NHHS4-65B-R3B

Packaging and Weights

Width, packed	456 mm 17.953 in
Depth, packed	357 mm 14.055 in
Length, packed	1975 mm 77.756 in
Weight, gross	39.7 kg 87.523 lb

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Above maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
ROHS	Compliant/Exempted



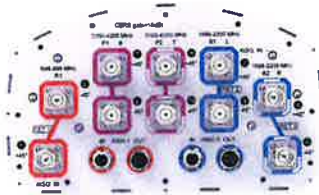
Included Products

- BSAMNT-3 – Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note Severe environmental conditions may degrade optimum performance

NHHSS-65B-R2BT10



10-port sector antenna, 2x 698–896, 4x 1695–2200 and 4x 3100–4200 MHz, 65° HPBW, 2x RETs and 2x SBTs. Both high bands share the same electrical tilt.

- Perfect antenna to add 3.5GHz CBRS to macro sites
- Low band and mid band performance mirrors the performance of existing NHH hex port antennas
- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One LB RET and one HB RET. Both high bands are controlled by one RET to ensure same tilt level for 4x MIMO

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light Gray (RAL 7035)
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, mid band	4
RF Connector Quantity, low band	2
RF Connector Quantity, total	10

Remote Electrical Tilt (RET) Information

RET Hardware	CommRET v2
RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	2 female 2 male
Input Voltage	10–30 Vdc
Internal RET	High band (1) Low band (1)

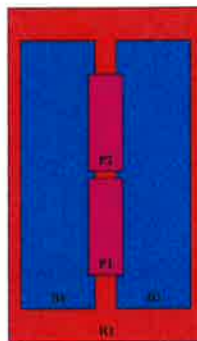
NHHSS-65B-R2BT10

Power Consumption, active state, maximum	10 W
Power Consumption, idle state, maximum	2 W
Protocol	3GPP/AISG 2.0 (Single RET)

Dimensions

Width	301 mm 11.85 in
Depth	181 mm 7.126 in
Length	1828 mm 71.969 in
Net Weight, without mounting kit	23.1 kg 50.927 lb

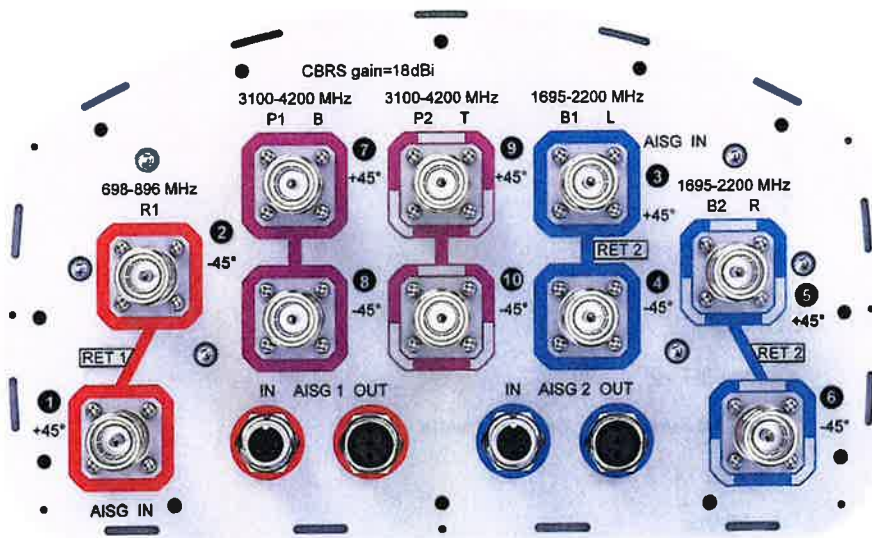
Array Layout



Array ID	Frequency (MHz)	RF Connector	RET (A/B/T)	AISG No.	AISG RET UID
B1	698-896	1 - 2	1	AISG1	CPxxxxxxxxxxxxR1
B2	1695-2200	3 - 4	2	AISG2	CPxxxxxxxxxxxxB1
P1	3100-4200	7 - 8	N/A	NA	N/A
P2	3100-4200	9 - 10			

Colors of colored boxes are not the depiction of array colors.

Port Configuration



NHHSS-65B-R2BT10

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2200 MHz 3100 – 4200 MHz 698 – 896 MHz
Polarization	±45°
Total Input Power, maximum	1,000 W @ 50 °C

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	3100–3550	3550–3700	3700–4200
Gain, dBi	14.8	15.2	17.4	17.8	18	17.8	17.6	17.2
Beamwidth, Horizontal, degrees	65	62	66	61	64	52	60	62
Beamwidth, Vertical, degrees	13	11.6	5.5	5.2	4.9	5.7	5.3	5.1
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	10	10	10
USLS (First Lobe), dB	15	15	16	18	18	15	19	18
Front-to-Back Ratio at 180°, dB	26	29	31	28	27	30	34	31
Isolation, Cross Polarization, dB	25	25	25	25	25	25	25	25
Isolation, Inter-band, dB	25	25	25	25	25	28	28	28
VSWR Return loss, dB	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-145	-145	-145
Input Power per Port at 50°C, maximum, watts	300	300	300	300	300	100	100	100

Electrical Specifications, BASTA

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	3100–3550	3550–3700	3700–4200
Gain by all Beam Tilts, average, dBi	14.6	14.8	17	17.5	17.7	17.4	17.1	16.6
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.4	±0.6	±0.3	±0.4	±0.7	±0.9	±0.8
Beamwidth, Horizontal Tolerance, degrees	±1.7	±1.3	±7.2	±3.1	±6.2	±8.1	±7	±7.2
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.8	±0.2	±0.2	±0.4	±0.5	±0.2	±0.3
USLS, beampeak to 20° above beampeak, dB	15	15	14	15	17	14	14	12
Front-to-Back Total Power at 180° ± 30°, dB	22	25	25	25	24	26	24	23

NHHSS-65B-R2BT10

CPR at Boresight, dB	24	17	16	21	19	15	17	14
CPR at Sector, dB	12	6	11	10	8	7	7	4

Mechanical Specifications

Wind Loading @ Velocity, frontal	278.0 N @ 150 km/h (62.5 lbf @ 150 km/h)
Wind Loading @ Velocity, lateral	230.0 N @ 150 km/h (51.7 lbf @ 150 km/h)
Wind Loading @ Velocity, maximum	537.0 N @ 150 km/h (120.7 lbf @ 150 km/h)
Wind Loading @ Velocity, rear	282.0 N @ 150 km/h (63.4 lbf @ 150 km/h)
Wind Speed, maximum	241 km/h 149.75 mph

Packaging and Weights

Width, packed	1973 mm 77.677 in
Depth, packed	441 mm 17.362 in
Length, packed	337 mm 13.268 in
Weight, gross	35.1 kg 77.382 lb

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system



Included Products

BSAMNT-3	– Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.
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* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance
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SAMSUNG

SAMSUNG C-Band 64T64R Massive MIMO Radio

for High Capacity and Wide Coverage

Samsung C-Band 64T64R Massive MIMO Radio enables mobile operators to increase coverage range, boost data speeds and ultimately offer enriched 5G experiences to users in the U.S..

Model Code: MT6407-77A



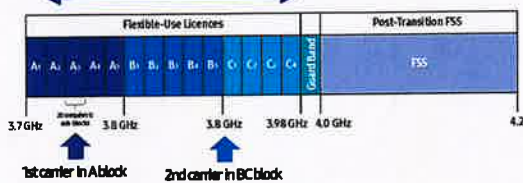
Points of Differentiation

Wide Bandwidth

With capability to support up to 2 CC carrier configuration, Samsung C-Band massive MIMO Radio supports 200 MHz bandwidth in the C-Band spectrum.

Samsung C-Band massive MIMO Radio covers the entire C-Band 280 MHz spectrum, so it can meet the operator's needs in current A block and future B/C blocks

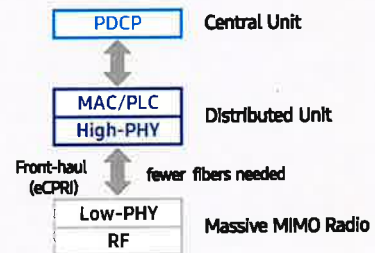
C-Band spectrum supported by Massive MIMO Radio



Future Proof Product

Samsung C-Band 64T64R Massive MIMO radio supports not only CPRI but also eCPRI as front-haul interface.

It enables operators can cut down on OPEX/CAPEX by reducing front-haul bandwidth through low layer split and using ethernet based higher efficient line.



Enhanced Performance

C-Band massive MIMO Radio creates sharp beams and extends networks' coverage on the critical mid-band spectrum using a large number of antenna elements and high output power to boost data speeds.

This helps operators reduce their CAPEX as they now need less products to cover the same area than before.

Furthermore, as C-Band massive MIMO Radio supports MU-MIMO (Multi-user MIMO), it enables to increase user throughput by minimizing interference.



Well Matched Design

Samsung C-Band Massive MIMO radio utilizes 64 antennas, supports up to 280MHz bandwidth, and delivers a 200W output power. Despite the above advanced performance, the Radio has a compact size of 50.9L and 79.4lbs. This makes it easy to install the Radio.

It is designed to look solid and compact, with a low profile appearance so that, when installed, harmonizes well with the surrounding environment.



Technical Specifications

Item	Specification
Tech	NR
Band	n77
Frequency Band	3700 - 3980 MHz
EIRP	78.5dBm (53.0 dBm+25.5 dBi)
IBW/OBW	280 MHz / 200 MHz
Installation	Pole/Wall
Size/Weight	16.06 x 35.06 x 5.51 inch (50.86L) / 79.4 lbs



SAMSUNG

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Samsung inspires the world and shapes the future with transformative ideas and technologies. The company is redefining the worlds of TVs, smartphones, wearable devices, tablets, digital appliances, network systems, and memory, system LSI, foundry and LED solutions.

129 Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, Korea

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SAMSUNG

700/850MHZ MACRO RADIO

DUAL-BAND AND HIGH POWER
FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This 700/850MHz 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code RF4440d-13A



Homepage
samsungnetworks.com

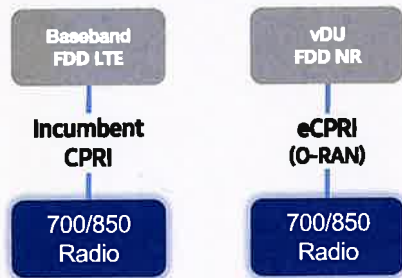


Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

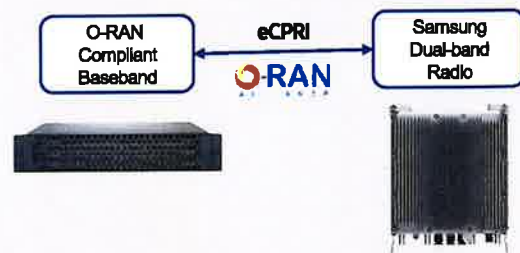
Samsung's 700/850MHz macro radio can support each incumbent CPRI interface as well as an advanced eCPRI interface. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help when implementing cost-effective networks because it is capable of sending more data without compromising additional investments.

Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

The number of required carriers varies according to site (region). The ability to support many carriers is essential for using all frequencies that the operator has available.

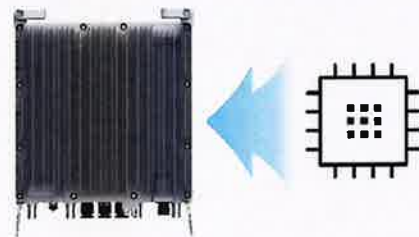
The new 700/850MHz dual-band radio can support up to 2 carriers in the B13 (700MHz) band and 3 carriers in the B5 (850MHz) band, respectively.



Secured Integrity

Access to sensitive data is allowed only to authorized software.

The Samsung radio's CPU can protect root of trust, which is credential information to verify SW integrity, and secure storage provides access control to sensitive data by using dedicated hardware (TPM).



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B13(700MHz), B5(850MHz)
Frequency Band	DL: 746 – 756MHz, UL: 777 – 787MHz DL: 869 – 894MHz, UL: 824 – 849MHz
RF Power	(B13) 4 × 40W or 2 × 60W (B5) 4 × 40W or 2 × 60W
IBW/OBW	(B13) 10MHz / 10MHz (B5) 25MHz / 25MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 9.05inch (33.2L) / 70.33 lb

SAMSUNG

AWS/PCS MACRO RADIO

DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This AWS/PCS 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code RF4439d-25A



Homepage
samsungnetworks.com

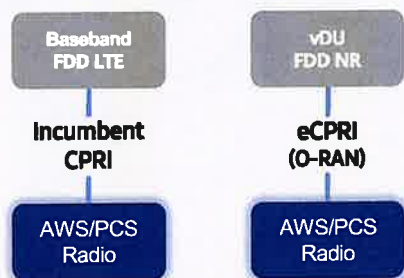


Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

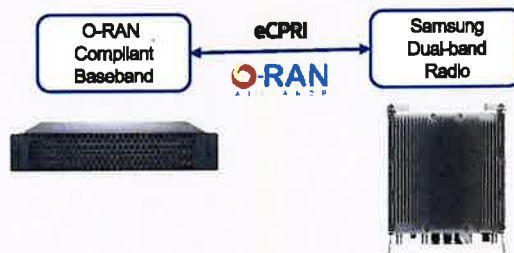
Samsung's AWS/PCS macro radio can support each incumbent CPRI interface as well as advanced eCPRI interfaces. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help in implementing cost-effective networks, which are capable of sending more data without compromising additional investments.

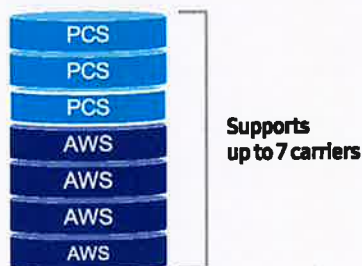
Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

The number of required carriers varies according to site (region). Supporting many carriers is essential for using all frequencies that the operator has available.

The new AWS/PCS dual-band radio can support up to 3 carriers in the PCS (1.9GHz) band and 4 carriers in the AWS (2.1GHz) band, respectively.



Brand New Features in a Compact Size

Samsung's AWS/PCS macro radio offers several features, such as dual connectivity for baseband for both CDU and vDU, O-RAN capability, more carriers and an enlarged PCS spectrum, combined into an incumbent radio volume of 36.8L.



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B25(PCS), B66(AWS)
Frequency Band	DL: 1930 – 1995MHz, UL: 1850 – 1915MHz DL: 2110 – 2200MHz, UL: 1710 – 1780MHz
RF Power	(B25) 4 × 40W or 2 × 60W (B66) 4 × 60W or 2 × 80W
IBW/OBW	(B25) 65MHz / 30MHz (B66) DL 90MHz, UL 70MHz / 60MHz
Installation	Pole, Wall
Size/Weight	14.96 x 14.96 x 10.04inch (36.8L) / 74.7lb

Specifications

The table below outlines the main specifications of the RRH.

Table 1. Specifications

Item	RT4401-48A
Air Technology	LTE
Band	Band 48 (3.5 GHz)
Operating Frequency (MHz)	3550 to 3700
RF Chain	4TX/4RX
Input Power	-48 V DC (-38 to -57 V DC, 1 SKU), with clip-on AC-DC converter (Option)
Dimension (W × D × H) (mm)	8.55 in. (217.4) × 4.15 in. (105.5) × 13.91 in. (353.5) * RRH only 11.39 in. (289.4) × 5.45 in. (138.5) × 16.16 in. (410.5) * with Clip-on antenna, AC-DC power unit
Cooling	Natural convection
Unwanted Emission	3GPP 36.104 Category A [B48]: FCC 47 CFR 96.41 e)
Spectrum Analyzer	TX/RX Support
Antenna Type	Integrated (Clip-on) antenna (Option), External antenna (Option)
Operating Humidity	5 to 100 [%] (RH), condensing, not to exceed 30 g/m ³ absolute humidity
Altitude	-60 to 1,800 m
Earthquake	Telcordia Earthquake Risk Zone4 (Telcordia GR-63-CORE)
Vibration in Use Transportation Vibration	Office Vibration Transportation Vibration
Noise	Fanless (natural convection cooling)
Wind Resistance	Telcordia GR-487-CORE, Section 3.34
EMC	FCC Title 47, CFR Part 96
Safety	UL 60950-1 2nd ED

Item	RT4401-48A
	UL 62368-1 UL 60950-22
RF	FCC Title 47, CFR Part 96

The table below outlines the AC/DC power unit specifications of the RRH system.

ATTACHMENT 4

STRUCTURAL ANALYSIS REPORT

For

Verizon Site Name: HARTFORD S 7 CT

TEP Site Number: 350658

300 Summit Street
Hartford, CT 06106

**Antennas Mounted within Proposed Stealth Enclosure;
Equipment within Enclosure on Steel Platform on Roof**



Prepared for:

verizon✓

20 Alexander Drive
Wallingford, CT 06492

Dated: September 27, 2022

Prepared by:

TEP
NORTHEAST

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





SCOPE OF WORK:

TEP Northeast (TEP NE) has been authorized by Verizon to conduct a structural evaluation of the structure supporting the proposed equipment located in the areas depicted in the latest TEP NE construction drawings.

This report represents this office's findings, conclusions and recommendations pertaining to the support of Verizon's proposed antennas listed below.

This office conducted an on-site visual survey of the above site on February 3, 2022. Attendees included Sergio Anastacio (TEP NE – Project Manager).

The following documents were used for our reference:

- Building Plans prepared by Cesar Pelli & Associates, Inc, dated April 14, 1989.

CONCLUSION SUMMARY:

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

	Member	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Beam	W14x26	Bending	72%	PASS
Existing Column	3-1/2" std.	Axial + Bending	16%	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
Antenna Mount	3	LC13	60%	PASS
Equipment Platform	6	LC12	96%	PASS

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

	Member	Stress Ratio	Pass/Fail
Antenna Mount Proposed Connection	5/8" Thru Bolt	10%	PASS
Equipment Platform Proposed Connection	5/8" Thru Bolt	39%	PASS

*Reference documents attached.



APPURTENANCE CONFIGURATION:

Appurtenances	Dimensions	Weight	**Elevation	Mount
(3) NHHS4-65B-R3B Antennas	72.0"x13.8"x8.2"	60 lbs	73'-0"	Steel Frame
(3) NHHSS-65B-R2BT0 Antennas	72.0"x11.9"x7.1"	44 lbs	73'-0"	Steel Frame
(3) MT6407-77A Antennas w/ RRH's	Not to Exceed 35.12"x16.06"x5.51"	Not to Exceed 87.1 lbs	73'-0"	Steel Frame
(3) RF4439d-25A RRH's	15.0"x15.0"x10.0"	98 lbs	-	Steel Frame
(3) RF4440d-13A RRH's	15.0"x15.0"x8.1"	82 lbs	-	Steel Frame
(3) CBRS RT4401-48A RRH's	16.2"x11.4"x5.5"	24 lbs	-	Steel Frame
(2) OVP's	28.9"x15.7"x10.3	32 lbs	-	Steel Frame
(1) CMC74-36B Battery Cabinet	80.8"x36.2"x43.7"	2000 lbs	-	Equipment Platform
(1) CMC74-36E Equipment Cabinet	80.8"x36.2"x43.7"	1500 lbs	-	Equipment Platform
(1) Telco Box	30.0"x30.0"x8.0"	50 lbs	-	Equipment Platform
(1) Hoffman Box	30.0"x30.0"x12.0"	50 lbs	-	Equipment Platform

* Proposed equipment shown in bold.

** Elevation to antenna centerline.



DESIGN CRITERIA:

International Building Code (IBC) 2015 with 2018 Connecticut State Building Code Amendments, and ASCE 7-10 (Minimum Design Loads for Buildings and Other Structures).		
Wind		
Reference Wind Speed:	135 mph	(2018 CSBC Appendix N)
Exposure Category:	B	(ASCE 7-10 Chapter 26)
Risk Category:	III	(ASCE 7-10 Table 1.5-1)
Snow		
Ground Snow, P_g :	30 psf	(2018 CSBC Appendix N)
Importance Factor (I_s):	1.1	(ASCE 7-10 Table 1.5-2)
Exposure Factor (C_e):	0.9	(Fully Exposed, Table 7-2)
Thermal Factor (C_t):	1.0	(ASCE 7-10 Table 7-3)
Flat Roof Snow Load:	21 psf	(ASCE 7-10 Equation 7.3-1)
Min. Flat Roof Snow Load:	30 psf	
EIA/TIA-222-H Structural Standards for Steel Antenna Towers and Antenna Supporting Structures		
Wind		
City/Town:	Hartford	
County:	Hartford	
Wind Load:	135 mph	(TIA-222-H Figure B-2)
Ice		
Design Ice Thickness (t_i):	1.5 in	(TIA-222-H Figure B-9)
Structure Class:	III	(TIA-222-H Table 2-1)
Importance Factor (I_i):	1.25	(TIA-222-H Table 2-3)
Factored Thickness of Radial Ice (t_{iz}):	2.03 in	(TIA-222-H Sec. 2.6.10)



EXISTING ROOF CONSTRUCTION:

- The existing tower roof construction consists of a roofing membrane over rigid insulation over metal decking supported by a system of steel beams and columns spanning to masonry bearing walls.
- The existing main roof construction consists of loosely-laid ballast stone over a roofing membrane over rigid insulation over metal decking supported by a system of steel beams and columns.

ANTENNA/RRH/OVP SUPPORT RECOMMENDATIONS:

The proposed antennas, RRH's, and OVP's are to be mounted on proposed pipe masts installed on a proposed steel frame located on the roof of the penthouse of the existing building. The proposed steel frame is to be enclosed with proposed FRP screen walls and supported by existing steel beams within the roof structure.

EQUIPMENT RECOMMENDATIONS:

The proposed Verizon equipment is to be installed on a proposed steel platform located on the main roof of existing building. The proposed equipment platform is to be enclosed with proposed FRP screen walls and supported by existing steel columns within the roof structure.

Limitations and Assumptions:

1. Reference the latest TEP NE construction drawings for all the equipment locations and details.
2. All detail requirements will be designed and furnished in the construction drawings.
3. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
4. TEP NE is not responsible for any modifications completed prior to and hereafter which TEP NE 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 antenna enclosure (view from the South).



Photo 1: Sample photo illustrating the proposed location of the antenna enclosure (view from the East).

FIELD PHOTOS (CONT.):



Photo 3: Sample photo illustrating the proposed location of the equipment platform (view from the West).



Photo 4: Sample photo illustrating the existing roof framing (fireproofed).

**Antenna Mount
Calculations**

Date: 9/27/2022

Project Name: HARTFORD S 7 CT

Designed By: CL Checked By: MSC



ICE WEIGHT CALCULATIONS

Thickness of ice: 2.03 in.
Density of ice: 56 pcf

NHHS4-65B-R3B Antenna

Weight of ice based on total radial SF area:
Height (in): 72.0
Width (in): 13.8
Depth (in): 8.2
Total weight of ice on object: 269 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 329 lbs

NHSS-65B-R2BT0 Antenna

Weight of ice based on total radial SF area:
Height (in): 72.0
Width (in): 11.9
Depth (in): 7.1
Total weight of ice on object: 236 lbs
Weight of object: 44.0 lbs
Combined weight of ice and object: 280 lbs

MT6407-77A Antenna

Weight of ice based on total radial SF area:
Height (in): 35.1
Width (in): 16.1
Depth (in): 5.5
Total weight of ice on object: 138 lbs
Weight of object: 87.1 lbs
Combined weight of ice and object: 225 lbs

RF4439d-25A RRH

Weight of ice based on total radial SF area:
Height (in): 15.0
Width (in): 15.0
Depth (in): 10.0
Total weight of ice on object: 62 lbs
Weight of object: 98.0 lbs
Combined weight of ice and object: 160 lbs

RF4440d-13A RRH

Weight of ice based on total radial SF area:
Height (in): 15.0
Width (in): 15.0
Depth (in): 8.1
Total weight of ice on object: 59 lbs
Weight of object: 82.0 lbs
Combined weight of ice and object: 141 lbs

CBRS RT4401-48A RRH

Weight of ice based on total radial SF area:
Height (in): 16.2
Width (in): 11.4
Depth (in): 5.5
Total weight of ice on object: 49 lbs
Weight of object: 24.0 lbs
Combined weight of ice and object: 73 lbs

OVP

Weight of ice based on total radial SF area:
Height (in): 28.9
Width (in): 15.7
Depth (in): 10.3
Total weight of ice on object: 124 lbs
Weight of object: 32.0 lbs
Combined weight of ice and object: 156 lbs

2" Pipe

Per foot weight of ice:
diameter (in): 2.38
Per foot weight of ice on object: 11 plf

2-1/2" Pipe

Per foot weight of ice:
diameter (in): 2.88
Per foot weight of ice on object: 12 plf

3" Pipe

Per foot weight of ice:
diameter (in): 3.5
Per foot weight of ice on object: 14 plf

Date: 9/27/2022
Project Name: HARTFORD S 7 CT
Designed By: CL **Checked By:** MSC



Wind Analysis → Antenna Enclosure

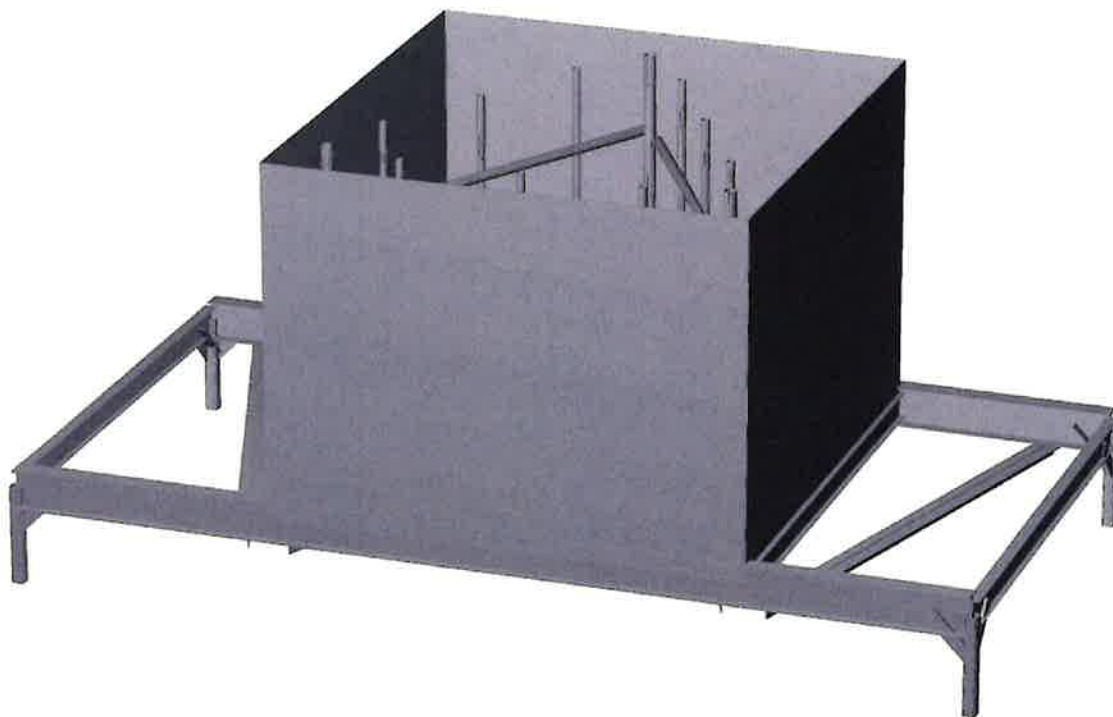
Reference Codes:

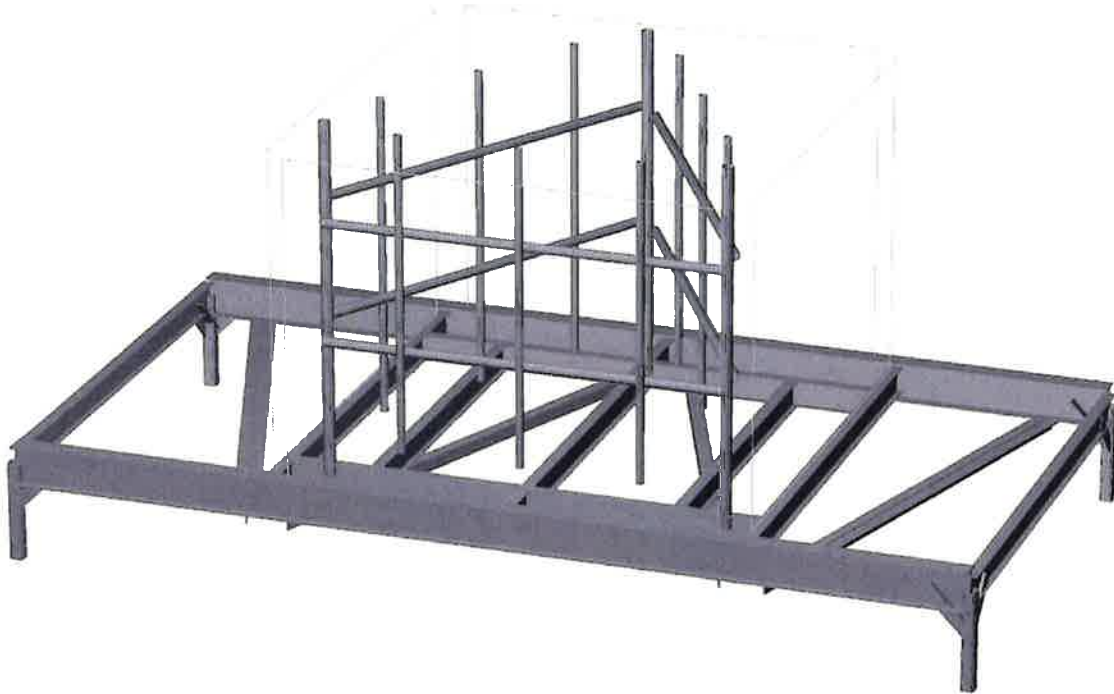
-2018 Connecticut State Building Code (2018 CTSBC)

-International Building Code 2015 (IBC 2015)

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

Structure Classification	III	(ASCE 7-10 Table 1.5-1)
Basic Wind Speed, V	135 mph	(CT Building Code 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	77 ft	(Top of Enclosure)
Exposure Coefficient, K _z	0.92	(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)
	= 38.55 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Enclosure Shape:	Square	
Net Force Coefficient, C _f	1.30	(ASCE 7-10 Figure 29.5-1)
Area Wind Force, F	= q _z GC _f	(ASCE 7-10 Equation 29.5-2)
	= 42.50 psf	







RAM Elements

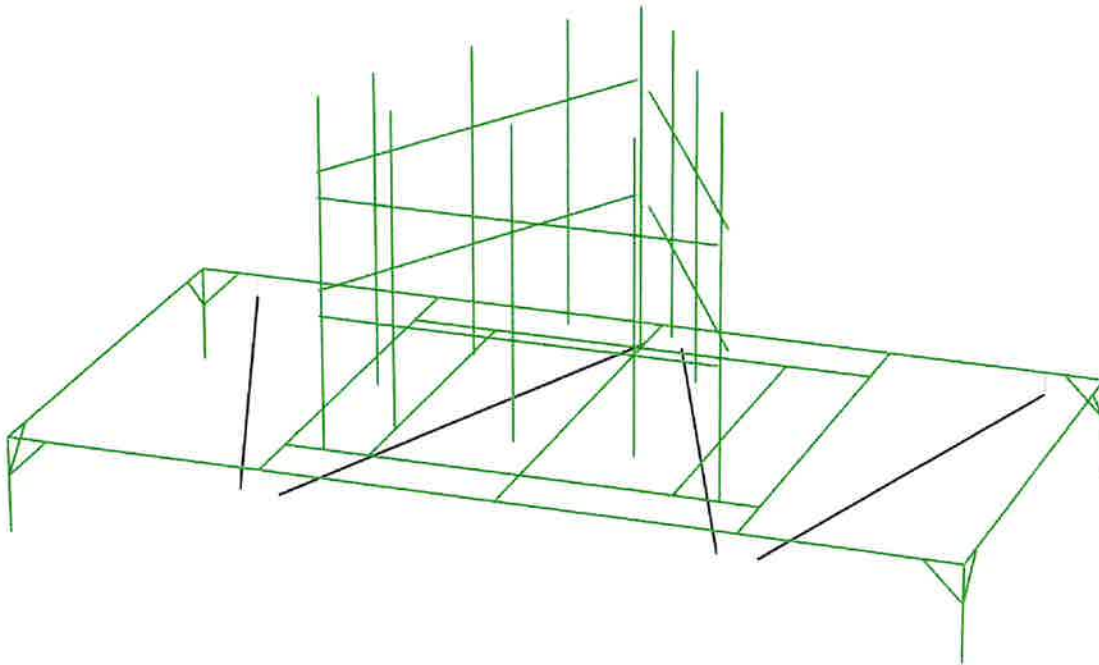
CONNECT Edition

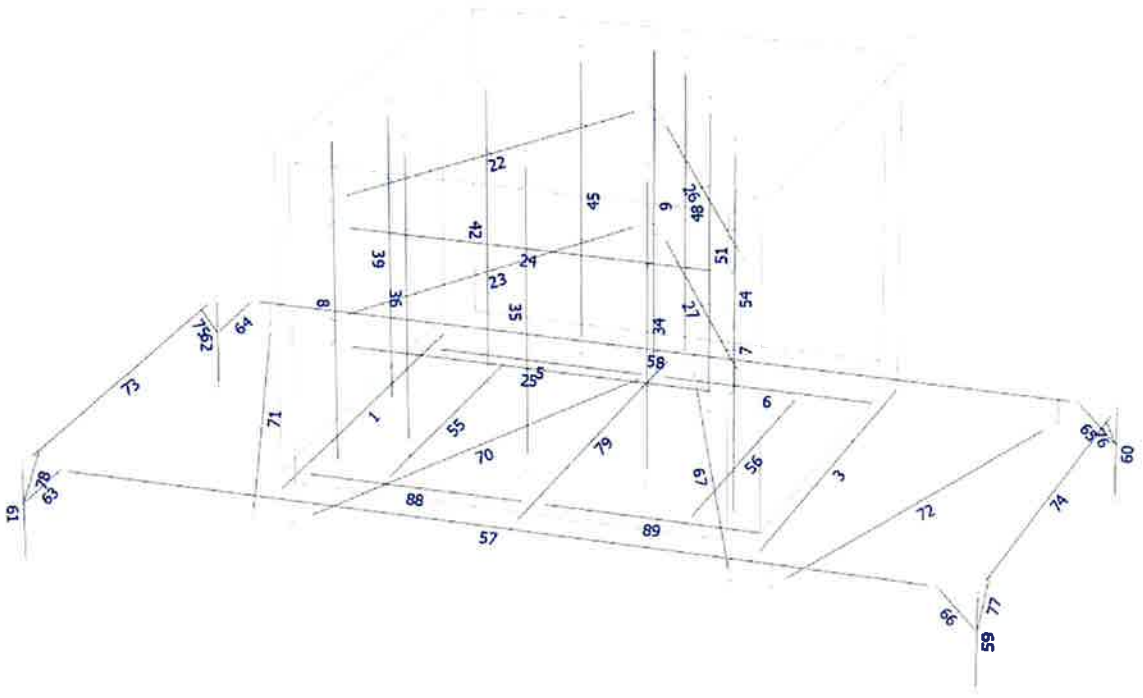
Current Date: 9/27/2022 11:16 AM

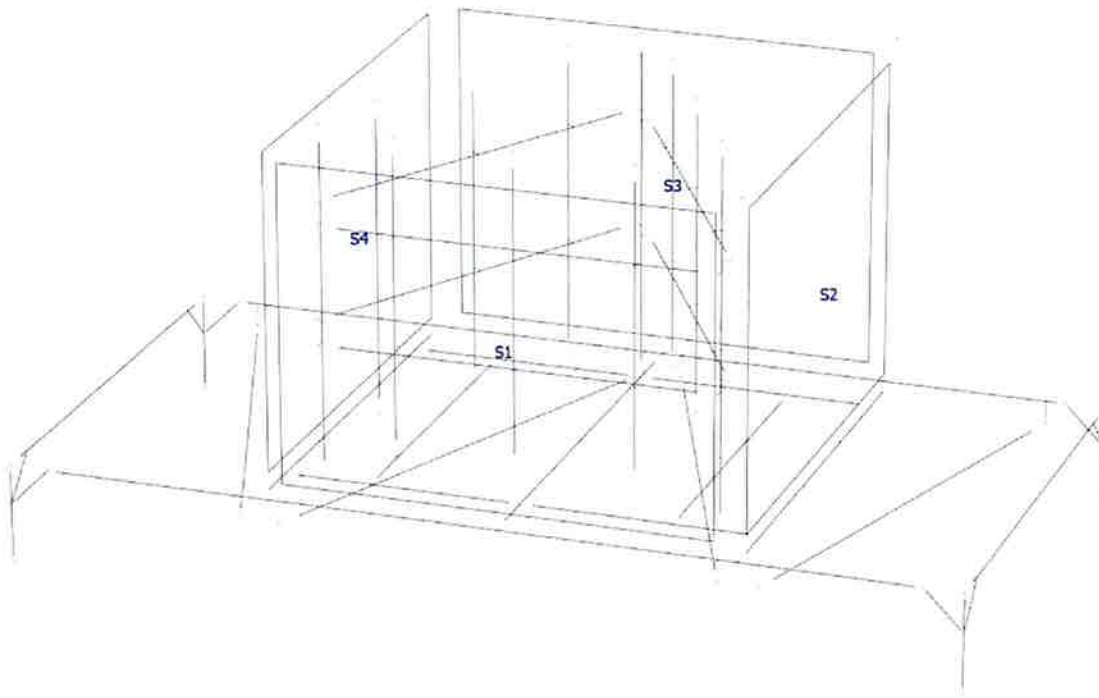
Units system: English

Design status

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







Load data

GLOSSARY

Comb : Indicates if load condition is a load combination

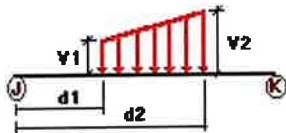
Load Conditions

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

Load on nodes

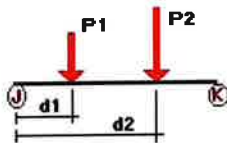
Condition	Node	FX [Kip]	FY [Kip]	FZ [Kip]	MX [Kip*ft]	MY [Kip*ft]	MZ [Kip*ft]
DL	1	0.00	-0.134	0.00	0.00	0.00	0.00
	2	0.00	-0.134	0.00	0.00	0.00	0.00
	3	0.00	-0.134	0.00	0.00	0.00	0.00
	4	0.00	-0.134	0.00	0.00	0.00	0.00
	93	0.00	-0.134	0.00	0.00	0.00	0.00
	94	0.00	-0.134	0.00	0.00	0.00	0.00
	95	0.00	-0.134	0.00	0.00	0.00	0.00
	96	0.00	-0.134	0.00	0.00	0.00	0.00
	97	0.00	-0.134	0.00	0.00	0.00	0.00
	98	0.00	-0.134	0.00	0.00	0.00	0.00
99	0.00	-0.134	0.00	0.00	0.00	0.00	
100	0.00	-0.134	0.00	0.00	0.00	0.00	

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DI	7	y	-0.014	-0.014	0.00	No	100.00	Yes
	8	y	-0.014	-0.014	0.00	No	100.00	Yes
	9	y	-0.014	-0.014	0.00	No	100.00	Yes
	22	y	-0.012	-0.012	0.00	No	100.00	Yes
	23	y	-0.012	-0.012	0.00	No	100.00	Yes
	24	y	-0.012	-0.012	0.00	No	100.00	Yes
	25	y	-0.012	-0.012	0.00	No	100.00	Yes
	26	y	-0.012	-0.012	0.00	No	100.00	Yes
	27	y	-0.012	-0.012	0.00	No	100.00	Yes
	34	y	-0.011	-0.011	0.00	No	100.00	Yes
	35	y	-0.011	-0.011	0.00	No	100.00	Yes
	36	y	-0.011	-0.011	0.00	No	100.00	Yes
	39	y	-0.011	-0.011	0.00	No	100.00	Yes
	42	y	-0.011	-0.011	0.00	No	100.00	Yes
	45	y	-0.011	-0.011	0.00	No	100.00	Yes
	48	y	-0.011	-0.011	0.00	No	100.00	Yes
	51	y	-0.011	-0.011	0.00	No	100.00	Yes
54	y	-0.011	-0.011	0.00	No	100.00	Yes	

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	34	y	-0.025	1.50	No
		y	-0.03	1.50	No
		y	-0.022	1.50	No
		y	-0.025	6.50	No
		y	-0.03	6.50	No
		y	-0.022	6.50	No
		y	-0.024	4.00	No
	35	y	-0.098	3.50	No
		y	-0.082	5.00	No
	36	y	-0.044	2.00	No
		y	-0.044	5.00	No
		y	-0.032	7.00	No
	39	y	-0.025	1.50	No
		y	-0.03	1.50	No
		y	-0.022	1.50	No
		y	-0.025	6.50	No
		y	-0.03	6.50	No
		y	-0.022	6.50	No
		y	-0.024	4.00	No
	42	y	-0.098	3.00	No
		y	-0.082	4.50	No
	45	y	-0.044	2.50	No
		y	-0.044	5.50	No
		y	-0.032	7.00	No
	48	y	-0.025	1.50	No
		y	-0.03	1.50	No
		y	-0.022	1.50	No

		y	-0.025	6.50	No
		y	-0.03	6.50	No
		y	-0.022	6.50	No
		y	-0.024	4.00	No
	51	y	-0.098	3.50	No
		y	-0.082	5.00	No
	54	y	-0.044	2.00	No
		y	-0.044	5.00	No
DI	34	y	-0.135	1.50	No
		y	-0.118	1.50	No
		y	-0.135	6.50	No
		y	-0.118	6.50	No
		y	-0.049	4.00	No
	35	y	-0.062	3.50	No
		y	-0.059	5.00	No
	36	y	-0.069	2.00	No
		y	-0.069	5.00	No
		y	-0.124	7.00	No
	39	y	-0.135	1.50	No
		y	-0.118	1.50	No
		y	-0.135	6.50	No
		y	-0.118	6.50	No
		y	-0.049	4.00	No
	42	y	-0.062	3.50	No
		y	-0.059	5.00	No
	45	y	-0.069	2.00	No
		y	-0.069	5.00	No
		y	-0.124	7.00	No
	48	y	-0.135	1.50	No
		y	-0.118	1.50	No
		y	-0.135	6.50	No
		y	-0.118	6.50	No
		y	-0.049	4.00	No
	51	y	-0.062	3.50	No
		y	-0.059	5.00	No
	54	y	-0.069	2.00	No
		y	-0.069	5.00	No
		y	-0.124	7.00	No

Load on shells

Condition	Shell	Pressure [Kip/ft ²]	Temp. [F]
WL1	1	-0.043	0.00
WL2	2	-0.043	0.00
WL3	3	-0.043	0.00
WL4	4	-0.043	0.00

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
WL1	Wind Load (Side 1)	No	0.00	0.00	0.00
WL2	Wind Load (Side 2)	No	0.00	0.00	0.00
WL3	Wind Load (Side 3)	No	0.00	0.00	0.00
WL4	Wind Load (Side 4)	No	0.00	0.00	0.00
DI	Dead Ice Load	No	0.00	0.00	0.00



Steel Code Check

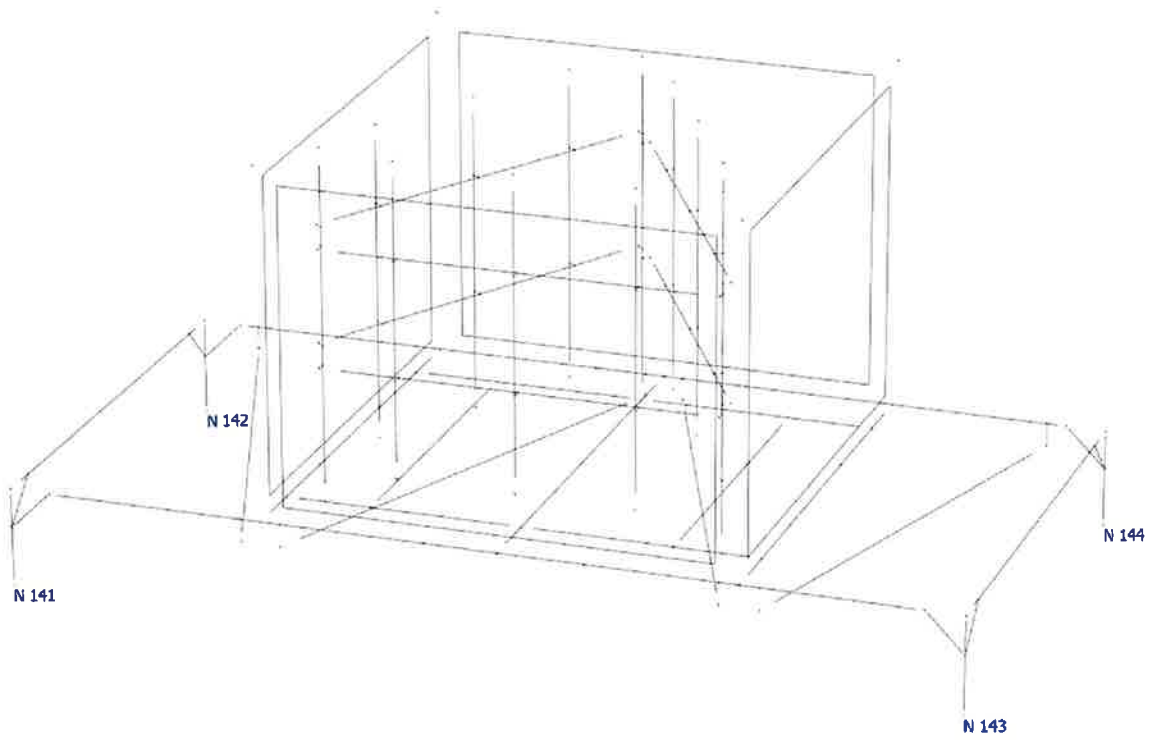
Report: Summary - Group by member

Load conditions to be included in design :

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

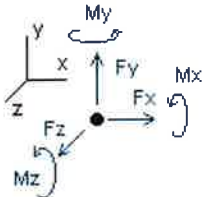
Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 4X4X3_8	59	LC13 at 40.63%	0.27	OK	
		60	LC11 at 40.63%	0.24	OK	
		61	LC13 at 40.63%	0.26	OK	
		62	LC11 at 40.63%	0.23	OK	
	L 4X4X3_8	63	LC12 at 43.75%	0.11	OK	
		64	LC12 at 37.50%	0.10	OK	
		65	LC14 at 43.75%	0.09	OK	
		66	LC14 at 37.50%	0.11	OK	
		67	LC13 at 50.00%	0.07	With warnings	
		70	LC13 at 50.00%	0.08	With warnings	
		75	LC11 at 43.75%	0.04	OK	
		76	LC11 at 37.50%	0.04	OK	
		77	LC13 at 43.75%	0.04	OK	
		78	LC9 at 37.50%	0.04	OK	
	PIPE 2-1_2x0.203	22	LC2 at 18.75%	0.21	OK	
		23	LC2 at 0.00%	0.23	OK	
		24	LC2 at 81.25%	0.21	OK	
		25	LC2 at 100.00%	0.23	OK	
		26	LC2 at 79.69%	0.23	OK	
		27	LC2 at 79.69%	0.23	OK	
	PIPE 2x0.154	34	LC2 at 31.25%	0.27	OK	
		35	LC2 at 66.67%	0.06	OK	
		36	LC2 at 31.25%	0.27	OK	
		39	LC2 at 25.00%	0.33	OK	
		42	LC11 at 25.00%	0.04	OK	
		45	LC2 at 25.00%	0.34	OK	
		48	LC2 at 64.58%	0.31	OK	
		51	LC13 at 29.17%	0.08	OK	
		54	LC2 at 64.58%	0.34	OK	

PIPE 3x0.216	7	LC13 at 38.75%	0.25	OK
	8	LC13 at 40.00%	0.20	OK
	9	LC13 at 0.00%	0.22	OK
T2L 4X4X3_8	71	LC11 at 50.00%	0.06	With warnings
	72	LC11 at 50.00%	0.05	With warnings
W 12X26	57	LC13 at 26.74%	0.39	OK
	58	LC11 at 26.74%	0.32	OK
W 8X10	1	LC13 at 0.00%	0.58	OK
	3	LC13 at 0.00%	0.60	OK
	5	LC11 at 37.50%	0.02	OK
	6	LC11 at 65.63%	0.02	OK
	55	LC1 at 50.00%	0.01	OK
	56	LC1 at 50.00%	0.01	OK
	73	LC13 at 91.67%	0.33	OK
	74	LC13 at 91.67%	0.35	OK
	79	LC2 at 12.50%	0.26	OK
	88	LC13 at 14.58%	0.09	OK
	89	LC13 at 83.33%	0.12	OK



Analysis result

Reactions



Direction of positive forces and moments

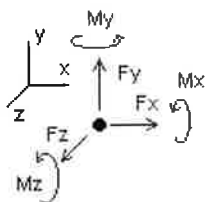
Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition LC1=1.4DL						
141	1.51793	2.59404	-0.05952	0.00000	0.00000	0.00000
142	1.22109	2.23670	0.05963	0.00000	0.00000	0.00000
143	-1.51813	2.75526	-0.05998	0.00000	0.00000	0.00000
144	-1.22089	2.36136	0.05987	0.00000	0.00000	0.00000
SUM	0.00000	9.94736	0.00000	0.00000	0.00000	0.00000
Condition LC2=1.2DL+1.6DI						
141	2.40087	3.90268	-0.04912	0.00000	0.00000	0.00000
142	1.72685	2.94715	0.05089	0.00000	0.00000	0.00000
143	-2.40409	4.18884	-0.05143	0.00000	0.00000	0.00000
144	-1.72363	3.14202	0.04966	0.00000	0.00000	0.00000
SUM	0.00000	14.18069	0.00000	0.00000	0.00000	0.00000
Condition LC3=1.2DL+0.5WL1						
141	1.01234	1.57538	0.46750	0.00000	0.00000	0.00000
142	1.34233	2.56526	0.64231	0.00000	0.00000	0.00000
143	-1.00698	1.65094	0.52479	0.00000	0.00000	0.00000
144	-1.34769	2.73472	0.68739	0.00000	0.00000	0.00000
SUM	0.00000	8.52631	2.32200	0.00000	0.00000	0.00000
Condition LC4=1.2DL+0.5WL2						
141	1.88634	2.55926	-0.04462	0.00000	0.00000	0.00000
142	1.65489	2.25862	0.05608	0.00000	0.00000	0.00000
143	-0.74844	2.02566	-0.06035	0.00000	0.00000	0.00000
144	-0.47079	1.68277	0.04889	0.00000	0.00000	0.00000
SUM	2.32200	8.52631	0.00000	0.00000	0.00000	0.00000
Condition LC5=1.2DL+0.5WL3						
141	1.58432	2.87065	-0.55944	0.00000	0.00000	0.00000
142	0.74453	1.27005	-0.54767	0.00000	0.00000	0.00000
143	-1.59504	3.07356	-0.62032	0.00000	0.00000	0.00000
144	-0.73381	1.31204	-0.59457	0.00000	0.00000	0.00000
SUM	0.00000	8.52631	-2.32200	0.00000	0.00000	0.00000

Condition LC6=1.2DL+0.5WL4						
141	0.72497	1.88757	-0.05988	0.00000	0.00000	0.00000
142	0.45087	1.57586	0.04912	0.00000	0.00000	0.00000
143	-1.86424	2.69736	-0.04520	0.00000	0.00000	0.00000
144	-1.63360	2.36551	0.05595	0.00000	0.00000	0.00000
SUM	-2.32200	8.52631	0.00000	0.00000	0.00000	0.00000
Condition LC7=1.2DL+WL1						
141	0.72465	0.92721	0.98825	0.00000	0.00000	0.00000
142	1.63929	3.21347	1.23136	0.00000	0.00000	0.00000
143	-0.71383	0.94018	1.10339	0.00000	0.00000	0.00000
144	-1.65010	3.44544	1.32101	0.00000	0.00000	0.00000
SUM	0.00000	8.52631	4.64400	0.00000	0.00000	0.00000
Condition LC8=1.2DL+WL2						
141	2.47135	2.89505	-0.03823	0.00000	0.00000	0.00000
142	2.26283	2.60005	0.06091	0.00000	0.00000	0.00000
143	-0.19539	1.68971	-0.06916	0.00000	0.00000	0.00000
144	0.10522	1.34150	0.04648	0.00000	0.00000	0.00000
SUM	4.64400	8.52631	0.00000	0.00000	0.00000	0.00000
Condition LC9=1.2DL+WL3						
141	1.86880	3.51778	-1.06548	0.00000	0.00000	0.00000
142	0.44376	0.62305	-1.14875	0.00000	0.00000	0.00000
143	-1.89009	3.78543	-1.18661	0.00000	0.00000	0.00000
144	-0.42248	0.60005	-1.24316	0.00000	0.00000	0.00000
SUM	0.00000	8.52631	-4.64400	0.00000	0.00000	0.00000
Condition LC10=1.2DL+WL4						
141	0.14862	1.55167	-0.06862	0.00000	0.00000	0.00000
142	-0.14523	1.23453	0.04714	0.00000	0.00000	0.00000
143	-2.42697	3.03309	-0.03899	0.00000	0.00000	0.00000
144	-2.22043	2.70701	0.06047	0.00000	0.00000	0.00000
SUM	-4.64400	8.52631	0.00000	0.00000	0.00000	0.00000
Condition LC11=1.2DL+WL1+DI						
141	1.41134	1.97428	0.98847	0.00000	0.00000	0.00000
142	2.06518	3.85958	1.23216	0.00000	0.00000	0.00000
143	-1.40274	2.07964	1.10235	0.00000	0.00000	0.00000
144	-2.07378	4.14679	1.32101	0.00000	0.00000	0.00000
SUM	0.00000	12.06030	4.64400	0.00000	0.00000	0.00000
Condition LC12=1.2DL+WL2+DI						
141	3.15865	3.94428	-0.03703	0.00000	0.00000	0.00000
142	2.68811	3.24402	0.06072	0.00000	0.00000	0.00000
143	-0.88455	2.83147	-0.06922	0.00000	0.00000	0.00000
144	-0.31821	2.04052	0.04554	0.00000	0.00000	0.00000
SUM	4.64400	12.06030	0.00000	0.00000	0.00000	0.00000

Condition LC13=1.2DL+WL3+DI						
141	2.55696	4.57009	-1.06320	0.00000	0.00000	0.00000
142	0.86801	1.26409	-1.15003	0.00000	0.00000	0.00000
143	-2.57985	4.93029	-1.18538	0.00000	0.00000	0.00000
144	-0.84512	1.29583	-1.24538	0.00000	0.00000	0.00000
SUM	0.00000	12.06030	-4.64400	0.00000	0.00000	0.00000
Condition LC14=1.2DL+WL4+DI						
141	0.83569	2.60101	-0.06748	0.00000	0.00000	0.00000
142	0.28005	1.87853	0.04710	0.00000	0.00000	0.00000
143	-3.11607	4.17476	-0.03900	0.00000	0.00000	0.00000
144	-2.64367	3.40599	0.05937	0.00000	0.00000	0.00000
SUM	-4.64400	12.06030	0.00000	0.00000	0.00000	0.00000
Condition LC15=0.9DL+WL1						
141	0.39948	0.37234	1.00121	0.00000	0.00000	0.00000
142	1.37743	2.73321	1.21838	0.00000	0.00000	0.00000
143	-0.38850	0.35081	1.11646	0.00000	0.00000	0.00000
144	-1.38841	2.93837	1.30795	0.00000	0.00000	0.00000
SUM	0.00000	6.39473	4.64400	0.00000	0.00000	0.00000
Condition LC16=0.9DL+WL2						
141	2.14601	2.33921	-0.02549	0.00000	0.00000	0.00000
142	2.00115	2.12075	0.04817	0.00000	0.00000	0.00000
143	0.12997	1.09929	-0.05628	0.00000	0.00000	0.00000
144	0.36688	0.83548	0.03360	0.00000	0.00000	0.00000
SUM	4.64400	6.39473	0.00000	0.00000	0.00000	0.00000
Condition LC17=0.9DL+WL3						
141	1.54327	2.96076	-1.05297	0.00000	0.00000	0.00000
142	0.18235	0.14492	-1.16127	0.00000	0.00000	0.00000
143	-1.56467	3.19376	-1.17406	0.00000	0.00000	0.00000
144	-0.16096	0.09530	-1.25571	0.00000	0.00000	0.00000
SUM	0.00000	6.39473	-4.64400	0.00000	0.00000	0.00000
Condition LC18=0.9DL+WL4						
141	-0.17663	0.99580	-0.05584	0.00000	0.00000	0.00000
142	-0.40689	0.75524	0.03431	0.00000	0.00000	0.00000
143	-2.10164	2.44270	-0.02615	0.00000	0.00000	0.00000
144	-1.95884	2.20100	0.04768	0.00000	0.00000	0.00000
SUM	-4.64400	6.39473	0.00000	0.00000	0.00000	0.00000

Envelope for nodal reactions

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



Direction of positive forces and moments

Envelope of nodal reactions for

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

Node		Forces						Moments					
		Fx	lc	Fy	lc	Fz	lc	Mx	lc	My	lc	Mz	lc
		[Kip]		[Kip]		[Kip]		[Kip*ft]		[Kip*ft]		[Kip*ft]	
141	Max	3.159	LC12	4.570	LC13	1.001	LC15	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.177	LC18	0.372	LC15	-1.065	LC9	0.00000	LC1	0.00000	LC1	0.00000	LC1
142	Max	2.688	LC12	3.860	LC11	1.232	LC11	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.407	LC18	0.145	LC17	-1.161	LC17	0.00000	LC1	0.00000	LC1	0.00000	LC1
143	Max	0.130	LC16	4.930	LC13	1.116	LC15	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-3.116	LC14	0.351	LC15	-1.187	LC9	0.00000	LC1	0.00000	LC1	0.00000	LC1
144	Max	0.367	LC16	4.147	LC11	1.321	LC11	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-2.644	LC14	0.095	LC17	-1.256	LC17	0.00000	LC1	0.00000	LC1	0.00000	LC1

Date: 9/27/2022
 Project Name: HARTFORD S 7 CT
 Designed By: CL Checked By: MSC



CHECK CONNECTION CAPACITY (Worst Case) → PROPOSED ANCHORS AT ANTENNA PLATFORM

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

Bolt Type = A325 5/8" Threaded Rod

Allowable Tensile Load =

$F_{Tall} = 13806 \text{ lbs.}$

Allowable Shear Load =

$F_{Vall} = 8283 \text{ lbs.}$

TENSILE FORCES

Reaction $F = 0 \text{ lbs.}$ (Gravity Load Supported by Existing Steel Beam)

SHEAR FORCES

Reactions in X direction: 3116 lbs. (See Bentley Output)

Reactions in Z direction: 1187 lbs. (See Bentley Output)

Resultant: 3334 lbs.

No. of Supports = 1

No. of Bolts / Support = 4

Tension Design Load /Bolts =

$f_t = 0.00 \text{ lbs.} < 13806 \text{ lbs.}$ **Therefore, OK !**

Shear Design Load / Bolts=

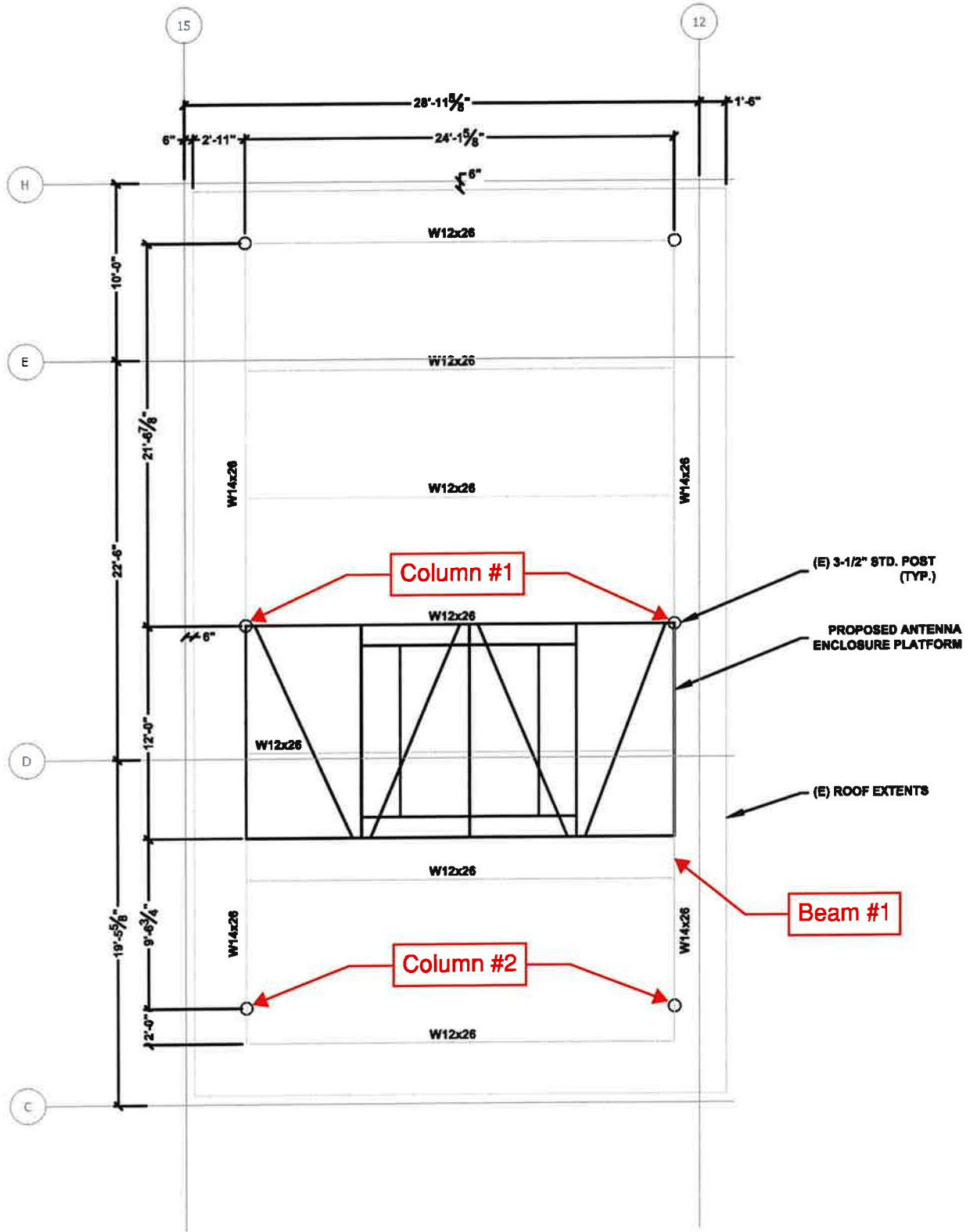
$f_v = 833.61 \text{ lbs.} < 8283.5 \text{ lbs.}$ **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

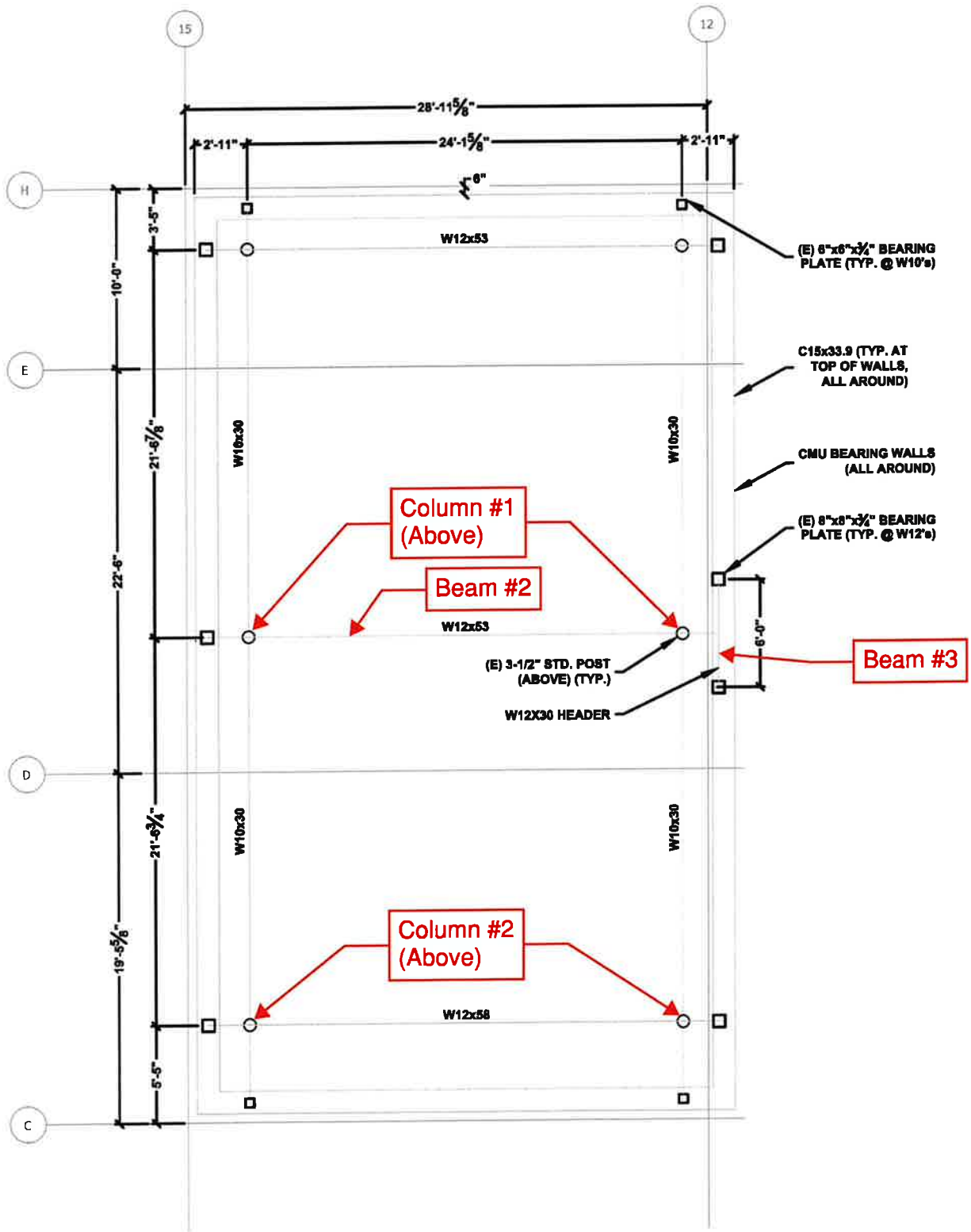
$f_t / F_T + f_v / F_V \leq 1.0$
 $0.000 + 0.101 = 0.101 < 1.0$ **Therefore, OK !**



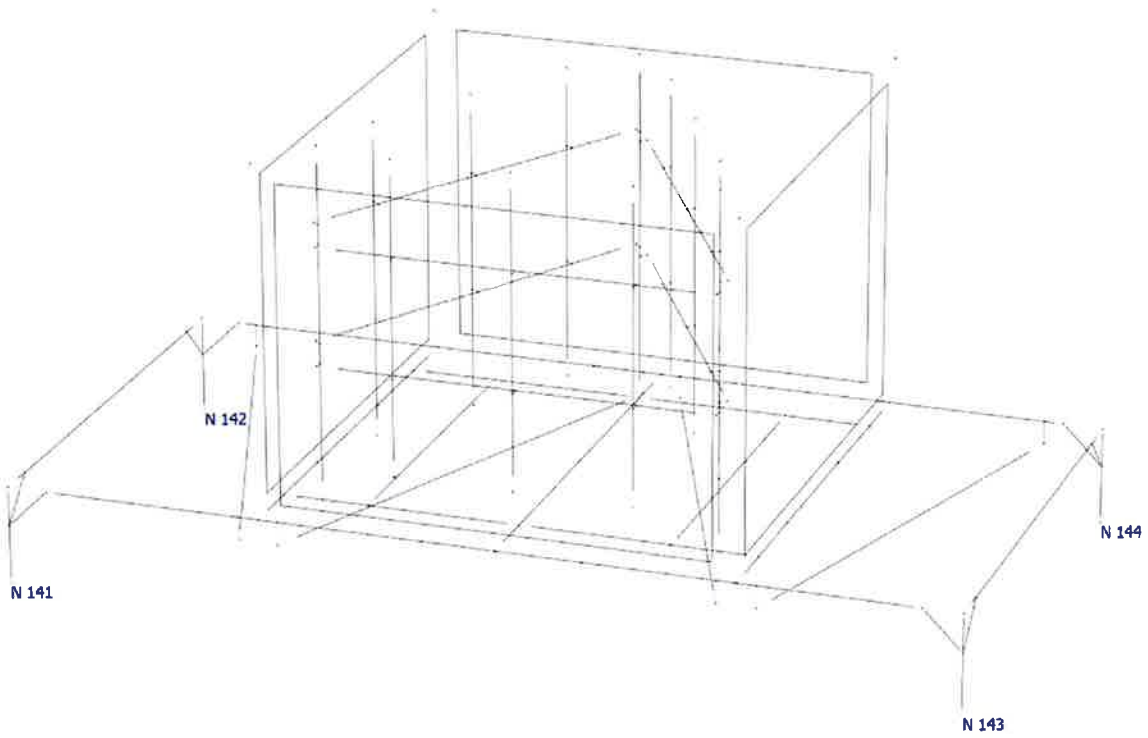
Penthouse Roof Framing Calculations



PENTHOUSE ROOF UPPER FRAMING PLAN
 SCALE: N.T.S.



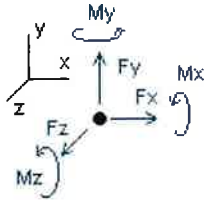
PENTHOUSE ROOF LOWER FRAMING PLAN
 SCALE: N.T.S.





Analysis result

Reactions



Direction of positive forces and moments

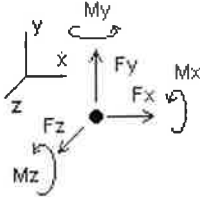
Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition DL=Dead Load						
141	1.08416	1.85286	-0.04251	0.00000	0.00000	0.00000
142	0.87222	1.59769	0.04259	0.00000	0.00000	0.00000
143	-1.08431	1.96799	-0.04285	0.00000	0.00000	0.00000
144	-0.87207	1.68672	0.04277	0.00000	0.00000	0.00000
SUM	0.00000	7.10526	0.00000	0.00000	0.00000	0.00000
Condition WL1=Wind Load (Side 1)						
141	-0.57581	-1.29222	1.04009	0.00000	0.00000	0.00000
142	0.59181	1.29232	1.17946	0.00000	0.00000	0.00000
143	0.58731	-1.41717	1.15568	0.00000	0.00000	0.00000
144	-0.60331	1.41708	1.26877	0.00000	0.00000	0.00000
SUM	0.00000	0.00000	4.64400	0.00000	0.00000	0.00000
Condition WL2=Wind Load (Side 2)						
141	1.17019	0.67177	0.01272	0.00000	0.00000	0.00000
142	1.21608	0.68271	0.00996	0.00000	0.00000	0.00000
143	1.10585	-0.67182	-0.01765	0.00000	0.00000	0.00000
144	1.15188	-0.68266	-0.00503	0.00000	0.00000	0.00000
SUM	4.64400	0.00000	0.00000	0.00000	0.00000	0.00000
Condition WL3=Wind Load (Side 3)						
141	0.56689	1.28977	-1.01544	0.00000	0.00000	0.00000
142	-0.60191	-1.28964	-1.19881	0.00000	0.00000	0.00000
143	-0.58859	1.41894	-1.13637	0.00000	0.00000	0.00000
144	0.62361	-1.41907	-1.29338	0.00000	0.00000	0.00000
SUM	0.00000	0.00000	-4.64400	0.00000	0.00000	0.00000
Condition WL4=Wind Load (Side 4)						
141	-1.15217	-0.67174	-0.01753	0.00000	0.00000	0.00000
142	-1.19190	-0.68279	-0.00419	0.00000	0.00000	0.00000
143	-1.12585	0.67166	0.01239	0.00000	0.00000	0.00000
144	-1.17409	0.68286	0.00932	0.00000	0.00000	0.00000
SUM	-4.64400	0.00000	0.00000	0.00000	0.00000	0.00000

Condition **DI=Dead Ice Load**

141	0.68676	1.04908	0.00118	0.00000	0.00000	0.00000
142	0.42541	0.64426	-0.00014	0.00000	0.00000	0.00000
143	-0.68877	1.14142	0.00000	0.00000	0.00000	0.00000
144	-0.42341	0.69924	-0.00103	0.00000	0.00000	0.00000
SUM	0.00000	3.53399	0.00000	0.00000	0.00000	0.00000

Envelope for nodal reactions

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



Direction of positive forces and moments

Envelope of nodal reactions for :
 DL=Dead Load
 WL1=Wind Load (Side 1)
 WL2=Wind Load (Side 2)
 WL3=Wind Load (Side 3)
 WL4=Wind Load (Side 4)
 DI=Dead Ice Load

Node		Forces						Moments					
		Fx	Ic	Fy	Ic	Fz	Ic	Mx	Ic	My	Ic	Mz	Ic
		[Kip]		[Kip]		[Kip]		[Kip*ft]		[Kip*ft]		[Kip*ft]	
141	Max	1.170	WL2	1.853	DL	1.040	WL1	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-1.152	WL4	-1.292	WL1	-1.015	WL3	0.00000	DL	0.00000	DL	0.00000	DL
142	Max	1.216	WL2	1.598	DL	1.179	WL1	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-1.192	WL4	-1.290	WL3	-1.199	WL3	0.00000	DL	0.00000	DL	0.00000	DL
143	Max	1.106	WL2	1.968	DL	1.156	WL1	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-1.126	WL4	-1.417	WL1	-1.136	WL3	0.00000	DL	0.00000	DL	0.00000	DL
144	Max	1.152	WL2	1.687	DL	1.269	WL1	0.00000	DL	0.00000	DL	0.00000	DL
	Min	-1.174	WL4	-1.419	WL3	-1.293	WL3	0.00000	DL	0.00000	DL	0.00000	DL

Date: 9/27/2022
Project Name: HARTFORD S 7 CT
Designed By: CL **Checked By:** MSC



Summary of Net Loading to be Applied to Roof Framing Members:

Beam #1:

Uniform Roof Load

Dead Load	=	10 psf	(Assumed)
Roof Live Load	=	20 psf	
Snow Load	=	30 psf	
Tributary Width	=	15.00 ft	

Antenna Enclosure Platform Point Load @ 9'-7"± of Span 2

Dead Load	=	1.968 kips	(See Bentley Output, N143)
Dead Ice Load	=	1.141 kips	(See Bentley Output, N143)
Net Dead Load	=	3.109 kips	
Wind Load, Max.	=	1.419 kips	(See Bentley Output, N143)

Antenna Enclosure Platform Point Load @ 21'-7" of Span 2 (located over Column #1)

Dead Load	=	1.687 kips	(See Bentley Output, N144)
Dead Ice Load	=	0.699 kips	(See Bentley Output, N144)
Net Dead Load	=	2.386 kips	
Wind Load, Max.	=	-1.419 kips	(See Bentley Output, N144)

Column #1:

Axial Load at Top of Column (Reactions from Beam #1 Analysis)

Dead Load	=	5.651 kips	(See Enercalc Output)
Roof Live Load	=	3.209 kips	(See Enercalc Output)
Snow Load	=	4.814 kips	(See Enercalc Output)
Wind Load	=	0.789 kips	(See Enercalc Output)

Column #2:

Axial Load at Top of Column (Reactions from Beam #1 Analysis)

Dead Load	=	3.998 kips	(See Enercalc Output)
Roof Live Load	=	3.865 kips	(See Enercalc Output)
Snow Load	=	5.797 kips	(See Enercalc Output)
Wind Load	=	0.789 kips	(See Enercalc Output)

Date: 9/27/2022
Project Name: HARTFORD S 7 CT
Designed By: CL Checked By: MSC



Summary of Net Loading to be Applied to Roof Framing Members: (cont.)

Beam #2:

Point Load @ 2'-11"± (Reactions from Column #1 Analysis)

Dead Load	=	5.697 kips	(See Enercalc Output)
Roof Live Load	=	3.209 kips	(See Enercalc Output)
Snow Load	=	4.814 kips	(See Enercalc Output)
Wind Load	=	0.789 kips	(See Enercalc Output)

Point Load @ 27'-1"± (Reactions from Column #1 Analysis)

Dead Load	=	5.697 kips	(See Enercalc Output)
Roof Live Load	=	3.209 kips	(See Enercalc Output)
Snow Load	=	4.814 kips	(See Enercalc Output)
Wind Load	=	0.789 kips	(See Enercalc Output)

Beam #3:

Point Load @ 3'-0"± (Reactions from Beam #2 Analysis)

Dead Load	=	6.494 kips	(See Enercalc Output)
Roof Live Load	=	3.209 kips	(See Enercalc Output)
Snow Load	=	4.814 kips	(See Enercalc Output)
Wind Load	=	0.789 kips	(See Enercalc Output)

Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Beam

Project File: Hartford S 7 CT (Rev.0).ec6

LIC#: KW-06013026, Build:20.22.8.17

Hudson Design Group LLC

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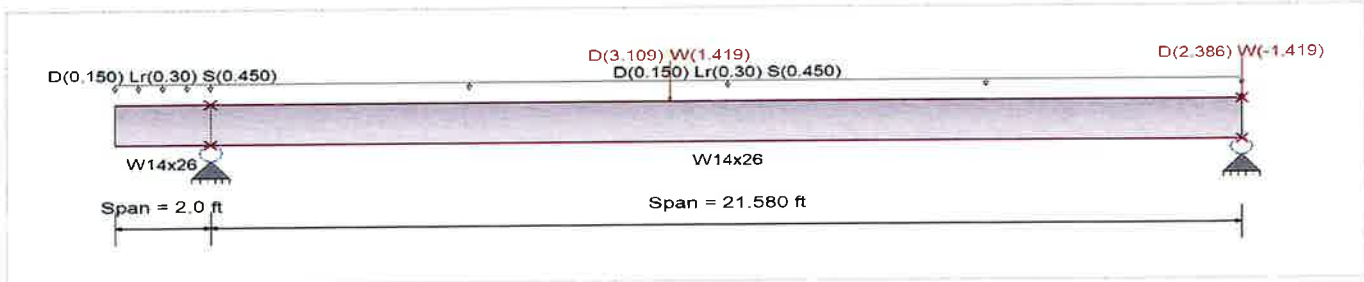
DESCRIPTION: Existing Beam - Beam #1

CODE REFERENCES

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

Material Properties

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



Applied Loads

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

Beam self weight calculated and added to loading
 Load for Span Number 1

Uniform Load : D = 0.010, Lr = 0.020, S = 0.030 ksf, Tributary Width = 15.0 ft, (Uniform Roof Load)

Load for Span Number 2

Uniform Load : D = 0.010, Lr = 0.020, S = 0.030 ksf, Tributary Width = 15.0 ft, (Uniform Roof Load)

Point Load : D = 3.109, W = 1.419 k @ 9.580 ft, (Antenna Enclosure Platform (N143))

Point Load : D = 2.386, W = -1.419 k @ 21.580 ft, (Antenna Enclosure Platform (N144))

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.718 : 1	Maximum Shear Stress Ratio =	0.205 : 1
Section used for this span	W14x26	Section used for this span	W14x26
Ma : Applied	51.858 k-ft	Va : Applied	10.465 k
Mn / Omega : Allowable	72.216 k-ft	Vn/Omega : Allowable	51.041 k
Load Combination	+D+S	Load Combination	+D+S
Span # where maximum occurs	Span # 2	Location of maximum on span	21.580 ft
		Span # where maximum occurs	Span # 2
Maximum Deflection			
Max Downward Transient Deflection	0.304 in Ratio = 850 >=360	Span: 2 : S Only	
Max Upward Transient Deflection	-0.088 in Ratio = 543 >=360	Span: 2 : S Only	
Max Downward Total Deflection	0.580 in Ratio = 446 >=180	Span: 2 : +D+S	
Max Upward Total Deflection	-0.168 in Ratio = 286 >=180	Span: 2 : +D+S	

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx/Vnx/Omega	
D Only														
Dsgn. L =	2.00 ft	1	0.005	0.071		-0.35	0.35	120.60	72.22	1.00	1.00	3.65	76.56	51.04
Dsgn. L =	21.58 ft	2	0.367	0.111	26.49	-0.35	26.49	120.60	72.22	1.00	1.00	5.65	76.56	51.04
+D+Lr														
Dsgn. L =	2.00 ft	1	0.013	0.135		-0.95	0.95	120.60	72.22	1.00	1.00	6.91	76.56	51.04
Dsgn. L =	21.58 ft	2	0.601	0.174	43.40	-0.95	43.40	120.60	72.22	1.00	1.00	8.86	76.56	51.04
+D+S														
Dsgn. L =	2.00 ft	1	0.017	0.167		-1.25	1.25	120.60	72.22	1.00	1.00	8.54	76.56	51.04
Dsgn. L =	21.58 ft	2	0.718	0.205	51.86	-1.25	51.86	120.60	72.22	1.00	1.00	10.46	76.56	51.04
+D+0.750Lr														
Dsgn. L =	2.00 ft	1	0.011	0.119		-0.80	0.80	120.60	72.22	1.00	1.00	6.09	76.56	51.04
Dsgn. L =	21.58 ft	2	0.542	0.158	39.17	-0.80	39.17	120.60	72.22	1.00	1.00	8.06	76.56	51.04

Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Beam

Project File: Hartford S 7 CT (Rev.0).ec6

LIC#: KW-06013026, Build:20.22.8.17

Hudson Design Group LLC

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DESCRIPTION: Existing Beam - Beam #1

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values					Summary of Shear Values				
			M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega Cb	Rm	Va Max	VnxVnx/Omega		
+D+0.750S														
Dsgn. L = 2.00 ft		1	0.014	0.143		-1.03	1.03	120.60	72.22	1.00	1.00	7.32	76.56	51.04
Dsgn. L = 21.58 ft		2	0.630	0.181	45.52	-1.03	45.52	120.60	72.22	1.00	1.00	9.26	76.56	51.04
+D+0.60W														
Dsgn. L = 2.00 ft		1	0.005	0.081		-0.35	0.35	120.60	72.22	1.00	1.00	4.12	76.56	51.04
Dsgn. L = 21.58 ft		2	0.430	0.101	31.03	-0.35	31.03	120.60	72.22	1.00	1.00	5.18	76.56	51.04
+D+0.750Lr+0.450W														
Dsgn. L = 2.00 ft		1	0.011	0.126		-0.80	0.80	120.60	72.22	1.00	1.00	6.45	76.56	51.04
Dsgn. L = 21.58 ft		2	0.590	0.151	42.58	-0.80	42.58	120.60	72.22	1.00	1.00	7.70	76.56	51.04
+D+0.750S+0.450W														
Dsgn. L = 2.00 ft		1	0.014	0.150		-1.03	1.03	120.60	72.22	1.00	1.00	7.67	76.56	51.04
Dsgn. L = 21.58 ft		2	0.677	0.174	48.92	-1.03	48.92	120.60	72.22	1.00	1.00	8.91	76.56	51.04
+0.60D+0.60W														
Dsgn. L = 2.00 ft		1	0.003	0.052		-0.21	0.21	120.60	72.22	1.00	1.00	2.66	76.56	51.04
Dsgn. L = 21.58 ft		2	0.283	0.057	20.43	-0.21	20.43	120.60	72.22	1.00	1.00	2.92	76.56	51.04
+0.60D														
Dsgn. L = 2.00 ft		1	0.003	0.043		-0.21	0.21	120.60	72.22	1.00	1.00	2.19	76.56	51.04
Dsgn. L = 21.58 ft		2	0.220	0.066	15.89	-0.21	15.89	120.60	72.22	1.00	1.00	3.39	76.56	51.04

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
	1	0.0000	0.000	+D+S	-0.1679	0.000
+D+S	2	0.5803	10.704		0.0000	0.000

Vertical Reactions

Support notation : Far left is #

Values in KIPS

Load Combination	Support 1	Support 2	Support 3
Overall MAXimum		9.796	10.465
Overall MINimum		0.789	-0.789
D Only		3.998	5.651
+D+Lr		7.863	8.860
+D+S		9.796	10.465
+D+0.750Lr		6.897	8.058
+D+0.750S		8.346	9.261
+D+0.60W		4.472	5.177
+D+0.750Lr+0.450W		7.252	7.703
+D+0.750S+0.450W		8.701	8.906
+0.60D+0.60W		2.873	2.917
+0.60D		2.399	3.390
Lr Only		3.865	3.209
S Only		5.797	4.814
W Only		0.789	-0.789

Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Column

Project File: Hartford S 7 CT (Rev.0).ec6

LIC#: KW-06013026, Build:20.22.8.17

Hudson Design Group LLC

(c) ENERCALC INC 1983-2022

DESCRIPTION: Existing Column - Column #1

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		My - End Moments	
	@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top	@ Base	@ Top
+D+0.60W	6.170									
+D+0.750Lr+0.450W	8.459									
+D+0.750S+0.450W	9.662									
+0.60D+0.60W	3.892									
+0.60D	3.418									
Lr Only	3.209									
S Only	4.814									
W Only	0.789									

Extreme Reactions

Item	Extreme Value	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		My - End Moments	
		@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top	@ Base	@ Top
Axial @ Base	Maximum	10.511									
"	Minimum	0.789									
Reaction, X-X Axis Base	Maximum	5.697									
"	Minimum	5.697									
Reaction, Y-Y Axis Base	Maximum	5.697									
"	Minimum	5.697									
Reaction, X-X Axis Top	Maximum	5.697									
"	Minimum	5.697									
Reaction, Y-Y Axis Top	Maximum	5.697									
"	Minimum	5.697									
Moment, X-X Axis Base	Maximum	5.697									
"	Minimum	5.697									
Moment, Y-Y Axis Base	Maximum	5.697									
"	Minimum	5.697									
Moment, X-X Axis Top	Maximum	5.697									
"	Minimum	5.697									
Moment, Y-Y Axis Top	Maximum	5.697									
"	Minimum	5.697									

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Max. Y-Y Deflection	
	Distance	Distance	Distance	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+Lr	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750S	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr+0.450W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750S+0.450W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D+0.60W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

Steel Section Properties : Pipe3-1/2 Std

Steel Section Properties : Pipe3-1/2 Std

Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Column

Project File: Hartford S 7 CT (Rev.0).ec6

LIC# : KW-06013026, Build:20.22.8.17

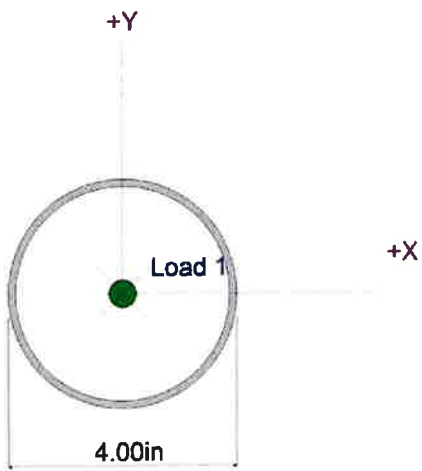
Hudson Design Group LLC

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DESCRIPTION: Existing Column - Column #1

Depth	=	4.000 in	I xx	=	4.52 in ⁴	J	=	9.040 in ⁴
			S xx	=	2.26 in ³			
Diameter	=	4.000 in	R xx	=	1.340 in			
Wall Thick	=	0.227 in	Zx	=	3.030 in ³			
Area	=	2.510 in ²	I yy	=	4.520 in ⁴			
Weight	=	9.176 plf	S yy	=	2.260 in ³			
			R yy	=	1.340 in			
Ycg	=	0.000 in						

Sketches



14 483k

14 493k

Height = 8.0

Height = 8.0



Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Column

Project File: Hartford S 7 CT (Rev.0).ec6

LIC#: KW-06013026, Build:20.22.8.17

Hudson Design Group LLC

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DESCRIPTION: Existing Column - Column #2

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
	@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
+D+0.60W	4.517										
+D+0.750Lr+0.450W	7.298										
+D+0.750S+0.450W	8.747										
+0.60D+0.60W	2.900										
+0.60D	2.426										
Lr Only	3.865										
S Only	5.797										
W Only	0.789										

Extreme Reactions

Item	Extreme Value	Axial Reaction	X-X Axis Reaction		k	Y-Y Axis Reaction		Mx - End Moments		k-ft	My - End Moments	
		@ Base	@ Base	@ Top		@ Base	@ Top	@ Base	@ Top		@ Base	@ Top
Axial @ Base	Maximum	9.841										
"	Minimum	0.789										
Reaction, X-X Axis Base	Maximum	4.044										
"	Minimum	4.044										
Reaction, Y-Y Axis Base	Maximum	4.044										
"	Minimum	4.044										
Reaction, X-X Axis Top	Maximum	4.044										
"	Minimum	4.044										
Reaction, Y-Y Axis Top	Maximum	4.044										
"	Minimum	4.044										
Moment, X-X Axis Base	Maximum	4.044										
"	Minimum	4.044										
Moment, Y-Y Axis Base	Maximum	4.044										
"	Minimum	4.044										
Moment, X-X Axis Top	Maximum	4.044										
"	Minimum	4.044										
Moment, Y-Y Axis Top	Maximum	4.044										
"	Minimum	4.044										

Maximum Deflections for Load Combinations

Load Combination	Max. X-X Deflection		Max. Y-Y Deflection	
	Distance	Distance	Distance	Distance
D Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+Lr	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+S	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750S	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.60W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750Lr+0.450W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+D+0.750S+0.450W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D+0.60W	0.0000 in	0.000 ft	0.000 in	0.000 ft
+0.60D	0.0000 in	0.000 ft	0.000 in	0.000 ft
Lr Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
S Only	0.0000 in	0.000 ft	0.000 in	0.000 ft
W Only	0.0000 in	0.000 ft	0.000 in	0.000 ft

Steel Section Properties : Pipe3-1/2 Std

Steel Section Properties : Pipe3-1/2 Std

Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Column

Project File: Hartford S 7 CT (Rev.0).ec6

LIC# : KW-06013026, Build:20.22.8.17

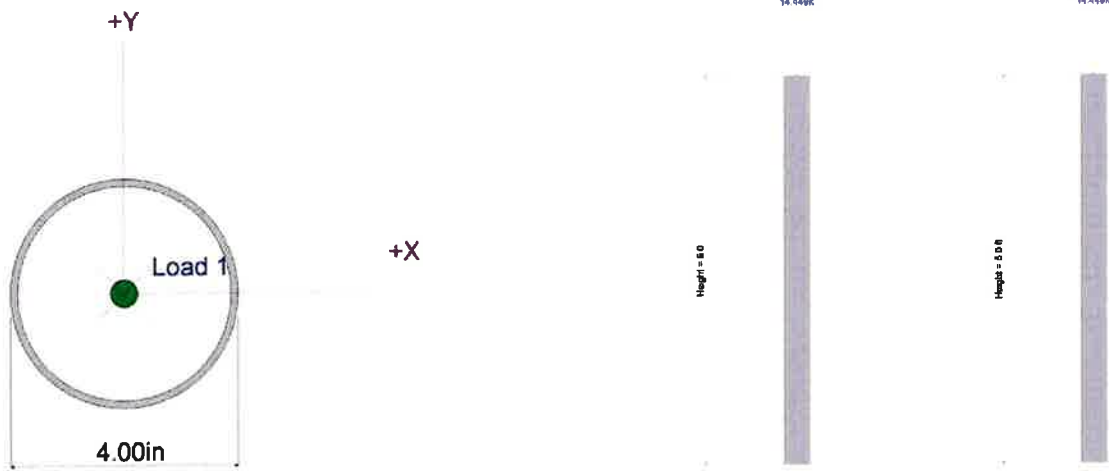
Hudson Design Group LLC

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DESCRIPTION: Existing Column - Column #2

Depth	=	4.000 in	I xx	=	4.52 in^4	J	=	9.040 in^4
			S xx	=	2.26 in^3			
Diameter	=	4.000 in	R xx	=	1.340 in			
Wall Thick	=	0.227 in	Zx	=	3.030 in^3			
Area	=	2.510 in^2	I yy	=	4.520 in^4			
Weight	=	9.176 plf	S yy	=	2.260 in^3			
			R yy	=	1.340 in			
Ycg	=	0.000 in						

Sketches



Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Beam

Project File: Hartford S 7 CT (Rev.0).ec6

LIC# : KW-06013026, Build:20.22.8.17

Hudson Design Group LLC

(c) ENERCALC INC 1983-2022

DESCRIPTION: Existing Beam - Beam #2

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values					Summary of Shear Values				
			M	V	Mmax +	Mmax -	Ma Max	Mnx Mnx/Omega	Cb Rm	Va Max	VnxVnx/Omega			
Dsgn. L =	30.00 ft	1	0.129	0.065	13.57		13.57	175.38	105.02	1.03	1.00	3.90	90.17	60.11

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.5594	15.086		0.0000	0.000

Vertical Reactions

Load Combination	Support notation : Far left is #			Values in KIPS
	Support 1	Support 2		
Overall MAXimum	11.308	11.308	-0.789	
Overall MINimum	0.789	0.789	-0.789	
D Only	6.494	6.494	-0.789	
+D+Lr	9.703	9.703	-0.789	
+D+S	11.308	11.308	-0.789	
+D+0.750Lr	8.900	8.900	-0.789	
+D+0.750S	10.104	10.104	-0.789	
+D+0.60W	6.967	6.967	-0.789	
+D+0.750Lr+0.450W	9.255	9.255	-0.789	
+D+0.750S+0.450W	10.459	10.459	-0.789	
+0.60D+0.60W	4.370	4.370	-0.789	
+0.60D	3.896	3.896	-0.789	
Lr Only	3.209	3.209	-0.789	
S Only	4.814	4.814	-0.789	
W Only	0.789	0.789	-0.789	

Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Beam

Project File: Hartford S 7 CT (Rev.0).ec6

LIC# : KW-06013026, Build:20.22.8.17

Hudson Design Group LLC

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DESCRIPTION: Existing Beam - Beam #3

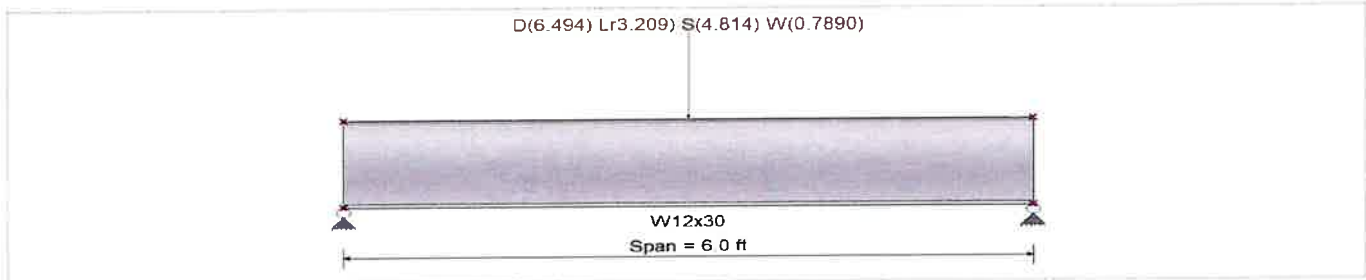
CODE REFERENCES

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

Material Properties

Analysis Method : Allowable Strength Design
 Beam Bracing : Completely Unbraced
 Bending Axis : Major Axis Bending

Fy : Steel Yield : 36.0 ksi
 E : Modulus : 29,000.0 ksi



Applied Loads

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

Beam self weight calculated and added to loading
 Load(s) for Span Number 1

Point Load : D = 6.494, Lr = 3.209, S = 4.814, W = 0.7890 k @ 3.0 ft, (Beam #2 Reaction)

DESIGN SUMMARY

Design OK

Maximum Bending Stress Ratio =	0.221 : 1	Maximum Shear Stress Ratio =	0.125 : 1
Section used for this span	W12x30	Section used for this span	W12x30
Ma : Applied	17.097 k-ft	Va : Applied	5.744 k
Mn / Omega : Allowable	77.425 k-ft	Vn/Omega : Allowable	46.051 k
Load Combination	+D+S	Load Combination	+D+S
Span # where maximum occurs	Span # 1	Location of maximum on span	0.000 ft
		Span # where maximum occurs	Span # 1
Maximum Deflection			
Max Downward Transient Deflection	0.005 in Ratio = 13,218	>=360	
Max Upward Transient Deflection	0.000 in Ratio = 0	<360	Span: 1 : S Only
Max Downward Total Deflection	0.013 in Ratio = 5572	>=180	Span: 1 : +D+S
Max Upward Total Deflection	0.000 in Ratio = 0	<180	

Maximum Forces & Stresses for Load Combinations

Load Combination	Segment Length	Span #	Max Stress Ratios		Summary of Moment Values						Summary of Shear Values			
			M	V	Mmax +	Mmax -	Ma Max	Mnx	Mnx/Omega	Cb	Rm	Va Max	Vnx/Vnx/Omega	
D Only														
Dsgn. L =	6.00 ft	1	0.128	0.072	9.88		9.88	129.30	77.43	1.31	1.00	3.34	69.08	46.05
+D+Lr														
Dsgn. L =	6.00 ft	1	0.190	0.107	14.69		14.69	129.30	77.43	1.31	1.00	4.94	69.08	46.05
+D+S														
Dsgn. L =	6.00 ft	1	0.221	0.125	17.10		17.10	129.30	77.43	1.31	1.00	5.74	69.08	46.05
+D+0.750Lr														
Dsgn. L =	6.00 ft	1	0.174	0.099	13.49		13.49	129.30	77.43	1.31	1.00	4.54	69.08	46.05
+D+0.750S														
Dsgn. L =	6.00 ft	1	0.197	0.112	15.29		15.29	129.30	77.43	1.31	1.00	5.14	69.08	46.05
+D+0.60W														
Dsgn. L =	6.00 ft	1	0.137	0.078	10.59		10.59	129.30	77.43	1.31	1.00	3.57	69.08	46.05
+D+0.750Lr+0.450W														
Dsgn. L =	6.00 ft	1	0.181	0.102	14.02		14.02	129.30	77.43	1.31	1.00	4.72	69.08	46.05
+D+0.750S+0.450W														
Dsgn. L =	6.00 ft	1	0.204	0.116	15.82		15.82	129.30	77.43	1.31	1.00	5.32	69.08	46.05
+0.60D+0.60W														
Dsgn. L =	6.00 ft	1	0.086	0.049	6.64		6.64	129.30	77.43	1.31	1.00	2.24	69.08	46.05
+0.60D														
Dsgn. L =	6.00 ft	1	0.077	0.043	5.93		5.93	129.30	77.43	1.31	1.00	2.00	69.08	46.05

Project Title: HARTFORD S 7 CT
 Engineer: CL
 Project ID: HARTFORD S 7 CT
 Project Descr: Antennas/Equipment Mounted on Rooftop

Steel Beam

Project File: Hartford S 7 CT (Rev.0).ec6

LIC# : KW-06013026, Build:20.22.8.17

Hudson Design Group LLC

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DESCRIPTION: Existing Beam - Beam #3

Overall Maximum Deflections

Load Combination	Span	Max. "-" Defl	Location in Span	Load Combination	Max. "+" Defl	Location in Span
+D+S	1	0.0129	3.017		0.0000	0.000

Vertical Reactions

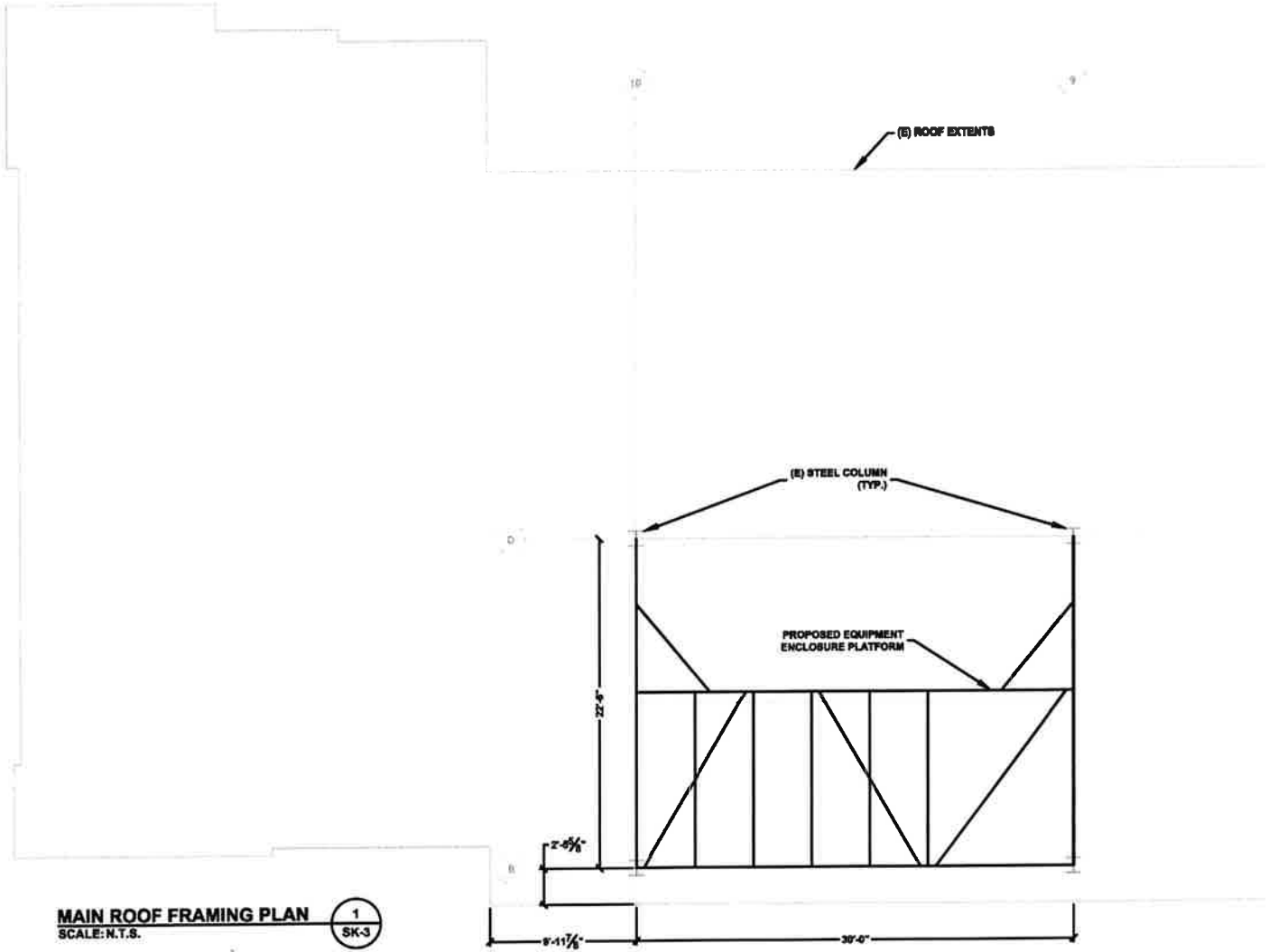
Support notation : Far left is #

Values in KIPS

Load Combination	Support 1	Support 2	
Overall MAXimum	5.744	5.744	-0.789
Overall MINimum	0.395	0.395	-0.789
D Only	3.337	3.337	-0.789
+D+Lr	4.941	4.941	-0.789
+D+S	5.744	5.744	-0.789
+D+0.750Lr	4.540	4.540	-0.789
+D+0.750S	5.142	5.142	-0.789
+D+0.60W	3.573	3.573	-0.789
+D+0.750Lr+0.450W	4.718	4.718	-0.789
+D+0.750S+0.450W	5.320	5.320	-0.789
+0.60D+0.60W	2.239	2.239	-0.789
+0.60D	2.002	2.002	-0.789
Lr Only	1.605	1.605	-0.789
S Only	2.407	2.407	-0.789
W Only	0.395	0.395	-0.789



**Equipment Platform
Calculations**



MAIN ROOF FRAMING PLAN
 SCALE: N.T.S.

1
 SK-3

Date: 9/27/2022
Project Name: HARTFORD S 7 CT
Designed By: CL **Checked By:** MSC



Wind Analysis → Platform Enclosure

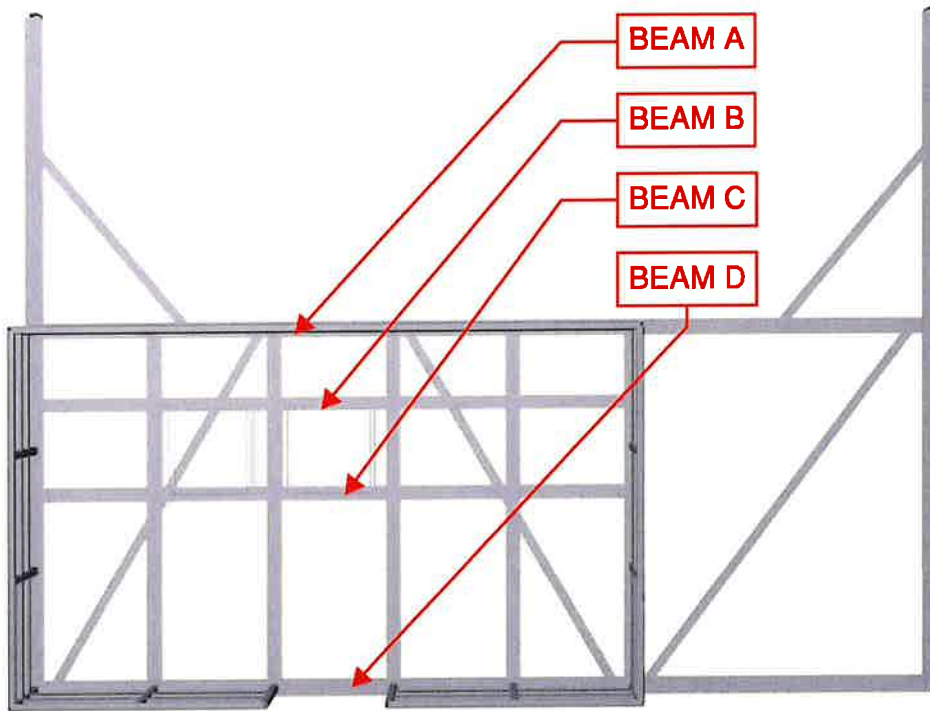
Reference Codes:

-2018 Connecticut State Building Code (2018 CTSBC)

-International Building Code 2015 (IBC 2015)

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

Structure Classification	III	(ASCE 7-10 Table 1.5-1)
Basic Wind Speed, V	135 mph	(CT Building Code 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	58 ft	(Top of Enclosure)
Exposure Coefficient, K_z	0.84	(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)
	= 35.36 psf	
Gust Factor, G	0.85	(ASCE 7-10 Section 26.9)
Enclosure Shape:	Square	
Net Force Coefficient, C_f	1.29	(ASCE 7-10 Figure 29.5-1)
Area Wind Force, F	$= q_zGC_f$	(ASCE 7-10 Equation 29.5-2)
	= 38.78 psf	



Date: 9/27/2022
Project Name: HARTFORD S 7 CT
Designed By: CL Checked By: MSC



Load Breakdown:

Live Loads:

Service = 25 psf

Dead Loads:

Grating = 15 psf

• **Beam A**

Live Load

→ Service = 25 psf x 1.3 ft. (Tributary Width)
= 31.3 plf

Dead Load

→ Grating = 15 psf x 1.3 ft. (Tributary Width)
= 18.8 plf

• **Beam B**

Live Load

→ Service = 25 psf x 2.8 ft. (Tributary Width)
= 68.8 plf

Dead Load

→ Grating = 15 psf x 2.8 ft. (Tributary Width)
= 41.3 plf

• **Beam C**

Live Load

→ Service = 25 psf x 4.8 ft. (Tributary Width)
= 118.8 plf

Dead Load

→ Grating = 15 psf x 4.8 ft. (Tributary Width)
= 71.3 plf

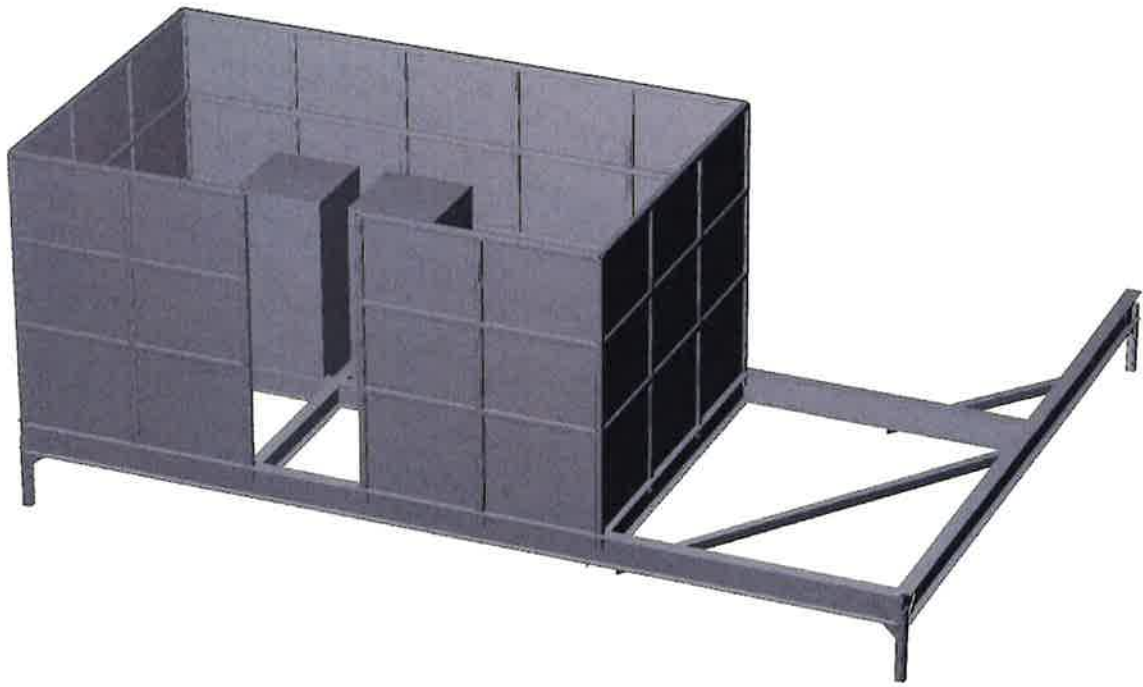
• **Beam D**

Live Load

→ Service = 25 psf x 3.3 ft. (Tributary Width)
= 81.3 plf

Dead Load

→ Grating = 15 psf x 3.3 ft. (Tributary Width)
= 48.8 plf

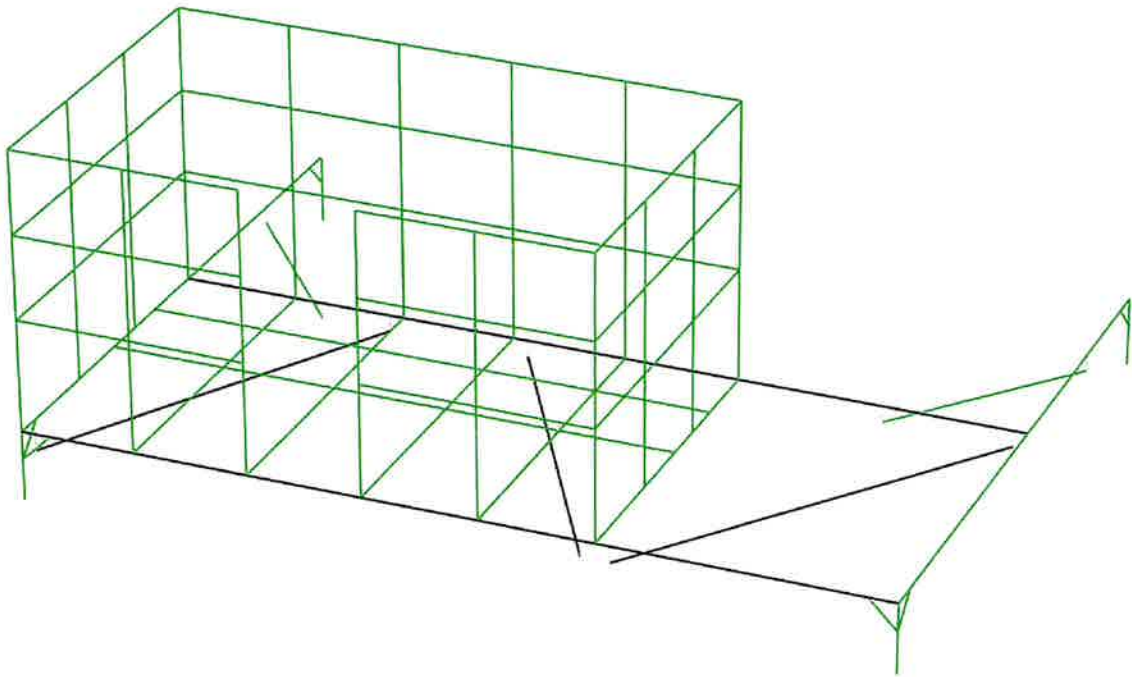


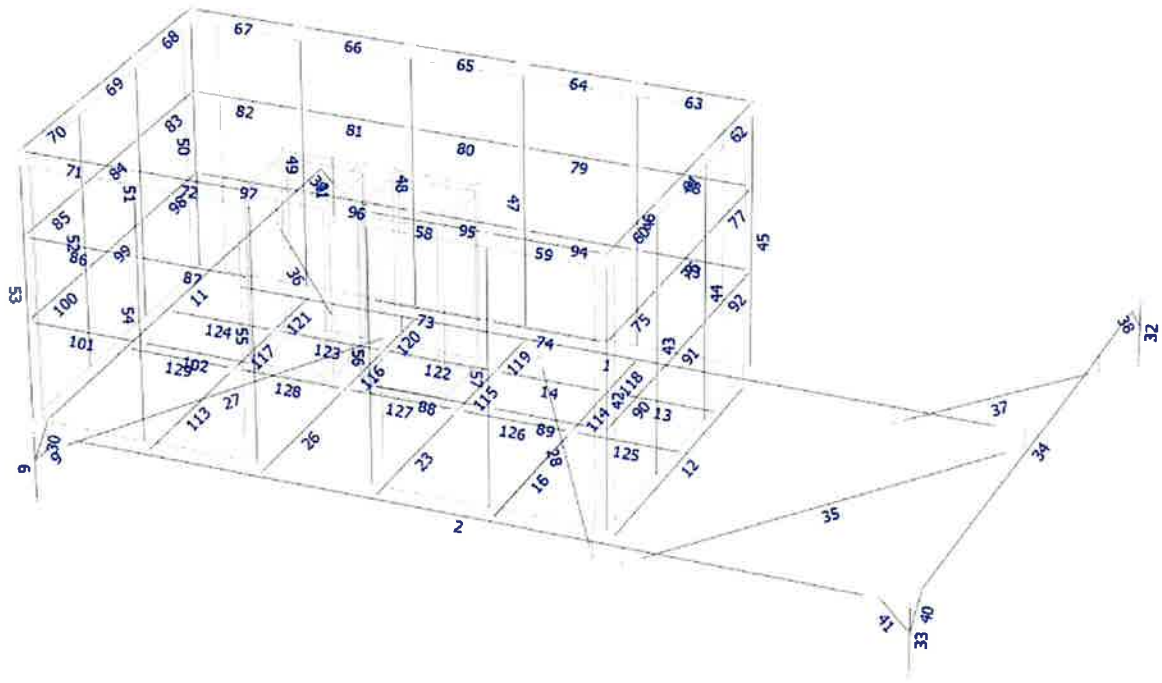


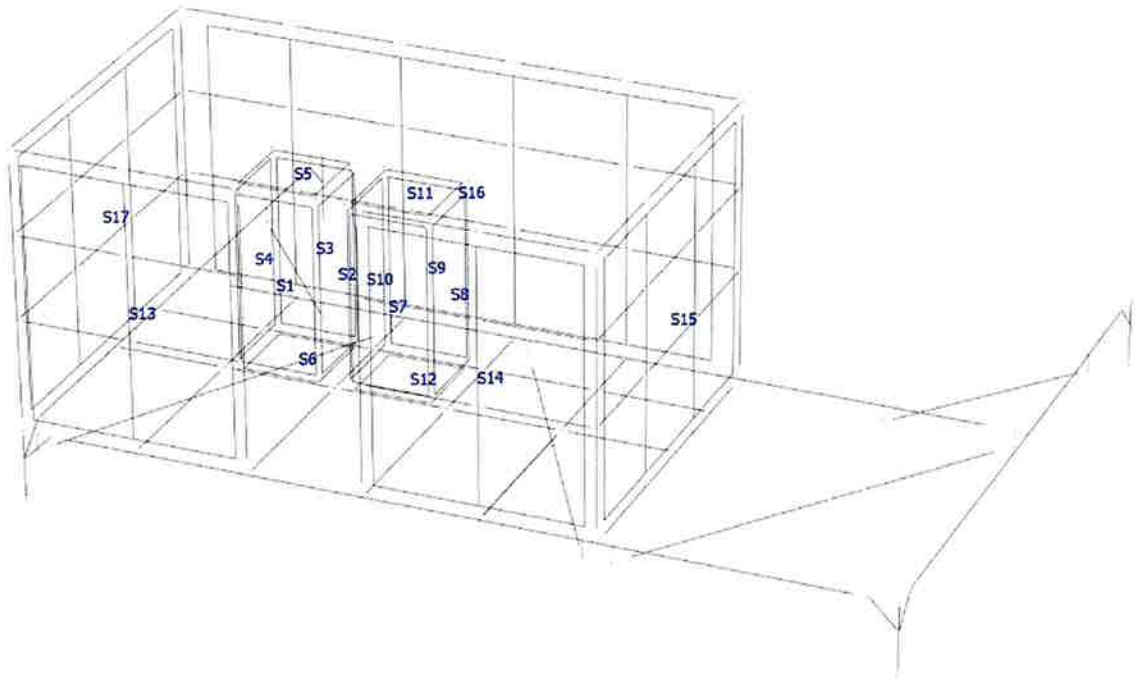


Design status

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







Load data

GLOSSARY

Comb : Indicates if load condition is a load combination

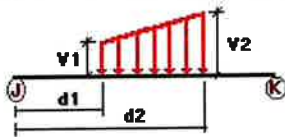
Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
WL1	Wind Load (Side 1)	No	WIND
WL2	Wind Load (Side 2)	No	WIND
WL3	Wind Load (Side 3)	No	WIND
WL4	Wind Load (Side 4)	No	WIND
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	47	0.00	-0.05	0.00	0.00	0.00	0.00
	48	0.00	-0.05	0.00	0.00	0.00	0.00

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	1	y	-0.019	-0.019	33.00	Yes	100.00	Yes
	2	y	-0.049	-0.049	33.00	Yes	100.00	Yes
	13	y	-0.042	-0.042	0.00	Yes	100.00	Yes
	14	y	-0.042	-0.042	0.00	Yes	100.00	Yes
	122	y	-0.042	-0.042	0.00	Yes	100.00	Yes
	123	y	-0.042	-0.042	0.00	Yes	100.00	Yes
	124	y	-0.042	-0.042	0.00	Yes	100.00	Yes
	125	y	-0.071	-0.071	0.00	Yes	100.00	Yes
	126	y	-0.071	-0.071	0.00	Yes	100.00	Yes
	127	y	-0.071	-0.071	0.00	Yes	100.00	Yes
	128	y	-0.071	-0.071	0.00	Yes	100.00	Yes
LL	129	y	-0.071	-0.071	0.00	Yes	100.00	Yes
	1	y	-0.031	-0.031	33.00	Yes	100.00	Yes

2	y	-0.081	-0.081	33.00	Yes	100.00	Yes
13	y	-0.069	-0.069	0.00	Yes	100.00	Yes
14	y	-0.069	-0.069	0.00	Yes	100.00	Yes
122	y	-0.069	-0.069	0.00	Yes	100.00	Yes
123	y	-0.069	-0.069	0.00	Yes	100.00	Yes
124	y	-0.069	-0.069	0.00	Yes	100.00	Yes
125	y	-0.119	-0.119	0.00	Yes	100.00	Yes
126	y	-0.119	-0.119	0.00	Yes	100.00	Yes
127	y	-0.119	-0.119	0.00	Yes	100.00	Yes
128	y	-0.119	-0.119	0.00	Yes	100.00	Yes
129	y	-0.119	-0.119	0.00	Yes	100.00	Yes

Load on shells

Condition	Shell	Pressure [Kip/ft ²]	Temp. [F]
DL	6	-0.167	0.00
	12	-0.222	0.00
WL1	1	-0.039	0.00
	7	-0.039	0.00
	13	-0.039	0.00
	14	-0.039	0.00
	16	0.039	0.00
WL2	15	-0.039	0.00
	17	0.039	0.00
WL3	13	0.039	0.00
	14	0.039	0.00
	16	-0.039	0.00
WL4	15	0.039	0.00
	17	-0.039	0.00

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
WL1	Wind Load (Side 1)	No	0.00	0.00	0.00
WL2	Wind Load (Side 2)	No	0.00	0.00	0.00
WL3	Wind Load (Side 3)	No	0.00	0.00	0.00
WL4	Wind Load (Side 4)	No	0.00	0.00	0.00
LL	Live Load	No	0.00	0.00	0.00



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+0.5WL1
- LC4=1.2DL+0.5WL2
- LC5=1.2DL+0.5WL3
- LC6=1.2DL+0.5WL4
- LC7=1.2DL+WL1
- LC8=1.2DL+WL2
- LC9=1.2DL+WL3
- LC10=1.2DL+WL4
- LC11=1.2DL+WL1+LL
- LC12=1.2DL+WL2+LL
- LC13=1.2DL+WL3+LL
- LC14=1.2DL+WL4+LL
- LC15=0.9DL+WL1
- LC16=0.9DL+WL2
- LC17=0.9DL+WL3
- LC18=0.9DL+WL4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 3X3X3_8	42	LC13 at 0.00%	0.27	OK	
		43	LC12 at 39.58%	0.37	OK	
		44	LC12 at 39.58%	0.33	OK	
		45	LC11 at 0.00%	0.54	OK	
		46	LC17 at 39.58%	0.36	OK	
		47	LC11 at 39.58%	0.40	OK	
		48	LC11 at 39.58%	0.34	OK	
		49	LC17 at 39.58%	0.35	OK	
		50	LC11 at 0.00%	0.55	OK	
		51	LC14 at 39.58%	0.30	OK	
		52	LC14 at 39.58%	0.37	OK	
		53	LC13 at 100.00%	0.18	OK	
		54	LC17 at 39.58%	0.37	OK	
		55	LC11 at 39.58%	0.24	OK	
		56	LC13 at 39.58%	0.40	OK	
		57	LC15 at 39.58%	0.37	OK	
		58	LC13 at 50.00%	0.02	OK	
		59	LC12 at 50.00%	0.02	OK	
		60	LC13 at 46.88%	0.03	OK	
		61	LC12 at 50.00%	0.01	OK	
		62	LC13 at 50.00%	0.04	OK	
		63	LC11 at 50.00%	0.02	OK	
		64	LC11 at 50.00%	0.03	OK	
		65	LC11 at 0.00%	0.03	OK	
		66	LC11 at 0.00%	0.02	OK	
		67	LC14 at 50.00%	0.01	OK	
		68	LC13 at 46.88%	0.04	OK	
		69	LC11 at 0.00%	0.02	OK	
		70	LC11 at 50.00%	0.03	OK	
		71	LC12 at 46.88%	0.02	OK	
		72	LC11 at 50.00%	0.01	OK	
		73	LC13 at 50.00%	0.02	OK	

	74	LC13 at 46.88%	0.02	OK
	75	LC13 at 46.88%	0.02	OK
	76	LC14 at 50.00%	0.02	OK
	77	LC15 at 50.00%	0.02	OK
	78	LC11 at 50.00%	0.02	OK
	79	LC11 at 50.00%	0.03	OK
	80	LC11 at 50.00%	0.02	OK
	81	LC11 at 46.88%	0.02	OK
	82	LC11 at 46.88%	0.02	OK
	83	LC13 at 46.88%	0.03	OK
	84	LC12 at 50.00%	0.02	OK
	85	LC11 at 50.00%	0.02	OK
	86	LC11 at 50.00%	0.02	OK
	87	LC9 at 50.00%	0.02	OK
	88	LC13 at 50.00%	0.03	OK
	89	LC12 at 50.00%	0.02	OK
	90	LC13 at 46.88%	0.03	OK
	91	LC14 at 50.00%	0.02	OK
	92	LC17 at 50.00%	0.03	OK
	93	LC11 at 50.00%	0.03	OK
	94	LC11 at 50.00%	0.03	OK
	95	LC11 at 50.00%	0.02	OK
	96	LC11 at 50.00%	0.02	OK
	97	LC11 at 46.88%	0.02	OK
	98	LC13 at 46.88%	0.03	OK
	99	LC12 at 50.00%	0.03	OK
	100	LC11 at 50.00%	0.03	OK
	101	LC12 at 46.88%	0.02	OK
	102	LC13 at 50.00%	0.02	OK
<hr/>				
HSS_SQR 4X4X1_2	6	LC12 at 59.38%	0.96	OK
	31	LC11 at 40.63%	0.68	OK
	32	LC11 at 59.38%	0.41	OK
	33	LC14 at 59.38%	0.89	OK
<hr/>				
L 3X3X3_8	9	LC12 at 46.88%	0.67	OK
	30	LC13 at 43.75%	0.40	OK
	38	LC11 at 43.75%	0.32	OK
	39	LC11 at 50.00%	0.54	OK
	40	LC14 at 50.00%	0.21	OK
	41	LC14 at 43.75%	0.48	OK
<hr/>				
L 4X4X3_8	27	LC11 at 50.00%	0.18	With warnings
	28	LC7 at 50.00%	0.16	With warnings
	35	LC7 at 50.00%	0.39	With warnings
	36	LC9 at 50.00%	0.03	OK
	37	LC7 at 50.00%	0.03	OK
<hr/>				
W 10X22	13	LC11 at 0.00%	0.36	OK
	14	LC11 at 100.00%	0.31	OK
	15	LC11 at 0.00%	0.01	OK
	16	LC11 at 0.00%	0.01	OK
	23	LC13 at 0.00%	0.01	OK
	26	LC11 at 0.00%	0.02	OK
	113	LC13 at 0.00%	0.02	OK
	114	LC14 at 0.00%	0.01	OK
	115	LC11 at 0.00%	0.01	OK
	116	LC11 at 0.00%	0.00	OK
	117	LC14 at 0.00%	0.01	OK
	118	LC15 at 0.00%	0.00	OK
	119	LC12 at 0.00%	0.01	OK
	120	LC11 at 0.00%	0.02	OK
	121	LC11 at 0.00%	0.01	OK
	122	LC11 at 10.94%	0.33	OK

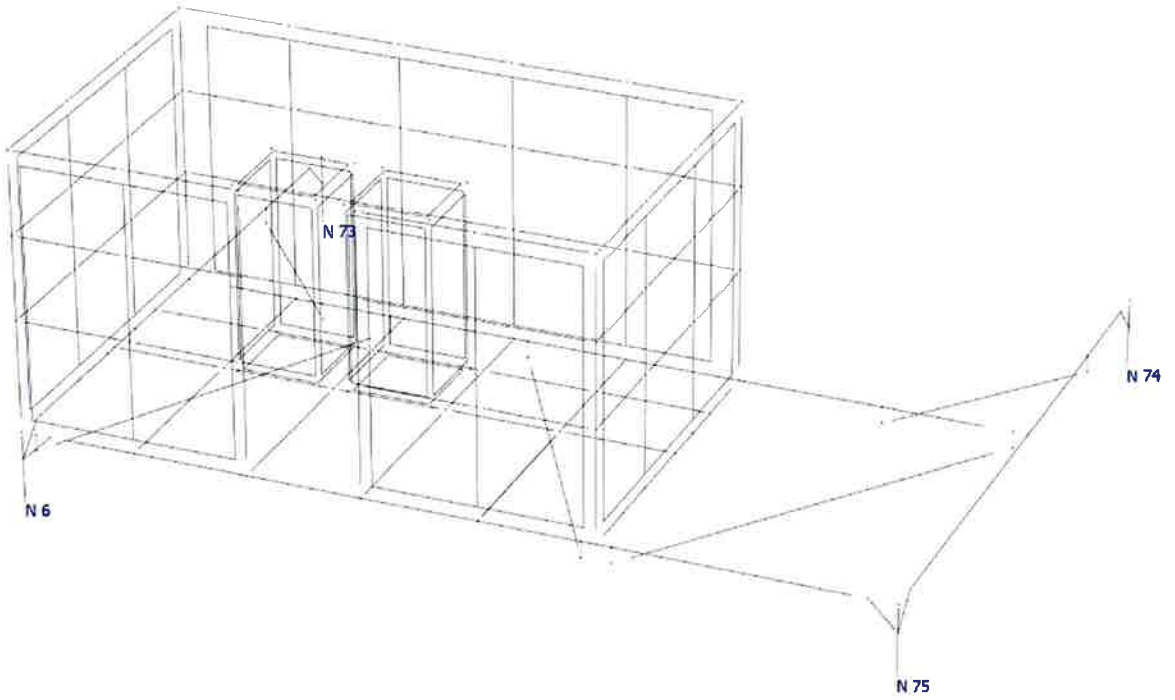
123	LC11 at 87.50%	0.43	OK
124	LC11 at 0.00%	0.28	OK
125	LC11 at 0.00%	0.32	OK
126	LC11 at 100.00%	0.32	OK
127	LC11 at 10.94%	0.34	OK
128	LC13 at 87.50%	0.38	OK
129	LC13 at 0.00%	0.26	OK

W 12X26

12	LC11 at 54.37%	0.32	OK
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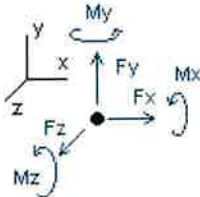
W 12X30

1	LC11 at 33.04%	0.81	With warnings
2	LC14 at 32.99%	0.71	With warnings
11	LC11 at 53.31%	0.79	OK
34	LC11 at 52.50%	0.53	OK



Analysis result

Reactions



Direction of positive forces and moments

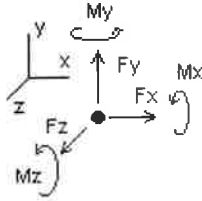
Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition LC1=1.4DL						
6	4.90188	11.57195	-4.76675	0.00000	0.00000	0.00000
73	-0.00401	5.20995	4.75755	0.00000	0.00000	0.00000
74	-0.00774	3.05542	3.21833	0.00000	0.00000	0.00000
75	-4.89013	6.53676	-3.20913	0.00000	0.00000	0.00000
SUM	0.00000	26.37408	0.00000	0.00000	0.00000	0.00000
Condition LC2=1.2DL+1.6LL						
6	6.45299	14.63307	-5.73372	0.00000	0.00000	0.00000
73	-0.00491	6.15828	5.72205	0.00000	0.00000	0.00000
74	-0.00996	3.49213	3.75655	0.00000	0.00000	0.00000
75	-6.43812	7.94080	-3.74488	0.00000	0.00000	0.00000
SUM	0.00000	32.22428	0.00000	0.00000	0.00000	0.00000
Condition LC3=1.2DL+0.5WL1						
6	3.18074	8.16139	-2.22686	0.00000	0.00000	0.00000
73	-0.04409	6.22235	7.45648	0.00000	0.00000	0.00000
74	-0.02049	3.37653	4.64976	0.00000	0.00000	0.00000
75	-3.11616	4.84608	-2.07196	0.00000	0.00000	0.00000
SUM	0.00000	22.60636	7.80741	0.00000	0.00000	0.00000
Condition LC4=1.2DL+0.5WL2						
6	6.32620	10.95929	-4.85867	0.00000	0.00000	0.00000
73	-0.01739	4.58475	3.90167	0.00000	0.00000	0.00000
74	-0.01455	2.49890	3.00438	0.00000	0.00000	0.00000
75	-1.61425	4.56341	-2.04738	0.00000	0.00000	0.00000
SUM	4.68000	22.60636	0.00000	0.00000	0.00000	0.00000
Condition LC5=1.2DL+0.5WL3						
6	5.20666	11.51489	-5.70179	0.00000	0.00000	0.00000
73	0.02380	2.87026	1.02945	0.00000	0.00000	0.00000
74	0.01060	1.88655	0.97923	0.00000	0.00000	0.00000
75	-5.24106	6.33465	-3.32689	0.00000	0.00000	0.00000
SUM	0.00000	22.60636	-7.02000	0.00000	0.00000	0.00000

Condition LC6=1.2DL+0.5WL4						
6	2.06922	8.87848	-3.31005	0.00000	0.00000	0.00000
73	0.00859	4.34634	4.25233	0.00000	0.00000	0.00000
74	0.00421	2.73856	2.51036	0.00000	0.00000	0.00000
75	-6.76202	6.64297	-3.45265	0.00000	0.00000	0.00000
SUM	-4.68000	22.60636	0.00000	0.00000	0.00000	0.00000
Condition LC7=1.2DL+WL1						
6	2.18692	6.41074	-0.36231	0.00000	0.00000	0.00000
73	-0.10110	7.97177	10.82375	0.00000	0.00000	0.00000
74	-0.03021	4.12637	6.53402	0.00000	0.00000	0.00000
75	-2.05562	4.09747	-1.38064	0.00000	0.00000	0.00000
SUM	0.00000	22.60636	15.61482	0.00000	0.00000	0.00000
Condition LC8=1.2DL+WL2						
6	8.44759	11.99956	-5.63290	0.00000	0.00000	0.00000
73	-0.03418	4.70409	3.72639	0.00000	0.00000	0.00000
74	-0.02037	2.37970	3.25183	0.00000	0.00000	0.00000
75	0.96697	3.52300	-1.34532	0.00000	0.00000	0.00000
SUM	9.36000	22.60636	0.00000	0.00000	0.00000	0.00000
Condition LC9=1.2DL+WL3						
6	6.23844	13.11915	-7.31044	0.00000	0.00000	0.00000
73	0.04099	1.26702	-2.02896	0.00000	0.00000	0.00000
74	0.03163	1.14387	-0.81102	0.00000	0.00000	0.00000
75	-6.31106	7.07632	-3.88959	0.00000	0.00000	0.00000
SUM	0.00000	22.60636	-14.04000	0.00000	0.00000	0.00000
Condition LC10=1.2DL+WL4						
6	-0.06658	7.83791	-2.53550	0.00000	0.00000	0.00000
73	0.01792	4.22730	4.42783	0.00000	0.00000	0.00000
74	0.01735	2.85900	2.26366	0.00000	0.00000	0.00000
75	-9.32869	7.68215	-4.15599	0.00000	0.00000	0.00000
SUM	-9.36000	22.60636	0.00000	0.00000	0.00000	0.00000
Condition LC11=1.2DL+WL1+LL						
6	3.61592	9.36129	-1.39064	0.00000	0.00000	0.00000
73	-0.11493	9.02602	11.85674	0.00000	0.00000	0.00000
74	-0.02687	4.66141	7.14596	0.00000	0.00000	0.00000
75	-3.47412	5.56883	-1.99723	0.00000	0.00000	0.00000
SUM	0.00000	28.61756	15.61482	0.00000	0.00000	0.00000
Condition LC12=1.2DL+WL2+LL						
6	9.86804	14.94331	-6.67019	0.00000	0.00000	0.00000
73	-0.05496	5.75609	4.74120	0.00000	0.00000	0.00000
74	-0.03202	2.93123	3.89074	0.00000	0.00000	0.00000
75	-0.42106	4.98694	-1.96176	0.00000	0.00000	0.00000
SUM	9.36000	28.61756	0.00000	0.00000	0.00000	0.00000

Condition LC13=1.2DL+WL3+LL						
6	7.63189	16.06307	-8.34508	0.00000	0.00000	0.00000
73	0.04734	2.32726	-1.00820	0.00000	0.00000	0.00000
74	0.02447	1.69886	-0.17464	0.00000	0.00000	0.00000
75	-7.70370	8.52836	-4.51208	0.00000	0.00000	0.00000
SUM	0.00000	28.61756	-14.04000	0.00000	0.00000	0.00000
Condition LC14=1.2DL+WL4+LL						
6	1.32757	10.78685	-3.55948	0.00000	0.00000	0.00000
73	0.03587	5.29127	5.46895	0.00000	0.00000	0.00000
74	0.02501	3.39934	2.87347	0.00000	0.00000	0.00000
75	-10.74846	9.14009	-4.78294	0.00000	0.00000	0.00000
SUM	-9.36000	28.61756	0.00000	0.00000	0.00000	0.00000
Condition LC15=0.9DL+WL1						
6	1.11708	3.92951	0.66032	0.00000	0.00000	0.00000
73	-0.08749	6.85680	9.79759	0.00000	0.00000	0.00000
74	-0.03487	3.48010	5.85291	0.00000	0.00000	0.00000
75	-0.99472	2.68835	-0.69599	0.00000	0.00000	0.00000
SUM	0.00000	16.95477	15.61482	0.00000	0.00000	0.00000
Condition LC16=0.9DL+WL2						
6	7.38236	9.51982	-4.60179	0.00000	0.00000	0.00000
73	-0.01371	3.59249	2.71855	0.00000	0.00000	0.00000
74	-0.00788	1.71998	2.54721	0.00000	0.00000	0.00000
75	1.99922	2.12247	-0.66396	0.00000	0.00000	0.00000
SUM	9.36000	16.95477	0.00000	0.00000	0.00000	0.00000
Condition LC17=0.9DL+WL3						
6	5.19894	10.63992	-6.28611	0.00000	0.00000	0.00000
73	0.03454	0.14975	-3.04190	0.00000	0.00000	0.00000
74	0.03920	0.48123	-1.51139	0.00000	0.00000	0.00000
75	-5.27269	5.68387	-3.20060	0.00000	0.00000	0.00000
SUM	0.00000	16.95477	-14.04000	0.00000	0.00000	0.00000
Condition LC18=0.9DL+WL4						
6	-1.10465	5.35840	-1.52125	0.00000	0.00000	0.00000
73	0.00032	3.10569	3.39509	0.00000	0.00000	0.00000
74	0.00807	2.20859	1.58675	0.00000	0.00000	0.00000
75	-8.26375	6.28209	-3.46059	0.00000	0.00000	0.00000
SUM	-9.36000	16.95477	0.00000	0.00000	0.00000	0.00000

Envelope for nodal reactions

Note.- **lc** 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+0.5WL1
- LC4=1.2DL+0.5WL2
- LC5=1.2DL+0.5WL3
- LC6=1.2DL+0.5WL4
- LC7=1.2DL+WL1
- LC8=1.2DL+WL2
- LC9=1.2DL+WL3
- LC10=1.2DL+WL4
- LC11=1.2DL+WL1+LL
- LC12=1.2DL+WL2+LL
- LC13=1.2DL+WL3+LL
- LC14=1.2DL+WL4+LL
- LC15=0.9DL+WL1
- LC16=0.9DL+WL2
- LC17=0.9DL+WL3
- LC18=0.9DL+WL4

Node		Forces						Moments					
		Fx	lc	Fy	lc	Fz	lc	Mx	lc	My	lc	Mz	lc
		[Kip]		[Kip]		[Kip]		[Kip*ft]		[Kip*ft]		[Kip*ft]	
6	Max	9.868	LC12	16.063	LC13	0.660	LC15	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-1.105	LC18	3.930	LC15	-8.345	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
73	Max	0.047	LC13	9.026	LC11	11.857	LC11	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.115	LC11	0.150	LC17	-3.042	LC17	0.00000	LC1	0.00000	LC1	0.00000	LC1
74	Max	0.039	LC17	4.661	LC11	7.146	LC11	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.035	LC15	0.481	LC17	-1.511	LC17	0.00000	LC1	0.00000	LC1	0.00000	LC1
75	Max	1.999	LC16	9.140	LC14	-0.664	LC16	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-10.748	LC14	2.122	LC16	-4.783	LC14	0.00000	LC1	0.00000	LC1	0.00000	LC1

Date: 9/27/2022
 Project Name: HARTFORD S 7 CT
 Designed By: CL Checked By: MSC



CHECK CONNECTION CAPACITY (Worst Case) → PROPOSED ANCHORS AT EQUIPMENT PLATFORM

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

Bolt Type = A325 5/8" Threaded Rod

Allowable Tensile Load =

$F_{Tall} = 13806 \text{ lbs.}$

Allowable Shear Load =

$F_{Vall} = 8283 \text{ lbs.}$

TENSILE FORCES

Reaction $F = 0 \text{ lbs.}$ (Gravity Load Supported by Existing Steel Beam)

SHEAR FORCES

Reactions in X direction: 9868 lbs. (See Bentley Output)

Reactions in Z direction: 8345 lbs. (See Bentley Output)

Resultant: 12923 lbs.

No. of Supports = 1

No. of Bolts / Support = 4

Tension Design Load / Bolts =

$f_t = 0.00 \text{ lbs.} < 13806 \text{ lbs. Therefore, OK !}$

Shear Design Load / Bolts =

$f_v = 3230.87 \text{ lbs.} < 8283.5 \text{ lbs. Therefore, OK !}$

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	\leq	1.0	
0.000	+	0.390	=	0.390	< 1.0 Therefore, OK !

Reference Documents



TRINITY COLLEGE
HARTFORD, CONNECTICUT

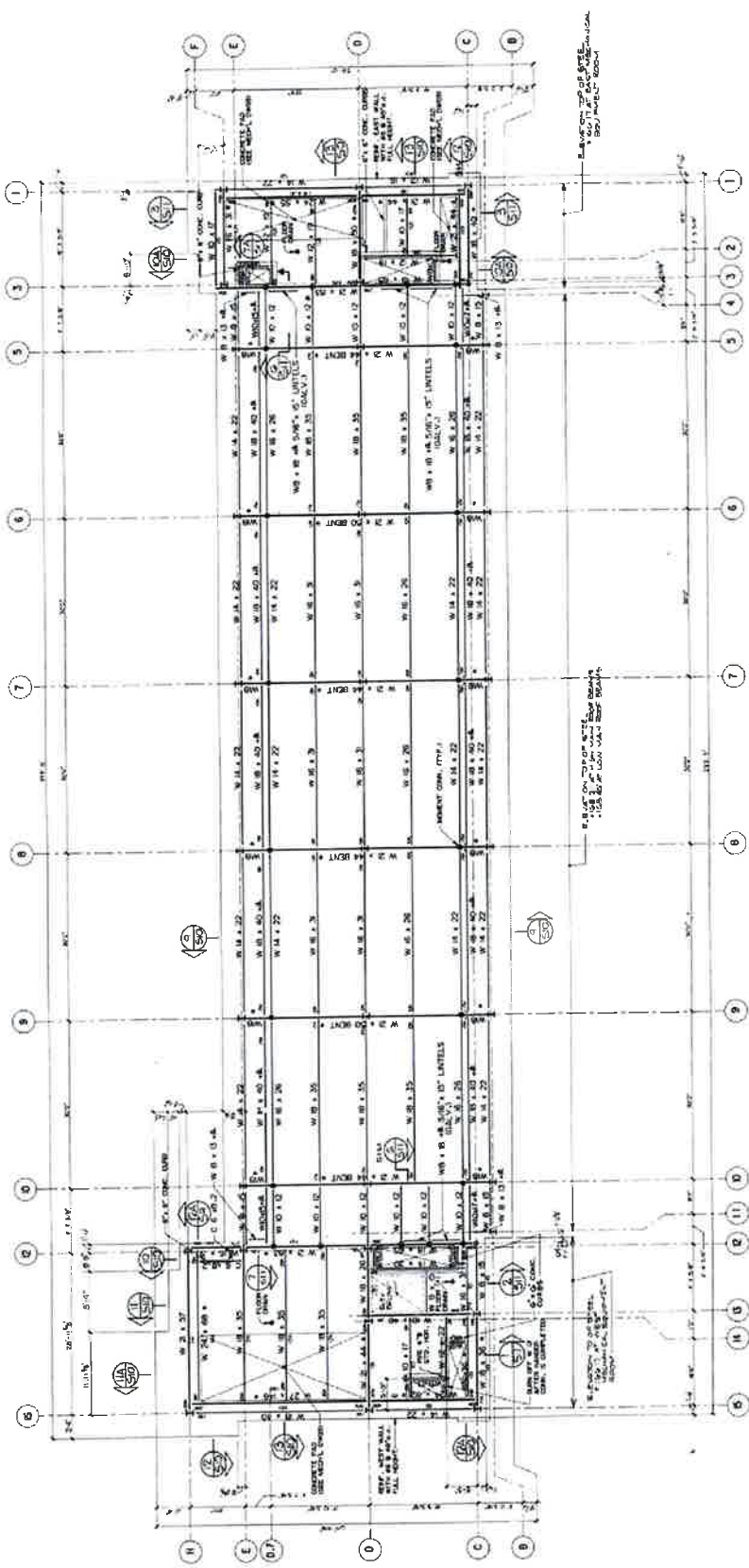
Casey Hill & Associates, Inc.
Architects
1034 Chapel Street
New Haven, Connecticut 06510

Siegel & Zamparelli, Inc.
Structural Engineers
1035 Chapel Street
New Haven, Connecticut 06510

Savage Engineering, Inc.
Consulting Engineers
277 Belmont Avenue
Barnett, Connecticut 06020

Drawn By: [blank]
Checked By: [blank]
Date: 1-1-84
Scale: AS NOTED

PROJECT NUMBER: 74
DATE: APRIL 1981
SHEET NO. 542

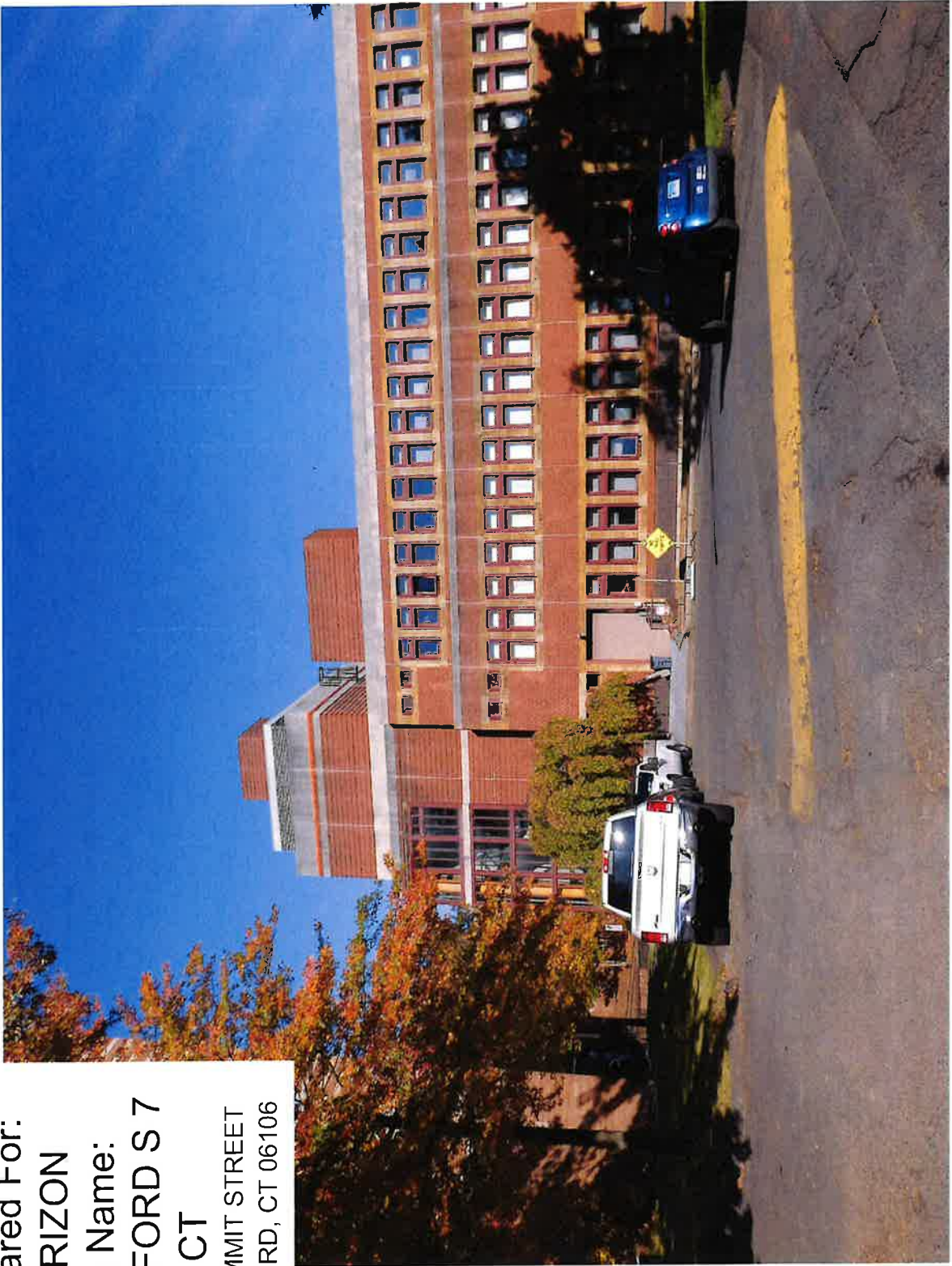


ATTACHMENT 5

Prepared For:
VERIZON

Site Name:
HARTFORD S 7
CT

300 SUMMIT STREET
HARTFORD, CT 06106



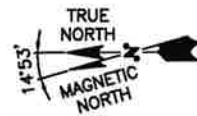
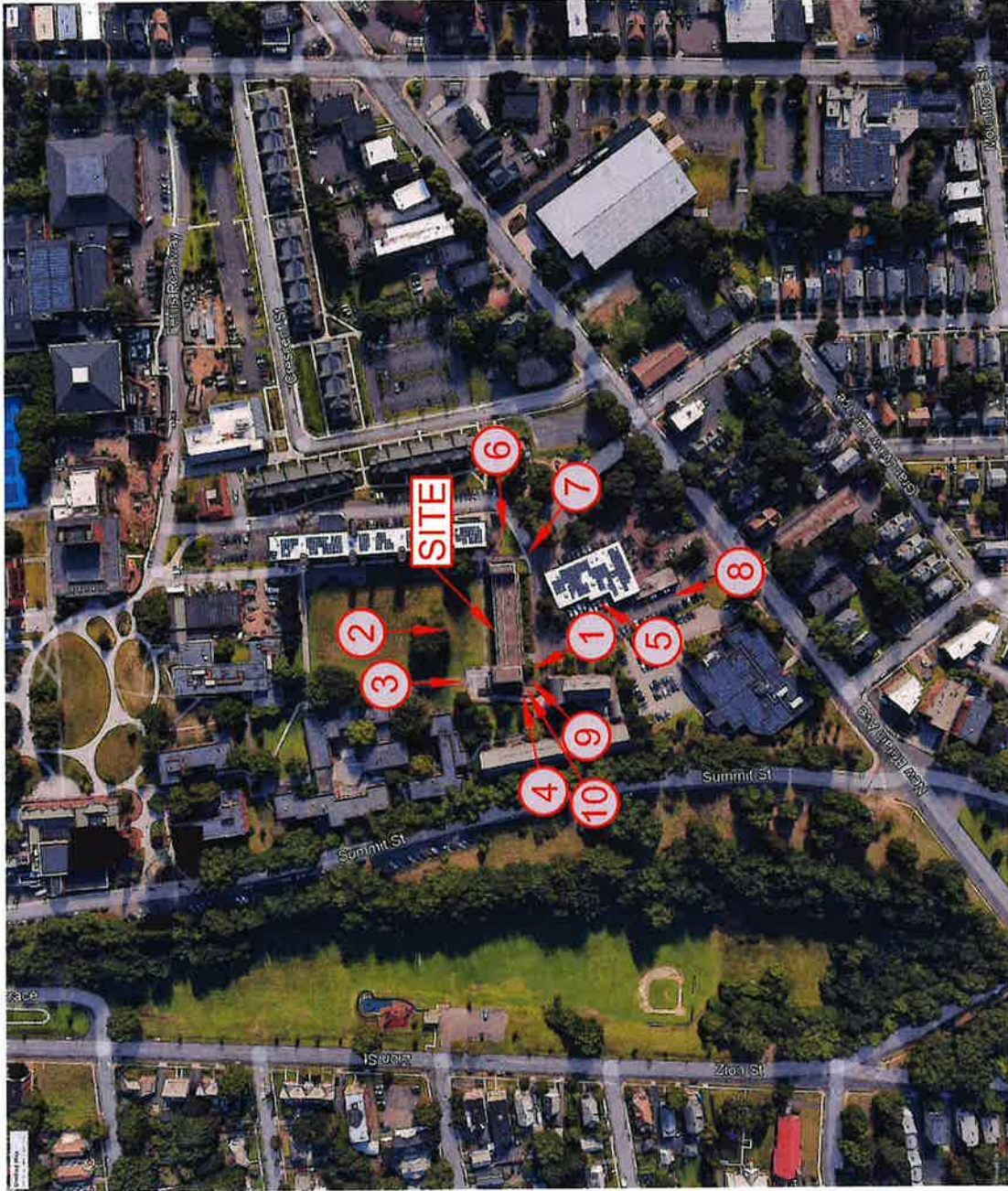
THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

SITE TYPE: ROOFTOP
DATE: 03/11/2022
REV: 1
DRAWN BY: AM
SCALE: N.T.S.

H2G
HUDSON
Design Group LLC
45 WILKINSON ROAD
N. ANDOVER, MA 01845
TEL: 978.687.6644
FAX: 978.687.6222

PREPARED FOR
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106



SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
 HARTFORD, CT 06106

PREMIER FOR
verizon
 118 FLANDERS ROAD
 WESTBOROUGH, MA 01581

H2G
HUDSON
 Design Group LLC
 45 HICKWOOD DRIVE
 WESTBOROUGH, MA 01581
 TEL: 978.336.5255
 FAX: 978.336.5255

SITE TYPE: ROOFTOP
DATE: 03/11/2022
DRAWN BY: AM
SCALE: N.T.S.

PHOTO LOCATION
 THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.
 PAGE 2 OF 16

EXISTING CONDITIONS

LOCATION # 1

DATE OF PHOTO: 11/03/2021



VIEW NORTH FROM PARKING LOT

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PREPARED FOR:

verizon

118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HDS
HUDSON
Design Group LLC

45 WILLOWOOD DRIVE
N ANDOVER, MA 01845
TEL: 978-547-5400
FAX: 978-236-2266

SITE TYPE: ROOFTOP

DATE: 03/11/2022 REV: 1

DRAWN BY: AM

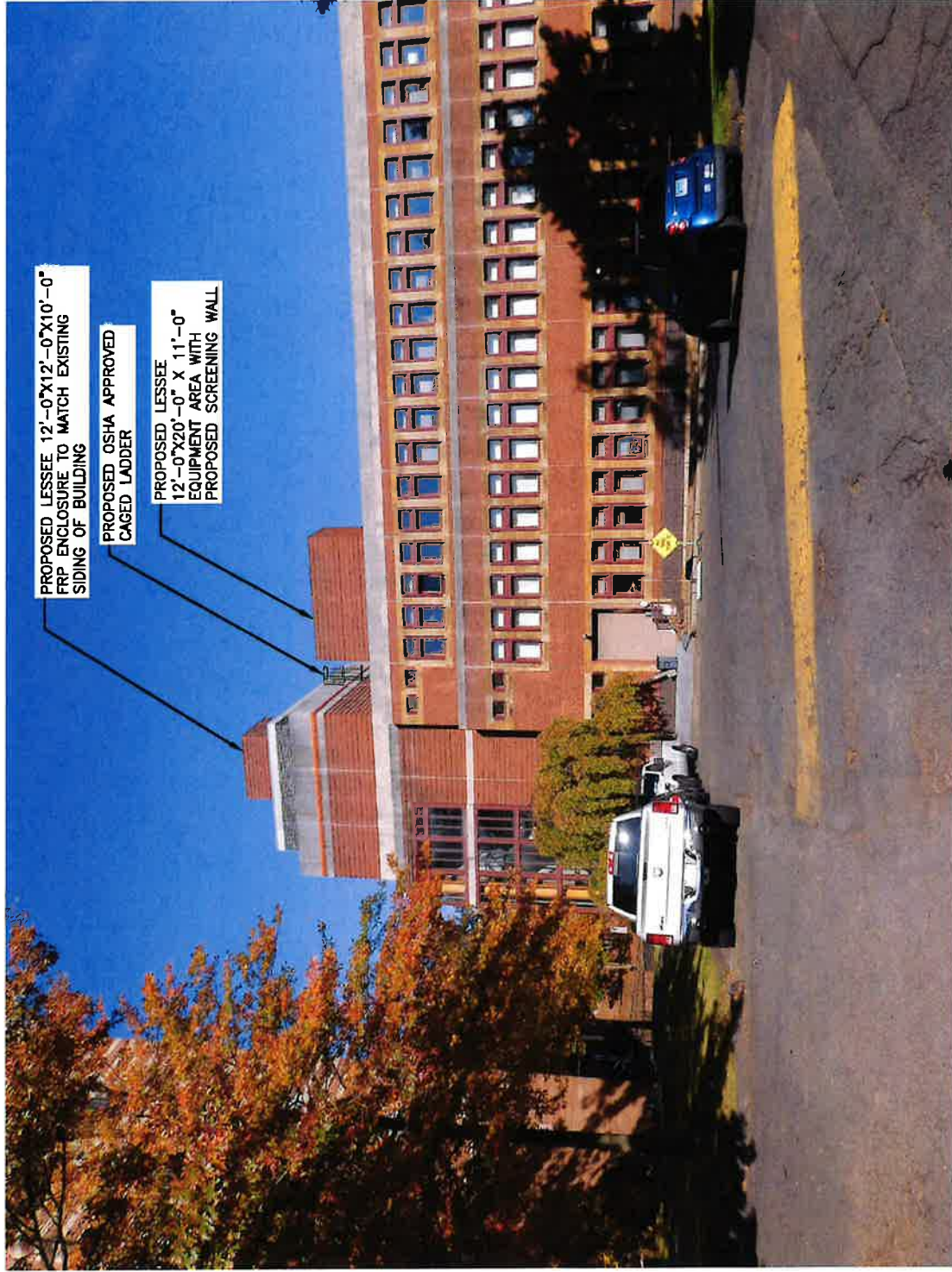
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PROPOSED CONDITIONS

LOCATION # 1

DATE OF PHOTO: 11/03/2021



VIEW NORTH FROM PARKING LOT

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PREPARED FOR:

verizon

118 FLANDERS ROAD
WESTBOROUGH, MA 01581

H2G HUDSON
Design Group LLC
44 STITCHWOOD DRIVE
N. ANDOVER, MA 01854
TEL: 978.657.4952
FAX: 978.324.2522

SITE TYPE: ROOFTOP

DATE: 03/11/2022
REV: 1

DRAWN BY: AM

SCALE: N.T.S.

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EXISTING CONDITIONS

LOCATION # 2

DATE OF PHOTO: 11/03/2021



VIEW SOUTH FROM BACK GARDEN

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PROVIDED FOR:
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HDG
HUDSON
Design Group LLC
44 RITCHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 537-5553
FAX: (978) 334-5556

SITE TYPE: ROOFTOP
DATE: 03/1/2022
REV: 1
DRAWN BY: AM
SCALE: N.T.S.

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PROPOSED CONDITIONS

LOCATION # 2

DATE OF PHOTO: 11/03/2021



VIEW SOUTH FROM BACK GARDEN

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
 HARTFORD, CT 06106

PREPARED FOR:
verizon
 118 FLANDERS ROAD
 WESTBOROUGH, MA 01581

H2G
HUDSON
Design Group LLC
14 AIRCRAFT DRIVE
 WESTBOROUGH, MA 01581
 TEL: 978.867.6650
 FAX: 978.834.6550

SITE TYPE: ROOFTOP
DATE: 03/11/2022
REV: 1
DRAWN BY: AM
SCALE: N.T.S.

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EXISTING CONDITIONS

LOCATION # 3

DATE OF PHOTO: 11/03/2021



VIEW SOUTH FROM BACK GARDEN

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PREPARED FOR:

verizon

118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HGG
HUDSON
Design Group LLC

45 ALFRED ROAD
N ANDOVER, MA 01845
TEL: (978) 435-5553
FAX: (978) 334-5553

SITE TYPE: ROOFTOP

DATE: 03/11/2022 **REV:** 1

DRAWN BY: AM

SCALE: N.T.S.

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PROPOSED CONDITIONS

LOCATION # 3

DATE OF PHOTO: 11/03/2021

- PROPOSED LESSEE 12'-0"x12'-0"x10'-0" FRP ENCLOSURE TO MATCH EXISTING SIDING OF BUILDING
- PROPOSED OSHA APPROVED CAGED LADDER
- PROPOSED LESSEE 12'-0"x20'-0" X 11'-0" EQUIPMENT AREA WITH PROPOSED SCREENING WALL



VIEW SOUTH FROM BACK GARDEN

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
 HARTFORD, CT 06106

PREPARED FOR:

verizon

118 FLANDERS ROAD
 WESTBOROUGH, MA 01581

HDS
HUDSON
 Design Group LLC

45 BEECHWOOD DRIVE
 N. ANDOVER, MA 01854
 TEL: 978.657.6666
 FAX: 978.336.2558

SITE TYPE: ROOFTOP	
DATE: 03/11/2022	REV: 1
DRAWN BY: AM	
SCALE: N.T.S.	

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PAGE 8 OF 16

EXISTING CONDITIONS

LOCATION # 4

DATE OF PHOTO: 11/03/2021



VIEW NORTHEAST FROM BUILDING STAIRS

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
 HARTFORD, CT 06106

PREPARED FOR:
verizon
 118 FLANDERS ROAD
 WESTBOROUGH, MA 01581

HDG HUDSON
Design Group LLC
45 STEPHENS DRIVE
 HARTFORD, CT 06115
 TEL: 860.465.6550
 FAX: 878.334.2335

SITE TYPE: ROOFTOP
DATE: 03/11/2022
REV: 1
DRAWN BY: AM
SCALE: N.T.S.

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PROPOSED CONDITIONS

LOCATION # 4

DATE OF PHOTO: 11/03/2021



PROPOSED LESSEE 12'-0"X12'-0"X10'-0"
FRP ENCLOSURE TO MATCH EXISTING
SIDING OF BUILDING

PROPOSED CABLE TRAY TO MATCH
EXISTING BUILDING COLOR

PROPOSED LESSEE
12'-0"X20'-0" X 11'-0"
EQUIPMENT AREA WITH
PROPOSED SCREENING WALL

VIEW NORTHEAST FROM BUILDING STAIRS

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PREPARED FOR:



118 FLANDERS ROAD
WESTBOROUGH, MA 01581



45 LITCHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: 978.697.6553
FAX: 978.234.5554

SITE TYPE: ROOFTOP	
DATE: 03/11/2022	REV: 1
DRAWN BY: AM	
SCALE: N.T.S.	

THIS STUDY DOES NOT CLAIM IN ANY WAY TO SHOW THE ONLY AREAS OF VISIBILITY. IT IS MEANT TO SHOW A BROAD REPRESENTATION OF AREAS WHERE THE PROPOSED INSTALLATION MAY BE VISIBLE BASED UPON THE BEST INFORMATION FOR TOPOGRAPHY AND VEGETATION LOCATIONS AVAILABLE TO DATE.

EXISTING/PROPOSED CONDITIONS **LOCATION # 5** **DATE OF PHOTO: 11/03/2021**



VIEW NORTHEAST FROM PARKING LOT (EQUIPMENT NOT VISIBLE)

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SITE TYPE: ROOFTOP
DATE: 03/11/2022 REV: 1
DRAWN BY: AM
SCALE: N.T.S.

H2G HUDSON
Design Group LLC
45 HARTFORD PARK
HARTFORD, MA 01105
TEL: 860.437.4650
FAX: 877.236.2250

PREPARED FOR:
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

SITE NAME: HARTFORD S 7 CT

ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

EXISTING/PROPOSED CONDITIONS **LOCATION # 6** **DATE OF PHOTO: 11/03/2021**



VIEW WEST FROM CRESCENT ST (EQUIPMENT NOT VISIBLE)

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PREPARED FOR:
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

H2G HUDSON
Design Group LLC
45 TECHWOOD DRIVE
N ANDOVER, MA 01845
TEL: 978.857.6652
FAX: 978.336.2259

SITE TYPE: ROOFTOP
DATE: 03/11/2022 **REV:** 1
DRAWN BY: AM
SCALE: N.T.S.

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EXISTING CONDITIONS

LOCATION # 7

DATE OF PHOTO: 11/03/2021



VIEW NORTHEAST FROM SIDEWALK

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PREPARED FOR:

verizon

118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HDG
HUDSON
Design Group LLC

45 MITCHELL DRIVE
N ANDOVER, MA 01845
TEL: (978) 537-6552
FAX: (978) 336-3359

SITE TYPE: ROOFTOP

DATE: 03/11/2022

REV: 1

DRAWN BY: AM

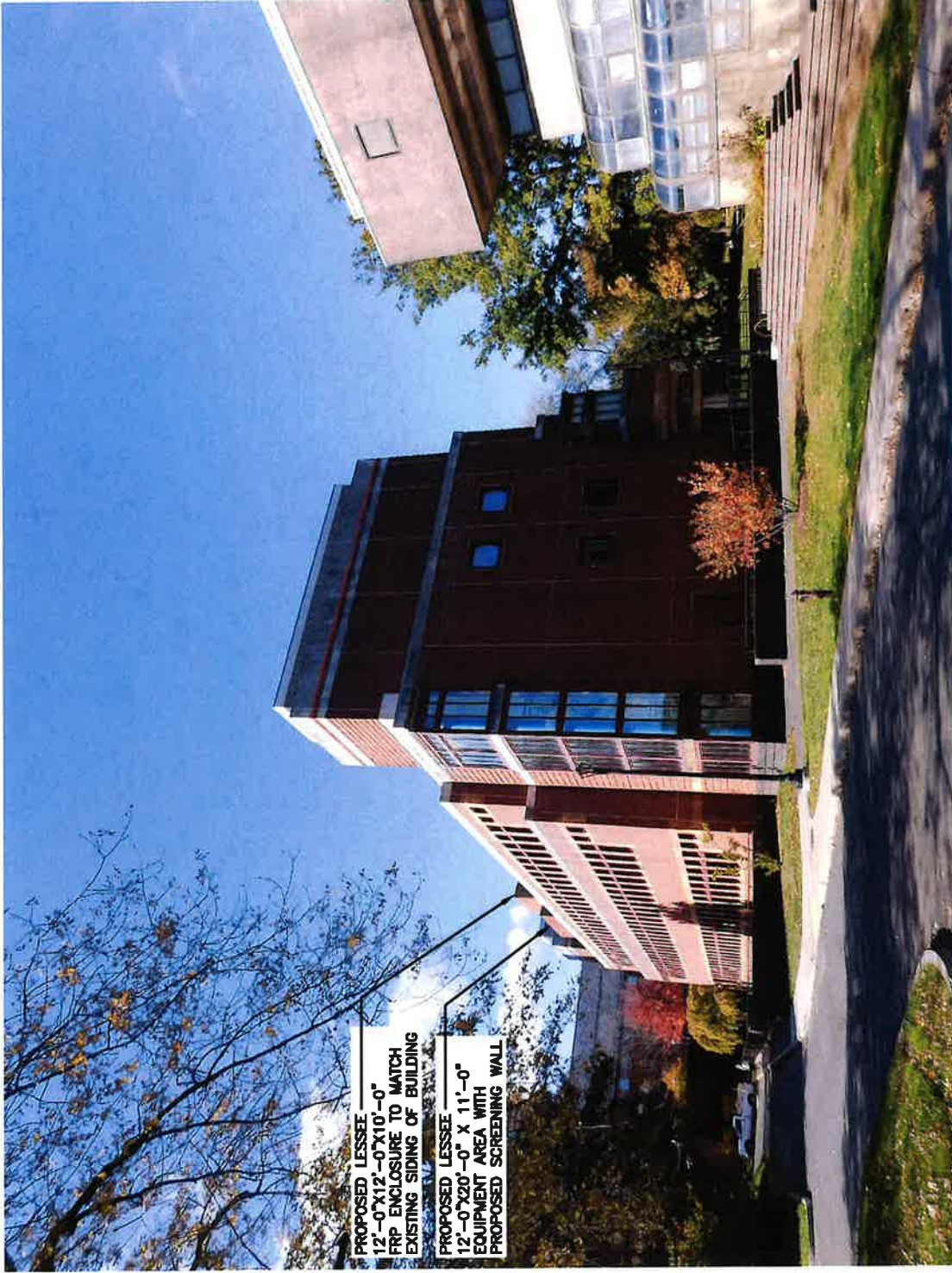
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PROPOSED CONDITIONS

LOCATION # 7

DATE OF PHOTO: 11/03/2021



PROPOSED LESSEE
 12'-0"X12'-0"X10'-0"
 FRP ENCLOSURE TO MATCH
 EXISTING SIDING OF BUILDING

PROPOSED LESSEE
 12'-0"X20'-0" X 11'-0"
 EQUIPMENT AREA WITH
 PROPOSED SCREENING WALL

VIEW NORTHEAST FROM SIDEWALK

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
 HARTFORD, CT 06106

PREPARED FOR:
verizon
 118 FLANDERS ROAD
 WESTBOROUGH, MA 01581

H2G HUDSON
Design Group LLC
 45 WASHINGTON STREET
 N ANDOVER, MA 01845
 TEL: 978.657.6550
 FAX: 978.656.5350

SITE TYPE: ROOFTOP
DATE: 03/11/2022
REV: 1
DRAWN BY: AM
SCALE: N.T.S.

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EXISTING CONDITIONS

LOCATION # 8

DATE OF PHOTO: 11/03/2021



VIEW NORTHEAST FROM SIDEWALK

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
 HARTFORD, CT 06106

PREPARED FOR:
verizon
 118 FLANDERS ROAD
 WESTBOROUGH, MA 01581

H2G HUDSON
Design Group LLC
 45 STEPHENSON DRIVE
 WILMINGTON, MA 01895
 TEL: 978.455.6552
 FAX: 978.234.3332

SITE TYPE: ROOFTOP

DATE: 03/11/2022 **REV:** 1

DRAWN BY: AM

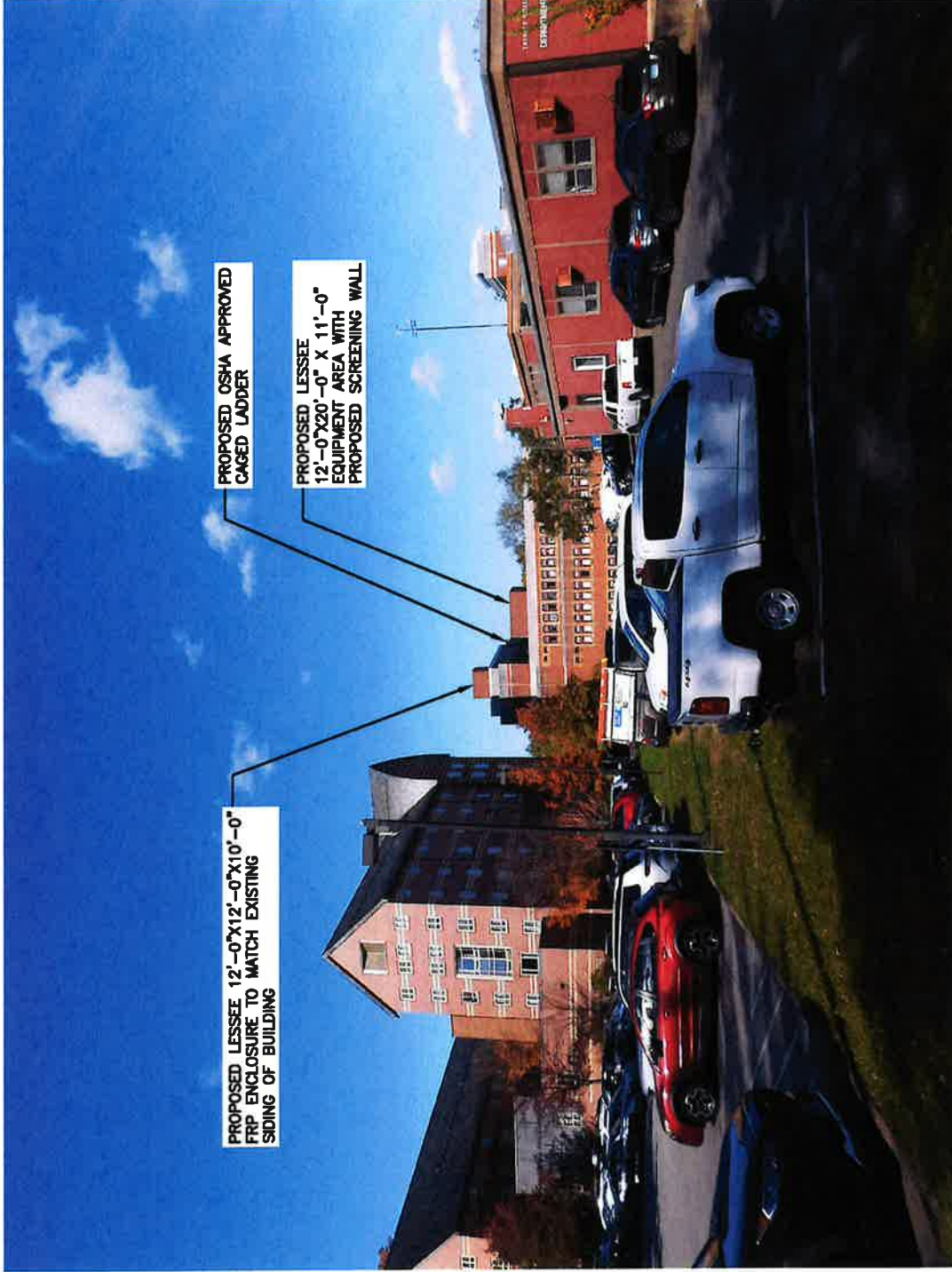
SCALE: N.T.S.

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PROPOSED CONDITIONS

LOCATION # 8

DATE OF PHOTO: 11/03/2021



PROPOSED LESSEE 12'-0"X12'-0"X10'-0"
FRP ENCLOSURE TO MATCH EXISTING
SIDING OF BUILDING

PROPOSED OSHA APPROVED
CAGED LADDER

PROPOSED LESSEE
12'-0"X20'-0" X 11'-0"
EQUIPMENT AREA WITH
PROPOSED SCREENING WALL

VIEW NORTHEAST FROM SIDEWALK

SITE NAME:HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PROVIDED FOR:
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

H2G HUDSON
Design Group LLC
45 STEELWOOD DRIVE
N. ANDOVER, MA 01845
TEL: 978.327.5553
FAX: 978.326.5556

SITE TYPE: ROOFTOP	
DATE: 03/11/2022	REV: 1
DRAWN BY:AM	
SCALE: N.T.S.	

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EXISTING CONDITIONS

LOCATION # 9

DATE OF PHOTO: 11/03/2021



VIEW NORTHEAST FROM BUILDING STAIRS

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

POWERED BY:
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HDG
HUDSON
Design Group LLC
45 TECHWOOD DRIVE
N ANDOVER, MA 01845
TEL: 978.657.4550
FAX: 978.334.3339

SITE TYPE: ROOFTOP

DATE: 03/11/2022

REV: 1

DRAWN BY: AM

SCALE: N.T.S.

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PROPOSED CONDITIONS

LOCATION # 9

DATE OF PHOTO: 11/03/2021



PROPOSED CABLE TRAY
TO MATCH EXISTING
BUILDING COLOR

PROPOSED LESSEE
12'-0" X 20'-0" X 11'-0"
EQUIPMENT AREA WITH
PROPOSED SCREENING WALL

VIEW NORTHEAST FROM BUILDING STAIRS

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PREPARED FOR
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

H2G HUDSON
Design Group LLC
45 LITCHWOOD DRIVE
N. ANDOVER, MA 01855
TEL: (978) 527-8555
FAX: (978) 334-5594

SITE TYPE: ROOFTOP

DATE: 03/11/2022 **REV:** 1

DRAWN BY: AM

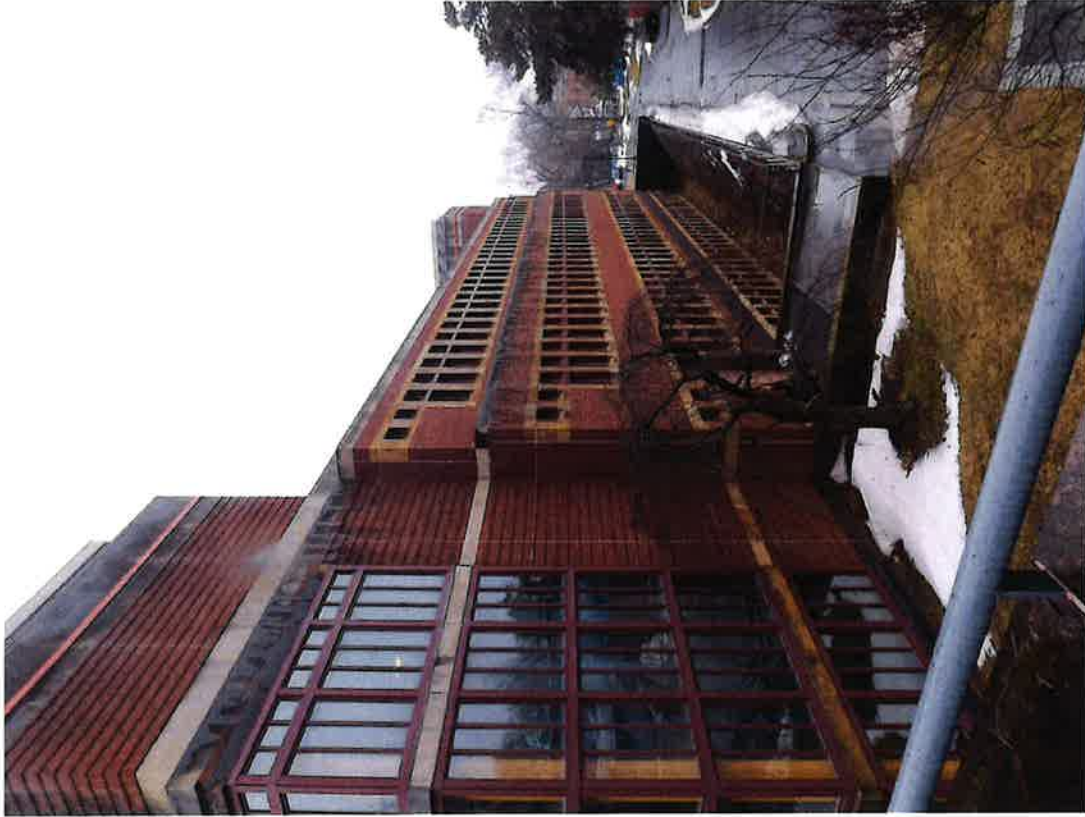
SCALE: N.T.S.

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IT IS MEANT TO SHOW A BROAD
REPRESENTATION OF AREAS WHERE THE
PROPOSED INSTALLATION MAY BE VISIBLE
BASED UPON THE BEST INFORMATION FOR
TOPOGRAPHY AND VEGETATION
LOCATIONS AVAILABLE TO DATE.

EXISTING CONDITIONS

LOCATION # 10

DATE OF PHOTO: 11/03/2021



VIEW NORTHEAST FROM BUILDING STAIRS

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
 HARTFORD, CT 06106

PREPARED FOR:
verizon
 118 FLANDERS ROAD
 WESTBOROUGH, MA 01581

HDG
HUDSON
Design Group LLC
 42 BECHWOOD DRIVE
 FARMINGTON, CT 06030
 TEL: 860.635.1000
 FAX: 860.635.0200

SITE TYPE: ROOFTOP

DATE: 03/11/2022 **REV:** 1

DRAWN BY: AM

SCALE: N.T.S.

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PROPOSED CONDITIONS

LOCATION # 10

DATE OF PHOTO: 11/03/2021



PROPOSED CABLE TRAY TO MATCH
EXISTING BUILDING COLOR

PROPOSED LESSEE 12'-0"X12'-0"X10'-0"
FRP ENCLOSURE TO MATCH EXISTING
SIDING OF BUILDING

VIEW NORTHEAST FROM BUILDING STAIRS

SITE NAME: HARTFORD S 7 CT
ADDRESS: 300 SUMMIT STREET
HARTFORD, CT 06106

PREPARED FOR:
verizon
118 FLANDERS ROAD
WESTBOROUGH, MA 01581

HDPG
Hudson
Design Group LLC
46 BEECHWOOD DRIVE
NANDUKE, MA 01863
TEL: 978.657.6600
FAX: 978.336.3336

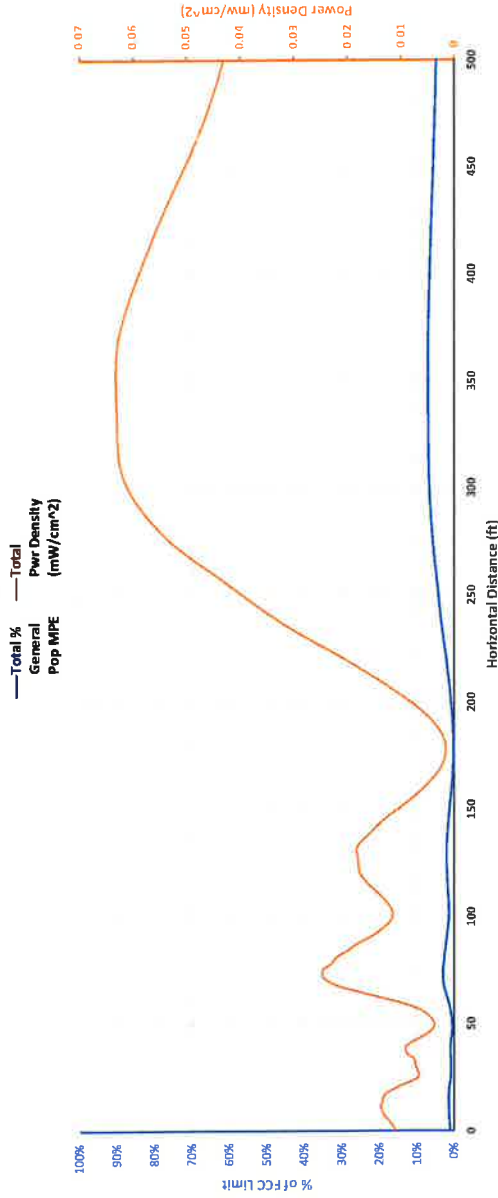
SITE TYPE: ROOFTOP
DATE: 03/11/2022
REV: 1
DRAWN BY: AM
SCALE: N.T.S.

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REPRESENTATION OF AREAS WHERE THE
PROPOSED INSTALLATION MAY BE VISIBLE
BASED UPON THE BEST INFORMATION FOR
TOPOGRAPHY AND VEGETATION FOR
LOCATIONS AVAILABLE TO DATE

ATTACHMENT 6

HARTFORD S. CT						
Location	10/20/2022					
Date						
Band	C-Band	PCS	850-LTE	700		
Operating Frequency (MHz)	3,700	3,550	2,145	1,970	880	746
General Population MPE (mW/cm ²)	1	1	1	1	0.588666667	0.497333333
ERP Per Transmitter (Watts)	13,335	50	1,496	1,486	752	669
Number of Transmitters	2	4	4	4	4	4
Antenna Configuration (feet)	73	73	73	73	73	73
Total ERP (Watts)	26,670	200	5,984	5,944	3,008	2,676
Total ERP (dBm)	74	53	68	68	65	64
Maximum % of General Population Served	7.6%					

RF Exposure 6ft Above Ground Level Far Field Formula (per FCC OET65)



Angle Below Horizon	C-Band	850-LTE	PCS	AWS	700 MHz	850-LTE	PCS	AWS	700 MHz	C-Band	PCS	AWS	700 MHz	C-Band	PCS	AWS	700 MHz	CMRA	700 MHz	Distance	Total Pwr Density (mW/cm ²)	Total % General Pop Served	
90	0.010561297	7.66874E-06	9.34779E-06	0.000161352	2.09498E-05	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588	0.000246588
89	0.010558802	5.81596E-06	1.17648E-05	0.000176006	2.04631E-05	0.000270315	2.04631E-05	0.000270315	2.04631E-05	0.000270315	2.04631E-05	0.000270315	2.04631E-05	0.000270315	2.04631E-05	0.000270315	2.04631E-05	0.000270315	2.04631E-05	1.029848831	0.011084771	1.13%	
88	0.010797091	3.0501E-06	1.44636E-05	0.000280132	1.9988E-05	0.000347459	1.9988E-05	0.000347459	1.9988E-05	0.000347459	1.9988E-05	0.000347459	1.9988E-05	0.000347459	1.9988E-05	0.000347459	1.9988E-05	0.000347459	1.9988E-05	2.0603254	0.011439484	1.17%	
87	0.010934357	4.30329E-06	1.44465E-05	0.000328737	1.90659E-05	0.000408365	1.90659E-05	0.000408365	1.90659E-05	0.000408365	1.90659E-05	0.000408365	1.90659E-05	0.000408365	1.90659E-05	0.000408365	1.90659E-05	0.000408365	1.90659E-05	3.092058878	0.011709275	1.20%	
86	0.011170524	7.81773E-06	1.28541E-05	0.000368239	1.77639E-05	0.000525204	1.77639E-05	0.000525204	1.77639E-05	0.000525204	1.77639E-05	0.000525204	1.77639E-05	0.000525204	1.77639E-05	0.000525204	1.77639E-05	0.000525204	1.77639E-05	4.125681905	0.012102405	1.25%	
85	0.01144672	9.16546E-06	1.34812E-05	0.000452067	1.61663E-05	0.000647766	1.61663E-05	0.000647766	1.61663E-05	0.000647766	1.61663E-05	0.000647766	1.61663E-05	0.000647766	1.61663E-05	0.000647766	1.61663E-05	0.000647766	1.61663E-05	5.161831148	0.012285316	1.28%	
84	0.011376608	7.88072E-06	1.39634E-05	0.000594366	1.50479E-05	0.000773157	1.50479E-05	0.000773157	1.50479E-05	0.000773157	1.50479E-05	0.000773157	1.50479E-05	0.000773157	1.50479E-05	0.000773157	1.50479E-05	0.000773157	1.50479E-05	6.201149881	0.012766342	1.35%	
83	0.011341473	7.07495E-06	2.7267E-05	0.000781133	0.000889461	1.43263E-05	0.000889461	1.43263E-05	0.000889461	1.43263E-05	0.000889461	1.43263E-05	0.000889461	1.43263E-05	0.000889461	1.43263E-05	0.000889461	1.43263E-05	0.000889461	1.43263E-05	7.244289053	0.013056236	1.37%
82	0.011300972	5.95607E-06	3.26651E-05	0.000957572	1.42751E-05	0.000966676	1.42751E-05	0.000966676	1.42751E-05	0.000966676	1.42751E-05	0.000966676	1.42751E-05	0.000966676	1.42751E-05	0.000966676	1.42751E-05	0.000966676	1.42751E-05	8.291909247	0.013282317	1.40%	
81	0.011255321	1.72329E-05	3.65021E-05	0.001146584	0.001035587	1.55888E-05	0.001035587	1.55888E-05	0.001035587	1.55888E-05	0.001035587	1.55888E-05	0.001035587	1.55888E-05	0.001035587	1.55888E-05	0.001035587	1.55888E-05	0.001035587	1.55888E-05	9.344681979	0.013528886	1.44%
80	0.010949807	2.59644E-05	4.07695E-05	0.001372229	1.86567E-05	0.001524587	1.86567E-05	0.001524587	1.86567E-05	0.001524587	1.86567E-05	0.001524587	1.86567E-05	0.001524587	1.86567E-05	0.001524587	1.86567E-05	0.001524587	1.86567E-05	10.40329186	0.013855986	1.46%	
79	0.010645732	3.17841E-05	4.87695E-05	0.001679698	2.50402E-05	0.001757259	2.50402E-05	0.001757259	2.50402E-05	0.001757259	2.50402E-05	0.001757259	2.50402E-05	0.001757259	2.50402E-05	0.001757259	2.50402E-05	0.001757259	2.50402E-05	11.46683714	0.014272328	1.48%	
78	0.009378388	3.86644E-05	6.10563E-05	0.002008251	3.51743E-05	0.002370935	3.51743E-05	0.002370935	3.51743E-05	0.002370935	3.51743E-05	0.002370935	3.51743E-05	0.002370935	3.51743E-05	0.002370935	3.51743E-05	0.002370935	3.51743E-05	12.54083714	0.014715218	1.46%	
77	0.00897558	4.61643E-05	7.46635E-05	0.002345222	4.93846E-05	0.002815294	4.93846E-05	0.002815294	4.93846E-05	0.002815294	4.93846E-05	0.002815294	4.93846E-05	0.002815294	4.93846E-05	0.002815294	4.93846E-05	0.002815294	4.93846E-05	13.62127328	0.015134518	1.45%	
76	0.008244392	5.3851E-05	8.51607E-05	0.002614127	6.61811E-05	0.003143916	6.61811E-05	0.003143916	6.61811E-05	0.003143916	6.61811E-05	0.003143916	6.61811E-05	0.003143916	6.61811E-05	0.003143916	6.61811E-05	0.003143916	6.61811E-05	14.71035217	0.015580235	1.47%	
75	0.007462316	5.85977E-05	8.85433E-05	0.002826052	8.46545E-05	0.003428482	8.46545E-05	0.003428482	8.46545E-05	0.003428482	8.46545E-05	0.003428482	8.46545E-05	0.003428482	8.46545E-05	0.003428482	8.46545E-05	0.003428482	8.46545E-05	15.80900235	0.01603260894	1.47%	
74	0.006596705	5.67981E-05	6.92302E-05	0.0030216422	0.000103356	0.002213749	0.000103356	0.002213749	0.000103356	0.002213749	0.000103356	0.002213749	0.000103356	0.002213749	0.000103356	0.002213749	0.000103356	0.002213749	0.000103356	16.91797776	0.01646447	1.46%	
73	0.006596705	5.67981E-05	6.92302E-05	0.003216495	0.000123251	0.002463666	0.000123251	0.002463666	0.000123251	0.002463666	0.000123251	0.002463666	0.000123251	0.002463666	0.000123251	0.002463666	0.000123251	0.002463666	0.000123251	18.03811021	0.01686146	1.44%	

ATTACHMENT 7

* Federal Airways & Airspace *
* Summary Report: New Construction *
* Antenna Structure *

Airspace User: Not Identified

File: HARTFORDS7

Location: Hartford, CT

Latitude: 41°-44'-40.15" Longitude: 72°-41'-29.09"

SITE ELEVATION AMSL.....111 ft.
STRUCTURE HEIGHT.....77 ft.
OVERALL HEIGHT AMSL.....188 ft.

NOTICE CRITERIA

FAR 77.9(a): NNR (DNE 200 ft AGL)
FAR 77.9(b): NR (Exceeds Notice Slope, Maximum: 113 ft.)
FAR 77.9(c): NNR (Not a Traverse Way)
FAR 77.9: NNR FAR 77.9 IFR Straight-In Notice Criteria for HFD
FAR 77.9: NNR FAR 77.9 IFR Straight-In Notice Criteria for 4B8
FAR 77.9(d): NNR (Off Airport Construction)

NR = Notice Required

NNR = Notice Not Required

PNR = Possible Notice Required (depends upon actual IFR procedure)
For new construction review Air Navigation Facilities at bottom
of this report.

Notice to the FAA is required because height exceeds Notice Slope criteria.
The maximum height to avoid notice is 113 ft AMSL.

OBSTRUCTION STANDARDS

FAR 77.17(a)(1): DNE 499 ft AGL
FAR 77.17(a)(2): DNE - Airport Surface
FAR 77.19(a): DNE - Horizontal Surface
FAR 77.19(b): DNE - Conical Surface
FAR 77.19(c): DNE - Primary Surface
FAR 77.19(d): DNE - Approach Surface
FAR 77.19(e): DNE - Approach Transitional Surface
FAR 77.19(e): DNE - Abeam Transitional Surface

VFR TRAFFIC PATTERN AIRSPACE FOR: HFD: HARTFORD-BRAINARD

Type: A RD: 9967.417 RE: 13.9

FAR 77.17(a)(1): DNE
FAR 77.17(a)(2): DNE - Height No Greater Than 200 feet AGL.
VFR Horizontal Surface: DNE

VFR Conical Surface: DNE
 VFR Primary Surface: DNE
 VFR Approach Surface: DNE
 VFR Transitional Surface: DNE

The structure is within VFR - Traffic Pattern Airspace Runway Side Area. Structures that exceed horizontal, conical, and/or 500' AGL will receive a hazard determination from the FAA.

VFR TRAFFIC PATTERN AIRSPACE FOR: 4B8: ROBERTSON FLD

Type: A RD: 50554.79 RE: 201.6

FAR 77.17(a)(1): DNE
 FAR 77.17(a)(2): DNE - Greater Than 5.99 NM.
 VFR Horizontal Surface: DNE
 VFR Conical Surface: DNE
 VFR Primary Surface: DNE
 VFR Approach Surface: DNE
 VFR Transitional Surface: DNE

TERPS DEPARTURE PROCEDURE (FAA Order 8260.3, Volume 4)

FAR 77.17(a)(3) Departure Surface Criteria (40:1)
 DNE Departure Surface

MINIMUM OBSTACLE CLEARANCE ALTITUDE (MOCA)

FAR 77.17(a)(4): DNE - No Airway Found

PRIVATE LANDING FACILITIES

FACIL IDENT TYP NAME	BEARING To FACIL	RANGE IN NM	DELTA ARP FAA ELEVATION IFR
0CT9 HEL HARTFORD HOSPITAL No Impact to Private Landing Facility Structure 23 ft below heliport.	43.91	.83	-23
0CT5 HEL ST FRANCIS HOSPITAL No Impact to Private Landing Facility Structure is beyond notice limit by 6241 feet.	349.13	1.85	+4
CT88 HEL RENTSCHLER No Impact to Private Landing Facility Structure is beyond notice limit by 12499 feet.	79.37	2.88	+140
CT06 HEL DELTA ONE No Impact to Private Landing Facility Structure is beyond notice limit by 13228 feet.	27.48	3.00	+167
CT75 HEL UCONN HEALTH No Impact to Private Landing Facility Structure 152 ft below heliport.	261.63	4.61	-152

CT38	HEL CORPORATE CENTER	112.6	5.04	+84
No Impact to Private Landing Facility				
Structure is beyond notice limit by 25624 feet.				
CT62	HEL TWIN MANUFACTURING COMPANY	43.12	5.36	+128
No Impact to Private Landing Facility				
Structure is beyond notice limit by 27568 feet.				
CT28	HEL CT DEPT OF VETERANS AFFAIRS	159.11	5.53	+38
No Impact to Private Landing Facility				
Structure is beyond notice limit by 28601 feet.				
CT04	HEL CHASE	299.17	5.54	-512
No Impact to Private Landing Facility				
Structure 512 ft below heliport.				

AIR NAVIGATION ELECTRONIC FACILITIES

FAC		ST		DIST		DELTA		GRND
IDNT	TYPE	AT	FREQ	VECTOR	(ft)	ELEVA	ST LOCATION	ANGLE

HFD	ATCT	I	A/G	107.71	11435	+113	CT HARTFORD-BRAINARD	.57
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Notice Not Required for Stations operating with an ERP no greater than 3500 watts and frequencies are within the FAA/FCC co-location policy frequency bands. If ERP of 3500 watts is exceeded notice to the FAA is required.

HFD	LOCALIZER	I	109.7	111.45	11728	+177	CT RWY 02 HARTFORD-B	.86
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HFD	VOR/DME	R	114.9	133.82	54465	-661	CT HARTFORD	-.7
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BDL	RADAR	I		1.97	70760	-48	CT BRADLEY INTL	-.04
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No Impact. This structure does not require Notice based upon EMI. The studied location is within 20 NM of a Radar facility. The calculated Radar Line-Of-Sight (LOS) distance is: 36 NM. This location and height is within the Radar Line-Of-Sight.

BDL	VORTAC	D	109.0	.62	71613	+28	CT BRADLEY	.02
-----	--------	---	-------	-----	-------	-----	------------	-----

BAF	VORTAC	R	113.0	357.47	152273	-79	MA BARNES	-.03
-----	--------	---	-------	--------	--------	-----	-----------	------

MAD	VOR/DME	I	110.4	180.08	156910	-28	CT MADISON	-.01
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CEF	TACAN	R	114.0	15.16	171088	-52	MA WESTOVER	-.02
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ORW	VOR/DME	I	110.0	110.15	201186	-122	CT NORWICH	-.03
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CTR VOR/DME R 115.1 340.7 211237 -1412 MA CHESTER

-.38

CFR Title 47, §1.30000-§1.30004

AM STUDY NOT REQUIRED: Structure is not near a FCC licensed AM station.
Movement Method Proof as specified in §73.151(c) is not required.
Please review 'AM Station Report' for details.

Nearest AM Station: WRYM @ 7205 meters.

Airspace® Summary Version 22.9.653

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10-18-2022

19:24:46

ATTACHMENT 8

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

November 7, 2022

Via Certificate of Mailing

Luke Bronin, Mayor
City of Hartford
550 Main Street
Hartford, CT 06103

Re: **Petition for Declaratory Ruling Filed with the Connecticut Siting Council for Modifications to its Existing Wireless Telecommunications Facility at 300 Summit Street, Hartford, Connecticut**

Dear Mayor Bronin:

This firm represents Cellco Partnership d/b/a Verizon Wireless (“Cellco”). Today, Cellco filed a Petition for Declaratory Ruling (“Petition”) with the Connecticut Siting Council (“Council”) seeking approval for the installation of a wireless telecommunications facility on the roof of a building at Trinity College, 300 Summit Street in Hartford (the “Property”).

The facility will consist of the installation of six (6) panel-type antennas and nine (9) remote radio heads attached to a new metal frame lattice antenna structure in the western portion of the roof. Equipment associated with the antennas will be placed on a steel platform also on the roof of the building. The antennas and equipment will be screened and painted to match the building.

A copy of the full Petition is attached for your review. Landowners whose parcels are considered to abut the Property were also sent notice of this filing along with a copy of the Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,



Kenneth C. Baldwin

Attachment

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

November 7, 2022

Via Certificate of Mailing

Aimee Chambers, Director of Planning
City of Hartford
260 Constitution Plaza, 1st Floor
Hartford, CT 06103

Re: **Petition for Declaratory Ruling Filed with the Connecticut Siting Council for Modifications to its Existing Wireless Telecommunications Facility at 300 Summit Street, Hartford, Connecticut**

Dear Ms. Chambers:

This firm represents Cellco Partnership d/b/a Verizon Wireless (“Cellco”). Today, Cellco filed a Petition for Declaratory Ruling (“Petition”) with the Connecticut Siting Council (“Council”) seeking approval for the installation of a wireless telecommunications facility on the roof of a building at Trinity College, 300 Summit Street in Hartford (the “Property”).

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Please contact me if you have any questions regarding this proposal.

Sincerely,



Kenneth C. Baldwin

Attachment

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

November 7, 2022

Via Certificate of Mailing

The Trustees of Trinity College
300 Summit Street
Hartford, CT 06106

Re: **Petition for Declaratory Ruling Filed with the Connecticut Siting Council for Modifications to its Existing Wireless Telecommunications Facility at 300 Summit Street, Hartford, Connecticut**

Dear Sir or Madam:

This firm represents Cellco Partnership d/b/a Verizon Wireless (“Cellco”). Today, Cellco filed a Petition for Declaratory Ruling (“Petition”) with the Connecticut Siting Council (“Council”) seeking approval for the installation of a wireless telecommunications facility on the roof of a building at Trinity College, 300 Summit Street in Hartford (the “Property”).

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A copy of the full Petition is attached for your review. Landowners whose parcels are considered to abut the Property were also sent notice of this filing along with a copy of the Petition.

Please contact me if you have any questions regarding this proposal.

Sincerely,



Kenneth C. Baldwin

Attachment

ATTACHMENT 9

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

November 7, 2022

Via Certificate of Mailing

«Name_and_Address»

Re: Petition for Declaratory Ruling Filed with the Connecticut Siting Council for Modifications to an Existing Wireless Telecommunications Facility at 300 Summit Street, Hartford, Connecticut

Dear «Salutation»:

This firm represents Cellco Partnership d/b/a Verizon Wireless (“Cellco”). Today, Cellco filed a Petition for Declaratory Ruling (“Petition”) with the Connecticut Siting Council (“Council”) seeking approval for the installation of a wireless telecommunications facility on the roof of a building at Trinity College, 300 Summit Street in Hartford (the “Property”).

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This notice and a full copy of the Petition is being sent to you because you are listed on the Town Assessor’s records as an owner of land that abuts the Property. If you have any questions regarding the Petition, the Council’s process for reviewing the Petition or the details of the filing itself, please feel free to contact me at the number listed above. You may also contact the Council directly at 860-827-2935.

Robinson + Cole

November 7, 2022

Page 2

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth C. Baldwin". The signature is fluid and cursive, with the first name being the most prominent.

Kenneth C. Baldwin

Attachment

CELLCO PARTNERSHIP D/B/A VERIZON WIRELESS

ABUTTING PROPERTY OWNERS

**300 SUMMIT STREET
HARTFORD, CONNECTICUT**

	Property Address	Owner's and Mailing Address
1.	2 Fairfield Avenue	City of Hartford Park Department 550 Main Street Hartford, CT 06103
2.	10 Fairfield Avenue	Fairfield Avenue Realty LLC 37 Country Club Road Wethersfield, CT 06109
3.	8 Fairfield Avenue	City of Hartford Fire Department 550 Main Street Hartford, CT 06103
4.	283-287 New Britain Avenue	Richard and Jadwiga Staron 24 Tee Lane Wethersfield, CT 06109
5.	275-277 New Britain Avenue	Rocio Mota 275-277 New Britain Avenue Hartford, CT 06106
6.	240 New Britain Avenue	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
7.	255-257 New Britain Avenue	George Petrykevych 210 Mohegan Drive West Hartford, CT 06117
8.	249 New Britain Avenue	Premium Apt LLC 20 Regal Court Lakewood, NJ 08701
9.	241-243 New Britain Avenue	Keith Chaney 148 Collins Street Hartford, CT 06105

	Property Address	Owner's and Mailing Address
10.	235-237 New Britain Avenue	Mary Opoku Boakye 235 New Britain Avenue Hartford, CT 06106
11.	234 New Britain Avenue	Trustees of Trinity College 111 deKoven Drive, Apt. 1103 Middletown, CT 06457
12.	228-230 New Britain Avenue	Trustees of Trinity College 300 Summit Street Hartford, CT 06106
13.	216 New Britain Avenue	Trustees of Trinity College 216 New Britain Avenue Hartford, CT 06106
14.	122 Crescent Street	Trustees of Trinity College 300 Summit Street Hartford, CT 06106
15.	114 Crescent Street	Trustees of Trinity College 300 Summit Street Hartford, CT 06106
16.	Crescent Street Town Houses	Trustees of Trinity College 300 Summit Street Hartford, CT 06106
17.	78 Crescent Street, Unit B	Trustees of Trinity College 300 Summit Street Hartford, CT 06106
18.	11 Crescent Street	Crescent Street At Trinity College LLC 45 Eastdale Avenue N, Suite 200 Poughkeepsie, NY 12603
19.	14 Crescent Street	Trustees of Trinity College 300 Summit Street Hartford, CT 06106
20.	1705 Broad Street	Trustees of Trinity College 300 Summit Street Hartford, CT 06106

	Property Address	Owner's and Mailing Address
21.	1710 Broad Street	John Giarenakis Bordonaro Service Center 1710 Broad Street Hartford, CT 06106
22.	1694-1696 Broad Street	Trevor Morrison 1694 Broad Street Hartford, CT 06106
23.	1686-1688 Broad Street	Vera F. Anderson 1686 Broad Street Hartford, CT 06106
24.	1678 Broad Street	ADK Associates LLC P.O. Box 330487 West Hartford, CT 06133
25.	1668 Broad Street	ADK Associates LLC P.O. Box 330487 West Hartford, CT 06133
26.	1660 Broad Street	1650-1680 Broad LLC 15 Allen Place, Suite A2 Hartford, CT 06106
27.	1650 Broad Street	1650-1680 Broad LLC 15 Allen Place, Suite A2 Hartford, CT 06106
28.	1642-1644 Broad Street	Urban Preservation Association LP 400 Washington Street Hartford, CT 06106
29.	1630-1632 Broad Street	Annabelle Diaz 700 Forbes Street East Hartford, CT 06118
30.	1620 Broad Street	Armando Gonzalez 1620 Broad Street Hartford, CT 06106
31.	1608-1612 Broad Street	Sina Properties Inc. 207 Washington Street Hartford, CT 06106

	Property Address	Owner's and Mailing Address
32.	1580 Broad Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
33.	73 Colonial Street	Broad Partners LLC 1543 E 38 th Street Brooklyn, NY 11230
34.	1536-1538 Broad Street	Sony and Gertrude Augustin 1536 Broad Street, 1538 Hartford, CT 06106
35.	1526-1528 Broad Street	Trinity Gateway Apartments LLC 1034 Prospect Avenue Hartford, CT 06105
36.	1500-1502 Broad Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
37.	53 Vernon Street	City of Hartford Learning Corridor 550 Main Street Hartford, CT 06103
38.	1300 Broad Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
39.	58-60 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
40.	66 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
41.	70 Vernon Street	The Trustees of Trinity College 70 Vernon Street Hartford, CT 06106
42.	72 Vernon Street	The Trustees of Trinity College 72 Vernon Street Hartford, CT 06106

	Property Address	Owner's and Mailing Address
43.	74 Vernon Street	The Trustees of Trinity College 74 Vernon Street Hartford, CT 06106
44.	76 Vernon Street	The Trustees of Trinity College 76 Vernon Street Hartford, CT 06106
45.	78 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
46.	84 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
47.	86-88 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
48.	90-92 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
49.	94 Vernon Street	TAU Alphas House Corp. Attn: Taylor Wolfe 305 Whiton Street 101 Jersey City, NJ 07304
50.	98 Vernon Street	The Alpha Chi Alumni Association 243 N. Main Street East Long Meadow, MA 01028
51.	100-102 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
52.	104-106 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
53.	108 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106

	Property Address	Owner's and Mailing Address
54.	110-112 Vernon Street	The Trustees of Trinity College 110 Vernon Street Hartford, CT 06106
55.	114 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
56.	118 Vernon Street	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
57.	183 Allen Place	The Trustees of Trinity College 300 Summit Street Hartford, CT 06106
58.	122 Vernon Street	Fraternity of Phi Kappa Chapter of the Alpha Delta Phi 1275 Welsh Road Huntington Valley, PA 19006
59.	134 Vernon Street	The Trustees of Trinity College 134 Vernon Street Hartford, CT 06106
60.	81 Vernon Street	The Colt Trust Inc. c/o Berry Group CT LLC 46 Wordwell Road West Hartford, CT 06107
61.	79 Vernon Street	The Trustees of Trinity College 79 Vernon Street Hartford, CT 06106