BZA APPLICATION FORM

GENERAL INFORMATION

The undersigned hereby petitions the Board of Zoning Appeal for the following:

Special Permit: X **Variance:** _____ **Appeal:** _____

2022 FEB 10 PM 4:36

PETITIONER: Cellco Partnership, d/b/a Verizon Wireless

PETITIONER'S ADDRESS: 900 Chelmsford Street, Tower 2, Floor 5, Lowell, MA 01851

LOCATION OF PROPERTY: 799 Concord Avenue, Cambridge

TYPE OF OCCUPANCY: Hospital **ZONING DISTRICT:** Office 1; AOD3

REASON FOR PETITION:

_____	Additions	_____	New Structure
_____	Change in Use/Occupancy	_____	Parking
_____	Conversion to Addi'l Dwelling Unit's	_____	Sign
_____	Dormer	_____	Subdivision
X	Other: Mobile Communications Facility		

DESCRIPTION OF PETITIONER'S PROPOSAL:

Special Permit for non-substantial changes to an existing rooftop mobile communications facility. The project will replace three existing panel antennas with new antennas, to be located in roughly the same locations on the building on existing mounting pipes. The project will also slightly extend the footprint of the existing rooftop fiberglass enclosures at three locations to conceal the new equipment. As modified, the enclosures will maintain the full screening of the facility and will be consistent in appearance with the existing enclosure.

SECTIONS OF ZONING ORDINANCE CITED:

Article 4 Section 4.32(g)(1) and Footnote 49 (Section 4.40.49)

Article 10 Section 10.40 (Special Permit)

Article _____ Section _____

Applicants for a **Variance** must complete Pages 1-5
Applicants for a **Special Permit** must complete Pages 1-4 and 6
Applicants for an **Appeal** to the BZA of a Zoning determination by the Inspectional Services Department must attach a statement concerning the reasons for the appeal

Original Signature(s): _____

(Petitioner(s)/Owner)

Michael S. Giaimo, attorney for Cellco Partnership d/b/a Verizon Wireless

(Print Name)

Address: Verizon Wireless, Attn: Andrew Candiello
900 Chelmsford Street, Tower 2, Floor 5,
Lowell, MA 01851

Tel. No.: (508)439-3278

E-Mail Address: mgiaimo@rc.com

*Robinson + Cole LLP
One Boston Place, 25th Floor, Boston, MA 02108
(617) 557-5959

Date: 12/20/2021

BZA APPLICATION FORM - OWNERSHIP INFORMATION

To be completed by OWNER, signed before a notary and returned to The Secretary of the Board of Zoning Appeals.

I/We Sancta Maria Hospital, INC.
(OWNER)

Address: 799 Concord Ave, Cambridge, MA 02138

State that I/We own the property located at 799 Concord Ave., which is the subject of this zoning application.

The record title of this property is in the name of Sancta Maria Hospital, INC.

*Pursuant to a deed of duly recorded in the date 4-16-64, Middlesex South County Registry of Deeds at Book 10521, Page 187; or Middlesex Registry District of Land Court, Certificate No. _____ Book _____ Page _____.

Mother Mary Janice Zdunczyk
*SIGNATURE BY LAND OWNER OR AUTHORIZED TRUSTEE, OFFICER OR AGENT**

Written evidence of Agent's standing to represent petitioner may be requested.

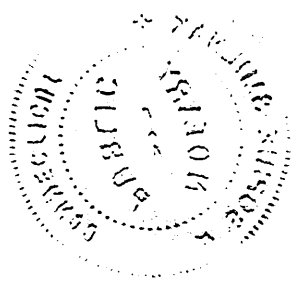
Commonwealth of Massachusetts, County of Middlesex

The above-name Mother M. Janice Zdunczyk personally appeared before me, this 10 of December 2021 and made oath that the above statement is true.

Sophie Smilnak Notary

My commission expires 7-31-2024 (Notary Seal).

- If ownership is not shown in recorded deed, e.g. if by court order, recent deed, or inheritance, please include documentation.



BZA APPLICATION FORM

DIMENSIONAL INFORMATION

APPLICANT: Cellco Partnership d/b/a Verizon Wireless **PRESENT USE/OCCUPANCY:** Hospital

LOCATION: 799 Concord Avenue **ZONE:** Office 1; AOD3

PHONE: (508)439-3278 **REQUESTED USE/OCCUPANCY:** Mobile Communications Facility

		EXISTING CONDITIONS	REQUESTED CONDITIONS	ORDINANCE REQUIREMENTS[1]	
TOTAL GROSS FLOOR AREA:			No Change	NA	(max.)
LOT AREA:		223,093	No Change	5,000	(min.)
RATIO OF GROSS FLOOR AREA TO LOT AREA:[2]			No Change	0.75	(max.)
LOT AREA FOR EACH DWELLING UNIT:		NA	No Change	1,200	(min.)
SIZE OF LOT:	WIDTH		No Change	NA	(min.)
	DEPTH			NA	
Setbacks in Feet:	FRONT	243'	No Change	25'	(min.)
	REAR	186'	No Change	63.26'	(min.)
	LEFT SIDE	104'	No Change	31.64'	(min.)
	RIGHT SIDE	48'	No Change	31.64'	(min.)
SIZE OF BLDG.:	HEIGHT	71'4" (high roof) 86'6" (penthouse)	No Change	55'/65'	(max.)
	LENGTH				
	WIDTH				
RATIO OF USABLE OPEN SPACE TO LOT AREA:[3])		NA	NA	NA	(min.)
NO. OF DWELLING UNITS:		NA	NA	NA	(max.)
NO. OF PARKING SPACES:		NA	NA	NA	(min./max.)
NO. OF LOADING AREAS:		NA	NA	NA	(min.)
DISTANCE TO NEAREST BLDG. ON SAME LOT:		41'	No Change	NA	(min.)

Describe where applicable, other occupancies on same lot, the size of adjacent buildings on same lot, and type of construction proposed, e.g.; wood frame, concrete, brick, steel, etc.

Not applicable

1. SEE CAMBRIDGE ZONING ORDINANCE ARTICLE 5.000, SECTION 5.30 (DISTRICT OF DIMENSIONAL REGULATIONS).
2. TOTAL GROSS FLOOR AREA (INCLUDING BASEMENT 7'-0" IN HEIGHT AND ATTIC AREAS GREATER THAN 5') DIVIDED BY LOT AREA.
3. OPEN SPACE SHALL NOT INCLUDE PARKING AREAS, WALKWAYS OR DRIVEWAYS AND SHALL HAVE A MINIMUM DIMENSION OF 15'.

BZA APPLICATION FORM

SUPPORTING STATEMENT FOR A SPECIAL PERMIT

Please describe in complete detail how you meet each of the following criteria referring to the property and proposed changes or uses which are requested in your application. Attach sheets with additional information for special permits which have additional criteria, e.g.; fast food permits, comprehensive permits, etc., which must be met.

Granting the Special Permit requested for 799 Concord Avenue (location) would not be a detriment to the public interest because:

A) Requirements of the Ordinance can or will be met for the following reasons:

As demonstrated by the documents and information provided with this application and as will be further demonstrated at the hearing on this matter, the proposed equipment meets the requirements of the Zoning Ordinance and the special permit granted in BZA Case No. 10518.

B) Traffic generated or patterns of access or egress would not cause congestion hazard, or substantial change in established neighborhood character for the following reasons:

The existing facility has created virtually no traffic demand, with approximately one or two vehicle trips per month by a standard passenger vehicle during normal business hours for routine maintenance. This condition will not change as a result of the non-substantial equipment changes.

C) The continued operation of or the development of adjacent uses as permitted in the Zoning Ordinance would not be adversely affected by the nature of the proposed use for the following reasons:

The new equipment will have no adverse effects on the operation or development of adjacent uses. The facility emits no light, odor, dust, or glare and generates no unusual noise or other adverse impacts.

D) Nuisance or hazard would not be created to the detriment of the health, safety and/or welfare of the occupant of the proposed use or the citizens of the City for the following reasons:

The existing facility does not generate traffic or other negative impacts on the surrounding properties or within the City of Cambridge and the new equipment will not contribute any additional impacts. The facility requires no water or sewer service and emits no light, odor, dust, or glare, and generates no unusual noise or other adverse impacts. The availability of wireless communications enhances the health, safety, and welfare of the community. The existing facility was installed in 2015 and has operated continuously since then.

E) For other reasons, the proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the intent or purpose of this ordinance for the following reasons:

The facility was designed and constructed to minimize its visual impact and is in harmony with the general purpose of the Zoning Ordinance and complies with the requirements of the Zoning Ordinance.

CITY OF CAMBRIDGE, MASSACHUSETTS
BOARD OF ZONING APPEAL

STATEMENT IN SUPPORT OF
APPLICATION FOR SPECIAL PERMIT

Applicant:	Cellco Partnership d/b/a Verizon Wireless
Property:	799 Concord Avenue (Map and Parcel 267D-339)
Zoning:	Office 1 (O-1), Alewife Overlay District (AOD3), Parkway Overlay District, and Concord Avenue Parkway Subdistrict
Proposed Use:	Mobile Communications Facility

BACKGROUND

The Applicant, Cellco Partnership d/b/a Verizon Wireless ("Applicant" or "Verizon Wireless"), is licensed by the Federal Communications Commission ("FCC") to provide cellular mobile radiotelephone service within the market area that includes the City of Cambridge. On March 11, 2015, the Board of Zoning Appeal (the "BZA") granted a special permit to Verizon Wireless for the installation, use, and operation of a mobile communications facility at 799 Concord Avenue (*see* BZA Case No. 10518). A copy of BZA's decision in Case No. 10518 ("2015 Special Permit") is attached as **Exhibit A**. On April 13, 2017, the Applicant came back before the BZA requesting a special permit to continue operating the telecommunications facility beyond the two-year time limit imposed by the 2015 Special Permit, with no physical changes to the facility being proposed at that time. The BZA granted approval of the renewal, recorded as BZA Case No.012697-2017 ("2017 Renewal"). A copy of that decision is attached as **Exhibit B**. The 2017 Renewal granted approval for the continued operation of the telecommunications facility.

Verizon Wireless now seeks a special permit under Section 4.32.g.1 and associated Footnote 49 of the Zoning Ordinance of the City of Cambridge (the "Ordinance") to make non-substantial changes to the existing rooftop equipment ("Proposed Changes"). The changes involve swapping three existing panel antennas for new equipment, to be located in roughly the same locations on the building on existing mounting pipes. Verizon Wireless is also proposing to slightly extend the footprint of the existing rooftop fiberglass enclosures at three locations to conceal the new equipment. As modified, the enclosures will maintain the full screening of the facility and will be consistent in appearance with the existing enclosure. Verizon Wireless makes this application with full reservation of its rights under applicable federal, state and local law, including particularly and without limitation, Section 6409(a) of the federal Middle Class Tax Relief and Jobs Creation Act of 2012 (the "Spectrum Act").

As shown on the plans titled "Belmont 2 MA, 799 Concord Ave. Cambridge, MA 02138," dated November 29, 2021, prepared by Dewberry Engineers Inc. (the "Plans") (*see* **Exhibit C**) and the Photosims titled "Belmont 2 MA, 799 Concord Ave. Cambridge, MA 02138 undated") ("Photosims") (*see* **Exhibit D**), the Property is improved with a six-story brick and masonry structure that steps down to two stories toward the rear of the Property and is currently used as a hospital facility. The Existing Facility is a personal wireless services facility within the meaning

of the Federal Telecommunications Act ("TCA"), 47 U.S.C. § 332(c)(7)(C)(ii) and a mobile communications facility within the meaning of Section 4.32.g.1 and accompanying Footnote 49 of the Ordinance.

DESCRIPTION OF EXISTING MOBILE COMMUNICATIONS FACILITY AND PROPOSED CHANGES

As depicted in the Plans submitted with this application, the Existing Facility contains three arrays of four panel antennas each, for a total of twelve panel antennas, on the roof of the six-story building situated on the Property. One antenna array is mounted on the south façade of the existing rooftop penthouse located at the southwest corner of the building, and a second array of antennas is mounted on the west façade of the same penthouse. The third antenna array is mounted on the north façade of the existing rooftop penthouse located on the northeast corner of the building. As shown on the Plans, each antenna array is enclosed by a fiberglass enclosure with an exterior surface finished to match the brick façade of the host penthouse, completely concealing the antennas from view. An emergency power generator and communications equipment cabinet are located inside the ground level garage on the west side of the building, and two HVAC condensers are situated on the roof of the garage. Cables connecting the communications equipment in the garage to the antennas on the roof were routed along the west and north exterior walls and are enclosed within cable trays that were painted to match the existing building façade. A GPS antenna is mounted on the roof of the garage. Verizon Wireless now seeks to swap out three panel antennas on the existing penthouse rooftop facility. This application is an eligible facilities request under federal law.

SATISFACTION OF SPECIAL PERMIT STANDARDS FOR MOBILE COMMUNICATIONS FACILITIES UNDER ORDINANCE SECTION 4.32.g.1

Pursuant to Section 4.32.g.1 of the Ordinance, mobile communications facilities in the Office-1 District require a special permit issued by the BZA. In reviewing a special permit application for a mobile communications facility, the BZA applies the standards set forth at Footnote 49 to the Table of Use Regulations.[1] The following analysis demonstrates that Proposed Changes meet each of these standards.[2]

1. *The scope of or limitations imposed by any license secured from any state or federal agency having jurisdiction over such matters.*

As documented at **Exhibit E**, Verizon Wireless is licensed by the Federal Communications Commission ("FCC") to provide cellular mobile radiotelephone service within the market area that includes the City of Cambridge.

[1] Footnote 49 is codified as Section 4.40.49 of the Ordinance.

[2] In providing information addressing the standards set forth in the Ordinance that concern the wireless communications use, Verizon Wireless does not concede, and expressly reserves all of its rights with respect to, any attempt by the City to exercise jurisdiction over matters concerning Verizon Wireless' license or the technical performance of the proposed site or its network.

2. *The extent to which the visual impact of the various elements of the proposed facility is minimized: (1) through the use of existing mechanical elements on a building's roof or other features of the building as support and background; (2) through the use of materials that in texture and color blend with the materials to which the facilities are attached; or (3) other effective means to reduce the visual impact of the facility from off the site.*

As shown in the Plans and Photosims submitted with this application, the antenna arrays, as modified, will continue to be mounted on an existing building and will continue to be enclosed by a brick-faced fiberglass enclosure that completely conceals the antennas from view.

Associated communications and power equipment, as well as the emergency generator for use as a backup power supply, are located inside the existing ground level garage space. Condensers for the air conditioning in the equipment room are located on the roof of the garage. No changes are proposed to these conditions.

3. *Where it is proposed to erect such a facility in any residential zoning district, the extent to which there is a demonstrated public need for the facility at the proposed locations, the existence of alternative, functionally suitable sites in nonresidential locations, the character of the prevailing uses in the area, and the prevalence of other, existing mechanical systems and equipment carried on or above the roof of nearby structures. The Board of Zoning Appeal shall grant a special permit to erect such a facility in a residential zoning district only upon a finding that nonresidential uses predominate in the vicinity of the proposed facility's location and that the telecommunication facility is not inconsistent with the character that does prevail in the surrounding neighborhood.*

Not applicable. The Facility is not located in a residential zoning district.

SATISFACTION OF SPECIAL PERMIT STANDARDS UNDER SECTION 10.43 OF THE ORDINANCE

Section 10.43 of the Ordinance states that special permits "will normally be granted where specific provisions of this Ordinance are met, except when particulars of the location or use, not generally true of the district or of the uses permitted in it, would cause granting of such permit to be to the detriment of the public interest." The following analysis of Section 10.43 special permit standards demonstrates that the Existing Facility is not detrimental to the public interest.

1. *The requirements of this Ordinance can or will be met for the following reasons*:

The Existing Facility is authorized by the 2015 Special Permit, as modified by the 2017 Special Permit. The Existing Facility was installed in 2015 and has operated continuously since then. The Proposed Changes represent an insignificant change to the Existing Facility, will not result in

any negative impacts and will, in fact, be beneficial to the public interest by resulting in improved mobile communications.

2. *Traffic generated or patterns of access or egress would not cause congestion, hazard, or substantial change in established neighborhood character for the following reasons*:

The Existing Facility creates virtually no traffic demand and only requires approximately one or two vehicle trips per month by a standard passenger vehicle during normal business hours for routine facility maintenance. The Proposed Changes will not result in any additional traffic.

3. *The continued operation of or the development of adjacent uses as permitted in the Zoning Ordinance would not be adversely affected by the nature of the proposed use for the following reasons*:

The Existing Facility has no adverse effect on the operation or development of adjacent uses. The Proposed Changes will not result in any adverse effects, as the panels emit no light, odor, dust, or glare and generate no unusual noise or other adverse impacts.

4. *A nuisance or hazard would not be created to the detriment of the health, safety and/or welfare of the occupant of the proposed use or the citizens of the City for the following reasons*:

The Proposed Changes will generate no additional traffic beyond the occasional single vehicle trip that currently occurs for maintenance of the Existing Facility, will require no water or sewer service, will not emit light, odor, dust, or glare, and will generate no unusual noise or other adverse impacts. The Proposed Changes will strengthen the availability of reliable wireless communications, thereby enhancing the health, safety and welfare of the community.

5. *The proposed use would not impair the integrity of the district or adjoining district, or otherwise derogate from the intent and purpose of this Ordinance for the following reasons*:

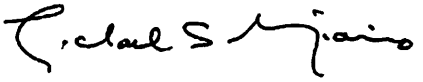
The Existing Facility as well as the Proposed Changes are a passive use involving no on-site employees, and have been designed to avoid any impacts on nearby properties, both inside and outside the zoning district. The improved wireless service it will provide enhances public safety and is a benefit to business and institutional uses located in the area and to residents, employees, visitors and others travelling to Sancta Maria hospital or who are in the area for other reasons. Wireless communications are increasingly relied on by civil defense and other safety officers as well as the public in times of crisis, natural disaster, inclement weather, and similar circumstances. It also provides a convenience to residents, and is an attractive feature to businesses. It is used not just for voice service but to transfer data using mobile devices. By providing these services, the Existing Facility promotes the health, safety, and general welfare of the City's residents and visitors consistent with the intent and purpose of the Zoning Ordinance.

For all the above reasons, the Proposed Changes are in harmony with the general purpose of the Zoning Ordinance as required by G.L. c. 40A, §9, and complies with its provisions, including the specific requirements of Section 4.32.g.1 and Footnote 49 concerning mobile communications facilities.

CONCLUSION

For all of the foregoing reasons, and with full reservation of its rights under applicable federal, state and local law, including particularly and without limitation the Spectrum Act, Verizon Wireless respectfully requests that the Board of Zoning Appeal, acting as the special permit granting authority, grant the special permit pursuant to Section 4.32.g.1 of the Ordinance, as well as such other relief as may be necessary or appropriate, to allow the Proposed Changes to the Existing Facility described in this application and documented in the provided Plans and Photosims.

Respectfully submitted,
Verizon Wireless
By its attorney,



Michael S. Giaimo, Esq.
Robinson & Cole LLP
One Boston Place, 25th Floor
Boston, MA 02108
(617) 557-5959

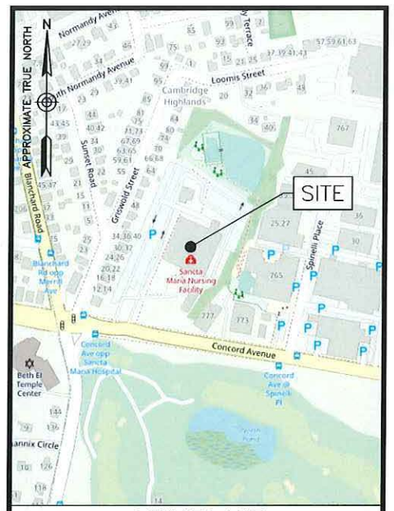
Dated: December 12, 2021

BELMONT 2 MA

799 CONCORD AVE.
CAMBRIDGE, MA 02138

FUZE PROJECT ID: 16230098

PSLC: 182417



VICINITY MAP N.T.S.

ENGINEER

DEWBERRY ENGINEERS INC.
99 SUMMER ST.
SUITE 700
BOSTON, MA 02110

PHONE # (617) 531-0800

CONTACT: BENJAMIN REVETTE, PE

CONSTRUCTION

VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581-3956

COORDINATES*:

LATITUDE: 42° 23' 29.58" N
LONGITUDE: 71° 09' 19.39" W
*PER FAA-2C

GROUND ELEVATION*:

35.8' (NAVD 88)
*PER FAA-2C

PROJECT INFORMATION

VZW LOCATION CODE (PSLC):	182417
FUZE NUMBER:	16230098
MOUNT MODIFICATION REQUIRED?	YES

CONTRACTOR PMI REQUIREMENTS

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

A.D.A. COMPLIANCE:
FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

1. INSTALL (3) LSub6 ANTENNA/RADIO UNITS ON EXISTING PIPE MASTS (1/SECTOR).
2. INSTALL (3) 2x1 HYBRID CABLES FROM OVP BOX TO NEW ANTENNA (1/SECTOR).
3. EXPAND (1) EXISTING FIBERGLASS SCREEN WALL SECTION ON ALL (3) SECTORS.

NOTE:

1. SCOPE OF WORK BASED ON ANTENNA REC FOR BELMONT 2 MA DATED 09/10/2020. VERIFY SCOPE OF WORK WITH FINAL RFDS PRIOR TO CONSTRUCTION.

SCOPE OF WORK

SHT. NO.	DESCRIPTION
T-1	TITLE SHEET
GN-1	GENERAL NOTES
C-1	ROOF PLAN
C-2	EXISTING & PROPOSED SECTOR PLANS
C-3	NORTH ELEVATION
C-4	SCREENWALL EXPANSION-I
C-5	SCREENWALL EXPANSION-II
C-6	CONSTRUCTION DETAILS
C-7	EQUIPMENT CONFIGURATION

SHEET INDEX

verizon WIRELESS

VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581-3956

BELMONT 2 MA

ANTMO DRAWINGS		
2	11/29/21	FOR SUBMITTAL
1	08/10/21	FOR SUBMITTAL
0	06/28/21	FOR SUBMITTAL
A	06/11/21	FOR REVIEW

Dewberry®

Dewberry Engineers Inc.
99 SUMMER ST.
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

COMMONWEALTH OF MASSACHUSETTS
SAHNOUNE ABED
No. 53352
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY:	SCA
REVIEWED BY:	MFT
CHECKED BY:	SA
PROJECT NUMBER:	50121487
JOB NUMBER:	50121978

SITE NUMBER

182417

SITE ADDRESS

799 CONCORD AVE.
CAMBRIDGE, MA 02138

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1

GENERAL CONSTRUCTION NOTES :

1. ALL WORK SHALL CONFORM TO ALL CURRENT APPLICABLE FEDERAL, STATE, AND LOCAL CODES, AND COMPLY WITH VERIZON WIRELESS SPECIFICATIONS.
2. CONTRACTOR SHALL CONTACT "DIG SAFE" (888-344-7233) FOR IDENTIFICATION OF UNDERGROUND UTILITIES PRIOR TO START OF CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL REQUIRED INSPECTIONS.
4. ALL DIMENSIONS TO, OF, AND ON EXISTING BUILDINGS, DRAINAGE STRUCTURES, AND SITE IMPROVEMENTS SHALL BE VERIFIED IN FIELD BY CONTRACTOR WITH ALL DISCREPANCIES REPORTED TO THE ENGINEER.
5. DO NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS.
6. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
7. THESE DRAWINGS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY WHICH IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
8. CONTRACTOR SHALL BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED. THESE ELEMENTS ARE AS FOLLOWS: LATERAL BRACING, ANCHOR BOLTS, ETC.
9. CONTRACTOR SHALL DETERMINE EXACT LOCATION OF EXISTING UTILITIES, DRAIN PIPES, VENTS, ETC. BEFORE COMMENCING WORK.
10. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH REMEDIAL ACTION SHALL REQUIRE WRITTEN APPROVAL BY THE OWNER'S REPRESENTATIVE PRIOR TO PROCEEDING.
11. EACH CONTRACTOR SHALL COOPERATE WITH THE OWNER'S REPRESENTATIVE, AND COORDINATE HIS WORK WITH THE WORK OF OTHERS.
12. CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY CONSTRUCTION OF THIS PROJECT TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE VERIZON WIRELESS CONSTRUCTION MANAGER.
13. ALL CABLE/CONDUIT ENTRY/EXIT PORTS SHALL BE WEATHERPROOFED DURING INSTALLATION USING A SILICONE SEALANT.
14. WHERE EXISTING CONDITIONS DO NOT MATCH THOSE SHOWN IN THIS PLAN SET, CONTRACTOR WILL NOTIFY ENGINEER, VERIZON WIRELESS PROJECT CONSTRUCTION MANAGER, AND LANDLORD IMMEDIATELY.
15. CONTRACTOR SHALL ENSURE ALL SUBCONTRACTORS ARE PROVIDED WITH A CURRENT SET OF DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
16. ALL ROOF WORK SHALL BE DONE BY A QUALIFIED AND EXPERIENCED ROOFING CONTRACTOR IN COORDINATION WITH ANY CONTRACTOR WARRANTING THE ROOF TO ENSURE THAT THE WARRANTY IS MAINTAINED.
17. CONTRACTOR SHALL REMOVE ALL RUBBISH AND DEBRIS FROM THE SITE AT THE END OF EACH DAY.
18. CONTRACTOR SHALL COORDINATE WORK SCHEDULE WITH LANDLORD AND TAKE PRECAUTIONS TO MINIMIZE IMPACT AND DISRUPTION OF OTHER OCCUPANTS OF THE FACILITY.
19. CONTRACTOR SHALL FURNISH VERIZON WIRELESS WITH THREE AS-BUILT SETS OF DRAWINGS UPON COMPLETION OF WORK.
20. ANTENNAS AND CABLES ARE TYPICALLY PROVIDED BY VERIZON WIRELESS. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL COORDINATE WITH PROJECT MANAGER TO DETERMINE WHAT, IF ANY, ITEMS WILL BE PROVIDED BY VERIZON WIRELESS. ALL ITEMS NOT PROVIDED BY VERIZON WIRELESS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR. CONTRACTOR WILL INSTALL ALL ITEMS PROVIDED BY VERIZON WIRELESS.
21. PRIOR TO SUBMISSION OF BID, CONTRACTOR WILL COORDINATE WITH VERIZON WIRELESS PROJECT MANAGER TO DETERMINE IF ANY PERMITS WILL BE OBTAINED BY VERIZON WIRELESS. ALL REQUIRED PERMITS NOT OBTAINED BY VERIZON WIRELESS MUST BE OBTAINED, AND PAID FOR, BY THE CONTRACTOR.
22. GENERAL CONTRACTOR SHALL HAVE A LICENSED HVAC CONTRACTOR START THE HVAC UNITS, SYNCHRONIZE THE THERMOSTATS, ADJUST ALL SETTINGS ON EACH UNIT ACCORDING TO VERIZON WIRELESS CONSTRUCTION MANAGER'S SPECIFICATIONS, AND THOROUGHLY TEST AND BALANCE EACH UNIT TO ENSURE PROPER OPERATION PRIOR TO TURNING THE SITE OVER TO OWNER.
23. CONTRACTOR SHALL INSTALL ALL SITE SIGNAGE IN ACCORDANCE WITH VERIZON WIRELESS SPECIFICATIONS AND REQUIREMENTS.
24. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION.
25. UNLESS OTHERWISE NOTED VERIZON WIRELESS SHALL PROVIDE ALL REQUIRED RF MATERIAL FOR CONTRACTOR TO INSTALL, INCLUDING ANTENNAS, TMA'S, BIAS-T'S, COMBINERS, PDU, DC BLOCKS, SURGE ARRESTORS, GPS ANTENNA, GPS SURGE ARRESTOR, COAXIAL CABLE.
26. PRIOR TO SUBMISSION OF BID, CONTRACTOR SHALL VERIFY ALL EQUIPMENT TO BE PROVIDED BY VERIZON WIRELESS FOR INSTALLATION BY CONTRACTOR.
27. ALL EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND LOCATED ACCORDING TO VERIZON WIRELESS SPECIFICATIONS, AND AS SHOWN IN THESE PLANS.
28. DETAILS SHOWN ARE TYPICAL; SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED.
29. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
30. CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS IN ADVANCE PRIOR TO CONSTRUCTION START, MORE SPECIFICALLY BEFORE; SEALING ANY FLOOR, WALL OR ROOF PENETRATION, FINAL UTILITY CONNECTIONS, POURING CONCRETE, BACKFILLING UTILITY TRENCHES AND STRUCTURAL POST OR MOUNTING CONNECTIONS, FOR ENGINEERING REVIEW AND INSPECTION.
31. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED D FIRE CODE APPROVED MATERIALS.
32. REPAIR ANY DAMAGE DURING CONSTRUCTION TO MATCH EXISTING PRE-CONSTRUCTION CONDITIONS TO THE SATISFACTION OF THE CONSTRUCTION MANAGER AND LANDLORD.
33. ALL DISRUPTIVE WORK AND WORK WITHIN TENANT SPACES TO BE COORDINATED WITH BUILDING REPRESENTATIVE.

CODE SPECIFICATIONS:

1. ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

   MASSACHUSETTS STATE BUILDING CODE, 9TH EDITION, CONSISTENT WITH THE FOLLOWING CODES:
   2015 INTERNATIONAL RESIDENTIAL CODE (IRC)
   2015 INTERNATIONAL BUILDING CODE (IBC)
   2015 INTERNATIONAL EXISTING BUILDING CODE (IBC)
   2020 NATIONAL ELECTRICAL CODE (NEC)

   IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL.
2. ALL STRUCTURAL WORK TO BE DONE IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL, 13TH EDITION (AISC 13TH ED.)
3. ALL CONCRETE WORK TO BE DONE IN ACCORDANCE WITH THE AMERICAN CONCRETE INSTITUTE (ACI 301) SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 318) AND BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
4. ALL REINFORCING STEEL WORK TO BE DONE IN ACCORDANCE WITH THE (ACI 315) MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.

GROUNDING NOTES:

1. GROUNDING SHALL COMPLY WITH NEC ART. 250.
2. GROUNDING CONDUCTORS SHALL BE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR INDOOR USE.
3. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
4. ROUTE GROUNDING CONNECTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NOT BE BENT AT RIGHT ANGLE. ALWAYS MAKE 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY.
5. CONNECTIONS TO GROUNDING BAR SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
6. TEST COMPLETED GROUNDING SYSTEM AND RECORD RESISTANCE VALUES FOR PROJECT CLOSE-OUT DOCUMENTATION. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS.
7. GROUNDING CONDUCTORS BETWEEN MGB AND WATERMAIN SHALL BE #2/0. BONDING JUMPERS FROM METALLIC SURFACES SHALL BE #2 MINIMUM. ALL GROUND CONDUCTORS AND BONDING JUMPERS SHALL BE SOFT DRAWN ANNEALED, TINNED, BARE STRANDED COPPER WIRE. COAXIAL CABLES SHALL BE GROUNDED AT A MINIMUM OF TWO LOCATIONS USING VERIZON PROVIDED GROUNDING KITS. EXACT LOCATIONS SHALL BE FINALIZED IN THE FIELD BY THE CONSTRUCTION MANAGER.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST EDITION OF THE AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
2. STRUCTURAL STEEL ROLLED SHAPES, PLATES, AND BARS SHALL CONFORM TO THE FOLLOWING ASTM DESIGNATIONS:

ASTM A-992, GRADE 50	ALL W SHAPES, UNLESS NOTED OR A992 OTHERWISE.
ASTM A-36	ALL OTHER ROLLED SHAPES, PLATES AND BARS UNLESS NOTED OTHERWISE.
ASTM A-500, GRADE B	HSS SECTION (SQUARE, RECTANGULAR, ROUND)
ASTM A-325, TYPE SC OR N	ALL BOLTS FOR CONNECTING STRUCTURAL MEMBERS.
F1554, GRADE 36	ALL ANCHORS BOLTS, UNLESS NOTED OTHERWISE.
ASTM A-53, GRADE B	STEEL PIPE

3. ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND AWS D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION. WHERE WELD LENGTH IS NOT INDICATED, USE FULL LENGTH WELD. AT THE COMPLETION OF ALL WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.
4. BOLTED CONNECTIONS SHALL USE BEARING TYPE GALVANIZED ASTM A325 BOLTS (3/4" DIA.) SUPPLIED WITH A NUT AND WASHER UNDER TURNED END AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
5. DO NOT DRILL HOLES THROUGH STRUCTURAL STEEL MEMBERS EXCEPT AS SHOWN AND DETAILED ON STRUCTURAL DRAWINGS.
6. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. GALVANIZED ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
7. USE PRECAUTIONS & PROCEDURES PER AWS D1.1 WHEN WELDING GALVANIZED METALS.
8. ALL EXISTING BEAM AND COLUMN DIMENSIONS SHALL BE FIELD VERIFY BY CONTRACTOR PRIOR TO FABRICATION. ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND THOSE SHOWN SHALL BE REPORTED TO DEWBERRY ENGINEER IMMEDIATELY.
9. CONNECTION DESIGN BY FABRICATOR WILL BE SUBJECT TO REVIEW AND APPROVAL BY ENGINEER.
10. ALL EXTERIOR STEEL WORK SHALL BE GALVANIZED IN ACCORDANCE WITH SPECIFICATION ASTM A123/A123M-00 HOT-DIP GALVANIZED FINISH UNLESS OTHERWISE NOTED. GALVANIZING SHALL BE PERFORMED AFTER SHOP FABRICATION TO THE GREATEST EXTENT POSSIBLE. ALL DINGS, SCRAPES, MARS, AND WELDS IN THE GALVANIZED AREAS SHALL BE REPAIRED. REPAIR DAMAGED GALVANIZED COATINGS ON GALVANIZED ITEMS WITH GALVANIZED REPAIR PAINT ACCORDING TO ASTM A780 AND MANUFACTURER'S WRITTEN INSTRUCTIONS, PRIOR TO COMPLETION OF WORK. TOUCHUP ALL DAMAGED GALVANIZED STEEL WITH APPROVED COLD ZINC, "GALVANOX", "DRY GALV", "ZINC-IT", OR APPROVED EQUIVALENT, IN ACCORDANCE WITH MANUFACTURERS GUIDELINES. TOUCHUP DAMAGED NON GALVANIZED STEEL WITH SAME PAINT APPLIED IN SHOP OR FIELD.
11. ALL WELDED COMPONENTS TO BE SHOP WELDED PRIOR TO INSTALLATION. NO WELDING ACTIVITIES IS PERMITTED DURING INSTALLATION OF PROPOSED EQUIPMENTS AND/OR HARDWARE ON SITE.

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BELMONT 2 MA

ANTMO	DRAWINGS	
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COMMONWEALTH OF MASSACHUSETTS
SAHNOUNE ABED
No. 53352
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY:	SCA
REVIEWED BY:	MFT
CHECKED BY:	SA
PROJECT NUMBER:	50121487
JOB NUMBER:	50121978

SITE NUMBER

182417

SITE ADDRESS

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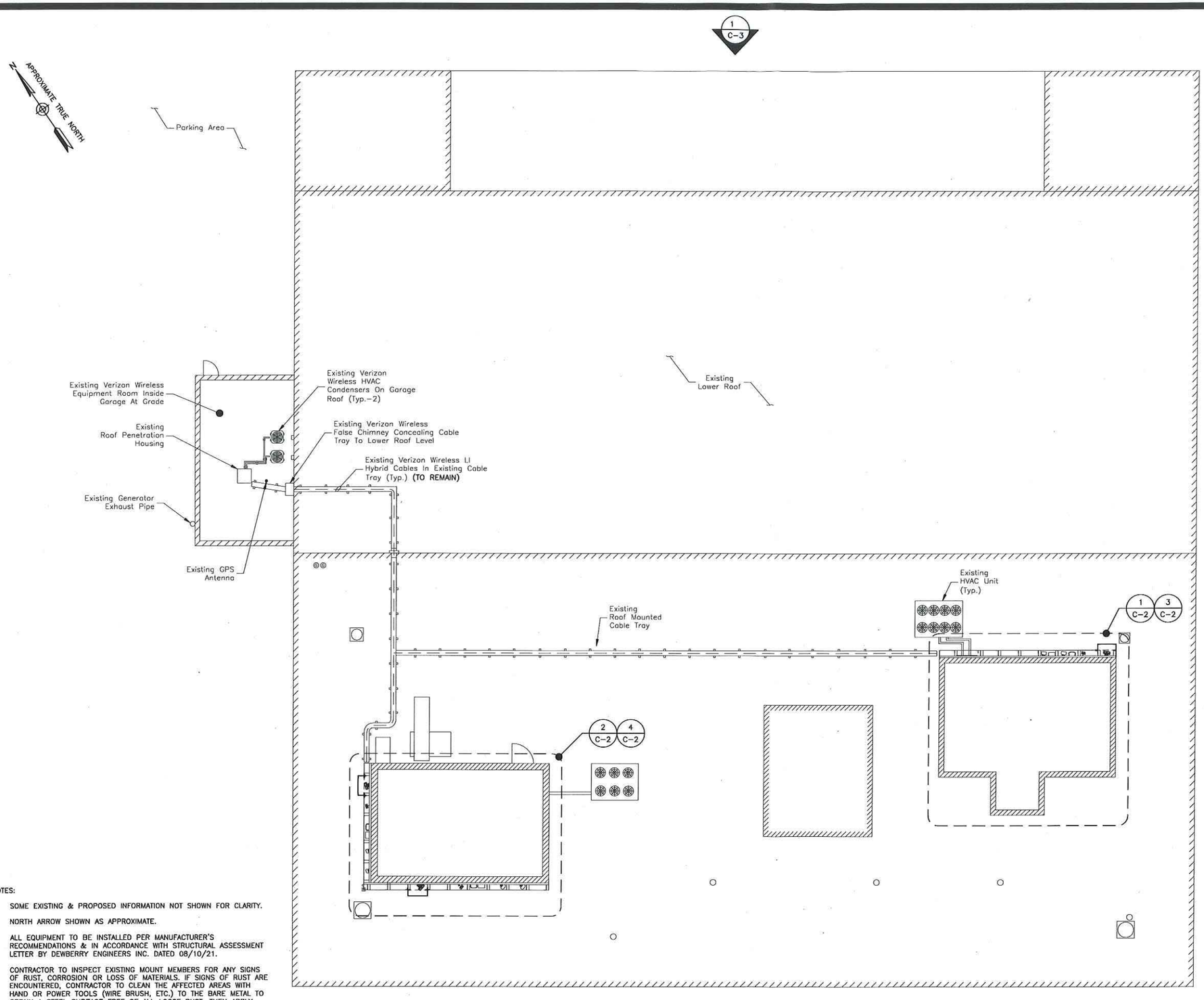
CAMBRIDGE, MA 02138

SHEET TITLE

GENERAL NOTES

SHEET NUMBER

GN-1



NOTES:

1. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
2. NORTH ARROW SHOWN AS APPROXIMATE.
3. ALL EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS & IN ACCORDANCE WITH STRUCTURAL ASSESSMENT LETTER BY DEWBERRY ENGINEERS INC. DATED 08/10/21.
4. CONTRACTOR TO INSPECT EXISTING MOUNT MEMBERS FOR ANY SIGNS OF RUST, CORROSION OR LOSS OF MATERIALS. IF SIGNS OF RUST ARE ENCOUNTERED, CONTRACTOR TO CLEAN THE AFFECTED AREAS WITH HAND OR POWER TOOLS (WIRE BRUSH, ETC.) TO THE BARE METAL TO OBTAIN A STEEL SURFACE FREE OF ALL LOOSE RUST, THEN APPLY COLD GALVANIZING COMPOUND TO TOUCH UP ALL AFFECTED AREAS.

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

0' 10' 20'

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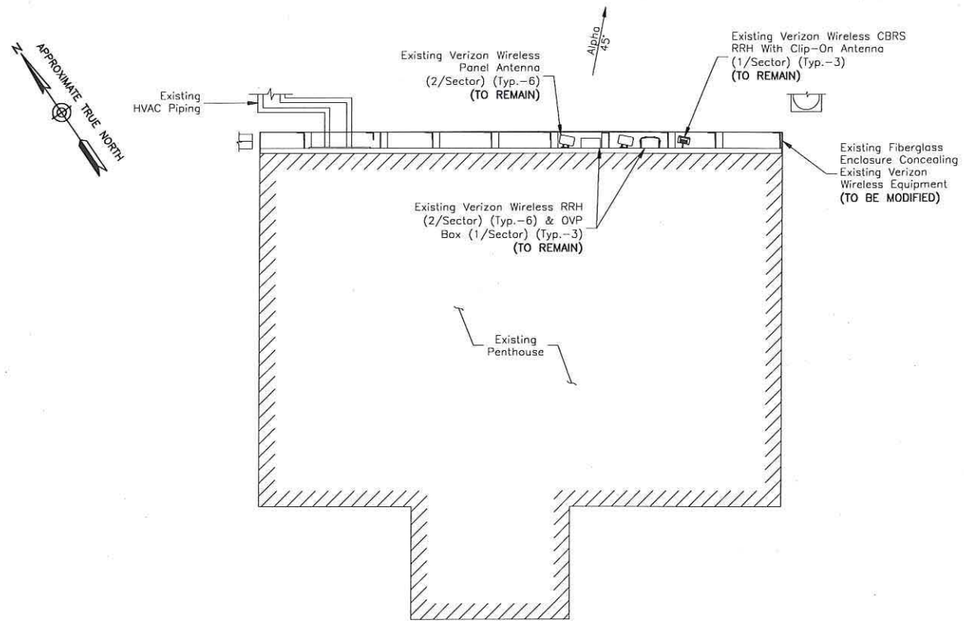
SHEET TITLE

ROOF PLAN

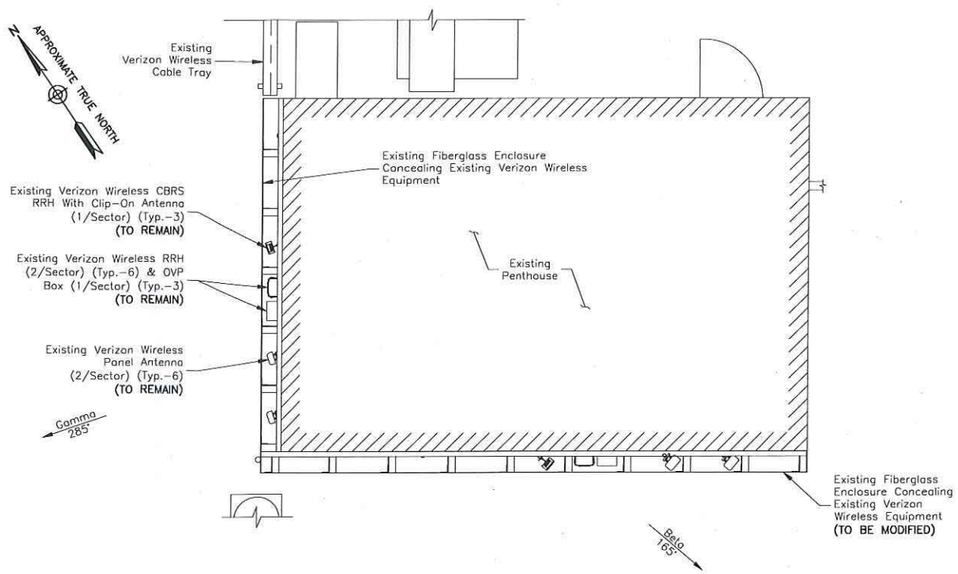
SHEET NUMBER

C-1



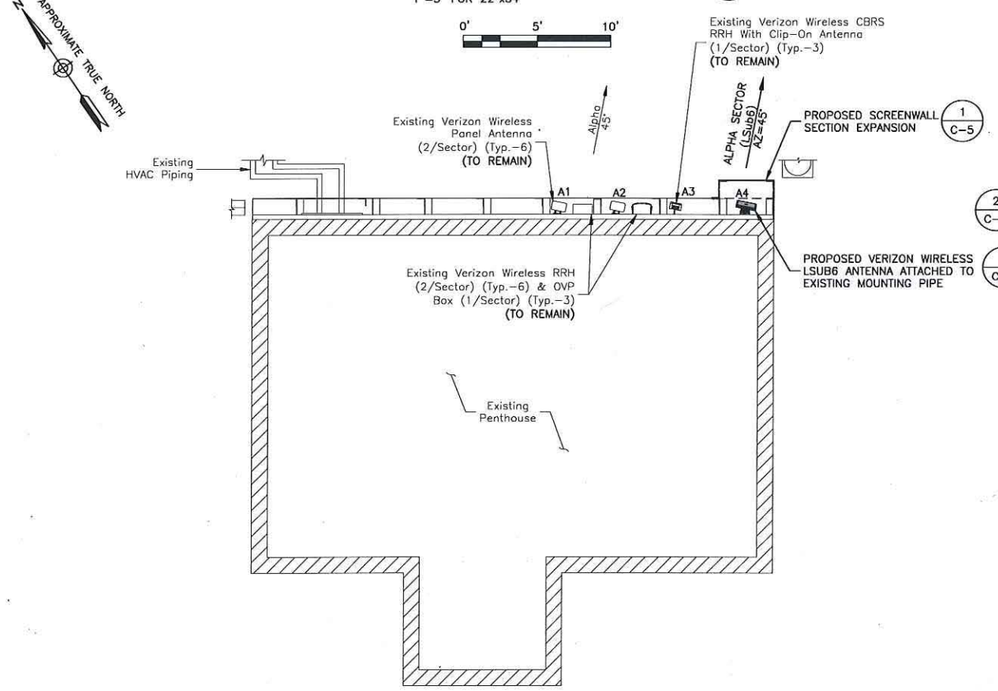
EXISTING ALPHA SECTOR PLAN 1

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"



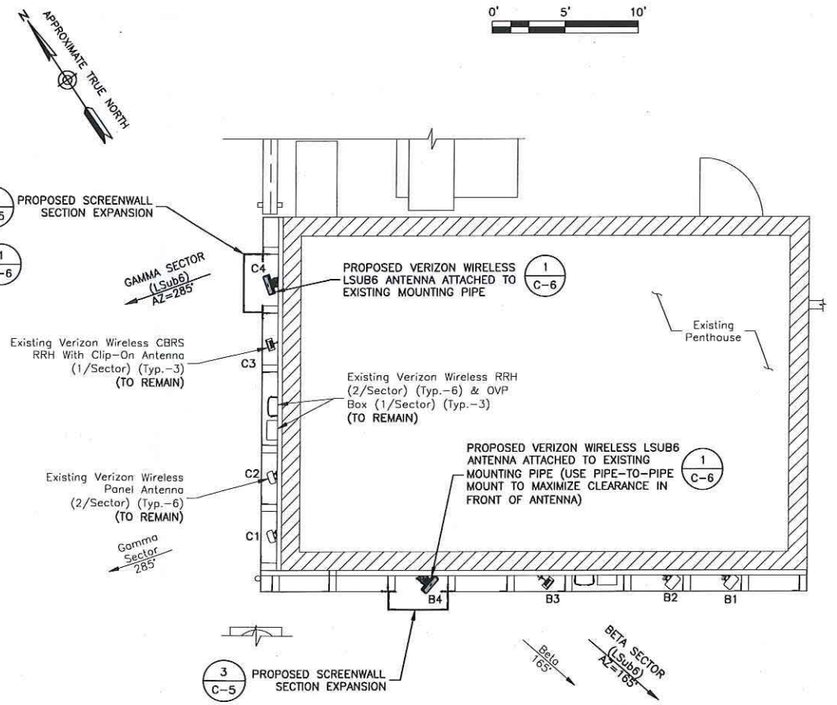
EXISTING BETA & GAMMA SECTOR PLAN 2

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"



PROPOSED ALPHA SECTOR PLAN 3

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"



PROPOSED BETA & GAMMA SECTOR PLAN 4

SCALE: 1"=10' FOR 11"x17"
1"=5' FOR 22"x34"

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SAHOUNE ABED
No. 53352
REGISTERED PROFESSIONAL ENGINEER

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REVIEWED BY:	MFT
CHECKED BY:	SA
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JOB NUMBER:	50121978

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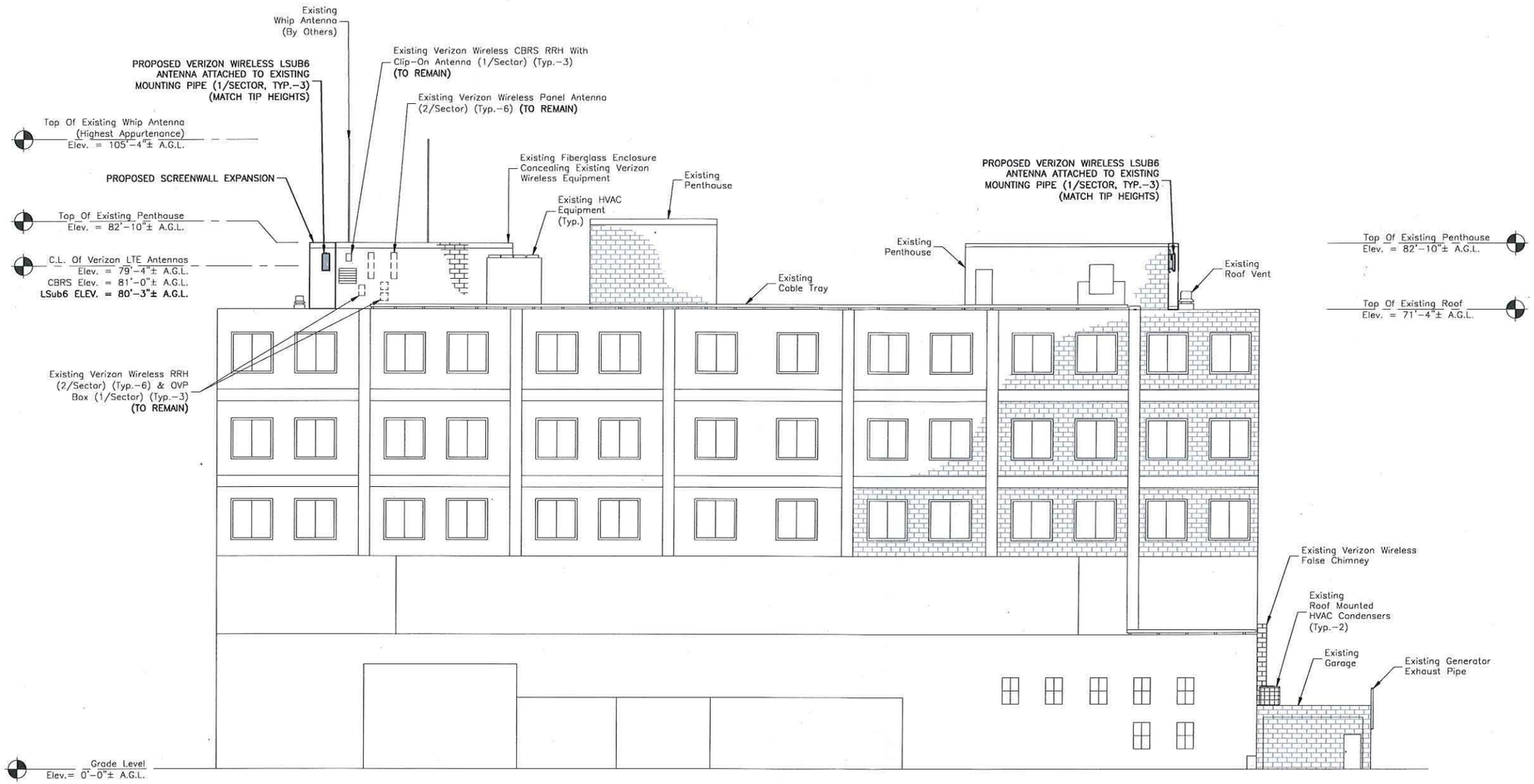
SHEET TITLE

EXISTING & PROPOSED SECTOR PLANS

SHEET NUMBER

C-2



NOTES:

1. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
2. ELEVATION SHOWN AS APPROXIMATE.
3. ALL EQUIPMENT TO BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS & IN ACCORDANCE WITH STRUCTURAL ASSESSMENT LETTER BY DEWBERRY ENGINEERS INC. DATED 08/10/21.
4. CONTRACTOR TO INSPECT EXISTING MOUNT MEMBERS FOR ANY SIGNS OF RUST, CORROSION OR LOSS OF MATERIALS. IF SIGNS OF RUST ARE ENCOUNTERED, CONTRACTOR TO CLEAN THE AFFECTED AREAS WITH HAND OR POWER TOOLS (WIRE BRUSH, ETC.) TO THE BARE METAL TO OBTAIN A STEEL SURFACE FREE OF ALL LOOSE RUST. THEN APPLY COLD GALVANIZING COMPOUND TO TOUCH UP ALL AFFECTED AREAS.
2. A.G.L. = ABOVE GRADE LEVEL
A.R.L. = ABOVE ROOF LEVEL
NAVD88 = NORTH AMERICAN VERTICAL DATUM OF 1988

NORTH ELEVATION (1)

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

0' 8' 16' 24'

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BELMONT 2 MA

ANTMO DRAWINGS		
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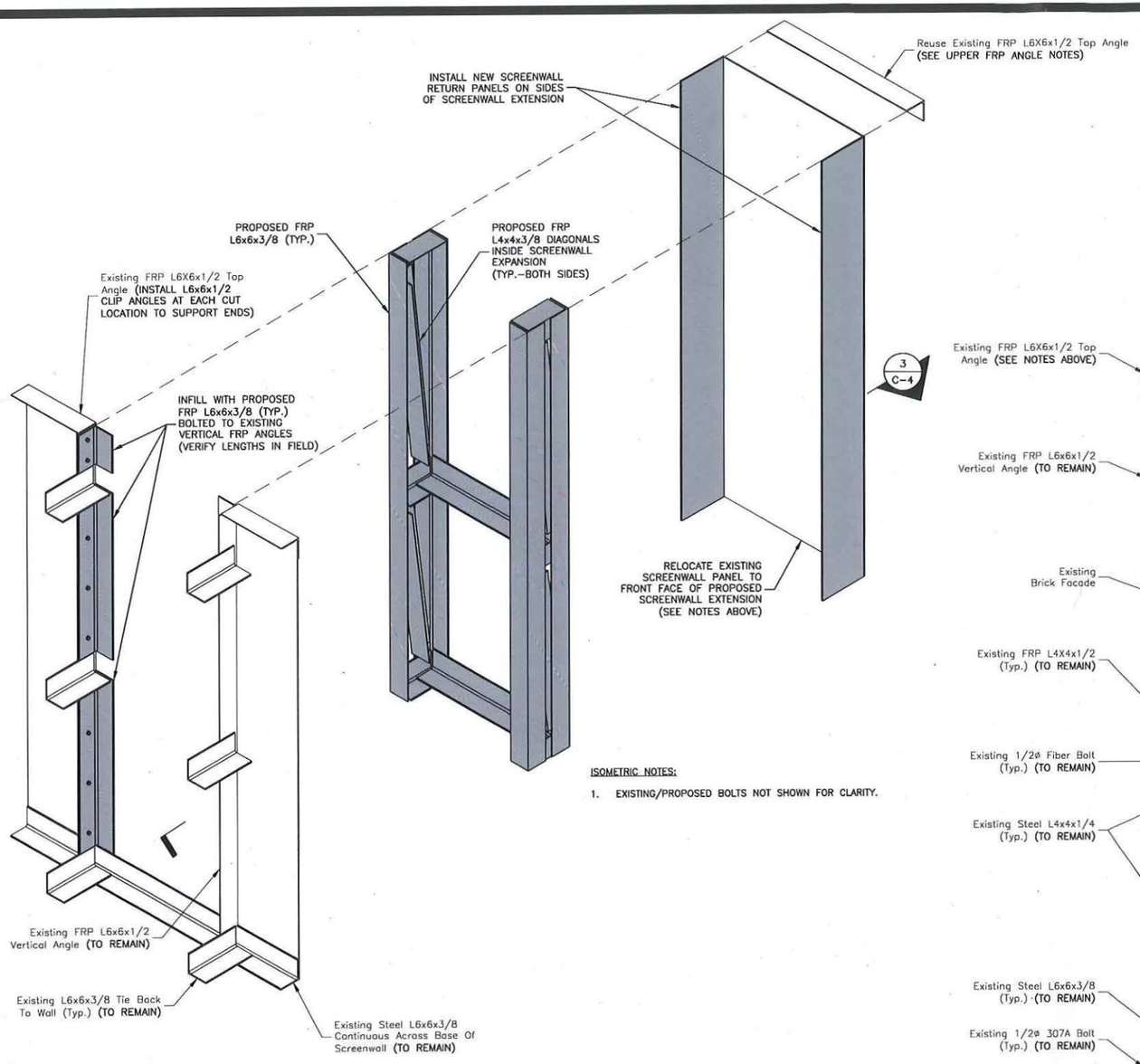
SHEET TITLE

NORTH ELEVATION

SHEET NUMBER

C–3



ISOMETRIC NOTES:

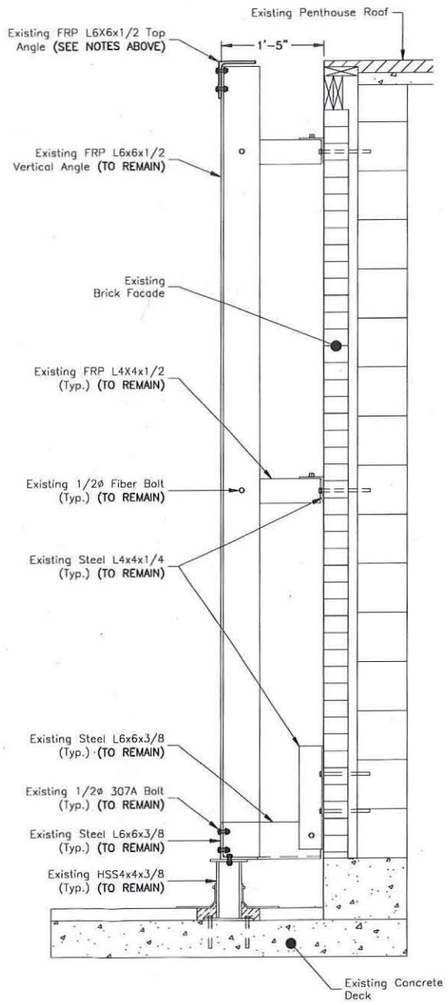
1. EXISTING/PROPOSED BOLTS NOT SHOWN FOR CLARITY.

PROPOSED SCREENWALL EXTENSION ISOMETRIC (1)

SCALE: N.T.S.

LEGEND

- PROPOSED FRP
- Existing Members



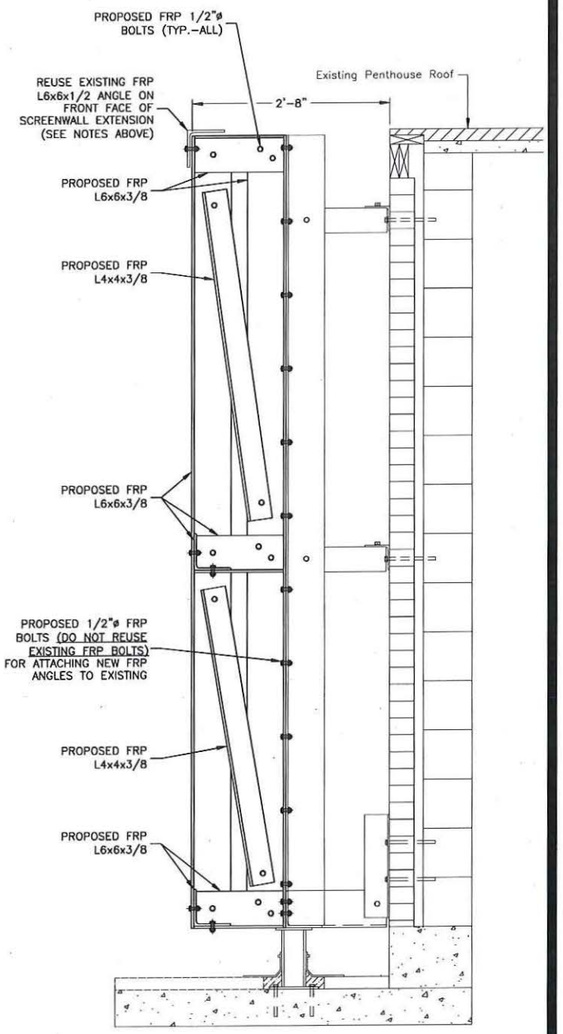
EXISTING SCREENWALL SECTION (2)

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

0' 1' 2'

UPPER FRP ANGLE NOTES:

1. ALPHA SECTOR TOP FRP: CUT EXISTING L6x6x1/2 TOP ANGLE AT START OF NEW SCREENWALL EXTENSION. RELOCATE TO SCREENWALL EXTIONS.
2. BETA/GAMMA SECTOR TOP FRP: RELOCATE TO SCREENWALL EXTENSION. INSTALL NEW FRP L6x6x1/2 ANGLE FOR ADDITIONAL LENGTH REQUIRED AND BOLT TO EXISTING WITH NEW 1/2"ø FIBER BOLTS.
3. CONTRACTOR TO INSTALL NEW 1/2"ø FRP BOLTS AT ALL PROPOSED CONNECTIONS. DO NOT REUSE EXISTING FRP BOLTS.



PROPOSED SCREENWALL SECTION (3)

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

0' 1' 2'

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JOB NUMBER:	50121978
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SHEET TITLE

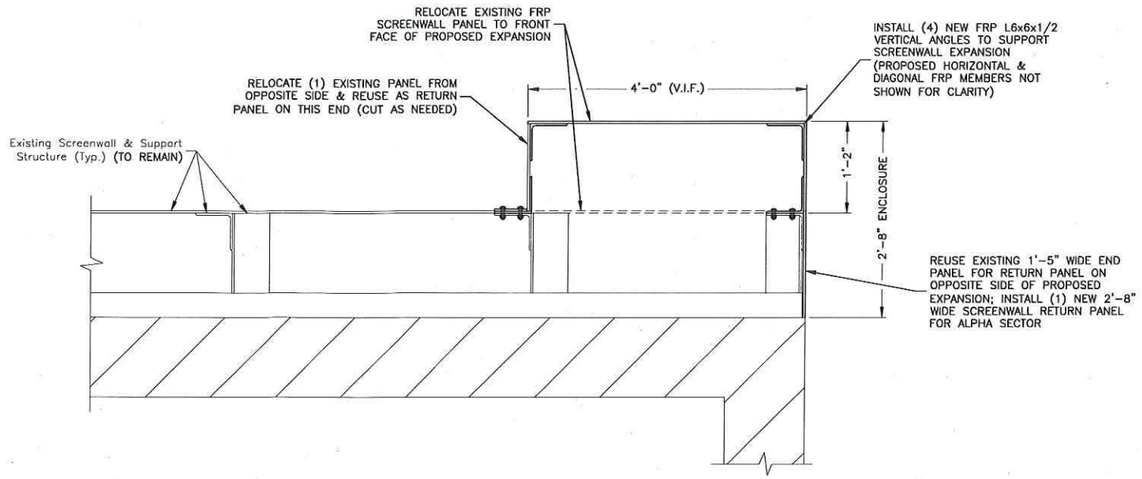
SCREENWALL EXPANSION-I

SHEET NUMBER

C-4

UPPER FRP ANGLE NOTES:

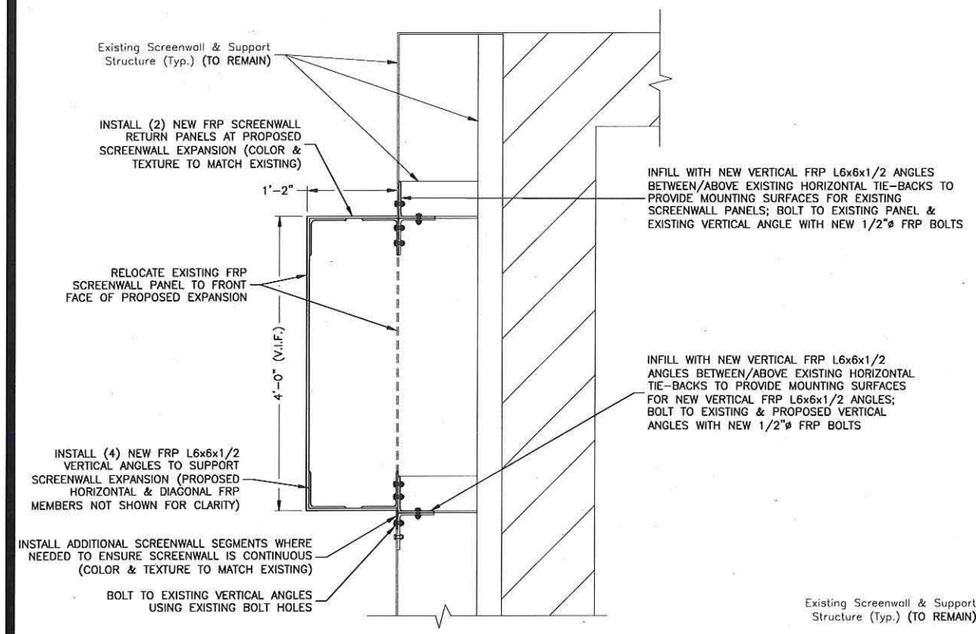
1. ALPHA SECTOR TOP FRP: CUT EXISTING L6x6x1/2 TOP ANGLE AT START OF NEW SCREENWALL EXTENSION. RELOCATE TO SCREENWALL EXTIONS.
2. BETA/GAMMA SECTOR TOP FRP: RELOCATE TO SCREENWALL EXTENSION. INSTALL NEW FRP L6x6x1/2 ANGLE FOR ADDITIONAL LENGTH REQUIRED AND BOLT TO EXISTING WITH NEW 1/2"ø FIBER BOLTS.



ALPHA SECTOR PLAN 1

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

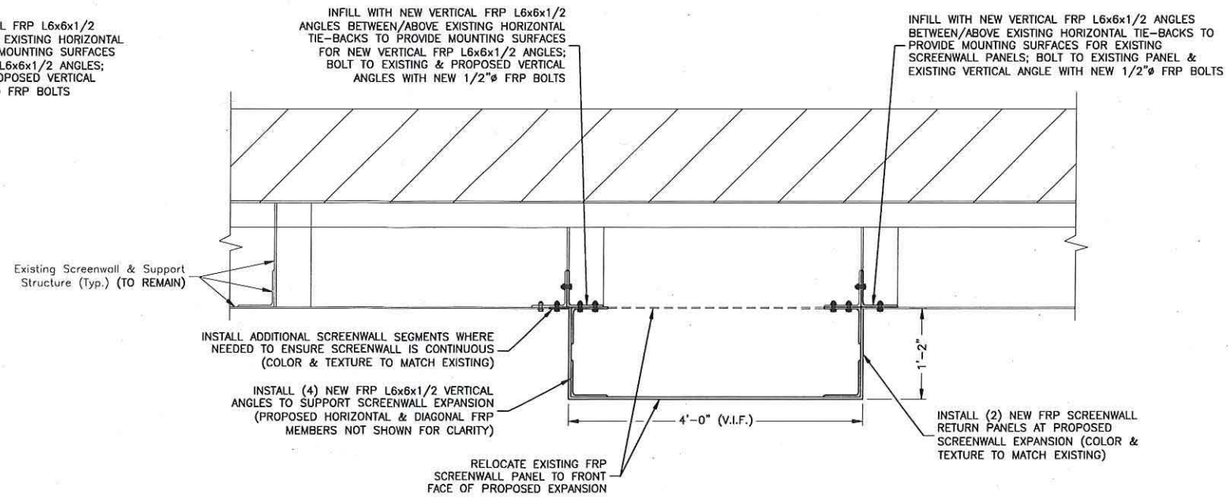
0' 1' 2'



GAMMA SECTOR PLAN 2

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

0' 1' 2'



BETA SECTOR PLAN 3

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

0' 1' 2'

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No. 53352
REGISTERED PROFESSIONAL ENGINEER

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REVIEWED BY:	MFT
CHECKED BY:	SA
PROJECT NUMBER:	50121487
JOB NUMBER:	50121978

SITE NUMBER

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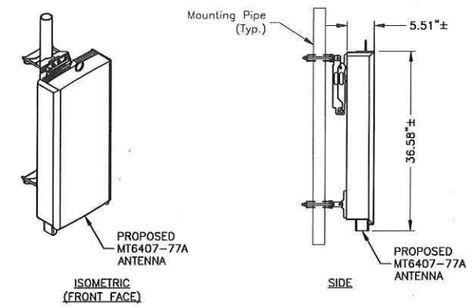
SHEET TITLE

SCREENWALL EXPANSION-II

SHEET NUMBER

C-5

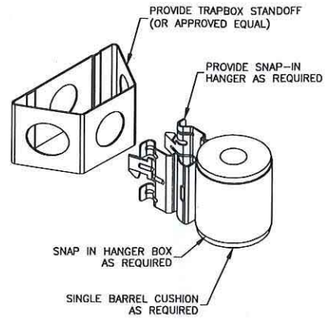


MODEL:	MT6407-77A
DIMENSIONS:	35.1"H X 16.1"W X 5.5"D (NOT TO EXCEED)
WEIGHT:	87.1 LBS (NOT TO EXCEED)

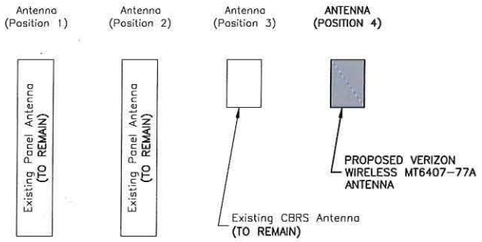
NOTES:

1. INSTALL ALL EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. USE APPROPRIATE MOUNTING HARDWARE FOR CONSTRUCTION TYPE.

PIPE MOUNTED ANTENNA DETAIL (1)
SCALE: N.T.S.



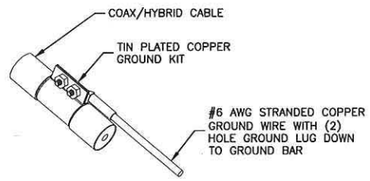
JUMPER MOUNT (2)
SCALE: N.T.S.



NOTES:

1. AS VIEWED BEHIND THE ANTENNAS.
2. TYPICAL FOR ALL (3) SECTORS.

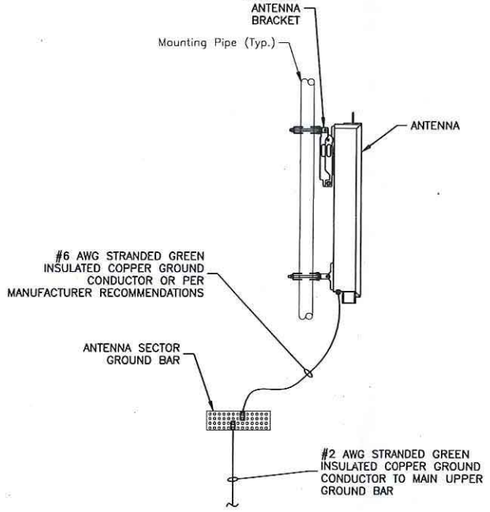
ANTENNA CONFIGURATION (3)
SCALE: N.T.S.



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND. ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TIN PLATED COPPER WITH TWO-HOLE LUG, SIZE PER COAX DIAMETER.
3. WEATHER SEAL GROUND KIT PER CARRIER REQUIREMENTS.
4. COAX CABLE GROUND KIT LOCATION & QUANTITY SHALL BE PER CARRIER SPECIFICATIONS & STANDARDS.

COAX/HYBRID GROUNDING DETAIL (4)
SCALE: N.T.S.



NOTES:

1. VERIFY EXISTING GROUNDING SYSTEM IS INSTALLED PER VERIZON WIRELESS STANDARDS.
2. BOND NEW EQUIPMENT INTO EXISTING GROUND SYSTEM IN ACCORDANCE WITH VERIZON WIRELESS STANDARDS AND MANUFACTURER'S RECOMMENDATIONS.

TYPICAL ANTENNA GROUNDING DETAIL (5)
SCALE: N.T.S

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REVIEWED BY:	MFT
CHECKED BY:	SA
PROJECT NUMBER:	50121487
JOB NUMBER:	50121978

SITE NUMBER

182417

SITE ADDRESS

799 CONCORD AVE.
CAMBRIDGE, MA 02138

SHEET TITLE

CONSTRUCTION DETAILS

SHEET NUMBER

C-6

FINAL EQUIPMENT CONFIGURATION

SECTOR	POSITION	TECHNOLOGY	ANTENNA MODEL	VENDOR	RRH (QTY./MODEL)	CENTERLINE	AZIMUTH	OVP	HYBRID CABLE TYPE	FEED LINE LENGTH*
ALPHA	A1	LTE 1900/AWS	(E) SBNHH-1D65A	COMMSCOPE	(1) (E) B2/B66A RFV01U-D1A	79'-4"±	45°	(1) (E) OVP BOX TO REMAIN	(1) (E) 6X12 LI HYBRID CABLE TO REMAIN	330'±
	A2	LTE 700/850	(E) SBNHH-1D65A	COMMSCOPE	(1) (E) B5/B13 RFV01U-D2A	79'-4"±	45°			
	A3	CBRS	(E) XXDWMM-12.5-65-8T	SAMSUNG	–	81'-0"±	45°			
	A4	5G	(P) MT6407-77A	SAMSUNG	–	80-3"'±	45°			
BETA	B1	LTE 1900/AWS	(E) SBNHH-1D65A	COMMSCOPE	(1) (E) B2/B66A RFV01U-D1A	79'-4"±	165°	(1) (E) OVP BOX TO REMAIN	(1) (E) 6X12 LI HYBRID CABLE TO REMAIN	280'±
	B2	LTE 700/850	(E) SBNHH-1D65A	COMMSCOPE	(1) (E) B5/B13 RFV01U-D2A	79'-4"±	165°			
	B3	CBRS	(E) XXDWMM-12.5-65-8T	SAMSUNG	–	81'-0"±	165°			
	B4	5G	(P) MT6407-77A	SAMSUNG	–	80-3"'±	165°			
GAMMA	G1	LTE 1900/AWS	(E) SBNHH-1D65A	COMMSCOPE	(1) (E) B2/B66A RFV01U-D1A	79'-4"±	285°	(1) (E) OVP BOX TO REMAIN	(1) (E) 6X12 LI HYBRID CABLE TO REMAIN	250'±
	G2	LTE 700/850	(E) SBNHH-1D65A	COMMSCOPE	(1) (E) B5/B13 RFV01U-D2A	79'-4"±	285°			
	G3	CBRS	(E) XXDWMM-12.5-65-8T	SAMSUNG	–	81'-0"±	285°			
	G4	5G	(P) MT6407-77A	SAMSUNG	–	80-3"'±	285°			

*CONTRACTOR TO FIELD VERIFY HYBRID CABLE LENGTHS PRIOR TO CONSTRUCTION. LENGTH IS ESTIMATED FROM THE BASE EQUIPMENT OVP TO SECTOR OVP WITH 15% BUFFER.

(E) = Existing
(P) = PROPOSED

FINAL EQUIPMENT CONFIGURATION (1)
SCALE: N.T.S.

verizon WIRELESS
VERIZON WIRELESS
118 FLANDERS ROAD
WESTBOROUGH, MA 01581-3956

BELMONT 2 MA

ANTMO DRAWINGS		
2	11/29/21	FOR SUBMITTAL
1	08/10/21	FOR SUBMITTAL
0	06/28/21	FOR SUBMITTAL
A	06/11/21	FOR REVIEW

Dewberry®
Dewberry Engineers Inc.
99 SUMMER ST,
SUITE 700
BOSTON, MA 02110
PHONE: 617.695.3400
FAX: 617.695.3310

COMMONWEALTH OF MASSACHUSETTS
SAHNOUNE ABED
No. 53352
REGISTERED PROFESSIONAL ENGINEER

DRAWN BY:	SCA
REVIEWED BY:	MFT
CHECKED BY:	SA
PROJECT NUMBER:	50121487
JOB NUMBER:	50121978

SITE NUMBER
182417

SITE ADDRESS
799 CONCORD AVE.
CAMBRIDGE, MA 02138

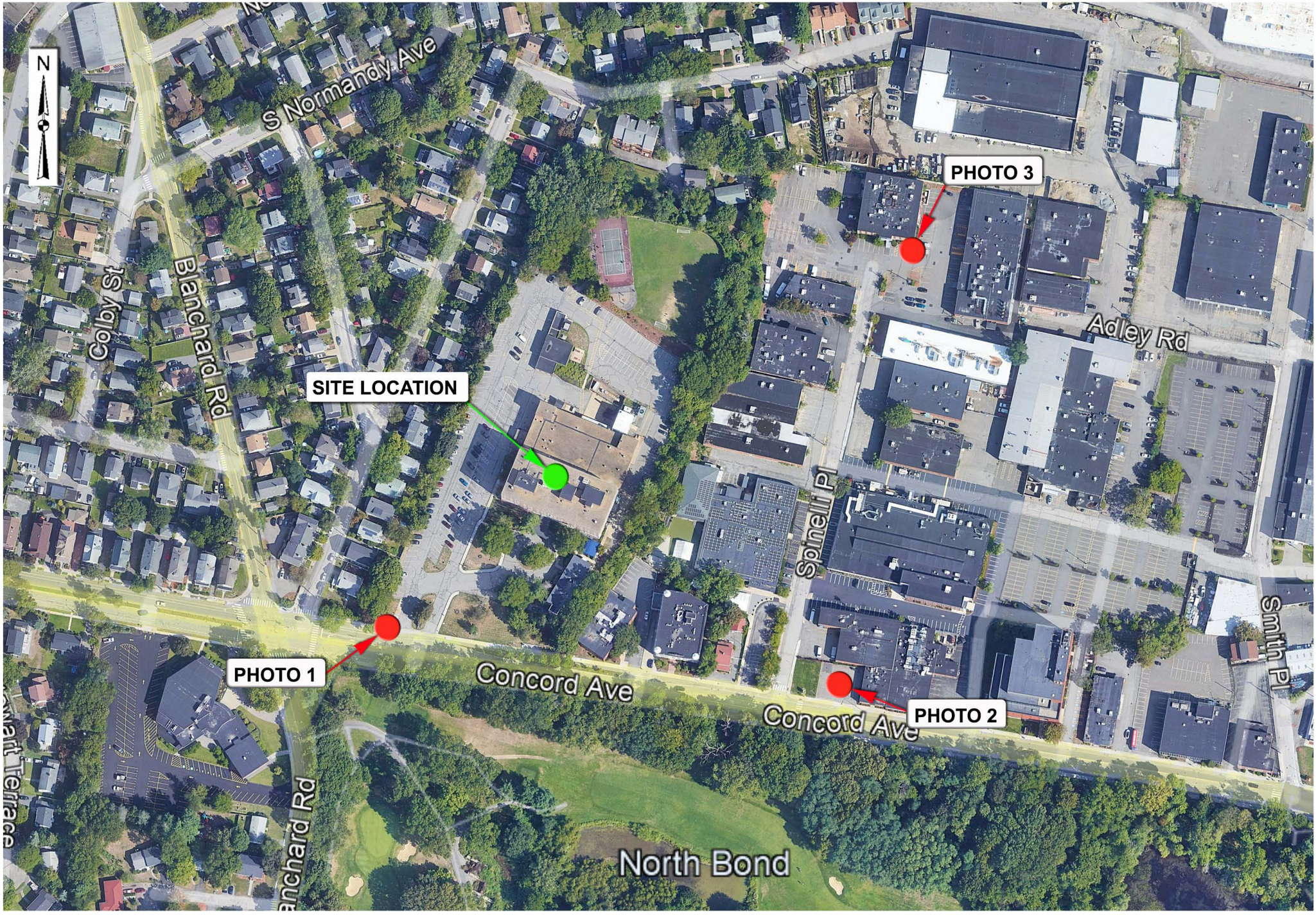
SHEET TITLE
EQUIPMENT CONFIGURATION

SHEET NUMBER
C-7

verizon WIRELESS

Belmont 2 MA
799 Concord Ave.
Cambridge, MA 02138

Dewberry



verizon WIRELESS

Belmont 2 MA
799 Concord Ave.
Cambridge, MA 02138

Dewberry

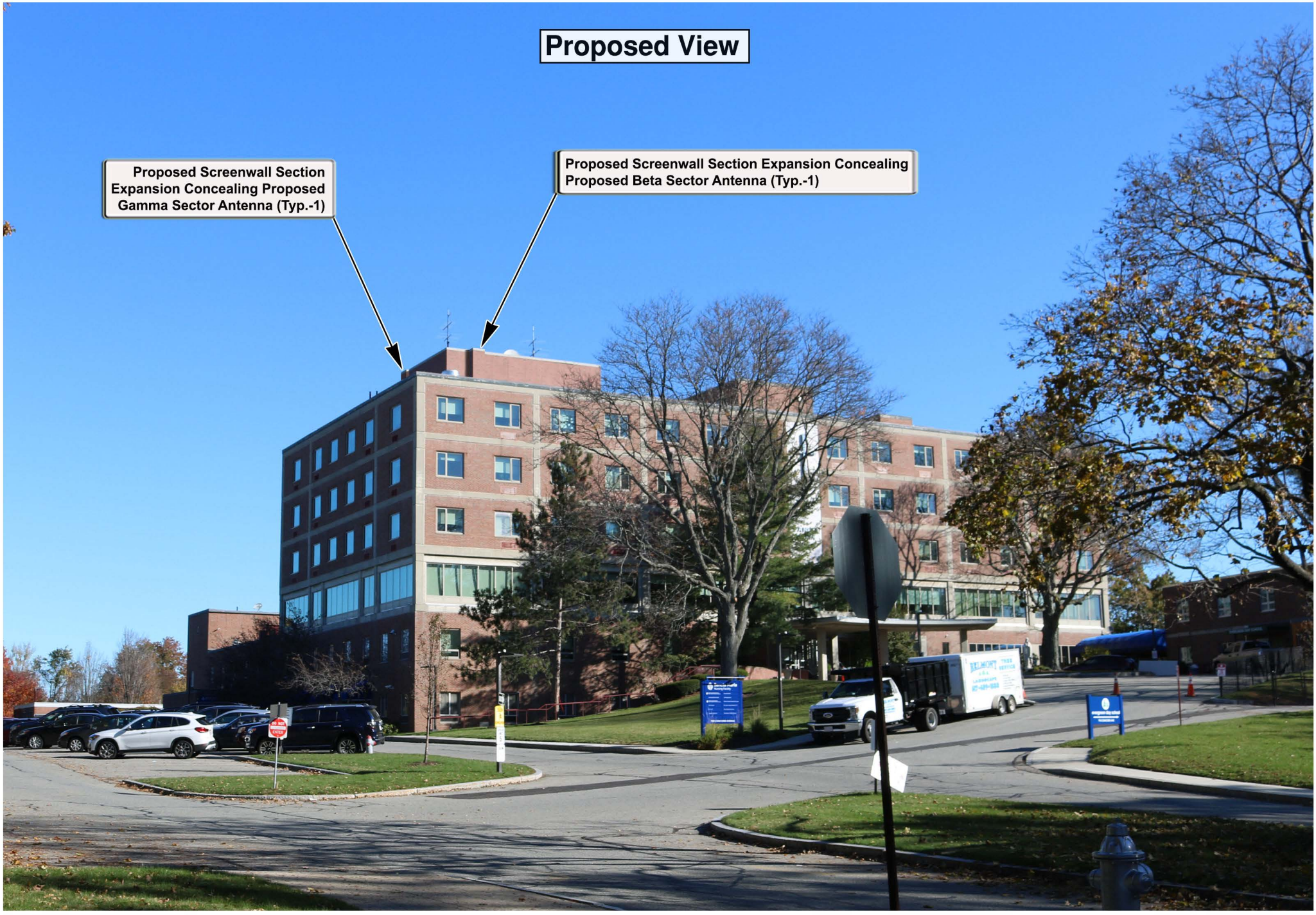
verizon WIRELESS

Belmont 2 MA

View Facing Northeast From Concord Ave.

PHOTO 1A

Dewberry



verizon WIRELESS

Belmont 2 MA

View Facing Northeast From Concord Ave.

PHOTO 1B

Dewberry

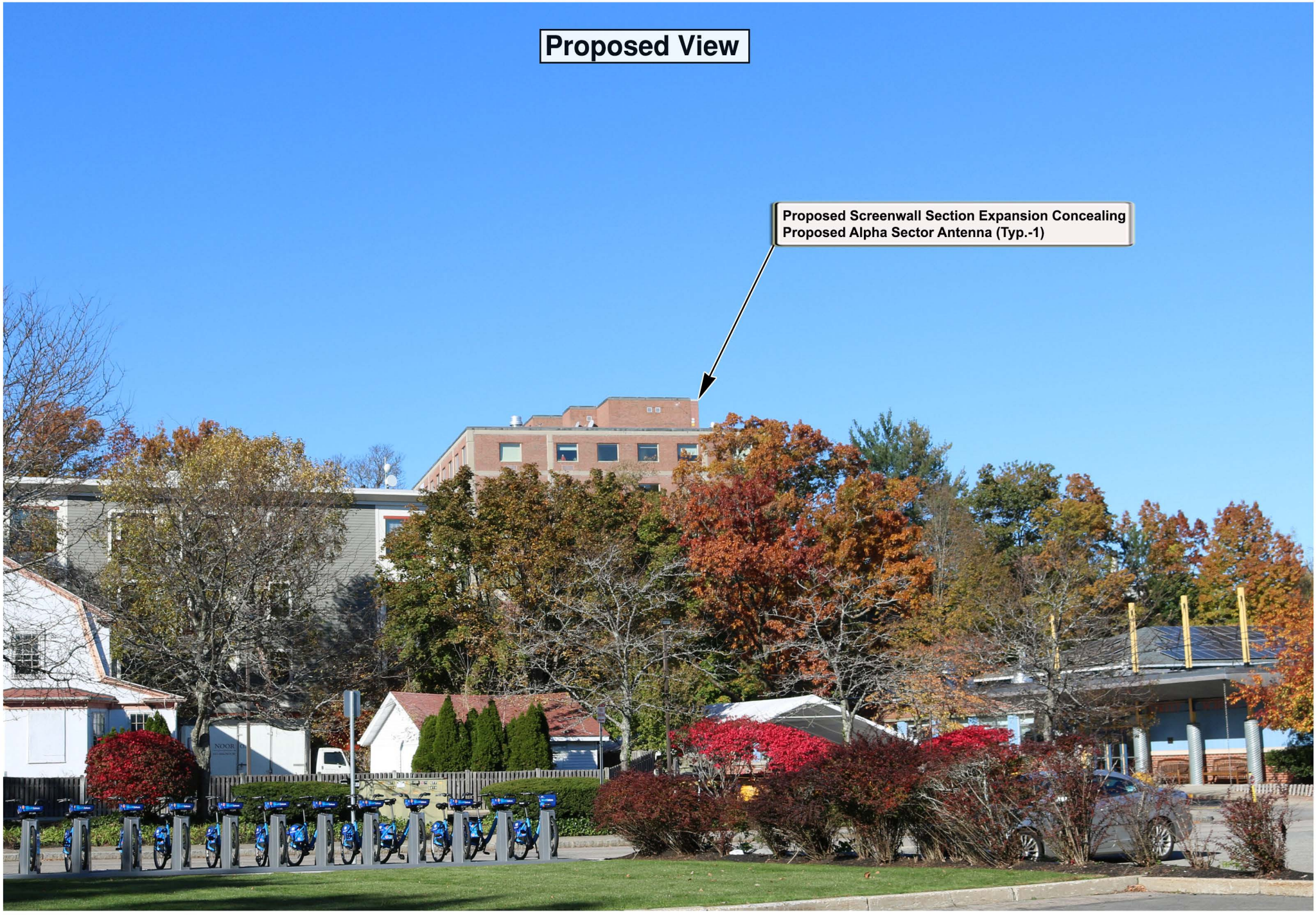
verizon WIRELESS

Belmont 2 MA

View Facing Northwest From Concord Ave.

PHOTO 2A

Dewberry



verizon WIRELESS

Belmont 2 MA

View Facing Northwest From Concord Ave.

PHOTO 2B

(Page 6 of 8)

Dewberry

verizon WIRELESS

Belmont 2 MA

View Facing Northwest From Concord Ave.

PHOTO 3A

(Page 7 of 8)

Dewberry

verizon WIRELESS

Belmont 2 MA

View Facing Northwest From Concord Ave.

PHOTO 3B

Dewberry

Dewberry

Dewberry Engineers Inc.
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Boston, MA 02110-1200

617.695.3400
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www.dewberry.com

August 10, 2021

Andrew Leone
Verizon Wireless
118 Flanders Road
Westborough, MA 01581

Re: Belmont 2 MA Rev.1
Site ID: 182417
Fuze #: 16230098
799 Concord Ave.
Cambridge, MA 02138

Dear Mr. Leone:

Verizon Wireless has proposed to replace three (3) existing antennas with three (3) new Samsung VZS01 with integrated RRHs and to expand three (3) fiberglass enclosure sections (1 per sector) which conceal Verizon equipment at the above referenced site. The existing fiberglass enclosures are connected to the concrete masonry units framed penthouse and posted down onto the concrete roof slab supported by steel frames. Verizon has also six (6) SBNHH-1D65A antennas, three (3) CBRS RRHs RT4401-48A w/ integrated XXDWMM-12.5-65-8T antennas, three (3) Samsung B2/B66a RRHs, three (3) Samsung B5/B13 RRHs and three (3) 6-OVPs boxes that are to remain. The existing building is a 5-story healthcare facility constructed with cast-in-place concrete.

Dewberry Engineers Inc. (Dewberry) has reviewed the antenna design sheets (dated 09/10/20) provided by Verizon Wireless and has determined, based on an ultimate wind speed of 139 mph and a minimum flat roof load of 30 psf per the Massachusetts State Building Code – 780 CMR 9th Edition, the existing building façade, the existing rooftop and the proposed expanded screen wall sections have adequate capacity to support the proposed equipment configuration. Dewberry assumes that the new antennas and associated equipment are installed per the latest Construction Drawings by Dewberry.

Our assessment is based on the assumption that the existing the building structure and the fiberglass enclosures structural elements are in good condition and were constructed in conformance with all applicable state and local building codes. If, during construction, any damage, deterioration, and/or discrepancies are noticed, Dewberry is to be notified to assess any deviation from the assumed condition. Any alteration in equipment loading described above and on the associated plans will void any conclusions expressed herein and will require further analysis and design. No structural qualification is made or implied by this structural letter for existing structural members not supporting the proposed installation.

If you have any questions, please do not hesitate to call me at 617-531-0810.

Sincerely,
Dewberry Engineers Inc.

COMMONWEALTH OF MASSACHUSETTS
SAHNOUNE ABED
No. 53352
REGISTERED PROFESSIONAL ENGINEER

Sahnoune Abed, P.E.
Structural Project Engineer

Dewberry Engineers, Inc.
Structural Analysis Summary Sheet

Job No.:	50121487/50121978	**By:**	SA	**Date:**	08/06/21
Job Name:	Belmont 2 MA	**Checked:**	DAP	**Date:**	08/10/21

Location: 799 Concord Ave., Cambridge, MA 02138
Client: Verizon Wireless

Scope of Work:

- Proposed three (3) Samsung VZS01 with integrated RRHs.
- Proposed to expand three (3) existing fiberglass enclosure sections.

Codes / Standards / References:

- IBC 2015
- Massachusetts State Building Code – 780 CMR 9th Edition
- TIA-222-G
- AISC 14th Ed.
- ASCE 7-10
- RFDS dated 09/10/20
- Site visits by Dewberry Engineers on 02/26/21 & 05/20/21
- Existing building plans by Curtin & Riley Architects dated 4/14/66.
- Existing Structural Analysis by Dewberry Engineers, dated 03/18/15
- Latest Construction Drawings by Dewberry Engineers Rev. A, dated 06/11/21

Design & Analysis Assumptions:

- Design and analysis are based on dead and wind loads. The analysis checks for normal bending and shear stresses.

Conclusion / Recommendations:

- The existing building and the expanded screen walls structural elements have sufficient capacity to support the proposed installation.

Dewberry

Job Number	50121978
Made by:	SA
Date:	8/6/2021
Checked by:	DAP
Date:	8/9/2021

(Belmont 2 MA) - Design Wind Load on Screen Wall Enclosure

R:\50121487\50121978 - Belmont 2 MA\Engineering\Structural\Rev.1\Report\50121978 - Enclosure Calcs 8.9.21.xlsx

Site Name: Belmont 2 MA

Wind Load per ASCE 7-10, Chapter 30 (Components & Cladding)

Design Criteria

Height, h =	77.08 ft	*(CL of Screen Wall / Enclosure)*
Risk Category =	III	*(Table 1.5-1, ASCE 7-10)*
Basic Wind Speed, V =	139 mph	*(780 CMR - MA Amendments to the IBC)*
K_d =	0.85	*(Table 26.6-1, ASCE 7-10)*
Exposure Category =	B	*(Sect. 26.7.3, ASCE 7-10)*
K_{zt} =	1	*(Sect.26.8.2, ASCE 7-10)*
G =	0.85	*(Sect. 26.9.4, ASCE 7-10)*
K_h =	0.92	*(Table 27.3-1, ASCE 7-10)*

Velocity Pressure

$q_h = 0.00256 * K_h * K_{zt} * K_d * V^2$ *(Eqn. 27.3-1, ASCE 7-10)*

$= 38.68$ lb/ft²

$p_w = q_h[GC_p - (GC_{pi})]$ *(Eqn. 30.10-1, ASCE 7-10)* $GC_{pi} = 0$

Design Wind Force for Alpha Sector

- Effective Wind Area =377.4 S.F
- Negative applied @ Zone 5, Positive applied at Zone 4. ASCE 7-10, Fig. 30.4-1 a = 3.67 ft

$p_{w(-)} = q_h GC_p$ *(neg. external pressure)*

$= -32.88$ lb/ft² where: $GC_p = -0.85$ *(ASCE 7-10, Fig. 30.4-1)*

$p_{w(+)} = q_h GC_p$ *(pos. external pressure)*

$= 27.08$ lb/ft² where: $GC_p = 0.7$ *(ASCE 7-10, Fig. 30.4-1)*

Values of GC_p for walls shall be reduced by 10% when $\theta \leq 10°$

Design Wind Force for Beta Sector

- Effective Wind Area = 386.5 S.F
- Negative applied @ Zone 5, Positive applied at Zone 4. ASCE 7-10, Fig. 30.4-1 a = 3.65 ft

$p_{w(-)} = q_h GC_p$ *(neg. external pressure)*

$= -27.85$ lb/ft² where: $GC_p = -0.72$ *(ASCE 7-10, Fig. 30.4-1)*

$p_{w(+)} = q_h GC_p$ *(pos. external pressure)*

$= 24.37$ lb/ft² where: $GC_p = 0.63$ *(ASCE 7-10, Fig. 30.4-1)*

Values of GC_p for walls shall be reduced by 10% when $\theta \leq 10°$

Design Wind Force for Gamma Sector

- Effective Wind Area = 244 S.F
- Negative applied @ Zone 5, Positive applied at Zone 4. ASCE 7-10, Fig. 30.4-1 a = 3.00 ft

$p_{w(-)} = q_h GC_p$ *(neg. external pressure)*

$= -34.81$ lb/ft² where: $GC_p = -0.9$ *(ASCE 7-10, Fig. 30.4-1)*

$p_{w(+)} = q_h GC_p$ *(pos. external pressure)*

$= 32.88$ lb/ft² where: $GC_p = 0.85$ *(ASCE 7-10, Fig. 30.4-1)*

Values of GC_p for walls shall be reduced by 10% when $\theta \leq 10°$

Job Information

	Engineer	Checked	Approved
Name:	SA	DAP	
Date:	8/9/2021	8/9/2021	

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	83	Highest Node	83
Number of Elements	105	Highest Beam	118
Number of Plates	11	Highest Plate	117

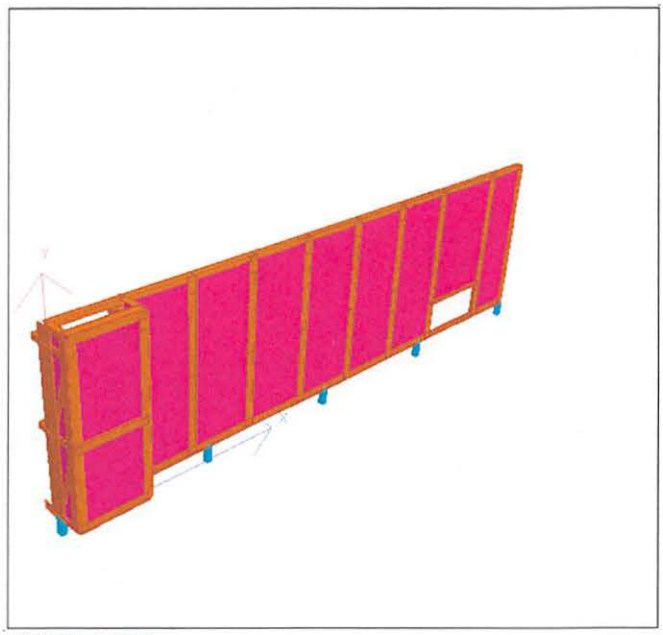
Number of Basic Load Cases	2
Number of Combination Load Cases	1

Included in this printout are data for:

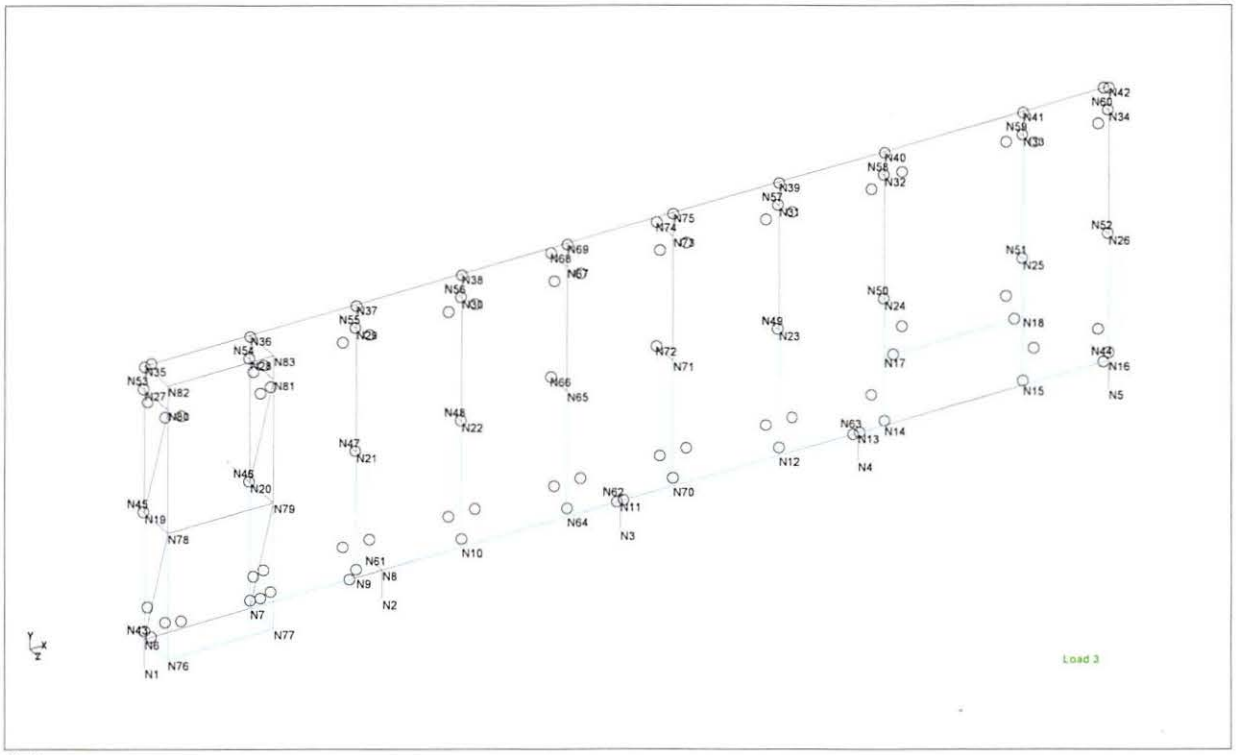
All	The Whole Structure

Included in this printout are results for load cases:

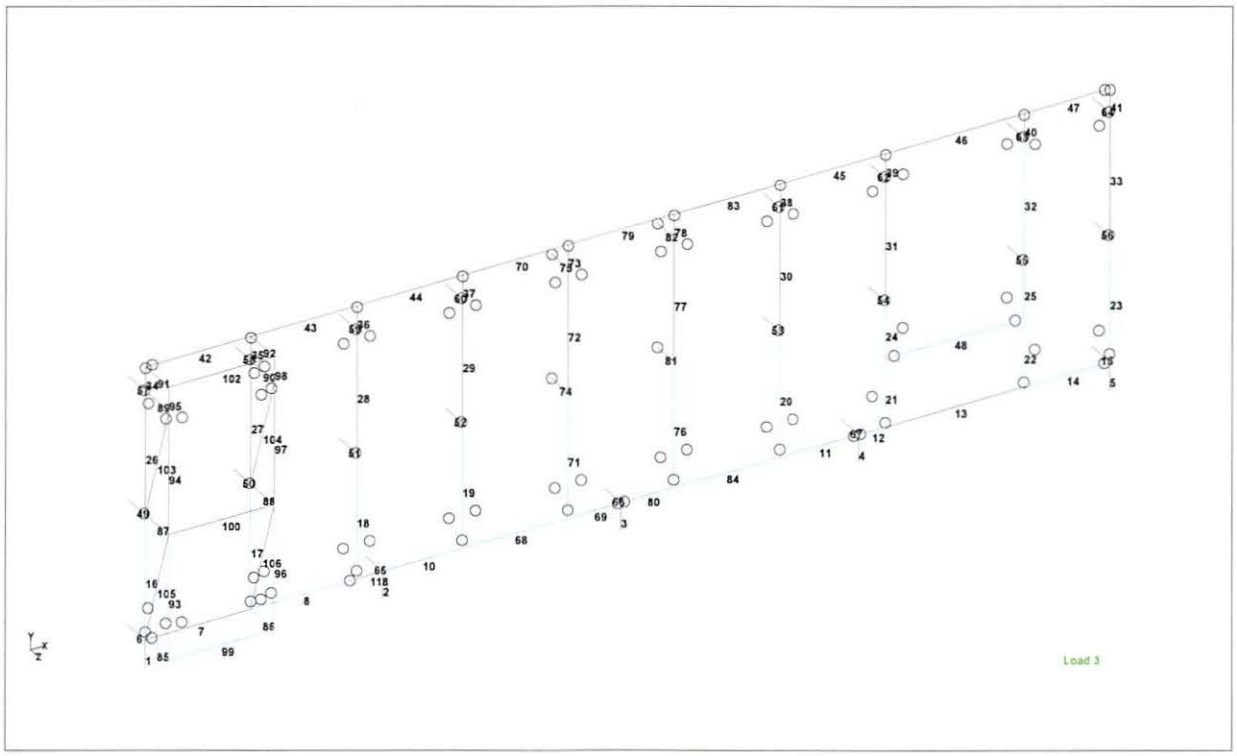
Type	L/C	Name
Combination	3	DL + 0.6 WL



3D Rendered View



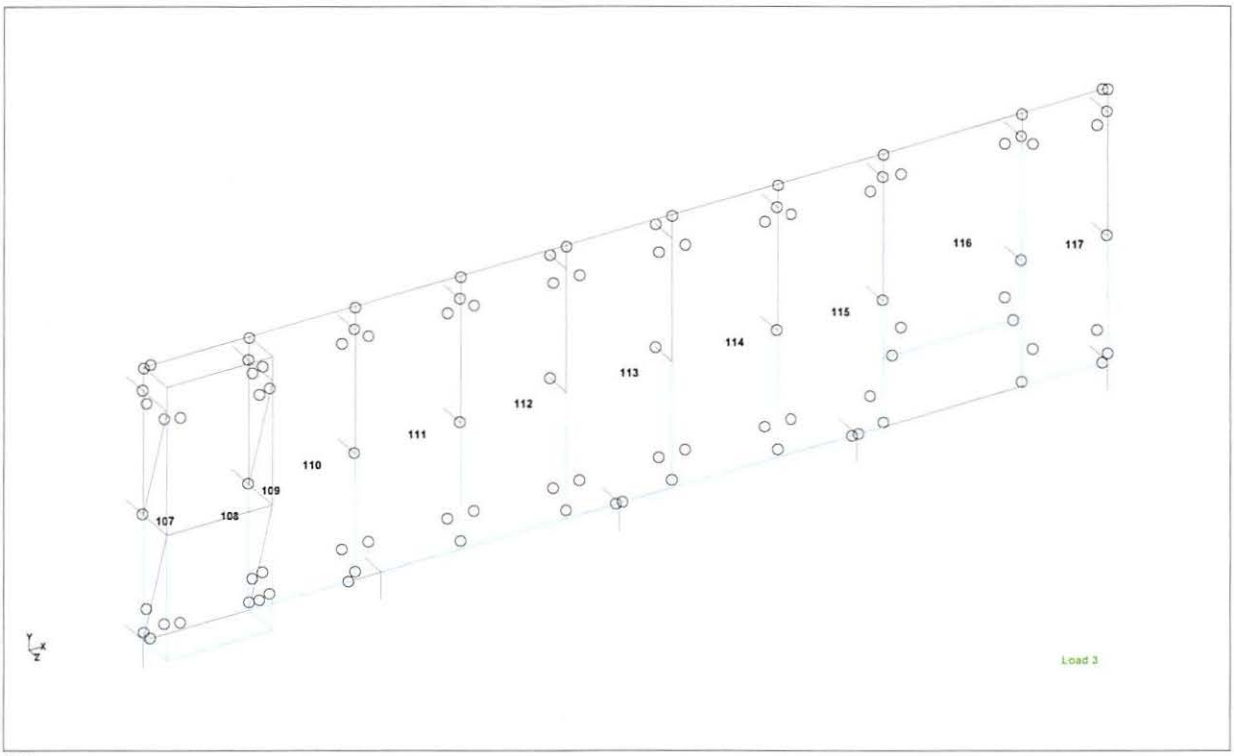
Nodes



Beams

Plates

Plate	Node A	Node B	Node C	Node D	Property
107	35	82	76	6	1
108	82	83	77	76	1
109	83	36	7	77	1
110	36	37	9	7	1
111	37	38	10	9	1
112	38	69	64	10	1
113	69	75	70	64	1
114	75	39	12	70	1
115	39	40	14	12	1
116	40	41	18	17	1
117	41	42	16	15	1



Plates

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
2	HSST4X4X0.375	4.780	10.300	10.300	16.985	STEEL
3	L60606	4.380	24.518	6.256	0.208	STEEL
4	L60608	5.770	31.688	8.128	0.490	FIBERGLASS
5	L40408	3.750	8.828	2.295	0.323	FIBERGLASS
6	L60606	4.380	24.518	6.256	0.208	FIBERGLASS
7	L60608	11.540	72.572	39.816	0.958	FIBERGLASS

Plate Thickness

Prop	Node A (in)	Node B (in)	Node C (in)	Node D (in)	Material
1	0.250	0.250	0.250	0.250	FIBERGLASS

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	CONCRETE	3.15E+3	0.170	8.68e-05	5.5E -6
2	ALUMINUM	10E+3	0.330	9.8e-05	12.8E -6
3	STEEL_50_KSI	29E+3	0.300	0.000283	6.5E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000283	9.9E -6
5	STEEL_36_KSI	29E+3	0.300	0.000283	6.5E -6
6	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
7	STEEL	29E+3	0.300	0.000283	6E -6
8	FIBERGLASS	2.8E+3	0.350	0.000	4.400
9	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip-ft/deg)	rY (kip-ft/deg)	rZ (kip-ft/deg)
1	Fixed	Fixed	Fixed	-	Fixed	-
2	Fixed	Fixed	Fixed	-	Fixed	-
3	Fixed	Fixed	Fixed	-	Fixed	-
4	Fixed	Fixed	Fixed	-	Fixed	-
5	Fixed	Fixed	Fixed	-	Fixed	-
43	Fixed	Fixed	Fixed	-	-	Fixed
44	Fixed	Fixed	Fixed	-	-	Fixed
45	Fixed	Fixed	Fixed	-	-	Fixed
46	Fixed	Fixed	Fixed	-	-	Fixed
47	Fixed	Fixed	Fixed	-	-	Fixed
48	Fixed	Fixed	Fixed	-	-	Fixed
49	Fixed	Fixed	Fixed	-	-	Fixed
50	Fixed	Fixed	Fixed	-	-	Fixed
51	Fixed	Fixed	Fixed	-	-	Fixed
52	Fixed	Fixed	Fixed	-	-	Fixed
53	Fixed	Fixed	Fixed	-	-	Fixed
54	Fixed	Fixed	Fixed	-	-	Fixed
55	Fixed	Fixed	Fixed	-	-	Fixed
56	Fixed	Fixed	Fixed	-	-	Fixed
57	Fixed	Fixed	Fixed	-	-	Fixed
58	Fixed	Fixed	Fixed	-	-	Fixed
59	Fixed	Fixed	Fixed	-	-	Fixed
60	Fixed	Fixed	Fixed	-	-	Fixed
61	Fixed	Fixed	Fixed	-	-	Fixed
62	Fixed	Fixed	Fixed	-	-	Fixed
63	Fixed	Fixed	Fixed	-	-	Fixed
66	Fixed	Fixed	Fixed	-	-	Fixed
68	Fixed	Fixed	Fixed	-	-	Fixed
72	Fixed	Fixed	Fixed	-	-	Fixed
74	Fixed	Fixed	Fixed	-	-	Fixed

Releases

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

Beam	Node	x	y	z	rx	ry	rz
7	6	Fixed	Fixed	Fixed	Fixed	Pin	Pin
8	9	Fixed	Fixed	Fixed	Fixed	Pin	Pin
11	13	Fixed	Fixed	Fixed	Fixed	Pin	Pin
12	13	Fixed	Fixed	Fixed	Fixed	Pin	Pin
14	16	Fixed	Fixed	Fixed	Fixed	Pin	Pin
16	6	Fixed	Fixed	Fixed	Pin	Fixed	Pin
17	7	Fixed	Fixed	Fixed	Pin	Fixed	Pin
18	9	Fixed	Fixed	Fixed	Pin	Fixed	Pin
19	10	Fixed	Fixed	Fixed	Pin	Fixed	Pin
20	12	Fixed	Fixed	Fixed	Pin	Fixed	Pin
21	14	Fixed	Fixed	Fixed	Pin	Fixed	Pin
22	15	Fixed	Fixed	Fixed	Pin	Fixed	Pin
23	16	Fixed	Fixed	Fixed	Pin	Fixed	Pin
34	35	Fixed	Fixed	Fixed	Pin	Fixed	Pin
35	36	Fixed	Fixed	Fixed	Pin	Fixed	Pin
36	37	Fixed	Fixed	Fixed	Pin	Fixed	Pin
37	38	Fixed	Fixed	Fixed	Pin	Fixed	Pin
38	39	Fixed	Fixed	Fixed	Pin	Fixed	Pin
39	40	Fixed	Fixed	Fixed	Pin	Fixed	Pin
40	41	Fixed	Fixed	Fixed	Pin	Fixed	Pin
41	42	Fixed	Fixed	Fixed	Pin	Fixed	Pin
42	35	Fixed	Fixed	Fixed	Fixed	Pin	Pin
47	42	Fixed	Fixed	Fixed	Fixed	Pin	Pin
48	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
48	18	Fixed	Fixed	Fixed	Fixed	Pin	Pin
49	19	Fixed	Fixed	Fixed	Pin	Pin	Fixed
50	20	Fixed	Fixed	Fixed	Pin	Pin	Fixed
51	21	Fixed	Fixed	Fixed	Pin	Pin	Fixed
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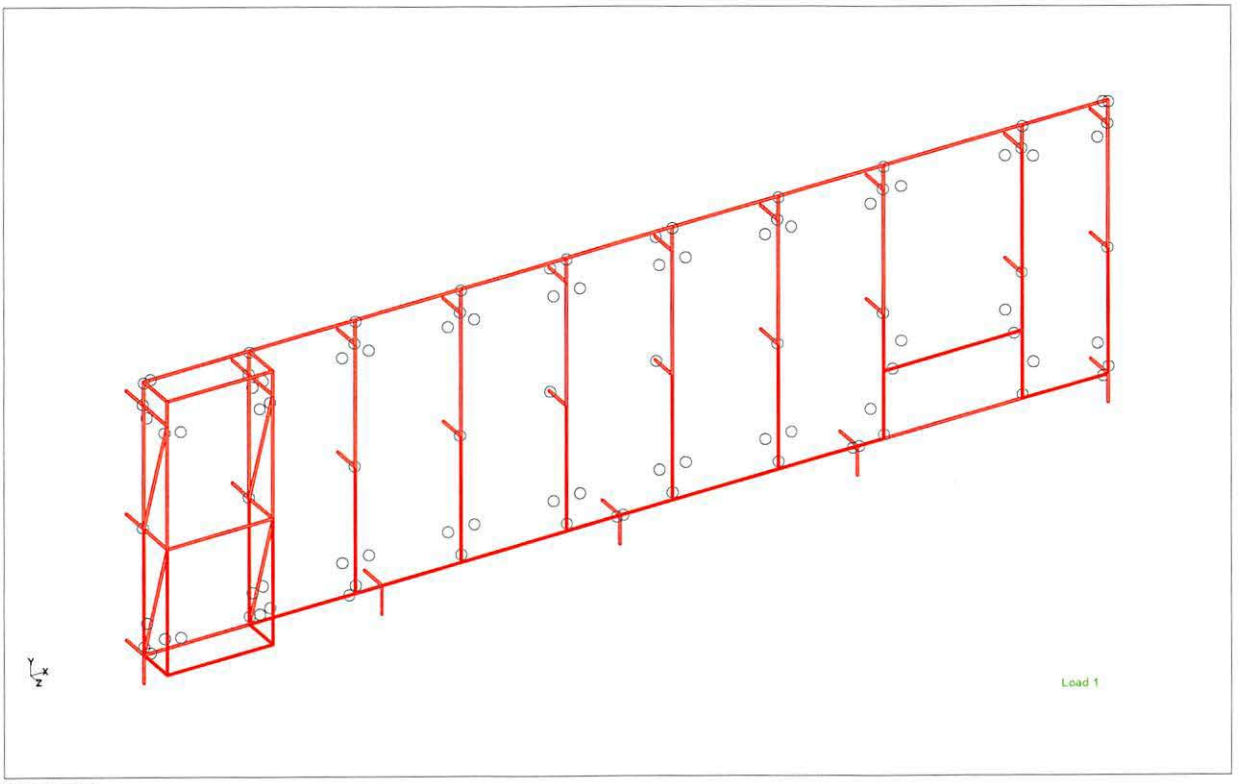
54	24	Fixed	Fixed	Fixed	Pin	Pin	Fixed
55	25	Fixed	Fixed	Fixed	Pin	Pin	Fixed
56	26	Fixed	Fixed	Fixed	Pin	Pin	Fixed
57	27	Fixed	Fixed	Fixed	Pin	Pin	Fixed
58	28	Fixed	Fixed	Fixed	Pin	Pin	Fixed
59	29	Fixed	Fixed	Fixed	Pin	Pin	Fixed
60	30	Fixed	Fixed	Fixed	Pin	Pin	Fixed
61	31	Fixed	Fixed	Fixed	Pin	Pin	Fixed
62	32	Fixed	Fixed	Fixed	Pin	Pin	Fixed
63	33	Fixed	Fixed	Fixed	Pin	Pin	Fixed
64	34	Fixed	Fixed	Fixed	Pin	Pin	Fixed
69	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
71	64	Fixed	Fixed	Fixed	Pin	Fixed	Pin
73	69	Fixed	Fixed	Fixed	Pin	Fixed	Pin
74	66	Fixed	Fixed	Fixed	Pin	Pin	Fixed
75	68	Fixed	Fixed	Fixed	Pin	Pin	Fixed
76	70	Fixed	Fixed	Fixed	Pin	Fixed	Pin
78	75	Fixed	Fixed	Fixed	Pin	Fixed	Pin
80	11	Fixed	Fixed	Fixed	Fixed	Pin	Pin
81	72	Fixed	Fixed	Fixed	Pin	Pin	Fixed
82	74	Fixed	Fixed	Fixed	Pin	Pin	Fixed

Primary Load Cases

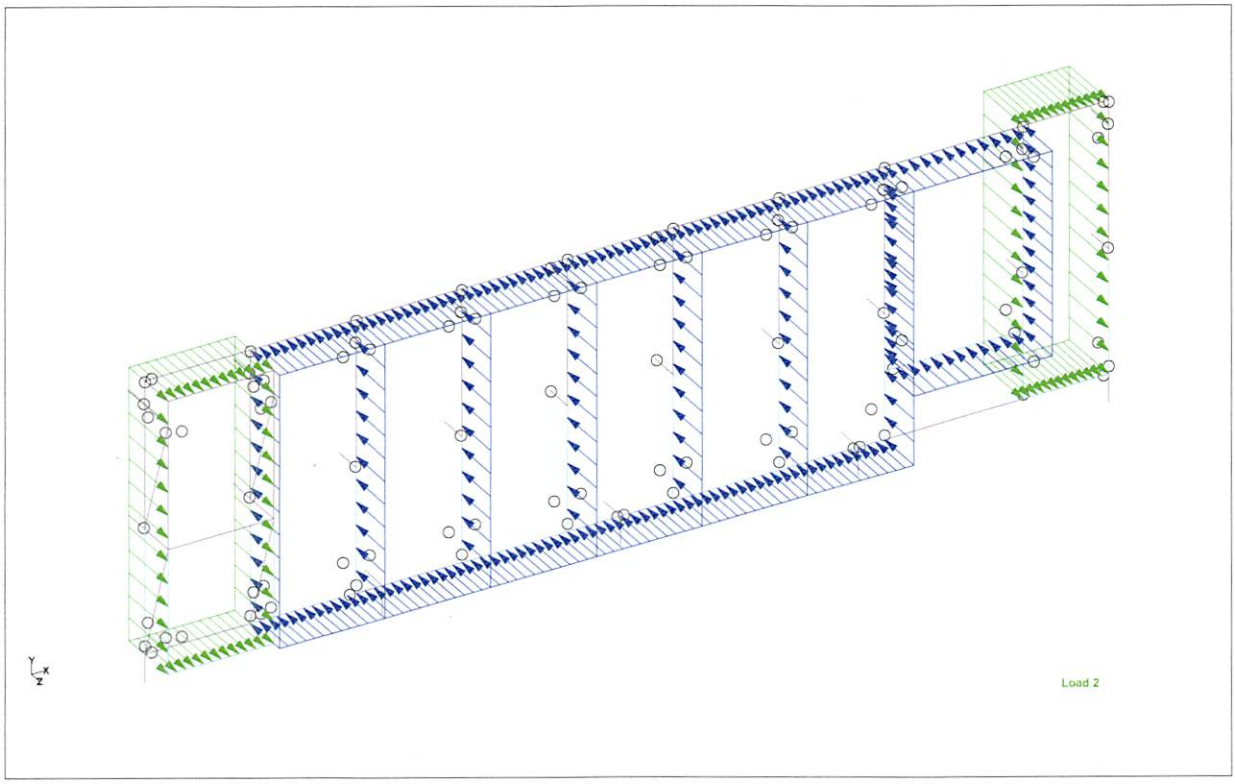
Number	Name	Type
1	DEAD	Dead
2	WIND	Wind

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
3	DL + 0.6 WL	1	DEAD	1.00
		2	WIND	0.60



Dead Loads



Wind Loads (Z)

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST4X4X0	HSST4X4X0	0.005	1.000	0.005	AISC- H1-3	3	4.780	10.300	10.300	17.500
2	HSST4X4X0	HSST4X4X0	0.027	1.000	0.027	AISC- H1-3	1	4.780	10.300	10.300	17.500
3	HSST4X4X0	HSST4X4X0	0.009	1.000	0.009	AISC- H1-3	2	4.780	10.300	10.300	17.500
4	HSST4X4X0	HSST4X4X0	0.005	1.000	0.005	AISC- H2-1	2	4.780	10.300	10.300	17.500
5	HSST4X4X0	HSST4X4X0	0.006	1.000	0.006	AISC- H1-3	3	4.780	10.300	10.300	17.500
6	L60606	L60606	0.029	1.000	0.029	AISC- H2-1	2	4.380	6.203	24.571	0.205
7	L60606	L60606	0.012	1.000	0.012	AISC- H1-3	1	4.380	6.203	24.571	0.205
8	L60606	L60606	0.014	1.000	0.014	AISC- H2-1	1	4.380	6.203	24.571	0.205
10	L60606	L60606	0.251	1.000	0.251	AISC- H1-3	2	4.380	6.203	24.571	0.205
11	L60606	L60606	0.291	1.000	0.291	AISC- H1-3	2	4.380	6.203	24.571	0.205
12	L60606	L60606	0.128	1.000	0.128	AISC- H1-3	2	4.380	6.203	24.571	0.205
13	L60606	L60606	0.123	1.000	0.123	AISC- H1-3	2	4.380	6.203	24.571	0.205
14	L60606	L60606	54949	1.000	0.054949	AISC- H1-3	2	4.380	6.203	24.571	0.205
15	L60606	L60606	0.015	1.000	0.015	AISC- H2-1	2	4.380	6.203	24.571	0.205
65	L60606	L60606	0.083	1.000	0.083	AISC- H1-3	2	4.380	6.203	24.571	0.205
66	L60606	L60606	0.039	1.000	0.039	AISC- H1-3	2	4.380	6.203	24.571	0.205
67	L60606	L60606	31255	1.000	0.031255	AISC- H1-3	2	4.380	6.203	24.571	0.205
68	L60606	L60606	0.212	1.000	0.212	AISC- H1-3	2	4.380	6.203	24.571	0.205
69	L60606	L60606	0.213	1.000	0.213	AISC- H1-3	2	4.380	6.203	24.571	0.205
80	L60606	L60606	0.257	1.000	0.257	AISC- H1-3	2	4.380	6.203	24.571	0.205
84	L60606	L60606	0.292	1.000	0.292	AISC- H1-3	2	4.380	6.203	24.571	0.205
118	L60606	L60606	0.144	1.000	0.144	AISC- H2-1	1	4.380	6.203	24.571	0.205

Failed Members

There is no data of this type.

Reactions

Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	Moment MY (kip-in)	Moment MZ (kip-in)
1	3:DL + 0.6 WL	-0.001	0.411	0.014	0	-0.468	0
2	3:DL + 0.6 WL	-0.091	0.796	-0.045	0	-1.644	0
3	3:DL + 0.6 WL	-0.001	0.393	0.025634	0	-0.469	0
4	3:DL + 0.6 WL	-0.000	0.215	0.015	0	-0.420	0
5	3:DL + 0.6 WL	-0.014	0.381	0.007	0	-0.450	0
43	3:DL + 0.6 WL	-0.048	0.023	-0.169	0	0	0.007
44	3:DL + 0.6 WL	-0.033	0.004	-0.224	0	0	0.006
45	3:DL + 0.6 WL	-0.002	0.003	0.013	0	0	0
46	3:DL + 0.6 WL	-0.003	0.005	-0.034	0	0	0
47	3:DL + 0.6 WL	0.001	0.001	-0.091	0	0	0
48	3:DL + 0.6 WL	0.001	0.001	-0.089	0	0	0
49	3:DL + 0.6 WL	0.001	0.001	-0.080	0	0	0
50	3:DL + 0.6 WL	0.001	0.001	0.025451	0	0	0
51	3:DL + 0.6 WL	0.000	0.001	0.113	0	0	0
52	3:DL + 0.6 WL	0.000	0.002	0.049	0	0	0
53	3:DL + 0.6 WL	0.011	-0.009	-0.282	0	0	0
54	3:DL + 0.6 WL	0.003	-0.001	-0.002	0	0	0
55	3:DL + 0.6 WL	-0.001	0.002	0.394	0	0	0
56	3:DL + 0.6 WL	-0.001	0.002	0.416	0	0	0
57	3:DL + 0.6 WL	-0.001	0.002	0.408	0	0	0
58	3:DL + 0.6 WL	-0.001	0.003	0.391	0	0	0
59	3:DL + 0.6 WL	-0.000	0.002	-0.006	0	0	0
60	3:DL + 0.6 WL	-0.000	0.001	-0.207	0	0	0
61	3:DL + 0.6 WL	0.243	-0.030	0.780	0	0	0.005
62	3:DL + 0.6 WL	-0.034	0.031	0.441	0	0	0.007
63	3:DL + 0.6 WL	-0.030	0.029	0.471	0	0	0.006
66	3:DL + 0.6 WL	0.000	-0.029	-0.045	0	0	0
68	3:DL + 0.6 WL	-0.000	0.127	0.384	0	0	0
72	3:DL + 0.6 WL	0.000	-0.036	-0.040	0	0	0
74	3:DL + 0.6 WL	-0.000	0.127	0.382	0	0	0

Posts Reactions

Roof slab is 10 1/2" thick + 6" concrete topping = 16 1/2".

Screen wall posts are spaced @ 9'0" +/- . Let's divide the slab into 9' wide strips. Strip L = 21.75'

Self Wt. / strip = (16.5/12)150 pcf = 206 psf

Strip Total Wt. = 9'(21.75')206 psf =40,325 lb. e.a. strip

796 lb./40,325 lb. = 1.97 % increase DL < 5 % allowed - OK -

Max. shear value for fiberglass connection

- Steel wall connections OK by Inspection

- Shear strength of 1/2' Dia. Fiberglass bolts @ Fiberglass connections (S.F. = 4):

7,400 lb (Double Shear) ---> 7,400 lb /2 = 3,700 lb (Single Shear)

Allowable Shear = 3,700 lb /4 = 925 lb > 471 lb

- Bearing capacity:

Allowable Bearing Stress = 33 ksi /4 = 8.25 ksi

8.25 ksi x 1/2" dia. x 1/2" (Angle thickness) = 2.06 kips >>0.471kips -OK-

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

				Axial	Shear		Torsion	Bending	
	Beam	L/C	d (ft)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip˜in)	My (kip˜in)	Mz (kip˜in)
Max Fx	60	3:DL + 0.6 WL	0	**0.416**	0.002	-0.001	0	-0.000	0.000
Min Fx	57	3:DL + 0.6 WL	0	**-0.282**	-0.014	-0.001	0	-0.000	0.000
Max Fy	73	3:DL + 0.6 WL	0	0.087	**0.240**	-0.240	0	2.653	2.652
Min Fy	41	3:DL + 0.6 WL	0	0.095	**-0.118**	0.119	0	-1.318	-1.297
Max Fz	41	3:DL + 0.6 WL	0	0.095	-0.118	**0.119**	0	-1.318	-1.297
Min Fz	73	3:DL + 0.6 WL	0	0.087	0.240	**-0.240**	0	2.653	2.652
Max Mx	43	3:DL + 0.6 WL	0	-0.022	0.008	0.012	**0.003**	-0.368	0.155
Min Mx	31	3:DL + 0.6 WL	0	-0.016	-0.044	0.046	**-0.013**	-0.037	0.068
Max My	73	3:DL + 0.6 WL	0	0.087	0.240	-0.240	0	**2.653**	2.652
Min My	24	3:DL + 0.6 WL	0	-0.004	-0.063	0.063	0	**-1.667**	-1.552
Max Mz	73	3:DL + 0.6 WL	0	0.087	0.240	-0.240	0	2.653	**2.652**
Min Mz	24	3:DL + 0.6 WL	0	-0.004	-0.063	0.063	0	-1.667	**-1.552**

Dewberry

Job Number	50121978
Made by:	SA
Date:	8/6/2021
Checked by:	DAP
Date:	8/9/2021

(Belmont 2 MA) - L 4x4x0.5 FRP Angles - Alpha Sector Check

R:\50121487\50121978 - Belmont 2 MA\Engineering\Structural\Rev.1\Report\50121978 - Enclosure Calcs 8.9.21.xlsx

Design Method ASD

STAAD Output STAAD: *FRP Angles - Alpha Sector*

* axis based on figure below

Axial Tension =	282 lb	Shear (Fx) =	240 lb	Bending (Mx) =	2653 lb-in
Axial Compression =	416 lb	Shear (Fy) =	240 lb	Bending (My) =	2652 lb-in

Member Properties

FRP Member: L 4x4x0.5

Cross Sectional Properties

		X-X Axis		*Y-Y Axis*		*Design*	
Depth (h) =	4.00 in						
Width (b or h) =	4.00 in	I_x =	5.45 in^4	I_y =	5.45 in^4	J =	N/A
Thickness (t) =	0.50 in	S_x =	1.93 in^3	S_y =	1.93 in^3	C_w =	N/A
Area =	3.72 in^2	r_x =	1.21 in	r_y =	1.21 in		
Weight =	2.79 lb/ft	r_z =	0.77 in				

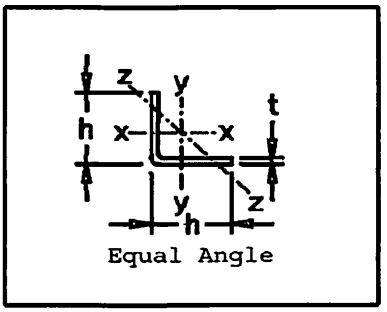
Unbraced Length			Effective Length Factor (Table 11-1)	
L_x =	1.15 ft	= 13.8 in	K_x =	1.00
L_y =	1.15 ft	= 13.8 in	K_y =	1.00

Material Properties

Tensile Strength (F_{ut}) =	7,500 psi
Compressive Strength (F_{uc}) =	16,500 psi
Bearing Stress (σ) =	18,000 psi
Flexural Strength (F_u) =	11,000 psi
Shear Strength (F_{uv}) =	4,500 psi
Modulus of Elasticity (E) =	2.60E+06 psi
Poisson's Ratio (v) =	0.32

Safety Factors

Tension	4.00
Compression	3.00
Flexural	2.50
Shear	3.00



Equal Angle

Check Tension

f_t = P/A = 282 lb / 3.72 in² = 76 psi
F_t = F_{tu} /S.F. = 7500 psi / 4 = 1875 psi

76 psi < 1875 psi ☑

Check Compression

Major Axis

σ_c = P/A = 416 lb / 3.72 in² = 112 psi

Bearing	$\sigma_{ult} = \sigma$	= 18000 psi
Local Buckling	$\sigma_{ult,l} = \Phi k(\pi^2 E/[12(1-\nu^2)])(t/\alpha)^2$	= 14890 psi
Global Buckling	$\sigma_{ult,Euler} = \pi^2 E/[(K_x L_x/r_x)^2]$	= 80723 psi
FT Buckling	$\sigma_{ult,ft} = \Phi(E/[2(1+\nu)])(t/\alpha^2)$	= 24621 psi

$\sigma_{allow} = \sigma_{ult}$ /S.F. = 14890 psi / 3 = = 4963 psi

112 psi < 4963 psi ☑

Minor Axis

σ_c = P/A = 416 lb / 3.72 in² = 112 psi

Bearing	$\sigma_{ult} = \sigma$	= 18000 psi
Local Buckling	$\sigma_{ult,l} = \Phi k(\pi^2 E/[12(1-\nu^2)])(t/\alpha)^2$	= 14890 psi
Global Buckling	$\sigma_{ult,Euler} = \pi^2 E/[(K_y L_y/r_y)^2]$	= 80723 psi
FT Buckling	$\sigma_{ult,ft} = \Phi(E/[2(1+\nu)])(t/\alpha^2)$	= 24621 psi

$\sigma_{allow} = \sigma_{ult}$ /S.F. = 14890 psi / 3 = = 4963 psi

112 psi < 4963 psi ☑

Check Flexure

Major Axis

f_{bx} = M_x/S_x = 2653 lb-in / 1.93 in³ = 1375 psi
F_b = F_u /S.F. = 11000 psi / 2.5 = 4400 psi

1375 psi < 4400 psi ☑

Minor Axis

f_{by} = M_y/S_y = 2652 lb-in / 1.93 in³ = 1374 psi
F_b = F_u /S.F. = 11000 psi / 2.5 = 4400 psi

1374 psi < 4400 psi ☑

Check Combined Flexure and Axial

$$UR = \frac{f_{bx} + f_{by} + \left(\frac{f_c}{F_c} \text{ or } \frac{f_t}{F_t}\right)}{F_{bx} + F_{by} +} \leq 1.0 \text{ (for operating conditions)}$$

f_{bx} =	1375 psi	F_{bx} =	4400 psi
f_{by} =	1374 psi	F_{by} =	4400 psi
f_c =	112 psi	F_c =	4963 psi
f_t =	76 psi	F_t =	1875 psi

f_{bx}/F_{bx} =	0.313	f_{by}/F_{by} =	0.312
f_c/F_c =	0.023	f_t/F_t =	0.041

0.67 < 1.00 ☑

Check Shear

f_{vx} = V_x/A_w = 240 lb / 3.72 in² = 65 psi
f_{vy} = V_y/A_w = 240 lb / 3.72 in² = 65 psi
F_v = F_{vu} /S.F. = 4500 psi / 3 = 1500 psi

65 psi < 1500 psi ☑

Job Information

	Engineer	Checked	Approved
Name:	SA	DAP	
Date:	8/4/2021	8/6/2021	

Project ID	
Project Name	

Structure Type	SPACE FRAME

Number of Nodes	128	Highest Node	128
Number of Elements	167	Highest Beam	190
Number of Plates	19	Highest Plate	187

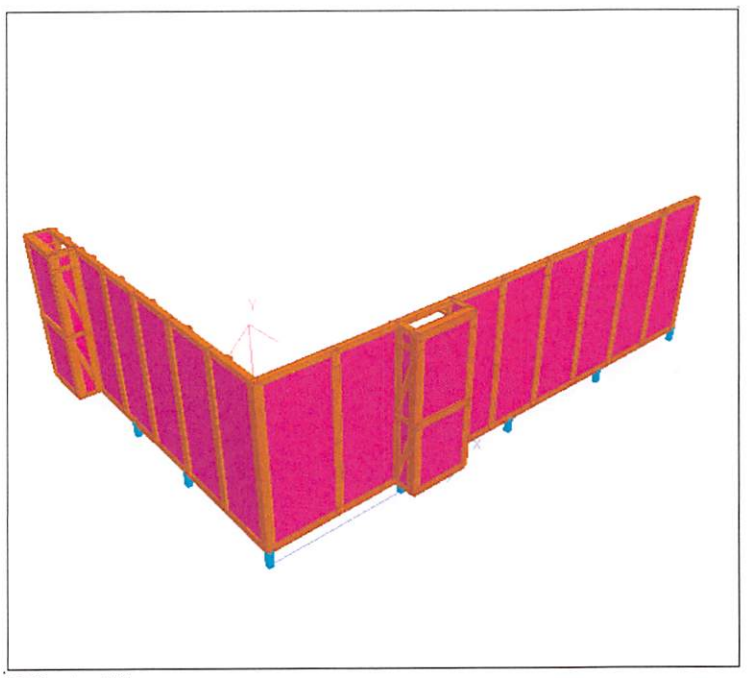
Number of Basic Load Cases	3
Number of Combination Load Cases	2

Included in this printout are data for:

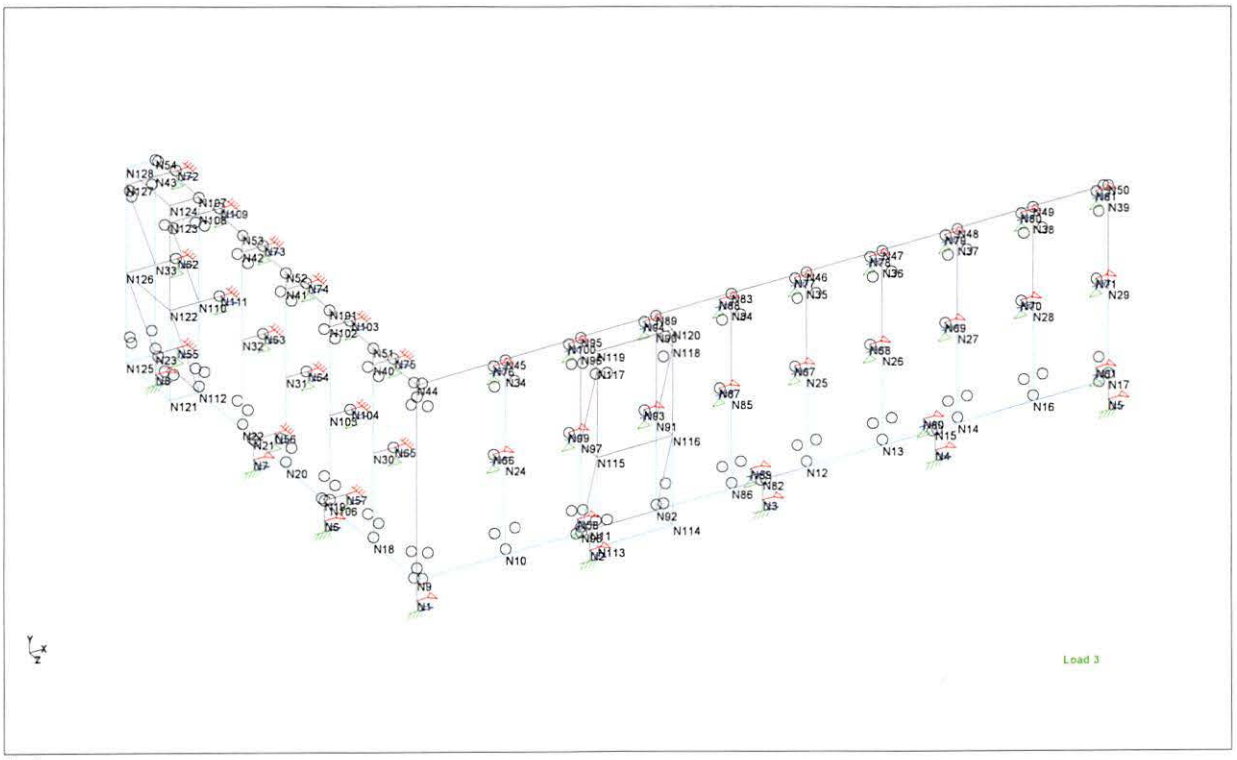
All	The Whole Structure

Included in this printout are results for load cases:

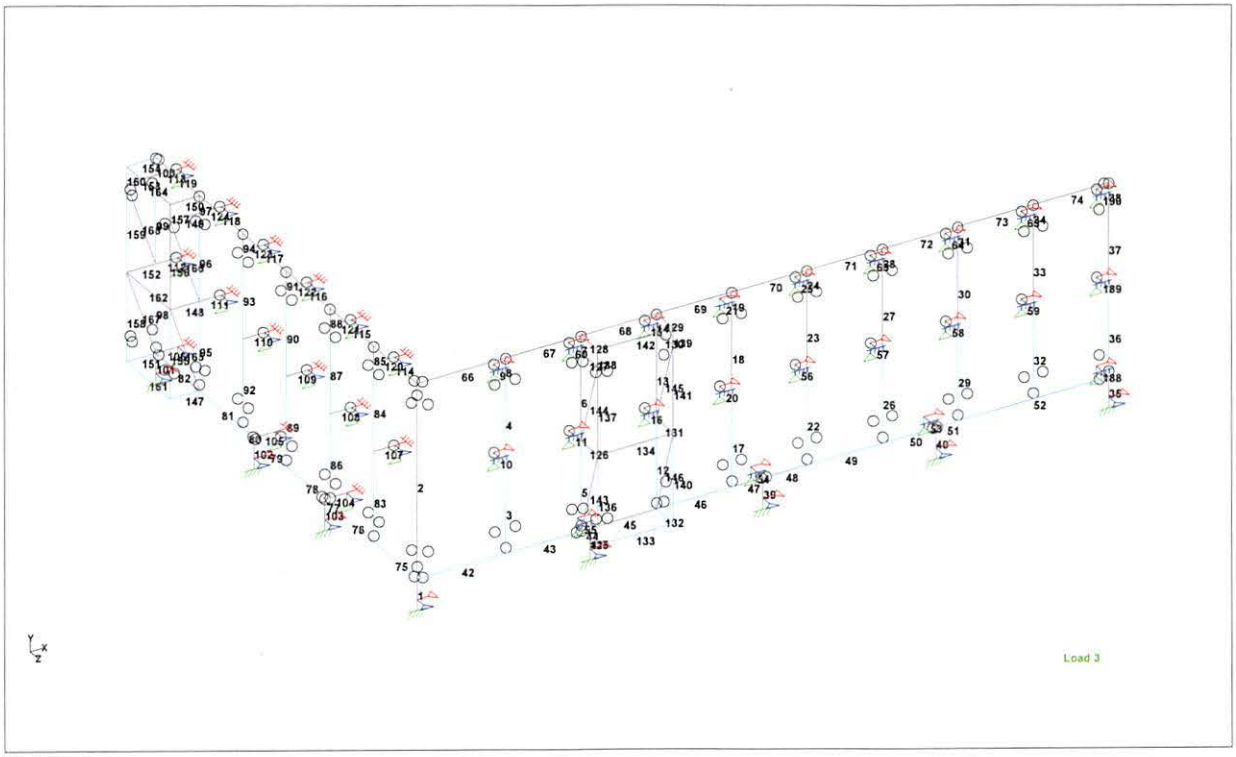
Type	L/C	Name
Combination	4	DL + 0.6 WL(X)
Combination	5	DL + 0.6 WL(Z)



3D Rendered View



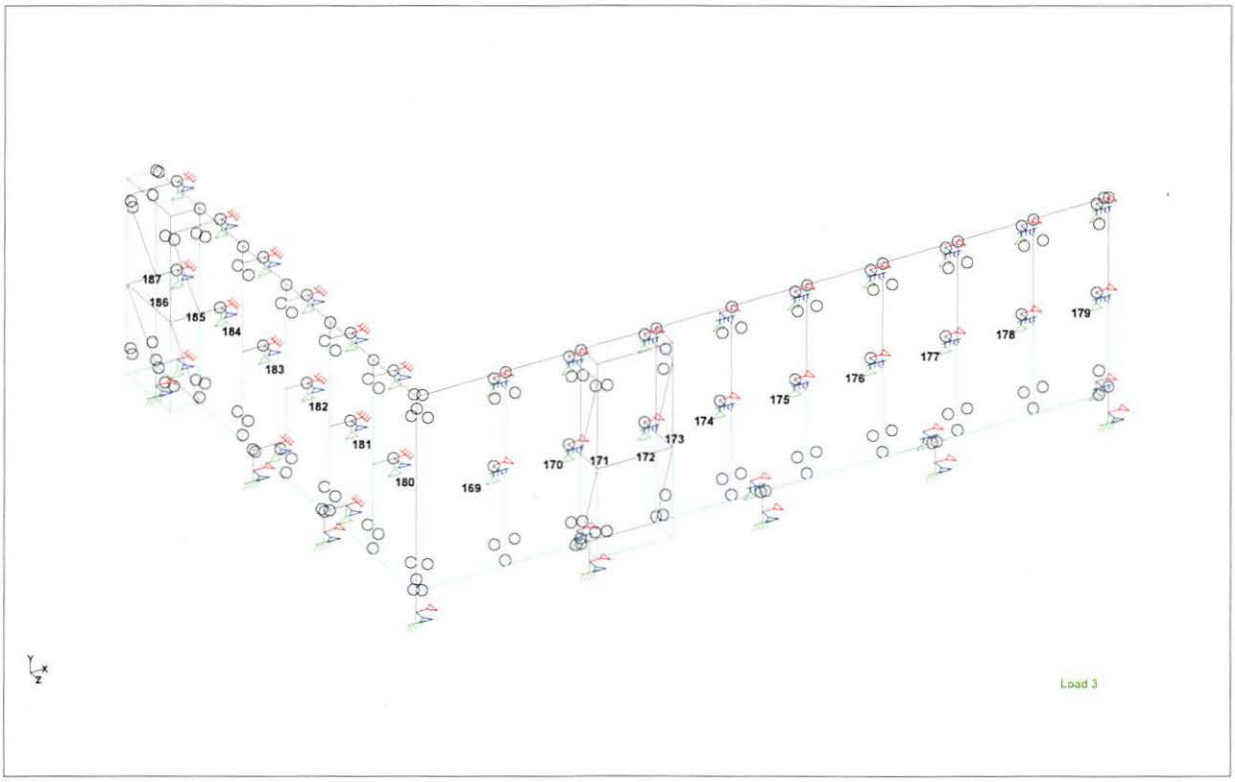
Nodes



Beams

Plates

Plate	Node A	Node B	Node C	Node D	Property
169	44	45	10	9	1
170	45	95	98	10	1
171	95	119	113	98	1
172	119	120	114	113	1
173	120	89	92	114	1
174	89	83	86	92	1
175	83	46	12	86	1
176	46	47	13	12	1
177	47	48	14	13	1
178	48	49	16	14	1
179	49	50	17	16	1
180	51	44	9	18	1
181	101	51	18	106	1
182	52	101	106	20	1
183	53	52	20	22	1
184	107	53	22	112	1
185	124	107	112	121	1
186	128	124	121	125	1
187	54	128	125	23	1



Plates

Section Properties

Prop	Section	Area (in^2)	I_{yy} (in^4)	I_{zz} (in^4)	J (in^4)	Material
2	HSST4X4X0.375	4.780	10.300	10.300	16.985	STEEL
3	L60606	4.380	24.518	6.256	0.208	STEEL
4	L60608	5.770	31.688	8.128	0.490	FIBERGLASS
5	L40408	3.750	8.828	2.295	0.323	FIBERGLASS
6	L60608 LD SP 0.00	11.540	72.572	39.816	0.958	FIBERGLASS
7	L60606	4.380	24.518	6.256	0.208	FIBERGLASS

Plate Thickness

Prop	Node A (in)	Node B (in)	Node C (in)	Node D (in)	Material
1	0.250	0.250	0.250	0.250	FIBERGLASS

Materials

Mat	Name	E (kip/in^2)	ν	Density (kip/in^3)	α (/°F)
1	CONCRETE	3.15E+3	0.170	8.68e-05	5.5E -6
2	ALUMINUM	10E+3	0.330	9.8e-05	12.8E -6
3	STEEL_50_KSI	29E+3	0.300	0.000283	6.5E -6
4	STAINLESSSTEEL	28E+3	0.300	0.000283	9.9E -6
5	STEEL_36_KSI	29E+3	0.300	0.000283	6.5E -6
6	STEEL_275_NMM2	29.7E+3	0.300	0.000	6.67E -6
7	STEEL	29E+3	0.300	0.000283	6E -6
8	FIBERGLASS	2.8E+3	0.350	0.000	4.400
9	STEEL_355_NMM2	29.7E+3	0.300	0.000	6.67E -6

Supports

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip-ft/deg)	rY (kip-ft/deg)	rZ (kip-ft/deg)
1	Fixed	Fixed	Fixed	-	Fixed	-
2	Fixed	Fixed	Fixed	-	Fixed	-
3	Fixed	Fixed	Fixed	-	Fixed	-
4	Fixed	Fixed	Fixed	-	Fixed	-
5	Fixed	Fixed	Fixed	-	Fixed	-
6	Fixed	Fixed	Fixed	-	Fixed	-
7	Fixed	Fixed	Fixed	-	Fixed	-
8	Fixed	Fixed	Fixed	-	Fixed	-
55	Fixed	Fixed	Fixed	Fixed	-	-
56	Fixed	Fixed	Fixed	Fixed	-	-
57	Fixed	Fixed	Fixed	Fixed	-	-
58	Fixed	Fixed	Fixed	-	-	Fixed
59	Fixed	Fixed	Fixed	-	-	Fixed
60	Fixed	Fixed	Fixed	-	-	Fixed
61	Fixed	Fixed	Fixed	-	-	Fixed
62	Fixed	Fixed	Fixed	Fixed	-	-
63	Fixed	Fixed	Fixed	Fixed	-	-
64	Fixed	Fixed	Fixed	Fixed	-	-
65	Fixed	Fixed	Fixed	Fixed	-	-
66	Fixed	Fixed	Fixed	-	-	Fixed
67	Fixed	Fixed	Fixed	-	-	Fixed
68	Fixed	Fixed	Fixed	-	-	Fixed
69	Fixed	Fixed	Fixed	-	-	Fixed
70	Fixed	Fixed	Fixed	-	-	Fixed
71	Fixed	Fixed	Fixed	-	-	Fixed
72	Fixed	Fixed	Fixed	Fixed	-	-
73	Fixed	Fixed	Fixed	Fixed	-	-
74	Fixed	Fixed	Fixed	Fixed	-	-
75	Fixed	Fixed	Fixed	Fixed	-	-
76	Fixed	Fixed	Fixed	-	-	Fixed
77	Fixed	Fixed	Fixed	-	-	Fixed
78	Fixed	Fixed	Fixed	-	-	Fixed
79	Fixed	Fixed	Fixed	-	-	Fixed
80	Fixed	Fixed	Fixed	-	-	Fixed
81	Fixed	Fixed	Fixed	-	-	Fixed
87	Fixed	Fixed	Fixed	-	-	Fixed

Supports Cont...

Node	X (kip/in)	Y (kip/in)	Z (kip/in)	rX (kip*ft/deg)	rY (kip*ft/deg)	rZ (kip*ft/deg)
88	Fixed	Fixed	Fixed	-	-	Fixed
93	Fixed	Fixed	Fixed	-	-	Fixed
94	Fixed	Fixed	Fixed	-	-	Fixed
99	Fixed	Fixed	Fixed	-	-	Fixed
100	Fixed	Fixed	Fixed	-	-	Fixed
103	Fixed	Fixed	Fixed	Fixed	-	-
104	Fixed	Fixed	Fixed	Fixed	-	-
109	Fixed	Fixed	Fixed	Fixed	-	-
111	Fixed	Fixed	Fixed	Fixed	-	-

Releases

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

Beam	Node	x	y	z	rx	ry	rz
2	9	Fixed	Fixed	Fixed	Pin	Fixed	Pin
2	44	Fixed	Fixed	Fixed	Pin	Fixed	Pin
3	10	Fixed	Fixed	Fixed	Pin	Fixed	Pin
5	98	Fixed	Fixed	Fixed	Pin	Fixed	Pin
7	95	Fixed	Fixed	Fixed	Pin	Fixed	Pin
8	45	Fixed	Fixed	Fixed	Pin	Fixed	Pin
9	76	Fixed	Fixed	Fixed	Pin	Pin	Fixed
10	66	Fixed	Fixed	Fixed	Pin	Pin	Fixed
11	99	Fixed	Fixed	Fixed	Pin	Pin	Fixed
12	92	Fixed	Fixed	Fixed	Pin	Fixed	Pin
14	89	Fixed	Fixed	Fixed	Pin	Fixed	Pin
15	94	Fixed	Fixed	Fixed	Pin	Pin	Fixed
16	93	Fixed	Fixed	Fixed	Pin	Pin	Fixed
17	86	Fixed	Fixed	Fixed	Pin	Fixed	Pin
19	83	Fixed	Fixed	Fixed	Pin	Fixed	Pin
20	87	Fixed	Fixed	Fixed	Pin	Pin	Fixed
22	12	Fixed	Fixed	Fixed	Pin	Fixed	Pin
24	46	Fixed	Fixed	Fixed	Pin	Fixed	Pin
25	77	Fixed	Fixed	Fixed	Pin	Pin	Fixed
26	13	Fixed	Fixed	Fixed	Pin	Fixed	Pin
28	47	Fixed	Fixed	Fixed	Pin	Fixed	Pin
29	14	Fixed	Fixed	Fixed	Pin	Fixed	Pin
31	48	Fixed	Fixed	Fixed	Pin	Fixed	Pin
32	16	Fixed	Fixed	Fixed	Pin	Fixed	Pin
34	49	Fixed	Fixed	Fixed	Pin	Fixed	Pin
36	17	Fixed	Fixed	Fixed	Pin	Fixed	Pin
38	50	Fixed	Fixed	Fixed	Pin	Fixed	Pin
42	9	Fixed	Fixed	Fixed	Fixed	Pin	Pin
43	98	Fixed	Fixed	Fixed	Fixed	Pin	Pin
44	98	Fixed	Fixed	Fixed	Fixed	Pin	Pin
47	82	Fixed	Fixed	Fixed	Fixed	Pin	Pin
48	82	Fixed	Fixed	Fixed	Fixed	Pin	Pin
50	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
51	15	Fixed	Fixed	Fixed	Fixed	Pin	Pin
52	17	Fixed	Fixed	Fixed	Fixed	Pin	Pin
56	67	Fixed	Fixed	Fixed	Pin	Pin	Fixed

Releases Cont...

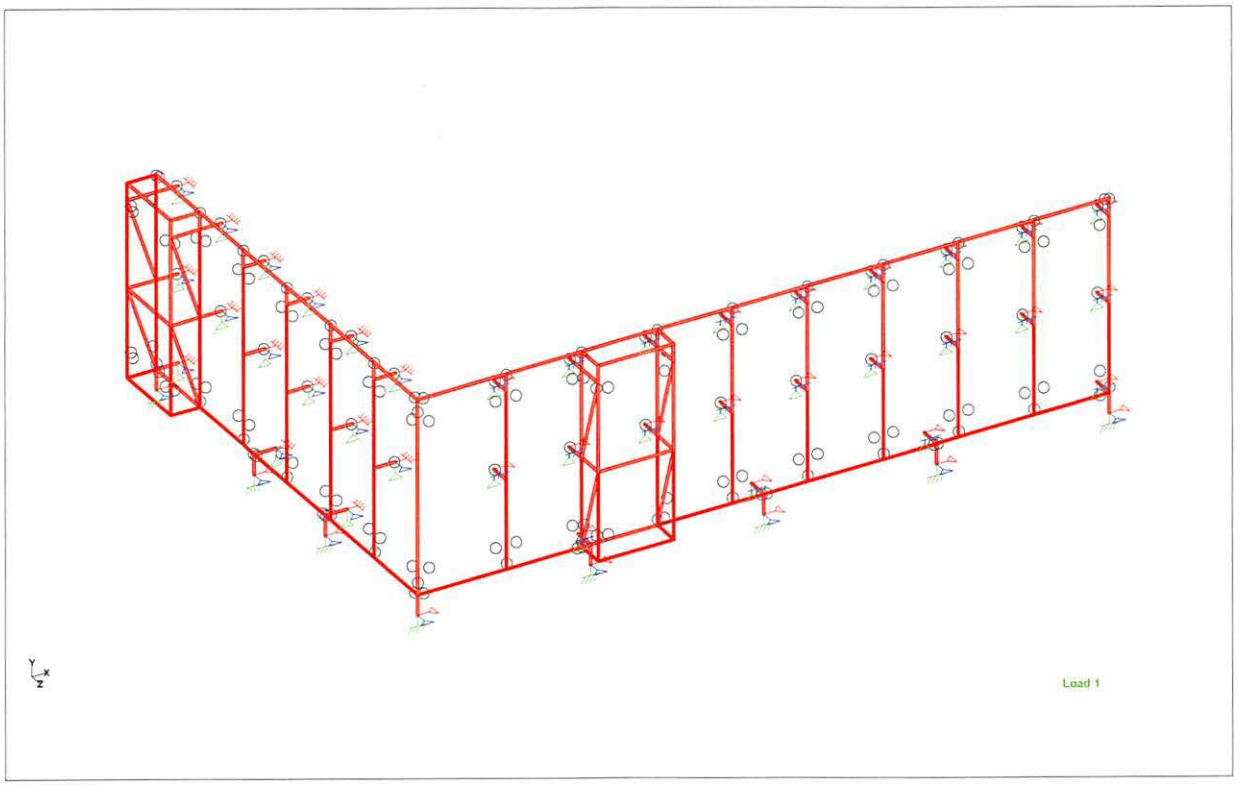
Beam	Node	x	y	z	rx	ry	rz
57	68	Fixed	Fixed	Fixed	Pin	Pin	Fixed
58	69	Fixed	Fixed	Fixed	Pin	Pin	Fixed
59	70	Fixed	Fixed	Fixed	Pin	Pin	Fixed
60	100	Fixed	Fixed	Fixed	Pin	Pin	Fixed
63	78	Fixed	Fixed	Fixed	Pin	Pin	Fixed
64	79	Fixed	Fixed	Fixed	Pin	Pin	Fixed
65	80	Fixed	Fixed	Fixed	Pin	Pin	Fixed
66	44	Fixed	Fixed	Fixed	Fixed	Pin	Pin
74	50	Fixed	Fixed	Fixed	Fixed	Pin	Pin
75	9	Fixed	Fixed	Fixed	Pin	Pin	Fixed
77	19	Fixed	Fixed	Fixed	Pin	Pin	Fixed
78	19	Fixed	Fixed	Fixed	Pin	Pin	Fixed
79	21	Fixed	Fixed	Fixed	Pin	Pin	Fixed
80	21	Fixed	Fixed	Fixed	Pin	Pin	Fixed
82	23	Fixed	Fixed	Fixed	Pin	Pin	Fixed
83	18	Fixed	Fixed	Fixed	Pin	Fixed	Pin
85	51	Fixed	Fixed	Fixed	Pin	Fixed	Pin
86	106	Fixed	Fixed	Fixed	Pin	Fixed	Pin
88	101	Fixed	Fixed	Fixed	Pin	Fixed	Pin
89	20	Fixed	Fixed	Fixed	Pin	Fixed	Pin
91	52	Fixed	Fixed	Fixed	Pin	Fixed	Pin
92	22	Fixed	Fixed	Fixed	Pin	Fixed	Pin
94	53	Fixed	Fixed	Fixed	Pin	Fixed	Pin
95	112	Fixed	Fixed	Fixed	Pin	Fixed	Pin
97	107	Fixed	Fixed	Fixed	Pin	Fixed	Pin
98	23	Fixed	Fixed	Fixed	Pin	Fixed	Pin
100	54	Fixed	Fixed	Fixed	Pin	Fixed	Pin
107	65	Fixed	Fixed	Fixed	Fixed	Pin	Pin
108	104	Fixed	Fixed	Fixed	Fixed	Pin	Pin
109	64	Fixed	Fixed	Fixed	Fixed	Pin	Pin
110	63	Fixed	Fixed	Fixed	Fixed	Pin	Pin
111	111	Fixed	Fixed	Fixed	Fixed	Pin	Pin
112	62	Fixed	Fixed	Fixed	Fixed	Pin	Pin
113	72	Fixed	Fixed	Fixed	Fixed	Pin	Pin
114	44	Fixed	Fixed	Fixed	Pin	Pin	Fixed
119	54	Fixed	Fixed	Fixed	Pin	Pin	Fixed
120	75	Fixed	Fixed	Fixed	Fixed	Pin	Pin
121	103	Fixed	Fixed	Fixed	Fixed	Pin	Pin
122	74	Fixed	Fixed	Fixed	Fixed	Pin	Pin
123	73	Fixed	Fixed	Fixed	Fixed	Pin	Pin
124	109	Fixed	Fixed	Fixed	Fixed	Pin	Pin
189	71	Fixed	Fixed	Fixed	Pin	Pin	Fixed
190	81	Fixed	Fixed	Fixed	Pin	Pin	Fixed

Primary Load Cases

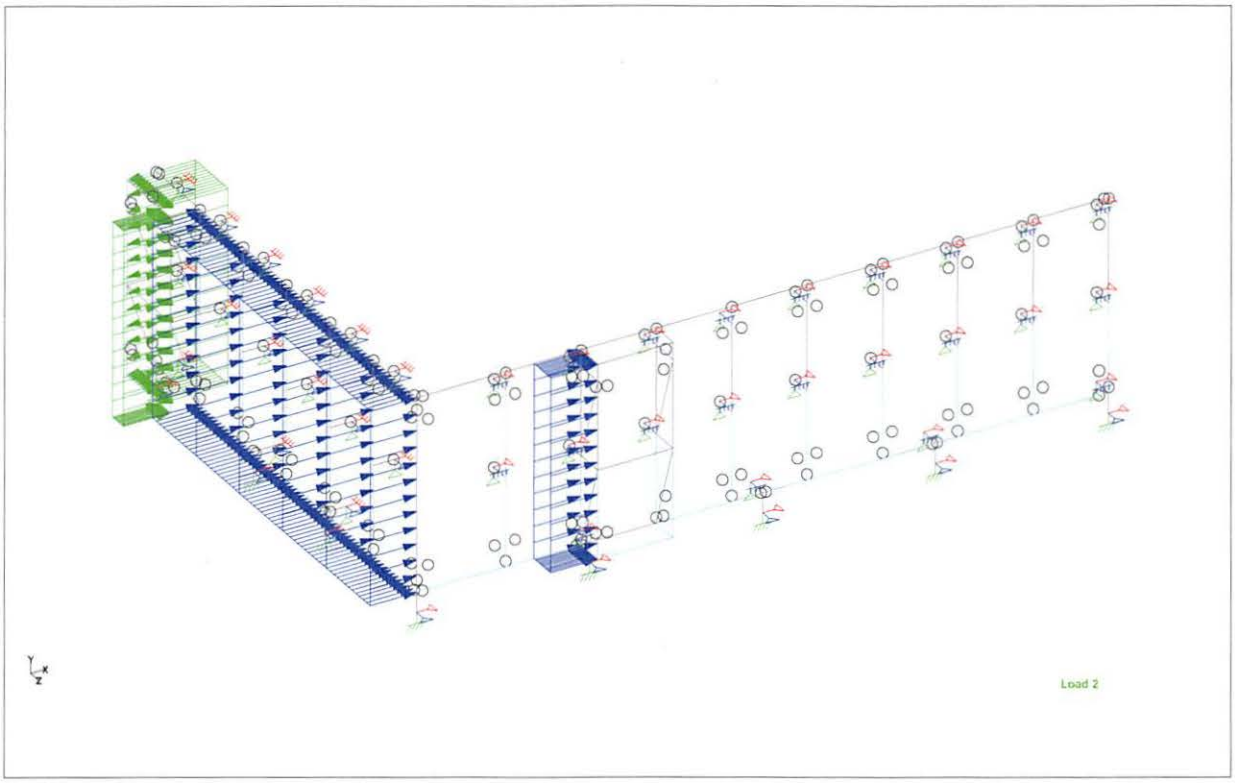
Number	Name	Type
1	DEAD	Dead
2	WIND X	Wind
3	WIND Z	Wind

Combination Load Cases

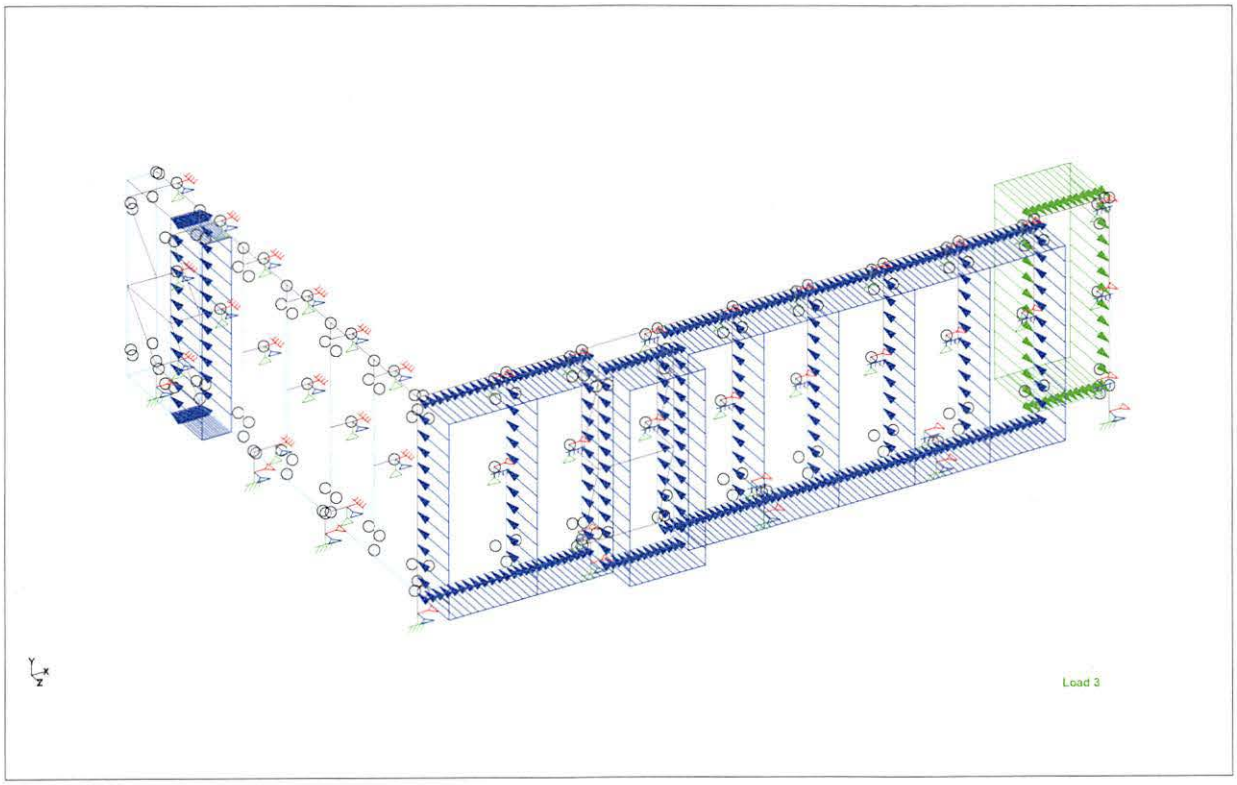
Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
4	DL + 0.6 WL(X)	1	DEAD	1.00
		2	WIND X	0.60
5	DL + 0.6 WL(Z)	1	DEAD	1.00
		3	WIND Z	0.60



Dead Loads



Wind Loads (X)



Wind Loads (Z)

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (in^2)	Iz (in^4)	Iy (in^4)	Ix (in^4)
1	HSST4X4X0	HSST4X4X0	0.029	1.000	0.029	AISC- H2-1	2	4.780	10.300	10.300	17.500
35	HSST4X4X0	HSST4X4X0	0.009	1.000	0.009	AISC- H1-3	4	4.780	10.300	10.300	17.500
39	HSST4X4X0	HSST4X4X0	0.006	1.000	0.006	AISC- H1-3	2	4.780	10.300	10.300	17.500
40	HSST4X4X0	HSST4X4X0	0.006	1.000	0.006	AISC- H1-3	2	4.780	10.300	10.300	17.500
41	HSST4X4X0	HSST4X4X0	0.075	1.000	0.075	AISC- H1-3	2	4.780	10.300	10.300	17.500
42	L60606	L60606	0.252	1.000	0.252	AISC- H1-3	3	4.380	6.203	24.571	0.205
43	L60606	L60606	0.252	1.000	0.252	AISC- H1-3	3	4.380	6.203	24.571	0.205
44	L60606	L60606	0.101	1.000	0.101	AISC- H1-3	4	4.380	6.203	24.571	0.205
45	L60606	L60606	0.187	1.000	0.187	AISC- H1-3	3	4.380	6.203	24.571	0.205
46	L60606	L60606	0.192	1.000	0.192	AISC- H1-3	3	4.380	6.203	24.571	0.205
47	L60606	L60606	0.195	1.000	0.195	AISC- H1-3	3	4.380	6.203	24.571	0.205
48	L60606	L60606	0.286	1.000	0.286	AISC- H1-3	3	4.380	6.203	24.571	0.205
49	L60606	L60606	0.293	1.000	0.293	AISC- H1-3	3	4.380	6.203	24.571	0.205
50	L60606	L60606	0.293	1.000	0.293	AISC- H1-3	3	4.380	6.203	24.571	0.205
51	L60606	L60606	0.141	1.000	0.141	AISC- H1-3	3	4.380	6.203	24.571	0.205
52	L60606	L60606	0.139	1.000	0.139	AISC- H1-3	3	4.380	6.203	24.571	0.205
53	L60606	L60606	0.040	1.000	0.040	AISC- H1-3	2	4.380	6.203	24.571	0.205
54	L60606	L60606	0.043	1.000	0.043	AISC- H1-3	2	4.380	6.203	24.571	0.205
55	L60606	L60606	0.087	1.000	0.087	AISC- H1-3	2	4.380	6.203	24.571	0.205
75	L60606	L60606	0.236	1.000	0.236	AISC- H2-1	2	4.380	6.203	24.571	0.205
76	L60606	L60606	0.236	1.000	0.236	AISC- H2-1	2	4.380	6.203	24.571	0.205
77	L60606	L60606	0.163	1.000	0.163	AISC- H2-1	2	4.380	6.203	24.571	0.205
78	L60606	L60606	0.166	1.000	0.166	AISC- H2-1	2	4.380	6.203	24.571	0.205
79	L60606	L60606	0.166	1.000	0.166	AISC- H2-1	2	4.380	6.203	24.571	0.205
80	L60606	L60606	0.117	1.000	0.117	AISC- H2-1	2	4.380	6.203	24.571	0.205
81	L60606	L60606	0.081	1.000	0.081	AISC- H2-1	2	4.380	6.203	24.571	0.205
82	L60606	L60606	0.081	1.000	0.081	AISC- H2-1	2	4.380	6.203	24.571	0.205
101	HSST4X4X0	HSST4X4X0	0.017	1.000	0.017	AISC- H1-3	2	4.780	10.300	10.300	17.500
102	HSST4X4X0	HSST4X4X0	0.016	1.000	0.016	AISC- H2-1	3	4.780	10.300	10.300	17.500
103	HSST4X4X0	HSST4X4X0	0.043	1.000	0.043	AISC- H2-1	2	4.780	10.300	10.300	17.500
104	L60606	L60606	0.079	1.000	0.079	AISC- H2-1	3	4.380	6.203	24.571	0.205
105	L60606	L60606	0.084	1.000	0.084	AISC- H2-1	3	4.380	6.203	24.571	0.205
106	L60606	L60606	0.069	1.000	0.069	AISC- H1-3	3	4.380	6.203	24.571	0.205
188	L60606	L60606	0.037	1.000	0.037	AISC- H1-3	2	4.380	6.203	24.571	0.205

Failed Members

There is no data of this type.

Reactions

Posts Reactions

Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
1	4:DL + 0.6 WL(	-0.020	0.229	0.118	0	1.786	0
	5:DL + 0.6 WL(	0.017	0.164	0.099	0	1.050	0
2	4:DL + 0.6 WL(	-0.321	0.989	-0.051	0	-1.291	0
	5:DL + 0.6 WL(	-0.038	0.635	0.054	0	-1.208	0
3	4:DL + 0.6 WL(	-0.002	0.309	-0.029	0	-1.638	0
	5:DL + 0.6 WL(	-0.001	0.409	0.006	0	-0.543	0
4	4:DL + 0.6 WL(	-0.002	0.201	-0.028	0	-1.579	0
	5:DL + 0.6 WL(	-0.001	0.328	0.005	0	-0.479	0
5	4:DL + 0.6 WL(	-0.017	0.540	-0.016	0	-1.554	0
	5:DL + 0.6 WL(	-0.009	0.330	-0.003	0	-0.480	0
6	4:DL + 0.6 WL(	-0.035	0.101	-0.142	0	-0.727	0
	5:DL + 0.6 WL(	-0.052	0.497	0.093	0	3.554	0
7	4:DL + 0.6 WL(	-0.009	0.272	-0.010	0	-0.335	0
	5:DL + 0.6 WL(	-0.074	0.392	-0.03705	0	3.091	0
8	4:DL + 0.6 WL(	-0.005	0.514	-0.058	0	-0.398	0
	5:DL + 0.6 WL(	0.030	0.611	0.070	0	3.436	0
55	4:DL + 0.6 WL(	0.029612	0.010	0.007	-0.002	0	0
	5:DL + 0.6 WL(	-0.122	-0.020	0.145	0.044	0	0
56	4:DL + 0.6 WL(	-0.625	0.017	-0.015	-0.005	0	0
	5:DL + 0.6 WL(	0.115	0.078	0.262	0.049	0	0
57	4:DL + 0.6 WL(	-0.753	0.042	0.081	-0.000	0	0
	5:DL + 0.6 WL(	0.064	0.057	0.173	0.046	0	0
58	4:DL + 0.6 WL(	-0.243	-0.040	0.114	0	0	0.014
	5:DL + 0.6 WL(	0.119	0.059	0.798	0	0	0.008
59	4:DL + 0.6 WL(	-0.119	-0.017	0.052	0	0	0.024
	5:DL + 0.6 WL(	-0.039	0.013	0.657	0	0	0.008
60	4:DL + 0.6 WL(	-0.114	-0.019	0.033848	0	0	0.024
	5:DL + 0.6 WL(	-0.035	0.013	0.623	0	0	0.007
61	4:DL + 0.6 WL(	-0.113	-0.021	0.013	0	0	0.023
	5:DL + 0.6 WL(	-0.035	-0.002	-0.107	0	0	0.007
62	4:DL + 0.6 WL(	-0.016	0.005	-0.003	-0.000	0	0
	5:DL + 0.6 WL(	-0.004	0.007	0.003	-0.000	0	0
63	4:DL + 0.6 WL(	0.055	-0.011	0.000	-0.002	0	0
	5:DL + 0.6 WL(	-0.005	0.018765	-0.000	0.000	0	0
64	4:DL + 0.6 WL(	0.057	-0.017	0.000	-0.002	0	0
	5:DL + 0.6 WL(	-0.004	0.013	-0.000	0.000	0	0
65	4:DL + 0.6 WL(	0.049	-0.031	0.000	-0.002	0	0
	5:DL + 0.6 WL(	-0.002	0.008	-0.000	0.000	0	0
66	4:DL + 0.6 WL(	0.000	0.008	0.001	0	0	0
	5:DL + 0.6 WL(	0.000	-0.037	-0.041	0	0	0
67	4:DL + 0.6 WL(	-0.000	0.044	0.010	0	0	0
	5:DL + 0.6 WL(	0.000	-0.041	-0.039	0	0	0
68	4:DL + 0.6 WL(	-0.000	0.040	0.009	0	0	0
	5:DL + 0.6 WL(	0.000	-0.042	-0.037	0	0	0
69	4:DL + 0.6 WL(	-0.000	0.031	0.007	0	0	0
	5:DL + 0.6 WL(	0.000	-0.022	-0.049	0	0	0
70	4:DL + 0.6 WL(	-0.000	0.017	0.007	0	0	0
	5:DL + 0.6 WL(	-0.000	-0.039	0.034	0	0	0
71	4:DL + 0.6 WL(	-0.000	0.004	0.004	0	0	0
	5:DL + 0.6 WL(	-0.000	0.013	0.026	0	0	0

Strip Total Wt. = 9'(21.75')206 psf
=40,325 lb. e.a. strip

989 lb./40,325 lb. = 2.45 %
increase DL < 5 % allowed - OK -

Reactions Cont...

Node	L/C	Horizontal FX (kip)	Vertical FY (kip)	Horizontal FZ (kip)	Moment MX (kip-in)	MY (kip-in)	MZ (kip-in)
72	4:DL + 0.6 WL(	0.288	-0.001	0.016	0.001	0	0
	5:DL + 0.6 WL(	0.063	0.015	0.023	0.001	0	0
73	4:DL + 0.6 WL(	-0.443	0.158	-0.000	0.006	0	0
	5:DL + 0.6 WL(	0.006	0.017	0.000	-0.000	0	0
74	4:DL + 0.6 WL(	-0.465	0.162	-0.000	0.007	0	0
	5:DL + 0.6 WL(	0.005	0.011	0.000	0.000	0	0
75	4:DL + 0.6 WL(	-0.449	0.154	-0.000	0.008	0	0
	5:DL + 0.6 WL(	0.002	0.006	0.000	0.000	0	0
76	4:DL + 0.6 WL(	-0.000	0.003	-0.007	0	0	0
	5:DL + 0.6 WL(	-0.000	0.135	0.401	0	0	0
77	4:DL + 0.6 WL(	0.000	0.033	-0.016	0	0	0
	5:DL + 0.6 WL(	-0.000	0.132	0.394	0	0	0
78	4:DL + 0.6 WL(	0.000	0.030	-0.012	0	0	0
	5:DL + 0.6 WL(	-0.000	0.132	0.392	0	0	0
79	4:DL + 0.6 WL(	0.000	0.025	-0.010	0	0	0
	5:DL + 0.6 WL(	-0.000	0.125	0.382	0	0	0
80	4:DL + 0.6 WL(	0.000	0.016	-0.008	0	0	0
	5:DL + 0.6 WL(	0.000	0.025558	0.017043	0	0	0
81	4:DL + 0.6 WL(	0.000	0.007	-0.001	0	0	0
	5:DL + 0.6 WL(	0.000	-0.051	-0.175	0	0	0
87	4:DL + 0.6 WL(	0.000	0.043	0.009	0	0	0
	5:DL + 0.6 WL(	0.000	-0.027	-0.046	0	0	0
88	4:DL + 0.6 WL(	-0.000	0.038	-0.006	0	0	0.001
	5:DL + 0.6 WL(	-0.000	0.123	0.378	0	0	-0.006
93	4:DL + 0.6 WL(	-0.009	0.057692	0.006	0	0	0
	5:DL + 0.6 WL(	-0.002	-0.009	0.188	0	0	0
94	4:DL + 0.6 WL(	0.006	0.050	0.038	0	0	0
	5:DL + 0.6 WL(	0.004	0.016247	0.311	0	0	0
99	4:DL + 0.6 WL(	-0.006	0.009	-0.037	0	0	0
	5:DL + 0.6 WL(	-0.001	0.001	-0.052	0	0	0
100	4:DL + 0.6 WL(	0.009	0.003	-0.086	0	0	0
	5:DL + 0.6 WL(	-0.006	0.028	0.354	0	0	0
103	4:DL + 0.6 WL(	-0.466	0.158	-0.000	0.007	0	0
	5:DL + 0.6 WL(	0.003	0.008	0.000	0.000	0	0
104	4:DL + 0.6 WL(	0.060	-0.018	0.000	-0.002	0	0
	5:DL + 0.6 WL(	-0.002	0.007	-0.000	0.000	0	0
109	4:DL + 0.6 WL(	-0.159	0.034	0.012	0.001	0	0
	5:DL + 0.6 WL(	-0.010	0.026	0.016775	0.001	0	0
111	4:DL + 0.6 WL(	-0.112	0.022	-0.004	-0.000	0	0
	5:DL + 0.6 WL(	0.013	0.035	0.002	0.000	0	0

- Steel wall connections OK by Inspection
- Shear strength of 1/2' Dia. Fiberglass bolts @ Fiberglass connections (S.F. = 4):
7,400 lb (Double Shear) ---> 7,400 lb /2 = 3,700 lb (Single Shear)
Allowable Shear = 3,700 lb /4 = 925 lb > 401 lb
- Bearing capacity:
Allowable Bearing Stress = 33 ksi /4 = 8.25 ksi
8.25 ksi x 1/2" dia. x 1/2" (Angle thickness) = 2.06 kips >>>0.401 kips -OK-

Beam Force Detail Summary

Sign convention as diagrams:- positive above line, negative below line except Fx where positive is compression. Distance d is given from beam end A.

				Axial	Shear		Torsion	Bending	
	Beam	L/C	d (ft)	Fx (kip)	Fy (kip)	Fz (kip)	Mx (kip˜in)	My (kip˜in)	Mz (kip˜in)
Max Fx	121	4:DL + 0.6 WL(	0	**0.466**	-0.110	0.110	-0.007	-1.531	-1.526
Min Fx	113	4:DL + 0.6 WL(	0	**-0.288**	0.014	-0.008	-0.001	0.125	0.182
Max Fy	91	4:DL + 0.6 WL(	0	0.100	**0.292**	-0.292	0	3.229	3.227
Min Fy	122	4:DL + 0.6 WL(	1.150	0.465	**-0.114**	0.114	-0.007	-0	-0
Max Fz	7	5:DL + 0.6 WL(	0	0.096	0.007	**0.222**	0	-2.219	0.076
Min Fz	91	4:DL + 0.6 WL(	0	0.100	0.292	**-0.292**	0	3.229	3.227
Max Mx	139	4:DL + 0.6 WL(	0	-0.039	0.007	-0.011	**0.005**	0.087	-0.059
Min Mx	120	4:DL + 0.6 WL(	0	0.449	-0.107	0.107	**-0.008**	-1.488	-1.485
Max My	91	4:DL + 0.6 WL(	0	0.100	0.292	-0.292	0	**3.229**	3.227
Min My	7	5:DL + 0.6 WL(	0	0.096	0.007	0.222	0	**-2.219**	0.076
Max Mz	91	4:DL + 0.6 WL(	0	0.100	0.292	-0.292	0	3.229	**3.227**
Min Mz	122	4:DL + 0.6 WL(	0	0.465	-0.112	0.112	-0.007	-1.564	**-1.559**

Dewberry

Job Number	50121978
Made by:	SA
Date:	8/6/2021
Checked by:	DAP
Date:	8/9/2021

(Belmont 2 MA) - L 4x4x0.5 FRP Angles - Beta/Gamma Sector Check

R:\50121487\50121978 - Belmont 2 MA\Engineering\Structural\Rev.1\Report\50121978 - Enclosure Calcs 8.9.21.xlsx

Design Method ASD

STAAD Output STAAD: *FRP Angles - Beta/Gamma Sector*

* axis based on figure below

Axial Tension =	288 lb	Shear (Fx) =	292 lb	Bending (Mx) =	3229 lb-in
Axial Compression =	466 lb	Shear (Fy) =	292 lb	Bending (My) =	3327 lb-in

Member Properties

FRP Member: L 4x4x0.5

Cross Sectional Properties

		X-X Axis		*Y-Y Axis*		*Design*	
Depth (h) =	4.00 in						
Width (b or h) =	4.00 in	I_x =	5.45 in^4	I_y =	5.45 in^4	J =	N/A
Thickness (t) =	0.50 in	S_x =	1.93 in^3	S_y =	1.93 in^3	C_w =	N/A
Area =	3.72 in^2	r_x =	1.21 in	r_y =	1.21 in		
Weight =	2.79 lb/ft	r_z =	0.77 in				

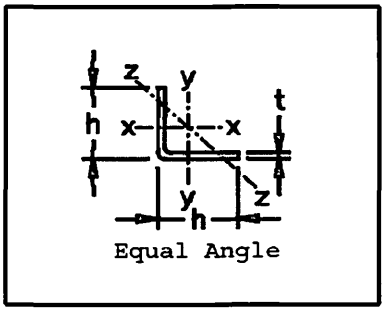
Unbraced Length			Effective Length Factor (Table 11-1)	
L_x =	1.15 ft	= 13.8 in	K_x =	1.00
L_y =	1.15 ft	= 13.8 in	K_y =	1.00

Material Properties

Tensile Strength (F_{ut}) =	7,500 psi
Compressive Strength (F_{uc}) =	16,500 psi
Bearing Stress (σ) =	18,000 psi
Flexural Strength (F_u) =	11,000 psi
Shear Strength (F_{uv}) =	4,500 psi
Modulus of Elasticity (E) =	2.60E+06 psi
Poisson's Ratio (ν) =	0.32

Safety Factors

Tension	4.00
Compression	3.00
Flexural	2.50
Shear	3.00



Check Tension

f_t = P/A = 288 lb / 3.72 in² = 77 psi
F_t = F_{tu} /S.F. = 7500 psi / 4 = 1875 psi

77 psi < 1875 psi ☑

Check Compression

Major Axis

σ_c = P/A = 466 lb / 3.72 in² = 125 psi

Bearing	$\sigma_{ult} = \sigma$	= 18000 psi
Local Buckling	$\sigma_{ult,l} = \Phi k(\pi^2 E/[12(1-\nu^2)])(t/\alpha)^2$	= 14890 psi
Global Buckling	$\sigma_{ult,Euler} = \pi^2 E/[(K_x L_x/r_x)^2]$	= 80723 psi
FT Buckling	$\sigma_{ult,ft} = \Phi(E/[2(1+\nu)])(t/\alpha^2)$	= 24621 psi

$\sigma_{allow} = \sigma_{ult}$ /S.F. = 14890 psi / 3 = = 4963 psi

125 psi < 4963 psi ☑

Minor Axis

σ_c = P/A = 466 lb / 3.72 in² = 125 psi

Bearing	$\sigma_{ult} = \sigma$	= 18000 psi
Local Buckling	$\sigma_{ult,l} = \Phi k(\pi^2 E/[12(1-\nu^2)])(t/\alpha)^2$	= 14890 psi
Global Buckling	$\sigma_{ult,Euler} = \pi^2 E/[(K_y L_y/r_y)^2]$	= 80723 psi
FT Buckling	$\sigma_{ult,ft} = \Phi(E/[2(1+\nu)])(t/\alpha^2)$	= 24621 psi

$\sigma_{allow} = \sigma_{ult}$ /S.F. = 14890 psi / 3 = = 4963 psi

125 psi < 4963 psi ☑

Check Flexure

Major Axis

f_{bx} = M_x/S_x = 3229 lb-in / 1.93 in³ = 1673 psi
F_b = F_u /S.F. = 11000 psi / 2.5 = 4400 psi

1673 psi < 4400 psi ☑

Minor Axis

f_{by} = M_y/S_y = 3327 lb-in / 1.93 in³ = 1724 psi
F_b = F_u /S.F. = 11000 psi / 2.5 = 4400 psi

1724 psi < 4400 psi ☑

Check Combined Flexure and Axial

$$UR = \frac{f_{bx} + f_{by} + \left(\frac{f_c}{E_c} \text{ or } \frac{f_t}{F_t}\right)}{F_{bx} + F_{by} +} \leq 1.0 \text{ (for operating conditions)}$$

f_{bx} =	1673 psi	F_{bx} =	4400 psi
f_{by} =	1724 psi	F_{by} =	4400 psi
f_c =	125 psi	F_c =	4963 psi
f_t =	77 psi	F_t =	1875 psi
f_{bx}/F_{bx} =	0.380	f_{by}/F_{by} =	0.392
f_c/F_c =	0.025	f_t/F_t =	0.041

0.81 < 1.00 ☑

Check Shear

f_{vx} = V_x/A_w = 292 lb / 3.72 in² = 78 psi
f_{vy} = V_y/A_w = 292 lb / 3.72 in² = 78 psi
F_v = F_{vu} /S.F. = 4500 psi / 3 = 1500 psi

78 psi < 1500 psi ☑

Material Properties of Superstud!™/Nuts!
Fiber Reinforced Polymer Fastener System

The following data was derived from ASTM coupon and full section testing. The results are average values based on random sampling and testing of production lots. Composite materials are not homogeneous, and therefore the location of the coupon extraction can cause variances in the coupon test results. Creative Pultrusions, Inc. publishes an average value of random samples from production lots.

Property (coupon values)	ASTM Test	Units	Diameter/Threads per Inch				
			3/8" 16 UNC	1/2" 13 UNC	5/8" 11 UNC	3/4" 10 UNC	1" 8 UNC
Ultimate Thread Strength Using Standard C P Nut [126]		lbs	1,250	2,500	3,900	5,650	7,400
Max. Ultimate Design Tensile Load using C P Nut [1256]		lbs	1,000	2,000	3,120	4,520	6,200
Flexural Strength [23]	D790	psi	60,000	60,000	60,000	60,000	60,000
Flexural Modulus [23]	D790	10^6psi	2.0	2.0	2.0	2.5	2.75
Compressive Strength (LW) [23]	D695	psi	55,000	55,000	55,000	55,000	60,000
Ultimate Transverse Shear [23]	B565	load lb	4,200	7,400	11,600	17,200	27,400
Transverse Shear Yield [23]		load lb	2,100	3,300	4,500	7,500	12,500
Dielectric Strength [23]	D149	KV/in	40	40	40	40	40
Water Absorption [2]	D570	%	1	1	1	1	1
Coefficient of Thermal Expansion (LW)	D696	10^{-6}in/in/°F	3.0	3.0	3.0	3.0	3.0
Ultimate Torque Strength Using C P Full Nut Lubricated w/ SAE 10W30 Motor Oil [2456]		ft-lb	8	15	33	50	115
Stud Weight [3]		lb/ft	.076	.129	.209	.315	.592
Flammability			25	25	25	25	25

LW = Lengthwise

[1] Applies to single nut only; multiple nuts do not yield corresponding results.
[2] Ultimate strength values are averages obtained in design testing.
[3] Values are based on unthreaded rod.
[4] Torque results are dependant on several variable factors including the lubricant used, the length of the studs between nuts, alignment, washer surfaces, etc. Therefore, if such results of torque are important, it is vital that torque limits be determined experimentally for the exact installation conditions.
[5] Appropriate safety factors must be applied.
[6] Properties apply to Superstud!™ used with CP nut.

Safety factors are defined as the ratio of the ultimate stress to the allowable stress.

Safety Factor (S.F.) = Ultimate Stress (U.S.)/ Allowable Stress (A.S.)
Therefore, A.S. = U.S./S.F.

Safety factors compensate for:

- allowable tolerances of the part
- uncertainty of the anticipated loading (magnitude, type or placement)
- assumptions in methods of analysis
- fabrication tolerances (squareness of cuts, normal tolerances, etc.)

The safety factors used in the various design equations were chosen to prevent "first deformation" of the part. First deformation is defined as the first visible deformation including local flange or web buckling, twisting, crushing, etc. The recommended safety factors used for design are:

LOADING TYPE	RECOMMENDED SAFETY FACTORS
Flexural members, beams	2.5
Compression members, columns	3.0
Tension members	4.0
Beam shear	3.0
Connections	4.0

MODULII	RECOMMENDED SAFETY FACTORS
Modulus of Elasticity	1.0
Shear Modulus	1.0

NOTES:

1. The safety factors given are for **static load conditions only**. Safety factors for impact loads and dynamic loads are typically **two times** the static load safety factor. Long term service loads which result in creep deformations will require even higher safety factors to insure satisfactory performance. For creep effects, see *Structural Plastics Design Manual,* American Society of Civil Engineers, 345 East 47th Street, New York, NY 10017, Vols. 1 and 2, September 1981.

These recommended safety factors are not the only safety factors that may be used in design. The designer may choose to adjust the safety factors based on particular applications and considerations including margin of safety, costs, confidence of loads or materials, etc.

Ultimately, the final selection of a safety factor is the designer's privilege as well as responsibility.

Material Properties of Pultex® Fiber Reinforced Polymer SuperStructural Profiles

Angles

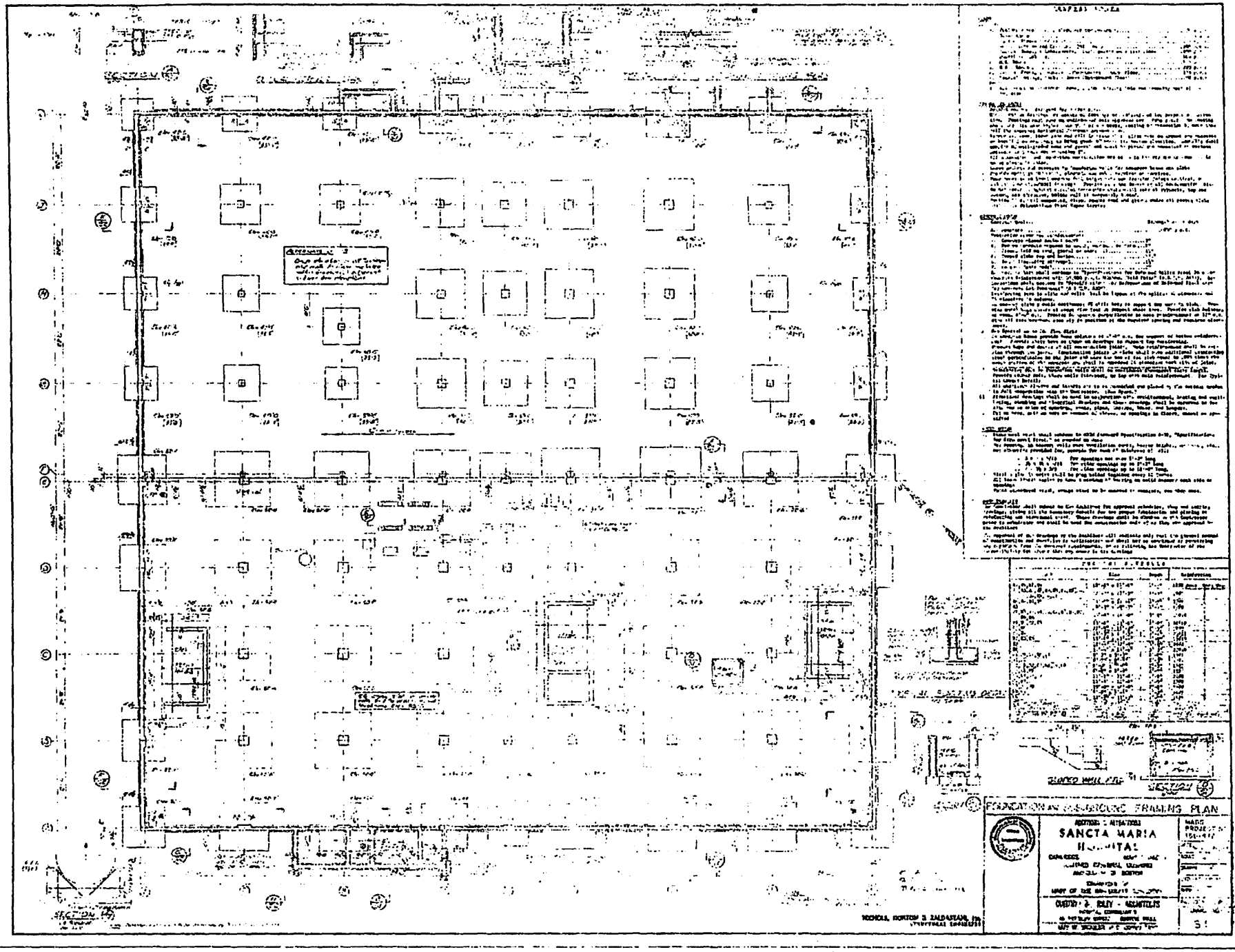
Angle profile sizes are 4" x4" x ¼" and larger.

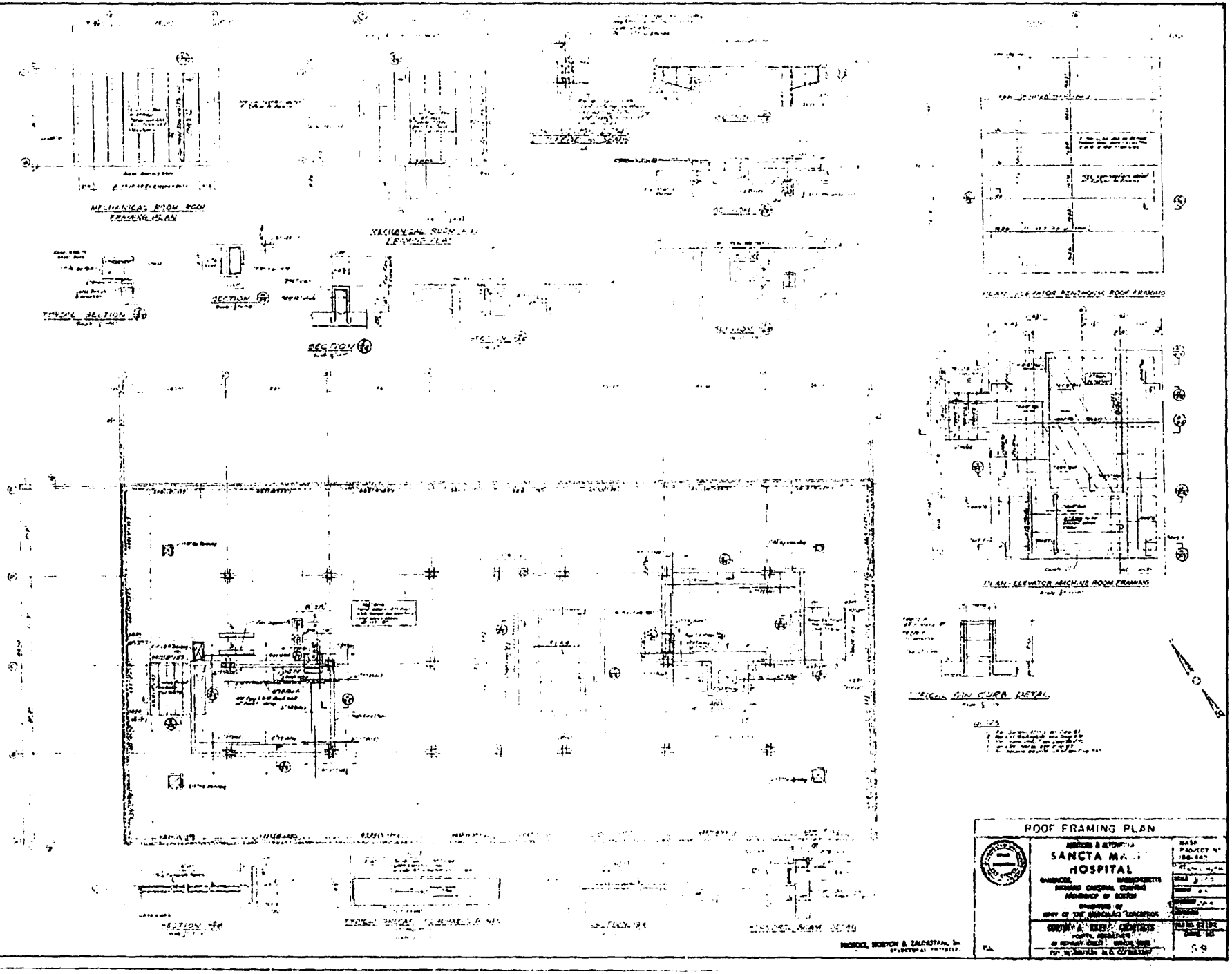
1500 Series- Thermoset Polyester- Olive Green
1525 Series- Thermoset Polyester Class 1 FR- Gray
1625 Series- Thermoset Vinyl Ester Class 1 FR- Beige

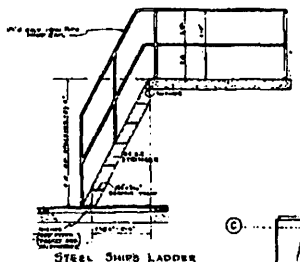
The following data was derived from ASTM coupon and full section testing. The results are average values based on random sampling and testing of production lots. Composite materials are not homogeneous, and therefore the location of the coupon extraction can cause variances in the coupon test results. Creative Pultrusions, Inc. publishes an average value of random samples from production lots.

Property (coupon values)		ASTM Test	Units	1500/1525 Series	1625 Series
Mechanical					
Tensile Strength (LW)		D638	psi	31,000	35,600
Tensile Strength (CW)		D638	psi	16,500	18,900
Tensile Modulus (LW)		D638	10^6 psi	3.5	3.5
Tensile Modulus (CW)		D638	10^6 psi	1.0	1.0
Compressive Strength (LW)		D695	psi	33,800	44,500
Compressive Strength (CW)		D695	psi	25,500	29,000
Compressive Modulus (LW)		D695	10^6 psi	3.0	3.0
Compressive Modulus (CW)		D695	10^6 psi	2.2	2.2
Flexural Strength (LW)		D790	psi	43,500	50,000
Flexural Strength (CW)		D790	psi	24,000	27,500
Flexural Modulus (LW)		D790	10^6 psi	1.9	1.9
Flexural Modulus (CW)		D790	10^6 psi	1.6	1.6
Modulus of Elasticity		Full Section [2]	10^6 psi	2.8	2.8
Shear Modulus		Full Section [2]	10^6 psi	0.5	0.5
Interlaminar Shear (LW)		D2344	psi	3,400	3,900
Shear Strength by Punch (PF)		D732	psi	5,500	6,000
Notched Izod Impact (LW)		D256	ft – lbs/in	34	39
Notched Izod Impact (CW)		D256	ft – lbs/in	33	38
Bearing Stress (LW)		D953	psi	33,000	38,000
Bearing Stress (CW)		D953	psi	33,000	38,000
Poisson's Ration (LW)		D3039	in/in	0.35	0.35
Poisson's Ration (CW)		D3039	in/in	0.12	0.12
In-plane Shear (LW)	modified	D2344	psi	4,500	4,500
In-plane Shear (CW)	modified	D2344	psi	7,000	7,000

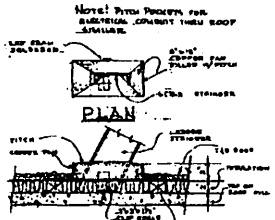
(Continued next page)


FOUNDATION & STRUCTURAL FRAMING PLAN
SANCTA MARIA
HOSPITAL
CHESTER A. RILEY - ASSOCIATES
NICHOLS, MORTON & ZALDASTANI, INC.
51


MECHANICAL ROOM ROOF FRAMING PLAN
TYPICAL SECTION
SECTION
SECTION
ELEVATOR PENTHOUSE ROOF FRAMING
ELEVATOR MACHINE ROOM FRAMING
TYPICAL FAN CURB DETAIL
SECTION
ROOF FRAMING PLAN
SANCTA MA
HOSPITAL
59



STEEL SHIP'S LADDER



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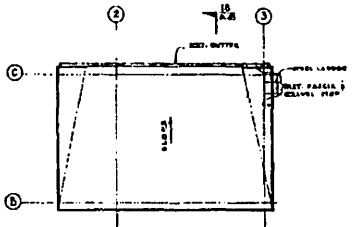
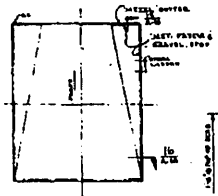
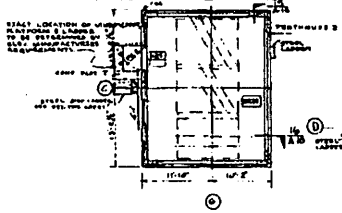


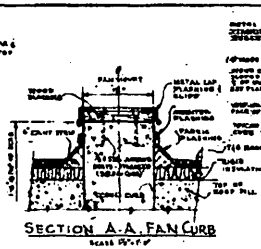
ROOF PLAN - PENTHOUSE #1



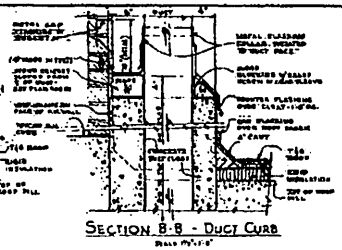
ROOF PLAN - PENTHOUSE #2



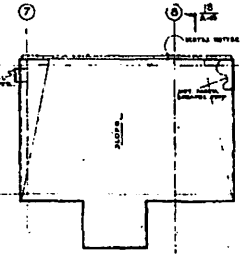
MACHINE ROOM FL. PLAN



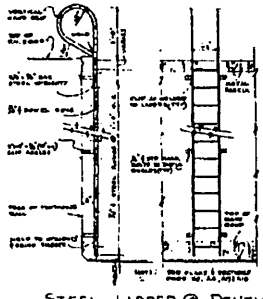
SECTION A-A FAN CURB



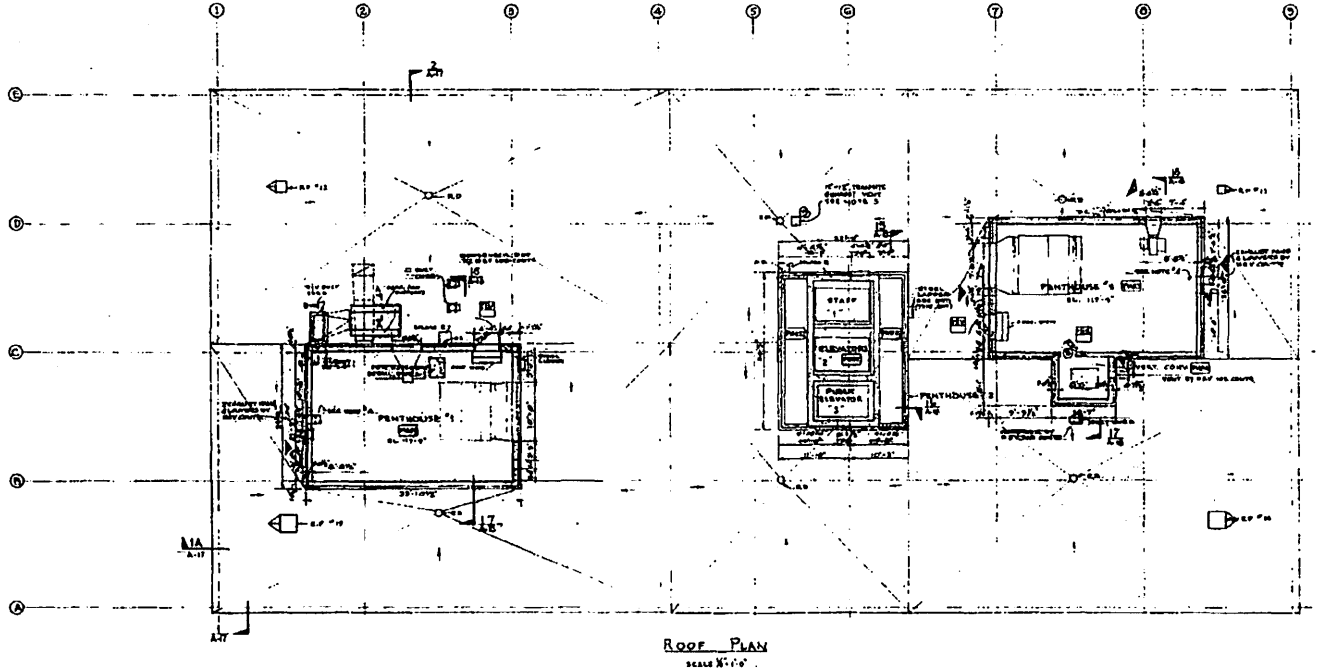
SECTION B-B - DUCT CURB



ROOF PLAN - PENTHOUSE #3



STEEL LADDER @ PENTHOUSES



ROOF PLAN

NOTES:

1. FOR GENERAL NOTES, SEE DWG. A-1.
2. FOR ROOM FINISH SCHEDULE, SEE DWG. A-12.
3. SEE DWG. A-6 FOR ROOF FAN CURBS.

NO.	DESCRIPTION	DATE
2	REVISIONS	6/24/66
1	REVISIONS	

ROOF PLAN

ARCHITECTS & ENGINEERS

SANCTA MARIA HOSPITAL

CAMBRIDGE, MASSACHUSETTS

RICHARD CARDINAL CUSHING
ARCHBISHOP OF BOSTON

DAUGHTERS OF
MARY OF THE IMMACULATE CONCEPTION

CURTIS & BLILEY - ARCHITECTS
HOSPITAL CONSULTANTS
45 MONMOUTH STREET, SOMERVILLE, MASS.

GUY W. SHOCKLEY, M.D. CONSULTANT

PROJECT NO. M.S.S.H. 180/442

DATE 3 FEB. 15/1966

SCALE AS NOTED

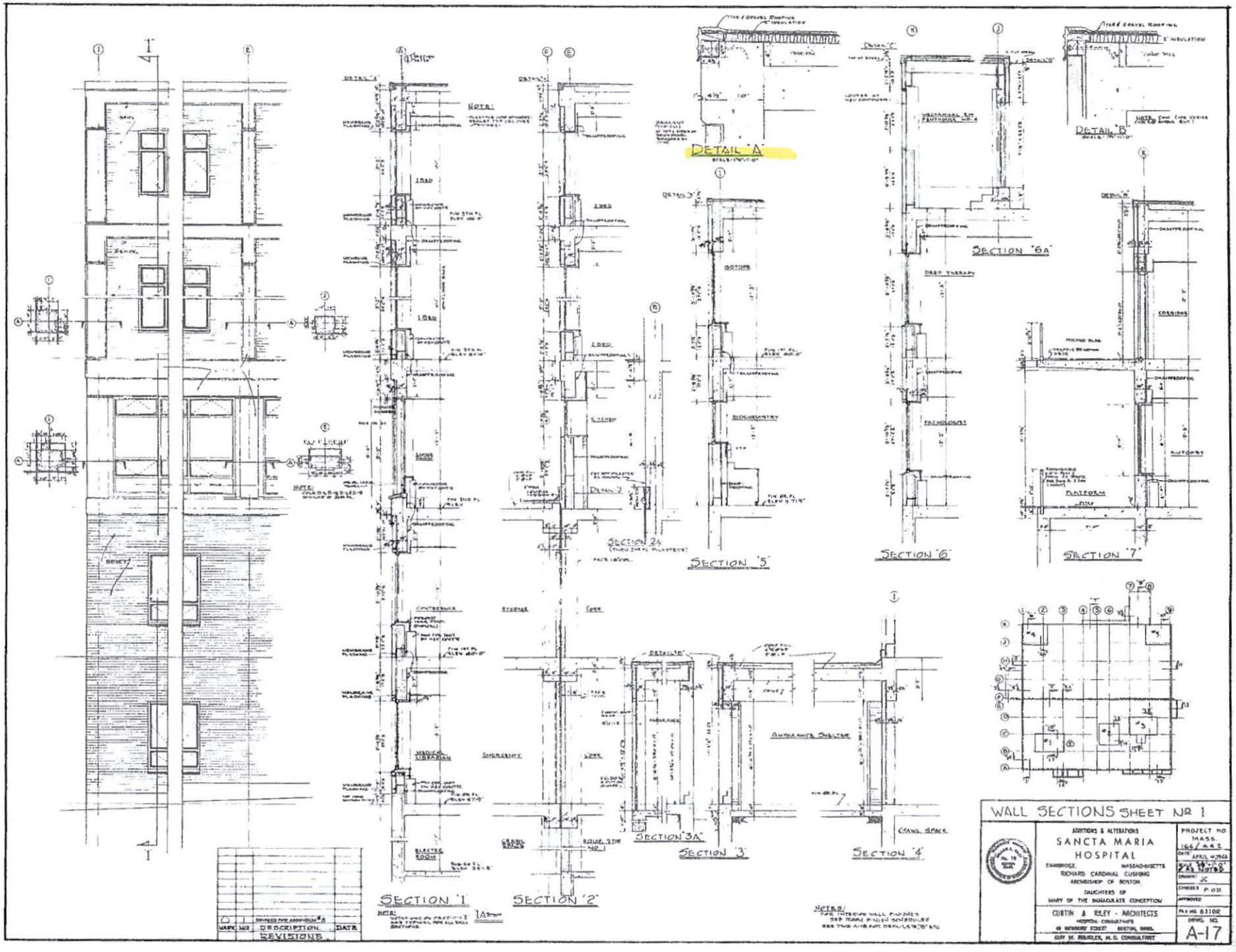
DRAWN A.E.M.

CHECKED F.O.D.

APPROVED

FILE NO. 6310R

DRWG. NO. A-8

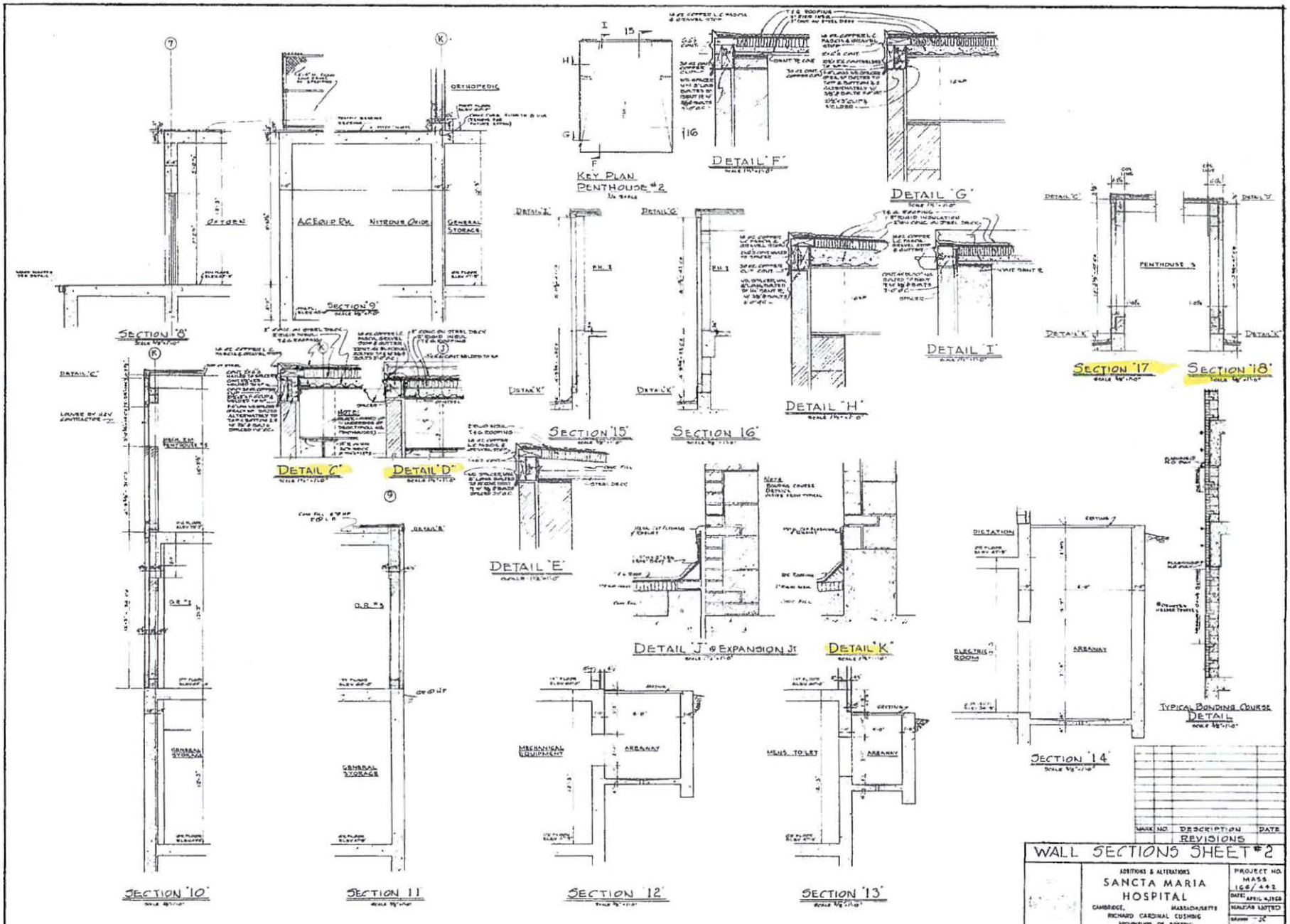


WALL SECTIONS SHEET NO 1

ADDITIONS & ALTERATIONS
SANCTA MARIA HOSPITAL
CAMBRIDGE, MASSACHUSETTS
RICHARD CARDINAL CUSHING
ARCHBISHOP OF BOSTON
DAUGHTERS OF
MARY OF THE IMMACULATE CONCEPTION

CURTIN & RILEY · ARCHITECTS
HOSPITAL CONSULTANTS
68 NEWBURY STREET BOSTON, MASS.
GUY W. BRUNDER, M.D. CONSULTANT

PROJECT NO. MASS. 165/442
DATE APRIL 1962
BY
DRAWN JC
CHECKED P.O.D.
APPROVED
FILE NO. 8310R
DRWG. NO. A-17



NOTE:

MARK NO.	DESCRIPTION	DATE
	REVISIONS	

WALL SECTIONS SHEET #2

ADDITIONS & ALTERATIONS
SANCTA MARIA HOSPITAL
CAMBRIDGE, MASSACHUSETTS
RICHARD CARDINAL CUSHING
ARCHBISHOP OF BOSTON
DAUGHTERS OF
MARY OF THE IMMACULATE CONCEPTION

CURTIN & RILEY - ARCHITECTS
HOSPITAL CONSULTANTS
45 KENNARD STREET BOSTON, MASS.
GUY W. BRADLEY, M.D. CONSULTANT

PROJECT NO. MASS 168/442
DATE APRIL 4,1958
REVISED
DRAWN JR
CHECKED F.G.D
APPROVED
FILE NO. 6340 R
DRWG. NO. A-18

2015 00048977
Bk: 65163 Pg: 213 Doc: DECIS
Page: 1 of 4 04/02/2015 03:36 PM

City of Cambridge

MASSACHUSETTS

BOARD OF ZONING APPEAL

831 Mass Avenue, Cambridge, MA.
(617) 349-6100

2015 MAR 11 PM 2 05
OFFICE OF THE CITY CLERK
CAMBRIDGE, MASSACHUSETTS

RE-HEARING

CASE NO: 10518

LOCATION: 799 Concord Avenue / Office -1 Zone/ AOD
Cambridge, MA

PETITIONER: Bell Atlantic Mobile of Massachusetts Corporation, LTD. /
D/B/A Verizon Wireless – C/o Timothy C. Twardowski, Esq.

PETITION: Special Permit: To reconsider the petitioner's application for a special permit in light of a revised design and/or plan to locate mobile communications antennas on the roof of the existing building and place equipment inside an existing ground level garage space.

VIOLATION: Art. 4.000, Sec. 4.32.G.1 (Footnote 49) (Telecommunication Facility).
Art. 10.000, Sec. 10.40 (Special Permit).

MARGINAL REFERENCE REQUESTED
62852 405
BOOK 40521 PAGE 187

DATE OF PUBLIC NOTICE: February 12 & 19, 2015

DATE OF PUBLIC HEARING: February 26, 2015

MEMBERS OF THE BOARD:

CONSTANTINE ALEXANDER – CHAIR	✓
TIMOTHY HUGHES – VICE-CHAIR	✓
BRENDAN SULLIVAN	✓
THOMAS SCOTT	✓
JANET O. GREEN	✓

ASSOCIATE MEMBERS:

DOUGLAS MYERS	
SLATER W. ANDERSON	
ANDREA A. HICKEY	
ALISON HAMMER	
JIM MONTEVERDE	
GEORGE S. BEST	
LAURA WERNICK	

Members of the Board of Zoning Appeal heard testimony and viewed materials submitted regarding the above request for relief from the requirements of the Cambridge Zoning Ordinance. The Board is familiar with the location of the petitioner's property, the layout and other characteristics as well as the surrounding district.

Case No. 10518
Location: 799 Concord Avenue
Petitioner: Bell Atlantic Mobile of MA Corp. Ltd. – D/B/A Verizon Wireless

On February 26, 2015, Petitioner's attorney Timothy Twardowski appeared before the Board of Zoning Appeal requesting a special permit in order to locate mobile communications antennas on the roof of the existing building and place equipment inside an existing ground level garage space. The Petitioner requested relief from Article 4, Section 4.32.G.1of the Cambridge Zoning Ordinance ("Ordinance"). The Petitioner submitted application materials including information about the project, plans, and photographs.

Mr. Twardowski stated that the case had been heard and denied in 2013. He stated that it had been appealed and was now being reheard upon a remand from the Federal District Court. He stated that the site had been redesigned so as to place all antennas behind a screen wall on the roof, making them not visible to the public.

Several neighbors spoke or wrote in opposition to the proposal based on negative effects to their businesses, which included schools and medical facilities, and to their property values due to actual or perceived health and/or environmental risks from radio frequency radiation. Some neighbors expressed concern about adverse health effects on students attending schools in the immediate neighborhood. The Chair explained that there was a federal law which had limited the Board's ability to deny an application based upon the health and environmental effects of the Petitioner's installation.

After discussion, the Chair moved that the Board grant the special permit for relief in order to locate mobile communications antennas on the roof of the existing building and place equipment inside an existing ground level garage space based upon the finding that traffic generated or patterns of access or egress resulting from the installation would not cause congestion, hazard, or substantial change in established neighborhood character. The Chair moved that the Board find that the continued operation of, and development of adjacent uses, would not be adversely affected by the nature of the proposed use. The Chair moved that the Board find that no nuisance or hazard would be created to the detriment of the health, safety, and/or welfare of the occupant of the proposed use or the citizens of the city. The Chair moved that the Board find that the proposed use would not impair the integrity of the district or adjoining districts or otherwise derogate from the intent and purpose of the Ordinance. The Chair moved that the Board grant the special permit on the following conditions:

1. that the work proceed in accordance with and be entirely consistent with photo simulations, architectural drawings, and engineering plans submitted by the petitioner, as initialed by the Chair,
2. that should the petitioner discontinue telecom services at this facility, the equipment be promptly removed and the building be restored to its prior condition to the extent reasonable and practical,
3. that, inasmuch as the health effects of the transmission of electromagnetic energy waves is a matter of ongoing societal concern and scientific study, the special permit is also subject to the following conditions:
   A. that the petitioner shall file with the Inspectional Services Department each report it files with the federal authorities regarding the electromagnetic energy waves emissions emanating from all the petitioner's equipment on the site. Each such report shall be filed with the Inspectional Services Department no later than ten business days after the report has been filed with the federal authorities. Failure to timely file any such report with the Inspectional Services Department shall ipso facto terminate the special permit granted here,
   B. that in the event that at any time federal authorities notify the petitioner that its equipment on the site, including, but not limited to the special permit granted here, fails to comply with the requirements of law or governmental regulation, whether with regard to the emissions of electromagnetic energy waves or otherwise, the petitioner, within ten business days of receipt of such notification of such failure shall file with the Inspectional Services Department a report disclosing in reasonable detail that such failure has occurred and the basis for such claimed failure. The special permit granted here shall ipso facto terminate if any of the petitioner's federal licenses is or are suspended, revoked, or terminated.
   C. that to the extent that a special permit has terminated pursuant to the foregoing paragraphs A and B, the petitioner may apply to this Board for a new special permit provided that the public notice concerning such application discloses in reasonable detail that the application has been filed because of a termination of the special permit pursuant to paragraphs A or B above. Any such new application shall not be deemed a repetitive petition and therefore shall not be subjected to the two-year period during which repetitive petitions may not be filed.
   D. that prior to the installation of the equipment, the petitioner shall file with the Inspectional Services Department a sworn Affidavit of the person in charge of the installation of equipment by the petitioner with a geographical area that includes Cambridge, stating that A, he or she has such responsibility; and B, that the equipment is being installed pursuant to the special permit granted here, will comply with all federal safety rules and will be situated and maintained in locations with

appropriate barricades and other protections, such that individuals, including nearby residents and occupants of nearby structures, will be sufficiently protected from excessive radio frequency radiation under federal law.

4. that the special permit granted here shall continue for two years and that after two years should the petitioner want to continue to use this facility, it must reapply for the special permit. At that point the Board and the public will have the ability to take into account any new developments, either scientifically or legislatively, with regard to telecommunications facilities.

The five member Board voted unanimously in favor of granting the special permit (Alexander, Hughes, Sullivan, Scott, and Green) as conditioned. Therefore, the special permit is granted.

The Board based its decision upon all the information presented, and upon the following findings:

1) The meeting of the requirements of the Ordinance;
2) Traffic generated or patterns of access or egress would not cause congestion, hazard, or substantial change in the established neighborhood character;
3) The continued operation of or the development of adjacent uses as permitted in the Ordinance would not be adversely affected by the nature of the proposed uses;
4) Nuisance or hazard would not be created to the detriment of the health, safety and /or welfare of the occupants of the proposed use;
5) The proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the Ordinance, and in fact would be a significant improvement to the structure and benefit the neighborhood, and;
6) The new use or building construction is not inconsistent with the Urban Design Objectives set forth in Section 19.30 of the Cambridge Zoning Ordinance.

Constantine Alexander, Chair

Attest: A true and correct copy of decision filed with the offices of the City Clerk and Planning Board on 3/11/15 by Maria Pacheco, Clerk.

Twenty days have elapsed since the filing of this decision.

No appeal has been filed ✓.

Appeal has been filed and dismissed or denied.

Date: April 1, 2015 Donna P. Lopez City Clerk.

Middlesex South Registry of Deeds

Electronically Recorded Document

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Recording Information

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Document Type	: DECL
Recorded Date	: May 31, 2017
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Number of Pages(including cover sheet)	: 4
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Recording Fee	: $75.00

Middlesex South Registry of Deeds
Maria C. Curtatone, Register
208 Cambridge Street
Cambridge, MA 02141
617-679-6300
www.middlesexsouthregistry.com

CITY OF CAMBRIDGE
MASSACHUSETTS
BOARD OF ZONING APPEAL
831 MASSACHUSETTS AVENUE
CAMBRIDGE, MA 02139
617 349-6100

2017 MAY -5 AM 10:52

OWNER: Sancta Maria Hospital, Inc.
Book 10521 Pg 187

CASE NO: BZA-012697-2017 Office 1 Zone/AOD-3

LOCATION: 799 Concord Ave
Cambridge, MA

PETITIONER: Cellco Partnership d/b/a Verizon Wireless - C/O Timothy C. Twardowski, Esq.

PETITION: Special Permit: To continue operation of existing mobile communications facility located at 799 Concord Avenue as previously granted under BZA Case 10518.

VIOLATION :

Article 4.000 Section 4.32.G.1 (Telecommunication Facility).
Article 4.000 Section 4.40 (Footnote 49) (Telecommunication Facility).
Article 10.000 Section 10.40 (Special Permit).

DATE OF PUBLIC NOTICE: March 30, 2017 and April 06, 2017

DATE OF PUBLIC HEARING: April 13, 2017;

MEMBERS OF THE BOARD:

CONSTANTINE ALEXANDER - CHAIR	✓
BRENDAN SULLIVAN - VICE-CHAIR	✓
JANET O. GREEN	✓
PATRICK TEDESCO	✓
ANDREA A. HICKEY	✓

ASSOCIATE MEMBERS:

DOUGLAS MYERS	
SLATER W. ANDERSON	
ALISON HAMMER	
JIM MONTEVERDE	
GEORGE BEST	
LAURA WERNICK	

Members of the Board of Zoning Appeal heard testimony and viewed materials submitted regarding the above request for relief from the requirements of the Cambridge Zoning Ordinance. The Board is familiar with the location of the petitioner's property, the layout and other characteristics as well as the surrounding district.

Case No. BZA-012697-2017
Location: 799 Concord Avenue
Petitioner: Cellco Partnership d/b/a Verizon Wireless – c/o Timothy Twardowski, Esq.

On April 13, 2017, Petitioner's attorney Timothy Twardowski appeared before the Board of Zoning Appeal requesting a special permit in order to continue operation of an existing telecommunications facility as granted in BZA Case #10518. The Petitioner requested relief under Article 4, Section 4.32.G.1 and Article 10, Section 10.40 of the Cambridge Zoning Ordinance ("Ordinance"). The Petitioner submitted materials in support of their application including information about the project, plans, and photographs.

Mr. Twardowski stated that the petitioner was FCC licensed. He stated that the petitioner held a special permit to operate a telecommunications facility at the site. He stated that the special permit was time limited and that that limit was about to run. He stated that the proposal was to continue to operate the facility without altering it in any way. He stated that there was no neighborhood opposition to the proposal or complaints regarding the facility.

The Chair asked if anyone wished to be heard on the matter, no one indicated such.

After discussion, the Chair moved that the Board make the following findings based upon the application materials submitted and all evidence before the Board and that based upon the findings the Board grant the requested relief as described in the Petitioner's submitted materials and the evidence before the Board: that the Board renew the special permit granted in BZA Case #10518 and incorporate the findings from that case, here, as there were no changes to the proposal that would require a change to those findings.

The Chair further moved that based upon all the information presented the Board grant the requested relief as described in the Petitioner's submitted materials and the evidence before the Board on the conditions imposed in BZA Case #10518, except that be no time limit imposed on this grant.

The five member Board voted unanimously in favor of granting the special permit with the above condition (Alexander, Sullivan, Green, Hickey, and Tedesco). Therefore, the special permit is granted as conditioned.

The Board of Zoning Appeal is empowered to waive local zoning regulations only. This decision therefore does not relieve the petitioner in any way from the duty to comply with local ordinances and regulations of the other local agencies, including, but not limited to the Historical Commission, License Commission and/or compliance with requirements pursuant to the Building Code and other applicable codes.

CC

Constantine Alexander, Chair

Attest: A true and correct copy of decision filed with the offices of the City Clerk and Planning Board on 5-5-17 by Maria Pacheco, Clerk.

Twenty days have elapsed since the filing of this decision.

No appeal has been filed ✓.

Appeal has been filed and dismissed or denied.

Date: May 26, 2017 Donna P. Lopez City Clerk

ULS License

Cellular License - KNKA201 - Cellco Partnership

Call Sign	KNKA201	Radio Service	CL - Cellular
Status	Active	Auth Type	Regular

Market

Market	CMA006 - Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	Channel Block	B
Submarket	0	Phase	2

Dates

Grant	08/26/2014	Expiration	10/01/2024
Effective	11/01/2016	Cancellation	

Five Year Buildout Date

08/27/1989

Control Points

3 500 W. Dove Rd., TARRANT, Southlake, TX
P: (800)264-6620

Licensee

FRN	0003290673	Type	General Partnership

Licensee

Cellco Partnership
5055 North Point Pkwy, NP2NE Network Engineering
Alpharetta, GA 30022
ATTN Regulatory

P:(770)797-1070
F:(770)797-1036
E:LicensingCompliance@VerizonWireless.com

Contact

Cellco Partnership
Licensing Manager
5055 North Point Pkwy, NP2NE Network Engineering
Alpharetta, GA 30022
ATTN Regulatory

P:(770)797-1070
F:(770)797-1036
E:LicensingCompliance@VerizonWireless.com

Ownership and Qualifications

Radio Service Type	Mobile		
Regulatory Status	Common Carrier	Interconnected	Yes

Alien Ownership
The Applicant answered "No" to each of the Alien Ownership questions.

Basic Qualifications
The Applicant answered "No" to each of the Basic Qualification questions.

Demographics

Race

Ethnicity Gender

ULS License

PCS Broadband License - KNLH242 - Cellco Partnership

Call Sign	KNLH242	Radio Service	CW - PCS Broadband
Status	Active	Auth Type	Regular

Rural Service Provider Bidding Credit

Is the Applicant seeking a Rural Service Provider (RSP) bidding credit?

Reserved Spectrum

Reserved Spectrum

Market

Market	BTA051 - Boston, MA	Channel Block	F
Submarket	0	Associated Frequencies (MHz)	001890.00000000-001895.00000000 001970.00000000-001975.00000000

Dates

Grant	06/02/2017	Expiration	06/27/2027
Effective	06/02/2017	Cancellation	

Buildout Deadlines

1st	06/27/2002	2nd	

Notification Dates

1st	05/17/2002	2nd	

Licensee

FRN	0003290673	Type	Joint Venture

Licensee

Cellco Partnership
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ATTN Regulatory

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F:(770)797-1036
E:LicensingCompliance@VerizonWireless.com

Ownership and Qualifications

Radio Service Type	Mobile		
Regulatory Status	Common Carrier	Interconnected	Yes

Alien Ownership

Universal Licensing System

ULS Lease

KNLF646 - L000026571 - Cellco Partnership

HELP

Lease ID	L000026571	Radio Service	CW - PCS Broadband
Status	Active	Classification of Lease	Spectrum Manager Lease
		Term of Lease	Long

Dates

Grant/Accepted	03/08/2018	Expiration	01/03/2027
Commencement	02/16/2018	Cancellation	

Lessee

FRN	0003290673 (View Ownership Filing)	Type	General Partnership

Lessee

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ATTN Regulatory

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E:licensingcompliance@verizonwireless.com

Real Party in Interest	Cellco Partnership	FRN of Real Party in Interest	0003290673

Contact

Verizon
Sarah Trosch
1300 I Street, NW - Suite 500 East
Washington, DC 20005

P:(202)515-2453
E:sarah.trosch@verizon.com

Lessee Qualifications and Ownership Information

Radio Service Type

Regulatory Status Interconnected

Alien Ownership
The Applicant answered "No" to each of the Alien Ownership questions.

Basic Qualifications
The Applicant answered "No" to each of the Basic Qualification questions.

ULS License

AWS (1710-1755 MHz and 2110-2155 MHz) License - WQGA900 - Cellco Partnership

Call Sign	WQGA900	Radio Service	AW - AWS (1710-1755 MHz and 2110-2155 MHz)
Status	Active	Auth Type	Regular

Rural Service Provider Bidding Credit

Is the Applicant seeking a Rural Service Provider (RSP) bidding credit?

Reserved Spectrum

Reserved Spectrum

Market

Market	BEA003 - Boston-Worcester-Lawrence-Lowell-Brockton, MA-NH-RI-VT	Channel Block	B
Submarket	1	Associated Frequencies (MHz)	001720.00000000-001730.00000000 002120.00000000-002130.00000000

Dates

Grant	11/29/2006	Expiration	11/29/2021
Effective	11/01/2016	Cancellation	

Buildout Deadlines

1st	2nd

Notification Dates

1st	2nd

Licensee

FRN	0003290673	Type	General Partnership

Licensee

Cellco Partnership
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Alpharetta, GA 30022
ATTN Regulatory

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F:(770)797-1036
E:LicensingCompliance@VerizonWireless.com

Contact

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Alpharetta, GA 30022
ATTN Regulatory

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F:(770)797-1036
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Ownership and Qualifications

ULS License

AWS (1710-1755 MHz and 2110-2155 MHz) License - WQGB266 - Cellco Partnership

Call Sign	WQGB266	Radio Service	AW - AWS (1710-1755 MHz and 2110-2155 MHz)
Status	Active	Auth Type	Regular

Rural Service Provider Bidding Credit

Is the Applicant seeking a Rural Service Provider (RSP) bidding credit?

Reserved Spectrum

Reserved Spectrum

Market

Market	CMA006 - Boston-Lowell-Brockton-Lawrence-Haverhill, MA-NH	Channel Block	A
Submarket	0	Associated Frequencies (MHz)	001710.00000000-001720.00000000 002110.00000000-002120.00000000

Dates

Grant	11/29/2006	Expiration	11/29/2021
Effective	11/01/2016	Cancellation	

Buildout Deadlines

1st 2nd

Notification Dates

1st 2nd

Licensee

FRN 0003290673 Type General Partnership

Licensee

Cellco Partnership
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Ownership and Qualifications

Radio Service Type Mobile

ULS License

700 MHz Upper Band (Block C) License - WQJQ689 - Cellco Partnership

This license has pending applications: 0008938399

Call Sign	WQJQ689	Radio Service	WU - 700 MHz Upper Band (Block C)
Status	Active	Auth Type	Regular

Rural Service Provider Bidding Credit

Is the Applicant seeking a Rural Service Provider (RSP) bidding credit?

Reserved Spectrum

Reserved Spectrum

Market

Market	REA001 - Northeast	Channel Block	C
Submarket	0	Associated Frequencies (MHz)	000746.00000000-000757.00000000 000776.00000000-000787.00000000

Dates

Grant	09/11/2019	Expiration	06/13/2029
Effective	09/11/2019	Cancellation	

Buildout Deadlines

1st	06/13/2013	2nd	06/13/2019

Notification Dates

1st	06/20/2013	2nd	06/17/2019

Licensee

FRN	0003290673	Type	General Partnership

Licensee

Cellco Partnership
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Alpharetta, GA 30022
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Contact

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Alpharetta, GA 30022
ATTN Regulatory

P:(770)797-1070
E:LicensingCompliance@VerizonWireless.com

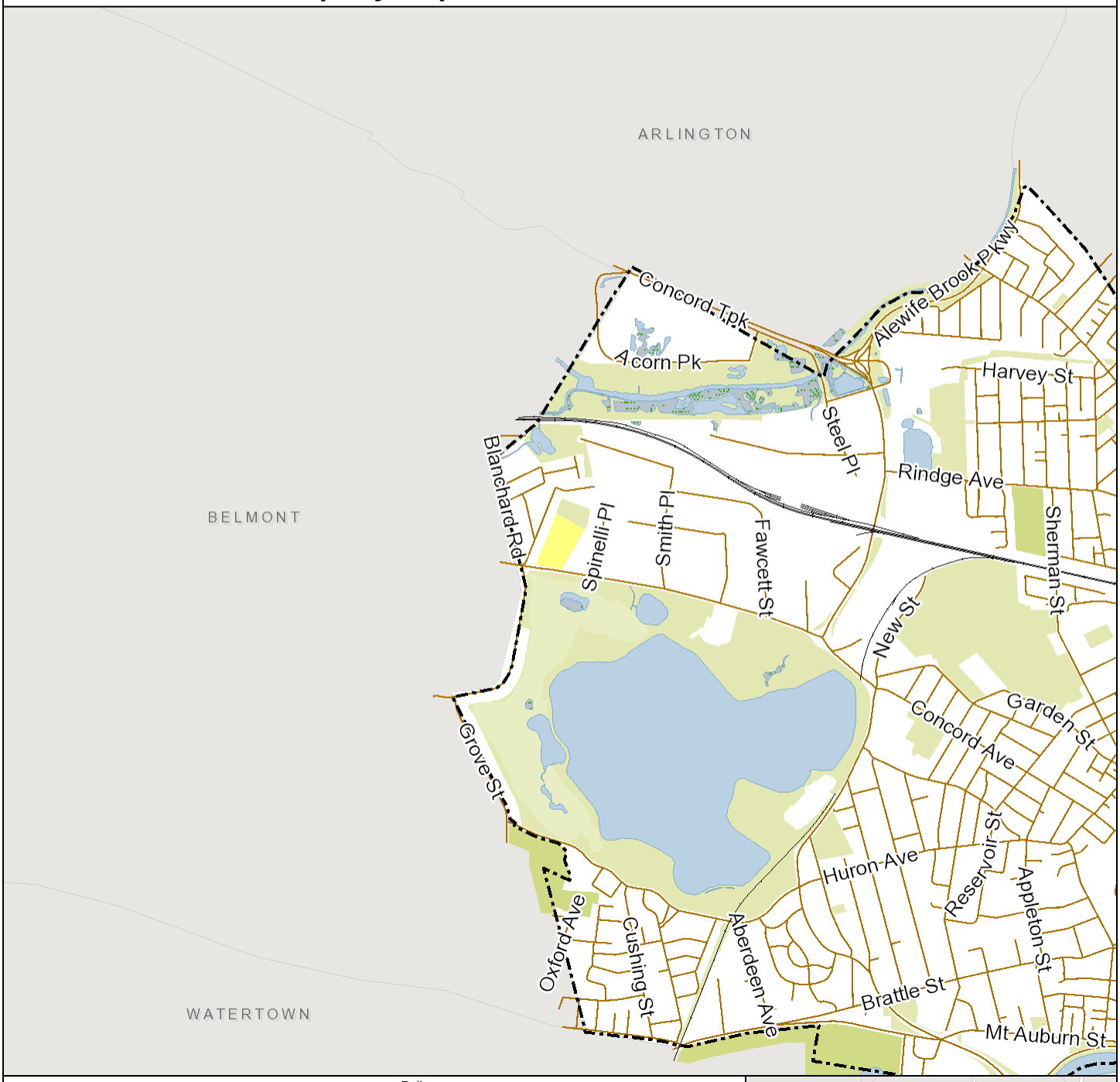
Ownership and Qualifications

Radio Service Type	Mobile		
Regulatory Status	Common Carrier	Interconnected	Yes

City of Cambridge

Property Map for 795-799 CONCORD AVE.

December 7, 2021



City of Cambridge
Massachusetts

1" = 1839 ft

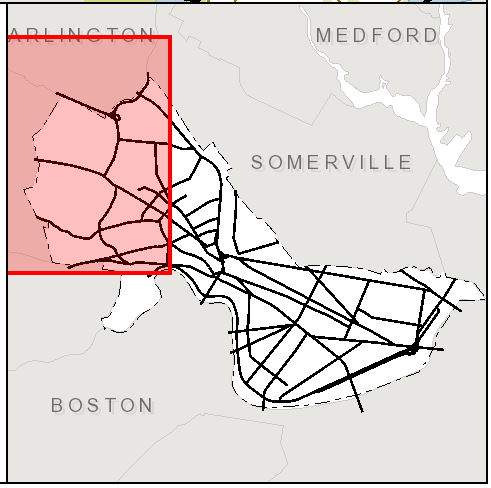
All data is provided for graphic representation only. The City of Cambridge expressly disclaims all warranties of any type, expressed or implied, including, but not limited to, any warranty as to the accuracy of the data, merchantability, or fitness for a particular purpose.

www.cambridgema.gov/gis

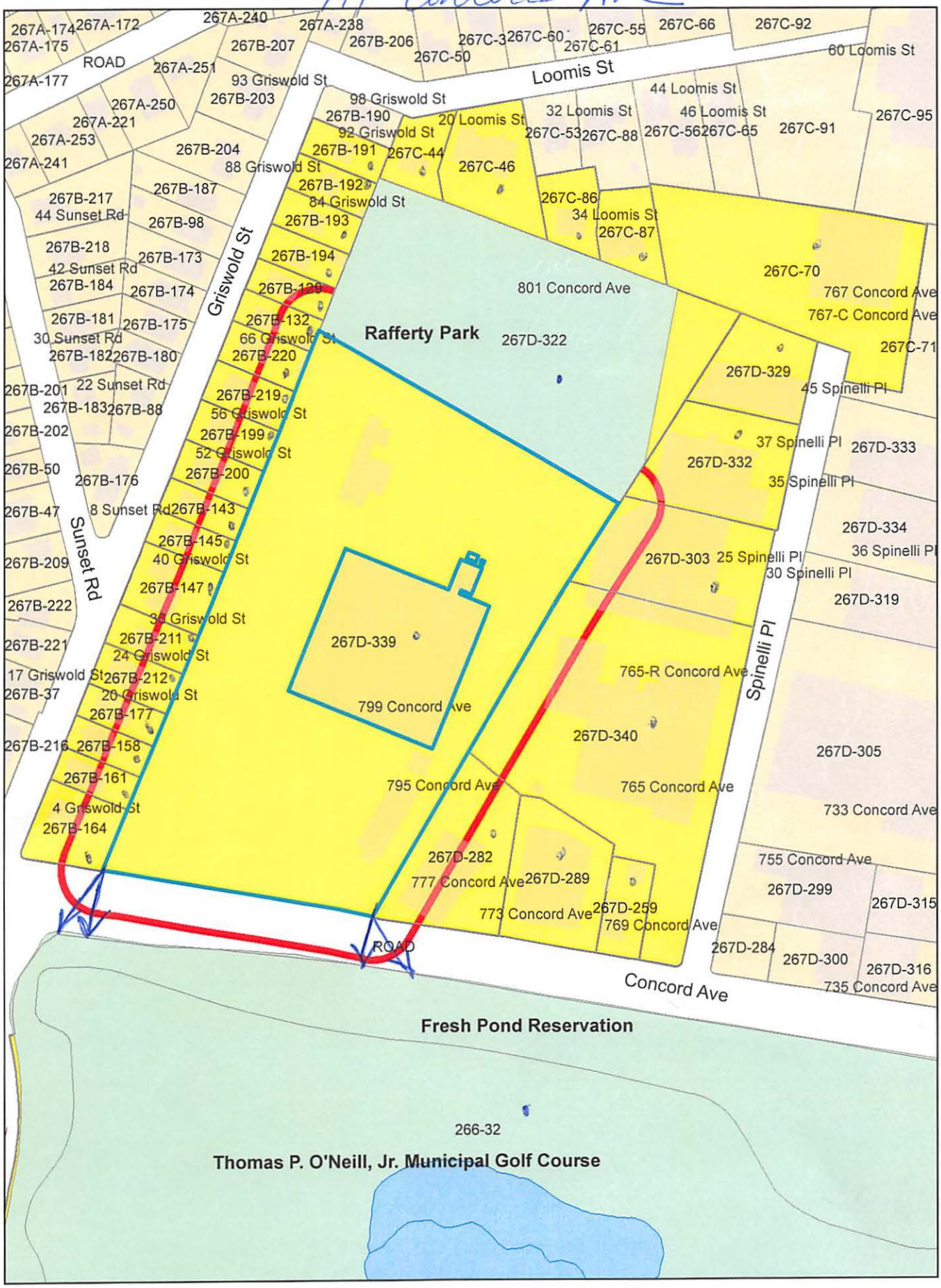
- Rail
- Road Centerline Cityscale

Paved Surfaces

- Paved Roads
- Bridges
- Unpaved Roads
- Unpaved Parking
- Sidewalks
- Driveways
- Alleys
- Other Paved Surface
- Public Footpath



799 Concord Ave



799 Concord Ave

Petitioner 1 of 3

ROBINSON + COLE LLP
C/O MICHAEL S. GIAIMO, ESQ.
ONE BOSTON PLACE – 25TH FL.
BOSTON, MA 02108

266-32
CAMBRIDGE CITY OF RECREATION DEPT
51 INMAN ST
CAMBRIDGE, MA 02139

267D-322
CAMBRIDGE CITY OF RAFFERTY PARK
CITY HALL
CAMBRIDGE, MA 02139

266-32/267D-322
CITY OF CAMBRIDGE
C/O NANCY GLOWA
CITY SOLICITOR

266-32/267D-322
CITY OF CAMBRIDGE
C/O LOUIS DEPASQUALE
CITY MANAGER

267B-145
MCDONOUGH, MARY T. & JANET E. GRIFFIN
44 GRISWOLD ST
CAMBRIDGE, MA 02138-1012

267B-192
ROSA, LOUIS C.
88 GRISWOLD ST
CAMBRIDGE, MA 02138

267B-219
SACK, HOM KWONG
64 GRISWOLD ST
CAMBRIDGE, MA 02138

267C-70 /267D-329-332
WEST CAMBRIDGE SCIENCE PARK, LLC
38 PEQUOSSETTE RD
BELMONT, MA 02478

267B-164
IGNAZIO, JOSEPH L. & MARY J. IGNAZIO,
A LIFE ESTATE
76 WILSON ROAD
BEDFORD, MA 01730

267B-193
CORTIZAS, ANTHONY P., JR.
84 GRISWOLD ST
CAMBRIDGE, MA 02138-1012

267B-199
SQUIRES, ANNE C.
56 GRISWOLD ST.
CAMBRIDGE, MA 02138-1012

267B-211
DANILIUK, MICHAEL & RENEE DANILIUK
30 GRISWOLD ST
CAMBRIDGE, MA 02138

267B-212
DEGNEN, GERALD E. & VICTORIA M. GINSBERG
24 GRISWOLD ST
CAMBRIDGE, MA 02138

267D-282
MUGNIER, RENE & JESSICA L. FEWKES
777 CONCORD AVE., UNIT #201
CAMBRIDGE, MA 02138

267D-282
777 CONCORD AVE UNIT 206, LLC.
777 CONCORD AVE., UNIT#206
CAMBRIDGE, MA 02138

267D-282
SMITH, JUDITH E. & DIRAN S. ZAHIGIAN
777 CONCORD AVE., #302
CAMBRIDGE, MA 02138

267D-339
SANCTA MARIA HOSPITAL
799 CONCORD AVE
CAMBRIDGE, MA 02138

267D-259
TRUELOVE, JOHN M.,
TR. OF THE 769 CONCORD AVE REALTY TRUST
769 CONCORD AVE
CAMBRIDGE, MA 02138

267B-158
KOSKO, JOHN J. & KAREN N. KOSKO
16 GRISWOLD STREET
CAMBRIDGE, MA 02138-1012

267D-282
ELECTROMAGNETICS ACADEMY, INC
C/O J.A. KONG
777 CONCORD AVE UNIT 207
CAMBRIDGE, MA 02138

267B-147
RANAGAN, SCOTT
P.O. BOX 391
MANCHESTER, MA 01944

267C-46
RENN, ROBERT D., NANCY D. RENN &
MELISSA LEIGH RENN
20 LOOMIS ST. UNIT#4
CAMBRIDGE, MA 02138

267B-129
RAFFERTY, JAMES J. TRUSTEE
907 MASS AVE, SUITE 300
CAMBRIDGE, MA 02139

267B-143
EVANS, MARTIN G. & NANCY R. EVANS
48 GRISWOLD ST
CAMBRIDGE, MA 02138-1012

267B-147
HOM, VINCENT M. & WING YEE HOM
36 GRISWOLD ST
CAMBRIDGE, MA 02138

267B-147
YUEN, MAN K. & KAREN H. CHAN
34 GRISWOLD ST., #3
CAMBRIDGE, MA 02138

267B-177
SULLIVAN, ROBERT
46 IVY LANE
WALTHAM, MA 02452

267B-191
GRIFFIN, CLAIRE E. A LIFE ESTATE
92 GRISWOLD ST
CAMBRIDGE, MA 02138

267B-194
IANNOTTI, MICHAEL
80 GRISWOLD ST
CAMBRIDGE, MA 02138

799 Concord Ave

293

267B-200
MULLEN, FRANCIS T. &
BARBARA CLARK MULLEN
52 GRISWOLD
CAMBRIDGE, MA 02138-1012

267B-220
XIONG, DAVID & LING LI
66 GRISWOLD
CAMBRIDGE, MA 02138

267C-44
MOSCARDINI, LORRAINE & LEANDERS H. SMITH
14 LOOMIS ST.
CAMBRIDGE, MA 02138-1003

267C-86
AMOROSO, JOSEPH A. & FLORA G. AMOROSO
LIFE ESTATE
40 LOOMIS ST
CAMBRIDGE, MA 02138

267D-282
THOMPSON, ROBERT
5 APPLESEED DR
WESTBOROUGH, MA 01581

267D-282
THE STORROW COMPANY, INC
777 CONCORD AVE., #205
CAMBRIDGE, MA 02138

267D-340
THE FAYERWEATHER STREET SCHOOL
765 CONCORD AVE
CAMBRIDGE, MA 02138

267B-161
ABBASI, SALMAN
1-3 GRISWOLD ST
CAMBRIDGE, MA 02138-1011

267B-132
MADDEN, SHERLY A.
70 GRISWOLD ST
CAMBRIDGE, MA 02138

267C-46
COSTELLO, MICHAEL C.
20 LOOMIS ST. UNIT#1
CAMBRIDGE, MA 02138

267C-87
AMOROSO, PATRICIA L.
40 LOOMIS STREET
CAMBRIDGE, MA 02138

267D-282
DELEO, JOSEPH F.
777 CONCORD AVE., UNIT #101
CAMBRIDGE, MA 02138

267D-282
CIRAFICE, RICHARD P.,
TRUSTEE OF SYDKAL REALTY TRUST.
777 CONCORD AVE., UNIT #102
CAMBRIDGE, MA 02138

267D-282
AARUSHI LLC,
2407 WINDSOR RIDGE DRIVE.
WESTBOROUGH, MA 01581

267D-282
FORSTER, JOHN T.A.
P. O. BOX 48
M.I.T. BRANCH P.O.
CAMBRIDGE, MA 02139-7048

267C-46
CHEN HONGBO & JIALI HUANG
20 LOOMIS ST - UNIT 2
CAMBRIDGE, MA 02138

267D-282
LYDIAN CENTER, LLC
777 CONCORD AVE. SUITE 301
CAMBRIDGE, MA 02138

267D-282
FULLER, MICHAEL J.,
TRUSTEE THE MICHAEL J. FULLER TRUST
68 BRIDGE ST
LEXINGTON, MA 02421

267D-289
SUN, YI
773 CONCORD AVE., #204
CAMBRIDGE, MA 02138

267D-289
LE SAGE, DAVID & ANDREA TSAI
773 CONCORD AVE., #203
CAMBRIDGE, MA 02138

267D-289
SANCHEZ, JOSEFA LOPEZ &
JAQUIN LOPEZ VERAZA
773 CONCORD AVE. UNIT#202
CAMBRIDGE, MA 02138

267D-289
KANG, JANE M.
773 CONCORD AVE. UNIT# 107
CAMBRIDGE, MA 02138

267D-289
ABBRUZZESE, DAVID
773 CONCORD AVE UNIT #105
CAMBRIDGE, MA 02138

267D-289
ROY, BIDYUT KUMAR & SANTONA RANI ROY
773 CONCORD AVE. UNIT#201
CAMBRIDGE, MA 02138

267D-289
WANG, XIAOEN & BIANLING LIU
773 CONCORD AVE., #104
CAMBRIDGE, MA 02138

267D-289
MCAULIFFE, WILLIAM J.
773 CONCORD AVE., #102
CAMBRIDGE, MA 02138

267D-289
HARTLEY, DOUGLAS
15791 BEAR CREEK PKWY APT B514
REDMOND, WA 98052

267D-289
SCOTT, MICHELE N.
773 CONCORD AVE., #106
CAMBRIDGE, MA 02138

267D-289
KATZ, WILLIAM H.
773 CONCORD AVE. UNIT#103
CAMBRIDGE, MA 02138

267D-289
LEVAUX, JEAN,
TRUSTEE THE JEAN LEVAUX TRUST
773 CONCORD AVE., #304
CAMBRIDGE, MA 02138

799 Concord Ave

393

267D-289
OLCUM, SELIM A. & GOKCE AKIN OLCUM
773 CONCORD AVE. UNIT 404
CAMBRIDGE, MA 02138

267D-289
BETHUNE, CRISTINA M.
773 CONCORD AVE., #405
CAMBRIDGE, MA 02138

267D-289
HARIKA, CHERRY
20 HAMMOND POND PKWY
CHESTNUT HILL, MA 02467

267D-289
CHOI, DANIEL
12 SPRINGDALE RD
LEXINGTON, MA 02421

267D-289
THAKORE, KOMAL & ROMIT THAKORE
773 CONCORD AVE. UNIT#403
CAMBRIDGE, MA 02138

267D-289
ROLLI, SIMONA
458 EXCHANGE AVENUE
GAITHERSBURG, MD 20878

267D-289
O'CONNOR, CORNELIA,
TRUSTEE O'CONNOR REALTY TRUST
773 CONCORD AVE., #306
CAMBRIDGE, MA 02138

267D-289
COLUCCI, ROBERT D. & KATHRYN M. COLUCCI
P.O BX 808
NEWTOWN, CT 06470

267D-289
ALLY, SAID A. & SADA SALUM
773 CONCORD AVE. UNIT#303
CAMBRIDGE, MA 02138

267D-303
25 SPINELLI PLACE LLC
125 HIGH STREET, SUITE 2111
BOSTON, MA 02110

267D-289
JAIN, SIDDHARTHA
773 CONCORD AVE #406
CAMBRIDGE, MA 02138

267D-282
HARTUNIAN, BYRON VARTON &
MARGARET COOPER NICHOLS CO-TRUSTEES
21 PARKLAND LANE
ACTON, MA 01720

267D-289
BARANOVA NADIA TRS NADIA BARANOVA TR
773 CONCORD AVE - UNIT 101
CAMBRIDGE, MA 02138

267C-46
ANDERSON KRISTER ARPIN CLAIRE
20 LOOMIS ST #3
CAMBRIDGE, MA 02138

267D-289
CRAWFORD, PEGGY A.
773 CONCORD AVE UNIT 301
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267D-282
DHANABALAN, UMA
SHIVAJI DHANABALAN, TRS
100 LEXINGTON ST APT C9
BELMONT, MA 02478

267D-289
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RUBY MATHAI PAUL R. MATHAI
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