



CITY OF CAMBRIDGE

BOARD OF ZONING APPEALS

831 Massachusetts Avenue, Cambridge MA 02139

617-349-6100

2021 FEB -4 PM 12:03
OFFICE OF THE CITY CLERK
CAMBRIDGE MASSACHUSETTS

BZA Application Form

BZA Number: 106902

General Information

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

Special Permit: _____ Variance: X Appeal: _____

PETITIONER: Massachusetts Institute of Technology C/O Kelley Brown

PETITIONER'S ADDRESS: MIT Campus Planning, 77 Massachusetts Avenue, Cambridge, MA

LOCATION OF PROPERTY: 59 Vassar St., Cambridge, MA

TYPE OF OCCUPANCY: Institutional, Educational
4.33.b.1

ZONING DISTRICT: Residence C-3B1

REASON FOR PETITION:

/Additions/

DESCRIPTION OF PETITIONER'S PROPOSAL:

The addition of mechanical penthouse volume exceeds 25% cumulative volume added to non-~~e~~

Conforming Building

SECTIONS OF ZONING ORDINANCE CITED:

- Article: 8.000 Section: 8.22.3 (Non-Conforming Structure).
- Article: 5.000 Section: 5.31 (Table of Dimensional Requirements).

Original
Signature(s):

Kelley Brown
(Petitioner (s) / Owner)

Kelley Brown

(Print Name)

Address:

Tel. No.

617-293-6380

E-Mail Address:

kbrown@mit.edu

Date:

2/3/21

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.

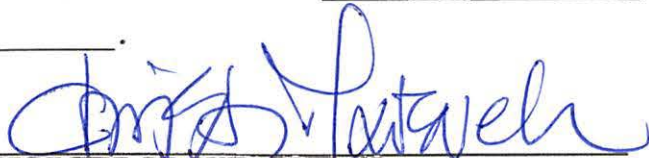
I/We Massachusetts Institute of Technology
(OWNER)

Address: 77 Massachusetts Avenue, NW23-100, Cambridge, MA 02139

State that I/We own the property located at 59 Vassar Street, Cambridge, MA,
which is the subject of this zoning application.

The record title of this property is in the name of _____
Massachusetts Institute of Technology

*Pursuant to a deed of duly recorded in the date Feb. 12, 1912, Middlesex South
County Registry of Deeds at Book 3678, Page 190; or
Middlesex Registry District of Land Court, Certificate No. _____
Book _____ Page _____.


**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 Christos Maravelias personally appeared before me,
this 26 of January, 2021, and made oath that the above statement is true.

 Notary

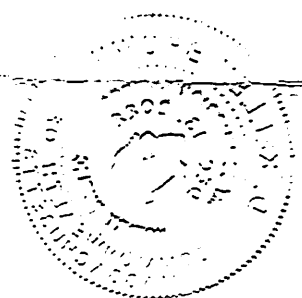
My commission expires December 16, 2022 (Notary Seal).

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

1911

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BZA Application Form**DIMENSIONAL INFORMATION**

Applicant: <u>Massachusetts Institute of Technology</u>	Present Use/Occupancy: <u>Institutional, Educational 4.33.b.1</u>
Location: MIT Campus Planning, 77 Massachusetts Avenue	Zone: <u>Residence C-3B Zone</u>
Phone: 617-293-6380	Requested Use/Occupancy: <u>Institutional, Educational 4.33.b.1</u>

		<u>Existing Conditions</u>	<u>Requested Conditions</u>	<u>Ordinance Requirements</u>	
<u>TOTAL GROSS FLOOR AREA:</u>		494,165 (multi-building lot)	494,165 (no additional SF of GFA for penthouse)	1,227,783 (allowed on multi-building lot)	(max.)
<u>LOT AREA:</u>		409,261 (Entire block serves as lot for multiple buildings)	409,261	5,000 (Minimum lot size)	(min.)
<u>RATIO OF GROSS FLOOR AREA TO LOT AREA: ²</u>		1.21	1.21	3.0/4.0 (Housing)	
<u>LOT AREA OF EACH DWELLING UNIT</u>		NA	NA	N/A	
<u>SIZE OF LOT:</u>	WIDTH	1,404	1,404	50	
	DEPTH	268	268	N/A	
<u>SETBACKS IN FEET:</u>	FRONT	0	0	10	
	REAR	57 (distance between B. 42 and B.42C)	57 (distance between B. 42 and B.42C)	None	
	LEFT SIDE	220	220	None	
	RIGHT SIDE	269	269	None	
<u>SIZE OF BUILDING:</u>	HEIGHT	66' 10"	66' 10" (penthouse addition not incl. in height (Sec. 5.23)	120	
	WIDTH	402 (Building 42 only)	402 (Building 42 only)	N/A	
<u>RATIO OF USABLE OPEN SPACE TO LOT AREA:</u>		NA	NA	N/A	
<u>NO. OF DWELLING UNITS:</u>		0	0	N/A	
<u>NO. OF PARKING SPACES:</u>		0	0	N/A	
<u>NO. OF LOADING AREAS:</u>		NA	NA	N/A	
<u>DISTANCE TO NEAREST BLDG. ON SAME LOT</u>		86	86	(63 + 67)/6 = 21.7	

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

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 VARIANCE

EACH OF THE FOLLOWING REQUIREMENTS FOR A VARIANCE MUST BE ESTABLISHED AND SET FORTH IN COMPLETE DETAIL BY THE APPLICANT IN ACCORDANCE WITH MGL 40A, SECTION 10.

- A)** A literal enforcement of the provisions of this Ordinance would involve a substantial hardship, financial or otherwise, to the petitioner or appellant for the following reasons:

The proposed mechanical penthouse at 59 Vassar Street (Building 42) will connect to a series of utility buildings on this block. Building 42 was made non-conforming in 2001, when the City replaced the existing Industrial zone, which had no front yard setback requirement, with the Residence C-3B zone, which has a ten-foot front yard setback. These connections are for functional, regulatory, and safety purposes. Disallowing the mechanical penthouse, which will be the central pillar in the conversion of the century-old steam distribution system on the MIT campus to a modern Medium Temperature Hot Water (MTHW) system, would hinder the core educational purposes of the university and cause substantial hardship for MIT, nullifying its educational use.

- B)** The hardship is owing to the following circumstances relating to the soil conditions, shape or topography of such land or structures and especially affecting such land or structures by not affecting generally the zoning district in which it is located for the following reasons:

The Central Utility Plant for MIT is over one hundred years old, serving the campus since MIT moved to Cambridge in 1916. Like almost all of the industrial buildings in the neighborhood at that time, it was built to the lot line and a safe distance from the adjacent rail line which delivered coal to the plant. The contemporary multi-building structure has been re-fashioned internally to provide steam, chilled water, and electricity to the campus. Until the construction of the new Building 42C which houses the twin combustion turbines (CT), the expansions since 2001 have been achieved within City zoning regulations which limit the expansion of non-conforming structures. The Board enabled the new Building 42C combined heat and power plant by granting a necessary variance (BZA-011971 – 2016). Achieving resiliency, greenhouse gas emission reduction goals, and converting the legacy steam distribution system to a Medium Temperature Hot Water system, requires an expansion of volume beyond what is allowed for non-conforming structures. The MTHW equipment is arranged at the closest possible proximities in line with safety standards and maximum efficiencies. In addition, the volume is expanded because resiliency needs require placing the MTHW above 100-year storm flood levels.

- C) DESIRABLE RELIEF MAY BE GRANTED WITHOUT EITHER:**

- 1) Desirable relief may be granted without substantial detriment to the public good for the following reasons:
 - To achieve maximum energy efficiency, MIT is minimizing energy loss by closely aligning the necessary equipment to convert high pressure steam to medium temperature hot water.
 - MIT's investment in MTHW ensures the maximum resiliency and efficiency in thermal distribution.
 - MTHW will contribute to MIT goals to reduce GHG emissions by at least 32% from the 2014 baseline year.
 - The MTHW plant will serve the overall conversion to MTHW distribution. The distribution system will reduce pipe failures that required excavations disruptive to pedestrian, cyclist and vehicle circulation on and around campus, including in public ways.
 - The project is making use of an existing facility and existing nearby infrastructure.

- 2) Desirable relief may be granted without nullifying or substantially derogating from the intent or purpose of this Ordinance for the following reasons:

The front yard non-conformance is located on Vassar Street. The current project does not expand this non-conformance. The penthouse itself is fully conforming to zoning requirements. This section of Building 42 that supports the mechanical penthouse is set back approximately 49 feet from the lot line.

The intent and purpose of the zoning ordinance with respect to the new front yard is to establish a new and more generous building line to reflect and support the altered overall context, which has shifted from industrial uses and structures to a modern urban mix of institutional, commercial and high-density residential uses that now predominate in the neighborhood.

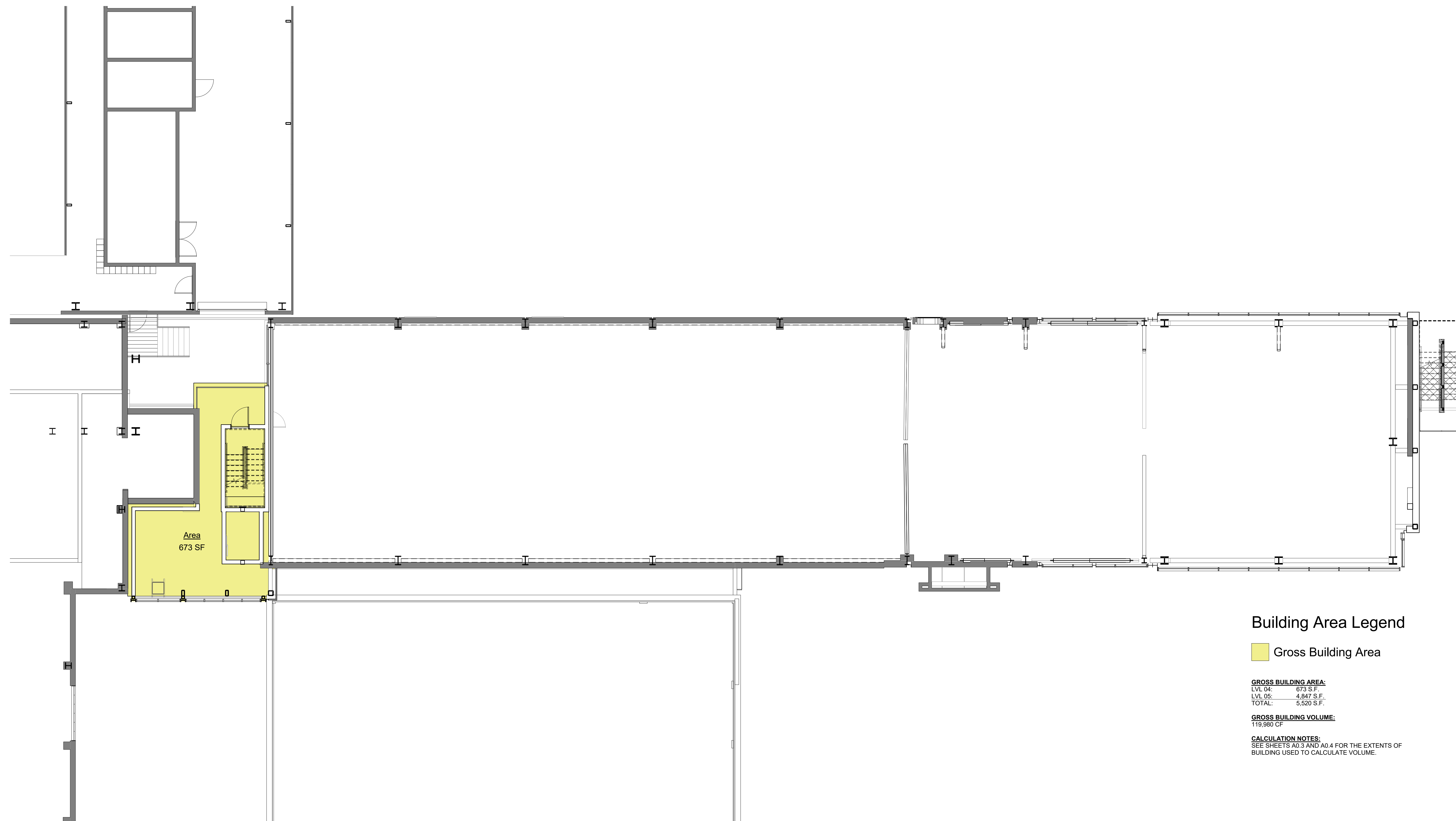
While the small amount of additional volume associated with the current project does not qualify it for an Article 19 Project Review Special Permit, the Citywide Urban Design Objectives (19.30) provide a guide to the broad purposes and intents of the zoning ordinance.

In Section 19.31, the guidance is to be responsive to existing or anticipated patterns of development, in particular with regard to the interaction of new buildings with the streetscape (19.31.2) and the historic context. The proposed project respects the historic context of Vassar Street. The penthouse is being designed to be consistent with the form and materiality of Building 42. It is unlikely that passersby will be able to distinguish the original Building 42 from the new penthouse.

In Section 19.35, the objective is to reinforce and enhance the complex urban aspects of Cambridge as it has historically developed, specifically indicated by concentrating institutional uses on the historic campus area (19.35.1), providing for active pedestrian traffic to and from new buildings (19.35.2) and respecting historic buildings and contexts (19.35.4). The penthouse on Vassar Street is on the historic campus, provides substantial room for pedestrians and cyclists and, in retaining the original buildings on Vassar Street, preserves historic structures and environments.

***If you have any questions as to whether you can establish all of the applicable legal requirements, you should consult with an attorney.**

Key Plan



Building Area Legend

Gross Building Area

GROSS BUILDING AREA:
LVL 04: 673 S.F.
LVL 05: 4,847 S.F.
TOTAL: 5,520 S.F.

GROSS BUILDING VOLUME:
119,980 CF

CALCULATION NOTES:
SEE SHEETS A0.3 AND A0.4 FOR THE EXTENTS OF BUILDING USED TO CALCULATE VOLUME.

1 LVL - 04
1/8" = 1'-0"

REV.	DATE	DESCRIPTION

RGV Job No: 28621.01	MIT Job No.
Drawn by: Author	
Checked by: Checker	
Date of Original: 06/19/20	
Scale: 1/8" = 1'-0"	

Project: MIT
CUP
THERMAL RENEWAL

Sheet Title: LVL 04 GROSS BUILDING AREA



AREA
ELEV.



MASSACHUSETTS INSTITUTE OF TECHNOLOGY

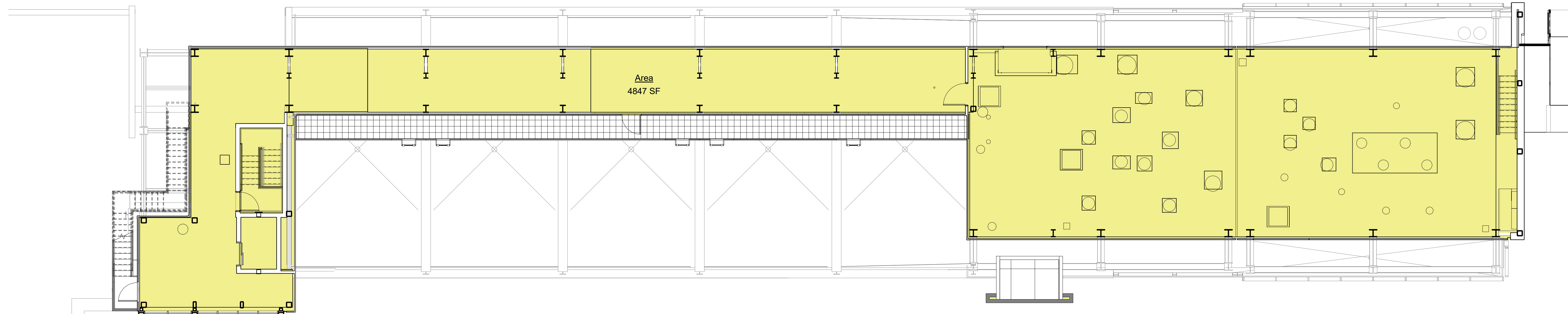
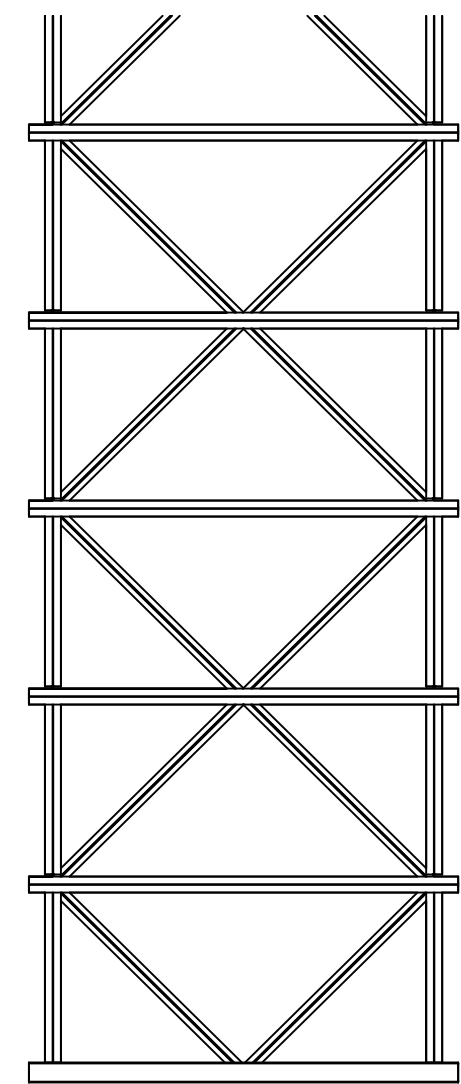
**VANDERWEIL
POWER GROUP**

R.O. Vanderweil Engineers, LLP 617-423-7423 TEL
274 Summer Street 617-566-4479 FAX
Boston, MA 02210 vanderweil.com



LeMessurier.

1380 SOLDIERS FIELD ROAD
BOSTON, MA 02135
617-866-1200
WWW.LEMESSURIER.COM



Area
4847 SF

Building Area Legend

Gross Building Area

GROSS BUILDING AREA:
LVL 04: 673 S.F.
LVL 05: 4,847 S.F.
TOTAL: 5,520 S.F.

GROSS BUILDING VOLUME:
119,980 CF

CALCULATION NOTES:
SEE SHEETS A0.3 AND A0.4 FOR THE EXTENTS OF
BUILDING USED TO CALCULATE VOLUME.

1 LVL - 05 TOC
1/8" = 1'-0"

Key Plan

REV.	DATE	DESCRIPTION

Project: MIT
CUP
THERMAL RENEWAL

Sheet Title:
LVL 05 TOC GROSS BUILDING
AREA



AREA
ELEV.

A0.2



MASSACHUSETTS INSTITUTE OF TECHNOLOGY

**VANDERWEIL
POWER GROUP**

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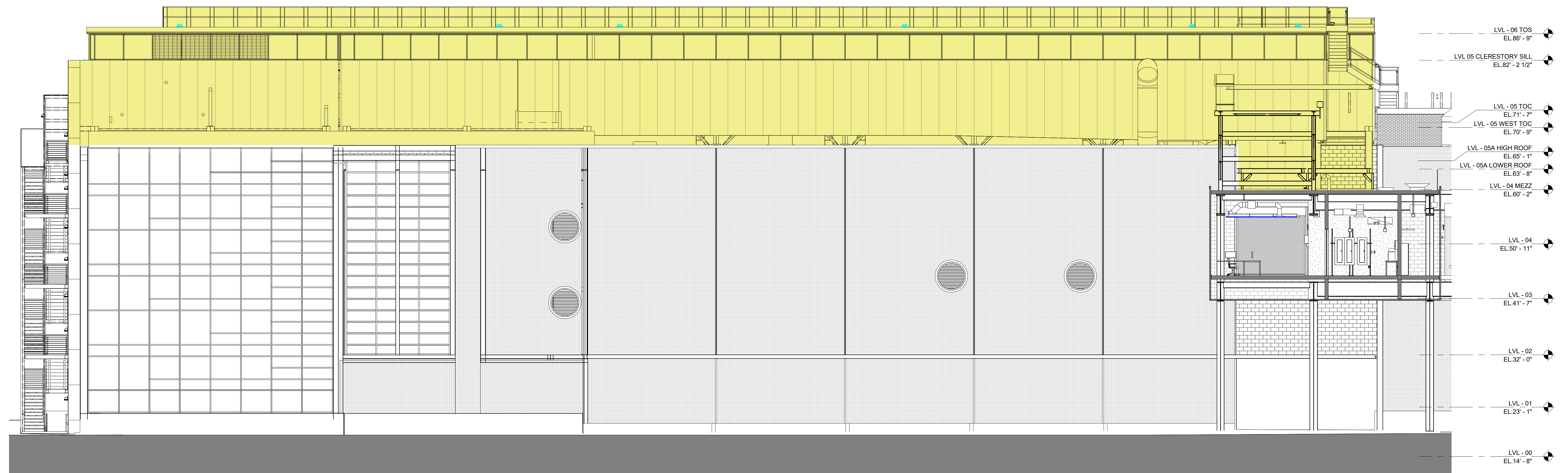


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2 SOUTH EXTERIOR ELEVATION GROSS VOLUME
1/8" = 1'-0"



1 NORTH EXTERIOR ELEVATION GROSS VOLUME
1/8" = 1'-0"

Key Plan

REV. DATE DESCRIPTION

RGV Job No:	28621.01	MIT Job No.	
Drawn by:	Author	Checked by:	Checker
Date of Original:	06/19/20	Scale:	1/8" = 1'-0"

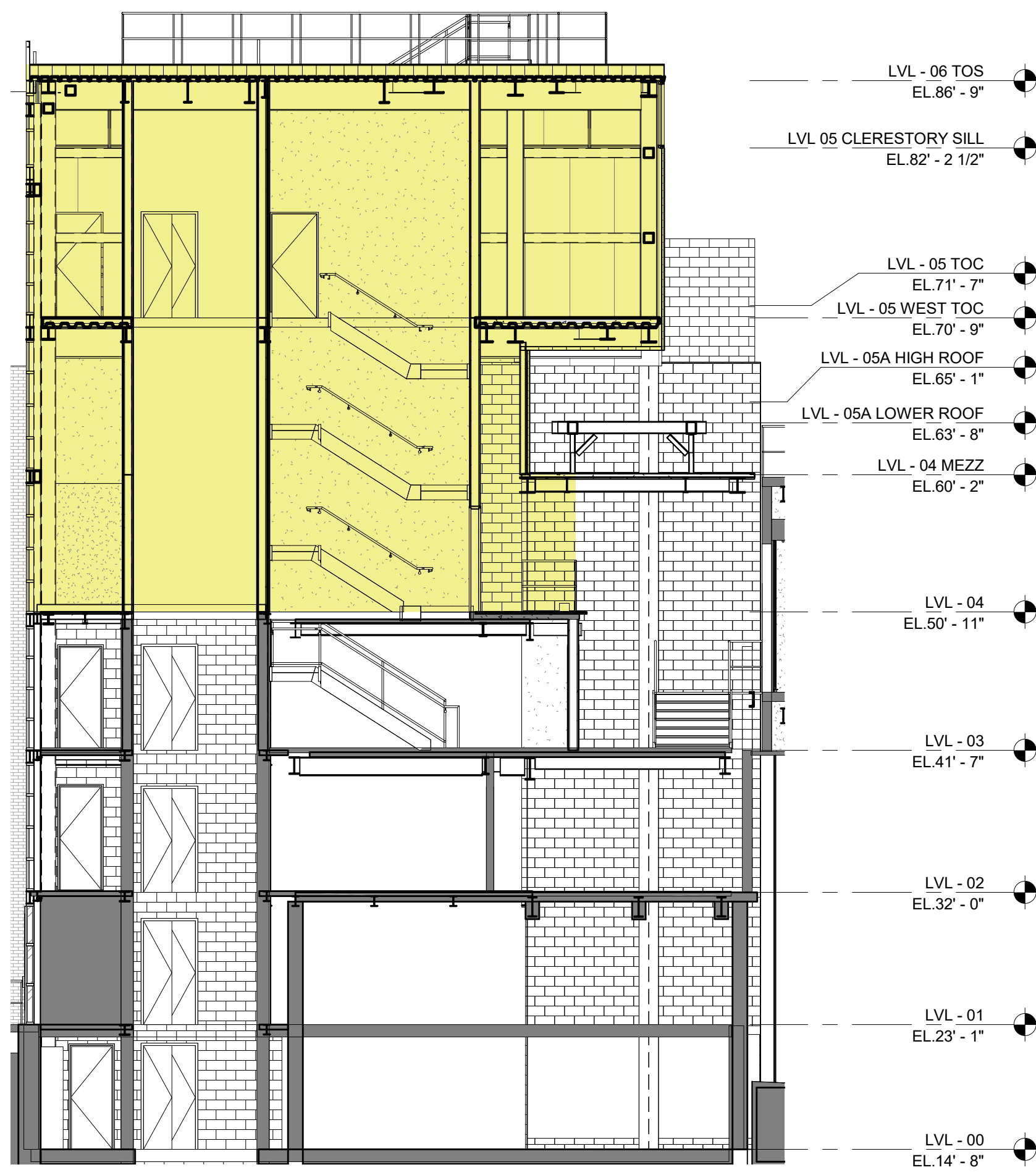
Project: MIT CUP THERMAL RENEWAL

Sheet Title: EXTERIOR ELEVATION GROSS VOLUMES

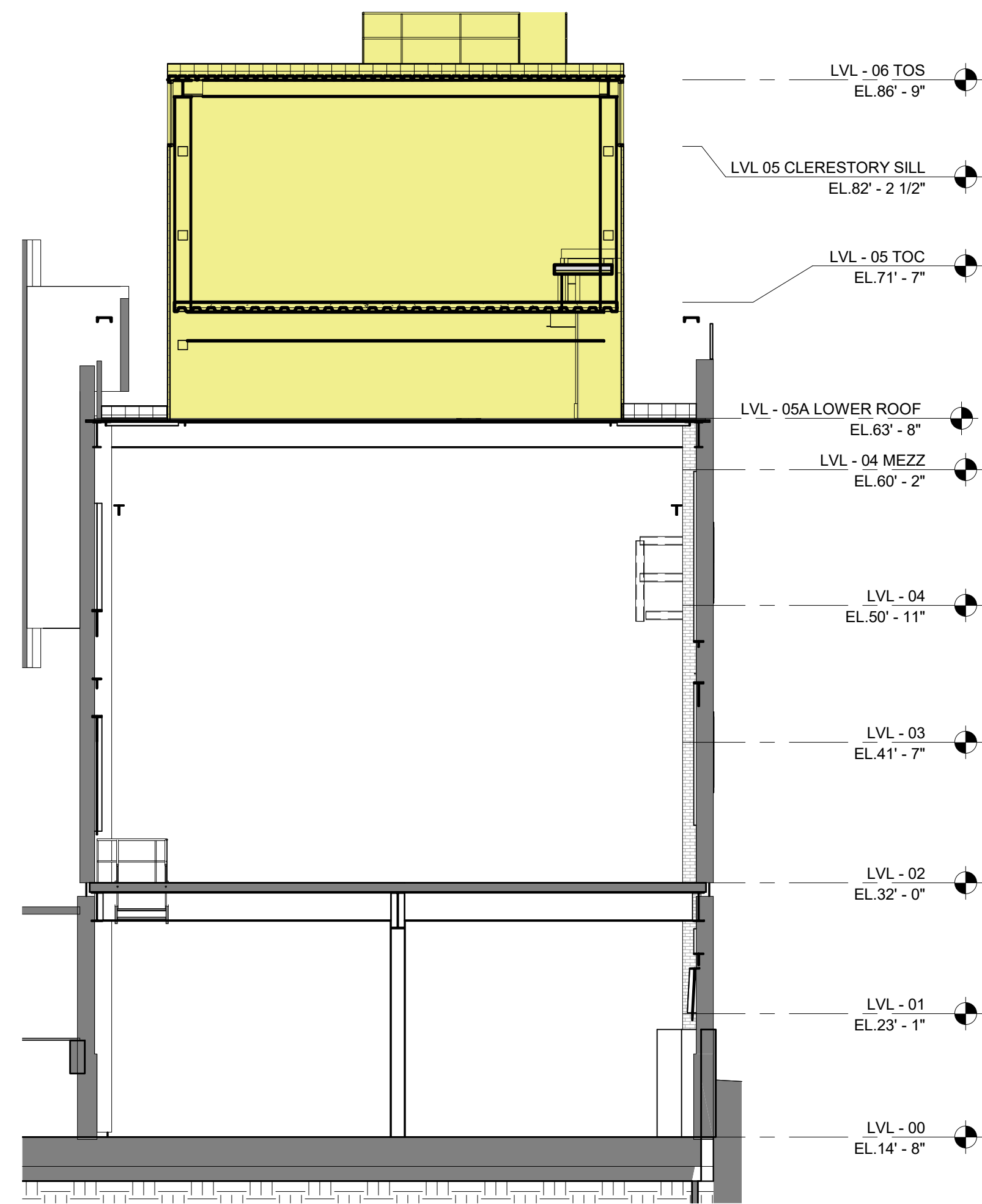


AREA
ELEV.

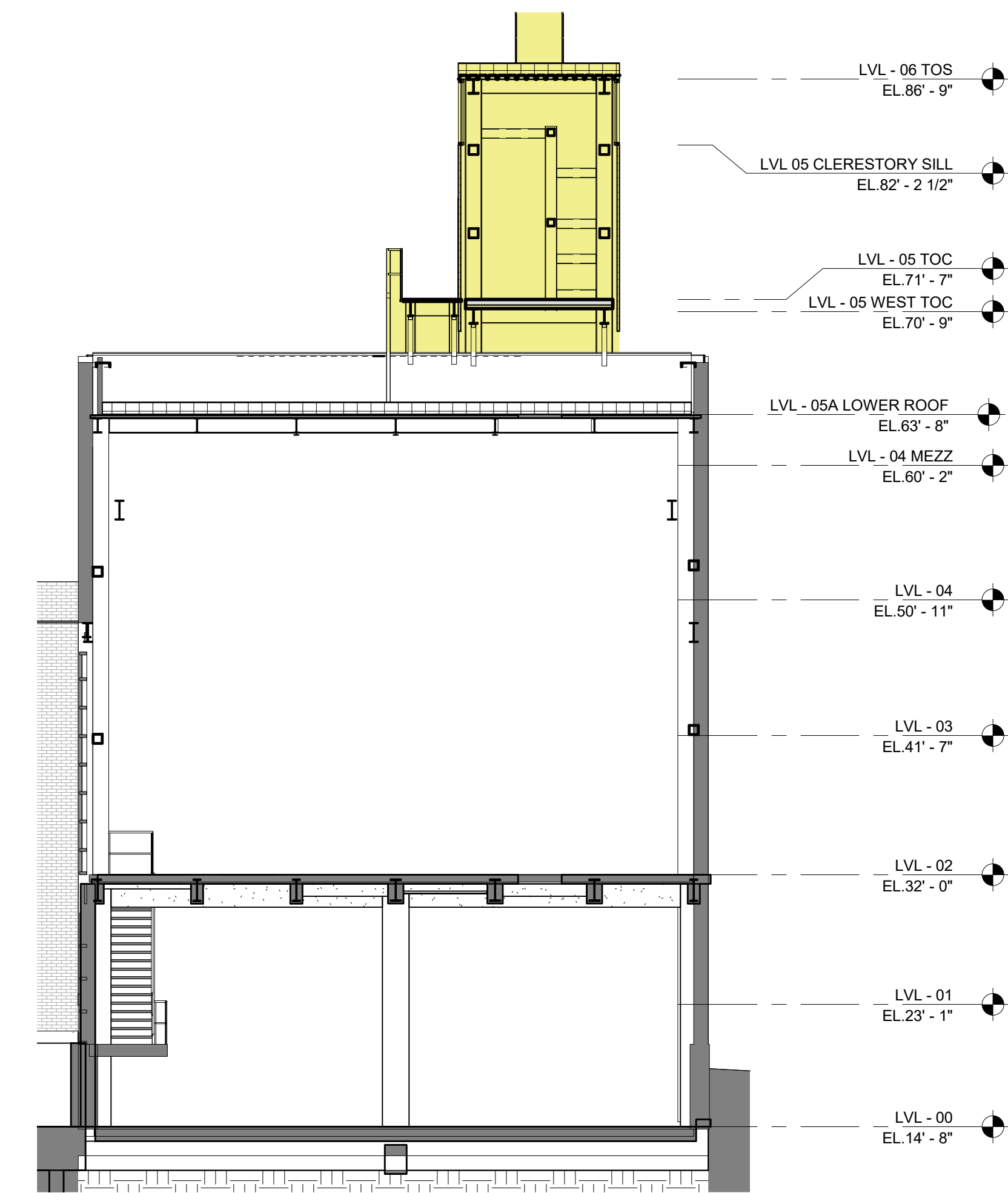
A0.3



3 BLDG SECTION AT WEST PENTHOUSE - GROSS VOLUME
1/8" = 1'-0"



2 BLDG SECTION AT PENTHOUSE - WEST GROSS VOLUME
1/8" = 1'-0"



1 BLDG SECTION AT WALKWAY - WEST GROSS VOLUME
1/8" = 1'-0"

Key Plan

REV.	DATE	DESCRIPTION

REV.	DATE	DESCRIPTION
RGV Job No.	28621.01	MIT Job No.
Drawn by:	Author	
Checked by:	Checker	
Date of Original:	06/19/20	
Scale:	1/8" = 1'-0"	

Project: MIT
CUP
THERMAL RENEWAL

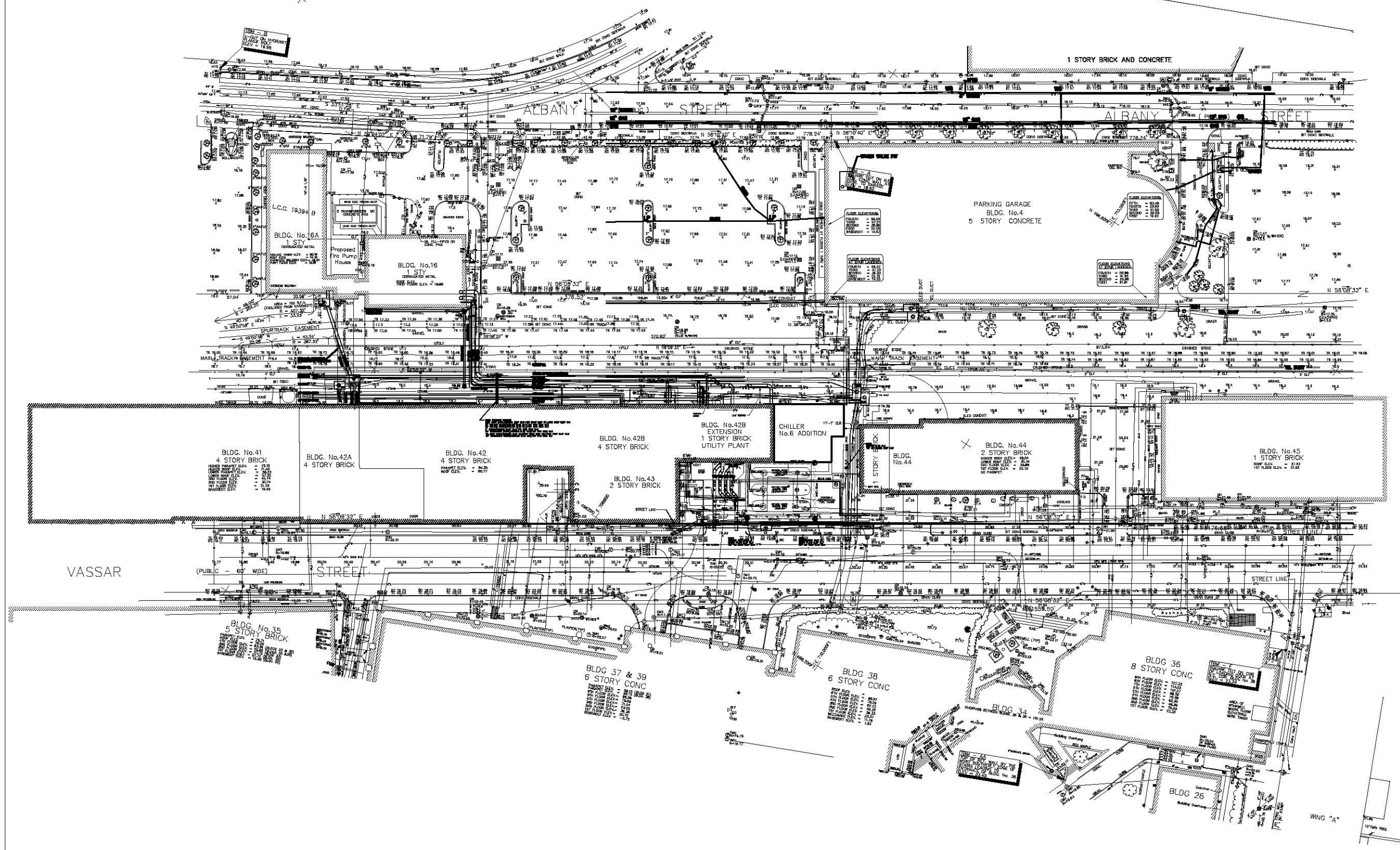
Sheet Title:
BUILDING SECTION GROSS VOLUMES



AREA
ELEV.

A0.4

NOTE:
 SURVEY INFORMATION
 IN THIS DRAWING
 WAS PREPARED BY
 BAYSTATE SUBSURFACE
 INVESTIGATIONS (BSI),
 DATED 6/7/99.



Ellenzweig Associates, Inc.
 Architects
 1280 Massachusetts Avenue,
 Cambridge, Massachusetts 02138
 Telephone: 617-491-5575
 Fax: 617-868-2318

Project: MIT CHILLED WATER EXPANSION
 CHILLER No.6
 Title: SURVEY / SITE PLAN
 File: j/29817/cadd/sd/Mitsite1dwg

Job No: 29817.00
 Scale: 1"=20'
 Date: 11/10/99
 Drawing:

January 28, 2021

Ranjit Singanayagam
Board of Zoning Appeal
City of Cambridge
831 Massachusetts Avenue
Cambridge, MA 02139

**RE: MIT – CUP Thermal Renewal Project
[Medium Temperature Hot Water (MTHW)]
Building 42 Mechanical Penthouse, 59 Vassar Street**

Dear Ranjit,



The Massachusetts Institute of Technology is filing its application for a variance for the above referenced project. This application seeks a variance under Section 8.22.3 for exceeding the limits for square foot and volume extension of a non-conforming building. The proposed MIT-CUP Thermal Renewal mechanical penthouse is proposed for the Building 42 utility plant at 59 Vassar Street. Building 42 is connected to the north back to Building 42C, N16, N16 A-B-C, and the Cooling Tower.

Zoning Background

Building 42, originally constructed in 1916, was made non-conforming in 2001, when the City replaced the existing Industrial District zone, which had no front yard setback requirement, with the Residence C-3B zone, which has a ten-foot front yard setback. As a result, all of the then existing connected buildings (41, 42, and 43) became non-conforming. At the time of the zoning change, the utility complex had 54,179 square feet of gross floor area. There were a number of small additions since 2001, (N16, N16A, N16B, N16C and a set of cooling towers) which added only small amounts of gross floor area, as they were comprised almost exclusively of mechanical space excluded from gross floor area. These extensions of a non-conforming structure cumulatively amounted to less than 10% and were allowed with building permits only under Section 8.22.1.f.

When the MIT Central Utility Plant Second Century Project in Building 42C (38-50 Albany Street) was proposed in 2016, the additional gross floor area of 13,319 square feet associated with the project resulted in a cumulative addition of 29% over the gross floor area of the utility complex when it became non-conforming in 2001. In addition, Building 42C also added volume that contributed to a cumulative excess of 25% over the volume of the 2001 utility complex. This required a variance under Section 8.22.3 that MIT sought and obtained (BZA-011971-2016).

Zoning for the Current Project

The proposed MIT-CUP Thermal Renewal Project is a mechanical penthouse on Building 42 cogeneration plant at 59 Vassar Street. It has 5,520 gross square feet but zero (0) square feet of gross floor area as it is comprised of only mechanical space and an access stairwell and elevator that are not connected to any floor area that would otherwise be counted as gross floor area (see Art. 2, Floor Area Gross (7)).

However, the MIT-CUP Thermal Renewal Project medium temperature hot water (MTHW) penthouse would add a volume of 119,980 cubic feet, further exceeding the 25% cumulative maximum allowed without a variance. This application seeks a variance under Section 8.22.3. The mechanical penthouse addition is otherwise conforming to the Cambridge Zoning Ordinance.

Purpose and Benefit of the project

The MIT Central Utilities Plant (CUP) has been designed to provide near 100% reliability through maintaining standby units at all times, as the heat and electrical power generated is used to maintain critical research facilities, laboratories, classrooms and dormitories. The CUP provides electricity, steam heat, medium temperature hot water, and chilled water to more than 100 MIT buildings.

The MIT Central Utility Plant Second Century Project in Building 42C at 38-50 Albany Street, now about to go into operation, consists of two nominal 22 megawatt (MW) combustion turbine (CT) units fired primarily on natural gas.

Each CT will exhaust to its own heat recovery steam generator (HRSG) with a 134 million Btu per hour (MMBtu/hr) higher heating value (HHV) gas-fired duct burner. The HRSG will include selective catalytic reduction (SCR) for Oxides of Nitrogen (NO_x) control, and an oxidation catalyst for the control of Carbon Monoxide (CO) and Volatile Organics (VOC).

The ongoing conversion of the campus from high pressure steam distribution to medium temperature hot water is one step in meeting the Institute's goal to reduce greenhouse gases at least 32% by 2030. In addition to a direct reduction in campus greenhouse gases, the transition to a modern district energy heating system provides enhanced resiliency, increased reliability and safety, lower energy losses, and lower life-cycle and maintenance costs.

The project includes a rooftop mechanical addition on Building 42, the existing Central Utilities Plant. This addition will house a central hot water heat exchange plant that will convert steam to hot water for more effective thermal distribution to campus buildings.

MIT-CUP Thermal Renewal Project [Medium Temperature Hot Water (MHTW)]
Mechanical Penthouse
Building 42, 59 Vassar Street
Page 3

The project will also address code updates in Building 42, add architectural screening to improve views on Vassar Street, install a new hot water distribution piping system for the proposed MIT Stephen A. Schwarzman College of Computing (Building 45), and enable the future transition of the Brain and Cognitive Sciences Building (Building 46) to medium temperature hot water.

As we have stated in previous zoning applications, our counsel has instructed us to provide this statement reserving our rights under the Dover Amendment. As a nonprofit educational corporation, MIT has certain protections granted by the so-called Dover Amendment, M.G.L. c.40A, §3. There is some question as to the enforceability of the variance requirements with respect to this project in light of the Dover Amendment protections. The strict application of the limits to the expansion of the non-conforming multi-building complex would have the practical effect of nullifying the use exemption afforded educational institutions. Compliance with the expansion of non-conforming building requirements would substantially diminish the usefulness of Building 42 and the entire central utility complex without appreciably advancing the City's legitimate concerns.

MIT is submitting this application in an effort to satisfy the City's policy objectives under the zoning ordinance as a whole. However, in doing so, MIT must reserve the right to assert that some or all of the requirements of certain zoning provisions do not apply to MIT's proposed project under the Dover Amendment.

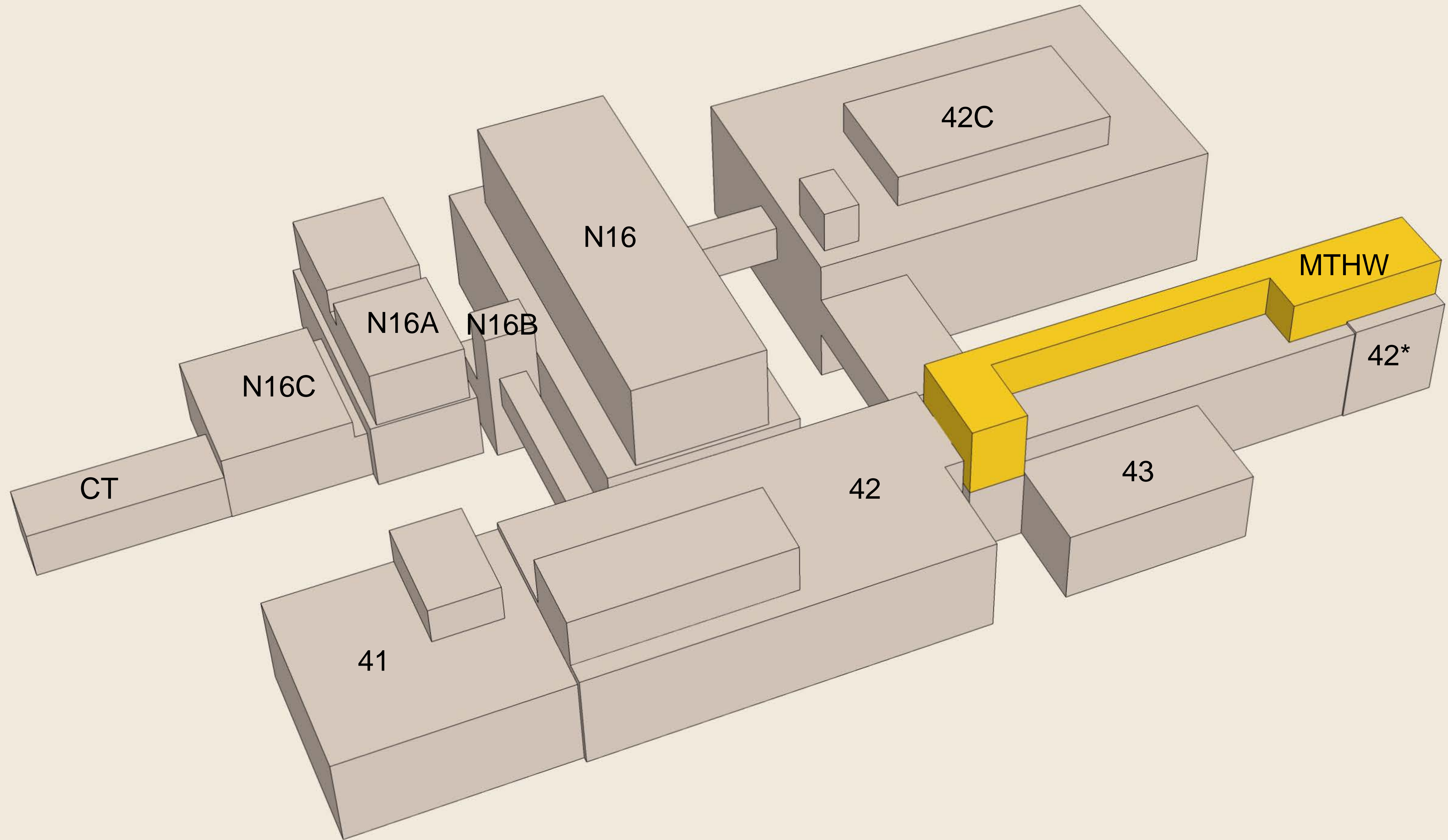
Please contact me (kbrown@mit.edu, 617-293-6380) if you need any further information or documentation concerning this matter.

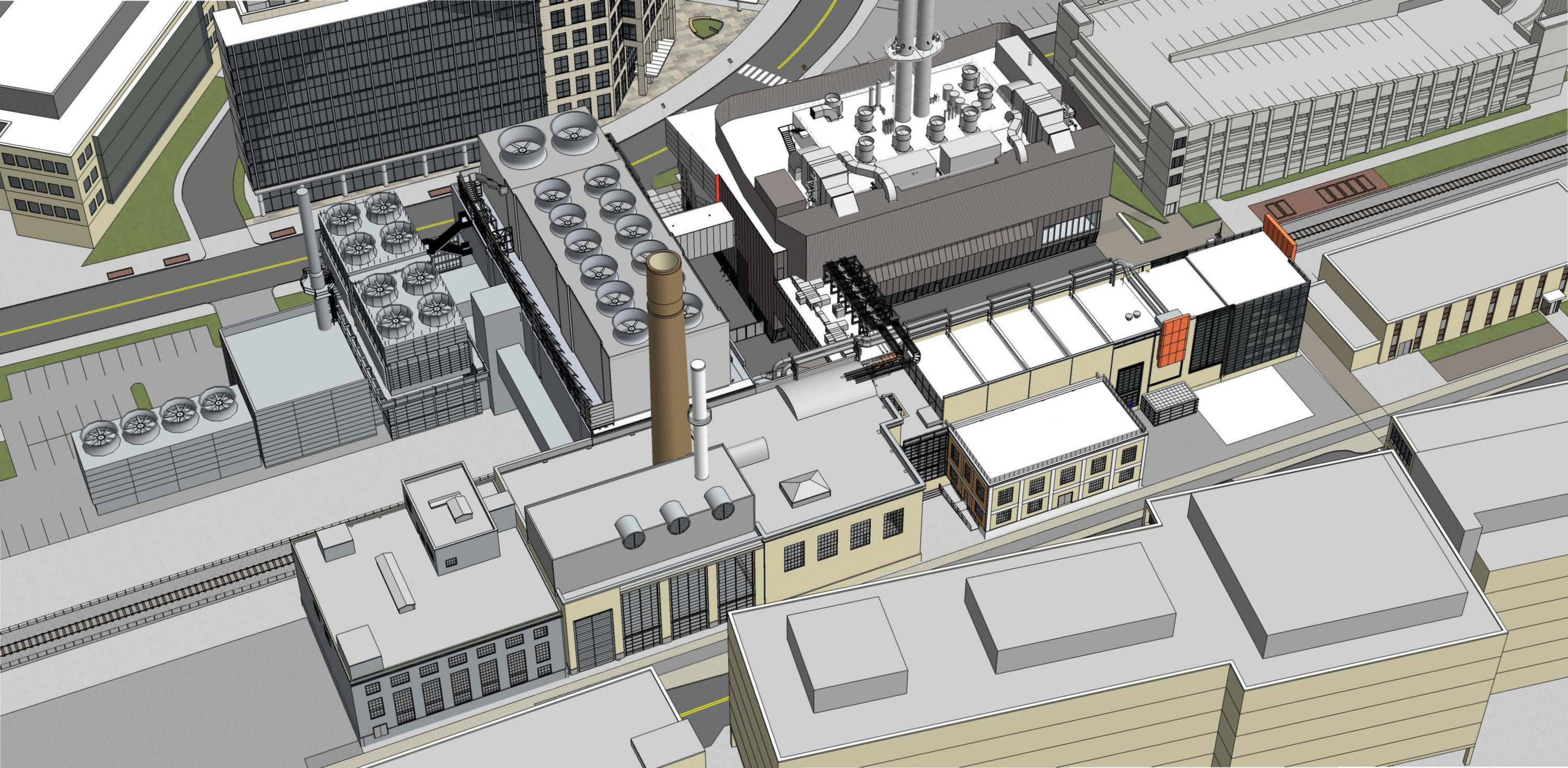
With regards,

Kelley Brown

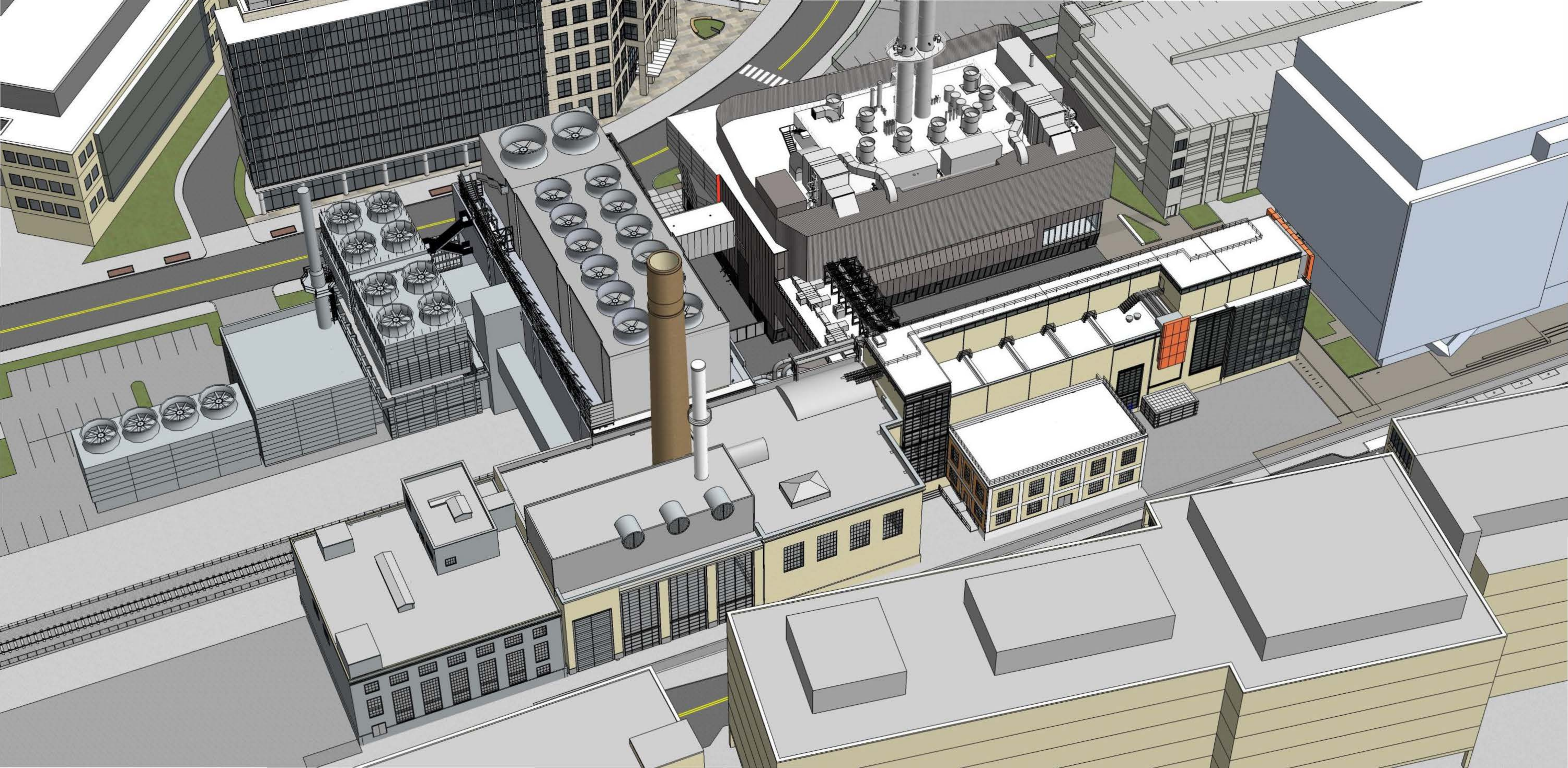
Kelley Brown
Senior Campus Planner

Enclosures















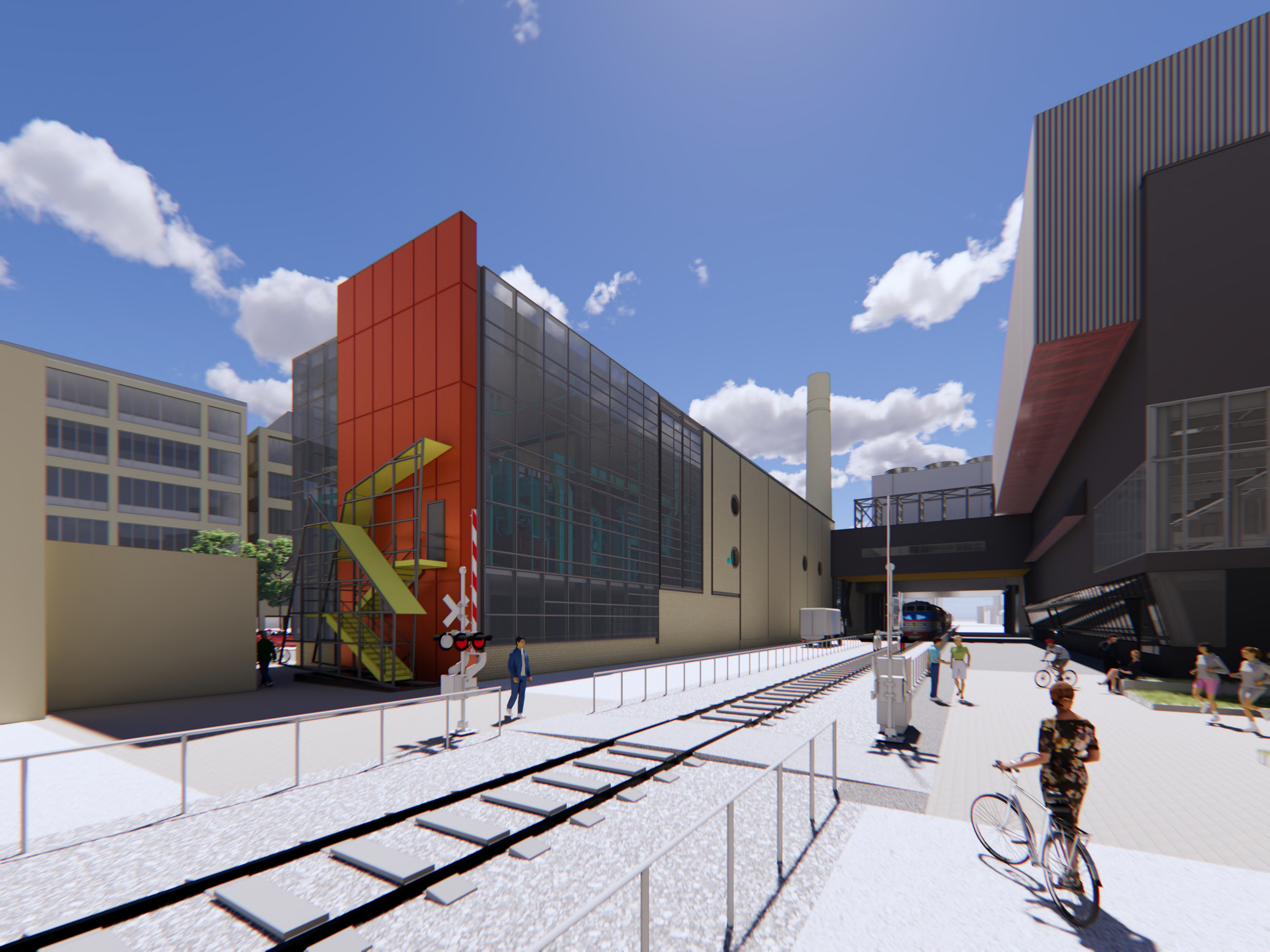


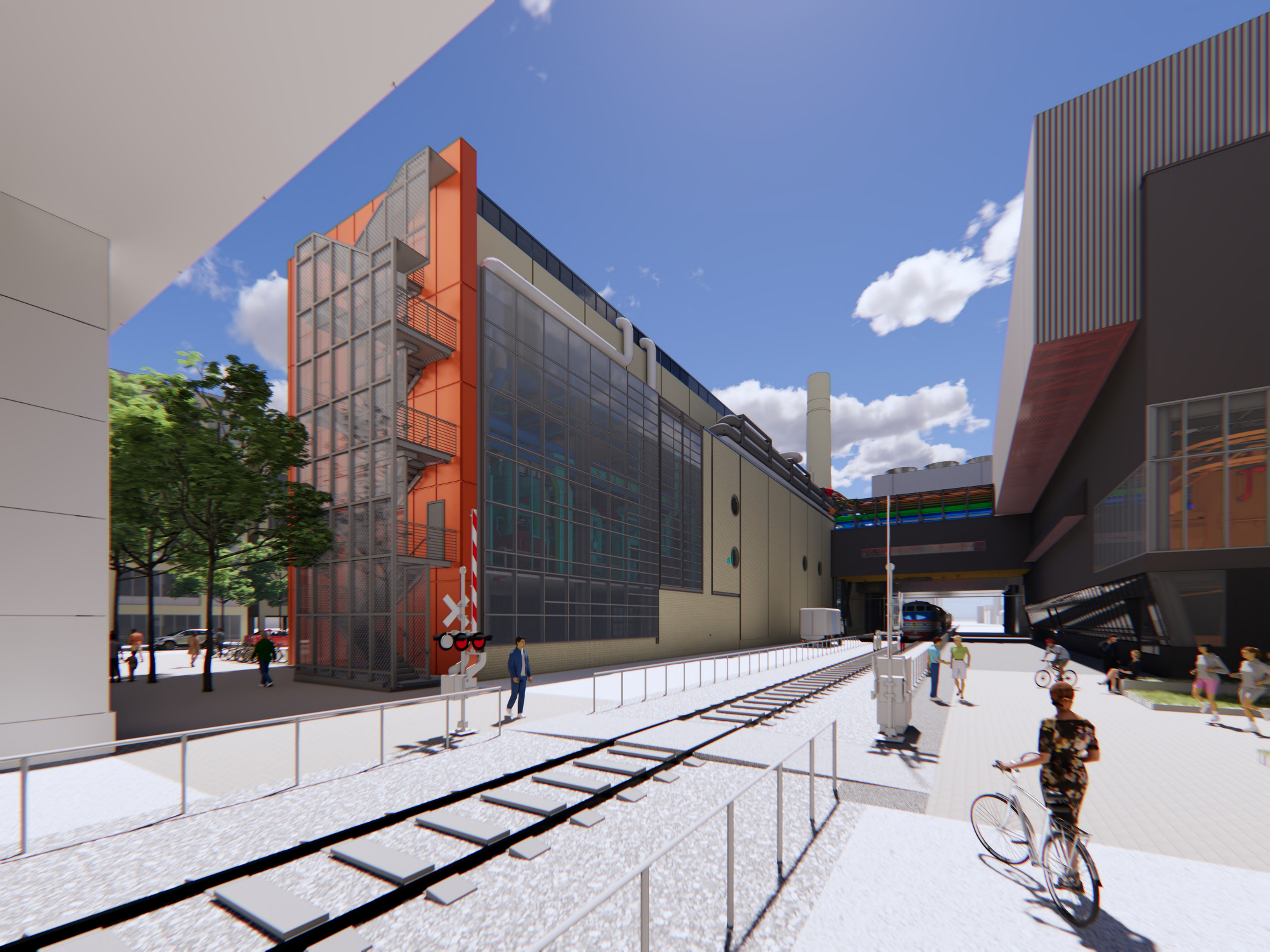




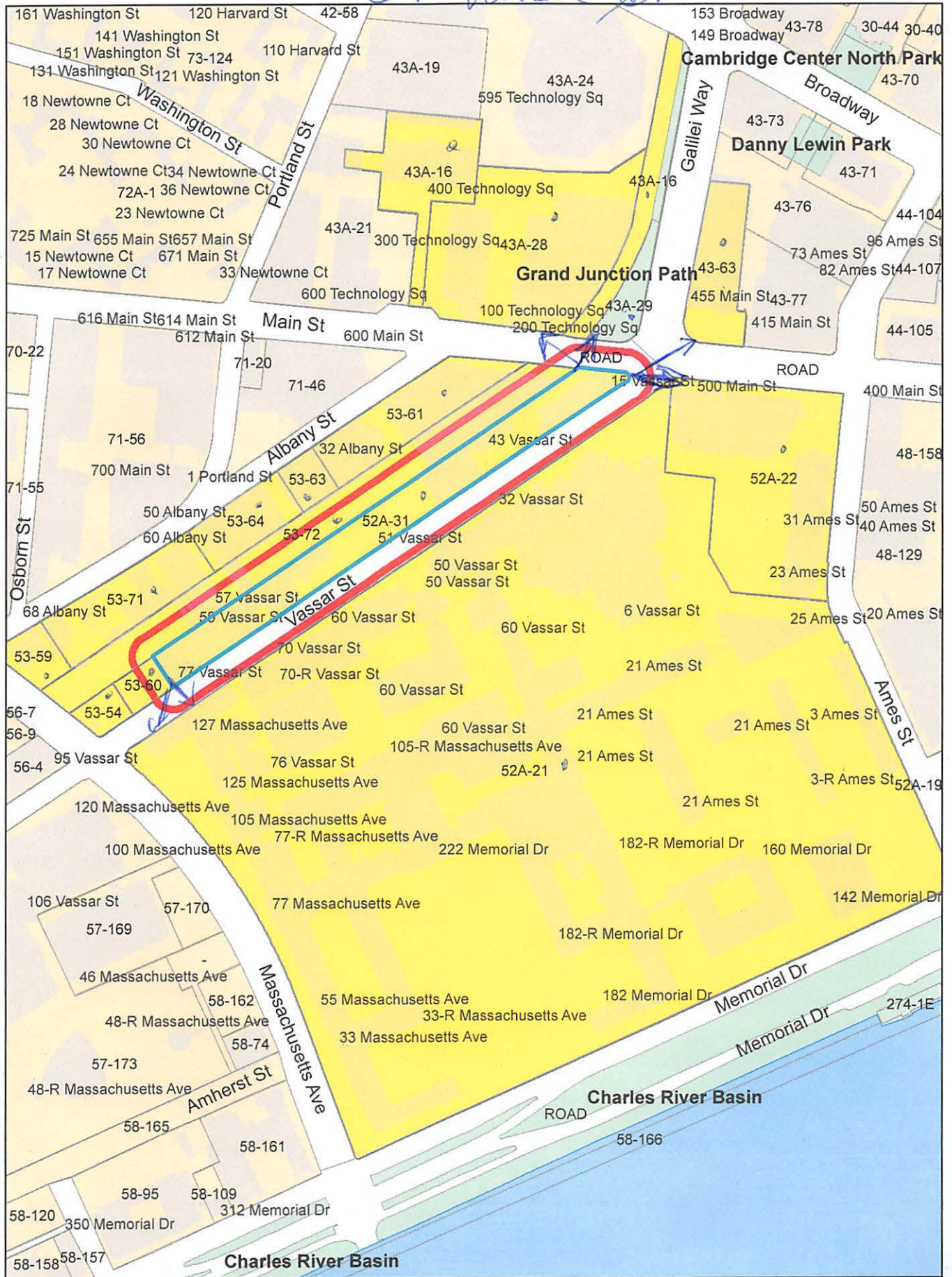








59 Vassar St.



59 Vassar St.

Petitioner

43A-28-16
MIT REAL ESTATE, LLC,
C/O ARE-TECH SQ, LLC/ MIT REAL ESTATE
P.O. BOX 847
CARLSBAD, CA 92018

52A-22-31-21
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
C/O MIT INVESTMENTS MANAGEMENT CO
ONE BROADWAY, SUITE 09-200
CAMBRIDGE, MA 02142

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
C/O KELLEY BROWN
MIT CAMPUS PLANNING
77 MASS AVENUE - NW23-100
CAMBRIDGE, MA 02139

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RESEARCH
9 CAMBRIDGE CENTER
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43A-29
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