Massachusetts Institute of Technology

Central Utility Plant Second Century Plant Expansion

Chapter 40 § 54A Application

September 8, 2016

Massachusetts Institute of Technology **Office of Campus Planning**

77 Massachusetts Avenue
Building NW23-100
Cambridge, Massachusetts
02139–4307

September 7, 2016

Stephanie Pollack
Secretary and Chief Executive Officer
Massachusetts Department of Transportation
10 Park Plaza, Suite 4160 Boston, MA 02116

RE: MGL chapter 40 § 54A – Massachusetts Institute of Technology ("MIT")
Item 15a Project Description

Dear Secretary Pollack:

Enclosed is the Massachusetts Department of Transportation form for MIT's application for consent to issue a building permit by the City of Cambridge to construct an expansion of the existing Central Utility Plant at 60 Albany Street (attachment #1). Because this project proposes construction partially on land purchased from the New York Central Railroad in 1964, MGL c 40 § 54A requires that, prior to issuance of a building permit, consent in writing must be first obtained from the Secretary and Chief Executive Officer of the Massachusetts Department of Transportation (MassDOT). The first step in this process is for the Applicant to request a building permit from the City of Cambridge Inspectional Services Department. This resulted in a letter from the City asking MassDOT to hold the requisite public hearing (attachments #2 and #3).

It should be noted that this project is a continuation of the planned upgrades to MIT's Central Utility Plant ("CUP") and has been the subject of prior c. 40 § 54A applications that were approved in April 2009 and March 2011 (attachment #4).

MIT acquired fee title to sections of the Grand Junction Branch line in December, 1964 from the New York Central Railroad, as evidenced by the deed (attachment #5) that was recorded in the Middlesex County South Registry of Deeds at Book 10719, page 278. The railroad reserved rights for continued operations over the branch and those rights are currently owned by the Commonwealth of Massachusetts, under jurisdiction of MassDOT (MBTA).

The primary site of the proposed improvements is on Registered Land shown on Land Court Plan No. 19394B and Unregistered Land, Lots 12, 13, 14, 15 and 16 shown on a plan recorded with the Middlesex South Registry of Deeds in Plan Book 28, Plan 10 (attachment # 6) For deeds and Certificates of Title, see attachment # 7.

As noted above, MIT has previous experience with constructing facilities along and above the railroad corridor and this planned expansion of the CUP will present minimal to no impacts in its permanent condition on railroad operations. MIT enjoys a constructive relationship with the engineering department staff at Keolis Commuter Rail and is committed to working closely with MBTA and MassDOT in the development of plans for the project as well as daily communication

during construction, as may be required. A preliminary on-site meeting was conducted on July 25th with representatives of both the MBTA and Keolis Commuter Services.

Furthermore, this project will continue to honor MIT's commitments to the requirements of prior consent letters to maintain the sixty-four foot horizontal clearance at grade of the corridor through the project area, and will include relocation of a stairway that was included in the earlier Chiller Plant expansion 22'5" above grade, and protection of the twenty-two and one half foot vertical clearance over top of rail – both clearances for the purpose of protecting future transportation uses within the corridor.

The Project

MIT plans to expand the Central Utility Plant (CUP) commencing in 2017 to replace the existing cogeneration unit that is approaching the end of its design life, adding a second cogeneration unit, and increasing the chilled water capacity along with updating some aged equipment in the CUP. The project focus will be to improve the resiliency of the campus utilities while reducing MIT's environmental impact and improving overall efficiency. The work is being accomplished in partnership with the existing utility providers and will result in improvements to the public utility systems in the area of MIT's campus.

The project is the subject of a Certificate of the Secretary of Energy and Environmental Affairs on the Single Environmental Impact Report, dated July 1, 2016 (attachment #8), and the Certificate of the Secretary of Energy and Environmental Affairs on the Public Benefit Determination, dated July 22, 2016 (attachment #9).

The Project elements include:

- Replacement of a 21 megawatt (MW) combustion turbine generator (CTG) with two nominal 22 MW gas fired CTG's, each with a heat recovery steam generator (HRSG) with a gas fired duct burner;
- Addition of a 2MW Ultra Low Sulfur Diesel (ULSD) fired cold-start engine to start the CTG's in an emergency;
- Conversion of five boilers from ULSD fuel to natural gas;
- Increase permitting limits of two gas fired boilers to take advantage of the energy efficiency of the units;
- Replacement of six cooling towers with three new cooling towers (four existing cooling towers will be retained); and,
- Installation of a new gas regulator station.

The Project Site

The current CUP commenced operations in 1995, and provides 60% of the electricity used on the MIT campus and generates steam for heating and cooling via steam driven chillers. The CUP is linked to the campus by electrical, steam and chilled water distribution systems. The CUP is identified as MIT Building # 42 and is bordered by Vassar Street to the south and Albany Street to the north. The CUP is located on both sides of the Grand Junction rail corridor right-of-way.

The project provides for a 40-foot wide pedestrian and bicycle path along the north side of the proposed building that will connect Albany Street to the railroad corridor and the Vassar Street cycle track.

The Secretary's Certificate (MEPA) noted the request of the City of Cambridge, the Cambridge Bicycle Committee and the Boston Bicyclists Union for MIT to consider expanding the overall width of the corridor right-of-way from the current 64 feet to 72 feet. MIT has examined this request and we find it is not feasible. MIT stands by its earlier commitments to maintain the 64-foot r-o-w to accommodate future transportation uses within the corridor, including a potential multi-use path.

Completion of the proposed CUP expansion will enable MIT to meet future energy demands, increasing reliability and resilience while meeting energy efficiency and carbon reduction goals. The project will be constructed on the site of an existing surface parking lot, and will promote energy conservation and greenhouse gas reductions as well as enhancing the natural gas supply to both the campus and the surrounding community by installation of a new regulator station to be utilized by Eversource Energy.

Attachment # 10 is a locus plan with the project site indicated. Attachment # 11 illustrates the site plan for the project that showing both existing conditions and proposed future conditions.

The Process

MIT looks forward to a speedy resolution of our request for your consent under MGL c.40 § 54A. To move the process forward we would appreciate having the public hearing scheduled as soon as possible so that we may properly advertise the time, date and location.

Thank you for your consideration. Please contact me at 617-293-6380 should you require any further information.

With Regards,

Kelley Brown
Senior Campus Planner

Attachments

1. MGL Chapter 40 § 54A Application
2. Building Permit Plans
3. Building Commissioner's Letter

4. Prior Secretary Chapter 54 § 54A Approval letters
5. Grand Junction Acquisition Deed and Plan
6. Site Acquisition Plans
7. Site Acquisition Deeds and Certificates of Title
8. Certificate of the Secretary of Energy and Environmental Affairs on the Single Environmental Impact Report, July 1, 2016
9. Certificate of the Secretary of Energy and Environmental Affairs on the Public Benefit Determination, July 22, 2016
10. Project Locus Plan
11. Project Site Plan

Attachment 1 - MGL Chapter 40 § 54A Application

M.G.L. CHAPTER 40, SECTION 54A, APPLICATION

(PLEASE TYPE OR PRINT)

Please answer in detail

1. CONTACT PERSON:
Kelley Brown
Senior Campus Planner
Tel. No: 617-452-2410

2. ADDRESS OF CONTACT PERSON:
Massachusetts Institute of Technology
77 Massachusetts Ave., Bldg. NW23-100
Cambridge, MA 02139-4307

3. BUILDING INSPECTOR OR CITY/TOWN OFFICIAL:
Ranjit Singanayagam, Commissioner
Inspectional Services Department

4. ADDRESS OF BUILDING INSPECTOR OR CITY/TOWN OFFICIAL:
831 Massachusetts Ave.
Cambridge, MA 02139

5. NAME OF PRESENT PROPERTY OWNER:
Massachusetts Institute of Technology

6. ADDRESS OF PROPERTY OWNER:
77 Massachusetts Ave.
Cambridge, MA 02139

7. NAME OF APPLICANT:
Kelley Brown, on behalf of
Massachusetts Institute of Technology
CO APPLICANT (IF APPLICABLE):

8. ADDRESS OF APPLICANT:
77 Massachusetts Ave.
Cambridge, MA 02139

9. PROPERTY LOCATION (CITY/TOWN):
Cambridge, Massachusetts

10. TYPE OF CONSTRUCTION:
Industrial (utility)

TOTAL NUMBER OF STRUCTURES TO BE CONSTRUCTED: one

USE: COMMERCIAL, RESIDENTIAL, INDUSTRIAL: Institutional (education)

13. PROPERTY IS:
- ☐ on railroad corridor
- ☐ appurtenant to a railroad corridor
- ☑ includes land both appurtenant to a corridor and on a corridor

If property is adjacent to the railroad corridor, please indicate approximate distance from (former) railroad property boundary line to the proposed structure
Air rights - 22'6" overhead clearance

14. PROPERTY IS ADJACENT TO:
(Check N/A, if not applicable)
- ☐ an abandoned railroad line
- ☑ an active railroad line
- ☐ N/A

Name of Right of Way – i.e. Branch Line
Grand Junction Branch

Distance from boundary line to nearest track:
48'

15. APPROX. WIDTH OFCORRIDOR:

82'10"

16. TOTAL PARCEL AREA INCLUDING FORMER RAILROAD PROPERTY:

128,957

15a **REQUIRED** - ATTACH A DESCRIPTION OF PROPERTY TO BE CONSTRUCTED

Improvements and expansion of MIT's existing Central Utility Plant located at 60 Albany St.

APPROXIMATE AREA OF FORMER RAILROAD PROPERTY

110,208 SF +/-

17. CITY/TOWN ASSESSOR'S PARCEL IDENTIFICATION NUMBER:

Lot # 53 Map # 64 and 12

18. FORMER RAILROAD OWNER:

New York Central RR

Date of Abandonment:

NA

19. APPROXIMATE DATE OF RAILROAD DISPOSITION

December, 1964

20. DATE OF PRESENT OWNER ACQUISITION:

December, 1964

21. Under ***M.G.L., Chapter 40, Section 54A Statute*** the Secretary of MassDOT will notify both the City/Town Building Inspector and Applicant in writing. If the applicant would like other person(s) to be copied, please indicate name(s) and address(s') below:

Kelley Brown, Senior Campus Planner, MIT

77 Massachusetts Ave., Bldg NW23-100,

Cambridge, MA 02139-4307

Kelley Brown, AICP, LEED AP

Print Name

Signature

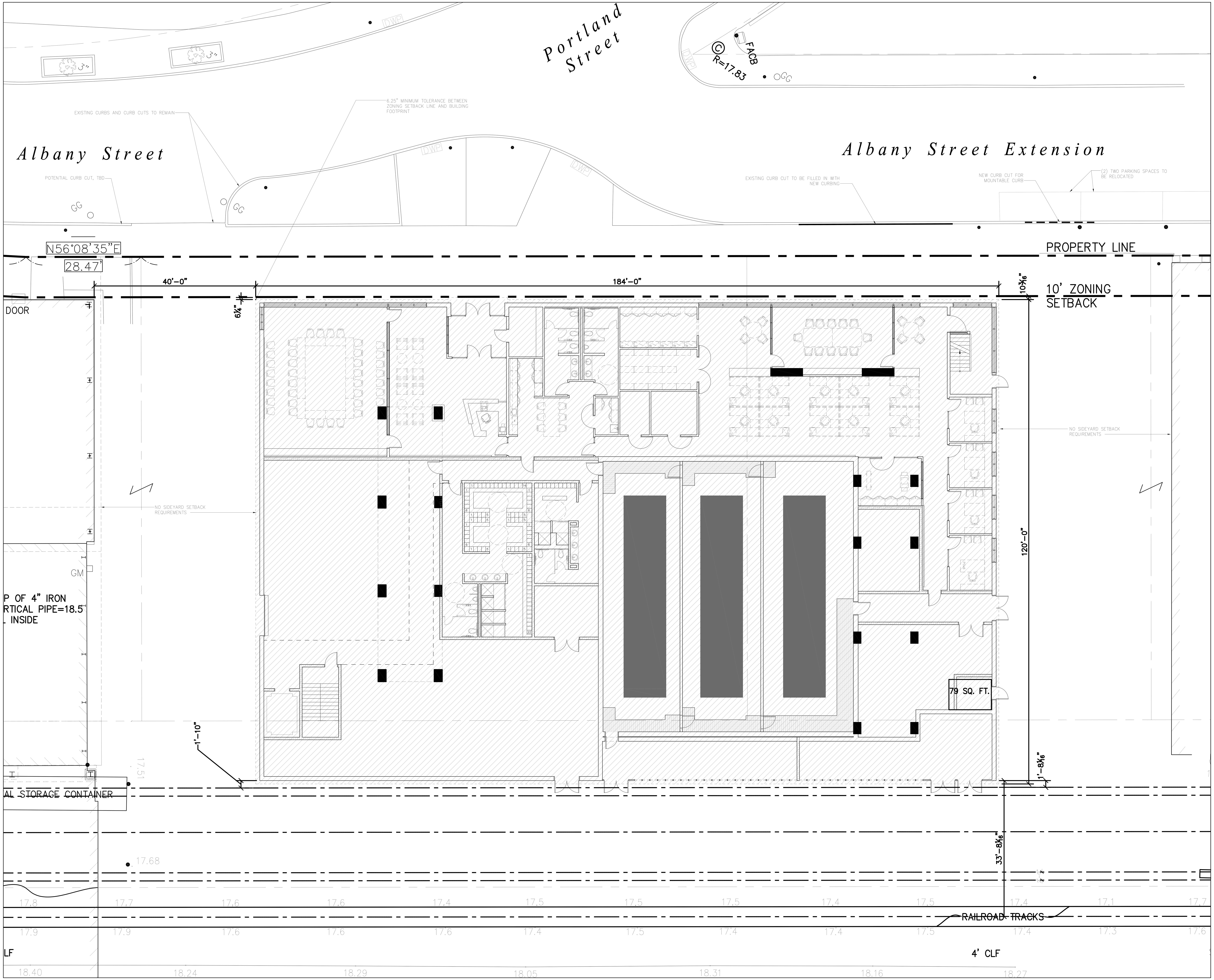
Applicant, Contact Person or Attorney

Attachment 2 - Building Permit Plans

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VANDERWEIL POWER GROUP
R.G. Vanderweil Engineers, LLP
274 Summer Street
Boston, MA 02210
617.423.7423 TEL
617.423.7401 FAX
vanderweil.com

ELLENZWEIG
ARCHITECTURE | PLANNING
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.5575 F 617.868.2318 W ellenzweig.com



Portland Street
R=17.83
FACB
Albany Street
Albany Street Extension
EXISTING CURBS AND CURB CUTS TO REMAIN
6.25" MINIMUM TOLERANCE BETWEEN ZONING SETBACK LINE AND BUILDING FOOTPRINT
POTENTIAL CURB CUT, TBD
EXISTING CURB CUT TO BE FILLED IN WITH NEW CURBING
NEW CURB CUT FOR MOUNTABLE CURB
(2) TWO PARKING SPACES TO BE RELOCATED
N56°08'35"E
28.47'
PROPERTY LINE
10' ZONING SETBACK
40'-0"
184'-0"
6¼"
10⅞"
DOOR
NO SIDEYARD SETBACK REQUIREMENTS
NO SIDEYARD SETBACK REQUIREMENTS
120'-0"
GM
P OF 4" IRON
RTICAL PIPE=18.5
L INSIDE
79 SQ. FT.
1'-10"
1'-8⅜"
33'-8⅜"
AL STORAGE CONTAINER
17.51
17.68
RAILROAD TRACKS
LF
4' CLF

Graphic Scale

Key Plan

REV.	DATE	DESCRIPTION

RGV Job No. 27664.00 MIT Job No. 14133
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Date of original:
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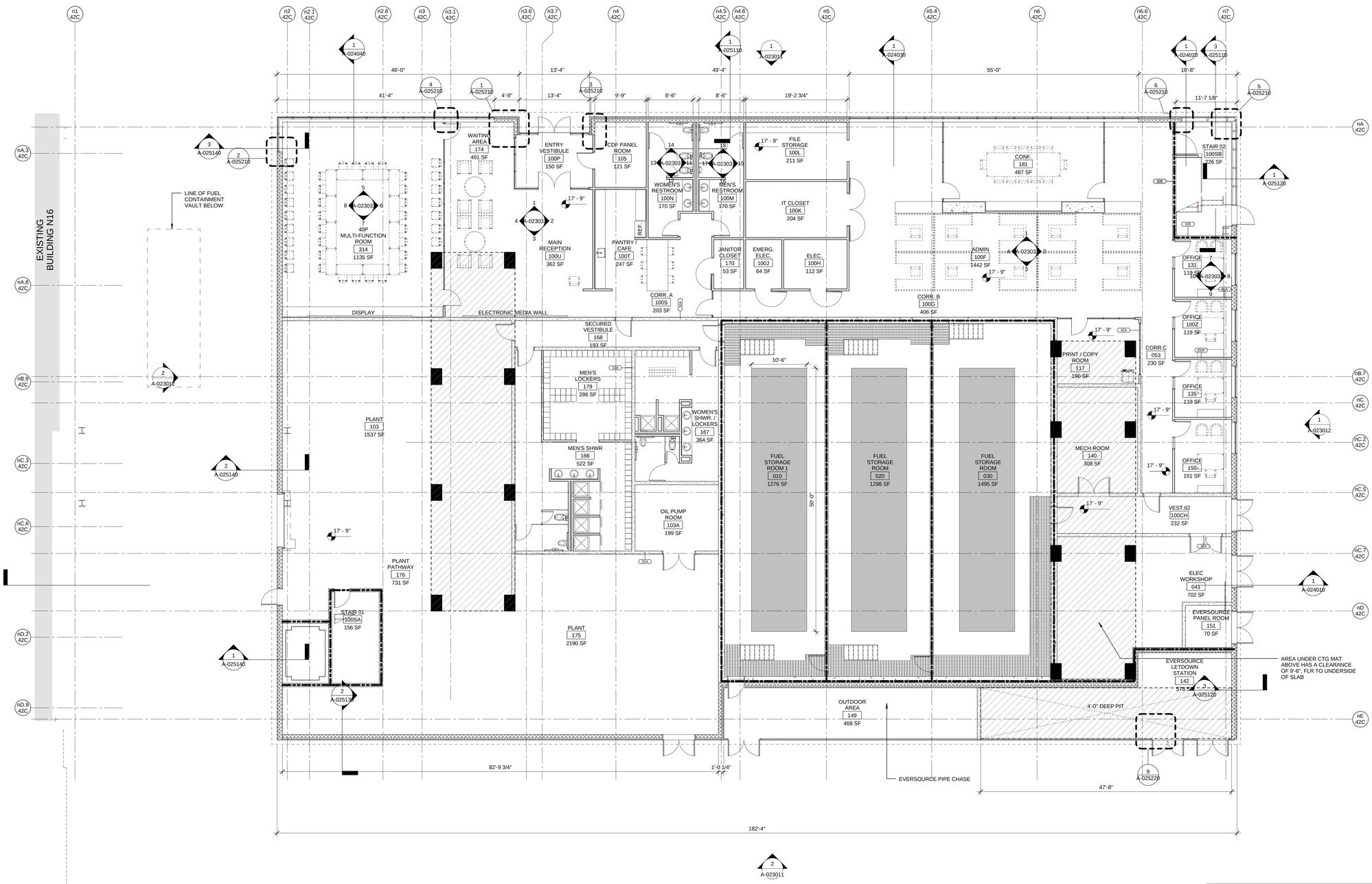
Project
MIT SECOND CENTURY PLANT UPGRADE

Sheet Title
ARCHITECTURAL SITE PLAN

SITE PLAN



LIFE SAFETY KEY

1-HOUR UL RATED WALL	
2-HOUR UL RATED WALL	
3-HOUR UL RATED WALL	
4-HOUR UL RATED WALL	
MAXIMUM TRAVEL DISTANCE	
WALL MOUNTED FIRE EXTINGUISHER LOCATIONS	FE
EMERGENCY EYEWASH AND/OR SHOWER-EYEWASH COMBO STATIONS	

1 LV-02 AREA 2
1/8" = 1'-0"

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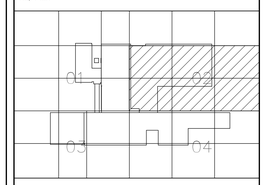
VANDERWEIL POWER GROUP
R.G. Vanderweil Engineers, LLP
274 Summer Street
Boston, MA 02210
t 617.423.7423 TEL
f 617.423.7430 FAX
vanderweil.com

ELLENZWEIG
ARCHITECTURE | PLANNING
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.3525 F 617.868.2398 W ellenzweig.com

Graphic Scale

Key Plan



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B	09-25-15	WP3 - 75% ISSUE
A	05-15-15	WP3 60% DESIGN

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Date of original:	
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Project

MIT SECOND CENTURY PLANT UPGRADE

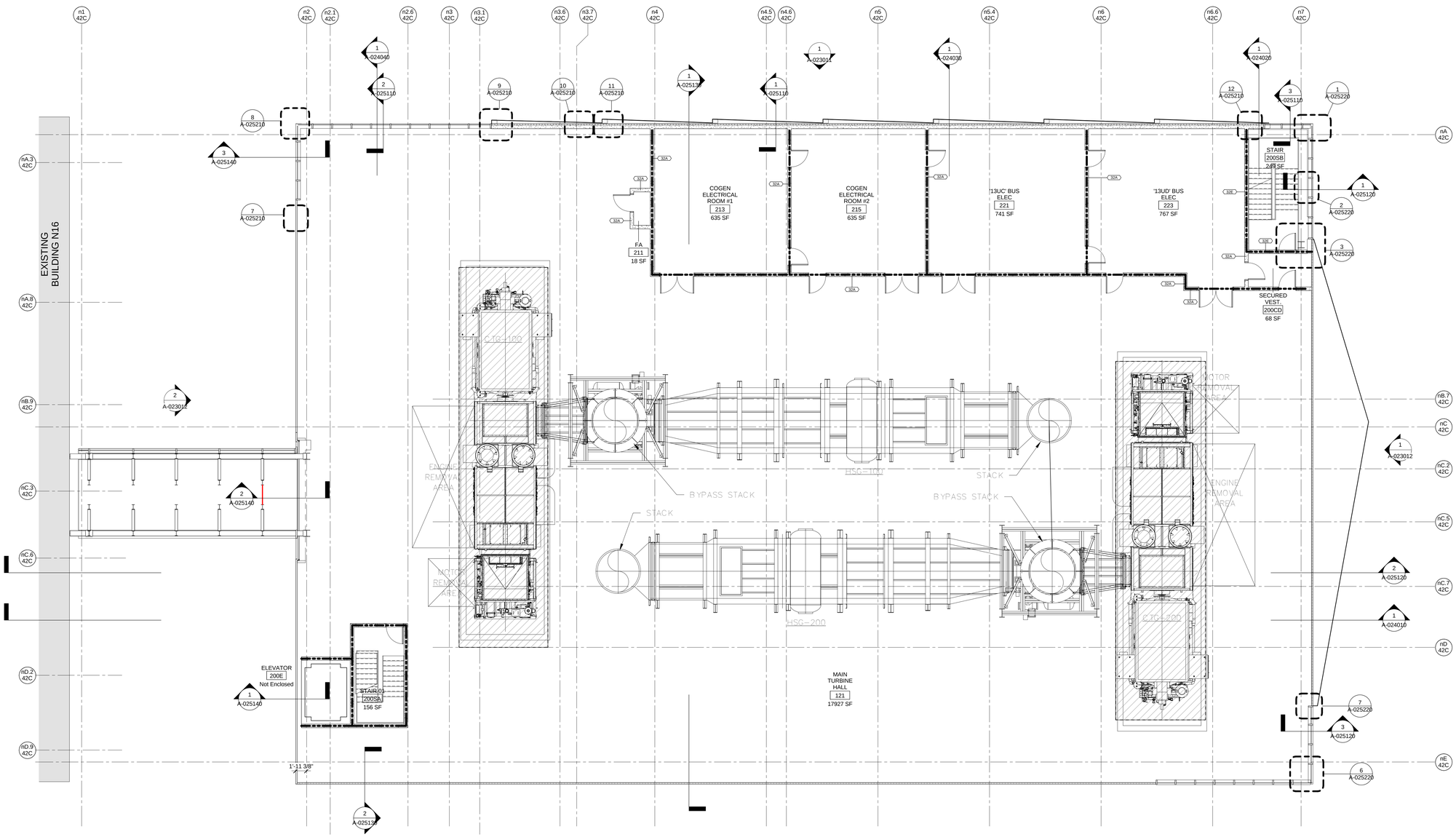
Sheet Title

PLAN LEVEL 02

AREA 02

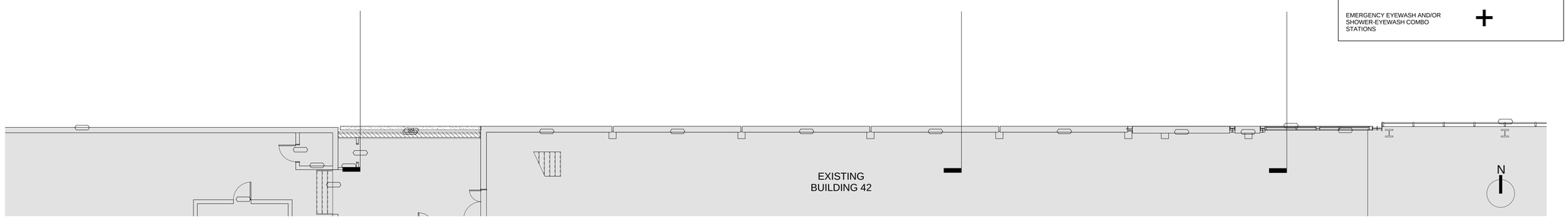
ELEV. 16'-6"/18'-4"

A-022200



LIFE SAFETY KEY

1-HOUR UL RATED WALL	
2-HOUR UL RATED WALL	
3-HOUR UL RATED WALL	
4-HOUR UL RATED WALL	
MAXIMUM TRAVEL DISTANCE	
WALL MOUNTED FIRE EXTINGUISHER LOCATIONS	FE
EMERGENCY EYEWASH AND/OR SHOWER-EYEWASH COMBO STATIONS	+



1 LV-03 AREA 2
1/8" = 1'-0"

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274 Summer Street
Boston, MA 02210
617.423.7423 TEL
617.423.7430 FAX
vanderweil.com

ELLENZWEIG ARCHITECTURE | PLANNING
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.3575 F 617.868.2918 W ellenzweig.com

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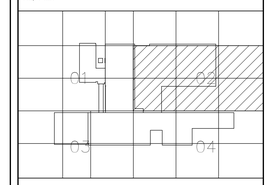
Key Plan



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A	05-15-15	WP3 60% DESIGN

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MIT SECOND CENTURY PLANT UPGRADE

Sheet Title

PLAN LEVEL 03

AREA 02

ELEV. 30'-0"

A-022300

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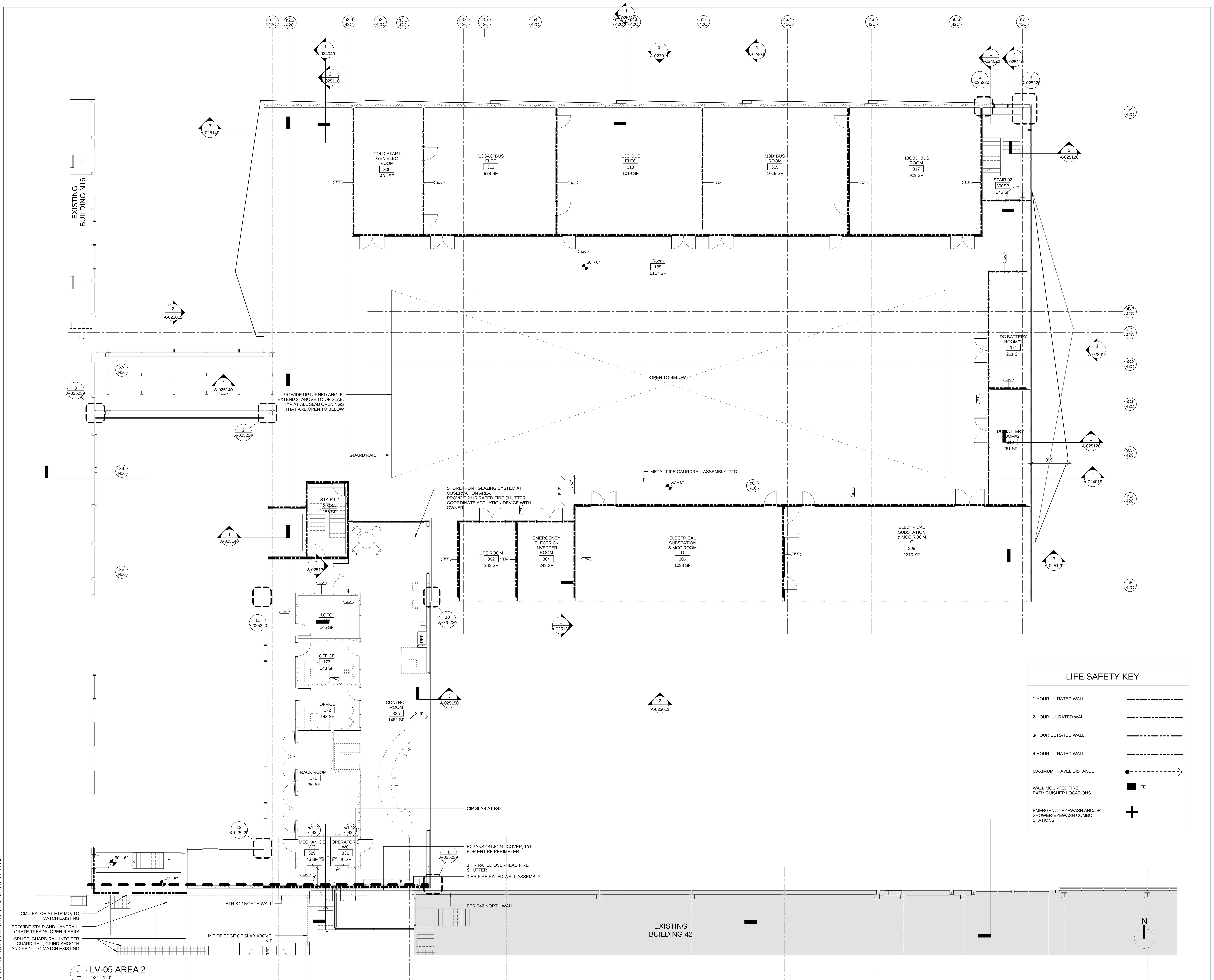

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274 Summer Street
Boston, MA 02210
617.423.7423 TEL
617.423.7401 FAX
vanderweil.com

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ARCHITECTURE | PLANNING
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T 617.491.5575 F 617.868.2318 W ellenzweig.com

Graphic Scale

Key Plan

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A	05-15-15	WP3 60% DESIGN

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Project

MIT SECOND CENTURY PLANT UPGRADE

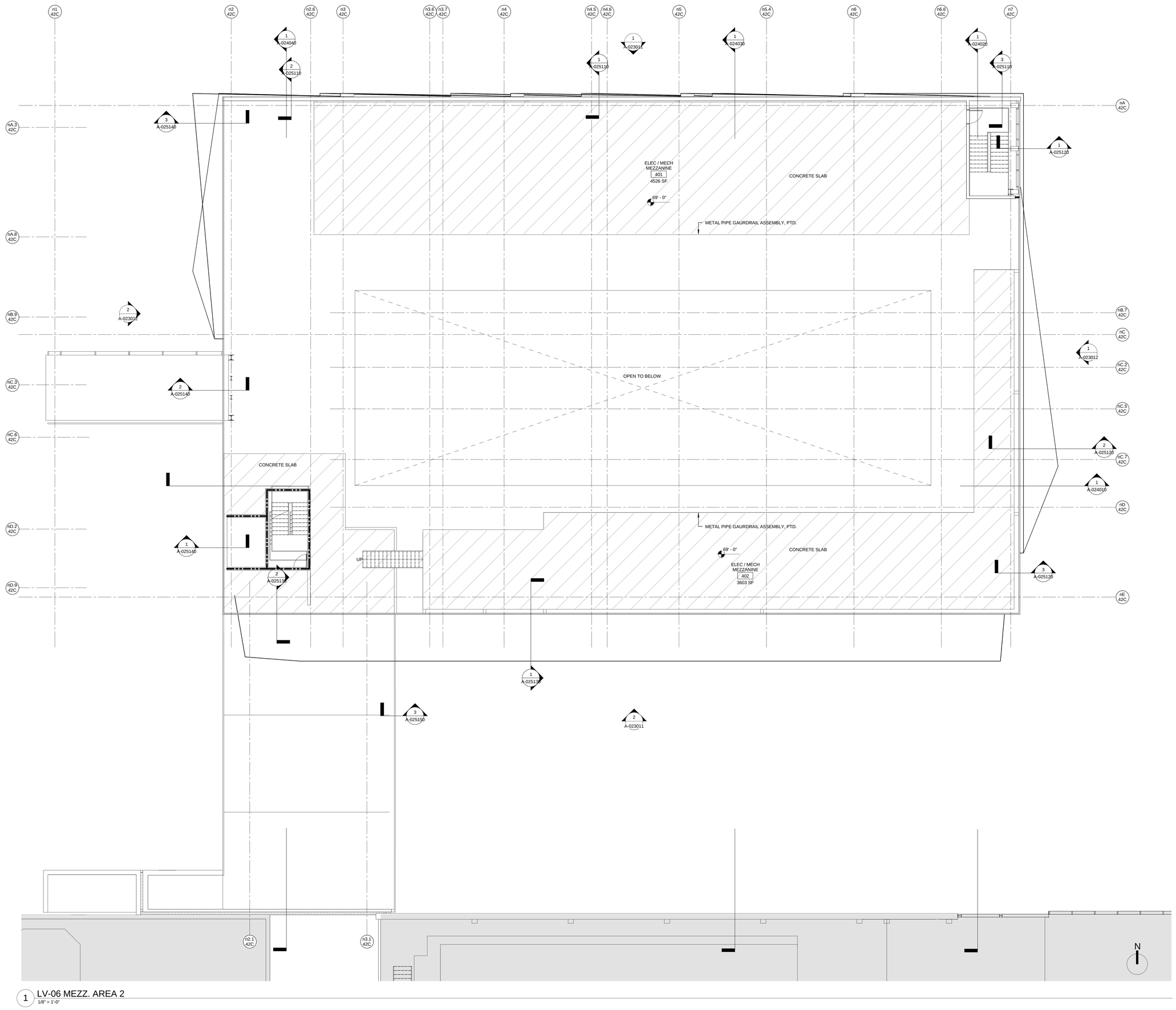
Sheet Title

PLAN LEVEL 05

AREA 2

ELEV. 45'-6"/50'-6"

A-022500



1 LV-06 MEZZ. AREA 2
1/8" = 1'-0"

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POWER GROUP

R.G. Vanderweil Engineers, LLP
274 Summer Street
Boston, MA 02210

617.423.7423 TEL
617.423.7440 FAX
vanderweil.com

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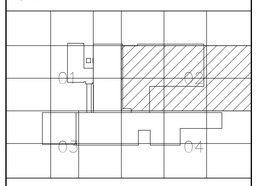
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.3525 F 617.868.2918 W ellenzweig.com

Graphic Scale

Key Plan



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Project

MIT SECOND CENTURY PLANT UPGRADE

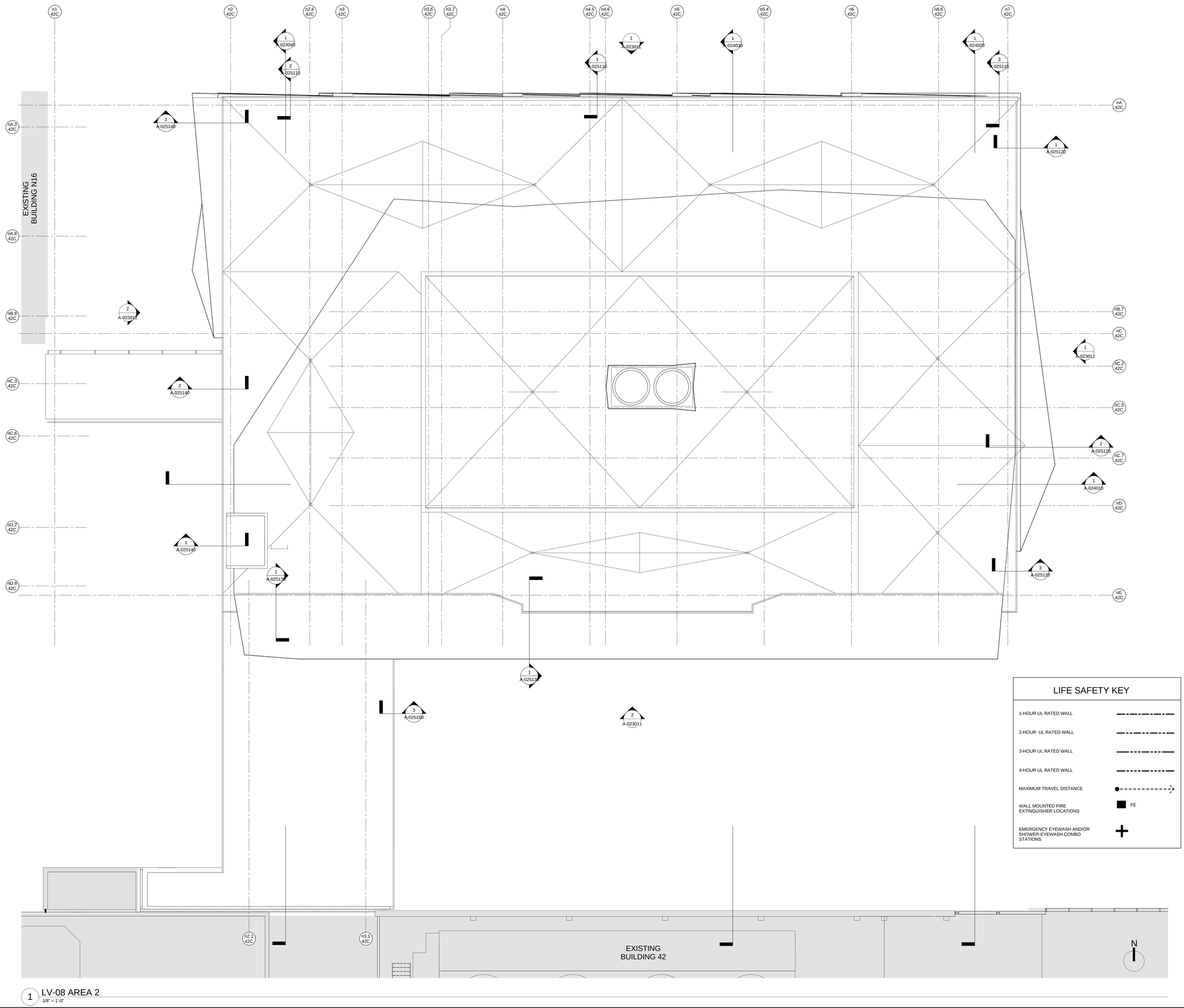
Sheet Title

PLAN LEVEL 06 MEZZNINE

AREA 02

ELEV. 69'-0"

A-022610



LIFE SAFETY KEY

1-HOUR UL RATED WALL	
2-HOUR UL RATED WALL	
3-HOUR UL RATED WALL	
4-HOUR UL RATED WALL	
MAXIMUM TRAVEL DISTANCE	
WALL MOUNTED FIRE EXTINGUISHER LOCATIONS	FE
EMERGENCY EYEWASH AND/OR SHOWER-EYEWASH COMBO STATIONS	

1 LV-08 AREA 2
1/8" = 1'-0"

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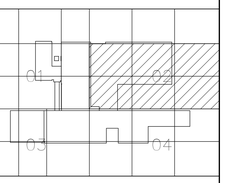
R.G. Vanderweil Engineers, LLP
274 Summer Street
Boston, MA 02210
t 617.423.7423 TEL
f 617.423.7430 FAX
vanderweil.com

ELLENZWEIG
ARCHITECTURE | PLANNING
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.3525 F 617.868.2998 W ellenzweig.com

Graphic Scale

Key Plan



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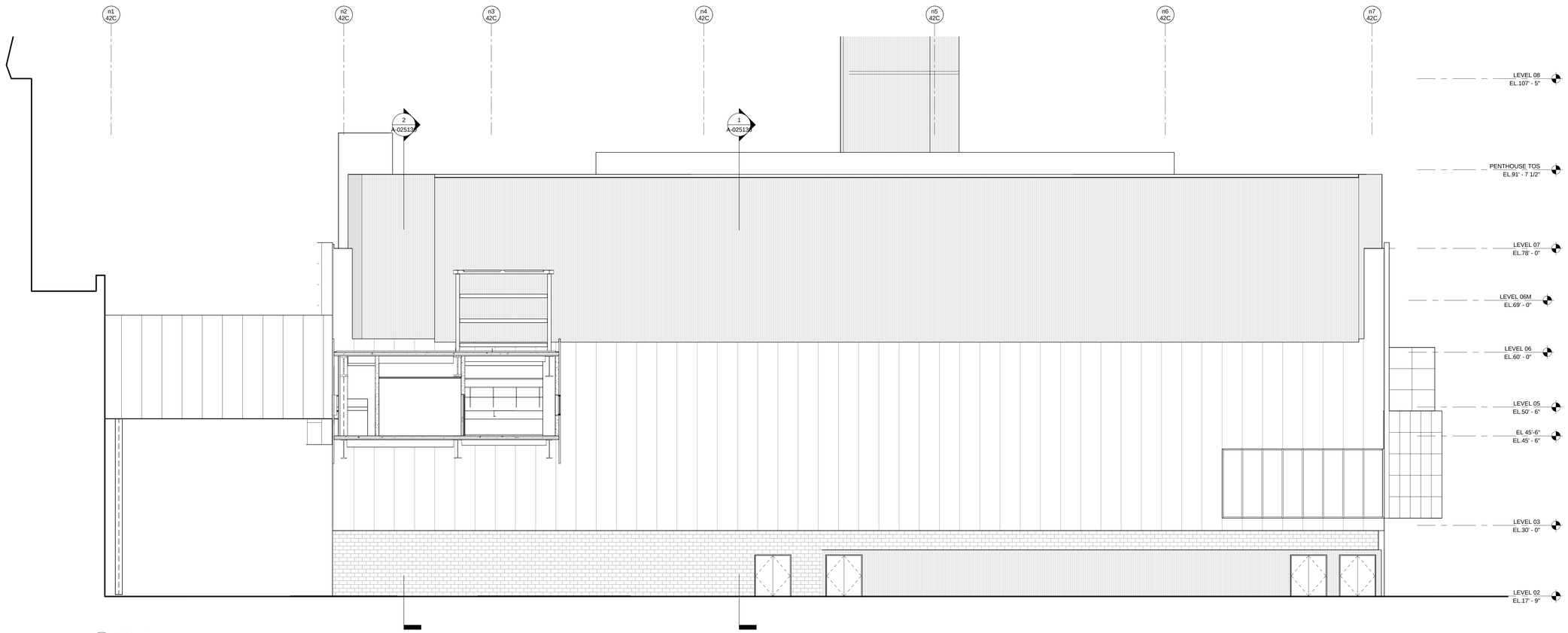
Sheet Title

PLAN LEVEL 08

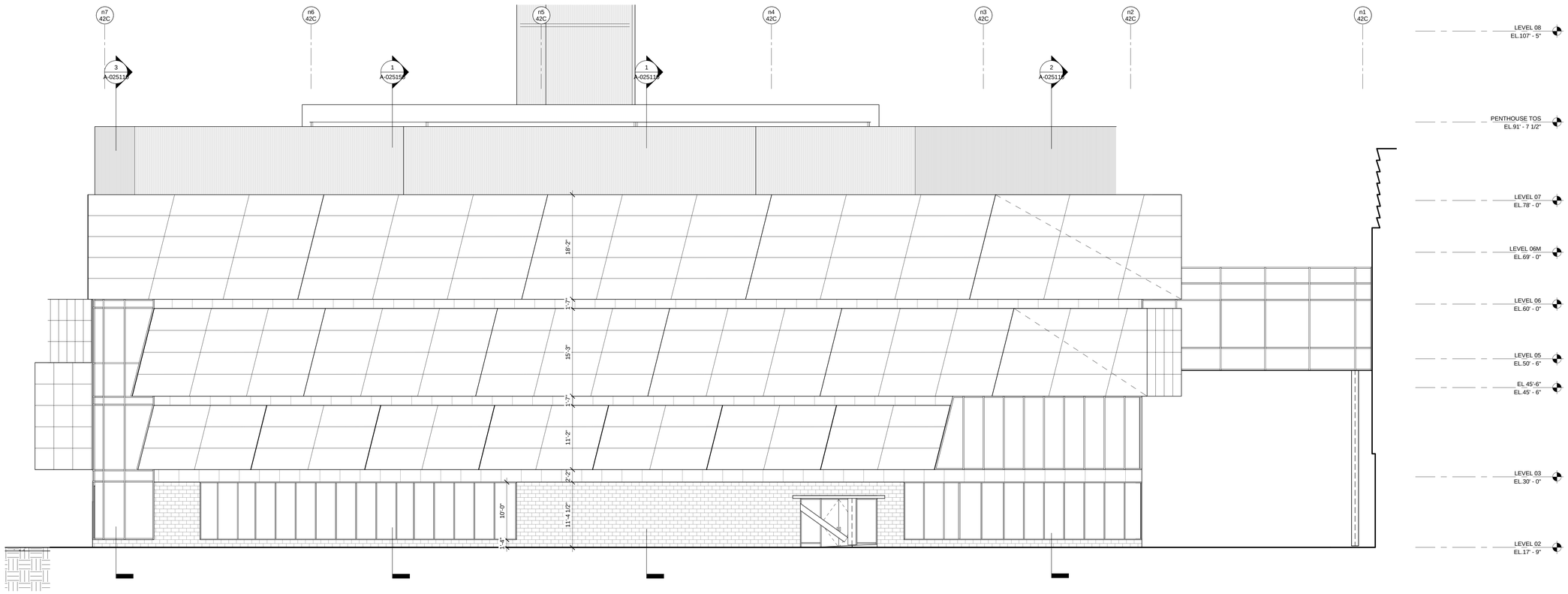
AREA 02

ELEV. 107'-00"

A-022800



2 SOUTH
1/8" = 1'-0"



1 NORTH
1/8" = 1'-0"

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POWER GROUP
R.G. Vanderweil Engineers, LLP
274 Summer Street
Boston, MA 02210
617.423.7423 TEL
617.423.7430 FAX
vanderweil.com

ELLENZWEIG
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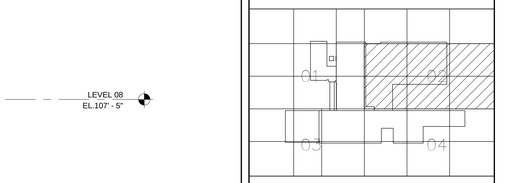
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.3525 F 617.868.2398 W ellenzweig.com

CURTAIN WALL TYPES:

TYPE 1: SOUND ISOLATION
TYPE 2: CONVENTIONAL

Graphic Scale

Key Plan



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Project

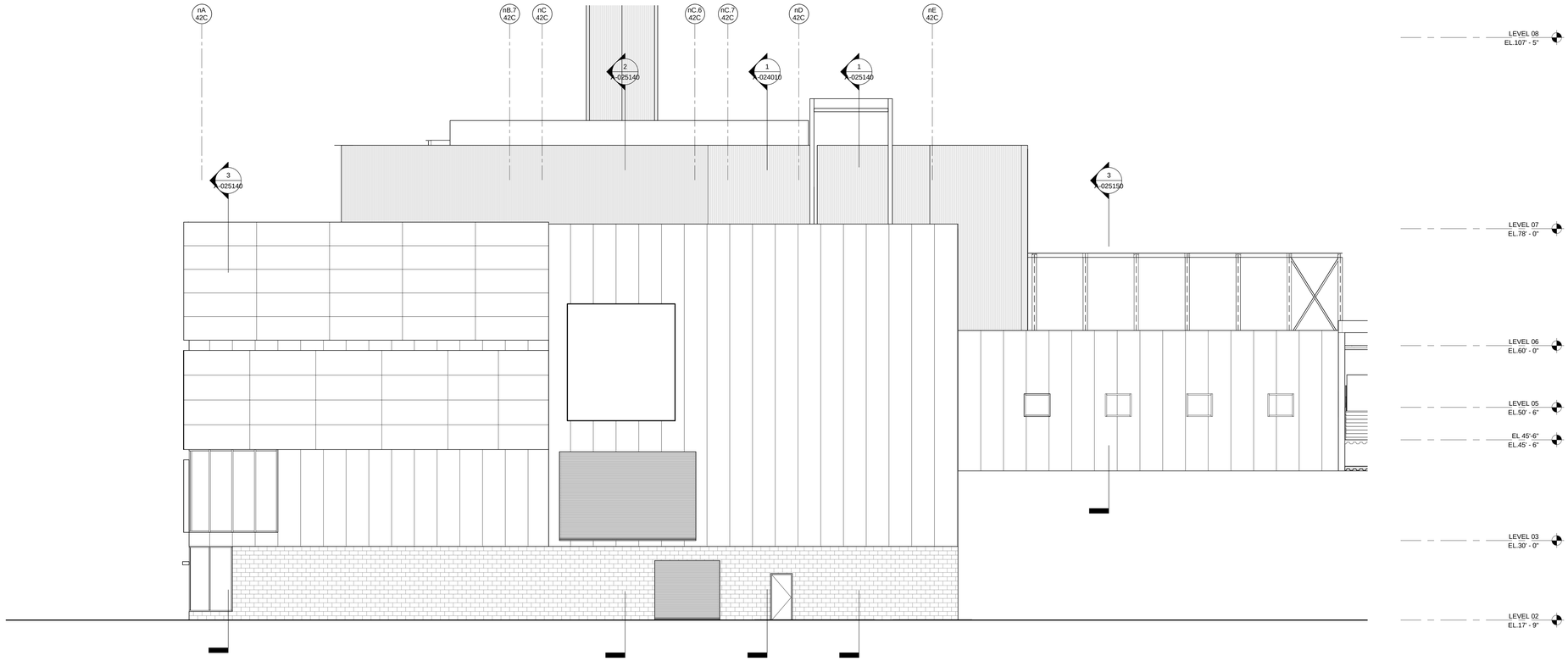
MIT SECOND CENTURY
PLANT UPGRADE

Sheet Title

NORTH & SOUTH
ELEVATIONS

AREA
02

A-023011



2 WEST
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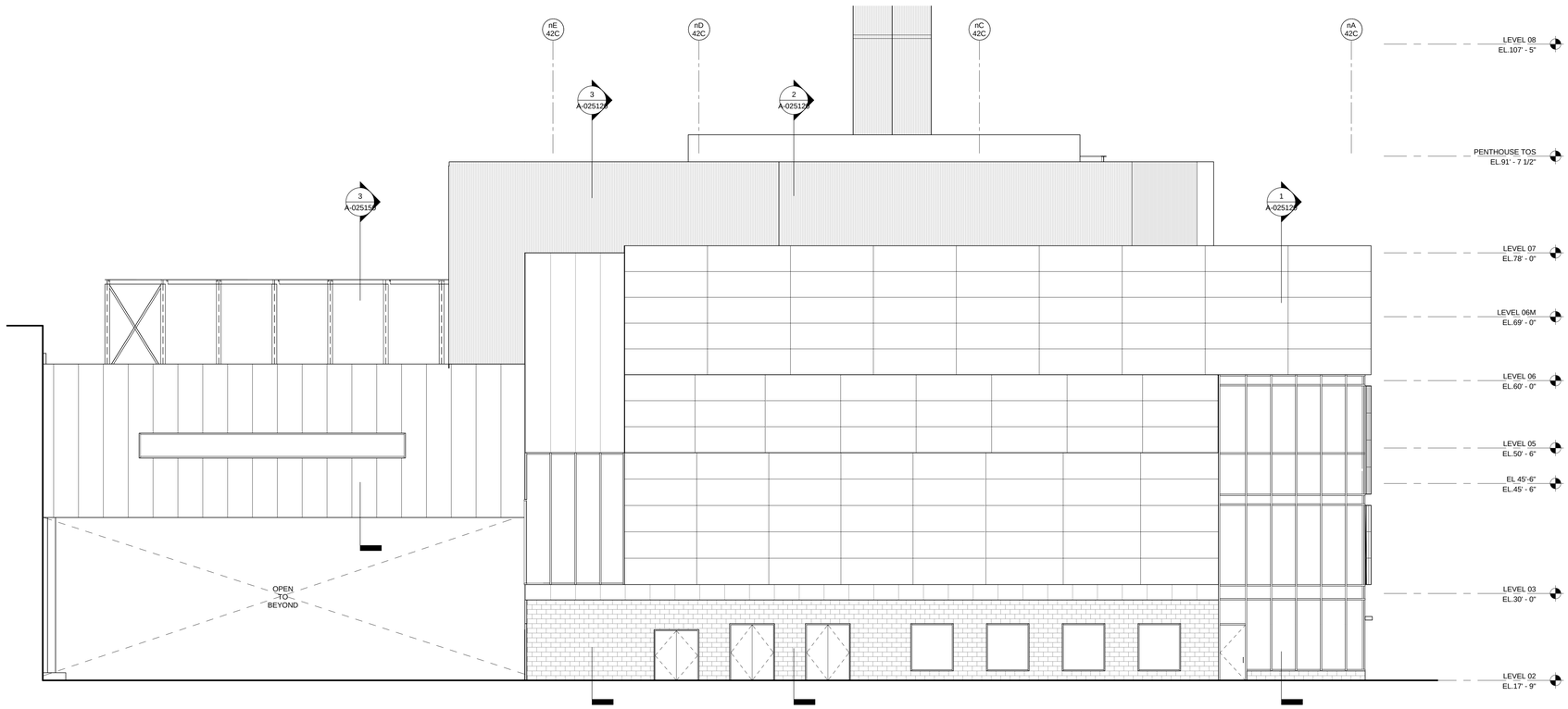

1 EAST
1/8" = 1'-0"

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VANDERWEIL
POWER GROUP
R.G. Vanderweil Engineers, LLP
274 Summer Street
Boston, MA 02210
617.423.7423 TEL
617.423.7430 FAX
vanderweil.com

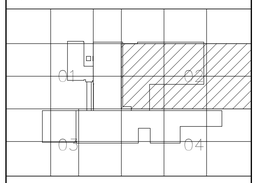
ELLENZWEIG
ARCHITECTURE | PLANNING
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.3575 F 617.868.2918 W ellenzweig.com

CURTAIN WALL TYPES:

TYPE 1: SOUND ISOLATION
TYPE 2: CONVENTIONAL

Graphic Scale

Key Plan



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A	09-25-15	WP3 - 75% ISSUE

RGV Job No. 27664.00 | MIT Job No. 14133
Drawn by:
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Date of original:
Scale: 1/8" = 1'-0"

Project

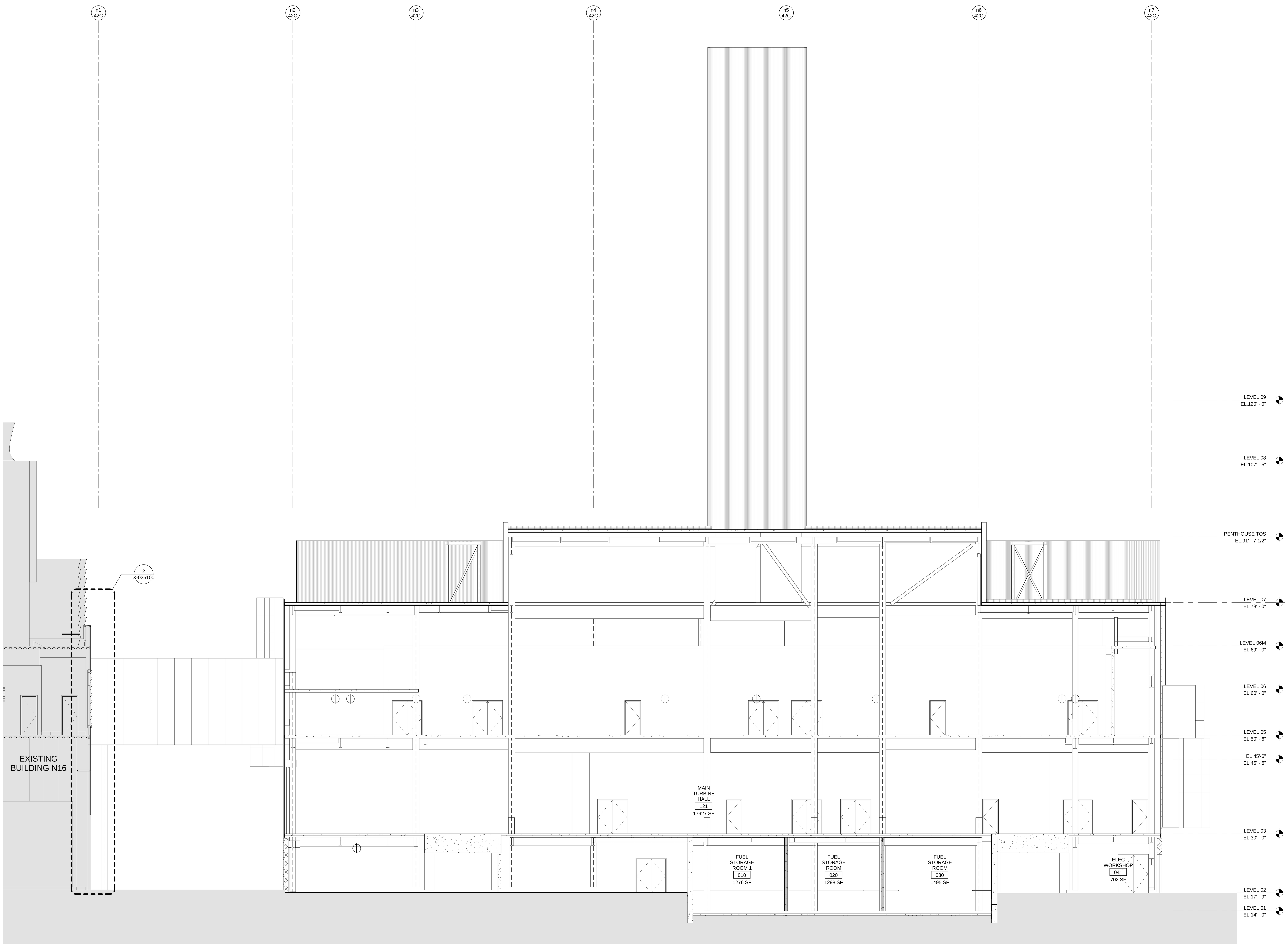
MIT SECOND CENTURY PLANT UPGRADE

Sheet Title

EAST & WEST ELEVATIONS

AREA 02

A-023012



1 BUILDING SECTION EAST-WEST
1/8" = 1'-0"

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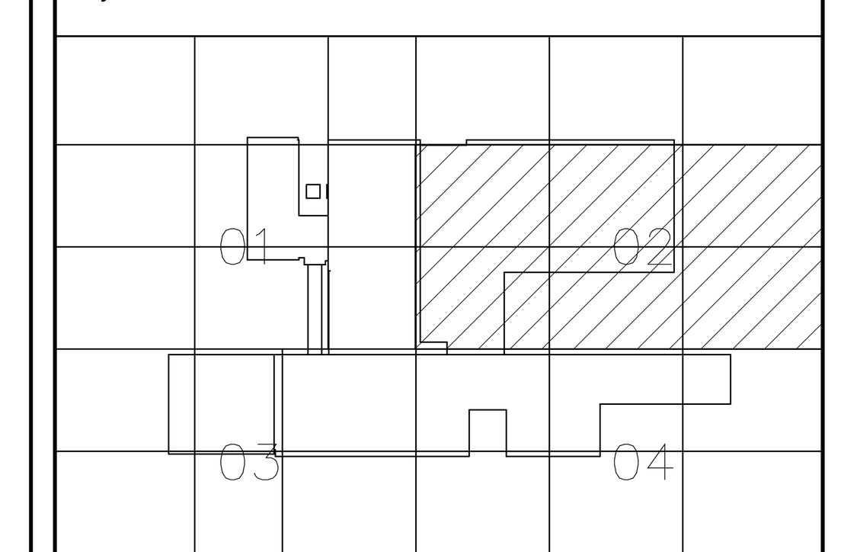
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VANDERWEIL POWER GROUP
R.G. Vanderweil Engineers, LLP
274 Summer Street
Boston, MA 02210
617.423.7423 TEL
617.423.7401 FAX
vanderweil.com

ELLENZWEIG
ARCHITECTURE | PLANNING
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.5575 F 617.868.2318 W ellenzweig.com

Graphic Scale

Key Plan



REV.	DATE	DESCRIPTION
C	10-09-15	WP3 - 75% ISSUE - ADDENDUM NO. 1
B	09-25-15	WP3 - 75% ISSUE
A	05-15-15	WP3 60% DESIGN

RGV Job No. 27664.00 | MIT Job No. 14133

Drawn by:

Checked by:

Date of original:

Scale: 1/8" = 1'-0"

Project

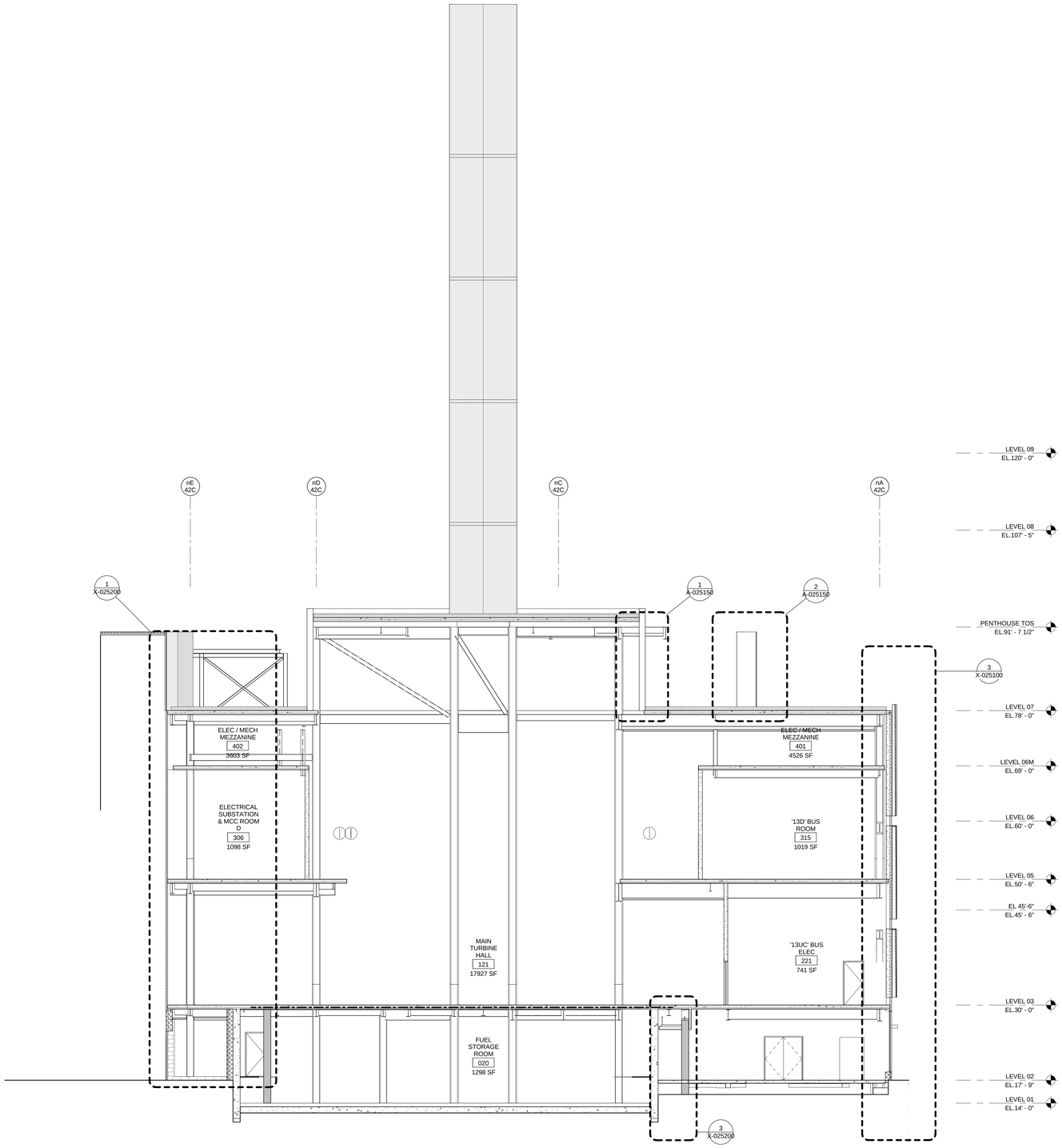
MIT SECOND CENTURY PLANT UPGRADE

Sheet Title

BUILDING SECTION EAST-WEST

AREA 02

A-024010



1 BUILDING SECTION NORTH-SOUTH B
1/8" = 1'-0"

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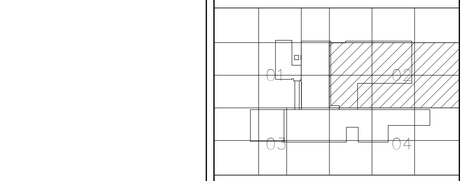
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VANDERWEIL
POWER GROUP
R.G. Vanderweil Engineers, LLP
274 Summer Street
Boston, MA 02210
617.423.7423 TEL
617.423.7461 FAX
vanderweil.com

ELLENZWEIG
ARCHITECTURE | PLANNING
1280 Massachusetts Avenue Cambridge, MA 02138
T 617.491.3525 F 617.868.2918 W ellenzweig.com

Graphic Scale

Key Plan



REV.	DATE	DESCRIPTION
B	09-25-15	WP3 - 75% ISSUE
A	05-15-15	WP3 60% DESIGN

RGV Job No. 27664.00 MIT Job No. 14133

Drawn by:

Checked by:

Date of original:

Scale: 1/8" = 1'-0"

Project

MIT SECOND CENTURY
PLANT UPGRADE

Sheet Title

BUILDING SECTION
NORTH-SOUTH B

AREA
02

A-024030

Attachment 3 – Building Commissioner's Letter

CITY OF CAMBRIDGE
INSPECTIONAL SERVICES DEPARTMENT 831 MASS. AVE.
CAMBRIDGE, MASSACHUSETTS 02139 (617) 349-6100

Ranjit Singanayagam
Commissioner

August 16, 2016

Stephanie Pollack, Secretary and Chief Executive Officer
Massachusetts Department of Transportation
10 Park Plaza, Suite 4160
Boston, MA 02116-3969

Subject: M.G.L. Chapter 40 § 54A Hearing Request

Dear Secretary Pollack:

The Massachusetts Institute of Technology has requested that the city of Cambridge issue a building permit to construct an expansion of MIT's existing Central Utility Plant. The property for which the permit is requested is located at 60 Albany Street.

Because this project proposes construction partially on land purchased in part from the New York Central Railroad in 1964, MGL c 40 § 54A requires that prior to issuance of a building permit consent in writing must first be obtained from the Secretary and Chief Executive Officer of the Massachusetts Department of Transportation (MassDOT).

I hereby request that a public hearing be held to determine whether consent will be granted by MassDOT for MIT to construct the above referenced project on the former railroad property.

Thank you,

Ranjit Singanayagam
Commissioner
Inspectional Services Department

Copy: Astrid Glynn, Administrator, MassDOT Railroad & Transit Division
Kelley Brown, Senior Campus Planner, MIT

Attachment 4 - Prior Secretary Chapter 40 § 54A Approval Letters

THE COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF TRANSPORTATION

EOT

DEVAL L. PATRICK
GOVERNOR

TIMOTHY P. MURRAY
LIEUTENANT GOVERNOR

JAMES A. ALOISI JR.
SECRETARY

April 10, 2009

Mr. Ranjit Singanayagam, Commissioner
City of Cambridge Inspectional Services Department
831 Massachusetts Ave.
Cambridge, Massachusetts 02139

Re: Request for Consent to the Issuance of a Building Permit under M.G.L. Chapter 40, Section 54A - 59 Vassar and 60 Albany Streets, Cambridge, MA

Dear Commissioner:

This letter is in reply to your letter of December 12, 2008 for my consent to the issuance of a building permit for construction at 59 Vassar and 60 Albany Streets on land currently owned by Massachusetts Institute of Technology ("MIT").

A public hearing was held on this matter on January 15, 2009 at 11:00 a.m. at the Executive Office of Transportation and Public Works ("EOT") in accordance with the requirements of M.G.L. Chapter 40, Section 54A. As Secretary I have the authority and responsibility on behalf of the Commonwealth of Massachusetts ("the Commonwealth") to preserve rail transportation opportunities for the public's benefit under Massachusetts General Laws Chapter 6A, Section 19, Chapter 161C *et seq.*, and Chapter 40, Section 54A.

MIT has proposed construction on former railroad property that would expand the chilled water capacity of the existing Central Utility Plant, creating a new structure that would span a section of the Grand Junction Line (the "New Building") located at 59 Vassar Street and 60 Albany Street, Cambridge, Middlesex County, Massachusetts (the "Property"). MIT owns said Property by virtue of a deed executed in December of 1964 and recorded with the Middlesex County South Registry of Deeds in Book 10719, Page 278 (the "1964 Deed"), said deed being the instrument by which New York Central Railroad did sell certain of its property to MIT.

CSX Transportation, Inc. ("CSXT") currently enjoys use of an easement over the track located upon the Property pursuant to the December, 1964 deed, said tracks being part of the Grand Junction line, an active rail line that has potential for future public transportation uses. MIT's title to the Property grants to MIT certain rights to construct buildings adjacent to and above the tracks within the limitations described in the 1964 Deed.

As Secretary of Transportation for the Commonwealth, I hereby consent to the issuance of the requested building permit subject to the following terms and conditions:

1. The New Building's design and construction shall comply with the provisions contained in the 1964 Deed and shall be consistent with all applicable CSXT and generally accepted railroad standards.

2. The New Building shall provide a vertical clearance of no less than twenty-two and one half feet (22.5') high over the Property, measured from the top of the existing rail to the lowest point of the New Building spanning the track, including any exposed fixtures, stairwells, and any other appurtenances affixed to the New Building. The project is presently designed with a new stair enclosure that will restrict the overhead clearance to 19'+/- on the south side of the clearance envelope. Should this height restriction become an impediment to the development of future public transportation uses in this immediate area, MIT at its sole cost will raise or remove this stair providing a clear height of not less than 22.5 feet from the top of existing rail. It is further understood that MIT shall require no further permission from EOT under Chapter 40, Section 54A in order for the City of Cambridge to issue a building permit for the modification or removal of this stair at a later time.

3. The New Building shall provide horizontal clearance of no less than sixty-four feet (64') wide to accommodate transportation uses.

4. MIT acknowledges that there may be surface and subsurface utilities on and adjacent to the Property and agrees to exercise reasonable care in performance of all construction activities and within all applicable laws and regulations. If MIT installs new underground utilities as part of its construction of the New Building, it agrees to locate said utilities at a depth no greater than fourteen feet (14') below the ground's surface.

5. MIT shall cooperate with CSXT or its successor(s) in interest during all phases of the New Building's design and construction to ensure the safe and efficient movement of rail equipment before, during, and after construction. MIT shall conform to all federal, state, and local laws concerning construction activities within active railroad rights of way.

6. Upon completion of construction, MIT shall provide EOT and the Massachusetts Bay Transportation Authority ("MBTA") each with one (1) reproducible "as-built" copy of each approved architectural and structural construction drawing of the New Building to assist EOT and the MBTA in the potential planning and construction of public transportation uses along the Grand Junction branch within the Property.

This consent is granted by means of two (2) original letters, one to the City of Cambridge Inspectional Services Department and another to the applicant.

Sincerely,

James A. Aloisi
Secretary

Cc: John G. Engle, MIT
Peter O'Connor, EOT
Timothy Doherty, EOT

Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor
Jeffrey B. Mullan, Secretary & CEO

massDOT
Massachusetts Department of Transportation

March 22, 2011

Michael Nicoloro
Deputy Commissioner
Inspectional Services Department
City of Cambridge
831 Massachusetts Ave.
Cambridge, Massachusetts 02139

Re: Request for Consent to the Issuance of a Building Permit
Property Located at 60 Albany Street in Cambridge, Massachusetts
File Reference # 10A-32

Dear Mr. Nicoloro:

I am writing with respect to your request for my consent to the issuance of a building permit for the Massachusetts Institute of Technology's (MIT) construction of a building that will contain a new and an existing boiler at 60 Albany Street in Cambridge, MA. The total parcel area is 110,208 square feet. It is adjacent to the former New York Central Railroad, which is now the active Grand Junction Track owned by the Massachusetts Department of Transportation (MassDOT).

Because this project proposes to construct the building partially on land purchased in part from the New York Central Railroad in 1964 and MIT owns said Property by virtue of a deed executed in December of 1964 and recorded with the Middlesex County South Registry of Deeds in Book 10719, Page 278 (the "1964 Deed"), said deed being the instrument by which New York Central Railroad did sell certain of its property to MIT, the project is subject to the requirements of Chapter 40, Section 54A.

The Commonwealth through MassDOT and the Massachusetts Bay Transportation Authority (MBTA) currently enjoys use of an easement over the track located upon the Property pursuant to the December, 1964 deed, with said tracks being part of the Grand Junction line, an active rail line that currently accommodates CSX Transportation (CSX) freight operations as well as non-revenue movement of passenger equipment by both the MBTA and the National Passenger Rail Corporation (Amtrak) and further has potential for future public transportation uses. MIT's title to the Property grants to MIT certain rights to construct buildings adjacent to and above the tracks within the limitations described in the 1964 Deed.

Massachusetts General Laws, Chapter 40, Section 54A, provides that no city or town in the Commonwealth shall issue a permit to build a structure of any kind on land "formerly used as a railroad right-of-way or any property appurtenant thereto formerly used by any railroad

Ten Park Plaza, Suite 3170, Boston, MA 02116
Tel: 617-973-7000, TDD: 617-973-7306
www.mass.gov/massdot

company in the Commonwealth," without the written consent of the Secretary of the Massachusetts Department of Transportation. Pursuant to the intent of this statute, I have the responsibility to preserve former railroad property in the Commonwealth for present or future transportation-related use where appropriate.

After reviewing information on file at our office, canvassing interested agencies and conducting a public hearing on January 27, 2011, it has been determined that the proposed construction will not adversely impact any potential transportation use. Accordingly, I give my consent to the issuance of a building permit for the above-referenced construction as detailed by the application material.

This consent is conditional based upon the applicant's compliance with the MBTA's requirements. The applicant will comply with the 1964 Deed and not interfere with railroad or transit operations of any kind. The building must not negatively affect the current conditions and operation of the Grand Junction right-of-way. The proponent is responsible for a barrier that separates their property from the MBTA's right-of-way and is also responsible for the maintenance and repair of that barrier. No drainage is allowed toward or onto the right-of-way. Moreover, no snow or debris shall be pushed onto the MBTA's right-of-way.

Please note, a rail trail is shown in the 2008 MassDOT Bicycle Transportation Plan as Proposed Project 12-35/Grand Junction. This adjacent rail property has been the subject of a feasibility study by the City of Cambridge for a potential trail rail along the Grand Junction rail right-of-way. Any future construction in this area should take the City's proposed shared use path plans into account. MIT must ensure that the structure will not interfere with other uses of the right-of-way, the potential bike path or other uses that may develop from the ongoing Grand Junction rail trail study.

Furthermore, Vassar Street itself is a major bicycling and walking thoroughfare. All efforts should guarantee the proposed construction promotes bicycle and pedestrian travel, in keeping with MassDOT's GreenDOT Policy.

As Secretary of Transportation for the Commonwealth, I hereby consent to the issuance of the requested building permit subject to the following terms and conditions:

1. The New Building's design and construction shall comply with the provisions contained in the 1964 Deed.

2. The New Building shall provide horizontal clearance at grade of no less than sixty-four feet (64') wide, and a vertical clearance of no less than twenty-two feet, six inches (22' 6") above the top of rail to accommodate transportation uses.

3. MIT acknowledges that there may be surface and subsurface utilities on and adjacent to the Property and agrees to exercise reasonable care in performance of all construction activities and within all applicable laws and regulations. If MIT installs new underground utilities as part of its construction of the New Building, it agrees to locate said utilities at a depth no greater than fourteen feet (14') and no less than eight feet (8') below the ground's surface.

4. MIT shall cooperate with the MBTA during all phases of the New Building's design and construction to ensure the safe and efficient movement of rail equipment before, during and after construction. MIT shall conform to all federal, state, and local laws concerning construction activities adjacent to active railroad rights-of-way.

5. Upon completion of construction, to assist in the potential planning and construction of public transportation uses along the Grand Junction branch, MIT shall provide MassDOT and the MBTA (each) with one (1) reproducible "as-built" plan of the New Building foundation, structural and architectural drawings.

This consent is granted by means of two original letters, one to the City of Cambridge Deputy Building Commissioner and the other to the applicant.

Sincerely,

Massachusetts Department of Transportation

Jeffrey B. Mullan
Secretary and Chief Executive Officer

Attachment 5 - Grand Junction Acquisition Deed and Plan

Send to Dennis Coffey

BKBW 0 7119 23/64 PG 278

DEC 22-64 PM 3:43 218RE **12.00

SEE PLAN IN RECORD BOOK 10719 PAGE 278

OW 8

DEED

THE NEW YORK CENTRAL RAILROAD COMPANY, A Delaware corporation, corporate successor of the Boston and Albany Railroad Company, a Massachusetts corporation (hereinafter called Grantor), for consideration paid, grants to MASSACHUSETTS INSTITUTE OF TECHNOLOGY, a Massachusetts corporation (hereinafter called Grantee), the land over which runs a section of the Grand Junction Branch of the Grantor's Boston and Albany Division in the City of Cambridge, County of Middlesex and Commonwealth of Massachusetts comprising that portion of the railroad location between the easterly side line of Massachusetts Avenue and the southwesterly side line of Main Street, being eighty-two and one-half feet wide for seven hundred twenty-three and 93/100 feet easterly from Massachusetts Avenue measuring along the center line of the location, and ten feet less in width off the north side of the original location for the remainder of the distance to Main Street, containing 110,208 square feet more or less, and more particularly shown on the plan by William S. Crocker, Inc., Civil Engineers & Surveyors, dated November 30, 1964, recorded herewith.

Excepting the railroad tracks, signals and appurtenances now thereon, which outside of the Maintrack and Spurtrack easements hereinafter reserved may be removed by the Grantor by June 1, 1965, or shall otherwise then become the property of the Grantee.

Reserving to the Grantor rights and easements (a) permanently, perpetually and exclusively to use for railroad and related purposes the Maintrack Easement Area shown on said plan, subject to construction thereover as hereinafter provided; (b) exclusively to use for railroad and related purposes the Spurtrack Easement Areas shown on said plan, subject to such construction, so long

as the Grantor desires or is required to render sidetrack service thereover; (c) to maintain, repair, renew and exclusively use any facilities and equipment for ventilation, lighting and maintenance required by the Grantor as hereinafter provided in connection with construction over Easement Areas and (d) to attach to the underside of buildings and structures and to columns, bracings, supports, and foundations therefor constructed as hereinafter provided in Easement Areas, and to maintain, repair, renew and exclusively use, ducts, pipes, conduits, cables and other facilities from time to time needed for operation of the railroad, all in such locations and manner as not to interfere unreasonably with such buildings, structures, columns, bracings, supports, and foundations or their use, and pursuant to plans and specifications first approved by the Grantee.

Use for railroad and related purposes includes construction, maintenance, repair and replacement of tracks, signals, facilities and appurtenances, and access to and from public streets for such purposes, and in case of the Spurtrack Easement Area use for sidetrack purposes, whether under existing sidetrack agreements and leases, under future sidetrack agreements and leases in form from time to time customarily used in the Grantor's railroad operations, or otherwise, but shall not prevent construction, maintenance, repair, replacement and use of buildings and structures above an elevation of twenty-two and one-half feet above the top of rail or tracks, and of columns, bracings, supports and foundations for such buildings and structures at such locations as shall not interfere unreasonably with railroad operation or use for railroad or related purposes, and of tunnels, ducts, pipes, conduits and cables beneath, provided all such construction is pursuant to plans first approved by the Grantor.

The Grantee covenants with the Grantor that:

1. The Grantee will not damage or injure the tracks, signals, facilities and appurtenances of the Grantor in the easement areas, or interfere with the railroad traffic, and will take such reasonable precautions and comply with such reasonable rules and regulations as the Grantor may require for the purpose of safeguarding and protecting them and the railroad traffic.

2. In all construction work in or over any Easement Area the Grantee shall (a) use columns, bracings, supports and foundations of adequate carrying capacity so located as to afford clearances reasonably satisfactory to the Grantor; (b) if required by the Grantor, include at the Grantee's expense, any facilities and equipment for ventilation and lighting (including controls at track level) and for maintenance and access, on or adjacent to the Easement Areas reasonably necessary for proper operation of the railroad and use of the Easement Areas for railroad and related purposes and which would not be necessary except for such buildings, structures, columns, bracings, supports and foundations of the Grantee; (c) to provide for the Grantor at the Grantee's expense, throughout the period of the construction work, Railroad Protective Insurance obtained at the Grantee's election either by the Grantee or by the Grantee's contractor or by the Grantor after advance notice and payment of premium by the Grantee in forms and companies reasonably satisfactory to the Grantor with limits of at least $1,000,000 for any one accident and $500,000 for injury to any one person and for damage to property or substantially equivalent amounts in case of substantial change in the value of the dollar; and (d) reimburse the Grantor for all its costs and expenses in connection with such work, including checking of plans, furnishing necessary inspectors, watchmen and flagmen, and any changes, temporary or permanent in its tracks, structures or facilities to accommodate the construction.

3. The Grantee shall at its own cost and expense furnish the electric current or power required for operation of lighting and ventilation facilities required pursuant to clause (b) of the covenant numbered 2 above.

The Grantor covenants with the Grantee that:

1. The Grantor will not damage or injure the buildings and other construction of the Grantee constructed in, over, or under Easement Areas as herein provided, and will take reasonable precautions to safeguard and protect them, and

2. The Grantor will furnish the Grantee with copies of all sidetrack agreements and leases affecting Easement Areas and afford to the Grantee the same protection with respect to the Areas affected thereby as is provided to the Grantor by the persons served under such agreements and leases, and take such actions as the Grantee may from time to time reasonably request in order to assure such protection.

The Grantee will be responsible for maintenance and condition of such buildings and other construction of the Grantee, and for meeting obligations to public authorities with respect thereto, and the Grantor will be responsible for maintenance and condition of the surface of the Easement Areas not occupied by columns, supports or foundations of the Grantee, and of tracks, signals, facilities and appurtenances of the Grantor, and for meeting obligations to public authorities with respect thereto, each subject only to the obligations each to the other above set forth.

The Grantor and Grantee agree that if either party desires to change the location of all or any part of the Spurtrack Easement Area and the tracks therein to another location on land hereby conveyed over which reasonably equivalent spur track service can be provided or to construct additional spurtracks on such land to

serve abutters thereon other than the Grantee, and such change or addition will not interfere unreasonably with buildings or structures theretofor constructed or planned by the Grantee, the party desiring the change or addition shall submit to the other plans and specifications therefor for approval, and upon such approval, (a) equivalent rights will be granted to the Grantor in any new Spurtrack Easement Area and released to the Grantee in any Spurtrack Easement Area no longer needed; (b) in case of any resulting change in aggregate area of land within Spurtrack Easement Areas, payment shall be made at the rate of One Dollar per square foot from the Grantee to the Grantor for each square foot of reduction in area, and by the Grantor to the Grantee for each square foot of increase in area; (c) any necessary track work shall be done or caused to be done by the party desiring the change or addition at such party's expense; and (d) in case of work desired by the Grantee, the Grantee shall reimburse the Grantor for the Grantor's costs and expenses in connection with such work, including checking of plans, and furnishing necessary inspectors, watchmen and flagmen, and no payment shall be made by the Grantor on account of any increase in Spurtrack Easement Area. The rights of the parties with respect to new Spurtrack Easement Areas shall be the same as with respect to the original Spurtrack Easement Area. The Grantor may at any time abandon any or all Maintrack Easement Areas or Spurtrack Easement Areas by release thereof suitable for record delivered to the Grantee after at least ninety days prior written notice, and the Grantee shall pay to the Grantor in exchange for such release, One Dollar for each square foot of Easement Area released. All tracks and equipment not removed prior to delivery of such release shall thereupon become property of the Grantee.

The rights and easements granted and reserved by this Deed and the covenants and agreements herein contained, shall run with the land and inure to the benefit of and be binding upon the

successors and assigns of the parties hereto respectively. Approval on behalf of the Grantor may be given by its Chief Engineer and on behalf of the Grantee by the Treasurer or any Assistant Treasurer of the Grantee, and shall be in writing and not unreasonably withheld.

IN WITNESS WHEREOF the Grantor and Grantee have caused their corporate seals to be hereto affixed and these presents to be executed in their respective names and behalf, in case of the Grantor by S. H. HELLENBRAND Vice President, hereunto duly authorized, and in case of the Grantee, by Joseph J. Snyder, its Vice President and Treasurer, hereunto duly authorized, in duplicate, December 10, 1964.

Attest:
ASSISTANT Secretary

THE NEW YORK CENTRAL RAILROAD COMPANY

By
Vice President

Attest:
Secretary of the Executive Committee

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

By
Vice President and Treasurer

STATE OF NEW YORK

New York, ss.

December 10, 1964

Then personally appeared the above named S. H. HELLENBRAND Vice President, and acknowledged the foregoing instrument to be the free act and deed of The New York Central Railroad Company, before me,

THOMAS H. GOLDER
Notary Public, State of New York
No. 60-6567425
Qualified in Westchester County
Certificate filed in New York County
Commission Expires March 30, 1966

Notary Public

My commission expires:

COMMONWEALTH OF MASSACHUSETTS

Middlesex, ss.

December 10, 1964

Then personally appeared the above named Joseph J. Snyder, Vice President and Treasurer, and acknowledged the foregoing instrument to be the free act and deed of Massachusetts Institute of Technology, before me,

Notary Public

My commission expires:

My commission expires June 2, 1967

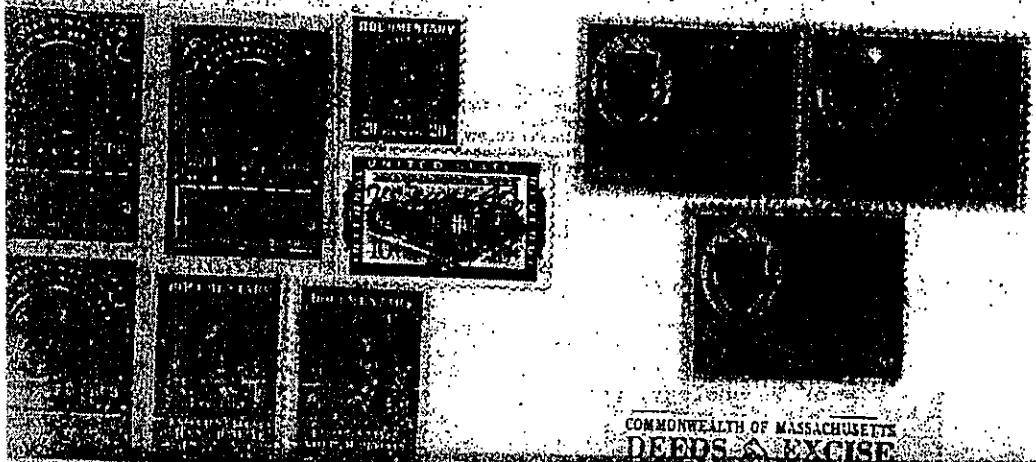
At a meeting of the Board of Directors of The New York Central Railroad Company, duly called and held at New York, New York, on the 10th day of December, 1964, at which a quorum was present and acting throughout, the foregoing instrument having been presented, it was inter alia -

"RESOLVED: That the President or any Vice President be, and he is hereby, authorized to execute, acknowledge and deliver on behalf of this Company the deed to Massachusetts Institute of Technology of a parcel of land in the City of Cambridge, County of Middlesex and Commonwealth of Massachusetts, which has just been presented."

THE NEW YORK CENTRAL RAILROAD COMPANY DELAWARE 1080 CORPORATE SEAL

ATTEST:

ASSISTANT SECRETARY



COMMONWEALTH OF MASSACHUSETTS
DEEDS EXCISE

165

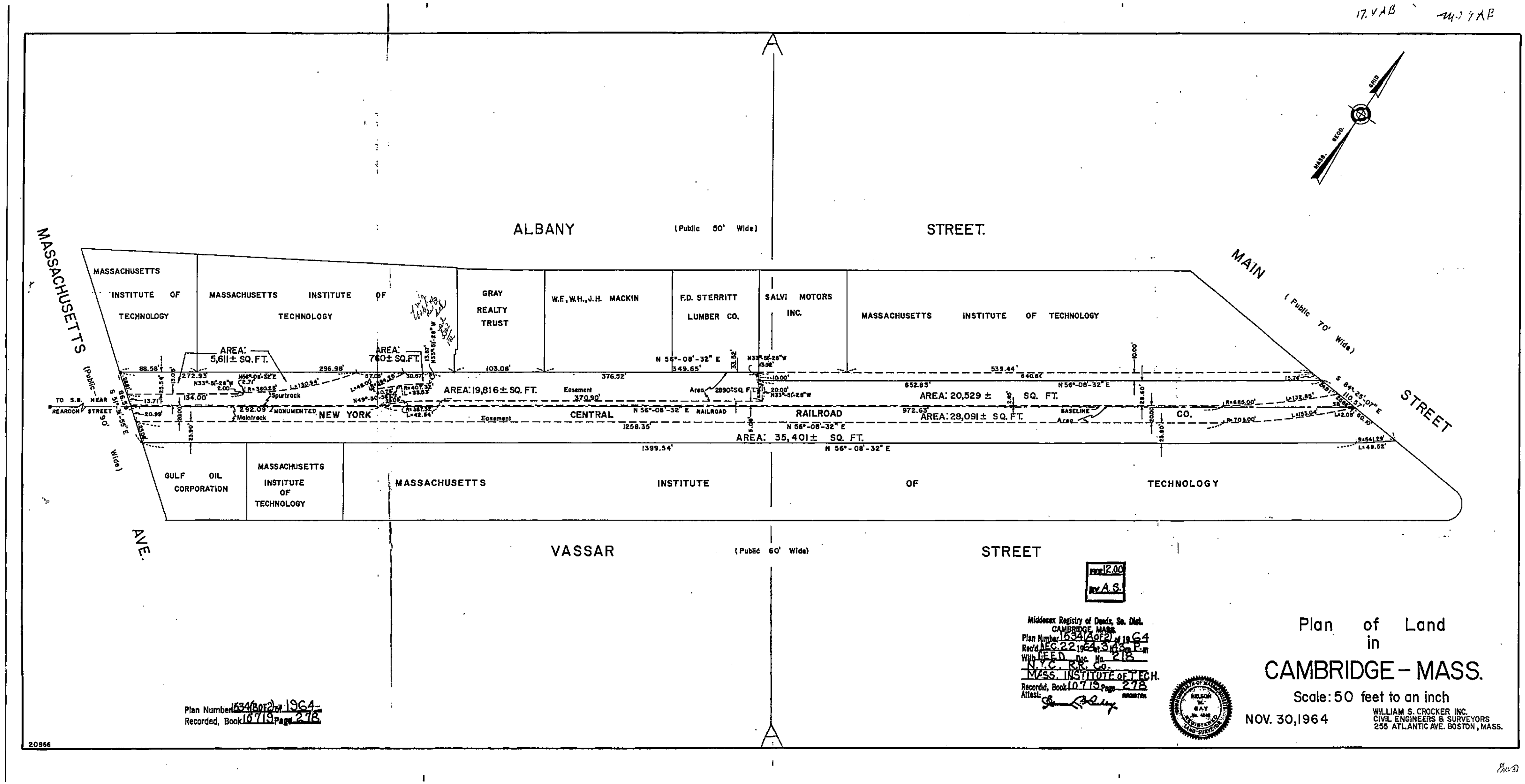
OFFICE OF THE PRESIDENT

I, Malcolm G. Kispert, do hereby certify that I am Secretary of the Executive Committee of the Corporation of Massachusetts Institute of Technology and that the following is a true and correct copy of a vote duly adopted by said Executive Committee at a regular meeting held on December 3, 1964, at which a quorum was present and voting throughout:

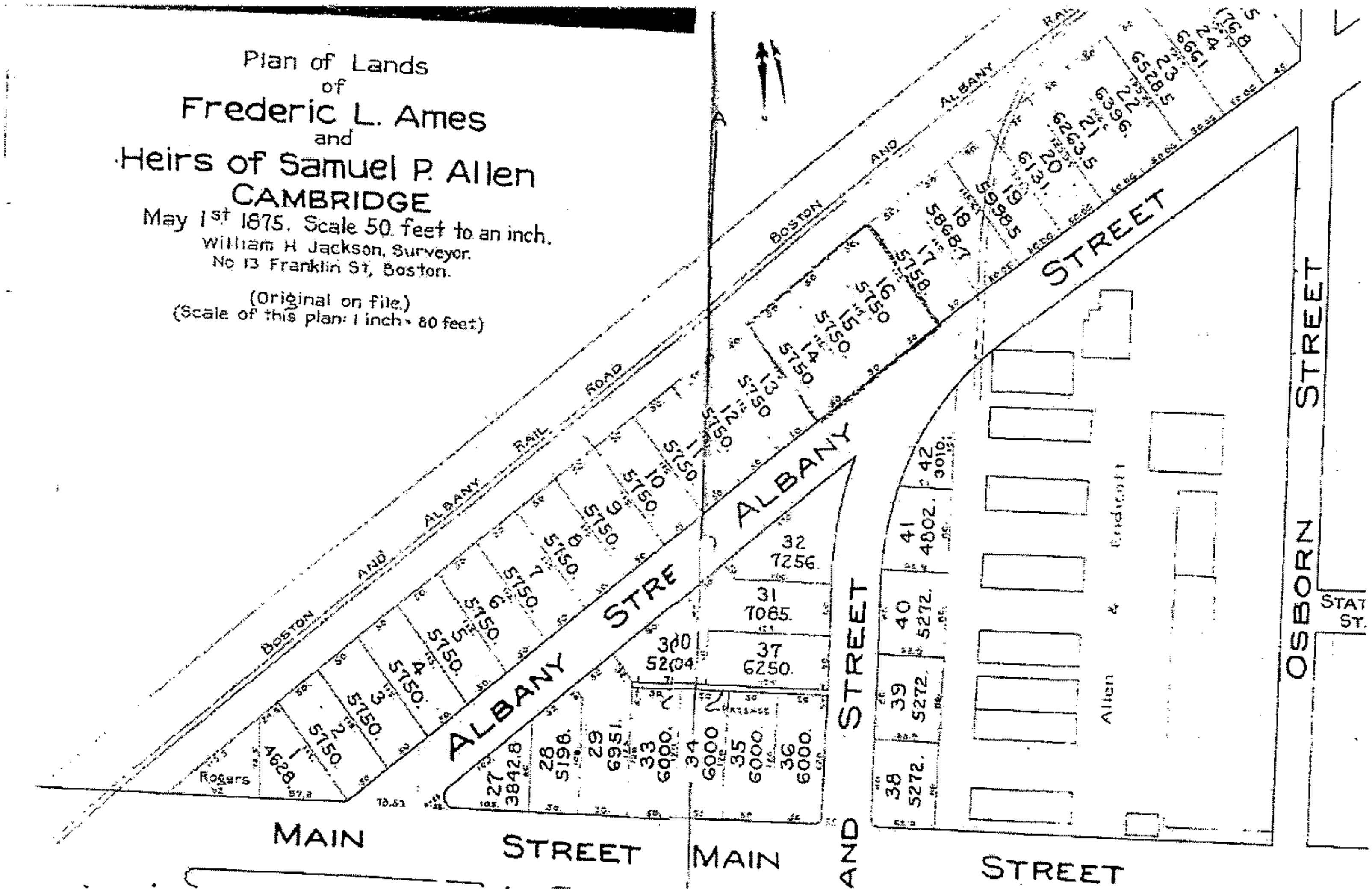
VOTED: That this Corporation purchase from The New York Central Railroad Company its land between Massachusetts Avenue and Main Street, Cambridge, Massachusetts, comprising about 110,208 square feet, subject to appropriate easements for railroad and related uses for the present mainline track of the Grand Junction Branch of its Boston & Albany Division, and for spurtracks therefrom, but with appropriate rights in this Corporation for buildings and structures above an elevation of 22 1/2 feet above such tracks; and that Joseph J. Snyder, Treasurer, and Frederic W. Watriss, Assistant Treasurer, or either of them, are hereby authorized to determine the terms of such purchase and provisions establishing the respective rights of this Corporation and the Railroad Company with respect to track easement areas, and in the name and behalf of this Corporation to sign, seal with the corporate seal, acknowledge and deliver such deeds and other instruments, and take such other actions, as they or either of them deem necessary or desirable in order to carry out such purchase and establish such respective rights, the execution of any such instrument by either of them to be a conclusive determination that it is authorized by this vote.

IN WITNESS WHEREOF, I have hereunto set my hand and the seal of Massachusetts Institute of Technology on this third day of December, 1964.

Malcolm G. Kispert
Secretary of the Executive Committee
of the Corporation of
Massachusetts Institute of Technology


17.YAB
ALBANY (Public 50' Wide) STREET.
VASSAR (Public 60' Wide) STREET
MASSACHUSETTS (Public 90' Wide) AVE.
MAIN (Public 70' Wide) STREET
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
GRAY REALTY TRUST
W.E., W.H., J.H. MACKIN
F.D. STERRITT LUMBER CO.
SALVI MOTORS INC.
GULF OIL CORPORATION
NEW YORK CENTRAL RAILROAD CO.
AREA: 5,611± SQ. FT.
AREA: 760± SQ. FT.
AREA: 19,816± SQ. FT.
AREA: 20,529± SQ. FT.
AREA: 28,091± SQ. FT.
AREA: 35,401± SQ. FT.
Area 2890± SQ. FT.
N 56°-08'-32" E
1399.54'
1258.35'
Spurtrack
Maintrack
Easement
BASELINE
GRID
MASS. GEOD.
FEE 12.00
BY A.S.
Middlesex Registry of Deeds, So. Dist.
CAMBRIDGE, MASS.
Plan Number 1534 (A of 2) of 1964
Rec'd DEC. 22 1964 at 3h 43m P.M.
With DEED Doc. No. 218
N.Y.C. R.R. Co.
MASS. INSTITUTE OF TECH.
Recorded, Book 10719 Page 278
Attest: REGISTER
Plan Number 1534 (B of 2) of 1964
Recorded, Book 10719 Page 278
Plan of Land in
CAMBRIDGE - MASS.
Scale: 50 feet to an inch
NOV. 30, 1964
WILLIAM S. CROCKER INC.
CIVIL ENGINEERS & SURVEYORS
255 ATLANTIC AVE. BOSTON, MASS.
NELSON W. GAY
REGISTERED LAND SURVEYOR
20956

Attachment 6 - Site Acquisition Plans


Plan of Lands
of
Frederic L. Ames
and
Heirs of Samuel P. Allen
CAMBRIDGE
May 1st 1875. Scale 50 feet to an inch.
William H. Jackson, Surveyor.
No 13 Franklin St, Boston.
(Original on file.)
(Scale of this plan: 1 inch = 80 feet)
BOSTON AND ALBANY RAIL ROAD
ALBANY STREET
MAIN STREET
MAIN AND STREET
OSBORN STREET
STAT ST.
Rogers
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34 6000
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37 6250.
38 5272.
39 5272.
40 5272.
41 4802.
42 3010.

Ct. 19394 Book 299 Page 26

SUBDIVISION PLAN OF LAND IN CAMBRIDGE

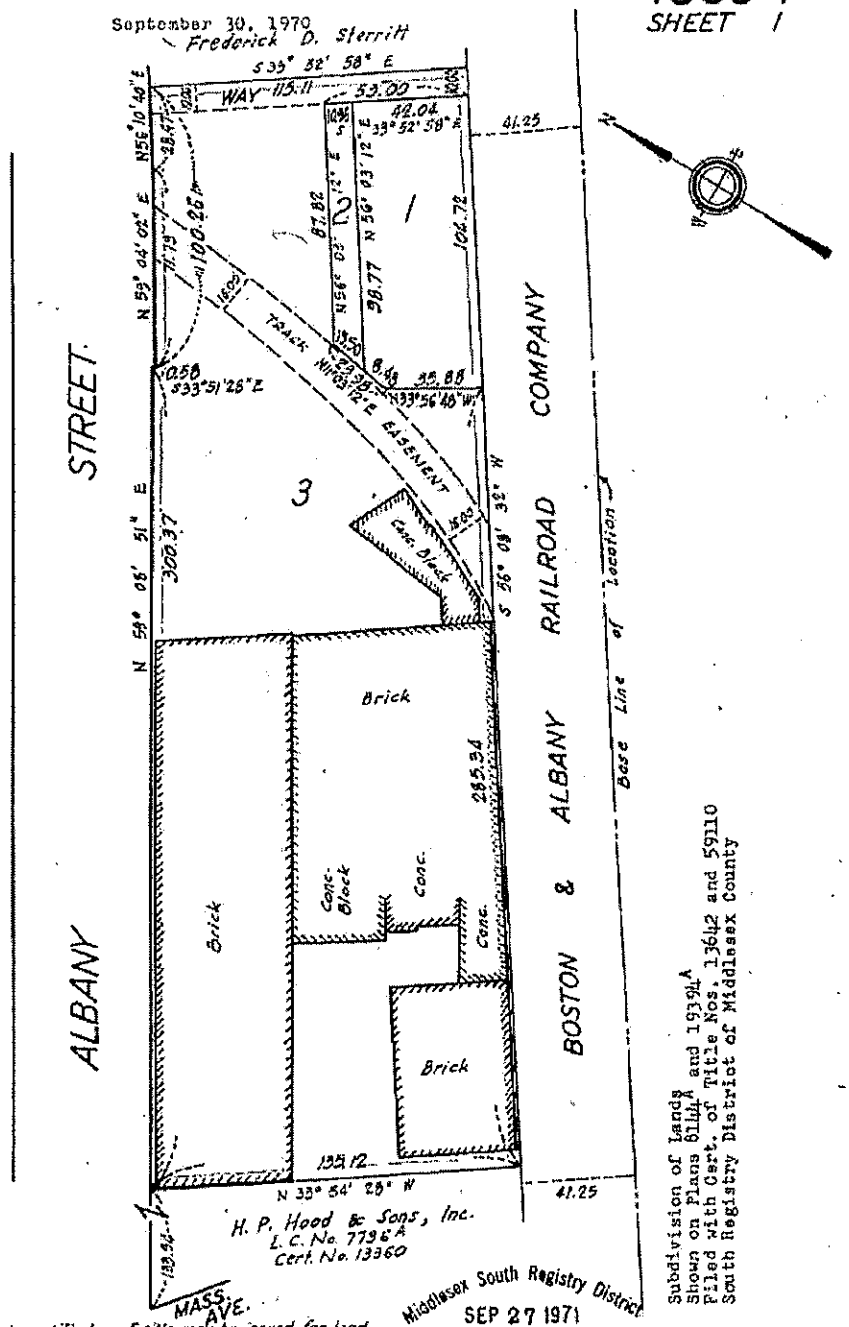
William S. Crocker, Inc., Surveyors

September 30, 1970

Frederick D. Sterrit

19394B

SHEET 1



Subdivision of Lands Shown on Plans 611A and 19394A Filed with Cert. of Title Nos. 13642 and 59110 South Registry District of Middlesex County

Middlesex South Registry District

SEP 27 1971

Separate certificates of title may be issued for land shown hereon and on sheet 2 as lots 1, 2 and 3. By the Court.

RECEIVED FOR REGISTRATION Copy of part of plan filed in LAND REGISTRATION OFFICE

O'CLOCK 3 P.M. DEC. 1, 1970

Scale of this plan 40 feet to an inch

R.L. Woodbury, Engineer for Court #2

DEC. 1, 1970

Recorder

Fee $1.00

Form LCE-S-3 1500-1-72

Attachment 7 - Site Acquisition Deeds and Certificates of Title

MASSACHUSETTS QUITCLAIM DEED SHORT FORM (INDIVIDUAL) 881

25.00 RE 988 TR 10/10/86 03:11

I, LUCILLE MACKIN,

of Honolulu, Hawaii---------- County, Massachusetts

being unmarried, for consideration paid, and in full consideration of THREE HUNDRED FIFTY THOUSAND DOLLARS ($350,000.00)----------

grant to MASSACHUSETTS INSTITUTE OF TECHNOLOGY *

of Cambridge, MA, with quitclaim covenants

[Description and encumbrances, if any]

All my right, title and interest in and to three (3) lots of land situated on the Southeasterly side of Albany Street so-called in that part of Cambridge, Middlesex County, Commonwealth of Massachusetts, called Cambridgeport, numbered 14, 15 and 16 on a Plan of Land of Frederick L. Ames and Heirs of Samuel P. Allen, W. H. Jackson, surveyor, said Plan being dated May 1, 1875, and recorded with Middlesex South District Registry of Deeds, Book of Plans 28, Plan 10. Said three lots are together bounded:

NORTHWESTERLY by said Albany Street, one hundred and fifty (150) feet;

NORTHEASTERLY by Lot 13 on said plan, one hundred and fifteen (115) feet;

SOUTHEASTERLY by land of the Boston & Albany Railroad Corporation, one hundred fifty (150) feet; and

SOUTHWESTERLY by Lot 17 on said plan, one hundred and fifteen (115) feet.

Containing seventeen thousand two hundred and fifty (17,250) feet, be the same more or less.

Being the same premises described in a deed from Frederick A. Emerick to Frederick D. Sterritt dated February 21, 1918 and recorded with Middlesex South District Deeds in Book 4189, Page 305.

For my title see deed of William F. Mackin to William F. Mackin and Lucille Mackin, husband and wife as tenants by the entirety, dated August 8, 1979, and recorded with Middlesex South District Deeds in Book 13766, Page 414.

The said William F. Mackin died on September 3, 1980.

Witness my hand and seal this 10th day of October, 19 86

Lucille Mackin

LUCILLE MACKIN

The Commonwealth of Massachusetts

Middlesex ss. October 10 19 86.

Then personally appeared the above named LUCILLE MACKIN

and acknowledged the foregoing instrument to be her free act and deed, before me

Notary Public

My commission expires July 19 92

COMMONWEALTH OF MASSACHUSETTS DEEDS EXCISE OCT 10 '86 $798.00

- Joint Tenants — Tenants in Common.

CHAPTER 183 SEC. 6 AS AMENDED BY CHAPTER 497 OF 1969

Every deed presented for record shall contain or have endorsed upon it the full name, residence and post office address of the grantee and a recital of the amount of the full consideration thereof in dollars or the nature of the other consideration therefor, if not delivered for a specific monetary sum. The full consideration shall mean the total price for the conveyance without deduction for any liens or encumbrances assumed by the grantee or remaining thereon. All such endorsements and recitals shall be recorded as part of the deed. Failure to comply with this section shall not affect the validity of any deed. No register of deeds shall accept a deed for recording unless it is in compliance with the requirements of this section.

T-2

DEED

JOHN F. MACKIN of Waltham, Middlesex County, and RICHARD W. MACKIN of Weymouth, Norfolk County, both of Massachusetts for $1,142,857.16 consideration paid GRANT to MASSACHUSETTS INSTITUTE OF TECHNOLOGY, a Massachusetts corporation with offices at c/o Treasurer's Office, 238 Main Street, Cambridge, MA 02143 with QUITCLAIM COVENANTS:

That parcel of land situated on Albany Street in CAMBRIDGE, being Lot No. 12 on a plan of land of F. L. Ames and Heirs of Samuel P. Allen drawn by William H. Jackson, dated May 1, 1875 and recorded with Middlesex South District Deeds in Book of Plans No. 28, Plan 10, and being a portion of the land conveyed to Frederick L. Ames by Samuel P. Allen et al by deed dated May 21, 1875, and recorded with Middlesex South District Deeds, Lib. 1351, Page 269, containing 5750 square feet more or less and being a portion of the land conveyed to Oliver Ames, Samuel Carr and Oliver W. Mink, as Trustees of the Ames Real Estate Trust by Ralph Frederick Brukard by deed dated August 2, 1915 and heretofore recorded with Middlesex South District Deeds.

Also a second parcel of land adjoining the above described parcel and bounded and described as follows:

The land in CAMBRIDGE on the Southeasterly side of Albany Street, being shown as Lot No. 13 on a plan recorded with Middlesex South District Deeds in Plan Book 28, Plan 10, bounded:

NORTHERLY	by said Albany Street, fifty (50) feet;
EASTERLY	by Lot No. 12 on said plan, one hundred fifteen (115) feet;
SOUTHERLY	by the location of the Boston & Albany Railroad, fifty (50) feet;
WESTERLY	by Lot No. 14 on said plan, one hundred fifteen (115) feet.

Containing according to said plan, 5750 square feet of land.

For title reference see deed of Gary Mackin to the Grantors recorded with said deeds at Book 14503, Page 51.

**** MASS. EXCISE TAX: 5212.08 *** MSD 09/25/91 09:28:20 136 25.00

Address of Premises: 38-46 Albany Street, Cambridge, MA

Executed as a sealed instrument this 24th day of September, 1991.

John F. Mackin

John F. Mackin

Richard W. Mackin

Richard W. Mackin

THE COMMONWEALTH OF MASSACHUSETTS

Suffolk, ss. September 24, 1991

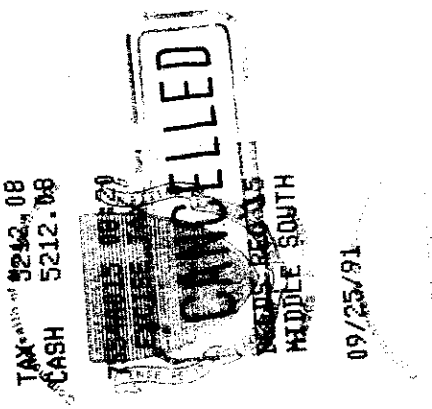
Then personally appeared the above named John F. Mackin and Richard W. Mackin and acknowledged the foregoing instrument to be their free act and deed, before me,

Stuart T. Freeland

Notary Public
Stuart T. Freeland

My commission expires: January 13, 1995

STUART T. FREELAND, Notary Public
My Commission Expires Jan. 13, 1995



E-2

DEED

JOHN F. MACKIN of Waltham, Middlesex County, Massachusetts for $857,142.84 consideration paid GRANTS to MASSACHUSETTS INSTITUTE OF TECHNOLOGY, a Massachusetts corporation with offices at c/o Treasurer's Office, 238 Main Street, Cambridge, MA 02143 with QUITCLAIM COVENANTS

an undivided one-half (½) interest in and to three (3) lots of land situated on the southeasterly side of Albany Street so-called in that part of Cambridge, Middlesex County, Commonwealth of Massachusetts, called Cambridgeport, numbered 14, 15, 16 on a Plan of Land of Frederick L. Ames and heirs of Samuel P. Allen, W. H. Jackson, surveyor, said Plan being dated May 1, 1875, and recorded with Middlesex South District Registry of Deeds, Book of Plans 28, Plan 10. Said three lots are together bounded:

NORTHWESTERLY	by said Albany Street, one hundred and fifty (150) feet;
NORTHEASTERLY	by Lot 13 on said Plan, one hundred and fifteen (115) feet;
SOUTHEASTERLY	by land of the Boston & Albany Railroad Corporation, one hundred fifty (150) feet; and
SOUTHWESTERLY	by Lot 17 on said plan, one hundred and fifteen (115) feet.

Containing seventeen thousand, two hundred and fifty (17,250) feet, be the same more or less.

Being the same premises conveyed to the Grantor by deed of Gertrude R. Mackin dated December 29, 1984, recorded with said Deeds at Book 15,861, Page 444 to which reference may be had for Grantor's title. See also will of James H. Mackin, Middlesex Probate Docket #495361 and death certificate of Agnes Mackin recorded with said Deeds at Book 15 861, Page 442.

Address of Premises: 50 Albany Street, Cambridge, MA
MSD 09/25/91 09:28:22 138 25.00
3910.20 ***
**** MASS. EXCISE TAX:

Executed as a sealed instrument this 24th day of September, 1991.

John F Mackin
John F. Mackin

THE COMMONWEALTH OF MASSACHUSETTS

Suffolk, ss. September 24, 1991

Then personally appeared the above named John F. Mackin and acknowledged the foregoing instrument to be his free act and deed, before me

Stuart T Freeland
Notary Public
Stuart T. Freeland
My commission expires: January 13, 1995

STUART T. FREELAND, Notary Public
My Commission Expires Jan. 13, 1995

TAX 3910.20
CASH 3910.20
~~755A015 09:41~~
EXCISE CANCELLED
DEEDS REG 15
MIDDLE SOUTH
09/25/91

478

481

Transfer Certificate of Title.

No. 71662

From Original Certificate No. 59110, Originally Registered June 28, 1946, in Registration Book 383 Page 177 for the South Registry District of Middlesex County.

This is to Certify that Massachusetts Institute of Technology, a Massachusetts corporation having its principal place of business in Cambridge in the County of Middlesex and Commonwealth of Massachusetts, ~~married to~~ is the owner in fee simple of that certain parcel of land with the buildings thereon, situate in Cambridge in the County of Middlesex and said Commonwealth, bounded and described as follows:

Northwesterly by Albany Street, three hundred and 36/100 feet;
Northeasterly, ninety-three and 45/100 feet,
Southeasterly, one and 69/100 feet,
Northeasterly, four and 80/100 feet,
Southeasterly, forty one hundredths (0.40) of a foot, and
Northeasterly, twenty-one and 16/100 feet by land now or formerly of Joseph F. Corcoran et al;
Southeasterly by land now or formerly of the Boston & Albany Railroad Company, two hundred ninety-six and 98/100 feet; and
Southwesterly by land now or formerly of H. P. Hood & Sons, Inc., one hundred thirty-five and 04/100 feet.

All of said boundaries are determined by the Court to be located as shown on a plan, as modified and approved by the Court, filed in the Land Registration Office, a copy of a portion of which is filed in the Registry of Deeds for the South Registry District of Middlesex County in Registration Book 383, Page 177, with Certificate 59110.

So much of the above described land as is included within the limits of the Track Easement 16 feet wide, shown on said plan, is subject to, and has the benefit of, rights and easements as set forth in a stipulation between Whittemore Brothers Corporation and the General Latex & Chemical Corporation et al, dated December 26, 1945, filed and registered as Document 205054.

Address of Owner: Cambridge, Mass.

Released 9307-30

And it is further certified that said land is under the operation and provisions of Chapter 185 of the General Laws, and any amendments thereto, and that the title of said Massachusetts Institute of Technology to said land is registered under said Chapter, subject, however, to any of the encumbrances mentioned in Section forty-six of said Chapter, and any amendments thereto, which may be subsisting, and subject also as aforesaid.

WITNESS, John E. Fenton, Esquire, Judge of the Land Court, at Cambridge, in said County of Middlesex, the thirtieth day of November in the year nineteen hundred and fifty at 11 o'clock and 15 minutes in the fore-noon.

Attest, with the Seal of said Court,

Albert J. Luttheim
Assistant Recorder.

(Land Court Case No. 19394)

MEMORANDA OF ENCUMBRANCES ON THE LAND DESCRIBED IN THIS CERTIFIC

Document Number	Kind	Running in Favor of	Terms	Date of Instrument	Date of Registration: Year & Month	D.	H.	M.	A.M. or P.M.	Signature of Assistant Recorder	
321896	Votes, Copy of Resolution and Agreement	Massachusetts Institute of Technology with Gilfoy Realty Co. et al	See Document	1957	1957						expunged 938532
481174	Deed and Agmt. &c.	Health and Educational Facilities Authority	Conveying lots 1 and 2 (being pt. within described and other registered land) with easement over lot 3 and unregistered land this certificate cancelled as to said lots. Pl. in Bk. 799, P. 76.	July 31 1970	Aug. 1970	26	11	5	a.m.	William H Rockwell Jr Acting	See Certificat Book 799
499074	Taking	Comwlth. of Massachusetts (Metro. Dist. Comm.)	Taking temporary easement in, through and under part lot 3, for drainage purposes. Pl. in Bk. 799, P. 76.	Nov. 30 1972	Dec. 1972	3	11	30	a.m.	Georgett Stelmach ACTING	
				June 21	June 2?		3	5?	P.M.	George H. Stelmach ACTING	
938531	Agreement &c.	Polaroid Corporation with Massachusetts Institute of Technology	Releasing all rights under Document No. 205054, referred to in this certificate and terminating Document No. 321896 See Doc	1993 Sept. 1 1993	1994 Feb. 1994	17	2	48	PM	[signature]	
938532	Order of Court		Amending this certificate by expunging therefrom the following paragraph, beginning "So much of the above" and ending "Document No. 205054." See Doc.	Dec. 21	Feb.	17	2	48	PM	[signature]	

[SEE OVER]

1

BK770 PG160

Transfer Certificate of Title.

No.128110

From Transfer Certificate No.123200, Originally Registered March 8, 1967, in Registration Book 746 Page 50 for the South Registry District of Middlesex County.

This is to Certify that

Massachusetts Institute of Technology, a Massachusetts corporation having its usual place of business in,

~~of~~ Cambridge in the County of Middlesex and Commonwealth of Massachusetts, ~~married to~~ is the owner in fee simple

of that certain parcel of land situate in Cambridge in the County of Middlesex and said Commonwealth, bounded and described as follows:

Northwesterly by Albany Street, one hundred and 26/100 feet;
Northeasterly by land now or formerly of Frederick D. Sterritt, one hundred and fifteen feet;
Southeasterly by land now or formerly of the Boston & Albany Railroad Company, one hundred three and 08/100 feet, said boundary being a line parallel with and distant forty-one and 25/100 feet northwesterly from the base line of the location of said Railroad;
Southwesterly, twenty-one and 16/100 feet,
Northwesterly, forty hundredths (0.40) of a foot,
Southwesterly, four and 80/100 feet,
Northwesterly, one and 69/100 feet, and
Southwesterly, ninety-two and 85/100 feet, by land now or formerly of Whittemore Brothers Corporation.

All of said boundaries are determined by the Court to be located as shown on a plan, as modified and approved by the Court, filed in the Land Registration Office, a copy of a portion of which is filed in the Registry of Deeds for the South Registry District of Middlesex County in Registration Book 84, Page 557, with Certificate 13642.(Plan. No. 8144^{A})

The above described land is subject to the easement set forth in a stipulation by and between Joseph F. Corcoran et al and Endicott Building Company et al, filed on March 27, 1922, being Document 38705. BWT

The above described land is subject to and has the benefit of a lease dated September 11, 1946 between Ira C. Foss and Frank E. Damrell and the New York Central Railroad Company set forth in Document No. 226327. BWT

And it is further certified that said land is under the operation and provisions of Chapter 185 of the General Laws, and any amendments thereto, and that the title of said

Massachusetts Institute of Technology

to said land is registered under said Chapter, subject, however, to any of the encumbrances mentioned in Section forty-six of said Chapter, and any amendments thereto, which may be subsisting, and subject also as aforesaid.

WITNESS, ELWOOD H. HETTRICK, Esquire, Judge of the Land Court, at Cambridge, in said County of Middlesex, the seventh day of October the year nineteen hundred and sixty-eight at 12 o'clock and 55 minutes in the after-noon.

Attest, with the Seal of said Court,

Assistant Recorder

Address of owner: 77 Massachusetts Avenue, Cambridge, Mass. 02139

Land Court Case No. 8144

FORM 26 LC 2M 8/68

MEMORANDA OF ENCUMBRANCES ON THE LAND DESCRIBED IN THIS CERTIFICATE. No. 128110

Document Number.	Kind.	Running in Favor of.	Terms.	Date of Instrument.	Date of Registration.					Signature of Assistant Recorder.	Discharge.
					Year & Month	D.	H.	M.	A. M. or P. M.		
481174	Deed and Agmt. &c.	Health and Educational Facilities Authority	Conveying lots 1 and 2(being pt. within described and other registered land)with easement over lot 3 and unregistered land, this certificate cancelled as to said lots. Pl.in Bk.799,P.76.	1970 Nov. 30	1970 Dec.	3	11	20	AM		See Certificate 133826 Book 799.....Page 76
492638	Vote and Grant of Easements and Agmt.to Reconvey	Massachusetts Institute of Technology to Health and Educational Facilities Authority	See Document Pl. attached.	1971 Nov. 18	1971 Dec.	6	2	50	PM		
499024	Taking	Comwlth.of Massachusetts (Metro.Dist.Comm.)	Taking temporary easement in, through and under part lot 3 for drainage purposes.Pl.in Bk.799,P.76. See Doc.	1972 June 21	1972 June	27	3	30	PM		
938531	Agreement &c.	Poloroid Corporation with Massachusetts Institute of Technology	Releasing all rights under Document No. 38705, referred to in this certificate.	1993 Sept. 1	1994 Feb.	17	2	48	PM		
938533	Order of Court		Amending this certificate by expunging therefrom the following paragraphs, beginning "The above described" and ending "Document No. 38705" and also one beginning "The above described land" and ending "Document No. 226327. See Doc.	1994 Feb. 15	1994 Feb.	17	2	48	PM		

2005 01398396
Bk: 01313 Pg: 67 Cert#: 235771
Doc: DEED 12/23/2005 03:15 PM

BOTH WAYS

QUITCLAIM DEED

KNOW ALL MEN BY THESE PRESENTS that Massachusetts Health and Educational Facilities Authority, ~~a/k/a~~ formerly known as the Health and Educational Facilities Authority, a body politic and corporate and public instrumentality of the Commonwealth of Massachusetts, having a mailing address of Ten Post Office Square, Boston, Massachusetts 02109, IN CONSIDERATION OF $100 and the covenants and agreements made by the Grantee in an agreement dated as of November 12, 1970, hereby GRANTS unto Massachusetts Institute of Technology, a Massachusetts Corporation, having a mailing address of 77 Massachusetts Avenue, Cambridge, Massachusetts 02139, with QUITCLAIM COVENANTS, the following:

A certain parcel of land situated between Vassar and Albany Streets in Cambridge, Middlesex County, Massachusetts, shown as Lot 2, Lot 1 and Parcel A on Plan entitled "Plan of Land in Cambridge Mass" dated September 29, 1970, by William S. Crocker Inc., Civil Engineers and Surveyors, recorded with the Middlesex County (Southern District) Registry of Deeds (the "Registry") as Plan No. 1224 of 1970, together bounded and described as follows:

SOUTHEASTERLY by land of the Grantor herein eighty-three and 71/100 feet;

SOUTHWESTERLY by the same four and 50/100 feet;.

SOUTHEASTERLY by the same twenty-one feet;

SOUTHWESTERLY by the same forty-two and 50/100 feet;

WESTERLY by the same twenty-three and 98/100 feet;

NORTHWESTERLY by the same eighty-seven and 82/100 feet; and

NORTHEASTERLY by the same sixty-three and 96/100 feet.

Containing 6460 square feet of land more or less.

There is included in said premises the following parcels of registered land:

Lot 1 shown on Plan entitled "Subdivision Plan of Land in Cambridge Mass (being a subdivision of land shown on Land Court Cases 8144A and 19394A)" dated September 30, 1970, by William S. Crocker Inc., Civil Engineers and Surveyors and filed with the Middlesex County (Southern District) Registry District of the Land Court (the "Land Court") as Plan No. 19394B, being portions of the premises described in Certificate of Title Number 128110 issued by the Land Court and Certificate of Title Number 71662 issued by the Land Court.

TRA 2088601v.3

OK per Ed Williams

133826

Lot 2 shown on said Subdivision Plan dated September 30, 1970, being a portion of the premises described in said Certificate of Title Number 128110.

Said premises are hereby conveyed together with:

1. The right to use the ten foot way to Albany Street as shown on said Plan dated September 30, 1970 for all purposes for which streets or ways may now or hereafter be commonly used in said Cambridge.

2. The right to use the "easement area = 1594 sq. ft." shown on said Plan dated September 29, 1970, extending Southeasterly from the Southerly Corner of Parcel A for passage on foot and for utility lines subject to the provisions of a deed from The New York Central Railroad Company to the Grantee dated December 10, 1964, recorded with the Registry in Book 10719, Page 278.

3. The right to use for the transmission of electricity and water utility easement shown on said Plan dated September 29, 1970, extending from the Easterly Corner of Parcel A in a Southeasterly and Northeasterly direction subject to the provisions of said deed from The New York Central Railroad to the Grantee.

Said Parcel A is included in the premises conveyed to the Grantee by said deed of The New York Central Railroad and is hereby conveyed subject to the provisions thereof.

Being all the same premises conveyed to the Grantor by deed dated November 30, 1970 from the Grantee and recorded with the Registry in Book 11927, Page 473 and filed with the Land Court as Document No. 481174, under Certificate of Title No. 133826. The herein described land is conveyed subject to and with the benefit of the provisions contained in said deed and certificate of title.

That certain lease dated as of November 12, 1970 between Massachusetts Health and Educational Facilities Authority, a/k/a the Health and Educational Facilities Authority, a body politic and corporate and public instrumentality of the Commonwealth of Massachusetts, as landlord, and Massachusetts Institute of Technology, a Massachusetts corporation, as tenant, a notice of which is recorded with the Registry in Book 11927 at Page 475 and filed with the Land Court as Document No. 481175, is hereby terminated by merger of the fee.

(Signatures on following page.)

Executed as a sealed instrument this 13th day of December, 2005.

139 8394

MASSACHUSETTS HEALTH AND EDUCATIONAL FACILITIES AUTHORITY, ~~a/k/a~~ formerly FINTA the Health and Educational Facilities Authority, a body politic and corporate and public instrumentality of the Commonwealth of Massachusetts

By _____
Name: Benson T. Caswell
Title: Executive Director

COMMONWEALTH OF MASSACHUSETTS

Suffolk, ss.

On this 13th day of December, 2005, before me, the undersigned notary public, personally appeared Benson T. Caswell, the Executive Director of the Massachusetts Health and Educational Facilities Authority, proved to me through satisfactory evidence of identification which was License, to be the person whose name is signed on the preceding document and acknowledged to me that s/he signed it voluntarily for its stated purpose.

Tonya Ingram
Notary Public
Print Name:
My Commission Expires:

TONYA L. INGRAM
Notary Public
Commonwealth of Massachusetts
My Commission Expires Oct 31, 2008

student receive such scholarship aid

) a person shall (1) be a citizen of the commonwealth; (2) be a high school ucation; (3) have been accepted for an accredited college or university e a course of instruction satisfactory ı the consent of his parent or legal lirector or his designated representa- a period of three years following his livision during the regular periods of such college or university except for or may establish by regulation; pro- ıall not be liable to pay wages to said ls.

ilable appropriations and grants from division a program of graduate study nd any accredited graduate program to further the training of personnel n of sections twenty-six to fifty-three,

granted by the director under this asis.

rules and regulations as he deems ıs authorized by this section.

Approved July 16, 1968.

O THE TIME WITHIN WHICH CERTAIN ST ARCHITECTS, ENGINEERS, BUILDING THERS FOR DAMAGES ARISING OUT OF EAL PROPERTY MAY BE COMMENCED.

s is hereby amended by inserting after

damages arising out of any deficiency ; construction or general administra- perty shall be commenced only within f action accrues; provided, however, ıs be commenced more than six years ıg of such design, planning, construc-

Approved July 16, 1968.

E THE SALARY OF THE CLERK OF THE OF BROOKLINE.

f chapter 218 of the General Laws is triking out the line reading "municipal e V by inserting after the line reading appearing in section 1 of chapter 718 line: — municipal court of Brookline,.

Approved July 16, 1968.

Chap. 614. AN ACT ESTABLISHING THE EDUCATIONAL FACILITIES AUTHORITY.

Be it enacted, etc., as follows:

SECTION 1. *Declaration of Policy.*—It is hereby declared that for the benefit of the people of the commonwealth, the increase of their commerce, welfare and prosperity and the improvement of their health and living conditions it is essential that this and future generations of youth be given the fullest opportunity to learn and to develop their intellectual and mental capacities; that it is essential that institutions for higher education within the state be provided with appropriate additional means to assist such youth in achieving the required levels of learning and development of their intellectual and mental capacities; and that it is the purpose of this act to provide a measure of assistance and an alternative method to enable institutions for higher education in the state to provide the facilities and structures which are sorely needed to accomplish the purposes of this act, all to the public benefit and good, to the extent and manner provided herein.

SECTION 2. *Short Title of Act.*—This act may be referred to and cited as the "Educational Facilities Authority Act."

SECTION 3. *Definitions.*—In this act, the following words and terms shall, unless the context otherwise requires, have the following meanings:

(a) "Authority", the Educational Facilities Authority created by section four.

(b) "Project", a structure or structures suitable for use as a dormitory or other housing facility, including housing facilities for student nurses, a dining hall, student union, administration building, academic building, library, laboratory, research facility, classroom, athletic facility, health care facility, and maintenance, storage or utility facility and other structures or facilities related thereto or required or useful for the instruction of students or the conducting of research or the operation of an institution for higher education, including parking and other facilities or structures essential or convenient for the orderly conduct of such institution for higher education, and shall also include landscaping, site preparation, furniture, equipment and machinery and other similar items necessary or convenient for the operation of a particular facility or structure in the manner for which its use is intended but shall not include such items as books, fuel, supplies or other items the costs of which are customarily deemed to result in a current operating charge, and shall not include any facility used or to be used for sectarian instruction or as a place of religious worship nor any facility which is used or to be used primarily in connection with any part of the program of a school or department of divinity for any religious denomination.

(c) "Cost", as applied to a project or any portion thereof financed under the provisions of this act embraces all or any part of the cost of construction, acquisition, alteration, enlargement, reconstruction and remodeling of a project including all lands, structures, real or personal property, rights, rights of way, franchises, easements and interests acquired or used for or in connection with a project, the cost of demolishing or removing any buildings or structures on land so acquired, including the cost of acquiring any lands to which such

buildings or structures may be moved, the cost of all machinery and equipment, financing charges, interest prior to, during and for a period after completion of such construction and acquisition, provisions for reserves for principal and interest and for extensions, enlargements, additions and improvements, the cost of architectural, engineering, financial and legal services, plans, specifications, studies, surveys, estimates of cost and of revenues, administrative expenses, expenses necessary or incident to determining the feasibility or practicability of constructing the project and such other expenses as may be necessary or incident to the construction and acquisition of the project, the financing of such construction and acquisition and the placing of the project in operation.

(d) "Bonds" or "revenue bonds", revenue bonds of the authority issued under the provisions of this act, including revenue refunding bonds, notwithstanding that the same may be secured by mortgage or the full faith and credit of a participating institution for higher education or any other lawfully pledged security of a participating institution for higher education.

(e) "Institution for higher education", a nonprofit educational institution within the commonwealth authorized by law to provide a program of education beyond the high school level.

(f) "Participating institution for higher education", an institution for higher education which, pursuant to the provisions of this act, undertakes the financing and construction or acquisition of a project or undertakes the refunding or refinancing of obligations or of a mortgage or of advances as provided in this act.

SECTION 4. *Educational Facilities Authority.*—(a) There is hereby created a body politic and corporate to be known as the "Educational Facilities Authority", hereinafter in this act called the authority. Said authority is constituted a public instrumentality and the exercise by the authority of the powers conferred by this act shall be deemed and held to be the performance of an essential public function. Said authority shall consist of seven members, to be appointed by the governor, who shall be residents of the commonwealth, not more than four of whom shall be members of the same political party. At least one of the members shall be a trustee, director, officer or employee of an institution for higher education, at least one shall be a person having a favorable reputation for skill, knowledge and experience in the field of state and municipal finance, either as a partner, officer or employee of an investment banking firm which originates and purchases state and municipal securities, or as an officer or employee of an insurance company or bank whose duties relate to the purchase of state and municipal securities as an investment and to the management and control of a state and municipal securities portfolio, and at least one shall be a person having a favorable reputation for skill, knowledge and experience in the building construction field. The members of the authority first appointed shall serve for terms expiring on July first in the years nineteen hundred and sixty-nine, nineteen hundred and seventy, nineteen hundred and seventy-one, nineteen hundred and seventy-two, nineteen hundred and seventy-three, nineteen hundred and seventy-four and nineteen hundred and seventy-five, respectively, the term of each such member to be designated by the governor. Upon the expiration of the term of any member his

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(c) The executive
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documents and paper
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(d) Four members
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lished or posted.

(e) Before the issu
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mance of such duties.

(g) Any member,
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of vacant positions; and (4) a list
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said lists and statement.
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ɔe paid for the purposes and in the
venty-five B from the fund estab-
enty-eight of chapter sixty-four C,
ɔh transactions under the heading

f the appropriation accounts, sub-
in section two of this act shall be
;y-nine. However, beginning June
ine, obligations may be incurred
ts or subsidiary accounts, if any,
l or for services to be rendered on
ed and sixty-nine; provided, they
amounts thereof do not exceed the
or subsidiary account. Where the
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June, nineteen hundred and sixty-
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chedules as provided for in section
ɔ of the General Laws shall be filed
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ation account or subsidiary account
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is hereby directed to send a copy of
ve, of this act to each departmental,
mediately following passage of this

nty-one, inclusive, of this act shall
ıundred and sixty-nine and sections
;ake effect upon the passage of this

Approved June 26, 1969.

Chap. 453. AN ACT PROVIDING THAT PARENTS SHALL BE LIABLE FOR INJURIES OR DAMAGES RESULTING FROM WILFUL ACTS OF THEIR MINOR CHILDREN WHO ARE BETWEEN SEVEN AND SEVENTEEN YEARS OF AGE.

Be it enacted, etc., as follows:

Chapter 231 of the General Laws is hereby amended by inserting after section 85F the following section: —

Section 85G. Parents of an unemancipated child under the age of seventeen and over the age of seven years shall be liable in a civil action for any wilful act committed by said child which results in injury or death to another person or damage to the property of another. This section shall not apply to a parent who, as a result of a decree of any court of competent jurisdiction, does not have custody of such a child at the time of the commission of the tort. Recovery under this section shall not exceed three hundred dollars for any such cause of action.

Approved June 26, 1969.

Chap. 454. AN ACT ENLARGING THE PURPOSES OF THE EDUCATIONAL FACILITIES AUTHORITY TO INCLUDE ASSISTANCE TO HOSPITALS AND CHANGING THE NAME OF SAID AUTHORITY TO THE HEALTH AND EDUCATIONAL FACILITIES AUTHORITY.

Whereas, The deferred operation of this act would tend to defeat its purpose, which is, in part, to provide forthwith additional funds for urgently needed facilities for hospitals in the commonwealth, therefore it is hereby declared to be an emergency law, necessary for the immediate preservation of the public health, welfare and convenience.

Be it enacted, etc., as follows:

SECTION 1. Chapter 614 of the acts of 1968 is hereby amended by striking out sections 1 and 2 and inserting in place thereof the following two sections: —

Section 1. Declaration of Policy. — It is hereby declared that for the benefit of the people of the commonwealth, the increase of their commerce, welfare and prosperity and the improvement of their health and living conditions it is essential that this and future generations of youth be given the fullest opportunity to learn and to develop their intellectual and mental capacities; that it is essential that institutions for higher education within the commonwealth be provided with appropriate additional means to assist such youth in achieving the required levels of learning and development of their intellectual and mental capacities; that it is essential that hospitals within the commonwealth be provided with appropriate additional means to expand, enlarge and establish health care, hospital and other related facilities; and that it is the purpose of this act to provide a measure of assistance and an alternative method to enable institutions for higher education and hospitals in the commonwealth to provide the facilities and structures which are solely needed to accomplish the purposes of this act, all to the public benefit and good, to the extent and manner provided herein.

Section 2. Short Title of Act. — This act may be referred to and cited as the "Health and Educational Facilities Authority Act."

apter 614 is hereby amended by
and inserting in place thereof the

Educational Facilities Authority

articipating institution for higher
suitable for use as a dormitory or
students, faculty, officers or em-
administration building, academic
ch facility, classroom, athletic fa-
ace, storage or utility facility and
o any of the foregoing or required
ts or the conducting of research or
igher education, including parking
ntial or convenient for the orderly
r education, and shall also include
re, equipment and machinery and
venient for the operation of a par-
anner for which its use is intended
ooks, fuel, supplies or other items
eemed to result in a current oper-
ny facility used or to be used for
religious worship nor any facility
in connection with any part of the
f divinity for any religious denom-
ating hospital, a structure or struc-
clinic, or other health care facility,
ms residence or other multi-unit
, patients or relatives of patients
al, doctors office building, adminis-
aintenance, storage or utility fa-
es related to any of the foregoing
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ntial or convenient for the orderly
lso include landscaping, site prepa-
achinery and other similar items
eration of a particular facility or
se is intended but shall not include
items the costs of which are cus-
t operating charge; and "project"
or more of the foregoing undertaken
tion for higher education or any
ore other participating institutions
hospitals.
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the word "way", in line 5, the
rting after the word "additions",
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id chapter 614 is hereby further
(*d*) and inserting in place thereof

, revenue bonds of the authority
act, including revenue refunding

bonds, notwithstanding that the same may be secured by mortgage or by the full faith and credit or by any other lawfully pledged security of either one or more participating institutions for higher education or one or more participating hospitals, or both.

SECTION 5. Said section 3 of said chapter 614 is hereby further amended by adding the following two paragraphs: —

(g) "Hospital", a nonprofit hospital within the commonwealth licensed by the department of public health.

(h) "Participating hospital", a hospital which, pursuant to the provisions of this act, undertakes the financing and construction or acquisition of a project or undertakes the refunding or refinancing of obligations or of a mortgage or of advances as provided in this act.

SECTION 6. Section 4 of said chapter 614 is hereby amended by striking out, in line 1, the caption "*Educational Facilities Authority*" and inserting in place thereof the following caption: — *Health and Educational Facilities Authority,* — and by striking out paragraph (*a*) and inserting in place thereof the following paragraph: —

(*a*) There is hereby created a body politic and corporate to be known as the "Health and Educational Facilities Authority", hereinafter in this act called the authority. Said authority is constituted a public instrumentality and the exercise by the authority of the powers conferred by this act shall be deemed and held to be the performance of an essential public function. Said authority shall consist of nine members, to be appointed by the governor, who shall be residents of the commonwealth, not more than five of whom shall be members of the same political party. At least two of the members shall be trustees, directors, officers or employees of institutions for higher education, at least two shall be trustees, directors, officers or employees of hospitals, at least one shall be a person having a favorable reputation for skill, knowledge and experience in the field of state and municipal finance, either as a partner, officer or employee of an investment banking firm which originates and purchases state and municipal securities, or as an officer or employee of an insurance company or bank whose duties relate to the purchase of state and municipal securities as an investment and to the management and control of a state and municipal securities portfolio, and at least one shall be a person having a favorable reputation for skill, knowledge and experience in the building construction field. The members of the authority first appointed shall serve for terms expiring on July first in the years nineteen hundred and sixty-nine, nineteen hundred and seventy, nineteen hundred and seventy-one, nineteen hundred and seventy-two, nineteen hundred and seventy-three, nineteen hundred and seventy-four and nineteen hundred and seventy-five, respectively, the term of each such member to be designated by the governor; except that of the two members first appointed who are trustees, directors, officers or employees of hospitals, one shall serve until July first, nineteen hundred and seventy-two and one until July first, nineteen hundred and seventy-four. Upon the expiration of the term of any member his successor shall be appointed for a term of seven years. The governor shall fill any vacancy for the remainder of the unexpired term. Any member of the authority may be removed by the governor for misfeasance, malfeasance or wilful neglect of duty or other cause after notice and a public hearing unless such notice and hearing shall be expressly waived in writing.

identified as Brown's Ledge on Chart No. 1210 or its subsequent replacement published by the United States Coast and Geodetic Survey or by its successor, extending from said baseline to the outer limits of the territorial sea of the United States. In the event that a court of competent jurisdiction decrees that the coastal baseline shall run otherwise than herein described, the territorial limits of the commonwealth in Rhode Island Sound shall be measured from such other baseline. The ocean boundary with the state of Rhode Island shall be a line running from the most southerly point of the land boundary between the commonwealth and Rhode Island through the above-mentioned point on Brown's Ledge to the furthest limits of the territorial sea of the United States. The marine boundaries of the commonwealth in the area of Nantucket Sound shall be drawn to include the entire area of Nantucket Sound as territorial waters of the commonwealth.

SECTION 2. This act shall take effect on January the first, nineteen hundred and seventy-two. The department of public works is hereby directed to incorporate the marine boundaries of the commonwealth herein described into the report, plans and maps prepared pursuant to chapter eight hundred and ten of the acts of nineteen hundred and seventy, which plans and maps shall be filed with the state secretary no later than January the first, nineteen hundred and seventy-two.

Approved November 10, 1971.

Chap. 1036. AN ACT MAKING CERTAIN CHANGES IN THE HEALTH AND EDUCATIONAL FACILITIES AUTHORITY ACT, RELATIVE TO THE POWERS AND DUTIES OF THE AUTHORITY, AND CHANGING THE NAME OF SAID AUTHORITY TO THE MASSACHUSETTS HEALTH AND EDUCATIONAL FACILITIES AUTHORITY.

Be it enacted, etc., as follows:

SECTION 1. Section 4 of chapter 614 of the acts of 1968, as amended by section 6 of chapter 454 of the acts of 1969, is hereby further amended by inserting before the word "*Health*", in line 2, the word: — *Massachusetts.*

SECTION 2. Said section 4 of said chapter 614 is hereby further amended by striking out paragraph (*e*) and inserting in place thereof the following paragraph: —

(*e*) Before the issuance of any revenue bonds under the provisions of this act, the chairman, vice chairman, executive director and assistant executive director and any other member of the authority authorized by resolution of the authority to handle funds or sign checks of the authority shall execute a surety bond in the penal sum of fifty thousand dollars, or in lieu thereof the chairman shall obtain a blanket position bond covering the executive director and every member and other employee of the authority in the penal sum of fifty thousand dollars. Each such bond shall be conditioned upon the faithful performance of the duties of the principal or the members, executive director and other employees, as the case may be, shall be executed by a surety company authorized to transact business in the commonwealth as surety, shall be approved by the attorney general and shall be filed in the office of the state secretary. The cost of each such bond shall be paid by the authority.

edge on Chart No. 1210 or its subsequent re-
the United States Coast and Geodetic Survey
ending from said baseline to the outer limits of
e United States. In the event that a court of
decrees that the coastal baseline shall run other-
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southerly point of the land boundary between
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marine boundaries of the commonwealth in the
ıd shall be drawn to include the entire area of
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shall take effect on January the first, nineteen
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the marine boundaries of the commonwealth
e report, plans and maps prepared pursuant to
and ten of the acts of nineteen hundred and
ıd maps shall be filed with the state secretary
ıe first, nineteen hundred and seventy-two.

Approved November 10, 1971.

IAKING CERTAIN CHANGES IN THE HEALTH AND
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RS AND DUTIES OF THE AUTHORITY, AND CHANG-
AME OF SAID AUTHORITY TO THE MASSACHUSETTS
ND EDUCATIONAL FACILITIES AUTHORITY.

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tion 4 of said chapter 614 is hereby further
t paragraph (*e*) and inserting in place thereof
: —

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n, vice chairman, executive director and assis-
and any other member of the authority autho-
ıe authority to handle funds or sign checks of
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the executive director and every member and
authority in the penal sum of fifty thousand
ıd shall be conditioned upon the faithful per-
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ved by the attorney general and shall be filed
secretary. The cost of each such bond shall be

Section 3. Section 8 of said chapter 614, as amended by section 10 of chapter 454 of the acts of 1969, is hereby further amended by striking out, in lines 14 and 15, the words ", free and clear of all liens and encumbrances".

Section 4. Section 9 of said chapter 614 is hereby amended by inserting after the fourth sentence the following sentence: — Such resolution or resolutions may delegate to the executive director, assistant executive director, or any member of the authority or any combination of them, the power to determine any of the details of the notes and to award such notes to a purchaser or purchasers.

Section 5. Paragraph (*c*) of section 10 of said chapter 614, as amended by section 11 of chapter 454 of the acts of 1969, is hereby further amended by inserting after the second sentence the following sentence: — Such resolution or resolutions may delegate to the executive director, assistant executive director or any member of the authority or any combination of them, the power to determine any of the matters set forth in this section and the power to award the bonds to a purchaser or purchasers at public sale or to negotiate a sale to a purchaser or purchasers provided in the latter case that the bonds are to be reoffered to the public.

Section 6. Section 20 of said chapter 614 is hereby amended by adding the following two paragraphs: —

Notwithstanding any provision of chapter one hundred and six of the General Laws or of any other provision of law, the authority by the filing of financing statements, as provided in said chapter one hundred and six, may perfect security interests in revenues and receipts of participating hospitals and participating institutions for higher education, whether in the form of proceeds of accounts receivable or contract rights or otherwise, and in any rights to receive such revenues and receipts, and such perfected security interests shall take priority over any subsequently perfected security interests in such revenues, receipts or rights or in the accounts receivable, goods, contract rights, or other rights or personal property giving rise to such revenues, receipts or rights provided that the financing statements filed by the authority contain a reference to this section.

In calculating the value of real and personal property for the purpose of any general or special law limiting the amount of real and personal property which may be owned or held by an institution for higher education or a hospital, there shall be excluded from such calculation any real or personal property which forms or has formed any part of the cost of a project financed or refinanced in whole or in part by the authority.

Approved November 10, 1971.

Chap. 1037. An Act providing for the compensation of the members of the Massachusetts Parking Authority.

Be it enacted, etc., as follows:

Section 3 of chapter 606 of the acts of 1958 is hereby amended by striking out the second paragraph and inserting in place thereof the following paragraph: —

The Authority shall consist of three members, two of whom, hereinafter referred to as the governer's appointees, shall be appointed by the

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DOCUMENT 01398396

Southern Middlesex LAND COURT

REGISTRY DISTRICT

RECEIVED FOR REGISTRATION

On: Dec 23,2005 at 03:15P

Document Fee: 125.00
Receipt Total: $325.00

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STREET ADDRESS

CITY OR TOWN ZIP

Attachment 8 - Certificate of the Secretary of Energy and Environmental Affairs on the Single Environmental Impact Report, July 1, 2016

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

July 1, 2016

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
SINGLE ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Central Utilities Plant Second Century Plant Expansion
PROJECT MUNICIPALITY	: Cambridge
PROJECT WATERSHED	: Charles River
EEA NUMBER	: 15453
PROJECT PROPONENT	: Massachusetts Institute of Technology
DATE NOTICED IN MONITOR	: May 25, 2016

Pursuant to the Massachusetts Environmental Policy Act (MEPA) (M.G. L. c. 30, ss. 61-62I) and Section 11.07 of the MEPA regulations (301 CMR 11.00), I have reviewed the Single Environmental Impact Report (SEIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations.

Project Description

As described in the Expanded Environmental Notification Form (EENF) and SEIR, the project will expand the Proponent's Central Utilities Plant (CUP) to meet future energy demand, increase reliability and resilience, and meet energy efficiency and carbon emissions reduction goals. The CUP includes a Combined Heat and Power (CHP) system that provides electricity, heat, and steam to over 100 buildings on the campus of the Massachusetts Institute of Technology (MIT), including dormitories, classroom buildings, laboratories, offices, and recreational facilities.

The project will include the following components:

- Replacement of a 21-megawatt (MW) combustion turbine generator (CTG) with two nominal 22-MW gas-fired CTGs, each with a heat recovery steam generator (HRSG) with a gas fired duct burner;
- Addition of a two-MW Ultra Low Sulfur Diesel (ULSD) fired cold-start engine to start the CTGs in an emergency;
- Conversion of five boilers from ULSD fuel to natural gas;
- Seek an increase in permitting limits of two gas-fired boilers to take advantage of the energy-efficiency of the units;
- Replacement of six cooling towers with three new cooling towers (four existing cooling towers will be retained); and,
- Installation of a new gas regulator station.

The CTGs and boilers will use natural gas as the primary fuel source, and ULSD for testing purposes and as a backup fuel source when gas is not available. Use of backup fuel will not exceed 168 hours per year. The duct burners, using gas as a fuel source, will provide a supplemental heat source to the HRSGs to produce additional steam when necessary.

The new CTGs, HRSGs, pollution control equipment, and regulator station will be installed within a 184-foot by 118-ft by 63-ft high addition to the CUP. It will be constructed in a parking lot adjacent to the CUP. Air emissions will be released through a 167-ft high stack containing flues from each HRSG. The emergency generator will be mounted on the roof of the new building and will have its own exhaust stack extending 165 feet above ground level. A new gas line will be constructed to the site from a nearby gas main. Critical project components will be elevated above the 500-year flood elevation to provide resiliency from extreme storm events.

Project Site

The existing CUP commenced operations in 1995. It provides 60 percent of the electricity on the MIT campus and generates steam for heating and for cooling via steam-driven chillers. The CUP is linked to the campus by electrical, steam, and chilled water distribution systems. It is located in Building 42, which is bordered by Vassar Street to the south and Albany Street to the north. MIT buildings surround the CUP to the east and west. The facility is located on either side of the Grand Junction rail right-of-way (ROW). An elevated and enclosed walkway spans the railroad tracks.

The existing CUP includes a 21-MW CTG with an HRSG and duct burner, five boilers, a 2-MW emergency generator, and ten cooling towers. Exhaust gasses are vented from stacks ranging in height from 115 to 177 feet above ground level.

Portions of the existing CUP and the area of its proposed expansion are located within landlocked tidelands. The site does not contain any properties listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth. Four nearby buildings are listed in the State Register of Historic Places. The site is located near three Historic Districts, including the MIT Historic District encompassing the original campus, the Charles River Basin Historic District, and the Old Cambridgeport Historic District.

The project site is located within a five-mile radius of Environmental Justice (EJ) communities in Cambridge, Boston, Brookline, Newton, Watertown, Arlington, Medford, Malden, Everett, Somerville, and Revere. According to the EEA Environmental Justice Viewer (http://maps.massgis.state.ma.us/map_ol/ej.php), the EJ communities in these municipalities are classified as: minority; income; English isolation; minority and income; minority and English isolation; income and English isolation; and, minority, income, and English isolation.

Changes Since the Filing of the EENF

The Preferred Alternative has been modified with the selection of slightly smaller Solar Titan 250 CTGs in place of the GE LM2500 CTGs considered in the EENF analysis. According to the SEIR, the use of these CTGs will allow for more efficient generation of electricity and thermal energy, and will result in lower emissions of Greenhouse Gas (GHG) and other pollutants compared to the CTGs evaluated in the EENF. The SEIR included updated GHG and air quality analyses to reflect the change in the CTGs.

The design of the building housing the new CTGs has been refined and resulted in a smaller footprint of the proposed building has been reduced. The building will measure 184 ft by 118 ft rather than 224 ft by 118 ft as described on the EENF. The project has also been revised to include a 40-ft wide pedestrian path along the north side of the building that will connect Albany Street to the railroad ROW and other MIT buildings.

Jurisdiction and Permitting

The project is subject to a Mandatory EIR pursuant to 301 CMR Section 11.03(8)(a)(2) of the MEPA regulations because it requires a State Agency Action and will modify an existing Stationary Source with federal potential emissions that collectively will result, after construction and the imposition of required controls, in 75,000 tons per year (tpy) of GHGs based on CO_2 equivalent. The project exceeds the ENF threshold at 301 CMR 11.03 (7)(b)(2) because it consists of expansion of an existing electric generating facility by 25 or more MW. The project requires a Major Comprehensive Air Plan Approval (MCPA) from the Massachusetts Department of Environmental Protection (MassDEP).

The project requires a Public Benefits Determination and is subject to review under the May 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol ("the Policy"). In addition, the project is subject to the Executive Office of Energy and Environmental Affairs (EEA) EJ Policy.

The project requires federal air permitting under the Clean Air Act (CAA), specifically the Prevention of Significant Deterioration (PSD) permitting requirements. Pursuant to the Agreement for Delegation of the Federal Prevention of Significant Deterioration Program, dated April 2011, by the United States Environmental Protection Agency (EPA), Region I with MassDEP, MassDEP is delegated to administer the federal PSD program in Massachusetts.

The project is not seeking Financial Assistance from the Commonwealth. Therefore, MEPA jurisdiction is limited to the subject matter of required State Agency Actions that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations. These include GHG emissions, land alteration, air quality, and tidelands.

Environmental Impacts

Potential environmental impacts of the project include emissions of air pollutants, emissions of GHG, and noise. Emissions will include 28.9 tons per year (tpy) of nitrous oxide (NO_x), 20.3 tpy of carbon monoxide (CO), 38.5 tpy of volatile organic compounds (VOC), 55.4 tpy of particulate matter (PM), 7.8 tpy of sulfur dioxide (SO_2); and 362,740 tpy of carbon dioxide (CO_2). As a result of the selection of a different type of CTG, potential pollutant levels have decreased compared to those presented in the EENF. The project will avoid, minimize and mitigate potential impacts by using clean fuels and pollution control technologies, such as selective catalytic reduction (SCR) and oxidation catalysts. The project will mitigate noise impacts by installing the CTGs and other equipment in acoustically designed enclosures and using mufflers on ventilation, intake and exhaust systems.

The project will be supported primarily by existing infrastructure. The project will increase the CUP's water use by 65,600 gallons per day (gpd) and decrease its wastewater generation by 3,200 gpd. Stormwater from the roof of the new building will be collected for use on campus and will not be directed into the City of Cambridge's stormwater system.

Review of the SEIR

The SEIR described the project, including its major components such as the CTGs, HRSGs, boilers, and cooling towers, and included plans of existing conditions, the proposed building and interior components, and associated infrastructure. It identified changes to the project, including the selection of a slightly smaller CTG unit and a change to the design of the CUP building, and responded to comments submitted on the EENF. The SEIR described the impacts of the project, including emission of air pollutants and noise, and mitigation measures to minimize these impacts. The SEIR included additional information regarding the EJ analysis and outreach conducted by the proponent an analysis of alternatives for meeting the energy reliability and demand needs of the campus. It provided revised analyses of projected air emissions that serve as the basis for the project's air quality permit applications. The SEIR also provided a revised GHG analysis of the CUP and described measures incorporated into the design to minimize GHG emissions. The SEIR provided technical specifications of the Solar Titan 250 CTG unit selected for use in the CUP.

Environmental Justice

The project exceeds an EIR threshold for air and is located within five miles of designated EJ populations. Therefore, it is subject to the EJ Policy, which requires enhanced public participation and enhanced analysis of impacts and mitigation under MEPA. The SEIR included a chapter describing the Proponent's enhanced outreach efforts and impact analysis. In addition to the outreach efforts described in the EENF, the Proponent prepared revised fact sheets in Spanish, Portuguese, Cantonese, and French describing the project and published a notice of the availability of the SEIR in Portuguese, Spanish, and Chinese in local newspapers.

- Preparation of a fact sheet, translated into Spanish, Portuguese, Chinese, and French, providing a summary of the project, its impacts, and public comment opportunities;

- Notice of the EENF review was placed in newspapers with local circulation, including newspapers that publish in Portuguese, Spanish, and Chinese; and
- Spanish, Cantonese, and Portuguese interpreters were available at the MEPA Consultation meeting on January 14, 2016.

The air quality dispersion modeling conducted for the PSD application included an analysis of the project's effects on EJ populations. The SEIR included a table that identified the population-weighted average concentration of PM_{10} and $PM_{2.5}$ for averaging times using worst case impacts from modeling of the CUP operations. The population weighted averages for EJ communities within five miles of the site were compared to those of non-EJ communities. The analysis concluded that the differences were not significant and that the project impacts will not disproportionately affect EJ communities.

The SEIR provided additional information and analysis in response to the comment letter submitted by the Department of Public Health (DPH) on the EENF. The SEIR summarized the review of control technologies to be adopted by the project, including the use of clean-burning fuels and other technologies reviewed in the Best Available Control Technology (BACT) analysis performed as part of the MCPA application submitted to MassDEP. The analysis demonstrated that substitution of oil with gas to fuel the CUP would reduce the peak concentrations of NO_x and $PM_{2.5}$ by over 50 percent in the vicinity of the project site. The SEIR included a map showing the results of air dispersion modeling indicating that the area subject to Significant Impact Levels (SIL) of these pollutants would be reduced and much more confined to the vicinity of MIT.

The SEIR provided an evaluation of the baseline health of EJ communities in the broader area surrounding the project site using data from the DPH's Environmental Public Health Tracking website. The analysis reviewed cancer data from 2007 to 2011 and the incidence of asthma from 2008 to 2012. Cancer rates, including pediatric cancer rates, were found to be similar to the statewide average rate. The analysis also found that asthma rates are not significantly higher than the statewide average, although rates of pediatric asthma varied by school in the surrounding area, with some schools having rates above and some below the statewide value. As noted earlier, the reduced emissions from the CUP compared to existing conditions is expected to reduce peak concentrations of airborne pollutants, including within nearby EJ communities.

Alternatives Analysis

The purpose of the project is to replace the existing cogeneration system as it nears the end of its service life, maintain reliability and resilience of the energy system, meet the energy demand of the campus, and to incorporate energy efficiency and other measures to reach MIT's GHG reduction goals. The SEIR did not evaluate additional alternatives, but described the Preferred Alternative as modified by the selection of the smaller Solar Titan 250 CTG units. The refinement of the final design of the CUP was anticipated in the EENF.

The Proponent's *Plan for Climate Action*, released in 2015, established a goal of reducing GHG emissions from campus activities by at least 32 percent by 2030. The Proponent has identified GHG reduction efforts, such as integration of on-site renewable energy generation and clean power purchased from off-site sources that are being explored as ways to meet the GHG goals. The SEIR described the

suitability of the Preferred Alternative under a future scenario where the Proponent has achieved significant reductions in energy use and increased generation or purchase of renewable energy. The CTGs are projected to operate 78 percent of the time to meet MIT's electrical and thermal needs. According to the SEIR, the CUP operations can be reduced by 20 percent and still operate efficiently and within permit parameters. When the CTGs are operating, the HRSGs are anticipated to meet approximately 93 percent of the campus's annual thermal load over the 20-year life of the system. To meet its GHG reduction goals, the Proponent is pursuing means of reducing building energy use by 15 to 40 percent by 2030, installing rooftop solar photovoltaic (PV) systems, purchasing electricity from renewable sources, and reducing mobile source emissions.

Air Quality

The SEIR provided a revised discussion of the project's air quality impacts and mitigation measures based on the proposed use of Solar Titan 250 CTGs. The SEIR reviewed pollution emission controls through a series of BACT analyses for pollutant emissions from the CTGs, duct burners, cold-start engine, and boilers. It described the project's air quality impacts based on the selected emissions controls and in comparison to National Ambient Air Quality Standards (NAAQS) or Massachusetts Ambient Air Quality Standards (MAAQS). The results of the analyses presented in the SEIR do not differ significantly from the analyses presented in the EENF.

BACT Analysis

According to the SEIR, the Solar Titan 250 CTGs will continue to meet the emission limits from the Top-Case and Top-Down BACT analyses presented in the EENF for the LM2500 units. The Proponent will continue to use the Top-Case BACT for the CTGs and duct burners as defined in MassDEP guidelines. The Top-Case BACT specified potential emissions control technologies that can be used for the CTGs and duct burners and the resulting emission rates. The project will use Selective Catalytic Reduction (SCR) as the control technology for NO_x and ammonia (NH_3) and oxidation catalysts to control CO and VOC. The project will use clean fuels (natural gas and ULSD) that are low in sulfur to control particulate matter (PM) and SO_2. The CTGs and duct burners will meet the Top-Case BACT emission rates during full-load, steady state operations. The SEIR noted that emission rates for NO_x, CO, VOC, and NH_3 will be slightly higher when the CTGs and duct burners are operating in certain conditions, such as using ULSD as fuel or during transient operating conditions when the CTGs are responding to changes in energy demand. According to the SEIR, the use of Solar Titan 250 units will require fewer variations and less relief from Top-Case BACT than were proposed in the EENF for the LM 2500 CTGs.

The SEIR also presented essentially the same separate Top-Case BACT analyses for the cold-start engine and for Boilers 7 and 9 that were provided in the EENF. The Top-Case BACT for the cold-start engine specifies the use of ULSD, operating limits of 300 hours per 12-month period, and emission rates that meet EPA limits for off-road engines. The Top-Case BACT for boilers 7 and 9 will also involve the use of clean fuels to meet the BACT emissions rates for CO, NO_x, PM, SO_2, VOC, and CO_2.

Based on the use of BACT as described above, consisting of SCR, oxidation catalysts, and the use of clean fuels, the total potential emissions of the project are: 28.9 tpy of NO_x; 20.3 tpy of CO; 38.5 tpy of VOC; 55.2 tpy of PM; 7.8 tpy of SO_2; and 362,740 tpy of CO_2. These emission rates represent

reductions compared to those proposed in the EENF. As discussed in the GHG section below, the expected actual CO_2 emissions are expected to range from 133,980 tpy during the first year of operations in 2019 to 151,794 tpy in 2030 due to increasing energy demand.

MassDEP indicated that it has conducted a preliminary review of the MCPA application and will complete its review after the MEPA process has concluded. MassDEP comments did not identify any additional information required with regard to the BACT analysis.

Modeling and Potential Impacts

The SEIR provided a summary of the air dispersion modeling analysis of the project that was included in the MCPA application. This analysis was performed to demonstrate that the project will not cause or contribute to the violation of NAAQS or MAAQS. The SEIR described the methodology and models used in the analysis, including limitations and assumptions, and the sources of data used to establish concentrations for all pollutants.

The EPA-approved AEROMOD model was used for the analysis. This analysis was prepared by first determining the operating conditions under which the model predicts that the CUP would have its worst-case impact on air quality. Two scenarios were developed. Scenario 1 represented an initial short-term operating condition when the existing CTG (and associated duct burner, HRSG, and boilers) will be operating alongside one new CTG unit. Scenario 2 represented the proposed project. To determine the worst case scenarios for each scenario, the model calculated the short-term (24 hours or less) and long-term (annual) emissions generated by the CTGs, duct burners, cold-start engine, and boilers under a range of operating conditions.

The modeled concentrations of emissions from the CUP under both scenarios were then compared to SILs, which are the levels below which a source is expected to have insignificant impact on air quality. Concentrations of SO_2 and CO were below SILs. The emissions of these pollutants were then modeled with ambient concentrations of these contaminants as measured at the nearby Kenmore Square air monitoring station in Boston. The physical dimensions of the stacks and meteorological data were incorporated into the dispersion model. The combined effect of the CUP and ambient air concentrations of SO_2 and CO was compared to the NAAQS/MAAQS to determine if the project will cause any of the contaminants to exceed the standards. The analysis concluded that, for both scenarios, the modeled maximum daily one-hour and three-hour concentrations, as well as the 24-hour and annual concentrations of SO_2 and CO, would be no more than 13 percent of the corresponding NAAQS/MAAQS.

Because the model determined that the CUP would emit concentrations of PM and NO_2 that exceeded SILs, a cumulative analysis of the CUP emissions and emissions of these contaminants from six nearby facilities was conducted. The purpose of the cumulative analysis was to determine if the CUP emissions would contribute to a violation of NAAQS or MAAQS in combination with the other facilities. The model results indicated that the addition the cumulative impact of the CUP would not contribute to violations of NAAQS or MAAQS. The SEIR also included increment modeling for particulates performed in connection with the PSD permit application. The PSD increment reflects the maximum pollutant concentration that is allowed to occur over a baseline value. According to the SEIR, the project will not exceed the allowable incremental increase for PM.

Greenhouse Gas Emissions (GHG)

This project is subject to review under the May 5, 2010 MEPA Greenhouse Gas Emission Policy and Protocol (GHG Policy). The GHG Policy requires identification of GHG emissions associated with the project and adoption of all feasible measures to avoid, minimize and mitigate these increases. The GHG Policy is one element of a comprehensive effort to meet the Commonwealth's obligations under the Global Warming Solutions Act (GWSA) which include reducing carbon emissions by between 10 and 25 percent below 1990 emissions levels by the year 2020, and by 80 percent below 1990 emissions levels by the year 2050. Consistent with MEPA's overall purpose to evaluate alternatives that avoid, minimize and mitigate environmental impacts to the maximum extent practicable (301 CMR 11.01), the Policy requires that GHG impacts of projects have been carefully considered and that all feasible means and measures to reduce those impacts are adopted. The Policy requires that all projects that are subject to an EIR quantify GHG emissions, evaluate measures that could reduce GHG emissions and quantify potential reductions of mitigation measures. This is a case-by-case inquiry that allows project proponents to select mitigation measures that are determined to be feasible for the particular project being proposed, thereby providing project proponents with maximum flexibility to design their projects.

GHG emissions from two alternatives were evaluated, a Base Case representing a "business as usual" scenario with separate generation of electricity and steam, and the Preferred Alternative, as described in the SEIR. GHG emissions for both cases were calculated based on the following emissions factors:

- 117 pounds of CO_2 per million British Thermal Unit (BTU) of natural gas based on the U.S. Energy Information Administration national average;
- 941 pounds of CO_2 per megawatt-hour of electricity generated based on current Marginal Emission Factor for the *Independent System Operator-New England (ISO-NE) Electric Generator Air Emissions Report (January 2016)* for calculation involving the analysis of a CHP system; and
- 726 pounds of CO_2 per megawatt-hour of electricity generated for calculation of balance of plant GHG savings based on the ISO-NE *Electric Generator Air Emissions Report (January 2016).*

As required, the Single EIR provided additional information on the performance of the selected and alternative CTGs in to meet required electrical and thermal loads and addresses other comments on GHG emissions. The SEIR included the results of dispatch modeling for each of the years from 2019 – 2030 for different turbine options. As noted previously, MIT has selected 2 smaller CTG's that allow more hours of cogeneration and run more efficiently at the forecasted load. In addition, the choice of CTG's will reduce the load on the electrical system in Cambridge during peak periods. MIT has selected a technology that will significantly reduce GHG emissions, presented a comprehensive analysis to demonstrate how the technology was selected, and presented associated emissions reductions.

The SEIR included an updated analysis of GHG emissions associated with the Base Case and the Preferred Alternative. The model determined how operation of the proposed CUP would affect the use of electricity and steam onsite and how much electricity would have to be imported from the grid. In this analysis, the difference between the GHG emissions of the Preferred Alternative and the displaced

emissions from grid electricity and conventional heating systems represents the overall reduction in GHG emissions as a result of the implementation of the Preferred Alternative. Selection of the smaller CTG's will result in a very significant decrease in GHG emissions.

The EENF Alternative identified 192,000 tpy of GHG emissions and displacement of 217,000 tpy consisting of 113,000 tpy from grid electricity and 104,000 tpy from natural gas used to power a conventional heating system. The EENF Alternative would reduce GHG emissions by 25,000 tpy, or approximately 12 percent.

GHG emissions associated with the SEIR Preferred Alternative (Year 2030) would be 151,794 tpy and displacement of 239,632 tpy consisting of 132,276 tpy from grid electricity and 107,355 tpy from natural gas. The Preferred Alternative would reduce GHG emissions by 87,838 tpy, or approximately 37 percent.

The SEIR identified upgrades that are being considered to improve the overall energy efficiency of the existing facility and MIT operations. These include: heat recovery for use in heating dormitories through medium temperature hot water systems; automation of the chilled water system to maximize overall efficiency; blow down heat recovery for all boilers; capture of rain water for use in cooling tower make up, reducing use from city water system; improved cooling tower efficiency using permanent magnet motors to drive the cooling tower fans, reducing electrical power usage; improved chilled water efficiency through high efficiency series counter flow chillers; and, connecting buildings with standalone compressors to the CUP air system.

The SEIR reviewed other alternatives for generating all or a portion of the electricity and steam needed at the campus. According to the EENF, the campus does not have sufficient space on rooftops or on the ground to install a solar photovoltaic (PV) or solar hot water heating system, wind turbines, or ground source heat pumps to an extent that could provide a significant amount of renewable energy. MIT has 70 kw of installed capacity on campus and is undertaking a comprehensive assessment of roofs to identify opportunities for sustainable roof technology including solar and green roofs.

The SEIR described features of the Preferred Alternative that would serve to minimize GHG emissions and analyzed the effect of changes to balance of plant operations on GHG emissions. The Mitigation section of this Certificate identifies measures that will reduce GHG emissions, including the technology, fuel choice balance of plant elements.

Comments from DOER note the substantive response to its comments provided by MIT and applaud the commitment to expand CHP. The comments emphasize the significant reductions in overall source emissions of GHG and the incorporation of measures to provide important energy resiliency capabilities including the ability to operate in island mode during grid outages.

Noise

The SEIR summarized the noise analysis included in the MCPA application. The project has been designed to comply with MassDEP's Noise Policy and the City of Cambridge's Noise Ordinance. Noise generated by the project will include sound from the CTGs, HRSGs, fuel gas compressors, chillers, new cooling towers, cold-start engine, and supporting equipment. Noise generated by the Solar

Titan 250 CTGs is not expected to be significantly different than that modeled for the LM2500 units studies in the EENF.

Ambient noise levels were sampled on two consecutive nights in August, 2014. The analysis in the EENF estimated sound levels at the property lines and nearest residential locations and compared these levels to ambient noise levels at the quietest time of the day (midnight to 4:00 AM). The noise levels at the project site will be approximately 85 dBA or less. The project will raise noise levels at three property lines and at the closest residential locations by three decibels (dBA) or less, which meets the standard of a 10 dBA increase allowed by MassDEP's Noise Policy and will meet the standard for pure tones.

The Mitigation section of this Certificate identifies measures to avoid, minimize and mitigate noise impacts.

Climate Change Adaptation and Resiliency

The SEIR provided additional information regarding the climate change resiliency features and considerations incorporated into the project. The CUP has been designed based on expected flood levels generated by 10-year and 100-year storm events modeled by the City of Cambridge's Climate Change Vulnerability Assessment (CCVA). The CCVA projected the elevation of these flood events to be approximately two to three feet above grade. The CUP has been designed to locate all critical equipment at elevation 26 feet (Cambridge Datum), which is approximately three feet higher than the preliminary 500-year flood elevation determined by the Federal Emergency Management Agency (FEMA) for Boston Inner Harbor. The CUP has been designed to operate under higher temperature conditions expected in the future and will include measures to mitigate the "heat island effect," including landscaping and the use of reflective paving and roofing materials. The project will also improve resilience by allowing the campus to continue to operate during an outage of the regional distribution grid. The project will allow the campus to have more energy distribution points located in areas protected from climate that will provide a more stable distribution of power to the campus and the ability to prioritize the distribution of power in the event of an outside utility loss of power.

Stormwater

The site is currently a paved parking lot. The project will not increase impervious area. According to the SEIR, rainwater from the roof of the CUP will be discharged to an existing approximately 145,000 gallon water holding basin. Water from this holding basin will be used in the facility's cooling towers rather than discharged into the City of Cambridge's stormwater system. If the cooling towers are cannot accept more stormwater, it will be directed to on-site infiltrating catch basins.

Construction

The SEIR described construction procedures and identified mitigation measures to minimize impacts during construction, including dust and noise control measures, recycling of construction solid waste, hazardous waste management, stormwater management. Mitigation measures are identified in the Mitigation section of this Certificate.

Landlocked Tidelands/Public Benefits Determination

A portion of the project will occur within landlocked tidelands as defined by the Waterways Regulations (310 CMR 9.00) and is subject to the Public Benefit Determination regulations (301 CMR 13.00). The SEIR provided a public benefits analysis of the project consistent with the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168) (the Act).

The project will replace a surface parking lot with expansion of a facility which will provide resiliency to the campus to protect research and public safety, promote energy conservation and GHG reduction, and improve gas supply to the site and the surrounding area of Cambridge through installation of a new regulator station to be used by Eversource Energy. In addition, the project will retain and use rainwater to reduce stormwater.

The site design incorporates walkways, lighting, seating and landscaping. The reduced footprint of the CUP will support a 40-ft wide path along the east side of the building that will provide a connection between Albany Street and Vassar Street, and associated bicycle infrastructure. The SEIR provided a cross-section of the proposed Grand Junction multi-use path in relation to existing buildings and the proposed CUP building. According to the SEIR, the project will retain an approximately 24-ft ROW that would not preclude future construction of the Grand Junction Community Path.

Comments from the City of Cambridge, the Cambridge Bicycle Committee, and the Boston Cyclists Union continue to urge MIT retain a wider ROW (32-feet) and construct a portion of the Path to support the City's efforts to enhance multi-modal transportation. I encourage MIT to consider design changes that could increase the width of the ROW.

Consistent with Section 8 of the Act, I must conduct a Public Benefits Review as part of the EIR review of projects located on landlocked tidelands that entail new use or modification of an existing use. I will issue a Public Benefits Determination (PBD) within 30 days of the issuance of the final Certificate for this project.

Mitigation/Draft Section 61 Findings

The SEIR contains a separate chapter on mitigation measures and draft Section 61 Findings for MassDEP. It describes mitigation measures and contains clear commitments to mitigation. The Proponent has committed to implement the following measures to avoid, minimize, and mitigate environmental impacts:

GHG Emissions

- Use variable frequency drives (VFD) for fuel gas compressor;
- Review use of high-efficiency motors and VFDs in final project design.
- Use waste heat to assist in urea vaporization;
- Use of an adsorption rotary drum dryer associated with the compressed air system;
- Construct HRSGs with surface area and piping required to implement a Medium Temperature Hot Water system;

- Use light-emitting diode (LED) lighting and an occupancy lighting system in the building expansion to reduce electricity use;and,
- Provide a GHG self-certification to the MEPA Office.

Air Quality

- Use of clean-burning fuels (natural gas and ULSD) that are low in sulfur to control particulate matter (PM) and SO_2;
- Removal of residual oil firing for existing Boilers 3, 4 and 5 and removal of ULSD firing for existing Boilers 7 and 9;
- Low-NO_x combustors and use of Selective Catalytic Reduction (SCR) to control NO_x;
- Minimize CO and VOC emissions through combustion control and use of Ammonia (NH_3) and oxidation catalysts;
- CTs include option to use dry low-NO_x combustors instead of water injection;
- High efficiency drift eliminators will minimize emissions from new cooling towers;
- Limit use of ULSD to 300 hours per 12-month period; and,
- Will comply with emission rates that meet EPA limits for off-road engines.

Noise

- Noise producing equipment (e.g. CTGs, cogeneration equipment, fuel gas compressor and drive motor, and diesel generator) will be enclosed in sound-attenuating materials, enclosures or behind sound barrier walls;
- Mufflers will be installed on the gas turbine air intake, gas exhaust, turbine enclosure and ventilation systems;
- Mufflers will be installed on the non-emergency steam vents as necessary;
- Reduced-noise fans with VFDs will be used in the cooling towers; and
- Equipment and building air ventilation paths will include treatments (mufflers, lined ducts, acoustic louvers, and local barriers) with suitable sound attenuation; and,
- The shell of the new building will be designed to reduce noise levels to 55 to 60 dBA directly outside the building walls facing the neighborhood.

Construction Period

- Use fencing and barricades to isolate construction areas from pedestrians;
- Encourage use of alternative transportation to the site by construction workers;
- Use construction equipment that meets or exceeds EPA Exhaust Emission Standards;
- Use wetting agents as necessary and covered trucks to reduce the spread of dust;
- Establish a tire cleaning area to prevent dirt from reaching city streets;
- Minimize exposed storage of debris on-site;
- Clean sidewalks and streets to minimize dust aggregation;
- Turn off idling equipment;
- Use and maintain mufflers on construction equipment and enclosures around continuously-operating equipment to reduce noise;
- Separate or shield noisy equipment from sensitive receptors;
- Divert construction waste from landfills by recycling waste material;
- Conduct a hazardous waste survey prior to the start of construction to ensure appropriate disposal of hazardous material, including asbestos; and

- Install stormwater management controls to meet City of Cambridge requirements.
- Use a Certified Industrial Hygienist to develop and implement Dust Mitigation Plan and air quality requirements during activities that could expose people to contaminated soil or groundwater or other hazardous conditions.

Conclusion

Based on a review of the SEIR and in consultation with State Agencies, I find that the SEIR adequately and properly complies with MEPA and its implementing regulations. The project may proceed to permitting. State Agencies and the Proponent should forward copies of the final Section 61 Findings to the MEPA Office for publication in accordance with 301 CMR 11.12.

July 1, 2016
Date

Matthew A. Beaton

Comments received:

06/20/16	Cambridge Bicycle Committee
06/24/16	Massachusetts Department of Environmental Protection (MassDEP) – Northeast Regional Office (NERO)
06/24/16	City of Cambridge
06/24/16	Cambridge Pedestrian Committee
06/24/16	Boston Cyclists Union
06/27/16	Department of Energy Resources (DOER)

MAB/AJS/ajs

Buckley, Deirdre (EEA)

From: Strysky, Alexander (EEA)
Sent: Tuesday, June 28, 2016 9:44 PM
To: Buckley, Deirdre (EEA)
Subject: Fw: CBC Follow-up Comments re: MIT Central Utilities Plant Second Century Plant Expansion July 20, 2016
Attachments: CBC Response 6-20-16 MIT Central Utilities Plant Expansion.pdf

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From: J Adams <jon1adams@hotmail.com>
Sent: Monday, June 20, 2016 11:37 PM
To: Strysky, Alexander (EEA); csnowdon@epsilonassociates.com
Cc: Seiderman, Cara; cbikecomm@googlegroups.com
Subject: CBC Follow-up Comments re: MIT Central Utilities Plant Second Century Plant Expansion July 20, 2016

Good evening, please see the attachment which contains follow-up comments from the Cambridge Bicycle Committee regarding the MIT Central Utilities Plant Second Century Plant Expansion. We appreciate the opportunity to provide feedback on this important project and maintain interest in ongoing developments.

Best regards,
Jonathan Adams
On behalf of the Cambridge Bicycle Committee

Cambridge Bicycle Committee
Cambridge City Hall Annex
344 Broadway
Cambridge, MA 02139
June 20, 2016

Secretary, Matthew A. Beaton
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston MA 02114
By Email (alexander.strysky@state.ma.us, csnowdon@epsilonassociates.com)

Re: MIT Central Utilities Plant Second Century Plant Expansion & Impact on Grand Junction Community Path

Dear Secretary Beaton,

Thank you for your response to the recommendations made by the Cambridge Bicycle Committee regarding the proposed MIT Central Utilities Plant Second Century Plant Expansion. We are pleased to see that we share a common interest in making this expansion project work well and to that end many of the recommendations we suggested are already anticipated. The Cambridge Bicycle Committee is committed to ensuring a feasible, community-friendly and constructive approach to the upgrade of MIT's utilities plant and we stress the following points as vital components of this plan. Implementation of these points will only bolster MIT's standing within the community as a student-focused, environmentally and family-friendly institution.

We respectfully suggest that MIT construct the path along the Grand Junction as its public contribution as part of the construction of this facility. A proposal in this location should be providing public benefits; this construction as proposed further limits public access to the right of way. The construction of the path would also address Environmental Justice concerns, as it would provide enhanced open space access for people living in this dense urban environment, by enabling them to eventually travel along a linear park (the Grand Junction) and access the Charles River and the North Point parks.

CBC.1 Management of the Grand Junction Right of Way

> *Epsilon response: The agreements for the management of the path will be determined by a discussion between the interested parties.*

CBC.1a The Cambridge Bicycle Committee maintains strong interest in the Grand Junction pathway progress and is pleased to participate in these discussions.

CBC.2 Maintain Current Width of Grand Junction

Epsilon response: As noted in Response to Comment CAM.25, the 24-foot dimension is sufficient to accommodate a multi-use path, the service drive, and the railroad. It will be clear of meters, pipes and other obstacles. There are plans for person-access doors in the rear of the building, but they will not interfere with the 24-foot clear horizontal dimension.

CBC.2a The recommended MassDOT multi-use path is accomplished by a 32-foot clearance which excludes vehicular traffic (except by emergency vehicles or rare circumstances) sharing the pedestrian and cyclist section of the path. This is necessary to allow for the safe and secure usage of the Grand Junction path by people of all ages and abilities. While portions of the proposed Grand Junction space are less than the recommended MassDOT standard for multi-use paths, this does not justify a new structure that further reduces the width of the path at the location of the MIT central utilities plant. In addition, as proposed the structure will extend above the Grand Junction space, creating a naturally darker and more enclosed space, distracting from the usability of the space. Assuring a 32-foot horizontal dimension will be an adequate compromise to enclosing the vertical space in this section of the pathway.

CBC.6 *Grand Junction Advancement*

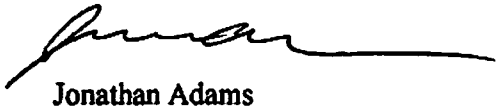
Epsilon response: As stated in Response to Comment CAM.20 above, there are no plans to construct any portion of the Grand Junction pathway at this time or as part of the Project.

CBC.6a The Grand Junction pathway construction is progressing, most recently with the historical ribbon cutting ceremony for the section of the Grand Junction pathway at the corner of Main Street and Galileo Galilei Way. MITs commitment to this important infrastructure will improve circulation in and around the MIT campus for students, visitors, and local community alike. Building into the plans basic pavement markings and pathway designs are excellent and simple ways to make great progress, moving the pathway project forward. We strongly encourage MIT to view the construction of the Main Street to Massachusetts Avenue portion of the Grand Junction pathway as an opportunity that cannot be missed. As articulated in the City's original feasibility study of the Grand Junction it has always been the case that path connections, even only a block in length, have high value.

Again, we thank you for your attention to this matter, and for your continued support of bicycle and pedestrian facilities in Cambridge throughout this and many more projects. We reinforce

MassDOT's recommendation that a horizontal width of at least 32-feet is necessary to create a safe, enjoyable, and usable space by all vested parties.

Yours Sincerely,



Jonathan Adams

On behalf of the Cambridge Bicycle Committee

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

June 24, 2016

Matthew A. Beaton, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

Attn: MEPA Unit

RE: Cambridge
Central Utilities Plant Second Century Plant Expansion
59 Vassar Street, Building 42C
EEA # 15453 (previously EEA #7856)

Dear Secretary Beaton:

The Massachusetts Department of Environmental Protection Northeast Regional Office (MassDEP-NERO) has reviewed the Single Environmental Impact Report (SEIR) submitted by the Massachusetts Institute of Technology to add two, nominal 22 MW combustion turbines to the existing Central Utilities Plant, which currently consists of a 21 MW combustion turbine, heat recovery steam generator (HRSG) and electric generator, five boilers, an emergency generator, and cooling towers on a 2.4 acre site in Cambridge (EEA #15453).

The turbines will be fueled primarily by natural gas with ultra low sulfur diesel (ULSD) as a backup for up to 168 hours per year for testing and when natural gas is unavailable. In addition, a 2 MW ULSD fired cold-start engine, to be mounted on the roof, is proposed for starting the turbines during emergency conditions.

An approximately 26,500 square foot addition to the existing, 203,082 sf building (three floors) will be constructed for the project[1]. The addition is reported to be approximately 184 feet x 118 feet x 63 feet above ground level. A 167 foot tall stack with two 167 foot high flues also is proposed. In conjunction with the project, Boilers 3, 4, 5, 7, and 9 will burn only natural gas with ULSD as backup for up to 168 hours per year for testing and when natural gas is unavailable. Three new cooling towers will replace Towers 3 and 4. Towers 1, 2, and 5 will be retired. Towers 7, 8, 9,

[1] The total square footage based on the dimensions would be about 21,700 square feet. However, in GHG Section 5.2, the footprint of the addition is reported to be 26,500 square feet.

and 10 will remain. Indoor space will be provided to Eversource for a regulator station to provide high-pressure natural gas to improve natural gas availability to the area of Cambridge around MIT.

Currently the existing combustion turbine at the Central Utilities Plant provides about 60 percent of the electricity on campus. The steam is used for heating, and steam-driven chillers for cooling buildings on campus. The existing combustion turbine was installed in 1995 and is reaching the end of its useful service life. The existing turbine will be retired following the commissioning of the second turbine unit in 2020.

MassDEP submitted comments on the Expanded Environmental Notification Form (EENF) for the proposed project in its letter, dated January 22, 2016. MIT's response to comments, included in the SEIR provided many satisfactory responses to MassDEP comments. MassDEP would like to follow-up and provide the following comments on the SEIR.

Stormwater

The runoff from the proposed project would be reduced by collection and reuse of rainwater from the rooftops in cooling towers on site. Surface runoff from the paved parking lot is reported to be collected and infiltrated into the subsurface soils with excess rooftop runoff. There is no reported stormwater discharge to the City of Cambridge drainage system or to the Charles River.

Air Quality Permitting (State)

The SEIR refers to the Major Comprehensive Plan Approval Application (MCPA Application) that Epsilon prepared pursuant to 310 CMR 7.00. MIT notes in the SEIR that the MCPA Application is available online for public review at https://powering.mit.edu. MassDEP may not take action on the MCPA Application until the MEPA process has concluded. To date, MassDEP has conducted a preliminary review of the Application, but will conduct a thorough and comprehensive review prior to taking action on the MCPA Application. Relating to the SEIR and the MCPA Application, MassDEP NERO further notes:

A. The SEIR states that MIT is proposing variations from top-case Best Available Control Technology (BACT) for non-full load, non-steady state turbine operating conditions. The MCPA Application includes a Best Available Control Technology (BACT) analysis which will undergo particular scrutiny during MassDEP's review, consistent with MassDEP's review of all submitted MCPA Applications.

B. As part of its comprehensive BACT review, MassDEP will ensure that the items identified and the resultant emissions included in MIT's BACT emissions calculations are considered as part of the proposed Central Utilities Plant Second Century project.

C. MassDEP notes that there appears to be an error regarding the BACT emission rates stated for Boiler 7 in the SEIR. The oxides of Nitrogen (NO_x) emissions limit, contained in the current Operating Permit is 0.046 pounds per 1,000,000 British thermal units (lb/MMBtu). However, the BACT limit proposed in the MCPA is 0.10 lb/MMBtu.

D. In response to MassDEP's comment on the EENF regarding the energy efficiency of preferred and alternative turbines, the SEIR responded with reference to Table 5-1 of the SEIR. It should be noted that the proposed turbine selection will undergo particular scrutiny with regard to energy efficiency as it pertains to Greenhouse Gas emissions during MassDEP's review of the MCPA Application. As the design progresses, MIT may perform additional evaluation of the use of energy efficiency measures. Upon further review of the MCPA Application, MassDEP may provide additional comments.

E. The SEIR states that the MCPA provides an air dispersion modeling analysis, the details of which will undergo a comprehensive review by the MassDEP Boston BWP Air Planning and Evaluation Branch.

F. Should the proposed timeline for installation and operation of the subject equipment change, MassDEP expects that MIT will update the MCPA Application to reflect such changes, which MassDEP will then review with particular attention paid to any resultant changes in Project emissions and modeling impacts.

State Air Quality – Noise Analysis

In response to MassDEP's comments on the EENF regarding the Noise Analysis, MIT's response states a Noise Analysis is included in the MCPA Application. This noise analysis will undergo a comprehensive review by MassDEP, in particular with regard to existing sound sources, monitoring durations, and proposed mitigation measures.

Air Quality PSD Permitting (Federal)

MassDEP notes that the proposed project not only triggers Massachusetts state air quality permitting (the MCPA Application requirement under Massachusetts Clean Air Act and 310 CMR 7.00), but also triggers federal air permitting requirements under the federal Clean Air Act, specifically the Prevention of Significant Deterioration (PSD) permitting requirements. *See* Clean Air Act (CAA) Chapter I, Part C (42 U.S.C. Section 7470, *et seq.*), and the regulations found at the Code of Federal Regulations Title 40, Section 52.21. Pursuant to the Agreement for Delegation of the Federal Prevention of Significant Deterioration Program, dated April 2011, by the United States Environmental Protection Agency, Region 1 (EPA), MassDEP is delegated to administer the federal PSD program in Massachusetts.

A. MIT has submitted a PSD Permit Application to MassDEP. MIT notes in the SEIR that the PSD Permit Application is available online for public review at https://powering.mit.edu.

B. The SEIR indicates that the PSD Permit Application has addressed federal Environmental Justice issues [2] and that air dispersion modeling analysis conducted for the PSD Permit Application indicates there will be no disproportionately high and adverse human health or environmental effects of the project on areas with minority populations

[2] The federal Environmental Justice requirements are in addition to Massachusetts' Environmental Justice requirements.

and low-income populations. The submitted air dispersion modeling will be reviewed by the MassDEP Boston BWP Air Planning and Evaluation Branch.

C. The SEIR indicates that the PSD Permit Application includes a BACT analysis, which will be reviewed by MassDEP.

D. Should the proposed timeline for installation and operation of the subject equipment change, MassDEP will expect that MIT will update the PSD Permit Application to reflect such changes which MassDEP will then review with particular attention paid to any resultant changes in Project emissions and modeling impacts.

Greenhouse Gas Emissions (GHG)

The GHG emission calculations have been updated from the EENF to reflect the change of proposed turbines, which are different from those described in the EENF. The SEIR indicates that Solar Titan 250 or equivalent combustion turbine units are proposed. The overall emissions profile for each turbine design varies, resulting from the particular engineering design of the unit. Some designs result in higher emissions of certain pollutants and lower emissions of other pollutants. NOx, SO2, Particulate Matter or PM, and GHG emissions vary for each turbine design. Some turbines that have lower emissions of criteria pollutants have slightly higher GHG emissions, but may on an overall basis meet current BACT requirements for turbine. As noted above, MassDEP NERO will conduct a thorough review of MIT's MCPA Application and the BACT analysis contained therein. In addition, the revised analysis showed that these smaller units meet the MIT power needs for more hours of the year by providing more hours of combined heat and power utilization than the larger GE LM2500 units identified in the EENF.

The GHG analysis in the SEIR also was revised with hour-by-hour modeling of the project on MIT's energy demand over annual weather conditions from 2019 through 2030, taking into account the effect of the project on MIT's operations of other electricity and steam generating equipment. The revised estimate of the net GHG emissions reduction is 37 percent, (ranging from 77,420 tons of CO_2 per year (tpy) in 2019 to 87,838 tpy in 2030), when compared with separate electricity and thermal energy production replaced by the proposed CHP. The amended MCPA Application, received May 23, 2016, indicates that potential GHG emissions from the turbines and HRSGs will increase from 285,350 tons to 294,970 tons per twelve month rolling period due to the selection of proposed turbines which differs from those described in the EENF. As noted previously, during MassDEP's review of the MCPA Application, turbine selection will undergo particular scrutiny with regard to energy efficiency as it pertains to GHG emissions. MassDEP's review of the MCPA Application will seek to ensure that the Project will minimize emissions of all pollutants, while maximizing energy efficiency of the Project.

The MassDEP Northeast Regional Office appreciates the opportunity to comment on this proposed project. Please contact Edward.Braczyk@state.ma.us at (978) 694-3289 for further information on the air quality issues. If you have any general questions regarding these comments, please contact Nancy.Baker@state.ma.us , MEPA Review Coordinator at (978) 694-3338.

Sincerely,

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

John D. Viola
Deputy Regional Director

cc: Brona Simon, Massachusetts Historical Commission
Eric Worrall, Susan Ruch, Jeanne Argento, Ed Braczyk, Susan McConnell, MassDEP-NERO

City of Cambridge
Richard C. Rossi • City Manager

Executive Department
Lisa C. Peterson • Deputy City Manager

June 24, 2016

Matthew A. Beaton, Secretary
Executive Office of Energy & Environmental Affairs
Attn: MEPA Office
Alex Strysky, EEA No. 15453
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: City of Cambridge comments on SEIR for MIT Central Utilities Plant Project

Dear Secretary Beaton:

The City of Cambridge appreciates the opportunity to comment on the Single Environmental Impact Report (SEIR) for the proposed expansion of the Central Utilities Plant at MIT.

As we have noted previously, in the past this project would have been seen as a state of the art approach to providing clean and reliable energy to the campus while minimizing off-site impacts. Unfortunately, climate change is the context in which we have to view this project. We believe MIT is moving toward a sustainable and lower-carbon future. The City continues to urge MIT to begin soon to assess and plan its transition so that the campus emissions reductions will facilitate the community's goal of achieving net zero greenhouse gas emissions from building operations by 2050. We recognize the transition will be challenging and take time, as it will be for many community stakeholders.

There are also some issues concerning the design of the project in regard to its impact on the Grand Junction multi-use path that need to be resolved. We will work with MIT to ensure the necessary design modifications are incorporated into the project.

If you have any questions about our comments, please contact Susanne Rasmussen on my staff at srasmussen@cambridgema.gov or 617-349-4607. Thank you.

Yours very truly,

Richard C. Rossi

Richard C. Rossi
City Manager

City of Cambridge
Comments on Single EIR
for the
MIT Central Utility Plant Second Century Project
EEA #15453

Grand Junction

In our initial comments, we wrote extensively about the cross-section details for ensuring the establishment of the Grand Junction Multi-Use Path, which is a top priority for the City of Cambridge, and which this proposed development would impact. We continue to have concerns that the technical explanation is not responsive to the issues raised.

- The project continues the more constrained width as defined in the feasibility study adjacent to a service drive (based on State and Cambridge policy, the desired width is defined as 32'). The proponent states that "The benefit of the wider cross section for only 350 feet along the Grand Junction corridor is quite limited, when the adjacent parcel has only the 24-foot dimension." It also references that other openings are only 20' and that there are limited opportunities to realize the desired width. While there are, indeed, pinch points along the corridor, further proliferating pinch points would make the multiuse path less desirable and useable, and we are concerned that it will impact the ultimate viability of the path. It would be beneficial to take advantage of any of the limited opportunities to reserve the desired width, especially since the adjacent section behind the Albany Garage also has the opportunity to provide a wider cross section. Combined, these two sections would also allow for a significant portion of the path where conflicts can be minimized and be more consistent with the portions of the multi-use path already constructed and about to be constructed north of Main Street. If usage of the "service drive" behind the project site is restricted to only the occasional emergency vehicles (e.g. fire and medical) as proposed by the project proponent (eliminating the loading dock access on the south side), 24' width would only be acceptable depending on the design because at almost all times, the service drive space could be used as a multi-use path. In this case, the space should be designed as a path with the ability to accommodate emergency vehicles (including outriggers and stabilization legs), when needed.
- In general, the proximity of this new construction to the railroad, obstacles, and the service drive adjacent to the Brain & Cognitive Sciences Complex push the space allocated for the multi-use path next to the railroad alignment. The responses state that it is not possible to reserve the 33' needed (specified by MassDOT) for possible future transit to the south side of the tracks. The City would like MIT to confirm that this is acceptable to MassDOT and ensure that this would not jeopardize the use of the north side of the track for the multi-use path, particularly given the proposed proximity of the multi-use path to the tracks, and continue to work with the City and MassDOT to ensure that the needs of transit and the multi-use path are being met to the full extent feasible.

Regarding the impacts of this project, we have the following comments:

- Community Impact and Need to Provide Community Benefits

- As part of the MEPA certificate, the proponent is required to create a community benefit, and the Grand Junction Multi-Use Path is a top priority for the City, as identified in the Eastern Cambridge Planning Study (2001), the Green Ribbon Report (2002), the Grand Junction Rail with Trail Feasibility Study (2006), the Kendall Square Plan (2013), and in the decision to appropriate $10 million to further the construction of the path north of Binney St. In addition, the first portion of the path has been constructed, with an improved open space and park features, from Main St to Broadway, and the second portion will be built soon as part of the Binney Park Parcel (Broadway to Binney). At a minimum, providing an easement of the appropriate path width and building design that creates a conducive environment for the full-width path is a way to realize the required community benefit.

- Environmental Justice
  - This project is in a City of Cambridge Neighborhood Revitalization Area: https://www.cambridgema.gov/cdd/federalgrants/nrs
  - This project lies within an area of EJ concern, as identified in the SEIR.
  - The community is disadvantaged by not having adequate access to open space; part of the public benefit would be to provide access to a linear community path on the Grand Junction ROW, which will enable people in the area further access to the Charles River, new parks in East Cambridge currently under design, the extensive park systems in North Point, and the future Somerville Community path.

Climate Change

The SEIR indicates that the life expectancy of the project is 20 years (p. 1-11). This contrasts somewhat with MIT's project website which states the CUP will serve the MIT campus for "at least the next 20 years." We note the SEIR indicates the operations of the new plant can be reduced to 20 percent of capacity and still meet emissions requirements (p.3-3). And in response to City comments, MIT agrees that the project is viewed as a bridge to a low-carbon future. Taken as a whole, we interpret the SEIR to indicate that MIT intends to ultimately replace its fossil-fuel based campus energy system by 2050, but that at this time the solution is not clear. The City urges MIT to begin soon to actively study and develop an alternative campus energy system or other options that will enable the institute to move toward a net zero state by 2050. Whatever the solution is, it will undoubtedly require a long time to implement.

The SEIR indicates that the project is being designed to be resilient to future climate change impacts including flood risks and increasing temperatures. The design elevation to protect against flooding is 26 feet (Cambridge Datum). Based on the future flood risk modeling done for the Cambridge Climate Change Vulnerability Assessment, the 2070 0.2% flood risk elevation is estimated to be 22.15 feet CCB. So MIT's design elevation seems more than adequate. While the SEIR indicates that electrical equipment in the new CUP will be above the 26-foot elevation, it was not clear if the black start unit and its fuel supply will also be elevated above that elevation or otherwise protected from flooding. It would be helpful to clarify this.

In our comments on the ENF, the City requested that MIT analyze the alternative of utilizing the steam generated for the Veolia district steam system and purchasing grid electricity. It does not appear that this alternative was analyzed. The SEIR assumed that there would be no difference since the Veolia system is supplied by a similar co-gen unit at Kendall Station. It is the City's understanding that Veolia has excess steam capacity. And given the declining carbon-content of grid electricity, it therefore seems appropriate to analyze this alternative to ensure the project indeed has the least environmental impact.

Buckley, Deirdre (EEA)

From: Strysky, Alexander (EEA)
Sent: Tuesday, June 28, 2016 9:44 PM
To: Buckley, Deirdre (EEA)
Subject: Fw: MIT CUP Second Century Project

From: Sean Peirce <seanpeirce@hotmail.com>
Sent: Friday, June 24, 2016 4:46 PM
To: Strysky, Alexander (EEA)
Subject: MIT CUP Second Century Project

Cambridge Pedestrian Committee
c/o Community Development Department
344 Broadway
Cambridge, MA 02139

June 24, 2016

Matthew A. Beaton, Secretary of Energy and Environmental Affairs
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston MA 02114

BY EMAIL

RE: MIT Central Utilities Plant Second Century Project

Dear Secretary Beaton:

The Cambridge Pedestrian Committee is the city's official advisory body for pedestrian issues and works to create a more comfortable, safe, and pleasant environment for walking in Cambridge. On behalf of the Committee, I am writing to offer comments from the Committee on the MIT Central Utilities Plant Second Century Project, and in particular on its potential impacts on the Grand Junction Community Path.

The Grand Junction Community Path has been the subject of a longstanding planning effort. It is not only an important link for non-motorized travel in the growing Kendall Square area, but also one step toward a larger network of bicycle and pedestrian paths that would connect to the Charles River and beyond, including multiple neighboring communities.

Having considered the issue at our June 23 meeting, the Committee feels strongly that it would be contrary to the public interest and common good for the proposed power plant project to impede, in any way, the ability to complete the Grand Junction Community Path at the full 32-foot width indicated by Massachusetts DOT planning studies. On the contrary, construction of this portion of the path seems to suggest itself as an appropriate environmental mitigation measure for the project.

Our colleagues from the Cambridge Bicycle Committee expressed similar sentiments in their June 20 letter to you. We support their comments and note that their letter presents a cogent, point-by-point rebuttal of the earlier arguments presented by the project proponent.

Existing planning studies for the path have acknowledged some of the design challenges and space limitations of this unique corridor. However, the intended width of the path in this section is around 32 feet as a minimum to ensure comfortable and safe operations for all users. Safety and comfort are key components of attracting walkers and cyclists to the path, and thus for contributing to a reduction in automobile emissions and greenhouse gases. While the project proponent has suggested that 24 feet may be minimally adequate, that suggestion is contrary to the Mass. DOT study, and in any event, we would suggest aiming for more than a bare minimum to ensure that the full benefits of the path are realized.

We would also note the Environmental Justice aspects of this project for the low-income and minority populations near the site. Nearly one in three Cambridge residents commutes on foot or by bicycle, and many others walk or bike to access public transportation. For many in our community, biking and walking are not merely recreation, but important forms of low-cost mobility that also happen to be nearly emissions-free.

The Grand Junction Community Path is an opportunity that many other cities would envy – a chance to enhance local quality of life through new open space and a valuable bicycle/pedestrian path, in an otherwise highly constrained urban area. The Grand Junction Community Path is also an important part of the city's overall goals of expanding non-motorized travel, managing transportation demand, and reducing greenhouse gas emissions. It would a sad irony, and seemingly a throwback to less enlightened times, if the Grand Junction could not be developed to its fullest potential because its presence would make it slightly more inconvenient to burn fossil fuels in a power plant.

Sincerely,
Sean Peirce
for the Cambridge Pedestrian Committee

Boston Cyclists Union
P.O. Box 301394
Jamaica Plain, MA 02130
617-516-8877

June 24, 2016

Via Email (alexander.strysky@state.ma.us, csnowdon@epsilonassociates.com)

Matthew A. Beaton, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston MA 02114

Re: Central Utilities Plant Second Century Plant Expansion, Cambridge, MA, EOEEA No. 15453

Dear Secretary Beaton;

The Boston Cyclists Union (BCU) has reviewed the Single Environmental Impact Report (SEIR) submitted by MIT for the above-referenced project and appreciates the opportunity to submit the following comments in connection with MIT's responses to certain comments provided by the City of Cambridge (CAM) and others:

BCU.1 Development of the Grand Junction Path.

In its response to CAM.20, MIT states that: "There are no plans to construct any portion of the multi-use path in the Grand-Junction corridor at t his time or as part of the CUP upgrade project."

The original recommendation by the City of Cambridge that the proposed project include construction of the multi-use path along the Grand-Junction corridor, from Main Street to Massachusetts Avenue, was sound and should be followed. After many years of efforts, the multi-use path is finally becoming a reality. The City of Cambridge just celebrated the opening of an initial section of the path, between Main Street and Galileo Galilei Way (the "**CRA Segment**"). Other sections will likely follow in the near future, and the City has also committed to a $10m bond issue to fund design and implementation of other sections of the path. It is time for MIT to step up and do its part toward creating this important transportation linkage and public amenity. This project represents a major opportunity to incorporate such a key segment of the path, and we strongly urge that a requirement in this regard be imposed as part of the project mitigation. Moreover, since MIT urges repeatedly that the project will not interfere with any future construction of a multi-use path (see e.g. MITs response to FGIP.2), there can surely be no objection to completing path completion now rather than at some unspecified date in the future.

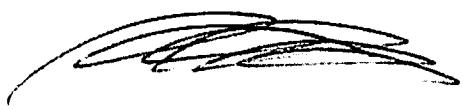
BCU.2 No Further Constriction of the Grand Junction Path Corridor.

In its response to CAM.25, MIT states that "The 24-foot dimension, which will be clear of meters, pipes and doors, is sufficient to accom modate the train, the multi-use path, and the service drive. Only emergency vehicles are planned to access the serv ice drive."

As noted in CAM.25, the width needed in order to accommodate the MassDOT-recommended cross-section suitable for a multi-use path is 32 feet. MIT's flat assertion in its response to CAM.25 that the 24-foot cross-section will be sufficient is simply not persuasive. The fact that certain segments of the future Grand Junction Path corridor contain pinch points or other obstacles cannot and should not provide a basis to justify additional or extended pinch points that will further compromise any eventual path and potentially place path users at risk and limit the path's utility as a corridor for sustainable mobility. Kendall Square continues to experience rapid growth, in substantial part driven by MIT itself. With no room to create additional roadway capacity (even if this were desirable), active mobility is essential to the transportation future of the Kendall Square area, and it is vital to this that the full, 32' cross section, with vehicle access **excluded**, be retained to the greatest possible extent. We also urge retention of width in order to incorporate appropriate open-space treatments consistent with the beautiful design standards applied to the CRA Segment, referenced above.

Thank you again for the opportunity to comment.

Sincerely,



Steven Bercu
Board President
Boston Cyclists Union

cc:

Cambridge Bicycle Committee
cbikecomm@googlegroups.com

Cambridge CDD
cseiderman@cambridgema.gov

Rebecca Wolfson, Executive Director, Boston Cyclists Union
becca@bostoncyclistsunion.org

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
BOSTON, MA 02114
Telephone: 617-626-7300
Facsimile: 617-727-0030

Charles D. Baker
Governor

Karyn E. Polito
Lt. Governor

Matthew A. Beaton
Secretary

Judith F. Judson
Commissioner

27 June 2016

Matthew Beaton, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114

Attn: MEPA Unit

RE: MIT Central Utility Plant EEA #15403

Cc: Arah Schuur, Director of Energy Efficiency Programs, Department of Energy Resources
Judith Judson, Commissioner, Department of Energy Resources

The general intent of the DOER review of this submittal is to both ensure that the content submitted conforms to the guidance provided for the application of the MEPA GHG Policy and Protocol (the Policy) for this project, and to point out areas and aspects of the design and proposed mitigation as described in the GHG related content that ether require further clarification and/or may present opportunities for further reductions in both energy usage and GHG emissions. Where these opportunities appear to exist, these comments also suggest measures and/or approaches that the DOER puts forward that should be considered for adoption with the goal of achieving further reductions in both energy consumption and source GHG emissions.

The DOER commends MIT for the decision to implement an expanded combined heat and power (CHP) capacity as the primary source of both electricity and heat to be supplied by the expanded Central Utility Plant (CUP) to the intra-campus distributed energy system. CHP is an inherently more efficient technology for generating electricity and useful heat than obtaining electricity and heat from the electric grid and conventional on-site boilers or furnaces, which is the business as usual (BAU) scenario. When fueled primarily by natural gas, both the lower emission per MWH due to a lower GHG emitting fuel and the overall reduction in fuel consumed per unit energy generated combine to achieve a significant reduction in overall source emissions of GHG when compared with the BAU.

The DOER also commends the proposed project on the incorporation of measures that will provide vital energy resiliency capabilities, including the ability of the system to start and continue operating to supply power, heating and cooling to the MIT campus during grid outages.

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DOER Comments and Project Responses

On the advice of MEPA, DOER provided preliminary comments to the project. The comments and the project's responses were:

C1 Turbine Inlet Air Cooling (p 5-7, 8 & Table 5-2)

The estimated additional output at summer peak conditions is 8 MW, which is a significant amount.

The addition of this peaking capacity could represent a benefit so the electric supply system especially if the network that would be unloaded is already considered to be at or nearly at capacity during summer peak. In addition the Available Power as a function of Inlet Air Temperature as shown in the Titan 250 product literature shows a steep decline in both capacity and efficiency at temperatures above 70 dg F.

For all of these reasons, the DOER suggests that the proponent consider the possibility of hybrid system that would utilize both inlet spray of DI water to increase the mass flow rate and turbine inlet cooling system that would be achieved by adiabatic evaporation of the spray water plus cooling with the chiller.

Project Response:

MIT modeled the utilization of Combustion Air Cooling Coils in this project. The model results did not show a GHG reduction in this application. MIT will evaluate the feasibility of utilizing a hybrid system as outlined above as part of the design development. MIT will also model the financial economics of both types of inlet cooling options.

C2: Medium Temperature Hot Water: (p 5-9)

Was the option of generating the hot water by directing some of the HRSG steam though a steam to hot water converter? If so explain why this option was rejected.

Project Response:

Yes, some of the steam from the HRSG will be used to heat hot water in addition hot water will be generated directly from the balance of waste heat leaving the HRSG.

C3: *Re-heating of Throttled Natural Gas"*

This was discussed in the pre-filing meeting as a useful thermal load which would be included for *information but not credited to the project. I did not see this in the submittal.*

Project Response:

Waste heat will be used to reheat gas at the Eversource step down station servicing the City of Cambridge. This will benefit the residents of Cambridge be reducing the Joule–Thomson effect.

C4: *Blow down Heat Recovery: (Table 5-2)*

The DOER urges blow down heat recovery for the HRSGs at least to be included in the present project if it is shown to have a payback period of under 4 yrs. The recovery of blow down heat with transfer to the feed water heating will add to the APS credits that the system can earn. This income could be included as an incremental benefit in the pay back analysis.

Project Response:

HRSG blow down heat recovery is included in this project.

C5: Concurrent Facility Upgrades: (Section 5-8)

The DOER urges the project to implement all of these measures during the construction of the CUP *project. \C5:*

Project Response:

All measures, outlined in Section 5.8, are currently in construction or will be adopted as part of this project.

C6: Revised Energy Model Results: (Section 5-9 p 5-12)

Suggest that also include the benefit of unloading the grid electric supply system.

Project Response:

When in operation, the project will produce electricity and relieve stress on the electric system during periods of high demand. This will be a benefit to the City of Cambridge. MIT is working with Eversource to model the impact of the project to the grid.

C7: Climate Resilience: 7.2 p 7-4, 56:

If the proposed system is designed to be able to black start and operate in island mode whenever the gird is down, this should be described in this section. Suggest a sub-section "Energy Supply Resilience" of similar.

Project Response:

The project will have cold start capability. This is a primary design objective. In the case of a loss of grid power the project will be designed to be able to load shed to keep critical loops powered and then continue to operate as an island.

C8: Summary of Mitigation Measures: (Table A

Add in the GHG section:

a) Minimize the combustion of emitting fuels

b) Combustion of clean burning fuels

Add in the Climate Change Resilience:

a) Black Start an Island Mode Capable

Project Response:

Yes these items are all part of the project.

C9) Excel Performance Tables:

The efficiencies listed appear to be based on the lower heating value (LHV) of natural gas. The EPA, ISO-NE and the DOER use the higher heating value (HHV) of natural gas when expressing efficiencies which typically will result in values that are 10% lower. For the purpose of clarity, the DOER suggests that the project add columns expressing the efficiencies based on the HHV of natural gas.

Project Response:

MIT will add columns expressing the efficiencies based on the HHV of natural gas for clarity.

The DOER commends the project on both the content and completeness of the responses above.

John Ballam

John Ballam
Engineering Manager
CHP Program Manager
MA Dept. of Energy Resources

Attachment 9 - Certificate of the Secretary of Energy and Environmental Affairs on the Public Benefit Determination, July 22, 2016

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

July 22, 2016

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
PUBLIC BENEFIT DETERMINATION

PROJECT NAME	: Central Utilities Plant Second Century Plant Expansion
PROJECT MUNICIPALITY	: Cambridge
PROJECT WATERSHED	: Charles River
EEA NUMBER	: 15453
PROJECT PROPONENT	: Massachusetts Institute of Technology
DATE NOTICED IN MONITOR	: May 25, 2016

Consistent with the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands*, I hereby determine that the above-referenced project will have a public benefit. A Certificate on the Single Environmental Impact Report (SEIR) was issued on July 1, 2016. The Certificate indicated that the SEIR adequately and properly complied with MEPA and its implementing regulations (301 CMR 11.0) and that the project could proceed to permitting.

Project Description

As described in the Expanded Environmental Notification Form (EENF) and SEIR, the project will expand the Proponent's Central Utilities Plant (CUP) to meet future energy demand, increase reliability and resilience, and meet energy efficiency and carbon emissions reduction goals. The CUP includes a Combined Heat and Power (CHP) system that provides electricity, heat, and steam to over 100 buildings on the campus of the Massachusetts Institute of Technology (MIT), including dormitories, classroom buildings, laboratories, offices, and recreational facilities.

The project will include the following components:

- Replacement of a 21-megawatt (MW) combustion turbine generator (CTG) with two nominal 22-MW gas-fired CTGs, each with a heat recovery steam generator (HRSG) with a gas fired duct burner;
- Addition of a two-MW Ultra Low Sulfur Diesel (ULSD) fired cold-start engine to start the CTGs in an emergency;
- Conversion of five boilers from ULSD fuel to natural gas;
- Seek an increase in permitting limits of two gas-fired boilers to take advantage of the energy-efficiency of the units;
- Replacement of six cooling towers with three new cooling towers (four existing cooling towers will be retained); and,
- Installation of a new gas regulator station.

The CTGs and boilers will use natural gas as the primary fuel source, and ULSD for testing purposes and as a backup fuel source when gas is not available. Use of backup fuel will not exceed 168 hours per year. The duct burners, using gas as a fuel source, will provide a supplemental heat source to the HRSGs to produce additional steam when necessary.

The new CTGs, HRSGs, pollution control equipment, and regulator station will be installed within a 184-foot by 118-ft by 63-ft high addition to the CUP. It will be constructed in a parking lot adjacent to the CUP. Air emissions will be released through a 167-ft high stack containing flues from each HRSG. The emergency generator will be mounted on the roof of the new building and will have its own exhaust stack extending 165 feet above ground level. A new gas line will be constructed to the site from a nearby gas main. Critical project components will be elevated above the 500-year flood elevation to provide resiliency from extreme storm events.

Project Site

The existing CUP commenced operations in 1995. It provides 60 percent of the electricity on the MIT campus and generates steam for heating and for cooling via steam-driven chillers. The CUP is linked to the campus by electrical, steam, and chilled water distribution systems. It is located in Building 42, which is bordered by Vassar Street to the south and Albany Street to the north. MIT buildings surround the CUP to the east and west. The facility is located on either side of the Grand Junction rail right-of-way (ROW). An elevated and enclosed walkway spans the railroad tracks.

The existing CUP includes a 21-MW CTG with an HRSG and duct burner, five boilers, a 2-MW emergency generator, and ten cooling towers. Exhaust gasses are vented from stacks ranging in height from 115 to 177 feet above ground level.

Portions of the existing CUP and the area of its proposed expansion are located within landlocked tidelands. The site does not contain any properties listed in the State Register of Historic Places or the Inventory of Historic and Archaeological Assets of the Commonwealth. Four nearby buildings are listed in the State Register of Historic Places. The site is located near

three Historic Districts, including the MIT Historic District encompassing the original campus, the Charles River Basin Historic District, and the Old Cambridgeport Historic District.

The project site is located within a five-mile radius of Environmental Justice (EJ) communities in Cambridge, Boston, Brookline, Newton, Watertown, Arlington, Medford, Malden, Everett, Somerville, and Revere. According to the EEA Environmental Justice Viewer (http://maps.massgis.state.ma.us/map_ol/ej.php), the EJ communities in these municipalities are classified as: minority; income; English isolation; minority and income; minority and English isolation; income and English isolation; and, minority, income, and English isolation.

Changes Since the Filing of the EENF

The Preferred Alternative has been modified with the selection of slightly smaller Solar Titan 250 CTGs in place of the GE LM2500 CTGs considered in the EENF analysis. According to the SEIR, the use of these CTGs will allow for more efficient generation of electricity and thermal energy, and will result in lower emissions of Greenhouse Gas (GHG) and other pollutants compared to the CTGs evaluated in the EENF. The SEIR included updated GHG and air quality analyses to reflect the change in the CTGs.

The design of the building housing the new CTGs has been refined and resulted in a smaller footprint. The building will measure 184 ft by 118 ft rather than 224 ft by 118 ft as described on the EENF. The project has also been revised to include a 40-ft wide pedestrian path along the north side of the building that will connect Albany Street to the railroad ROW and other MIT buildings.

Jurisdiction and Permitting

The project is subject to a Mandatory EIR pursuant to 301 CMR Section 11.03(8)(a)(2) of the MEPA regulations because it requires a State Agency Action and will modify an existing Stationary Source with federal potential emissions that collectively will result, after construction and the imposition of required controls, in 75,000 tons per year (tpy) of GHGs based on CO_2 equivalent. The project exceeds the ENF threshold at 301 CMR 11.03 (7)(b)(2) because it consists of expansion of an existing electric generating facility by 25 or more MW. The project requires a Major Comprehensive Air Plan Approval (MCPA) from the Massachusetts Department of Environmental Protection (MassDEP).

The project requires a Public Benefits Determination and is subject to review under the May 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol ("the Policy"). In addition, the project is subject to the Executive Office of Energy and Environmental Affairs (EEA) EJ Policy.

The project requires federal air permitting under the Clean Air Act (CAA), specifically the Prevention of Significant Deterioration (PSD) permitting requirements. Pursuant to the Agreement for Delegation of the Federal Prevention of Significant Deterioration Program, dated April 2011, by the United States Environmental Protection Agency (EPA), Region I with MassDEP, MassDEP is delegated to administer the federal PSD program in Massachusetts.

The project is not seeking Financial Assistance from the Commonwealth. Therefore, MEPA jurisdiction is limited to the subject matter of required State Agency Actions that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations. These include GHG emissions, land alteration, air quality, and tidelands.

Environmental Impacts

Potential environmental impacts of the project include emissions of air pollutants, emissions of GHG, and noise. Emissions will include 28.9 tons per year (tpy) of nitrous oxide (NO_x), 20.3 tpy of carbon monoxide (CO), 38.5 tpy of volatile organic compounds (VOC), 55.4 tpy of particulate matter (PM), 7.8 tpy of sulfur dioxide (SO_2); and 362,740 tpy of carbon dioxide (CO_2). As a result of the selection of a different type of CTG, potential pollutant levels have decreased compared to those presented in the EENF. The project will avoid, minimize and mitigate potential impacts by using clean fuels and pollution control technologies, such as selective catalytic reduction (SCR) and oxidation catalysts. The project will mitigate noise impacts by installing the CTGs and other equipment in acoustically designed enclosures and using mufflers on ventilation, intake and exhaust systems.

The project will be supported primarily by existing infrastructure. The project will increase the CUP's water use by 65,600 gallons per day (gpd) and decrease its wastewater generation by 3,200 gpd. Stormwater from the roof of the new building will be collected for use on campus and will not be directed into the City of Cambridge's stormwater system.

Tidelands

The Project proposes structural alterations and changes of use on previously filled, landlocked tidelands that are not subject to Chapter 91 (c. 91) licensing. Landlocked tidelands comprise approximately 3,400 sf of the 0.9-acre project site.

Consistent with the provisions of *An Act Relative to Licensing Requirements for Certain Tidelands* (2007 Mass. Acts ch. 168, sec.8) (the Act), which was enacted on November 15, 2007, I must conduct a Public Benefit Review for projects in tidelands that are required to file an EIR.

The legislation states the following regarding the Public Benefit Determination:

> *"In making said public benefit determination, the secretary shall consider the purpose and effect of the development; the impact on abutters and the surrounding community; enhancement to the property; benefits to the public trust rights in tidelands or other associated rights, including, but not limited to, benefits provided through previously obtained municipal permits; community activities on the development site; environmental protection and preservation; public health and safety; and the general welfare; provided further, that the secretary shall also consider the differences between tidelands, landlocked tidelands and great pond lands when assessing the public benefit and shall consider the practical impact of the public benefit on the development."*

The following addresses each of the considerations identified in the legislation.

1. *purpose and effect of the development*

The project proposes to expand MIT's existing CUP to meet future energy demand, increase reliability and resilience, and meet energy efficiency and carbon emissions reduction goals. The project includes the use of a high-efficiency Combined Heat and Power (CHP) system that will provide electricity, heat, and steam to over 100 buildings on the MIT campus, including dormitories, classroom buildings, laboratories, offices, and recreational facilities.

2. *impact on abutters and the surrounding community*

The project includes expansion of the CUP adjacent to the facility and construction will be limited to an existing parking lot. The project will be required to meet air quality and noise standards during construction and operation of the facility.

The design includes a 30-foot wide easement through the southern portion of the project site as requested by the City of Salem to preserve the possibility of an extension of Commercial Street to Flint Street.

3. *enhancement to the property*

The project will be constructed in an existing parking lot. The project will include a stormwater management system that will collect rainwater from the roof of the building and reuse it in the facility's cooling towers rather than discharging it into the City of Cambridge stormwater system.

4. *benefits to the public trust rights in tidelands or other associated rights*

In considering the public benefits of the project, the Act indicates that particular emphasis should be placed on the benefit to the public trust rights in tidelands. The project is located approximately 1,575 feet from the Charles River and will not affect the ability of the public to access the river. The site design incorporates walkways, lighting, seating and landscaping. The reduced footprint of the CUP will support a 40-ft wide path along the east side of the building that will provide a connection between Albany Street and Vassar Street, and associated bicycle infrastructure. The SEIR provided a cross-section of the proposed Grand Junction multi-use path in relation to existing buildings and the proposed CUP building. According to the SEIR, the project will retain an approximately 24-ft ROW that would not preclude future construction of the Grand Junction Community Path. I encourage MIT to consider design changes that could increase the width of the ROW.

5. *community activities on the development site*

The industrial nature of the CUP precludes public access to most of the site. A large portion of the site outside of the building footprint will be open to the public as described above.

6. environmental protection and preservation

The project has been designed to avoid, minimize and mitigate potential environmental impacts including GHG emissions, air quality, noise, stormwater, and construction period impacts and potential impacts associated with climate change. These include:

GHG Emissions

- Use variable frequency drives (VFD) for fuel gas compressor;
- Review use of high-efficiency motors and VFDs in final project design.
- Use waste heat to assist in urea vaporization;
- Use of an adsorption rotary drum dryer associated with the compressed air system;
- Construct HRSGs with surface area and piping required to implement a Medium Temperature Hot Water system;
- Use light-emitting diode (LED) lighting and an occupancy lighting system in the building expansion to reduce electricity use;and,
- Provide a GHG self-certification to the MEPA Office.

Air Quality

- Use of clean-burning fuels (natural gas and ULSD) that are low in sulfur to control particulate matter (PM) and SO_2;
- Removal of residual oil firing for existing Boilers 3, 4 and 5 and removal of ULSD firing for existing Boilers 7 and 9;
- Low-NO_x combustors and use of Selective Catalytic Reduction (SCR) to control NO_x;
- Minimize CO and VOC emissions through combustion control and use of Ammonia (NH_3) and oxidation catalysts;
- CTs include option to use dry low-NO_x combustors instead of water injection;
- High efficiency drift eliminators will minimize emissions from new cooling towers;
- Limit use of ULSD to 300 hours per 12-month period; and,
- Will comply with emission rates that meet EPA limits for off-road engines.

Noise

- Noise producing equipment (e.g. CTGs, cogeneration equipment, fuel gas compressor and drive motor, and diesel generator) will be enclosed in sound-attenuating materials, enclosures or behind sound barrier walls;
- Mufflers will be installed on the gas turbine air intake, gas exhaust, turbine enclosure and ventilation systems;
- Mufflers will be installed on the non-emergency steam vents as necessary;
- Reduced-noise fans with VFDs will be used in the cooling towers; and
- Equipment and building air ventilation paths will include treatments (mufflers, lined ducts, acoustic louvers, and local barriers) with suitable sound attenuation; and,
- The shell of the new building will be designed to reduce noise levels to 55 to 60 dBA directly outside the building walls facing the neighborhood.

Construction Period

- Use fencing and barricades to isolate construction areas from pedestrians;
- Encourage use of alternative transportation to the site by construction workers;
- Use construction equipment that meets or exceeds EPA Exhaust Emission Standards;
- Use wetting agents as necessary and covered trucks to reduce the spread of dust;
- Establish a tire cleaning area to prevent dirt from reaching city streets;
- Minimize exposed storage of debris on-site;
- Clean sidewalks and streets to minimize dust aggregation;
- Turn off idling equipment;
- Use and maintain mufflers on construction equipment and enclosures around continuously-operating equipment to reduce noise;
- Separate or shield noisy equipment from sensitive receptors;
- Divert construction waste from landfills by recycling waste material;
- Conduct a hazardous waste survey prior to the start of construction to ensure appropriate disposal of hazardous material, including asbestos; and
- Install stormwater management controls to meet City of Cambridge requirements.
- Use a Certified Industrial Hygienist to develop and implement Dust Mitigation Plan and air quality requirements during activities that could expose people to contaminated soil or groundwater or other hazardous conditions.

7. *public health and safety, and the general welfare*

The project will protect public health and safety, and the general welfare by using Best Available Control Technology (BACT) to minimize emissions of air contaminants and will incorporate sound-proofing to minimize operational noise.

Enforcement of Public Benefits

In accordance with M.G.L. c. 30, s. 62I, the Proponent shall file a copy of the Certificate on the SEIR and this Public Benefit Determination with MassDEP within 30 days of today's date to notify the Department that work will be conducted within tidelands. MassDEP will then have the authority to enforce the conditions outlined herein and in the Public Benefit Determination pursuant to the statute.

I recognize that the public benefit commitments may be subject to certain revisions as the project proceeds. If the public benefits to be provided should change, the Proponent is instructed to submit a Request for Advisory Opinion to the MEPA Office for a determination as to whether the change is sufficiently material to require the submission of a Notice of Project Change (NPC) pursuant to 301 CMR 11.10. Otherwise, the Proponent may submit a NPC without requesting an Advisory Opinion if it is clear that the change(s) are material.

Conclusion

Based on the foregoing, I hereby determine that the project will have a positive public benefit to public trust rights in tidelands. To meet the publication requirements of the legislation, this Determination will be published in the Environmental Monitor on August 10, 2016.

July 22, 2015
Date

Matthew A. Beaton

MAB/AJS/ajs

Attachment 10 - Project Locus Plan

Central Utility Plant Expansion Location

Massachusetts Institute of Technology
Office of Campus Planning
July 26, 2016

1,000 Feet

Attachment 11 - Project Site Plan

Grand Junction

(24’) Twenty-four foot No Build Zone