RAGON INSTITUTE 2.0

600-624 Main St, Cambridge MA 02139

APPLICATION FOR PROJECT REVIEW SPECIAL PERMIT

January 29, 2021

VOLUME ONE

Narrative Materials

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Cambridge, MA 02139

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Contact: Julian Astbury

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Ragon Institute of MGH, MIT and Harvard

Corrie Martin
Chief Operating Officer
Ragon Institute of MGH, MIT and Harvard
400 Technology Square, Room 870 I Cambridge, MA 02139
857.268.7074 I cmartin45@mgh.harvard.edu

December 21, 2020

Planning Board
City of Cambridge
344 Broadway
Cambridge, MA 02139

Re. 600-624 Main Street

Dear Members of the Planning Board,

On behalf of The Ragon Institute, I am pleased to submit this application for a Project Review Special Permit for our new home at 600-624 Main Street. The application consists of the following materials:

Volume 1: Special Permit Narrative materials including the Dimensional Form, notarized Ownership Certificate, certified Tree Study and Green Building Report.

Volume 2: Graphic materials, including elevations, floor plans, site plan, and Landscape Plan.

We appreciate your consideration of this request and look forward to working with you in this effort.

Sincerely,

Corrie Martin
Chief Operating Officer
Ragon Institute of MGH, MIT and Harvard

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CITY OF CAMBRIDGE, MASSACHUSETTS

PLANNING BOARD

CITY HALL ANNEX, 344 BROADWAY, CAMBRIDGE, MA 02139

SPECIAL PERMIT APPLICATION • COVER SHEET

In accordance with the requirements of the City of Cambridge Zoning Ordinance, the undersigned hereby petitions the Planning Board for one or more Special Permits for the premises indicated below.

Location of Premises: 600 & 624 Main Street

Zoning District: Industry B

Applicant Name: The Ragon Institute

Applicant Address:

Contact Information: 617.492.1000 (Telephone #) jrafferty@adamsraffery (Email Address) 617.492.3131 (Fax #)

List all requested special permit(s) (with reference to zoning section numbers) below. *Note that the Applicant is responsible for seeking all necessary special permits for the project. A special permit cannot be granted if it is not specifically requested in the Application.*

Section 2	Basement Gross Floor Area Exemption
Section 6.35.1	Reduction in Minimum Required Parking
Section 6.43.5(b)	Maximum Width of Curb Cut
Section 10.40	Special Permit
Section 19.20	Project Review Special Permit
Section 19.50	Building and Site Plan Requirements

List all submitted materials (include document titles and volume numbers where applicable) below.

Ownership Certificate, Dimensional Form, Application, Supporting Statements, Project Narrative, Site Plan, Survey, Floor Plans, Elevations, Photographs, Landscape Plan and other Graphics

Signature of Applicant: Ahin Handa, MGH Real Estate
The General Hospital Coorporation, a Massachusetts Hospital Coorporation, in its capacity as home of the Ragon Institute

For the Planning Board, this application has been received by the Community Development Department (CDD) on the date specified below:

Date Signature of CDD Staff

DIMENSIONAL FORM

Project Address: 600 Main St **Application Date:** 01/29/21

	Existing	Allowed or Required (max/min)	Proposed	Permitted
Lot Area (sq ft)	67,579	0	67,579sf	
Lot Width (ft)	23' to 348'	0	23' to 348'	
Total Gross Floor Area (sq ft)	51,050	185,842	185,810	
Residential Base	N/A	N/A	N/A	
Non-Residential Base	51,050	185,842	185.810	
Inclusionary Housing Bonus	N/A	N/A	N/A	
Total Floor Area Ratio	0.75	2.75	2.75	
Residential Base	N/A	N/A	N/A	
Non-Residential Base	0.75	2.75	2.75	
Inclusionary Housing Bonus	N/A	N/A	N/A	
Total Dwelling Units	0	0	0	
Base Units	N/A	N/A	N/A	
Inclusionary Bonus Units	N/A	N/A	N/A	
Base Lot Area / Unit (sq ft)	N/A	N/A	N/A	
Total Lot Area / Unit (sq ft)	N/A	N/A	N/A	
Building Height(s) (ft)	22'-0" / 24'-0"	120'-0"	120'-0"	
Front Yard Setback (ft) - Main	0"-0" to 3'-10"	0	5'-8" to 21'-8"	
Front Yard Setback (ft) - Portland	3'-2"	0	12'-4"	
Front Yard Setback (ft) - Albany	0'-0"	0	4'-0" to 7'-0" (1)	
Rear Yard Setback (ft)	N/A	N/A	N/A	
Open Space (% of Lot Area)	31.6%	0	48.0%	
Private Open Space	0	0	4,018 sf	
Permeable Open Space	1,110sf	0	6,509 sf	
Other Open Space (Specify)	20,239sf	0	25,911 (2)	
Off-Street Parking Spaces	35	139	120	
Long-Term Bicycle Parking	N/A	41	41	
Short-Term Bicycle Parking	N/A	12	12	
Loading Bays	0	2	4	

Use space below and/or attached pages for additional notes:

(1) - The project team intends to align the building with the curb line of Albany St as the design progresses. The final setback dimension is expected to be slightly more than the 4'-0" currently shown near the intersection of Portland St. and Albany St. The exact dimension is still to be determined.
(2) - "Other Open Space" refers to the area of the site that is not building footprint and does not meet the definition of Permeable Open Space

OWNERSHIP CERTIFICATE

Project Address: 600-624 Main Street **Application Date:** 12/18/20

This form is to be completed by the property owner, signed, and submitted with the Special Permit Application:

I hereby authorize the following Applicant: The Ragon Institute

at the following address: 400 Technology Square, Cambridge, MA 02139

to apply for a special permit for: Research Laboratory Building

on premises located at: 600-624 Main Street

for which the record title stands in the name of: Massachusetts Institute of Technology

whose address is: 77 Massachusetts Ave, Cambridge, MA 02139

by a deed duly recorded in the:

Registry of Deeds of County: Middlesex Book: 75529 Page: 565

OR Registry District of the Land Court, Certificate No.: Book: Page:

Signature of Land Owner (If authorized Trustee, Officer or Agent, so identify)

To be completed by Notary Public:

Commonwealth of Massachusetts, County of Middlesex

The above named Glen Sher personally appeared before me,

on the month, day and year Dec. 11, 2020 and made oath that the above statement is true.

Notary: Kim Medeiros

My Commission expires: 06/26/2026

Kim Medeiros
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
06/26/2026

Kim Medeiros
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
06/26/2026

Kim Medeiros
My Commission Expires 06/26/2026
NOTARY PUBLIC
COMMONWEALTH OF MASSACHUSETTS

FEE SCHEDULE

Project Address: 600 Main Street **Application Date:**

The Applicant must provide the full fee (by check or money order) with the Special Permit Application. Depending on the nature of the proposed project and the types of Special Permit being sought, the required fee is the larger of the following amounts:

- If the proposed project includes the creation of new or substantially rehabilitated floor area, or a change of use subject to Section 19.20, the fee is ten cents ($0.10) per square foot of total proposed Gross Floor Area.

- If a Flood Plain Special Permit is being sought as part of the Application, the fee is one thousand dollars ($1,000.00), unless the amount determined above is greater.

- In any case, the minimum fee is one hundred fifty dollars ($150.00).

Fee Calculation

New or Substantially Rehabilitated Gross Floor Area (SF): 185,810sf	× $0.10 = $18,581.00	
Flood Plain Special Permit	Enter $1,000.00 if applicable:	
Other Special Permit	Enter $150.00 if no other fee is applicable:	
TOTAL SPECIAL PERMIT FEE	**Enter Larger of the Above Amounts:**	

2.1 - PROJECT OVERVIEW

Introduction

This is an application by The General Hospital Corporation, in its capacity as the administrative home of the Philip T. and Susan M. Ragon Institute, hereinafter referred to as The Ragon Institute (the "Applicant") for a Special Permit to authorize the construction of a 185,810 GFA building containing a Technical Office and Laboratory for Research and Development at 600 Main Street (the "Project"). The Project includes the redevelopment of an approximately 1.55 acre site currently occupied by a vacant, single-story building at 600 Main Street and a vacant, two-story building at 624 Main Street. A small amount of off-street surface parking currently exists in the southwest portion of the site.

The Applicant is seeking Special Permits pursuant to Section 10.40 and a Project Review Special Permit pursuant to Article 19.20. Additional Special Permits are being sought to increase the curb cut width (Section 6.43.5); allow for the exclusion of basement space from the definition of Gross Floor Area (Section 2.000), allow for a reduction in Required Amount of Parking (6.35.1), and to allow for additional height where abuttting a residential zoning district (Section 19.50).

As set forth in the plans and related material included in this Application, the project has been designed in accordance with the Urban Design Guidelines set forth in Article 19.30 and the K2C2 Central Square Design Guidelines, along with reference to the K2C2 Kendall Square Design Guidelines.

Background

The Ragon Institute of MGH, MIT, and Harvard is a unique, Cambridge-based, philanthropy-funded, non-profit organization that is dedicated to the research and development of vaccines and cures for the most vexing infectious diseases confronting humankind today, including COVID 19.

The Ragon Institute was first conceived when Terry Ragon and Dr. Bruce Walker traveled together to South Africa in 2007. Dr. Walker had seen some of the first cases of a deadly and yet unnamed disease that would eventually come to be known as AIDS. A deep friendship between the two developed when Dr. Walker convinced Mr. Ragon to accompany him on an expedition to Durban, South Africa to show him how much HIV/AIDS was affecting the lives of people in South Africa, often considered the epicenter of the epidemic.

During that trip, Dr. Walker stressed that he thought an HIV vaccine was a solvable problem, but that funding mechanisms prevented drawing on all the available knowledge from disparate disciplines. Dr. Walker believed that by leveraging the collective expertise of immunologists, clinicians, engineers, computational biologists, physical scientists and geneticists, and bringing them together under one roof, one could create a powerful scientific exchange that would accelerate unlocking the secrets of the viruses. The mission was clear: to harness the immune system to prevent and cure human disease. And there would be no better place to do this than in Kendall Square in Cambridge, arguably the foremost biomedical research ecosystem in the world, located in the epicenter of MIT, Harvard, and Massachusetts General Hospital.

Inspired by this vision, in 2009 Terry and Susan Ragon generously donated the necessary funding to create the Ragon Institute of MGH, MIT and Harvard. The Institute is currently housed at 400 Technology Square in Kendall Square, making it readily accessible to all three institutions. Its Governance Board is comprised of Mr. Ragon and the Presidents of MGH, MIT and Harvard, and it has played a pivotal role in promoting collaborative research among these institutions.

Due to its unique philanthropy-based funding, the Ragon Institute is able to do something rare in academic biomedical research: provide seed money to researchers wanting to pivot to new challenges as they arise,

allowing them to respond quickly to new findings before embarking on the months or years long process of securing sustainable grant funding. This flexibility allows Ragon Institute faculty to readily apply findings, data, and breakthroughs from one field to another, catalyzing exploration and collaborative growth. As a result, just ten years or so from its inception, the Ragon Institute has expanded to address other global health threats including tuberculosis, influenza, West Nile, SARS, Zika, and most recently, COVID-19. Indeed, the Ragon Institute response to the COVID-19 pandemic is an outstanding example of the power of the Ragon model of collaboration and flexible catalytic funding. As soon as the new coronavirus was identified, the Ragon Institute researchers pivoted to apply knowledge gained from HIV to the new problem of COVID-19; they adapted the HIV vaccine platform to develop a COVID-19 vaccine, which became Johnson & Johnson's vaccine candidate currently in Phase III clinical trials. In addition, Ragon Institute researchers immediately used the COVID-19 genomic sequence to produce spike protein, which would, mere months later, ship to labs across the world to support global COVID-19 research efforts.

In recognition of the collective achievements of the Ragon Institute, Terry and Susan Ragon generously provided another endowment in the spring of 2019, ensuring the Institute's work could continue in perpetuity. However, given the recent growth of the Ragon Institute over the last few years, it became clear that more laboratory space is needed. Once again, the Ragon's generously committed to fund a new laboratory research building to meet the new challenges of a changing world. From the initial discussions on where the Institute should be located, there was no question that it needed to be in Kendall Square, a location which has contributed so much to the previous decade of success.

The new building, which will be exclusively dedicated to laboratory research regarding harnessing the human immune system to prevent and to cure human infectious diseases, is the next step towards advancing the Ragon Institute's mission. The new building will enable the Ragon Institute to double its size, bringing more scientists, researchers, clinicians, post-doctorate fellows, and operational staff into its collaborative fold while strengthening its ties to our community. The mission is simple, but ambitious, and the new building, located within the Kendall Square community, will play a major role in supporting it through the 21st century and beyond.

Recognizing the importance of the Ragon Institute mission and the importance of it being located in Kendall Square, MIT agreed to lease its property at 600/625 Main Street via a long term ground lease to enable the Ragon Institute to expand its research. Recognizing the importance to the City of Cambridge of the city block at this location, Mr. Ragon determined that the design of the building must be world class, befitting both the role of Cambridge as the epicenter of biomedical breakthroughs and the role of the Ragon Institute as a beacon of hope. Mr. Ragon also recognized that the design of the building must reach out to the community and provide an oasis of serenity and open space. Therefore, the innovative design of the site presents a collection of spaces and forms which engage the city and enhance the public realm, dedicating fully half of the site to open space, all of which is designed for public use except for an outdoor children's play area. The innovative sweeping, curving, and sloping shape of the building accentuates the unique triangular site upon which it sits and reflects the innovation of the research that is unfolding inside.

Project Description

In the context of Cambridge and Central Square, both the triangular site and the Project are quite unique. The Project sits at the intersection of the Central and Kendall Square districts and therefore is challenged with negotiating the significant difference in scale and urban character of these two districts. The Project addresses this unique challenge with a design which resolves the complications of a triangular site, reconciles the distinct urban scales, and creates a vital, publicly accessible urban plaza anchored by its innovative, forward-thinking architecture. The project is designed to be flexible in response to future programmatic changes and resilient to the impacts of climate change and responsible in its stewardship of the environment. Through its design, the

Project strives to encourage a vital and sustainable urban environment, reduce both embodied and operational carbon demands, conserve water, and protect the health and wellness of its occupants.

The triangular site imposes unique planning challenges which the Project resolves through its unique form. This concept arranges its program into what are essentially two simple bar buildings sitting at angles to each other on top of a common base and connected by a sweeping form which links those bars together around an internal atrium. The upper mass of the building defines the corner at the intersection of Main Street and Portland Street, while the base of the building presents a uniform street-wall to both Portland Street and Albany Street. At the ground plane, a publicly accessible linear park engages the public realm at the northwest corner of the site and traces the sweeping geometry of the building base as it expands into an inviting and diverse public plaza at the northeast corner of the site. The base of the building is a combination of floor-to-ceiling, ultra-clear glass along the Portland Street and Main Street / Plaza elevations, while Albany Street will be enhanced with a textured cladding system that will be warm in tone and punctuated with punched windows which provide both visual and tactile interest. Sculptural shade panels which will be similarly warm in tone but lighter in color will be the dominant material characterizing the majority of the upper portion of the building. The exception to this material palette will be the exterior wall at the atrium, which is expressed as a transparent glass wall to maximize access to daylight and to present a dynamic visual presence along Main Street.

The project is designed to achieve a minimum LEED Gold level of performance and will comply with all energy code requirements. Particular attention has been paid to the design and selection of building systems to reduce both embodied and operational carbon demands as much as possible. High performance, triple pane glazing will reduce energy loads while allowing use of natural daylight in perimeter spaces to further reduce energy loads. Sculptural shading panels protecting a rain-screen wall with a combination of glass and cementitious panels will further improve the thermal performance while introducing a dynamic visual character to the exterior wall. High-performance mechanical systems are designed to adapt to variable loads and to recover waste heat, and are able to transition to all-electric (non-fossil fuel using) systems in the future as doing so becomes more feasible.

The triangular site is bounded by Main Street to the north, Portland Street to the West, and Albany Street to the southeast. The site is comprised of two parcels, both of which are currently occupied by vacant buildings and which together comprise a site of approximately 67,579sf. The site is located entirely in an Industry-B zoning district. The Project use will be a Technical Office for Research and Development / Laboratory (Section 4.34.f), and is allowed as-of-right.

600 Main Street is occupied by a single story, approximately 41,600sf building with masonry load bearing walls. The building at 600 Main Street was originally built prior to 1929, and has been determined by the Executive Director of the Cambridge Historical Commission to not be significant. 624 Main Street is currently occupied by a two-story, approximately 9,600sf building with masonry load bearing walls. The building at 624 Main St was originally built prior to 1886 and has been determined by the Cambridge Historical Commission to be significant, but not preferably preserved. The Cambridge Historical Commission voted to authorize demolition of the building at 624 Main Street on October 1, 2020.

The project includes 6 stories above grade and ranges in height from approximately 86 feet nearest the intersection of Main Street and Portland Streets to 120 feet nearest the intersection of Main Street and Albany Street. The project includes two levels of below-grade parking accommodating 120 parking spaces. Loading will occur through an interior, four-bay loading dock accessed off of Albany Street.

Long-term bicycle parking for (41) bicycles is provided in a dedicated bicycle room on the first floor, located directly on the southeast side of the building and accessed from Albany Street. Short-term bicycle parking for (12) bicycles is distributed around the site, with (4) spaces located in convenient proximity to each of the three building entrances.

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2.2 - SPECIAL PERMITS REQUESTED

1. The Applicant respectfully requests the granting of a Special Permit pursuant to Section 10.40.
2. The Applicant respectfully requests the granting of a Special Permit pursuant to Section 19.20 for a Project Review Special Permit to construct a new building in excess of 50,000 gross square feet. Narrative documentation of compliance with the individual parts of Section 19.30 is included elsewhere in this document.
3. The Applicant respectfurlly requests the granting of a Special Permit to exclude basement area from the definition of Gross Floor Area pursuant to the provisions of Section 2.000.
4. The Applicant respectfully requests the granting of a Special Permit as allowed by Section 6.35.1 for a reduction in the minimum required amount of parking required under Section 6.36.
5. The Applicant respectfully requests the granting of a Special Permit allowed by Section 6.43.5 (b) to allow a curb cut in excess of 30-feet in width to promote the flow of traffic and protect public safety. The proposed width of the loading dock curb cut is 35 feet, which is the minimum width that can accommodate the loading docks required for the Project. The curb cut will be constructed per the city standard driveway apron detail. The loading docks have been angled to improve ingress and egress, which facilitates traffic flow by minimizing the time trucks will be using Albany Street to maneuver into the dock. The 35-foot wide single curb cut facilitates safety by allowing movements associated with the loading dock to occur safely, efficiently, and within a single driveway.
6. The Applicant respectfully requests the granting of a Special Permit as allowed by Section 19.50 allow for additional height where abuttting a residential zoning district with a more restrictive height limit (Section 19.50).

2.3 - SPECIAL PERMIT COMPLIANCE

Article 2.000 - Definitions

Compliance with Criteria for Exemption of Gross Floor Area Located in the Basement - The uses occupying such exempted GFA support the character of the neighborhood or district in which the applicable lot is located.

- The basement will contain Low Vibration Imaging Equipment designed to support highly specialized research microscopes that are best accommodated with slab on grade construction. This activity is commonly located in below grade spaces in laboratories in the District. The basement will also be programmed to include shared glass washing facilities that are also frequently located in the basement of research laboratories. Such a placement is necessary to avoid any water damage that might result from a malfunction of equipment

Section 10.40 - Special Permits

Section 10.43 - *Criteria*. Special permits will normally be granted where specific provisions of this Ordinance are met, except when particulars of the location or use, not generally true of the district or of the uses permitted in it, would cause granting of such permit to be to the detriment of the public interest because:

(a) It appears that requirements of this Ordinance cannot or will not be met.

- With the requested Special Permits noted above, the proposed project will meet all other requirements of the Zoning Ordinance.

(b) Traffic generated or patterns of access or egress would cause congestion, hazard, or substantial change in established neighborhood character

- The Transportation Impact Study (TIS) prepared for the Project by Vanasse & Associates, Inc. (VAI) and attached as Volume Three of this Application reviews the potential transportation impacts,

defines site access requirements, and identifies strategies to reduce traffic impacts associated with the Project. The study also reviews the Project with respect to the City of Cambridge Special Permit Criteria regarding traffic impacts, is in accordance with the City's guidelines for TIS, and follows the scoping determination issued by the Cambridge Traffic, Parking & Transportation (TP&T) and dated September 30, 2020. The TIS concludes that the proposed Project will not result in a public hazard due to significantly increased vehicular traffic or parking in this area of Cambridge. Specifically, the Project is not anticipated to have a significant adverse impact on motorist delays in the area, and adequate parking supply will exist at the site to support the Project. Accordingly, the TIS finds that the Project can be accommodated within the existing area infrastructure and on the roadway network with minimal effects, resulting in the ability to implement the Project with the appropriate mitigation measures.

(c) The continued operation of or the development of adjacent uses as permitted in the Zoning Ordinance would be adversely affected by the nature of the proposed use

- Adjacent uses will not be adversely affected by the proposed project. Directly adjacent uses generally consists of research buildings similar in purpose to the proposed project and a parking garage owned and operated by the Massachusetts Institute of Technology (MIT) for the sole benefit of persons affiliated with MIT. Diagonally across from the northwest corner of the site is the Newtowne Court residential neighborhood. None of these adjacent or nearby uses would experience negative impacts as a result of the proposed project, the requested reduction in off-street parking, or the requested exemption of basement level program area from the calculation of GFA. Beyond experiencing no negative impact as a result of the proposed project, the addition of enhanced landscaping and the provision of publicly accessible open space will provide a significant benefit to the larger community.

(d) Nuisance or hazard would be created to the detriment of the health, safety and/or welfare of the occupant of the proposed use or the citizens of the City

- Neither the proposed project, the requested reduction in off-street parking, or the requested exemption of basement level program area from the calculation of GFA will create any nuisance or hazard to the detriment of the health, safety and/or welfare of the project's occupants or the citizens of Cambridge. The Applicant is currently operating a research laboratory at 400 Technology Square with the same uses as the proposed project with no detriment to occupants or to residents of the City. Further, as stated above, the laboratory research uses are similar to those that are prevalent in the immediate vicinity of the proposed project.

(e) For other reasons, the proposed use would impair the integrity of the district or adjoining district, or otherwise derogate from the intent and purpose of this Ordinance

- The proposed project will be a significant enhancement to the Industrial District within which it is located and will effectively negotiate the transition to the diagonally adjacent Residential district across the intersection of Main Street and Portland Street. The project includes significant landscape areas along Main, Portland and Albany Streets which will contribute to the visual enhancement of the neighborhood and includes a total of approximately 28,191sf of publicly accessible landscape and open space on the site.

(f) The new use or building construction is inconsistent with the Urban Design Objectives set forth in Section 19.30.

- The proposed project is consistent with the Urban Design Objectives set forth in Section 19.30 of the Zoning Ordinance. A complete analysis of the project's compliance with those Objectives is set forth

2.4 - URBAN DESIGN OBJECTIVES NARRATIVE

Section 19.30 - Citywide Urban Design Objectives

Section 19.31 - New projects should be responsive to the existing or anticipated pattern of development. Indicators include:

(1) Heights and setbacks provide suitable transition to abutting or nearby residential zoning districts that are generally developed to low scale residential uses.

- The massing of the proposed project is specifically conceived to negotiate the significant differences in scale that exist to the immediate east and west of the site. To the east, the building rises to the maximum allowable height of 120 feet to correspond well with the height and bulk of the Brain & Cognitive Science building on the opposite site of Albany Street. While providing a conventional street wall on the north side of Albany Street, the building mass at the eastern edge of the site is organized to create the only significant publicly accessible open space on the south side of Main St between Kendall and Central Square. To the west, the gently sloping roof-line reduces to the height of the building significantly to approximately 86 feet at the intersection of Portland and Main St; thus, the Ragon building sits in a comfortable relationship with the existing building on the opposite side of Portland St, while also respecting the lower scale of the C-1 Residential District diagonally across the intersection. At this end of the site, the building creates a traditional street edge along the eastern side of Portland Street. The upper mass of the building facing onto Main St aligns with the face of 1 Portland St to continue the street edge from the west before gently opening into a large, publicly accessible open space.

(2) New buildings are designed and oriented on the lot so as to be consistent with the established streetscape on those streets on which the project lot abuts. Streetscape is meant to refer to the pattern of building setbacks and heights in relationship to public streets.

- As noted above, the height of the building is conceived to negotiate the significant differences in scale that exist to the east and west of the site. At its western end, (nearest the intersection of Main Street and Portland Street) the upper portion of the building is parallel to Main Street and aligns with the street wall established by the building at 1 Portland Street. While the urban context to the west is in many ways a continuation of the scale and spirit of Central Square, to the east the context is defined by the considerably more institutional character of Kendall Square. At street level, rather than attempting to negotiate this transition in character with a hybrid solution that belongs to neither Central nor Kendall Square, the proposed project resolves the inherently transitional nature ot this site by creating a generous, publicly accessible open space that belongs comfortably to both. In doing so it creates a destination space that welcomes all of its neighbors and serves the common need of everyone to find places of respite and relaxation within a dense urban realm.

  The creation of this open space is achieved by siting the building such that it defines a consistent street wall along both Portland and Albany Streets with the mass of the building being held back from the corner of Main Street and Albany Street. The large open space at the eastern edge of the site that results is in many ways a seamless, almost inevitable expansion of the linear park that begins at the corner of Main Street and Portland Street and extends continuously along the Main Street frontage from one end of the site to the other. At the corner of Portland and Main, the basic geometry of the building is organized in a manner that serves multiple urban objectives. The upper volume of the building aligns with and extends the street wall to the west. At 60 feet in width, it provides an appropriately scaled terrminal facade for that streetwall before the mass of the building pulls back from Main Street, opening the site up for public space and allowing for generous solar access on the ground plane.

Beneath that upper volume, the sweeping arc of the building base opens up space at the corner of Main and Portland, echoing the width of the sidewalk on the north side of Main Street and establishing the beginning of the linear park that ties the entire site together. At this corner, the ribbon of landscape along the base of the building includes stone benches for public seating, either in the protective shade of the overhanging building above or in the warmth of the afternoon sun. As pedestrians move along the site to the east, the base of the building pulls away from Main Street in two large steps. The first of these steps creates the Oculus Plaza, with its protective canopy formed by the second level terrace garden. The second step opens up the full depth of the site at its most eastern end, completing the urban space made possible by the basic massing of the building. Uniting the different areas of the site that are defined by the building massing is the continuous linear park that parallels Main St. The sidewalk along this linear park is constantly changing width in response to the curved edges of the planting areas. At its narrowest points, the 10-foot dimension of the sidewalk approximates the typical sidewalk widths to the west and gently recalls that sense of urban scale. As the sidewalk opens up from those zones of compression, paved paths that follow natural desire lines into and across the site invite pedestrians into the interior of the open space at its eastern end in a fluid, almost seamless manner. Benches and cafe type seating distributed frequently around the site afford ample opportunities for the public to occupy and use this space in a variety of ways.

(3) In mixed-use projects, uses are to be located carefully to respect the context, e.g. retail should front onto a street, new housing should relate to any adjacent existing residential use, etc.

- The proposed project is not a mixed-use development.

(4) Where relevant, historical context are respected, e.g. special consideration should be given to buildings on the site or neighboring buildings that are preferably preserved.

- The Cambridge Historical Commission has determined that the building at 624 Main Street is not preferably preserved in the context of the proposed replacement structure and authorized its demolition on October 1, 2020. The Executive Director of the Cambridge Historical Commission further determined that the building at 600 Main Street was not significant.

Section 19.32 - Development should be pedestrian and bicycle-friendly, with a positive relationship to its surroundings. Indicators include:

(1) Ground floors, particularly where they face public streets, public parks, and publicly accessible pathways, consist of spaces that are actively inhabited by people, such as retail stores, consumer service businesses and restaurants where they are allowed, or general office, educational or residential uses and building lobbies. Windows and doors that normally serve such inhabited spaces are encouraged to be a prominent aspect of the relevant building facades. Where a mix of activities are accommodated in a building, the more active uses are encouraged facing public streets, parks and pathways.

- As a result of program needs and FAR limitations, there is not an opportunity to include retail space or other publicly accessible businesses as part of the project. The building will, however, include a large, very active, ground-level colloquium room which faces out to Main Street and two very active seminar spaces which face out to the primary open space on the site.

  The Ragon Institute is unique from nearly all other entities in Cambridge. At its heart, it is an enterprise built on collaboration among a multitude of immunologists, biologists, clinicians, geneticists, physical scientists, infectious disease experts, biological engineers, computer scientists, and others. These collaborators involve people from MIT, Harvard, MGH, Harvard Medical School, the Harvard School of Public Health, the various hospitals in the Longwood Medical Area, and others. The Ragon Institute serves as a meeting hub for these scientists and experts, with daily

meetings drawing on people from these various locations. Innovation and collaboration in science is absolutely enhanced by in-person, scheduled, and spontaneous interactions among people in different fields and different laboratories, and often from different institutions. It is exactly why the Ragon Institute was conceived, and why it has been so successful in discovering so many breakthroughs in infectious disease treatments.

As a result, the number and placement of the colloquium and seminar rooms was crucial in the programming and design of the building. While there are competing criteria and compelling reasons to provide these spaces on upper floors where they're closer to the laboratory functions, it became clear that these spaces were the most active, lively spaces throughout the day in the program and in the use of the building. Understanding the city's desire to activate the streetscape in a meaningful way that is consistent with the use of the building, this overriding criteria won out – therefore, these spaces have been strategically located along the Main Street frontage of the building.

Both of the seminar rooms are expected to be used daily for meetings throughout the day and often into the evening. They will be used for classes, seminars, lab group meetings, faculty meetings, impromptu collaboration meetings when available, administration meetings, staff meetings, and other group meetings as needed. Lab groups alone will use these seminar meetings extensively; each lab group generally meets weekly, and the building is designed for 32 lab groups – yielding an average of 6 lab meetings each day in these two seminar rooms. In addition, classes which draw students/researchers from both Harvard and MIT are expected to be held in two hour blocks at least six times per week, some of which will be held in the evening, activating the spaces after dark as well. This schedule may well increase in the new building. When other meetings as described above are added to the booking of these rooms, it is anticipated that they will be used nearly full time throughout the day. In fact, during the programming process, the Ragon Institute considered including a third seminar room, but the FAR limitations and other programmatic needs negated that possibility. However, to provide more space when needed, the colloquium room has been designed as a multi-use space to allow the types of meetings described above to be held there as well.

Rather than utilizing sloped floor seating, the colloquium room has been designed with a level floor and moveable seating so that it can be set up and used in a variety of ways. For large lectures, presentations, or other gatherings, it can be set up in a lecture format as currently shown on the drawings, with a speaker and screens situated to address the entire room. For smaller lectures, seminars, meetings, classes, etc., including all of the various functions described above, the room will be set up to accommodate the size of the group as needed, and possibly multiple groups at once, including tables and chairs as needed for any particular group. In addition to larger meetings and lectures, the colloquium room will be utilized as the third seminar room that was eliminated from the program due to space constraints. Therefore, this room is expected to be used multiple times each day and sometimes into the evening.

The large lecture room/auditorium in the Ragon Institute's current space at 400 Tech Square has been utilized periodically by outside groups when requested, although most of the users have been other non-profit groups, other biotech organizations, or other users in the Technology Square development when a large spaces has been needed. However, given the prominent street-level location and expanse of 2-story high glass directly facing Main Street at the corner of Portland Street, it is expected that there will be many more requests to use the space for large gatherings. When not in use, the Ragon Institute would welcome the use of the colloquium room or seminar rooms on a pre-scheduled basis for activities such as public hearings held by the city, neighborhood meetings, Kendall Square Association meetings and events, and other municipal or public events.

A Child Care Center is also located on the ground floor and will provide vibrant activity throughout the day as the children move about inside the child care center and make use of the dedicated playground space at the corner of Portland and Albany Streets. The Child Care Center is designed to accommodate up to 45 children, including a mix of infants, toddlers, and preschoolers. The primary intent of the Child Care Center is to provide a convenient and efficient option for those who work at the Ragon Institute and need child care in order to do so. This is an important component of the Institute's ability to attract and retain the very best researchers, scientists, and clinicians, many of whom are in the age group likely to have young families. Spaces in the Child Care Center that are not utilized by those who work in the Ragon building will be made available to the public at large

In commercial districts, such active space consists of retail and consumer service stores and building lobbies that are oriented toward the street and encourage pedestrian activity on the sidewalk. However, in all cases such ground floor spaces should be occupied by uses

(a) permitted in the zoning district within which the building is located
(b) consistent with the general character of the environment within which the structure is located, and
(c) compatible with the principal use for which the building is designed.

- The proposed project is not located in a Commercial District. As noted above, the most routinely active program components in the building have been located on the ground floor, adjacent to the street and the publicly accessible plaza space for the purpose of providing vitality to the urban environment.

(2) Covered parking on the lower floors of a building and on-grade open parking, particularly where located in front of a building, is discouraged where a building faces a public street or public park, and publicly accessible pathways.

- All parking provided as part of the proposed project is located in an underground parking garage with access from Albany Street.

(3) Ground floors should be generally 25-50% transparent. The greatest amounts of glass would be expected for retail uses with lesser amounts for office, institutional or residential use.

- The ground floor of the building is approximately 60% transparent with large expanses of glass facing onto Main St and towards the open plaza at the east end of the site. Significant amounts of glass are provided at all entry, lobby, and meeting spaces.

(4) Entries to buildings are located so as to ensure safe pedestrian movement across streets, encourage walking as a preferred mode of travel within the city and to encourage the use of public transit for employment and other trips. Relating building entries as directly as possible to crosswalks and to pathways that lead to bus stops and transit stations is encouraged; siting buildings on a lot and developing site plans that reinforce expected pedestrian pathways over the lot and through the district is also encouraged.

- The main entrance to the building is located in a covered plaza facing onto Main St. This location maximizes its visibility to/from Main St, as well as its convenience to visitors and occupants arriving via the MBTA Red Line or public buses. A second entrance to the building is located on Albany Street in relative proximity to the intersection with Portland Street in a location that is convenient to students and researchers coming to and from MIT. A third entrance to the building is located along Portland St. and serves primarily as the point of entry for children enrolled in the child care center and participants in clinical trials who need to visit the Translational Research Center located on the ground floor of the building. The Translational Research Center provides a convenient, easily accessible location for participants in clinical trials to meet with clinician researchers engaged in Phase III clinical trials of experimental medications or treatment protocols. This program is not an

outpatient clinic, is not open to the general public and will not be used for routine medical visits with primary care physicians or as a setting to provide other conventional medical care.

(5) Pedestrians and bicyclists are able to access the site safely and conveniently; bicyclists should have, secure storage facilities conveniently located on-site and out of the weather. If bicycle parking is provided in a garage, special attention must be aid to providing safe access to the facilities from the outside.

- Sidewalks located around all three sides of the site will provide safe and convenient access for pedestrians moving through the area as well as those coming to or leaving from the building. Safe and convenient grade-level access is also provided for cyclists to the short-term bicycle parking distributed in three locations around the site (each in close proximity to a building entrance) and to the ground level long-term bike parking room for 41 bicycles located inside the building and accessed via an at-grade entrance on Albany St.

(6) Alternate means of serving this policy objective 19.32 through special building design, siting, or site design can be anticipated where the building form or use is distinctive such as freestanding parking structures, large institutional buildings such as churches and auditoriums, freestanding service buildings, power plants, athletic facilities, manufacturing plants, etc.

- The Ragon Institute is a non-profit research institution dedicated to developing treatments for some of the world's most devastating infectious diseases. Befitting the Institutes's mission to serve the public good through its commitment to improving public health, the proposed project likewise seeks to serve the public good through the nature and quality of its design. It's striking architectural form helps to mediate the significant differences in scale that exist on either side of its site. Composed into a highly transparent base which engages and gives scale to the pedestrian realm, atop which sits the sweeping form of the research tower, the project negotiates its challenging triangular site in a way that improves the urban condition on all sides. Along Portland and Albany Streets, the 24-foot tall base of the building steps back slightly from the street edge to allow the introduction of significant landscaped zones which help to unify the site while enhancing the pedestrian experience. Expanses of floor-to-ceiling glass promote visibility into the building wherever programmatically appropriate, while punched window openings provide a sense of scale and rhythm to areas where more limited transparency is appropriate. Above this base, the sweeping form of the research building is clad in a variable pattern of fins, the visual density of which ebbs and flows in response to the various programs housed inside the building. This pulsating effect is further punctuated by a collection of vertical slices - one a literal slice into the mass of the building which allows visibility into the atrium from the Portland / Albany Street intersection and the others more conceptual slices, articulated by the introduction of vertical curtain wall elements at the locations of the stair towers.

  Recognizing that Main Street is a vitally important urban thoroughfare, the proposed project presents a collection of spaces and forms which dynamically engage the city and enhance the public realm through both the quality of the architectural design and the provision of important public amenities. While the base of the building along Portland and Albany Streets has a large degree of continuity along the length of the building, Main Street is afforded a wide range of spaces with different characters and scales to provide opportunities for building occupants, pedestrians and community members to engage in different activities. At the corner of Portland and Main Streets, the elevated research building holds the street wall that exists to the west, while the sloping form of the roof line reduces the scale of the building at this corner out of respect for the residential neighborhood diagonally across the street. At the same time, the transparent 24-foot tall base of the building sweeps around the corner to continue and expand the landscaped base from Portland St and introduce some of the only significant planting on the south side of Main Street anywhere

between Kendall and Central Squares. In addition to simply being an urban amenity, this landscaped base includes benches for public seating and provides visual interest for neighbors and pedestrians.

As one continues east from this corner, the main entrance to the building is defined by a lightly landscaped plaza, partially open to the sky and partially under the cover of a canopy. To ensure that the covered areas remain warm and inviting, an oculus carved into the canopy both organizes the space and ensures generous access to daylight. A variety of seating options allows visitors to occupy and enjoy this space while remaining connected to the larger public realm. Further to the east, the site becomes more densely landscaped and more shaded by trees, creating an entirely different quality of space that is more intimately scaled. A water wall proposed under the overhanging research tower along Albany Street creates yet another type of space, with the semi-private terrace affording a partially secluded and more contemplative setting.

The proposed project replaces the blank walls, surface parking, and deteriorating urban character of the existing 600 and 624 Main Street sites with an institution dedicated to serving the public good. Through its visually striking architecture, sensitive urban planning, and vibrant landscape, the proposed project creates a pedestrian friendly environment and serves as a significant enhancement to its immediate neighborhood and to the city at large.

Section 19.33 - The building and site design should mitigate adverse environmental impacts of a development upon its neighbors. Indicators include:

(1) Mechanical equipment that is carefully designed, well organized or visually screened from its surroundings and is acoustically buffered from neighbors. Consideration is given to the size, complexity and appearance of the equipment, its proximity to residential areas, and its impact on the existing streetscape and skyline. The extent to which screening can bring order, lessen negative visual impacts, and enhance the overall appearance of the equipment should be taken into account. More specifically:

(a) Reasonable attempts have been made to avoid exposing rooftop mechanical equipment to public view from city streets. Among the techniques that might be considered are the inclusion of screens or a parapet around the roof of the building to shield low ducts and other equipment on the roof from view.

- Nearly all of the rooftop mechanical equipment is located within a fully enclosed mechanical room that is located within the building's allowable height. While the cooling towers and emergency generator are not located inside this enclosed mechanical room, both are located in a mechanical well and are designed to remain below the sloping plane of the roof so that they will not be visible to pedestrians. The only components of the building's mechanical equipment that extend above the sloping roof plane are the building exhaust stacks which are gathered together into compact areas and shrouded behind a sculptural, oval-shaped shroud.

(b) Treatment of the mechanical equipment (including design and massing of screening devices as well as exposed mechanical elements) that relates well to the overall design, massing, scale and character of the building.

- The gently sloping roof line of the proposed project helps to unify the unique geometry of the building mass into a cohesive architectural form while seamlessly transitioning from the lower scaled buildings along Main Street to the west of the site with the larger scale buildings to the east. The integrity of this gesture is preserved through the careful coordination of rooftop mechanical equipment to avoid wherever possible any interruption of the sloped roof plane. Where code or technical performance criteria requires that certain mechanical components extend above the roof plane (e.g. building exhaust stacks), those components are gathered together into compact areas and shrouded by sculptural, oval-shaped mechanical screens that preserve the clean, simple appearance of the roof. As noted above, all other rooftop equipment is invisible from the street level.

(c) Placement of mechanical equipment at locations on the site other than on the rooftop (such as in the basement), which reduces the bulk of elements located on the roof; however, at-grade locations external to the building should not be viewed as desirable alternatives.

- All mechanical, electrical, plumbing and fire protection equipment that can reasonably be located somewhere other than the top or the very bottom of the building has been located on a mechanical equipment platform above the ground level within the building. No mechanical equipment is located external to the building at grade. In addition to reducing the required size the mechanical penthouse and associated risk of visual clutter, locating this equipment on this mechanical equipment platform serves important resiliency goals and protects the health and safety of the building occupants as well as the safety and security of the research being carried out by the faculty and staff of the Ragon Institute.

(d) Tall elements, such as chimneys and air exhaust stacks, which are typically carried above screening devices for functioning reasons, are carefully designed as features of the building, thus creating interest on the skyline.

- The sculptural, oval-shaped exhaust stack shrouds which punctuate the sloping roof plane are held as far back as possible from the edges and ends of the building to minimize their visibility from the street. Their height is limited to the minimum required to meet building code and technical performance requirements. The locations of the exhaust stack shrouds and the atrium skylight (the only other major feature that will exist on the roof plane) are also thoughtfully placed relative to each other to provide a carefully composed arrangement of rooftop elements for individuals viewing the roof from an elevated position in neighboring buildings.

(e) All aspects of the mechanical equipment have been designed with attention to their visual impact on adjacent areas, particularly with regard to residential neighborhoods and views and vistas.

- All mechanical equipment has been designed with the intent of minimizing the visual impact of these elements on the surrounding area, and in particular with regard to pedestrian views and sight lines from the residential area diagonally across from to the site. Mechanical equipment that cannot be completely concealed is designed to have a clean, simple and minimal appearance.

(2) Trash that is handled to avoid impacts (noise, odor, and visual quality) on neighbors, e.g. the use of trash compactors or containment of all trash storage and handling within a building is encouraged.

- Dumpsters and trash compactors are located inside the enclosed loading dock accessed from Albany St which is designed with a vertically acting bi-fold door that will be closed except when service vehicles are actively accessing the loading dock.

(3) Loading docks that are located and designed to minimize impacts (visual and operational) on neighbors.

- The program of the building does not require significant amounts of truck traffic for delivery or distribution purposes. Nevertheless, the location of the enclosed loading dock on Albany St allows for any potentially negative impact of loading dock operations to be kept as far away as possible from the C-1 Residential Zoning District located diagonally across the intersection of Portland Street and Main Street. In addition, Albany Street has the least amount of traffic of the three streets that abut the site. As noted above, the enclosed loading dock will be designed with a vertically acting bi-fold door that will allow the dock to be closed to the street whenever possible. Warning devices will be provided to alert pedestrians and/or motorists to the presence of trucks entering or exiting the loading dock.

(4) Stormwater Best Management Practices and other measures to minimize runoff and improve water quality are implemented.

- The Massachusetts Stormwater Standards will be incorporated into the Project.

  The drainage design and stormwater management plan address both the quality and flow rates of stormwater runoff from the site and conforms to the standards outlined by the Massachusetts Department of Environmental Protection Stormwater Management Policy and the City of Cambridge Department of Public Works Stormwater Management Guidelines.

  The proposed stormwater management system will consist of roof top detention at flat roof areas, infiltration systems, deep sump catchbasins and manholes, area and trench drains, and piping.

(5) Landscaped areas and required Green Area Open Space, in addition to serving as visual amenities, are employed to reduce the rate and volume of stormwater runoff compared to pre-development conditions.

- Planting areas, where applicable, are designed as rain gardens to receive runoff from impermeable paved areas. These rain gardens will act as detention stormwater planters, equipped with overflow drains that will feed into underground cisterns.

(6) The structure is designed and sited to minimize shadow impacts on neighboring lots, especially shadows that would have a significant impact on the use and enjoyment of adjacent open space and shadows that might impact the operation of a Registered Solar Energy System as defined in Section 22.60 of this Zoning Ordinance.

- There are no Registered Solar Energy Systems located on any neighboring lots and therefore no predicted impact on the operation of any such systems. Shadow impacts on nearby open spaces have been carefully analyzed and the building massing organized to minimize those impacts. Studies documenting the extent of net new shadows, including net new shadows lasting longer than two hours, are included in Volume Three of this report.

(7) Changes in grade across the lot are designed in ways that minimize the need for structural retaining walls close to property lines.

- Site grading has been designed to eliminate any need for retaining walls along property lines. Small retaining walls or sloped landscaped areas are proposed in certain locations to resolve existing grades along adjacent streets with the proposed ground level elevation of the buliding at 20.5’.

(8) Building scale and wall treatment, including the provision of windows, are sensitive to existing residential uses on adjacent lots.

- There are no residential uses on directly adjacent lots. Through the sloping roof form, the height of the building is lowered to the maximum extent possible at the northwest corner of the site which lies diagonally across from to the Newtowne Court residential neighborhood.

(9) Outdoor lighting is designed to provide minimum lighting and necessary to ensure adequate safety, night vision, and comfort, while minimizing light pollution.

- It is the intent of the project to comply with the requirements of the LEED Light Pollution Reduction credit. Outdoor lighting will be designed to provide appropriate levels of night-time illumination for the safety and security of pedestrians navigating the site. Light fixtures will be selected and located to minimize or eliminate any contribution to light pollution and to limit spill-over of light onto public spaces or adjacent properties.

(10) The creation of a Tree Protection Plan that identifies important trees on the site, encourages their protection, or provides for adequate replacement of trees lost to development on the site.

- There are two large trees existing on the site, both at the corner of Albany and Main St. A tree protection plan has been developed and approved by the City. Both trees will be protected during construction and integrated into the new landscape design for the site.

Section 19.34 - Projects should not overburden the City infrastructure services, including neighborhood roads, city water supply system, and sewer system. Indicators include:

(1) The building and site design are designed to make use of water-conserving plumbing and minimize the amount of stormwater run-off through the use of best management practices for stormwater management.

- Through the specification of low flow and high efficiency plumbing fixtures, the building is designed to achieve at least a 30% reduction in indoor water use relative to the EPA baseline. Outdoor water use will be reduced by at least 50% through plant selection and specification of efficient irrigation systems and weather sensors. The project fully utilizes best management practices for stormwater management.

(2) The capacity and condition of drinking water and wastewater infrastructure systems are shown to be adequate, or the steps necessary to bring them up to an acceptable level are identified.

- The capacity of the existing water supply was reviewed by the Cambridge Water Department and is adequate. Hydrant flow tests will be performed in the near future to determine the pressure in the street mains against the water demand of the building. Based on the preliminary program and using Title V flow estimates, the building will utilize approximately 15,000 gallons per day of water.

  An aged water main adjacent to the site on Main Street is being considered for replacement by the Project. The Applicant has been in discussion with the Water Department to determine specific details of the replacement (if needed) and those discussions will continue. Specific details of the new domestic and fire protection connections for the building have been shared with Water Department personnel and will continue to be coordinated with the Department as the design progresses.

  The capacity of the existing wastewater and storm systems was reviewed by the Department of Public Works and is adequate. The Project will comply with the City's requirement to reduce the 25-year stormwater runoff equal to the preconstruction 2-year rate using a combination of roof top storage, underground storage, and infiltration. Phosphorus removal will be based on the infiltration rates of the soil. Testing scheduled during the upcoming geo/environmental soils investigation by Haley and Aldrich will determine the soil infiltration rates throughout the site. In addition to any infiltration that may be possible into shallow soils, crushed stone columns are being considered to connect the infiltration systems to an underlying deep sand layer. Once the infiltration and storage systems are full, water will be routed to the Albany Street drainage system.

  It is anticipated that the building will have two separate sanitary connections; a connection to the Albany Street system and a second to the Portland Street system. The Project will comply with the requirements of the Massachusetts Department of Environmental Protection. With an anticipated net new flow of 15,000 gallons, the Project will be required to remove approximately 60,000 gallons of Infiltration/Inflow. The Applicant will accomplish this with on-site infiltration.

(3) Buildings are designed to use natural resources and energy resources efficiently in construction, maintenance, and long-term operation of the building, including supporting mechanical systems that reduce the need for mechanical equipment generally and its location on the roof of a building specifically. The buildings are sited on the lot to allow construction on adjacent lots to do the same. Compliance with Leadership in Energy and Environmental Design (LEED) certification standards and other evolving environmental efficiency standards is encouraged.

- The proposed project is being designed as a leading edge facility that will be certifiable at a LEED Gold level. It is located on a previously developed site in a densely built area with convenient access

to public transit. Although only (3) are required, charging stations are provided for 6% of all parking spaces (8 total) to support and encourage the use of electric vehicles for building occupants who must drive. In addition, the project will install the infrastructure, including sufficient electrical capacity in the building and feeder conduit to allow for the expansion of electrical vehicle charging capacity to 50% (60 spaces total) in the future. A high-albedo roof is designed to minimize the urban heat island effect while generous open spaces on the site will significantly expand the urban canopy in the vicinity of the project.

Strategies for conservation of natural and energy resources include the minimization of both embodied and operational carbon and the design of high efficiency mechanical systems, including heat recovery from the exhaust air stream. Chilled beams and localized fan coil units will be used to decouple thermal control and ventilation demands. High efficiency LED light fixtures will minimize energy used for artificial lighting while strategically located glazing will maximize the use of daylighting and provide expansive views to the surrounding area for building occupants. The building is also designed to be solar ready.

Material and product specifications will take into consideration the sourcing of raw materials and will prioritize selection of products and materials with available Environmental and Health Product Declarations. Occupant health and wellness will be protected through the selection of products and materials which have low VOC content and exclude the 'six classes' of chemicals identified by the Green Science Policy Institute and the Red List published by the International Living Future Institute.

Section 19.35 - New construction should reinforce and enhance the complex urban aspects of Cambridge as it has developed historically. Indicators include:

(1) New educational institutional construction that is focused within the existing campuses

- The Ragon Institute is dedicated to scientific learning and is appropriately located on a parcel of land owned by MIT and immediately adjacent to its campus. Scientists, researchers, clinicians, and post-doctoral fellows will be conducting scientific research throughout the building.

(2) Where institutional construction occurs in commercial areas, retail, consumer service enterprises, and other uses that are accessible to the general public are provided at the ground (or lower) floors of buildings. Where such uses are not suitable for programmatic reasons, institutional uses that encourage active pedestrian traffic to and from the site.

- The proposed project islocated in an Industry B zoning district and is a research institute associated with MGH, MIT and Harvard. As a result of program requirements and FAR limitations, there is not an opportunity to include retail space as part of the project. However, as described more fully in the response to Section 19.32 (1), the building will include large colloquium and seminar spaces on the ground floor which face out to Main Street and out to the primary open space on the site. These spaces will be routinely used for scientific lectures, presentations, symposia, and graduate level teaching, and will be the most actively used spaces in the building throughout the day and often into the evening. In addition, a Child Care Center is located on the ground floor and will provide vibrant activity throughout the day as the children move about inside the child care center and make use of the dedicated outdoor playground space at the corner of Portland St. and Albany St.

(3) In large, multiple-building non-institutional developments, a mix of uses, including publicly accessible retail activity, is provided where such uses are permitted and where the mix of uses extends the period of time the area remains active throughout the day.

- The proposed project is a single institutional building.

(4) Historic structures and environments are preserved.

- The project team worked closely with the Cambridge Historical Commission (CHC) to determine whether any of the structures existing on the site were preferably preserved. After evaluation, it was determined that the building located at 600 Main St. was not significant and its demolition was authorized. While the building located at 624 Main was found to be significant, the Cambridge Historical Commission determined that the building was not preferably preserved and voted to authorize its demolition on October 1, 2020.

(5) Preservation or provision of facilities for start-up companies and appropriately scaled manufacturing activities that provide a wide diversity of employment paths for Cambridge residents as a component of the development; however, activities heavily dependent on trucking for supply and distribution are not encouraged.

- The project will provide research related employment opportunities for existing and future residents of Cambridge. The proposed project is similar to other uses in the vicinity and will not require frequent trucking for supply and distribution purposes.

Section 19.36 - Expansion of the inventory of housing in the city is encouraged. Indicators include:

(1) Housing is a component of any large, multiple building commercial development. Where such development abuts residential zoning districts substantially developed to low-scale residential uses, placement of housing within the development such that it acts as a transition/buffer between uses within and without the development.

- No housing is being provided as part of this project.

(2) Where housing is constructed, providing affordable units exceeding that mandated by the Ordinance. Targeting larger family-sized middle income units is encouraged.

- No housing is being provided as part of this project.

Section 19.37 - Enhancement and expansion of open space amenities in the city should be incorporated into new development in the city. Indicators include:

(1) On large-parcel commercial developments, publicly beneficial open space is provided.

- Approximately 28,191sf of publicly accessible open space (approximately 2/3 of an acre) is planned for the project, of which approximately 11,955sf will be landscaped. A variety of pedestrian paths, outdoor seating areas, and a playground associated with the proposed child care center make up the balance of open space planned for the site. Organized into a linear park which begins at the corner of Main Street and Portland Street and expands into a large, publicly accessible plaza space as one moves to the east, the combination of landscape and hardscape will provide a diverse and welcoming array of outdoor environments to accommodate a wide range of different activities. With the exception of the playground dedicated to the child care center, open space on the site is publicly accessible and specifically designed to invite public use. A small terrace located along Albany Street will be semi-public in that it will be designed for occasional use by building occupants for outdoor activities, but will be accessible to the public when not in use for events.

(2) Open space facilities are designed to enhance or expand existing facilities or to expand networks of pedestrian and bicycle movement within the vicinity of the development.

- The project is designed to coordinate with the desired construction of a raised, separated bike lane along the south side of Main Street. Beginning with the linear park space at the intersection of Main Street and Portland Street, landscaped and paved areas are designed to invite pedestrian circulation

and public use of the accessible open spaces. The large plaza space at the intersection of Main Street and Albany Street provides an important complement to the existing open space at Technology Square with a wider variety of scales and characteristics that invite different forms of public use. On all sides of the site, street trees are planned between the sidewalk and the curb along all three sides of the site, while additional landscaping located along the base of the building will significantly enhance the pedestrian experience. Short-term bicycle parking is provided in convenient proximity to all building entrances, while an long-term bicycle parking room accommodating 41 bicycles invites employees to commute by bike.

(3) A wider range of open space activities than presently found in the abutting area is provided.

- The extent and variety of publicly accessible open space planned for the site distinguishes the proposed project from buildings to its west which have a tendency to sequester open space on the interior of the site, surrounded by buildings and largely invisible from the public realm. Technology Square is considerably more inviting for public use by remaining open to the street and through the canopy of large trees, which helps to differentiate the otherwise uniform space while offering a degree of privacy from building occupants. The open space provided as part of the proposed project is closer in spirit to the example of Technology Square with the open space both visible and immediately accessible from the public realm, but complements the character of Technology Square by providing spaces with a greater variety in scale and openness to support a more diverse array of public activity.

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2.5 - K2C2 CENTRAL SQUARE DESIGN GUIDELINES NARRATIVE

Section 4.a - Streets and Sidewalks

Goal #1: Establish Massachusetts Avenue and Main Street as great public spaces.

(a) Require active ground floor uses in new and substantially renovated buildings (either retail or designed to accommodate retail in the future)

- The proposed project provides active ground floor uses in the form of a large colloquium room and seminar spaces which face out to Main Street and out to the primary open space on the site. As described more fully in Section 19.32 (1), these spaces will be routinely used for scientific lectures, presentations, symposia, graduate level teaching, and other meetings and activities, and will be the most actively used spaces in the building throughout the day and often into the evening. In addition, a child care center is located on the ground floor and will provide vibrant activity throughout the day as the children move about inside the child care center and make use of the dedicated outdoor playground space at the corner of Portland St. and Albany St.

(b) - Priority areas for developing/adapting building to include active ground floor uses include:

- East side of Sidney Street at Lafayette Square (e.g. through replacement of the existing frame residential buildings). Retain historically/culturally significant structures.
- City Parking lot edges, and other large parking lot frontage along streets/sidewalks.
  - Part (b) of this goal identifies priority areas which do not include this site, and therefore is not applicable to the proposed project.

Goal #2: Enhance the street network to make walking more convenient, safe and fun.

(a) Improve pedestrian street lighting with a plan that addresses safety, identity and convenient access. Consider opportunities for building-mounted lighting to supplement street lighting

- Sidewalks and other pedestrian paths will be designed and located to provide easy access into the building and convenient circulation through and around the site. While maintaining a cohesive overall character, landscape design will vary in different locations around the site to help create a sense of place and enhance the pedestrian experience. A minimum of (1) foot-candle at the walking surface will be provided at all sidewalks, with between (3) and (5) foot-candles provided at building entrances to enhance security and aid in wayfinding. Light fixtures will be selected and located to minimize or eliminate any contribution to light pollution and to limit spill-over of light onto public spaces or adjacent properties. Site lighting may include fixtures that are building-mounted, pole-mounted and/or ground-mounted.

(b) Encourage transparent retail storefronts

- Part (b) of this goal is not applicable as the proposed project does not include retail uses.

(c) At non-residential uses, a setback of up to 10 feet may be provided to accommodate outdoor dining or other active programming.

- The landscape design includes planting zones of variable width between the primary pedestrian travel zone and the base of the building. The design includes a variety of public seating areas distributed along the base of the building and in the plaza spaces located along Main Street to encourage public activity and invite pedestrians and community members to relax, read, socialize, play chess or checkers on the chess tables that will be provided, enjoy a meal, or otherwise engage with and contribute to the vitality of urban life in the Kendall / Central Square area.

(d) Encourage compact front gardens along residential building frontage on streets other than Massachusetts Avenue and Main Street to introduce attractive plantings, express the square's diversity, and help balance the goals of active street edges and residential privacy. These gardens should be 5 to 10 feet deep from sidewalk to principal facade line

- Part (d) of this goal is not applicable as the proposed project does not include residential uses.

Section 4.b - Integrating Buildings with Public Places

Goal #1: As the design of existing public spaces is revised and as part of the redevelopment of adjacent properties, seek to improve the attractiveness and functionality of open spaces at all levels.

- Refer to the response provided to Urban Design Objectives Section 19.37 (3) for a description of the project features which will improve the attractiveness and functionality of open space on the site.

Goal #2: Create new outdoor and/or indoor gathering spaces.

(a) Encourage establishment of a Public Room, cultural center and/or public market of 5,000 sf or more floor area in association with property redevelopment or adaptive reuse. Prime locations to consider include redevelopment sites of one acre or more.

- Due to program requirements and FAR limitations on the building size, there is not sufficient area for such facilities.

(b) In conjunction with active uses of private development, encourage installation of publicly accessible spaces such as plazas, play areas, pedestrian connectors, and parklets either on site or on underutilized sidewalk areas to be activated by adjacent active uses

- Refer to the response provided to the Urban Design Objectives Narrative Section 19.37 (1) and the response provided to K2C2 Central Square Design Guidelines Narrative, Section 4.a Goal #2-(c) for a description of the publicly accessible open spaces on the site.

Section 4.c - Active Ground Floor

Goal #1: Expand the apparent public realm by expanding the publicly accessible private spaces along the sidewalk, in association with the creation of housing, retail, cultural and/or office space.

(a) Transparent materials and interior lighting should be used to maximize visibility of street level uses.

- While the proposed project does not include housing, retail, cultural or office space on the ground level, it does include significant use of transparent materials to maximize visibility into the interior of the building. The proposed project provides active ground floor uses in the form of a large colloquium room and seminar spaces which face out to Main Street and out to the primary open space on the site. As described more fully in the response provided to the Urban Design Objectives Narrative, Section 19.32 (1), these spaces will be routinely used for scientific lectures, presentations, symposia, graduate level teaching, and other meetings and activities, and will be the most actively used spaces in the building. In addition, a child care center is located on the ground floor and will provide vibrant activity throughout the day as the children move about inside the child care center and make use of the dedicated outdoor playground space at the corner of Portland St. and Albany St.

(b) Active ground level spaces should have strong, interactive connections with adjacent public sidewalk/plaza space using strategies such as extensive transparent glazing, interactive media or public art, large operable doors and windows, and/or associated outdoor seating.

- The proposed project includes large colloquium and seminar spaces on the ground floor which face out to Main Street and out to the large open spaces near the intersection of Main Street and Albany

Street. As described more fully in the response provided to the Urban Design Objectives Narrative, Section 19.32 (1), these spaces will be routinely used for scientific lectures, presentations, symposia, and graduate level teaching, and other meetings and activities, and will be the most actively used spaces in the building. These spaces face the street utilizing extensive, 2-story high ultra-clear glass walls along virtually the entire street frontage along Main Street. In addition, a Child Care Center is located on the ground floor and will provide vibrant activity throughout the day as the children move about inside the child care center and make use of the dedicated outdoor playground space at the corner of Portland St. and Albany St. A variety of outdoor seating areas are incorporated throughout the site and in various locations along Main St., Portland St., and Albany St in the landscaped area between the primary pedestrian travel zone and the base of the building.

(c) Blank walls exceeding 10 feet in length should be avoided.

- The base of the building along Portland Street and Main Street is nearly 100% transparent. Along Albany Street the buliding base is regularly punctuated with doors or windows that are less than 10 feet apart, though there are by necessity limited sections of wall of up to 15 feet in length with no openings.

Goal #2: Storefronts should be oriented to the pedestrian and provide visual interest both day and night along Massachusetts Avenue and Main Street. Pedestrians should be encouraged to window shop by the provisions of varied and interesting display areas. Every effort should be made to facilitate access into the store and to create an individual building or store identity.

- Goal #2 of this Section is not applicable to the proposed project as retail uses are not included. However, as stated above, the project includes large colloquium and seminar spaces on the ground floors that will be routinely used for scientific lectures, presentations, symposiums, graduate level teaching, and other meetings and activities, as well as a Child Care Center.

Section 4.d - Built Form

Goal #1: Height of buildings should be consistent within height range of overall context of the surrounding properties. Variation of height within this range is encouraged; while buildings are encouraged to align facade elements with tops of adjacent buildings, overall building height is not necessarily intended to be uniform from one building to another.

(a) Allow the greatest height and bulk of the building on Massachusetts Avenue with a diminution in height and bulk as the project approaches the lower residential uses in abutting areas (see streetwalls and setbacks).

- The proposed project is not located on Massachusetts Avenue.

(b) Consider opportunities to maintain and enhance views to significant historic structures when composing building height and bulk.

- Part (b) of this goal is not applicable as there are no historic structures in the vicinity for which preservation of view corridors would be important.

(c) In street wall situations it is desirable to relate architectural elements of new construction to the significant architectural elements including cornice heights on adjacent buildings.

- The ground level of the building is generously scaled at 24 feet tall, and is expressed architecturally as a continuous base on which the sweeping form of the research building sits. The height of this base was established to recall the height of the building that currently exists on the site at 624 Main Street and to create a more intimate and pedestrian friendly scale that respects both the street wall

to the west of the site and the residential neighborhood diagonally across the intersection of Main Street and Portland Street.

(d) The combined length of any two adjacent facades should not exceed 220'.

- The building facades facing towards Main Street and overlooking the large open space near the intersection of Main Street and Albany Street are all considerably shorter than 200 feet. The building elevations along both Portland and Albany Street do exceed this length, but are punctuated by strong vertical elements which interrupt the typical wall surface in order to introduce a more appropriate sense of scale and rhythm to these walls. The longest wall surface in between a building corner and one of these vertical interruptions is approximately 210 feet, though within that length the sculptural shading panels vary in width across a consistent module of 31'-6" to create a smaller sense of scale and rhythm.

Goal #2: Continuation of a strong linear retail frontage is critical to preserving the strength and historic character of the commercial district. Building fronts should maintain a strong linear edge along Massachusetts Avenue. Adjacent structures should build to a common party wall, although occasional setbacks of up to 15 feet to accommodate outdoor dining or retail sales, integrated with ground floor design and programming, are encouraged. Alleyways between buildings are not encouraged except at identified locations where public pedestrian passages are desirable.

- The proposed project is not located on Massachusetts Avenue.

Limit shadow impacts of new development on portions of neighborhoods outside the study area and public parks within approximately 1-2 blocks or 500 feet of development site. Shadow impacts should not substantially reduce the appeal of public spaces, nor direct sun access to neighborhood housing, during spring and fall. Limit shadow impacts to no more than 2 hours per day between March 1 and October 31.

- Shadow impacts on surrounding areas have been carefully studied during the design process. Refer to the detailed shadow studies included Volume Three of this report for additional information.

Goal #3: Building facades along Massachusetts Avenue and Main Street should both reinforce the traditional 55 foot height range of many traditional buildings, and introduce variation in height, including volumes that exceed the 55-60 foot range. Added height is especially encouraged where it can help buildings serve as attractive landmarks.

(a) Streetwall height should step down progressively from the Massachusetts Avenue/Main Street toward neighborhood context.

- The massing of the proposed project is specifically conceived to negotiate the significant differences in scale that exist to the immediate east and west of the site. On the eastern end of the site, the building rises to the maximum allowable height of 120 feet to correspond well with the height and bulk of the Brain & Cognitive Science building on the opposite side of Albany Street. A conventional street wall on the north side of Albany Street maintains this appropriate scalar relationship with other MIT-owned buildings on the south side of Albany Street. On the western end of the site, the gently sloping roof-line reduces the height of the building significantly. At a height of approximately 86 feet at the intersection of Portland and Main St, the building sits in a comfortable relationship with the building on the opposite side of Portland St, while also respecting the lower scale of the C-1 Residential District diagonally across the intersection.

(b) A maximum streetwall height of 45 feet should be maintained along streets perpendicular to Massachusetts Avenue and Main Street within 100 feet of adjacent neighborhood zoning districts.

- The proposed site does not abut a residential zoning district, though there is a C-1 Residential District diagonally across the intersection of Main Street and Portlant Street. On the south side of Main Street, neither Portland Street nor Albany Street (which obviously is not 'perpendicular' to Main Street) contain residential neighborhoods, nor are characterized by buildings that maintain a 45-foot high streetwall. Nevertheless, the proposed project honors the spirit of this goal by simultaneously establishing comfortable scale relationships with its neighboring buildings and proactively creating an inviting pedestrian realm through the clear physical and material distinction between its base and the upper floors of the building.

(c) Taller volumes are permitted if set back from this streetwall at least 15 feet and within the height overlay limits.

- The proposed project is within the allowable height limits of the Industry-B zoning district, and with the exception of the exhaust stacks concealed by sculptural, oval-shaped screening elements does not avail itself of the exception allowing rooftop mounted mechanical equipment to exceed that height limit. As noted above, the height and mass of the building and its presence on the street is specifically conceived to create harmonious relationships with its neighboring buildings. As the height of the building at 1 Portland Street steps up to over 100 feet, the introduction of an arcade creates a human-scaled space which preserves the quality of the pedestrian experience. The proposed project adopts a similar strategy for giving scale and definition to the pedestrian realm by creating a strong visual distiction between the base of the building and the overhanging upper floors. This same strategy is employed along Albany Street, though in this case the formal arrangement provides a degree of definition and continuity which is a welcome contrast to the variable scale and character existing on the south side of the street.

Goal #4: The heavy pedestrian activity in the Square must be recognized in renovations and new construction projects. Treatment of the ground floor plane should relate to the human dimension and be rich in detail to enhance the pedestrian experience.

- The massing of the proposed building is specifically arranged to provide an appropriate human scale to the base of the building. The combination of transparent and opaque materials, working in conjunction with the landscaping along the base of the building, will provide a rich and engaging experience for pedestrians walking along and through the site.

Section 4.e - Parking and Service Areas

Goal #1: Off-street parking and service areas should be screened from the public realm wherever possible, to enable more attractive and active settings to adjoin sidewalks and other public places.

(a) Off-street parking should be located below grade wherever possible. It is acceptable to locate public parking at grade level if it is surrounded by active uses and surmounted by additional building floors.

- All parking provided as part of the proposed project is located in an underground parking garage with access from Albany Street.

(b) Where existing surface parking is expected to remain for a significant period of time, improve edges along sidewalks with plantings and/or public art.

- The proposed project removes all surface parking currently existing on the site.

(c) Locate service areas on alleys or side streets, never along Mass Ave or Main Street. Loading docks should be faced with a garage door that typically remains closed except when vehicles are entering or leaving, and that is designed to complement the architecture of the building.

- Entrances to both the loading dock and the underground parking garage are located on Albany Street. The loading dock will have a vertically acting bi-fold door that is opened only when vehicles are entering and/or exiting the loading dock. The loading dock door will be finished with materials that are complementary with the base of the building.

2.6 - SUMMARY OF COMMUNITY ENGAGEMENT

In accordance with Section 5 of the Rules of the Planning Board, The Ragon Institute hosted two Early Community Engagement meeting to share their plans with area residents. After consultation with the Community Development Department, invitations were sent to property owners along Main Street. In addition to individual property owners, invitations were also extended to the adjacent neighborhood and civic associations including the Area Four Neighborhood Coalition, Essex Street Neighbors, and the Margaret Fuller Neighborhood House. Attached is a complete list of invitees. A meeting was hosted virtually via zoom on Thursday, November 5 at 6:00pm. Invitations were mailed two weeks prior to the event. Copies of the invitation are attached hereto. Notices of the meeting were posted on the CDD website and the City Calendar.

A second meeting for residents of the Newtowne Court apartments was scheduled for December 9 at 6:00pm. Invitations and meeting details were coordinated through CHA Housing Manager Damaris Rodriguez of the Cambridge Housing Authority.

Present at both Community Meetings were representatives of The Ragon Institute and local land use counsel.

There were no attendees at either meeting.

The applicant will continue to work with the Cambridge Housing Authority to explore additional ways to engage with residents of Newtowne Court.

1.

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

2.

CAMBRIDGE HOUSING AUTHORITY
675 MASSACHUSETTS AVE
CAMBRIDGE, MA 02139

in care of:

Damaris Rodriguez
Pisani Center
131 Washington Street
Cambridge, MA 02139

3.

ALEXANDRIA REAL ESTATE EQUITIES, INC.
ATTN: MICHELLE LOWER
400 TECHNOLOGY SQUARE, SUITE 101
CAMBRIDGE, MA 02139

The Port - Neighborhood 4	
Area Four Neighborhood Coalition	Leadership Committee: Julian Cassa Liz Layton area4neighborhoodcoalition@gmail.com
Essex Street Neighbors	Steering Committee: Jean Cummings, cummings@cityresearch.com Laurie Friedman Arleen Henry, arleenh@hotmail.com Jonathan King, jaking@mit.edu Nancy Ryan, nancyryan4@comcast.net

Margaret Fuller Neighborhood House Web: http://www.margaretfullerhouse.org/ Facebook: Margaret Fuller Neighborhood House 71 Cherry Street Cambridge, MA 02139 617/547-4680	Selvin Chambers, Executive Director schambers@margaretfullerhouse.org

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2.7 - NOISE ORDINANCE COMPLIANCE NARRATIVE

ACENTECH

33 Moulton Street
Cambridge MA 02138
617 499 8000
acentech.com

December 11, 2020

Stuart Baur
Payette
290 Congress Street, 5th Floor
Boston, MA 02210

Subject: MGH Ragon 2.0 Lab Building
Community Noise Control Narrative
Acentech Project No. 633430

Dear Stuart:

Noise emissions from the planned new MGH Ragon 2.0 building must be consistent with the requirements of the Cambridge Noise Regulation. There is a residential neighborhood to the northwest of the site where the requirement is to meet a noise goal of 50 dBA for evening and nighttime hours (as well as all day on Sunday). Other buildings adjacent to the site are commercial properties where the noise requirement is 65 dBA at all times of day.

The primary sources of noise emission from the facility are the cooling towers, air handing system air intakes, exhaust air systems, standby emergency generators and the garage ventilation system. These noise sources and mitigation planned for each are discussed below.

Cooling Towers

The cooling towers are planned to have low-noise fans and will be located in a solid-screened well at the roof which will shield sound from the equipment that would otherwise propagate into the community. This is especially relevant for residential neighbors who will be at very much lower elevations than the towers. The towers are also located at the end of the site that is most distant from the nearest residential receivers. The tower noise emissions and noise control features are planned to meet the most stringent nighttime noise requirements for full operation; at off-peak times, which will particularly include the nighttime hours in the regulation, the noise due to the towers that reaches the neighbors will be even lower because the towers will be operated with VFD control. The noise of the tower fans is primarily a function of speed and at the reduced fan speeds that will occur during the off-peak times, the noise is expected to be significantly quieter than the requirements.

Air Handling Unit (AHU) Air Intakes

Each of the main air handing units will be enclosed in a rooftop mechanical penthouse. Modest 3-foot duct silencers similar to Vibro-Acoustics RD-HV will be used on the outside air intakes. Sound from all rooftop AHUs operating at full load will meet noise requirements in all locations during daytime hours. Further, the fans in these units will operate with VFD controls so that when office area airflow demand is low, such as at night and on weekends, the noise emissions are expected to be commensurately lower than for full design conditions. With a nominal nighttime and weekend setback of 80% fan speed for AHUs servicing offices areas on the west side of the building, which will be programmed into the system, AHU noise emissions will meet applicable noise regulations and goals.

Exhaust Air Systems

There are two sets of exhaust fans located in the rooftop penthouse. Noise emission to the surrounding community is expected to some degree from the discharge stacks and each of these will be provided by the supplier with a silencer.

LEP-1 and LEP-2 fans, which will run continuously at full load at night and on weekends, will comply with applicable regulations when installed with the supplier-provided silencer.

To attenuate sound in the community from laboratory exhaust fans LEP-3 and LEP-4, which are assumed to operate continuously at night and on weekends, the following mitigation measures will be implemented:

1. Include an alternative in-line silencer/attenuator selection to provide an additional 4 dB of attenuation to what is specified by the silencer listed on the supplier cut sheet
2. Maintain a fan speed setback during nighttime (from 6pm to 7am daily) and all day on Sunday, to approximately 70% maximum fan RPM.

With these mitigation measures implemented, LEP-3 and LEP-4 will also comply with applicable noise regulations.

Generators

The base building includes one (two-megawatt) or two (one-megawatt) standby emergency generators. These units will be located in a roof well at the northeast of the project rooftop, and they will each be provided with weatherproof/noise reduction enclosures. The screens surrounding on the roof wells will substantially mitigate the noise transmission to the surrounding community.

Enclosures will be designed such that the two-megawatt generator will emit no greater than 75 dBA at 100 feet in free-field conditions, or that each of the one-megawatt generators will emit no greater than 72 dBA at 100 feet in free-field conditions, inclusive of mechanical, ventilation, and combustion exhaust paths. Meeting this design goal will not only satisfy regulations for noise in the community, but will reduce sounds to the Ragon building occupants on floors below.

Generators will be tested only during daytime hours identified in the noise regulation; the generators are only expected to run at night in the event of an emergency. As an administrative measure for the building, just one generator will be tested at a time to avoid additive noise from multiple units running together.

Garage Ventilation Systems

The garage ventilation systems are designed to exhaust to a shared areaway on the south of the building. Each of these fans will be designed with a 3-foot duct attenuator/silencer to reduce sound for passers-by on the sidewalk, and to account for the potential redevelopment of the parking facility to the southeast of the project. Inclusion of this silencer will attenuate fan noise such that the project meets the noise regulation of 65 dBA at property line receptors to the southeast during full load operating conditions.

Furthermore, our experience with similar exhaust systems that utilize this sort of operational scheme is that the fans infrequently operate at full speed and noise emissions are significantly less. Incorporation of a short attenuator for these units will ensure that they meet regulatory limits for future residential development for all operational conditions, however infrequent.

Miscellaneous Other Small Vent Systems

It is anticipated that there will be other smaller miscellaneous equipment noise sources associated with the project that have not yet been identified. These are not likely to have substantial exterior noise emissions, but the project will provide suitable attenuation treatments for them to control exterior noise emissions to meet the overall noise goals identified herein, as may be needed.

* * * * * * *

With the noise control treatments described herein, noise emissions from the project will meet the requirements of the Cambridge Noise Regulation and all other applicable noise laws and regulations. With the operation of the equipment that is planned, at off peak times, which will be most of the defined nighttime hours, we expect noise from the building will be lower than the requirements.

I trust that this provides the summary you need of noise control measures that are planned for the project to mitigate community noise emissions and meet the city noise requirements. Please let me know if you have further questions.

Sincerely Yours,

ACENTECH INCORPORATED

Ben Davenny
Principal Consultant

Jack Briskie
Consultant

Community Noise Control Narrative

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2.8 - UTILITIES AND INFRASTRUCTURE NARRATIVES

The development parcel is located between Main Street, Portland Street and Albany Street in the Area 4 section of Cambridge. The parcel encompasses approximately 67,580 square feet (1.55 acres) and is currently developed with multiple buildings and paved areas. The site is nearly 100% impervious, with the exception of a small grass area in the northeastern most portion of the site. The existing brick and concrete structures will be demolished prior to new building construction, along with all of the asphalt. Utilities servicing the existing buildings, including water, sewer, gas, electric and telephone will be cut and capped as part of this work. Catchbasins and piping within the site will also be removed. The location of the site is shown in the Existing Conditions Plan in Volume 2 along with the planned new building footprint.

Water

The existing water mains located in the streets adjacent to the site are shown in Figure 2 (see Volume 2) and include:

- Main Street, south side, 12-in installed in 1910 (located directly adjacent to the property line)
- Main Street, north side, 12-in installed in 1909
- Albany Street, 8-in installed in 1884
- Albany Street, 12-in installed in 2009 (record of ownership is being reviewed)
- Portland Street, 6-in installed in 1898
- Portland Street, 24-in installed in 2012

The fire protection and domestic water services for the new building will need to be connected to the street mains. Redundant domestic water services (primary and secondary) are required for a building of this size. The condition of the water mains and the planned connections have been discussed with the Cambridge Water Department. Based on these discussions, the project is proposing to connect the primary domestic feed to the 24-in ductile iron main in Portland Street. The secondary domestic service is currently planned to be fed from the 8-in main in Albany Street.

Given the age of the 12-in cast iron main on the south side of Main Street, the Applicant is considering the replacement and relocation of approximately 440 linear feet of water main further north in Main Street. The section of water main between Portland Street and Albany Street would be relocated nearer the center of the roadway in the alignment of an abandoned 8-in gas line. This has been discussed at length with the Cambridge Water Department and they would support a replacement and relocation, if needed. Details regarding the cutting and capping, abandonment, installation and connection points of the new main will continue to be coordinated with the Water Department as the building design progresses.

The proposed connections and contemplated relocated main are shown in Figure 3. Depending on the location of the building' sprinkler connection, a new site hydrant may be added.

With a GFA of 185,810 square feet for the proposed building and using Title V flows, the building will demand approximately 18,470 gallons per day of water. The demand may be reduced through the use of a rainwater collection system being considered for the building.

Hydrant flow tests were performed in November of this year to determine the pressure in the main against the anticipated water demand of the building. The flow tests confirmed that sufficient pressure and flow are present in the mains tested. The capacity of the existing water supply has been reviewed by the Water Department and they concur that the capacity is adequate.

The proposed connection and new lateral shown in Figure 3 have been shared and discussed with the Water Department. Specific details of the connection, valving and water demand will continue to be coordinated with the Water Department as the design progresses.

Stormwater

The existing site is predominantly buildings and paved parking areas. Impervious areas comprise 95% of the site. Stormwater was routed to catchbasins located throughout the site. Although no plans exist, it is believed that the catchbasins were connected to the 12-in drain pipe in Albany Street. Stormwater left the site unmitigated and untreated. The 12-in drain is connected to the 20-in drain in Main Street which is routed to the 42-in siphon below the Red Line subway tunnel. From there, the system drains to the 96-in combined pipe in Binney Street. The existing pipe network is shown in Figure 4 and includes:

- Main Street 24-in drain; discharges to the Portland Street and then to Binney Street
- Albany Street 12-in drain (size varies); discharges to 24-in in Main Street

The proposed stormwater management system will consist of roof top detention, infiltration systems, deep sump catchbasins and manholes, area and trench drains and piping. A rainwater collection system is being considered for the project and will likely consist of capturing a portion of water that falls on the roof and storing it in a tank located on the garage level beneath the building.

Site redevelopment will include approximately 11,955 square feet of pervious areas including grass and landscaping. This represents a 17% reduction of impervious area. Impervious areas will include the roof, driveway, walkways and other hardscaped outdoor areas.

The on-site stormwater system will meet four key requirements:

1. Water Quality: Capture and Infiltrate the first inch of runoff to reduce phosphorus and treat water to remove approximately 80% of total suspended solids.
2. Reduction in Flow: Reduce the discharge rate to the City system equal to the 2-year storm event. The City's estimates for 2030 storms have been used in the analysis.
3. Infiltration/Inflow Removal: Infiltrate 1.72 inches of stormwater to meet the State's Infiltration/Inflow requirement (discussed in further detail in the Sanitary Sewer section).
4. State Standards: Comply with Massachusetts' Stormwater Standards.

Water Quality: Three separate on-site storage/infiltration systems are proposed for the site. Water from the roof of the new building and the site will be sent to deep sump manholes or catchbasins for treatment (80% sediment removal) prior to being routed to the infiltration systems. The infiltration systems will be sized to infiltrate the first inch of runoff. The first inch of water from the site, or first flush, typically contains the highest concentrations of phosphorus from fertilizers and coliform from pet waste. By infiltrating the first inch of runoff, according to the EPA BMP Performance Curves, approximately 95% of phosphorous is expected to be removed from site runoff. The actual phosphorus removal will be based on the infiltration rate(s) of site soils. Testing scheduled during the upcoming geo/environmental soils investigation by Haley and Aldrich will confirm soil infiltration rates throughout the site. Preliminary borings at the site indicate that soils from 0 to 10 feet below grade may not be suitable for infiltration. Therefore, stone columns will be installed to connect to the underlying sand layer. Therefore, to satisfy the four key requirements above, the infiltration system will consist of 44 4-ft x 4-ft x 4-ft concrete galleys to store the water, a two-foot layer of crushed stone beneath the galleys to connect the galleys to the columns and 32 stone columns installed into the sand layer. The 44 galleys will be separated into three separate systems, shown on the attached figure. The stone columns will be spaced 10 feet apart and

will generally be installed below the concrete galleys used for water storage.

Once the infiltration systems are full, water will be discharged to the Albany Street drain.

Reduction in flow: Reducing the 25-year storm flow to the 2-year flow will be achieved by storing water on specific sections of the building roof (blue roof) and slowly releasing it to the site infiltration systems. The infiltration systems will also provide a significant amount of storage. Preliminary pre- and post-construction hydraulic modeling of the site and building was performed and the results are below:

Condition/Event	2-year (cfs)	10-year (cfs)	25-year (cfs)
Pre-Construction	5.76	9.73	12.62
Post-Construction	1.5	3.34	5.57
Percent Reduction	73%	65%	55%

As discussed with the Cambridge DPW, the 2030 storm events were used in the preliminary analysis. Once the final layout of the building and the site landscaping has been decided and the hydraulic testing by Haley and Aldrich performed, the hydraulic model will be updated and a Stormwater Management Report submitted to DPW for review. The Applicant is confident that the City required reduction in flow can be achieved.
Infiltration/Inflow: this is discussed in further detail in the sewer section below.

State Standards: The Massachusetts Stormwater Standards will be reviewed and incorporated into the project. The forth coming 600 Main Street Stormwater Management Report will detail how the system will meet the ten requirements.

Sanitary Sewer

The existing sanitary sewers in the streets adjacent to the development parcel are shown in Figure 4 and include:

- Portland Street MWRA's 30-in North Charles Relief Sewer
- Portland Street City 24-in x 30-in combined sewer
- Main Street 24-in x 26-in brick sewer
- Albany Street 10-in clay sewer

Using Title V offices flows, the building is expected to generate approximately 18,470 gallons of wastewater per day. The final generation rate was determined from building uses including a day care, 108 seat café and office space. The prior buildings are estimated to have generated approximately 100 gallons per day, for a net of 18,370 gallons of new wastewater generation.

Wastewater from the new building will be sent to the 10-in sewer in Albany Street. The 10-in sewer flows northerly and is connected to the 24-in x 30-in sewer in Main Street. The Main Street sewer flows westerly to the North Charles Relief Sewer.

The Massachusetts Department of Environmental Protection requires that all new sanitary flows to combined sewers greater than 15,000 gallons per day, must remove four times the new flows from the combined sewer system. This is commonly referred to as Infiltration/Inflow (I/I) removal. In municipalities with combined sewer systems, the MassDEP has provided guidance that I/I removal volumes be calculated using the one-year, six-hour

design storm event having a total depth of 1.72 inches of rainfall with an average intensity of 0.29 inches per hour over six hours.

With a net new flow of 18,370 gallons, the project exceeds the threshold and will be required to remove 4 times the anticipated sewer flow. Using the net new flow of 18,370 gallons, the project would be required to remove approximately 73,800 gallons of I/I. The Applicant has implanted an I/I removal strategy that has been incorporated into the overall stormwater management for the site. The infiltration systems will be sized to infiltrate the full 1.72 inch I/I storm from the site which will remove approximately 72,600 gallons from the sanitary sewer. We will work with the City to remove an additional 1,280 gallons from the system.

Resiliency

Using the City FloodViewer v2.1, the 2030 and 2070 predicted flood elevations due to precipitation and storm surge/sea level rise (SS/SLR) were determined:

Address: 600 Main St

Ground Elevation Min:	16.80 ft-CCB
Ground Elevation Max:	20.60 ft-CCB
2070- 100 Year- SLR/SS	18.3
2070- 100 Year - Precip	20.2
2070- 10 Year - SLR/SS	N/A
2070- 10 Year - Precip	18.2
2030- 100 Year - Precip	19.7
2030- 10 Year - Precip	17.8
Present Day - 100 Year	19.2
Present Day - 10 Year	17.7
FEMA 500 Year	N/A
FEMA 100 Year	N/A

Selected Map-Lot: 71-46
Selected Address: 600 Main St

The southern portion of the site is susceptible to storm surges due to its elevation. The 2070 100-year precipitation elevation is 20.2.

In order to negate the effects of precipitation flooding, all building entrances and openings will be kept at or above 20.2 or higher. The finished first floor of the building will be set at elevation 20.5, therefore, all doorway thresholds will be approximately 0.3-ft higher than the 2070 100-year flood elevation. Based on preliminary roadway, curb and sidewalk grading, the entrance to the underground garage will slope up from the back of sidewalk to elevation 18.63, which is above the storm surge elevation of 18.2 but below the 2070 100-year precipitation flood elevation. To help make the building resilient in the event of an extraordinary rain event, a flood barrier will be kept on site and will be deployed when significant rainfall events are predicted. Critical building infrastructure will be located above the 20.2 flood elevation either on the first floor at elevation 20.5' or on the mechanical equipment platform at elevation 32.5'. This will include the electrical vault, water

service room, fire pump room and the MDF room. The loading bays, located on the southeastern side of the building, will be internal to the building with the entrance at elevation at the property line of approximately 18.2. Additional flood barriers will be deployed in a significant rain for storm surge event to prevent water from entering the loading bays.

Recognizing the impact flooding can have on the performance of the stormwater management system, the major components of the stormwater storage and infiltration system have been located in the northeastern portion of the site, outside the sea level rise/storm surge flood area. Although site grading is still being developed, we anticipate siting the system at or above the precipitation flood elevation.

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3.1 - CERTIFIED TREE STUDY

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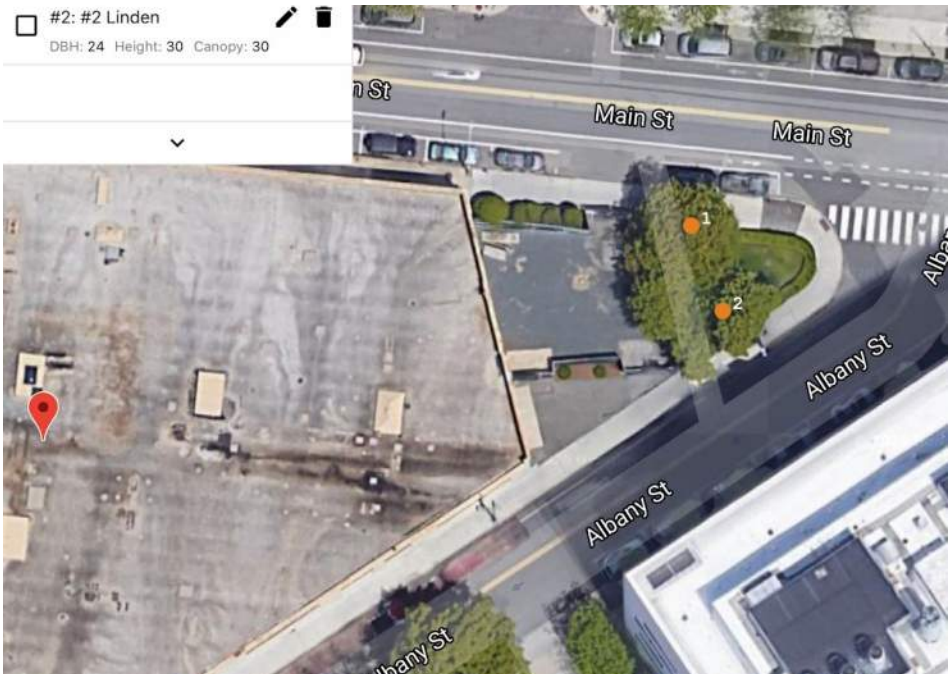
Tree Survey

Ragon II Project Site 600 Main St Cambridge MA

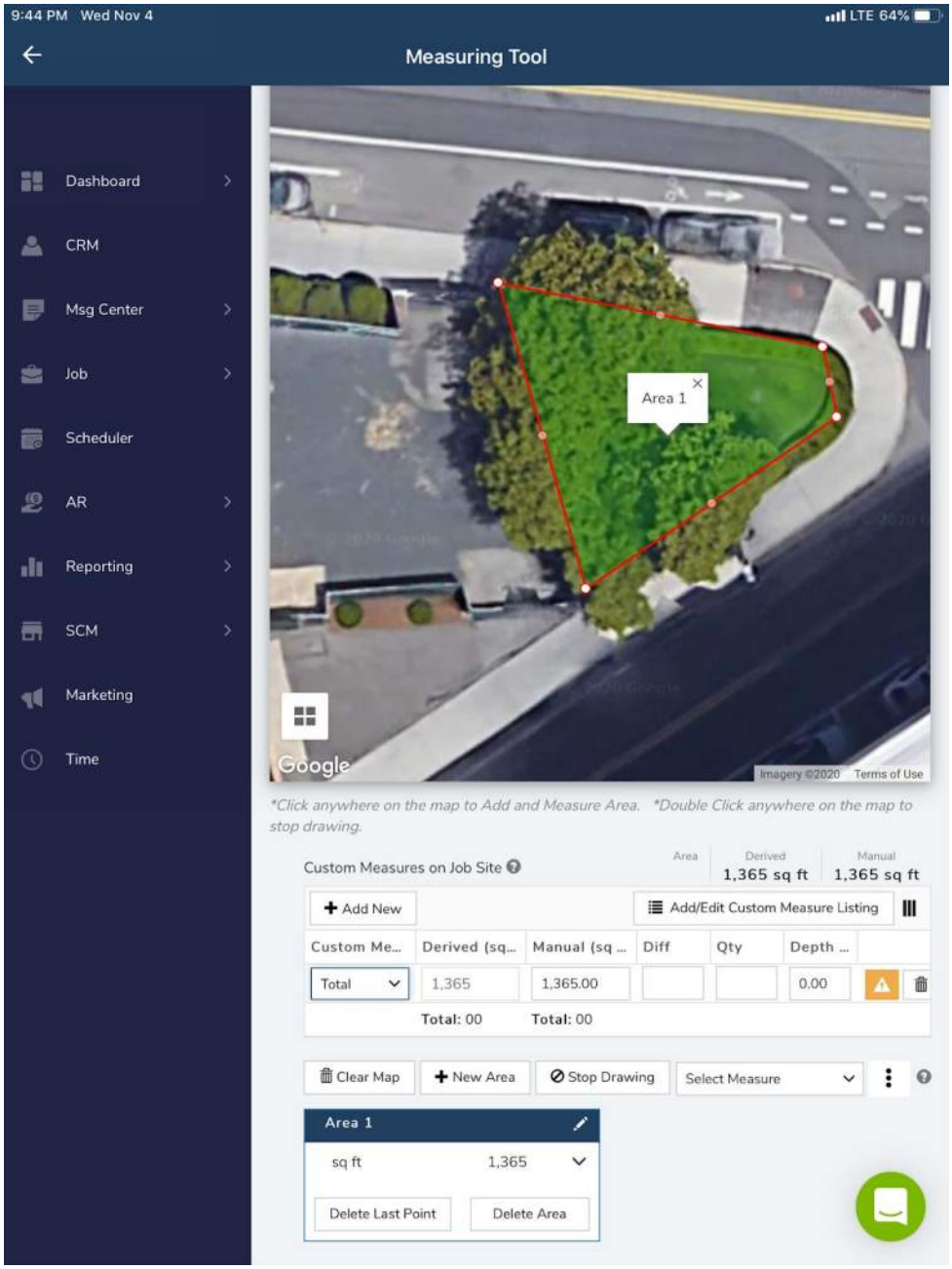


Tree one: 24” diameter linden that becomes co-dominant at roughly 8 feet. Bifurcation is narrow with bark inclusion. Canopy is full with little to no die-back visible. Leaf size and color are of good quality. Some deadwood in interior that appears to only be related to normal branch shedding. Interior is covered with sooty mold as a result of some insect (aphid) activity. Root flare is exposed. No major trunk or stem defects or signs of decay/dysfunction. Some lateral roots have been damaged by people pressure, but large aggregate pathway has been installed to minimize impact. Mulch has been placed around the base of tree to also reduce impact. Root flare is present and soil gradient is adequate throughout critical root zone.

Tree two: 24” diameter linden. Top of tree was lost or removed, leaving no central leader. Large lateral leaders break out horizontally, but have strong unions. Significant decay outwardly visible where 12-14” diameter central leader was cut.

Tree Inventory

TYPE	HEIGHT	DBH
Tilia cordata - Tree 1	50’	24”
Tilia cordata -Tree 2	35’	24”



Tree save area 1500sq/ft area surrounding canopies. Area is surrounded by cement sidewalks and an 8' privacy fence that currently separates the trees from the proposed construction zone on one side.

Tree Protection Plan

Fall 2020:

Soil Testing/Deep root fertilize the entire 1500sq/ft area . Fertilization will be based upon the soil test and will adjust pH / address any nutrient deficiencies.

Winter 2020/2021:

Prune canopies to improve health and structure. Install supplemental support in canopy of 1 tree with co-dominant union

Spring 2021:

Deep root fertilize entire 1500 sq/ft area

Remove stone under the dripline. Air spade root zone to drip line. apply 2 inches of compost and 2-3" of mulch to root zones.

Install tree protection fencing around the entire perimeter of 1500 sq/ft landscape bed.

Monitor trees and protection zones during and post- construction. Monitoring will be conducted by a Massachusetts Certified Arborist.

Arborist Ben Anderson

11/2/20
Harrison Mcphee Inc.
MCA#2444

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3.2 - GREEN BUILDING REPORT

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Green Building Project Checklist

Green Building
Project Location: 600 Main St

Applicant

Name: Sarah Michelman
Address: 23 Bradford Street, First Floor, Concord, MA 01742
Contact Information
Email Address: Sarah@greenengineer.com
Telephone #: 978-341-5462

Project Information (select all that apply):

- ☒ New Construction – GFA: 185,842 GFA
- ☐ Addition – GFA of Addition: _____
- ☐ Rehabilitation of Existing Building – GFA of Rehabilitated Area: _____
  - ☐ Existing Use(s) of Rehabilitated Area: _____
  - ☐ Proposed Use(s) of Rehabilitated Area: _____
- ☒ Requires Planning Board Special Permit approval
- ☒ Subject to Section 19.50 Building and Site Plan Requirements
- ☐ Site was previously subject to Green Building Requirements

Green Building Rating Program/System:

- ☒ Leadership in Energy and Environmental Design (LEED) – Version: v4
  - ☒ Building Design + Construction (BD+C) – Subcategory: New Construction
  - ☐ Residential BD+C – Subcategory: _____
  - ☐ Interior Design + Construction (ID+C) – Subcategory: _____
  - ☐ Other: _____
- ☐ Passive House – Version: _____
  - ☐ PHIUS+
  - ☐ Passivhaus Institut (PHI)
  - ☐ Other: _____
- ☐ Enterprise Green Communities – Version: _____

Project Phase

☒ **SPECIAL PERMIT**

Before applying for a building permit, submit this documentation to CDD for review and approval.

Required Submissions

All rating programs:

- ☒ Rating system checklist
- ☒ Rating system narrative
- ☒ Net zero narrative (see example template for guidance)
- ☒ Affidavit signed by Green Building Professional with attached credentials – use City form provided (Special Permit)

Project Phase

☐ **BUILDING PERMIT**

Before applying for a building permit, submit this documentation to CDD for review and approval.

Required Submissions

All rating programs:

- ☐ Rating system checklist – updated from any prior version
- ☐ Rating system narrative – updated from any prior version with additional supporting information from construction documents
- ☐ Net zero narrative – updated from any prior version (see example template for guidance)
- ☐ Energy Simulation Tool results demonstrating compliance with selected rating system. *[Note: For Passive House rating program, must use WUFI Passive, Passive House Planning Package (PHPP), or comparable software tool authorized by Passive House.]*
- ☐ Credentials of Green Commissioning Authority (or copy of contract between developer and Commissioning Authority if an independent consultant or subcontractor), including documentation of Green Commissioning process experience on at least two building projects with a scope of work similar to the proposed project extending from early design phase through at least ten (10) months of occupancy
- ☐ Affidavit signed by Green Building Professional with attached credentials – use City form provided (Building Permit)

Passive House rating program only:

- ☐ Letter of intent from Passive House rater/verifier hired for on-site verification, with credentials of rater/verifier
- ☐ Credentials of Certified Passive House Consultant who has provided design, planning, or consulting services (if different from the Green Building Professional for the project)
- ☐ Construction drawings and specifications

Project Phase

☐ **CERTIFICATE OF OCCUPANCY**

Before applying for a certificate of occupancy, submit this documentation to CDD for review and approval.

Required Submissions

All rating programs:

- ☐ Rating system checklist – updated from any prior version
- ☐ Rating system narrative – updated from any prior version with additional supporting information from as-built conditions
- ☐ Net zero narrative – updated from any prior version (see example template for guidance)
- ☐ Energy Simulation Tool results demonstrating compliance with selected rating system, updated to as-built conditions. *[Note: For Passive House rating program, must use WUFI Passive, Passive House Planning Package (PHPP), or comparable software tool authorized by Passive House.]*
- ☐ Affidavit with schedule of commissioning requirements signed by Green Commissioning Authority, with attached credentials – use City form provided (Certificate of Occupancy)
- ☐ Affidavit signed by Green Building Professional with attached credentials – use City form provided (Certificate of Occupancy)

Passive House rating program only:

- ☐ Pressure Test Verification
- ☐ Ventilation Commissioning
- ☐ Quality Assurance Workbook
- ☐ Final testing and verification report from rater/verifier

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Green Building Report

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Cambridge Article 22: Green Building Report

Issued: November 18, 2020

Project: Ragon II

Image courtesy of Payette

The Green Engineer
Sustainable Design Consulting

www.greenengineer.com

Table of Contents

Section I. PROJECT DESCRIPTION

The proposed Ragon Institute 2.0 building will be located at 600 Main Street. The proposed project is a freestanding building in a sweeping form that takes advantage of the triangular site. It creates a gateway to the larger scale buildings of Tech Square and MIT by transitioning in a sweeping form through the interior corner of the site to address the intersection of Albany and Main Street and Tech Square beyond. The new building will be a five-story office/laboratory and research building with a two floor, below grade parking garage. The building program includes an entry lobby to support the building's daycare and education and function spaces on the ground floor. The project will also feature natural elements such as a landscaped outdoor courtyard located along Main Street, an accessible green roof area on the second level, and an atrium extending from the second level to the fifth level. The roof of the sweep mediates the scale change of the site context from West to East. The space formed between the sweeping 'arms' creates the large atrium that extends multiple levels and drives daylight through a skylight to the interior spaces and provides a large window to Main Street.

The entry area landscape and flowing gestures of expressive paving and sculpted seating intuitively lead people to the building's entries while simultaneously creating unique outdoor spaces. The paths are further defined by robust planting of trees and lower groundcovers, providing ample shade and sense of nature but not limiting views from a pedestrian perspective to the building and larger urban context. The landscape will double as storm water retention zones, contributing to the retention of water on site. A building canopy with an oculus creates a transitional indoor/outdoor space and welcoming courtyard as you enter the building.

Below the exterior oculus large trees will extend through the opening and visually connect the ground floor to a second floor roof garden. Here, the continuation of the flowing forms of the ground plane and robust planting extend up and onto the building.

The current design of the new Ragon 2.0 building includes high-efficiency HVAC systems and LED lighting. The design indicates an energy use intensity of (EUI) approximately 135, and an energy use savings of 35.7% relative to ASHRAE 90.1-2013 Baseline, which exceeds the 10% minimum requirement for Stretch Code. Additionally, three of the required additional efficiency package options listed under section C406.1 are included in the proposed design and included in both the baseline and proposed design energy models. Detailed information is included in the report within the Net Zero Energy narrative.

The Green Engineer
Sustainable Design Consulting

www.greenengineer.com

Section II. AFFIDAVIT

I, Sarah Michelman, do hereby affirm that I have thoroughly reviewed the supporting documents for the LEEDv4 for New Construction rating system and confirm that the Ragon Institute 2.0 project is targeted to meet the requirement for Gold with **66** points and 6 possible ('maybe') points. The Ragon Institute 2.0 project, located in Cambridge, MA will be designed to meet the green building requirement under Article 22.20 of the Cambridge Zoning Ordinance.

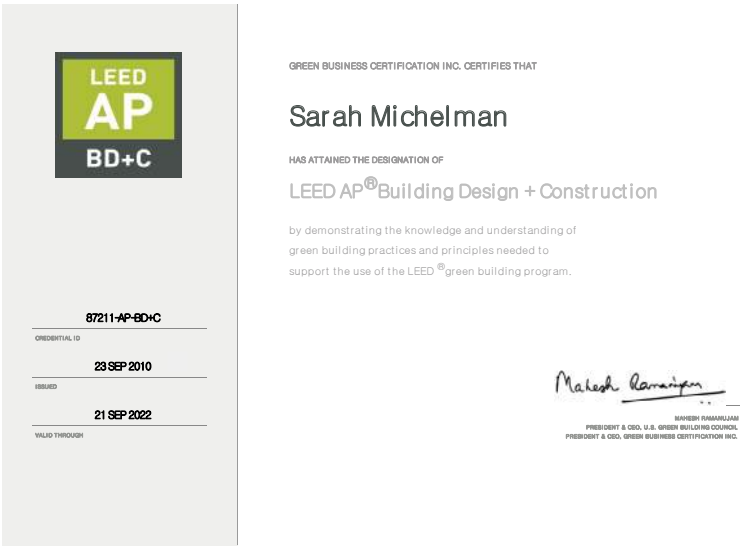
Sarah Michelman, RA, LEED AP BD+C is a Principal of The Green Engineer, Inc. Sarah has over 15 years of experience working as an architect and additional 10 years of experience as a sustainable design consultant with a focus on energy efficiency and sustainability.

A long-time promoter of sustainable design, Sarah has been a member of the US Green Building Council (USGBC) LEED since 2007. She is a registered architect in the State of Massachusetts.

To date, Sarah and The Green Engineer, Inc team have managed or been involved in over 200 LEED certified projects.

An executed Cambridge Affidavit has been provided.

Sarah Michelman, LEED BD+C, WELL AP, Fitwel Ambassador
Massachusetts Architectural Registration #10402
The Green Engineer, Inc.


LEED AP BD+C

87211-AP-BD+C
CREDENTIAL ID

23 SEP 2010
ISSUED

21 SEP 2022
VALID THROUGH

GREEN BUSINESS CERTIFICATION INC. CERTIFIES THAT

Sarah Michelman

HAS ATTAINED THE DESIGNATION OF

LEED AP® Building Design + Construction

by demonstrating the knowledge and understanding of green building practices and principles needed to support the use of the LEED ® green building program.

MAHESH RAMANUJAM
PRESIDENT & CEO, U.S. GREEN BUILDING COUNCIL
PRESIDENT & CEO, GREEN BUSINESS CERTIFICATION INC.

Section III. LEEDv4 SCORECARD SUMMARY

The project was reviewed for compliance using the USGBC's LEED for New Construction (LEED-NC), version 4 rating system. The project is targeting 66 out of a possible 110 credit points with an additional 6 credit points still undergoing evaluation to determine feasibility of achievement. By targeting 66 credit points, the project anticipates meeting the City of Cambridge requirement to be LEED v4 Gold 'certifiable'. In addition to the City of Cambridge requirements, the project will be registered under the LEED-NC v4 rating system and will be pursuing formal certification with the USGBC.

The team will continue to evaluate design options against LEED requirements with the goal to design and construct a building which minimize its impact on the environment, create an engaging and healthy space for occupants and reduce operating costs. Several credits remain designated as 'Maybe' due to the uncertainty of future design decisions, which is common at this phase of the Project. The team will continue to evaluate LEED credits to pursue to ensure enough of a "point cushion" to ensure the LEED Gold requirement is met.

The USGBC recently released the beta version of the LEEDv4.1 rating system which is intended to serve as an update to (and improvement upon) LEEDv4. Recent guidance issued by the USGBC allows LEEDv4 projects to substitute any prerequisite or targeted credit for the LEEDv4.1 equivalent. Credits this project intends to pursue using the LEED v4.1 criteria have been denoted with (LEEDv4.1) adjacent to the credit name within the scorecard below and ensuing credit narratives.

Y	M	N			
1	0	0	**Integrative Process**		1
1			Credit 1	Integrative Process	1

13	0	3	**Location and Transportation**		16
		N	Credit 1	LEED for Neighborhood Development Location	
1			Credit 2	Sensitive Land Protection	1
1		1	Credit 3	High Priority Site	2
5			Credit 4	Surrounding Density and Diverse Uses	5
3		2	Credit 5 (LEEDv4.1)	Access to Quality Transit	5
1			Credit 6 (LEEDv4.1)	Bicycle Facilities	1
1			Credit 7 (LEEDv4.1)	Reduced Parking Footprint	1
1			Credit 8 (LEEDv4.1)	Green Vehicles	1

7	0	3	**Sustainable Sites**		10
Y			Prereq 1	Construction Activity Pollution Prevention	Required
1			Credit 1	Site Assessment	1
		2	Credit 2 (LEEDv4.1)	Site Development - Protect or Restore Habitat	2
1			Credit 3	Open Space	1
2		1	Credit 4 (LEEDv4.1)	Rainwater Management	3
2			Credit 5	Heat Island Reduction	2
1			Credit 6	Light Pollution Reduction	1

6	0	5	**Water Efficiency**		11
Y			Prereq 1	Outdoor Water Use Reduction	Required
Y			Prereq 2	Indoor Water Use Reduction	Required
Y			Prereq 3	Building-Level Water Metering	Required
1		1	Credit 1 (LEEDv4.1)	Outdoor Water Use Reduction	2
3		3	Credit 2	Indoor Water Use Reduction	6

1		1	Credit 3 (LEEDv4.1)	Cooling Tower Water Use	2
1			Credit 4	Water Metering	1

14	6	13	Energy and Atmosphere		33
Y			Prereq 1	Fundamental Commissioning and Verification	Required
Y			Prereq 2	Minimum Energy Performance	Required
Y			Prereq 3	Building-Level Energy Metering	Required
Y			Prereq 4	Fundamental Refrigerant Management	Required
5	1		Credit 1	Enhanced Commissioning	6
9	3	6	Credit 2	Optimize Energy Performance	18
		1	Credit 3	Advanced Energy Metering	1
		2	Credit 4 (LEEDv4.1)	Grid Harmonization	2
		3	Credit 5	Renewable Energy Production	3
		1	Credit 6	Enhanced Refrigerant Management	1
		2	Credit 7	Green Power and Carbon Offsets	2

6	0	7	Materials and Resources		13
Y			Prereq 1	Storage and Collection of Recyclables	Required
Y			Prereq 2	Construction and Demolition Waste Management Planning	Required
		5	Credit 1 (LEEDv4.1)	Building Life-Cycle Impact Reduction	5
1		1	Credit 2 (LEEDv4.1)	BPDO – EPD	2
1		1	Credit 3 (LEEDv4.1)	BPDO - Sourcing of Raw Materials	2
2			Credit 4 (LEEDv4.1)	BPDO – Material Ingredients	2
2			Credit 5 (LEEDv4.1)	Construction and Demolition Waste Management	2

12	0	4	Indoor Environmental Quality		16
Y			Prereq 1	Minimum Indoor Air Quality Performance	Required
Y			Prereq 2	Environmental Tobacco Smoke Control	Required
2			Credit 1	Enhanced Indoor Air Quality Strategies	2
3			Credit 2 (LEEDv4.1)	Low-Emitting Materials	3
1			Credit 3	Construction Indoor Air Quality Management Plan	1
2			Credit 4	Indoor Air Quality Assessment	2
1			Credit 5	Thermal Comfort	1
1		1	Credit 6	Interior Lighting	2
1		2	Credit 7 (LEEDv4.1)	Daylight	3
1			Credit 8	Quality Views	1
		1	Credit 9 (LEEDv4.1)	Acoustic Performance	1

6	0	0	Innovation		6
1			Credit 1	Exemplary Performance: Heat Island Reduction	1
1			Credit 2	Innovation: Purchasing - Lamps	1
1			Credit 3	Exemplary Performance: Reduced Parking Footprint	1
1			Credit 4	Innovation in Design: TBD	1
1			Credit 5	Pilot Credit: Integrative Analysis of Building Materials	1
1			Credit 6	LEED Accredited Professional	1

1	2	1	Regional Priority (earn up to 4 points)	4

1			Credit 1	Regional Priority Credit: SSc4	1
		1	Credit 2	Regional Priority Credit: LTc3 (2 points)	1
	1		Credit 3	Regional Priority Credit: EAc2 20% (8 points)	1
	1		Credit 4	Regional Priority Credit: MRc1 (2 points)	1

66	6	38	TOTALS	Possible Points: 110

Section IV. LEED Credit Narrative

As detailed below, the Project meets the LEEDv4 New Construction Minimum Program Requirements and each of the required Prerequisites. Additionally, the following credits are being targeted.

A. Integrative Process (IP)

IP Credit 1 Integrative Process — 1 credit point

The Project has met the intent of this credit through identification of cross discipline opportunities to design a sustainable building project. Sustainable design focused meetings have been conducted in early design to assist the team in establishing shared sustainable design and energy / water efficiency goals for the project. Early design phase energy modeling will be conducted to review systems synergies and assess areas where energy loads may be significantly reduced. A water use analysis will be conducted to aid in establishing water use reduction targets.

The Project has conducted interdisciplinary early meetings focusing on sustainability. These meetings have included the ownership group, architect, MEP engineer, energy analyst, and sustainability expert. An initial charrette was conducted in Fall 2020. Early energy modeling will be performed to provide real feedback on decision-making. Additionally, the Project will be linked into the MassSave energy-efficiency incentive program. This early work will push the design to optimize the performance of the envelope and HVAC systems and explore additional opportunities for decreasing water use within the project.

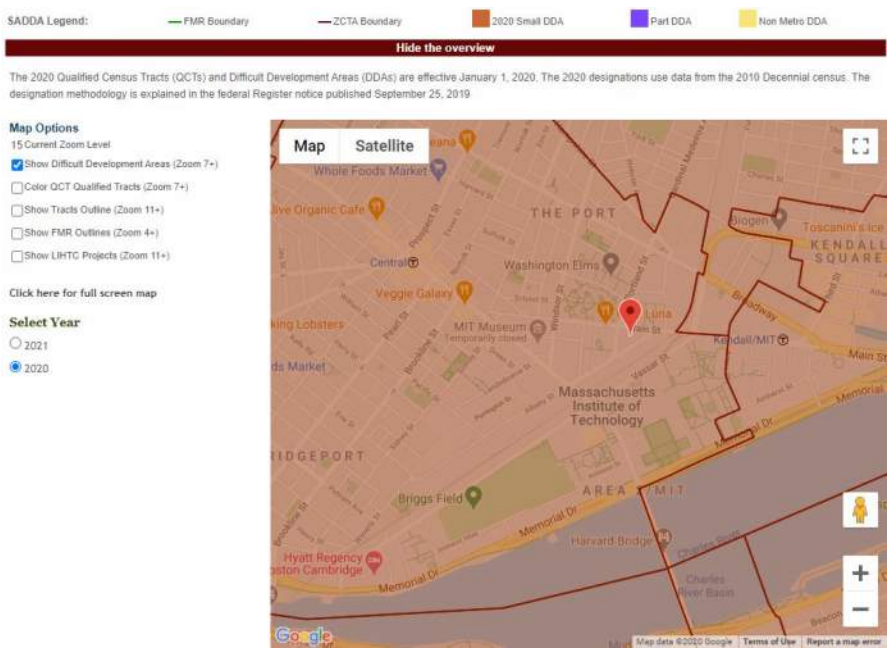
B. Location and Transportation (LT)

LT Credit 2 Sensitive Land Protection — 1 credit points

The Project will meet the credit requirements by being located on land that has been previously developed.

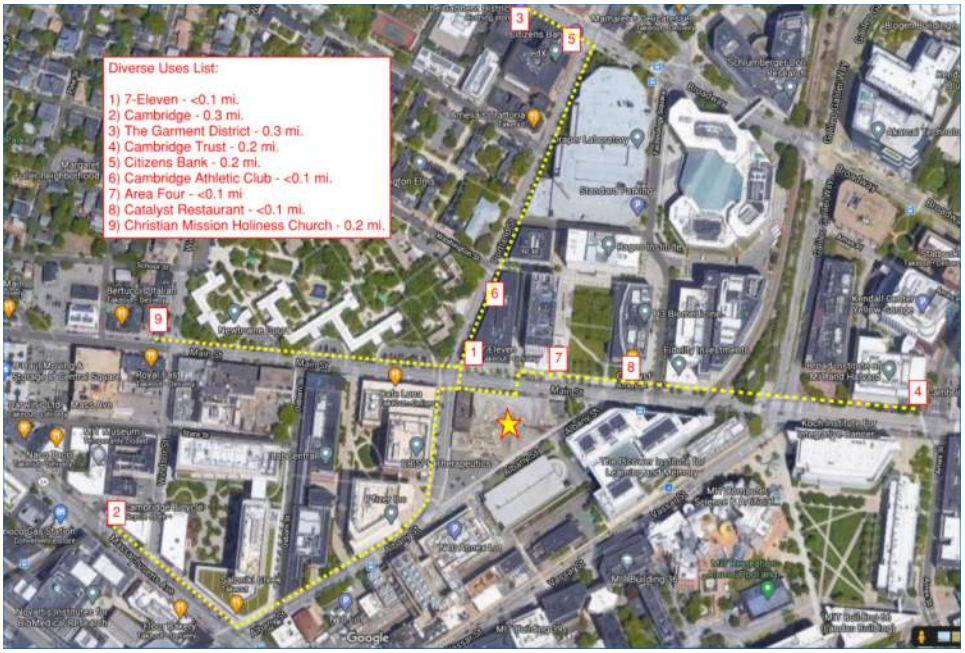
LT Credit 3 High Priority Site — 1 credit point

The Project will meet the credit requirements by being located on a site in a U.S. Department of Housing and Urban Development's Difficult Development Area as shown in the map below.



LT Credit 4 Surrounding Density and Diverse Uses 5 credit points

The Project will meet Option 1 for Surrounding Density by being located in an area with an average density greater than 35,000 sf/acre. The Project will meet Option 2 for Diverse Uses by being located within ½ mile walking distance of at least 9 publicly available diverse uses in at least three separate use categories.



The Project are located within ½ mile of the following 9 diverse uses:

Category	Use Type	Number	Business Name	Distance
Community-serving retail	Convenience Store	1	7-Eleven	<0.1 mi
	Other Retail	2	Cambridge Bicycle	0.3 mi
	Other Retail	3	The Garment District	0.3 mi
Services	Bank	4	Cambridge Trust	0.2 mi
	Bank	5	Citizens Bank	0.2 mi
	Gym	6	Cambridge Athletic Club	<0.1 mi
	Restaurant	7	Area Four	<0.1 mi
	Restaurant	8	Catalyst Restaurant	<0.1 mi
Civic and community facilities	Place of Worship	9	Christian Mission Holiness Church	0.2 mi

LT Credit 5 Access to Quality Transit (LEEDv4.1) 3 credit points
LEEDv4.1: The Project is located within ½ mile walking distance of the Kendall/MIT station and within ¼ mile walking distance of the Massachusetts Ave @ Albany St Bus Stop. The Kendall/MIT transit station provides occupants with access to 106 weekday rides and 85 weekend rides via the MBTA Red Line and the Massachusetts Ave @ Albany Bus Stop provides 108 weekday rides and 113 weekend rides.

	Total Rides Per Day		Percent of Total Rides Per Line		Walking Distance to Closes Stop (mi.)
Red Line - Alewife, Ashmont	106	85	50%	43%	0.30
Bus # 1	108	113	50%	57%	0.25
Total:	214	198			

LT Credit 6 Bicycle Facilities (LEEDv4.1) 1 credit point
A minimum of 12 exterior short-term and 41 covered long-term bicycle storage is planned for visitors and regular occupants of the Project. Additionally, shower and changing facilities will be provided for use by building occupants. The immediate neighborhood provides a direct connection to a local bicycle network that links to a variety of services with pedestrian and cyclist access. The Project will meet City of Cambridge requirements for bike storage.

LT Credit 7 Reduced Parking Footprint (LEEDv4.1) 1 credit point
A new, one or two-level parking garage is proposed to provide on-site parking for employees and visitors. The new parking garage will provide 120-122 parking spaces depending on scheme, which is an 87% reduction to the baseline number of parking spaces calculated from the ratios set forth in the LEED reference guide.

LT Credit 8 Green Vehicles (LEEDv4.1) 1 credit point
The Building Owner has committed to provide EV charging stations to satisfy the LEED credit by providing EV charging stations for 2% of the total parking capacity. There are 120-122 parking spaces that will be provide. Of those spaces, 2% will be outfitted as electric vehicle charging stations, which will require a total of 3 EV charging stations.

C. Sustainable Sites (SS)

SS Prerequisite 1: Construction Activity Pollution Prevention Required
The construction manager will be required to submit and implement an appropriate SWPPP/Erosion and Sedimentation Control (ESC) Plan for construction activities related to the construction of the Project. The ESC Plan will conform to the erosion and sedimentation

requirements of the applicable NPDES regulations and specific municipal requirements for the City of Cambridge. Additionally, the ESC Plan will address management and containment of dust and particulate matter generated by on site demolition and construction activities. Civil design drawings will include measures for the implementation of the ESC plan.

SS Credit 1: Site Assessment 1 credit point
A comprehensive site assessment will be completed as part of the Project. The site assessment will include topography, hydrology, climate, vegetation, soils, human use, and human health effects and was used to inform the design.

SS Credit 3: Open Space (LEEDv4.1) 1 credit point
The project design will provide outdoor space that is physically accessible and will be equal to or greater than 30% of the total site area. A minimum of 25% of the physically accessible site area will be planted with two or more types of vegetation or have overhead vegetated canopy.

SS Credit 4: Rainwater Management (LEEDv4.1) 2 credit points, *1 maybe point*
The project design will replicate natural site hydrology processes to retain the 85th percentile of regional or local rainfall events using low-impact development (LID) and green infrastructure (GI) practices. The project is planning to use the planting areas as storm water retention zones and infiltration tanks to contain all water on-site.

SS Credit 5 Heat Island Reduction 2 credit points
The roof and non-roof hardscape materials of the Project will include light-colored surfaces to reduce the overall heat island effect impact on the Project site. The roof membrane will be high albedo roof product with an initial SRI value of 82 minimum. All parking associated with the Project will be located undercover, qualifying the Project for an exemplary performance point.

SS Credit 6 Light Pollution Reduction 1 credit point
The Project will meet uplight and light trespass requirements by complying with the LEED v4 BUG Rating method. To meet credit requirements, the site lighting will not exceed the LEEDv4 allowable luminaire backlight, uplight and glare ratings for Lighting Zone 3.

D. Water Efficiency (WE)

WE Prerequisite 1 Outdoor Water Use Reduction, 30% Required
Through the use of native/adaptive plant species selection the Project's landscape water requirement (as calculated by the EPA WaterSense Water Budget Tool) will be reduced by at least 30% from the calculated baseline for the site's peak watering month. The landscape design will include softscape areas which will be planted with a diverse palette of materials which are native, adaptive, low-maintenance, and no irrigation requirements beyond establishment and have year-round aesthetic appeal. At a minimum the Project will meet the Cambridge DPW water management standards.

WE Prerequisite 2 Indoor Water Use Reduction, 20% Reduction Required
Through the specification of low flush and flow and high efficiency plumbing fixtures, The Project will reduce potable water consumption by at least 20% over the baseline calculated for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements. The proposed plumbing fixtures within the base building scope of work are as follows:

Fixture Type	Flush / Flow Rate
Water Closet	1.28 gpf
Urinal	0.125 gpf
Lavatory Faucet	0.35 gpm
Showerhead	1.5 gpm

WE Prerequisite 3 Building Level Water Metering — Required

The Project will meet the requirements of this prerequisite by installing permanent water meters that measure the total potable water use the building and associated grounds. In addition to installing the meters, the Project will commit to sharing water usage data with the USGBC for a five-year period beginning on the date the Project accepts LEED certification or typical occupancy, whichever comes first. It is understood that the building will be subject to the Building Energy Use Disclosure Ordinance and will annually report and disclose energy performance in terms of energy usage.

WE Credit 1 Outdoor Water Use Reduction - No Irrigation (LEEDv4.1) — 1 credit point

The project will be able to achieve a 50% reduction in landscaping water demand through plant selection, and if permanent irrigation is provided, water efficient irrigation delivery and weather sensors. The project will also explore the ability to not need permanent irrigation.

WE Credit 2 Indoor Water Use Reduction — 3 credit points

Through the specification of low flow and high efficiency plumbing fixtures, the Project will implement water use reduction strategies that at a minimum result in a 30% reduction in potable water use annually when compared to EPA baseline fixtures for the building (not including irrigation) after meeting Energy Policy Act of 1992 fixture performance requirements.

Group Name	Baseline Case (gallons/year)			Design Case (gallons/year)		
	Annual Flush Volume	Annual Flow Volume	Annual Consumption	Annual Flush Volume	Annual Flow Volume	Annual Consumption
Visitors	4,964.00	912.50	5,876.50	2,985.70	456.25	3,441.95
FTEs	1,177,344.00	560,640.00	1,737,984.00	752,659.20	315,360.00	1,068,019.20

Annual baseline water consumption (gallons/year)	1,743,860.50
Annual design water consumption (gallons/year)	1,071,461.15
Percent water use reduction (%)	**38.56%**

WE Credit 3 Cooling Tower Water Use (LEEDv4.1) — 1 credit point

The Project will conduct a one-time potable water analysis for the cooling tower water and calculate the cycles of concentration. Through increasing the level of treatment in the make-up and/or condenser water, the Project will achieve the calculated maximum number of cycles before any of the parameters analyzed exceed their maximum allowable levels of concentration. The control parameters that are required to be assessed are: Ca, total alkalinity, SiO_2, Ci, and conductivity.

In addition to meeting the requirements of the WEc3 Cooling Tower Water Use credit, the Project will prioritize implementing as many best practices as possible for water use reduction in labs as per the International Institute for Sustainable Laboratories.

WE Credit 4 Water Metering 1 credit point

To support water management and identify opportunities for additional water savings, the Project will include permanent water meters for, condenser water, chilled water, and domestic hot water.

E. Energy and Atmosphere (EA)

EA Prerequisite 1 Fundamental Commissioning and Verification Required

A commissioning agent will be engaged by the Building Owner for purposes of providing fundamental commissioning services for the building energy related systems by the end of Design Development. The commissioning agent will perform the scope of work required to comply with the prerequisite in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007 for HVAC & R systems.

The commissioning agent (CxA) will be independent of the project's design and construction management teams. The commissioning agent will report findings to the Building Owner. The Owner's Project Requirements and the Basis of Design documents will be provided to the CxA for review.

The following systems will be included in the Commissioning scope of work:

- Heating, ventilating, air conditioning and refrigeration (HVAC&R) systems
- HVAC controls
- Lighting controls
- Electrical systems
- Domestic hot water systems
- Plumbing and pumps
- Building Automation System

EA Prerequisite 2 Minimum Energy Performance Required

To meet the prerequisite, the Project's building performance will demonstrate a minimum of 5% improvement in energy use by cost when compared to a baseline building performance as calculated using the rating method in Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2010. The Project is also required to meet the MA Stretch Energy Code requirements.

This project will achieve these savings through inclusion of the following ECMs:

1. Improved envelope assemblies with triple-pane glazing
2. Reduced LPD
3. Reduced ACH rate capability during unoccupied hours
4. SAT Reset to minimize reheat loads
5. High-efficiency heat recovery chilled water plant and hot water plants
6. Low-flow domestic hot water fixtures

Comprehensive, iterative energy modeling will be used to explore design options to meet all Code requirements and to provide substantiation for the LEED application. Energy performance goals were established during the Schematic Design for the Project phase. The Project utilized the International Institute for Sustainable Laboratories Benchmarking Tool to establish an energy performance benchmark. The Project also graphed the project site energy performance against the Cambridge operating laboratory buildings which reported their site EUI from 2016 through 2019 as required by the City of Cambridge Building Energy Use Disclosure Ordinance (BEUDO).

EA Prerequisite 3 Building Level Energy Metering Required

To meet the requirements of this prerequisite, the Project will install whole building energy meters for gas and electricity. In addition to installing the meters, the Project will commit to sharing energy usage data with the USGBC for a five-year period beginning on the date each accepts LEED certification or typical occupancy, whichever comes first. It is understood that at a minimum, the Project will be subject to the Building Energy Use Disclosure Ordinance and will annually report and disclose energy performance in terms of energy usage.

EA Prerequisite 4 Fundamental Refrigerant Management Required

CFC based refrigerants will not be used in the Project's HVAC & R systems.

EA Credit 1 Enhanced Commissioning 5 credit points, 1 *maybe points*

In addition to EApr1 Fundamental Commissioning and Verification requirements, Option 1 Path 1 Enhanced Commissioning and Option 2 Building Envelope Commissioning will be pursued by the Project. The Building Owner will engage a commissioning agent to review the proposed design and verify the building systems meet the Owner's expectations and requirements.

The following commissioning process activities in addition to those required under EA Prerequisite Fundamental Commissioning and Verification will be completed by the commissioning agent, in accordance with ASHRAE Guideline 0–2005 and ASHRAE Guideline 1.1–2007 for HVAC&R systems, as they relate to energy, water, indoor environmental quality, and durability:

- Review contractor submittals.
- Verify inclusion of systems manual requirements in construction documents.
- Verify inclusion of operator and occupant training requirements in construction documents.
- Verify systems manual updates and delivery.
- Verify operator and occupant training delivery and effectiveness.
- Verify seasonal testing.
- Review building operations 10 months after substantial completion.
- Develop an on-going commissioning plan.

In addition to the commissioning of mechanical and electrical systems, the Building Owner is considering engaging the commissioning agent to perform monitoring-based commissioning activities as they relate to the operations and maintenance of the building once it has been occupied.

Requirements for enhanced and monitoring-based commissioning will be included in the OPR and BOD.

EA Credit 2 Optimize Energy Performance 9 credit points, *3 maybe points*

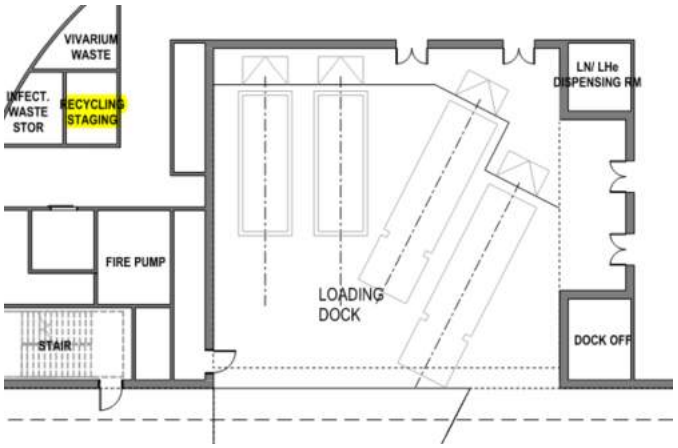
The project is designed to meet IECC 2015/ASHRAE 90.1-2013 energy efficiency requirements to comply with the requirements of the Massachusetts Stretch Energy Code. Based on preliminary modeling, it is expected that the project will achieve at least a 22% annual energy cost savings when compared to the ASHRAE 90.1-2010 baseline.

The team recognizes the importance of energy efficiency and will continue to evaluate opportunities reduce energy use and increase points within the Energy & Atmosphere category, specifically within the Optimize Energy Performance credit.

F. Materials and Resources (MR)

MR Prerequisite 1 Storage and Collection of Recyclables — Required

Storage of collected recyclables will be accommodated in a designated recycling area within the loading dock area. Recyclable materials collected will include mixed paper, corrugated cardboard, glass, plastics, and metals, and the disposal of batteries and electronic waste. A contracted waste management company will collect the recyclables on a regular basis.



MR Prerequisite 2 Construction and Demolition Waste Management Planning — Required

The Project will meet the requirements of this prerequisite by including a Construction Waste Management section in Division 1 of the project manual. The specification will include direction for the construction manager to submit and implement a compliant waste management plan for the duration of construction. Waste diversion goals for the project will include at least five materials targeted for diversion.

MR Credit 2 Building Product Disclosure & Optimization (BPDO): EPDs (LEEDv4.1)

1 credit point, 1 Exemplary Performance point

The Project will achieve this credit via Option 1. The technical specifications will include direction for the construction manager and their sub-contractors to provide and submit materials and products Environmental Product Declarations that conform to ISO 14025, 14040, 14044, and EN 15804 or ISO 21930 and have at least a cradle to gate scope. The team will work to provide documentation for 20 different permanently installed products sourced from at least 3 different manufacturers.

MR Credit 3 BPDO: Sourcing of Raw Materials (LEEDv4.1) — 1 credit point

The Project will pursue this credit. The technical specification will include information for applicable products and materials to meet one of the following extraction criteria (as applicable): Extended producer responsibility, Bio-Based materials, FSC wood, Materials reuse, Recycled Content, and/or regionally extracted and manufactured (within 100 miles of the project site). Credit achievement cannot be determined until construction phase.

MR Credit 4 BPDO: Material Ingredients (LEEDv4.1) — 2 credit points

The Project will pursue Option 1 and Option 2 for product and material disclosure, and by selecting products and materials with third party confirmation of reduced hazardous substances. The project manual will include the information and direction for the construction manager and their sub-contractors to provide and submit materials and products documentation identifying the chemical make-up. The documentation may be Health Product Declarations, Cradle-to-Cradle or Declare certification. The team will provide documentation

for 20 different permanently installed products sourced from at least 3 different manufacturers.

MR Credit 5 Construction & Demolition Waste Management (LEEDv4.1) 2 credit points
The Project will meet the requirements of this credit by including a Construction Waste Management section in Division 1 of the project manual. The specification will include direction for the construction manager to attempt to divert a minimum of 75% of the demolition and construction waste generated on site from area landfills. The construction waste management plan will include tracking five waste streams. Diverted material reported will include at least three different material streams. Demolition waste will be separated on site as part of the strategy to meet this credit.

G. Indoor Environmental Quality (IEQ)

IEQ Prerequisite 1 Minimum IAQ Performance Required
The Project's mechanical systems are designed to exceed the requirements of ASHRAE Standard 62.1-2010 sections 4 through 7. The mechanical engineer will complete a ventilation rate procedure (VRP) calculator to verify compliance for the Project. Outdoor airflow monitors are included in the project.

IEQ Prerequisite 2 Environmental Tobacco Smoke Control (LEEDv4.1) Required
Smoking will be prohibited in The Project and within 25' of the building. Signage will be posted within 10' of all building entrances to indicate the interior and exterior no-smoking policy.

IEQ Credit 1 Enhanced Indoor Air Quality Strategies 2 credit points
The Project is being designed to incorporate permanent entryway systems, properly enclosed and ventilated chemical use/storage areas, and compliant filtration media (MERV 13+).

Additionally, the project will meet the requirements of Option 2 by providing a CO2 sensor in all densely occupied spaces.

IEQ Credit 2 Low Emitting Materials (LEEDv4.1) 3 credit points
The Project will achieve this credit through meeting the compliance criteria for the following compliant categories: interior paints and coatings, adhesives and sealants, flooring, ceilings, insulation, and composite wood. Intending to achieve at least 4 categories for 3 points.

IEQ Credit 3 Construction Indoor Air Quality Management Plan 1 credit point
The project manuals for the Project will include direction for the construction manager to develop and implement an Indoor Air Quality Management plan in compliance with applicable control measures as stated in the SMACNA IAQ Guidelines for Occupied Buildings under construction 2nd Edition, 2007 ANSI/SMACNA 008-2008 Chapter 3. Additional measures will be implemented to ensure absorptive materials will be protected from moisture damage.

IEQ Credit 4 IAQ Assessment 2 credit points
To meet the requirements of Option 2, after construction ends and before occupancy, but under ventilation conditions typical for occupancy, the project will conduct baseline IAQ testing for all occupied spaces

IEQ Credit 5 Thermal Comfort 1 credit points
The project will design heating, ventilating, and air-conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55–2010, Thermal Comfort Conditions for Human Occupancy.

Additionally, the project will provide individual thermal comfort controls for at least 50% of individual occupant spaces and group thermal comfort controls for all shared multi-occupant spaces. The thermal comfort controls will allow occupants to adjust air temperature, air speed, and/or humidity.

IEQ Credit 6 Interior Lighting 1 credit point
At least 90% of individual occupant spaces, provide individual lighting controls that enable occupants to adjust the lighting to suit their individual tasks and preferences, with at least three lighting levels or scenes (on, of, midlevel). Midlevel is 30% to 70% of the maximum illumination level (not including daylight contributions.
All shared multi-occupant spaces will have multizone control systems that enables occupants to adjust the lighting to meet group needs and preferences, with at least three lighting levels or scenes (on, of, midlevel), lighting for any presentation or projection wall will be separately controlled, and switches or manual controls will be located in the same space as the controlled luminaires.

IEQ Credit 7 Daylight (LEEDv4.1) 1 credit point
The project will demonstrate through computer modeling that spatial daylight autonomy for each regularly occupied meets levels of a minimum of $sDA_{300/50\%}$ for at least 40% of the regularly occupied floor area.

IEQ Credit 8 Quality Views 1 credit point
A direct line of sight to the outdoors and/or atrium will be provided for 75% of the regularly occupied floor area of the Project. 75% of the regularly occupied floor area will also have quality views to the outdoors which will include multiple lines of sight; unobstructed views; views to landscaped areas, sky, pedestrian walkways, and streetscapes.

H. Innovation (IN)

INc1 Exemplary Performance: SSc5 Heat Island Reduction 1 credit point
The Project will achieve Exemplary Performance for Heat Island Reduction by meeting both Option 1: Roof and Nonroof and Option 2: Parking Under Cover.

INc2 Innovation: Purchasing - Lamps 1 credit point
The Project will achieve one innovation point by complying with LEED Innovation Credit: Purchasing – Lamps, which requires that the calculated average mercury content for the Project be below 35 picograms of Hg per lumen hour. The project will be 100% LED.

INc3 Exemplary Performance: LTc7 Reduced Parking Footprint 1 credit point
The Project will achieve Exemplary Performance for Reduced Parking Footprint by reducing parking from the baseline by more than 60%.

INc4 Innovation, Pilot Credit, Exemplary Performance: To be Determined 1 credit point
The Project is exploring options to achieve this Innovation credit and is confident that a path will be found to earn all innovation credits. Options include, but are not limited to, exemplary performance in an existing credit, Green Building Education, Occupant Comfort Survey, Social Equity within the Project team, or Beauty and Design WELL feature compliance.

INc5 Pilot: Integrative Analysis of Building Materials 1 credit point
The Project will specify, purchase and install three different permanently installed products that have a documented qualitative analysis of potential health, safety, and environmental impacts of the product over its life cycle.

INc6 LEED Accredited Professional 1 credit point
Many members of the team are LEED Accredited Professionals (APs).

I. Regional Priority (RP)

Regional Priority Credits (RPCs) are established by the USGBC to have priority for a particular area of the country. When a project team achieves one of the designated RPCs, an additional credit is awarded to the project. LEEDv4 RPCs applicable to the Cambridge area include: LTc3 High Priority Site (2 points), SSc4 Rainwater Management (2 points), WEc2 Indoor Water Use Reduction (4 points), EAc2 Optimize Energy Performance (17%/8 points), EAc5 Renewable Energy Production (3%/2 points), and MRc1 Building Life-Cycle Impact Reduction (2 points).

The Project is currently tracking the following RPCs:

RPc1 SSc4 Rainwater Management (2 points)	1 credit point
RPc2 WEc2 Indoor Water Use Reduction (4 points)	*1 maybe point*
RPc3 EAc2 Optimize Energy Performance (17%/8 points)	*1 maybe point*

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The Green Engineer
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Net Zero Energy Narrative

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Project Name: Ragon 2
Submitted By: The Green Engineer, Inc.
Date of Submission: 12/02/2020

The Green Engineer
Sustainable Design Consulting

Project Profile

Development Characteristics

Proposed Land Use(s) and Gross Floor Area (sq.ft.), by Use:	Laboratory/Office 185,842 GFA
Proposed Building Height(s) (ft. and stories):	120 feet 6 Floors above grade (including Penthouse).
Proposed Dwelling Units:	N/A
Proposed Open Space (sq.ft.):	32,956sf
Proposed Parking Spaces:	120 - 122
Proposed Bicycle Parking Spaces (Long-Term and Short-Term):	Minimum of 41 spaces long term and 12 spaces short term

Green Building Rating System

Choose the Rating System selected for this project:

LEED-Leadership in Energy & Environmental Design (U.S. Green Building Council)			
Rating System & Version:	LEED v4 New Construction	**Seeking Certification?**	Yes
Rating Level:	LEED Gold	**# of Points:**	66

Enterprise Green Communities			
Rating System & Version:	n/a	**Seeking Certification?**	No
Rating Level:	n/a	**# of Points:**	n/a

Passive House Institute US (PHIUS) or Passivhaus Institut (PHI)			
Rating System & Version:	n/a	**Seeking Certification?**	No

Project Name: Ragon 2
Submitted By: The Green Engineer, Inc.
Date of Submission: 12/02/2020

The Green Engineer
Sustainable Design Consulting

Proposed Project Design Characteristics

Building Envelope

The building is a laboratory building typology (60/40 laboratory/office split). The Project is incorporating ea

Assembly Descriptions:

Roof:	The primary Building Roof will be a white (high-albedo) EPDM roof over rigid insulaton designed to achieve a minimum R-40. Higher insulation values are being explored. Tapered insulation will be used to create minimum 1/4" per foot slopes to direct water to paired primary and overfow roof drains. Sloped roof areas may have an extensive (tray-based) green roof system to aid in the retenton of storm water. Additonal study is required to determine whether generally flat roof areas will be designed as a green roof, blue roof (for storm water retenton), both or neither.
Foundation:	Foundation walls will be insulated concrete walls designed with a maximum C-value of 0.119.
Exterior Walls:	Opaque exterior walls will be a rainscreen system using a panelized material designed to achieve a u-value between 0.0275 and 0.033. Assembly materials will be selected and detailed to minimize thermal bridging.
Windows:	Exterior glazing will be a high-performance triple-glazed IGUs with a Basis of Design U-value between 0.18 and 0.22
Window-to-Wall Ratio:	The window-to-wall ratio will be approximately 47%. A more detailed ratio will be finalized as the design progresses.
Slab-on-Grade:	The building is designed with a 4-foot thick mat slab foundation below the lowest level of the parking garage. Due to its thickness, this slab is uninsulated. All at-grade spaces exist above the sub-terranean parking garage, and therefore there are no slabs on grade in the building. Slabs at cantilevered portions of the building will be designed to achieve a minimum R-19, with higher insulation values being evaluated.
Underground Walls:	See description of foundation walls.
Other Components:	
Building Infiltration	

Envelope Performance:

	Proposed		Baseline	
	Area (sf)	*U-value*	*Area (sf)*	*U-value*
Window	51,228 sf	0.18 - 0.22		0.42
Wall	57,297 sf	.0275 - .033		0.0452
Roof	44,870 sf	0.025		0.0255

Envelope Commissioning Process:

Building envelope commissioning will be pursued for this project in accordance with ASHRAE Guidelines 0-2005 and National Institute of Building Sciences Guideline 3-2012, Exterior Enclosure Technical Requirements for the Commissioning Process, as they relate to energy, water, indoor environmental quality, and durability. Services by qualified Building Enclosure Commissioning Agents will be sought with previous experience on projects of similar characteristics to review design and submittals, verify inclusion of operator and occupant training, verify seasonal testing of the envelope, to develop and provide an on-going commissioning plan, and to review building operations 10 months after substantial completion.

Project Name: Ragon 2
Submitted By: The Green Engineer, Inc.
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The Green Engineer
Sustainable Design Consulting

Building Energy Systems

Systems Descriptions:

The building is a laboratory building typology (60/40 laboratory/office split). The Project is incorporating ea

HVAC System	High equipment efficiencies are targeted for main plant equipment, i.e. condensing boilers, premium efficiency motors, variable frequency drives
Space Heating:	Heating Hot Water (HHW) will be provided by natural gas fired condensing boilers supplying 140°F water to the AHU glycol energy recovery system, fan coil units (FCU), VAV reheat coils, and other HVAC related heating devices. A heat recovery chiller will provide additional heating when there is a simultaneous heating and cooling demand in the building. Energy recovery will be used to provide preheating of outside air to the building via a closed loop, glycol piping system, pumps, heat exchangers, expansion tanks, etc. Energy will be recovered from the laboratory exhaust air stream.
Space Cooling:	Cooling will be through two water-cooled chillers and cooling towers each sized for 700 tons (70% of peak load). Hydronic cooling, predominantly active chilled beams (ACBs) and limited quantity of fan coil units, will be employed.
Heat Rejection:	The building shall be provided with two main forms of energy recovery: enthalpy wheels on non-lab units and run-around coil systems for lab spaces.
Pumps & Auxiliary:	Ducts and pipes will be sized for low pressure drops to reduce fan and pumping power
Ventilation:	Minimum space ventilation rates will meet the requirements of ASHRAE 62.1-2016, with additional ventilation provided as required for laboratory spaces.
Domestic Hot Water:	Gas-fired condensing water heaters located in penthouse - separate heaters for domestic and laboratory usage.
Interior Lighting:	High-efficiency lighting with occupant controls. Lighting will utilize LED and low lighting power densities by space type.
Exterior Lighting:	Exterior lighting will comply with all City and LEED requirements regarding safe nighttime lighting environments and light spillage.
Other Equipment:	Air-cooled diesel generator for emergency and legally required standby and optional loads.

Systems Commissioning Process:

66

The commissioning agent will perform the scope of work required to comply with the prerequisite in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007 for HVAC & R systems. Enhanced commissioning scope will include reviewing the owner's project requirements, and the basis of design, creating, distributing and implementing a commissioning plan, performing a design review of the project documents, witnessing on-site installations and testing and performing commissioning of installed HVAC, lighting, lighting controls and domestic hot water systems.

Project Name: Ragon 2
Submitted By: The Green Engineer, Inc.
Date of Submission: 12/02/2020

The Green Engineer
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Anticipated Energy Loads and Greenhouse Gas Emissions

Assumptions

The building is a laboratory building typology (60/40 laboratory/office split). The Project is incorporating early energy modeling via IES software for whole building analysis at multiple stages of design to explore opportunities for energy reduction on mechanical systems, improve energy efficiency, and reduce greenhouse gas emissions. ASHRAE code minimums were used for all baseline equipment sizes.

Annual Projected Energy Consumption and Greenhouse Gas (GHG) Emissions

	Baseline Building (ASHRAE 90.1-2013)		Proposed Design		NZE Option (Future Scenario)	
	MMBTU	% of Total	MMBTU	% of Total	MMBTU	% of Total
Space Heating	32,930	62%	17,628	51%	9,389	35%
Space Cooling	2,027	4%	1,235	4%	1,923	7%
Heat Rejection	623	1%	252	1%	192	1%
Pumps & Aux	321	1%	148	0%	53	0%
Ventilation/Fans	9,463	18%	7,690	22%	7,997	30%
Domestic Hot Water	382	1%	382	1%	382	1%
Interior Lighting	3,329	6%	2,525	7%	2,525	9%
Exterior Lighting	-	0%	-	0%	-	0%
Misc. Equipment	4,417	8%	4,425	6600%	4,425	16%
On Site PV (future)	-	0%	-	0%	*1,505*	6%
	$US, kBtu, Kbtu/sf		$US, kBtu, Kbtu/sf, kWh, therm	% Reduction from Baseline	$US, kBtu, Kbtu/sf, kWh, therm	% Reduction from Baseline
Total Energy Cost ($US)	$1,725,829		$1,330,806	23%	$1,301,058	25%
Total Energy Use (kWh)	7,712,375		6,651,237	13.8%	7,326,282	5.0%
Total Energy Use (therms)	271,812		115,942	57.3%	3,821.0	98.6%
Site EUI (kBTU/SF)	210.0		135	35.7%	99.1	52.8%
Source EUI (kBTU/SF)						
	MMBTU	% of Total	MMBTU	% of total	MMBTU	% of total
On-Site Renewable Energy Generation	-	-	-	-	1,505	5.6%
Off-Site Renewable Energy Generation	-	-	-	-	-	0%
	MTons CO2 [/sf]		MTCO2e [/sf]	% Reduction from Baseline	MTCO2e [/sf]	% Reduction from Baseline
GHG Emissions	3293		2211	32.9%	1778	46.0%
GHG Emissions per sf	0.013		0.009	32.9%	0.007	46.0%

Results are based on energy model report dated November 16, 2020 issued by Arup

Project Name: Ragon 2
Submitted By: The Green Engineer, Inc.
Date of Submission: 12/02/2020

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Anticipated Energy Usage

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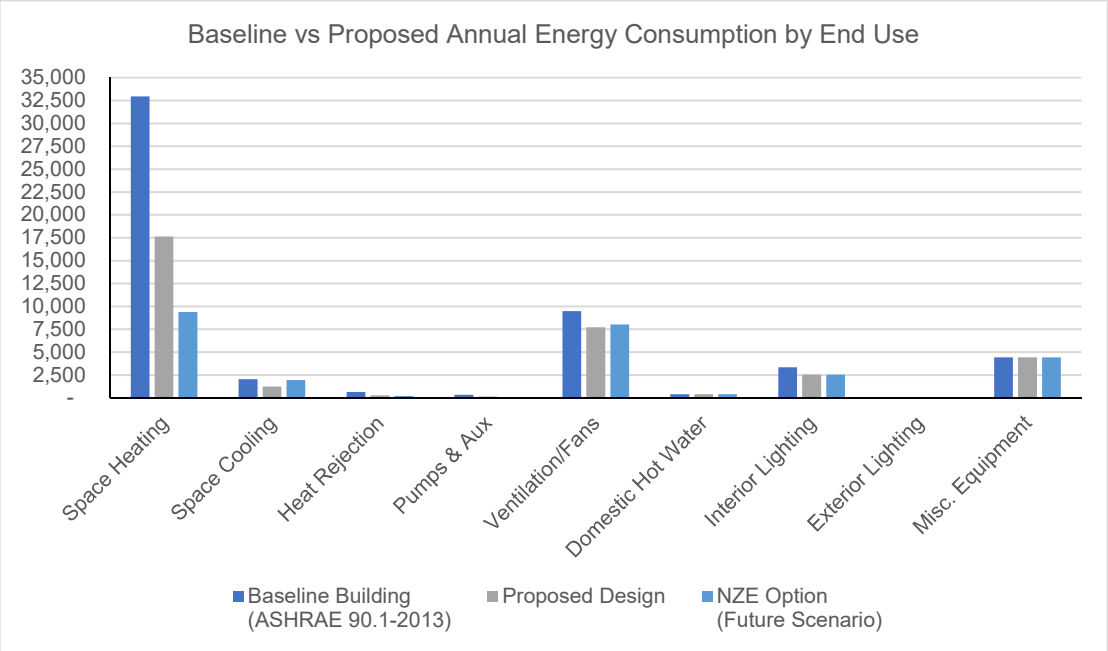

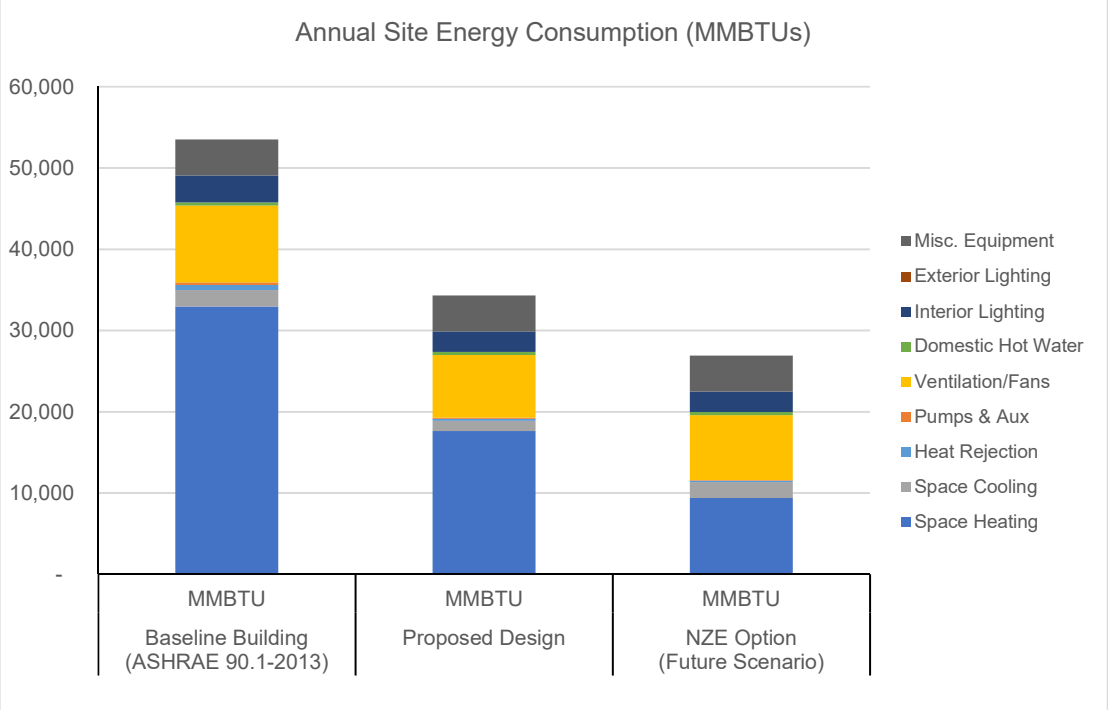

Project Name: Ragon 2
Submitted By: The Green Engineer, Inc.
Date of Submission: 12/02/2020

The Green Engineer
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Building Energy Performance Measures

Overview:

The building is a laboratory building typology (60/40 laboratory/office split). The Project is incorporating early energy modeling via IES software for whole building analysis at multiple stages of design to explore opportunities for energy reduction on mechanical systems, improve energy efficiency, and reduce greenhouse gas emissions. ASHRAE code minimums were used for all baseline equipment sizes.

Land Uses:	Sited on previously developed land, which is also classified as U.S. Department of Housing and Urban Development's Difficult Development Area
Building Orientation and Massing:	The Project is on a previously developed urban site with limited potential of massing and orientation changes. Fenestration area is optimized for the project to minimize thermal losses and unwanted gains, and to bring in sufficient daylight into the spaces.
Envelope Systems:	High performing envelope which meets the new code envelope backstop criteria has been designed for the project. It includes continous insulation on walls and roofs, high performaing glazing assemblies and optimized window wall ratio.
Mechanical Systems:	High efficiency equipment and energy/heat recovery equipment, and high efficiency chiller and boiler plants.
Renewable Energy Systems:	The Project's roof is being designed as solar ready and the team is continuing to evaluate economics for solar. Due to the nature of the Project, part of the roof will be occupied by large mechanical systems. On areas of the roof free of mechanical systems and with good solar availability, the potential of installing photovoltaic panels is under evaluation.
District-Wide Energy Systems	The Project evaluated the feasibility of the district steam. Energy and emissions impacts are difficult to quantify because steam production data is unavailable at the current time. Additionally, steam is produced via a non-renewable source fuel, which will not assist with the City NZE goals.
Other Systems:	EV charging stations to be provided for 2% of the total parking capacity for the project.

Integrative Design Process:

The development team has conducted numerous interdisciplinary early meetings focusing on sustainability. These meetings have included the ownership groups, architects, MEP engineers, civil engineers, landscape architects, energy analysts, and sustainability experts. An initial sustainability kick-off meeting for the Project was conducted in November 2020 focusing on sustainability and energy goals. Energy modeling is occurring and providing real feedback on decision-making; and the Project will link into the MassSave energy-efficiency incentive program. Early energy studies were used to estimate site Energy Use Intensities (EUI) and greenhouse gas (GHG) emissions and identify energy conservation measures for Building Envelope, Lighting Power Density, Equipment Efficiencies, etc. This early work has pushed the design to increase the performance of the envelope and HVAC systems and explore additional opportunities for decreasing water use. As the building design progresses, integrative analysis remains part of the design strategy to validate that Project's energy performance and GHG emissions reduction goals are being met.

Project Name: Ragon 2
Submitted By: The Green Engineer, Inc.
Date of Submission: 12/02/2020

The Green Engineer
Sustainable Design Consulting

Solar Ready Roof Assesment

The purpose of this assessment is to determine the technical feasibility of solar energy system installation, either as part of the proposed project or in the future. It is helpful to supplement this narrative with a plan depicting the information provided.

The building is a laboratory building typology (60/40 laboratory/office split). The Project is incorporating early energy mod

Total Roof Area (sf)	39,040 sf at the top of the building.
Unshaded Roof Area (sf)	27,400sf (excludes areas with big mechanical equipment, shaded area, 15% additional deductions for setbacks, fire code, spaces for vent-pipes, shafts, etc.)
Structural Support:	The roofs will be PV/Solar ready for the areas identified with good solar access. The team is continuing to evaluate economics for solar/PV.
Electrical Infrastructure:	The design team will take electrical infrastructure into account while evaluating the economics for solar/PV on the roofs.
Other Roof Appurtenances:	Certain mechanical equipment, namely exhuast, will occupy and further shade roof area. Consideration will be given as to impacts of this equiment on future PV placements.
Solar Ready Roof Area (SF)	The roofs will be PV/Solar ready and the team is continuing to evaluate economics for solar/PV. The final amount of total square footage provided as solar-ready may change as the building design process progresses
Capacity of Solar Array (kW):	The project has capacity for a 341 kW PV system with an installed cost of about $1.2M. Anticipatd annual production is 441,150 kWh at a 20 degree tilt. The simple payback is calcualted to be 17 years. On-site photovoltaic system is likely not to be economically feasible due to the limited size of the roof space that would allow for solar power generation. Off-site PV, or other means of off-site renewable energy system may be considered by the Ragon Institute by purchasing electricity from renewable energy sources.
Financial Incentives ($):	There are federal and state (SMART) incentives available for eligible PV generation systems. These incentives programs are continously changing. Therefore, this analysis will be performed at the time of PV system design.
Cost Feasibility:	As noted in the capacity assessment, on-site generation does not initially appear to be an economically feasible source of renewable energy for the project.

Green Building Incentive Program Assistance

The project will involve utility rate incentives through a Memorandum of Understanding (MOU) with Eversource. The Integrated Design Path for Large Buildings is provided by the Mass Save Program Administrators (Eversource) for projects greater than 100,000 square feet. Eversource and Ragon will engage a third-party Engineer to evaluate potential energy saving measures through energy modeling compared to the state energy code baseline. Eversource will be part of the integrative design process through design development. The results of the energy model and pricing exercise will be used to determine utility incentives as well as aid in system decision making.

Project Name: Ragon 2
Submitted By: The Green Engineer, Inc.
Date of Submission: 12/02/2020

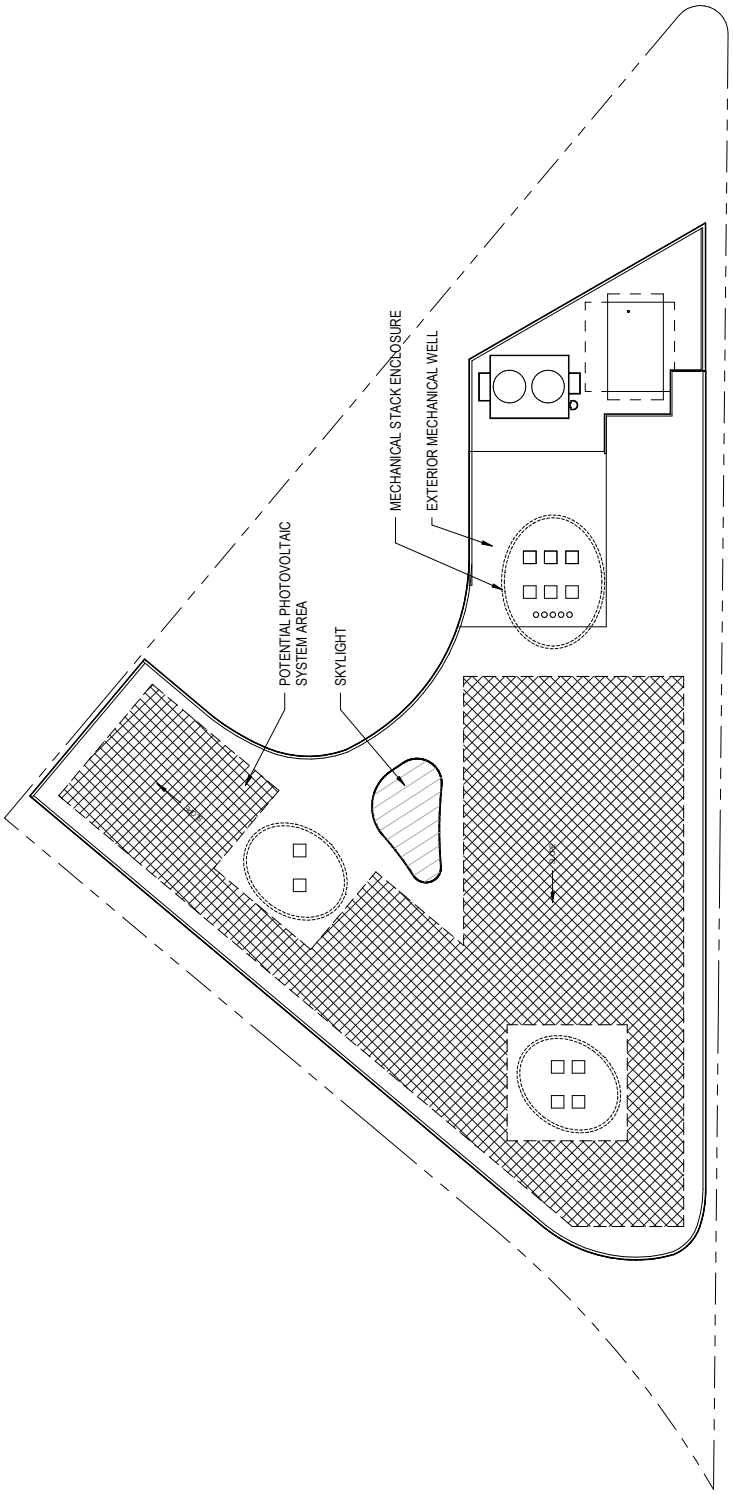
The Green Engineer
Sustainable Design Consulting

Net Zero Scenario Transistion

Several opportunities for future improvement of the Project have been identified that may be implemented for a Net Zero Option scenario.

The building is a

	Net Zero Condition	Transistion Process
Lighting Design	High-efficiency lighting with occupant controls. Lighting will utilize LED and low lighting power densities by space type. It is not anticipated that significant additional energy savings will be realized through lighting. As lighting relies on electricity, the transition to Net Zero relies on off-site renewable electricity supply.	It is important to acknowlege that the new Massachusetts Building Energy Code has stringent LPD thresholds and the Applicant will designing to go beyond the code thresholds where possible.
Future Lighting Upgrades	We anticipate that overtime, the future lighting improvements will reduce both interior and exterior lighting by 50%. This will also have the effect of reducing cooling loads while increasing heating loads.	Lighting technology continues to improve, as LED technology and automatic lighting controls become commonplace. Lighting upgrades may be implemented to take advantage of a future enhanced technology.
Domestic Hot Water:	To lower energy use in the future, domestic hot water heating source can be a heat pump type water heater.	At the end of life of the original equipment it is possible to easily convert the existing system to a high efficienct heat pump system for domestic hot water system.
Receptacle Loads	In Net Zero Option, plug loads are assumed to be 25% lower than the current design scenario. This would also have the effect of reducing cooling loads while increasing heating loads	Receptacle loads represent a significant energy end use in the Project, due to the high numbers of lab equipment, computers, etc. Currently plug loads are growing and continure to grow, as phones, tablets, etc proliferate, along with phanton loads their chargers create. We anticipate that this trend will reverse with improvement in technology.
Fossil Fuel Free HVAC Systems	Future NZE scenario assumes some sort of air source heat pump technology would be used. In this option the boilers and chillers would be replaced with modular air-cooled heat pumps that could provide chilled and hot water as needed.	While not currently economically feasible, the Project could eventually be converted to all electric service. We would expect this to occur at the end of life of the original HVAC systems. There are a few options available. The actual methodology will depend on innovations in technology over the next several decades. Potenital difficulties include the hot water temperatures the heat pumps can generate. Current technology struggles to heat beyond the 130F. It is possible that future heat pump technology can generate higher temperatures, but it should also be noted that the proposed HVAC systems will use lower temperatures to maximize boiler efficiency.


MECHANICAL STACK ENCLOSURE
EXTERIOR MECHANICAL WELL
POTENTIAL PHOTOVOLTAIC SYSTEM AREA
SKYLIGHT

The Green Engineer
Sustainable Design Consulting

www.greenengineer.com

Green Building Professional Affidavit

23 Bradford St., Concord, MA 01742

T: 978.369.8978

GREEN BUILDING PROJECT CHECKLIST • ARTICLE 22.000 • GREEN BUILDING REQUIREMENTS

Affidavit Form for Green Building Professional
Special Permit

Green Building
Project Location: 600 - 624 Main Street, Cambridge, MA

Green Building Professional

Name: Sarah Michelman

☒ Architect

☐ Engineer

License Number: MA Lic No. 10402

Company: The Green Engineer, Inc.

Address: 23 Bradford Street, First Floor, Concord, MA 01742

Contact Information

Email Address: Sarah@greenengineer.com

Telephone Number: 978-341-5462

I, Sarah Michelman, as the Green Building Professional for this Green Building Project, have reviewed all relevant documents for this project and confirm to the best of my knowledge that those documents indicate that the project is being designed to achieve the requirements of Section 22.24 under Article 22.20 of the Cambridge Zoning Ordinance.

X _____ 11/11/2020
(Signature) *(Date)*

Attach either:

☒ Credential from the applicable Green Building Rating Program indicating advanced knowledge and experience in environmentally sustainable development in general as well as the applicable Green Building Rating System for this Green Building Project.

☐ If the Green Building Rating Program does not offer such a credential, evidence of experience as a project architect or engineer, or as a consultant providing third-party review, on at least three (3) projects that have been certified using the applicable Green Building Rating Program.

PAYETTE

LEED AP BD+C

GREEN BUSINESS CERTIFICATION INC. CERTIFIES THAT

Sarah Michelman

HAS ATTAINED THE DESIGNATION OF

LEED AP® Building Design + Construction

by demonstrating the knowledge and understanding of green building practices and principles needed to support the use of the LEED® green building program.

87211-AP-BD+C

CREDENTIAL ID

23 SEP 2010

ISSUED

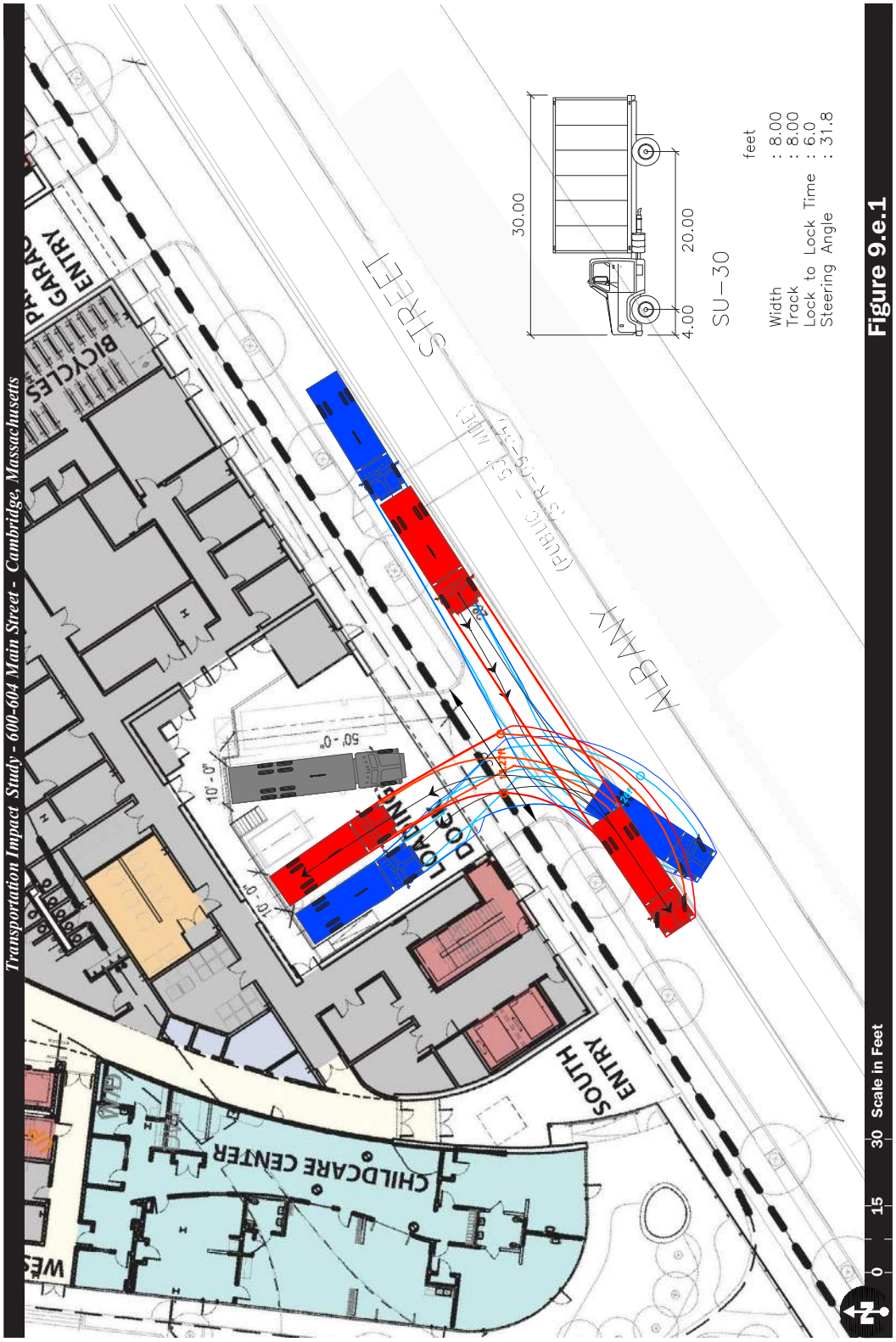
21 SEP 2022

VALID THROUGH

Mahesh Ramanujam

MAHESH RAMANUJAM
PRESIDENT & CEO, U.S. GREEN BUILDING COUNCIL
PRESIDENT & CEO, GREEN BUSINESS CERTIFICATION INC.

3.3 - TRUCK TURNING DIAGRAMS



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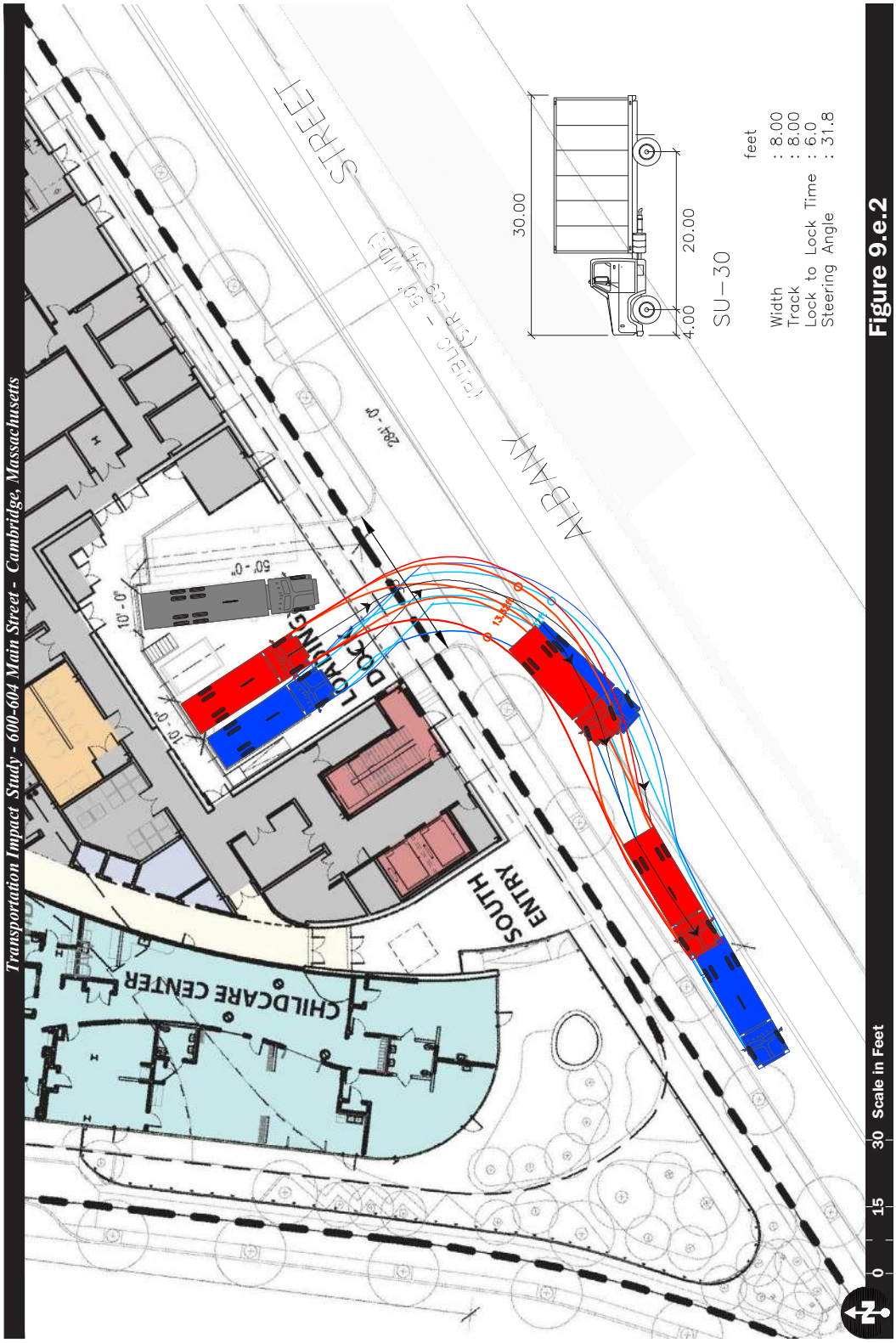

Figure 9.e.2
Autoturn Diagram
SU-30 Exiting Loading Dock
To South Bay 1 & 2

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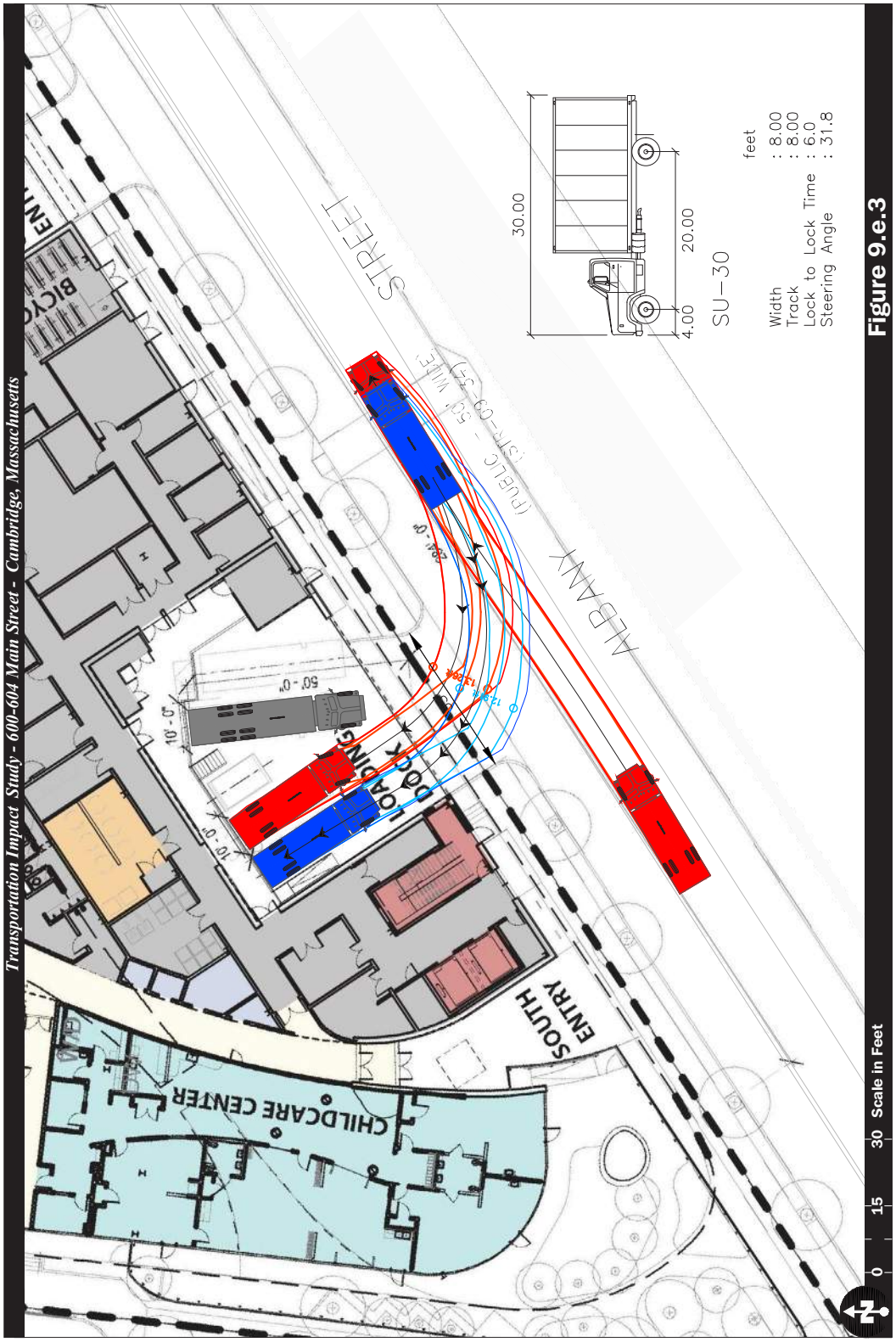

Figure 9.e.3
Autoturn Diagram
SU-30 Entering Loading Dock
From South Bay 1 & 2

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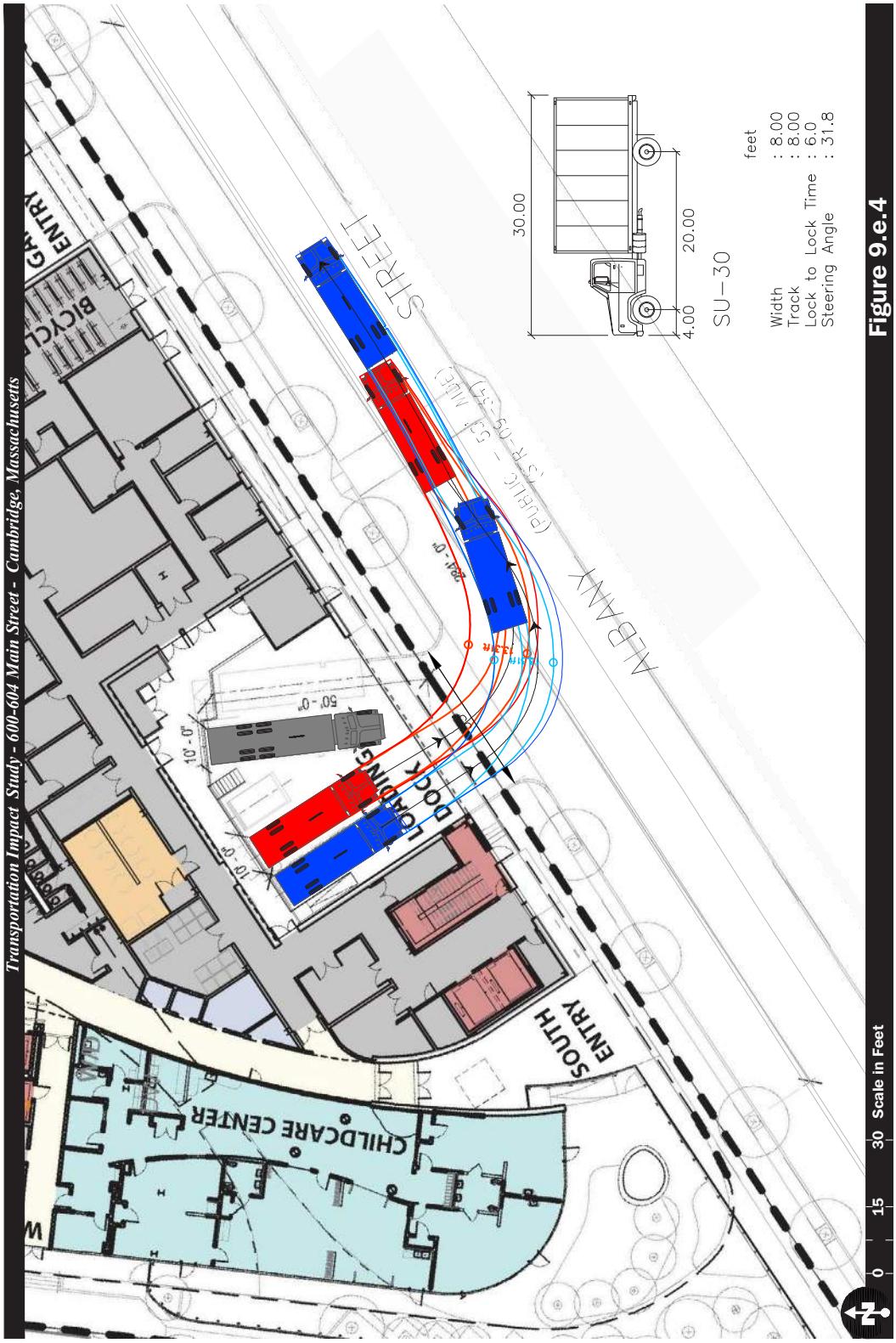

Figure 9.e.4
Autoturn Diagram
SU-30 Exiting Loading Dock
To North Bay 1 & 2

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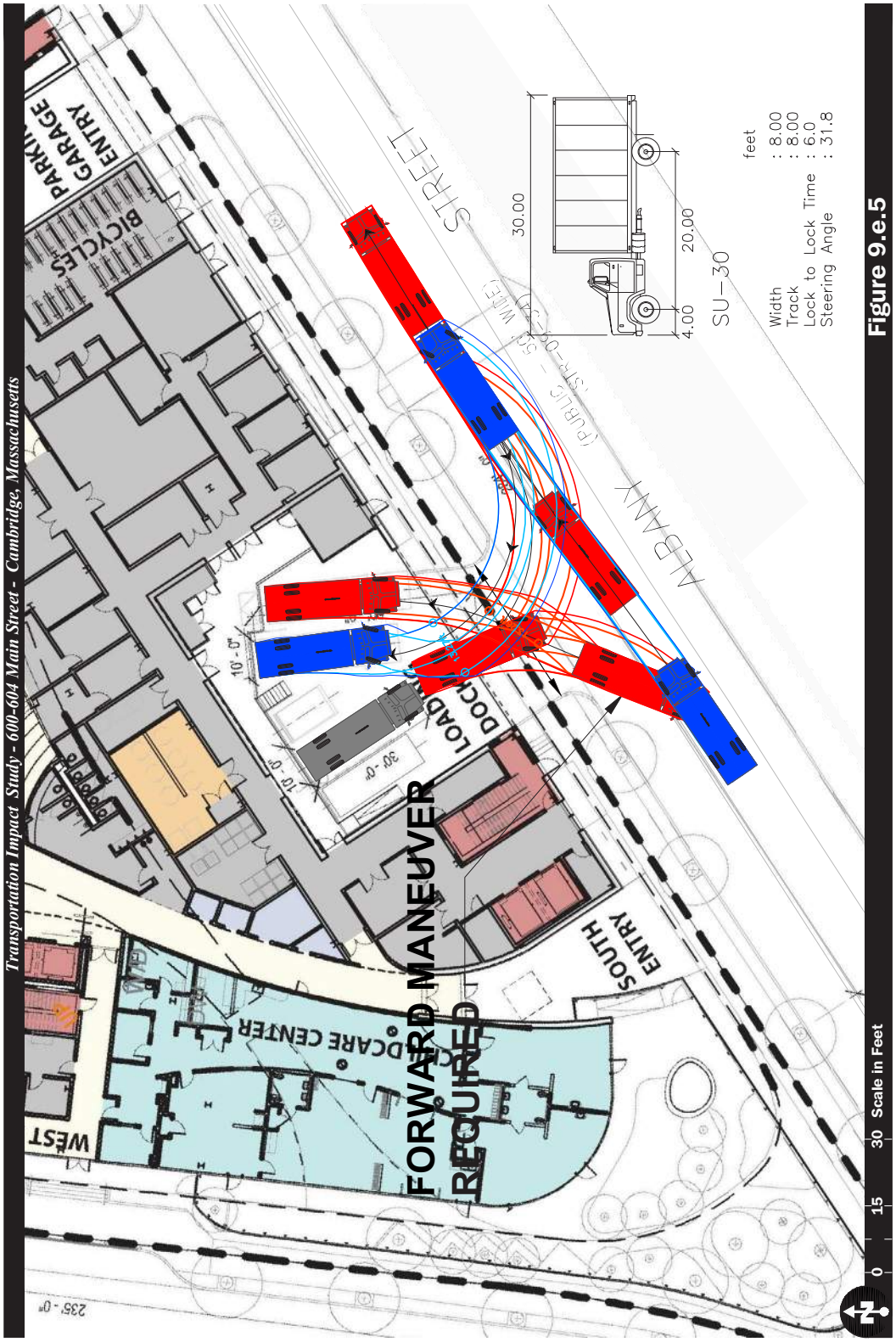

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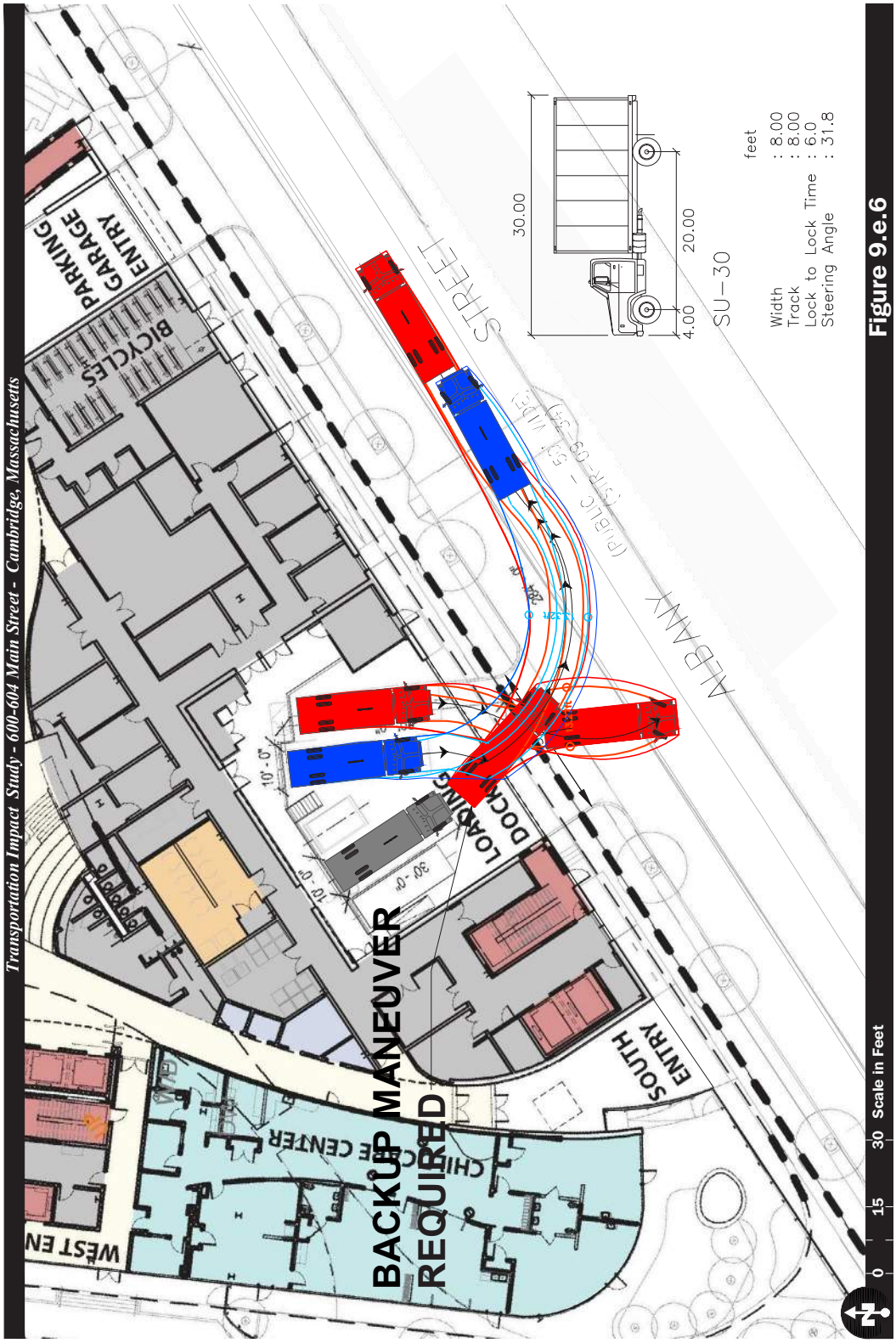

Figure 9.e.6
Autoturn Diagram
SU-30 Exiting Loading Dock
To North Bay 3 & 4

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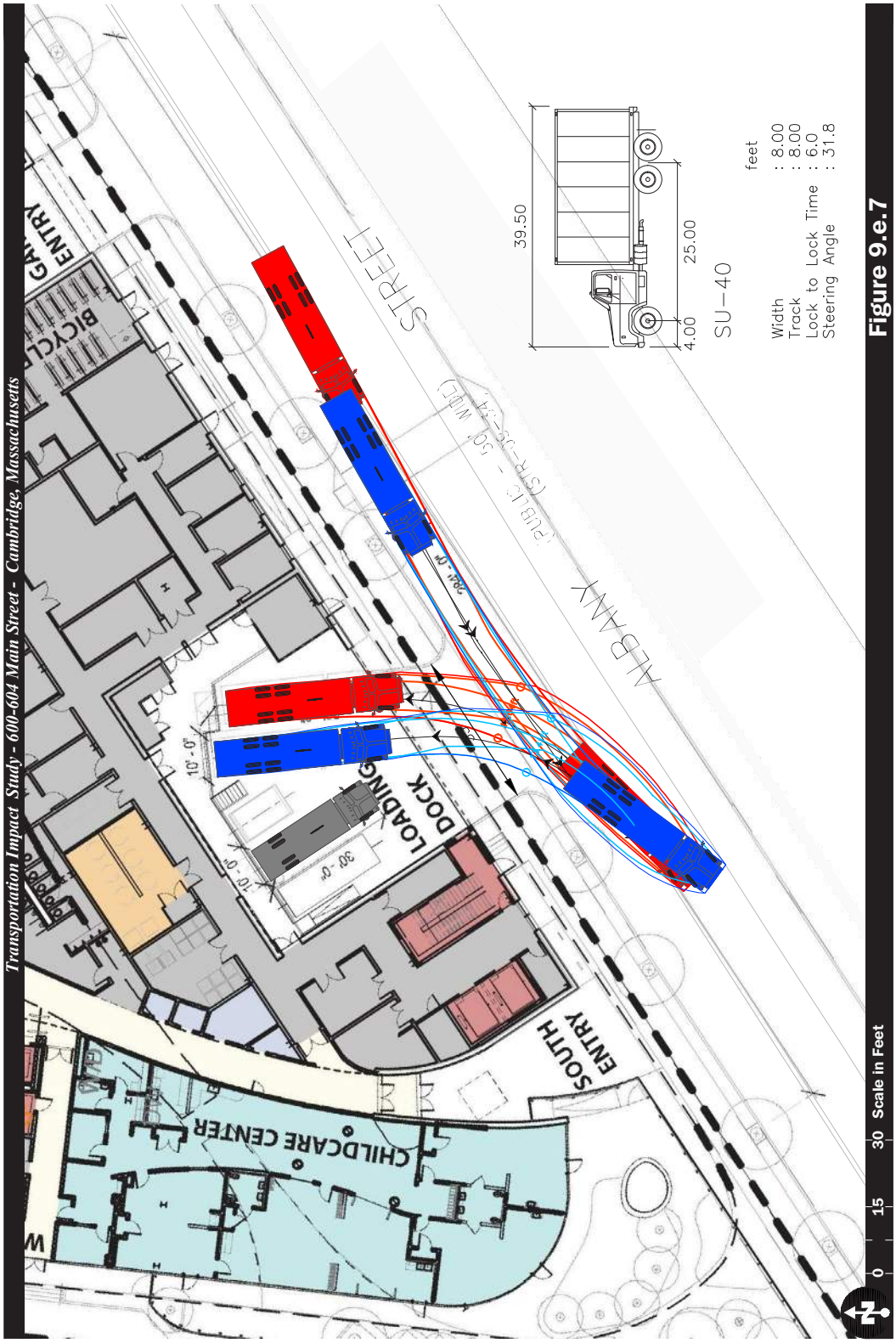

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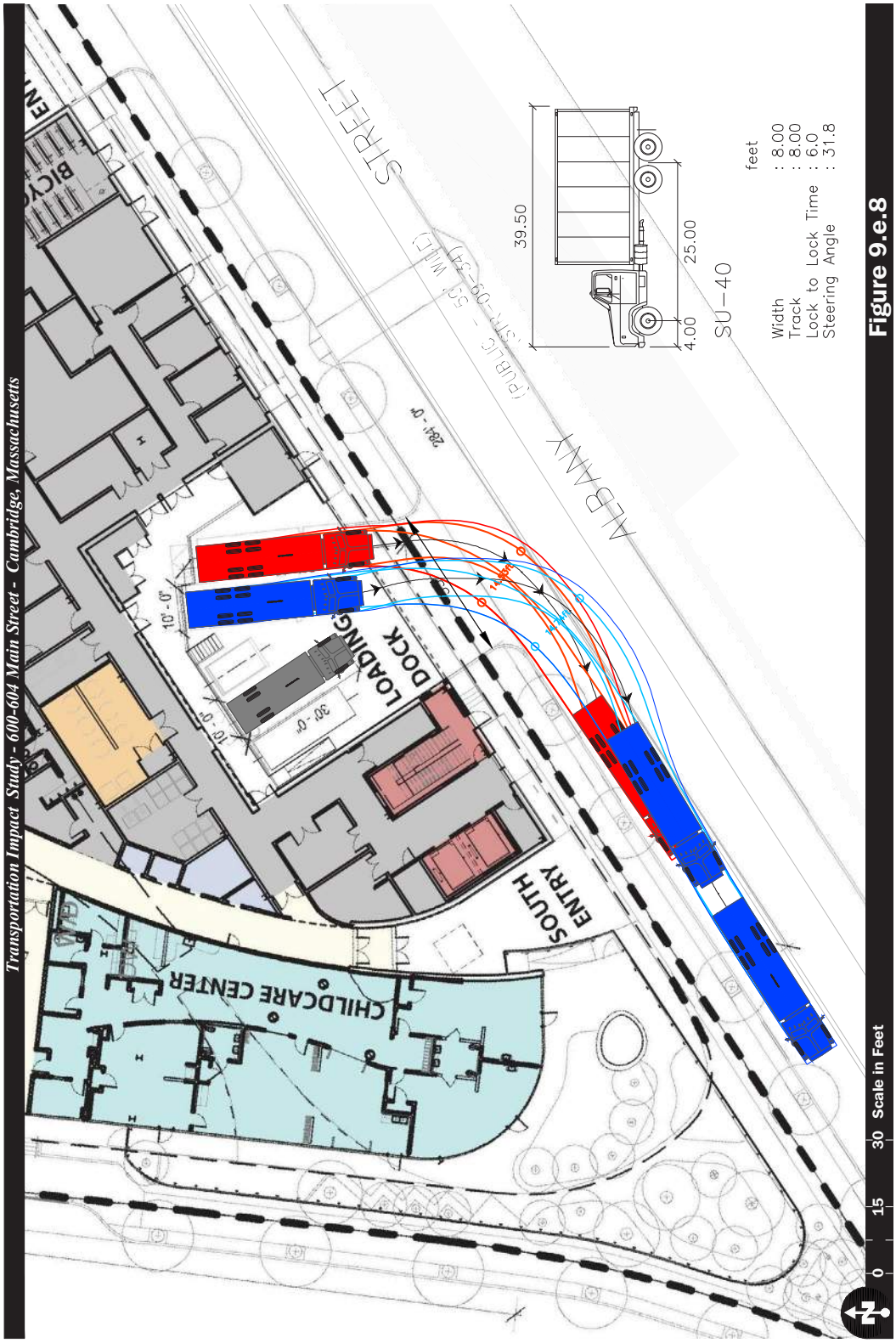

Figure 9.e.8
Autoturn Diagram
SU-40 Exiting Loading Dock
To South Bay 3 & 4

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