



161 FIRST STREET: PLANNING BOARD **SPECIAL PERMIT #243**

DESIGN REVIEW NON-GRAPHIC MATERIAL | JULY 2019

PROJECT ADDRESS:

161 First Street
Cambridge, MA

OWNER:

ARE - MA Region No.21, LLC
Alexandria Real Estate Equities, Inc.
400 Technology Square, Suite 101
Cambridge, MA 02139

PROJECT FOR DESIGN REVIEW PER PUD / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

PROJECT TEAM

Owner

Alexandria Real Estate Equities, Inc.

Project Management

RedGate

Architect

Perkins+Will

Civil Engineering

Kleinfelder

Landscape Architect

Copley Wolff Design Group

Structural Engineering

McNamara Salvia

Mechanical, Electrical, Plumbing + Fire Protection

BR+A Engineering, Inc.

Code Consultant

Code Red Consultants

Acoustical Consultant

Acentech

Transportation Consulting Services

Vanasse Hangen Brustlin, Inc.

TABLE OF CONTENTS

3	ARE Cover Letter
4	Project Description
6	Dimensional Form
8	Appendix A LEED Documentation
23	Appendix B Energy Model Inputs
26	Pathway to Net Zero
28	Acoustics Compliance





ALEXANDRIA®

July 3, 2019

Ms. Catherine Preston Connolly
Chair
Cambridge Planning Board
344 Broadway, Cambridge 02139

Re: Planning Board Case #243
161 First Street Design Review

Dear Ms. Preston Connolly,

Pursuant to the provisions in the above captioned PUD Special Permit, Alexandria Real Estate Equities, Inc. (ARE) is pleased to submit the enclosed material for Design Review for 161 First Street.

As you may recall, the Third Amendment to Special Permit 243 allowed for the “Renovation of the existing 161 First Street, including demolition of a rear annex of which up to 10,000 square feet may be exempt from GFA limitations as Innovation Office Space in accordance with Section 13.59.11 of the Zoning Ordinance”.

We look forward to an upcoming appearance before the Board to present the design details for your review.

Thank you for your time and effort in this matter.

Very truly yours,

Thomas J. Andrews
Co-President & Regional Market Director – Greater Boston
Alexandria Real Estate Equities, Inc.



Site Characteristics and Improvements

161 First Street is an existing, underutilized four-story brick building, including a partial below-grade basement, planned for adaptive reuse as part of PUD Special Permit #243. Constructed circa 1907 for factory and warehouse uses, the historic structure is in need of a complete renovation to restore architectural features to their former glory; address deferred maintenance, code compliance, and energy efficiency issues; and create forward thinking spaces appealing to modern behavior. The property owner, Alexandria Real Estate Equities, Inc. (ARE), is proposing shell, core, and site improvements (the Project) to address the aforementioned coupled with accommodating technical office and Innovation Space to support the neighborhood's life science and technology ecosystem.

The Project will include new windows and masonry repointing respectful of the building's historic character preservation and energy efficiency goals; code compliance improvements to entries, stairwells, elevators, and building systems; building common spaces including a patio at the building's western edge and a roof deck designed to support a collaborative, modern work environment. The main entrance will remain on First Street within close proximity to the intersection of First and Binney Streets. The experience at the eastern, southern, and northern edges of the site is limited by the proximity of the existing building to the street, but will be dedicated to welcoming pedestrian sidewalks with the existing street tree buffer and new short-term bicycle parking. Long-term bicycle parking, shower rooms, and mechanical spaces will be on Levels 1 and 2 including a new transformer elevated above the 100-year flood level projected for 2070.

The Project will include approximately 8,000 square feet of Innovation Office Space, in ordinance with Section 13.59.11 of the Zoning Ordinance. The space will be occupied by individual entities that may include small business incubators, small research laboratories, office space for investors and entrepreneurs, facilities for teaching and for theoretical, basic and applied research, product development and testing, and prototype fabrication or production of experimental products.

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ALEXANDRIA CENTER AT KENDALL SQUARE



At least twenty-five percent (25%) of the leased Innovation Office Space shall be set aside as below market rent space. Market rent shall be determined annually by analysis of similarly situated office spaces in comparable buildings. The analysis shall be conducted annually by a licensed commercial real estate broker, experienced in the leasing of technical office and life sciences space in East Cambridge, as selected by ARE.

An annual Innovation Office Space report will be submitted to the Cambridge Community Development Department summarizing use, occupancy, and market rent of the Innovation Office Space. The report will include the following items, (a) a list of occupants/tenants; (b) a general description of the business/activity conducted by each occupant/tenant; (c) the duration of each occupancy/tenancy; (d) the size of each occupied/leased area; (e) a description of shared resources, e.g., co-working areas; and (f) confirmation 25% of the leased Innovation Office Space has been set aside as below market rate space.

DIMENSIONAL FORM

Project Address:

Application Date:

	Existing	Allowed or Required (max/min)	Proposed	Permitted
Lot Area (sq ft)				
Lot Width (ft)				
Total Gross Floor Area (sq ft)				
Residential Base				
Non-Residential Base				
Inclusionary Housing Bonus				
Total Floor Area Ratio				
Residential Base				
Non-Residential Base				
Inclusionary Housing Bonus				
Total Dwelling Units				
Base Units				
Inclusionary Bonus Units				
Base Lot Area / Unit (sq ft)				
Total Lot Area / Unit (sq ft)				
Building Height(s) (ft)				
Front Yard Setback (ft) - First St (ft)				
Front Yard Setback - Rogers St (ft)				
Front Yard Setback - Binney St (ft)				
Side Yard Setback (ft)				
Open Space (% of Lot Area)				
Private Open Space				
Permeable Open Space				
Other Open Space (Specify)				
Off-Street Parking Spaces				
Long-Term Bicycle Parking				
Short-Term Bicycle Parking				
Loading Bays				

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

DIMENSIONAL FORM

Project Address: 161 First Street

Application Date: July, 2019

ADDITIONAL NOTES TO DIMENSIONAL FORM:

*	Address	GFA
	225 Binney Street	297,187
	75/125 Binney Street	338,262
	50/60 Binney Street	467,509
	100 Binney Street	367,992
	41 Linskey Way	21,492

** Per CZO 13.43.2, the lot size requirement applies to the development parcel in which these buildings are contained.

*** Per CZO 13.59.11, up to 10,000 sf of GFA dedicated as Innovation Office Space shall not be counted as GFA for the purposes of calculating maximum GFA for the Final Development Plan. This building has 7,102 sf of Innovation Office Space in addition to the 30,290 sf of GFA for a total building GFA of 37,392 sf.

**** Per CZO 13.45, the open space requirement applies to the development parcel in which this building contained.

***** 17 Parking spaces will be located in the 75/125 Binney Street parking garage and 10 spaces will be located in the 50 & 60 Binney Street parking garage.

END

DIMENSIONAL FORM

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Application Date:

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END

ARTICLE 22 PERMIT ISSUE COMPLIANCE

CONCEPT SUSTAINABILITY INITIATIVES NARRATIVE



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Cambridge, MA



ALEXANDRIA.

OWNER:
ARE - MA Region No.21, LLC
Alexandria Real Estate Equities
400 Technology Square, Suite 101
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I. PROJECT DESCRIPTION

The Project is being designed under the guidelines of LEED Green Building Design and Construction for Core & Shell Version 4 rating system of the U.S. Green Building Council; a Silver level of certification is being pursued.

II. AFFIDAVIT

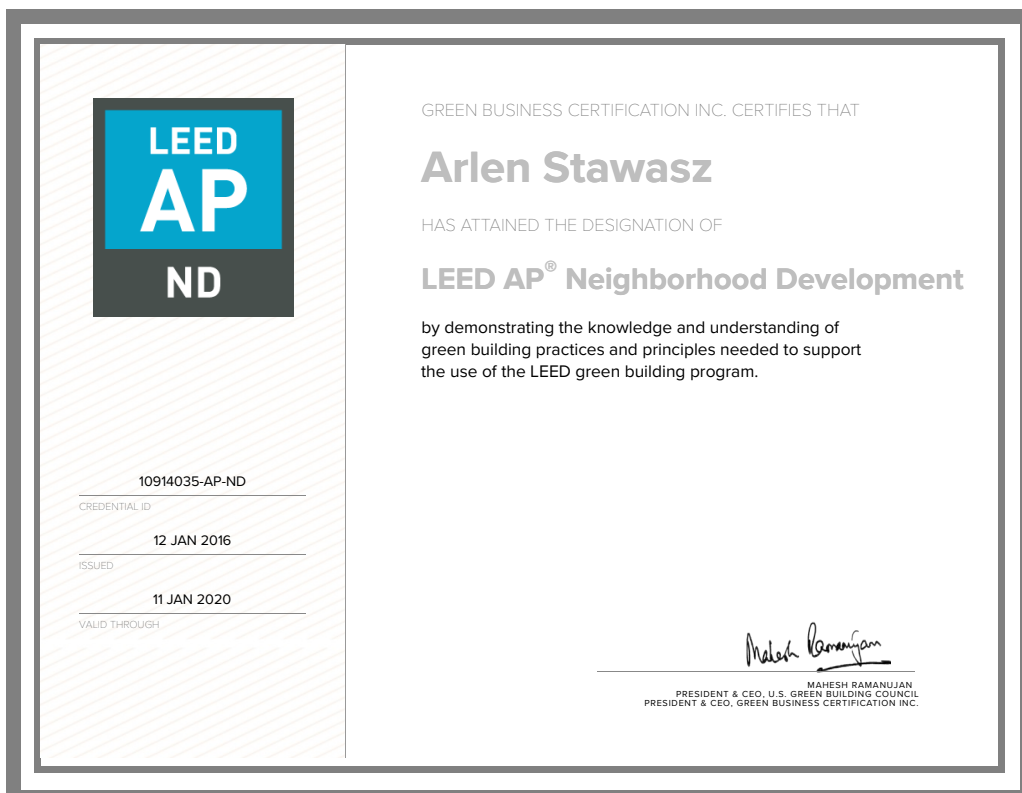
As the LEED Project Administrator, I reviewed the project documents and consulted ARE, and the design and Construction teams to address LEED-related issues and will be compiling LEED Documentation that meets the review requirements stated in the LEED v4 Reference Guide for Core and Shell to qualify the project for a minimum of Silver Certification. A copy of my LEED AP ND Certificate is below.

Arlen Stawasz, LEED AP ND, CPHC, RELI AP

Perkins+Will

t +16174063466

arlen.stawasz@perkinswill.com



III. LEED C+S V4

The Project design team will take an integrative approach in an effort to enhance the efficiency of all systems serving the building. This effort will commence in the Project's early design stages and will include a goal-setting workshop with all relevant parties, completion of a preliminary energy model, and completion of a full building water budget. Through these efforts, the design team will identify the project goals and determine how those goals can be achieved while also optimizing individual system operation and interactive system operation. Design changes implemented as a result of this early analysis will be documented in the Owner's Project Requirements and the Basis of Design for the project.

A LEED checklist for the Project is included herein.

IV. LEED C+S: V4 SCORECARD SUMMARY

Table 1: LEED for Core and Shell v4 checklist summary:

Category	Yes Points	Maybe Points
Integrative Process	1	-
Location and Transportation	11	2
Sustainable Sites	4	1
Water Efficiency	5	3
Energy and Atmosphere	15	2
Materials and Resources	6	0
Indoor Environmental Quality	8	0
Innovation	4	1
Regional Priority	0	1
Total Points	54	10

The project is currently planned to meet the LEED Silver Certification level.

Further studies will be performed to determine the feasibility of a path to achieving LEED Gold Certification. Potential upgrades to the building's envelope and infrastructure could help improve energy efficiency levels and baseline performance which would put the project on a path to net zero status including the following:

- Added insulation to all of the interior faces of existing brick wall construction
- Changing the building's energy supply to an all electric system

It should be noted that these improvements on envelope efficiency would compromise the intent to maintain the historic character of the building. Adding extensive insulation on the interior of the existing masonry walls would be burying some of the building's finest attributes. In addition, gas service is already currently in place to the building and would require more manipulation of the existing infrastructure of the building to achieve the required change over to the all electric option. Therefore the design team will pursue other opportunities to improve the energy efficiency of the building without negatively impacting its historic appeal.

VI. NARRATIVE FOR LEED CREDITS

A. Integrative Process (Eligible for 1 of 1 possible points)

IP Integrative Process	1 Yes Point
Option 1: Integrative Project Team (Yes)	
<p>Beginning in pre-design and continuing throughout the design process, the team will identify and use opportunities to achieve synergies across disciplines and building systems.</p> <p>The team will analyze energy-related systems by performing a preliminary energy model analysis before the completion of schematic design and explore the building energy loads to accomplish related sustainability goals. The team will document how this analysis informed the design decisions.</p> <p>The team will perform a preliminary water budget analysis before the completion of schematic design that explores how to reduce potable water loads in the building and accomplish related sustainability goals. The team will assess and estimate the project’s potential non-potable water supply sources and water demand volumes. The team will document how this analysis informs the building and site design decisions.</p>	

B. Location and Transportation (Eligible for 13 of 20 Possible Points)

LT Floodplain Avoidance	Required
This site is located in the flood plain but since it’s a previously developed land parcel, it will meet the credit requirements	
LT Sensitive Site Selection	2 Yes points
The Project is located in a dense urban area and on an infill site, both features translate into lower environmental impact than a similar development on an undeveloped site or Greenfield. In addition, the Project supports the rejuvenation of the surrounding neighborhoods.	
LT Surrounding Density and Diverse Uses	2 Yes points; 2 Maybe points
<p>The Project is located on a site with density and diverse uses. Depending on applicability, it may be eligible for 2-4 points based on residential and non-residential densities and their (DU/acre) and (FAR). The design team will perform the required calculations to verify total number of credits.</p> <p>The main entrance is located within a ½ mile walking distance of four to eight existing and publicly available diverse uses (as referenced list below).</p> <ol style="list-style-type: none"> 1. Catalyst Cafe – Restaurant (0.1 miles) 2. Best Buy – Retail Store (0.2 miles) 3. Coco Nail and Spa – Salon (0.2 miles) 4. Eastern Bank – Bank (0.3 miles) 5. Ann Taylor – Retail Store (0.2 miles) 6. Museum of Science – Museum / Cultural Center (0.5 miles) 7. Rowland Institute at Harvard – College (0.2 miles) 8. Charles Park, Cambridge – Park (0.1 miles) 9. Cambridge Athletic Club – Fitness (450 ft) 10. Community Charter School of Cambridge – School (0.5 miles) 	

APPENDIX A / SPECIAL PERMIT #243

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LT Access to Quality Transit	6 Yes points																																																																					
<p>The Project's functional entries are within a 0.25 mile walking distance of several existing planned bus or rideshare stops, and within a 0.50 mile of rapid transit via the Kendall Square and Lechmere MBTA Stations for both weekday and weekend trips.</p> <ol style="list-style-type: none"> 1. Lechmere MBTA Station (0.4 miles) 2. Kendall MBTA Station (0.5 miles) 																																																																						
LT Bicycle Facilities	1 Yes point																																																																					
<p>Bicycle Network: The Project is 0.2 miles from the Dr. Paul Dudley White Bike Path. The Project's functional entry will have bicycle parking within 200-yards (walking or biking) from a bicycle network that connects to at least 10 diverse uses all within a 3-mile bicycling distance of the Project boundary.</p> <p>Bicycle Parking and Shower Rooms: Short-term bicycle parking for at least 2.5% of all peak visitors (and no fewer than four storage spaces per building) will be provided. Long-term bicycle storage for at least 5% of all regular building occupants (but no fewer than four storage spaces per building in addition to short-term bicycle storage spaces) will be provided. The Project will feature shower rooms and changing facilities for building occupants. Reference chart below:</p>																																																																						
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C. Sustainable Sites (Eligible for 5 of 11 Possible Points)

SS Construction Activity Pollution Prevention	Required
<p>A management plan will enforce measures to protect adjacent areas from pollution, wind, and water-borne soil and sedimentation. The civil design team will prepare an erosion and sedimentation plan meeting the local codes and the EPA Construction General Permit of the National Pollution Discharge Elimination System (NPDES) program. The construction team will implement the erosion and sedimentation measures and will follow the requirements of the stormwater pollution prevention plan.</p>	
SS Site Assessment	1 Yes point
<p>The Project is located in the flood plain, but meets the credit requirements since it is located on a previously developed, dense urban area. The Project is not within 100 feet of any wetlands or area of special concern identified by state or local authorities. The Project does not violate any of the established criteria. The design team will provide a site survey that includes topography, hydrology, climate, vegetation, soils, human use, and human health effects. This survey will demonstrate the relationships between the site features and topics listed above, as well as how these features influence the project design and give reasons for not addressing any of these topics.</p>	

APPENDIX A / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

SS Site Development – Protect or Restore Habitat	1 Yes point
The Project is able to attain 1 credit point if financial support of at least \$0.40 per acre square foot for the total site area (including building footprint) is provided to a nationally or locally recognized land trust or conservation organization within the same EPA Level III ecoregion or the Commonwealth of Massachusetts. The land trust must be accredited by the Land Trust Alliance.	
SS Heat Island Reduction	1 Maybe point
The Project will explore options to replace the existing roofing with a new assembly that will improve and meet the minimum solar reflectance index requirements for a low sloped roof defined by LEED v4. In addition, the design calls for a new roof deck and landscaped vegetation which will also assist in mitigating the heat island effect.	
SS Light Pollution Reduction	1 Yes point
The Project lighting design will improve nighttime visibility and reduce the consequences of development on wildlife by meeting the uplight and light trespass requirements demonstrated through calculations or the BUG (backlight-uplight-glare) method. Additionally, the façade lighting will have automated shut off between midnight and 6.00 am.	
SS Tenant Design and Construction Guidelines	1 Yes point
ARE will develop Tenant Guidelines that include a description of the Project's sustainable design and construction features, and information on LEED for Commercial Interiors. Collectively this information will enable the Tenant(s) to coordinate the design and construction of their space(s) with the core and shell design in a manner that optimizes environmental performance and/or achieves a Commercial Interiors LEED Certification.	

D. Water Efficiency (Eligible for 8 of 11 Possible Points)

WE Outdoor Water Use Reduction	Required
The Project's landscape design will implement strategies to reduce potable water for irrigation. Careful selection of native/adaptive and drought tolerant plant species combined with efficient irrigation technology will yield a 50% water savings over the LEED baseline.	
WE Indoor Water Use Reduction	Required
The Project's plumbing fixture selection will reduce water consumption by at least 30% when compared to a conventional design. The specified plumbing fixtures will be WaterSense Labeled where applicable, and low flush/flow fixtures. Specified fixtures will include 1.28/0.9 dual water closets, 0.125 gpf urinals, 1.75 gpm showers, and 0.5 gpm lavatories.	
WE Building Level Water Metering	Required
The Project's total potable water consumption will be tracked and monitored by one water meter. Readings from the meter will produce monthly and annual summaries, which will allow building operations staff to evaluate actual water consumption against the anticipated design water consumption, and to identify unexpected peaks in usage.	
In addition to the whole building water metering, sub-metering will track water used for irrigation and boiler operation. This metering will, achieve goals similar to the whole building metering, but allow system operation evaluation on a more granular level.	
WE Outdoor Water Use Reduction	1 Yes Point
The landscape will have a permanent irrigation system and target 50% reduction of water use. Landscape plantings will be selected to be climate appropriate.	

APPENDIX A / SPECIAL PERMIT #243

161 FIRST STREET

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WE Indoor Water Use Reduction	3 Yes Points; 3 Maybe Points
<p>The Project’s plumbing fixture selection will reduce water consumption by at least 30% when compared to a conventional design. The specified plumbing fixtures will be WaterSense Labeled where applicable, and low flush/flow fixtures. Specified fixtures will include 1.28/0.9 dual water closets, 0.125 gpf urinals, 1.75 gpm showers, and 0.5 gpm lavatories.</p>	
WE Water Metering	1 Yes Point
<p>The Project’s total potable water consumption will be tracked and monitored by one water meter. Readings from the meter will produce monthly and annual summaries, which will allow building operations staff to evaluate actual water consumption against the anticipated design water consumption, and to identify unexpected peaks in usage.</p> <p>In addition to the whole building water metering, submetering will track water used for irrigation and boiler operation. This metering will, achieve goals similar to the whole building metering, but allow system operation evaluation on a more granular level.</p>	

E. Energy and Atmosphere (Eligible for 17 of 33 Possible Points)

EA Fundamental Commissioning and Verification	Required
<p>The Project will be commissioned in accordance with the Fundamental, Enhanced Commissioning & Monitoring Based Commissioning, and Envelope Commissioning requirements to ensure the heating, cooling, ventilation systems and associated controls, lighting systems, domestic hot water systems, and building’s thermal envelope function correctly. The Commissioning Agent will review the Project documents, develop the applicable Specification Sections and Commissioning Plan, review ARE’s Project Requirements and Basis of Design, review contractor submittals, develop a Systems Manual, train the building operations staff, and develop an ongoing commissioning plan. Findings will be documented in a commissioning report.</p> <p>This additional layer of commissioning will allow ongoing monitoring of system performance and real time identification of operational issues. The commissioning agent will work with the Project team to establish measurement requirements appropriate to the Project, determine acceptable levels of performance, create an action plan to correct operational errors and deficiencies in real time, train operations personnel for ongoing activities, and establish a plan for the frequency of ongoing analysis. The commissioning agent will be engaged before the end of Design Development.</p>	
EA Minimum Energy Performance	Required
<p>The Project uses the Massachusetts Energy Stretch code as the energy code of reference at a minimum, and ASHRAE Standard 90.1-2010 for LEED purposes. Preliminary energy modeling has been performed based on the conceptual building systems.</p> <p>The Project design will comply with mandatory provisions of ANSI/ASHRAE/IESNA Standard 90.1–2010, with errata. Other energy conservation measures (ECMs) will be utilized to increase the energy savings, which include but are not limited to the following: new windows with low u-value and low-E glazing, a low lighting power density (LPD) using all LED lights in the core and shell areas with dimming controls and occupancy sensors, high-efficiency gas-fired condensing boilers, variable volume hot water pumping, high-efficiency VRF fan coil units for space heating and cooling, and reduced-flow hot water fixtures (lavatory and shower) to reduce hot water demand. These ECMs will result in at least 3% energy cost reduction compared to ASHRAE 90.1-2010 baseline, which will meet the prerequisite requirements.</p>	

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EA Building Level Energy Metering	Required
<p>Energy meters will be provided per tenant to measure both electrical and natural gas demands.</p> <p>The Project team will commit to sharing resulting energy consumption and electrical demand data with the USGBC beginning on the date the project accepts LEED certification for a period of five years or until ownership changes.</p>	
EA Fundamental Refrigerant Management	Required
<p>The Project meets this prerequisite by not utilizing CDC-based refrigerants.</p>	
EA Enhanced Commissioning	6 Yes Points
<p>The Project will achieve enhanced commissioning credits when fundamental commissioning and verification process is achieved. A commissioning agent must assist with the documentation process, and have experience with at-least two building projects with a similar scope of work. The commissioning agent must be a qualified employee of ARE, an independent consultant, or disinterested subcontractor of the design team.</p> <p>The Project plans to achieve 6 points under the Optimize Energy Performance credit. The Energy modeling team will perform the energy analysis in accordance with the ASHRAE 90.1-2007, Appendix G, protocols using eQuest v3.64 software. The project will pursue both options listed below to achieve a total of (6) points:</p> <p style="padding-left: 40px;">Option 1: Enhanced Systems Commissioning (4) Points</p> <p style="padding-left: 80px;">Path 1: Enhanced Commissioning (3 points): completion of mechanical, electrical, plumbing, and renewable energy systems and assemblies in accordance with ASHRAE Guidelines 0-2005 and ASHRAE Guideline 1.1-2007 for HVAC&R systems, as they relate to energy, water, indoor environmental quality, and durability.</p> <p style="padding-left: 80px;">Path 2: Enhanced and Monitoring-Based Commissioning (4 points): development of a monitoring-based procedure that identifies points to be measured and evaluated to assess performance of energy and water consuming systems.</p> <p style="padding-left: 40px;">Option 2: Envelope Commissioning (2) Points</p> <p style="padding-left: 80px;">Fulfill the requirements of Fundamental Commissioning and Verification as they apply to the buildings thermal envelop in addition to mechanical and electrical systems and assemblies.</p>	
EA Optimize Energy Performance	7 Yes Points; 2 Maybe Points
<p>ECMs mentioned in the Minimum Energy Performance Prerequisite above will result in at least 8% reduction in energy cost savings compared to ASHRAE 90.1-2010 (LEED Baseline) which gives the Project 7 points.</p>	

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EA Green Power and Carbon Offsets	2 Yes Points
<p>The Project is eligible to investigate the cost of purchasing renewable energy credits in the amount of at least 50% of the electricity used in the building, based on the results of the energy model, and may purchase 100% to achieve an innovation point for Exemplary Performance.</p> <p>Upon completion of the energy model, the design team will share the energy usage of the Project with ARE as the reference for the Green Power Purchase to achieve these two points.</p>	

F. Materials and Resources (Eligible for 6 of 14 Possible Points)

MR Storage and Collection of Recyclables	Required
<p>The Project program will include a dedicated recyclable storage area easily accessible to local recycling handlers for the collection of paper, corrugated cardboard, glass, plastics and metals.</p>	
MR Construction and Demolition Waste Management	Required
<p>The Construction Manager will implement a waste management plan that will seek to divert at least 75% of construction and demolition waste material removed from the site from landfills through recycling and salvaging. This prerequisite is expected to be achieved, and may be pursued aggressively with the demolition materials in an effort to gain an exemplary performance credit of at least 95% construction waste recycling.</p>	
MR Building Product Disclosure and Optimization – Environmental Product Declarations	2 Yes Points
<p>The Project will achieve building product disclosure and optimization credits by providing the following:</p> <p>Option 1: Environmental Product Declaration: use at least 20 different permanently installed products sourced from at least five different manufacturers that meet one of the disclosure criteria below:</p> <ul style="list-style-type: none"> • Product specific declaration • Environmental product declarations that confirm to ISO 14025 and EN 15804 or ISO 21930 • USGBC approved program of products that comply with environmental product declaration frameworks. <p>Option 2: Multi-Attribute Optimization: Use products that comply with one of the criteria below for 50%, by cost, of the total value of permanently installed products in the project.</p> <ul style="list-style-type: none"> • Third party certified products that demonstrate impact reduction below industry average • USGBC approved program – products that comply with other USGBC approved multi-attribute frameworks 	

APPENDIX A / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

MR Building Product Disclosure and Optimization – Sourcing Raw Materials	2 Yes Points
<p>The Project will achieve building product disclosure and optimization credits for sourcing raw materials by providing the following:</p> <p>Option 1: Raw Material Source and Extraction Reporting: Use at least 20 different permanently installed products from at least five different manufacturers that have publicly released a report from their raw material suppliers which include raw material supplier extraction locations, a commitment to long-term ecologically responsible land use, a commitment to reducing environmental harms from extraction and/or manufacturing processes, and a commitment to meeting applicable standards or programs voluntarily that address responsible sourcing criteria:</p> <ul style="list-style-type: none">• Global Reporting Initiative (GRI) Sustainability Report• Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises• U.N. Global Compact: Communication of Progress• ISO 26000: 2010 Guidance on Social Responsibility• USGBC approved program: Other USGBC approved programs meeting the CSR criteria. <p>Option 2: Leadership Extraction Practices: Use products that meet at least one of the responsible extraction criteria below for at least 25%, by cost, of the total value of permanently installed building products in the project.</p> <ul style="list-style-type: none">• Extended producer responsibility• Bio-based materials• Wood products• Materials reuse• Recycled content• USGBC approved program	
MR Building Product Disclosure and Optimization – Material Ingredients	2 Yes Points
<p>The Project will achieve building product disclosure and optimization credits for material ingredients by providing the following:</p> <p>Option 1: Material Ingredient Reporting: Use at least 20 different permanently installed products from at least five different manufacturers that use any of the following programs to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm).</p> <ul style="list-style-type: none">• Manufacturer Inventory• Health Product Declaration• Cradle to Cradle• Declare• ANSI/BIFMA e3 Furniture Sustainability Scorecard• Advanced Level in e3-2014• Cradle to Cradle Material Health Certificate• ProductLens Certification• Facts – NSF/ANSI 336• USGBC approved program	

<p>Option 2: Material Ingredient Optimization: Use products that document their material ingredient optimization using the paths below for at least 25%, by cost, of the total value of permanently installed products in the project.</p> <ul style="list-style-type: none"> • GreenScreen v1.2 Benchmark • Cradle to Cradle Certified • International Alternative Compliance Path <p>Option 3: Product Manufacturer Supply Chain Optimization: Use building products for at least 25%, by cost, of total value of permanently installed products in the project:</p> <ul style="list-style-type: none"> • Sourced from product manufacturers who engage in validated and robust safety, health, hazard, and risk programs which at a minimum document at least 99% of the ingredients used to make the building product or material • Are sourced from product manufacturers with independent third party verification

G. Indoor Environmental Air Quality (Eligible for 8 of 10 Possible Points)

EQ Minimum Indoor Air Quality Performance	Required
<p>ASHRAE 62.1-2010 is the ventilation code of reference, as required by the current Massachusetts Building Code. Two (2) rooftop 100% outside air ventilation units will serve the building ventilation, with one unit dedicated to each side of the building. The rooftop air-handling units will be designed to provide ventilation air to Building common and Tenant spaces. The project will meet the minimum requirements of ASHRAE 62.01-2010, Minimum Ventilation Rate Procedure by using these air handling units.</p> <p>A direct outdoor airflow measurement station will be provided in each of the rooftop air handling units, which will be capable of measuring the minimum outdoor air intake flow with an accuracy of +/-10% of the design minimum outdoor airflow rate, as defined by the ventilation requirements of ASHRAE 62.1-2010. An alarm will indicate when the outdoor airflow value varies by 15% or more from the outdoor airflow setpoint.</p>	
EQ Environmental Tobacco Smoke Control	Required
<p>Smoking will be prohibited within the building, on all terraces, and within 25 feet of entry doors, operable windows, and air intakes. The no-smoking policy will be conveyed via signage installed within 10 feet of all building entries except emergency exits equipped with alarms.</p>	
EQ Enhanced Indoor Air Quality Strategies	2 Yes Points
<p>The Project is expected to achieve both 2 points of this credit by meeting criteria that fulfills both Option 1 and 2:</p> <p>Option 1, Enhanced IAQ Strategies for 1 point.</p> <p>The project will incorporate the following strategies under the “Mechanically Ventilated Spaces” Requirements to achieve 1 point for this option:</p> <ul style="list-style-type: none"> • Entryway System: permanent entryway systems at least 10 feet in length in 	

<p>the primary direction of travel, which is capable of collecting dirt and particulates entering the building will be installed at all regularly used entrances to the exterior. These entryway systems will be maintained on a weekly basis at a minimum.</p> <ul style="list-style-type: none"> • Interior Cross-Contamination Prevention: All toxic rooms, such as Janitor closets, will be negatively pressurized from adjacent spaces at a rate of at least 0.5 CFM/SF to prevent cross contamination. • Filtration: The air handling units will contain MERV 13 filters in accordance with ASHRAE 52.2-2007. <p>Option 2, Additional Enhanced IAQ Strategies for additional point. The Project will use a signed lease agreement for CO2 sensors in densely occupied spaces as defined by LEED to achieve 2 points for this credit.</p>	
EQ Low Emitting Materials	1 Yes Point
<p>Wood and solid flooring materials, carpet and carpet pads, adhesives, and grouts will be specified with low-VOC content limits as prescribed by the respective applicable standards.</p>	
EQ Construction Indoor Air Quality Management Plan	1 Yes Point
<p>An Indoor Air Quality Management plan will be implemented during the construction phase in accordance with the SMACNA Indoor Air Quality for Buildings under Construction Guideline. This document will define the procedures for maintaining good indoor air quality inside the building during construction and address construction practices to allow the best possible indoor environment after occupancy. These practices include cleaning during construction, interrupting paths of odor and dust travel within the building, segregating odor and dust producing activities from absorbent materials, and scheduling similar odor or dust producing activities to occur at the same time.</p>	
EQ Daylight	3 Yes Point
<p>The existing building currently offers significant daylight through large windows that account for approximately 40% of the total area of the building envelope. It is anticipated that further analysis will determine the spatial daylight autonomy and annual sunlight exposure will meet the requirements to achieve this credit per the following:</p> <p>Option 1: Simulation (credits 2-3): Spatial Daylight Autonomy and Annual Sunlight Exposure: in order to achieve this credit, computer simulations that convey spatial daylight autonomy of at least 55%, 75%, or 90% can be achieved. The computer simulation must also provide the annual sunlight exposure of no more than 10% achieved. Since finishes in the interior space will not be completed as part of the Project, the use of default surface reflectance shall be 80% for ceilings, 20% for floors, and 50% for walls.</p> <p>Option 2: Simulation (credits 1-2): Illuminance Calculations: in order to achieve these points, computer modeling that displays illuminance levels between 300 lux and 3,000 lux for 9 a.m. and 3.p.m. both on a clear sky day at the equinox, for the floor area must be achieved.</p> <p>Option 3: Measurement (credits 2-3): the project must achieve illuminance levels between 300 lux and 3,000 lux for the floor area.</p>	

APPENDIX A / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

EQ Quality Views	1 Yes point
<p>The Project provides quality views due to the existing window openings that will be maintained throughout. In order to achieve this credit, sight to the outdoors via vision glazing for 75% of all regularly occupied floor area must be achieved. View glazing in the contributing area must provide a clear image of the exterior, not obstructed by frits, fibers, patterned glazing, or added tints that distort color balance. The design and layout of the building interior will be planned to preserve the required views.</p> <p>Additionally, 75% of all regularly occupied floor area must have at least four kinds of views:</p> <ul style="list-style-type: none"> • Multiple lines of sight to vision glazing in difference directions at least 90 degrees apart • Views that include at least two of the following: (1) flora, fauna, or sky; (2) movement and (3) objects at least 25 feet from the exterior of the glazing • Unobstructed views within the distance of three times the head height of the vision glazing • Views with a view factor of 3 or greater, as desired in “Windows and Offices; A Study of Office Worker Performance and the Indoor Environment” <p>Calculations of interior permanent interior obstructions will be included, and moveable furniture and partitions may be excluded.</p>	

H. Innovation (Eligible for 5 of 5 Possible Points)

ID Green Cleaning Product Purchasing	1 Yes point
<p>The Project plans to achieve this credit by closely following EBOMv4 Eqp3 Green Cleaning Product Purchasing.</p>	
ID Sustainable Purchasing Policy	1 Yes point
<p>The Project plans to achieve this credit by developing an Environmentally Preferable Purchasing (EPP) policy that includes, at a minimum, product purchasing policies for the building and site addressing the requirements of MR Credit 1: Sustainable Purchasing—Ongoing Consumables. Per the requirements of LEED-EB the policy must apply to the entire building. Copies of legal binding sales and lease agreements requiring all tenants to comply with the EPP policy will be required for documentation.</p>	
ID Solid Waste Management Policy	1 Yes point
<p>The Project plans to achieve this credit by implementing a solid waste management policy for the building and site addressing the requirements of the waste management credits listed below as well as recycling of all mercury-containing lamps. This policy must adhere to the LEED 2009 for Existing Buildings: Operations & Maintenance policy model (see Introduction). At a minimum, the policy must cover the waste streams that are within the building and site management’s control.</p>	
ID Exemplary Performance / Pilot Credit	1 Maybe point
<p>The Project team plans to pursue options to develop the criteria to meet Exemplary Performance or Pilot credit.</p>	

APPENDIX A / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

ID LEED Accredited Professional	1 Yes point
The Project plans to achieve this credit by utilizing a LEED accredited professional: Arlen Stawasz	

I. Regional Priority(Eligible for 1 of 4 Possible Points)

RP Indoor Water Use Reduction	1 Maybe point
The Project plans to achieve this credit by further reducing fixture and fitting water use from the calculated baseline in WE Prerequisite Indoor Water Use Reduction. The design team will review the feasibility of pursuing this credit.	

VI. PROJECT SPECIFIC LEED CHECKLIST

LEED v4 for BD+C: Core and Shell Project Checklist

Project Name: 161 First Street
Date: 6/25/2019

Y	?	N	Credit	Integrative Process	1
1				Integrative Process	1
11 2 7 Location and Transportation 20					
			Credit	LEED for Neighborhood Development Location	20
			Credit	Sensitive Land Protection	2
			Credit	High Priority Site	3
			Credit	Surrounding Density and Diverse Uses	6
			Credit	Access to Quality Transit	6
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
			Credit	Green Vehicles	1
4 1 6 Sustainable Sites 11					
			Prereq	Construction Activity Pollution Prevention	Required
			Credit	Site Assessment	1
			Credit	Site Development - Protect or Restore Habitat	2
			Credit	Open Space	1
			Credit	Rainwater Management	3
			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1
			Credit	Tenant Design and Construction Guidelines	1
5 3 3 Water Efficiency 11					
			Prereq	Outdoor Water Use Reduction	Required
			Prereq	Indoor Water Use Reduction	Required
			Prereq	Building-Level Water Metering	Required
			Credit	Outdoor Water Use Reduction	2
			Credit	Indoor Water Use Reduction	6
			Credit	Cooling Tower Water Use	2
			Credit	Water Metering	1
15 2 16 Energy and Atmosphere 33					
			Prereq	Fundamental Commissioning and Verification	Required
			Prereq	Minimum Energy Performance	Required
			Prereq	Building-Level Energy Metering	Required
			Prereq	Fundamental Refrigerant Management	Required
			Credit	Enhanced Commissioning	6
			Credit	Optimize Energy Performance	18
			Credit	Advanced Energy Metering	1
			Credit	Demand Response	2
			Credit	Renewable Energy Production	3
			Credit	Enhanced Refrigerant Management	1
			Credit	Green Power and Carbon Offsets	2
6 0 8 Materials and Resources 14					
			Prereq	Storage and Collection of Recyclables	Required
			Prereq	Construction and Demolition Waste Management Planning	Required
			Credit	Building Life-Cycle Impact Reduction	6
			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
			Credit	Building Product Disclosure and Optimization - Material Ingredients	2
			Credit	Construction and Demolition Waste Management	2
8 0 2 Indoor Environmental Quality 10					
			Prereq	Minimum Indoor Air Quality Performance	Required
			Prereq	Environmental Tobacco Smoke Control	Required
			Credit	Enhanced Indoor Air Quality Strategies	2
			Credit	Low-Emitting Materials	3
			Credit	Construction Indoor Air Quality Management Plan	1
			Credit	Daylight	3
			Credit	Quality Views	1
4 1 1 Innovation 6					
			Credit	Innovation	5
			Credit	LEED Accredited Professional	1
0 1 3 Regional Priority 4					
			Credit	Regional Priority: Specific Credit	Renewable Energy Production
			Credit	Regional Priority: Specific Credit	Optimize Energy Performance
			Credit	Regional Priority: Specific Credit	Rainwater Management
			Credit	Regional Priority: Specific Credit	Indoor Water Use Reduction
54 10 46 TOTALS Possible Points: 110					
Certified: 40 to 49 points, Silver: 50 to 59 points, Gold: 60 to 79 points, Platinum: 80 to 110					

I. ENERGY MODEL INPUTS

List of Assumptions for Energy Model Inputs		
Model Input Parameter	Baseline Model (Per ASHRAE 90.1-2010)	Proposed Design Model
Space Use Type	Commercial	Commercial
Building Area	40,000 SF	40,000 SF
Conditioned Area in eQUEST	Per Design Drawing	Per Design Drawing
Operating Schedule	8/5/260	8/5/260
Temperature Setpoints °F	Cooling-Occupied Space : 75°F (8am-5pm) , 80°F (rest of the hours) Cooling- Unoccupied Service Spaces (Mech, Electrical, Stairs): 80°F	Cooling-Occupied Space : 75°F (8am-5pm) , 80°F (rest of the hours) Cooling- Unoccupied Service Spaces (Mech, Electrical, Stairs): 80°F
	Heating-Occupied Space : 72°F (8am-5pm) , 68°F (rest of the hours) Heating- Unoccupied Spaces (Mech, Electrical, Stairs): 60°F	Heating-Occupied Space : 72°F (8am-5pm) , 68°F (rest of the hours) Heating- Unoccupied Spaces (Mech, Electrical, Stairs): 60°F
Weather Data File	Boston-Logan Intl AP 725090 (TMY3)	Boston-Logan Intl AP 725090 (TMY3)
HDD65	5641	5641
CDD50	2897	2897
Building Envelope	Baseline Model	Proposed Design Model
Walls	Existing Brick wall condition: 3 Wythe Masonry Construction	Above Grade: Existing Exterior Wall: Brick + 1-1/2" Air Space + 3" Rigid Insulation (assume 30% coverage of interior wall face) + Air/Vapor Barrier + 5/8" GWB Below Grade: Existing concrete foundation wall with 3" Rigid Insulation + Air/Vapor Barrier + 5/8" GWB
Floors	U-0.038 (Steel-Joint)	Existing Wood Deck Flooring with substrate and finish flooring - TBD
Slab-On-Grade Floors	F-0.073 (Insulation not required Unheated Slab)	Existing Concrete Slab on Grade (assume no insulation) with finish flooring - TBD
Roof	U-0.048 (R-20 c.i. Insulated Entirely above Deck)	Typical Roof: Existing Roof + Air film + Roof Membrane + Protection Board + 4" Tapered Insulation (R-49)
Window-to-Wall Ratio	Existing	Approximately 35-40% glazing
Window type and U-factor	Metal (U factor: 0.55) Metal Curtain Wall/Storefront (U factor: 0.45)	U factor = 0.30
Window SHGC	0.4	0.27
Shading Devices	None	None
Doors	U-0.5	Assume U-0.5
Lighting & Equipment (per ENERGY STAR MFHR Modeling Guideline)	Baseline Model	Proposed Design Model
Office lighting power density (LPD)- Using Building Area Method	0.90 W/SF	Per Design Drawing
Exterior lights	Lighting Allowance per ASHRAE 90.1-2010 Table 9.4.3A & B	Per Design Drawing
Lighting Controls	Time of day schedule with occupancy sensors in required spaces.	Occupancy Sensors for all areas to be electronically connected to BMS system (central control)

APPENDIX B / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

Daylight Dimming Controls	In perimeter zones where required by ASHRAE 90.1-2010 sections 9.4.1.4 and 9.4.1.5	Occupancy sensors in all spaces. Perimeter lighting fixtures (within 12 ft from windows) will be controlled (dimmed) via local photocell sensors.
HVAC - Air-side	Baseline Model	Proposed Design Model
Primary HVAC Air System	Nonresidential and 5 Floors or less and 25,000 sqf to 150,000 sqf - Packaged VAV with Reheat (ASHRAE Baseline System 5) Support spaces - Packaged Roof Top Air Conditioning (ASHRAE Baseline System 3)	1. Conditioned common spaces - DOAS with DX Cooling Coil for demand control ventilation & VRF fan coil units for space heating/cooling Heating common spaces - Baseboard and/or cabinet unit heaters
Supply Air Flow (Cooling)	Auto sized by eQUEST, 15% oversized	Per Design Drawing
Outdoor Air (Ventilation)	Per ASHRAE 62.1-2010 minimum ventilation requirements	20% increase over baseline
Fan Power	Per ASHRAE 90.1-2010 Table G3.1.3.7	0.0003 kW/CFM
Cooling Capacity	Auto sized by eQUEST, 15% oversized	Per Design Drawing
Heating Plant Capacity	Auto sized by eQUEST, 25% oversized	(2) 400,000 BTU/h boilers (redundant boilers) for perimeter heating & VRF fan coil units for additional space heating (per design drawings)
Unitary Efficiency	Packaged Roof Top Air Conditioning per ASHRAE 90.1-2010 Table 6.8.1A	Rooftop condensing units SEER -20 Heating AFUE - 98%
Fan System Operation	Fans are operated based on occupancy schedule and cycle on to meet unoccupied loads.	Variable Speed
ERV	None Per ASHRAE 90.1-2010 section 6.56 (OA less than 30%)	100% OA Ventilation Unit with Energy Recovery Wheel
Zones System Type	VAV box with 30% min turndown	VRF for space heating/cooling
Zone System Fan Power	N/A	Per Design
Zone System Heating Efficiency	N/A	Per Design
Zone System Cooling Efficiency	N/A	Per Design
HVAC - Water-side	Baseline Model	Proposed Design Model
Number of Boilers	2	2 centralized gas fired condensing hot water boiler
Boiler Capacity (Each)	2 equally sized boilers	400,000 BTU/h Boilers (800,000 BTU/h total)
Boiler Efficiency	82%	Thermal efficiency-98%
Boiler Water Loop Supply Temperature	180F	Per Design Drawing
Hot Water Loop Delta T	50F	Per Design Drawing
HW Loop Reset Parameters	180F @ 20F OA and below , 150F @ 50F OA and above	Per Design Drawing
Number of HW Pumps	1	Per Design Drawing
HW Loop Pump Power	19 W/GPM	Per Design Drawing
Domestic Hot Water System	Baseline Model	Proposed Design Model
DHW Equipment Type	Same as Design	Condensing Gas Fired Water Heater
Equipment efficiency	80%	Common Boiler: Thermal Efficiency -95%
Process Flow (GPM)	Calculate based on EPA baseline flow rates	Calculate based on design drawing
Capacity (BTU/hr)		399,000 BTU/h

APPENDIX B / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

Design HW Temp (°F)	140	130
Storage Capacity (Gallons)	Same as design	120
Miscellaneous (referencing ENERGY STAR MFHR Modeling Guideline)	Baseline Model	Proposed Design Model
Office	Same as design	Per Design
Corridor, Restroom & Stairs	Same as design	Per Design
Elevator	Same as design	Per Design
Other Public and Common Area	Same as design	Per Design
Utility Cost (referencing EIA price data)	Baseline Model	Proposed Design Model
Electricity (\$/KWH)	Same as design	Architect input
Gas (\$/THERM)	Same as design	Architect input

PATHWAY TO NET ZERO

Introduction

The City of Cambridge continues to lead the way to an efficient and low carbon future by setting aggressive goals and guidelines. Understanding that close to 80% of its greenhouse gas emissions result from building operations, in June 2015, Cambridge unanimously adopted the Net Zero 25-year Action Plan. The plan clearly outlines proposed policy goals for new construction by sector type; by 2022, Cambridge, in cooperation with the local industry and stakeholders, will have developed new zoning requirements for residential new construction sector.

161 First Street development will not be a net zero building; however, significant thought and planning has been dedicated by the development team to align the project with the City’s goals. As outlined below, cost effective and practical steps will be taken to make the building efficient and ready for on- site solar photovoltaic generation. To aid the City in its path to net zero emissions in commercial new construction, technically viable options are presented below. While, these may not be financially feasible at this moment, they do outline a path for future policies to carbon neutral commercial construction.

Pathway to Net Zero Emissions:

Building Size Above Grade: Approx. 30,000 GSF
 Below Grade: Approx. 10,000 GSF

Building Height 3 levels + 1 garden level (below grade)

Net Zero Emissions Pathway

The pathway to net zero emissions for 161 First Street development is to improve envelope performance, replace gas-fired equipment with high efficiency electric alternatives, maximize the electricity generated on site, and then purchase green energy or carbon offsets to offset the emissions from the remaining electric load.

Envelope:

Planned: The existing structure will be retrofitted with additional insulation including:

Approximately 30% of the existing masonry exterior walls will be supplemented with 3” rigid insulation on the interior. The existing windows will be replaced with new high performance aluminum clad wood windows with a U- value < 0.27. A new roof system including continuous insulation with a minimum R value of 49, will replace the existing roofing assembly. All improvements will be in accordance with the 2015 EDITION OF THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC) AS AMENDED BY 780 CMR 13.00.

Pathway to Net Zero: While it is rarely practical to increase the performance of a building’s envelope post construction, it is important to note that the planned improvements to the existing building envelope are scheduled to be high performance. Wall and roof insulation significantly reduces the structure’s heating and cooling loads as compared to base code requirements and therefore energy consumption. Additional measures may include increased exterior insulation, increased cavity insulation, triple pane glazing, and increased full slab insulation.

HVAC System

As Designed: Each tenant shall be individually cooled and heated using a variable refrigerant flow (VRF) fan coil unit within the space and air-cooled condensing unit (ACCU) located on the roof. The ACCU will be a high efficiency condenser unit mounted on the roof.

Ventilation to each tenant space, as well as common spaces, will be provided by a 100% outside air AHU with VRF heat pump coil, enthalpy wheel for energy recovery, and gas heating.

Perimeter hot water finned tube heating will be provided via a 98% efficient condensing boiler.

Pathway to Net Zero Alternative:

Options such as ground source heat pumps (GSHP) for the centralized systems may be considered though it is likely impractical to use GSHP for this building. There is limited space for GSHP wells and a retrofit will be difficult due to site constraints. Wells can be located below the first floor; however, since the ground floor is below grade drilling would have to occur during construction.

Insulating the brick wall and replacing the glazing with the windows with triple glazed window would remove the need of perimeter heat with hot water finned tube.

DOAS system with dual wheel instead of one wheel and second wheel as desiccant wheel.

Replace DHW System

As Designed: Centralized water heater circulates hot water to the bathrooms and showers at the basement level. Unit is a tank type gas fired unit.

Pathway to Net Zero Alternative #1: Using Air source heat pump in lieu of a gas fired domestic water heater. Requires a 300 gallon tank to act as a buffer during the higher use shower periods. Extra insulation is required around the tank to minimize heat loss.

Pathway to Net Zero Alternative #2: Using electric point to use equipment will drive up the incoming service size due to the larger amperage draw of heating water. Each fixture would be served by its own point of use heater.

Lighting

As Designed: All common spaces, and all outdoor lighting will be high efficacy LED fixtures. All common areas will be operated using occupancy sensors, and outdoor lighting shall be photocell operated. The lease agreement between landlord and tenant shall include a limitation on lighting power density and requirement to use only high-efficiency LED fixtures in the tenant fitout space.

Pathway to Net Zero Alternative: Install daylight harvesting and adaptive lighting controls in all common spaces. Educate occupants on lighting controls.

On-Site Renewables

We are not pursuing this at this time. It is unlikely we would have enough area on the roof to take advantage of the solar PV systems.

Pathway to Net Zero Alternative: Install a canopy photovoltaic (PV) system above the entire span of the roof.

Off-Site Renewables/RECs

Purchase green power (RECs) or carbon offsets to cover remainder of building common meter load emissions not covered by on-site solar PV array; engage tenants in a group purchase of green power or carbon offsets to cover tenant meter load emissions. In cases where it may not be practical to abandon gas-fired equipment, purchase RECs to offset the equivalent electrical source energy. This will make the project class D Net Zero Energy building.

ACOUSTIC COMPLIANCE



May 2, 2019 (updated from May 1, 2019)

Michael J. Boone
Perkins + Will
225 Franklin Street
Suite 1100
Boston, MA 02110

Subject **Environmental Sound Analysis**
161 First Street Redevelopment – Alexandria Real Estate
Cambridge, MA
Acentech Project No. 631947

Dear Mr. Boone:

This letter presents our review and recommendations on the proposed rooftop mechanical equipment for the 161 First Street redevelopment in Cambridge, MA. This project site needs to comply with the City of Cambridge noise regulation as well as the Massachusetts state regulation.

APPLICABLE NOISE REGULATION

Massachusetts

The Massachusetts Department of Environmental Protection (MassDEP) noise policy defines noise pollution by the condition resulting when:

- The equipment increases broadband sound level by more than 10 dBA above ambient, or
- The equipment with tonal sound - when any octave band center frequency sound pressure level exceeds the two adjacent bands by 3 dB or more

The ambient sound level is defined “as the background A-weighted sound level that is exceeded 90% of the time measured during equipment operating hours”.

For this project, our experience in this area tells us that the existing background sound levels are high enough in this area that meeting the City of Cambridge Noise Regulation would be the more stringent criteria.

City of Cambridge

The City of Cambridge Noise Regulation has fixed sound emissions level limits for daytime and nighttime hours. There are different limits based on the zoning district. Based on the latest version of the City of Cambridge Zoning Map, the equipment of our project should meet the Residential Zoning Districts at the closest receiver (R1 shown in Figure 1) with sound pressure levels as shown. Table 1 on the following page shows the sound limits established for Residential and Business/Commercial Zones. Daytime is defined by the City as the period between 7AM and 6PM except Sunday and holidays.

Octave Band Center Frequency of Measurement (Hz)	Residential Area (Daytime) dB	Residential Area (Nighttime) dB	Commercial/Business (All Times) dB
31.5	76	68	79
63	75	67	78
125	69	61	73
250	62	52	68
500	56	46	62
1000	50	40	56
2000	45	33	51
4000	40	28	47
8000	38	26	44
Single Number Equivalent	60 dBA	50 dBA	65 dBA

Table 1. City of Cambridge Maximum Allowable Octave Band Pressure Levels

NEW EQUIPMENT EVALUATION

This project will have two new air handling units and three new ACCUs, all of which will be located on the roof level as shown in Exhibit A. Additionally, there are approximately eight tenant ACCU modules expected to be added by future tenants, which are included in the current evaluation. Our building is adjacent to some high rise residential buildings, thus the project should be designed to meet the Residential noise limits at the residential receiver as established by the City of Cambridge.

This study is based on a mechanical roof plan, site plan, and sound data provided to us on April 29, 2019. An exterior noise modeling software called CadnaA was used to predict sound levels to the closest receptors shown as R1 through R5. R1 is residential zone, and all other areas are commercially zoned.



Figure 1. Project Site Plan and Receiver Locations

ACOUSTIC COMPLIANCE / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

Table 2 below shows the predicted sound levels to the 5 receiver locations.

Receiver	Predicted Sound Levels (dBA)	Cambridge Nighttime Limit (dBA)
1	41	50
2	32	65
3	30	65
4	34	65
5	42	65

We have also reviewed the predicted sound at all locations and confirmed that no tone is expected at the receivers from the project equipment.

CONCLUSION

We are confident that as the design develops, the project equipment are expected to meet the City of Cambridge Noise Regulation.

* * * * *

I trust this letter provides the information that you need at this time. If you have questions, please call me on my direct line at 617.499.8080.

Sincerely,



Rose Mary Su
Principal Consultant

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ACOUSTIC COMPLIANCE / SPECIAL PERMIT #243

161 FIRST STREET

ALEXANDRIA CENTER AT KENDALL SQUARE

EXHIBIT A – ROOF PLAN

