

87-101 Blanchard Road Cambridge

May 1, 2024 | Volume 3: Other Requirements



Green Building Requirements

- Green Building Report Certification
- Green Building Report and Affidavit
- Green Building Report Project Information Matrix

Green Factor Standards

- Green Factor Standard Certification
- Green Factor Certification Form
- Cool Score Report

Flood Resilience Requirements

- Flood Resilience Compliance Confirmation
- Building Sections with Long Term Flood Elevations
- Flood Zone Memorandum
- Stormwater Management Narrative
- Site Grading and Drainage Plan

Green Building Requirements - Article 22.20, Section 22.24 of Cambridge Zoning Ordinance
Certification for Green Building Report – Affordable Housing Overlay (AHO) Submission
Project: 87 Blanchard Road

Project summary/Status: The Community Development Department (CDD) received the Green Building Report (GBR) for the AHO review stage for Walden Square II, per Section 22.25.1 of the Zoning Ordinance, on 2/1/2024. The proposed multifamily residential project includes 93,900 S.F. of new construction. CDD staff have reviewed the Report and are providing the following Determination, Summary of Compliance, and Advisory Comments on the project’s sustainability.

CDD Determination: The documentation provided by the Applicant sufficiently demonstrates compliance with the Green Building Requirements applicable to the AHO review stage. However, a revised submission with additional documentation or clarification may be required at the Building Permit and Certificate of Occupancy stage.

Summary of Compliance:

Green Building Professional Affidavit Certification

- Paul Eddowes of New Ecology, Inc has been identified as the Green Building Professional for the project. The affidavit states that this professional has reviewed all relevant documents for this project and confirm that those documents indicate that the project is designed to achieve the requirements of Section 22.24 under Article 22.20 of the Cambridge Zoning Ordinance.
- A copy of the professional’s credential from the Green Building Rating Program has been provided.

Rating System Checklist, and Net Zero Narrative

- Rating System: Phius CORE 2021
- Total energy cost/year: \$162,400
- Site EUI: 19.49 kBTU/SF-yr
- Source EUI: 35.08 kBTU/SF-yr
- GHG emissions reduction proposed: no baseline model yet
- GHG emissions total: 145 mtCO_{2e}
- Solar Ready: Yes
- Solar Capacity: 21.6 kW
- Solar Ready (Roof area): 7,451 S.F.
- Building Envelope:
 - Window-to-Wall Ratio: 30%
 - Triple-glazing used: Yes
 - Window U-value: 0.17

Advisory Comments:

Embodied carbon is important to the City’s climate action plan and net zero goals. Staff recommend that the Project team conduct an analysis in Tally of the project’s life cycle emissions. In subsequent submissions, continual use of the tool is encouraged along with information on how the results may have influenced design decisions for materials, products, and/or systems within the project.

Date: March 11, 2024

Green Building Requirements - Article 22.20, Section 22.24 of Cambridge Zoning Ordinance
Certification for Green Building Report – Affordable Housing Overlay (AHO) Submission
Project: 87 Blanchard Road

Information about selected materials' attributes and relevant environmental qualities i.e., Environmental Product Declarations (EPDs) will also be requested from the Architect in the next phases regardless of the rating system used. GHG emissions reduction needs to be reported for next phase.

The project will be subject to review prior to receiving Building Permit and Certificate of Occupancy. CDD staff look forward to receiving updates including the annual expected CO2 emissions, annual energy consumption as well as information on building materials and resources.

City of Cambridge Community Development Department
344 Broadway
Cambridge, MA 02139

January 12, 2024

Dear Cambridge Community Development Department,

The 87 Blanchard project team is excited to share the current building sustainability features for this highly efficient 100% affordable senior multifamily development. The project is targeting Passive House certification. 87 Blanchard is designed for resilience and incorporates a number of sustainable features including an air-tight boundary, continuous insulation, a roof-top solar PV system, and all electric heating, cooling, and hot water systems.

Incorporated in this submission package is the Net Zero Narrative discussing building envelope and building system performance. This includes current energy model outputs, as well as an outlined pathway to a Net Zero building on pages 7-8 of the report. The project team would also like to note that page 11 of the Net Zero Narrative includes the current WUFI model summary of building performance, and pages 12-15 are detailed outputs on building energy consumption from the same WUFI model. Also included in this submission is the Ratings System Narrative outlining the building performance requirements required by PHIUS.

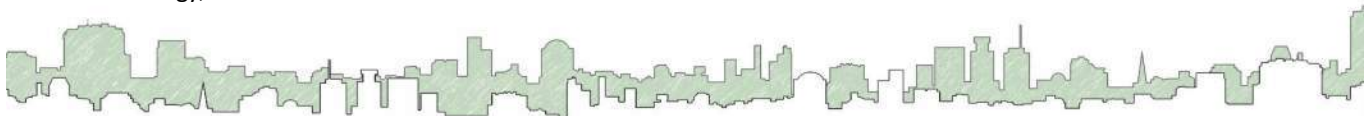
The project team expects 87 Blanchard to reach full certification as a Passive House under the PHIUS+ CORE rating system. The project team would be happy to share the WUFI energy model report with CDD as the project progresses.

As part of the PHIUS requirements, the project will also earn the EPA Indoor airPLUS certification, the ENERGY STAR Multifamily New Construction certification, and the Zero Energy Ready Homes certification. The EPA Indoor airPLUS certification program focuses on high quality indoor air and low or no emissions from building materials (low/no VOCs). The project will include MERV 13 filters to maintain indoor air quality. In addition to these certification requirements, this project will follow all Massachusetts Department of Housing and Community Development (DHCD) design requirements.

The resulting building will be an exceptionally high performance structure demonstrating a careful focus on envelope performance including low air infiltration rates, a well-insulated envelope, and high quality indoor air with continuous energy recovery ventilation.

The project team looks forward to creating an affordable, resilient, and high performance building with a focus on occupant comfort and high indoor air quality. They are excited to share informational updates on project progress with CDD.

Sincerely,
Paul Eddowes
New Ecology, Inc.



Green Building Project Checklist

Green Building

Project Location:

87-101 Blanchard Rd, Cambridge, MA 02138

Applicant

Name:

Paul Eddowes of New Ecology, Inc. on behalf of BBH Community Development LLC

Address:

294 Washington St, STE 830, Boston , MA 02108

Contact Information

Email Address:

paul.eddowes@newecology.org

Telephone #:

Project Information (select all that apply):

- New Construction - GFA: 93,900 sq.ft
- 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: _____
 - Building Design + Construction (BD+C) - Subcategory: _____
 - Residential BD+C - Subcategory: _____
 - Interior Design + Construction (ID+C) - Subcategory: _____
 - Other: _____
- Passive House - Version: PHIUS+ CORE 2021
 - 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)

87 Blanchard Rd PHIUS+ CORE Net Zero Narrative

87 Blanchard Road Passive House
87-101 Blanchard Road, Cambridge MA, 02138
January 12, 2024



Submitted To:
Community Development Department, City of Cambridge
344 Broadway, Cambridge MA, 02138

Net Zero Narrative – 87 Blanchard Rd

Project Name/Address: 87-101 Blanchard Rd, Cambridge, MA 02138

Submitted By: New Ecology, Inc.

Date of Submission: 1/12/2024



Project Profile

Development Characteristics

Lot Area (sq.ft.):	37,908 sq.ft.
Existing Land Use(s) and Gross Floor Area (sq.ft.), by Use:	Currently Blair Pond Estates with various local businesses. Footprint is currently approximately 7,747.6 sq.ft.
Proposed Land Use(s) and Gross Floor Area (sq.ft.), by Use:	93,900 sq.ft. with approximately 7,451 sq.ft. of amenity spaces on the first floor, the rest being residential units.
Proposed Building Height(s) (ft. and stories):	6 Stories
Proposed Dwelling Units:	110 units
Proposed Open Space (sq.ft.):	10,087 sq.ft. of open space
Proposed Parking Spaces:	30 spaces, 4 handicap accessible
Proposed Bicycle Parking Spaces (Long-Term and Short-Term):	34 outdoor long-term bicycle racks (68 spaces) and 16 outdoor, short-term bicycle racks (32 spaces).

Green Building Rating System

Choose the Rating System selected for this project:

Passive House Institute US (PHIUS) or Passivhaus Institut (PHI)					
Rating System & Version:	PHIUS+ CORE	Seeking Certification?*	Yes	No	TBD

**NOTE: Certification is not required through the Green Building Requirements. However, you may choose to indicate if the Project Team intends to pursue formal certification through these Green Building Rating Programs (or their affiliates).*

Net Zero Narrative – 87 Blanchard Rd

Project Name/Address: 87-101 Blanchard Rd, Cambridge, MA 02138

Submitted By: New Ecology, Inc.

Date of Submission: 1/12/2024



Proposed Project Design Characteristics

Building Envelope

Assembly Descriptions:

Roof:	Roof trusses with ~R-40 rigid insulation.
Foundation:	Slab on grade with ~R-16 rigid EXPS insulation.
Exterior Walls:	Ground level: 6" metal wall filled w/ spray mineral fiber insulation + 3" of continuous exterior mineral wool w/ a thermally broken rainscreen system. Upper 5 levels: 2x6" wood stud wall filled w/ spray mineral fiber and 2" of continuous exterior mineral wool w/ a thermally broken rainscreen system.
Windows:	Phius approved window assemblies, thermally broken storefront system.
Window-to-Wall Ratio:	~30%
Other Components:	N/A

Envelope Performance:

Provide estimates of the thermal transmittance (U-value) for the building envelope compared to "Baseline" standards required by the Massachusetts Stretch Energy Code, latest adopted edition.

	Proposed		Baseline
	Area (sf)	U-value	U-value
Window	11,733.6	0.15(fixed), 0.17(operable)	U-0.38 (fixed), U-0.46 (operable)
Wall	38,748.3	0.037	U-0.051
Roof	18,027.1	0.023	U-0.032

Envelope Commissioning Process:

The project team has planned to test and verify the envelope air barrier and air infiltration rates using bi-directional blower door testing both at construction midpoint and again after construction completion. Two (2) inspections will be performed after framing and air-sealing are complete but before insulation is installed, in order to identify any potential areas of thermal bridging and/or air infiltration. These inspections will be documented with site photos. Once installed, the air barrier will be tested with a bi-directional whole building blower door test conducted to PHIUS+ CORE standards. At the end of construction, the whole building blower door test will be repeated to confirm air-tightness, and 22 units will be blower door tested for air infiltration rates per RESNET sampling protocols. In addition, a two hour inspection using a thermal imaging camera will be conducted to show compliance with thermal bridging and air sealing protocols.

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Building Mechanical Systems

Descriptions:

Space Heating:	VRF Air-Source Heat Pumps
Space Cooling:	VRF Air-Source Heat Pumps
Heat Rejection:	N/A
Pumps & Auxiliary:	TBD
Ventilation:	2-3 central ERV units on the roof. CAR dampers included at each inlet/outlet. MERV 13 filters at the kitchen range hood.
Domestic Hot Water:	Semi-centralized heat-pump water heaters with a recirculation loop.
Interior Lighting:	LED
Exterior Lighting:	LED
Other Equipment:	TBD

Systems Commissioning Process:

The project will retain a licensed commissioning agent (CxA) who will develop a detailed commissioning plan based on the building specifications and systems. The CxA will develop a functional performance test sheet for each system to be commissioned, and will commission the following systems: Mechanical systems and equipment including Energy Recovery Ventilation (ERV) systems, common space exhaust fans, the central VRF heating and cooling system and all apartment fan coils, and all direct digital controls. For lighting systems, all common space lighting control systems including occupancy sensors will be commissioned and sampled at the appropriate rate. For plumbing systems, the domestic hot water heating system including hot water heaters, storage tanks, circulating pumps, thermostatic mixing valves, and controls will be sampled at the appropriate rate.

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Building Energy Performance Measures

Overview

Broadly describe the ways in which building energy performance has been integrated into the following aspects of the project’s planning, design, engineering, and commissioning. More detail on specific measures can be provided in appendices.

Land Uses:	The project is an affordable senior residential building. It is located within walking distance of Blair Pond and Little Pond which promotes walking and bicycling. The project is utilizing an existing development for the location instead of building on undeveloped land. The building is located near Alewife MBTA station, as well as a bicycle path connection and boardwalk over wetlands. There is another apartment building on the land as well as proximity to a synagogue to foster a sense of community.
Building Orientation and Massing:	The building is a 6-story residential building with access on Normandy Ave and from the parking lot behind it.
Envelope Systems:	High performance glazing and building envelope reduces the heating/cooling equipment sizes and low air infiltration rates improve indoor air quality and thermal comfort to the occupants. The envelope will have continuous air sealing and insulation and will be tested to meet 0.06 cfm50/sq.ft. There will be compartmentalization between apartments to ensure healthy indoor air and resident comfort.
Mechanical Systems:	High efficiency mechanical systems include energy recovery ventilation, efficient air-source heat pump technology, MERV 13 filtration, LED lighting, and low-flow plumbing fixtures.
Renewable Energy Systems:	The project will be pursuing a rooftop-solar PV system. Current analysis shows a 100kW inverter with 24 optimizers and 48 modules. Tilt: 35.3 degrees, azimuth: 168 degrees, shading: 13.2%, total annual output: 26,927.7kWh. This analysis is preliminary and the team is looking to do a full analysis once the plans have been finalized.
District-Wide Energy Systems:	N/A
Other Systems:	Bicycle Parking and Electric Vehicle Parking will help incentivize alternative forms of transportation as well as healthy senior living.

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Integrative Design Process

Describe how different parties in the development process (owners, developers, architects, engineers, contractors, commissioning agents) have collaborated in the design. Include the Basis of Design and Owner’s Project Requirements and describe how they have been informed by planning activities such as meetings or design charrettes. Describe how continuing collaborative processes will inform Schematic/Design and Construction Documents.

The development team will present to the community on potential designs, design features, and the inclusion of affordable units as part of their early stage process. As part of the integrative design process, the developer, architect, mechanical engineer, and environmental consultant have met to discuss green strategies and will continue to do so to ensure a cohesive and focused team.

Green Building Incentive Program Assistance

Describe any programs applicable to this project that would support improved energy performance or reduced greenhouse gas emissions, and which of those programs have been contacted and may be pursued. Programs may be offered by utility companies, government agencies, and other organizations, and might include rebates, grants, financing, technical assistance, and other incentives.

The project plans to offset the costs of an energy efficient building envelope and electric heating and cooling system cost by utilizing all available rebate programs. The project is enrolled in the MassSave Passive House incentive program, and expects to use the Passive House Feasibility incentives from this program to offset the costs of energy modeling to meet Passive House standards. The project team plans to fully certify the building in order to be eligible for the full incentive package offered by MassSave.

Net Zero Scenario Transition

Describe the technical framework by which the project can be transitioned to net zero greenhouse gas emissions in the future, acknowledging that such a transition might not be economically feasible at first. This description should explain the future condition and the process of transitioning from the proposed design to the future condition.

	Net Zero Condition:	Transition Process:
Building Envelope:	The building envelope will be built to PHIUS Passive House standards, making it an ideal structure to achieve Net Zero.	The building envelope will be the highest standard of envelope available – there currently is no better option. The envelope will be well insulated and have a low level of air infiltration which will be tested and verified at construction.

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<p>HVAC Systems:</p>	<p>The heating and cooling systems will be all-electric, with a highly efficient central VRF system installed at construction. In addition, central rooftop energy recovery ventilation will be used to capture energy from the ventilation system.</p>	<p>This system will have a zero (site) emissions system at installation.</p>
<p>Domestic Hot Water:</p>	<p>This project will be utilizing an all-electric semi-centralized heat pump DHW system.</p>	<p>This system will have a zero (site) emissions system at installation.</p>
<p>Lighting:</p>	<p>The project will use LED lighting throughout at construction. The building energy model for this project, completed using WUFI modeling software for use in Passive House projects, does factor in and measure Lighting Power Density as a calculation in overall building energy consumption. Fixtures have been modeled and will be specified in project documents to meet or exceed the energy requirement of the WUFI model.</p>	<p>The building and management team will include updated technology as it is available and will update systems at the end of service life of the lighting systems.</p>
<p>Renewable Energy Systems:</p>	<p>This project is pursuing a roof mounted solar PV system.</p>	<p>Current analysis shows a 100kW inverter with 24 optimizers and 48 modules. Tilt: 35.3 degrees, azimuth: 168 degrees, shading: 13.2%, total annual output: 26,927.7kWh. This analysis is preliminary and the team is looking to do a full analysis once the plans have been finalized.</p>
<p>Other Strategies:</p>	<p>N/A</p>	<p>Since the project is all-electric and maximizing rooftop solar PV; any further gains towards Net Zero would be reliant on a cleaner energy grid.</p>

Net Zero Narrative – 87 Blanchard Rd

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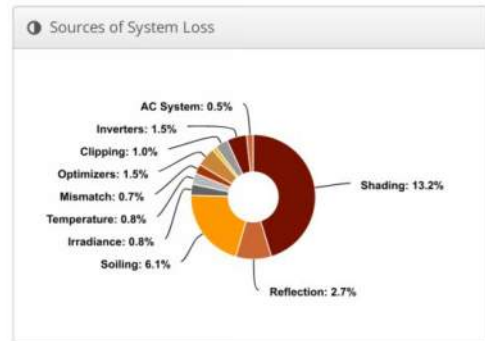
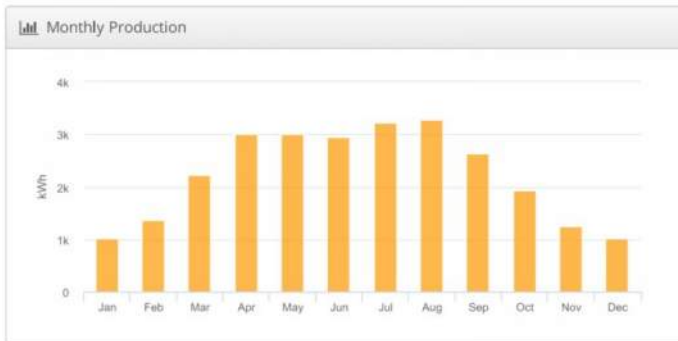
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Date of Submission: 1/12/2024



Helioscope Solar Roof Assessment

The graphs below show the Helioscope preliminary analysis for the rooftop-solar PV system. The project team will be seeking a confirmed analysis from a solar installer once the plans have been finalized.



Description	Racking	Orientation	Tilt	Azimuth	Intrarow Spacing	Frame Size	Frames	Modules	Power
Field Segment 1	Fixed Tilt	Landscape (Horizontal)	35.319584°	168°	1.6 ft	1x1	48	48	21.6 kW

	Description	Output	% Delta
Irradiance (kWh/m ²)	Annual Global Horizontal Irradiance	1,422.7	
	POA Irradiance	1,684.5	18.4%
	Shaded Irradiance	1,462.3	-13.2%
	Irradiance after Reflection	1,422.8	-2.7%
	Irradiance after Soiling	1,336.2	-6.1%
	Total Collector Irradiance	1,338.2	0.1%
Energy (kWh)	Nameplate	28,937.6	
	Output at Irradiance Levels	28,693.7	-0.8%
	Output at Cell Temperature Derate	28,452.0	-0.8%
	Output After Mismatch	28,249.0	-0.7%
	Optimizer Output	27,831.3	-1.5%
	Optimal DC Output	27,746.9	-0.3%
	Constrained DC Output	27,475.1	-1.0%
	Inverter Output	27,063.0	-1.5%
Energy to Grid	26,927.7	-0.5%	
Temperature Metrics			
	Avg. Operating Ambient Temp		12.1 °C
	Avg. Operating Cell Temp		18.8 °C
Simulation Metrics			
	Operating Hours	4692	
	Solved Hours	4692	

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Requirements for Phius+ Core Certified Buildings

PHIUS sets strict standards for building certification under its PHIUS+ CORE rating system. PHIUS+ CORE sets requirements for building metrics in five areas: heating demand, cooling demand, heating load, cooling load, and source energy consumption based on the expected number of residents. These 5 metrics, illustrated in the table below, are modeled, measured, and verified by PHIUS using WUFI modeling. After preliminary modeling, the project is at or near passing in all categories and as the design progresses, we will be sure that the design meets all requirements.

PHIUS+ CORE Criteria	Units	Target Not to Exceed	Building Performance
Heating Demand	kBtu/ft ² per year	5.3	3.41
Cooling Demand	kBtu/ft ² per year	7.6	2.81
Heating Load	Btu/hr.ft ²	4.3	3.4
Cooling Load	Btu/hr.ft ²	3.3	2.77
Source Energy	kWh/person per year	5,300	4,342

Anticipated Energy Loads and Greenhouse Gas Emissions

Assumptions

Describe the assumptions and methodology used to conduct preliminary energy modeling and set energy targets for the project. Specifically describe what components of the building were included and excluded.

The project will pursue Passive House certification and utilize WUFI energy modeling to demonstrate energy loads and energy use. The anticipated baseline building (ASHRAE 90.1-2013) energy use is indicated in the table below. Building heating and cooling loads, hot water heating load, lighting in units and common spaces, appliance and plug loads as well as miscellaneous system loads were included in this preliminary energy model.

	Proposed
Site EUI (kBtu/yr./sq.ft.)	19.49
Source EUI (kBtu/yr./sq.ft.)	35.08

Net Zero Narrative – 87 Blanchard Rd

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Annual Projected Greenhouse Gas (GHG) Emissions

The annual expected Co2 emissions for the building based on the preliminary WUFI energy model are as follows:

Utility	Co2 emissions in metric tons/yr. (2019 grid factor)	Co2 emissions in metric tons/yr. (2035 grid factor)
Electricity	145	90
Natural Gas	0	0

Annual Projected Energy Consumption

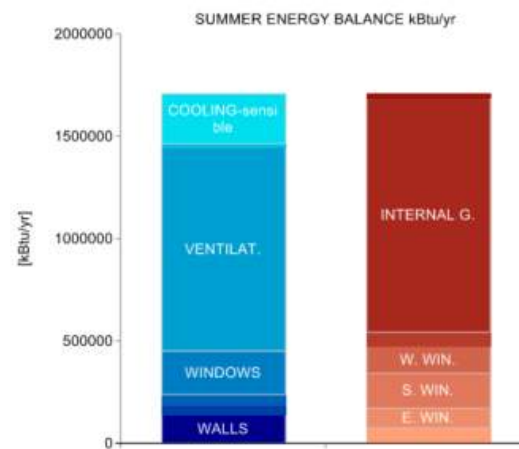
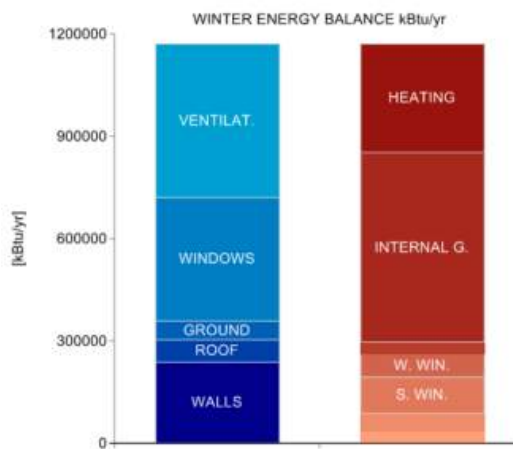
The annual expected energy consumption for the project is presented in the tables on the following pages. These tables were generated as part of the preliminary WUFI modeling exercise for the project.

ANNUAL HEAT DEMAND

Transmission losses :	719,144 kBtu/yr
Ventilation losses:	450,010 kBtu/yr
Total heat losses:	1,169,154 kBtu/yr
Solar heat gains:	351,107 kBtu/yr
Internal heat gains:	661,405 kBtu/yr
Total heat gains:	1,012,512 kBtu/yr
Utilization factor:	84.2 %
Useful heat gains:	852,497 kBtu/yr
Annual heat demand:	316,657 kBtu/yr
Specific annual heat demand:	3,408 Btu/ft ² yr

ANNUAL COOLING DEMAND

Solar heat gains:	539,732 kBtu/yr
Internal heat gains:	1,147,665 kBtu/yr
Total heat gains:	1,687,396 kBtu/yr
Transmission losses :	1,155,305 kBtu/yr
Ventilation losses:	2,571,902 kBtu/yr
Total heat losses:	3,727,207 kBtu/yr
Utilization factor:	38.7 %
Useful heat losses:	1,443,173 kBtu/yr
Cooling demand - sensible:	244,223 kBtu/yr
Cooling demand - latent:	17,051 kBtu/yr
Annual cooling demand:	261,274 kBtu/yr
Specific annual cooling demand:	2.8 kBtu/ft ² yr



Net Zero Narrative – 87 Blanchard Rd

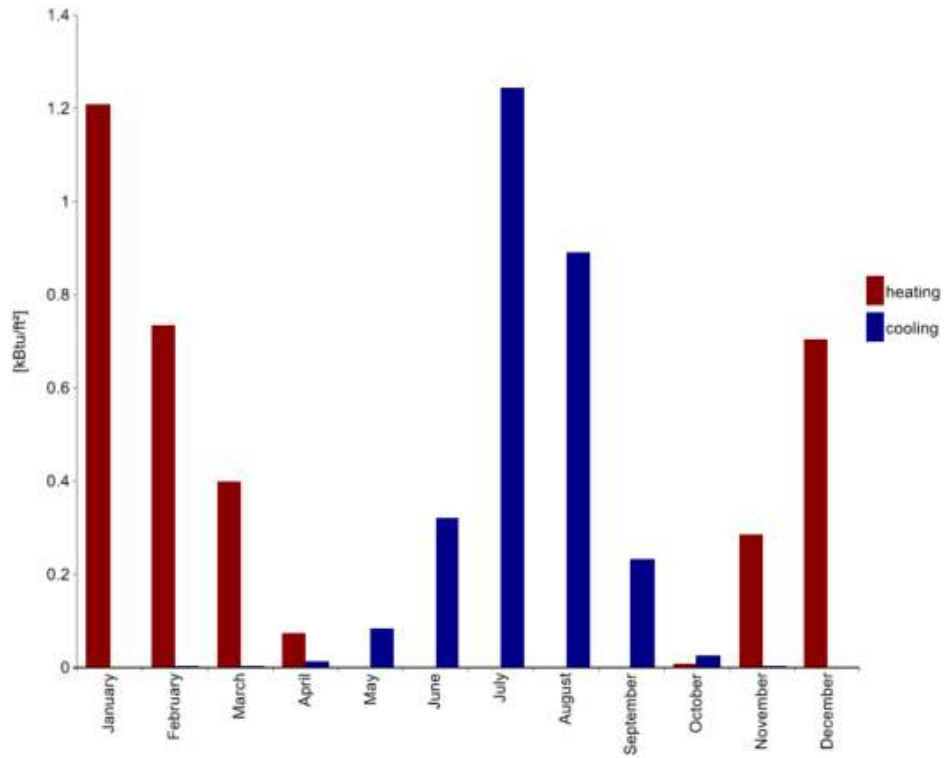
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SPECIFIC HEAT/COOLING DEMAND MONTHLY



Month	Heating [kBtu/ft²]	Cooling [kBtu/ft²]
January	1.2	0
February	0.7	0
March	0.4	0
April	0.1	0
May	0	0.1
June	0	0.3
July	0	1.2
August	0	0.9
September	0	0.2
October	0	0
November	0.3	0
December	0.7	0

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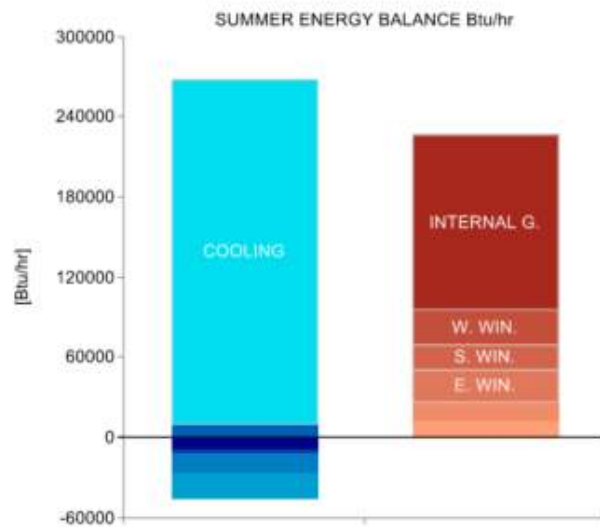
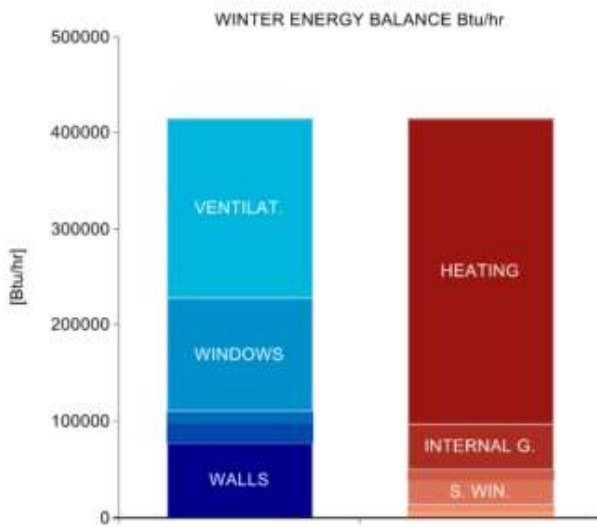


HEATING LOAD

	First climate	Second climate
Transmission heat losses:	228,141 Btu/hr	165,636.8 Btu/hr
Ventilation heat losses:	185,377.5 Btu/hr	131,795.4 Btu/hr
Total heat loss:	413,518.5 Btu/hr	297,432.3 Btu/hr
Solar heat gain:	50,283.9 Btu/hr	28,223.4 Btu/hr
Internal heat gain:	47,131.3 Btu/hr	47,131.3 Btu/hr
Total heat gains heating:	97,415.2 Btu/hr	75,354.7 Btu/hr
Heating load:	316,103.2 Btu/hr	222,077.6 Btu/hr
Relevant heating load:	316,103.2 Btu/hr	
Specific heating load:	3.4 Btu/hr ft²	

COOLING LOAD

Solar heat gain:	95,535.1 Btu/hr
Internal heat gain:	131,024.8 Btu/hr
Total heat gains cooling:	226,559.9 Btu/hr
Transmission heat losses:	-11,867.8 Btu/hr
Ventilation heat losses:	-18,805.6 Btu/hr
Total heat loss:	-30,673.3 Btu/hr
Cooling load - sensible:	257,233.3 Btu/hr
Cooling load - latent:	0 Btu/hr
Relevant cooling load:	257,233.3 Btu/hr
Specific maximum cooling load:	2.8 Btu/hr ft²



Net Zero Narrative – 87 Blanchard Rd

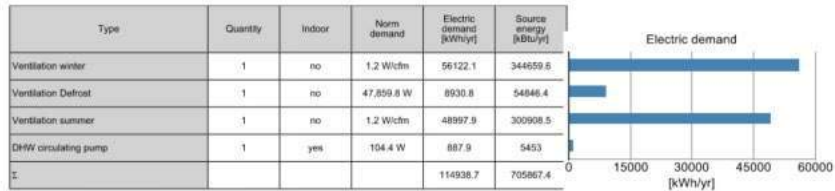
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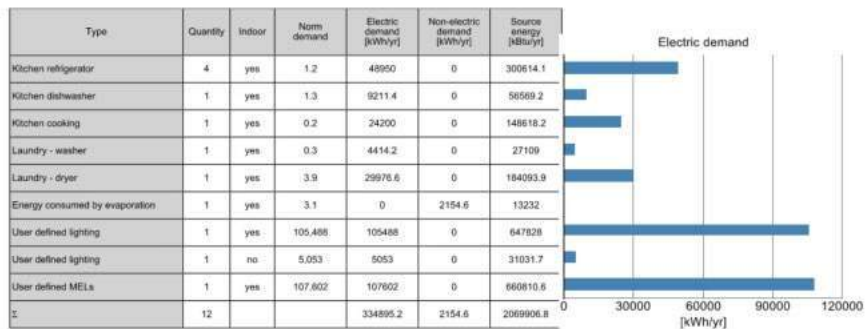
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ELECTRICITY DEMAND - AUXILIARY ELECTRICITY



ELECTRICITY DEMAND RESIDENTIAL BUILDING



DHW AND DISTRIBUTION

DHW consumption per person per day:	6.6 gal/Person/day
Average cold water temperature supply:	52.8 °F
Useful heat DHW:	384,444.5 kBtu/yr
Specific useful heat DHW:	4,137.6 Btu/ft²/yr
Total heat losses of the DHW system:	95,294.2 kBtu/yr
Specific losses of the DHW system:	1,025.6 Btu/ft²/yr
Performance ratio DHW distribution system and storage:	1.2
Utilization ratio DHW distribution system and storage:	0.8
Total heat demand of DHW system:	479,738.6 kBtu/yr
Total specific heat demand of DHW system:	5,163.2 Btu/ft²/yr
Total heat losses of the hydronic heating distribution:	0 kBtu/yr
Specific losses of the hydronic heating distribution:	0 Btu/ft²/yr
Performance ratio of heat distribution:	100 %

Net Zero Narrative – 87 Blanchard Rd

Project Name/Address: 87-101 Blanchard Rd, Cambridge, MA 02138

Submitted By: New Ecology, Inc.

Date of Submission: 1/12/2024



RESILIENCY

The project team has considered various resiliency strategies to reduce the project’s and the residents’ overall vulnerability. These resilience strategies are identified and summarized below in five sections.

EXISTING SITE ASSESSMENT

In accordance with the City’s Flood Resiliency Standard’s the project site is located in an area with a projected 2070 100-year Flood Elevation (Sea Level Rise/Storm Surge) of 23.3 Cambridge City Base.

The proposed building has been designed with a First Floor Elevation (FFE) of 23.5 to be above this projected 2070 flood elevation, and the proposed transformer will be located on the southerly side of the building (away from the stream) with the transformer pad also set at elevation 23.5 to provide for resiliency against current and future year flood events.



Address: 87 Blanchard Rd

Ground Elevation Min:	14.0 ft-CCB
Ground Elevation Max:	25.3 ft-CCB
2070 - 1% - SLR/SS	23.3
2070 - 1% - Precip	20.8
2070 - 10% - SLR/SS	22.1
2070 - 10% - Precip	N/A
2030 - 1% - Precip	N/A
2030 - 10% - Precip	N/A
Present Day - 1% - Precip	N/A
Present Day - 10% - Precip	N/A
FEMA 500-Year	22.4
FEMA 100-Year	18.4
1% - LTFE	23.3
10% - LTFE	22.1

Selected Map-Lot: 267.3-28

Selected Address: 87 Blanchard Rd



Net Zero Narrative – 87 Blanchard Rd

Project Name/Address: 87-101 Blanchard Rd, Cambridge, MA 02138

Submitted By: New Ecology, Inc.

Date of Submission: 1/12/2024



PROTECTION STRATEGIES

The proposed project will include an Erosion and Sediment Control Plan prepared in conformance with the City's Erosion and Sediment Standards. The plan will include but not be limited to:

- Crushed stone construction entrance(s) to prevent sediment from tracking onto City streets.
- Street sweeping as required.
- Erosion control compost filter socks along the downgradient limit of work.
- Silt sacks in existing catch basins.
- Controlled dewatering discharged to onsite temporary sediment basins.
- Proper management and disposal of construction waste.
- Dust control.

The project team will continue to coordinate with the DPW and Conservation Commission as the project plans are further developed and associated Erosion and Sediment Controls are fully designed.

The project will also reduce the quantity of runoff leaving the site, improve water quality, and provide groundwater recharge compared with existing conditions. A Stormwater Management Plan will be prepared for the project in compliance with the DPW's Stormwater Management Standards including:

- Improvement to the quality of stormwater leaving the site post-development compared with pre-development conditions.
- Mitigation of the quantity of stormwater leaving the project site post-development compared with pre-development conditions.

ADAPTATION STRATEGIES

The project team is exploring the following strategies to improve the facility's ability to adapt to changing climate conditions. These strategies include both building elements and mechanical systems.

Building adaptation strategies include, but are not limited to, the following: Passive House level building envelope with operable windows to help with "passive survivability" – keeping the building habitable during extended power outages in any season.

Building mechanical system adaptation strategies include, but are not limited to, the following: Decentralized VRF heat pump mechanical system for both heating and cooling locates mechanical equipment on roof and in units instead of an area that can be potentially damaged by flooding. Other mechanical equipment, including air handlers, energy recovery ventilators, and emergency generator, are located on the roof and away from flood risk. All residential living areas are elevated, all are located on the second floor or above.

Net Zero Narrative – 87 Blanchard Rd

Project Name/Address: 87-101 Blanchard Rd, Cambridge, MA 02138

Submitted By: New Ecology, Inc.

Date of Submission: 1/12/2024



BACKUP STRATEGIES

The project team is exploring how to provide for critical needs if the building loses power or other services. The project team plans to include an emergency generator located on the roof, and are still discussing ideas for what that generator will power based on the needs of the residents with the elevator already confirmed.

COMMUNITY RESILIENCE STRATEGIES

The project team is exploring different resiliency measures, advised by New Ecology, Inc. Mainly looking at the type of residents, the hazards for the area, and what already exists in the community. Resiliency strategies are an on-going discussion.

87 Blanchard Rd PHIUS+ CORE Ratings System Narrative

87 Blanchard Road Passive House
87-101 Blanchard Road, Cambridge MA, 02138
January 12, 2024



Submitted To:
Community Development Department, City of Cambridge
344 Broadway, Cambridge MA, 02138

PHIUS+2021 RATINGS SYSTEMS REQUIREMENTS

The project team will pursue Passive House certification to the standards set by the Passive House Institute US (PHIUS) for their PHIUS+ CORE rating system as well as certifying through the EPA Indoor airPLUS program. The PHIUS+ CORE rating system includes stringent and verified building performance metrics as well as professional testing of the building envelope and air sealing at two stages during building construction. EPA Indoor airPLUS certification includes verification of indoor air quality (IAQ) quality control measures including but not limited to: moisture control, HVAC venting and sealing, and use of low VOC materials in construction. The project team believes that these two ratings systems will result in a highly efficient building which protects occupant health through excellent indoor air quality.

While there is no rating system checklist for PHIUS+ CORE, there is a PHIUS Verifier workbook that will be completed as part of the field verification process as well as an EPA Indoor airPLUS checklist. The metrics measured and inspected by the PHIUS Verifier include:

- Building Envelope Air Infiltration & Compartmentalization
- Ventilation Air Flow Rates
- Heating and Cooling Equipment & Air Filtration Verification
- Domestic Hot Water System Specification Verification
- Appliance Energy Consumption Verification
- Indoor Air Quality Verification using the EPA Indoor airPLUS Verification Checklist

The PHIUS+ CORE rating system includes feasibility modeling to reach specified building performance metrics which are presented below in table format. The PHIUS verification process for the building energy model includes review and comments by a model evaluator from the PHIUS organization. This review of the model examines building assumptions for the envelope and mechanical systems, and is known to be a thorough and rigorous examination of building systems. The project team expects that the outcome of this modeling and review process, combined with envelope and air infiltration testing, will lead to a very high performance building with greatly reduced heating and cooling needs as compared with a baseline building.

REQUIREMENTS FOR PHIUS+ CORE CERTIFIED BUILDINGS

PHIUS sets strict standards for building certification under its PHIUS+ CORE rating system. PHIUS+ CORE sets requirements for building metrics in five areas: heating demand, cooling demand, heating load, cooling load and source energy consumption based on the expected number of residents. These 5 metrics, illustrated in the table below, are modeled, measured and verified by PHIUS using WUFI modeling. The project is at or near passing in all categories and as the design progresses, we will be sure that the design meets all requirements.

Table 1: PHIUS+ CORE Energy Modeling Requirements

PHIUS+ CORE Criteria	Units	Target Not to Exceed	Building Performance
Heating Demand	kBtu/ft ² per year	5.3	3.41
Cooling Demand	kBtu/ft ² per year	7.6	2.81
Heating Load	Btu/hr.ft ²	4.3	3.4
Cooling Load	Btu/hr.ft	3.3	2.77
Source Energy	kWh/person per year	5300	4342

A rigorous and field-tested air-tightness standard is also applied to buildings seeking certification. The building envelope is tested twice using blower door testing. The first test is conducted after the installation of the air barrier, and the second at the completion of construction.

The PHIUS Passive House Air Tightness standard is as follows:

- Residential Units, Air Leakage: 0.30 CFM50 per sq. ft. of unit enclosure area, or less, demonstrated through blower door testing performed by the PHIUS+ Verifier following PHIUS sampling protocols.
- Whole Building, Air Leakage: 0.06 CFM50 per sq. ft. of building enclosure area, or less, demonstrated through a blower door test performed by the PHIUS+ Verifier.

Field Inspections During Construction:

A credentialed PHIUS+ Verifier will inspect, document and confirm the following features of the building envelope and building performance:

- Air Infiltration: Blower door testing will be done at project mid-point for the whole building and at project completion for both the units (sampled per RESNET protocols) and the whole building in order to ensure compliance with the requirements outlined above.
- Thermal Bridging and Air Infiltration Inspection: The project will be inspected after framing, but before insulation installation to inspect construction and identify potential areas of thermal bridging and air infiltration.
- Thermal Bridging: Thermal imaging inspection with an infrared camera to review and show compliance with thermal bridging and air sealing protocols.
- EPA Indoor airPLUS: review of compliance and documentation.
- HVAC: review of the HVAC functional test checklist, and four (4) site visits to observe testing and balancing of the HVAC systems as required by PHIUS.

REQUIREMENTS FOR EPA INDOOR airPLUS CERTIFIED BUILDINGS

The EPA Indoor airPLUS certification is a checklist based set of requirements focusing on building techniques that improve indoor air quality both through the construction process and throughout the lifetime of the building. Requirements are mainly focused on using low VOC materials, using proper procedures when building ductwork and systems, and following building procedures to prevent future water damage and/or mold growth. The EPA Indoor airPLUS certification is integral to the PHIUS+ CORE certification, and it will be independently reviewed and verified by a qualified reviewer.

The EPA Indoor airPLUS checklist requirements are assembled into the following categories: moisture control, radon, pests, HVAC systems, combustion pollutants, materials and final (inspection). The program requirements are outlined in the [EPA Indoor airPLUS Construction Specifications Version 1 \(Rev 04\)](#) and are summarized below. All requirements will be verified and confirmed by the qualified verifier and/or builder.

- Moisture Control
 - Drain or sump pump installed in basements and crawlspaces. In EPA Radon Zone 1, check valve also installed.
 - Layer of aggregate or sand (4 in.) with geotextile matting installed below slabs AND radon techniques used in EPA Radon Zone 1.
 - Basements/crawlspaces insulated, sealed and conditioned.
 - Protection from water splash damage if no gutters.
 - Supply piping in exterior walls insulated with pipe wrap.
 - Hard-surface flooring in kitchens, baths, entry, laundry, and utility rooms
- Radon
 - Radon-resistant features installed in Radon Zone 1 homes in accordance with Construction Specification 2.1.
- Pests
 - Corrosion-proof rodent/bird screens installed at all openings that cannot be fully sealed. (Not required for clothes dryer vents.)
- HVAC Systems
 - Duct systems protected from construction debris AND no building cavities used as air supplies or returns
 - No air-handling equipment or ductwork installed in garage.
 - Clothes dryers vented to the outdoors or plumbed to a drain according to manufacturer's instructions.
 - Central forced-air HVAC system(s) have minimum MERV 8 filter AND no ozone generators in home. Temporary filter installed to protect unit from construction dust.

- Combustion Pollutants
 - Emissions standards met for fuel-burning and space-heating appliances.
 - CO alarms installed in each sleeping zone (e.g., common hallway) according to NFPA 720.
 - Multifamily buildings: Smoking restrictions implemented AND ETS transfer pathways minimized.
 - Attached garages: Door closer installed on all connecting doors
 - Attached garages: In homes with exhaust-only whole-house ventilation EITHER
 - ◆ 70 cfm exhaust fan installed in garage OR
 - ◆ Pressure test conducted to verify the effectiveness of the garage-to-house air barrier.

- Materials
 - All composite wood products certified low-emission.
 - Interior paints and finishes certified low-emission.
 - Carpet, carpet adhesives, and carpet cushion certified low-emission.

- Final (Inspection)
 - HVAC system and ductwork verified to be dry and clean AND new filter installed.
 - Home ventilated before occupancy.
 - Equipment manuals, Indoor airPLUS label, and certificate provided for owner/occupant.

The project team looks forward to the construction of a very high efficiency building with a focus placed on reducing energy consumption and protecting resident health. The project team believes that following the above ratings systems, PHIUS+ CORE and EPA Indoor airPLUS will accomplish these goals and create a high quality living environment well into the future at 87 Blanchard Rd.

Affidavit Form for Green Building Professional Special Permit

Green Building

Project Location: 87-101 Blanchard Rd, Cambridge, MA 02138

Green Building Professional

Name: Paul Eddowes

Architect

Engineer

License Number: _____

Company: New Ecology, Inc.

Address: 294 Washington Street. STE 830, Boston, MA 02108

Contact Information

Email Address: eddwes@newecology.org

Telephone Number: 617 557 1700

I, Paul Eddowes, 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.



01/24/2024

(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.



Certificate

Passive House Consultant



Dr. Wolfgang Feist
64283 Darmstadt
Germany
www.passivehouse.com

Valid until 6th February 2024

Paul Eddowes

Date of birth: 26th August 1984

is entitled to use the seal below during the five year validity of the certificate and is listed during this period in the list of Certified Passive House Designers/Consultants at www.passivehouse-designer.org

The qualification was obtained according to the valid examination regulations

at: **North American Passive House Network in cooperation with Passive House Academy / O'Leary, Tomás**

in: **New York, United States of America**



Darmstadt, 6th February 2019

A handwritten signature in blue ink that reads 'Wolfgang Feist'.

Prof. Dr. Wolfgang Feist

This certificate does not qualify the recipient for authentication under public law and therefore does not replace any official authorisation to present building documents.

Please fill out Green Building Report (GBR) Project Information Matrix items below:

GBR Project Information	Metrics/Units/Data
Date	2/22/2024
Project name:	87 Blanchard Road
Building Gross Floor Area	93,900 sqft
Project Design Phase (% Complete SC/DD/CD)	Schematic Design
Project Stage at CDD (SP/Des Rev/BP or Cert of Occ)	AHO Review
Energy Code Compliance Pathway used for the building per Massachusetts Energy Code (Indicate PATHWAY)	Phius+ CORE 2021
Fossil Fuel use (Yes/No-all electric). If Yes, what extent?	No- all electric
District energy - (Yes/No)	No
Improved energy performance compared to Stretch Code/ASHRAE standard 90.1. (%)	Wufi model for PHIUS. No ASHRAE 90.1 Baseline
LEED Alternative Compliance Path (ACP) V4 EApc 95 (Yes/No)	N/A - PHIUS
Energy Cost Savings - LEED project - compared to baseline reported in LEED EA (%)	N/A - PHIUS
Energy Use Savings - LEED project - reduction compared to baseline reported in LEED EA (%)	N/A - PHIUS
Total energy cost/year (\$)	~162,400
Site EUI - Stretch Code standards. (kBTU/SF-yr)	19.49*
Source EUI - Stretch Code standards. (kBTU/SF-yr)	35.08*
GHG intensity (kg CO2/sf)	1.759**
GHG emissions reduction proposed (%)	No baseline model
Annual GHG emissions (mtCO2e)	145 (2019 grid factor), 90 (2035 grid factor)
Solar Ready (Yes / No)	Yes
Solar Capacity (kW)	21.6 kW (DC)
Solar (renewable energy cost) contribution (%)	~6%
Solar Ready - Roof area (SF)	~7,451 sqft
Green Roof (extensive or intensive) (Yes/No - SF)	No
Bio-Solar Roof (using green roof and solar) (Yes/No-SF)	No
Building Envelope commissioning (Yes/No)	Yes - BCxA TBD
Window-to-wall (%)	~30%
Triple-glazing used (Yes/No)	Yes
U value of glazing used (value)	0.15(fixed), 0.17(operable)
VLT for vertical glazing at ground level uses (%)	0.43
Indoor water use reduction below LEED baseline (%)	N/A

Outdoor water use reduction below LEED baseline (%)	N/A
Lighting design/plug load reduction (%)	TBD
Number of EV ready spaces (% of total parking)	3 EVSE, 3 EV Ready, 2 EV Capable
C & D waste diverted from landfill (%)	TBD post construction
Building Certification Rating Used (Rating System-v.)	PHIUS+ CORE 2021
LEED Certification Level (Platinum,Gold, Silver)	N/A
LEED Credit points (points pursued or verified)	N/A
Whole building Life-cycle assesement tool - (Athena, Tally, EC3, OneClickLCA, TRACI, others)	N/A
Expected Life time GHG emissions - CO2/CO2e *	N/A
Residential units (# of Inclusionary-if residential)	110 units - all affordable
Home Energy Rating System (HERS scores)	TBD

* Estimate of total GHG emissions in MTCO2e. GHG emissions is for both building operation and embodied carbon.

- The total GHG emissions should account for the reductions in operational carbon anticipated in the annual projected energy consumption and GHG emissions from the Project's net zero narrative and account the reductions in embodied carbon anticipated in the design and construction process.
- Embodied carbon should be based on a whole building life cycle assessment using LCA tool per LEED v4 framework and informed by third-party verified EPDs.
- LCA stages (i.e., building/product life cycle stages A1-A5, B2-B5, and C1-C4) from cradle to grave. Building service life should be least 60 years.
- At minimum, embodied carbon calculations should be performed for building structure (concrete and steel framing) and building envelope.
- Envelope components should include glass, metal panels, aluminum framing and insulation to the interior finish.
- Total GHG emissions estimate should also show total GHG emissions projected from building occupancy to year 2050.

*Project specific

**With Solar PV (2035 Grid Emissions Factor)

CDD Determination and/or comments for Special Permit submission

The Community Development Department (CDD) received the Green Factor (GF) documentation for the AHO Design Review stage. Pursuant to Section 22.96 of the Zoning Ordinance, CDD staff have reviewed the project’s GF documentation and provide the following Determination and Summary of Compliance.

CDD Determination: The documentation provided by the Applicant is adequate and demonstrates compliance with the Green Factor Standard applicable to the AHO Design Review stage.

Summary of Compliance:

- Solar Reflectance Index of Roof – 82
- Solar Reflectance Index of Paving – N/A
- Cool Score – 1.48

Green Factor Certification Form

This is for projects that are subject to the Green Factor Standard in Section 22.90 of the Cambridge Zoning Ordinance, which requires site and landscape design features that reduce urban heat.

Review Section 22.90 of the Cambridge Zoning Ordinance and the Cambridge Cool Score Information and Guidelines before completing this form. When submitting a completed form, attach the supporting materials listed in the Green Factor Checklist.

Project Address/Location: 87-101 Blanchard Road

Planning Board (PB) and/or Board of Zoning Appeal (BZA) case number (if applicable): AHO-7

Developer Name and Contact Information

Name: BBH Community Development, LLC

Mailing Address: c/o B'nai B'rith Housing 34 Washington St, Brighton, MA 02135

Email Address: david@bbhousing.org

Telephone #: (978) 270-8594

Applicability: Section 22.92 & Section 5.22.5

Is this project subject to Green Building Requirements (Section 22.20)?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does this project involve the construction of a new building?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Does this project enlarge an existing building's footprint by at least 50%?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Does this project involve the creation of new surface parking area?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Answer the questions below if the answer is "Yes" to any of the above

Requirements

Cool Roof Requirement

Does this project involve the construction of a new building roof or replacement of more than 50% of an existing roof?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Has this project received a Certificate of Appropriateness from the Cambridge Historical Commission or a Neighborhood Conservation District Commission, or a determination of adverse effect by the Executive Director of the Cambridge Historical Commission? [if "Yes," attach the document to your submission]	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Last Updated: April, 2023

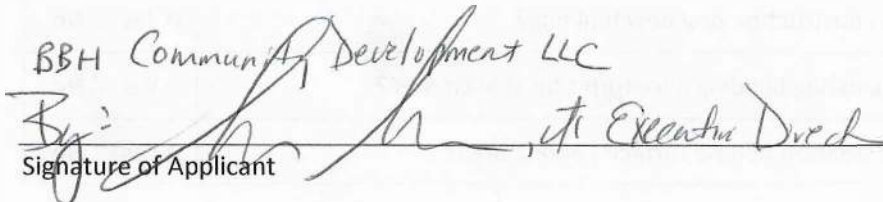
How much of the new or replaced roof area (in sq. ft.) has a slope (rise:run) of less than 2:12? [Cool Roof Requirement is not applicable to roof area with a 2:12 or steeper slope]	17,000 SF +/-
What is the initial Solar Reflectance Index (SRI) of the proposed roof surface material for the area described above, excluding any solar energy systems or green roof area? [Minimum is 82]	82

Cool Score – Base information on the attached Cool Score Sheet and Site/Roof Plan

What is the Cool Score of the proposed site design? [Minimum is 1.0 except per below]	1.48
What is the Cool Score of the existing site? [If the project does not involve a new building or enlargement of a building footprint, the proposed Cool Score must not be less than the Cool Score of the existing site]	

Modifications to Requirements

Has the project received, or will the project seek, a special permit from the Planning Board to modify the Green Factor Standard for this proposal?	<input type="checkbox"/> Received SP (date: _____) <input type="checkbox"/> Seeking SP <input checked="" type="checkbox"/> No modification
---	--

BBH Community Development LLC
 By: , its Executive Director
 Signature of Applicant
 Date: 3/7/2024

Green Factor Checklist

Project Phase

Required Submissions

**Special Permit
(if applicable)**

- Green Factor Certification Form
 - Cool Score Sheet
 - Site and Roof Plans
-

Building Permit

- Green Factor Certification Form (updated from prior version)
 - Cool Score Sheet (updated from prior version)
 - Site and Roof Plans (updated from prior version)
 - Specifications of roof surface material including initial Solar Reflectivity Index (SRI)
 - Catalog of landscape materials including plant species and pavement (including SRI)
 - Specifications of green roof installation with operations and maintenance plan (if applicable)
-

Certificate of Occupancy

All materials updated based on as-built conditions:

- Green Factor Certification Form (updated from prior version)
 - Cool Score Sheet (based on as-built conditions)
 - Site and Roof Plans (based on as-built conditions)
 - Specifications of roof surface material including initial Solar Reflectivity Index (SRI)
 - Catalog of landscape materials including plant species and pavement (including SRI)
 - Specifications of green roof installation with operations and maintenance plan (if applicable)
-

Last Updated: April, 2023

Project Address 87-101 Blanchard Road	Special Permit Number AHO-7	Total Lot Area (SF) 138844
Applicant Name BBH Community Development, LLC	Phone Number 978-270-8594	Open Space Requirement (%) 30%
Applicant Contact / Address c/o B'nai B'rith Housing 34 Washington Street, Brighton, MA 02135	Email Address david@bbhousing.org	
Project Description Demolition of an existing 2-story commercial building and construction of a 6-story, 110-unit over-55 age restricted apartment building and associated site improvements.		Result Pass

Enter minimum required open space ratio. If the ratio is less than 20%, enter 20 here.

		Outside 20' of PROW	Value Factor		Within 20' of PROW	Value Factor	Contributing Area
Trees Enter the number of trees in each category. Count each tree only once on this form.	Preserved Existing Trees						
	A1	Understory tree currently <10' canopy spread	11	0.80	+	1	1,560
	A2	Understory tree currently >10' canopy spread	0	1.00	+	0	-
	A3	Canopy tree currently <15' canopy spread	0	0.80	+	0	-
	A4	Canopy tree currently between 15' and 25' canopy spread	12	1.00	+	1	9,800
	A5	Canopy tree currently >25' canopy spread	2	1.20	+	9	16,800
	New or Transplanted Trees						
A6	Understory tree	5	0.60	+	3	990	
A7	Canopy tree	19	0.70	+	12	21,070	
Planting Areas Enter area in square feet of each component in the box provided	B1	Lawn Area	6700	0.30	+	5260	5,166
	B2	Low Planting Area	0	0.40	+	0	-
	B3	High Planting Area	5453	0.50	+	3563	6,289
Green Roofs & Facades For definitions, see reference document.	C1	Green Façade	0	0.10	+	0	-
	C2	Living Wall	0	0.30	+	0	-
	C3	Green Roof Area	0	0.30	+	0	-
	C4	Short Intensive Green Roof Area	0	0.50	+	0	-
	C5	Intensive Green Roof Area		0.60	+	0	-
Paving & Structures	D1	High-SRI Roof	Required	N/A			
	D2	High-SRI Paving	0	0.1			-
	D3	Shaded Area	0	0.2	+	0	-
Project Summary	Portion of lot area utilizing green strategies 44%					Total Contributing Area	61,675
	Portion of score from green strategies 97%					Total Area Goal	41,653
	Portion of score from trees 79%					COOL FACTOR SCORE	1.48
	Portion of score contributing to public realm cooling 58%						

When entering strategies that are within 20' of the public right of way (column L), do not also enter them in column H.

High-SRI roofs are a prerequisite of the Cool Factor and therefore are not assigned a point value.

If your project scores 1 or above, you have successfully met the requirements of the Cool Factor.



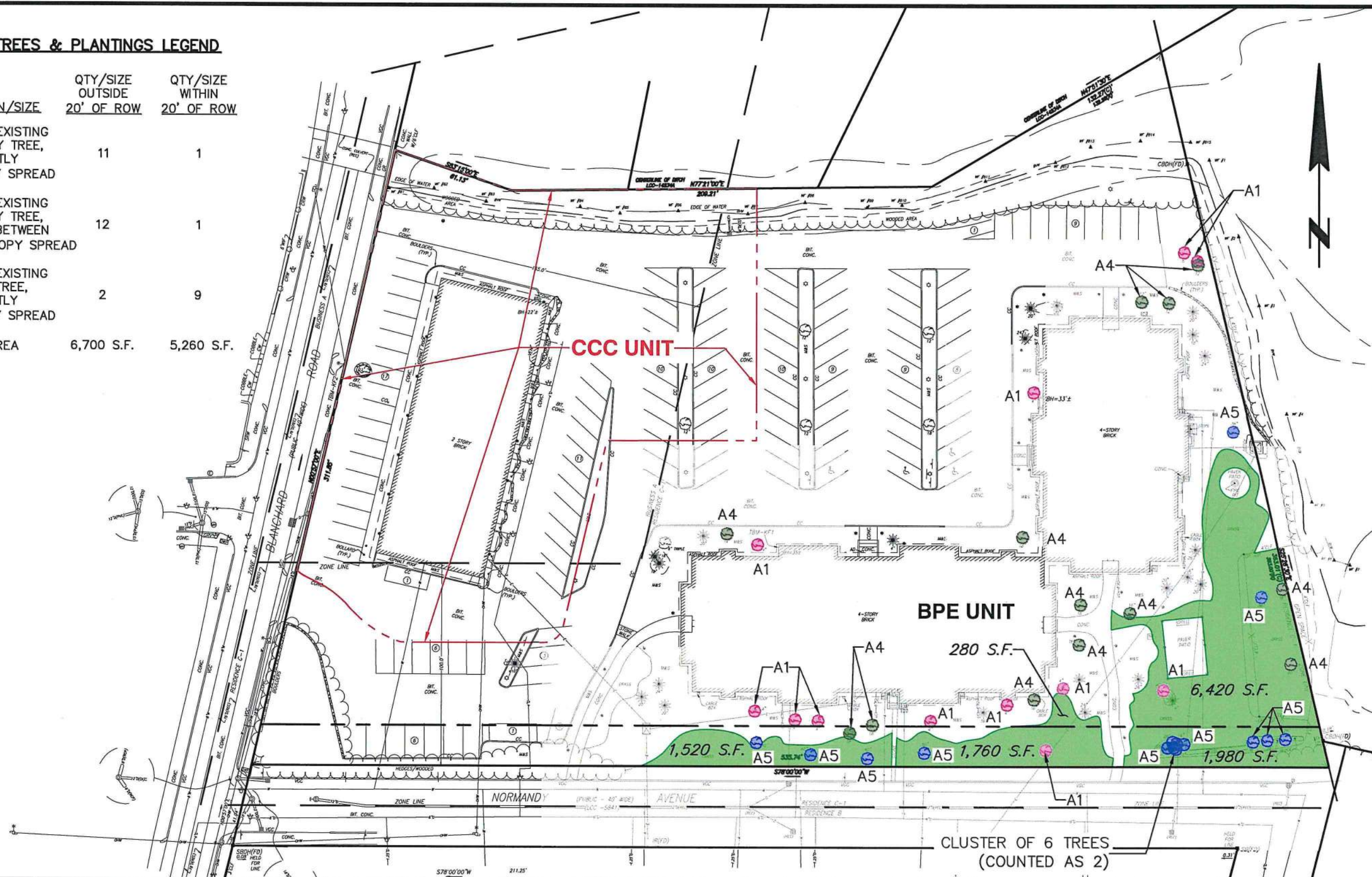
LEGEND		sq.ft.
	PROPERTY LINE	
	PROPERTY LINE 20' OFFSET	
	HIGH PLANTING AREA WITHIN 20' OF PROW	3563.0
	HIGH PLANTING AREA OUTSIDE 20' OF PROW	5452.8

87-101 BLANCHARD RD.- COOL SCORE DIAGRAM

SCALE: 1:40

PRESERVED EXISTING TREES & PLANTINGS LEGEND

TYPE	COLOR	DESCRIPTION/SIZE	QTY/SIZE OUTSIDE 20' OF ROW	QTY/SIZE WITHIN 20' OF ROW
A1		PRESERVED EXISTING UNDERSTORY TREE, CURRENTLY < 10' CANOPY SPREAD	11	1
A4		PRESERVED EXISTING UNDERSTORY TREE, CURRENTLY BETWEEN 15' AND 25' CANOPY SPREAD	12	1
A5		PRESERVED EXISTING CANOPY TREE, CURRENTLY > 25' CANOPY SPREAD	2	9
		LAWN AREA	6,700 S.F.	5,260 S.F.

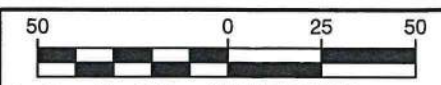


--- PROPERTY LINE 20' OFFSET
 ——— PROPERTY LINE

H.W. Moore
 ASSOCIATES
 CIVIL ENGINEERING | LAND PLANNING
 A DIVISION OF HANCOCK ASSOCIATES
 121 E. Berkeley Street
 Boston, MA 02118
 tel 617-357-8145
 fax 617-357-9495

COOL SCORE SHEET DIAGRAM

89 BLANCHARD ROAD
PRESERVED EXISTING TREES & LAWN AREAS
 Plan Ref. 26708SP39.DWG



Date: 3/25/24
 Rev: 4/17/24
 SHEET

CITY OF CAMBRIDGE
DEPARTMENT OF PUBLIC WORKS

147 Hampshire Street, Cambridge, MA 02139

Phone (617) 349-4800



Flood Resilience Compliance Confirmation

Confirmation Number: 262232

Date Issued: April 12, 2024

Project Address/ Location: 87 Blanchard Rd
Map/Lot: 267.3-28
Project Stage: Building Permit

Applicant:

Name: David White
Mailing Address: 121 East Berkeley Street Boston, Boston, MA 02118
Email Address: dwhite@hancockassociates.com
Telephone #: 6173578145

Applicability:

- Is this project subject to Green Building Requirements (Section 22.20)? Yes
- Does this project involve the construction of a new building? Yes
- Does this project enlarge an existing building's footprint by at least 50%? No
- Does Any development in Stories Below Grades seeking exemption under Section 5.25.2? No

LTFE:

	SLR/SS	Precip	LTFE*
2070 1%	23.3	20.8	23.3
2070 10%	22.1	N/A	22.1

All Elevations in Cambridge City Base

*As defined by Zoning, whichever is higher of 1% and 10% events.

Meeting of Development Standards

Describe compliance with Section 22.84.1 (a): All occupiable spaces shall be protected from 10 % LTFE:

All occupiable spaces are set at elevation 23.5. The 10% LTFE is 22.1. Therefore occupiable spaces are protected from the 10% LTFE.

Describe compliance with Section 22.84.1 (b and c): Habitable spaces and critical building equipment shall be protected from the 1% LTFE:

All habitable spaces and critical building equipment such as the first floor of the building and electrical pads are set at elevation 23.5. The 1% LTFE elevation is 23.3. Therefore habitable spaces and critical building equipment are protected from the 1% LTFE.

Describe compliance with Section 22.84.2, how spaces below the 10% LTFE will recover from flood event.

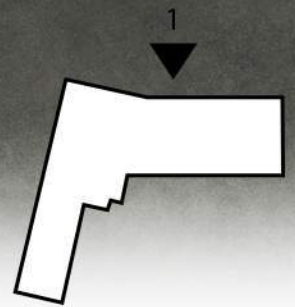
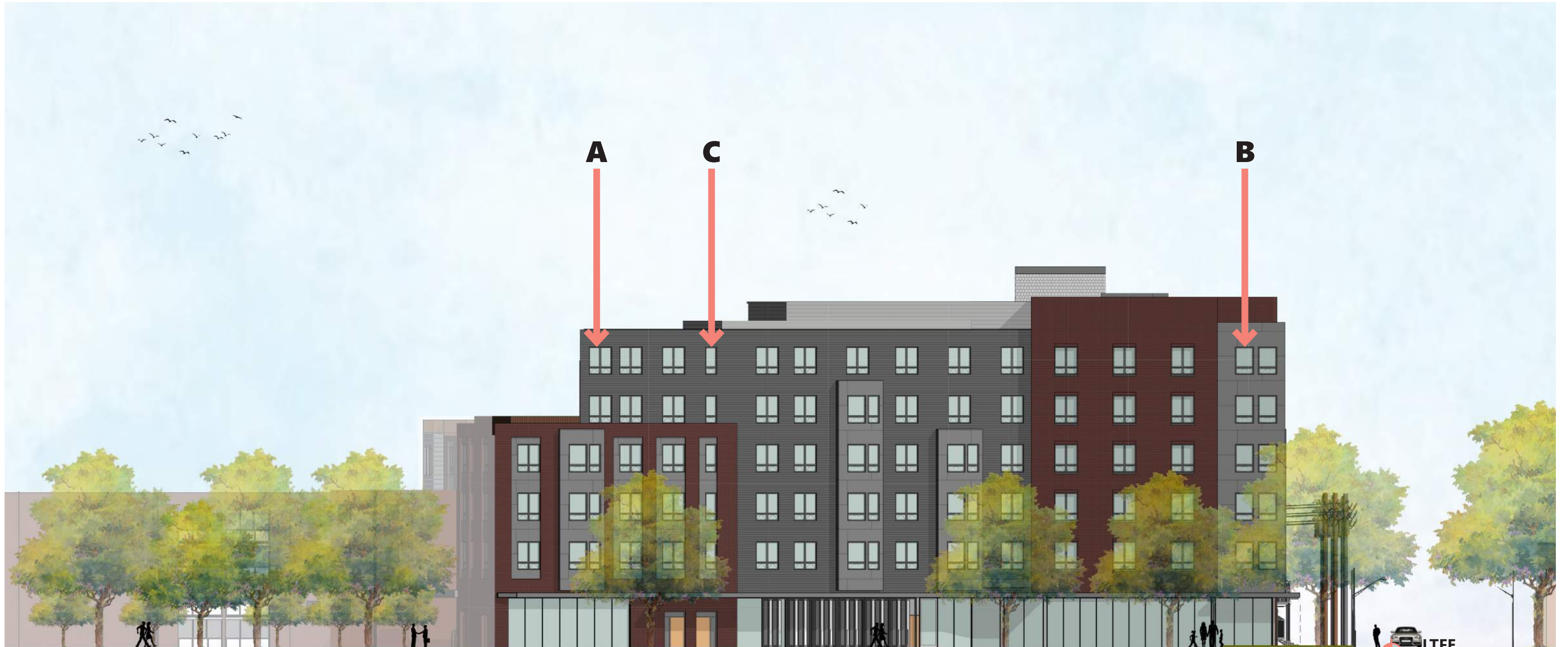
There are no below grade spaces inside the proposed building under the 10% LTFE.

Notes/Conditions:

This Document Confirms that the above mentioned project is in Conformance with the Flood Resilience Standards.

Confirmation #: **262232** Date: **April 12, 2024**

Site Elevations



	A - (2) 5'-0" x 6'-0"
	B - 4'-0" x 6'-0"
	C - 2'-6" x 6'-0"

Site Elevations



Site Elevations



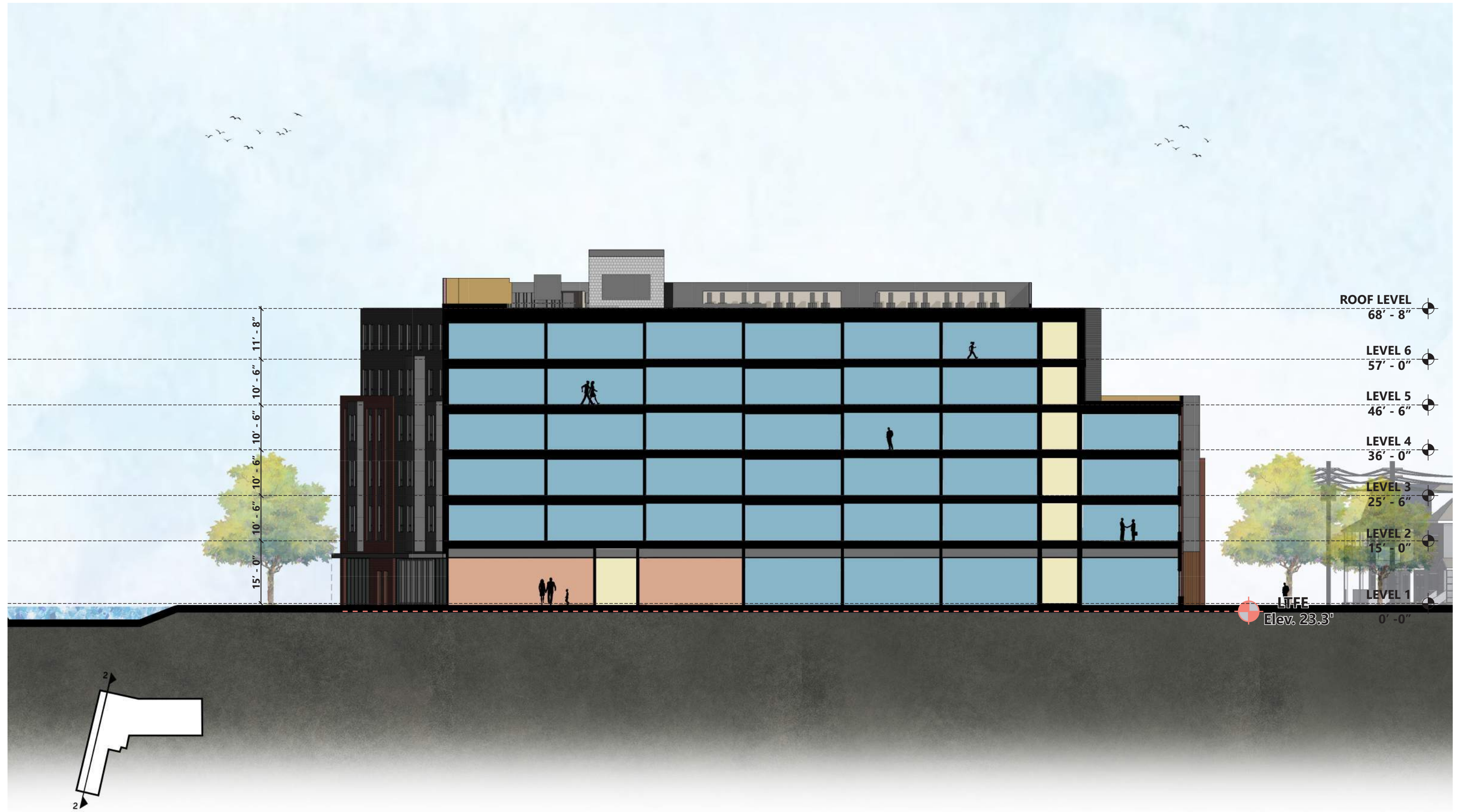
Site Elevations



Site Sections



Site Sections



Site Sections



Site Sections



H.W. Moore

ASSOCIATES
A Division of Hancock Associates

MEMORANDUM
FEMA FLOOD ZONE
PROPOSED SENIOR HOUSING – 89 BLANCHARD ROAD
CAMBRIDGE, MA

TO: David Webster, B'nai B'rith Housing
FROM: Fred Keylor – H. W. Moore Associates
DATE: February 22, 2024

According to Note #4 on the “Existing Conditions Plan 89 Blanchard Road Cambridge, Mass.” dated August 21, 2023, and last revised October 3, 2023, prepared by Feldman Geospatial (copy appended hereto):

...”a portion of the parcel shown hereon lies within Zone “AE” Special Flood Area (SFHAS) subject to inundation by the 1% annual chance flood, having a base flood elevation (BFE) of 6.9’ (scaled, NAVD88)(18.6’, Cambridge City Base elevation), as shown on the Federal Emergency Management Agency (F.E.M.A.) Flood Insurance Rate Map (F.I.R.M.) for Middlesex County, Massachusetts, Map Number 25017C0418E, City of Cambridge Community Number 250186, Panel Number 0418E, having an effective date of June 4, 2010.”

Elevations on Feldman’s Existing Conditions Plan refer to Cambridge City Base (CCB). The subject portion of the parcel within the AE Zone is located along the northerly property line and is associated with Wellington Brook which flows easterly from the Blanchard Road culvert to Blair Pond. Elevation 18.6 is at about the midpoint of the embankment between the brook’s channel (elevation 15±) and site’s paved parking lot (elevation 22±). Accordingly, the 1% annual chance flood (100-year flood) is contained within brook’s embankment and does not extend onto the developed portion of the property.

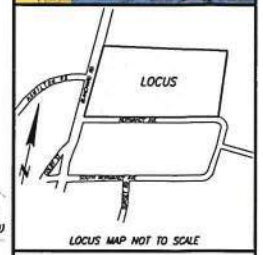
The existing commercial building, residential buildings, and associated parking areas and drives are at elevations ranging from 22± to 24± which are well above the 100-year flood elevation of 18.6 CCB. The existing commercial building will be demolished and replaced with a new residential building and the surrounding parking areas and drives will be reconfigured, all of the proposed site improvements will be located well above the 100-year flood elevation. Replacing an existing corroded metal outfall pipe to the brook with new reinforced concrete pipe is the only work proposed within the flood zone. Embankment grades will be restored after installation of the new pipe.

The existing parking areas and drives drain to a single catch basin under current conditions which is woefully inadequate and provides little in the way of water quality and runoff mitigation. The proposed redevelopment project includes several new deep sump catch basins

with hooded outlets, and three (3) subsurface stormwater infiltration systems with isolator rows for water quality, all sized to mitigate the project's stormwater runoff in full compliance with MassDEP and City of Cambridge Stormwater Management Standards.

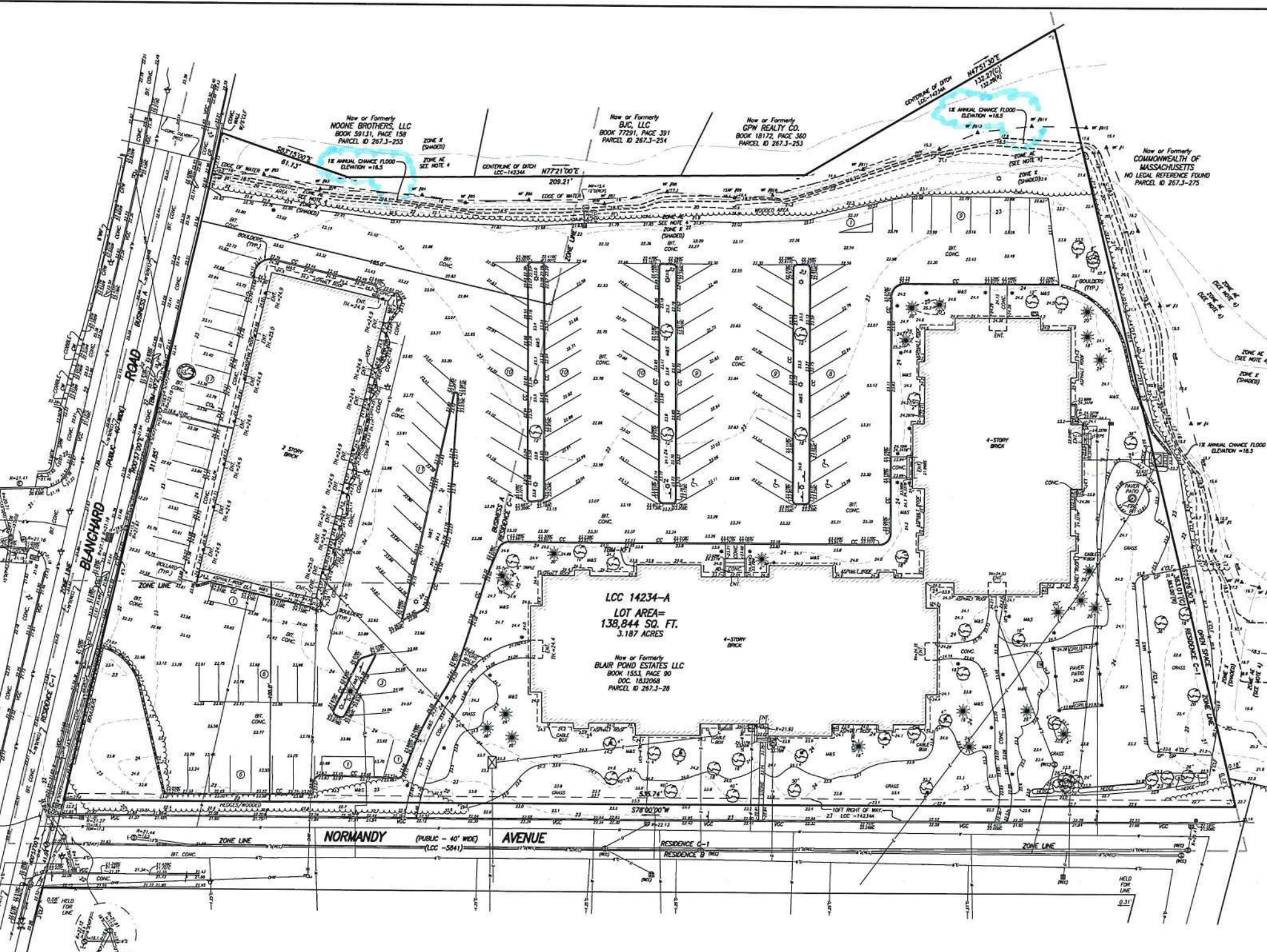
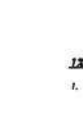
The proposed stormwater management systems have been reviewed and approved by the Cambridge Conservation Commission and DPW Engineering Division. These proposed stormwater management strategies will result in significant reductions in runoff from the site under all storm events compared with existing conditions.

Lastly, the proposed redevelopment is also being designed to comply with the City's Flood Resilience Standards. Per the City's FloodViewer 2022, the applicable 2070 Long Term Flood Elevation (LTFE) for the site is projected to be elevation 23.3 accounting for Sea Level Rise and Storm Surge. The proposed building and associated transformer will be at elevation 23.5, above the projected 2070 flood elevation in compliance with the Resiliency Standards.



LOCUS MAP NOT TO SCALE

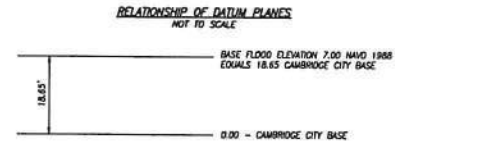
- LEGEND**
- SEWER MANHOLE
 - DRAIN MANHOLE
 - HYDRANT
 - WATER SHUT OFF/WATER GATE
 - GAS SHUT OFF/GAS GATE
 - CATCH BASIN
 - CLEAN OUT
 - CURB RETURN
 - TRANSFORMER
 - D-FRAME CATCH BASIN
 - "DON'T DUMP" PLACARD
 - DRILL HOLE
 - ELECTRIC CONDUIT RISER
 - UTILITY POLE
 - LIGHT POLE
 - WALK LIGHT
 - ELECTRIC HANDHOLE
 - BOLLARD
 - GATE POST
 - WALK BOX
 - SIGN
 - ROOF DRAIN
 - OBSERVATION WELL
 - BOUND FOUND
 - IRON ROD
 - AIR CONDITIONING UNIT
 - SPRINKLER HEAD
 - WETLAND FLAG
 - NUMBER OF PARKING SPACES
 - CONIFEROUS TREE
 - DECIDUOUS TREE
 - CURVED STONE AND/OR SANITARY LINE
 - BOTTOM OF CURB
 - BOTTOM
 - BITUMINOUS
 - BOTTOM ELEVATION
 - BORDERING VEGETATED WETLANDS
 - CALCULATED
 - CONCRETE CURB
 - CONCRETE
 - CHAIN LINK FENCE
 - DRILL HOLE
 - DETECTABLE WARNING PANEL
 - ENTRANCE
 - FOUND
 - GUARD RAIL
 - GRAVEL
 - INVERT ELEVATION
 - IRON ROD
 - LAND COURT CASE
 - LANDSCAPED AREA
 - MASH & SHRUBS
 - NO VISIBLE PIPES
 - RW ELEVATION
 - RECORD
 - RECORD MAP (REC)
 - STONE BOUND
 - SQUARE FEET
 - TOP
 - TEMPORARY BENCH MARK
 - TOP OF CURB
 - THRESHOLD
 - TOP OF DEBRIS
 - TOP OF WATER
 - TOP OF TRAP
 - TYPICAL
 - THROUGH
 - METAL GRANITE CURB
 - METAL FLAG NUMBER
 - DRAIN
 - ELECTRIC
 - GAS
 - OVERHEAD WIRES
 - ROOF DRAIN
 - SEWER
 - WATER
 - PIPE SIZE AND MATERIAL
 - CAST IRON
 - DUCTILE IRON
 - POLYETHYLENE GLYCOL
 - REINFORCED CONCRETE PIPE
 - UNKNOWN CONNECTION
 - VITRIFIED CLAY PIPE
 - EDGE OF WOODED AREA



- NOTES:**
- BENCH MARK INFORMATION:**
BENCH MARK USED:
ELEVATIONS WERE OBTAINED BY GPS OBSERVATIONS ON JANUARY 25, 2023.
TEMPORARY BENCH MARKS SET:
TBM-KT1: MAG NAIL SET IN 15TH BRICK UP ABOVE VENT ALONG NORTHERLY SIDE OF FOUR STORY BUILDING, AS SHOWN HEREON. ELEVATION = 27.78
TBM-KT2: SPIKE SET APPROXIMATELY 2.0 FEET ABOVE GRADE IN UTILITY POLE #79/59 ALONG EASTERLY SIDELINE OF BLANCHARD ROAD, AS SHOWN HEREON. ELEVATION = 25.31
 - ELEVATIONS REFER TO CAMBRIDGE CITY BASE.
 - CONTOUR INTERVAL EQUALS ONE (1) FOOT.
 - BY GRAPHIC PLOTTING ONLY, A PORTION OF THE PARCEL SHOWN HEREON LIES WITHIN A ZONE "X" (SHADED), AN AREA WITH A 0.2% ANNUAL CHANCE FLOOD; AREAS OF 1% ANNUAL CHANCE FLOOD WITH AVERAGE DEPTHS OF LESS THAN 1 FOOT OR WITH DRAINAGE AREAS LESS THAN 1 SQUARE MILE; AND AREAS PROTECTED BY LEVEES FROM 1% ANNUAL CHANCE FLOOD, AND A PORTION OF THE PARCEL SHOWN HEREON LIES WITHIN ZONE "AE" SPECIAL FLOOD AREA (SHADED) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD, HAVING A BASE FLOOD ELEVATION (BFE) OF 6.5' (SCALED, NAVD83), CAMBRIDGE CITY (BASE ELEVATION). AS SHOWN ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) FLOOD INSURANCE RATE MAP (FIRM) FOR MIDDLESEX COUNTY, MASSACHUSETTS, MAP NUMBER 25017C0418C, CITY OF CAMBRIDGE COMMUNITY NUMBER 250188, PANEL NUMBER 0418C, HAVING AN EFFECTIVE DATE OF JUNE 4, 2018.
 - UTILITY INFORMATION SHOWN IS BASED ON BOTH A FIELD SURVEY AND PLANS OF RECORD. THE LOCATIONS OF UNDERGROUND PIPES AND CONDUITS HAVE BEEN DETERMINED FROM THE AFORESAID RECORD PLANS AND ARE APPROXIMATE ONLY. WE CANNOT ASSUME RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES THAT ARE OMITTED OR INACCURATELY SHOWN ON SAID RECORD PLANS, SINCE SUBSURFACE UTILITIES CANNOT BE VISIBLY VERIFIED, BEFORE PLANNING FUTURE CONNECTIONS. THE PROPER UTILITY ENGINEERING DEPARTMENT SHOULD BE CONSULTED AND THE ACTUAL LOCATION OF SUBSURFACE STRUCTURES SHOULD BE DETERMINED IN THE FIELD, CALL TOLL FREE, THE DIG SAFE CALL CENTER AT 1-888-344-7333 SEVENTY-TWO HOURS PRIOR TO THE EXCAVATION.
 - THIS DOCUMENT IS AN INSTRUMENT OF SERVICE OF FELDMAN GEOSPATIAL, ISSUED TO OUR CLIENT FOR PURPOSES RELATED DIRECTLY AND SOLELY TO FELDMAN GEOSPATIAL'S SCOPE OF SERVICES UNDER CONTRACT TO OUR CLIENT FOR THIS PROJECT. ANY USE OR REUSE OF THIS DOCUMENT FOR ANY REASON BY ANY PARTY FOR PURPOSES UNRELATED DIRECTLY AND SOLELY TO SAID CONTRACT SHALL BE AT THE USER'S SOLE AND UNLIMITED RISK AND LIABILITY, INCLUDING LIABILITY FOR VIOLATION OF COPYRIGHT LAWS, UNLESS WRITTEN CONSENT IS PROVIDED BY FELDMAN GEOSPATIAL.**

1% ANNUAL CHANCE FLOOD NOTE:

- 1% ANNUAL CHANCE FLOOD ELEVATION IS BASED UPON AN ANALYSIS OF THE FLOOD PROFILE FOR MELLINGTON BROOK PRODUCED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA). THE 1% ANNUAL CHANCE FLOOD LINE WAS ESTIMATED TO BE AT ELEVATION 6.8 AS SHOWN ON THE PROFILE AS IT CROSSES THE SUBJECT PROPERTY, AND IS BASED UPON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD1988). ELEVATION 6.8 (NAVD1988) IS EQUIVALENT TO ELEVATION 18.5 CAMBRIDGE CITY BASE, UPON WHICH THIS PLAN IS BASED.



I CERTIFY THAT THIS PLAN IS BASED ON AN ACTUAL FIELD SURVEY AND THE LATEST RECORD PLANS, DEEDS AND CERTIFICATES OF TITLE.

JOSEPH R. ZAMBITO, PLS (MA# 52783)
JZAMBITO@FELDMANGO.COM

OCTOBER 3, 2023
DATE



DRAWING NAME:
EXISTING CONDITIONS PLAN
89 BLANCHARD ROAD
CAMBRIDGE, MASS.

DATE: AUGUST 21, 2023

REVISIONS:	DATE:	DESCRIPTION:
3/16/22		ADDITIONAL TOPOGRAPHY
8/22/23		1% ANNUAL CHANCE FLOOD
10/3/23		ADDITIONAL UTILITIES

FILENAME: 230078-02-1.dwg
RESEARCHER: JZ
FIELD CHECK: JZ
FIELD MGR: JZ
CALC: JZ
FIELD ENG: JZ

SCALE: 1"=20'

SHEET NO. 1 OF 1

Stormwater Management

Existing Conditions:

Under existing conditions roof runoff from the two Blair Pond Estates residential buildings is piped to the existing 12” diameter municipal storm drain located in Normandy Avenue, and roof runoff from the existing commercial building fronting on Blanchard Road is piped to the existing 18” diameter municipal storm drain in Blanchard Road.

Surface runoff from the large parking area in the central portion of the site sheet flows to a single catch basin structure located along the northerly edge adjacent to the stream. There is no curbing along the northerly edge and any runoff not collected by the catch basin flows overland into the stream. The stream drains in an easterly direction to Blair Pond.

Surface runoff from the “nose-in” parking stalls between Blanchard Road and the commercial building as well as the parking area south of the commercial building sheet flows to a double grate catch basin located in Blanchard Road in front of the project site. This double grate catch basin connects to the 18” diameter municipal storm drain which in turn drains northerly discharging to the stream running along the north edge of the project site.

Other than the existing on-site catch basin and Blanchard Road double grate catch basin, surface runoff from the paved parking areas do not receive any water quality enhancement prior to reaching the stream.

Proposed Conditions:

The proposed project will reduce the quantity of runoff leaving the site, improve water quality, and provide groundwater recharge compared with existing conditions.

The proposed project will require a Stormwater Control Permit from the Cambridge Department of Public Works (DPW). A Stormwater Management Plan will be prepared for the project in compliance with the DPW’s Stormwater Management Standards including:

- Improvement to the quality of stormwater leaving the site post-development compared with pre-development conditions.
- Mitigation of the quantity of stormwater leaving the project site post-development compared with pre-development conditions.

The proposed project will reduce the site’s impervious surface area by approximately 2,750 square feet by removing existing asphalt and installing landscaping and permeable pavers for some of the proposed pedestrian walkways. This reduction of impervious surface area will result in a reduction in the quantity of stormwater leaving the site.

The parking layout will be reconfigured for better circulation, curbing will be installed along the perimeter within the limits of work and at proposed landscaped islands, and the parking areas

regraded to create shallow depressions with deep sump/hooded catch basins collecting and treating stormwater runoff. Subsurface infiltration systems comprised of StormTech SC-740 infiltration chambers with isolator-row water quality enhancement will receive runoff from the proposed catch basins as well as roof runoff from the proposed residential building. These subsurface infiltration systems will be sized to store the difference in site runoff between the pre-construction 2-year storm event and the post-construction 25-year storm event in compliance with the DPW's Stormwater Management Standards.

The proposed catch basins and isolator-row water quality enhancement will satisfy the DPW's requirements for Total Suspended Solids (TSS) removal, and the infiltration systems will remove between 65-100% of the average annual load of Total Phosphorous generated by the site's post-development impervious surface area in compliance with the DPW's Standards.

The Applicant will continue to coordinate with the DPW and Conservation Commission as the project plans are further developed and associated stormwater management systems are fully designed.

Erosion and Sediment Controls

The proposed project will include an Erosion and Sediment Control Plan prepared in conformance with the City's Erosion and Sediment Standards.

The plan will include but not be limited to:

- Crushed stone construction entrance(s) to prevent sediment from tracking onto City streets.
- Street sweeping as required.
- Erosion control compost filter socks along the downgradient limit of work.
- Silt sacks in existing catch basins.
- Controlled dewatering discharged to onsite temporary sediment basins.
- Proper management and disposal of construction waste.
- Dust control.

The Applicant will continue to coordinate with the DPW and Conservation Commission as the project plans are further developed and associated Erosion and Sediment Controls are fully designed.

Flood Resiliency

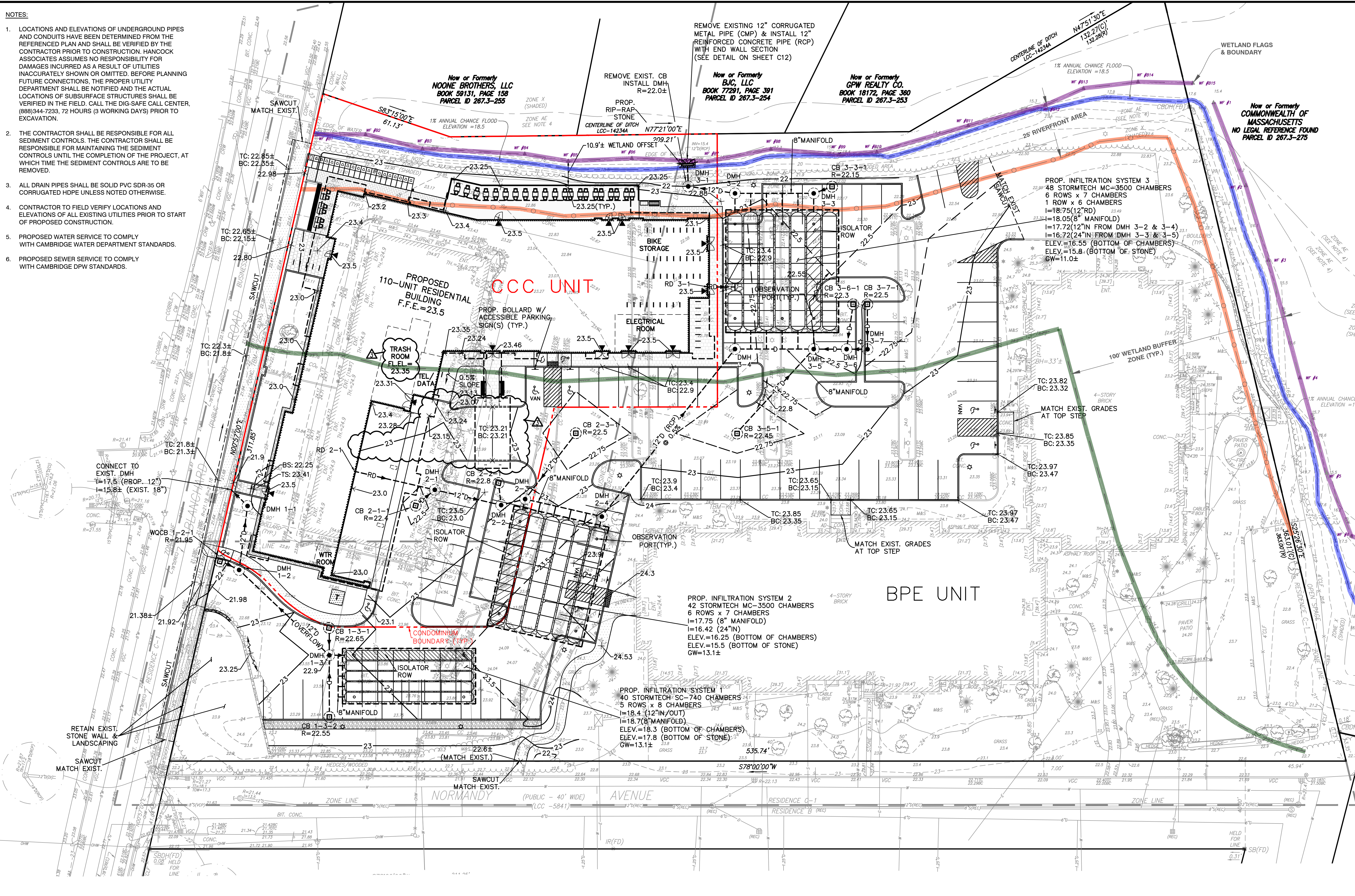
In accordance with the City's Flood Resiliency Standard's the project site is located in an area with a projected 2070 100-year Flood Elevation (Sea Level Rise/Storm Surge) of 23.3 Cambridge City Base.

The proposed building has been designed with a First Floor Elevation (FFE) of 23.5 to be above this projected 2070 flood elevation, and the proposed transformer will be located on the

southerly side of the building (away from the stream) with the transformer pad also set at elevation 23.5 to provide for resiliency against current and future year flood events.

NOTES:

1. LOCATIONS AND ELEVATIONS OF UNDERGROUND PIPES AND CONDUITS HAVE BEEN DETERMINED FROM THE REFERENCED PLAN AND SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. HANCOCK ASSOCIATES ASSUMES NO RESPONSIBILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES INACCURATELY SHOWN OR OMITTED. BEFORE PLANNING FUTURE CONNECTIONS, THE PROPER UTILITY DEPARTMENT SHALL BE NOTIFIED AND THE ACTUAL LOCATIONS OF SUBSURFACE STRUCTURES SHALL BE VERIFIED IN THE FIELD. CALL THE DIG-SAFE CALL CENTER, (888)344-7233, 72 HOURS (3 WORKING DAYS) PRIOR TO EXCAVATION.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SEDIMENT CONTROLS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SEDIMENT CONTROLS UNTIL THE COMPLETION OF THE PROJECT, AT WHICH TIME THE SEDIMENT CONTROLS ARE TO BE REMOVED.
3. ALL DRAIN PIPES SHALL BE SOLID PVC SDR-35 OR CORRUGATED HDPE UNLESS NOTED OTHERWISE.
4. CONTRACTOR TO FIELD VERIFY LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES PRIOR TO START OF PROPOSED CONSTRUCTION.
5. PROPOSED WATER SERVICE TO COMPLY WITH CAMBRIDGE WATER DEPARTMENT STANDARDS.
6. PROPOSED SEWER SERVICE TO COMPLY WITH CAMBRIDGE DPW STANDARDS.



-----4"W-----	4" DOMESTIC WATER SERVICE	-----12"D-----	12" DRAIN PIPE
-----6"F-----	6" FIRE SERVICE	-----RD-----	ROOF DRAIN
-----6"S-----	6" SEWER SERVICE	CB (□)	CATCH BASIN
-----E-----	ELECTRICAL DUCTBANK	DMH (○)	DRAIN MANHOLE
-----T/D-----	TEL/DATA DUCTBANK	WQCB (⊕)	WATER QUALITY CATCH BASIN
-----T/P-----	TRANSFORMER PAD		

BBH SITE PLAN

89 BLANCHARD ROAD
CAMBRIDGE, MA 02138

PREPARED FOR:
BBH COMMUNITY DEVELOPMENT LLC
34 WASHINGTON STREET
BRIGHTON, MA 02135

HANCOCK ASSOCIATES

Civil Engineers
Land Surveyors
Wetland Scientists

121 EAST BERKELEY STREET, BOSTON, MA 02118
VOICE (617) 357-8145, FAX (617) 357-9495
WWW.HANCOCKASSOCIATES.COM

NO.	BY	APP	DATE	ISSUE/REVISION DESCRIPTION
1	CMK	FK	1/10/24	CONS. COMM. COMMENTS
2	CMK	FK	2/29/24	PLANNING BOARD COMMENTS
3	CMK	FK	5/01/24	PLANNING BOARD COMMENTS

DATE: 7/21/2023 DESIGN BY: FAK
SCALE: 1"=20' DRAWN BY: CMK
APPRVD. BY: JP CHECK BY: AD

SITE GRADING & DRAINAGE PLAN

DWG: 26708sp40.dwg
LAYOUT: C5-G&D
SHEET: 5 OF 12
PROJECT NO.: 26708

C-5