

Special Permit Sustainability Narrative Crafts Street Elder Housing with Services Newton, MA April 4, 2022



PROJECT SUSTAINABILITY GOALS

The Crafts Street Elder Housing with Services project team is dedicated to the development of an efficient, sustainable senior housing community that affords the residents safe and healthy living spaces with access to interior and exterior amenity spaces. To satisfy the requirements of Newton's Zoning Ordinance, the project will be designed and constructed in alignment with the US Green Building Council (USGBC) Leadership in Energy and Environmental Design, Building Design and Construction rating system for New Construction projects (LEED-NC). For the duration of design and construction, the project team will continue to evaluate the project against the LEED-NC framework to ensure the building meets high standards in energy efficiency and sustainable design.

Mark Development and the project team understand the importance of building sustainable projects. The team has engaged in early discussions with the intent of integrating sustainability into the project at the start. The project will incorporate applicable Green Newton *Green Building Principles* such as assessing the project for inclusion of Passive House design measures, evaluating building structure and enclosure materials to mitigate the environmental impact of the whole building and researching interior finish materials to ensure they are both durable and of low toxicity.

The site is located on Crafts Street near the intersection with Washington Street. This location is within an aged and unsightly commercial and industrial area with some adjacent residential homes. Crafts Street is a viable location for a compact, sustainable senior housing development. The site provides pedestrian connections to local services and shopping areas, is within walking distance of multiple bus stops, and provides easy access to the Massachusetts Turnpike.

The proposed project replaces two existing homes on Court St, an existing two-story office building and a vacant lot presently used for school bus parking. Locating housing on this site helps to revitalize the area and continues to support smart growth by developing in an area that is both residential and commercial where there is access to services and public transportation.

The building will be designed and constructed with sustainable principals that address the overall project environmental impact, the energy efficiency of the building, the on-going annual maintenance and operations of the building once complete, and the health and well-being of the residents.

Mark Development is working on other projects in Newton and has demonstrated its commitment to sustainable development. To ensure the project is designed and constructed in alignment with the sustainability and energy efficiency goals, the project team is committed to evaluating the following:

- Energy Demand Reduction
- On Site Renewable Energy Systems (Photovoltaics)
- Passive House Design Principals (building envelope)
- LEED for New Construction (LEED -NC) v4 Gold 'Certifiable'
 - On site Rainwater management
 - Analysis of Embodied carbon

PROJECT SUSTAINABILITY FEATURES

Energy Demand Reduction

The goal of the project is to mitigate Greenhouse gas emissions to the extent possible. The project design team will review and assess the building systems to understand the implications of full electrification and the overall building energy demand. *Note - The commercial kitchen requires some equipment to be gas powered.*

As a first step, the project team will identify pathways to reducing the overall annual energy demand, including researching high efficiency building systems such as air source heat pumps and variable refrigerant flow systems.

The entire exterior envelope of the building will be well insulated, resulting in very little heat transmission through the exterior walls, which reduces the need for mechanical heating in the winter or cooling in the summer. The double glazed, highly transparent windows offer U values in the range of 0.2 with shading coefficients approaching 0.4, resulting in a very energy efficient window that also provides a quiet interior.

Additionally, passive house design principals will be studied for inclusion in the envelope design to ensure the building envelope is high performing and helps reduce the energy demand needed for heating and cooling.

Other energy reduction measures such as energy recovery units, all LED lighting, and energy star commercial kitchen equipment will be incorporated into the building's design. Within the individual units, low demand flush and flow domestic plumbing fixtures and all electric energy star rated residential appliances will be included.

On Site Renewable Energy Systems

The inclusion of on-site renewable energy systems helps offset the amount of electricity the project draws from the electric grid, thus reducing demand from commercial generation sources. The most appropriate on-site renewable for a project such as this is roof top Photovoltaics (PV).

At a minimum, the building will be constructed to be 'solar ready' with the appropriate structural roof design and electrical infrastructure to support a future PV array. As part of the early design process the team will undertake an analysis to confirm the size and extent of the photovoltaic array can be accommodated on the building roof top.

Passive House Design Principals

Passive building refers to a set of building design principles that are put in place to push projects to extremely high levels of durability, occupant health, thermal comfort, and energy efficiency. The driving principles behind passive building are:

- Continuous insulation
- Thermal bridge-free design & construction • Improved airtightness
- High-performance glazing

- Solar gain control
- Balanced ventilation with energy recovery • Minimized mechanical systems

The project will implement a feasibility study to gain an understanding of how including Passive House measures may benefit the project. The team will use the PHIUS+ 2021 guidance for the feasibility study.

Health and Wellbeing

Health and wellbeing contribute significantly to the sustainable design drivers for the project. The exterior envelope of the buildings fulfills three important aspects of these objectives: Energy Efficiency, Fresh Air Ventilation, and Ample Daylighting. The interior environment provides clean high quality interior air and ample access to daylight and views.

LEED for New Construction (LEED-NC) v4 Compliance Rating System Narrative

Integrative Process

The project team, including the architect, landscape architect and civil engineer, collaborated on the preliminary concept design. For the duration of the project the team will continue collaborating to identify and use opportunities to achieve synergies across disciplines and energy-related and water-related building systems. Preliminary energy modeling and water budgeting will be completed during further concept design work. We will take an iterative approach to assess multiple scenarios and provide the team with the capacity to make informed decisions. During schematic design energy and water use targets will be further refined and set. These analyses will inform the owner's project requirements (OPR), and the project basis of design (BOD).

Location and Transportation

The project will take advantage of the existing well-established transportation infrastructure in the immediate community. The Project is located at a transition point between a residential neighborhood and a more commercial district and as such provides an opportunity to create a project that reflects and embodies the neighborhood.

The existing parcel will be transformed into a vibrant hub that supports the senior residents with interior and exterior healthy and safe community spaces. The location is pedestrian friendly and easily accessible to two MBTA bus routes and a branch of the commuter rail. Newton streets are generally restricted 25 MPH, which improves the safety of bicycling. With the inclusion of bike racks and changing rooms with showers for employees, the project is bike friendly for staff, visitors, and residents.

On-site parking will be below grade, a minimum of 10% of the parking will be designated for electric vehicle charging stations and an additional 10% of the parking spaces will be electric vehicle charging ready. To actively discourage car use, parking spaces will not be included in resident leases, they will require an additional charge. The quantity of parking spaces provided is

significantly reduced from the LEED referenced baseline. Additionally, the project will provide an onsite transportation including a shuttle bus.

Sustainable Sites

The project team has considered the features of the existing site and the surrounding context and are proposing a building that is sustainable and environmentally conscious while aligning with the scale of the surrounding neighborhood. The team is committed to evaluating measures to address site rainwater including capture and recharge.

The 'side' yard and generous green perimeter provide direct rainwater recharge areas in addition to accessible outdoor space. The courtyard and side yard provide shaded areas and a variety of comfortable seating arrangements, integrated with nature and available for resident use at all times.

In addition to providing areas of respite, the vegetated outdoor use areas will help both mitigate heat island effect and assist in retaining rainwater on site through infiltration. To further mitigate the heat island effect, landscape and pedestrian oriented paving materials and the roof membrane will be SRI compliant. Site lighting will include pedestrian level fixtures; general light pollution will be abated through the incorporation of dark sky compliant exterior light fixtures.

Water Efficiency

To reduce potable water demand, the project will specify and install high efficiency, low-flow domestic plumbing fixtures. Exterior vegetation will be comprised of regionally appropriate, drought tolerant, indigenous plants. Potable water demand for irrigation use will be significantly reduced. The commercial kitchen will include low water demand and energy star rated (or equivalent) equipment.

Energy and Atmosphere (EA)

The building systems shall be designed to optimize energy performance and reduce energy consumption through high efficiency building systems equipment and systems and a high performance building envelope. The proposed project will study the feasibility of all-electric systems. The roof will be designed to accommodate a Photovoltaic (PV) array. If a roof top PV array is installed it will be used to offset a portion of the annual electrical demand of the building.

The project will meet and/or exceed the requirements of the Massachusetts Stretch Energy code and establish a target Energy Use Index (EUI) during the early Schematic Design phase. The proposed residential building will include either air source heat pumps or variable refrigerant flow systems and all electric energy star appliances. For the building envelope design, the project will evaluate Passive House envelope design and infiltration measures for inclusion in the final design.

The proponent plans to implement the use of a whole building energy modeling to document the annual energy use and cost savings. A preliminary energy model will be started during the schematic design phase to assist the design team and owner in making informed decisions about building mechanical, electrical and plumbing and envelope systems.

To ensure the building is designed and constructed as per the Owner's Project Requirements, the team will engage a building commissioning agent to provide document and submittal reviews and on-site observation for the proper installation and operation of the building envelope, HVAC, lighting, PV and plumbing systems. Building level energy and water meters will be included and the project will explore opportunities to participated in a demand response program either upon occupancy or in the future.

The team will work with the local utility companies to ensure applicable incentive programs are pursued. The project will mitigate Greenhouse Gas Emissions to the extent possible and actively contribute to the City's initiative towards Carbon Neutrality.

Materials and Embodied Carbon

The proposed project will be thoughtful about the selection of building materials and products for the structure, enclosure and interior finishes. The team will evaluate the embodied carbon and other possible environmental impacts associated with the extraction, processing, transport, maintenance, and disposal of building materials. The team will endeavor to include design and construction requirements that support a life-cycle approach that improves performance and promotes resource efficiency. Each specific focus will be a component of the larger context of a life-cycle approach to environmental impact reduction.

The project may elect to assess proposed building structure and enclosure materials via a Life Cycle Analysis to better understand and compare the environmental impact of possible materials for inclusion in the project. The current approach for the structural components is to use concrete foundations and below grade construction with above grade wood frame construction, both materials contribute to reduced overall building embodied carbon.

To further reduce embodied carbon the exterior cladding materials will be evaluated for environmental impact, as will a number of interior materials such as gypsum board, light gauge metal framing, ceramic tile, ceiling tile and carpeting.

Interior Air Quality and Environment

As a residential building specifically designed for the elderly, the comfort and well-being of the residents is of utmost importance if not critical, especially given the inclusion of an assisted living residential wing. The project team is aware that elements such as the indoor air quality, access to natural light, exterior views and thermal comfort that make up the interior environment must be carefully studied and considered and designed to address the needs of this aging, vulnerable population.

The exterior walls will be well insulated, and the HVAC system supplies filtered outside air to each unit, providing resident comfort throughout the year. Large operable windows offer residents the opportunity to open the window and let the natural fresh air into the living rooms and bedrooms. 2BR units and many 1BR units also have exterior balconies, which allow residents to have private outdoor space, regardless of the season.

The project mechanical systems will be carefully designed to provide easy access to responsive thermal comfort controls and operable windows. The ventilation system will provide high quality

interior air. A pre-occupancy flush out and on-going maintenance programs will ensure the interior air quality is consistently healthy.

Cleaning policies and procedures for the circulation spaces, common and amenity areas will use low toxicity products including the interior and exterior pest management programs Low-emitting, ultra low toxicity durable materials will be carefully evaluated during the interior finish selection process.

Due to the wide windows with tall heads and low sills the apartments have an abundance of natural daylight deep into the apartments throughout the day and sweeping views of the surrounding neighborhood.

The building and grounds will be non-smoking and the building design will include measures such as entry vestibules and walk-off mats to mitigate the entry of pollutants into the building to maintain a consistent healthy interior environment.

Innovation in Design (IN)

The project will explore opportunities to be innovative and engage with and/or support the local community. For example, the on-site restaurant/café can institute a composting program that the independent living residents can also participate in. Compost could be collected and donated to local community garden groups. Other innovative strategies may include integrated pest management, green cleaning policies and using all LED lamps.

During the process of assessing building materials the team will further analyze them for integrated properties and endeavor to install products within the building that have documented qualitative analysis of the potential health, safety, and environmental impacts of the product in five stages of the products life cycle.

LEED-NC v4 Scorecard

We are providing a preliminary LEED-NC v4 project scorecard to demonstrate that this project will meet the requirement to be "LEED certifiable". The proposed project will target LEED Gold Certification compliance; the supporting LEED scorecard demonstrates that the proposed project will meet the Gold threshold minimum requirement with over 60 credit points and plans to continue exploring additional 'maybe' credits for inclusion in the project.

Resident Health and Wellness

Several of the elements of design and the policies and procedures that will be implemented upon occupancy included in the narrative above, directly impact and address the health and wellbeing of the project population. In addition to the features noted, the project includes access to outdoor, landscaped seating areas, an interior fitness room, activity rooms and a full service restaurant that will provide healthy nutritious meals and a very walkable neighborhood.

Common rooms and amenity spaces will be cleaned on a regular basis, especially the high touch items, such as door handles and faucets. Hands-free design will be employed in appropriate locations, to the extent possible.