Perkins&Will

The Green Engineer
Sustainable Design Consulting

Davis Square Phase 2 **P&Z 21-039 / P&Z 21-042**

BASIS OF DESIGN

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Sustainable Design

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EXECUTIVE SUMMARY

This Section includes an overview of the Davis Square Plaza Development approach to Sustainable Design. The project has established a goal to target LEED-CS v4 Gold Certification for Phase 1 [existing building] and is targeting LEED-CS v4 Platinum for Phase 2 [new construction] and demonstrate compliance with applicable portions of the Somerville Zoning Code. Additionally, the new construction, Phase 2 building project will meet the requirements of the new Massachusetts State Energy Code.

The below narrative describes the project approach for **Phase 2** and the **Civic Plaza** the new construction project, using the USGBC LEED for Building Design and Construction rating system for Core and Shell projects as guidance.

INTEGRATIVE PROCESS

The credit requires the team 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 the building schematic design phase and energy and water use targets will be set. These analyses will inform the owner's project requirements (OPR), be incorporated into the building basis of design, (BOD), design documents, and as appropriate into the construction documents.

LOCATION AND TRANSPORTATION

This category encourages project teams to take advantage of the infrastructure elements in existing communities that provide environmental and human health benefits. The location of the project in the heart of Davis Square, Somerville on a previously developed parcel provides the development opportunities to take advantage of existing and new infrastructure and neighborhood amenities. Below is a list of LEED credits the building projects will target.

Sensitive Land Protection: The development is located on a previously developed site and therefore meets the credit requirements.

High Priority Site: The project is located in a Difficult Development Area and therefore complies with Option 2: Priority Designation, achieving 2 credit points.

Surrounding Density and Diverse Uses: The project is located in a neighborhood with an average density greater than 35,000 square feet per acre and is located within ½-mile walking distance of more than eight diverse uses and therefore achieves all 6 points for meeting the credit requirements for both Option 1 and Option 2.

Access to Quality Transit: The project is within ¼ mile walking distance from the Davis Square MBTA Red Line station which provides access to the subway as well as MBTA bus routes 87, 88, 89, 90, 94 and 96. Collectively the access to public transportation provides a total of 371weekday trips and 242 weekend trips. Per the credit requirements, the number of rides per day achieves 6 credit points.

Bicycle Facilities: The project will provide long-term bike storage for at least 5% of all regular building occupants and short-term bike storage for 2.5% of all peak visitors for each building. Shower facilities and changing rooms will also be provided.

Reduced Parking Footprint: The development is not seeking to add new parking in support of this project

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SUSTAINABLE SITES

The Proponent and Project team have carefully studied the features of the Site and the surrounding context to develop a project that is sustainable and environmentally sensitive.

Prerequisite – Construction Activity Pollution Prevention: The project will create and implement a compliant ESC plan for construction activities associated with the project.

Site Assessment: The team assessed opportunities for the development during the conceptual design phase. The previously developed site is in a dense urban area; it has existing constraints that provide limited opportunities. The team has maximized the site including a renovation of the existing plaza and the inclusion of a blue roof.

Open Space: The development project will target providing open space through the on grade plaza. In total the open space will target greater than 30% of the total site area with 25% or more of the outdoor space to be vegetated.

Rainwater Management: Through the inclusion of a below grade retention tank the development project will target managing enough rainwater on site to meet the requirements for a Zero Lot line - 80th percentile storm.

Heat Island Reduction: The project will include SRI compliant materials for both roof and pedestrian oriented hardscape.

Light Pollution Reduction: The site and building lighting will be designed to align with the allowable backlight uplight, or glare (BUG) ratings for exterior lighting as specified in the Somerville Zoning Code.

Tenant Design and Construction Guidelines: The project will provide future tenants with Tenant Design and Construction guidelines that outline the sustainable and energy efficiency measures included in the core and shell base building. The guidelines will include recommendations for sustainable strategies, products, services, and general information to help tenants streamline the LEED certification process should they elect to pursue it.

WATER EFFICIENCY

In order to improve on-site water efficiency and reduce the burden on municipal water supply and wastewater systems, the development will reduce potable water use for sewage conveyance and process water use. Both whole-building and end-use water metering will be installed in the building project, an air cooled VRF system will be employed to mitigate potable water use for process water. Additionally, the project will specify low flow and high efficiency plumbing fixtures to reduce the amount of potable water used throughout the building. Exterior vegetation will be comprised of regionally appropriate, drought tolerant, indigenous plants.

Preliminary annual water use calculations indicate that a selection of low-flow, high-efficiency fixtures will reduce the potable water demand for the project by approximately 35% when compared to EPA baselines.

Prerequisite/Credit: Outdoor Water Use Reduction: There will not be a permanent irrigation system included in the landscape design**.** The project will pursue the credit implementing the LEED-CS v4.1 requirements for 3 credit points.

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Prerequisite/Credit: Indoor Water Use Reduction: The project will exceed the required 20% annual potable water use reduction and will target an annual potable water reduction of 35% or more for 3 points.

Prerequisite: Whole Building-Level Water Metering: Permanent whole building water meters will be installed and the data will be made available to the USGBC for a minimum of five years.

Water Metering: The credit will be pursued by including meters for two or more water consuming subsystems. As design progresses, the project team will identify two water consuming systems to be sub-metered.

ENERGY AND ATMOSPHERE

The proposed building systems are designed to optimize energy performance and reduce energy consumption through the selection of high efficiency building equipment. The Project team will engage a building commissioning agent and building envelope commissioning agent to ensure the proper installation and operation of systems.

Prerequisite/Credit: Fundamental and Enhanced Commissioning and Verification: The project team will engage a Commissioning Agent (CxA) to review the proposed design and confirm the building systems are installed and function as intended and desired. The project will pursue Enhanced Commissioning and Building Envelope Commissioning to further support the design, construction, and operational requirements for enclosure, energy, water, indoor environmental quality, and durability. Additionally, the project will pursue monitor-based commissioning

Prerequisite/Credit: Energy Performance: As design progresses, the design team will continue to use whole building energy modeling to assess the annual energy use and cost savings. Early energy analysis results from a preliminary assessment estimate annual energy cost savings of approximately 21% (10 points) for the project, when compared to the LEED v4 baseline - Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2010.

Prerequisite/Credit: Building-level Energy Metering: Permanent whole building energy meters for building will be installed and the data made available to the USGBC for a minimum of five years.

Prerequisite: Fundamental Refrigerant Management: Per the prerequisite requirements, the project will not use CFC-based refrigerants in all newly installed mechanical and refrigeration systems.

Credit: Advanced Energy Metering: The credit can be achieved by installing meters for all energy using end uses that consume 10% or more of the total annual building energy use. As design progresses, the project team will continue assess the applicability of this credit.

Green Power and Carbon Offsets: The developer may elect to purchase green power and/or carbon offsets through a 5-year contract to offset 100% of the building's energy use.

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MATERIALS AND RESOURCES

This category focuses on minimizing the embodied energy and other impacts associated with the extraction, processing, transport, maintenance, and disposal of building materials. The requirements are designed to support a life-cycle approach that improves performance and promotes resource efficiency. Each requirement identifies a specific action that fits into the larger context of a life-cycle approach to embodied impact reduction.

Prerequisite: Storage and Collection of Recyclables: Recyclables will be collected throughout the building and designated storage for collected recyclables will be provided for the future tenants. The building management will contract with a local waste hauler to pick up collected/stored recyclables on a regular basis.

Prerequisite/Credit: Construction and Demolition Waste Management: The project manual will include direction for the CM to provide and implement a compliant Construction Waste Management Plan. The construction management team will endeavor to divert demolition debris and construction waste from area landfills to the extent possible. The team will target a minimum diversion rate of 75% overall, using at least two separate material waste streams. The LEED credit will be evaluated based on performance during the construction process.

Building Life-Cycle Impact Reduction: The project will pursue this credit via option 4, Whole Building Life Cycle Assessment. A Life Cycle Analysis will be conducted to assess the buildings impact on the environment.

Building Product Disclosure & Optimization – Raw Materials: The project manual will include technical specifications that enable the CM to procure and install environmentally responsible products and materials.

Building Product Disclosure & Optimization – Environmental Product Declarations: The project manual will include materials and product specification that enable the CM to procure and install at least 20 different permanently-installed products sourced from at least five different manufacturers with compliant EPD documentation.

Building Product Disclosure & Optimization – **Material Ingredients:** The project manual will include materials and product specification that enable the CM to procure and install least 20 different permanently-installed products sourced from at least five manufacturers that use approved program certification to demonstrate the chemical inventory of the product.

INDOOR ENVIRONMENTAL QUALITY

The comfort and well-being of the building occupants will be paramount in regard to air quality, access to light, and thermal comfort. An indoor air quality management plan will be implemented during construction to enhance the well-being of construction workers and to promote a better indoor environment for building occupants. Low-emitting materials will be employed throughout the building to reduce the quantity of indoor air contaminants and promote the comfort and well-being of installers and building occupants.

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Construction practices will promote a high level of indoor air quality during construction. Low-emitting materials (low to no Volatile Organic Compounds, or VOCs) will be used throughout the project to promote health and wellness for occupants. Quality views of will be provided for occupants. Design strategies will focus on future tenant occupant comfort, controllability, and well-being.

Prerequisite: Minimum Indoor Air Quality Performance: The project's mechanical systems will be designed to meet or exceed the requirements of ASHRAE Standards 62. 1-2010.

Prerequisite: Environmental Tobacco Smoke Control: The project will be smoke free, and smoking will be prohibited within 25 feet of building entrances, openings, and air intakes. Signage will be posted as required.

Enhanced Indoor Air Quality Strategies: The project team designed to mitigate and control the entry of pollutants into the building and contain chemical use areas by installing entryway systems, preventing interior cross contamination, and provide proper filtration.

Low-Emitting Materials: The project will comply with the LEED v4.1 requirements for Low Emitting Materials. The project manual will include technical specifications to enable the CM to procure and install materials and products that comply with the credit VOC limits and General Emissions evaluation requirements. The project will endeavor to meet the requirements of four of the following optional compliance categories: adhesives/sealants; paints/coatings; flooring, wall board, ceilings, insulation, composite wood and exterior applied products.

Construction Indoor Air Quality Management Plan: The project manual will provide direction for the CM to develop and implement a compliant Indoor Air Quality Management Plan for the construction and pre-occupancy phases of the Project to meet/exceed the recommended Control Measures of the SMACNA IAQ Guidelines for Occupied buildings Under Construction 2nd Edition 2007, ANSI/SMACNA 008-2008 (Chapter 3).

Daylight: The project will perform a daylight simulation model assessment to demonstrate and confirm illuminance levels will be between 300 lux and 3,000 lux for 9 a.m. and 3 p.m., both on a clear-sky day at the equinox, for 90% (2pts) of the regularly occupied floor area.

Quality Views: A direct line of sight to the outdoors via vision glazing must be provided for 75% of all regularly occupied floor area; a clear image must be provided of the exterior. Demonstration of achievement of this credit will be demonstrated through the use of tenant test fit plans.

INNOVATION IN DESIGN

The project can achieve additional points for implementing, new innovative methodologies, at least one pilot credit, and achieve exemplary performance by exceeding the existing prerequisite and credit requirements.

- **Exemplary Performance:** The project will pursue exemplary performance for MR BPDO - EPDs
- **Innovation:** Low Mercury Lighting – the project will specify and install all LED lighting
- **Innovation:** Occupant Comfort Survey
- **Innovation:** The project will pursue exemplary performance for MR BPDO – Material Ingredients
- **Pilot Credit:** Integrative Analysis of Materials
- **LEED Accredited Professional:** The design team for the project includes several LEED Accredited Professionals. Therefore, this credit will be achieved.

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REGIONAL PRIORITY

Regional Priority Credits (RPCs) are established LEED credits designated by the USGBC to have priority for a particular area of the country. When a project team achieves one of the designated RPCs, an additional credit is awarded to the project for up to four total points.

Applicable Regional Priority Credits (RPC) for the Project include:

- Optimized Energy Performance (17% - 8 points threshold)
- Building Life-Cycle Impact Reduction (2 points threshold)
- High Priority Site (2 points threshold)
- Rainwater Management (2 points threshold)
- Indoor water Use Reduction (40% - 4 points threshold)
- Optimize Energy Performance (17% - 8 points threshold)

The project is currently anticipating one point as 'Yes' for the High Priority Site and Rainwater Management Regional Priority Credits. Achievement of these credit and any additional credits will be confirmed during the design process.